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Testing Specifications for FA Control Network [FL-net]

In case of any doubt arising as to this translation version in English, the original edition of JEM 1480 (J) in Japanese shall prevail.

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TESTING SPECIFICATIONS FOR

FA CONTROL NETWORK [FL-NET]

FOREWORD FOR THE ENGLISH EDITION

This document is the translation version in English of JEM 1480 (J) that is the original edition and is written in Japanese, and is provided for convenience to users and developers of FL-net who feel difficult to understand Japanese language. However, the JEM 1480 (J) is the original and is prevailing while this document is intended for reference only.

This document may be revised to improve the English expression without noticeable version change while the original JEM 1480 (J) is unchanging.

The Working Group on Test and Certification of the FL-net Promotion Committee in the JEMA (The Japan Electrical Manufacturers' Association), is responsible for and maintains the translation of the JEM 1480 (J), and, for that purpose, any comments and questions on the English expression are welcome and helpful for future improvement.

FOREWORD

This document is the standard of the Japan Electrical Manufacturers' Association (the JEMA). After the deliberations by the Working Group on Test and Certification, the FL-net Promotion Committee and the Standardization Committee in the JEMA, this document had been approved as the JEMA standard by the Steering Technical Committee in the JEMA.

It should be remarked that some parts of this standard may conflict with patent rights to technical properties, patent right registration applications after application public release, patent rights for utility articles, or patent right registration application for utility articles after application public release. The Japan Electrical Manufacturers' Association accepts no responsibility for confirmations of such patent rights to technical properties, patent right applications after application public release, patent rights for utility articles, or patent right applications for utility articles after application public release.

TESTING SPECIFICATIONS

FOR FA CONTROL NETWORK [FL-NET]

1 Scope

This document defines the verification tests for checking the conformance and interconnectability of the equipments and the devices that are manufactured in accordance with the Protocol specification for FA control network [FL-NET].

2 Referred standards

The following JEMA standards are referred to in this document, and thus constitute some portions of this document. The latest version (including their addenda) of these referred JEMA standards shall apply. Among these JEMA standards, for those with the year added, the edition of the year mentioned applies, and subsequent revised editions (including amendments) do not apply. For those JEMA standards without annotation of year, the latest version (including any amendments) shall be applied.

JEM 1479:2000 Protocol specification for FA control network standard

JEM 1479:2002 Protocol specification for FA control network standard

JEM 1479:2011 Protocol specification for FA control network standard

JEM 1479:2012 Protocol specification for FA control network standard

JIS B 3521:2004 Protocol specification for FA control network standard

JIS B 3521:2021 Protocol specification for FA control network standard

ISO/IEC/IEEE 8802-3 Telecommunications and exchange between information technology systems - Requirements for local and metropolitan area networks - Part 3: Standard for Ethernet

3 Definitions

Definitions of main and related terms used in this document are listed below. The definitions comply with JEM 1479, while some of them are specifically described below.

3.1 FL-net

Name of the controller-level and device-level network that establishes a communication network between PLC, RC, NC, and FA controllers or personal computers to which UDP/IP and TCP/IP superimposition has been added.

Note: Hereafter, the network in this standard means the FL-net.

3.2 Configuration tool interface

A software module that simulates configuration tools. They may use UDP communication or TCP communication.

3.3 Test equipment

Equipment used to conduct the tests defined in this standard. This standard defines the equipment used for the conformance test, and that for the interconnectability test. The test equipment for interconnectability test shall be equipment whose accuracy has been verified through checks consistent with this standard or other means, and which shall possess display

capabilities which make it easy to check the test results.

4 Notation and abbreviations

4.1 Notation

Numbers not especially specified are decimalized. To denote a hexadecimal number, “16#” precedes the number.

Hexadecimal numbers are to be denoted as a two-digit, four-digit, or eight-digit number. Hexadecimal numbers in eight-digit notation are to be separated by an underscore (_) every four digits.

Example 1. Decimal number	-12	0	4 782	65 546
Example 2. Hexadecimal number	16#FF	16#00	16#12AE	16#0001_000A

In this standard, “#” precedes a node number.

Example: Node number 1 Node #1

“Ver.*.*” is used to denote a version of the protocol specifications in this standard. “*” is a decimal number 0 to 15. The integer part denotes its major version, and the fraction part denotes its minor version. The collective name of a protocol is expressed with only its major version (Example: Ver. 2 protocol).

The minor version consists of two figures.

The following versions exist for FL-net:

The version of JEM 1479: 2000 is denoted as “Ver.1.00”.

The version of JEM 1479: 2002 and JIS B 3521: 2004 are denoted as “Ver.2.00”.

The version of JEM 1479: 2011 is denoted as “Ver.3.00”.

The version of JEM 1479: 2012 and JIS B 3521: 2021 is denoted as “Ver.3.01”.

Note that there is no connection compatibility between a Ver.1 device and a Ver.2 device. In addition, it is also important to note that Ver. 2 devices are also included in the specification of Ver. 3 devices.

4.2 Abbreviation

Table 1 shows abbreviations used in this standard.

Table 1 – List of abbreviations

Abbreviation	Description
3CWT	three circulation waiting time
AWT	message acknowledge waiting time
BCT	broadcast transmission
BSIZE	current block size
CBN	current fragment block number
C_AD1	common memory area 1 data top address
C_AD2	common memory area 2 data top address
C_SZ1	common memory area 1 data size
C_SZ2	common memory area 2 data size
DA	destination address
DNA	node address of destination side
H_TYPE	header type
LKS	FA link status
MAJ_VER	FA link protocol version (major version)
MFT	allowable minimum frame interval time
MIN_VER	FA link protocol version (minor version)
MODE	message mode [FA link protocol version (major version, minor version), token mode]
MSN	manufacturer model name of node information
M_ADD	message offset-address in virtual address space
M_CTL	message control
M_RLT	message result
M_SZ	message data size in virtual address space
NDN	node name of node information
PAT	participation request frame acceptance time
PDU	protocol data unit
PPT	peer to peer transmission
PRI	message priority
PWT	participation request frame transmission waiting time
P_TYPE	protocol type
RCT	allowable refresh cycle time

Table 1 – List of abbreviations (continued)

RMT	refresh cycle measurement time
RPA	response data by ACK
SA	source address
SDU	service data unit
SEQ	sequence number
SNA	node address of source side
TBN	total fragment block number
TCD	transaction code
TFL	total frame octet length of header and data
TW	token watchdog time
TrWT	trigger frame transmission waiting time
ULS	upper layer status
VDN	vender code of node information
VER	program version
V_SEQ	version of sequence number

5 Testing conditions

Unless otherwise specified, the general testing conditions defined in Table 2 are applied when conducting tests:

Table 2 – General testing conditions

Main power supply	Rated voltage, rated frequency
Temperature	15 ºC through 35 ºC
Relative humidity	45% through 85%
Atmospheric pressure	86 kPa through 106 kPa

Manufacturers are required to perform relevant environmental tests (including weather endurance tests, electrical tests, and mechanical tests) on equipment and devices in accordance with JIS B 3521 and JEM 1479. These tests are not defined in this standard.

6 Conformance test

6.1 Structure of conformance test

The conformance test employs an equipment under test (EUT), a PC-based conformance test equipment and a HUB to connect these equipments. The HUB and the equipment are connected with category 5e or more UTP cables. Communication speed of the network is 10 Mbps, 100 Mbps or 1000 Mbps in accordance with the equipment. The structure of the conformance test is shown as Figure 1:

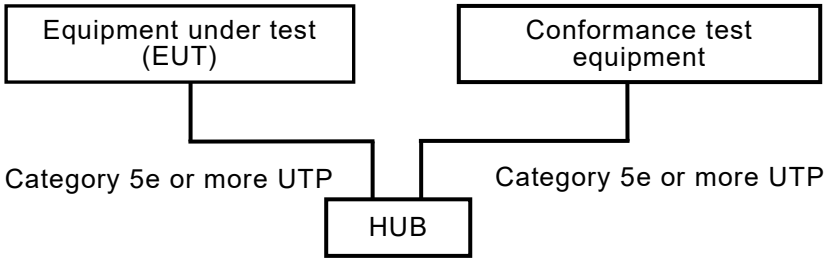


Figure 1 – Structure of conformance test system

a) Conformance test equipment : A node installed with the FL-net protocol to carry out the test. The software for conformance tests must possess a dummy nodes function. For details about the dummy nodes function, see 6.4 c) 1).

b) Equipment under test (EUT) : A node undergoes the FL-net protocol behavior test.

c) Use a switching hub (sw-hub) that has an auto-negotiation function and supports 10 Mbps, 100 Mbps, and 1000 Mbps. Set the hub setting to one of the following according to the communication speed supported by EUT.

   1) Enable auto-negotiation function

   2) 100 Mbps full duplex communication

   3) 10 Mbps full duplex communication

d) In case that the EUT is 100 Mbps-only node or 10/100 Mbps node, the HUB is a switching hub for 100 Mbps.

6.2 Testing items

The test objects are listed in Table 3. For details about the individual items of the test, see 6.6.

Table 3 – Test objects

Major test group	Test group	Test objects	Test No.	Table No.
Initial setting	Initial setting test	Node number and initialization error flag	V2-001	Table 7
		Top address and size of common memory	V2-002	Table8
		Token watchdog time	V2-003	Table 9
		Node name, manufacturer name, model name and transmission frame	V2-004	Table 10
		IP address	V2-005	Table 11
New participation	Normal operation test	Trigger frame, transmission sequence of participation request frame and solicitation frame	V2-006	Table 12
		New participation operation 1	V2-007	Table 13
		New participation operation 2	V2-008	Table 14
		New participation operation 3	V2-009	Table 15
		New participation operation 4	V2-010	Table 16
	Abnormal operation test	Node number duplication	V2-011	Table 17
		Address duplication	V2-012	Table 18
		Discard of abnormal frame (TCD)	V2-013	Table 19
		Token mode discordance (trigger frame)	V2-014	Table 20
		Token mode discordance (participation request frame)	V2-015	Table 21
Halfway participation	Normal operation test	Halfway participation of own node (update of participation node management table)	V2-016	Table 22
		Halfway participation of other nodes	V2-017	Table 23
	Abnormal operation test	Processing at common memory address overlapping	V2-018	Table 24
		Node number duplication	V2-019	Table 25
		Token mode discordance (own node participation)	V2-020	Table 26
		Token mode discordance (other nodes participation)	V2-021	Table 27
Basic function	Basic operation test	Refresh cycle measurement time, Allowable refresh cycle time	V2-022	Table 28
		Secession and rejoining of network	V2-023	Table 29
		Reissue of token	V2-024	Table 30
		Out-ring process, Participation/disengagement flag of the self node	V2-025	Table 31
		Token multiplication	V2-026	Table 32
	Node status test	Token watchdog time error, Token watchdog time error flag	V2-027	Table 33
		Allowable minimum frame interval time	V2-028	Table 34
		Update of participation node management table	V2-029	Table 35

Table 3 – Test objects con (continued)

Major test group	Test group	Test objects	Test No.	Table No.
Cyclic transmission	Normal operation test	Frame format	V2-030	Table 36
		Frame format (divided)	V2-031	Table 37
	Abnormal operation test	Discard of abnormal frame (TBN, CBN)	V2-032	Table 38
		Discard of abnormal frame (BSIZE)	V2-033	Table 39
		Discard of abnormal frame (TCD)	V2-034	Table 40
	Continuous running test	Cyclic transmission echo back test (number of nodes: 2)	V2-035	Table 41
		Cyclic transmission echo back test (number of nodes: 32)	V2-036	Table 42
Message transmission (basic operation)	Message basic function test	No response to peer-to-peer message	V2-037	Table 43
		ACK error of peer-to-peer message	V2-038	Table 44
		Judgment on availability for sending peer-to-peer message request	V2-039	Table 45
	Sequence number and its version (broadcast) test	Version of sequence number setting at message transmission	V2-040	Table 46
		Sequence number setting at message transmission	V2-041	Table 47
		Version of sequence number abnormality at message transmission	V2-042	Table 48
		Version of sequence number abnormality at message reception	V2-043	Table 49
		Sequence number duplication at message reception	V2-044	Table 50
		Sequence number skip at message reception	V2-045	Table 51
		Version of sequence number setting at message transmission	V2-046	Table 52
		Sequence number setting at message transmission	V2-047	Table 53
	Abnormal operation test	Discard of abnormal frame (TCD)	V2-048	Table 54
Message transmission (server function)	Peer-to-peer message operation test (server function)	Byte block read, Byte block write	V2-049	Table 55
		Word block read, Word block write	V2-050	Table 56
		Network parameter read	V2-051	Table 57
		Network parameter write	V2-052	Table 58
		Start command, Stop command	V2-053	Table 59
		Profile read	V2-054	Table 60
		Log data read	V2-055	Table 61
		Log data clear	V2-056	Table 62
		Message echo back	V2-057	Table 63
		Transparent mode message	V2-058	Table 64
	broadcast message operation	Log data clear	V2-059	Table 65
		Transparent mode message	V2-060	Table 66

Table 3 – Test objects con (continued)

Major test group	Test group	Test objects	Test No.	Table No.
Message transmission (client function)	Peer-to-peer message operation test (client function)	Byte block read	V2-061	Table 67
		Byte block write	V2-062	Table 68
		Word block read	V2-063	Table 69
		Word block write	V2-064	Table 70
		Network parameter read	V2-065	Table 71
		Network parameter write	V2-066	Table 72
		Start command	V2-067	Table 73
		Stop command	V2-068	Table 74
		Profile read	V2-069	Table 75
		Log data read	V2-070	Table 76
		Log data clear	V2-071	Table 77
		Message echo back	V2-072	Table 78
		Transparent mode message	V2-073	Table 79
	Broadcast message operation	Log data clear	V2-074	Table 80
		Transparent mode message	V2-075	Table 81
General purpose command server function	Basic operation test (UDP)	Frame sequence number	V3-001	Table 82
		Frame sequence number skip	V3-002	Table 83
	Basic operation test (TCP)	Connection open, close	V3-003	Table 84
		Frame sequence number	V3-004	Table 85
		Frame sequence number skip	V3-005	Table 86
	Operation test of single setting tool (UDP)	IO allocation setting, read	V3-006	Table 87
		Token retention time measurement start/end	V3-007	Table 88
		General purpose communication data sender log measurement start/end	V3-008	Table 89
		Configuration parameter setting, self node setting information parameter read	V3-009	Table 90
		Participating node management information parameter read	V3-010	Table 91
		Self node management information parameter read	V3-011	Table 92
		Node reset	V3-012	Table 93
		Network parameter read	V3-013	Table 94
		Log data read	V3-014	Table 95
		Log data clear	V3-015	Table 96
		Message echo back	V3-016	Table 97
		Byte block read, Byte block write	V3-017	Table 98
		Word block read, Word block write	V3-018	Table 99
		Network parameter write	V3-019	Table 100
		Profile read	V3-020	Table 101
		Start command, Stop command	V3-021	Table 102
	Operation test of double setting tools (UDP)	IO allocation setting (lock confirmation), read	V3-022	Table 103
		IO allocation setting (lock timeout), read	V3-023	Table 104
		IO allocation setting (unlock), read	V3-024	Table 105
		Token retention time measurement start/end	V3-025	Table 106
		General purpose communication data sender log measurement start/end	V3-026	Table 107

Table 3 – Test objects con (continued)

Major test group	Test group	Test objects	Test No.	Table No.
General purpose command server function (continued)	Operation test of single setting tool (TCP)	IO allocation setting, read	V3-027	Table 108
		Token retention time measurement start/end	V3-028	Table 109
		General purpose communication data sender log measurement start/end	V3-029	Table 110
		Configuration parameter setting, self node setting information parameter read	V3-030	Table 111
		Participating node management information parameter read	V3-031	Table 112
		Self node management information parameter read	V3-032	Table 113
		Node reset	V3-033	Table 114
		Network parameter read	V3-034	Table 115
		Log data read	V3-035	Table 116
		Log data clear	V3-036	Table 117
		Message echo back	V3-037	Table 118
		Byte block read, Byte block write	V3-038	Table 119
		Word block read, Word block write	V3-039	Table 120
		Network parameter write	V3-040	Table 121
		Profile read	V3-041	Table 122
		Start command, Stop command	V3-042	Table 123
	Operation test of double setting tools (TCP)	IO allocation setting (lock confirmation), read	V3-043	Table 124
		IO allocation setting (lock timeout), read	V3-044	Table 125
		IO allocation setting (unlock), read	V3-045	Table 126
		Token retention time measurement start/end	V3-046	Table 127
		General purpose communication data sender log measurement start/end	V3-047	Table 128
	Operation test of double setting tools (coexisting UDP and TCP)	IO allocation setting (lock confirmation), read	V3-048	Table 129
		IO allocation setting (lock timeout), read	V3-049	Table 130
		IO allocation setting (unlock), read	V3-050	Table 131
		Token retention time measurement start/end	V3-051	Table 132
		General purpose communication data sender log measurement start/end	V3-052	Table 133

Table 3 – Test objects con (continued)

Major test group	Test group	Test objects	Test No.	Table No.
Device level network function	Slave in fixed setting mode	Slave status, actual slave type and simple setting area	V3-053	Table 134
		IO output upon disengagement of the master	V3-054	Table 135
		IO output upon remote control flag OFF	V3-055	Table 136
		IO input upon remote control flag OFF	V3-056	Table 137
	Master in fixed setting mode	Input and output data	V3-057	Table 138
		Output status	V3-058	Table 139
	Slave in flexible setting mode	New participation operation 1	V3-059	Table 140
		New participation operation 2	V3-060	Table141
		New participation operation 3	V3-061	Table142
		New participation operation 4	V3-062	Table143
		participation to operating network 1	V3-063	Table144
		participation to operating network 2	V3-064	Table145
		participation to operating network 3	V3-065	Table146
		Disengaging/re-joining of flexible master	V3-066	Table147
		Solicitation frame during link establishment	V3-067	Table148
		Slave status, actual slave type, and simple setting confirmation area	V3-068	Table149
		IO output upon disengagement of the master	V3-069	Table150
		IO output upon remote control flag OFF	V3-070	Table151
		IO input upon remote control flag OFF	V3-071	Table152
	Master in flexible setting mode	Joining operation 1	V3-072	Table153
		Joining operation 2	V3-073	Table154
		Joining operation 3	V3-074	Table155
		Disengagement/re-join of flexible slave 1	V3-075	Table156
		disengagement/re-join of flexible slave 2	V3-076	Table157
		Input and output data	V3-077	Table158
		Output status	V3-078	Table159
performance measurement	performance measurement	Measurement of token response time	V2-076	Table160

6.3 Setting range of major parameters in conformance test

The setting range of major parameters in the conformance test is shown in Table 4:

Table 4 – Setting range of major parameters

Major Parameter	Minimum Value	Maximum Value
Node number	1	254
Numbers of cyclic frame	1	17
Common memory: Area 1 data top address	0	511
Common memory: Area 2 data top address	0	8 191
Common memory: Area 1 data size	0	511
Common memory: Area 2 data size	0	8 191
Number of nodes	2	32
Number of IO of flexible slave	0	4032
Number of IO of fixed slave	0	3968

6.4 Test equipment for conformance test

The test equipment used in the conformance test must possess the following functions:

a) **FL-net protocol operating function** All functions specified in JIS B 3521 and JEM 1479, except the following:

- FL-net node load measurement function (however, the functions as the configuration tool is required)
- General-purpose command server function (however, the functions as the configuration tool is required.)

b) **Analyzer function** Function to analyze whether communication frames flowing through the network are normal or not. The basic function for analysis is run while no network transmission is being performed. The analyzer function must be able to analyze the following objects:

1) Ver. 2 Protocol
   - Frame contents of trigger, participation request frame and token at new participation
   - Sequence of trigger, participation request frame and token at new participation
   - Frame contents of participation request frame and token at halfway participation
   - Sequence of participation request frame and token at halfway participation
   - Normal circulation sequence at token circulation
   - Seceding node sequence at token circulation
   - Skip secession sequence at token circulation
   - Multiplexing sequence at token circulation
   - ACK response sequence of peer-to-peer message
   - Resend sequence of peer-to-peer message
   - Request and response sequence of peer-to-peer message
   - ACK non-response sequence of broadcast message
2) Ver. 3 Protocol—Command servers
   - Command frame content in UDP communication
   - Command frame sequence in UDP communication
   - Command frame content in TCP communication
   - Command frame sequence in TCP communication
3) Ver. 3 Device Level Network (flexible master)
   - Content of the trigger and solicitation frames at new participation of the flexible master
   - Sequence of the trigger and solicitation frames at new participation of the flexible master
   - Content of the trigger and solicitation frames from a flexible master at disengagement/re-joining of the flexible slave
   - Sequence of the trigger and solicitation frames from the flexible master at disengagement/re-joining of the flexible slave

- IO data from the flexible master to the flexible slave during link establishment
- Output status from the flexible master to the flexible slave during link establishment

4) Ver. 3 Device Level Network (fixed master)

- IO data from the fixed master to the fixed slave during link establishment
- Output status from the fixed master to the fixed slave during link establishment

5) Ver. 3 Device Level Network (flexible slave)

- Participation request and token contents after the flexible slave receives a solicitation frame at new participation
- Sequence after the flexible slave receives a solicitation frame at new participation
- Behavior of the flexible slave during the disengagement/re-joining of the flexible master
- Contents of the input status area of a flexible slave
- Contents of the flexible slave IO that are output during the disengagement of the flexible master
- Contents from the flexible slave that are output to the flexible master
- IO contents from the flexible slave that are output to the flexible master during a status change

6) Ver.3 Device Level Network (fixed slave)

- Contents of the input status area of a fixed slave
- IO contents that are output during the disengagement of the fixed master
- IO contents from the fixed slave that are output to the fixed master during a status change

c) **Simulator function** The following functions are included:

1) Ver.2 Protocol

- Simulated operation of a single node (dummy node)
- Simulated operation of up to 31 nodes (dummy nodes)
- Adjustment of the trigger transmission timing at new participation
- Adjustment of the participation request frame transmission timing at new participation
- One-node secession operation at token circulation
- Skip operation at token circulation
- Token multiplexing at token circulation
- Reading and writing of common memory data in cyclic transmission
- Creation of a multi-frame CBN error in cyclic transmission
- Creation of a multi-frame BSIZE error in cyclic transmission
- Cyclic transmission echo back test
- Peer-to-peer message transmission

- Peer-to-peer message reception
- ACK non-response creation at peer-to-peer message transmission
- ACK status error creation at peer-to-peer message transmission
- Transmission-interval-adjusted continuous transmission of message at peer-to-peer message transmission
- Creation of abnormal version of sequence number for transmission message at peer-to-peer message transmission
- Creation of abnormal sequence number for transmission message at peer-to-peer message transmission
- Creation of abnormal ACK Version of sequence number at peer-to-peer message transmission
- Peer-to-peer message transmission echo back test
- Broadcast message transmission
- Broadcast message reception
- Transmission of token mode frames=0
- Transmission of abnormal TCB frames to UDP port = 55 000
- Transmission of abnormal TCB frames to UDP port = 55 001
- Transmission of abnormal TCB frames to UDP port = 55 002
- Change in LKS and ULS of token frames

2) Ver.3 setting tool interface
- Single tool UDP operation
- Double tools UDP operation
- Single tool TCP operation
- Double tools TCP operation
- Mixed operation of one UDP and one TCP
- Request command transmission
- Response command acquisition
- Creation of abnormal sequence number for request frames

3) Ver.3 UDP/TCP superimposition
- General-purpose communication data transmission

4) Ver.3 Device Level Network
- Simulated operation of a single node (Class 3-7) (dummy node)
- Simulated operation of multiple nodes (including Class 3-7 coexisting) (dummy nodes)
- Fixed master node simulator
- Fixed slave node simulator

- Flexible master node simulator
- Flexible slave node simulator

d) **Report function** The report function outputs a list of test results. The following functions are included:

- Display of the list of test results
- Report file generation on the test results

The symbols and contents in the files for the report file creation function used in the conformance test are described in Table 5.

Table 5 – Symbols used in the report file on the conformance test

Symbol	Description	Value
BID	Test ID (unique value)	Sequential numbers of test units. Automatic increment by one at each input of test profile (001 through 999).
BDate	Date of testing	System date when test profile is input
BTester	Test executor	Test profile input item
BTool	Name of testing unit (testing tool)	Fixed value: “FL-net Ver.3.01 Conformance test certification tool”
BTarget	Name of the unit under test	Test profile input item
BVersion	Firmware version of the unit under test	Test profile input item
BPlace	Testing site	Test profile input item
BMaker	Manufacturer of the unit under test	Test profile input item
BPerson	Observer of the test	Test profile input item
BClassNo	Class No. of equipment under test	Test profile input item (1 through 7)
BAnyMaster	Device level network function－implementation of flexible master	Test profile input item (1: implemented, 0: not implemented)
BFixMaster	Device level network function－implementation of fixed master	
BAnySlave	Device level network function－implementation of flexible slave	
BFixSlave	Device level network function－implementation of fixed slave	
BSlaveInScore	Device level network function－number of slave input points	Test profile input item (points)
BSlaveOutScore	Device level network function－number of slave output points	
BByteRead	Message transmission client function－implementation of (peer-to-peer) byte block read	Test profile input item (1: implemented, 0: not implemented)
BByteWrite	Message transmission client function－implementation of (peer-to-peer) byte block write	
BWordRead	Message transmission client function－implementation of (peer-to-peer) word block read	
BWordWrite	Message transmission client function－implementation of (peer-to-peer) word block write	
BNetRead	Message transmission client function－implementation of (peer-to-peer) network parameter read	
BNetWrite	Message transmission client function－implementation of (peer-to-peer) network parameter write	
BRun	Message transmission client function－implementation of (peer-to-peer) operation command	
BStop	Message transmission client function－implementation of (peer-to-peer) stop command	
BProfileRead	Message transmission client function－implementation of (peer-to-peer) profile read	
BLogRead	Message transmission client function－implementation of (peer-to-peer) log data read	

Table 5 – Symbols used in the report file on the conformance test (continued)

Symbol	Description	Value
BLogClear1	Message transmission client function－implementation of (peer-to-peer) log data clear	Test profile input item (1: implemented, 0: not implemented) (continued)
BMsgBack	Message transmission client function－implementation of (peer-to-peer) message echo back	
BTransMsg1	Message transmission client function－implementation of (peer-to-peer) transparent mode messages	
BLogClearN	Message transmission client function－implementation of (broadcast) log data clear	Test profile input item (1: implemented, 0: not implemented)
BTransMsgN	Message transmission client function－implementation of (broadcast) transparent mode messages	
BServerTcp	Command server function－implementation of TCP protocol	Test profile input item (1: implemented, 0: not implemented)
BServerMeasure	Implementation of command server load measurement function	
TID	Test ID (ID for basic items reference)	Sequential numbers of test units. Automatic increment by one at each input of test result.
TTime	Test time	System time when test result is output
TTestNum	Test number	Test number
TResult	Test results	Test result (OK/NG/Not implemented)
TNote	Note for test results	Evaluation criterion number and reason for NG result
TPar1	Measured value 1	Values measured during test. Content output depends on the test number.
TPar1Max	Maximum value of measured value 1	
TPar1Min	Minimum value of measured value 1	
TParN	Measured value N (N=2 through 10)	
TParNMax	Maximum value of measured value N	
TParNMin	Minimum value of measured value N	
Note The letter “B” at the head of the symbol names indicates a basic item. The letter “T” indicates a test object.		

6.5 Special instructions about equipment under test (EUT)

6.5.1 Display function

The EUT shall equip any measure such as a peripheral device to confirm items listed in Table 6 through its upper layer.

Table 6 – Confirmation items required to the EUT

Confirmation Items
Node name
Manufacturer name and equipment model name
IP address
Own node status
Participating node management information (upper layer status, top address of the common memory, size, token watchdog time, and FA link status)
FA link status of the self node management information
Participation information of other nodes (participation/disengagement)
Network management information (allowable minimum frame interval time)
Common memory contents
Operation status of upper layer (RUN/STOP)
Reception of transparent mode message
Byte block read response
Word block read response

Table 6 – Confirmation items required to the EUT (continued)

Network parameter read response
Profile read response
Log data read response
Message echo back response
Input data and status from slave (in case the EUT implements master function)
Output data and status from master (in case the EUT implements slave function)
Slave status

6.5.2 Peripheral equipment and test program

To execute this conformance test, the EUT and its peripheral equipment shall install an upper layer application program for the test .

6.6 Test tables for the conformance test

6.6.1 Overview

The test tables for the conformance test are Tables 7 through 160. In the parameter setting of each table, the recommended values for the token watchdog time and allowable minimum frame interval time are listed in parentheses. These values may be modified to fit the EUT performance.

In each table, the “conformance test equipment” is referred to as “test equipment”.

The legend for the EUT Class test objects is as follows:

- “R” indicates that the test is required.
- “O” indicates that the test is required when the corresponding function is implemented.
- “N” indicates that the test is not required.

Note that EUT peripherals, such as a display, are used to check for the flags, such as ULS and LKS in the evaluation criteria.

6.6.2 Initial setting

Tests for initial setting are shown in Tables 7 through 11.

Table 7 – Node number and initialization error flag

Test number		V2-001
Major test group		Initial setting
Test group		Initial setting test
Test objects		Node number, initialization error flag
Test procedure		a) Set initialization data, then start EUT b) Check frames with the test equipment
Evaluation criteria		a) Confirm that the EUT does not accept any value out of the defined setting range when setting the node number. b) In case the EUT can set a value out of the defined range, set the EUT an abnormal value and start it. Confirm that no frame is transmitted to the network by the frame monitoring c) Confirm that an initialization error flag is set in the EUT.
Test necessity identified by the EUT class	Class 1	R
	Class 2	R
	Class 3	R
	Class 4	R
	Class 5	R
	Class 6	R
	Class 7	R

Table 7 – Node number and initialization error flag (continued)

Setting parameters (node)	Pattern 1 (node number = 0)			
	EUT (The parameters will vary according to the class)	Classes 1, 2 and 3	Node number	0
			Token watchdog time	50
			Allowable minimum frame interval time	(0)
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
		Classes 4 and 5	Node number	0
			Token watchdog time	50
			Allowable minimum frame interval time	(0)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1024
			Area 2 data size	1024
		Classes 6 and 7	Node number	0
			Token watchdog time	50
			Allowable minimum frame interval time	(0)
			Area 1 data top address	Optional
			Area 1 data size	To be calculated from number of input points of the slave, the EUT
			Area 2 data top address	Optional
			Area 2 data size	To be calculated from numbers of input and output points of the slave, the EUT
	Test equipment		NA	
	Pattern 2 (Node number = 255)			
	EUT (The parameters will vary according to the class)	Classes 1, 2 and 3	Node number	255
			Token watchdog time	50
			Allowable minimum frame interval time	(0)
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
		Classes 4 and 5	Node number	255
			Token watchdog time	50
			Allowable minimum frame interval time	(0)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1024
			Area 2 data size	1024

Table 7 – Node number and initialization error flag (continued)

Setting parameters (node) (continued)	EUT (The parameters will vary according to the class)	Classes 6 and 7	Node number	255
			Token watchdog time	50
			Allowable minimum frame interval time	(0)
			Area 1 data top address	Optional
			Area 1 data size	To be calculated from number of input points of the slave, the EUT
			Area 2 data top address	Optional
			Area 2 data size	To be calculated from numbers of input and output points of the slave, the EUT
	Test equipment		NA	
Setting parameters (test data)	NA			

Table 8 – Common memory top address and size

Test number		V2-002		
Major test group		Initial setting		
Test group		Initial setting test		
Test objects		Common memory top address and size		
Test procedure		a) Set initialization data, then start the EUT b) Check frame with the test equipment		
Evaluation criteria		Check following items at Patterns 1 through 4 a) Confirm that the EUT does not accept any value out of the defined setting range when setting top address and data size of the common memory. b) In case the EUT can set a value out of the defined range, set the EUT an abnormal value and start it. Confirm that no frame is transmitted to the network by the frame monitoring. c) Confirm that an initialization error flag is set in the EUT.		
Test necessity identified by the EUT class	Class 1	R		
	Class 2	N		
	Class 3	R		
	Class 4	R		
	Class 5	N		
	Class 6	N		
	Class 7	N		
Setting parameters (node)		EUT	Pattern 1 (Illegal Area 1 data top address and size)	Node number	1
				Token watchdog time	50
				Allowable minimum frame interval time	(0)
				Area 1 data top address	512
				Area 1 data size	1
				Area 2 data top address	0
				Area 2 data size	0

Table 8 – Common memory top address and size (continued)

Setting parameters (node) (continued)	EUT (continued)	Pattern 2 (Illegal area 1 data size)	Node number	1
			Token watchdog time	50
			Allowable minimum frame interval time	(0)
			Area 1 data top address	0
			Area 1 data size	513
			Area 2 data top address	0
			Area 2 data size	0
		Pattern 3 (Illegal area 2 address and data size)	Node number	1
			Token watchdog time	50
			Allowable minimum frame interval time	(0)
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	8192
			Area 2 data size	1
		Pattern 4 (Illegal area 2 data size)	Node number	1
			Token watchdog time	50
			Allowable minimum frame interval time	(0)
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	8193
	Test equipment		NA	
Setting parameter (test data)	NA			

Table 9 – Token watchdog time

Test number	V2-003
Major test group	Initial setting
Test group	Initial setting test
Test objects	Token watchdog time
Test procedure	a) Set initialization data, then start the EUT b) Check frame with the test equipment
Evaluation criteria	a) Confirm that the EUT does not accept any value out of the defined setting range when setting token watchdog time. b) In case the EUT can set a value out of the defined range, set the EUT an abnormal value and start it. Confirm that no frame is transmitted to the network by the frame monitoring. c) Confirm that an initialization error flag is set in the EUT.

Table 9 – Token watchdog time (continued)

Test necessity identified by the EUT class	Class 1	R			
	Class 2	R			
	Class 3	R			
	Class 4	R			
	Class 5	R			
	Class 6	R			
	Class 7	R			
Setting parameters (node)		EUT (The parameters will vary according to the class)	Classes 1, 2 and 3	Node number	1
				Token watchdog time	0
				Allowable minimum frame interval time	(0)
				Area 1 data top address	0
				Area 1 data size	0
				Area 2 data top address	0
				Area 2 data size	0
			Classes 4 and 5	Node number	100
				Token watchdog time	0
				Allowable minimum frame interval time	(0)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1024
				Area 2 data size	1024
			Classes 6 and 7	Node number	1
				Token watchdog time	0
				Allowable minimum frame interval time	(0)
				Area 1 data top address	0
				Area 1 data size	To be calculated from number of input points of the slave, the EUT
				Area 2 data top address	0
				Area 2 data size	To be calculated from numbers of input and output points of the slave, the EUT
		Test equipment		NA	
Setting parameter (test data)		NA			

Table 10 – Node name, manufacturer, manufacturer model name and transmission frame

Test number		V2-004			
Major test group		Initial setting			
Test group		Initial setting test			
Test objects		Node name, manufacturer, manufacturer model name and transmission frame			
Test procedure		a) Confirm settings of manufacturer name and manufacturer model name. b) Set initialization data, then start the EUT and fetch frame. c) In case the EUT is class 6, the test equipment transmits a solicitation frame. d) Check frame with the test equipment			
Evaluation criteria		a) Confirm that the EUT transmits node name that the test equipment set, manufacturer name, manufacturer model name, which will be checked by a EUT peripheral device such as a display, to the network with trigger frame and participation request frame. b) Confirm that initialization error flag is reset. c) Confirm that the frame sent is UDP protocol and that port number is 55003.			
Test necessity identified by the EUT class	Class 1	R			
	Class 2	R			
	Class 3	R			
	Class 4	R			
	Class 5	R			
	Class 6	R			
	Class 7	R			
Setting parameter (node)		EUT (the parameters will vary according to the class)	Classes 1, 2 and 3	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(0)
				Area 1 data top address	0
				Area 1 data size	0
				Area 2 data top address	0
				Area 2 data size	0
				Node name	"TargetNode"
				Manufacturer name	Manufacturer's definition
				Manufacturer model name	Manufacturer's definition
			Classes 4 and 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(0)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1024
				Area 2 data size	1024
				Node name	"TargetNode"
				Manufacturer name	Manufacturer's definition
				Manufacturer model name	Manufacturer's definition

Table 10 – Node name, manufacturer, manufacturer model name and transmission frame (continued)

Setting parameter (node) (continued)	EUT (the parameters will vary according to the class) (continued)	Classes 6 and 7	Node number	1
			Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave
			Node name	"TargetNode"
			Manufacturer name	Manufacturer's definition
			Manufacturer model name	Manufacturer's definition
	Test equipment		NA	
Setting parameter (test data)	Solicitation frame		Node address of source side (SNA)	100
			TCD	65014
			Data size	16
			Contents of data	Slave node number = 16#8001 (flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = to be calculated from the number of input points of the slave, the EUT
				Output data address = depends on number of output points of the slave, the EUT * 0 point : 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = to be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#9000 (Area 2, address = 16#1000)
				Lock ID = 100

Table 11 – IP address

Test number		V2-005			
Major test group		Initial setting			
Test group		Initial setting test			
Test objects		IP address			
Test procedure		a) Set initialization data, then start the EUT. b) In case the EUT is class 6, the test equipment transmits a solicitation frame. c) Check frame with the test equipment.			
Evaluation criteria		Confirm that IP address part of the communication frame the EUT transmitted to the network is the setting value by trigger frame.			
Test necessity identified by the EUT class	Class 1	R			
	Class 2	R			
	Class 3	R			
	Class 4	R			
	Class 5	R			
	Class 6	R			
	Class 7	R			
Setting parameter (node)		EUT (the parameters will vary according to the class)	Classes 1, 2 and 3	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(0)
				Area 1 data top address	0
				Area 1 data size	0
				Area 2 data top address	0
				Area 2 data size	0
				Node name	"TargetNode"
				Manufacturer name	Manufacturer's definition
				Manufacturer model name	Manufacturer's definition
				IP address	192.168.250.1
			Classes 4 and 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(0)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1024
				Area 2 data size	1024
				Node name	"TargetNode"
				Manufacturer name	Manufacturer's definition
				Manufacturer model name	Manufacturer's definition
				IP address	192.168.250.100

Table 11 – IP address (continued)

Setting parameter (node) (continued)	EUT (the parameters will vary according to the class) (continued)	Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	0
			Area 1 data size	To be calculated from number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from numbers of input and output points of the slave, the EUT
			Node name	"TargetNode"
			Manufacturer name	Manufacturer's definition
			Manufacturer model name	Manufacturer's definition
			IP address	192.168.250.1
	Test equipment		NA	
Setting parameter (test data)	Solicitation frame		Node address of source side (SNA)	100
			TCD	65017
			Data size	16
			Contents of data	Slave node number = 16#8001 (flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = to be calculated from the number of input points of the slave, the EUT
				Output data address = depends on number of output points of the slave, the EUT * 0 point : 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = to be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#9000 (Area 2, address = 16#1000)
				Lock ID = 100

6.6.3 New participation

a) Normal operation in new participation

Tables 12 through 16 show test tables for normal operation in new participation.

Table 12 – Transmission sequence on trigger frame, participation request frame and solicitation frame

Test number		V2-006
Major test group		New participation
Test group		Normal operation test
Test objects		Transmission sequence on trigger frame, participation request frame and solicitation frame
Test procedure		a) Set upper layer of the EUT into operation and start the EUT only. b) If the EUT is class 6, the test equipment transmits a solicitation frame 8000ms after start of the EUT. c) Confirm operation on evaluation criteria 1. d) Start the test equipment. Confirm operation on evaluation criteria 2. e) Stop the upper layer of the EUT. Confirm evaluation criteria 3.
Evaluation criteria	Criteria 1	Decision criteria varies according to the EUT class a) Classes 1, 2 and 3 (without flexible master function): 1) Confirm transmitting a trigger frame and a participation request frame in this order. 2) Confirm transmitting a trigger frame in every (4200 +/- 10) ms. 3) Confirm transmitting a participation request frame (512 +/- 2) ms after the trigger frame. 4) Confirm not transmitting solicitation frames. 5) Confirm reception waiting flag is set. b) Classes 3 (with flexible master function) and 4: 1) Confirm transmitting a trigger frame, a participation request frame and a solicitation frame in this order. 2) Confirm transmitting trigger frames in every (4200 +/- 10) ms. 3) Confirm transmitting a participation request frame (512 +/- 2) ms after the trigger frame. 4) Confirm transmitting a solicitation frame (1200 +/- 2) ms after the trigger frame. 5) Confirm reception waiting flag is set. c) Class 5: 1) Confirm transmitting a trigger frame and a participation request frame in this order. 2) Confirm transmitting trigger frames in every (4216 +/- 10)ms. 3) Confirm transmitting a participation request frame (400 +/- 2)ms after the trigger frame. 4) Confirm not transmitting solicitation frames. 5) Confirm reception waiting flag is set. d) Class 6: 1) Confirm not transmitting frames until the test equipment transmits a solicitation frame. 2) Confirm transmitting a trigger frame and a participation frame in this order after a solicitation frame from the test equipment. 3) Confirm transmitting trigger frames in every (4208 +/- 10) ms. 4) Confirm transmitting a participation request frame (8 +/- 2) ms after the trigger frame. 5) Confirm not transmitting solicitation frames.. 6) Confirm reception waiting flag is set. e) Class 7: 1) Confirm transmitting a trigger frame and a participation request frame in this order. 2) Confirm transmitting trigger frames in every (4208 +/- 10) ms. 3) Confirm transmitting a participation request frame (8 +/- 2) ms after the trigger frame. 4) Confirm not transmitting solicitation frames.. 5) Confirm reception waiting flag is set.

Table 12 – Transmission sequence on trigger frame, participation request frame and solicitation frame (continued)

Evaluation criteria (continued)	Criteria 2	Confirm that the test equipment transmits first token and that the token circulates 3 times. Confirm that values on common memory and token watchdog time of the test equipment in the participation node management table of the EUT are the same as those setting values at the test equipment Confirm that the test equipment participates to the network. The participation status is confirmed by self node participation table and participation node management table. Confirm status of the EUT that ULS (upper layer status) RUN flag is "1", upper layer operation signal error flag of LKS (FA link status) is "0", address duplication detection flag is 0 and statuses of common memory validity notification flag and common memory setting complete flag are the same as those that the manufacturer intents.			
	Criteria 3	Confirm that ULS (upper layer status) RUN flag of the EUT is "0".			
Test necessity identified by the EUT class	Class 1	R			
	Class 2	R			
	Class 3	R			
	Class 4	R			
	Class 5	R			
	Class 6	R			
	Class 7	R			
Setting parameter (node)		EUT (parameters will vary according to the class)	Classes 1, 2 and 3 (without flexible master function)	Node number	128
				Token watchdog time	(50)
				Allowable minimum frame interval time	(0)
				Area 1 data top address	0
				Area 1 data size	0
				Area 2 data top address	0
				Area 2 data size	0
				Node name	"TargetNode"
				Manufacturer name	Manufacturer's definition
				Manufacturer model name	Manufacturer's definition
			Classes 3 (with flexible master function) and 4	Node number	128
				Token watchdog time	(100)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1024
				Area 2 data size	1024
				Node name	"TargetNode"
				Manufacturer's name	Manufacturer's definition
				Manufacturer's model name	Manufacturer's definition
				IO allocation setting (number of control slaves)	10

Table 12 – Transmission sequence on trigger frame, participation request frame and solicitation frame (continued)

Setting parameter (node)	EUT (parameters will vary according to the class)	Classes 3 (with flexible master function) and 4	IO allocation setting (slave setting) (N = 0 through 9)	Slave node number = 16#8001 + N (flexible setting mode, node number = N + 1
				Input data address = 16#0000 + (4 x N) (Area 1, address = 4 x N)
				Input data size = 4
				Output data address = 16#0100 + (4 x N) (Area 1, Address = 256 + 4 x N)
				Output data size = 4
				Input status address = 16#8000 + (16 x N) (Area 2, address = 16 x N)
				Output status address = 16#8400 + (16 x N) (Area 2, address = 1024 + 16 x N)
		Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1024
			Area 2 data size	1024
			Node name	"TargetNode"
			Manufacturer name	Manufacturer's definition
			Manufacturer model name	Manufacturer's definition
		Classes 6 and 7	Node number	2
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	Depends on the number of input point of the slave, the EUT: * 0 point: 0 * 1 point or more: 4
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	16
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT.
			Node name	"TargetNode"
			Manufacturer name	Manufacturer's definition
			Manufacturer model name	Manufacturer's definition

Table 12 – Transmission sequence on trigger frame, participation request frame and solicitation frame (continued)

Setting parameter (node) (continued)	EUT (The settings will vary according to the class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	50
			Allowable minimum frame interval time	0
			Area 1 data top address	64
			Area 1 data size	32
			Area 2 data top address	128
			Area 2 data size	16
		Classes 6 and 7	Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	50
			Allowable minimum frame interval time	0
			Area 1 data top address	256
			Area 1 data size	32
			Area 2 data top address	1024
			Area 2 data size	16
Setting parameter (test data)	Solicitation frame		Node address of source side (SNA)	1
			TCD	65017
			Data size	16
			Contents of data	Slave node number = 16#8002 (Flexible setting mode, node number = 2)
				Input data address = According to number of input points of the slave, the EUT * 0 point: 16#0000 (Area 1, address = 0) 1 point or more: 16#0004 (Area 1, address = 4)
				Input data size = To be calculated from the number of input points of the slave, the EUT
				Output data address = According to number of output points of the slave, the EUT * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8010 (Area 2, address = 16)
				Output status address = 16#8400 (Area 2, address = 1024)
				Lock ID = 128

Table 12 – Transmission sequence on trigger frame, participation request frame and solicitation frame (continued)

Setting parameter (test data) (continued)	EUT (The parameters will vary according to the class)	Classes 1, 2, 3, 4 and 5	Participation node management table data: Top address and size of node #1 common memory and FA link status	Area 1 data top address = 64
				Area 1 data size = 32
				Area 2 data top address = 128
				Area 2 data size = 16
				FA link status (participation flag) = set
		Classes 6 and 7	Participation node management table data: Top address and size of node #1 common memory and FA link status	Area 1 data top address = 256
				Area 1 data size = 32
				Area 2 data top address = 1024
				Area 2 data size = 16
				FA link status (participation flag) = set
	Test equipment		Self node status	Criteria 1: waiting-for-receive flag is ON
			FA link status	Criteria 2: participation/disengaging flag is ON
			LES	16#60 or 16#61
			Upper layer operation status	Criteria 2: RUN/STOP is ON
				Criteria 3: RUN/STOP in OFF

Table 13 – New participation operation 1

Test number		V2-007
Major test group		New participation
Test group		Normal operation test
Test objects		New participation operation 1
Test procedure		a) Start the EUT, then start the test equipment b) In case the EUT is class 6, the test equipment transmits a solicitation frame. c) The test equipment transmits a trigger frame (4200 + 200)ms after the EUT transmits a trigger frame. (Because the EUT transmits a trigger frame first, the test equipment does not transmit one at normal timing.)
Evaluation criteria		a) Confirm the EUT transmits a participation request frame (T +/- 2)ms after the test equipment transmits the trigger frame. Value T varies according to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: T = 4 * Class 5: T = 400 b) Confirm the EUT transmits the first token frame. c) Confirm the token frame circulates 3 times. d) Confirm the first token frame is transmitted more than (1200 - 2)ms and less than (1200 + EUT token watchdog time)ms after the trigger frame.
Test necessity identified by the EUT class	Class 1	R
	Class 2	R
	Class 3	R
	Class 4	R
	Class 5	R
	Class 6	R
	Class 7	R

Table 13 – New participation operation 1 (continued)

Setting parameter (node)	EUT (the parameters will vary according to the class)	Classes 1, 2 and 3	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
			Node name	"TargetNode"
			Manufacturer name	Manufacturer's definition
			Manufacturer model name	Manufacturer's definition
		Class 4	Node number	1
			Token watchdog time	(100)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1024
			Area 2 data size	1024
			Node name	"TargetNode"
			Manufacturer name	Manufacturer's definition
			Manufacturer model name	Manufacturer's definition
		Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1024
			Area 2 data size	1024
			Node name	"TargetNode"
			Manufacturer name	Manufacturer's definition
			Manufacturer model name	Manufacturer's definition
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0

Table 13 – New participation operation 1 (continued)

Setting parameter (node)	EUT (The parameters will vary according to the class)	Classes 6 and 7 (continued)	Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
			Node name	"TargetNode"
			Manufacturer name	Manufacturer's definition
			Manufacturer model name	Manufacturer's definition
	Test equipment		Implementation class	3 (Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	0
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data top address	0
Setting parameter (test data)	Solicitation frame		Node address of source side (SNA)	128
			TCD	65017
			Data size	16
			Contents of data	Slave node number = 16#0001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = To be calculated from the number of input points of the slave, the EUT
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#8400 (Area 2, address = 1024)
				Lock ID = 128

Table 14 – New participation operation 2

Test number		V2-008			
Major test group		New participation			
Test group		Normal operation test			
Test objects		New participation operation 2			
Test procedure		a) Start the EUT, then start the test equipment b) In case the EUT is class 6, the test equipment transmits a solicitation frame. c) The test equipment transmits a trigger frame (4200 - 200) ms after the EUT transmits a trigger frame. (After the test equipment transmits the trigger frame, the EUT starts participation operation without transmitting a trigger frame.)			
Evaluation criteria		a) Confirm that the EUT transmits a participation request frame (T +/- 2)ms after the test equipment transmits a trigger frame. Value T varies according to the EUT class. * Classes 1, 3, 4, 6 and 7: T = 4 * Class 5: T = 400 b) Confirm that the EUT transmits the first token frame. c) Confirm that the token frame circulates 3 times. d) Confirm that the first token frame is transmitted more-than--(1200 - 2)ms and less-than-(1200 + EUT token watchdog time)ms after the trigger frame.			
Test necessity identified by the EUT class	Class 1	R			
	Class 2	R			
	Class 3	R			
	Class 4	R			
	Class 5	R			
	Class 6	R			
	Class 7	R			
Setting parameter (node)		EUT (The parameter will vary according to the class)	Classes 1, 2 and 3	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(0)
				Area 1 data top address	0
				Area 1 data size	0
				Area 2 data top address	0
				Area 2 data size	0
			Class 4	Node number	1
				Token watchdog time	(100)
				Allowable minimum frame interval time	(0)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1024
				Area 2 data size	1024
				IO allocation setting	optional
			Class 5	Node number	100
				Token watchdog time	(100)

Table 14 – New participation operation 2 (continued)

Setting parameter (node) (continued)	EUT (The parameters will vary according to the class)	Class 5 (condign)	Allowable minimum frame interval time	(0)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1024
			Area 2 data size	1024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment		Implementation class	3 (Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	0
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
Setting parameter (test data)	Solicitation frame		Node address of source side (SNA)	128
			TCD	65017
			Data size	16
			Contents of data	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = To be calculated from the number of input points of the slave, the EUT
				Output data address = According to the number of output points of the slave, the EUT * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)

Table 14 – New participation operation 2 (continued)

Setting parameter (test data) (continued)	Solicitation frame (continued)	Contents of data (continued)	Output status address = 16#8400 (Area 2, address = 1024)
			Lock ID = 128

Table 15 – New participation operation 3

Test number		V2-009			
Major test group		New participation			
Test group		Normal operation test			
Test objects		New participation operation 3			
Test procedure		a) Start the EUT, then start the test equipment b) In case the EUT is class 6, the test equipment transmits a solicitation frame c) The test equipment transmits a trigger frame (4200 + 200)ms after the EUT transmits a trigger frame. (Because the EUT transmits a trigger frame first, the test equipment does not transmit one at normal timing.)			
Evaluation criteria		a) Confirm that the EUT transmits a participation request frame (T +/- 2)ms after the test equipment transmits a trigger frame. Value T varies according to the class of the EUT. * Classes 1, 2, 3 and 4: T = 1016 * Class 5: T = 400 * Class 6: T = 996 * Class 7: T = 8 b) Confirm that the EUT transmits the first token frame c) Confirm that the token frame circulates 3 times.			
Test necessity identified by the EUT class	Class 1	R			
	Class 2	R			
	Class 3	R			
	Class 4	R			
	Class 5	R			
	Class 6	R			
	Class 7	R			
Setting parameter (node)		EUT (The parameters will vary according to the class)	Classes 1, 2 and 3	Node number	254
				Token watchdog time	(50)
				Allowable minimum frame interval time	(0)
				Area 1 data top address	0
				Area 1 data size	0
				Area 2 data top address	0
				Area 2 data size	0
			Class 4	Node number	254
				Token watchdog time	(100)
				Allowable minimum frame interval time	(0)
				Area 1 data top address	256
				Area 1 data size	256

Table 15 – New participation operation 3 (continued)

Setting parameter (node)	EUT (The parameters will vary according to the class)	Class 4 (continued)	Area 2 data top address	1024
			Area 2 data size	1024
			IO allocation setting	Optional
		Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1024
			Area 2 data size	1024
		Class 6	Node number	249
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
		Class 7	Node number	2
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	According to the number of input points of the slave, the EUT: * 0 point: 0 * 1 point or more: 4
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	16
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment		Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	50
			Allowable minimum frame interval time	0
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0

Table 15 – New participation operation 3 (continued)

Setting parameter (node) (continued)	Test equipment (continued)	Area 2 data size (continued)	0
Setting parameter (test data)	Solicitation frame	Node address of source side (SNA)	128
		TCD	65017
		Data size	16
		Contents of data	Slave node number = 16#80F9 (Flexible setting mode, node number = 249
			Input data address = 16#0000 (Area 1, address = 0)
			Input data size = To be calculated from the number of input points of the slave, the EUT
			Output data address = According to the number of output points of the slave, the EUT * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
			Output data size = To be calculated from the number of output points of the slave, the EUT
			Input status address = 16#8000 (Area 2, address = 0)
			Output status address = 16#8400 (Area 2, address = 1024)
			Lock ID = 128

Table 16 – New participation operation 4

Test number		V2-010
Major test group		New participation
Test group		Normal operation test
Test objects		New participation operation 4
Test procedure		a) Start the EUT, then start the test equipment b) In case the EUT is class 6, the test equipment transmits a solicitation frame. c) The test equipment transmits a trigger frame (4200 + 200)ms after the EUT transmits a trigger frame. (Because the EUT transmits a trigger frame first, the test equipment does not transmit one at normal timing.)
Evaluation criteria		a) Confirm that the EUT transmits a participation request frame (T +/- 2)ms after the test equipment transmits a trigger frame. Value T varies according to the class of the EUT. * Classes 1, 2, 3 and 4: T = 1016 * Class 5: T = 400 * Class 6: T = 996 * Class 7: T = 8 b) Confirm that the EUT transmits the first token frame c) Confirm that the token frame circulates 3 times.
Test necessity identified by the EUT class	Class 1	R
	Class 2	R
	Class 3	R
	Class 4	R
	Class 5	R
	Class 6	R
	Class 7	R

Table 16 – New participation operation 4 (continued)

Setting parameter (node)	EUT (The parameters will vary according to the class)	Classes 1, 2 and 3	Node number	254
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
		Class 4	Node number	254
			Token watchdog time	(100)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1024
			Area 2 data size	1024
			IO allocation setting	Optional
		Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1024
			Area 2 data size	1024
		Class 6	Node number	249
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
		Class 7	Node number	2
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	According to the number of input points of the slave, the EUT: * 0 points: 0 * 1 points or more: 4

Table 16 – New participation operation 4 (continued)

Setting parameter (node) (continued)	EUT (The parameters will vary according to the class) (continued)	Class 7 (continued)	Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment		Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	50
			Allowable minimum frame interval time	0
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
Setting parameter (test data)	Solicitation frame		Node address of source side (SNA)	128
			TCD	65017
			Data size	16
			Contents of data	Slave node number = 16#00F9 (Flexible setting mode, node number = 249)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = To be calculated from the number of input points of the slave, the EUT
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#8400 (Area 2, address = 1024)
				Lock ID = 128

b) Abnormal operation in new participation Table 17 to Table 21 show the test tables for abnormal operation in new participation.

Table 17 – Node number duplication

Test number		V2-011		
Major test group		New participation		
Test group		Abnormal operation test		
Test objects		Node number duplication		
Test procedure		a) Start the test equipment after the EUT becomes in stable operation. b) In case the EUT is class 6, the test equipment transmits a solicitation frame. c) The test equipment transmits a participation request frame in 300ms.		
Evaluation criteria		Confirm followings after the test equipment transmits the participation request frame: a) The EUT does not transmit a participation request frame. b) The EUT sets node number duplication flag.		
Test necessity identified by the EUT class	Class 1	R		
	Class 2	R		
	Class 3	R		
	Class 4	R		
	Class 5	R		
	Class 6	R		
	Class 7	R		
Setting parameter (node)		EUT (The parameters will vary according to the class)	Classes 1, 2 and 3	Node number: 100 Token watchdog time: (50) Allowable minimum frame interval time: (0) Area 1 data top address: 0 Area 1 data size: 0 Area 2 data top address: 0 Area 2 data size: 0
			Classes 4 and 5	Node number: 100 Token watchdog time: (100) Allowable minimum frame interval time: (0) Area 1 data top address: 256 Area 1 data size: 256 Area 2 data top address: 1024 Area 2 data size: 1024 IO allocation setting (Class 4): Optional
			Classes 6 and 7	Node number: 1 Token watchdog time: (50) Allowable minimum frame interval time: (0) Area 1 data top address: 0

Table 17 – Node number duplication (continued)

Setting parameter (node)	EUT (The parameters will vary according to the class)	Classes 6 and 7 (continued)	Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test eq1uipment (The parameters will vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	100
			Token watchdog time	50
			Allowable minimum frame interval time	0
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
		Classes 6 and 7	Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	50
			Allowable minimum frame interval time	0
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
Setting parameter (test data)	Solicitation frame		Node address of source side (SNA)	128
			TCD	65017
			Data size	16
			Contents of data	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = To be calculated from the number of input points of the slave, the EUT
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)

Table 17 – Node number duplication (continued)

Setting parameter (test data) (continued)	Solicitation frame (continued)	Contents of data (continued)	Output status address = 16#8400 (Area 2, address = 1024)
			Lock ID = 128

Table – 18 Address duplication

Test number		V2-012			
Major test group		New participation			
Test group		Abnormal operation test			
Test objects		Address duplication			
Test procedure		a) Start the test equipment after the EUT is in stable operation. b) In case the EUT is class 6, the test equipment transmits a solicitation frame. c) Execute tests with test data of patterns 1 through 3 in this order. (If the EUT is class 6 or 7 and number of input points of slave is 0 point, execute tests with test data of patterns 1 and 2 in this order.)			
Evaluation criteria		Confirm followings at each test data of patterns 1 through 3. a) The EUT set top address and size of the common memory to 0. b) The test equipment transmits a participation request frame before the EUT transmits the one. c) Token frame circulates. d) The EUT set address duplication detection flag.			
Test necessity identified by the EUT class	Class 1	R			
	Class 2	N			
	Class 3	R			
	Class 4	R			
	Class 5	R			
	Class 6	R (The test data pattern applied varies according to the number of input points of the slave) * 0 point: Patterns 1 and 2 * 1 point of more: Patterns 1 through 3			
	Class 7	R (The test data pattern applied varies according to the number of input points of the slave) * 0 point: Patterns 1 and 2 * 1 point of more: Patterns 1 through 3			
Setting parameter (node)		EUT (The parameters will vary according to the class)	Classes 1, 3 and 4	Node number	254
				Token watchdog time	(50)
				Allowable minimum frame interval time	(0)
				Area 1 data top address	4
				Area 1 data size	4
				Area 2 data top address	64
				Area 2 data size	64
				IO allocation setting (In case of class 4)	Optional
			Class 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(0)

Table – 18 Address duplication (continued)

Setting parameter (node) (continued)	EUT (The parameters will vary according to the class) (continued)	Class 5 (continued)	Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1024
			Area 2 data size	1024
		Classes 6 and 7	Node number	2
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	According to the number of input points of the slave, the EUT * 0 point: 0 * 1 point or more: 4
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT.
			Area 2 data top address	16
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment Pattern 1 (The parameters will vary according to the EUT class.)	Classes 1, 3 and 4	Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	50
			Allowable minimum frame interval time	0
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 5	Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	100
			Allowable minimum frame interval time	0
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1024
			Area 2 data size	1024
		Classes 6 and 7	Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	50
			Allowable minimum frame interval time	0
			Area 1 data top address	According to the number of input points of the slave, the EUT * 0 point: 0 * 1 point or more: 4
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT

Table – 18 Address duplication (continued)

Setting parameter (node) (continued)	Test equipment Pattern 1 (The parameters will vary according to the EUT class.)	Classes 6 and 7	Area 2 data top address	16
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment Patter 2 (The parameters will vary according to the EUT class)	Classes 1, 3 and 4	Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	50
			Allowable minimum frame interval time	0
			Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	127
			Area 2 data size	64
		Class 5	Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	100
			Allowable minimum frame interval time	0
			Area 1 data top address	0
			Area 1 data size	256
			Area 2 data top address	2047
			Area 2 data size	1024
		Classes 6 and 7	Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	50
			Allowable minimum frame interval time	0
			Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	15 + Area 2 data size of the EUT
			Area 2 data size	16

Table – 18 Address duplication (continued)

Setting parameter (node) (continued)	Test equipment Patter 3 (The parameters will vary according to the EUT class)	Classes 1, 3 and 4	Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	50
			Allowable minimum frame interval time	0
			Area 1 data top address	1
			Area 1 data size	4
			Area 2 data top address	128
			Area 2 data size	64
		Class 5	Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	100
			Allowable minimum frame interval time	0
			Area 1 data top address	1
			Area 1 data size	256

Table – 18 Address duplication (continued)

Setting parameter (node) (continued)	Test equipment Pattern 3 (The parameters will vary according to the EUT class)	Class 5 (continued)	Area 2 data top address	2048
			Area 2 data size	1024
		Classes 6 and 7	Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	50
			Allowable minimum frame interval time	0
			Area 1 data top address	1
			Area 1 data size	4
			Area 2 data top address	16 + Area 2 data size of the EUT
			Area 2 data size	16
Setting parameter (Test data)	Solicitation frame		Node address of source side (SNA)	1
			TCD	65017
			Data size	16
			Contents of data	Slave node number = 16#8002 (Flexible setting mode, node number = 2)
				Input data address = According to the number of input points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Input data size = To be calculated from the number of input points of the slave, the EUT
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8010 (Area 2, address = 16)
				Output status address = 16#8400 (Area 2, address = 1024)
				Lock ID = 1

Table 19 – Discard of abnormal frame

Test number		V2-013			
Major test group		New participation			
Test group		Abnormal operation test			
Test objects		Discard of abnormal frame (TCD)			
Test procedure		a) Start the EUT, then start the test equipment. b) In case the EUT is class 6, the test equipment transmits a solicitation frame. c) The test equipment transmits an abnormal TCD frame (4200 - 200)ms after the EUT transmits a trigger frame. d) The test equipment transmits a trigger frame just after the above. Test is executed with 2 patterns of abnormal TCD frames.			
Evaluation criteria		Confirm followings at each abnormal TCD frames of patterns 1 and 2: a) Confirm that the EUT transmits a participation request frame (T +/- 2) ms after the test equipment transmits the trigger frame. Value T varies depending on the EUT class: * Classes 1, 2, 3 and 4: T = 1016 * Class 5: T = 400 * Class 6: T = 996 * Class 7: T = 8			
Test necessity identified by the EUT class	Class 1	R			
	Class 2	R			
	Class 3	R			
	Class 4	R			
	Class 5	R			
	Class 6	R			
	Class 7	R			
Setting parameter (node)		EUT (The parameters will vary according to the class)	Classes 1, 2 and 3	Node number	254
				Token watchdog time	(50)
				Allowable minimum frame interval time	(0)
				Area 1 data top address	0
				Area 1 data size	0
				Area 2 data top address	0
				Area 2 data size	0
			Class 4	Node number	254
				Token watchdog time	(100)
				Allowable minimum frame interval time	(0)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1024
				Area 2 data size	1024
			Class 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(0)

Table 19 – Discard of abnormal frame (continued)

Setting parameter (node) (continued)	EUT (The parameters will vary according to the class) (continued)	Class 5 (continued)	Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1024
			Area 2 data size	1024
		Class 6	Node number	249
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
		Class 7	Node number	2
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	Depending on the number of input points of the slave, the EUT: * 0 point: 0 * 1 point of more: 4
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT.
			Area 2 data top address	16
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT.
	Test equipment		Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	50
			Allowable minimum frame interval time	0
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
Setting parameter (test data)	Solicitation frame		Node address of source side (SNA)	128
			TCD	65017
			Data size	16
			Contents of data	Slave node number = 16#80F9 (Flexible setting mode, node number = 249)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = To be calculated from the number of input points of the slave, the EUT

Table 19 – Discard of abnormal frame (continued)

Setting parameter (test data) (continued)	Solicitation frame (continued)	Contents of data (continued)	Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
			Output data size = To be calculated from the number of output points of the slave, the EUT
			Input status address = 16#8000 (Area 2, address = 0)
			Output status address = 16#8400 (Area 2, address = 1024)
			Lock ID = 128
	Pattern 1	Destination port number	55002
		TCD	0
	Pattern 2	Destination port number	55002
		TCD	65000

Tables 20 – Token mode discordance

Test number		V2-014		
Major test group		New participation		
Test group		Abnormal operation test		
Test objects		Token mode discordance		
Test procedure		Start the EUT, then start the test equipment. In case the EUT is class 6, the test equipment transmits a solicitation frame. The test equipment transmits a trigger frame with token mode = 0 (4200 - 200) ms after the EUT transmits a trigger frame.		
Evaluation criteria		Confirm followings after the test equipment transmits the trigger frame. The EUT does not transmit any frame to the network. The EUT sets self node invalid communication detection flag.		
Test necessity identified by the EUT class	Class 1	R		
	Class 2	R		
	Class 3	R		
	Class 4	R		
	Class 5	R		
	Class 6	R		
	Class 7	R		
Setting parameter (node)		EUT (The parameters will vary according to the class)	Classes 1, 2 and 3	Node number: 254 Token watchdog time: (50) Allowable minimum frame interval time: (0) Area 1 data top address: 0 Area 1 data size: 0 Area 2 data top address: 0 Area 2 data size: 0

Tables 20 – Token mode discordance (continued)

Setting parameter (node)	EUT (The parameters will vary according to the class)	Class 4	Node number	254
			Token watchdog time	(100)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1024
			Area 2 data size	1024
			IO allocation setting	Optional
		Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1024
			Area 2 data size	1024
		Class 6	Node number	249
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
		Class 7	Node number	2
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	According to the number of input points of the slave, the EUT: * 0 point: 0 * 1 point or more: 4
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	16
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment		Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	50
			Allowable minimum frame interval time	0
			Area 1 data top address	0

Tables 20 – Token mode discordance (continued)

Setting parameter (node) (continued)	Test equipment (continued)	Area 1 data size	0
		Area 2 data top address	0
		Area 2 data size	0
Setting parameter (test data)	Solicitation frame	Node address of source side (SNA)	128
		TCD	65017
		Data size	16
		Contents of data	Slave node number = 16#80F9 (Flexible setting mode, node number = 249)
			Input data address = 16#0000 (Area 1, address = 0)
			Input data size = To be calculated from the number of input points of the slave, the EUT
			Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
			Output data size = To be calculated from the number of output points of the slave, the EUT
			Input status address = 16#8000 (Area 2, address = 0)
			Output status address = 16#8400 (Area 2, address = 1024)
			Lock ID = 128
	Frame with token mode = 0		

Table 21 – Token mode discordance (participation request frame)

Test number	V2-015
Major test group	New participation
Test group	Abnormal operation test
Test objects	Token mode discordance (participation request frame)
Test procedure	a) Start the EUT, then start the test equipment. b) In case the EUT is class 6, the test equipment transmits a solicitation frame. c) The test equipment transmits a trigger frame (4200 + 200)ms after the EUT transmits the one. (Because the EUT transmits the trigger frame first, the test equipment does not transmit the one at normal timing.) d) The test equipment transmits a participation request frame with token mode = 0.
Evaluation criteria	Confirm followings after the test equipment transmits the participation request frame. a) The EUT does not any frame to the network. b) The EUT sets self node invalid communication detection flag.

Table 21 – Token mode discordance (participation request frame) (continued)

Test necessity identified by the EUT class	Class 1	R			
	Class 2	R			
	Class 3	R			
	Class 4	R			
	Class 5	R			
	Class 6	R			
	Class 7	R			
Setting parameter (node)		EUT (The parameters will vary according to the class)	Classes 1, 2 and 3	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(0)
				Area 1 data top address	0
				Area 1 data size	0
				Area 2 data top address	0
				Area 2 data size	0
			Class 4	Node number	1
				Token watchdog time	(100)
				Allowable minimum frame interval time	(0)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1024
				Area 2 data size	1024
				IO allocation setting	Optional
			Class 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(0)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1024
				Area 2 data size	1024
			Classes 6 and 7	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(0)
				Area 1 data top address	0
				Area 1 data size	To be calculated from the number of input points of the slave, the EUT
				Area 2 data top address	0
				Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT

Table 21 – Token mode discordance (participation request frame) (continued)

Setting parameter (node) (continued)	Test equipment	Implementation class	3 (Controller)
		Node number	254
		Token watchdog time	50
		Allowable minimum frame interval time	0
		Area 1 data top address	0
		Area 1 data size	0
		Area 2 data top address	0
		Area 2 data size	0
Setting parameter (test data)	Solicitation frame	Node address of source side (SNA)	128
		TCD	65017
		Data size	16
		Contents of data	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
			Input data address = 16#0000 (Area 1, address = 0)
			Input data size = To be calculated from the number of input points of the slave, the EUT
			Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
			Output data size = To be calculated from the number of output points of the slave, the EUT
			Input status address = 16#8000 (Area 2, address = 0)
			Output status address = 16#8400 (Area 2, address = 1024)
			Lock ID = 128
	Frame with token mode = 0		

6.6.4 Participation to operating network

Test for participation to operating network are defined as follows:

a) Normal operation in participation to operating network

Tables 22 and 23 show test tables for normal operation in participation to operating network.

Table 22 – Self node participation to operating network (update of participation node management table)

Test number		V2-016			
Major test group		Participation to operating network			
Test group		Normal operation test			
Test objects		Self node participation to operating network (update of participation node management table)			
Test procedure		a) Start the test equipment after the dummy nodes becomes in stable operation. b) The test equipment starts to fetch frames from the network. c) Start the EUT.			
Evaluation criteria		a) Confirm that the EUT sends a participation request frame. b) Confirm that the EUT does not send trigger frames. c) Confirm that the EUT responds to the first reception of the token frame directed to the EUT. d) Confirm that the EUT sets common memory setting of node #1 in the participation node management table correctly. e) Confirm that the EUT sends a token frame directed to node #130. f) The EUT confirms node #1 participation status at its upper layer (ULS and LKS).			
Test necessity identified by the EUT class	Class 1	R			
	Class 2	R			
	Class 3	R			
	Class 4	R			
	Class 5	R			
	Class 6	R			
	Class 7	R			
Setting parameter (node)		EUT (The parameters will vary according to the class)	Classes 1, 3 and 4	Node number	85
				Token watchdog time	(50)
				Allowable minimum frame interval time	(0)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	64
				IO allocation setting	Optional
			Class 2	Node number	85
				Token watchdog time	(50)
				Allowable minimum frame interval time	(0)
				Area 1 data top address	0
				Area 1 data size	0
				Area 2 data top address	0
				Area 2 data size	0
			Class 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(0)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1024
				Area 2 data size	1024

Table 22 – Self node participation to operating network (update of participation node management table) (continued)

Setting parameter (node) (continued)	EUT (The parameters will vary according to the class) (continued)	Classes 6 and 7	Node number	2
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	According to the number of input points of the slave, the EUT: * 0 point: 0 * 1 point or more: 4
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	16
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment (The parameters will vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	1
			Token watchdog time	50
			Allowable minimum frame interval time	0
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	2048
			Area 2 data size	1024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8002 (Flexible setting mode, node number = 2)
				Input data address = According to the number of input points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0004 (Area 1, address = 4)
				Input data size = To be calculated from the number of input points of the slave, the EUT

Table 22 – Self node participation to operating network (update of participation node management table) (continued)

Setting parameter (node) (continued)	Test equipment (The parameters will vary according to the EUT class) (continued)	Class 6 (continued)	IO allocation setting (slave setting) (continued)	Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8010 (Area 2, address = 16)
				Output status address = 16#8800 (Area 2, address = 2048)
		Class 7	Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	50
			Allowable minimum frame interval time	0
			Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	0
			Area 2 data size	16
	Dummy nodes (30 nodes) (N = 0 through 29)		Implementation class	3 (Controller)
			Node number	130 + N (in case N = 29, node number = 200)
			Token watchdog time	50
			Allowable minimum frame interval time	0
			Area 1 data top address	According to the EUT class: * Classes 1, 2, 3, 4 and 5: 8 + (4 x N) * Class 6: 0 * Class 7: 256 + (4 x N)
			Area 1 data size	According to the EUT class: * Classes 1, 2, 3, 4, 5, 7: 4 * Class 6: 0
			Area 2 data top address	According to the EUT class: * Classes 1, 2 and 3: 128 + (64 x N) * Class 5: 128 + (16 x n) * Classes 6 and 7: 1024 + (16 x N)
			Area 2 data size	According to the EUT class: * Classes 1, 2, 3 and 4: 64 * Classes 5, 6 and 7: 16
Setting parameter (test data)	NA			

Table 23 – Other nodes participation to operating network

Test number		V2-017			
Major test group		Participation to operating network			
Test group		Normal operation test			
Test objects		Other nodes participation to operating network			
Test procedure		a) Start the dummy nodes. Start the EUT after they become in stable operation. b) In case the EUT is class 6, a dummy node sends a solicitation frame. c) Start to log frames in the network. d) Start the test equipment.			
Evaluation criteria		a) Confirm that the EUT changes direction of token frame from node #130 to node #N1. N1 varies according to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: N1 = 85 * Class 5: N1 = 130 b) Confirm that the EUT does the direction change at the first token frame after a participation request frame sent by the test equipment.			
Test necessity identified by the EUT class	Class 1	R			
	Class 2	N			
	Class 3	R			
	Class 4	R			
	Class 5	R			
	Class 6	R			
	Class 7	R			
Setting parameter (node)		EUT (The parameters will vary according to the class)	Classes 1, 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(0)
				Area 1 data top address	4
				Area 1 data size	4
				Area 2 data top address	64
				Area 2 data size	64
				IO allocation setting (fore class 4)	Optional
			Class 2	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(0)
				Area 1 data top address	0
				Area 1 data size	0
				Area 2 data top address	0
				Area 2 data size	0
			Class 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(0)

Table 23 – Other nodes participation to operating network (continued)

Setting parameter (node)	EUT (The parameters will vary according to the class)	Class 5	Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1024
			Area 2 data size	1024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment (The parameters will vary according to the EUT class)	Classes 1, 2, 3 and 4	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	0
			Area 2 data size	64
		Class 5	Implementation class	3 (Controller)
			Node number	120
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	0
			Area 2 data size	64
		Classes 6 and 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	400
			Area 1 data size	4
			Area 2 data top address	2048
			Area 2 data size	64

Table 23 – Other nodes participation to operating network (continued)

Setting parameter (node) (continued)	Dummy nodes (30nodes) (N = 0 through 29)	Implementation class	3 (Controller)
		Node number	130 + N (in case N = 29, node number = 200)
		Token watchdog time	50
		Allowable minimum frame interval time	0
		Area 1 data top address	According to the EUT class: * Classes 1, 2, 3, 4 and 5: (4 x N) * Class 4: 0 * Class 7: 256 + (4 x N)
		Area 1 data size	According to the EUT class: * Classes 1, 2, 3, 4, 5 and 7: 4 * Class 6: 0
		Area 2 data top address	According to the EUT class: * Classes 1, 2, 3 and 4: 128 + (64 x N) * Class 5: 128 + (16 x N) * Class 6 and 7: 1024 + (16 x N)
		Area 2 data size	According to the EUT class: * Classes 1, 2, 3 and 4: 64 * Classes 5, 6 and 7: 16
Setting parameter (test data)	Solicitation frame	Node number source side (SNA)	130
		TCD	65017
		Data size	16
		Contents of data	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
			Input data address = 16#0000 (Area 1, address = 0)
			Input data size = To be calculated from the number of input points of the slave, the EUT
			Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area1, address = 0) * 1point or more: 16#0100 (Area 1, address = 256)
			Output data size = To be calculated from the number of output points of the slave, the EUT
			Input status address = 16#8000
			Output status address = 16#8400 (Area 2, address = 1024)
			Lock ID = 130

b) Abnormal operation in participation to operating network

Tables 24 through 27 show test tables for abnormal operation in participation to operating network.

Table 24 – Processing at common memory address overlapping

Test number		V2-018		
Major test group		Participation to operating network		
Test group		Abnormal operation test		
Test objects		Processing at common memory address overlapping		
Test procedure		a) Start the dummy nodes. Start the test equipment after the dummy nodes become in stable operation. b) Start the EUT after the test equipment becomes in stable operation. c) In case the EUT is class 6, the test equipment sends a solicitation frame. d) d) Execute tests with test data of patterns 1 through 3 in this order. (If the EUT is class 6 or 7 and number of input points of slave is 0 point, execute tests with test data of patterns 1 and 2 in this order.)		
Evaluation criteria		Confirm followings at each test data of patterns 1 through 3. a) The EUT set top address and size of the common memory to 0. b) The EUT sends a participation request frame. c) The EUT set address duplication detection flag.		
Test necessity identified by the EUT class	Class 1	R		
	Class 2	N		
	Class 3	R		
	Class 4	R		
	Class 5	R		
	Class 6	R (The test data pattern applied varies according to the number of input points of the slave) * 0 point: Patterns 1 and 2 * 1 point of more: Patterns 1 through 3		
	Class 7	R (The test data pattern applied varies according to the number of input points of the slave) * 0 point: Patterns 1 and 2 * 1 point of more: Patterns 1 through 3		
Setting parameter (node)		EUT (The parameters will vary according to the class)	Classes 1, 3 and 4	Node number: 254 Token watchdog time: (50) Allowable minimum frame interval time: (0) Area 1 data top address: 4 Area 1 data size: 4 Area 2 data top address: 64 Area 2 data size: 64 IO allocation setting (In case of class 4): Optional
			Class 5	Node number: 100 Token watchdog time: (100) Allowable minimum frame interval time: (0) Area 1 data top address: 256 Area 1 data size: 256 Area 2 data top address: 1024 Area 2 data size: 1024

Table 24 – Processing at common memory address overlapping (continued)

Setting parameter (node) (continued)	EUT (The parameters will vary according to the class) (continued)	Classes 6 and 7	Node number	3
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	According to the number of input points of the slave, the EUT: * 0 point: 0 * 1 point or more: 8
			Area 1 data size	To be calculated from the number of input points of the slave.
			Area 2 data top address	32
			Area 2 data size	To be calculated from the numbers of input and output points of the slave.
	Test equipment Pattern 1 (The parameters will vary according to the EUT class)	Classes 1, 3 and 4	Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 5	Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	(100)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1024
			Area 2 data size	1024
		Classes 6 and 7	Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	According to the number of input points of the slave: * 0 point:
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	32
			Area 2 data size	To be calculated from the number of input and output points of the slave, the EUT

Table 24 – Processing at common memory address overlapping (continued)

Setting parameter (node) (continued)	Test equipment Pattern 2 (The parameters will vary according to the EUT class)	Classes 1, 3 and 4	Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	127
			Area 2 data size	64
		Class 5	Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	(100)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	0
			Area 1 data size	256
			Area 2 data top address	2047
			Area 2 data size	1024
		Classes 6 and 7	Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	0
			Area 1 data size	8
			Area 2 data top address	31 + EUT Area 2 data size
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment Pattern 3 (The parameters will vary according to the EUT class)	Classes 1, 3 and 4	Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	1
			Area 1 data size	4
			Area 2 data top address	128
			Area 2 data size	64
		Class 5	Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	(100)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	1

Table 24 – Processing at common memory address overlapping (continued)

Setting parameter (node)	Test equipment Pattern 3 (The parameters will vary according to the EUT class) (continued)	Class 5 (continued)	Area 1 data size	256
			Area 2 data top address	2048
			Area 2 data size	1024
		Classes 6 and 7	Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	1
			Area 1 data size	8
			Area 2 data top address	32 + EUT Area 2 data size
			Area 2 data size	16
	Dummy node		Implementation class	3 (Controller)
			Node number	2
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
Setting parameter (test data)	Solicitation frame		Node number of source side (SNA)	1
			TCD	65017
			Data size	16
			Contents of data	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
				Input data address = According to the number of input points of the slave:, the EUT * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0008 (Area 1, address = 8)
				Input data size = To be calculated from the number of input points of the slave, the EUT
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area1, address = 0) * 1point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT

Table 24 – Processing at common memory address overlapping (continued)

Setting parameter (test data) (continued)	Solicitation frame (continued)	Contents of data (continued)	Input status address = 16#8020 (Area 2, address = 32)
			Output status address = 16#8400 (Area 2, address = 1024)
			Lock ID = 1

Table 25 – Node number duplication

Test number		V2-019			
Major test group		Participation to operating network			
Test group		Abnormal operation test			
Test objects		Node number duplication			
Test procedure		a) Start the dummy node. Start the test equipment after the dummy node becomes in stable operation. b) Start the EUT after the test equipment becomes in stable operation. c) In case the EUT is class 6, the test equipment sends a solicitation frame.			
Evaluation criteria		a) Confirm that the EUT sends a token frame. b) Confirm that the EUT does not send any participation request frame. c) Confirm that the EUT set node number duplication flag.			
Test necessity identified by the EUT class	Class 1	R			
	Class 2	R			
	Class 3	R			
	Class 4	R			
	Class 5	R			
	Class 6	R			
	Class 7	R			
Setting parameter (node)		EUT (The parameters will vary according to the class)	Classes 1, 2 and 3	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(0)
				Area 1 data top address	0
				Area 1 data size	0
				Area 2 data top address	0
				Area 2 data size	0
			Class 4	Node number	1
				Token watchdog time	(100)
				Allowable minimum frame interval time	(0)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1024
				Area 2 data size	1024
			Class 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(0)

Table 25 – Node number duplication (continued)

Setting parameter (node) (continued)	EUT (The parameters will vary according to the class) (continued)	Class 5 (continued)	Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1024
			Area 2 data size	1024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment (The parameters will vary according to the EUT class)	Classes 1, 2, 3, 4, 6 and 7	Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
		Class 5	Implementation class	3 (Controller)
			Node number	100
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
	Dummy node		Implementation class	3 (Controller)
			Node number	2
			Token watchdog time	50
			Allowable minimum frame interval time	0
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
Setting parameter (test data)	Solicitation frame		Node number source side (SNA)	2
			TCD	65017

Table 25 – Node number duplication (continued)

Setting parameter (test data) (continued)	Solicitation frame (continued)	Data size	16
		Contents of data	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
			Input data address = 16#0000 (Area 1, address = 0)
			Input data size = To be calculated from the number of input points of the slave, the EUT
			Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area1, address = 0) * 1point or more: 16#0100 (Area 1, address = 256)
			Output data size = To be calculated from the number of output points of the slave, the EUT
			Input status address = 16#8000 (Area 2, address = 0)
			Output status address = 16#8400 (Area 2, address = 1024)
			Lock ID = 2

Table 26 – Token mode discordance (self node participation)

Test number		V2-020			
Major test group		Participation to operating network			
Test group		Abnormal operation test			
Test objects		Token mode discordance (self node participation)			
Test procedure		a) Start the dummy nodes. Start the test equipment after the dummy nodes become in stable operation.. Set token mode of the dummy node and the test equipment to 0. b) Start the EUT after the test equipment becomes in stable operation.			
Evaluation criteria		a) Confirm that the Test equipment sends a token frame. b) Confirm that the EUT does not send any participation request frame. c) Confirm that the EUT set self node invalid communication detection flag.			
Test necessity identified by the EUT class	Class 1	R			
	Class 2	R			
	Class 3	R			
	Class 4	R			
	Class 5	R			
	Class 6	R			
	Class 7	R			
Setting parameter (node)		EUT (The parameters will vary according to the class)	Classes 1, 2 and 3	Node number	85
				Token watchdog time	(50)
				Allowable minimum frame interval time	(0)

Table 26 – Token mode discordance (self node participation) (continued)

Setting parameter (node) (continued)	EUT (The parameters will vary according to the class) (continued)	Classes 1, 2 and 3 (continued)	Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
		Class 4	Node number	85
			Token watchdog time	(100)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1024
			Area 2 data size	1024
			IO allocation setting (for class 4)	Optional
		Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1024
			Area 2 data size	1024
		Classes 6 and 7	Node number	3
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	According to the number of input points of the slave, the EUT: * 0 point: 0 * 1 point or more: 8
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	32
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment (The parameters will vary according to the EUT class)	Classes 1, 2, 3, 4, 5 and 7	Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
		Class 6	Implementation class	4 (Flexible master)
			Node number	1

Table 26 – Token mode discordance (self node participation) (continued)

Setting parameter (node) (continued)	EUT (The parameters will vary according to the class) (continued)	Class 6 (continued)	Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	1024
			Area 2 data size	1024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8003 (Flexible setting mode, node number = 3)
				Input data address = According to the number of input points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0008 (Area 1, address = 8)
				Input data size = To be calculated from the number of input points of the slave, the EUT
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8020 (Area 2, address = 32)
				Output status address = 16#8400 (Area 2, address = 1024)
			Token mode	0
	Dummy node		Implementation class	3 (Controller)
			Node number	2
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
			Token mode	0

Table 26 – Token mode discordance (self node participation) (continued)

Setting parameter (test data)	NA

Table 27 Token mode discordance (other node participation)

Test number		V2-021			
Major test group		Participation to operating network			
Test group		Abnormal operation test			
Test objects		Token mode discordance (other node participation)			
Test procedure		a) Start the dummy node. Start the EUT after the dummy nodes become in stable operation.. b) In case the EUT is class 6, a dummy node sends a solicitation frame. c) Start the test equipment with token mode = 0.			
Evaluation criteria		a) Confirm that the EUT does not disengage. b) Confirm that the test equipment does not participate to the network. c) Checking the EUT participation node management table for the test equipment, confirm that invalid communication detection flag is "1".			
Test necessity identified by the EUT class	Class 1	R			
	Class 2	R			
	Class 3	R			
	Class 4	R			
	Class 5	R			
	Class 6	R			
	Class 7	R			
Setting parameter (node)		EUT (The parameters will vary according to the class)	Classes 1, 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(0)
				Area 1 data top address	4
				Area 1 data size	4
				Area 2 data top address	64
				Area 2 data size	64
				IO allocation setting (fore class 4)	Optional
			Class 2	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(0)
				Area 1 data top address	0
				Area 1 data size	0
				Area 2 data top address	0
				Area 2 data size	0
			Class 5	Node number	100
				Token watchdog time	(100)

Table 27 – Token mode discordance (other node participation) (continued)

Setting parameter (node) (continued)	EUT (The parameters will vary according to the class) (continued)	Class 5 (continued)	Allowable minimum frame interval time	(0)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1024
			Area 2 data size	1024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT.
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT.
	Test equipment (The parameters will vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	64
		Classes 6 and 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	2048
			Area 2 data size	64
			Token mode	0
	Dummy nodes (30 nodes) (N = 0 through 29)		Implementation class	3 (Controller)
			Node number	130 + N (in case N = 29, node number = 200)
			Token watchdog time	50
			Allowable minimum frame interval time	0

Table 27 – Token mode discordance (other node participation) (continued)

Setting parameter (node) (continued)	Dummy nodes (30 nodes) (N = 0 through 29) (continued)	Area 1 data top address	According to the EUT class: * Classes 1, 2, 3, 4 and 5: 8 + (4 x N) * Class 4: 0 * Class 7: 260 + (4 x N)
		Area 1 data size	According to the EUT class: * Classes 1, 2, 3, 4, 5 and 7: 4 * Class 6: 0
		Area 2 data top address	According to the EUT class: * Class 1, 2, 3 and 4: 128 + (64 x N) * Class 5: 128 + (16 x N) * Classes 6 and 7: 1024 + (16 x N)
		Area 2 data size	According to the EUT class: * Classes 1, 2, 3 and 4: 64 * Classes 5, 6 and 7: 16
		Token mode	1
Setting parameter (test data)	Solicitation frame	Node number of source side (SNA)	130
		TCD	65017
		Data size	16
		Contents of data	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
			Input data address = 16#0000 (Area 1, address = 0)
			Input data size = To be calculated from the number of input points of the slave, the EUT
			Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area1, address = 0) * 1point or more: 16#0100 (Area 1, address = 256)
			Output data size = To be calculated from the number of output points of the slave, the EUT
			Input status address = 16#8000 (Area 2, address = 0)
			Output status address = 16#8400 (Area 2, address = 1024)
			Lock ID = 130

6.6.5 Basic function

Tables 28 through 35 show test tables for basic function.

Table 28 – Refresh cycle measurement time, allowable refresh cycle time

Test number		V2-022			
Major test group		Basic function			
Test group		Basic operation test			
Test objects		Refresh cycle measurement time, allowable refresh cycle time			
Test procedure		a) Start the dummy nodes. Start the EUT after the dummy nodes become in stable operation. b) In case the EUT is class 6, the dummy node sends a solicitation frame. c) Start to log frames on the network d) Start the test equipment			
Evaluation criteria		Checking refresh cycle measurement time of the EUT, confirm the value is the same as the refresh cycle time in the logging of frames on the network.			
Test necessity identified by the EUT class	Class 1	R			
	Class 2	R			
	Class 3	R			
	Class 4	R			
	Class 5	R			
	Class 6	R			
	Class 7	R			
Setting parameter (node)		EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(0)
				Area 1 data top address	4
				Area 1 data size	4
				Area 2 data top address	64
				Area 2 data size	64
				IO allocation setting (for class 4)	Optional
			Class 2	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(0)
				Area 1 data top address	0
				Area 1 data size	0
				Area 2 data top address	0
				Area 2 data size	0
			Class 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(0)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1024
				Area 2 data size	1024

Table 28 – Refresh cycle measurement time, allowable refresh cycle time (continued)

Setting parameter (node) (continued)	EUT (The parameters vary according to the class) (continued)	Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	0
			Area 2 data size	64
		Classes 6 and 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	2048
			Area 2 data size	64
	Dummy nodes (30 nodes) (N = 0 through 29)		Implementation class	3 (Controller)
			Node number	130 + N (in case N = 29, node number = 200)
			Token watchdog time	50
			Allowable minimum frame interval time	0
			Area 1 data top address	According to the EUT class: * Classes 1, 2, 3, 4 and 5: 8 + (4 x N) * Class 6: 0 * Class 7: 260 + (4 x N)
			Area 1 data size	According to the EUT class: * Classes 1, 2, 3, 4, 5 and 7: 4 * Class 6: 0
Setting parameter (node) (continued)	Dummy nodes (30 nodes) (N = 0 through 29) (continued)		Area 2 data top address	According to the EUT class: * Classes 1, 2, 3 and 4: 128 + (64 x N) * Class 5: 128 + (16 x N) * Classes 6 and 7: 1024 + (16 x N)
			Area 2 data size	According to the EUT class: * Classes 1, 2, 3 and 4: 64 * Classes 5, 6 and 7: 16

Table 28 – Refresh cycle measurement time, allowable refresh cycle time (continued)

Setting parameter (test data)	Solicitation frame	Node address of source side (SNA)	130
		TCD	65017
		Data size	16
		Contents of data	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
			Input data address = 16#0000 (Area 1, address = 0)
			Input data size = To be calculated from the number of input points of the slave, the EUT
			Output data address = According to the number of output points of the slave, the EUT: * 0 point : 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
			Output data size = To be calculated from the number of output points of the slave, the EUT
			Input status address = 16#8000 (Area 2, address = 0)
			Output status address = 16#8400 (Area 2, address = 1024)
			Lock ID = 130

Table 29 Disengaging/rejoining of network

Test number	V2-023
Major test group	Basic function
Test group	Basic operation test
Test objects	Disengaging/re-joining of network
Test procedure	a) Start the dummy nodes. Start the EUT after the dummy nodes become in stable operation. b) Start to log frames on the network. c) Start the test equipment. d) The test equipment stops sending token frames to the EUT. e) The test equipment restart to send token frames to the EUT when the EUT sends a participation request frame.

Table 29 Disengaging/rejoining of network (continued)

Evaluation criteria		a) Confirm that the EUT disengages from the network in case that it cannot receive token frames to the self node three times consecutively. b) Confirm that the EUT rejoins the network by sending the participation request frame.			
Test necessity identified by the EUT class	Class 1	R			
	Class 2	R			
	Class 3	R			
	Class 4	R			
	Class 5	R			
	Class 6	R			
	Class 7	R			
Setting parameter (node)		EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number	85
				Token watchdog time	(50)
				Allowable minimum frame interval time	(0)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	64
				IO allocation setting (for class 4)	Optional
			Class 2	Node number	85
				Token watchdog time	(50)
				Allowable minimum frame interval time	(0)
				Area 1 data top address	0
				Area 1 data size	0
				Area 2 data top address	0
				Area 2 data size	0
			Class 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(0)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1024
				Area 2 data size	1024
			Classes 6 and 7	Node number	2
				Token watchdog time	(50)
				Allowable minimum frame interval time	(0)
				Area 1 data top address	According to the number of input points of the slave, the EUT: * 0 point: 0 * 1 point or more: 4

Table 29 – Disengaging/rejoining of network (continued)

Setting parameter (node) (continued)	EUT (The parameters vary according to the class) (continued)	Classes 6 and 7 (continued)	Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	16
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	256
			Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	2048
			Area 2 data size	1024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8002 (Flexible setting mode, node number = 2)
				Input data address = 16#0004 (Area 1, address = 4)
				Input data size = To be calculated from the number of input points of the slave, the EUT
				Output data address = According to the number of output points of the slave, the EUT: * 0 point : 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8010 (Area 2, address = 16)

Table 29 – Disengaging/rejoining of network (continued)

Setting parameter (node) (continued) Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Class 6	IO allocation setting (slave setting)	Output status address = 16#8800 (Area 2, address = 2048)
		Class 7	Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	2048
			Area 2 data size	64
	Dummy nodes (30 nodes) (N = 0 through 29)		Implementation class	3 (Controller)
			Node number	130 + N (in case N = 29, node number = 200)
			Token watchdog time	50
			Allowable minimum frame interval time	0
			Area 1 data top address	According to the EUT class: * Classes 1, 2, 3, 4 and 5: 8 + (4 x N) * Class 6: 0 * Class 7: 256 + (4 x N)
			Area 1 data size	According to the EUT class: * Classes 1, 2, 3, 4, 5 and 7: 4 * Class 6: 0
			Area 2 data top address	According to the EUT class: * Classes 1, 2, 3 and 4: 128 + (64 x N) * Class 5: 128 + (16 x N) * Classes 6 and 7: 1024 + (16 x N)
			Area 2 data size	According to the EUT class: * Classes 1, 2, 3 and 4: 64 * Classes 5, 6 and 7: 16

Table 30 – Reissue of Token

Test number	V2-024
Major test group	Basic function
Test group	Basic operation test
Test objects	Reissue of token
Test procedure	a) Start the dummy nodes. Start the EUT after the dummy nodes become in stable operation. b) In case the EUT is class 6, the dummy node sends a solicitation frame. c) Start to log frames on the network. d) Start the test equipment. e) Disengage the test equipment from the network by not transmitting token frames.

Table 30 – Reissue of Token (continued)

<table>
<tr><td colspan="2">Evaluation criteria</td><td colspan="4">a) Confirm that the EUT reissues a token frame after token watchdog time the test equipment sets expires.
b) Confirm that the re-issuance of the token frame by the EUT occurs after the time passes by [(token watchdog time of the test equipment) - 1] ms.
c) Confirm that the re-issuance of the token frame by the EUT occurs before the time passes by [(token watchdog time of the test equipment) +(token watchdog time of the EUT)].
d) Confirm the EUT updates its participation node management table by recognizing disengagement of the test equipment.</td></tr>
<tr><td rowspan="7">Test necessity identified by the EUT class</td><td>Class 1</td><td colspan="4">R</td></tr>
<tr><td>Class 2</td><td colspan="4">R</td></tr>
<tr><td>Class 3</td><td colspan="4">R</td></tr>
<tr><td>Class 4</td><td colspan="4">R</td></tr>
<tr><td>Class 5</td><td colspan="4">R</td></tr>
<tr><td>Class 6</td><td colspan="4">R</td></tr>
<tr><td>Class 7</td><td colspan="4">R</td></tr>
<tr><td colspan="2" rowspan="24">Setting parameter (node)</td><td rowspan="24">EUT (The parameters vary according to the class)</td><td rowspan="9">Classes 1, 3 and 4</td><td>Node number</td><td>85</td></tr>
<tr><td>Token watchdog time</td><td>(50)</td></tr>
<tr><td>Allowable minimum frame interval time</td><td>(0)</td></tr>
<tr><td>Area 1 data top address</td><td>0</td></tr>
<tr><td>Area 1 data size</td><td>4</td></tr>
<tr><td>Area 2 data top address</td><td>0</td></tr>
<tr><td>Area 2 data size</td><td>64</td></tr>
<tr><td>IO allocation setting (for class 4)</td><td>Optional</td></tr>
<tr><td rowspan="8">Class 2</td><td>Node number</td><td>85</td></tr>
<tr><td>Token watchdog time</td><td>(50)</td></tr>
<tr><td>Allowable minimum frame interval time</td><td>(0)</td></tr>
<tr><td>Area 1 data top address</td><td>0</td></tr>
<tr><td>Area 1 data size</td><td>0</td></tr>
<tr><td>Area 2 data top address</td><td>0</td></tr>
<tr><td>Area 2 data size</td><td>0</td></tr>
<tr><td rowspan="7">Class 5</td><td>Node number</td><td>100</td></tr>
<tr><td>Token watchdog time</td><td>(100)</td></tr>
<tr><td>Allowable minimum frame interval time</td><td>(0)</td></tr>
<tr><td>Area 1 data top address</td><td>256</td></tr>
<tr><td>Area 1 data size</td><td>256</td></tr>
<tr><td>Area 2 data top address</td><td>1024</td></tr>
<tr><td>Area 2 data size</td><td>1024</td></tr>
</table>

Table 30 Reissue of Token (continued)

Setting parameter (node) (continued)	EUT (The parameters vary according to the class) (continued)	Classes 6 and 7	Node number	2
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	According to the number of input points of the slave, the EUT: * 0 point: 0 * 1 point or more: 4
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	16
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Classes 6 and 7	Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	2048
			Area 2 data size	64
	Dummy nodes (30 nodes) (N = 0 through 29)		Implementation class	3 (Controller)
			Node number	130 + N (in case N = 29, node number = 200)
			Token watchdog time	50
			Allowable minimum frame interval time	0
			Area 1 data top address	According to the EUT class: * Classes 1, 2, 3, 4 and 5: 8 + (4 x N) * Class 6 and 7: 256 + (4 x N)
			Area 1 data size	4

Table 30 – Reissue of Token (continued)

Setting parameter (node) (continued)	Dummy nodes (30 nodes) (N = 0 through 29) (continued)	Area 2 data top address	According to the EUT class: * Classes 1, 2, 3 and 4: 128 + (64 x N) * Class 5: 128 + (16 x N) * Classes 6 and 7: 1024 + (16 x N)
		Area 2 data size	According to the EUT class: * Classes 1, 2, 3 and 4: 64 * Classes 5, 6 and 7: 16
Setting parameter (test data)	Solicitation frame	Node address of source side (SNA)	130
		TCD	65017
		Data size	16
		Contents of data	Slave node number = 16#8002 (Flexible setting mode, node number = 2)
			Input data address = According to the number of input points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0004 (Area 1, address = 4)
			Input data size = To be calculated from the number of input points of the slave, the EUT
			Output data address = According to the number of output points of the slave, the EUT: * 0 point : 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
			Output data size = To be calculated from the number of output points of the slave, the EUT
			Input status address = 16#8010 (Area 2, address = 16)
			Output status address = 16#8400 (Area 2, address = 1024)
			Lock ID = 130

Table 31 – Processing of node disengagement, participation/disengagement flag of the self node

Test number		V2-025			
Major test group		Basic function			
Test group		Basic operation test			
Test objects		Processing of node disengagement, participation/disengagement flag of the self node			
Test procedure		a) Start the dummy nodes. Start the EUT after the dummy nodes become in stable operation. b) In case the EUT is class 6, the dummy node sends a solicitation frame. c) Start to log frames on the network d) Start the test equipment e) The test equipment disengage from the network (it stops sending token frames). f) Execute tests with settings of patterns 1 and 2, respectively.			
Evaluation criteria	Pattern 1	Confirm that the EUT changes token rotation order by updating its participation node management table at the fourth cycle of token frame rotation.			
	Pattern 2	a) Checking self node management table and participation node management table of the EUT before the disengagement of the test equipment, confirm that the EUT recognizes joining of the test equipment (node #170). b) Checking self node management table and participation node management table of the EUT after the disengagement of the test equipment, confirm that the EUT recognizes disengaging of the test equipment (node #170).			
Test necessity identified by the EUT class	Class 1	R			
	Class 2	R			
	Class 3	R			
	Class 4	R			
	Class 5	R			
	Class 6	R			
	Class 7	R			
Setting parameter (node)		EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number	85
				Token watchdog time	(50)
				Allowable minimum frame interval time	(0)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	64
				IO allocation setting (for class 4)	Optional
			Class 2	Node number	85
				Token watchdog time	(50)
				Allowable minimum frame interval time	(0)
				Area 1 data top address	0
				Area 1 data size	0
				Area 2 data top address	0
				Area 2 data size	0

Table 31 – Processing of node disengagement, participation/disengagement flag of the self node (continued)

Setting parameter (node) (continued)	EUT (The parameters vary according to the class) (continued)	Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1024
			Area 2 data size	1024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment Pattern 1 (The parameters vary according to the EUT class)	Classes 1, 2, 3 and 4	Implementation class	3 (Controller)
			Node number	96
			Token watchdog time	100
			Allowable minimum frame interval time	0
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 5	Implementation class	3 (Controller)
			Node number	120
			Token watchdog time	100
			Allowable minimum frame interval time	0
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Classes 6 and 7	Implementation class	3 (Controller)
			Node number	96
			Token watchdog time	100
			Allowable minimum frame interval time	0
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	2048
			Area 2 data size	64

Table 31 – Processing of node disengagement, participation/disengagement flag of the self node (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	170
			Token watchdog time	50
			Allowable minimum frame interval time	0
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Classes 6 and 7	Implementation class	3 (Controller)
			Node number	170
			Token watchdog time	50
			Allowable minimum frame interval time	0
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	2048
			Area 2 data size	64
	Dummy nodes (30 nodes) (N = 0 through 29)		Implementation class	3 (Controller)
			Node number	130 + N (in case N = 29, node number = 200)
			Token watchdog time	50
			Allowable minimum frame interval time	0
			Area 1 data top address	According to the EUT class: * Classes 1, 2, 3, 4 and 5: 8 + (4 x N) * Class 6 and 7: 260 + (4 x N)
			Area 1 data size	4
			Area 2 data top address	According to the EUT class: * Classes 1, 2, 3 and 4: 128 + (64 x N) * class 5: 128 + (16 x N) * Class 6 and 7: 1024 + (16 x N)
			Area 2 data size	According to the EUT class: * Classes 1, 2, 3 and 4: 64 * Class 5, 6 and 7: 16

Table 31 – Processing of node disengagement, participation/disengagement flag of the self node (continued)

Setting parameter (test data)	Solicitation frame	Node address of source side (SNA)	130
		TCD	65017
		Data size	16
		Contents of data	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
			Input data address = 16#0000 (Area 1, address = 0)
			Input data size = To be calculated from the number of input points of the slave, the EUT
			Output data address = According to the number of output points of the slave, the EUT: * 0 point : 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
			Output data size = To be calculated from the number of output points of the slave, the EUT
			Input status address = 16#8000 (Area 2, address = 0)
			Output status address = 16#8400 (Area 2, address = 1024)
			Lock ID = 130

Table – 32 Token multiplication

Test number		V2-026			
Major test group		Basic function			
Test group		Basic operation test			
Test objects		Token multiplication			
Test procedure		a) Start the dummy nodes. Start the EUT after the dummy nodes become in stable operation. b) In case the EUT is class 6, the dummy node sends a solicitation frame. c) Start to log frames on the network d) Start the test equipment e) The test equipment transmits token multiplication frames (it transmits an abnormal frame at each time when transmitting a token frame to the EUT, consecutively). f) Execute tests by settings with pattern 1 and 2, respectively.			
Evaluation criteria		a) Pattern 1: Confirm that the EUT does not send token frames. b) Pattern 2: Confirm that the EUT sends token frames.			
Test necessity identified by the EUT class	Class 1	R			
	Class 2	R			
	Class 3	R			
	Class 4	R			
	Class 5	R			
	Class 6	R			
	Class 7	R			
Setting parameter (node)		EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number	85
				Token watchdog time	(50)
				Allowable minimum frame interval time	(0)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	64
				IO allocation setting (for class 4)	Optional
			Class 2	Node number	85
				Token watchdog time	(50)
				Allowable minimum frame interval time	(0)
				Area 1 data top address	0
				Area 1 data size	0
				Area 2 data top address	0
				Area 2 data size	0
			Class 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(0)
				Area 1 data top address	256

Table 32 – Token multiplication (continued)

Setting parameter (node) (continued)	EUT (The parameters vary according to the class) (continued)	Class 5 (continued)	Area 1 data size	256
			Area 2 data top address	1024
			Area 2 data size	1024
		Classes 6 and 7	Node number	3
			Token watchdog time	(50)
			Allowable minimum frame interval time	(0)
			Area 1 data top address	According to the number of input points of the slave, the EUT: * 0 point: 0 * 1 point or more: 8
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	32
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	2
			Token watchdog time	50
			Allowable minimum frame interval time	20
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Classes 6 and 7	Implementation class	3 (Controller)
			Node number	2
			Token watchdog time	50
			Allowable minimum frame interval time	20
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	2048
			Area 2 data size	64
	Dummy nodes (30 nodes) (N = 0 through 29)		Implementation class	3 (Controller)
			Node number	130 + N (in case N = 29, node number = 200)
			Token watchdog time	50
			Allowable minimum frame interval time	0

Table 32 – Token multiplication (continued)

Setting parameter (node) (continued)	Dummy nodes (30 nodes) (N = 0 through 29) (continued)	Area 1 data top address	According to the EUT class: * Classes 1, 2, 3, 4 and 5: 8 + (4 x N) Classes 6 and 7: 256 + (4 x N)
		Area 1 data size	4
		Area 2 data top address	According to the EUT class: * Classes 1, 2, 3 and 4: 128 + (64 x N) * Class 5: 128 + (16 x N) * Classes 6 and 7: 1024 + (16 x N)
		Area 2 data size	According to the EUT class: * Classes 1, 2, 3 and 4: 64 * Classes 5, 6 and 7: 16
Setting parameter (test data)	Solicitation frame	Node address of source side (SNA)	130
		TCD	65017
		Data size	16
		Contents of data	Slave node number = 16#8003 (Flexible setting mode, node number = 3)
			Input data address = According to the number of input points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0008 (Area 1, address = 8)
			Input data size = To be calculated from the number of input points of the slave, the EUT
			Output data address = According to the number of output points of the slave, the EUT: * 0 point : 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
			Output data size = To be calculated from the number of output points of the slave, the EUT
			Input status address = 16#8020 (Area 2, address = 32)
			Output status address = 16#8400 (Area 2, address = 1024)
			Lock ID = 130
	Test equipment pattern 1	Abnormal token frame	SA = 2, DA = 1
	Test equipment pattern 2	Abnormal token frame	SA = 2, DA = 130

Table 33 – Token watchdog time error, token watchdog time error flag

Test number		V2-027		
Major test group		Basic function		
Test group		Node status test		
Test objects		Token watchdog time error, token watchdog time error flag		
Test procedure		Start the EUT, then start the test equipment.		
Evaluation criteria		a) Confirm that the EUT does not send tokens onto the network. b) Confirm that the EUT sets token watchdog time error flag.		
Test necessity identified by the EUT class	Class 1	R		
	Class 2	R		
	Class 3	R		
	Class 4	R		
	Class 5	R		
	Class 6	R		
	Class 7	R		
Setting parameter (node)		EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number: 85
				Token watchdog time: 2
				Allowable minimum frame interval time: (20)
				Area 1 data top address: 0
				Area 1 data size: 128
				Area 2 data top address: 0
				Area 2 data size: 2048
				IO allocation setting (for class 4): Optional
			Class 2	Node number: 85
				Token watchdog time: 2
				Allowable minimum frame interval time: 20
				Area 1 data top address: 0
				Area 1 data size: 0
				Area 2 data top address: 0
				Area 2 data size: 0
			Class 5	Node number: 100
				Token watchdog time: 2
				Allowable minimum frame interval time: (0)
				Area 1 data top address: 256
				Area 1 data size: 256
				Area 2 data top address: 1024
				Area 2 data size: 1024

Table 33 – Token watchdog time error, token watchdog time error flag (continued)

Setting parameter (node) (continued)	EUT (The parameters vary according to the class) (continued)	Classes 6 and 7	Node number	2
			Token watchdog time	2
			Allowable minimum frame interval time	20
			Area 1 data top address	According to the number of input points of the slave, the EUT: * 0 point: 0 * 1 point or more: 4
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	16
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4, 5 and 7	Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	50
			Allowable minimum frame interval time	20
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
		Class 6	Implementation class	4 (Flexible master)
			Node number	1
			Token watchdog time	50
			Allowable minimum frame interval time	20
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	1024
			Area 2 data size	1024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8002 (Flexible setting mode, node number = 2)
				Input data address = According to the number of input points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0004 (Area 1, address = 4)

Table 33 – Token watchdog time error, token watchdog time error flag (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Class 6 (continued)	IO allocation setting (slave setting) (continued)	Input data size = To be calculated from the number of input points of the slave, the EUT
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8010 (Area 2, address = 16)
				Output status address = 16#8400 (Area 2, address = 1024)
Setting parameter (test data)	NA			

Table 34 – Allowable minimum frame interval time

Test number		V2-028			
Major test group		Basic function			
Test group		Node status test			
Test objects		Allowable minimum frame interval time			
Test procedure		a) Start the dummy nodes. Start the EUT after the dummy nodes become in stable operation. b) In case the EUT is class 6, the dummy node sends a solicitation frame. c) Start the test equipment. Confirm allowable minimum frame interval time and token response time of the EUT. d) Execute tests with settings of patterns 1 and 2, respectively.			
Evaluation criteria		a) Confirm that the EUT sets value of its allowable minimum frame interval time to 50 at pattern 2. b) Confirm that the frame response time is more than 4ms and that the response time at pattern 2 is longer than that at pattern 1.			
Test necessity identified by the EUT class	Class 1	R			
	Class 2	R			
	Class 3	R			
	Class 4	R			
	Class 5	R			
	Class 6	R			
	Class 7	R			
Setting parameter (node)		EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number	1
				Token watchdog time	50
				Allowable minimum frame interval time	0 (or minimum value available)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0

Table 34 – Allowable minimum frame interval time (continued)

Setting parameter (node) (continued)	EUT (The parameters vary according to the class) (continued)	Class 1, 3 and 4 (continued)	Area 2 data size	64
			IO allocation setting (for class 4)	Optional
		Class 2	Node number	1
			Token watchdog time	50
			Allowable minimum frame interval time	0 (or minimum value available)
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
		Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	0 (or minimum value available)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1024
			Area 2 data size	1024
		Classes 6 and 7	Node number	1
			Token watchdog time	50
			Allowable minimum frame interval time	0 (or minimum value available)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment Pattern 1 (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	0
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Classes 6 and 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50

Table 34 – Allowable minimum frame interval time (continued)

Setting parameter (node) (continued)	Test equipment Pattern 1 (The parameters vary according to the EUT class) (continued)	Classes 6 and 7	Allowable minimum frame interval time	0
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	2048
			Area 2 data size	64
	Test equipment Pattern 2 (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	50
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Classes 6 and 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	50
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	2048
			Area 2 data size	64
	Dummy nodes (30 nodes) (N = 0 through 29)		Implementation class	3 (Controller)
			Node number	130 + N (in case N = 29, node number = 200)
			Token watchdog time	50
			Allowable minimum frame interval time	0
			Area 1 data top address	According to the EUT class: * Classes 1, 2, 3, 4 and 5: 8 + (4 x N) * Classes 6 and 7: 260 + (4 x N)
			Area 1 data size	4
			Area 2 data top address	According to the EUT class: * Classes 1, 2, 3 and 4: 128 + (64 x N) * Class 5: 128 + (16 x N) * Classes 6 and 7: 1024 + (16 x N)
			Area 2 data size	According to the EUT class: * Classes 1, 2, 3 and 4: 64 * Classes 5, 6 and 7: 16

Table 34 – Allowable minimum frame interval time (continued)

Setting parameter (test data)	Solicitation frame	Node address of source side (SNA)	130
		TCD	65017
		Data size	16
		Contents of data	Slave node number = 16#0001 (Flexible setting mode, node address = 1)
			Input data address = 16#0000 (Area 1, address = 0)
			Input data size = To be calculated from the number of input points of the slave, the EUT
			Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
			Output data size = To be calculated from the number of output points of the slave, the EUT
			Input status address = 16#8000 (Area 2, address = 0)
			Output status address = 16#8400 (Area 2, address = 1024)
			Lock ID = 130

Table 35 – Updating participation node management table

Test number	V2-029
Major test group	Basic function
Test group	Node status test
Test objects	Updating participation node management table
Test procedure	a) Start the EUT, then start the test equipment. b) Set both values of LKS and ULS in the token frame that the test equipment transmits 16#00.
Evaluation criteria	Confirm that participation node management table for the test equipment at the EUT are as follows: LKS: Bit 2, 3 (reserved) = 0 Bit 4 (upper layer operation signal error) = 0 Bit 5 (common memory data validity) = 1 Bit 6 (common memory setting completion) = 1 Bid 7 (address overlapping detection) = 0 ULS: Bit 12 (reserved) = 0 Bit 13 (WARNING) = 0 Bit 14 (ALARM) = 0 Bit 15 (RUN/STOP) = 1

Table 35 – Updating participation node management table (continued)

Test necessity identified by the EUT class	Class 1	R			
	Class 2	R			
	Class 3	R			
	Class 4	R			
	Class 5	R			
	Class 6	R			
	Class 7	R			
Setting parameter (node)		EUT (The parameters vary according to the class)	Classes 1, 2 and 3	Node number	128
				Token watchdog time	(50)
				Allowable minimum frame interval time	(0)
				Area 1 data top address	0
				Area 1 data size	0
				Area 2 data top address	0
				Area 2 data size	0
			Classes 4 and 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(0)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1024
				Area 2 data size	1024
				IO allocation setting (for class 4)	Optional
			Classes 6 and 7	Node number	2
				Token watchdog time	(50)
				Allowable minimum frame interval time	(0)
				Area 1 data top address	According to the number of input points of the slave, the EUT: * 0 point: 0 * 1 point or more: 4
				Area 1 data size	To be calculated from the number of input points of the slave, the EUT
				Area 2 data top address	16
				Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
		Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
				Node number	1
				Token watchdog time	50
				Allowable minimum frame interval time	0
				Area 1 data top address	64
				Area 1 data size	32
				Area 2 data top address	16
				Area 2 data size	128

Table 35 – Updating participation node management table (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Class 6	Implementation class	4 (Flexible master)
			Node number	1
			Token watchdog time	50
			Allowable minimum frame interval time	0
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point : 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	1024
			Area 2 data size	128
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8002 (Flexible setting mode, node number = 2)
				Input data address = According to the number of input points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0004 (Area 1, address = 4)
				Input data size = To be calculated from the number of input points of the slave, the EUT
				Output data address = According to the number of output points of the slave, the EUT: * 0 point : 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8010 (Area2, address = 16)
				Output status address = 16#8400 (Area 2, address = 1024)
		Class 7	Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	50
			Allowable minimum frame interval time	0
			Area 1 data top address	256
			Area 1 data size	32
			Area 2 data top address	1024
			Area 2 data size	128

Table 35 – Updating participation node management table (continued)

Setting parameter (test data)	Final cyclic frame	FA link status	16#60
		Upper layer status	16#8000
	Abnormal token frame	FA link status	16#00
		Upper layer status	16#0000

6.6.6 Cyclic Transmission

Test for cyclic transmission is as follows.

a) Normal operation of cyclic transmission

Tables 36 and 37 show test tables for the normal operation of cyclic transmission.

Table 36 – Frame format

Test number		V2-030		
Major test group		Cyclic transmission		
Test group		Normal operation test		
Test objects		Flame format		
Test procedure		a) Start the EUT, then start the test equipment. b) Execute tests with settings maximum three patterns according to class of the EUT.		
Evaluation criteria		Confirm that data size and contents of the header part are correct. Refer setting parameter (test data) for the contents of the header.		
Test necessity identified by the EUT class	Class 1	R (patterns 1 through 3)		
	Class 2	R (pattern 1)		
	Class 3	R (patterns 1 through 3)		
	Class 4	R (patterns 2 and 3)		
	Class 5	R (pattern 2)		
	Class 6	R (pattern 4)		
	Class 7	R (pattern 4)		
Setting parameter (node)		Pattern 1 (no common memory)		
		EUT	Node number	85
			Token watchdog time	100
			Allowable minimum frame interval time	10
			Area 1 data top address	0
			Area 1 data size	0
			Area 1 data pattern	NA
			Area 2 data top address	0
			Area 2 data size	0
			Area 2 data pattern	NA
			Node name	"TargetNode"
		Test equipment	Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	0

Table 36 – Frame format (continued)

Setting parameter (node) (continued)	Test equipment (continued)		Area 1 data size	0
			Area 1 data pattern	NA
			Area 2 data top address	0
			Area 2 data size	0
			Area 2 data pattern	NA
			Node name	"TargetNode"
	Pattern 2 (common memory size = single frame)			
	EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 1 data pattern	Optional
			Area 2 data top address	64
			Area 2 data size	64
			Area 2 data pattern	Optional
			Node name	"TargetNode"
			IO allocation setting (for class 4)	Optional
		Class 5	Node number	100
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	40
			Area 1 data pattern	Optional
			Area 2 data top address	1024
			Area 2 data size	160
			Area 2 data pattern	Optional
			Node name	"TargetNode"
	Test equipment		Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	0
			Area 1 data size	0
			Area 1 data pattern	NA
			Area 2 data top address	0
			Area 2 data size	0
			Area 2 data pattern	NA
			Node name	"Tester"

Table 36 – Frame format (continued)

Setting parameter (node) (continued)	Pattern 3 (common memory size = single frame maximum)		
	EUT	Node number	85
		Token watchdog time	50
		Allowable minimum frame interval time	10
		Area 1 data top address	4
		Area 1 data size	4
		Area 1 data pattern	Optional
		Area 2 data top address	64
		Area 2 data size	508
		Area 2 data pattern	Optional
		Node name	"TargetNode"
		IO allocation setting (for class 4)	Optional
	Test equipment	Implementation class	3 (Controller)
		Node number	1
		Token watchdog time	50
		Allowable minimum frame interval time	10
		Area 1 data top address	0
		Area 1 data size	0
		Area 1 data pattern	NA
		Area 2 data top address	0
		Area 2 data size	0
		Area 2 data pattern	NA
		Node name	"Tester"
	Pattern 4 (EUT slave node)		
	EUT	Node number	2
		Token watchdog time	50
		Allowable minimum frame interval time	10
		Area 1 data top address	According to the number of input points of the slave, the EUT: * 0 point: 0 * 1 point or more: 4
		Area 1 data size	To be calculated from the number of input points of the slave, the EUT
		Area 1 data pattern	Optional
		Area 2 data top address	16
		Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
		Area 2 data pattern	Optional
		Node name	"TargetNode"

Table 36 – Frame format (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class)	Class6	Implementation class	4 (Flexible master)
			Node number	1
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
			Area 1 data size	According to the number of output points of the slave, the EUT
			Area 1 data pattern	NA
			Area 2 data top address	1024
			Area 2 data size	16
			Area 2 data pattern	NA
			Node name	"Tester"
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8002 (Flexible setting mode, node number = 2)
				Input data address = According to the number of input points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0004 (Area 1, address = 4)
				Input data size = To be calculated from the number of input points of the slave, the EUT
				Output data address = According to the number of output points of the slave, the EUT: * 0 point : 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8010 (Area 2, address = 16)
				Output status address = 16#8400 (Area 2, address = 1024)

Table 36 – Frame format (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Class 7	Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	0
			Area 1 data size	0
			Area 1 data pattern	NA
			Area 2 data top address	0
			Area 2 data size	0
			Area 2 data pattern	NA
			Node name	"Tester"
Setting parameter (test data)	Pattern 1 (no common memory)			
	EUT		Cyclic frame	Token frame
			Header part data size = 64 octets	Header part data size = 64 octets
			Data size = 0 octet	Data size = 0 octet
			Contents of header (Offset: name = content)	Contents of header (Offset: name = content)
			16#00: H_TYPE = 16#4641_434E	16#00: H_TYPE = 16#4641_434E
			16#04: TFL = 16#0000_0040	16#04: TFL = 16#0000_0040
			16#08: SA = 16#0001_0055	16#08: SA = 16#0001_0055
			16#0C: DA = 16#0001_0001	16#0C: DA = 16#0001_0001
			16#10: V_SEQ = (Optional)	16#10: V_SEQ = (Optional)
			16#14: SEQ = (Optional)	16#14: SEQ = (Optional)
			16#18: M_CTL = any one of those follows: 16#0000_0000, 16#0100_0000, 16#0200_0000, 16#0300_0000	16#18: M_CTL = any one of those follows: 16#0000_0000, 16#0100_0000, 16#0200_0000, 16#0300_0000
			16#1C: ULS = (Optional)	16#1C: ULS = (Optional)
			16#1E: M_SZ = (Optional)	16#1E: M_SZ = (Optional)
			16#20: M_ADD = (Optional)	16#20: M_ADD = (Optional)
			16#24: MFT = 16#0A	16#24: MFT = 16#0A
			16#25: M_RLT = (Optional)	16#25: M_RLT = (Optional)
			16#28: TCD = 16#FDE9	16#28: TCD = 16#FDE8
			16#2A: VER = 16#0000	16#2A: VER = 16#0000
			16#2C: C_AD1 = 16#0000	16#2C: C_AD1 = 16#0000

Table 36 – Frame format (continued)

Setting parameter (test data) (continued)	EUT (continued)		16#2E: C_SZ1 = 16#0000	16#2E: C_SZ1 = 16#0000
			16#30: C_AD2 = 16#0000	16#30: C_AD2 = 16#0000
			16#32: C_SZ2 = 16#0000	16#32: C_SZ2 = 16#0000
			16#34: MODE = 16#8200	16#34: MODE = 16#8200
			16#36: P_TYPE = 16#80	16#36: P_TYPE = 16#80
			16#37: PRI = 16#00	16#37: PRI = 16#00
			16#38: CBN = 16#01	16#38: CBN = 16#01
			16#39: TBN = 16#01	16#39: TBN = 16#01
			16#3A: BSIZE = 16#0040	16#3A: BSIZE = 16#0040
			16#3C: LKS = (Optional)	16#3C: LKS = (Optional)
			16#3D: TW = 16#64	16#3D: TW = 16#64
			16#3E: RCT = (Optional)	16#3E: RCT = (Optional)
	Pattern 2 (common memory size = single frame)			
	EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Cyclic frame	Token frame
			Header part data size = 64 octets	Header part data size = 64 octets
			Data size = 136 octets	Data size = 0 octet
			Content of header (Offset: name = content)	Content of header (Offset: name = content)
			16#00: H_TYPE = 16#4641_434E	16#00: H_TYPE = 16#4641_434E
			16#04: TFL = 16#0000_00C8	16#04: TFL = 16#0000_0040
			16#08: SA = 16#0001_0055	16#08: SA = 16#0001_0055
			16#0C: DA = 16#0001_0001	16#0C: DA = 16#0001_0001
			16#10: V_SEQ = (Optional)	16#10: V_SEQ = (Optional)
			16#14: SEQ = (Optional)	16#14: SEQ = (Optional)
			16#18: M_CTL = any one of those follows: 16#0000_0000, 16#0100_0000, 16#0200_0000, 16#0300_0000	16#18: M_CTL = any one of those follows: 16#0000_0000, 16#0100_0000, 16#0200_0000, 16#0300_0000
			16#1C: ULS = (Optional)	16#1C: ULS = (Optional)
			16#1E: M_SZ = (Optional)	16#1E: M_SZ = (Optional)
			16#20: M_ADD = (Optional)	16#20: M_ADD = (Optional)
			16#24: MFT = 16#0A	16#24: MFT = 16#0A
			16#25: M_RLT = (Optional)	16#25: M_RLT = (Optional)
			16#28: TCD = 16#FDE9	16#28: TCD = 16#FDE8
			16#2A: VER = 16#0000	16#2A: VER = 16#0000
			16#2C: C_AD1 = 16#0004	16#2C: C_AD1 = 16#0004
			16#2E: C_SZ1 = 16#0004	16#2E: C_SZ1 = 16#0004
			16#30: C_AD2 = 16#0040	16#30: C_AD2 = 16#0040
			16#32: C_SZ2 = 16#0040	16#32: C_SZ2 = 16#0040

Table 36 – Frame format (continued)

Setting parameter (test data) (continued)	EUT (The parameters vary according to the class) (continued)	Classes 1, 3 and 4 (continued)	16#34: MODE = 16#8200	16#34: MODE = 16#8200
			16#36: P_TYPE = 16#80	16#36: P_TYPE = 16#80
			16#37: PRI = 16#00	16#37: PRI = 16#00
			16#38: CBN = 16#01	16#38: CBN = 16#01
			16#39: TBN = 16#01	16#39: TBN = 16#01
			16#3A: BSIZE = 16#00C8	16#3A: BSIZE = 16#0040
			16#3C: LKS = (Optional)	16#3C: LKS = (Optional)
			16#3D: TW = 16#32	16#3D: TW = 16#32
			16#3E: RCT = (Optional)	16#3E: RCT = (Optional)
		Class 5	Cyclic frame	Token frame
			Header part data size = 64 octets	Header part data size = 64 octets
			Data size = 400 octets	Data size = 0 octet
			Contents of header (Offset: name = content)	Contents of header (Offset: name = content)
			16#00: H_TYPE = 16#4641_434E	16#00: H_TYPE = 16#4641_434E
			16#04: TFL = 16#0000_01D0	16#04: TFL = 16#0000_0040
			16#08: SA = 16#0001_0064	16#08: SA = 16#0001_0064
			16#0C: DA = 16#0001_0001	16#0C: DA = 16#0001_0001
			16#10: V_SEQ = (Optional)	16#10: V_SEQ = (Optional)
			16#14: SEQ = (Optional)	16#14: SEQ = (Optional)
			16#18: M_CTL = any one of those follows: 16#0000_0000, 16#0100_0000, 16#0200_0000, 16#0300_0000	16#18: M_CTL = any one of those follows: 16#0000_0000, 16#0100_0000, 16#0200_0000, 16#0300_0000
			16#1C: ULS = (Optional)	16#1C: ULS = (Optional)
			16#1E: M_SZ = (Optional)	16#1E: M_SZ = (Optional)
			16#20: M_ADD = (Optional)	16#20: M_ADD = (Optional)
			16#24: MFT = 16#0A	16#24: MFT = 16#0A
			16#25: M_RLT = (Optional)	16#25: M_RLT = (Optional)
			16#28: TCD = 16#FDE9	16#28: TCD = 16#FDE8
			16#2A: VER = 16#0000	16#2A: VER = 16#0000
			16#2C: C_AD1 = 16#0100	16#2C: C_AD1 = 16#0100
			16#2E: C_SZ1 = 16#0028	16#2E: C_SZ1 = 16#0028
			16#30: C_AD2 = 16#0400	16#30: C_AD2 = 16#0400
			16#32: C_SZ2 = 16#00A0	16#32: C_SZ2 = 16#00A0
			16#34: MODE = 16#8200	16#34: MODE = 16#8200
			16#36: P_TYPE = 16#80	16#36: P_TYPE = 16#80
			16#37: PRI = 16#00	16#37: PRI = 16#00
			16#38: CBN = 16#01	16#38: CBN = 16#01
			16#39: TBN = 16#01	16#39: TBN = 16#01
			16#3A: BSIZE = 16#01D0	16#3A: BSIZE = 16#0040
			16#3C: LKS = (Optional)	16#3C: LKS = (Optional)
			16#3D: TW = 16#32	16#3D: TW = 16#32
			16#3E: RCT = (Optional)	16#3E: RCT = (Optional)

Table 36 – Frame format (continued)

Setting parameter (test data) (continued)	Pattern 3 (common memory size = single frame maximum)		
	EUT	Cyclic frame	Token frame
		Header part data size = 64 octets	Header part data size = 64 octets
		Data size = 1024 octets	Data size = 0 octet
		Contents of header (Offset: name = content)	Contents of header (Offset: name = content)
		16#00: H_TYPE = 16#4641_434E	16#00: H_TYPE = 16#4641_434E
		16#04: TFL = 16#0000_0440	16#04: TFL = 16#0000_0040
		16#08: SA = 16#0001_0055	16#08: SA = 16#0001_0055
		16#0C: DA = 16#0001_0001	16#0C: DA = 16#0001_0001
		16#10: V_SEQ = (Optional)	16#10: V_SEQ = (Optional)
		16#14: SEQ = (Optional)	16#14: SEQ = (Optional)
		16#18: M_CTL = any one of those follows: 16#0000_0000, 16#0100_0000, 16#0200_0000, 16#0300_0000	16#18: M_CTL = any one of those follows: 16#0000_0000, 16#0100_0000, 16#0200_0000, 16#0300_0000
		16#1C: ULS = (Optional)	16#1C: ULS = (Optional)
		16#1E: M_SZ = (Optional)	16#1E: M_SZ = (Optional)
		16#20: M_ADD = (Optional)	16#20: M_ADD = (Optional)
		16#24: MFT = 16#0A	16#24: MFT = 16#0A
		16#25: M_RLT = (Optional)	16#25: M_RLT = (Optional)
		16#28: TCD = 16#FDE9	16#28: TCD = 16#FDE8
		16#2A: VER = 16#0000	16#2A: VER = 16#0000
		16#2C: C_AD1 = 16#0004	16#2C: C_AD1 = 16#0004
		16#2E: C_SZ1 = 16#0004	16#2E: C_SZ1 = 16#0004
		16#30: C_AD2 = 16#0040	16#30: C_AD2 = 16#0040
		16#32: C_SZ2 = 16#01FC	16#32: C_SZ2 = 16#01FC
		16#34: MODE = 16#8200	16#34: MODE = 16#8200
		16#36: P_TYPE = 16#80	16#36: P_TYPE = 16#80
		16#37: PRI = 16#00	16#37: PRI = 16#00
		16#38: CBN = 16#01	16#38: CBN = 16#01
		16#39: TBN = 16#01	16#39: TBN = 16#01
		16#3A: BSIZE = 16#0440	16#3A: BSIZE = 16#0040
		16#3C: LKS = (Optional)	16#3C: LKS = (Optional)
		16#3D: TW = 16#32	16#3D: TW = 16#32
		16#3E: RCT = (Optional)	16#3E: RCT = (Optional)
	Pattern 4 (EUT slave node)		
	EUT	Cyclic frame	Token frame
		Header part data size = 64 octets	Header part data size = 64 octets

Table 36 – Frame format (continued)

Setting parameter (test data) (continued)	EUT (continued)	Data size = According to the numbers of input and output points of the slave, the EUT	Data size = 0 octet
		Contents of header (Offset: name = content)	Contents of header (Offset: name = content)
		16#00: H_TYPE = 16#4641_434E	16#00: H_TYPE = 16#4641_434E
		16#04: TFL = According to the numbers of input and output points of the slave, the EUT	16#04: TFL = 16#0000_0040
		16#08: SA = 16#0001_0002	16#08: SA = 16#0001_0002
		16#0C: DA = 16#0001_0001	16#0C: DA = 16#0001_0001
		16#10: V_SEQ = (Optional)	16#10: V_SEQ = (Optional)
		16#14: SEQ = (Optional)	16#14: SEQ = (Optional)
		16#18: M_CTL = any one of those follows: 16#0000_0000, 16#0100_0000, 16#0200_0000, 16#0300_0000	16#18: M_CTL = any one of those follows: 16#0000_0000, 16#0100_0000, 16#0200_0000, 16#0300_0000
		16#1C: ULS = (Optional)	16#1C: ULS = (Optional)
		16#1E: M_SZ = (Optional)	16#1E: M_SZ = (Optional)
		16#20: M_ADD = (Optional)	16#20: M_ADD = (Optional)
		16#24: MFT = 16#0A	16#24: MFT = 16#0A
		16#25: M_RLT = (Optional)	16#25: M_RLT = (Optional)
		16#28: TCD = 16#FDE9	16#28: TCD = 16#FDE8
		16#2A: VER = 16#0000	16#2A: VER = 16#0000
		16#2C: C_AD1 = According to the number of input points of the slave, the EUT: * 0 point: 16#0000 * 1 point or more: 16#0004	16#2C: C_AD1 = According to the number of input points of the slave, the EUT: * 0 point: 16#0000 * 1 point or more: 16#0004
		16#2E: C_SZ1 = To be calculated from the number of input points of the slave, the EUT	16#2E: C_SZ1 = To be calculated from the number of input points of the slave, the EUT
		16#30: C_AD2 = 16#0010	16#30: C_AD2 = 16#0010
		16#32: C_SZ2 = To be calculated from the numbers of input and output points of the slave, the EUT	16#32: C_SZ2 = To be calculated from the numbers of input and output points of the slave, the EUT
		16#34: MODE = 16#8200	16#34: MODE = 16#8200
		16#36: P_TYPE = 16#80	16#36: P_TYPE = 16#80
		16#37: PRI = 16#00	16#37: PRI = 16#00
		16#38: CBN = To be calculated from the numbers of input and output points of the slave, the EUT	16#38: CBN = 16#01
		16#39: TBN = To be calculated from the numbers of input and output points of the slave, the EUT	16#39: TBN = 16#01

Table 36 – Frame format (continued)

Setting parameter (test data) (continued)	EUT (continued)	16#3A: BSIZE = To be calculated from the numbers of input and output points of the slave, the EUT	16#3A: BSIZE = 16#0040
		16#3C: LKS = (Optional)	16#3C: LKS = (Optional)
		16#3D: TW = 16#32	16#3D: TW = 16#32
		16#3E: RCT = (Optional)	16#3E: RCT = (Optional)

Table 37 – Frame format (divided)

Test number		V2-031			
Major test group		Cyclic transmission			
Test group		Normal operation test			
Test objects		Flame format (divided)			
Test procedure		a) Start the EUT, then start the test equipment. b) Execute tests with settings maximum three patterns according to class of the EUT.			
Evaluation criteria		Confirm that contents and size of the header part are correct. Refer setting parameter (test data) for the contents of the header.			
Test necessity identified by the EUT class	Class 1	R (patterns 1 through 3)			
	Class 2	N			
	Class 3	R (patterns 1 through 3)			
	Class 4	R (patterns 2 through 3)			
	Class 5	R (patterns 1 and 2)			
	Class 6	No			
	Class 7	N			
Setting parameter (node)		Pattern 1 (common memory size = minimum)			
		EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number	85
				Token watchdog time	50
				Allowable minimum frame interval time	10
				Area 1 data top address	4
				Area 1 data size	1
				Area 1 data pattern	Optional
				Area 2 data top address	64
				Area 2 data size	512
				Area 2 data pattern	Optional
				Node name	"TargetNode"

Table 37 – Frame format (divided) (continued)

Setting parameter (node) (continued)	EUT (The parameters vary according to the class) (continued)	Class 5	Node number	100
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	104
			Area 1 data pattern	Optional
			Area 2 data top address	1024
			Area 2 data size	416
			Area 2 data pattern	Optional
			Node name	"TargetNode"
	Test equipment		Node number	1
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	0
			Area 1 data size	0
			Area 1 data pattern	NA
			Area 2 data top address	0
			Area 2 data size	0
			Area 2 data pattern	NA
			Node name	"Tester"
	Pattern 2 (common memory size = intermediate)			
	EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	200
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	256
			Area 1 data pattern	Optional
			Area 2 data top address	64
			Area 2 data size	4096
			Area 2 data pattern	Optional
			Node name	"TargetNode"

Table 37 – Frame format (divided) (continued)

Setting parameter (node) (continued)	EUT (The parameters vary according to the class) (continued)	Class 5	Node number	100
			Token watchdog time	200
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	256
			Area 1 data pattern	Optional
			Area 2 data top address	1024
			Area 2 data size	1024
			Area 2 data pattern	Optional
			Node name	"TargetNode"
	Test equipment		Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	0
			Area 1 data size	0
			Area 1 data pattern	NA
			Area 2 data top address	0
			Area 2 data size	0
			Area 2 data pattern	NA
			Node name	"Tester"
	Pattern 3 (common memory size = maximum)			
	EUT		Node number	80
			Token watchdog time	200
			Allowable minimum frame interval time	10
			Area 1 data top address	0
			Area 1 data size	512
			Area 1 data pattern	Optional
			Area 2 data top address	0
			Area 2 data size	8192
			Area 2 data pattern	Optional
			Node name	"TargetNode"

Table 37 – Frame format (divided) (continued)

Setting parameter (node) (continued)	Test equipment		Implementation class	3(controller)	
			Node number	1	
			Token watchdog time	50	
			Allowable minimum frame interval time	10	
			Area 1 data top address	0	
			Area 1 data size	0	
			Area 1 data pattern	NA	
			Area 2 data top address	0	
			Area 2 data size	0	
			Area 2 data pattern	NA	
			Node name	"Tester"	
Setting parameter (test data)	Pattern 1 (common memory size = minimum)				
	EUT (The parameters vary according to the class)	Classes 1, 3 and 4	a) Cyclic frame (CBN != TBN)	b) Cyclic frame (CBN = TBN)	c) Token frame
			Header part data size = 64 octets	Header part data size = 64 octets	Header part data size = 64 octets
			Data size = 1024 octets	Data size = 2 octets	Data size = 0 octet
			Contents of header (Offset: name = content)	Contents of header (Offset: name = content)	Contents of header (Offset: name = content)
			16#00: H_TYPE = 16#4641_434E	16#00: H_TYPE = 16#4641_434E	16#00: H_TYPE = 16#4641_434E
			16#04: TFL = 16#0000_0442	16#04: TFL = 16#0000_0442	16#04: TFL = 16#0000_0040
			16#08: SA = 16#0001_0055	16#08: SA = 16#0001_0055	16#08: SA = 16#0001_0055
			16#0C: DA = 16#0001_0001	16#0C: DA = 16#0001_0001	16#0C: DA = 16#0001_0001
			16#10: V_SEQ = (Optional)	16#10: V_SEQ = (Optional)	16#10: V_SEQ = (Optional)
			16#14: SEQ = (Optional)	16#14: SEQ = (Optional)	16#14: SEQ = (Optional)
			16#18: M_CTL = any one of those follows: 16#0000_0000, 16#0100_0000, 16#0200_0000, 16#0300_0000	16#18: M_CTL = any one of those follows: 16#0000_0000, 16#0100_0000, 16#0200_0000, 16#0300_0000	16#18: M_CTL = any one of those follows: 16#0000_0000, 16#0100_0000, 16#0200_0000, 16#0300_0000
			16#1C: ULS = (Optional)	16#1C: ULS = (Optional)	16#1C: ULS = (Optional)

Table 37 – Frame format (divided) (continued)

Setting parameter (test data)	EUT (The parameters vary according to the class) (continued)	Classes 1, 3 and 4 (continued)	16#1E: M_SZ = (Optional)	16#1E: M_SZ = (Optional)	16#1E: M_SZ = (Optional)
			16#20: M_ADD = (Optional)	16#20: M_ADD = (Optional)	16#20: M_ADD = (Optional)
			16#24: MFT = (Optional)	16#24: MFT = 16#0A	16#24: MFT = 16#0A
			16#25: M_RLT = (Optional)	16#25: M_RLT = (Optional)	16#25: M_RLT = (Optional)
			16#28: TCD = 16#FDE9	16#28: TCD = 16#FDE9	16#28: TCD = 16#FDE8
			16#2A: VER = 16#0000	16#2A: VER = 16#0000	16#2A: VER = 16#0000
			16#2C: C_AD1 = 16#0004	16#2C: C_AD1 = 16#0004	16#2C: C_AD1 = 16#0004
			16#2E: C_SZ1 = 16#0001	16#2E: C_SZ1 = 16#0001	16#2E: C_SZ1 = 16#0001
			16#30: C_AD2 = 16#0040	16#30: C_AD2 = 16#0040	16#30: C_AD2 = 16#0040
			16#32: C_SZ2 = 16#0200	16#32: C_SZ2 = 16#0200	16#32: C_SZ2 = 16#0200
			16#34: MODE = 16#8200	16#34: MODE = 16#8200	16#34: MODE = 16#8200
			16#36: P_TYPE = 16#80	16#36: P_TYPE = 16#80	16#36: P_TYPE = 16#80
			16#37: PRI = 16#00	16#37: PRI = 16#00	16#37: PRI = 16#00
			16#38: CBN = 16#01	16#38: CBN = 16#02	16#38: CBN = 16#01
			16#39: TBN = 16#02	16#39: TBN = 16#02	16#39: TBN = 16#02
			16#3A: BSIZE = 16#0440	16#3A: BSIZE = 16#0042	16#3A: BSIZE = 16#0040
			16#3C: LKS = (Optional)	16#3C: LKS = (Optional)	16#3C: LKS = (Optional)
			16#3D: TW = 16#32	16#3D: TW = 16#32	16#3D: TW = 16#32
			16#3E: RCT = (Optional)	16#3E: RCT = (Optional)	16#3E: RCT = (Optional)
		Class 5	a) Cyclic frame (CBN != TBN)	b) Cyclic frame (CBN = TBN)	c) Token frame
			Header part data size = 64 octets	Header part data size = 64 octets	Header part data size = 64 octets
			Data size = 1024 octets	Data size = 16 octets	Data size = 0 octet
			Contents of header (Offset: name = content)	Contents of header (Offset: name = content)	Contents of header (Offset: name = content)
			16#00: H_TYPE = 16#4641_434E	16#00: H_TYPE = 16#4641_434E	16#00: H_TYPE = 16#4641_434E

Table 37 – Frame format (divided) (continued)

Setting parameter (test data) (continued)	EUT (The parameters vary according to the class) (continued)	Class 5 (continued)	16#04: TFL = 16#0000_0450	16#04: TFL = 16#0000_0450	16#04: TFL = 16#0000_0040
			16#08: SA = 16#0001_0064	16#08: SA = 16#0001_0064	16#08: SA = 16#0001_0064
			16#0C: DA = 16#0001_0001	16#0C: DA = 16#0001_0001	16#0C: DA = 16#0001_0001
			16#10: V_SEQ = (Optional)	16#10: V_SEQ = (Optional)	16#10: V_SEQ = (Optional)
			16#14: SEQ = (Optional)	16#14: SEQ = (Optional)	16#14: SEQ = (Optional)
			16#18: M_CTL = any one of those follows: 16#0000_0000, 16#0100_0000, 16#0200_0000, 16#0300_0000	16#18: M_CTL = any one of those follows: 16#0000_0000, 16#0100_0000, 16#0200_0000, 16#0300_0000	16#18: M_CTL = any one of those follows: 16#0000_0000, 16#0100_0000, 16#0200_0000, 16#0300_0000
			16#1C: ULS = (Optional)	16#1C: ULS = (Optional)	16#1C: ULS = (Optional)
			16#1E: M_SZ = (Optional)	16#1E: M_SZ = (Optional)	16#1E: M_SZ = (Optional)
			16#20: M_ADD = (Optional)	16#20: M_ADD = (Optional)	16#20: M_ADD = (Optional)
			16#24: MFT = (Optional)	16#24: MFT = 16#0A	16#24: MFT = 16#0A
			16#25: M_RLT = (Optional)	16#25: M_RLT = (Optional)	16#25: M_RLT = (Optional)
			16#28: TCD = 16#FDE9	16#28: TCD = 16#FDE9	16#28: TCD = 16#FDE8
			16#2A: VER = 16#0000	16#2A: VER = 16#0000	16#2A: VER = 16#0000
			16#2C: C_AD1 = 16#0100	16#2C: C_AD1 = 16#0100	16#2C: C_AD1 = 16#0100
			16#2E: C_SZ1 = 16#0068	16#2E: C_SZ1 = 16#0068	16#2E: C_SZ1 = 16#0068
			16#30: C_AD2 = 16#0400	16#30: C_AD2 = 16#0400	16#30: C_AD2 = 16#0400
			16#32: C_SZ2 = 16#01A0	16#32: C_SZ2 = 16#01A0	16#32: C_SZ2 = 16#01A0
			16#34: MODE = 16#8200	16#34: MODE = 16#8200	16#34: MODE = 16#8200
			16#36: P_TYPE = 16#80	16#36: P_TYPE = 16#80	16#36: P_TYPE = 16#80
			16#37: PRI = 16#00	16#37: PRI = 16#00	16#37: PRI = 16#00
			16#38: CBN = 16#01	16#38: CBN = 16#02	16#38: CBN = 16#01
			16#39: TBN = 16#02	16#39: TBN = 16#02	16#39: TBN = 16#01
			16#3A: BSIZE = 16#0440	16#3A: BSIZE = 16#0050	16#3A: BSIZE = 16#0040

Table 37 – Frame format (divided) (continued)

Setting parameter (test data) (continued)	EUT (The parameters vary according to the class) (continued)	Class 5 (continued)	16#3C: LKS = (Optional)	16#3C: LKS = (Optional)	16#3C: LKS = (Optional)
			16#3D: TW = 16#32	16#3D: TW = 16#32	16#3D: TW = 16#32
			16#3E: RCT = (Optional)	16#3E: RCT = (Optional)	16#3E: RCT = (Optional)
	Pattern 2 (common memory size = intermediate)				
	EUT (The parameters vary according to the class)	Classes 1, 3 and 4	a) Cyclic frame (CBN != TBN)	b) Cyclic frame (CBN = TBN)	c) Token frame
			Header part data size = 64 octets	Header part data size = 64 octets	Header part data size = 64 octets
			Data size = 1024 octets	Data size = 512 octets	Data size = 0 octet
			Contents of header (Offset: name = content)	Contents of header (Offset: name = content)	Contents of header (Offset: name = content)
			16#00: H_TYPE = 16#4641_434E	16#00: H_TYPE = 16#4641_434E	16#00: H_TYPE = 16#4641_434E
			16#04: TFL = 16#0000_2240	16#04: TFL = 16#0000_2240	16#04: TFL = 16#0000_0040
			16#08: SA = 16#0001_0055	16#08: SA = 16#0001_0055	16#08: SA = 16#0001_0055
			16#0C: DA = 16#0001_0001	16#0C: DA = 16#0001_0001	16#0C: DA = 16#0001_0001
			16#10: V_SEQ = (Optional)	16#10: V_SEQ = (Optional)	16#10: V_SEQ = (Optional)
			16#14: SEQ = (Optional)	16#14: SEQ = (Optional)	16#14: SEQ = (Optional)
			16#18: M_CTL = any one of those follows: 16#0000_0000, 16#0100_0000, 16#0200_0000, 16#0300_0000	16#18: M_CTL = any one of those follows: 16#0000_0000, 16#0100_0000, 16#0200_0000, 16#0300_0000	16#18: M_CTL = any one of those follows: 16#0000_0000, 16#0100_0000, 16#0200_0000, 16#0300_0000
			16#1C: ULS = (Optional)	16#1C: ULS = (Optional)	16#1C: ULS = (Optional)
			16#1E: M_SZ = (Optional)	16#1E: M_SZ = (Optional)	16#1E: M_SZ = (Optional)
			16#20: M_ADD = (Optional)	16#20: M_ADD = (Optional)	16#20: M_ADD = (Optional)
			16#24: MFT = (Optional)	16#24: MFT = 16#0A	16#24: MFT = 16#0A
			16#25: M_RLT = (Optional)	16#25: M_RLT = (Optional)	16#25: M_RLT = (Optional)
			16#28: TCD = 16#FDE9	16#28: TCD = 16#FDE9	16#28: TCD = 16#FDE8
			16#2A: VER = 16#0000	16#2A: VER = 16#0000	16#2A: VER = 16#0000

Table 37 – Frame format (divided) (continued)

Setting parameter (test data) (continued)	EUT (The parameters vary according to the class) (continued)	Classes 1, 3 and 4 (continued)	16#2C: C_AD1 = 16#0004	16#2C: C_AD1 = 16#0004	16#2C: C_AD1 = 16#0004
			16#2E: C_SZ1 = 16#0100	16#2E: C_SZ1 = 16#0100	16#2E: C_SZ1 = 16#0100
			16#30: C_AD2 = 16#0040	16#30: C_AD2 = 16#0040	16#30: C_AD2 = 16#0040
			16#32: C_SZ2 = 16#1000	16#32: C_SZ2 = 16#1000	16#32: C_SZ2 = 16#0100
			16#34: MODE = 16#8200	16#34: MODE = 16#8200	16#34: MODE = 16#8200
			16#36: P_TYPE = 16#80	16#36: P_TYPE = 16#80	16#36: P_TYPE = 16#80
			16#37: PRI = 16#00	16#37: PRI = 16#00	16#37: PRI = 16#00
			16#38: CBN = 16#01 through 16#08	16#38: CBN = 16#09	16#38: CBN = 16#01
			16#39: TBN = 16#09	16#39: TBN = 16#09	16#39: TBN = 16#01
			16#3A: BSIZE = 16#0440	16#3A: BSIZE = 16#0240	16#3A: BSIZE = 16#0040
			16#3C: LKS = (Optional)	16#3C: LKS = (Optional)	16#3C: LKS = (Optional)
			16#3D: TW = (Optional)	16#3D: TW = 16#C8	16#3D: TW = 16#C8
			16#3E: RCT = (Optional)	16#3E: RCT = (Optional)	16#3E: RCT = (Optional)
		Class 5	a) Cyclic frame (CBN != TBN)	b) Cyclic frame (CBN = TBN)	C) Token frame
			Header part data size = 64 octets	Header part data size = 64 octets	Header part data size = 64 octets
			Data size = 1024 octets	Data size = 512 octets	Data size = 0 octet
			Contents of header (Offset: name = content)	Contents of header (Offset: name = content)	Contents of header (Offset: name = content)
			16#00: H_TYPE = 16#4641_434E	16#00: H_TYPE = 16#4641_434E	16#00: H_TYPE = 16#4641_434E
			16#04: TFL = 16#0000_0A40	16#04: TFL = 16#0000_0A40	16#04: TFL = 16#0000_0040
			16#08: SA = 16#0001_0064	16#08: SA = 16#0001_0064	16#08: SA = 16#0001_0064
			16#0C: DA = 16#0001_0064	16#0C: DA = 16#0001_0001	16#0C: DA = 16#0001_0001
			16#10: V_SEQ = (Optional)	16#10: V_SEQ = (Optional)	16#10: V_SEQ = (Optional)
			16#14: SEQ = (Optional)	16#14: SEQ = (Optional)	16#14: SEQ = (Optional)

Table 37 – Frame format (divided) (continued)

Setting parameter (test data) (continued)	EUT (The parameters vary according to the class) (continued)	Class 5 (continued)	16#18: M_CTL = any one of those follows: 16#0000_0000, 16#0100_0000, 16#0200_0000, 16#0300_0000	16#18: M_CTL = any one of those follows: 16#0000_0000, 16#0100_0000, 16#0200_0000, 16#0300_0000	16#18: M_CTL = any one of those follows: 16#0000_0000, 16#0100_0000, 16#0200_0000, 16#0300_0000
			16#1C: ULS = (Optional)	16#1C: ULS = (Optional)	16#1C: ULS = (Optional)
			16#1E: M_SZ = (Optional)	16#1E: M_SZ = (Optional)	16#1E: M_SZ = (Optional)
			16#20: M_ADD = (Optional)	16#20: M_ADD = (Optional)	16#20: M_ADD = (Optional)
			16#24: MFT = (Optional)	16#24: MFT = 16#0A	16#24: MFT = 16#0A
			16#25: M_RLT = (Optional)	16#25: M_RLT = (Optional)	16#25: M_RLT = (Optional)
			16#28: TCD = 16#FDE9	16#28: TCD = 16#FDE9	16#28: TCD = 16#FDE8
			16#2A: VER = 16#0000	16#2A: VER = 16#0000	16#2A: VER = 16#0000
			16#2C: C_AD1 = 16#0100	16#2C: C_AD1 = 16#0100	16#2C: C_AD1 = 16#0100
			16#2E: C_SZ1 = 16#0100	16#2E: C_SZ1 = 16#0100	16#2E: C_SZ1 = 16#0100
			16#30: C_AD2 = 16#0400	16#30: C_AD2 = 16#0400	16#30: C_AD2 = 16#0400
			16#32: C_SZ2 = 16#0400	16#32: C_SZ2 = 16#0400	16#32: C_SZ2 = 16#0400
			16#34: MODE = 16#8200	16#34: MODE = 16#8200	16#34: MODE = 16#8200
			16#36: P_TYPE = 16#80	16#36: P_TYPE = 16#80	16#36: P_TYPE = 16#80
			16#37: PRI = 16#00	16#37: PRI = 16#00	16#37: PRI = 16#00
			16#38: CBN = 16#01 through 16#08	16#38: CBN = 16#03	16#38: CBN = 16#01
			16#39: TBN = 16#03	16#39: TBN = 16#03	16#39: TBN = 16#01
			16#3A: BSIZE = 16#0440	16#3A: BSIZE = 16#0240	16#3A: BSIZE = 16#0040
			16#3C: LKS = (Optional)	16#3C: LKS = (Optional)	16#3C: LKS = (Optional)
			16#3D: TW = (Optional)	16#3D: TW = 16#C8	16#3D: TW = 16#C8
			16#3E: RCT = (Optional)	16#3E: RCT = (Optional)	16#3E: RCT = (Optional)

Table 37 – Frame format (divided) (continued)

Setting parameter (test data) (continued)	Pattern 3 (common memory size = maximum)			
	EUT	a) Cyclic frame (CBN != TBN)	b) Cyclic frame (CBN = TBN)	c) Token frame
		Header part data size = 64 octets	Header part data size = 64 octets	Header part data size = 64 octets
		Data size = 1024 octets	Data size = 1024 octets	Data size = 0 octet
		Contents of header (Offset: name = content)	Contents of header (Offset: name = content)	Contents of header (Offset: name = content)
		16#00: H_TYPE = 16#4641_434E	16#00: H_TYPE = 16#4641_434E	16#00: H_TYPE = 16#4641_434E
		16#04: TFL = 16#0000_4440	16#04: TFL = 16#0000_4440	16#04: TFL = 16#0000_0040
		16#08: SA = 16#0001_0055	16#08: SA = 16#0001_0055	16#08: SA = 16#0001_0055
		16#0C: DA = 16#0001_0001	16#0C: DA = 16#0001_0001	16#0C: DA = 16#0001_0001
		16#10: V_SEQ = (Optional)	16#10: V_SEQ = (Optional)	16#10: V_SEQ = (Optional)
		16#14: SEQ = (Optional)	16#14: SEQ = (Optional)	16#14: SEQ = (Optional)
		16#18: M_CTL = any one of those follows: 16#0000_0000, 16#0100_0000, 16#0200_0000, 16#0300_0000	16#18: M_CTL = any one of those follows: 16#0000_0000, 16#0100_0000, 16#0200_0000, 16#0300_0000	16#18: M_CTL = any one of those follows: 16#0000_0000, 16#0100_0000, 16#0200_0000, 16#0300_0000
		16#1C: ULS = (Optional)	16#1C: ULS = (Optional)	16#1C: ULS = (Optional)
		16#1E: M_SZ = (Optional)	16#1E: M_SZ = (Optional)	16#1E: M_SZ = (Optional)
		16#20: M_ADD = (Optional)	16#20: M_ADD = (Optional)	16#20: M_ADD = (Optional)
		16#24: MFT = (Optional)	16#24: MFT = 16#0A	16#24: MFT = 16#0A
		16#25: M_RLT = (Optional)	16#25: M_RLT = (Optional)	16#25: M_RLT = (Optional)
		16#28: TCD = 16#FDE9	16#28: TCD = 16#FDE9	16#28: TCD = 16#FDE8
		16#2A: VER = 16#0000	16#2A: VER = 16#0000	16#2A: VER = 16#0000
		16#2C: C_AD1 = 16#0000	16#2C: C_AD1 = 16#0000	16#2C: C_AD1 = 16#0000
		16#2E: C_SZ1 = 16#0200	16#2E: C_SZ1 = 16#2000	16#2E: C_SZ1 = 16#2000

Table 37 – Frame format (divided) (continued)

Setting parameter (test data) (continued)	EUT (continued)	16#30: C_AD2 = 16#0000	16#30: C_AD2 = 16#0000	16#30: C_AD2 = 16#0000
		16#32: C_SZ2 = 16#2000	16#32: C_SZ2 = 16#2000	16#32: C_SZ2 = 16#2000
		16#34: MODE = 16#8200	16#34: MODE = 16#8200	16#34: MODE = 16#8200
		16#36: P_TYPE = 16#80	16#36: P_TYPE = 16#80	16#36: P_TYPE = 16#80
		16#37: PRI = 16#00	16#37: PRI = 16#00	16#37: PRI = 16#00
		16#38: CBN = 16#01 through 16#10	16#38: CBN = 16#11	16#38: CBN = 16#01
		16#39: TBN = 16#11	16#39: TBN = 16#11	16#39: TBN = 16#01
		16#3A: BSIZE = 16#0440	16#3A: BSIZE = 16#0440	16#3A: BSIZE = 16#0040
		16#3C: LKS = (Optional)	16#3C: LKS = (Optional)	16#3C: LKS = (Optional)
		16#3D: TW = (Optional)	16#3D: TW = 16#C8	16#3D: TW = 16#C8
		16#3E: RCT = (Optional)	16#3E: RCT = (Optional)	16#3E: RCT = (Optional)

b) Abnormal operation of cyclic transmission

Tables 38 and 40 show test tables for abnormal operation of cyclic transmission.

Table 38 – Discard of abnormal frame (TBN, CBN)

Test number		V2-032
Major test group		Cyclic transmission
Test group		Abnormal operation test
Test objects		Discard of abnormal frame (TBN, CBN)
Test procedure		a) Start the EUT, then Start the test equipment. b) Execute tests for settings of patterns 1 and 2, respectively. c) The test equipment sends abnormal frames continuously after operation of the test equipment becomes stable. Refer the setting parameter table for format of the abnormal frames.
Evaluation criteria		Confirm followings for both patterns 1 and 2: a) All the contents of common memory area 1 and area 2 of the EUT have not changed. Substitute confirmations of following items are allowed depending on the EUT class: * Classes 1 and 3: top and tail of each area. * Classes 4 and 5: top and tail of input data from the test equipment (slave) and input status. * Classes 6 and 7: top and tail of output data from the test equipment (master) and output status. b) The test equipment does not disengage (timeout of such as token watchdog time does not occur).
Test necessity identified by the EUT class	Class 1	R
	Class 2	N
	Class 3	R
	Class 4	R
	Class 5	R
	Class 6	R
	Class 7	R

Table 38 – Discard of abnormal frame (TBN, CBN) (continued)

Setting parameter (node)	EUT (The parameter vary according to the class)	Classes 1 and 3	Node number	85
			Token watchdog time	100
			Allowable minimum frame interval time	10
			Area 1 data top address	0
			Area 1 data size	0
			Area 1 data pattern	NA
			Area 2 data top address	0
			Area 2 data size	0
			Area 2 data pattern	NA
			Node name	"TargetNode"
		Class 4	Node number	85
			Token watchdog time	100
			Allowable minimum frame interval time	10
			Area 1 data top address	0
			Area 1 data size	0
			Area 1 data pattern	NA
			Area 2 data top address	1024
			Area 2 data size	1024
			Area 2 data pattern	Optional
			Node name	"TargetNode"
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = 16#0100
				Output data address = 16#0000
				Output data size = 16#0000
				Input data status address = 16#8000 (Area 2, address = 0)
				Output data status address = 16#8400 (Area 2, address = 1024)

Table 38 – Discard of abnormal frame (TBN, CBN) (continued)

Setting parameter (node) (continued)	EUT (The parameter vary according to the class) (continued)	Class 5	Node number	100
			Token watchdog time	100
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	256
			Area 1 data pattern	Optional
			Area 2 data top address	1024
			Area 2 data size	1024
			Area 2 data pattern	Optional
			Node name	"TargetNode"
		Classes 6 and 7	Node number	1
			Token watchdog time	100
			Allowable minimum frame interval time	0
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 1 data pattern	Optional
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
			Area 2 data pattern	Optional
			Node name	"TargetNode"
	Test equipment (The parameters vary according to the EUT class)	Classes 1 and 3	Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	200
			Allowable minimum frame interval time	10
			Area 1 data top address	0
			Area 1 data size	256
			Area 1 data pattern	Optional
			Area 2 data top address	0
			Area 2 data size	4096
			Area 2 data pattern	Optional
			Node name	"Tester"

Table 38 – Discard of abnormal frame (TBN, CBN) (continued)

Setting parameter (node) (continued)	Test equipment (The parameter vary according to the EUT class) (continued)	Class 4	Implementation class	6 (Flexible slave)
			Node number	1
			Token watchdog time	200
			Allowable minimum frame interval time	10
			Area 1 data top address	40
			Area 1 data size	256
			Area 1 data pattern	Optional (to update input status optionally)
			Area 2 data top address	0
			Area 2 data size	1024
			Area 2 data pattern	Optional (to update input data optionally)
			Node name	"Tester"
			Number of input points of the slave	4096
			Number of output points of the slave	0
		Class 5	Implementation class	7 (Fixed slave)
			Node number	1
			Token watchdog time	200
			Allowable minimum frame interval time	10
			Area 1 data top address	0
			Area 1 data size	256
			Area 1 data pattern	Optional (to update input data optionally)
			Area 2 data top address	0
			Area 2 data size	1024
			Area 2 data pattern	Optional (to update input status optionally
			Node name	"Tester"
			Number of input points of the slave	4096
			Number of output points of the slave	0
		Class 6	Implementation class	4 (Flexible master)
			Node number	100
			Token watchdog time	200
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	256
			Area 1 data pattern	Optional (to update output data optionally)

Table 38 – Discard of abnormal frame (TBN, CBN) (continued)

Setting parameter (node) (continued)	Test equipment (The parameter vary according to the EUT class) (continued)	Class 6 (continued)	Area 2 data top address	1024
			Area 2 data size	1024
			Area 2 data pattern	Optional (to update output status optionally
			Node name	"Tester"
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = To be calculated from the number of input points of the slave, the EUT
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input data status address = 16#8000 (Area 2, address = 0)
				Output data status address = 16#8400 (Area 2, address = 1024)
		Class 7	Implementation class	5 (Fixed master)
			Node number	100
			Token watchdog time	200
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	256
			Area 1 data pattern	Optional (to update output data optionally)
			Area 2 data top address	1024
			Area 2 data size	1024
			Area 2 data pattern	Optional (to update output status optionally
			Node name	"Tester"

Table 38 – Discard of abnormal frame (TBN, CBN) (continued)

Setting parameter (test data)	Abnormal frame pattern 1 (depending to the EUT class)	Classes 1 and 3	Skipping CBN/TBN = 03/09, transmit frames with CBN/TBN = 01/09, 02/09, 04/09 through 09/09 in this order.
		Classes 4 and 5	Skipping CBN/TBN = 02/03, transmit frames with CBN/TBN = 01/03, 03/03 in this order.
		Classes 6 and 7	Skipping CBN/TBN = 02/03, transmit frames with CBN/TBN = 01/03, 03/03 in this order.
	Abnormal frame pattern 2 (depending to the EUT class)	Classes 1 and 3	Duplicating CBN/TBN = 03/09, transmit frames with CBN/TBN = 01/09, 02/09, 03/09, 03/09, 04/09 through 09/09 in this order.
		Classes 4 and 5	Duplicating CBN/TBN = 02/03, transmit frames with CBN/TBN = 01/03, 02/03, 02/03, 03/03 in this order.
		Classes 6 and 7	Duplicating CBN/TBN = 02/03, transmit frames with CBN/TBN = 01/03, 02/03, 02/03, 03/03 in this order.

Table 39 – Discard of abnormal frame (BSIZE)

Test number		V2-033
Major test group		Cyclic transmission
Test group		Abnormal operation test
Test objects		Discard of abnormal frame (BSIZE)
Test procedure		a) Start the EUT, then Start the test equipment. b) After operation of the test equipment becomes stable, the test equipment sends a BSIZE error frame as the final cyclic frame of dividing frame transmission. Refer the setting parameter table for format of the abnormal frame.
Evaluation criteria		a) Confirm that all the contents of common memory area 1 and area 2 of the EUT have not changed. Substitute confirmations of following items are allowed depending on the EUT class: * Classes 1 and 3: top and tail of each area (all 0). * Classes 4 and 5: top and tail of input data from the test equipment (slave) and input status. * Classes 6 and 7: top and tail of output data from the test equipment (master) and output status. b) Confirm that the test equipment does not disengage (timeout of such as token watchdog time does not occur).
Test necessity identified by the EUT class	Class 1	R
	Class 2	N
	Class 3	R
	Class 4	R
	Class 5	R
	Class 6	R
	Class 7	R

Table 39 – Discard of abnormal frame (BSIZE) (continued)

Setting parameter (node)	EUT (The parameter vary according to the class)	Classes 1 and 3	Node number	85
			Token watchdog time	100
			Allowable minimum frame interval time	10
			Area 1 data top address	0
			Area 1 data size	0
			Area 1 data pattern	NA
			Area 2 data top address	0
			Area 2 data size	0
			Area 2 data pattern	NA
			Node name	"TargetNode"
		Class 4	Node number	85
			Token watchdog time	100
			Allowable minimum frame interval time	10
			Area 1 data top address	0
			Area 1 data size	0
			Area 1 data pattern	NA
			Area 2 data top address	1024
			Area 2 data size	1024
			Area 2 data pattern	Optional
			Node name	"TargetNode"
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = 16#0100
				Output data address = 16#0000
				Output data size = 16#0000
				Input data status address = 16#8000 (Area 2, address = 0)
				Output data status address = 16#8400 (Area 2, address = 1024)
		Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	10

Table 39 – Discard of abnormal frame (BSIZE) (continued)

Setting parameter (node) (continued)	EUT (The parameter vary according to the class) (continued)	Class 5 (continued)	Area 1 data top address	256
			Area 1 data size	256
			Area 1 data pattern	Optional
			Area 2 data top address	1024
			Area 2 data size	1024
			Area 2 data pattern	Optional
			Node name	"TargetNode"
		Classes 6 and 7	Node number	1
			Token watchdog time	100
			Allowable minimum frame interval time	10
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 1 data pattern	Optional
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
			Area 2 data pattern	Optional
			Node name	"TargetNode"
	Test equipment (The parameters vary according to the EUT class)	Classes 1 and 3	Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	200
			Allowable minimum frame interval time	10
			Area 1 data top address	0
			Area 1 data size	256
			Area 1 data pattern	Optional
			Area 2 data top address	0
			Area 2 data size	4096
			Area 2 data pattern	Optional
			Node name	"Tester"
		Class 4	Implementation class	6 (Flexible slave)
			Node number	1
			Token watchdog time	200
			Allowable minimum frame interval time	10
			Area 1 data top address	40
			Area 1 data size	256

Table 39 – Discard of abnormal frame (BSIZE) (continued)

Setting parameter (node) (continued)	Test equipment (The parameter vary according to the EUT class) (continued)	Class 4 (continued)	Area 1 data pattern	Optional (to update input status optionally)
			Area 2 data top address	0
			Area 2 data size	1024
			Area 2 data pattern	Optional (to update input data optionally)
			Node name	"Tester"
			Number of input points of the slave	4096
			Number of output points of the slave	0
		Class 5	Implementation class	7 (Fixed slave)
			Node number	1
			Token watchdog time	200
			Allowable minimum frame interval time	10
			Area 1 data top address	0
			Area 1 data size	256
			Area 1 data pattern	Optional (to update input data optionally)
			Area 2 data top address	0
			Area 2 data size	16
			Area 2 data pattern	Optional (to update input status optionally
			Node name	"Tester"
			Number of input points of the slave	4096
			Number of output points of the slave	0
		Class 6	Implementation class	4 (Flexible master)
			Node number	100
			Token watchdog time	200
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	256
			Area 1 data pattern	Optional (to update output data optionally)
			Area 2 data top address	1024
			Area 2 data size	1024
			Area 2 data pattern	Optional (to update output status optionally
			Node name	"Tester"
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, node number = 1)

Table 39 – Discard of abnormal frame (BSIZE) (continued)

Setting parameter (node) (continued)	Test equipment (The parameter vary according to the EUT class) (continued)	Class 6 (continued)	IO allocation setting (slave setting) (continued)	Input data address = 16#0000 (Area 1, address = 0)
				Input data size = To be calculated from the number of input points of the slave, the EUT
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input data status address = 16#8000 (Area 2, address = 0)
				Output data status address = 16#8400 (Area 2, address = 1024)
		Class 7	Implementation class	5 (Fixed master)
			Node number	100
			Token watchdog time	200
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	256
			Area 1 data pattern	Optional (to update output data optionally)
			Area 2 data top address	1024
			Area 2 data size	1024
			Area 2 data pattern	Optional (to update output status optionally
			Node name	"Tester"
Setting parameter (test data)	Abnormal frame (depending on the EUT class)	Class 1 and 3	BSIZE of the last cyclic frame (CBN = 9) = 16#200 (refer: normal value = 16#240) The last cyclic frame shall be the same as a normal frame except BSIZE.	
		Class 4	BSIZE of the last cyclic frame (CBN = 3) = 16#1F0 (refer: normal value = 16#200) The last cyclic frame shall be the same as a normal frame except BSIZE.	
		Class 5	BSIZE of the last cyclic frame (CBN = 1) = 16#200 (refer: normal value = 16#260) The last cyclic frame shall be the same as a normal frame except BSIZE.	
		Class 6 and 7	BSIZE of the last cyclic frame (CBN = 3) = 16#200 (refer: normal value = 16#240) The last cyclic frame shall be the same as a normal frame except BSIZE.	

Table 40 – Discard of abnormal frame (TCD)

Test number		V2-034			
Major test group		Cyclic transmission			
Test group		Abnormal operation test			
Test objects		Discard of abnormal frame (TCD)			
Test procedure		a) Start the EUT, then Start the test equipment. b) In case the EUT is class 6, the test equipment sends a solicitation frame. c) c) Execute tests with each setting of patterns1 through 4, respectively. d) d) After operation of the test equipment becomes stable, the test equipment sends the abnormal frame. Refer the setting parameter table for format of the abnormal frame.			
Evaluation criteria		Confirm followings at each setting of patterns 1 throught4: a) the EUT does not disengage (timeout of such as token watchdog time does not occur).			
Test necessity identified by the EUT class	Class 1	R			
	Class 2	N			
	Class 3	R			
	Class 4	R			
	Class 5	R			
	Class 6	R			
	Class 7	R			
Setting parameter (node)		EUT (The parameters vary according to the class)	Classes 1 and 3	Node number	85
				Token watchdog time	100
				Allowable minimum frame interval time	10
				Area 1 data top address	0
				Area 1 data size	0
				Area 2 data top address	0
				Area 2 data size	0
			Classes 4 and 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1024
				Area 2 data size	1014
				IO allocation setting (for class 4)	Optional
			Classes 6 and 7	Node number	2
				Token watchdog time	(100)
				Allowable minimum frame interval time	(10)

Table 40 – Discard of abnormal frame (TCD) (continued)

Setting parameter (node) (continued)	EUT (The parameter vary according to the class) (continued)	Classes 6 and 7 (continued)	Area 1 data top address	According to the number of input points of the slave, the EUT: * 0 point: 0 * 1 point or more: 4
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	16
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment (The parameters vary according to the EUT class)	Classes 1, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	200
			Allowable minimum frame interval time	10
			Area 1 data top address	0
			Area 1 data size	256
			Area 2 data top address	0
			Area 2 data size	0
		Classes 6 and 7	Implementation class	3 (Controller)
			Node number	1
			Token watchdog time	200
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	0
			Area 2 data size	0
Setting parameter (test data)	Solicitation frame		Node number of source side (SNA)	1
			TCD	65017
			Data size	16
			Contents of data	Slave node number = 16#8002 (Flexible setting mode, node number = 2)
				Input data address: According to the number of input points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0004 (Area 1, address = 4)
				Input data size = To be calculated from the number of input points of the slave, the EUT.
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0100 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)

Table 40 – Discard of abnormal frame (TCD) (continued)

Setting parameter (test data) (continued)	Solicitation frame	Contents of data (continued)	Output data size = To be calculated from the numbers of input and output points of the slave, the EUT
			Input status address = 16#8000 (Area 2, address = 0)
			Output status address = 16#8400 (Area 2, address = 1024)
			Lock ID = 1
	Abnormal frame	Transmission format of abnormal frame of TCD, TBN and CBN is as follows: * Pattern 1: TCD/TBN/CBN = 0/1/1, 65001/1/1, 65000/1/1. Transmission shall take place in this order. * Pattern 2: TCD/TBN/CBN = 65001/1/1, 65012/1/1, 65000/1/1. Transmission shall take place in this order. * Pattern 3: TCD/TBN/CBN = 65002/1/1, 65001/1/1, 65000/1/1, 65000/1/1. Transmission shall take place in this order. * Pattern 4: TCD/TBN/CBN = 65000/1/1 only.	

c) Continuous operation of cyclic transmission

Tables 41 and 42 show test tables for continuous operation of cyclic transmission.

Table 41 – Cyclic transmission echo back (number of nodes: 2)

Test number	V2-035
Major test group	Cyclic transmission
Test group	Continuous operation test
Test objects	Cyclic transmission echo back (number of nodes: 2)
Test procedure	a) Implement cyclic transmission echo back program into the EUT. Specification of the program is to transfer or copy area 1 and area 2 data of the test equipment to area 1 and area 2 of self node. b) The test equipment increments (+ 1) data pattern that is correctly echo backed from the EUT. c) Start the EUT, then start the test equipment. d) Execute tests with settings of three patterns: patterns 1 through 3, respectively. * Pattern 1: sending/receiving of single cyclic frame. * Pattern 2: sending of cyclic divided frames * Pattern 3: receiving of cyclic divided frames.
Evaluation criteria	Confirm followings for each of the three patterns, patterns 1 through 3: Running time for each test pattern shall be ten minutes or more. a) The test equipment receive echo back data from the EUT as cyclic data. b) The received data sent from the EUT is identical to the data of the source in content and size for both area 1 and area 2. c) Simultaneousness of the received data is guaranteed (echo backed data of area 1 and that of area 2 are returned at the same timing).

Table 41 – Cyclic transmission echo back (number of nodes: 2) (continued)

Test necessity identified by the EUT class	Class 1	R			
	Class 2	N			
	Class 3	R			
	Class 4	N			
	Class 5	N			
	Class 6	N			
	Class 7	N			
Setting parameter (node)		Pattern 1: Sending / receiving of single cyclic frame	EUT	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	4
				Area 1 data pattern	Write four words of area 1 address 0 with data of area 1 address 4.
				Area 2 data top address	0
				Area 2 data size	64
				Area 2 data pattern	Write 64 words of area 2 address 0 with data of area 2 address 64.
				Node name	"TargetNode"
			Test equipment	Implementation class	3 (Controller)
				Node number	85
				Token watchdog time	50
				Allowable minimum frame interval time	10
				Area 1 data top address	4
				Area 1 data size	4
				Area 1 data pattern	Increment data starting with 16#0000 through 16#0003
				Area 2 data top address	64
				Area 2 data size	64
				Area 2 data pattern	Increment data starting with 16#0000 through 16#003F
				Node name	"Tester"
		Pattern 2: Sending of divided cyclic frames	EUT	Node number	170
				Token watchdog time	(100)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	508
				Area 1 data size	4
				Area 1 data pattern	Write four words of area 1 address 508 with data of area 1 address 0
				Area 2 data top address	7168
				Area 2 data size	1024

Table 41 – Cyclic transmission echo back (number of nodes: 2) (continued)

Setting parameter (node) (continued)	Pattern 2: Sending of divided cyclic frames (continued)	EUT (continued)	Area 2 data pattern	Write 64 words of area 2 address 8128 with data of area 2 address 0
			Node name	"TargetNode"
		Test equipment	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	100
			Allowable minimum frame interval time	10
			Area 1 data top address	0
			Area 1 data size	4
			Area 1 data pattern	Increment data starting with 16#0000 through 16#0003
			Area 2 data top address	0
			Area 2 data size	64
			Area 2 data pattern	Increment data starting with 16#0000 through 16#003F
			Node name	"Tester"
	Patter 3: Receiving of divided cyclic frames	EUT	Node number	254
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	4
			Area 1 data pattern	Write four words of area 1 address 0 with data of area 1 address 508.
			Area 2 data top address	0
			Area 2 data size	64
			Area 2 data pattern	Write 64 words of area 2 address 0 with data of area 2 address 8128.
			Node name	"TargetNode"
		Test equipment	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	100
			Allowable minimum frame interval time	10
			Area 1 data top address	508
			Area 1 data size	4
			Area 1 data pattern	Increment data starting with 16#0000 through 16#0003
			Area 2 data top address	64
			Area 2 data size	8128
			Area 2 data pattern	Increment data starting with 16#0000 through 16#003F
			Node name	"Tester"

Table 41 – Cyclic transmission echo back (number of nodes: 2) (continued)

Setting parameter (test data)	NA

Table 42 – Cyclic transmission echo back (number of nodes: 32)

Test number		V2-036		
Major test group		Cyclic transmission		
Test group		Continuous operation test		
Test objects		Cyclic transmission echo back (number of nodes: 32)		
Test procedure		a) Implement cyclic transmission echo back program into the EUT. Specification of the program is to transfer or copy area 1 and area 2 data of the test equipment to area 1 and area 2 of self node. b) The test equipment increments (+ 1) data pattern if both area 1 and area 2 data are correctly echo backed from the EUT. c) Start the EUT, start the test equipment, then start the dummy node.		
Evaluation criteria		a) Confirm running time for test shall be one hour or more. b) Confirm the test equipment receive echo back data from the EUT as cyclic data. c) Confirm the received data sent from the EUT is identical to the data of the source in content and size for both area 1 and area 2. d) Confirm simultaneousness of the received data is guaranteed (echo backed data of area 1 and that of area 2 are returned at the same timing).		
Test necessity identified by the EUT class	Class 1	R		
	Class 2	N		
	Class 3	R		
	Class 4	N		
	Class 5	N		
	Class 6	N		
	Class 7	N		
Setting parameter (node)		EUT	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	4
			Area 1 data pattern	Write four words of area 1 address 0 with data of area 1 address 4.
			Area 2 data top address	0
			Area 2 data size	64
			Area 2 data pattern	Write 64 words of area 2 address 0 with data of area 2 address 64.
			Node name	"TargetNode"
		Test equipment (continued)	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50

Table 42 Cyclic transmission echo back (number of nodes: 32) (continued)

Setting parameter (node) (continued)	Test equipment (continued)	Allowable minimum frame interval time	10
		Area 1 data top address	4
		Area 1 data size	4
		Area 1 data pattern	Increment data starting with 16#0000 through 16#0003
		Area 2 data top address	64
		Area 2 data size	64
		Area 2 data pattern	Increment data starting with 16#0000 through 16#003F
		Node name	"Tester"
	Dummy nodes (30 nodes) (N = 0 through 29)	Implementation class	3 (Controller)
		Node number	130 + N (N = 29 : node number = 200)
		Token watchdog time	50
		Allowable minimum frame interval time	0
		Area 1 data top address	8 + (4 x N)
		Area 1 data size	4
		Area 2 data top address	128 + (64 x N)
		Area 2 data size	64
Setting parameter (test data)	NA		

6.6.7 Message transmission (basic operation)

Procedures of message transmission (basic operation) are as follows:

- Message receiving process shall be confirmed by receiving a request message of network parameter read.
- Message transmitting process shall be confirmed by sending a response message of network parameter read.
- The confirmation shall be done by the sequence that the test equipment sends the request message of network parameter read to the EUT, and that the EUT sends the response massage of network parameter read.
- Broadcast message transmission shall be directed only to devices with transparent massage function.

a) Message basic function

Tables 43 through 45 show test tables for message basic function.

Table 43 – No response to peer-to-peer message

Test number		V2-037			
Major test group		Message transmission (basic operation)			
Test group		Message basic function test			
Test objects		No response to peer-to-peer message			
Test procedure		a) Start the EUT, then Start the test equipment. b) The test equipment sends a request message of network parameter read. c) The EUT sends a response message of network parameter read. The test equipment does not send an ACK back to the EUT.			
Evaluation criteria		a) Confirm that the EUT re-send the message three times. b) Confirm that the EUT re-send the message no sooner than 100ms and no later than 200ms after the token circulates three times.			
Test necessity identified by the EUT class	Class 1	R			
	Class 2	R			
	Class 3	R			
	Class 4	R			
	Class 5	R			
	Class 6	R			
	Class 7	R			
Setting parameter (node)		EUT (The parameter vary according to the class)	Classes 1, 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	64
				IO allocation setting (for class 4)	Optional
			Class 2	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	0
				Area 2 data top address	0
				Area 2 data size	0
			Class 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1024
				Area 2 data size	1024
			Classes 6 and 7	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)

Table 43 – No response to peer-to-peer message (continued)

Setting parameter (node) (continued)	EUT (The parameters vary according to the class)	Classes 6 and 7 (continued)	Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	1024
			Area 2 data size	1024
			IO allocation setting (number of control slave)	1
			IO allocation setting (slave setting)	Slave node address = 16#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = To be calculated from the number of input points of the slave, the EUT
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input data status = 16#8000 (Area 2, address = 0)
				Output data status = 16#8400 (Area 2, address = 1024)

Table 43 – No response to peer-to-peer message (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class)	Class 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1024
			Area 2 data size	64
Setting parameter (test data)	Request message		Interface	FL-net message
			Node number of source side (SNA)	85
			Node number of destination side (DNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 007 (network parameter read request)
			Data size	0
			Contents of data	NA
	Response message		Interface	FL-net message
			Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			Node number of destination side (DNA)	85
			TCD	65207 (network parameter read response)
			Data size	56
			Contents of data	Optional (no evaluation)

Table 44 – Peer-to-peer message ACK abnormality

Test number		V2-038
Major test group		Message transmission (basic operation)
Test group		Message basic function test
Test objects		Peer-to-peer message ACK abnormality
Test procedure		a) Start the EUT, then start the test equipment. b) The test equipment sends a network parameter read request message. c) The test equipment responds to first network parameter read response message with abnormal ACK frame (STS = 16#02). d) The test equipment responds to second network parameter read response message with normal ACK frame (STS = 16#01).
Evaluation criteria		Confirm that the EUT re-transmit the message once.
Test necessity identified by the EUT class	Class 1	R
	Class 2	R
	Class 3	R
	Class 4	R
	Class 5	R
	Class 6	R
	Class 7	R

Table 44 – Peer-to-peer message ACK abnormality (continued)

Setting parameter (node)	EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	0
			Area 2 data size	64
			IO allocation setting (for class 4)	Optional
		Class 2	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
		Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1024
			Area 2 data size	1024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT

Table 44 – Peer-to-peer message ACK abnormality (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 points: 0 * 1 point or more: 256
			Area 1 data size	To be calculated form the number of output points of the slave, the EUT
			Area 2 data top address	1024
			Area 2 data size	1024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = To be calculated from the number of input point of the slave, the EUT.
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#8400 (Area 2, address = 1024)

Table 44 – Peer-to-peer message ACK abnormality (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Class 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1024
			Area 2 data size	64
Setting parameter (test data)	Request message		Interface	FL-net message
			Node number of source side (SNA)	85
			Node number of destination side (DNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 007 (network parameter read request)
			Data size	0
			Contents of data	NA
	Response message		Interface	FL-net message
			Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			Node number of destination side (DNA)	85
			TCD	65207 (network parameter read response)
			Data size	56
			Contents of data	Optional (no evaluation)
			Abnormal ACK	2 (Buffer full)

Table 45 – Peer-to-peer message availability judgment of requested message transmission

Test number	V2-039
Major test group	Message transmission (basic operation)
Test group	Message basic function test
Test objects	Peer-to-peer message availability judgment of requested message transmission
Test procedure	a) Start the EUT, then start the test equipment. b) The test equipment send network parameter read request messages. The test equipment prolong network cycle while it continues to transmit the messages. c) The EUT sends network parameter read response messages.
Evaluation criteria	Confirm that the EUT stops sending the response message when measured refresh cycle time exceeds allowable refresh cycle time.

Table 45 – Peer-to-peer message availability judgment of requested message transmission

Test necessity identified by the EUT class	Class 1	R			
	Class 2	R			
	Class 3	R			
	Class 4	R			
	Class 5	R			
	Class 6	R			
	Class 7	R			
Setting parameter (node)		EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	64
				IO allocation setting (for class 4)	Optional
			Class 2	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	0
				Area 2 data top address	0
				Area 2 data size	0
			Class 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1024
				Area 2 data size	1024
			Class 6 and 7	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	To be calculated from the number of input points of the slave, the EUT
				Area 2 data top address	0
				Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT

Table 45 – Peer-to-peer message availability judgment of requested message transmission

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	1024
			Area 2 data size	1024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = To be calculated from the number of input points of the slave, the EUT.
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#8400 (Area 2, address = 1024)

Table 45 – Peer-to-peer message availability judgment of requested message transmission

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Class 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1024
			Area 2 data size	64
Setting parameter (test data)	Request message		Interface	FL-net message
			Node number of source side (SNA)	85
			Node number of destination side (DNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 007 (network parameter read request)
			Data size	0
			Contents of data	NA
	Response message		Interface	FL-net message
			Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			Node number of destination side (DNA)	85
			TCD	65207 (network parameter read response)
			Data size	56
			Contents of data	Optional (no evaluation)

b) Sequence number and version of sequence number (peer-to-peer)

Tables 46 through 51 show test tables for sequence number and version of sequence number.

Table 46 – Setting version of sequence number at message transmission

Test number	V2-040
Major test group	Message transmission (basic operation)
Test group	Sequence number and version of sequence number (peer-to-peer) test
Test objects	Setting version of sequence number at message transmission
Test procedure	a) Start the EUT, then start the test equipment. b) Record a version of sequence number of a token frame from the EUT. c) The test equipment sends a network parameter read request message. d) The EUT sends a network parameter read response message. e) Record the version of sequence number of the message.
Evaluation criteria	Confirm that the versions of sequence number of a participation request, of the token and of the message are identical.

Table 46 – Setting version of sequence number at message transmission (continued)

Test necessity identified by the EUT class	Class 1	R			
	Class 2	R			
	Class 3	R			
	Class 4	R			
	Class 5	R			
	Class 6	R			
	Class 7	R			
Setting parameter (node)		EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	64
				IO allocation setting (for class 4)	Optional
			Class 2	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	0
				Area 2 data top address	0
				Area 2 data size	0
			Class 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1024
				Area 2 data size	1024
			Classes 6 and 7	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	To be calculated from the number of input points of the slave, the EUT
				Area 2 data top address	0
				Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT

Table 46 – Setting version of sequence number at message transmission (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	1024
			Area 2 data size	1024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = To be calculated from the number of input points of the slave, the EUT.
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#8400 (Area 2, address = 1024)

Table 46 – Setting version of sequence number at message transmission (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Class 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1024
			Area 2 data size	64
Setting parameter (test data)	Request message		Interface	FL-net message
			Node number of source side (SNA)	85
			Node number of destination side (DNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 007 (network parameter read request)
			Data size	0
			Contents of data	NA
	Response message		Interface	FL-net message
			Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			Node number of destination side (DNA)	85
			TCD	65207 (network parameter read response)
			Data size	56
			Contents of data	Optional (no evaluation)

Table 47 – Setting a sequence number at message transmission

Test number	V2-041
Major test group	Message transmission (basic operation)
Test group	Sequence number and version of sequence number (peer-to-peer) test
Test objects	Setting a sequence number at message transmission
Test procedure	a) Start the EUT, then start the test equipment. b) Record a version of sequence number of a token frame from the EUT. c) The test equipment sends a network parameter read request message. d) The EUT sends a network parameter read response message. e) Record the version of sequence number of the message. f) The test equipment sends the request messages five times.
Evaluation criteria	Confirm that the EUT increments value of the sequence number at every message transmission to the test equipment.

Table 47 – Setting a sequence number at message transmission (continued)

Test necessity identified by the EUT class	Class 1	R			
	Class 2	R			
	Class 3	R			
	Class 4	R			
	Class 5	R			
	Class 6	R			
	Class 7	R			
Setting parameter (node)		EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	64
				IO allocation setting (for class 4)	Optional
			Class 2	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	0
				Area 2 data top address	0
				Area 2 data size	0
			Class 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1024
				Area 2 data size	1024
			Classes 6 and 7	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	To be calculated from the number of input points of the slave, the EUT
				Area 2 data top address	0
				Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT

Table 47 – Setting a sequence number at message transmission (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	1024
			Area 2 data size	1024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = To be calculated from the number of input points of the slave, the EUT.
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#8400 (Area 2, address = 1024)
		Class 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50

Table 47 – Setting a sequence number at message transmission (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Class 7 (continued)	Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1024
			Area 2 data size	64
Setting parameter (test data)	Request message		Interface	FL-net message
			Node number of source side (SNA)	85
			Node number of destination side (DNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 007 (network parameter read request)
			Data size	0
			Contents of data	NA
	Response message		Interface	FL-net message
			Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			Node number of destination side (DNA)	85
			TCD	65207 (network parameter read response)
			Data size	56
			Contents of data	Optional (no evaluation)

Table 48 – Version of sequence number abnormality at message transmission

Test number	V2-042
Major test group	Message transmission (basic operation)
Test group	Sequence number and version of sequence number (peer-to-peer) test
Test objects	Version of sequence number abnormality at message transmission
Test procedure	a) Start the EUT, then start the test equipment. b) Record a version of sequence number of a token frame from the EUT. c) The test equipment sends a network parameter read request message. d) The EUT sends a network parameter read response message. e) Record the version of sequence number of the message. The test equipment returns an ACK with version of sequence number abnormality f) Record the message transmission sequence.
Evaluation criteria	Confirm that the EUT re-sends the message when it receives the version of sequence number abnormality.

Table 48 – Version of sequence number abnormality at message transmission (continued)

Test necessity identified by the EUT class	Class 1	R			
	Class 2	R			
	Class 3	R			
	Class 4	R			
	Class 5	R			
	Class 6	R			
	Class 7	R			
Setting parameter (node)		EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	64
				IO allocation setting (for class 4)	Optional
			Class 2	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	0
				Area 2 data top address	0
				Area 2 data size	0
			Class 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1024
				Area 2 data size	1024
			Classes 6 and 7	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	To be calculated from the number of input points of the slave, the EUT
				Area 2 data top address	0
				Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT

Table 48 – Version of sequence number abnormality at message transmission (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	1024
			Area 2 data size	1024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = To be calculated from the number of input points of the slave, the EUT.
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#8400 (Area 2, address = 1024)

Table 48 – Version of sequence number abnormality at message transmission (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Class 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1024
			Area 2 data size	64
Setting parameter (test data)	Request message		Interface	FL-net message
			Node number of source side (SNA)	85
			Node number of destination side (DNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 007 (network parameter read request)
			Data size	0
			Contents of data	NA
	Response message		Interface	FL-net message
			Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			Node number of destination side (DNA)	85
			TCD	65207 (network parameter read response)
			Data size	56
			Contents of data	Optional (no evaluation)
			Abnormal ACK	5 (Version of sequence number abnormality)

Table 49 – Version of sequence number abnormality at message reception

Test number	V2-043
Major test group	Message transmission (basic operation)
Test group	Sequence number and version of sequence number (peer-to-peer) test
Test objects	Version of sequence number abnormality at message reception
Test procedure	a) Start the EUT, then start the test equipment. b) Record a version of sequence number of a token frame from the EUT. c) The test equipment sends a network parameter read request message with a version of sequence number which is different from that of its token. d) Record the message transmission sequence.
Evaluation criteria	Confirm that the EUT sends an abnormal ACK (contents of ACK header: STS = 16#05) when it receives the abnormal message (version of sequence number abnormality).

Table 49 – Version of sequence number abnormality at message reception (continued)

Test necessity identified by the EUT class	Class 1	R			
	Class 2	R			
	Class 3	R			
	Class 4	R			
	Class 5	R			
	Class 6	R			
	Class 7	R			
Setting parameter (node)		EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	64
				IO allocation setting (for class 4)	Optional
			Class 2	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	0
				Area 2 data top address	0
				Area 2 data size	0
			Class 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1024
				Area 2 data size	1024
			Classes 6 and 7	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	To be calculated from the number of input points of the slave, the EUT
				Area 2 data top address	0
				Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT

Table 49 – Version of sequence number abnormality at message reception (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	1024
			Area 2 data size	1024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = To be calculated from the number of input points of the slave, the EUT.
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#8400 (Area 2, address = 1024)
		Class 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50

Table 49 – Version of sequence number abnormality at message reception (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Class 7 (continued)	Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1024
			Area 2 data size	64
Setting parameter (test data)	Request message		Interface	FL-net message
			Node number of source side (SNA)	85
			Node number of destination side (DNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 007 (network parameter read request)
			Data size	0
			Contents of data	NA
	Response message		Interface	FL-net message
			Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			Node number of destination side (DNA)	85
			TCD	65207 (network parameter read response)
			Data size	56
			Contents of data	Optional (no evaluation)

Table 50 – Sequence number duplication at message reception

Test number	V2-044
Major test group	Message transmission (basic operation)
Test group	Sequence number and version of sequence number (peer-to-peer) test
Test objects	Sequence number duplication at message reception
Test procedure	a) Start the EUT, then start the test equipment. b) Record a version of sequence number of a token frame from the EUT. c) The test equipment sends a network parameter read request message. d) The test equipment sends another network parameter read request message with sequence number same as that of the previous message. e) Record the message reception sequence.
Evaluation criteria	a) Confirm that the EUT sends a normal ACK at each reception of the both messages. b) Confirm that the EUT sends a network parameter read response message at reception of the first message. c) Confirm that the EUT does not send any network parameter read response message at reception of the second message (abnormal message).

Table 50 – Sequence number duplication at message reception (continued)

Test necessity identified by the EUT class	Class 1	R			
	Class 2	R			
	Class 3	R			
	Class 4	R			
	Class 5	R			
	Class 6	R			
	Class 7	R			
Setting parameter (node)		EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	64
				IO allocation setting (for class 4)	Optional
			Class 2	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	0
				Area 2 data top address	0
				Area 2 data size	0
			Class 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1024
				Area 2 data size	1024
			Classes 6 and 7	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	To be calculated from the number of input points of the slave, the EUT
				Area 2 data top address	0
				Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT

Table 50 – Sequence number duplication at message reception (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	1024
			Area 2 data size	1024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = To be calculated from the number of input points of the slave, the EUT.
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#8400 (Area 2, address = 1024)

Table 50 – Sequence number duplication at message reception (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Class 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1024
			Area 2 data size	64
Setting parameter (test data)	Request message		Interface	FL-net message
			Node number of source side (SNA)	85
			Node number of destination side (DNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 007 (network parameter read request)
			Data size	0
			Contents of data	NA
	Response message		Interface	FL-net message
			Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			Node number of destination side (DNA)	85
			TCD	65207 (network parameter read response)
			Data size	56
			Contents of data	Optional (no evaluation)

Table 51 – Sequence number skip at message reception

Test number	V2-045
Major test group	Message transmission (basic operation)
Test group	Sequence number and version of sequence number (peer-to-peer) test
Test objects	Sequence number skip at message reception
Test procedure	a) Start the EUT, then start the test equipment. b) Record a version of sequence number of a token frame from the EUT. c) The test equipment sends a network parameter read request message. d) The test equipment sends another network parameter read request message with sequence number added by 10 to that of the previous message. e) Record the message reception sequence.
Evaluation criteria	a) Confirm that the EUT sends a normal ACK at each reception of the both messages. b) Confirm that the EUT sends a network parameter read response message at each reception of the both messages.

Table 51 – Sequence number skip at message reception (continued)

Test necessity identified by the EUT class	Class 1	R			
	Class 2	R			
	Class 3	R			
	Class 4	R			
	Class 5	R			
	Class 6	R			
	Class 7	R			
Setting parameter (node)		EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	64
				IO allocation setting (for class 4)	Optional
			Class 2	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	0
				Area 2 data top address	0
				Area 2 data size	0
			Class 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1024
				Area 2 data size	1024
			Classes 6 and 7	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	To be calculated from the number of input points of the slave, the EUT
				Area 2 data top address	0
				Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT

Table 51 – Sequence number skip at message reception (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	1024
			Area 2 data size	1024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = To be calculated from the number of input points of the slave, the EUT.
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#8400 (Area 2, address = 1024)

Table 51 – Sequence number skip at message reception (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Class 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1024
			Area 2 data size	64
Setting parameter (test data)	Request message		Interface	FL-net message
			Node number of source side (SNA)	85
			Node number of destination side (DNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 007 (network parameter read request)
			Data size	0
			Contents of data	NA
	Response message		Interface	FL-net message
			Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			Node number of destination side (DNA)	85
			TCD	65207 (network parameter read response)
			Data size	56
			Contents of data	Optional (no evaluation)

c) Sequence number and version of sequence number (broadcast)

Tables 52 and 53 show test tables for the sequence number and version of sequence number (broadcast).

Table 52 – Setting version of sequence number at message transmission

Test number	V2-046
Major test group	Message transmission (basic operation)
Test group	Sequence number and version of sequence number (broadcast) test
Test objects	Setting version of sequence number at message transmission
Test procedure	a) Start the EUT, then start the test equipment. b) Record a version of sequence number of a token frame and that of a message from the EUT. c) The EUT sends transparent mode messages 10 times. d) Content of data at each message is incremented by one from that at the previous message.
Evaluation criteria	a) Confirm that the version of sequence number of each of the ten messages sent by the EUT is the same as that of the token frame. b) Confirm that the EUT sends the messages one at a time.

Table 52 – Setting version of sequence number at message transmission (continued)

Test necessity identified by the EUT class	Class 1	R (No test executed without implementation of transparent mode massage (client function))			
	Class 2	R (No test executed without implementation of transparent mode massage (client function))			
	Class 3	R (No test executed without implementation of transparent mode massage (client function))			
	Class 4	R (No test executed without implementation of transparent mode massage (client function))			
	Class 5	R (No test executed without implementation of transparent mode massage (client function))			
	Class 6	R (No test executed without implementation of transparent mode massage (client function))			
	Class 7	R (No test executed without implementation of transparent mode massage (client function))			
Setting parameter (node)		EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	64
				IO allocation setting (for class 4)	Optional
			Class 2	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	0
				Area 2 data top address	0
				Area 2 data size	0
			Class 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1024
				Area 2 data size	1024
			Classes 6 and 7	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	To be calculated from the number of input points of the slave, the EUT
				Area 2 data top address	0
				Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT

Table 52 – Setting version of sequence number at message transmission (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	1024
			Area 2 data size	1024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = .
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#8400 (Area 2, address = 1024)

Table 52 – Setting version of sequence number at message transmission (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Class 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1024
			Area 2 data size	64
Setting parameter (test data)	Transmission message		Interface	FL-net message
			Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			Node number of destination side (DNA)	255
			TCD	10000 (Transparent mode message)
			Data size	512
			Contents of data	Incremental data of word unit that starts with 16#11AA.

Table 53 – Setting sequence number at message transmission

Test number		V2-047
Major test group		Message transmission (basic operation)
Test group		Sequence number and version of sequence number (broadcast) test
Test objects		Setting sequence number at message transmission
Test procedure		a) Start the EUT, then start the test equipment. b) Record a version of sequence number of a token frame and that of a message from the EUT. c) The EUT sends a peer-to-peer transparent mode message. d) The EUT sends a broadcast transparent mode messages. e) The EUT sends the messages 10 times in total (five times for peer-to-peer message and five times for broadcast one alternately).
Evaluation criteria		a) Confirm that the EUT increments the sequence number for broadcast messages. b) Confirm that the EUT does not re-send any broadcast message.
Test necessity identified by the EUT class	Class 1	R (No test executed without implementation of transparent mode massage (client function))
	Class 2	R (No test executed without implementation of transparent mode massage (client function))
	Class 3	R (No test executed without implementation of transparent mode massage (client function))
	Class 4	R (No test executed without implementation of transparent mode massage (client function))
	Class 5	R (No test executed without implementation of transparent mode massage (client function))
	Class 6	R (No test executed without implementation of transparent mode massage (client function))
	Class 7	R (No test executed without implementation of transparent mode massage (client function))

Table 53 – Setting sequence number at message transmission (continued)

Setting parameter (node)	EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	0
			Area 2 data size	64
			IO allocation setting (for class 4)	Optional
		Class 2	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
		Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1024
			Area 2 data size	1024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64

Table 53 – Setting sequence number at message transmission (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Class 6	Implementation class	4 (Flexible master)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	1024
			Area 2 data size	1024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = To be calculated from the number of input points of the slave, the EUT.
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#8400 (Area 2, address = 1024)
		Class 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1024
			Area 2 data size	64

Table 53 – Setting sequence number at message transmission (continued)

Setting parameter (test data)	Transmission message 1 (broadcast)	Interface	FL-net message
		Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
		Node number of destination side (DNA)	255
		TCD	10000 (Transparent mode message)
		Data size	512
		Contents of data	Incremental data of word unit that starts with 16#11AA.
	Transmission message 2 (peer-to-peer)	Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
		Node number of destination side (DNA)	85
		TCD	20000 (Transparent mode message)
		Data size	0
		Contents of data	NA

d) Abnormal operation test

Table 54 shows test table for abnormal operation.

Table 54 – Discard of abnormal frame (TCD)

Test number		V2-048
Major test group		Message transmission (basic operation)
Test group		Abnormal operation test
Test objects		Discard of abnormal frame (TCD)
Test procedure		a) Start the EUT, then start the test equipment. b) The test equipment transmits abnormal TCD frames with settings of the pattern 1 through 3. c) The test equipment transmits a network parameter read request message.
Evaluation criteria		Confirm followings for the settings of the pattern 1 through 3. a) The EUT does not respond. b) The EUT send a response message to the network parameter read request message the test equipment transmits.
Test necessity identified by the EUT class	Class 1	R
	Class 2	R
	Class 3	R
	Class 4	R
	Class 5	R
	Class 6	R
	Class 7	R

Table 54 – Discard of abnormal frame (TCD) (continued)

Setting parameter (node)	EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	0
			Area 2 data size	64
			IO allocation setting (for class 4)	Optional
		Class 2	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
		Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1 024
			Area 2 data size	1 024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64

Table 54 – Discard of abnormal frame (TCD) (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Class 6	Implementation class	4 (Flexible master)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = To be calculated from the number of input points of the slave, the EUT.
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#8400 (Area 2, address = 1 024)
		Class 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64

Table 54 – Discard of abnormal frame (TCD) (continued)

Setting parameter (test data)	Pattern 1	Interface	FL-net message
		Node number of source side (SNA)	85
		Node number of destination side (DNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
		TCD	60 000
		Data size	0
		Contents of data	NA
	Pattern 2	Interface	FL-net message
		Node number of source side (SNA)	85
		Node number of destination side (DNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
		TCD	62000
		Data size	0
		Contents of data	NA
	Pattern 3	Interface	FL-net message
		Node number of source side (SNA)	85
		Node number of destination side (DNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
		TCD	65 000
		Data size	0
		Contents of data	NA
	Network parameter read request message	Interface	FL-net message
		Node number of source side (SNA)	85
		Node number of destination side (DNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
		TCD	65 007 (network parameter read request)
		Data size	0
		Contents of data	NA

6.6.8 Message transmission (server function)

a) peer-to-peer message operation (server function)

Tables 55 through 64 show test tables for peer-to-peer message operation (server function).

Table 55 – Byte block read, byte block write

Test number		V2-049			
Major test group		Message transmission (server function)			
Test group		Peer-to-peer message operation test (server function)			
Test objects		Byte block read, byte block write			
Test procedure		a) Start the EUT, then start the test equipment. b) The test equipment transmits a byte block write request. c) The test equipment transmits a byte block read request after the EUT responds the byte block write. d) Use incremental (+ 1) words starting with 16#11AA as data for the byte block write.			
Evaluation criteria		a) Confirm that the EUT transmits byte block write response message to the byte block write request from the test equipment. b) Confirm that the EUT transmits byte block read response message to the byte block read request from the test equipment. c) Confirm that contents of data set by the request message are identical to those received by the response message. If the EUT does not support the message function applied for the test data, confirm that not-implemented ACK (M_RLT = 2) is transmitted			
Test necessity identified by the EUT class	Class 1	R			
	Class 2	R			
	Class 3	R			
	Class 4	R			
	Class 5	R			
	Class 6	R			
	Class 7	R			
Setting parameter (node)		EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	64
				IO allocation setting (for class 4)	Optional
			Class 2	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	0
				Area 2 data top address	0
				Area 2 data size	0

Table 55 Byte block read, byte block write (continued)

Setting parameter (node) (continued)	EUT (The parameters vary according to the class) (continued)	Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1024
			Area 2 data size	1024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1

Table 55 – Byte block read, byte block write (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Class 6 (continued)	IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
			IO allocation setting (slave setting) (continued)	Input data size = To be calculated from the number of input points of the slave, the EUT.
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#8400 (Area 2, address = 1 024)
		Class 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64

Table 55 – Byte block read, byte block write (continued)

Setting parameter (test data)	Byte block write	Transmission message	Interface	FL-net message
			Node number of source side (SNA)	85
			Node number of destination side (DNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 004 (Byte block write request)
			Data size	Equal to the virtual size
			Virtual address	Depending EUT specification (Input from the conformance tool display)
			Virtual size	Depending EUT specification (Input with the conformance tool display)
			Contents of data	Incremental word data starting with 16#11AA
		Reception message	Interface	FL-net message
			Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			Node number of destination side (DNA)	85
			TCD	65 204 (Byte block write response)
			Type of response message (M_RLT)	0 (normal) or 2 (not-implemented)

Table 55 – Byte block read, byte block write (continued)

Setting parameter (test data) (continued)	Byte block write (continued)	Reception message (continued)	Data size (in case of M_RLT = 0)	0
			Virtual address	Depending on the EUT specification (same value as the virtual address of write request)
			Virtual size	Depending on the EUT specification (same value as the virtual size of write request)
			Contents of data (in case of M_RLT = 0)	NA
	Byte block read	Transmission message	Interface	FL-net message
			Node number of source side (SNA)	85
			Node number of destination side (DNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 003 (byte block read request)
			Data size	0
			Virtual address	Depending on the EUT specification (same value as the virtual address of write request)
			Virtual size	Depending on the EUT specification (same value as the virtual size of write request)
			Contents of data	NA
		Reception message	Interface	FL-net message
			Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			Node number of destination side (DNA)	85
			TCD	65 203 (byte block read response)
			Type of response message (M_RLT)	0 (normal) or 2 (not-implemented)
			Data size (In case of M_RLT = 0)	Depending on the EUT specification (same value as the virtual size)
			Virtual address	Depending on the EUT specification (same value as the virtual address of read request)
Setting parameter (test data) (continued)	Byte block read (continued)	Reception message (continued)	Virtual size	Depending on the EUT specification (same value as the virtual size of read request)
			Contents of data (In case of M_RLT = 0)	Incremental word data starting with 16#11AA

Table 56 – Word block read, word block write

Test number		V2-050			
Major test group		Message transmission (server function)			
Test group		Peer-to-peer message operation test (server function)			
Test objects		Word block read, word block write			
Test procedure		a) Start the EUT, then start the test equipment. b) The test equipment transmits a word block write request. c) The test equipment transmits a word block read request after the EUT responds the word block write. d) Use incremental (+ 1) words starting with 16#11AA as data for the word block write.			
Evaluation criteria		a) Confirm that the EUT transmits a word block write response message to the word block write request from the test equipment. b) Confirm that the EUT transmits a word block read response message to the word block read request from the test equipment. c) Confirm that contents of data set by the request message are identical to those received by the response message. If the EUT does not support the message function applied for the test data, confirm that not-implemented ACK (M_RLT = 2) is transmitted			
Test necessity identified by the EUT class	Class 1	R			
	Class 2	R			
	Class 3	R			
	Class 4	R			
	Class 5	R			
	Class 6	R			
	Class 7	R			
Setting parameter (node)		EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	64
				IO allocation setting (for class 4)	Optional
			Class 2	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	0
				Area 2 data top address	0
				Area 2 data size	0

Table 56 – Word block read, word block write (continued)

Setting parameter (node) (continued)	EUT (The parameters vary according to the class) (continued)	Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1 024
			Area 2 data size	1 024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)

Table 56 – Word block read, word block write (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Class 6 (continued)	IO allocation setting (slave setting) (continued)	Input data size = To be calculated from the number of input points of the slave, the EUT.
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#8400 (Area 2, address = 1 024)
		Class 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64
Setting parameter (test data)	Word block write	Transmission message	Interface	FL-net message
			Node number of source side (SNA)	85
			Node number of destination side (DNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 006 (Word block write request)
			Data size	Virtual size x2
			Virtual address	Depending EUT specification (Input from the conformance tool display)
			Virtual size	Depending EUT specification (Input with the conformance tool display)
			Contents of data	Incremental word data starting with 16#11AA
		Reception message	Interface	FL-net message
			Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			Node number of destination side (DNA)	85
			TCD	65 206 (Word block write response)

Table 56 – Word block read, word block write (continued)

Setting parameter (test data) (continued)	Word block write (continued)	Reception message (continued)	Type of response message (M_RLT)	0 (normal) or 2 (not-implemented)
			Data size (in case of M_RLT = 0)	0
			Virtual address	Depending on the EUT specification (same value as the virtual address of write request)
			Virtual size	Depending on the EUT specification (same value as the virtual size of write request)
			Contents of data (in case of M_RLT = 0)	NA
	Word block read	Transmission message	Interface	FL-net message
			Node number of source side (SNA)	85
			Node number of destination side (DNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 005 (word block read request)
			Data size	0
			Virtual address	Depending on the EUT specification (same value as the virtual address of write request)
			Virtual size	Depending on the EUT specification (same value as the virtual size of write request)
			Contents of data	NA
		Reception message	Interface	FL-net message
			Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			Node number of destination side (DNA)	85
			TCD	65 205 (word block read response)
			Type of response message (M_RLT)	0 (normal) or 2 (not-implemented)
			Data size (In case of M_RLT = 0)	Depending on the EUT specification (same value as the virtual size)
			Virtual address	Depending on the EUT specification (same value as the virtual address of read request)
			Virtual size	Depending on the EUT specification (same value as the virtual size of read request)
			Contents of data (In case of M_RLT = 0)	Incremental word data starting with 16#11AA

Table 57 – Network parameter read

Test number		V2-051			
Major test group		Message transmission (server function)			
Test group		Peer-to-peer message operation test (server function)			
Test objects		Network parameter read			
Test procedure		a) Start the EUT, then start the test equipment. b) The test equipment transmits a network parameter request.			
Evaluation criteria		Confirm that the EUT transmits a response message to the request message from the test equipment.			
Test necessity identified by the EUT class	Class 1	R			
	Class 2	R			
	Class 3	R			
	Class 4	R			
	Class 5	R			
	Class 6	R			
	Class 7	R			
Setting parameter (node)		EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	64
				Node name	"TargetNode"
				IO allocation setting (for class 4)	Optional
			Class 2	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	0
				Area 2 data top address	0
				Area 2 data size	0
				Node name	"TargetNode"
			Class 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1 024
				Area 2 data size	1 024
				Node name	"TargetNode"

Table 57 – Network parameter read (continued)

Setting parameter (node) (continued)	EUT (The parameters vary according to the class) (continued)	Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
			Node name	"TargetNode"
	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	1024
			Area 2 data size	1024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = To be calculated from the number of input points of the slave, the EUT.
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)

Table 57 – Network parameter read (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Class 6 (continued)	IO allocation setting (slave setting) (continued)	Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#8400 (Area 2, address = 1 024)
		Class 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64
Setting parameter (test data)	Transmission message		Interface	FL-net message
			Node number of source side (SNA)	85
			Node number of destination side (DNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 007 (Network parameter read request)
			Data size	0
			Contents of data	NA
	Reception message		Interface	FL-net message
			Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			Node number of destination side (DNA)	85
			TCD	65 207 (Network parameter read response)
			Type of response message (M_RLT)	0 (normal)
			Data size (In case of M_RLT = 0)	56
			Contents of data (In case of M_RLT = 0)	Node name = "TargetNode"
				Vendor code = Depending on the EUT specification (Test executer confirms)
				Manufacturer model name = Depending on the EUT specification (Test executer confirms)

Table 57 – Network parameter read (continued)

Setting parameter (test data) (continued)	Reception message (continued)	Contents of data (In case of M_RLT = 0) (continued)	Area 1 data top address = According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 0 * Class 5: 256
			Area 1 data size = According to the EUT class: * Classes 1, 3 and 4: 4 * Class 2: 0 * Class 5: 256 * Classes 6 and 7: To be calculated number of input points of the slave, the EUT:
			Area 2 data top address = According to the EUT class: * Classes 1, 2, 3 and 4: 0 * Classes 5, 6 and 7: 1 024
			Area 2 data size = According to the EUT class: * Classes 1, 3 and 4: 64 * Class 2: 0 * Classes 5, 6 and 7: 1 024
			Token watchdog time = (No evaluation)
			Allowable minimum frame interval time = (No evaluation)
			Link status = (No evaluation)
			Protocol type = 128
			Upper layer status = (No evaluation)
			Allowable refresh cycle time = (No evaluation)
			Measured refresh cycle time (current) = (No evaluation)
			Measured refresh cycle time (maximum) = (No evaluation)
			Measured refresh cycle time (minimum) = (No evaluation)

Table 58 Network parameter write

Test number	V2-052
Major test group	Message transmission (server function)
Test group	Peer-to-peer message operation test (server function)
Test objects	Network parameter write
Test procedure	a) Start the EUT, start the test equipment, then start the dummy node. b) The test equipment transmits a network parameter write request. c) In case of class 2, 5, 6 or 7, the test equipment transmits a network parameter read request.

Table 58 Network parameter write (continued)

<table>
<tr><td colspan="2">Evaluation criteria</td><td colspan="4">a) Confirm that the EUT transmits a response message to the network parameter read request from the test equipment.
b) Decision criteria varies according to the EUT class:
* Classes 1, 3 and 4: Confirm that the EUT re-joins the network no later than 3s after an ACK to the network parameter write response.
* Classes 2, 5 6 and 7: Confirm that the EUT transmits a response message to the network parameter read request form the test equipment.
c) Decision criteria varies according to the EUT class:
* Classes 1, 3 and 4: Confirm that contents of token header after the rejoin are identical to the contents of data set by the network parameter write request message (C_AD1, C_SZ1, C_AD2, C_SZ2 and node name).
* Classes 2, 5, 6 and 7: Confirm that contents of data in the network parameter read response message are identical to those set by the network parameter write request message (node name).
d) In case that the EUT does not support network parameter write request message from the test equipment, confirm that the EUT transmits not-implemented response (TCD = 65 208, M_RLT = 2).</td></tr>
<tr><td rowspan="7">Test necessity identified by the EUT class</td><td>Class 1</td><td colspan="4">R</td></tr>
<tr><td>Class 2</td><td colspan="4">R</td></tr>
<tr><td>Class 3</td><td colspan="4">R</td></tr>
<tr><td>Class 4</td><td colspan="4">R</td></tr>
<tr><td>Class 5</td><td colspan="4">R</td></tr>
<tr><td>Class 6</td><td colspan="4">R</td></tr>
<tr><td>Class 7</td><td colspan="4">R</td></tr>
<tr><td colspan="2" rowspan="15">Setting parameter (node)</td><td rowspan="15">EUT
(The parameters vary according to the class)</td><td rowspan="8">Classes 1, 3 and 4</td><td>Node number</td><td>1</td></tr>
<tr><td>Token watchdog time</td><td>(50)</td></tr>
<tr><td>Allowable minimum frame interval time</td><td>(10)</td></tr>
<tr><td>Area 1 data top address</td><td>0</td></tr>
<tr><td>Area 1 data size</td><td>4</td></tr>
<tr><td>Area 2 data top address</td><td>0</td></tr>
<tr><td>Area 2 data size</td><td>64</td></tr>
<tr><td>IO allocation setting (for class 4)</td><td>Optional</td></tr>
<tr><td rowspan="7">Class 2</td><td>Node number</td><td>1</td></tr>
<tr><td>Token watchdog time</td><td>(50)</td></tr>
<tr><td>Allowable minimum frame interval time</td><td>(10)</td></tr>
<tr><td>Area 1 data top address</td><td>0</td></tr>
<tr><td>Area 1 data size</td><td>0</td></tr>
<tr><td>Area 2 data top address</td><td>0</td></tr>
<tr><td>Area 2 data size</td><td>0</td></tr>
</table>

Table 58 – Network parameter write (continued)

Setting parameter (node) (continued)	EUT (The parameters vary according to the class) (continued)	Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1 024
			Area 2 data size	1 024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1

Table 58 – Network parameter write (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Class 6 (continued)	IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = To be calculated from the number of input points of the slave, the EUT.
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#8400 (Area 2, address = 1024)
		Class 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1024
			Area 2 data size	64
	Dummy node		Implementation class	3 (Controller)
			Node number	2
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0

Table 58 – Network parameter write (continued)

Setting parameter (test data)	Network parameter write	Transmission message	Interface	FL-net message
			Node number of source side (SNA)	85
			Node number of destination side (DNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 008 (Network parameter write request)
			Data size	20
			Contents of data	Setting parameter flag = According to the EUT class: * Classes 1, 3 and 4: 3 * Classes 2, 5, 6 and 7: 2
				Area 1 data top address = 8
				Area 1 data size = 8
				Ares 2 data top address = 128
				Area 2 data size = 32
				Node name = "TargetNode"
		Reception message	Interface	FL-net message
			Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			Node number of destination side (DNA)	85
			TCD	65 208 (Network parameter write response)
			Type of response message (M_RLT)	0 (normal) or 2(not-implemented)
			Data size (In case of M_RLT = 0)	0
			Contents of data (in case of M_RLT = 0)	NA

Table 58 – Network parameter write (continued)

Setting parameter (test data) (continued)	Network parameter read	Transmission message	Interface	FL-net message
			Node number of source side (SNA)	85
			Node number of destination side (DNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 007 (Network parameter read request)
			Data size	0
			Contents of data	NA
		Reception message	Interface	FL-net message
			Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			Node number of destination side (DNA)	85
			TCD	65 207 (Network parameter read response)
			Type of response message (M_RLT)	0 (normal)
			Data size (In case of M_RLT = 0)	56
			Contents of data (In case of M_RLT = 0)	Node name = "TargetNode"
				Vendor code = Depending on the EUT specification (Test executer confirms)
				Manufacturer model name = Depending on the EUT specification (Test executer confirms)
				Area 1 data top address = According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 0 * Class 5: 256
				Area 1 data size = According to the EUT class: * Classes 1, 3 and 4: 4 * Class 2: 0 * Class 5: 256 * Classes 6 and 7: To be calculated number of input points of the slave, the EUT:
				Area 2 data top address = According to the EUT class: * Classes 1, 2, 3 and 4: 0 * Classes 5, 6 and 7: 1024
				Area 2 data size = According to the EUT class: * Classes 1, 3 and 4: 64 * Class 2: 0 * Classes 5, 6 and 7: 1024
				Token watchdog time = (No evaluation)
				Allowable minimum frame interval time = (No evaluation)
				Link status = (No evaluation)

Table 58 – Network parameter write (continued)

Setting parameter (test data) (continued)	Network parameter read (continued)	Reception message (continued)	Contents of data (In case of M_RLT = 0) (continued)	Protocol type = 128
				Upper layer status = (No evaluation)
				Allowable refresh cycle time = (No evaluation)
				Measured refresh cycle time (current) = (No evaluation)
				Measured refresh cycle time (maximum) = (No evaluation)
				Measured refresh cycle time (minimum) = (No evaluation)

Table 59 – Operation command, stop command

Test number		V2-053
Major test group		Message transmission (server function)
Test group		Peer-to-peer message operation test (server function)
Test objects		Operation command, stop command
Test procedure		a) Start the EUT, then start the test equipment. b) The test equipment transmits a stop command request. c) The test equipment transmits an operation command request. d) After the EUT becomes operation status, the test equipment transmits a stop command request.
Evaluation criteria		a) Confirm that the EUT transmits a response message to each of the request massages from the test equipment. b) Confirm that the EUT becomes operation status (USL (upper layer status) RUN flag = "1") on the operation command request. c) Confirm that the EUT becomes stop status (ULS (upper layer status) RUN flag = "0") on the stop command request. d) If the message from the test equipment is not implemented at the EUT, confirm that the EUT transmits a not-implemented response (M_RLT = 2).
Test necessity identified by the EUT class	Class 1	R
	Class 2	R
	Class 3	R
	Class 4	R
	Class 5	R
	Class 6	R
	Class 7	R

Table 59 – Operation command, stop command (continued)

Setting parameter (node)	EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	0
			Area 2 data size	64
			IO allocation setting (for class 4)	Optional
		Class 2	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
		Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1024
			Area 2 data size	1024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4

Table 59 – Operation command, stop command (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Classes 1, 2, 3, 4 and 5	Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = To be calculated from the number of input points of the slave, the EUT.
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#8400 (Area 2, address = 1 024)
		Class 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256

Table 59 – Operation command, stop command (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Class 7	Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64
Setting parameter (test data)	Operation command	Transmission message	Interface	FL-net message
			Node number of source side (SNA)	85
			Node number of destination side (DNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 010 (operation command request)
			Data size	0
			Contents of data	NA
		Reception message	Interface	FL-net message
			Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			Node number of destination side (DNA)	85
			TCD	65 210 (stop command response)
			Type of response message (M_RLT)	0 (normal) or 2(not-implemented)
			Data size (In case of M_RLT = 0)	0
			Contents of data (in case of M_RLT = 0)	NA
	Stop command	Transmission message	Interface	FL-net message
			Node number of source side (SNA)	85
			Node number of destination side (DNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 009 (operation command request)
			Data size	0
			Contents of data	NA
		Reception message	Interface	FL-net message
			Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			Node number of destination side (DNA)	85

Table 59 – Operation command, stop command (continued)

Setting parameter (test data) (continued)	Stop command (continued)	Reception message (continued)	TCD	65 209 (stop command response)
			Type of response message (M_RLT)	0 (normal) or 2(not-implemented)
			Data size (In case of M_RLT = 0)	0
			Contents of data (in case of M_RLT = 0)	NA

Table 60 – Profile read

Test number		V2-054			
Major test group		Message transmission (server function)			
Test group		Peer-to-peer message operation test (server function)			
Test objects		Profile read			
Test procedure		a) Start the EUT, then start the test equipment. b) The test equipment transmits a profile read request.			
Evaluation criteria		a) Confirm that the EUT transmits a response message to the request massage from the test equipment. b) Confirm that the contents of data received as the response message are identical to the settings of the EUT.			
Test necessity identified by the EUT class	Class 1	R			
	Class 2	R			
	Class 3	R			
	Class 4	R			
	Class 5	R			
	Class 6	R			
	Class 7	R			
Setting parameter (node)		EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	64
				IO allocation setting (for class 4)	Optional
			Class 2	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	0
				Area 2 data top address	0
				Area 2 data size	0
			Class 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1024
				Area 2 data size	1024
			Classes 6 and 7	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)

Table 60 – Profile read (continued)

Setting parameter (node) (continued)	EUT (The parameters vary according to the class) (continued)	Classes 6 and 7	Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	1024
			Area 2 data size	1024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = To be calculated from the number of input points of the slave, the EUT.
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)

Table 60 – Profile read (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Class 6 (continued)	IO allocation setting (slave setting) (continued)	Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#8400 (Area 2, address = 1 024)
		Class 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64
Setting parameter (test data)	Transmission message		Interface	FL-net message
			Node number of source side (SNA)	85
			Node number of destination side (DNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 011 (profile read request)
			Data size	0
			Contents of data	NA
	Reception message		Interface	FL-net message
			Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			Node number of destination side (DNA)	85
			TCD	65 211 (profile read response)
			Type of response message (M_RLT)	0 (normal)
			Data size (In case of M_RLT = 0)	Depending on the EUT specification
			Contents of data	Depending on the EUT specification (Test executer confirms)

Table 61 – Log data read

Test number		V2-055			
Major test group		Message transmission (server function)			
Test group		Peer-to-peer message operation test (server function)			
Test objects		Log data read			
Test procedure		a) Start the EUT, then start the test equipment. b) The test equipment transmits a log data request.			
Evaluation criteria		a) Confirm that the EUT transmits a response message to the request massage. b) If the log data in the EUT can be display onto such a device as a peripheral, confirm that the contents of data received by the response message are correct.			
Test necessity identified by the EUT class	Class 1	R			
	Class 2	R			
	Class 3	R			
	Class 4	R			
	Class 5	R			
	Class 6	R			
	Class 7	R			
Setting parameter (node)		EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	64
				IO allocation setting (for class 4)	Optional
			Class 2	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	0
				Area 2 data top address	0
				Area 2 data size	0
			Class 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1024
				Area 2 data size	1024
			Classes 6 and 7	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0

Table 61 – Log data read (continued)

Setting parameter (node) (continued)	EUT (The parameters vary according to the class) (continued)	Classes 6 and 7	Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)

Table 61 – Log data read (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Class 6 (continued)	IO allocation setting (slave setting) (continued)	Input data size = To be calculated from the number of input points of the slave, the EUT.
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#8400 (Area 2, address = 1 024)
		Class 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64
Setting parameter (test data)	Transmission message		Interface	FL-net message
			Node number of source side (SNA)	85
			Node number of destination side (DNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 013 (log data read request)
			Data size	0
			Contents of data	NA
	Reception message		Interface	FL-net message
			Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			Node number of destination side (DNA)	85
			TCD	65 213 (log data read response)
			Type of response message (M_RLT)	0 (normal)
			Data size (In case of M_RLT = 0)	512

Table 61 – Log data read (continued)

Setting parameter (test data) (continued)	Reception message (continued)	Contents of data (continued)	Depending on the EUT specification (Test executer confirms)

Table 62 – Log data clear

Test number		V2-055
Major test group		Message transmission (server function)
Test group		Peer-to-peer message operation test (server function)
Test objects		Log data clear
Test procedure		a) Start the EUT, then start the test equipment. b) The test equipment transmits a log data clear request. c) The test equipment transmits a log data read request after the EUT transmits a log data clear response.
Evaluation criteria		a) Confirm that the EUT transmits a response message to the request massage from the test equipment. b) After the test equipment transmits the log data read request, confirm that the contents of data received as the response message: number of joining in the log data is set to "0".
Test necessity identified by the EUT class	Class 1	R
	Class 2	R
	Class 3	R
	Class 4	R
	Class 5	R
	Class 6	R
	Class 7	R

Table 62 – Log data clear (continued)

Setting parameter (node)	EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	0
			Area 2 data size	64
			IO allocation setting (for class 4)	Optional
		Class 2	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
		Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1 024
			Area 2 data size	1 024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT

Table 62 – Log data clear (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = To be calculated from the number of input points of the slave, the EUT.
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#8400 (Area 2, address = 1024)

Table 62 – Log data clear (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Class 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64
Setting parameter (test data)	Log data clear	Transmission message	Interface	FL-net message
			Node number of source side (SNA)	85
			Node number of destination side (DNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 014 (log data clear request)
			Data size	0
			Contents of data	NA
		Reception message	Interface	FL-net message
			Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			Node number of destination side (DNA)	85
			TCD	65 214 (log data clear response)
			Type of response message (M_RLT)	0 (normal)
			Data size (In case of M_RLT = 0)	0
			Contents of data	NA
	Log data read	Transmission message	Interface	FL-net message
			Node number of source side (SNA)	85
			Node number of destination side (DNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 013 (log data read request)
			Data size	0
			Contents of data	NA
		Reception message	Interface	FL-net message
			Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			Node number of destination side (DNA)	85

Table 62 – Log data clear (continued)

Setting parameter (test data) (continued)	Log data read (continued)	Reception message (continued)	TCD	65 213 (log data read response)
			Type of response message (M_RLT)	0 (normal)
			Data size (In case of M_RLT = 0)	512
			Contents of data	Number of joining = 0

Table 63 – Message echo back

Test number		V2-057		
Major test group		Message transmission (server function)		
Test group		Peer-to-peer message operation test (server function)		
Test objects		Message echo back		
Test procedure		a) Start the EUT, then start the test equipment. b) The test equipment transmits a message echo back request. c) Use word incremental (+ 1) data starting with 16#11AA for the data in the transmission message.		
Evaluation criteria		a) Confirm that the EUT transmits a response message to the request massage from the test equipment. b) Confirm that the contents of data set in the request message and those received in the response massage are identical.		
Test necessity identified by the EUT class	Class 1	R		
	Class 2	R		
	Class 3	R		
	Class 4	R		
	Class 5	R		
	Class 6	R		
	Class 7	R		
Setting parameter (node)		EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number: 1
				Token watchdog time: (50)
				Allowable minimum frame interval time: (10)
				Area 1 data top address: 0
				Area 1 data size: 4
				Area 2 data top address: 0
				Area 2 data size: 64
				IO allocation setting (for class 4): Optional
			Class 2	Node number: 1
				Token watchdog time: (50)
				Allowable minimum frame interval time: (10)
				Area 1 data top address: 0
				Area 1 data size: 0
				Area 2 data top address: 0
				Area 2 data size: 0

Table 63 – Message echo back (continued)

Setting parameter (node) (continued)	EUT (The parameters vary according to the class) (continued)	Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1 024
			Area 2 data size	1 024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1

Table 63 – Message echo back (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Class 6 (continued)	IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
			IO allocation setting (slave setting) (continued)	Input data size = To be calculated from the number of input points of the slave, the EUT.
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#8400 (Area 2, address = 1024)
		Class 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1024
			Area 2 data size	64

Table 63 – Message echo back (continued)

Setting parameter (test data)	Transmission message	Interface	FL-net message
		Node number of source side (SNA)	85
		Node number of destination side (DNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
		TCD	65 015 (message echo back request)
		Data size	512
		Contents of data	Word incremental data starting with 16#11AA
	Reception message	Interface	FL-net message
		Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
		Node number of destination side (DNA)	85
		TCD	65 215 (message echo back response)
		Type of response message (M_RLT)	0 (normal)
		Data size (In case of M_RLT = 0)	512
		Contents of data	Word incremental data starting with 16#11AA

Table 64 – Transparent mode message

Test number		V2-058			
Major test group		Message transmission (server function)			
Test group		Peer-to-peer message operation test (server function)			
Test objects		Transparent mode message			
Test procedure		a) Start the EUT, then start the test equipment. b) The test equipment transmits a transparent mode message. c) Use word incremental (+ 1) data starting with 16#11AA for the data in the transmission message.			
Evaluation criteria		a) Confirm that the EUT transmits an ACK back to the test equipment. b) If the transparent mode message (server function) is implemented, confirm that the received data by the EUT is incremented.			
Test necessity identified by the EUT class	Class 1	R			
	Class 2	R			
	Class 3	R			
	Class 4	R			
	Class 5	R			
	Class 6	R			
	Class 7	R			
Setting parameter (node)		EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	64
				IO allocation setting (for class 4)	Optional
			Class 2	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	0
				Area 2 data top address	0
				Area 2 data size	0
			Class 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1 024
				Area 2 data size	1 024

Table 64 Transparent mode message (continued)

Setting parameter (node) (continued)	EUT (The parameters vary according to the class) (continued)	Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = To be calculated from the number of input points of the slave, the EUT.
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)

Table 64 – Transparent mode message (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Class 6 (continued)	IO allocation setting (slave setting) (continued)	Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#8400 (Area 2, address = 1024)
		Class 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1024
			Area 2 data size	64
Setting parameter (test data)	Transmission message		Interface	FL-net message
			Node number of source side (SNA)	85
			Node number of destination side (DNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	59 999 (transparent mode message)
			Data size	1024
			Contents of data	Word incremental data starting with 16#11AA

b) Broadcast message operation (server function)

Tables 65 and 66 show test tables for broadcast message operation (server function).

Table 65 – Log data clear

Test number		V2-059
Major test group		Message transmission (server function)
Test group		Broadcast message operation test
Test objects		Log data clear
Test procedure		a) Start the EUT, then start the test equipment. b) The test equipment transmits a log data clear request. c) The test equipment transmits a log data read request.
Evaluation criteria		a) Confirm that the EUT does not send any response message to the request massage from the test equipment. b) Confirm that a number of joining obtained from the log data read response is set to "0".
Test necessity identified by the EUT class	Class 1	R
	Class 2	R
	Class 3	R
	Class 4	R
	Class 5	R
	Class 6	R
	Class 7	R

Table 65 – Log data clear (continued)

Setting parameter (node)	EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	0
			Area 2 data size	64
			IO allocation setting (for class 4)	Optional
		Class 2	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
		Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1024
			Area 2 data size	1024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64

Table 65 – Log data clear (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Class 6	Implementation class	4 (Flexible master)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	1024
			Area 2 data size	1024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = To be calculated from the number of input points of the slave, the EUT.
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#8400 (Area 2, address = 1024)
		Class 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1024
			Area 2 data size	64

Table 65 – Log data clear (continued)

Setting parameter (test data)	Log data clear	Transmission message	Interface	FL-net message
			Node number of source side (SNA)	85
			Node number of destination side (DNA)	255
			TCD	65 014 (log data clear request)
			Data size	0
			Contents of data	NA
	Log data read	Transmission message	Interface	FL-net message
			Node number of source side (SNA)	85
			Node number of destination side (DNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 013 (log data read request)
			Data size	0
			Contents of data	NA
		Reception message	Interface	FL-net message
			Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			Node number of destination side (DNA)	85
			TCD	65 213 (log data read response)
			Type of response message (M_RLT)	0 (normal)
			Data size (In case of M_RLT = 0)	512
			Contents of data	Number of joining = 0

Table 66 – Transparent mode message

Test number		V2-060
Major test group		Message transmission (server function)
Test group		Broadcast message operation test
Test objects		Transparent mode message
Test procedure		a) Start the EUT, then start the test equipment. b) The test equipment transmits a transparent mode message. c) Use word incremental data starting with 16#11AA for the contents of transmission data.
Evaluation criteria		a) Confirm that the EUT transmits neither response message nor ACK response. b) If the transparent mode message (server function) is implemented, confirm that the received data by the EUT is incremented.
Test necessity identified by the EUT class	Class 1	R
	Class 2	R
	Class 3	R
	Class 4	R
	Class 5	R
	Class 6	R
	Class 7	R

Table 66 – Transparent mode message (continued)

Setting parameter (node)	EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	0
			Area 2 data size	64
			IO allocation setting (for class 4)	Optional
		Class 2	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
		Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1024
			Area 2 data size	1024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT

Table 66 – Transparent mode message (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	1024
			Area 2 data size	1024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = To be calculated from the number of input points of the slave, the EUT.
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#8400 (Area 2, address = 1024)

Table 66 – Transparent mode message (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Class 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1024
			Area 2 data size	64
Setting parameter (test data)	Transmission message		Interface	FL-net message
			Node number of source side (SNA)	85
			Node number of destination side (DNA)	255
			TCD	59 999 (Transparent mode message)
			Data size	1024
			Contents of data	Word incremental data starting with 16#11AA

6.6.9 Message transmission (client function)

Testing for message transmission (client function) are as follows:

a) peer-to-peer message operation (client function)

Tables 67 through 79 show test tables for peer-to-peer message operation (client function).

Table 67 – Byte block read

Test number		V2-061
Major test group		Message transmission (client function)
Test group		Peer-to-peer message operation test (client function)
Test objects		Byte block read
Test procedure		a) Start the EUT, then start the test equipment. b) The EUT sends a byte block read request. c) Use word incremental data starting from 16#11AA as contents of data in the transmission message.
Evaluation criteria		a) Confirm that the EUT receives a byte block read response from the test equipment. b) Confirm that contents of receive data are word incremental.
Test necessity identified by the EUT class	Class 1	O (if FL-net message peer-to-peer byte block read client function is implemented.)
	Class 2	O (if FL-net message peer-to-peer byte block read client function is implemented.)
	Class 3	O (if FL-net message peer-to-peer byte block read client function is implemented.)
	Class 4	O (if FL-net message peer-to-peer byte block read client function is implemented.)
	Class 5	O (if FL-net message peer-to-peer byte block read client function is implemented.)
	Class 6	O (if FL-net message peer-to-peer byte block read client function is implemented.)
	Class 7	O (if FL-net message peer-to-peer byte block read client function is implemented.)

Table 67 – Byte block read (continued)

Setting parameter (node)	EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	0
			Area 2 data size	64
			IO allocation setting (for class 4)	Optional
		Class 2	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
		Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1024
			Area 2 data size	1024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64

Table 67 – Byte block read (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Class 6	Implementation class	4 (Flexible master)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	1024
			Area 2 data size	1024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = To be calculated from the number of input points of the slave, the EUT.
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#8400 (Area 2, address = 1024)
		Class 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1024
			Area 2 data size	64

Table 67 – Byte block read (continued)

Setting parameter (test data)	Transmission message	Interface	FL-net message
		Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
		Node number of destination side (DNA)	85
		TCD	65 003 (Byte block read request)
		Data size	0
		Virtual address	64
		Virtual size	32
		Contents of data	NA
	Reception message	Interface	FL-net message
		Node number of source side (SNA)	85
		Node number of destination side (DNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
		TCD	65 203 (Byte block read response)
		Data size	32
		Virtual address	64
		Virtual size	32
		Contents of data	Word incremental data starting from 16#11AA

Table 68 – Byte block write

Test number		V2-062
Major test group		Message transmission (client function)
Test group		Peer-to-peer message operation test (client function)
Test objects		Byte block write
Test procedure		a) Start the EUT, then start the test equipment. b) The EUT sends a byte block write request. c) Use word incremental data starting from 16#11AA as contents of data in the transmission message.
Evaluation criteria		a) Confirm that the EUT sends the requirement message. b) Confirm that contents of the received data by the test equipment are incremental.
Test necessity identified by the EUT class	Class 1	O (if FL-net message peer-to-peer byte block write client function is implemented.)
	Class 2	O (if FL-net message peer-to-peer byte block write client function is implemented.)
	Class 3	O (if FL-net message peer-to-peer byte block write client function is implemented.)
	Class 4	O (if FL-net message peer-to-peer byte block write client function is implemented.)
	Class 5	O (if FL-net message peer-to-peer byte block write client function is implemented.)
	Class 6	O (if FL-net message peer-to-peer byte block write client function is implemented.)
	Class 7	O (if FL-net message peer-to-peer byte block write client function is implemented.)

Table 68 – Byte block write (continued)

Setting parameter (node)	EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	0
			Area 2 data size	64
			IO allocation setting (for class 4)	Optional
		Class 2	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
		Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1024
			Area 2 data size	1024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64

Table 68 – Byte block write (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Class 6	Implementation class	4 (Flexible master)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	1024
			Area 2 data size	1024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = To be calculated from the number of input points of the slave, the EUT.
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#8400 (Area 2, address = 1024)
		Class 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1024
			Area 2 data size	64

Table 68 – Byte block write (continued)

Setting parameter (test data)	Transmission message	Interface	FL-net message
		Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
		Node number of destination side (DNA)	85
		TCD	65 004 (Byte block write request)
		Data size	32
		Virtual address	64
		Virtual size	32
		Contents of data	Word incremental data starting from 16#11AA
	Reception message	Interface	FL-net message
		Node number of source side (SNA)	85
		Node number of destination side (DNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
		TCD	65 204 (Byte block write response)
		Data size	0
		Virtual address	64
		Virtual size	32
		Contents of data	NA

Table 69 – Word block read

Test number		V2-063
Major test group		Message transmission (client function)
Test group		Peer-to-peer message operation test (client function)
Test objects		Word block read
Test procedure		a) Start the EUT, then start the test equipment. b) The EUT transmits a word block read request. c) Use word incremental data starting from 16#11AA for contents of the transmission message.
Evaluation criteria		a) a) Confirm that the EUT receives a word block read response from the test equipment. b) b) Confirm that the received response data is word incremental.
Test necessity identified by the EUT class	Class 1	O (if FL-net message peer-to-peer word block read client function is implemented.).
	Class 2	O (if FL-net message peer-to-peer word block read client function is implemented.).
	Class 3	O (if FL-net message peer-to-peer word block read client function is implemented.).
	Class 4	O (if FL-net message peer-to-peer word block read client function is implemented.).
	Class 5	O (if FL-net message peer-to-peer word block read client function is implemented.).
	Class 6	O (if FL-net message peer-to-peer word block read client function is implemented.).
	Class 7	O (if FL-net message peer-to-peer word block read client function is implemented.).

Table 69 – Word block read (continued)

Setting parameter (node)	EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	0
			Area 2 data size	64
			IO allocation setting (for class 4)	Optional
		Class 2	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
		Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1024
			Area 2 data size	1024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64

Table 69 – Word block read (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Class 6	Implementation class	4 (Flexible master)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	1024
			Area 2 data size	1024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = To be calculated from the number of input points of the slave, the EUT.
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#8400 (Area 2, address = 1024)
		Class 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1024
			Area 2 data size	64

Table 69 – Word block read (continued)

Setting parameter (test data)	Transmission message	Interface	FL-net message
		Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
		Node number of destination side (DNA)	85
		TCD	65 005 (word block read request)
		Data size	0
		Virtual address	64
		Virtual size	32
		Contents of data	NA
	Reception message	Interface	FL-net message
		Node number of source side (SNA)	85
		Node number of destination side (DNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
		TCD	65 205 (word block read response)
		Data size	64
		Virtual address	64
		Virtual size	32
		Contents of data	Word incremental data starting from 16#11AA

Table 70 – Word block write

Test number		V2-064
Major test group		Message transmission (client function)
Test group		Peer-to-peer message operation test (client function)
Test objects		Word block write
Test procedure		a) Start the EUT, then start the test equipment. b) The EUT transmits a word block write request. c) Use word incremental data starting from 16#11AA for contents of the transmission message.
Evaluation criteria		a) Confirm that the EUT transmits the request message. b) Confirm that the received response data by the test equipment is word incremental.
Test necessity identified by the EUT class	Class 1	O (if FL-net message peer-to-peer word block write client function is implemented.)
	Class 2	O (if FL-net message peer-to-peer word block write client function is implemented.)
	Class 3	O (if FL-net message peer-to-peer word block write client function is implemented.)
	Class 4	O (if FL-net message peer-to-peer word block write client function is implemented.)
	Class 5	O (if FL-net message peer-to-peer word block write client function is implemented.)
	Class 6	O (if FL-net message peer-to-peer word block write client function is implemented.)
	Class 7	O (if FL-net message peer-to-peer word block write client function is implemented.)

Table 70 – Word block write (continued)

Setting parameter (node)	EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	0
			Area 2 data size	64
			IO allocation setting (for class 4)	Optional
		Class 2	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
		Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1024
			Area 2 data size	1024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64

Table 70 – Word block write (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Class 6	Implementation class	4 (Flexible master)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	1024
			Area 2 data size	1024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = To be calculated from the number of input points of the slave, the EUT.
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#8400 (Area 2, address = 1024)
		Class 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1024
			Area 2 data size	64

Table 70 – Word block write (continued)

Setting parameter (test data)	Transmission message	Interface	FL-net message
		Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
		Node number of destination side (DNA)	85
		TCD	6 006 (word block write request)
		Data size	64
		Virtual address	64
		Virtual size	32
		Contents of data	Word incremental data starting from 16#11AA
	Reception message	Interface	FL-net message
		Node number of source side (SNA)	85
		Node number of destination side (DNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
		TCD	65 206 (word block write response)
		Data size	0
		Virtual address	64
		Virtual size	32
		Contents of data	NA

Table 71 – Network parameter read

Test number		V2-065
Major test group		Message transmission (client function)
Test group		Peer-to-peer message operation test (client function)
Test objects		Network parameter read
Test procedure		a) Start the EUT, then start the test equipment. b) The EUT transmits a network parameter read request.
Evaluation criteria		a) Confirm that the EUT transmits the request message. b) Confirm that the received network parameter read response data by the EUT is identical to the data of the test equipment.
Test necessity identified by the EUT class	Class 1	O (if FL-net message peer-to-peer network parameter read client function is implemented.)
	Class 2	O (if FL-net message peer-to-peer network parameter read client function is implemented.)
	Class 3	O (if FL-net message peer-to-peer network parameter read client function is implemented.)
	Class 4	O (if FL-net message peer-to-peer network parameter read client function is implemented.)
	Class 5	O (if FL-net message peer-to-peer network parameter read client function is implemented.)
	Class 6	O (if FL-net message peer-to-peer network parameter read client function is implemented.)
	Class 7	O (if FL-net message peer-to-peer network parameter read client function is implemented.)

Table 71 – Network parameter read

Setting parameter (node)	EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	0
			Area 2 data size	64
			IO allocation setting (for class 4)	Optional
		Class 2	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
		Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1024
			Area 2 data size	1024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64

Table 71 – Network parameter read (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Class 6	Implementation class	4 (Flexible master)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	1024
			Area 2 data size	1024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = To be calculated from the number of input points of the slave, the EUT.
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#8400 (Area 2, address = 1024)
		Class 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1024
			Area 2 data size	64

Table 71 – Network parameter read (continued)

Setting parameter (test data)	Transmission message	Interface	FL-net message
		Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
		Node number of destination side (DNA)	85
		TCD	65 007 (network parameter read request)
		Data size	0
		Contents of data	NA
	Reception message	Interface	FL-net message
		Node number of source side (SNA)	85
		Node number of destination side (DNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
		TCD	65 207 (network parameter read response)
		Data size	56
		Contents of data	Node name = "Tester" (Test executer confirms)
			Vendor code and manufacturer model name are according to the test equipment

			* Area 1 data top address = According to the EUT class:
			* Classes 1, 2, 3, 4 and 5: 4
			* Class 6: according to the number of output points of the slave, the EUT:
			  * 0 point: 0
			  * 1 point or more: 256
			* Class 7: 256

			Area 2 data top address = According to the EUT class: * Classes 1, 2, 3, 4 and 5: 64 * Classes 6 and 7: 1024
			Area 2 data size = According to the EUT class: * Classes 1, 2, 3, 4, 5 and 7: 64 * Class 6: 1024
			Token watchdog time = 50

Table 71 – Network parameter read (continued)

Setting parameter (test data) (continued)	Reception message (continued)	Contents of data (continued)	Allowable minimum frame interval time = 10 (Test executer confirms)
			Link status = (No evaluation)
			Protocol type = 128 (Test executer confirms)
			Upper layer status = (No evaluation)
			Allowable refresh cycle time = (No evaluation)
			Refresh cycle measurement time (current) = (No evaluation)
			Refresh cycle measurement time (maximum) = (No evaluation)
			Refresh cycle measurement time (minimum) = (No evaluation)

Table 72 – Network parameter write

Test number		V2-066		
Major test group		Message transmission (client function)		
Test group		Peer-to-peer message operation test (client function)		
Test objects		Network parameter write		
Test procedure		a) Start the EUT, then start the test equipment. b) The EUT transmits a network parameter write request.		
Evaluation criteria		a) Confirm that the EUT transmits the request message. b) Confirm that the network parameter sent by the EUT is written correctly.		
Test necessity identified by the EUT class	Class 1	O (if FL-net message peer-to-peer network parameter write client function is implemented.).		
	Class 2	O (if FL-net message peer-to-peer network parameter write client function is implemented.).		
	Class 3	O (if FL-net message peer-to-peer network parameter write client function is implemented.).		
	Class 4	O (if FL-net message peer-to-peer network parameter write client function is implemented.).		
	Class 5	O (if FL-net message peer-to-peer network parameter write client function is implemented.).		
	Class 6	O (if FL-net message peer-to-peer network parameter write client function is implemented.).		
	Class 7	O (if FL-net message peer-to-peer network parameter write client function is implemented.).		
Setting parameter (node)		EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number: 1
				Token watchdog time: (50)
				Allowable minimum frame interval time: (10)
				Area 1 data top address: 0
				Area 1 data size: 4
				Area 2 data top address: 0
				Area 2 data size: 64
				Node name: "TargetNode"
				IO allocation setting (for class 4): Optional

Table 72 – Network parameter write (continued)

Setting parameter (node) (continued)	EUT (The parameters vary according to the class) (continued)	Class 2	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
			Node name	"TargetNode"
		Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1024
			Area 2 data size	1024
			Node Name	"TargetNode"
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
			Node name	"TargetNode"
	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256

Table 72 – Network parameter write (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Class 6 (continued)	Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	1024
			Area 2 data size	1024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = To be calculated from the number of input points of the slave, the EUT.
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#8400 (Area 2, address = 1024)
		Class 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1024
			Area 2 data size	64
Setting parameter	Transmission massage		Interface	FL-net message
			Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			Node number of destination side (DNA)	85
			TCD	65 008 (network parameter write request)
			Data size	20

Table 72 – Network parameter write (continued)

Setting parameter (test data) (continued)	Transmission message (continued)	Contents of data	Flag = 3
			Area 1 data top address = 264
			Area 1 data size = 4
			Area 2 data top address = 1152
			Area 2 data size = 64
			Node name = " NetParamet"
	Reception message	Interface	FL-net message
		Node number of source side (SNA)	85
		Node number of destination side (DNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
		TCD	65 208 (Network parameter write response)
		Data size	0
		Contents of data	NA

Table 73 – Operation command

Test number		V2-067			
Major test group		Message transmission (client function)			
Test group		Peer-to-peer message operation test (client function)			
Test objects		Operation command			
Test procedure		a) Start the EUT, then start the test equipment. b) The test equipment transmits a response to an operation command (RUN).			
Evaluation criteria		a) Confirm that the EUT transmits the request message. b) Confirm that ULS (upper layer status) RUN flag of the test equipment is "1".			
Test necessity identified by the EUT class	Class 1	O (if FL-net message peer-to-peer operation command client function is implemented.).			
	Class 2	O (if FL-net message peer-to-peer operation command client function is implemented.).			
	Class 3	O (if FL-net message peer-to-peer operation command client function is implemented.).			
	Class 4	O (if FL-net message peer-to-peer operation command client function is implemented.).			
	Class 5	O (if FL-net message peer-to-peer operation command client function is implemented.).			
	Class 6	O (if FL-net message peer-to-peer operation command client function is implemented.).			
	Class 7	O (if FL-net message peer-to-peer operation command client function is implemented.).			
Setting parameter (node)		EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	64
				IO allocation setting (for class 4)	Optional

Table 73 – Operation command (continued)

Setting parameter (node) (continued)	EUT (The parameters vary according to the class) (continued)	Class 2	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
		Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1024
			Area 2 data size	1024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	1024

Table 73 – Operation command (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Class 6 (continued)	Area 2 data size	1024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = To be calculated from the number of input points of the slave, the EUT.
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#8400 (Area 2, address = 1024)
		Class 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1024
			Area 2 data size	64
Setting parameter (test data)	Transmission massage		Interface	FL-net message
			Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			Node number of destination side (DNA)	85
			TCD	65 010 (operation command request)
			Data size	0
			Contents of data	NA
	Reception message		Interface	FL-net message
			Node number of source side (SNA)	85

Table 73 – Operation command (continued)

Setting parameter (test data) (continued)	Reception message (continued)	Node number of destination side (DNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
		TCD	65 210 (operation command response)
		Data size	0
		Contents of data	NA

Table 74 – Stop command

Test number		V2-068			
Major test group		Message transmission (client function)			
Test group		Peer-to-peer message operation test (client function)			
Test objects		Stop command			
Test procedure		a) Start the EUT, then start the test equipment. b) The EUT transmits the stop command (STOP).			
Evaluation criteria		a) Confirm that the EUT transmits the request message. b) Confirm that ULS (upper layer status) RUN flag of the test equipment is "0".			
Test necessity identified by the EUT class	Class 1	O (if FL-net message peer-to-peer stop command client function is implemented.).			
	Class 2	O (if FL-net message peer-to-peer stop command client function is implemented.).			
	Class 3	O (if FL-net message peer-to-peer stop command client function is implemented.).			
	Class 4	O (if FL-net message peer-to-peer stop command client function is implemented.).			
	Class 5	O (if FL-net message peer-to-peer stop command client function is implemented.).			
	Class 6	O (if FL-net message peer-to-peer stop command client function is implemented.).			
	Class 7	O (if FL-net message peer-to-peer stop command client function is implemented.).			
Setting parameter (node)		EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	64
				IO allocation setting (for class 4)	Optional
			Class 2	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	0
				Area 2 data top address	0
				Area 2 data size	0

Table 74 – Stop command (continued)

Setting parameter (node) (continued)	EUT (The parameters vary according to the class) (continued)	Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1024
			Area 2 data size	1024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	1024
			Area 2 data size	1024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = !6#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)

Table 74 – Stop command (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Class 6 (continued)	IO allocation setting (slave setting) (continued)	Input data size = To be calculated from the number of input points of the slave, the EUT.
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#8400 (Area 2, address = 1024)
		Class 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1024
			Area 2 data size	64
Setting parameter (test data)	Transmission massage		Interface	FL-net message
			Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			Node number of destination side (DNA)	85
			TCD	65 009 (stop command request)
			Data size	0
			Contents of data	NA
	Reception message		Interface	FL-net message
			Node number of source side (SNA)	85
			Node number of destination side (DNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 209 (stop command response)
			Data size	0
			Contents of data	NA

Table 75 – Profile read

Test number		V2-069			
Major test group		Message transmission (client function)			
Test group		Peer-to-peer message operation test (client function)			
Test objects		Profile read			
Test procedure		a) Start the EUT, then start the test equipment. b) The EUT transmits a profile read request.			
Evaluation criteria		a) Confirm that the EUT transmits the request message. b) Confirm that the EUT reads the profile data of the test equipment correctly.			
Test necessity identified by the EUT class	Class 1	O (if FL-net message peer-to-peer profile read client function is implemented.).			
	Class 2	O (if FL-net message peer-to-peer profile read client function is implemented.).			
	Class 3	O (if FL-net message peer-to-peer profile read client function is implemented.).			
	Class 4	O (if FL-net message peer-to-peer profile read client function is implemented.).			
	Class 5	O (if FL-net message peer-to-peer profile read client function is implemented.).			
	Class 6	O (if FL-net message peer-to-peer profile read client function is implemented.).			
	Class 7	O (if FL-net message peer-to-peer profile read client function is implemented.).			
Setting parameter (node)		EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	64
				IO allocation setting (for class 4)	Optional
			Class 2	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	0
				Area 2 data top address	0
				Area 2 data size	0
			Class 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1024
				Area 2 data size	1024

Table 75 – Profile read (continued)

Setting parameter (node) (continued)	EUT (The parameters vary according to the class) (continued)	Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	1024
			Area 2 data size	1024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = !6#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = To be calculated from the number of input points of the slave, the EUT
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
				Output data size = To be calculated from the number of output points of the slave, the EUT

Table 75 – Profile read (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Class 6 (continued)	IO allocation setting (slave setting) (continued)	Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#8400 (Area 2, address = 1024)
		Class 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1024
			Area 2 data size	64
Setting parameter (test data)	Transmission massage		Interface	FL-net message
			Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			Node number of destination side (DNA)	85
			TCD	65 011 (profile read request)
			Data size	0
			Contents of data	NA
	Reception message		Interface	FL-net message
			Node number of source side (SNA)	85
			Node number of destination side (DNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 211 (profile read response)
			Data size	Optional (Depending on the certification tool specification)
			Contents of data	Optional (Depending on the certification tool specification)

Table 76 – Log data read

Test number	V2-070
Major test group	Message transmission (client function)
Test group	Peer-to-peer message operation test (client function)
Test objects	Log data read
Test procedure	a) Start the EUT, then start the test equipment. b) The EUT transmits a log data read request.
Evaluation criteria	a) Confirm that the EUT transmits the request message. b) Confirm that the EUT reads the log data read of the test equipment correctly.

Table 76 – Log data read (continued)

Test necessity identified by the EUT class	Class 1	O (if FL-net message peer-to-peer log data read client function is implemented.).			
	Class 2	O (if FL-net message peer-to-peer log data read client function is implemented.).			
	Class 3	O (if FL-net message peer-to-peer log data read client function is implemented.).			
	Class 4	O (if FL-net message peer-to-peer log data read client function is implemented.).			
	Class 5	O (if FL-net message peer-to-peer log data read client function is implemented.).			
	Class 6	O (if FL-net message peer-to-peer log data read client function is implemented.).			
	Class 7	O (if FL-net message peer-to-peer log data read client function is implemented.).			
Setting parameter (node)		EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	64
				IO allocation setting (for class 4)	Optional
			Class 2	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	0
				Area 2 data top address	0
				Area 2 data size	0
			Class 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1024
				Area 2 data size	1024
			Classes 6 and 7	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	To be calculated from the number of input points of the slave, the EUT
				Area 2 data top address	0
				Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT

Table 76 – Log data read (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	1024
			Area 2 data size	1024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = !6#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = To be calculated from the number of input points of the slave, the EUT
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#8400 (Area 2, address = 1024)

Table 76 – Log data read (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Class 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1024
			Area 2 data size	64
Setting parameter (test data)	Transmission massage		Interface	FL-net message
			Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			Node number of destination side (DNA)	85
			TCD	65 013 (log data read request)
			Data size	0
			Contents of data	NA
	Reception message		Interface	FL-net message
			Node number of source side (SNA)	85
			Node number of destination side (DNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 213 (log data read response)
			Data size	512
			Contents of data	Optional (Depending on the certification tool specification)

Table 77 – Log data clear

Test number		V2-071
Major test group		Message transmission (client function)
Test group		Peer-to-peer message operation test (client function)
Test objects		Log data clear
Test procedure		a) Start the EUT, then start the test equipment. b) The EUT transmits a log data clear request.
Evaluation criteria		Confirm that the EUT transmits the request message.
Test necessity identified by the EUT class	Class 1	O (if FL-net message peer-to-peer log data clear client function is implemented.).
	Class 2	O (if FL-net message peer-to-peer log data clear client function is implemented.).
	Class 3	O (if FL-net message peer-to-peer log data clear client function is implemented.).
	Class 4	O (if FL-net message peer-to-peer log data clear client function is implemented.).
	Class 5	O (if FL-net message peer-to-peer log data clear client function is implemented.).
	Class 6	O (if FL-net message peer-to-peer log data clear client function is implemented.).
	Class 7	O (if FL-net message peer-to-peer log data clear client function is implemented.).

Table 77 – Log data clear (continued)

Setting parameter (node)	EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	0
			Area 2 data size	64
			IO allocation setting (for class 4)	Optional
		Class 2	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
		Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1024
			Area 2 data size	1024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64

Table 77 – Log data clear (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Class 6	Implementation class	4 (Flexible master)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	1024
			Area 2 data size	1024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = To be calculated from the number of input points of the slave, the EUT.
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#8400 (Area 2, address = 1024)
		Class 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1024
			Area 2 data size	64

Table 77 – Log data clear (continued)

Setting parameter (test data)	Transmission message	Interface	FL-net message
		Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
		Node number of destination side (DNA)	85
		TCD	65 014 (log data clear request)
		Data size	0
		Contents of data	NA
	Reception message	Interface	FL-net message
		Node number of source side (SNA)	85
		Node number of destination side (DNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
		TCD	65 214 (log data clear response)
		Data size	0
		Contents of data	NA

Table 78 – Message echo back

Test number		V2-072
Major test group		Message transmission (client function)
Test group		Peer-to-peer message operation test (client function)
Test objects		Message echo back
Test procedure		a) Start the EUT, then start the test equipment. b) The test equipment transmits a message echo back response. c) Use word incremental data starting from 16#11AA for contents of data of the transmission message
Evaluation criteria		Confirm that the EUT transmits the request message. The response message from the test equipment is identical to the request message.
Test necessity identified by the EUT class	Class 1	O (if FL-net message peer-to-peer message echo back client function is implemented.).
	Class 2	O (if FL-net message peer-to-peer message echo back client function is implemented.).
	Class 3	O (if FL-net message peer-to-peer message echo back client function is implemented.).
	Class 4	O (if FL-net message peer-to-peer message echo back client function is implemented.).
	Class 5	O (if FL-net message peer-to-peer message echo back client function is implemented.).
	Class 6	O (if FL-net message peer-to-peer message echo back client function is implemented.).
	Class 7	O (if FL-net message peer-to-peer message echo back client function is implemented.).

Table 78 – Message echo back (continued)

Setting parameter (node)	EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	0
			Area 2 data size	64
			IO allocation setting (for class 4)	Optional
		Class 2	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
		Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1024
			Area 2 data size	1024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64

Table 78 – Message echo back (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Class 6	Implementation class	4 (Flexible master)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	1024
			Area 2 data size	1024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = To be calculated from the number of input points of the slave, the EUT.
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#8400 (Area 2, address = 1024)
		Class 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1024
			Area 2 data size	64

Table 78 – Message echo back (continued)

Setting parameter (test data)	Transmission message	Interface	FL-net message
		Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
		Node number of destination side (DNA)	85
		TCD	65 015 (message echo back request)
		Data size	1024
		Contents of data	Word incremental data starting from 16#11AA
	Reception message	Interface	FL-net message
		Node number of source side (SNA)	85
		Node number of destination side (DNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
		TCD	65 215 (message echo back response)
		Data size	0
		Contents of data	Word incremental data starting from 16#11AA

Table 79 – Transparent mode message

Test number		V2-073
Major test group		Message transmission (client function)
Test group		Peer-to-peer message operation test (client function)
Test objects		Transparent mode message
Test procedure		a) Start the EUT, then start the test equipment. b) The EUT transmits a transparent mode message. c) Execute tests with settings of patterns 1 through 3, respectively. d) Use word incremental data starting from 16#11AA for contents of data of the transmission message
Evaluation criteria		Confirm that the test equipment receives the message from the EUT.
Test necessity identified by the EUT class	Class 1	O (if FL-net message peer-to-peer transparent mode message client function is implemented.).
	Class 2	O (if FL-net message peer-to-peer transparent mode message client function is implemented.).
	Class 3	O (if FL-net message peer-to-peer transparent mode message client function is implemented.).
	Class 4	O (if FL-net message peer-to-peer transparent mode message client function is implemented.).
	Class 5	O (if FL-net message peer-to-peer transparent mode message client function is implemented.).
	Class 6	O (if FL-net message peer-to-peer transparent mode message client function is implemented.).
	Class 7	O (if FL-net message peer-to-peer transparent mode message client function is implemented.).

Table 79 – Transparent mode message (continued)

Setting parameter (node)	EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	0
			Area 2 data size	64
			IO allocation setting (for class 4)	Optional
		Class 2	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
		Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1024
			Area 2 data size	1024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64

Table 79 – Transparent mode message (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Class 6	Implementation class	4 (Flexible master)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	1024
			Area 2 data size	1024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = To be calculated from the number of input points of the slave, the EUT.
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#8400 (Area 2, address = 1024)
		Class 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1024
			Area 2 data size	64

Table 79 – Transparent mode message (continued)

Setting parameter (test data)	Pattern 1	Interface	FL-net message
		Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
		Node number of destination side (DNA)	85
		TCD	10 000 (transparent mode message)
		Data size	1024
		Contents of data	Word incremental data starting from 16#11AA
	Pattern 2	Interface	FL-net message
		Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
		Node number of destination side (DNA)	85
		TCD	59 999 (transparent mode message)
		Data size	0
		Contents of data	NA
	Pattern 3	Interface	FL-net message
		Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
		Node number of destination side (DNA)	85
		TCD	10 000 (transparent mode message)
		Data size	512
		Contents of data	Word incremental data starting from 16#11AA

b) broadcast message operation (client function)

Tables 80 and 81 show test tables for broadcast message operation (client function)

Table 80 – Log data clear

Test number	V2-074
Major test group	Message transmission (client function)
Test group	Broadcast message operation
Test objects	Log data clear
Test procedure	a) Start the EUT, then start the test equipment. b) The EUT transmits a log data clear request.
Evaluation criteria	Confirm that the EUT transmits the request message.

Table 80 – Log data clear (continued)

Test necessity identified by the EUT class	Class 1	O (if FL-net message broadcast log data clear client function is implemented.).			
	Class 2	O (if FL-net message broadcast log data clear client function is implemented.).			
	Class 3	O (if FL-net message broadcast log data clear client function is implemented.).			
	Class 4	O (if FL-net message broadcast log data clear client function is implemented.).			
	Class 5	O (if FL-net message broadcast log data clear client function is implemented.).			
	Class 6	O (if FL-net message broadcast log data clear client function is implemented.).			
	Class 7	O (if FL-net message broadcast log data clear client function is implemented.).			
Setting parameter (node)		EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	64
				IO allocation setting (for class 4)	Optional
			Class 2	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	0
				Area 2 data top address	0
				Area 2 data size	0
			Class 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1024
				Area 2 data size	1024
			Classes 6 and 7	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	To be calculated from the number of input points of the slave, the EUT
				Area 2 data top address	0
				Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT

Table 80 – Log data clear (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	1024
			Area 2 data size	1024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = !6#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = To be calculated from the number of input points of the slave, the EUT
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#8400 (Area 2, address = 1024)

Table 80 – Log data clear (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Class 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1024
			Area 2 data size	64
Setting parameter (test data)	Transmission massage		Interface	FL-net message
			Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
			Node number of destination side (DNA)	255
			TCD	65 014 (log data clear request)
			Data size	0
			Contents of data	NA

Table 81 – Transparent mode message

Test number		V2-075
Major test group		Message transmission (client function)
Test group		Broadcast message operation
Test objects		Transparent mode message
Test procedure		a) Start the EUT, then start the test equipment. b) The EUT transmits a transparent mode message. c) Execute tests with settings of patterns 1 through 3, respectively.
Evaluation criteria		Confirm that the test equipment receives the message from the EUT.
Test necessity identified by the EUT class	Class 1	O (if FL-net message broadcast transparent mode message client function is implemented.).
	Class 2	O (if FL-net message broadcast transparent mode message client function is implemented.).
	Class 3	O (if FL-net message broadcast transparent mode message client function is implemented.).
	Class 4	O (if FL-net message broadcast transparent mode message client function is implemented.).
	Class 5	O (if FL-net message broadcast transparent mode message client function is implemented.).
	Class 6	O (if FL-net message broadcast transparent mode message client function is implemented.).
	Class 7	O (if FL-net message broadcast transparent mode message client function is implemented.).

Table 81 – Transparent mode message (continued)

Setting parameter (node)	EUT (The parameters vary according to the class)	Classes 1, 3 and 4	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	0
			Area 2 data size	64
			IO allocation setting (for class 4)	Optional
		Class 2	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
		Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1024
			Area 2 data size	1024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave, the EUT
	Test equipment (The parameters vary according to the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64

Table 81 – Transparent mode message (continued)

Setting parameter (node) (continued)	Test equipment (The parameters vary according to the EUT class) (continued)	Class 6	Implementation class	4 (Flexible master)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	According to the number of output points of the slave, the EUT: * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output points of the slave, the EUT
			Area 2 data top address	1024
			Area 2 data size	1024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = To be calculated from the number of input points of the slave, the EUT.
				Output data address = According to the number of output points of the slave, the EUT: * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = To be calculated from the number of output points of the slave, the EUT
				Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#8400 (Area 2, address = 1024)
		Class 7	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1024
			Area 2 data size	64

Table 81 – Transparent mode message (continued)

Setting parameter (test data)	Pattern 1	Interface	FL-net message
		Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
		Node number of destination side (DNA)	255
		TCD	10 000 (transparent mode message)
		Data size	1024
		Contents of data	Defined by the manufacturer
	Pattern 2	Interface	FL-net message
		Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
		Node number of destination side (DNA)	255
		TCD	59 999 (transparent mode message)
		Data size	0
		Contents of data	NA
	Pattern 3	Interface	FL-net message
		Node number of source side (SNA)	According to the EUT class: * Classes 1, 2, 3, 4, 6 and 7: 1 * Class 5: 100
		Node number of destination side (DNA)	255
		TCD	10 000 (transparent mode message)
		Data size	512
		Contents of data	Defined by the manufacturer

6.6.10 General purpose command server function

Table 82 to Table 133 show the test tables for general purpose command server function.

a) Basic operation test (UDP) Table 82 and Table 83 show the test tables for the basic operation test (UDP).

Table 82 – Frame sequence number

Test number	V3-001
Major test group	General purpose command server function
Test group	Basic operation test (UDP)
Test objects	Frame sequence number
Test procedure	d) Start the EUT, then start the test equipment. e) The test equipment (UDP setting tool interface) transmits a self node management information parameter read frame (request) 5 times.
Evaluation criteria	Confirm that the EUT transmits a self node management information parameter read frame (response) each time, with a sequence number that is the same as the sequence number of the request frame.

Table 82 – Frame sequence number (continued)

Test necessity identified by the EUT class	Class 1	N			
	Class 2	N			
	Class 3	R			
	Class 4	R			
	Class 5	R			
	Class 6	R			
	Class 7	R			
Setting parameter (node)		EUT (By class, parameters are different)	Classes 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	16
				IO allocation setting (for Class 4)	optional
			Class 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1 024
				Area 2 data size	1 024
			Classes 6 and 7	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	To be calculated from the number of input slave points in the EUT.
				Area 2 data top address	0
				Area 2 data size	To be calculated from the number of input slave points and output slave points in the EUT.
		Test equipment (By class of EUT, parameters are different)	Classes 3, 4 and 5	Implementation class	3 (controller)
				Node number	254
				Token watchdog time	50
				Allowable minimum frame interval time	10
				Area 1 data top address	4
				Area 1 data size	4
				Area 2 data top address	64
				Area 2 data size	64

Table 82 – Frame sequence number (continued)

Setting parameter (node) (continued)	Test equipment (By class of EUT, parameters are different) (continued)	Class 6	Implementation class	4 (flexible master)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	Depends on the number of output slave points in the EUT. * 0 point: 0 * 1 point or more: 256
			Area 1 data size	Depends on the number of output slave points in the EUT.
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number: 16#8001 (flexible setting mode, Node number: 1)
				Input data address: 16#0000 (area 1, address: 0)
				Input data size: To be calculated from the number of input slave points in the EUT.
				Output data address: Depends on the number of output slave points in the EUT. * 0 point:16#0000 (area 1, address: 0) * 1 point or more: 16#0100 (area 1, address: 256)
				Output data size: To be calculated form the number of output slave points in the EUT.
				Input status address: 16#8000 (area 2, address: 0)
				Output status address: 16#8400 (area 2, address: 1024)
		Class 7	Implementation class	3 (controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64

Table 82 – Frame sequence number (continued)

Setting parameter (test data)	Transmission frame	Interface	UDP setting tool interface
		Node address of source side (SNA)	254
		Node number of destination side (DNA)	Depends on EUT class. * Classes 3, 4, 6 and 7: 1 * Class 5: 100
		TCD	65 026 (self node management information parameter read request)
		Data size	0
		Contents of data	NA
	Reception frame	Interface	UDP setting tool interface
		Node address of source side (SNA)	Depends on EUT class. * Classes 3, 4, 6 and 7: 1 * Class 5: 100
		Node number of destination side (DNA)	254
		TCD	65 226 (self node management information parameter read response)
		Type of response message(M_RLT)	0 (normal)
		Data size	64
		Contents of data	optional (no evaluation)
	Response time limit (from request frame transmission to response frame reception)	1 s	

Table 83 – Frame sequence number skip

Test number		V3-002
Major test group		General purpose command server function
Test group		Basic operation test (UDP)
Test objects		Frame sequence number skip
Test procedure		a) Start the EUT, then start the test equipment. b) The test equipment (UDP setting tool interface) transmits a self node management information parameter read frame (request). c) The test equipment (UDP setting tool interface) transmits another self node management information parameter read frame (request) with its sequence number added by 10 to that of the transmitted last time.
Evaluation criteria		Confirm that the EUT transmits a self node management information parameter read frame (response) each time, with a sequence number that is the same as the sequence number of the request frame.
Test necessity identified by the EUT class	Class 1	N
	Class 2	N
	Class 3	R
	Class 4	R
	Class 5	R
	Class 6	R
	Class 7	R

Table 83 – Frame sequence number skip (continued)

Setting parameter (node)	EUT (By class, parameters are different)	Classes 3 and 4	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	0
			Area 2 data size	16
			IO allocation setting (for Class 4)	optional
		Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1 024
			Area 2 data size	1 024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input slave points in the EUT.
			Area 2 data top address	0
			Area 2 data size	To be calculated from the number of input slave points and output slave points in the EUT.
	Test equipment (By class of EUT, parameters are different)	Classes 3, 4 and 5	Implementation class	3 (controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (flexible master)
			Node number	254
			Token watchdog time	50

Table 83 – Frame sequence number skip (continued)

Setting parameter (node) (continued)	Test equipment (By class of EUT, parameters are different) (continued)	Class 6 (continued)	Allowable minimum frame interval time	10
			Area 1 data top address	Depends on the number of output slave points in the EUT. * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output slave points in the EUT.
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number: 16#8001 (flexible setting mode, Node number:1)
				Input data address: 16#0000 (area 1, address: 0)
				Input data size: To be calculated from the number of input slave points in the EUT.
				Output data address: Depends on the number of output slave points in the EUT. * 0 point: 16#0000 (area 1, address: 0) * 1 point or more: 16#0100 (area 1, address: 256)
				Output data size: To be calculated from the number of output slave points in the EUT.
				Input status address: 16#8000 (area 2, address: 0)
				Output status address: 16#8400 (area 2, address: 1 024)
		Class 7	Implementation class	3 (controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64

Table 83 – Frame sequence number skip (continued)

Setting parameter (test data)	Transmission frame	Interface	UDP setting tool interface
		Node address of source side (SNA)	254
		Node number of destination side (DNA)	Depends on EUT class. * Classes 3, 4, 6 and 7: 1 * Class 5: 100
		TCD	65 026 (self node management information parameter read request)
		Data size	0
		Contents of data	NA
Setting parameter (test data) (continued)	Reception frame	Interface	UDP setting tool interface
		Node address of source side (SNA)	Depends on EUT class. * Classes 3, 4, 6, and 7: 1 * Class 5: 100
		Node number of destination side (DNA)	254
		TCD	65 226 (self node management information parameter read response)
		Type of response message (M_RLT)	0 (normal)
		Data size	64
		Contents of data	optional (no evaluation)
	Response time limit (from request frame transmission to response frame reception)	1 s	

b) Basic operation test (TCP) Table 84 to Table 86 show the test tables for the basic operation test (TCP).

Table 84 – Connection open, close

Test number		V3-003			
Major test group		General purpose command server function			
Test group		Basic operation test (TCP)			
Test objects		Connection open, close			
Test procedure		a) Start the EUT, then start the test equipment. b) Repeat the following steps 10 times. * The test equipment (TCP setting tool interface) opens a connection to the EUT. * The test equipment (TCP setting tool interface) transmits a node management information parameter read frame (request). * The test equipment closes the connection to the EUT.			
Evaluation criteria		Confirm the followings: The opening of a connection to the EUT is successful on each of the 10 occasions. a) The EUT transmits a self node management information parameter read frame (response) on each of the 10 occasions.			
Test necessity identified by the EUT class	Class 1	N			
	Class 2	N			
	Class 3	O (in case the command server functions in TCP is implemented)			
	Class 4	O (in case the command server functions in TCP is implemented)			
	Class 5	O (in case the command server functions in TCP is implemented)			
	Class 6	O (in case the command server functions in TCP is implemented)			
	Class 7	O (in case the command server functions in TCP is implemented)			
Setting parameter (node)		EUT (By class, parameters are different)	Classes 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)

Table 84 – Connection open, close (continued)

Setting parameter (node) (continued)	EUT (By class, parameters are different) (continued)	Classes 3 and 4 (continued)	Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	0
			Area 2 data size	16
			IO allocation setting (for Class 4)	optional
		Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1 024
			Area 2 data size	1 024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input slave points in the EUT.
			Area 2 data top address	0
			Area 2 data size	To be calculated from the number of input slave points and output slave points in the EUT.
	Test equipment (By class of EUT, parameters are different)	Classes 3, 4 and 5	Implementation class	3 (controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (flexible master)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	Depends on the number of output slave points in the EUT. * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output slave points in the EUT.
			Area 2 data top address	1 024

Table 84 – Connection open, close (continued)

Setting parameter (node) (continued)	Test equipment (By class of EUT, parameters are different) (continued)	Class 6 (continued)	Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number: 16#8001 (flexible setting mode, Node number: 1)
				Input data address: 16#0000 (area 1, address: 0)
				Input data size: To be calculated from the number of input slave points in the EUT.
				Output data address: Depends on the number of output slave points in the EUT. * 0 point: 16#0000 (area 1, address: 0) * 1 point or more: 16#0100 (area 1, address: 256)
				Output data size: To be calculated from the number of output slave points in the EUT.
				Input status address: 16#8000 (area 2, address: 0)
				Output status address: 16#8400 (area 2, address: 1 024)
		Class 7	Implementation class	3 (controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64
Setting parameter (test data)	Transmission frame		Interface	TCP setting tool interface
			Node address of source side (SNA)	254
			Node number of destination side (DNA)	Depends on EUT class. * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 026 (self node management information parameter read request)
			Data size	0
			Contents of data	NA
	Reception frame		Interface	TCP setting tool interface
			Node address of source side (SNA)	Depends on EUT class. * Classes 3, 4, 6 and 7: 1 * Class 5: 100

Table 84 – Connection open, close (continued)

Setting parameter (test data) (continued)	Reception frame (continued)	Node number of destination side (DNA)	254
		TCD	65 226 (self node management information parameter read response)
		Type of response message (M_RLT)	0 (normal)
		Data size	64
		Contents of data	optional (no evaluation)
	Response time limit (from request frame transmission to response frame reception)	1 s	

Table 85 – Frame sequence number

Test number		V3-004			
Major test group		General purpose command server function			
Test group		Basic operation test (TCP)			
Test objects		Frame sequence number			
Test procedure		a) Start the EUT, then start the test equipment. b) The test equipment (TCP setting tool interface) opens a connection to the EUT. c) The test equipment (TCP setting tool interface) transmits a node management information parameter read frame (request) 5 times. d) The test equipment closes the connection to the EUT.			
Evaluation criteria		Confirm that the EUT transmits a self node management information parameter read frame (response) each time, with its sequence number which is the same as the sequence number of the corresponding request frame.			
Test necessity identified by the EUT class	Class 1	N			
	Class 2	N			
	Class 3	O (in case the command server functions in TCP is implemented)			
	Class 4	O (in case the command server functions in TCP is implemented)			
	Class 5	O (in case the command server functions in TCP is implemented)			
	Class 6	O (in case the command server functions in TCP is implemented)			
	Class 7	O (in case the command server functions in TCP is implemented)			
Setting parameter (node)		EUT (By class, parameters are different)	Classes 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	16
				IO allocation setting (for Class 4)	optional

Table 85 – Frame sequence number (continued)

Setting parameter (node) (continued)	EUT (By class, parameters are different) (continued)	Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1 024
			Area 2 data size	1 024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input slave points in the EUT.
			Area 2 data top address	0
			Area 2 data size	To be calculated from the number of input slave points and output slave points in the EUT.
	Test equipment (By class of EUT, parameters are different)	Classes 3, 4 and 5	Implementation class	3 (controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (flexible master)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	Depends on the number of output slave points in the EUT. * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output slave points in the EUT.
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number: 16#8001 (flexible setting mode, Node number: 1)
				Input data address: 16#0000 (area 1, address: 0)

Table 85 – Frame sequence number (continued)

Setting parameter (node) (continued)	Test equipment (By class of EUT, parameters are different) (continued)	Class 6 (continued)	IO allocation setting (slave setting) (continued)	Input data size: To be calculated from the number of input slave points in the EUT.
				Output data address: Depends on the number of output slave points in the EUT. * 0 point: 16#0000 (area 1, address: 0) * 1 point or more: 16#0100 (area 1, address: 256)
				Output data size: To be calculated from the number of output slave points in the EUT.
				Input status address: 16#8000 (area 2, address: 0)
				Output status address: 16#8400 (area 2, address: 1 024)
		Class 7	Implementation class	3 (controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64
Setting parameter (test data)	Transmission frame		Interface	TCP setting tool interface
			Node address of source side (SNA)	85
			Node number of destination side (DNA)	Depends on EUT class. * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 026 (self node management information parameter read request)
			Data size	0
			Contents of data	NA
	Reception frame		Interface	TCP setting tool interface
			Node address of source side (SNA)	Depends on EUT class. * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node number of destination side (DNA)	254
			TCD	65 226 (self node management information parameter read response)
			Type of response message (M_RLT)	0 (normal)
			Data size	64
			Contents of data	optional (no evaluation)

Table 85 – Frame sequence number (continued)

Setting parameter (test data) (continued)	Response time limit (from request frame transmission to response frame reception)	1 s

Table 86 – Frame sequence number skip

Test number		V3-005			
Major test group		General purpose command server function			
Test group		Basic operation test (TCP)			
Test objects		Frame sequence number skip			
Test procedure		a) Start the EUT, then start the test equipment. b) The test equipment (TCP setting tool interface) opens a connection to the EUT. c) The test equipment (TCP setting tool interface) transmits a self node management information parameter read frame (request). d) The test equipment (TCP setting tool interface) transmits another self node management information parameter read frame (request) with its sequence number added by 10 to that of the transmitted last time. e) The test equipment closes the connection to the EUT.			
Evaluation criteria		Confirm that the EUT transmits a self node management information parameter read frame (response) each time, with a sequence number which is in agreement with a sequence number of the request frame.			
Test necessity identified by the EUT class	Class 1	N			
	Class 2	N			
	Class 3	O (in case the command server functions in TCP is implemented)			
	Class 4	O (in case the command server functions in TCP is implemented)			
	Class 5	O (in case the command server functions in TCP is implemented)			
	Class 6	O (in case the command server functions in TCP is implemented)			
	Class 7	O (in case the command server functions in TCP is implemented)			
Setting parameter (node)		EUT (By class, parameters are different)	Classes 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	16
				IO allocation setting (for Class 4)	optional
			Class 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1 024
				Area 2 data size	1 024

Table 86 – Frame sequence number skip (continued)

Setting parameter (node) (continued)	EUT (By class, parameters are different) (continued)	Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input slave points in the EUT.
			Area 2 data top address	0
			Area 2 data size	To be calculated from the number of input slave points and output slave points in the EUT.
	Test equipment (By class of EUT, parameters are different)	Classes 3, 4 and 5	Implementation class	3 (controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (flexible master)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	Depends on the number of output slave points in the EUT. * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output slave points in the EUT.
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number: 16#8001 (flexible setting mode, Node number: 1)
				Input data address: 16#0000 (area 1, address: 0)
				Input data size: To be calculated from the number of input slave points in the EUT.

Table 86 – Frame sequence number skip (continued)

Setting parameter (node) (continued)	Test equipment (By class of EUT, parameters are different) (continued)	Class 6 (continued)	IO allocation setting (slave setting) (continued)	Output data address: Depends on the number of output slave points in the EUT. * 0 point: 16#0000 (area 1, address: 0) 1 point or more: 16#0100 (area 1, address: 256)
				Output data size: To be calculated from the number of output slave points in the EUT.
				Input status address: 16#8000 (area 2, address: 0)
				Output status address: 16#8400 (area 2, address: 1 024)
		Class 7	Implementation class	3 (controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64
Setting parameter (test data)	Transmission frame		Interface	TCP setting tool interface
			Node address of source side (SNA)	85
			Node number of destination side (DNA)	Depends on EUT class. * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 026 (self node management information parameter read request)
			Data size	0
			Contents of data	NA
	Reception frame		Interface	TCP setting tool interface
			Node address of source side (SNA)	Depends on EUT class. * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node number of destination side (DNA)	254
			TCD	65 226 (self node management information parameter read response)
			Type of response message(M_RLT)	0 (normal)
			Data size	64
			Contents of data	optional (no evaluation)

Table 86 – Frame sequence number skip (continued)

Setting parameter (test data)	Response time limit (from request frame transmission to response frame reception)	1 s

c) Operation test of single setting tool (UDP) Table 87 to Table 102 show the test tables for the Operation test of single setting tool (UDP).

Table 87 – IO allocation setting, read

<table>
<tr><td colspan="2">Test number</td><td colspan="4">V3-006</td></tr>
<tr><td colspan="2">Major test group</td><td colspan="4">General purpose command server function</td></tr>
<tr><td colspan="2">Test group</td><td colspan="4">Operation test of single setting tool (UDP)</td></tr>
<tr><td colspan="2">Test objects</td><td colspan="4">IO allocation setting, read</td></tr>
<tr><td colspan="2">Test procedure</td><td colspan="4">a) Start the EUT, then start the test equipment.
b) The test equipment (UDP setting tool interface) transmits an IO allocation setting frame (request).
c) Receiving an IO allocation setting normal response frame from the EUT, the test equipment (UDP setting tool interface) transmits an IO allocation read frame (request).
d) The tests are carried out for 3 patterns (number of control slaves: 0, 1 and 248).</td></tr>
<tr><td colspan="2">Evaluation criteria</td><td colspan="4">Confirm the followings:
a) The EUT transmits an IO allocation setting response frame, responding to the IO allocation setting request transmission from the test equipment.
b) The contents of the IO allocation setting frame (response) is as follows (Criteria are different by the EUT class).
NOTE: In case of Class 3 (flexible master function implemented) and 4: normal response (M_RLT: 0)
NOTE: In case of Class 3 (flexible master function not-implemented): normal response (M_RLT:0), not-implemented response (M_RL: 2), or no response.
* In case of normal response, the contents of data are correct.
c) The EUT transmits an IO allocation read response frame, responding to the IO allocation read request transmission from the test equipment.
d) The contents of the IO allocation read frame (response) is as follows (Criteria are different by the EUT class).
NOTE: In case of Class 3 (flexible master function implemented) and 4: normal response (M_RLT: 0)
NOTE: In case of Class 3 (flexible master function not-implemented): normal response (M_RLT: 0), not-implemented response (M_RLT: 2) or no response.
* In case of normal response, the contents of data are correct.
e) In case of Class 3 (flexible master function implemented) and 4: The EUT does not transmit any solicitation frames, if the number of control slaves in the IO allocation setting is 0.
f) In case of Class 3 (flexible master function implemented) and 4: The EUT transmits an solicitation frame, if the number of control slaves in the IO allocation setting is not 0.
g) In case of Class 3 (flexible master function not-implemented): The EUT does not transmit any solicitation frame.</td></tr>
<tr><td rowspan="7">Test necessity identified by the EUT class</td><td>Class 1</td><td colspan="4">N</td></tr>
<tr><td>Class 2</td><td colspan="4">N</td></tr>
<tr><td>Class 3</td><td colspan="4">R</td></tr>
<tr><td>Class 4</td><td colspan="4">R</td></tr>
<tr><td>Class 5</td><td colspan="4">N</td></tr>
<tr><td>Class 6</td><td colspan="4">N</td></tr>
<tr><td>Class 7</td><td colspan="4">N</td></tr>
<tr><td colspan="2" rowspan="7">Setting parameter (node)</td><td colspan="4">Pattern 1 (number of control slaves:0), Pattern 2 (number of control slaves:1)</td></tr>
<tr><td rowspan="6">EUT</td><td rowspan="6">Classes 3 and 4</td><td>Node number</td><td>1</td></tr>
<tr><td>Token watchdog time</td><td>(50)</td></tr>
<tr><td>Allowable minimum frame interval time</td><td>(10)</td></tr>
<tr><td>Area 1 data top address</td><td>256</td></tr>
<tr><td>Area 1 data size</td><td>16</td></tr>
<tr><td>Area 2 data top address</td><td>1 024</td></tr>
</table>

Table 87 – IO allocation setting, read (continued)

Setting parameter (node) (continued)	EUT (continued)	Classes 3 and 4 (continued)	Area 2 data size	64
			IO allocation setting (for Class 4)	optional
	Test equipment	Classes 3 and 4	Implementation class	3(controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
	Pattern 3 (number of control slaves:248)			
	EUT	Classes 3 and 4	Node number	249
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	248
			Area 2 data top address	4 096
			Area 2 data size	3 968
			IO allocation setting (for Class 4)	optional
	Test equipment	Classes 3 and 4	Implementation class	3 (controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
Setting parameter (test data)	Pattern 1 (number of control slaves: 0)			
	IO allocation setting	Request frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	254
			Node number of destination side (DNA)	1
			TCD	65 018 (IO allocation setting request)
			Data size	24
			Contents of data	Setting number: 0
				Number of control slaves (total): 0
				Lock ID: 0
				Lock timeout setting value: 1

Table 87 – IO allocation setting, read (continued)

Setting parameter (test data) (continued)	IO allocation setting (continued)	Request frame (continued)	Contents of data (continued)	Slave node number: 0
				Input data address: 0
				Input data size: 0
				Output data address: 0
				Output data size: 0
				Input status address: 0
				Output status address: 0
		:Response frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	1
			Node number of destination side (DNA)	254
			TCD	65 218 (IO allocation setting response)
			Type of response message (M_RLT)	Depends on EUT class. * Class 3(flexible master function implemented) and 4: 0 (normal) * Class 3 (flexible master function not-implemented): 0 (normal) or 2 (Non-implementation)
			Data size (M_RLT: 0)	8
			Contents of data (M_RLT: 0)	Result: 0(normal)
				Information: optional (no evaluation)
				Lock ID: optional (no evaluation)
	IO allocation read	Request frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	254
			Node number of destination side (DNA)	1
			TCD	65 019 (IO allocation read request)
			Data size	4
			Contents of data	Setting number: 1
		:Response frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	1
			Node number of destination side (DNA)	254
			TCD	65 219 (IO allocation read response)
			Type of response message (M_RLT)	Depends on EUT class. * Class 3 (flexible master function implemented) and 4: 0(normal) * Class 3 (flexible master function not-implemented): 0 (normal) or 2 (Non-implementation)
			Data size (M_RLT: 0)	20

Table 87 – IO allocation setting, read (continued)

Setting parameter (test data) (continued)	IO allocation read (continued)	:Response frame (continued)	Contents of data (M_RLT: 0)	Setting number: 0
				Number of control slaves: 0
				Slave node number: optional (no evaluation)
				Input data address: optional (no evaluation)
				Input data size: optional (no evaluation)
				Output data address: optional (no evaluation)
				Output data size: optional (no evaluation)
				Input status address: optional (no evaluation)
				Output status address: optional (no evaluation)
	Pattern 2 (number of control slaves: 1)			
	IO allocation setting	Request frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	254
			Node number of destination side (DNA)	1
			TCD	65 018 (IO allocation setting request)
			Data size	24
			Contents of data	Setting number: 1
				Number of control slaves (total): 1
				Lock ID: 0
				Lock timeout setting value: 2
				Slave node number: 16#800D (flexible setting mode, Node number: 13)
				Input data address: 16#0118 (area 1, address: 280)
				Input data size: 4
				Output data address: 16#010C (area 1, address: 268)
				Output data size: 4
				Input status address: 16#8460 (area 2, address: 1 120)
				Output status address: 16#8430 (area 2, address: 1 072)
		:Response frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	1
			Node number of destination side (DNA)	254

Table 87 – IO allocation setting, read (continued)

Setting parameter (test data) (continued)	IO allocation setting (continued)	:Response frame (continued)	TCD	65 218 (IO allocation setting response)
			Type of response message (M_RLT)	Depends on EUT class. •Class 3 (flexible master function implemented) and 4: 0 (normal) •Class 3(flexible master function not-implemented): 0 (normal) or 2 (Non-implementation)
			Data size (M_RLT: 0)	8
			Contents of data (M_RLT: 0)	Result: 0 (normal)
				Information: optional (no evaluation)
				Lock ID: not 0
	IO allocation read	Request frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	254
			Node number of destination side (DNA)	1
			TCD	65 019 (IO allocation read request)
			Data size	4
			Contents of data	Setting number: 1
		:Response frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	1
			Node number of destination side (DNA)	254
			TCD	65 219 (IO allocation read response)
			Type of response message (M_RLT)	Depends on EUT class. * Class 3 (flexible master function implemented) and 4: 0 (normal) * Class 3 (flexible master function not-implemented): 0 (normal) or 2 (Non-implementation)
			Data size (M_RLT: 0)	20

Table 87 – IO allocation setting, read (continued)

Setting parameter (test data) (continued)	IO allocation read (continued)	:Response frame (continued)	Contents of data (M_RLT: 0)	Setting number: 1
				Number of control slaves: 1
				Slave node number: 16#800D (flexible setting mode, Node number: 12)
				Input data address: 16#0118 (area 1, address: 280)
				Input data size: 4
				Output data address: 16#010C (area 1, address: 268)
				Output data size: 4
				Input status address: 16#8460 (area 2, address: 1 120)
				Output status address: 16#8430 (area 2, address: 1 072)
	Solicitation frame		Node address of source side (SNA)	1
			TCD	65 017 (solicitation frame)
			Data size	16
			Contents of data	Slave node number: 16#800D (flexible setting mode, Node number: 12)
				Input data address: 16#0118 (area 1, address: 280)
				Input data size: 4
				Output data address: 16#010C (area 1, address: 268)
				Output data size: 4
				Input status address: 16#8460 (area 2, address: 1 120)
				Output status address: 16#8430 (area 2, address: 1 072)
				Lock ID: 1
	Pattern 3(number of control slaves: 248)			
	IO allocation setting (*N*:0 to 247)	Request frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	254
			Node number of destination side (DNA)	249
			TCD	65 018 (IO allocation setting request)
			Data size	24

Table 87 – IO allocation setting, read (continued)

Setting parameter (test data) (continued)	IO allocation setting (*N*:0 to 247) (continued)	Request frame (continued)	Contents of data	Setting number: *N* + 1
				Number of control slaves(total): 248
				Lock ID: Depends on setting number. * 1: 0 * 2 to 248: the response Lock ID of setting number 1
				Lock timeout setting value: 496
				Slave node number: 16#8001 + *N* (flexible setting mode, Node number: 1 + *N*)
				Input data address: 16#0000 + *N* (area 1, address: *N*)
				Input data size: 1
				Output data address: 16#0100 + *N* (area 1, address: 256 + *N*)
				Output data size: 1
				Input status address: 16#8000 + (16 x *N*) (area 2, address: 16 x *N*)
				Output status address: 16#9000 + (16 x *N*) (area 2, address: 4 096 + (16 x *N*))
		:Response frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	249
			Node number of destination side (DNA)	254
			TCD	65 218(IO allocation setting response)
			Type of response message (M_RLT)	Depends on EUT class. * Class 3 (flexible master function implemented) and 4: 0(normal) * Class 3 (flexible master function not-implemented): 0 (normal) or 2 (Non-implementation)
			Data size (M_RLT: 0)	8
			Contents of data (M_RLT: 0)	Result: * *N:*0 to 246: 1 (continue) * *N:* 247: 0 (normal)
				Information: optional (no evaluation)
				Lock ID: Any value except zero that is the same at all *N*: 0 through 247

Table 87 – IO allocation setting, read (continued)

Setting parameter (test data) (continued)	IO allocation read (*N*:0 to 247)	Request frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	254
			Node number of destination side (DNA)	249
			TCD	65 019 (IO allocation read request)
			Data size	4
			Contents of data	Setting number: *N* + 1
		Response frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	1
			Node number of destination side (DNA)	254
			TCD	65 219 (IO allocation read response)
			Type of response message (M_RLT)	Depends on EUT class. * Class 3 (flexible master function implemented) and 4: 0 (normal) * Class 3 (flexible master function not-implemented): 0 (normal) or 2 (Non-implementation)
			Data size (M_RLT: 0)	20
			Contents of data (M_RLT: 0)	Setting number: *N* + 1
				Number of control slaves: 248
				Slave node number: 16#8001 + *N* (flexible setting mode, Node number: 1 + *N*)
				Input data address: 16#0000 + *N* (area 1, address: *N*)
				Input data size: 1
				Output data address: 16#0100 + *N* (area 1, address: 256 + *N*)
				Output data size: 1
				Input status address: 16#8000 + (16 x *N*) (area 2, address: 16 x *N*)
				Output status address: 16#9000 + (16 x *N*) (area 2, address: 4 096 + (16 x *N*))

Table 87 – IO allocation setting, read (continued)

Setting parameter (test data) (continued)	Solicitation frame (divided by four)	First frame of the division	Node address of source side (SNA)	249
			TCD	65 017 (solicitation frame)
			Data size	1 024
			Contents of data (64 nodes) (*N*: 0 to 63)	Slave node number: 16#8001 + *N* (flexible setting mode, Node number: 1 + *N*)
				Input data address: 16#0000 + *N* (area 1, address: *N*)
				Input data size: 1
				Output data address: 16#0100 + *N* (area 1, address: 256 + *N*)
				Output data size: 1
				Input status address: 16#8000 + (16 x *N*) (area 2, address: 16 x *N*)
				Output status address: 16#9000 + (16 x *N*) (area 2, address: 4 096 + (16 x *N*))
				Lock ID: 249
		Second frame of the division	Node address of source side (SNA)	249
			TCD	65 017 (solicitation frame)
			Data size	1 024
			Contents of data (64 nodes) (*N*: 0 to 63)	Slave node number: 16#8041 + *N* (flexible setting mode, Node number: 65 + *N*)
				Input data address: 16#0040 + *N* (area 1, address: 64 + *N*)
				Input data size: 1
				Output data address: 16#0140 + *N* (area 1, address: 320 + *N*)
				Output data size: 1
				Input status address: 16#8400 + (16 x *N*) (area 2, address: 1 024 + (16 x *N*))
				Output status address: 16#9400 + (16 x *N*) (area 2, address: 5 120 + (16 x *N*))
				Lock ID: 249

Table 87 – IO allocation setting, read (continued)

Setting parameter (test data) (continued)	Solicitation frame (divided by four) (continued)	Third frame of the division	Node address of source side (SNA)	249
			TCD	65 017 (solicitation frame)
			Data size	1 024
			Contents of data (64 nodes) (*N*:0 to 63)	Slave node number: 16#8081 + *N* (flexible setting mode, Node number: 129 + *N*)
				Input data address: 16#0080 + *N* (area 1, address: 128 + *N*)
				Input data size: 1
				Output data address: 16#0180 + *N* (area 1, address: 384 + *N*)
				Output data size: 1
				Input status address: 16#8800 + (16 x *N*) (area 2, address: 2 048 + (16 x *N*))
				Output status address: 16#9800 + (16 x *N*) (area 2, address: 6 144 + (16 x *N*))
				Lock ID:249
		Fourth frame of the division	Node address of source side (SNA)	249
			TCD	65 017 (solicitation frame)
			Data size	896
			Contents of data (56 nodes) (*N*:0 to 55)	Slave node number: 16#80C1 + *N* (flexible setting mode, Node number: 193 + *N*)
				Input data address: 16#00C0 + *N* (area 1, address: 192 + *N*)
				Input data size: 1
				Output data address: 16#01C0 + *N* (area 1, address: 448 + *N*)
				Output data size: 1
				Input status address: 16#8C00 + (16 x *N*) (area 2, address: 3 072 + (16 x *N*))
				Output status address: 16#9C00 + (16 x *N*) (area 2, address: 7 168 + (16 x *N*))
				Lock ID:249
	Response time limit (from request frame transmission to response frame reception)		1 s	

Table 88 – Token retention time measurement start/end

Test number		V3-007
Major test group		General purpose command server function
Test group		Operation test of single setting tool (UDP)
Test objects		Token retention time measurement start/end
Test procedure		a) Start the EUT, then start the test equipment. Then start the dummy node. b) The test equipment (UDP setting tool interface) transmits a token retention time measurement start frame (request). c) The test equipment disengages from the network. (Stop transmitting the token frame.) d) The test equipment rejoins the network. e) The test equipment (UDP setting tool interface) transmits a token retention time measurement end frame (request), 60 seconds later than a token retention time measurement start frame (normal response) reception from the EUT. f) The test equipment transmits a log data read message (request).
Evaluation criteria		Confirm the followings: a) The EUT transmits a token retention time measurement start response frame, to the token retention time measurement start request transmission from the test equipment. b) The token retention time measurement start response frame is a normal response (M_RLT: 0). c) The EUT transmits a token retention time measurement end response frame, to the token retention time measurement end request transmission from the test equipment. d) The token retention time measurement end frame (response) is a normal response (M_RLT: 0), and contents of data are as follows. * The number of tokens during measuring the token retention time is not 0. e) The EUT transmits a log data read response message, to the log data read request transmission from the test equipment. f) The log data read frame (response) is a normal response (M_RLT: 0), and contents of data are as follows. * The measuring time for token retention time * The number of tokens during measuring the token retention time is not 0.
Test necessity identified by the EUT class	Class 1	N
	Class 2	N
	Class 3	R
	Class 4	O (in case the command server load measure function is implemented)
	Class 5	O (in case the command server load measure function is implemented)
	Class 6	O (in case the command server load measure function is implemented)
	Class 7	O (in case the command server load measure function is implemented)

Table 88 – Token retention time measurement start/end (continued)

Setting parameter (node)	EUT (By class, parameters are different)	Classes 3 and 4	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	0
			Area 2 data size	16
			IO allocation setting (for Class 4)	optional
		Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1 024
			Area 2 data size	1 024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input slave points in the EUT.
			Area 2 data top address	0
			Area 2 data size	To be calculated from the number of input slave points and output slave points in the EUT.
	Test equipment (By class of EUT, parameters are different)	Classes 3, 4 and 5	Implementation class	3(controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (flexible master)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10

Table 88 – Token retention time measurement start/end (continued)

Setting parameter (node) (continued)	Test equipment (By class of EUT, parameters are different) (continued)	Class 6 (continued)	Area 1 data top address	Depends on the number of output slave points in the EUT. * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output slave points in the EUT.
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number: 16#8001 (flexible setting mode, Node number: 1)
				Input data address: 16#0000 (area 1, address: 0)
				Input data size: To be calculated from the number of input slave points in the EUT.
				Output data address: Depends on the number of output slave points in the EUT. * 0 point: 16#0000 (area 1, address: 0) * 1 point or more: 16#0100 (area 1, address: 256)
				Output data size: To be calculated from the number of output slave points in the EUT.
				Input status address: 16#8000 (area 2, address: 0)
				Output status address: 16#8400 (area 2, address: 1 024)
		Class 7	Implementation class	3 (controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64
	Dummy node		Implementation class	3 (controller)
			Node number	2
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	0
			Area 1 data size	0

Table 88 – Token retention time measurement start/end (continued)

Setting parameter (node) (continued)	Dummy node		Area 2 data top address	0
			Area 2 data size	0
Setting parameter (test data)	Token retention time measurement start	Request frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	254
			Node number of destination side (DNA)	Depends on EUT class. * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 020 (token retention time measurement start request)
			Data size	0
			Contents of data	NA
		:Response frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	Depends on EUT class. * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node number of destination side (DNA)	254
			TCD	65 220 (token retention time measurement start response)
			Type of response message (M_RLT)	0 (normal)
			Data size (M_RLT: 0)	0
			Contents of data	NA
	Token retention time measurement end	Request frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	254
			Node number of destination side (DNA)	Depends on EUT class. * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 021 (token retention time measurement end request)
			Data size	0
			Contents of data	NA
		:Response frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	Depends on EUT class. * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node number of destination side (DNA)	254
			TCD	65 221 (token retention time measurement end response)
			Type of response message(M_RLT)	0 (normal)
			Data size (M_RLT: 0)	76
			Contents of data (M_RLT: 0)	Number of tokens during measuring the token retention time: not 0

Table 88 – Token retention time measurement start/end (continued)

Setting parameter (test data) (continued)	Log data read	Request message	Interface	FL-net message
			Node address of source side (SNA)	254
			Node number of destination side (DNA)	Depends on EUT class. * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 013 (log data read request)
			Data size	0
			Contents of data	NA
		Response message	Interface	FL-net message
			Node address of source side (SNA)	Depends on EUT class. * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node number of destination side (DNA)	254
			TCD	65 213 (log data read response)
			Type of response message(M_RLT)	0 (normal)
			Data size	512
			Contents of data	Measuring time for token retention time: (equal to token retention time measurement end response)
				Number of tokens during measuring the token retention time: not 0
	Response time limit (from request frame transmission to response frame reception)		1 s	

Table 89 – General purpose communication data sender log measurement start/end

Test number		V3-008
Major test group		General purpose command server function
Test group		Operation test of single setting tool (UDP)
Test objects		General purpose communication data sender log measurement start/end
Test procedure		a) Start the EUT, then start the test equipment. b) The test equipment transmits general purpose communication data. c) The test equipment (UDP setting tool interface) transmits a general purpose communication data sender log measurement start frame (request). d) The test equipment transmits general purpose communication data (patterns 1 to 11). e) The test equipment (UDP setting tool interface) transmits a token retention time measurement end frame (request), 60 seconds later than a general purpose communication data sender log measurement start normal response frame reception from the EUT. f) The test equipment transmits a log data read message (request).
Evaluation criteria		Confirm the followings: a) The EUT transmits a general purpose communication data sender log measurement start frame (response), to the general purpose communication data sender log measurement start request transmission from the test equipment. b) The general purpose communication data sender log measurement start frame (response) is a normal response (M_RLT: 0). c) The EUT transmits a general purpose communication data sender log measurement end frame (response), to the general purpose communication data sender log measurement end request transmission from the test equipment. d) The general purpose communication data sender log measurement end frame (response) is a normal response (M_RLT: 0). e) The EUT transmits a log data read message (response), to the log data read request transmission from the test equipment. f) The log data read message (response) is a normal response (M_RLT: 0), and contents of data are as follows. * The measuring time for general purpose communication data sender log * The receiving counters (IP1 to IP10) are equal to the general purpose communication data sender log measurement stop response.
Test necessity identified by the EUT class	Class 1	N
	Class 2	N
	Class 3	R
	Class 4	O (in case the command server load measure function is implemented)
	Class 5	O (in case the command server load measure function is implemented)
	Class 6	O (in case the command server load measure function is implemented)
	Class 7	O (in case the command server load measure function is implemented)

Table 89 – General purpose communication data sender log measurement start/end (continued)

Setting parameter (node)	EUT (By class, parameters are different)	Classes 3 and 4	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	0
			Area 2 data size	16
			IO allocation setting (for Class 4)	optional
		Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1 024
			Area 2 data size	1 024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input slave points in the EUT.
			Area 2 data top address	0
			Area 2 data size	To be calculated from the number of input slave points and output slave points in the EUT.
	Test equipment (By class of EUT, parameters are different)	Classes 3, 4 and 5	Implementation class	3 (controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64

Table 89 – General purpose communication data sender log measurement start/end (continued)

Setting parameter (node) (continued)	Test equipment (By class of EUT, parameters are different) (continued)	Class 6	Implementation class	4 (flexible master)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	Depends on the number of output slave points in the EUT. * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output slave points in the EUT.
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number: 16#8001 (flexible setting mode, Node number: 1)
				Input data address: 16#0000 (area 1, address: 0)
				Input data size: To be calculated from the number of input slave points in the EUT.
				Output data address: Depends on the number of output slave points in the EUT. * 0 point: 16#0000 (area 1, address: 0) * 1 point or more: 16#0100 (area 1, address: 256)
				Output data size: To be calculated from the number of output slave points in the EUT.
				Input status address: 16#8000 (area 2, address: 0)
				Output status address: 16#8400 (area 2, address: 1 024)
		Class 7	Implementation class	3 (controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64

Table 89 – General purpose communication data sender log measurement start/end (continued)

Setting parameter (test data)	General purpose communication data sender log measurement start	Request frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	254
			Node number of destination side (DNA)	Depends on EUT class. * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 022 (general purpose communication data sender log measurement start request)
			Data size	0
			Contents of data	NA
		:Response frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	Depends on EUT class. * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node number of destination side (DNA)	254
			TCD	65 222 (general purpose communication data sender log measurement start response)
			Type of response message (M_RLT)	0 (normal)
			Data size (M_RLT: 0)	0
			Contents of data	NA
	General purpose communication data	Pattern *N* (*N*:1 to 6)	Interface	TCP
			Source IP address	192.168.250.(248 + *N*)
			Destination IP address	Depends on EUT class. * Classes 3, 4, 6 and 7: 192.168.250.1 * Class 5: 192.168.250.100
			Source port number	54 998 + *N*
			Destination port number	54 998 + *N*
			Data	optional
			Number of transmissions	*N* times
		Pattern 7	Interface	UDP
			Source IP address	1.2.3.4
			Destination IP address	1.2.3.255
			Source port number	10 000
			Destination port number	10 001
			Data	optional
			Number of transmissions	10 times
		Pattern 8	Interface	UDP
			Source IP address	192.168.0.254
			Destination IP address	192.168.0.255
			Source port number	55 001

Table 89 – General purpose communication data sender log measurement start/end (continued)

Setting parameter (test data) (continued)	General purpose communication data (continued)	Pattern 8 (continued)	Destination port number	55 000
			Data	optional
			Number of transmissions	9 times
		Pattern 9	Interface	UDP
			Source IP address	192.168.250.125
			Destination IP address	192.168.250.255
			Source port number	55 002
			Destination port number	55 001
			Data	optional
			Number of transmissions	8 times
		Pattern 10	Interface	UDP
			Source IP address	123.45.6.78
			Destination IP address	123.45.6.255
			Source port number	55 000
			Destination port number	55 003
			Data	optional
			Number of transmissions	7 times
		Pattern 11	Interface	TCP
			Source IP address	192.168.250.200
			Destination IP address	Depends on EUT class. * Classes 3, 4, 6 and 7: 192.168.250.1 * Class 5: 192.168.250.100
			Source port number	55 003
			Destination port number	55 000
			Data	optional
			Number of transmissions	6 times
	General purpose communication data sender log measurement stop	Request frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	254
			Node number of destination side (DNA)	Depends on EUT class. * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 023 (general purpose communication data sender log measurement stop request)
			Data size	0
			Contents of data	NA
		:Response frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	Depends on EUT class. * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node number of destination side (DNA)	254
			TCD	65 223 (general purpose communication data sender log measurement stop response)

Table 89 – General purpose communication data sender log measurement start/end (continued)

Setting parameter (test data) (continued)	General purpose communication data sender log measurement stop (continued)	:Response frame (continued)	Type of response message (M_RLT)	0(normal)
			Data size (M_RLT: 0)	84
			Contents of data (M_RLT: 0)	Optional(no evaluation)
	Log data read	Request message	Interface	FL-net message
			Node address of source side (SNA)	254
			Node number of destination side (DNA)	Depends on EUT class. * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 013 (log data read request)
			Data size	0
			Contents of data	NA
		Response message	Interface	FL-net message
			Node address of source side (SNA)	Depends on EUT class. * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node number of destination side (DNA)	254
			TCD	65 213 (log data read response)
			Type of response message(M_RLT)	0 (normal)
			Data size	512
			Contents of data	Measuring time for general purpose communication data sender log: (equal to general purpose communication data sender log measurement stop response)
				IP1: (equal to general purpose communication data sender log measurement stop response)
				IP1 receiving counter: (equal to general purpose communication data sender log measurement stop response)
				IP2: (equal to general purpose communication data sender log measurement stop response)
				IP2 receiving counter: (equal to general purpose communication data sender log measurement stop response)
				IP3: (equal to general purpose communication data sender log measurement stop response)
				IP3 receiving counter: (equal to general purpose communication data sender log measurement stop response)
				IP4: (equal to general purpose communication data sender log measurement stop response)

Table 89 – General purpose communication data sender log measurement start/end (continued)

Setting parameter (test data) (continued)	Log data read (continued)	Response message (continued)	Contents of data (continued)	IP4 receiving counter: (equal to general purpose communication data sender log measurement stop response)
				IP5: (equal to general purpose communication data sender log measurement stop response)
				IP5 receiving counter: (equal to general purpose communication data sender log measurement stop response)
				IP6: (equal to general purpose communication data sender log measurement stop response)
				IP6 receiving counter: (equal to general purpose communication data sender log measurement stop response)
				IP7: (equal to general purpose communication data sender log measurement stop response)
				IP7 receiving counter: (equal to general purpose communication data sender log measurement stop response)
				IP8: (equal to general purpose communication data sender log measurement stop response)
				IP8 receiving counter: (equal to general purpose communication data sender log measurement stop response)
				IP9: (equal to general purpose communication data sender log measurement stop response)
				IP9 receiving counter: (equal to general purpose communication data sender log measurement stop response)
				IP10: (equal to general purpose communication data sender log measurement stop response)
				IP10 receiving counter: (equal to general purpose communication data sender log measurement stop response)
	Response time limit (from request frame transmission to response frame reception)		1 s	

Table 90 – Configuration parameter setting, self node setting information parameter read

Test number	V3-009
Major test group	General purpose command server function
Test group	Operation test of single setting tool (UDP)
Test objects	Configuration parameter setting, self node setting information parameter read
Test procedure	a) Start the EUT, then start the test equipment. b) The test equipment (UDP setting tool interface) transmits a configuration parameter setting frame (request). c) After the configuration parameter setting normal response frame reception from the EUT, the test equipment (UDP setting tool interface) transmits a self node setting information parameter read frame (request).

Table 90 – Configuration parameter setting, self node setting information parameter read (continued)

<table>
<tr><td colspan="2">Evaluation criteria</td><td colspan="5">Confirm the followings:
a) The EUT transmits a configuration parameter setting frame (response), to the configuration parameter setting request transmission from the test equipment.
b) The contents of the configuration parameter setting frame (response) are as follows (Criteria are different by the EUT class).
* In case of Classes 3, 4 and 6: normal response (M_RLT: 0)
* In case of Classes 5 and 7: normal response (M_RLT:0), not-implemented response (M_RLT: 2), or no response.
NOTE: In case of normal response, the contents of data equal to the request data.
c) The EUT transmits a self node setting information parameter read frame (response), to the self node setting information parameter read request transmission from the test equipment.
d) The contents of the self node setting information parameter read frame (response) are as follows (Criteria are different by the EUT class).
* In case of Classes 3, 4,and 6: normal response (M_RLT: 0)
* In case of Classes 5 and 7: normal response (M_RLT:0), not-implemented response (M_RLT: 2), or no response.
NOTE: In case of normal response, the contents of data equal to the configuration parameter setting request data.</td></tr>
<tr><td rowspan="7">Test necessity identified by the EUT class</td><td>Class 1</td><td colspan="5">N</td></tr>
<tr><td>Class 2</td><td colspan="5">N</td></tr>
<tr><td>Class 3</td><td colspan="5">R</td></tr>
<tr><td>Class 4</td><td colspan="5">R</td></tr>
<tr><td>Class 5</td><td colspan="5">R</td></tr>
<tr><td>Class 6</td><td colspan="5">R</td></tr>
<tr><td>Class 7</td><td colspan="5">R</td></tr>
<tr><td colspan="2" rowspan="17">Setting parameter (node)</td><td rowspan="17">EUT (By class, parameters are different)</td><td rowspan="9">Classes 3 and 4</td><td>Node number</td><td>1</td></tr>
<tr><td>Token watchdog time</td><td>(50)</td></tr>
<tr><td>Allowable minimum frame interval time</td><td>(10)</td></tr>
<tr><td>Area 1 data top address</td><td>0</td></tr>
<tr><td>Area 1 data size</td><td>4</td></tr>
<tr><td>Area 2 data top address</td><td>0</td></tr>
<tr><td>Area 2 data size</td><td>16</td></tr>
<tr><td>IO allocation setting (for Class 4)</td><td>optional</td></tr>
<tr><td rowspan="7">Class 5</td><td>Node number</td><td>100</td></tr>
<tr><td>Token watchdog time</td><td>(100)</td></tr>
<tr><td>Allowable minimum frame interval time</td><td>(10)</td></tr>
<tr><td>Area 1 data top address</td><td>256</td></tr>
<tr><td>Area 1 data size</td><td>256</td></tr>
<tr><td>Area 2 data top address</td><td>1 024</td></tr>
<tr><td>Area 2 data size</td><td>1 024</td></tr>
<tr><td rowspan="2">Classes 6 and 7</td><td>Node number</td><td>1</td></tr>
<tr><td>Token watchdog time</td><td>(50)</td></tr>
</table>

Table 90 – Configuration parameter setting, self node setting information parameter read (continued)

Setting parameter (node) (continued)	EUT (By class, parameters are different) (continued)	Classes 6 and 7 (continued)	Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input slave points in the EUT.
			Area 2 data top address	0
			Area 2 data size	To be calculated from the number of input slave points and output slave points in the EUT.
	Test equipment (By class of EUT, parameters are different)	Classes 3, 4 and 5	Implementation class	3 (controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (flexible master)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	Depends on the number of output slave points in the EUT. * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output slave points in the EUT.
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number: 16#8001 (flexible setting mode, Node number: 1)
				Input data address: 16#0000 (area 1, address: 0)
				Input data size: To be calculated from the number of input slave points in the EUT.
				Output data address: Depends on the number of output slave points in the EUT. * 0 point: 16#0000 (area 1, address: 0) * 1 point or more: 16#0100 (area 1, address: 256)
				Output data size: To be calculated from the number of output slave points in the EUT.

Table 90 – Configuration parameter setting, self node setting information parameter read (continued)

Setting parameter (node) (continued)	Test equipment (By class of EUT, parameters are different) (continued)	Class 6 (continued)	IO allocation setting (slave setting) (continued)	Input status address: 16#8000 (area 2, address: 0)
				Output status address: 16#8400 (area 2, address: 1 024)
		Class 7	Implementation class	3 (controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64
Setting parameter (test data)	Configuration parameter setting	Request frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	254
			Node number of destination side (DNA)	Depends on EUT class. * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 024 (configuration parameter setting request)
			Data size	28
			Contents of data	Update flag: Depends on EUT class. * Classes 3 and 4: 16#000F * Classes 5, 6 and 7: 16#000E
				Node name: “RenewNode1”
				Common memory Area 1 data top address: 256
				Common memory Area 1 data size: 128
				Common memory Area 2 data top address: 4 096
				Common memory Area 2 data size: 1 024
				Token watchdog time: 200
				Allowable minimum frame interval time: 15
		:Response frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	Depends on EUT class. * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node number of destination side (DNA)	254
			TCD	65 224 (configuration parameter setting response)

Table 90 – Configuration parameter setting, self node setting information parameter read (continued)

Setting parameter (test data) (continued)	Configuration parameter setting (continued)	Response frame (continued)	Type of response message (M_RLT)	Depends on EUT class * Classes 3, 4 and 6: 0(normal) * Classes 5 and 7: 0 (normal) or 2 (Non-implementation)
			Data size (M_RLT: 0)	24
			Contents of data (M_RLT: 0)	Node name: “RenewNode1”
				Common memory Area 1 data top address: Depends on EUT class. * Classes 3, 4 and 5: 256 * Classes 6, and7: 0
				Common memory Area 1 data size: Depends on EUT class. * Classes 3 and 4: 128 * Class 5: 256 * Classes 6 and7: To be calculated from the number of input slave points in the EUT.
				Common memory Area 2 data top address: Depends on EUT class. * Classes 3 and 4: 4 096 * Class 5: 1 024 * Classes 6,and 7: 0
				Common memory Area 2 data size: Depends on EUT class. * Classes 3,and 4: 1 024 * Class 5: 1 024 * Classes 6 and 7: To be calculated from the number of input slave points and output slave points in the EUT.
				Token watchdog time: 200
				Allowable minimum frame interval time: 15
	Self node setting information parameter read	Request frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	254
			Node number of destination side (DNA)	Depends on EUT class. * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 027 (self node setting information parameter read request)
			Data size	0
			Contents of data	NA
		Response frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	Depends on EUT class. * Classes 3, 4, 6 and 7: 1 * Class 5: 100

Table 90 – Configuration parameter setting, self node setting information parameter read (continued)

Setting parameter (test data) (continued)	Self node setting information parameter read (continued)	Response frame (continued)	Node number of destination side (DNA)	254
			TCD	65 227 (self node setting information parameter read response)
			Type of response message (M_RLT)	Depends on EUT class. * Classes 3, 4 and 6: 0 (normal) * Classes 5 and 7: 0 (normal) or 2 (Non-implementation)
			Data size (M_RLT: 0)	24
			Contents of data (M_RLT: 0)	Common memory Area 1 data top address: Depends on EUT class. * Classes 3, 4 and 5: 256 * Classes 6,and 7: 0
				Common memory Area 1 data size: Depends on EUT class. * Classes 3,and 4: 128 * Class 5: 256 * Classes 6 and 7: To be calculated from the number of input slave points in the EUT.
				Common memory Area 2 data top address: Depends on EUT class. * Class 3 and 4: 4 096 * Class 5: 1 024 * Classes 6,and 7: 0
				Common memory Area 2 data size: Depends on EUT class. * Classes 3 and 4: 1 024 * Class 5: 1 024 * Classes 6 and 7: To be calculated from the number of input slave points and output slave points in the EUT.
				Token watchdog time: 200
				Allowable minimum frame interval time: 15
				Node name: “RenewNode1”
	Response time limit (from request frame transmission to response frame reception)		1 s	

Table 91 – Participating node management information parameter read

Test number		V3-010			
Major test group		General purpose command server function			
Test group		Operation test of single setting tool (UDP)			
Test objects		Participating node management information parameter read			
Test procedure		a) Start the EUT, then start the test equipment. b) The test equipment (UDP setting tool interface) transmits a participating node management information parameter read frame (request, node number: EUT). c) The test equipment (UDP setting tool interface) transmits a participating node management information parameter read frame (request, node number: test equipment).			
Evaluation criteria		Confirm the followings: a) The EUT transmits a response frame, to both of the request frames. b) The two response frames are normal response (M_RLT: 0), and the contents of data are correct.			
Test necessity identified by the EUT class	Class 1	N			
	Class 2	N			
	Class 3	R			
	Class 4	R			
	Class 5	R			
	Class 6	N			
	Class 7	N			
Setting parameter (node)		EUT	Classes 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	16
				IO allocation setting (for Class 4)	optional
			Class 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1 024
				Area 2 data size	1 024

Table 91 – Participating node management information parameter read (continued)

Setting parameter (node) (continued)	Test equipment	Classes 3, 4 and 5	Implementation class	3 (controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
Setting parameter (test data)	Participating node management information parameter read (Node number: EUT)	Request frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	254
			Node number of destination side (DNA)	Depends on EUT class. * Classes 3 and 4: 1 * Class 5: 100
			TCD	65 025 (participating node management information parameter read request)
			Data size	4
			Contents of data	Node number: Depends on EUT class. * Classes 3 and 4: 1 * Class 5: 100
		:Response frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	Depends on EUT class. * Classes 3 and 4: 1 * Class 5: 100
			Node number of destination side (DNA)	254
			TCD	65 225 (participating node management information parameter read response)
			Type of response message (M_RLT)	0 (normal)
			Data size (M_RLT: 0)	20
			Contents of data (M_RLT: 0)	Node number: Depends on EUT class. * Classes 3 and 4: 1 * Class 5: 100
				Common Area 1 data top address: Depends on EUT class. * Classes 3 and 4: 0 * Class 5: 256

Table 91 – Participating node management information parameter read (continued)

Setting parameter (test data) (continued)	Participating node management information parameter read (Node number:EUT) (continued)	Response frame (continued)	Contents of data (M_RLT: 0) (continued)	Common Area 1 data size: Depends on EUT class. * Classes 3 and 4: 4 * Class 5: 256
				Common Area 2 data top address: Depends on EUT class. * Classes 3 and 4: 0 * Class 5: 1 024
				Common Area 2 data size: Depends on EUT class. * Classes 3 and 4: 16 * Class 5: 1 024
				Allowable refresh cycle time: (no evaluation)
				Token watchdog time: (no evaluation)
				Allowable minimum frame interval time: (no evaluation)
				FA link status: (no evaluation)
	Participating node management information parameter read (Node number: test equipment)	Request frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	254
			Node number of destination side (DNA)	Depends on EUT class. * Classes 3 and 4: 1 * Class 5: 100
			TCD	65 025 (participating node management information parameter read request)
			Data size	4
			Contents of data	254
		:Response frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	Depends on EUT class. * Classes 3 and 4: 1 * Class 5: 100
			Node number of destination side (DNA)	254
			TCD	65 225 (participating node management information parameter read response)
			Type of response message (M_RLT)	0 (normal)
			Data size (M_RLT: 0)	20

Table 91 – Participating node management information parameter read (continued)

Setting parameter (test data) (continued)	Participating node management information parameter read (Node number: test equipment) (continued)	:Response frame (continued)	Contents of data (M_RLT: 0)	Node number: 254
				Common Area 1 data top address: 4
				Common Area 1 data size: 4
				Common Area 2 data top address: 64
				Common Area 2 data size: 64
				Allowable refresh cycle time: (no evaluation)
				Token watchdog time: 50
				Allowable minimum frame interval time: 10
				FA link status: (no evaluation)
	Response time limit (from request frame transmission to response frame reception)		1 s	

Table 92 – Self node management information parameter read

Test number	V3-011
Major test group	General purpose command server function
Test group	Operation test of single setting tool (UDP)
Test objects	Self node management information parameter read
Test procedure	a) Start the EUT, then start the test equipment. b) The test equipment (UDP setting tool interface) transmits a self node management information parameter read frame (request).
Evaluation criteria	Confirm the followings: a) The EUT transmits a response frame, to the request frame. b) The response frame is normal response (M_RLT: 0), and the contents of data are equal to the EUT setting parameter.

Table 92 – Self node management information parameter read (continued)

Test necessity identified by the EUT class	Class 1	N			
	Class 2	N			
	Class 3	R			
	Class 4	R			
	Class 5	R			
	Class 6	R			
	Class 7	R			
Setting parameter (node)		EUT (By class, parameters are different)	Classes 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	16
				Node name	“TargetNode”
				IO allocation setting (for Class 4)	optional
			Class 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1 024
				Area 2 data size	1 024
				Node name	“TargetNode”
			Classes 6 and 7	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	To be calculated from the number of input slave points in the EUT.
				Area 2 data top address	0
				Area 2 data size	To be calculated from the number of input slave points and output slave points in the EUT.
				Node name	“TargetNode”
		Test equipment (By class of EUT, parameters are different)	Classes 3, 4 and 5	Implementation class	3 (controller)
				Node number	254
				Token watchdog time	50
				Allowable minimum frame interval time	10

Table 92 – Self node management information parameter read (continued)

Setting parameter (node) (continued)	Test equipment (By class of EUT, parameters are different) (continued)	Classes 3, 4 and 5 (continued)	Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (flexible master)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	Depends on the number of output slave points in the EUT. * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output slave points in the EUT.
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number: 16#8001 (flexible setting mode, Node number: 1)
				Input data address: 16#0000 (area 1, address: 0)
				Input data size: To be calculated from the number of input slave points in the EUT.
				Output data address: Depends on the number of output slave points in the EUT. * 0 point: 16#0000 (area 1, address: 0) * 1 point or more: 16#0100 (area 1, address: 256)
				Output data size: To be calculated from the number of output slave points in the EUT.
				Input status address: 16#8000 (area 2, address: 0)
				Output status address: 16#8400 (area 2, address: 1 024)
		Class 7	Implementation class	3 (controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64

Table 92 – Self node management information parameter read (continued)

Setting parameter (test data)	Request frame	Interface	UDP setting tool interface
		Node address of source side (SNA)	254
		Node number of destination side (DNA)	Depends on EUT class. * Classes 3, 4, 6 and 7: 1 * Class 5: 100
		TCD	65 026 (self node management information parameter read request)
		Data size	0
		Contents of data	NA
	:Response frame	Interface	UDP setting tool interface
		Node address of source side (SNA)	Depends on EUT class. * Classes 3, 4, 6 and 7: 1 * Class 5: 100
		Node number of destination side (DNA)	254
		TCD	65 226 (self node management information parameter read response)
		Type of response message(M_RLT)	0 (normal)
		Data size	64
		Contents of data	Node number: Depends on EUT class. * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Common memory Area 1 data top address: Depends on EUT class. * Classes 3, 4, 6 and 7: 0 * Class 5: 256
			Common memory Area 1 data size: Depends on EUT class. * Classes 3 and 4: 4 * Class 5: 256 * Classes 6 and 7: To be calculated from the number of input slave points in the EUT.
			Common memory Area 2 data top address: Depends on EUT class. * Classes 3, 4, 6 and 7: 0 * Class 5: 1 024

Table 92 – Self node management information parameter read (continued)

Setting parameter (test data) (continued)	:Response frame (continued)	Contents of data (continued)	Common memory Area 2 data size: Depends on EUT class. * Classes 3 and 4: 16 * Class 5: 1 024 * Classes 6 and 7: To be calculated from the number of input slave points and output slave points in the EUT.
			Upper layer status: (no evaluation)
			Token watchdog time: (no evaluation)
			Allowable minimum frame interval time: (no evaluation)
			Vender code of node information: Depends on EUT specification (check by the test executor).
			Manufacturer model name: Depends on EUT specification (check by the test executor).
			Node name: “TargetNode”
			Protocol type: 128
			FA link status: (no evaluation)
			Status of the self node: (no evaluation)
			Identification of the self node class: EUT class No.
	Response time limit (from request frame transmission to response frame reception)	1 s	

Table 93 – Node reset

Test number		V3-012
Major test group		General purpose command server function
Test group		Operation test of single setting tool (UDP)
Test objects		Node reset
Test procedure		a) Start the EUT, then start the test equipment. Then start the dummy node. b) The test equipment (UDP setting tool interface) transmits a node reset frame (request).
Evaluation criteria		Confirm the followings. a) The EUT transmits a response frame, to the request frame. b) The response frame is as follows (Criteria are different by the EUT class). * In case of Classes 3 through 5: normal response (M_RLT:0), not-implemented response (M_RLT: 2), or no response. * In case of Classes 6 and 7: normal response (M_RLT: 0). c) In case of normal response, the EUT disengages from the network, then rejoins the network within 10 seconds.
Test necessity identified by the EUT class	Class 1	N
	Class 2	N
	Class 3	R
	Class 4	R
	Class 5	R
	Class 6	R
	Class 7	R

Table 93 – Node reset (continued)

Setting parameter (node)	EUT (By class, parameters are different)	Classes 3 and 4	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	0
			Area 2 data size	16
			IO allocation setting (for Class 4)	optional
		Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1 024
			Area 2 data size	1 024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input slave points in the EUT.
			Area 2 data top address	0
			Area 2 data size	To be calculated from the number of input slave points and output slave points in the EUT.
	Test equipment (By class of EUT, parameters are different)	Classes 3, 4 and 5	Implementation class	3 (controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (flexible master)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	Depends on the number of output slave points in the EUT. * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output slave points in the EUT.

Table 93 – Node reset (continued)

Setting parameter (node) (continued)	Test equipment (By class of EUT, parameters are different) (continued)	Class 6 (continued)	Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number: 16#8001 (flexible setting mode, Node number: 1)
				Input data address: 16#0000 (area 1, address: 0)
				Input data size: To be calculated from the number of input slave points in the EUT.
				Output data address: Depends on the number of output slave points in the EUT. * 0 point: 16#0000 (area 1, address: 0) * 1 point or more: 16#0100 (area 1, address: 256)
				Output data size: Depends on the number of output slave points in the EUT.
				Input status address: 16#8000 (area 2, address: 0)
				Output status address: 16#8400 (area 2, address: 1 024)
		Class 7	Implementation class	3 (controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64
	Dummy node		Implementation class	3 (controller)
			Node number	2
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0

Table 93 – Node reset (continued)

Setting parameter (test data)	Request frame	Interface	UDP setting tool interface
		Node address of source side (SNA)	254
		Node number of destination side (DNA)	Depends on EUT class. * Classes 3, 4, 6 and 7: 1 * Class 5: 100
		TCD	65 028 (node reset request)
		Data size	0
		Contents of data	NA
	:Response frame	Interface	UDP setting tool interface
		Node address of source side (SNA)	Depends on EUT class. * Classes 3, 4, 6 and 7: 1 * Class 5: 100
		Node number of destination side (DNA)	254
		TCD	65 228 (node reset response)
		Type of response message (M_RLT)	Depends on EUT class. * Class 3, 4, 5: 0 (normal) or 2 (Non-implementation) * Classes 6 and 7: 0 (normal)
		Data size (M_RLT: 0)	0
		Contents of data	NA
	Response time limit (from request frame transmission to response frame reception)	1 s	

Table 94 – Network parameter read

Test number		V3-013
Major test group		General purpose command server function
Test group		Operation test of single setting tool (UDP)
Test objects		Network parameter read
Test procedure		a) Start the EUT, then start the test equipment. b) The test equipment (UDP setting tool interface) transmits a network parameter read frame (request).
Evaluation criteria		Confirm the followings. a) The EUT transmits a response frame, to the request frame. b) The response frame is normal response (M_RLT: 0), not-implemented response (M_RLT: 2), or no response. In case of normal response, the contents of data are equal to the EUT setting parameter.
Test necessity identified by the EUT class	Class 1	N
	Class 2	N
	Class 3	R
	Class 4	R
	Class 5	R
	Class 6	R
	Class 7	R

Table 94 – Network parameter read (continued)

Setting parameter (node)	EUT (By class, parameters are different)	Classes 3 and 4	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	0
			Area 2 data size	16
			Node name	“TargetNode”
			IO allocation setting (for Class 4)	optional
		Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1 024
			Area 2 data size	1 024
			Node name	“TargetNode”
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input slave points in the EUT.
			Area 2 data top address	0
			Area 2 data size	To be calculated from the number of input slave points and output slave points in the EUT.
			Node name	“TargetNode”
	Test equipment (By class of EUT, parameters are different)	Classes 3, 4 and 5	Implementation class	3 (controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (flexible master)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10

Table 94 – Network parameter read (continued)

Setting parameter (node) (continued)	Test equipment (By class of EUT, parameters are different) (continued)	Class 6 (continued)	Area 1 data top address	Depends on the number of output slave points in the EUT. * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output slave points in the EUT.
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number: 16#8001 (flexible setting mode, Node number: 1)
				Input data address: 16#0000 (area 1, address: 0)
				Input data size: To be calculated from the number of input slave points in the EUT.
				Output data address: Depends on the number of output slave points in the EUT. * 0 point: 16#0000 (area 1, address: 0) * 1 point or more: 16#0100 (area 1, address: 256)
				Output data size: To be calculated from the number of output slave points in the EUT.
				Input status address: 16#8000 (area 2, address: 0)
				Output status address: 16#8400 (area 2, address: 1 024)
		Class 7	Implementation class	3 (controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64
Setting parameter (test data)	Request frame		Interface	UDP setting tool interface
			Node address of source side (SNA)	254
			Node number of destination side (DNA)	Depends on EUT class. * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 007 (network parameter read request)

Table 94 – Network parameter read (continued)

Setting parameter (test data) (continued)	Request frame (continued)	Data size	0
		Contents of data	NA
	:Response frame	Interface	UDP setting tool interface
		Node address of source side (SNA)	Depends on EUT class. * Classes 3, 4, 6 and 7: 1 * Class 5: 100
		Node number of destination side (DNA)	254
		TCD	65 207 (network parameter read response)
		Type of response message (M_RLT)	0 (normal) or 2 (Non-implementation)
		Data size (M_RLT: 0)	56
		Contents of data (M_RLT: 0)	Node name: “TargetNode”
			Vender code of node information: Depends on EUT specification (check by the test executor).
			Manufacturer model name of node information: Depends on EUT specification (check by the test executor).
			Area 1 data top address: Depends on EUT class. * Classes 3, 4, 6 and 7: 0 * Class 5: 256
			Area 1 data size: Depends on EUT class. * Classes 3 and 4: 4 * Class 5: 256 * Classes 6 and 7: To be calculated from the number of input slave points in the EUT.
			Area 2 data top address: Depends on EUT class. * Classes 3, 4, 6 and 7: 0 * Class 5: 1 024
			Area 2 data size: Depends on EUT class. * Classes 3 and 4: 16 * Class 5: 1 024 * Classes 6 and 7: To be calculated from the number of input slave points and output slave points in the EUT.
			Token watchdog time: (no evaluation)
			Allowable minimum frame interval time: (no evaluation)
			FA link status: (no evaluation)
			Protocol type: 128
			Upper layer status: (no evaluation)

Table 94 – Network parameter read (continued)

Setting parameter (test data) (continued)	:Response frame (continued)	Contents of data (M_RLT: 0) (continued)	Allowable refresh cycle time: (no evaluation)
			Refresh cycle measurement time (current): (no evaluation)
			Refresh cycle measurement time (maximum): (no evaluation)
			Refresh cycle measurement time (minimum): (no evaluation)
	Response time limit (from request frame transmission to response frame reception)	1 s	

Table 95 – Log data read

Test number		V3-014			
Major test group		General purpose command server function			
Test group		Operation test of single setting tool (UDP)			
Test objects		Log data read			
Test procedure		a) Start the EUT, then start the test equipment. b) The test equipment (UDP setting tool interface) transmits a log data read frame (request).			
Evaluation criteria		Confirm the followings. a) The EUT transmits a response frame, to the request frame. b) The response frame is normal response (M_RLT:0), not-implemented response (M_RLT: 2), or no response. In case of normal response, the contents of data are as follows. * The total number of transmission at the socket part is not 0. * The total number of reception at the socket part is not 0.			
Test necessity identified by the EUT class	Class 1	N			
	Class 2	N			
	Class 3	R			
	Class 4	R			
	Class 5	R			
	Class 6	R			
	Class 7	R			
Setting parameter (node)		EUT (By class, parameters are different)	Classes 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	16
				IO allocation setting (for Class 4)	optional
			Class 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(10)

Table 95 – Log data read (continued)

Setting parameter (node) (continued)	EUT (By class, parameters are different) (continued)	Class 5 (continued)	Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1 024
			Area 2 data size	1 024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input slave points in the EUT.
			Area 2 data top address	0
			Area 2 data size	To be calculated from the number of input slave points and output slave points in the EUT.
	Test equipment (By class of EUT, parameters are different)	Classes 3, 4 and 5	Implementation class	3 (controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (flexible master)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	Depends on the number of output slave points in the EUT. * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output slave points in the EUT.
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number: 16#8001 (flexible setting mode, Node number: 1)
				Input data address: 16#0000 (area 1, address: 0)
				Input data size: To be calculated from the number of input slave points in the EUT.

Table 95 – Log data read (continued)

Setting parameter (node) (continued)	Test equipment (By class of EUT, parameters are different) (continued)	Class 6 (continued)	IO allocation setting (slave setting) (continued)	Output data address: Depends on the number of output slave points in the EUT. * 0 point: 16#0000 (area 1, address: 0) * 1 point or more: 16#0100 (area 1, address: 256)
				Output data size: To be calculated from the number of output slave points in the EUT.
				Input status address: 16#8000 (area 2, address: 0)
				Output status address: 16#8400 (area 2, address: 1 024)
		Class 7	Implementation class	3 (controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64
Setting parameter (test data)	Request frame		Interface	UDP setting tool interface
			Node address of source side (SNA)	254
			Node number of destination side (DNA)	Depends on EUT class. * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 013 (log data read request)
			Data size	0
			Contents of data	NA
	:Response frame		Interface	UDP setting tool interface
			Node address of source side (SNA)	Depends on EUT class. * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node number of destination side (DNA)	254
			TCD	65 213 (log data read response)
			Type of response message(M_RLT)	0 (normal) or 2 (Non-implementation)
			Data size (M_RLT: 0)	512
			Contents of data (M_RLT: 0)	The total number of transmission at the socket part: not 0
				The total number of reception at the socket part: not 0

Table 95 – Log data read (continued)

Setting parameter (test data) (continued)	Response time limit (from request frame transmission to response frame reception)	1 s

Table 96 – Log data clear

Test number		V3-015			
Major test group		General purpose command server function			
Test group		Operation test of single setting tool (UDP)			
Test objects		Log data clear			
Test procedure		a) Start the EUT, then start the test equipment. b) The test equipment (UDP setting tool interface) transmits a log data clear frame (request). c) After the log data clear frame (normal response) reception from the EUT, the test equipment (UDP setting tool interface) transmits a log data read frame (request).			
Evaluation criteria		Confirm the followings. a) The EUT transmits a response frame, to the log data clear request transmission from the test equipment. b) The response frame is normal response (M_RLT:0), not-implemented response (M_RLT: 2), or no response. c) The EUT transmits a response frame, to the log data read request transmission from the test equipment. d) The response frame is normal response (M_RLT:0), not-implemented response (M_RLT: 2), or no response. In case of normal response, the contents of data are as follows. * The number of joining is 0.			
Test necessity identified by the EUT class	Class 1	N			
	Class 2	N			
	Class 3	R			
	Class 4	R			
	Class 5	R			
	Class 6	R			
	Class 7	R			
Setting parameter (node)		EUT (By class, parameters are different)	Classes 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	16
				IO allocation setting (for Class 4)	optional
			Class 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	256
				Area 1 data size	256

Table 96 – Log data clear (continued)

Setting parameter (node) (continued)	EUT (By class, parameters are different) (continued)	Class 5 (continued)	Area 2 data top address	1 024
			Area 2 data size	1 024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input slave points in the EUT.
			Area 2 data top address	0
			Area 2 data size	To be calculated from the number of input slave points and output slave points in the EUT.
	Test equipment (By class of EUT, parameters are different)	Classes 3 and 4, 5	Implementation class	3 (controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (flexible master)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	Depends on the number of output slave points in the EUT. * 0 point: 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output slave points in the EUT.
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number: 16#8001 (flexible setting mode, Node number: 1)
				Input data address: 16#0000 (area 1, address: 0)
				Input data size: To be calculated from the number of input slave points in the EUT.

Table 96 – Log data clear (continued)

Setting parameter (node) (continued)	Test equipment (By class of EUT, parameters are different) (continued)	Class 6 (continued)	IO allocation setting (slave setting) (continued)	Output data address: Depends on the number of output slave points in the EUT. * 0 point: 16#0000 (area 1, address: 0) * 1 point or more: 16#0100 (area 1, address: 256)
				Output data size: To be calculated from the number of output slave points in the EUT.
				Input status address: 16#8000 (area 2, address: 0)
				Output status address: 16#8400 (area 2, address: 1 024)
		Class 7	Implementation class	3 (controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64
Setting parameter (test data)	Log data clear	Request frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	254
			Node number of destination side (DNA)	Depends on EUT class. * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 014 (log data clear request)
			Data size	0
			Contents of data	NA
		Response frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	Depends on EUT class. * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node number of destination side (DNA)	254
			TCD	65 214 (log data clear response)
			Type of response message(M_RLT)	0 (normal) or 2 (Non-implementation)
			Data size (M_RLT: 0)	0
			Contents of data	NA

Table 96 – Log data clear (continued)

Setting parameter (test data) (continued)	Log data read	Request frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	254
			Node number of destination side (DNA)	Depends on EUT class. * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 013 (log data read request)
			Data size	0
			Contents of data	NA
		:Response frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	Depends on EUT class. * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node number of destination side (DNA)	254
			TCD	65 213 (log data read response)
			Type of response message(M_RLT)	0 (normal) or 2 (Non-implementation)
			Data size (M_RLT: 0)	512
			Contents of data (M_RLT: 0)	Number of joining:0
	Response time limit (from request frame transmission to response frame reception)		1 s	

Table 97 – Message echo back

Test number		V3-016
Major test group		General purpose command server function
Test group		Operation test of single setting tool (UDP)
Test objects		Message echo back
Test procedure		a) Start the EUT, then start the test equipment. b) The test equipment (UDP setting tool interface) transmits a message echo back (request) with word data whose contents are incremental (+1) numbers starting with 16#11AA.
Evaluation criteria		Confirm the followings: a) The EUT transmits a response frame, to the request frame. b) The response frame is normal response (M_RLT:0), not-implemented response (M_RLT: 2), or no response. In case of normal response, the contents of data are equal to the request data.
Test necessity identified by the EUT class	Class 1	N
	Class 2	N
	Class 3	R
	Class 4	R
	Class 5	R
	Class 6	R
	Class 7	R

Table 97 – Message echo back (continued)

Setting parameter (node)	EUT (By class, parameters are different)	Classes 3 and 4	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	0
			Area 2 data size	16
			IO allocation setting (for Class 4)	optional
		Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1 024
			Area 2 data size	1 024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input slave points in the EUT.
			Area 2 data top address	0
			Area 2 data size	To be calculated from the number of input slave points and output slave points in the EUT.
	Test equipment (By class of EUT, parameters are different)	Classes 3, 4 and 5	Implementation class	3 (controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (flexible master)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	Depends on the number of output slave points in the EUT. * 0 point: 0 * 1 point or more: 256

Table 97 – Message echo back (continued)

Setting parameter (node) (continued)	Test equipment (By class of EUT, parameters are different) (continued)	Class 6 (continued)	Area 1 data size	To be calculated from the number of output slave points in the EUT.
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number: 16#8001 (flexible setting mode, Node number: 1)
				Input data address: 16#0000 (area 1, address: 0)
				Input data size: To be calculated from the number of input slave points in the EUT.
				Output data address: Depends on the number of output slave points in the EUT. * 0 point: 16#0000 (area 1, address: 0) * 1 point or more: 16#0100 (area 1, address: 256)
				Output data size: To be calculated from the number of output slave points in the EUT.
				Input status address: 16#8000 (area 2, address: 0)
				Output status address: 16#8400 (area 2, address: 1 024)
		Class 7	Implementation class	3 (controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64
Setting parameter (test data)	Request frame		Interface	UDP setting tool interface
			Node address of source side (SNA)	254
			Node number of destination side (DNA)	Depends on EUT class. * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 015 (message echo back request)
			Data size	512
			Contents of data	Word data of incremental numbers from 16#11AA

Table 97 – Message echo back (continued)

Setting parameter (test data) (continued)	:Response frame	Interface	UDP setting tool interface
		Node address of source side (SNA)	Depends on EUT class. * Classes 3, 4, 6 and 7: 1 * Class 5: 100
		Node number of destination side (DNA)	254
		TCD	65 215 (message echo back response)
		Type of response message (M_RLT)	0 (normal) or 2 (Non-implementation)
		Data size (M_RLT:0)	512
		Contents of data (M_RLT:0)	Word data of incremental numbers from 16#11AA
	Response time limit (from request frame transmission to response frame reception)	1 s	

Table 98 – Byte block read, byte block write

Test number		V3-017
Major test group		General purpose command server function
Test group		Operation test of single setting tool (UDP)
Test object		Byte block read, byte block write
Test procedure		a) Start the EUT, and then start the test equipment. b) The test equipment (UDP setting tool interface) transmits a byte block write frame (request) with word data whose contents are incremental (+1) numbers starting with 16#11AA. c) The test equipment (UDP setting tool interface) transmits a byte block read frame (request) after receiving the byte block write frame (normal response) from the EUT.
Evaluation criteria		Confirm the followings: a) The EUT transmits a byte block write frame (response) to the byte block write request from the test equipment. b) The response frame is normal response (M_RLT: 0), not-implemented response (M_RLT: 2) or no response. c) The EUT transmits a byte block read frame (response) to the byte block read request from the test equipment. d) The response frame is normal response (M_RLT: 0), not-implemented response (M_RLT: 2) or no response, and the data received in the normal response frame is identical to the write data.
Test necessity identified by the EUT class	Class1	N
	Class2	N
	Class3	R
	Class4	R
	Class5	R
	Class6	R
	Class 7	R

Table 98 – Byte block read, byte block write (continued)

Setting parameter (node)	EUT (The parameter varies according to the EUT class)	Classes 3 and 4	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	0
			Area 2 data size	16
			IO allocation setting (class 4)	Optional
		Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1 024
			Area 2 data size	1 024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave of the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the number of input points and output points of the slave of the EUT
	Test equipment (The parameter varies according to the EUT class)	Classes 3, 4 and 5	Implementation class	3 (Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4(Flexible master)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	Depends on number of output points of the slave of the EUT * 0 point: 0 * 1 point of more: 256

Table 98 – Byte block read, byte block write (continued)

Setting parameter (continued)	Test equipment (The parameter varies according to the EUT class) (continued)	Class 6 (continued)	Area 1 data size	To be calculated from the number of output points of the slave of the EUT
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (Number of control slaves)	1
			IO allocation setting (Slave setting)	Slave node number: 16#8001 (Flexible setting mode, Node number: 1)
				Input data address: 16#0000 (Area1, Address: 0)
				Input data size: To be calculated from the number of input points of the slave of the EUT
				Output data address: Depends on number of output points of the slave of the EUT * 0 point: 16#0000 (Area1, Address: 0) * 1 point of more: 16#0100 (Area1, Address: 256)
				Output data size: To be calculated from the number of output points of the slave of the EUT
				Input status address: 16#8000 (Area2, Address: 0)
				Output status address: 16#8400 (Area2 Address: 1024)
		Class 7	Implementation class	3 (Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64
Setting parameter (Test data)	Byte block write	Request frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	Depends on the EUT class * Class3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 004 (Byte block write request)
			Data size	Same as virtual size
			Virtual address space	Depends on the EUT specification (Input on testing tool screen)

Table 98 – Byte block read, byte block write (continued)

Setting parameter (Test data) (continued)	Byte block write (continued)	Request frame (continued)	Virtual size	Depends on the EUT specification(Input on testing tool screen)
			Contents of data	Word data of incremental numbers from 16#11AA
		Response frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65 204 (Byte block write response)
			Type of response message (M_RLT)	0 (normal response) or 2 (not-implemented)
			Data size (M_RLT: 0)	0
			Virtual address space	Depends on the EUT specification(Same as virtual address of the write request)
			Virtual size	Depends on the EUT specification (Same as virtual size of the write request)
			Contents of data (In case of M_RLT = 0)	NA
	Byte block read	Request frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 003 (Byte block read request)
			Data size	0
			Virtual address space	Depends on the EUT specification (Same as virtual address of the write request)
			size of virtual address space	Depends on the EUT specification (Same as virtual size of the write request)
			Contents of data	NA
		Response frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65 203 (Byte block read response)
			Type of response message (M_RLT)	0 (normal response) or 2 (not-implemented)
			Data size (M_RLT: 0)	Depends on the EUT specification (Same as virtual size)

Table 98 – Byte block read, byte block write (continued)

Setting parameter (Test data) (continued)	Byte block read (continued)	Response frame (continued)	Virtual address	Depends on the EUT specification (Same as virtual address of read request)
			Virtual size	Depends on the EUT specification (Same as virtual size of read request)
			Contents of data (M_RLT: 0)	Word data of incremental numbers from 16#11AA
	Response watchdog time (from request frame transmission to response frame reception)		1 s	

Table 99 – Word block read, word block write

Test number		V3-018		
Major test group		General purpose command server function		
Test group		Operation test of single setting tool (UDP)		
Test object		Word block read, word block write		
Test procedure		a) Start the equipment under test (EUT), then start the test equipment b) The test equipment (UDP setting tool interface) transmits a word block write frame (request), with word data whose contents are incremental (+1) numbers starting with 16#11AA. c) The test equipment (UDP setting tool interface) transmits a word block read frame (request) after receiving a word block write frame (normal response) from the EUT.		
Evaluation criteria		Confirm the followings: a) The EUT transmits a word block write frame(response) to the word block write request from the test equipment. b) The response frame is normal response (M_RLT: 0), not-implemented response (M_RLT: 2) or no response. c) The EUT transmits a word block read frame (response) to the word block read request from the test equipment. d) The response frame is normal response (M_RLT: 0), not-implemented response (M_RLT: 2) or no response, and the data received in the normal response frame is identical to the write data.		
Test necessity identified by the EUT class	Class 1	N		
	Class 2	N		
	Class 3	R		
	Class 4	R		
	Class 5	R		
	Class 6	R		
	Class 7	R		
Setting parameter (node)		EUT (The parameter varies according to the EUT class)	Classes 3 and 4	Node number: 1 Token watchdog time: (50) Allowable minimum frame interval time: (10) Area 1 data top address: 0 Area 1 data size: 4 Area 2 data top address: 0 Area 2 data size: 16 IO allocation setting (class 4): optional

Table 99 – Word block read, word block write (continued)

Setting parameter (node) (continued)	EUT (The parameter varies according to the EUT class) (continued)	Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1 024
			Area 2 data size	1 024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave of the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the number of input points and output points of the slave of the EUT
	Test equipment (The parameter varies according to the EUT class)	Classes 3, 4 and 5	Implementation class	3 (Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	Depends on number of output points of the slave of the EUT * 0 point: 0 * 1 point of more: 256
			Area 1 data size	To be calculated from the number of output points of the slave of the EUT
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (Number of control slaves)	1
			IO allocation setting (Slave setting)	Slave node number: 16#8001 (Flexible setting mode, Node number: 1)
				Input data address: 16#0000 (Area1, Address: 0)

Table 99 – Word block read, word block write (continued)

Setting parameter (node) (continued)	Test equipment (The parameter varies according to the EUT class) (continued)	Class 6 (continued)	IO allocation setting (Slave setting) (continued)	Input data size: To be calculated from the number of input points of the slave of the EUT
				Output data address: Depends on number of output points of the slave of the EUT * 0 point: 16#0000 (Area1, Address: 0) * 1 point of more: 16#0100 (Area1, Address: 256)
				Output data size: To be calculated from the number of output points of the slave of the EUT
				Input status address: 16#8000 (Area2, Address: 0)
				Output status address: 16#8400 (Area2, Address: 1024)
		Class 7	Implementation class	3 (Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64
Setting parameter (Test data)	Word block write	Request frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 006 (Word block write request)
			Data size	Virtual size×2
			Virtual address	Depends on the EUT specification (Input on testing tool screen)
			Virtual size	Depends on the EUT specification (Input on testing tool screen)
			Contents of data	Word data of incremental numbers from 16#11AA
		Response frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65 206(Word block write response)

Table 99 – Word block read, word block write (continued)

Setting parameter (Test data) (continued)	Word block write (continued)	Response frame (continued)	Type of response message (M_RLT)	0 (normal response) or 2 (not-implemented)
			Data size (M_RLT: 0)	0
			Virtual address	Depends on the EUT specification (Same as virtual address of write request)
			Virtual size	Depends on the EUT specification (Same as virtual size of write request)
			Contents of data (In case of M_RLT = 0)	NA
	Word block read	Request frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 005 (Word block read request)
			Data size	0
			Virtual address	Depends on the EUT specification (Same as virtual address of write request)
			Virtual size	Depends on the EUT specification (Same as virtual size of write request)
			Contents of data	NA
		Response frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65 205(Word block read response)
			Type of response message (M_RLT)	0(normal response) or 2(not-implemented)
			Data size (M_RLT: 0)	Depends on the EUT specification (Virtual size×2)
			Virtual address space	Depends on the EUT specification (Same as virtual address of read request)
			Virtual size	Depends on the EUT specification (Same as virtual size of read request)
			Contents of data (M_RLT: 0)	Word data of incremental numbers from 16#11AA
	Response watchdog time (from request frame transmission to response frame reception)		1 s	

Table 100 – Network parameter write

<table>
<tr><td colspan="2">Test number</td><td colspan="4">V3-019</td></tr>
<tr><td colspan="2">Major test group</td><td colspan="4">General purpose command server function</td></tr>
<tr><td colspan="2">Test group</td><td colspan="4">Operation test of single setting tool (UDP)</td></tr>
<tr><td colspan="2">Test object</td><td colspan="4">Network parameter write</td></tr>
<tr><td colspan="2">Test procedure</td><td colspan="4">a) Start the EUT and the test equipment. Then start the dummy node.
b) The test equipment (UDP setting tool interface) transmits a network parameter write frame (request).
In case of classes 3 and 4, the EUT disengages from network then rejoin the network to change address and size.
In case of class 5, 6.and 7, the EUT only changes node name. It doesn’t disengage from network
c) In case of class5, 6.and 7, the test equipment transmits a network parameter read message (request).</td></tr>
<tr><td colspan="2">Evaluation criteria</td><td colspan="4">Confirm the followings:
a) The EUT transmits a response frame to the request frame from the test equipment.
b) The response frame is normal response (M_RLT: 0), not-implemented response (M_RLT: 2) or no response.
c) In case of normal response, the decision criteria varies according to the EUT class.
* Classes 3 and 4: The EUT rejoins the network within 10 seconds.
* Class 5, 6 and 7: The EUT transmits a response message to the network parameter read message (request) from the test equipment.
d) The decision criteria varies according to the EUT class.
* Classes 3 and 4: The participation request header contents after rejoining are identical to the contents of data (C_AD1, C_SZ1, C_AD2, C_SZ2 and node name) set in the request.
* Classes 5, 6 and 7: The Contents of data of network parameter read message (response) are identical to the contents of data (node name) set in the network parameter write frame (request).</td></tr>
<tr><td rowspan="7">Test necessity identified by the EUT class</td><td>Class 1</td><td colspan="4">N</td></tr>
<tr><td>Class 2</td><td colspan="4">N</td></tr>
<tr><td>Class 3</td><td colspan="4">R</td></tr>
<tr><td>Class 4</td><td colspan="4">R</td></tr>
<tr><td>Class 5</td><td colspan="4">R</td></tr>
<tr><td>Class 6</td><td colspan="4">O</td></tr>
<tr><td>Class 7</td><td colspan="4">R</td></tr>
<tr><td colspan="2" rowspan="9">Setting parameter (node)</td><td rowspan="9">EUT (The parameter varies according to the EUT class)</td><td rowspan="9">Classes 3 and 4</td><td>Node number</td><td>1</td></tr>
<tr><td>Token watchdog time</td><td>(50)</td></tr>
<tr><td>Allowable minimum frame interval time</td><td>(10)</td></tr>
<tr><td>Area 1 data top address</td><td>0</td></tr>
<tr><td>Area 1 data size</td><td>4</td></tr>
<tr><td>Area 2 data top address</td><td>0</td></tr>
<tr><td>Area 2 data size</td><td>16</td></tr>
<tr><td>IO allocation setting (Case of class4)</td><td>“TargetNode”</td></tr>
<tr><td>Node number</td><td>Optional</td></tr>
</table>

Table 100 – Network parameter write (continued)

Setting parameter (node) (continued)	EUT (The parameter varies according to the EUT class) (continued)	Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1 024
			Area 2 data size	1 024
			Node name	“TargetNode”
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave of the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the number of input points and output points of the slave of the EUT
			Node name	“TargetNode”
	Test equipment (The parameter varies according to the EUT class)	Classes 3, 4 and 5	Implementation class	3(Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	Depends on number of output points of the slave of the EUT * 0 point: 0 * 1 point of more: 256
			Area 1 data size	To be calculated from the number of output points of the slave of the EUT
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1

Table 100 – Network parameter write (continued)

Setting parameter (node) (continued)	Test equipment (The parameter varies according to the EUT class) (continued)	Class 6 (continued)	IO allocation setting (Slave setting)	Slave node number: 16#8001 (Flexible setting mode, Node number: 1)
				Input data address: 16#0000 (Area1, Address: 0)
				Input data size: To be calculated from the number of input points of the slave of the EUT
				Output data address: Depends on number of output points of the slave of the EUT * 0 point: 16#0000 (Area1, Address: 0) * 1 point of more: 16#0100 (Area1, Address: 256)
				Output data size: To be calculated from the number of output points of the slave of the EUT
				Input status address: 16#8000 (Area2, Address: 0)
				Output status address: 16#8400 (Area2, Address: 1024)
		Class 7	Implementation class	3 (Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64
	Dummy node		Implementation class	3 (Controller)
			Node number	2
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0

Table 100 – Network parameter write (continued)

Setting parameter (Test data)	Network parameter write	Request frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 008 (Network parameter write request)
			Data size	0
			Contents of data	Setting parameter flag: Depends on the EUT class * Class 3 and 4: 3 * Class 5, 6 and 7: 2
				Area 1 data top address: 256
				Area 1 data size: 128
				Area 2 data top address: 4 096
				Area 2 data size: 1 024
				Node name: “RenewNode1”
		Response frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65 208(Network parameter write response)
			Type of response message (M_RLT)	0 (normal response) or 2 (not-implemented)
			Data size (M_RLT: 0)	0
			Contents of data (In case of M_RLT = 0)	NA
	Response watchdog time (from request frame transmission to response frame reception)		1 s	

Table 100 – Network parameter write (continued)

Setting parameter (Test data) (continued)	Network parameter read	Request message	Interface	FL-net message
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	Depends on the EUT class * Classes 6 and 7: 1 * Class 5: 100
			TCD	65 007 (Network parameter read request)
			Data size	0
			Contents of data	NA
		Response message	Interface	FL-net message
			Node address of source side (SNA)	Depends on the EUT class * Classes 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65 207 (Network parameter read response)
			Type of response message (M_RLT)	0 (normal response)
			Data size(M_RLT: 0)	56
			Contents of data (M_RLT: 0)	Node name:“RenewNode1”
				Vender code of node information: (no evaluation)
				Manufacturer model name of node information: (no evaluation)
				Area 1 data top address: Depends on the EUT class * Class 5: 256 * Classes 6 and 7: 0
				Area 1 data size: Depends on the EUT class * Class 5: 256 * Classes 6 and 7: To be calculated from the number of input points of the slave of the EUT
				Area 2 data top address: Depends on the EUT class * Class 5: 1 024 * Classes 6, 7:0
				Area 2 data size: Depends on the EUT class * Class 5: 1 024 * Classes 6 and 7: To be calculated from the number of input points and output points of the slave of the EUT

Table 100 – Network parameter write (continued)

Setting parameter (Test data) (continued)	Network parameter read (continued)	Response message (continued)	Contents of data (M_RLT: 0) (continued)	Token watchdog time: (no evaluation)
				Allowable minimum frame interval time: (no evaluation)
				Link status: (no evaluation)
				Protocol type: 128
				Upper layer status: (no evaluation)
				Allowable refresh cycle time: (no evaluation)
				Refresh cycle measurement time (current): (no evaluation)
				Refresh cycle measurement time (maximum): (no evaluation)
				Refresh cycle measurement time (minimum): (no evaluation)

Table 101 – Profile read

Test number		V3-020		
Major test group		General purpose command server function		
Test group		Operation test of single setting tool (UDP)		
Test object		Profile read		
Test procedure		a) Start the EUT, then start the test equipment. b) The test equipment (UDP setting tool interface) transmits a profile read frame (request).		
Evaluation criteria		Confirm the followings: a) The EUT transmits a response frame to the request frame from the test equipment. b) The response frame is normal response (M_RLT:0), not-implemented response (M_RLT:2) or no response, and the contents of data in the normal response frame are identical to the setting data of the EUT.		
Test necessity identified by the EUT class	Class 1	N		
	Class 2	N		
	Class 3	R		
	Class 4	R		
	Class 5	R		
	Class 6	R		
	Class 7	R		
Setting parameter (node)		EUT (The parameter varies according to the EUT class)	Classes 3 and 4	Node number: 1
				Token watchdog time: (50)
				Allowable minimum frame interval time: (10)
				Area 1 data top address: 0
				Area 1 data size: 4
				Area 2 data top address: 0
				Area 2 data size: 16
				IO allocation setting (Case of class4): Optional
			Class 5	Node number: 100
				Token watchdog time: (100)

Table 101 – Profile read (continued)

Setting parameter (node) (continued)	EUT (The parameter varies according to the EUT class) (continued)	Class 5 (continued)	Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1 024
			Area 2 data size	1 024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave of the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the number of input points and output points of the slave of the EUT
	Test equipment (The parameter varies according to the EUT class)	Classes 3, 4 and 5	Implementation class	3 (Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	Depends on number of output points of the slave of the EUT * 0 point: 0 * 1 point of more: 256
			Area 1 data size	To be calculated from the number of output points of the slave of the EUT
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (Slave setting)	Slave node number: 16#8001 (Flexible setting mode, Node number: 1)
				Input data address: 16#0000 (Area1, Address: 0)
				Input data size: To be calculated from the number of input points of the slave of the EUT

Table 101 – Profile read (continued)

Setting parameter (node) (continued)	Test equipment (The parameter varies according to the EUT class) (continued)	Class 6 (continued)	IO allocation setting (Slave setting) (continued)	Output data address: Depends on number of output points of the slave of the EUT * 0 point: 16#0000 (Area1, Address: 0) * 1 point of more: 16#0100 (Area1, Address: 256)
				Output data size: To be calculated from the number of output points of the slave of the EUT
				Input status address: 16#8000 (Area2, Address: 0)
				Output status address: 16#8400 (Area2, Address: 1024)
		Class 7	Implementation class	3 (Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64
Setting parameter (Test data)	Request frame		Interface	UDP setting tool interface
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 011(Profile read request)
			Data size	0
			Contents of data	NA
	Response frame		Interface	UDP setting tool interface
			Node address of source side (SNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65 211 (Profile read response)
			Type of response message (M_RLT)	0 (normal response) or 2 (not-implemented)
			Data size (M_RLT: 0)	Depends on the EUT specification (Confirmed by test executor)
			Contents of data (M_RLT: 0)	Depends on the EUT specification (Confirmed by test executor)

Table 101 – Profile read (continued)

Setting parameter (Test data) (continued)	Response watchdog time (from request frame transmission to response frame reception)	1 s

Table 102 – Operation command, Stop command

Test number		V3-021			
Major test group		General purpose command server function			
Test group		Operation test of single setting tool (UDP)			
Test object		Operation command, stop command			
Test procedure		a) Start the EUT, then start the test equipment. b) The test equipment (UDP setting tool interface) transmits a stop command frame (request). c) The test equipment (UDP setting tool interface) transmits an operation command frame (request). d) The test equipment (UDP setting tool interface) transmits a stop command frame (request) after receiving an operation command frame (normal response) from the EUT.			
Evaluation criteria		Confirm the followings: a) The EUT transmits an operation command frame (response) to the operation command request from the test equipment. b) The response frame is normal response (M_RLT: 0), not-implemented response (M_RLT: 2) or no response. c) In case of normal response, the EUT runs. [ULS (Upper layer status) RUN flag is set to 1.] d) The EUT transmits a stop command frame (response) to the stop command request from the test equipment. e) The response frame is normal response (M_RLT: 0), not-implemented response (M_RLTL 2) or no response. f) In case of normal response, the EUT stops. [ULS (Upper layer status) RUN flag is set to 0.]			
Test necessity identified by the EUT class	Class 1	N			
	Class 2	N			
	Class 3	R			
	Class 4	R			
	Class 5	R			
	Class 6	R			
	Class 7	R			
Setting parameter (node)		EUT (The parameter varies according to the EUT class)	Classes 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	16
				IO allocation setting (Case of class4)	Optional
			Class5	Node number	100
				Token watchdog time	(100)

Table 102 – Operation command, Stop command (continued)

Setting parameter (node) (continued)	EUT (The parameter varies according to the EUT class) (continued)	Class 5 (continued)	Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1 024
			Area 2 data size	1 024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave of the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the number of input points and output points of the slave of the EUT
	Test equipment (The parameter varies according to the EUT class)	Classes 3, 4 and 5	Implementation class	3 (Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	Depends on number of output points of the slave of the EUT * 0 point: 0 * 1 point of more: 256
			Area 1 data size	To be calculated from the number of output points of the slave of the EUT
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (Slave setting)	Slave node number: 16#8001 (Flexible setting mode, Node number: 1)
				Input data address: 16#0000 (Area1, Address: 0)
				Input data size: To be calculated the size from number of input points of the slave of the EUT

Table 102 – Operation command, Stop command (continued)

Setting parameter (node) (continued)	Test equipment (The parameter varies according to the EUT class) (continued)	Class 6 (continued)	IO allocation setting (Slave setting) (continued)	Output data address: Depends on number of output points of the slave of the EUT * 0 point: 16#0000 (Area1, Address: 0) * 1 point of more: 16#0100 (Area1, Address: 256)
				Output data size: To be calculated the size from number of output points of the slave of the EUT
				Input status address: 16#8000 (Area2, Address: 0)
				Output status address: 16#8400 (Area2, Address: 1024)
		Class 7	Implementation class	3(Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64
Setting parameter (Test data)	Operation command	Request frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 010 (Operation command request)
			Data size	0
			Contents of data	NA
		Response frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65 210 (Operation command response)
			Type of response message (M_RLT)	0 (normal response) or 2 (not-implemented)
			Data size (M_RLT: 0)	0
			Contents of data (In case of M_RLT = 0)	NA

Table 102 – Operation command, Stop command (continued)

Setting parameter (Test data) (continued)	Stop command	Request frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 009 (Stop command request)
			Data size	0
			Contents of data	NA
		Response frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65 209 (Stop command response)
			Type of response message (M_RLT)	0 (normal response) or 2 (not-implemented)
			Data size (M_RLT: 0)	0
			Contents of data (M_RLT: 0)	NA
	Response watchdog time (from request frame transmission to response frame reception)		1 s	

d) Operation test of double setting tools (UDP) Operation test of double setting tools (UDP) is shown in Tables 103 through 107.

Table 103 – IO allocation setting (lock confirmation)/read

Test number	V3-022
Major test group	General purpose command server function
Test group	Operation test of double setting tools (UDP)
Test object	IO allocation setting (lock confirmation),/read
Test procedure	a) Start the EUT, then start the test equipment. b) The test equipment [the first UDP setting tool interface (hereafter called “setting tool A”)] transmits the first IO allocation setting frame (request, setting No.: 1/number of control slaves: 2). c) The test equipment [the second UDP setting tool interface (hereafter called “setting tool B”)] transmits the second IO allocation setting frame (request, setting No.: 1/number of control slaves: 3) after receiving the first IO allocation setting frame (response) from the EUT. d) The test equipment (UDP setting tool A) transmits the third IO allocation setting frame (request, setting No.: 2/number of control slaves: 2) after receiving the second IO allocation setting frame (response) from the EUT. e) The test equipment (UDP setting tool A) transmits the first IO allocation read frame (request, setting No.: 1) after receiving the third IO allocation setting frame (response) from the EUT. f) The test equipment (UDP setting tool A) transmits the second IO allocation read frame (request, setting No.: 2) after receiving the first IO allocation read frame (response) from the EUT.

Table 103 – IO allocation setting (lock confirmation)/read (continued)

Evaluation criteria	Confirm the followings: a) The EUT transmits the first IO allocation setting response frame to the first IO allocation setting request from the test equipment (UDP setting tool A). b) The contents of the first IO allocation setting response frame are as follows: (Decision criteria varies according to the EUT class.) * Classes 3 (flexible master function implemented) and 4: Normal response (M_RLT: 0). * Class3 (flexible master function not-implemented): Normal response (M_RLT: 0), not-implemented response (M_RLT: 2) or no response. NOTE: In case of normal response, the contents of data shall be correct. c) The EUT transmits the second IO allocation setting response frame to the second IO allocation setting request from the test equipment (UDP setting tool B). d) The contents of the second IO allocation setting response frame as follows: (Decision criteria varies according to the EUT class.) * Classes 3 (flexible master function implemented) and 4: Abnormal response (M_RLT: 1). * Class 3 (flexible master function not-implemented): Abnormal response (M_RLT: 1), not-implemented response (M_RLT:2) or no response. NOTE: In case of abnormal response, the result of response data shall be Abnormal (16#02) and Information shall be Locked by exclusive control (16#04). e) The EUT transmits the third IO allocation setting response frame to the third IO allocation setting request from the test equipment (UDP setting tool A). f) The contents of the third IO allocation setting response frame are as follows: (Decision criteria varies according to the EUT class.) * Classes 3 (flexible master function implemented) and 4: Normal response (M_RLT: 0). * Class3 (flexible master function not-implemented): Normal response (M_RLT: 0), not-implemented response (M_RLT: 2) or no response. NOTE: In case of normal response, the contents of data shall be correct. g) The EUT transmits the first IO allocation read response frame to the first IO allocation read request from the test equipment (UDP setting tool A). h) The contents of the first IO allocation read response frame are as follows: (Decision criteria varies according to the EUT class.) * Classes 3 (flexible master function implemented), 4: Normal response (M_RLT: 0). * Class 3 (flexible master function not-implemented): Normal response (M_RLT: 0), not-implemented response (M_RLT: 2) or no response. NOTE: In case of normal response, the contents of data shall be identical to the setting contents from the setting tool A. i) The EUT transmits the second IO allocation read response frame to the second IO allocation read request from the test equipment (UDP setting tool A). j) The contents of the second IO allocation read response frame are as follows: (Decision criteria varies according to the EUT class.) * Classes 3 (flexible master function implemented) and 4: Normal response (M_RLT: 0). * Class 3 (flexible master function not-implemented): Normal response (M_RLT: 0), not-implemented response (M_RLT: 2) or no response. NOTE: In case of normal response, the Contents of data shall be identical to the setting contents from the setting tool A. k) The EUT transmits a solicitation frame based on the setting contents from the setting tool A.

Table 103 – IO allocation setting (lock confirmation)/read (continued)

Test necessity identified by the EUT class	Class 1	N			
	Class 2	N			
	Class 3	R			
	Class 4	R			
	Class 5	N			
	Class 6	N			
	Class 7	N			
Setting parameter (node)		EUT	Classes 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	256
				Area 1 data size	16
				Area 2 data top address	1 024
				Area 2 data size	64
				IO allocation setting (Case of class4)	optional
		Test equipment	Classes 3 and 4	Implementation class	3 (Controller)
				Node number	254
				Token watchdog time	50
				Allowable minimum frame interval time	10
				Area 1 data top address	4
				Area 1 data size	4
				Area 2 data top address	64
				Area 2 data size	64
Setting parameter (Test data)		IO allocation setting (First)	Request frame	Interface	UDP setting tool interface
				Node address of source side (SNA)	254
				Node address of destination side (DNA)	1
				TCD	65 018 (IO allocation setting request)
				Data size	24
				Contents of data	Setting number: 1
					Number of control slaves (whole): 2
					Lock ID: 0
					Lock timeout setting value: 4
					Slave node number: 16#800C (Flexible setting mode, Node number: 12)

Table 103 – IO allocation setting (lock confirmation)/read (continued)

Setting parameter (Test data) (continued)	IO allocation setting (First) (continued)	Request frame (continued)	Contents of data (continued)	Input data address: 16#0080 (Area1, Address: 128)
				Input data size: 4
				Output data address: 16#0100 (Area1, Address: 256)
				Output data size: 8
				Input status address: 16#8200 (Area2, Address: 512)
				Output status address: 16#8400 (Area2, Address: 1024)
		Response frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	1
			Node address of destination side (DNA)	254
			TCD	65 218 (IO allocation setting response)
			Type of response message (M_RLT)	Depends on the EUT class * Class3 (flexible master function not-implemented): 0 (normal) or 2 (not-implemented) * Class3 (flexible master function implemented), 4: 0 (normal)
			Data size (M_RLT: 0)	8
			Contents of data (M_RLT: 0)	Result: 1 (continue)
				Information: (no evaluation)
				Lock ID: any value except 0
	IO allocation setting (Second)	Request frame	Interface	UDP setting tool B
			Node address of source side (SNA)	253
			Node address of destination side (DNA)	1
			TCD	65 018 (IO allocation setting request)
			Data size	24
			Contents of data	Setting number: 1
				Number of control slaves (whole): 3
				Lock ID: 0
				Lock timeout setting value: 6
				Slave node number: 16#8032 (Flexible setting mode, Node number: 50)
				Input data address: 16#00A0 (Area1, Address: 160)
				Input data size: 4

Table 103 – IO allocation setting (lock confirmation)/read (continued)

Setting parameter (Test data) (continued)	IO allocation setting (Second) (continued)	Request frame (continued)	Contents of data (continued)	Output data address: 16#010C (Area1, Address: 268)
				Output data size: 4
				Input status address: 16#8258 (Area2, Address: 600)
				Output status address: 16#8430 (Area2, Address: 1072)
		Response frame	Interface	UDP setting tool B
			Node address of source side (SNA)	1
			Node address of destination side (DNA)	253
			TCD	65 218 (IO allocation setting response)
			Type of response message (M_RLT)	Depends on the EUT class * Class 3 (flexible master function not-implemented): 1 (abnormal) or 2 (not-implemented) * Classes 3 (flexible master function implemented) and 4: 1 (abnormal)
			Data size (M_RLT: 1)	8
			Contents of data (M_RLT: 1)	Result: 2(abnormal)
				Information: 4 (locked by exclusive control)
				Lock ID: (no evaluation)
	IO allocation setting (Third)	Request frame	Interface	UDP setting tool A
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	1
			TCD	65 018 (IO allocation setting request)
			Data size	24
			Contents of data	Setting number: 2
				Number of control slaves (whole): 2
				Lock ID: Same value as lock ID of the first IO allocation setting response frame
				Lock timeout setting value: 4
				Slave node number: 16#8064 (Flexible setting mode, Node number: 100)

Table 103 – IO allocation setting (lock confirmation)/read (continued)

Setting parameter (Test data) (continued)	IO allocation setting (Third) (continued)	Request frame (continued)	Contents of data (continued)	Input data address: 16#008C (Area1, Address: 140)
				Input data size: 6
				Output data address: 16#0108 (Area1, Address: 264)
				Output data size: 8
				Input status address: 16#8220 (Area2, Address: 544)
				Output status address: 16#8420 (Area2, Address: 1056)
		Response frame	Interface	UDP setting tool A
			Node address of source side (SNA)	1
			Node address of destination side (DNA)	254
			TCD	65 218 (IO allocation setting response)
			Type of response message (M_RLT)	Depends on the EUT class * Class 3 (flexible master function not-implemented): 0 (normal) or 2 (not-implemented) * Classes 3 (flexible master function implemented) and 4: 0 (normal)
			Data size (M_RLT: 0)	8
			Contents of data (M_RLT: 0)	Result: 0 (normal)
				Information: (no evaluation)
				Lock ID: Same value as lock ID of the first IO allocation setting response frame
	IO allocation read (First)	Request frame	Interface	UDP setting tool A
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	1
			TCD	65 019 (IO allocation read request)
			Data size	4
			Contents of data	Setting number: 1
		Response frame	Interface	A UDP setting tool A
			Node address of source side (SNA)	1
			Node address of destination side (DNA)	254
			TCD	65 219 (IO allocation read response)

Table 103 – IO allocation setting (lock confirmation)/read (continued)

Setting parameter (Test data) (continued)	IO allocation read (First) (continued)	Response frame (continued)	Type of response message (M_RLT)	Depends on the EUT class * Class 3 (flexible master function not-implemented): 0 (normal) or 2 (not-implemented) * Classes 3 (flexible master function implemented) and 4: 0 (normal)
			Data size (M_RLT: 0)	20
			Contents of data (M_RLT: 0)	Setting number: 1
				Number of control slaves(The whole): 2
				Slave node number: 16#800C (Flexible setting mode, Node number: 12)
				Input data address: 16#0080 (Area1, Address: 128)
				Input data size: 4
				Output data address: 16#0100 (Area1, Address: 256)
				Output data size: 8
				Input status address: 16#8200 (Area2, Address: 512)
				Output status address: 16#8400 (Area2, Address: 1024)
	IO allocation read (Second)	Request frame	Interface	UDP setting tool A
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	1
Setting parameter (Test data) (continued)	IO allocation read (Second) (continued)	Request frame (continued)	TCD	65 019 (IO allocation read request)
			Data size	4
			Contents of data	Setting number: 2
		Response frame	Interface	UDP setting tool A
			Node address of source side (SNA)	1
			Node address of destination side (DNA)	254
			TCD	65 219 (IO allocation read response)
			Type of response message (M_RLT)	Depends on the EUT class * Class3 (flexible master function not-implemented): 0 (normal) or 2 (not-implemented) * Classes 3 (flexible master function implemented) and 4: 0 (normal)

Table 103 – IO allocation setting (lock confirmation)/read (continued)

Setting parameter (Test data) (continued)	IO allocation read (Second) (continued)	Response frame (continued)	Data size (M_RLT: 0)	20
			Contents of data (M_RLT: 0)	Setting number: 2
				Number of control slaves(whole): 2
				Slave node number: 16#8064 (Flexible setting mode, Node number: 100)
				Input data address: 16#008C (Area1, Address: 140)
				Input data size: 6
				Output data address: 16#0108 (Area1, Address: 264)
				Output data size: 8
				Input status address: 16#8220 (Area2, Address: 544)
				Output status address: 16#8420 (Area2, Address: 1056)
	Solicitation frame		Node address of source side (SNA)	1
			TCD	65017 (Solicitation)
			Data size	32
			Contents of data (For the first node)	Slave node number: 16#800C (Flexible setting mode, Node number: 12)
				Input data address: 16#0080 (Area1, Address: 128)
				Input data size: 4
				Output data address: 16#0100 (Area1, Address: 256)
				Output data size: 8
				Input status address: 16#8200 (Area2, Address: 512)
				Output status address: 16#8400 (Area2, Address: 1024)
				Lock ID: 1
			Contents of data (Second node)	Slave node number: 16#8064 (Flexible setting mode, Node number: 100)
				Input data address: 16#008C (Area1, Address: 140)
				Input data size: 6

Table 103 – IO allocation setting (lock confirmation)/read (continued)

Setting parameter (Test data) (continued)	Solicitation frame (continued)	Contents of data (Second node) (continued)	Output data address: 16#0108 (Area1, Address: 264)
			Output data size: 8
			Input status address: 16#8220 (Area2, Address: 544)
			Output status address: 16#8420 (Area2, Address: 1056)
			Lock ID: 1
	Response watchdog time (from request frame transmission to response frame reception)	1 s	

Table 104 – IO allocation setting (lock timeout)/read

Test number	V3-023
Major test group	General purpose command server function
Test group	Operation test of double setting tools (UDP)
Test object	IO allocation setting (lock timeout)/read
Test procedure	a) Start the EUT, then start the test equipment b) The test equipment [the first UDP setting tool interface (hereafter called “setting tool A”)] transmits the first IO allocation setting frame (request, setting number: 1/ number of control slaves: 2). c) The test equipment [the second UDP setting tool interface (hereafter called “setting tool B”)] transmits the second IO allocation setting frame (request, setting number: 1/ number of control slaves: 3) after receiving the first IO allocation setting frame (response) from the EUT. d) The test equipment (UDP setting tool A) transmits the first IO allocation setting frame, waits for the lock timeout time and transmits the third IO allocation setting frame (request, setting number: 2/number of control slaves: 2). e) The test equipment (UDP setting tool B) transmits the fourth IO allocation setting frame (request, setting number: 1/ number of control slaves: 1) after receiving the third IO allocation setting frame (response) from the EUT. f) The test equipment (UDP setting tool B) transmits the IO allocation read frame (request, setting number: 1) after receiving the fourth IO allocation setting frame (response) from the EUT.

Table 104 – IO allocation setting (lock timeout)/read (continued)

Evaluation criteria	Confirm the followings: a) The EUT transmits the first IO allocation setting response frame to the first IO allocation setting request from the test equipment (UDP setting tool A). b) The contents of the first IO allocation setting response frame are as follows: (Decision criteria varies according to the EUT class.) * Classes 3 (flexible master function implemented) and 4: Normal response (M_RLT: 0) * Class 3 (flexible master function not-implemented): Normal response (M_RLT: 0), not-implemented response (M_RLT: 2) or no response. NOTE: In case of normal response, the Contents of data shall be correct. c) The EUT transmits the second IO allocation setting response frame to the second IO allocation setting request from the test equipment (UDP setting tool B). d) The contents of the second IO allocation setting response frame are as follows: (Decision criteria varies according to the EUT class.) * Classes 3 (flexible master function implemented) and 4: Abnormal response (M_RLT: 1) * Class 3 (flexible master function not-implemented): Abnormal response (M_RLT: 1), not-implemented response (M_RLT: 2) or no response. NOTE: In case of abnormal response, the result of response data shall be Abnormal (16#02) and Information shall be Locked by exclusive control (16#04). e) The EUT transmits the third IO allocation setting response frame to the third IO allocation setting request from the test equipment (UDP setting tool A). f) The contents of the third IO allocation setting response frame are as follows: (Decision criteria varies according to the EUT class.) * Classes 3 (flexible master function implemented) and 4: Abnormal response (M_RLT: 1). * Class 3 (flexible master function not-implemented): Abnormal response (M_RLT: 1), not-implemented response (M_RLT: 2) or no response. NOTE: In the case of abnormal response, the result of response data shall be Abnormal (16#02) and Information shall be Exclusive lock timed out (16#05). g) The EUT transmits the fourth IO allocation setting response frame to the fourth IO allocation setting request from the test equipment(UDP setting tool B). h) The contents of the fourth IO allocation setting response frame are as follows: (Decision criteria varies according to the EUT class.) * Classes 3 (flexible master function implemented) and 4: Normal response (M_RLT: 0). * Class 3 (flexible master function not-implemented): Normal response(M_RLT: 0), not-implemented response (M_RLT: 2) or no response. NOTE: In the case of normal response, the Contents of data shall be correct. i) The EUT transmits the IO allocation read frame(response) to the IO allocation read request from the test equipment (UDP setting tool B). j) The contents of the IO allocation read frame(response) are as follows: (Decision criteria varies according to the EUT class.) * Classes 3 (flexible master function implemented) and 4: Normal response (M_RLT: 0) * Class 3 (flexible master function not-implemented): Normal response(M_RLT: 0), not-implemented response (M_RLT: 2) or no response. NOTE: In case of normal response, the contents of data shall be identical to the setting contents from the setting tool B. k) The EUT transmits a solicitation frame based on the setting contents from the setting tool B.

Table 104 – IO allocation setting (lock timeout)/read (continued)

Test necessity identified by the EUT class	Class 1	N			
	Class 2	N			
	Class 3	R			
	Class 4	R			
	Class 5	N			
	Class 6	N			
	Class 7	N			
Setting parameter (node)		EUT	Classes 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	256
				Area 1 data size	16
				Area 2 data top address	1 024
				Area 2 data size	64
				IO allocation setting (Case of class4)	optional
		Test equipment	Classes 3 and 4	Implementation class	3 (Controller)
				Node number	254
				Token watchdog time	50
				Allowable minimum frame interval time	10
				Area 1 data top address	4
				Area 1 data size	4
				Area 2 data top address	64
				Area 2 data size	64
		IO allocation setting (First)	Request frame	Interface	UDP setting tool A
				Node address of source side (SNA)	254
				Node address of destination side (DNA)	1
				TCD	65 018 (IO allocation setting request)
				Data size	24
				Contents of data	Setting number: 1
					Number of control slaves (whole): 2
					Lock ID: 0
					Lock timeout setting value: 4
					Slave node number: 16#800C (Flexible setting mode, Node number: 12)
					Input data address: 16#0080 (Area1, Address: 128)

Table 104 – IO allocation setting (lock timeout)/read (continued)

Setting parameter (Test data) (continued)	IO allocation setting (First) (continued)	Request frame (continued)	Contents of data (continued)	Input data size: 4
				Output data address: 16#0100 (Area1, Address: 256)
				Output data size: 8
				Input status address: 16#8200 (Area2, Address: 512)
				Output status address: 16#8400 (Area2, Address: 1024)
		Response frame	Interface	UDP setting tool A
			Node address of source side (SNA)	1
			Node address of destination side (DNA)	254
			TCD	65 218(IO allocation setting response)
			Type of response message (M_RLT)	Depends on the EUT class * Class3 (flexible master function not-implemented): 0 (normal) or 2 (not-implemented) * Classes 3 (flexible master function implemented) and 4: 0 (normal)
			Data size (M_RLT: 0)	8
			Contents of data (M_RLT: 0)	Result: 1 (continued)
				Information: (no evaluation)
				Lock ID: Any value except 0
	IO allocation setting (Second)	Request frame	Interface	UDP setting tool B
			Node address of source side (SNA)	253
			Node address of destination side (DNA)	1
			TCD	65 018 (IO allocation setting request)
			Data size	24
			Contents of data	Setting number: 1
				Number of control slaves (whole): 3
				Lock ID: 0
				Lock timeout setting value: 6
				Slave node number: 16#8032 (Flexible setting mode, Node number: 50)
				Input data address: 16#00A0 (Area1, Address: 160)
				Input data size: 4

Table 104 – IO allocation setting (lock timeout)/read (continued)

Setting parameter (Test data) (continued)	IO allocation setting (Second) (continued)	Request frame (continued)	Contents of data (continued)	Output data address: 16#010C (Area1, Address: 268)
				Output data size: 4
				Input status address: 16#8258 (Area2, Address: 600)
				Output status address: 16#8430 (Area2, Address: 1 072)
		Response frame	Interface	UDP setting tool B
			Node address of source side (SNA)	1
			Node address of destination side (DNA)	253
			TCD	65 218 (IO allocation setting response)
			Type of response message (M_RLT)	Depends on the EUT class * Class 3 (flexible master function not-implemented): 1 (abnormal) or 2 (not-implemented) * Classes 3 (flexible master function implemented) and 4: 1 (abnormal)
			Data size (M_RLT: 1)	8
			Contents of data (M_RLT: 1)	Result: 2 (abnormal)
				Information: 4 (locked by exclusive control)
				Lock ID: (no evaluation)
	IO allocation setting (Third)	Request frame	Interface	UDP setting tool A
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	1
			TCD	65 018 (IO allocation setting request)
			Data size	24
			Contents of data	Setting number: 2
				Number of control slaves (whole): 2
				Lock ID: Same as lock ID of the first IO allocation setting response frame
				Lock timeout setting value: 4
				Slave node number: 16#8064 (Flexible setting mode, Node number: 100)
				Input data address: 16#008C (Area1, Address: 140)

Table 104 – IO allocation setting (lock timeout)/read (continued)

Setting parameter (Test data) (continued)	IO allocation setting (Third) (continued)	Request frame (continued)	Contents of data (continued)	Input data size: 6
				Output data address: 16#0108 (Area1, Address: 264)
				Output data size: 8
				Input status address: 16#8220 (Area2, Address: 544)
				Output status address: 16#8420 (Area2, Address: 1056)
		Response frame	Interface	UDP setting tool A
			Node address of source side (SNA)	1
			Node address of destination side (DNA)	254
			TCD	65 218 (IO allocation setting response)
			Type of response message (M_RLT)	Depends on the EUT class * Class 3 (flexible master function not-implemented): 1 (abnormal) or 2 (not-implemented) * Classes 3 (flexible master function implemented) and 4: 1 (abnormal)
			Data size (M_RLT: 1)	8
			Contents of data (M_RLT: 1)	Result: 2 (abnormal)
				Information: 5 (exclusive lock timed out)
				Lock ID: (no evaluation)
	IO allocation setting (Fourth)	Request frame	Interface	UDP setting tool B
			Node address of source side (SNA)	253
			Node address of destination side (DNA)	1
			TCD	65 018 (IO allocation setting request)
			Data size	24
			Contents of data	Setting number: 1
				Number of control slaves (whole): 1
				Lock ID: 0
				Lock timeout setting value: 6
				Slave node number: 16#8064 (Flexible setting mode, Node number: 100)
				Input data address: 16#008C (Area1, Address: 140)
				Input data size: 6

Table 104 – IO allocation setting (lock timeout)/read (continued)

Setting parameter (Test data) (continued)	IO allocation setting (Fourth) (continued)	Request frame (continued)	Contents of data (continued)	Output data address: 16#0104 (Area1, Address: 260)
				Output data size: 12
				Input status address: 16#8210 (Area2, Address: 528)
				Output status address: 16#8410 (Area2, Address: 1 040)
		Response frame	Interface	UDP setting tool B
			Node address of source side (SNA)	1
			Node address of destination side (DNA)	253
			TCD	65 218 (IO allocation setting response)
			Type of response message (M_RLT)	Depends on the EUT class * Class 3 (flexible master function not-implemented): 0 (normal) or 2 (not-implemented) * Classes 3 (flexible master function implemented) and 4: 0 (normal)
			Data size (M_RLT: 0)	8
			Contents of data (M_RLT: 0)	Result: 0(normal)
				Information: (no evaluation)
				Lock ID: Any value except 0
	IO allocation read	Request frame	Interface	UDP setting tool B
			Node address of source side (SNA)	253
			Node address of destination side (DNA)	1
			TCD	65 019 (IO allocation read request)
			Data size	4
			Contents of data	Setting number: 1
		Response frame	Interface	UDP setting tool B
			Node address of source side (SNA)	1
			Node address of destination side (DNA)	253
			TCD	65 219 (IO allocation read response)
			Type of response message (M_RLT)	Depends on the EUT class * Class 3 (flexible master function not-implemented): 0 (normal) or 2 (not-implemented) * Classes 3 (flexible master function implemented) and 4: 0 (normal)
			Data size (M_RLT: 0)	20

Table 104 – IO allocation setting (lock timeout)/read (continued)

Setting parameter (Test data) (continued)	IO allocation read (continued)	Response frame (continued)	Contents of data (M_RLT: 0)	Setting number: 1
				Number of control slaves (whole): 1
				Slave node number: 16#8064 (Flexible setting mode, Node number: 100)
				Input data address: 16#008C (Area1, Address: 140)
				Input data size: 6
				Output data address: 16#0104 (Area1, Address: 260)
				Output data size: 12
				Input status address: 16#8210 (Area2, Address: 528)
				Output status address: 16#8410 (Area2, Address: 1 040)
	Solicitation frame		Node address of source side (SNA)	1
			TCD	65 017 (Solicitation)
			Data size	16
			Contents of data	Slave node number: 16#8064 (Flexible setting mode, Node number: 100)
				Input data address: 16#008C (Area1, Address: 140)
				Input data size: 6
				Output data address: 16#0104 (Area1, Address: 260)
				Output data size: 12
				Input status address: 16#8210 (Area2, Address: 528)
				Output status address: 16#8410 (Area2, Address: 1 040)
				Lock ID: 1
	Response watchdog time (from request frame transmission to response frame reception)		1 s	

Table 105 – IO allocation setting (unlock)/read

Test number	V3-024
Major test group	General purpose command server function
Test group	Operation test of double setting tools (UDP)
Test object	IO allocation setting (unlock)/read
Test procedure	a) Start the EUT, then start the test equipment. b) The test equipment [the first UDP setting tool interface (hereafter called “setting tool A”)] transmits the first IO allocation setting frame (request, setting number: 1/number of control slaves: 2). c) The test equipment (UDP setting tool A) transmits the second IO allocation setting frame (request, unlock) after receiving the first IO allocation setting frame (response) from the EUT. d) The test equipment [the second UDP setting tool interface (hereafter called “setting tool B”)] transmits the third IO allocation setting frame (request, setting number: 1/number of control slaves: 1) after receiving the second IO allocation setting frame (response) from the EUT. e) The test equipment (UDP setting tool B) transmits an IO allocation read frame (request, setting number: 1) after receiving the third IO allocation setting frame (response) from the EUT.
Evaluation criteria	Confirm the followings: a) The EUT transmits the first IO allocation setting response frame to the first IO allocation setting request from the test equipment (UDP setting tool A). b) The contents of the first IO allocation setting response frame are as follows: (Decision criteria varies according to the EUT class.) * Classes 3 (flexible master function implemented) and 4: Normal response (M_RLT: 0) * Class 3 (flexible master function not-implemented): Normal response (M_RLT: 0), not-implemented response (M_RLT: 2) or no response. NOTE: In case of normal response, the contents of data shall be correct. c) The EUT transmits the second IO allocation setting response frame to the second IO allocation setting request from the test equipment (UDP setting tool A). d) The contents of the second IO allocation setting response frame are as follows; (Decision criteria varies according to the EUT class.) * Classes 3 (flexible master function implemented) and 4: Normal response (M_RLT: 0) * Class 3 (flexible master function not-implemented): Normal response (M_RLT: 0), not-implemented response (M_RLT: 2) or no response. NOTE: In case of normal response, the contents of data shall be correct. e) The EUT transmits the third IO allocation setting response frame to the third IO allocation setting request from the test equipment (UDP setting tool B). f) The contents of the third IO allocation setting response frame are as follows: (Decision criteria varies according to the EUT class.) * Classes 3 (flexible master function implemented) and 4: Normal response (M_RLT: 0) * Class 3 (flexible master function not-implemented): Normal response (M_RLT: 0), not-implemented response (M_RLT: 2) or no response. NOTE: In case of normal response, the contents of data shall be correct. g) The EUT transmits an IO allocation read frame (response) to the IO allocation read request from the test equipment (UDP setting tool B). h) The contents of the IO allocation read frame (response) are as follows: (Decision criteria varies according to the EUT class.) * Classes 3 (flexible master function implemented) and 4: Normal response (M_RLT: 0) * Class 3 (flexible master function not-implemented): Normal response (M_RLT: 0), not-implemented response (M_RLT: 2) or no response/ NOTE: In case of normal response, the contents of data are identical to the setting contents from the setting tool B. i) The EUT transmits a solicitation frame based on the setting contents from the UDP setting tool B.

Table 105 – IO allocation setting (unlock)/read (continued)

Test necessity identified by the EUT class	Class 1	N			
	Class 2	N			
	Class 3	R			
	Class 4	R			
	Class 5	N			
	Class 6	N			
	Class 7	N			
Setting parameter (node)		EUT	Classes 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	256
				Area 1 data size	16
				Area 2 data top address	1 024
				Area 2 data size	64
				IO allocation setting (class 4)	optional
		Test equipment	Classes 3 and 4	Implementation class	3 (Controller)
				Node number	254
				Token watchdog time	50
				Allowable minimum frame interval time	10
				Area 1 data top address	4
				Area 1 data size	4
				Area 2 data top address	64
				Area 2 data size	64
Setting parameter (Test data)		IO allocation setting (First)	Request frame	Interface	UDP setting tool A
				Node address of source side (SNA)	254
				Node address of destination side (DNA)	1
				TCD	65 018 (IO allocation setting request)
				Data size	24

Table 105 – IO allocation setting (unlock)/read (continued)

Setting parameter (Test data) (continued)	IO allocation setting (First) (continued)	Request frame (continued)	Contents of data	Setting number: 1
				Number of control slaves (whole): 2
				Lock ID: 0
				Lock timeout setting value: 4
				Slave node number: 16#800C (Flexible setting mode, Node number 12)
				Input data address: 16#0080 (Area1, Address: 128)
				Input data size: 4
				Output data address: 16#0100 (Area1, Address: 256)
				Output data size: 8
				Input status address: 16#8200 (Area2, Address: 512)
				Output status address: 16#8400 (Area2, Address: 1024)
		Response frame	Interface	UDP setting tool A
			Node address of source side (SNA)	1
			Node address of destination side (DNA)	254
			TCD	65 218 (IO allocation setting response)
			Type of response message (M_RLT)	Depends on the EUT class * Class 3 (flexible master function not-implemented): 0 (normal) or 2 (not-implemented) * Classes 3 (flexible master function implemented) and 4: 0 (normal)
			Data size (M_RLT: 0)	8
			Contents of data (M_RLT: 0)	Result: 1 (continued)
				Information: (no evaluation)
				Lock ID: Any value except 0
	IO allocation setting (Second)	Request frame	Interface	UDP setting tool A
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	1
			TCD	65 018 (IO allocation setting request)
			Data size	24

Table 105 – IO allocation setting (unlock)/read (continued)

Setting parameter (Test data) (continued)	IO allocation setting (Second) (continued)	Request frame (continued)	Contents of data	Setting number: 16#FFFF
				Number of control slaves (whole): 16#FFFF
				Lock ID: Same as lock ID of the first IO allocation setting response frame
				Lock timeout setting value: 4
				Slave node number: 0
				Input data address: 0
				Input data size: 0
				Output data address: 0
				Output data size: 0
				Input status address: 0
				Output status address: 0
		Response frame	Interface	UDP setting tool A
			Node address of source side (SNA)	1
			Node address of destination side (DNA)	254
			TCD	65 218 (IO allocation setting response)
			Type of response message (M_RLT)	Depends on the EUT class * Class 3 (flexible master function not-implemented): 0 (normal) or 2 (not-implemented) * Classes 3 (flexible master function implemented) and 4: 0(normal)
			Data size (M_RLT: 0)	8
			Contents of data (M_RLT: 0)	Result: 1(abnormal)
				Information: (no evaluation)
				Lock ID: (no evaluation)
	IO allocation setting (Third)	Request frame	Interface	UDP setting tool B
			Node address of source side (SNA)	253
			Node address of destination side (DNA)	1
			TCD	65 018 (IO allocation setting request)
			Data size	24
			Contents of data	Setting number: 1
				Number of control slaves (whole): 1
				Lock ID: 0
				Lock timeout setting value: 4
				Slave node number: 16#8032 (Flexible setting mode, Node number: 50)

Table 105 – IO allocation setting (unlock)/read (continued)

Setting parameter (Test data) (continued)	IO allocation setting (Third) (continued)	Request frame (continued)	Contents of data (continued)	Input data address: 16#00A0 (Area1, Address: 160)
				Input data size: 4
				Output data address: 16#0108 (Area1, Address: 264)
				Output data size: 8
				Input status address: 16#8258 (Area2, Address: 600)
				Output status address: 16#8420 (Area2, Address: 1056)
		Response frame	Interface	UDP setting tool B
			Node address of source side (SNA)	1
			Node address of destination side (DNA)	253
			TCD	65 218 (IO allocation setting response)
			Type of response message (M_RLT)	Depends on the EUT class * Class 3 (flexible master function not-implemented): 0 (normal) or 2 (not-implemented) * Classes 3 (flexible master function implemented) and 4: 0 (normal)
			Data size (M_RLT: 0)	8
			Contents of data (M_RLT: 0)	Result: 0(normal)
				Information: (no evaluation)
				Lock ID: Value except 0
	IO allocation read	Request frame	Interface	UDP setting tool B
			Node address of source side (SNA)	253
			Node address of destination side (DNA)	1
			TCD	65 019(IO allocation read request)
			Data size	4
			Contents of data	Setting number: 1
		Response frame	Interface	UDP setting tool B
			Node address of source side (SNA)	1
			Node address of destination side (DNA)	253
			TCD	65 219(IO allocation read response)

Table 105 – IO allocation setting (unlock)/read (continued)

Setting parameter (Test data) (continued)	IO allocation read (continued)	Response frame (continued)	Type of response message (M_RLT)	Depends on the EUT class * Class3(flexible master function not-implemented): 0(normal) or 2(not-implemented) * Class3(flexible master function implemented), 4: 0(normal)
			Data size (M_RLT: 0)	20
			Contents of data (M_RLT: 0)	Setting number: 1
				Number of control slaves(The whole): 1
				Slave node number: 16#8032 (Flexible setting mode, Node number: 50)
				Input data address: 16#00A0 (Area1, Address: 160)
				Input data size: 4
				Output data address: 16#0108 (Area1, Address: 264)
				Output data size: 4
				Input status address: 16#8258 (Area2, Address: 600)
				Output status address: 16#8420 (Area2, Address: 1056)
	Solicitation frame		Node address of source side (SNA)	1
			TCD	65017 (Solicitation)
			Data size	16
			Contents of data	Slave node number: 16#8032 (Flexible setting mode, Node number: 50)
				Input data address: 16#00A0 (Area1, Address: 160)
				Input data size: 4
				Output data address: 16#0108 (Area1, Address: 264)
				Output data size: 4
				Input status address: 16#8258 (Area2, Address: 600)
				Output status address: 16#8420 (Area2, Address: 1056)
				Lock ID: 1
	Response watchdog time (from request frame transmission to response frame reception)		1 s	

Table 106 – Token retention time measurement start/end

Test number	V3-025
Major test group	General purpose command server function
Test group	Operation test of double setting tools (UDP)
Test object	Token retention time measurement start/end
Test procedure	a) Start the EUT and the test equipment, then start the dummy node. b) The test equipment [the first UDP setting tool interface (hereafter called “setting tool A”)] transmits the first start frame of token retention time measuring (request). c) The test equipment disengage from the network (stop the transmission of token frame.) d) The test equipment rejoin the network. e) The test equipment rejoin the network then the test equipment [the second UDP setting tool interface (hereafter called “setting tool B”)] waits for 10 seconds before it transmits the second start frame of token retention time measuring (request). f) The test equipment (UDP setting tool A) transmits the first end frame of token retention time measuring (request), 60 seconds later than receiving the second start frame of token retention time measuring (response) from the EUT. g) The test equipment (UDP setting tool B) transmits the second end frame of token retention time measuring frame(request) after receiving the first end frame of token retention time measuring (response) from the EUT.
Evaluation criteria	Confirm the followings: a) The EUT transmits the first start response frame to the first start request from the test equipment (UDP setting tool A). b) The first start response frame is normal response (M_RLT: 0). c) The EUT transmits the second start response frame to the second start request from the test equipment (UDP setting tool B). d) The second start response frame is normal response (M_RLT: 0). e) The EUT transmits the first end response frame to the first end request from the test equipment (UDP setting tool A). f) The first end response frame is normal response (M_RLT: 0), and the contents of data are as follows: Number of tokens during measuring the token retention time is not 0. g) The EUT transmits the second end response frame to the second end request from the test equipment (UDP setting tool B). h) The second end response frame is normal response (M_RLT: 0), and the contents of data are identical to the first end response data.

Table 106 – Token retention time measurement start/end (continued)

Test necessity identified by the EUT class	Class 1	N			
	Class 2	N			
	Class 3	R			
	Class 4	O (in case that command server load measurement function implemented)			
	Class 5	O (in case that command server load measurement function implemented)			
	Class 6	O (in case that command server load measurement function implemented)			
	Class 7	O (in case that command server load measurement function implemented)			
Setting parameter (node)		EUT (The parameter varies according to the EUT class)	Classes 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	16
				IO allocation setting (class4)	optional
			Class 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1 024
				Area 2 data size	1 024
			Classes 6 and 7	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	To be calculated from the number of input points of the slave of the EUT
				Area 2 data top address	0
				Area 2 data size	To be calculated from the number of input points and output points of the slave of the EUT
		Test equipment (The parameter varies according to the EUT class)	Classes 3, 4 and 5	Implementation class	3 (Controller)
				Node number	254
				Token watchdog time	50
				Allowable minimum frame interval time	10
				Area 1 data top address	4
				Area 1 data size	4
				Area 2 data top address	64
				Area 2 data size	64

Table 106 – Token retention time measurement start/end (continued)

Setting parameter (node) (continued)	Test equipment (The parameter varies according to the EUT class) (continued)	Class 6	Implementation class	4 (Flexible master)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	Depends on number of output points of the slave of the EUT * 0 point: 0 * 1 point of more: 256
			Area 1 data size	To be calculated from the number of output points of the slave of the EUT
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (Slave setting)	Slave node number: 16#8001 (Flexible setting mode, Node number: 1)
				Input data address: 16#0000 (Area1, Address: 0)
				Input data size: To be calculated from the number of input points of the slave of the EUT
				Output data address: Depends on number of output points of the slave of the EUT * 0 point: 16#0000 (Area1, Address: 0) * 1 point of more: 16#0100 (Area1, Address: 256)
				Output data size: To be calculated from the number of output points of the slave of the EUT
				Input status address: 16#8000 (Area2, Address: 0)
				Output status address: 16#8400 (Area2, Address: 1024)
		Class 7	Implementation class	3 (Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64
	Dummy node		Implementation class	3 (Controller)
			Node number	2
			Token watchdog time	50

Table 106 – Token retention time measurement start/end (continued)

Setting parameter (node) (continued)	Dummy node (continued)		Allowable minimum frame interval time	10
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
Setting parameter (Test data)	Token retention time measurement start (First)	Request frame	Interface	UDP setting tool A
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 020 (Token retention time measurement start request)
			Data size	0
			Contents of data	NA
		Response frame	Interface	UDP setting tool A
			Node address of source side (SNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65 220 (Token retention time measurement start response)
			Type of response message (M_RLT)	0 (normal)
			Data size (M_RLT: 0)	0
			Contents of data	NA
	Token retention time measurement start (Second)	Request frame	Interface	UDP setting tool B
			Node address of source side (SNA)	253
			Node address of destination side (DNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 020 (Token retention time measurement start request)
			Data size	0
			Contents of data	NA
		Response frame	Interface	UDP setting tool B
			Node address of source side (SNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	253
			TCD	65 220 (Token retention time measurement start response)

Table 106 – Token retention time measurement start/end (continued)

Setting parameter (Test data) (continued)	Token retention time measurement start (Second) (continued)	Response frame (continued)	Type of response message (M_RLT)	0 (normal)
			Data size (M_RLT: 0)	0
			Contents of data (in case of M_RLT = 0)	NA
	Token retention time measurement end (First)	Request frame	Interface	UDP setting tool A
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 021 (Token retention time measurement end request)
			Data size	0
			Contents of data	NA
		Response frame	Interface	UDP setting tool A
			Node address of source side (SNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65 221 (Token retention time measurement end response)
			Type of response message (M_RLT)	0 (normal)
			Data size (M_RLT: 0)	76
			Contents of data (M_RLT: 0)	Number of tokens during measuring the token retention time: not 0
	Token retention time measurement end (Second)	Request frame	Interface	UDP setting tool B
			Node address of source side (SNA)	253
			Node address of destination side (DNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 021 (Token retention time measurement end request)
			Data size	0
			Contents of data	NA
		Response frame	Interface	UDP setting tool B
			Node address of source side (SNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	253
			TCD	65 221 (Token retention time measurement end response)

Table 106 – Token retention time measurement start/end (continued)

Setting parameter (Test data) (continued)	Token retention time measurement end (Second) (continued)	Response frame (continued)	Type of response message (M_RLT)	0 (normal)
			Data size (M_RLT: 0)	76
			Contents of data (M_RLT: 0)	Number of tokens during measuring the token retention time: equal to the first end response
	Response watchdog time (from request frame transmission to response frame reception)		1 s	

Table 107 – General purpose communication data sender log measurement start/end

Test number	V3-026
Major test group	General purpose command server function
Test group	Operation test of double setting tools (UDP)
Test object	General purpose communication data sender log measurement start/end
Test procedure	a) Start the EUT, then start the test equipment. b) The test equipment [the first UDP setting tool interface (hereafter called “setting tool A”)] transmits the first general purpose communication data sender log measurement start frame (request). c) The test equipment transmits the first general purpose communication data 10 seconds later than receiving the first general purpose communication data sender log measurement start frame (response) from the EUT. d) The test equipment [the second UDP setting tool interface (hereafter called “setting tool B”)] transmits the second general purpose communication data sender log measurement start frame (request). e) The test equipment transmits the second general purpose communication data after receiving the second general purpose communication data sender log measurement start frame (response) from the EUT. f) The test equipment (UDP setting tool A) transmits the first general purpose communication data sender log measurement stop frame (request) 60 seconds later than receiving the second general purpose communication data sender log measurement start frame (response) from the EUT, g) The test equipment (UDP setting tool B) transmits the second general purpose communication data sender log measurement stop frame (request) after receiving the second general purpose communication data sender log measurement stop frame (response) from the EUT.
Evaluation criteria	Confirm the followings: a) The EUT transmits the first start response frame to the first start request from the test equipment (UDP setting tool A). b) The first start response frame is normal response (M_RLT: 0). c) The EUT transmits the second start response frame to the second start request from the test equipment (UDP setting tool B). d) The second start response frame is normal response (M_RLT: 0). e) The EUT transmits the first stop response frame to the first stop request from the test equipment (UDP setting tool A). f) The first stop response frame is normal response (M_RLT: 0). g) The EUT transmits the second stop response frame to the second stop request from the test equipment (UDP setting tool B). h) The second stop response frame is normal response (M_RLT: 0), and the contents of data are identical to the first stop response data.

Table 107 – General purpose communication data sender log measurement start/end (continued)

Test necessity identified by the EUT class	Class 1	N			
	Class 2	N			
	Class 3	R			
	Class 4	O (in case that command server load measurement function implemented)			
	Class 5	O (in case that command server load measurement function implemented)			
	Class 6	O (in case that command server load measurement function implemented)			
	Class 7	O (in case that command server load measurement function implemented)			
Setting parameter (node)		EUT (The parameter varies according to the EUT class)	Classes 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	16
				IO allocation setting (class 4)	optional
			Class 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1 024
				Area 2 data size	1 024
			Classes 6 and 7	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	To be calculated from the number of input points of the slave of the EUT
				Area 2 data top address	0
				Area 2 data size	To be calculated from the number of input points and output points of the slave of the EUT
		Test equipment (The parameter varies according to the EUT class)	Classes 3, 4 and 5	Implementation class	3 (Controller)
				Node number	254
				Token watchdog time	50
				Allowable minimum frame interval time	10
				Area 1 data top address	4
				Area 1 data size	4
				Area 2 data top address	64
				Area 2 data size	64

Table 107 – General purpose communication data sender log measurement start/end (continued)

Setting parameter (node) (continued)	Test equipment (The parameter varies according to the EUT class) (continued)	Class 6	Implementation class	4 (Flexible master)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	Depends on number of output points of the slave of the EUT * 0 point: 0 * 1 point of more: 256
			Area 1 data size	To be calculated from the number of output points of the slave of the EUT
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (Slave setting)	Slave node number: 16#8001 (Flexible setting mode, Node number: 1)
				Input data address: 16#0000 (Area1, Address: 0)
				Input data size: To be calculated from the number of input points of the slave of the EUT
				Output data address: Depends on number of output points of the slave of the EUT * 0 point: 16#0000 (Area1, Address: 0) * 1 point of more: 16#0100 (Area1, Address: 256)
				Output data size: To be calculated from the number of output points of the slave of the EUT
				Input status address: 16#8000 (Area2, Address: 0)
				Output status address: 16#8400 (Area2, Address: 1024)
		Class 7	Implementation class	3 (Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64

Table 107 – General purpose communication data sender log measurement start/end (continued)

Setting parameter (Test data)	General purpose communication data sender log measurement start (First)	Request frame	Interface	UDP setting tool A
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 022 (General purpose communication data sender log measurement start request)
			Data size	0
			Contents of data	NA
		Response frame	Interface	UDP setting tool A
			Node address of source side (SNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65 222 (General purpose communication data sender log measurement start response)
			Type of response message (M_RLT)	0 (normal)
			Data size (M_RLT: 0)	0
			Contents of data	NA
	General purpose communication data (First)	Pattern 1	Interface	TCP
			Source IP address	192.168.250.254
			Destination IP address	Depends on the EUT class * Classes 3, 4, 6 and 7: 192.168.250.1 * Class 5: 192.168.250.100
			Source port number	55 003
			Destination port number	55 000
			Data	optional
			Number of transmissions	1
		Pattern 2	Interface	UDP
			Source IP address	1.2.3.4
			Destination IP address	1.2.3.255
			Source port number	10 000
			Destination port number	10 001
			Data	optional
			Number of transmissions	2
	General purpose communication data sender log measurement start (Second)	Request frame	Interface	UDP setting tool B
			Node address of source side (SNA)	253

Table 107 – General purpose communication data sender log measurement start/end (continued)

Setting parameter (Test data) (continued)	General purpose communication data sender log measurement start (Second) (continued)	Request frame (continued)	Node address of destination side (DNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 022 (General purpose communication data sender log measurement start request)
			Data size	0
			Contents of data	NA
		Response frame	Interface	UDP setting tool B
			Node address of source side (SNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	253
			TCD	65 222 (General purpose communication data sender log measurement start response)
			Type of response message (M_RLT)	0 (normal)
			Data size (M_RLT: 0)	0
			Contents of data	NA
	General purpose communication data (Second)	Pattern N (*N*: 1 through 6)	Interface	TCP
			Source IP address	192.168.250.(248＋*N*)
			Destination IP address	Depends on the EUT class * Classes 3, 4, 6 and 7: 192.168.250.1 * Class 5: 192.168.250.100
			Source port number	54 998＋*N*
			Destination port number	54 998＋*N*
			Data	optional
			Number of transmissions	N
		Pattern 7	Interface	UDP
			Source IP address	1.2.3.4
			Destination IP address	1.2.3.255
			Source port number	10 000
			Destination port number	10 001
			Data	optional
			Number of transmissions	10 times
		Pattern 8	Interface	UDP
			Source IP address	192.168.0.254
			Destination IP address	192.168.0.255
			Source port number	55 001
			Destination port number	55 000
			Data	optional
			Number of transmissions	9

Table 107 – General purpose communication data sender log measurement start/end (continued)

Setting parameter (Test data) (continued)	General purpose communication data (Second) (continued)	Pattern 9	Interface	UDP
			Source IP address	192.168.250.125
			Destination IP address	192.168.250.255
			Source port number	55 002
			Destination port number	55 001
			Data	optional
			Number of transmissions	8
		Pattern 10	Interface	UDP
			Source IP address	123.45.6.78
			Destination IP address	123.45.6.255
			Source port number	55 000
			Destination port number	55 003
			Data	optional
			Number of transmissions	7
		Pattern 11	Interface	TCP
			Source IP address	192.168.250.200
			Destination IP address	Depends on the EUT class * Classes 3, 4, 6 and 7: 192.168.250.1 * Class 5: 192.168.250.100
			Source port number	55 003
			Destination port number	55 000
			Data	optional
			Number of transmissions	6
	General purpose communication data sender log measurement stop (First)	Request frame	Interface	UDP setting tool A
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 023 (General purpose communication data sender log measurement stop request)
			Data size	0
			Contents of data	NA
		Response frame	Interface	UDP setting tool A
			Node address of source side (SNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	254

Table 107 – General purpose communication data sender log measurement start/end (continued)

Setting parameter (Test data) (continued)	General purpose communication data sender log measurement stop (First) (continued)	Response frame (continued)	TCD	65 223 (General purpose communication data sender log measurement stop response)
			Type of response message (M_RLT)	0 (normal)
			Data size (M_RLT: 0)	84
			Contents of data (M_RLT: 0)	Optional(no evaluation)
	General purpose communication data sender log measurement stop (Second)	Request frame	Interface	UDP setting tool B
			Node address of source side (SNA)	253
			Node address of destination side (DNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 023 (General purpose communication data sender log measurement stop request)
			Data size	0
			Contents of data	NA
		Response frame	Interface	UDP setting tool B
			Node address of source side (SNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	253
			TCD	65 223 (General purpose communication data sender log measurement stop response)
			Type of response message (M_RLT)	0 (normal)
			Data size (M_RLT: 0)	84
			Contents of data (M_RLT: 0)	Measuring time for general purpose communication data sender log: (Identical to the first stop response)
				IP1: (Identical to the first stop response)
				IP1 receiving counter: (Identical to the first stop response)
				IP2: (Identical to the first stop response)
				IP2 receiving counter: (Identical to the first stop response)
				IP3: (Identical to the first stop response)
				IP3 receiving counter: (Identical to the first stop response)

Table 107 – General purpose communication data sender log measurement start/end (continued)

Setting parameter (Test data) (continued)	General purpose communication data sender log measurement stop (Second) (continued)	Response frame (continued)	Contents of data (M_RLT: 0) (continued)	IP4: (Identical to the first stop response)
				IP1 receiving counter: (Identical to the first stop response)
				IP5: (Identical to the first stop response)
				IP1 receiving counter: (Identical to the first stop response)
				IP6: (Identical to the first stop response)
				IP6 receiving counter: (Identical to the first stop response)
				IP7: (Identical to the first stop response)
				IP7 receiving counter: (Identical to the first stop response)
				IP8: (Identical to the first stop response)
				IP8 receiving counter: (Identical to the first stop response)
				IP9: (Identical to the first stop response)
				IP9 receiving counter: (Identical to the first stop response)
				IP10: (Identical to the first stop response)
				IP10 receiving counter: (Identical to the first stop response)
	Response watchdog time (from request frame transmission to response frame reception)		1 s	

e) Operation test of single setting tool (TCP) Operation test of single setting tool (TCP) is shown in Tables 108 through 123.

Table 108 – IO allocation setting/read

Test number	V3-027
Major test group	General purpose command server function
Test group	Operation test of single setting tool (TCP)
Test object	IO allocation setting/read
Test procedure	a) Start the EUT, then start the test equipment. b) The test equipment (setting tool interface) opens TCP connection with the EUT. c) The test equipment (TCP setting tool interface) transmits IO allocation setting frame (request). d) The test equipment (TCP setting tool interface) transmits IO allocation read frame (request) in case of receiving the normal response frame of IO allocation setting from the EUT, . e) The test equipment closes TCP connection with the EUT. f) The test shall be conducted with three (3) patterns of setting parameters (the number of control slaves: 0, 1 and 248), respectively.

Table 108 – IO allocation setting/read (continued)

<table>
<tr><td colspan="2">Evaluation criteria</td><td colspan="4">Confirm the followings:
a) The EUT transmits the IO allocation setting frame (response) to the IO allocation setting request from the test equipment .
b) The contents of the IO allocation setting frame (response) are as follows: (Decision criteria varies according to the EUT class.)
* Classes 3 (flexible master function implemented) and 4: Normal response (M_RLT: 0)
* Class 3 (flexible master function not-implemented): Normal response (M_RLT: 0), not-implemented response (M_RLT: 2) or no response.
NOTE: In case of normal response, the contents of data shall be correct.
c) The EUT transmits the IO allocation read frame (response) to the IO allocation read request from the test equipment.
d) The contents of the IO allocation read frame (response) are as follows: (Decision criteria varies according to the EUT class.)
* Classes 3 (flexible master function implemented) and 4: Normal response (M_RLT: 0)
* Class 3 (flexible master function not-implemented): Normal response (M_RLT: 0), not-implemented response (M_RLT: 2) or no response.
NOTE: In case of normal response, the Contents of data shall be correct.
e) In case the contents of IO allocation setting/number of control slaves is zero (0), the EUT does not transmit any solicitation frame.
f) In case the contents of IO allocation setting/number of control slaves is not zero (0), the EUT transmits solicitation frame(s).</td></tr>
<tr><td rowspan="7">Test necessity identified by the EUT class</td><td>Class 1</td><td colspan="4">N</td></tr>
<tr><td>Class 2</td><td colspan="4">N</td></tr>
<tr><td>Class 3</td><td colspan="4">O (In case TCP command server function implemented)</td></tr>
<tr><td>Class 4</td><td colspan="4">O (In case TCP command server function implemented)</td></tr>
<tr><td>Class 5</td><td colspan="4">N</td></tr>
<tr><td>Class 6</td><td colspan="4">N</td></tr>
<tr><td>Class 7</td><td colspan="4">N</td></tr>
<tr><td colspan="2" rowspan="18">Setting parameter (node)</td><td colspan="4">Pattern 1 (Number of control slaves: 0) and Pattern 2 (Number of control slaves: 1)</td></tr>
<tr><td rowspan="8">EUT</td><td rowspan="8"></td><td>Node number</td><td>1</td></tr>
<tr><td>Token watchdog time</td><td>(50)</td></tr>
<tr><td>Allowable minimum frame interval time</td><td>(10)</td></tr>
<tr><td>Area 1 data top address</td><td>256</td></tr>
<tr><td>Area 1 data size</td><td>16</td></tr>
<tr><td>Area 2 data top address</td><td>1 024</td></tr>
<tr><td>Area 2 data size</td><td>64</td></tr>
<tr><td>IO allocation setting (Case of class4)</td><td>optional</td></tr>
<tr><td rowspan="8">Test equipment</td><td rowspan="8"></td><td>Node number</td><td>3 (Controller)</td></tr>
<tr><td>Token watchdog time</td><td>254</td></tr>
<tr><td>Allowable minimum frame interval time</td><td>50</td></tr>
<tr><td>Area 1 data top address</td><td>10</td></tr>
<tr><td>Area 1 data size</td><td>4</td></tr>
<tr><td>Area 2 data top address</td><td>4</td></tr>
<tr><td>Area 2 data size</td><td>64</td></tr>
<tr><td>Node number</td><td>64</td></tr>
</table>

Table 108 – IO allocation setting/read (continued)

Setting parameter (node) (continued)	Pattern 3 (Number of control slaves: 248)			
	EUT		Node number	249
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	248
			Area 2 data top address	4 096
			Area 2 data size	3 968
			IO allocation setting (Case of class4)	optional
	Test equipment		Node number	3 (Controller)
			Token watchdog time	254
			Allowable minimum frame interval time	50
			Area 1 data top address	10
			Area 1 data size	4
			Area 2 data top address	4
			Area 2 data size	64
			Node number	64
Setting parameter (Test data)	Pattern 1 (Number of control slaves: 0)			
	IO allocation setting	Request frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	1
			TCD	65 018 (IO allocation setting request)
			Data size	24
			Contents of data	Setting number: 0
				Number of control slaves (whole): 0
				Lock ID: 0
				Lock timeout setting value: 1
				Slave node number: 0
				Input data address: 0
				Input data size: 0
				Output data address: 0
				Output data size: 0
				Input status address: 0
				Output status address: 0

Table 108 – IO allocation setting/read (continued)

Setting parameter (Test data) (continued)	IO allocation setting (continued)	Response frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	1
			Node address of destination side (DNA)	254
			TCD	65 218 (IO allocation setting response)
			Type of response message (M_RLT)	Depends on the EUT class * Classes 3 (flexible master function not-implemented) and 4: 0 (normal) * Class 3 (flexible master function implemented): 0 (normal) or 2 (not-implemented)
			Data size (M_RLT: 0)	8
			Contents of data (M_RLT: 0)	Result: 0(normal)
				Information: optional (no evaluation)
				Lock ID: optional (no evaluation)
	IO allocation read	Request frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	1
			TCD	65 019 (IO allocation read request)
			Data size	4
			Contents of data	Setting number: 1
		Response frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	1
			Node address of destination side (DNA)	254
			TCD	65 219 (IO allocation read response)
			Type of response message (M_RLT)	Depends on the EUT class * Classes 3 (flexible master function not-implemented) and 4: 0 (normal) * Class 3 (flexible master function implemented): 0 (normal) or 2 (not-implemented)
			Data size (M_RLT: 0)	20

Table 108 – IO allocation setting/read (continued)

Setting parameter (Test data) (continued)	IO allocation setting (continued)	Response frame (continued)	Contents of data (M_RLT: 0)	Setting number: 0
				Number of control slaves: 0
				Slave node number: optional (no evaluation)
				Input data address: optional (no evaluation)
				Input data size: optional (no evaluation)
				Output data address: optional (no evaluation)
				Output data size: optional (no evaluation)
				Input status address: optional (no evaluation)
				Output status address: optional (no evaluation)
	Pattern 2 (Number of control slaves: 1)			
	IO allocation setting	Request frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	1
			TCD	65 018 (IO allocation setting request)
			Data size	24
			Contents of data	Setting number: 1
				Number of control slaves (whole): 1
				Lock ID: 0
				Lock timeout setting value: 2
				Slave node number: 16#800D (Flexible setting mode, Node number: 13)
				Input data address: 16#0118 (Area1, Address: 280)
				Input data size: 4
				Output data address: 16#010C (Area1, Address: 268)
				Output data size: 4
				Input status address: 16#8460 (Area2, Address: 1 120)
				Output status address: 16#8430 (Area2, Address: 1 072)
		Response frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	1
			Node address of destination side (DNA)	254
			TCD	65 218 (IO allocation setting response)

Table 108 – IO allocation setting/read (continued)

Setting parameter (Test data) (continued)	IO allocation setting (continued)	Response frame (continued)	Type of response message (M_RLT)	Depends on the EUT class * Classes 3 (flexible master function not-implemented) and 4: 0 (normal) * Class 3 (flexible master function implemented): 0 (normal) or 2 (not-implemented)
			Data size (M_RLT: 0)	8
			Contents of data (M_RLT: 0)	Result: 0 (normal)
				Information: optional (no evaluation)
				Lock ID: not 0
	IO allocation read	Request frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	1
			TCD	65 019 (IO allocation read request)
			Data size	4
			Contents of data	Setting number: 1
		Response frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	1
			Node address of destination side (DNA)	254
			TCD	65 219 (IO allocation read response)
			Type of response message (M_RLT)	Depends on the EUT class * Classes 3 (flexible master function not-implemented) and 4: 0 (normal) * Class 3 (flexible master function implemented): 0 (normal) or 2 (not-implemented)
			Data size (M_RLT: 0)	20
			Contents of data (M_RLT: 0)	Setting number: 1
				Number of control slaves: 1
				Slave node number: 16#800D (Flexible setting mode, Node number: 13)
				Input data address: 16#0118 (Area1, Address: 280)
				Input data size: 4
				Output data address: 16#010C (Area1, Address: 268)

Table 108 – IO allocation setting/read (continued)

Setting parameter (Test data) (continued)	IO allocation read (continued)	Response frame (continued)	Contents of data (M_RLT: 0)	Output data size: 4
				Input status address: 16#8460 (Area2, Address: 1 120)
				Output status address: 16#8430 (Area2, Address: 1 072)
	Solicitation frame		Node address of source side (SNA)	1
			TCD	65 017(solicitation)
			Data size	16
			Contents of data	Slave node number: 16#800D (Flexible setting mode, Node number: 13)
				Input data address: 16#0118 (Area1, Address: 280)
				Input data size: 4
				Output data address: 16#010C (Area1, Address: 268)
				Output data size: 4
				Input status address: 16#8460 (Area2, Address: 1 120)
				Output status address: 16#8430 (Area2, Address: 1 072)
				Lock ID: 1
	Pattern 3 (Number of control slaves: 248)			
	(*N*: 0～247) IO allocation setting (*N*: 0 through 247)	Request frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	249
			TCD	65 018 (IO allocation setting request)
			Data size	24
			Contents of data	Setting number: *N* + 1
				Number of control slaves(The whole): 248
				Lock ID: Depends on setting number * Setting number1: 0 * Setting number2～248: Response Lock ID of setting number1
				Lock timeout setting value: 248
				Slave node number: 16#8001 + *N* (Flexible setting mode, Node number: 1 + *N*)
				Input data address: 16#0000 + *N* (Area1, Address: *N*)

Table 108 – IO allocation setting/read (continued)

Setting parameter (Test data) (continued)	(*N*: 0～247) IO allocation setting (*N*: 0 through 247) (continued)	Request frame (continued)	Contents of data (continued)	Input data size: 1
				Output data address: 16#0100 + *N* (Area1, Address: 256 + *N*)
				Output data size: 1
				Input status address: 16#8000 + (16 ×*N*) (Area2, Address: 16 × *N*)
				Output status address: 16#9000 + (16 ×*N*) (Area2, Address: 4 096＋16 × *N*)
		Response frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	249
			Node address of destination side (DNA)	254
			TCD	65 218 (IO allocation setting response)
			Type of response message (M_RLT)	Depends on the EUT class * Classes 3 (flexible master function not-implemented) and 4: 0 (normal) * Class 3 (flexible master function implemented): 0 (normal) or 2 (not-implemented)
			Data size (M_RLT: 0)	8
			Contents of data (M_RLT: 0)	* *N*: 0 through 246: 1 (continue) * *N*: 247: 0 (normal)
				Information: optional (no evaluation)
				Lock ID: same value except 0 at N: 0 through 247,
	(*N*: 0～247)	Request frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	249
			TCD	65 019 (IO allocation read request)
			Data size	4
			Contents of data	Setting number: *N* + 1
		Response frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	249
			Node address of destination side (DNA)	254

Table 108 – IO allocation setting/read (continued)

Setting parameter (Test data) (continued)	(*N*: 0～247) IO allocation read (*N*: 0 through 247) (continued)	Response frame (continued)	TCD	65 219 (IO allocation read response)
			Type of response message (M_RLT)	Depends on the EUT class * Classes 3 (flexible master function not-implemented) and 4: 0 (normal) * Class 3 (flexible master function implemented): 0 (normal) or 2 (not-implemented)
			Data size (M_RLT: 0)	20
			Contents of data (M_RLT: 0)	Setting number: *N* + 1
				Number of control slaves: 248
				Slave node number: 16#8001 + *N* (Flexible setting mode, Node number: 1 + *N*)
				Input data address: 16#0000 + *N* (Area1, Address: *N*)
				Input data size: 1
				Output data address: 16#0100 + *N* (Area1, Address: 256 + *N*)
				Output data size: 1
				Input status address: 16#8000 + (16 ×*N*) (Area2, Address: 16 × *N*)
				Output status address: 16#9000 + (16 ×*N*) (Area2, Address: 4 096＋16 × *N*)
	Solicitation frame (divided by four)	First division frame	Node address of source side (SNA)	249
			TCD	65 017 (solicitation)
			Data size	1 024
			Contents of data (for 64 nodes) (*N*: 0 through 63)	Slave node number: 16#8001 + *N* (Flexible setting mode, Node number: 1 + *N*)
				Input data address: 16#0000 + *N* (Area1, Address: *N*)
				Input data size: 1
				Output data address: 16#0100 + *N* (Area1, Address: 256 + *N*)
				Output data size: 1
				Input status address: 16#8000 + (16 ×*N*) (Area2, Address: 16 × *N*)
				Output status address: 16#9000 + (16 ×*N*) (Area2, Address: 4 096＋16 × *N*)
				Lock ID: 249

Table 108 – IO allocation setting/read (continued)

Setting parameter (Test data) (continued)	Solicitation frame (divided by four) (continued)	Second division frame	Node address of source side (SNA)	249
			TCD	65 017 (solicitation)
			Data size	1 024
			Contents of data (for 64 nodes) (N: 0～63)	Slave node number: 16#8041 + *N* (Flexible setting mode, Node number: 65 + *N*)
				Input data address: 16#0040 + *N* (Area1, Address: 64 + *N*)
				Input data size: 1
				Output data address: 16#0140 + *N* (Area1, Address: 320 + *N*)
				Output data size: 1
				Input status address: 16#8400 + (16 ×*N*) (Area2, Address: 1024 + 16 × *N*)
				Output status address: 16#9400 + (16 ×*N*) (Area2, Address: 5 120＋16 × *N*)
				Lock ID: 249
		Third division frame	Node address of source side (SNA)	249
			TCD	65 017 (solicitation)
			Data size	1 024
			Contents of data (for 64 nodes) (N: 0～63)	Slave node number: 16#8081 + *N* (Flexible setting mode, Node number: 129 + *N*)
				Input data address: 16#0080 + N (Area1, Address: 128 + N)
				Input data size: 1
				Output data address: 16#0180 + *N* (Area1, Address: 384 + *N*)
				Output data size: 1
				Input status address: 16#8800 + (16 ×*N*) (Area2, Address: 2048 + 16 × *N*)
				Output status address: 16#9800 + (16 ×*N*) (Area2, Address: 6 144＋16 × *N*)
				Lock ID: 249

Table 108 – IO allocation setting/read (continued)

Setting parameter (Test data) (continued)	Solicitation frame (divided by four) (continued)	Fourth division frame	Node address of source side (SNA)	249
			TCD	65 017 (solicitation)
			Data size	896
			Contents of data (for 56 nodes) (N: 0～55)	Slave node number: 16#80C1 + *N* (Flexible setting mode, Node number: 193 + *N*)
				Input data address: 16#00C0 + *N* (Area1, Address: 192 + *N*)
				Input data size: 1
				Output data address: 16#01C0 + *N* (Area1, Address: 448 + *N*)
				Output data size: 1
				Input status address: 16#8C00 + (16 ×*N*) (Area2, Address: 3 072 + 16 × *N*)
				Output status address: 16#9C00 + (16 ×*N*) (Area2, Address: 7 168＋16 × *N*)
				Lock ID: 249
	Response watchdog time (from request frame transmission to response frame reception)		1 s	

Table 109 – Token retention time measurement start/end

Test number		V3-028			
Major test group		General purpose command server function			
Test group		Operation test of single setting tool (TCP)			
Test object		Token retention time measurement start/end			
Test procedure		a) Start the EUT and the test equipment, then start the dummy node. b) The test equipment (setting tool interface) opens TCP connection with the EUT. c) The test equipment (TCP setting tool interface) transmits a token retention time measurement start (request). d) The test equipment disengage from the network. (stop the transmission of token frame.) e) The test equipment rejoin the network. f) The test equipment (TCP setting tool interface) transmits a token retention time measurement end (request) 60 seconds later than receiving a token retention time measurement start frame (normal response), g) The test equipment transmits a log data read message (request). h) The test equipment closes TCP connection with the EUT.			
Evaluation criteria		Confirm the followings: a) The EUT transmits the token retention time measurement start frame (response) to the token retention time measurement start request from the test equipment. b) The token retention time measurement start frame (response) is normal response (M_RLT: 0). c) The EUT transmits a token retention time measurement end frame (response) to the token retention time measurement end request from the test equipment. d) The token retention time measurement end frame (response) is normal response(M_RLT: 0), and contents of the data are as follows: * Number of tokens during measuring the token retention time is not zero (0). e) The EUT transmits a log data read message (response) to the log data read request from the test equipment. f) The log data read message (response) is normal response (M_RLT: 0), and contents of the data are as follows: * The measuring time for token retention time is identical to the token retention time measurement end response. * Number of tokens during measuring the token retention time is not zero (0).			
Test necessity identified by the EUT class	Class 1	N			
	Class 2	N			
	Class 3	O (In case TCP command server function implemented)			
	Class 4	O (In case TCP command server function and command server load measurement function implemented)			
	Class 5	O (In case TCP command server function and command server load measurement function implemented)			
	Class 6	O (In case TCP command server function and command server load measurement function implemented)			
	Class 7	O (In case TCP command server function and command server load measurement function implemented)			
Setting parameter (node)		EUT (The parameter varies according to the EUT class)	Classes 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0

Table 109 – Token retention time measurement start/end (continued)

Setting parameter (node)	EUT (The parameter varies according to the EUT class) (continued)	Classes 3 and 4 (continued)	Area 2 data size	16
			IO allocation setting (class 4)	optional
		Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1 024
			Area 2 data size	1 024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave of the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the number of input points and output points of the slave of the EUT
	Test equipment (The parameter varies according to the EUT class)	Classes 3, 4 and 5	Implementation class	3 (Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	Depends on number of output points of the slave of the EUT * 0 point: 0 * 1 point of more: 256
			Area 1 data size	To be calculated the size from number of output points of the slave of the EUT
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1

Table 109 – Token retention time measurement start/end (continued)

Setting parameter (node) (continued)	Test equipment (The parameter varies according to the EUT class) (continued)	Class 6 (continued)	IO allocation setting (Slave setting)	Slave node number: 16#8001 (Flexible setting mode, Node number: 1)
				Input data address: 16#0000 (Area1, Address: 0)
				Input data size: To be calculated from the number of input points of the slave of the EUT
				Output data address: Depends on number of output points of the slave of the EUT * 0 point: 16#0000 (Area1, Address: 0) * 1 point of more: 16#0100 (Area1, Address: 256)
				Output data size: To be calculated from the number of output points of the slave of the EUT
				Input status address: 16#8000 (Area2, Address: 0)
				Output status address: 16#8400 (Area2, Address: 1024)
		Class 7	Implementation class	3 (Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64
	dummy node		Implementation class	3 (Controller)
			Node number	2
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
Setting parameter (Test data)	Token retention time measurement start	Request frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100

Table 109 – Token retention time measurement start/end (continued)

Setting parameter (Test data) (continued)	Token retention time measurement start (continued)	Request frame (continued)	TCD	65 020 (token retention time measurement start request)
			Data size	0
			Contents of data	NA
		Response frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65 220 (token retention time measurement start response)
			Type of response message (M_RLT)	0 (normal response)
			Data size (M_RLT: 0)	0
			Contents of data	NA
	Token retention time measurement end	Request frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 021 (token retention time measurement end request)
			Data size	0
			Contents of data	NA
		Response frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65 221 (token retention time measurement end response)
			Type of response message (M_RLT)	0 (normal response)
			Data size (M_RLT: 0)	76
			Contents of data (M_RLT: 0)	Number of tokens during measuring the token retention time: not 0
	Log data read	Request message	Interface	FL-net message
			Node address of source side (SNA)	254

Table 109 – Token retention time measurement start/end (continued)

Setting parameter (Test data) (continued)	Log data read (continued)	Request message (continued)	Node address of destination side (DNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 013 (Log data read request)
			Data size	0
			Contents of data	NA
		Response message	Interface	FL-net message
			Node address of source side (SNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65 013 (Log data read response)
			Type of response message (M_RLT)	0 (normal response)
			Data size	512
			Contents of data	measuring time for token retention time: (token retention time measurement end response)
				Number of tokens during measuring the token retention time: (token retention time measurement end response)
	Response watchdog time (from request frame transmission to response frame reception)		1 s	

Table 110 – General purpose communication data sender log measurement start/end

Test number	V3-029
Major test group	General purpose command server function
Test group	Operation test of single setting tool (TCP)
Test object	General purpose communication data sender log measurement start/end
Test procedure	a) Start the EUT, then start the test equipment. b) The test equipment (setting tool interface) opens TCP connection with the EUT. c) The test equipment transmits a general purpose communication data. d) The test equipment (TCP setting tool interface) transmits a general purpose communication data sender log measurement start frame (request). e) The test equipment transmits a general purpose communication data. f) The test equipment (TCP setting tool interface) transmits a general purpose communication data sender log measurement end frame (request) 60 seconds later than receiving a general purpose communication data sender log measurement start frame (normal response) from the EUT. g) The test equipment transmits a log data read message (request). h) The test equipment closes TCP connection with the EUT.

Table 110 – General purpose communication data sender log measurement start/end (continued)

<table>
<tr><td colspan="2">Evaluation criteria</td><td colspan="4">Confirm the followings:
a) The EUT transmits a general purpose communication data sender log measurement start frame (response) to a general purpose communication data sender log measurement start request from the test equipment.
b) The general purpose communication data sender log measurement start frame (response) is normal response (M_RLT: 0).
c) The EUT transmits a general purpose communication data sender log measurement end frame (response) to a general purpose communication data sender log measurement end request from the test equipment.
d) The general purpose communication data sender log measurement end frame (response) is normal response (M_RLT: 0).
e) The EUT transmits a log data read message (response) to the log data read request from the test equipment.
f) The log data read message (response) is normal response (M_RLT: 0), and contents of the data are as follows:
* The measuring time for general purpose communication data sender log is identical to the general purpose communication data sender log measurement end response.
* IP1through IP10 (receiving counters) are identical to the general purpose communication data sender log measurement end response.</td></tr>
<tr><td rowspan="7">Test necessity identified by the EUT class</td><td>Class 1</td><td colspan="4">N</td></tr>
<tr><td>Class 2</td><td colspan="4">N</td></tr>
<tr><td>Class 3</td><td colspan="4">O (In case TCP command server function implemented)</td></tr>
<tr><td>Class 4</td><td colspan="4">O (In case TCP command server function and command server load measurement function implemented)</td></tr>
<tr><td>Class 5</td><td colspan="4">O (In case TCP command server function and command server load measurement function implemented)</td></tr>
<tr><td>Class 6</td><td colspan="4">O (In case TCP command server function and command server load measurement function implemented)</td></tr>
<tr><td>Class 7</td><td colspan="4">O (In case TCP command server function and command server load measurement function implemented)</td></tr>
<tr><td colspan="2" rowspan="14">Setting parameter (node)</td><td rowspan="14">EUT (The parameter varies according to the EUT class)</td><td rowspan="8">Classes 3 and 4</td><td>Node number</td><td>1</td></tr>
<tr><td>Token watchdog time</td><td>(50)</td></tr>
<tr><td>Allowable minimum frame interval time</td><td>(10)</td></tr>
<tr><td>Area 1 data top address</td><td>0</td></tr>
<tr><td>Area 1 data size</td><td>4</td></tr>
<tr><td>Area 2 data top address</td><td>0</td></tr>
<tr><td>Area 2 data size</td><td>16</td></tr>
<tr><td>IO allocation setting (class 4)</td><td>optional</td></tr>
<tr><td rowspan="6">Class 5</td><td>Node number</td><td>100</td></tr>
<tr><td>Token watchdog time</td><td>(100)</td></tr>
<tr><td>Allowable minimum frame interval time</td><td>(10)</td></tr>
<tr><td>Area 1 data top address</td><td>256</td></tr>
<tr><td>Area 1 data size</td><td>256</td></tr>
<tr><td>Area 2 data top address</td><td>1 024</td></tr>
<tr><td>Area 2 data size</td><td>1 024</td></tr>
</table>

Table 110 – General purpose communication data sender log measurement start/end (continued)

Setting parameter (node) (continued)	EUT (The parameter varies according to the EUT class) (continued)	Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave of the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the number of input points and output points of the slave of the EUT
	Test equipment (The parameter varies according to the EUT class)	Classes 3, 4 and 5	Implementation class	3 (Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	Depends on number of output points of the slave of the EUT * 0 point: 0 * 1 point of more: 256
			Area 1 data size	To be calculated from the number of output points of the slave of the EUT
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (Slave setting)	Slave node number: 16#8001 (Flexible setting mode, Node number: 1)
				Input data address: 16#0000 (Area1, Address: 0)
				Input data size: To be calculated from the number of input points of the slave of the EUT

Table 110 – General purpose communication data sender log measurement start/end (continued)

Setting parameter (node) (continued)	Test equipment (The parameter varies according to the EUT class) (continued)	Class 6 (continued)	IO allocation setting (Slave setting) (continued)	Output data address: Depends on number of output points of the slave of the EUT * 0 point: 16#0000 (Area1, Address: 0) * 1 point of more: 16#0100 (Area1, Address: 256)
				Output data size: To be calculated from the number of output points of the slave of the EUT
				Input status address: 16#8000 (Area2, Address: 0)
				Output status address: 16#8400 (Area2, Address: 1024)
		Class 7	Implementation class	3 (Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64
Setting parameter (Test data)	General purpose communication data sender log measurement start	Request frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 022 (general purpose communication data sender log measurement start request)
			Data size	0
			Contents of data	NA
		Response frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65 222 (general purpose communication data sender log measurement start response)
			Type of response message (M_RLT)	0 (normal response)

Table 110 – General purpose communication data sender log measurement start/end (continued)

Setting parameter (Test data) (continued)	General purpose communication data sender log measurement start (continued)	Response frame (continued)	Data size (M_RLT: 0)	0
			Contents of data	NA
	General purpose communication data	Pattern *N* (*N*: 1 through 6)	Interface	TCP
			Source IP address	192.168.250.(248 + *N*)
			Destination IP address	Depends on the EUT class * Classes 3, 4, 6 and 7: 192.168.250.1 * Class 5: 192.168.250.100
			Source port number	54 998＋*N*
			Destination port number	54 998＋*N*
			Data	optional
			Number of transmissions	*N*
		Pattern 7	Interface	UDP
			Source IP address	1.2.3.4
			Destination IP address	1.2.3.255
			Source port number	10 000
			Destination port number	10 001
			Data	optional
			Number of transmissions	10 times
		Pattern 8	Interface	UDP
			Source IP address	192.168.0.254
			Destination IP address	192.168.0.255
			Source port number	55 001
			Destination port number	55 000
			Data	optional
			Number of transmissions	9
		Pattern 9	Interface	UDP
			Source IP address	192.168.250.125
			Destination IP address	192.168.250.255
			Source port number	55 002
			Destination port number	55 001
			Data	optional
			Number of transmissions	8
		Pattern 10	Interface	UDP
			Source IP address	123.45.6.78
			Destination IP address	123.45.6.255
			Source port number	55 000
			Destination port number	55 003
			Data	optional
			Number of transmissions	7
		Pattern 11	Interface	TCP
			Source IP address	192.168.250.200

Table 110 – General purpose communication data sender log measurement start/end (continued)

Setting parameter (Test data) (continued)	General purpose communication data (continued)	Pattern 11 (continued)	Destination IP address	Depends on the EUT class * Classes 3, 4, 6 and 7: 192.168.250.1 * Class 5: 192.168.250.100
			Source port number	55 003
			Destination port number	55 000
			Data	optional
			Number of transmissions	6
	General purpose communication data sender log measurement end	Request frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 023 (General purpose communication data sender log measurement stop request)
			Data size	0
			Contents of data	NA
		Response frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65 223 (General purpose communication data sender log measurement stop response)
			Type of response message (M_RLT)	0(normal)
			Data size (M_RLT: 0)	84
			Contents of data (M_RLT: 0)	Optional(no evaluation)
	Log data read	Request message	Interface	FL-net message
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 013 (Log data read request)
			Data size	0
			Contents of data	NA

Table 110 – General purpose communication data sender log measurement start/end (continued)

Setting parameter (Test data) (continued)	Log data read (continued)	Response message (continued)	Interface	FL-net message
			Node address of source side (SNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65 213(Log data read response)
			Type of response message (M_RLT)	0(normal)
			Data size	512
			Contents of data	Measuring time for general purpose communication data sender log: (Identical to General purpose communication data sender log measurement stop response)
				IP1: (Identical to General purpose communication data sender log measurement stop response)
				IP1 receiving counter: (Identical to General purpose communication data sender log measurement stop response)
				IP2: (Identical to General purpose communication data sender log measurement stop response)
				IP2 receiving counter: (Identical to General purpose communication data sender log measurement stop response)
				IP3: (Identical to General purpose communication data sender log measurement stop response)
				IP3 receiving counter: (Identical to General purpose communication data sender log measurement stop response)
				IP4: (Identical to General purpose communication data sender log measurement stop response)
				IP4 receiving counter: (Identical to General purpose communication data sender log measurement stop response)
				IP5: (Identical to General purpose communication data sender log measurement stop response)
				IP5 receiving counter: (Identical to General purpose communication data sender log measurement stop response)
				IP6: (Identical to General purpose communication data sender log measurement stop response)
				IP6 receiving counter: (Identical to General purpose communication data sender log measurement stop response)
				IP7: (Identical to General purpose communication data sender log measurement stop response)
				IP7 receiving counter: (Identical to General purpose communication data sender log measurement stop response)
				IP8: (Identical to General purpose communication data sender log measurement stop response)
				IP8 receiving counter: (Identical to General purpose communication data sender log measurement stop response)

Table 110 – General purpose communication data sender log measurement start/end (continued)

Setting parameter (Test data) (continued)	Log data read (continued)	Response message (continued)	Contents of data (continued)	IP9: (Identical to General purpose communication data sender log measurement stop response)
				IP9 receiving counter: (Identical to General purpose communication data sender log measurement stop response)
				IP10: (Identical to General purpose communication data sender log measurement stop response)
				IP10 receiving counter: (Identical to General purpose communication data sender log measurement stop response)
	Response watchdog time (from request frame transmission to response frame reception)		1 s	

Table 111 – Configuration parameter setting, and self node setting information parameter read

Test number	V3-030
Major test group	General purpose command server function
Test group	Operation test of single setting tool (TCP)
Test object	Configuration parameter setting, and self node setting information parameter read
Test procedure	a) Start the EUT and the test equipment, then start the dummy node. b) The test equipment (setting tool interface) opens TCP connection with the EUT. c) The test equipment (TCP setting tool interface) transmits a configuration parameter setting frame (request). d) The test equipment (TCP setting tool interface) transmits a self node setting information parameter read frame (request) after receiving the configuration parameter setting frame (normal response) from the EUT . e) The test equipment closes TCP connection with the EUT.
Evaluation criteria	Confirm the followings: a) The EUT transmits a configuration parameter setting frame (response) to a configuration parameter setting request from the test equipment. b) The contents of a configuration parameter setting frame (response) are as follows: (Decision criteria varies according to the EUT class.) * Class3, 4, 6: Normal response (M_RLT: 0) * Classes 5 and 7: Normal response (M_RLT: 0), not-implemented response (M_RLT: 2) or no response. NOTE: In case of normal response, the contents of data shall be identical to the request data. c) The EUT transmits a self node setting information parameter read frame (response) to the self node setting information parameter read request from the test equipment. d) The contents of the self node setting information parameter read frame (response) are as follows; (Decision criteria varies according to the EUT class.) * Classes 3, 4 and 6: Normal response (M_RLT: 0) * Classes 5 and 7: Normal response (M_RLT: 0), not-implemented response (M_RLT: 2) or no response. NOTE: The contents of data in the normal response are identical to the configuration parameter setting request data.

Table 111 – Configuration parameter setting, and self node setting information parameter read (continued)

Test necessity identified by the EUT class	Class 1	N			
	Class 2	N			
	Class 3	O (In case TCP command server function implemented)			
	Class 4	O (In case TCP command server function implemented)			
	Class 5	O (In case TCP command server function implemented)			
	Class 6	O (In case TCP command server function implemented)			
	Class 7	O (In case TCP command server function implemented)			
Setting parameter (node)		EUT (The parameter varies according to the EUT class)	Classes 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	16
				IO allocation setting (Case of class4)	optional
			Class 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1 024
				Area 2 data size	1 024
			Classes 6 and 7	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	To be calculated from the number of input points of the slave of the EUT
				Area 2 data top address	0
				Area 2 data size	To be calculated from the number of input points and output points of the slave of the EUT
		Test equipment (The parameter varies according to the EUT class)	Classes 3, 4 and 5	Implementation class	3 (Controller)
				Node number	254
				Token watchdog time	50
				Allowable minimum frame interval time	10
				Area 1 data top address	4
				Area 1 data size	4
				Area 2 data top address	64
				Area 2 data size	64

Table 111 – Configuration parameter setting, and self node setting information parameter read (continued)

Setting parameter (node) (continued)	Test equipment (The parameter varies according to the EUT class) (continued)	Class 6	Implementation class	4 (Flexible master)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	Depends on number of output points of the slave of the EUT * 0 point: 0 * 1 point of more: 256
			Area 1 data size	To be calculated from the number of output points of the slave of the EUT
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (Slave setting)	Slave node number: 16#8001 (Flexible setting mode, Node number: 1)
				Input data address: 16#0000 (Area1, Address: 0)
				Input data size: To be calculated from the number of input points of the slave of the EUT
				Output data address: Depends on number of output points of the slave of the EUT * 0 point: 16#0000 (Area1, Address: 0) * 1 point of more: 16#0100 (Area1, Address: 256)
				Output data size: To be calculated from the number of output points of the slave of the EUT
				Input status address: 16#8000 (Area2, Address: 0)
				Output status address: 16#8400 (Area2, Address: 1024)
		Class 7	Implementation class	3 (Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64

Table 111 – Configuration parameter setting, and self node setting information parameter read (continued)

Setting parameter (Test data)	Configuration parameter setting	Request frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 024 (configuration parameter setting request)
			Data size	28
			Contents of data	Update flag: Depends on the EUT class * Classes 3 and 4: 16#000F * Class5, 6, 7: 16#000E
				Node name: “RenewNode1”
				Common memory Area 1 data top address: 256
				Common memory Area 1 data size: 128
				Common memory Area 2 data top address: 4 096
				Common memory Area 2 data size: 1 024
				Token watchdog time: 200
				Allowable minimum frame interval time: 15
		Response frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65 224 (configuration parameter setting response)
			Type of response message (M_RLT)	Depends on the EUT class * Class3, 4, 6: 0 (normal) * Class5, 7: 0 (normal) or 2 (not-implemented)
			Data size (M_RLT: 0)	24
			Contents of data (M_RLT: 0)	Node name: “RenewNode1”
				Common memory Area 1 data top address: Depends on the EUT class * Classes 3, and 4: 256 * Class 5: 256 * Classes 6 and 7: 0

Table 111 – Configuration parameter setting, and self node setting information parameter read (continued)

Setting parameter (Test data) (continued)	Configuration parameter setting (continued)	Response frame (continued)	Contents of data (M_RLT: 0) (continued)	Common memory Area 1 data size: Depends on the EUT class * Classes 3 and 4: 128 * Class 5: 256 * Classes 6 and 7: To be calculated from the number of input points of the slave of the EUT
				Common memory Area 2 data top address: Depends on the EUT class * Classes 3 and 4: 4 096 * Class 5: 1 024 * Classes 6 and 7: 0
				Common memory Area 2 data size: Depends on the EUT class * Classes 3 and 4: 1 024 * Class 5: 1 024 * Classes 6 and 7: To be calculated from the number of input points and output points of the slave of the EUT
				Token watchdog time: 200
				Allowable minimum frame interval time: 15
	Self node setting information parameter read	Request frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 027 (self node setting information parameter read request)
			Data size	0
			Contents of data	NA
		Response frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65 227 (self node setting information parameter read response)
			Type of response message (M_RLT)	Depends on the EUT class * Class3, 4, 6: 0 (normal) * Class5, 7: 0 (normal) or 2 (not-implemented)
			Data size (M_RLT: 0)	24

Table 111 – Configuration parameter setting, and self node setting information parameter read (continued)

Setting data (Test data) (continued)	Self node setting information parameter read (continued)	Response frame (continued)	Contents of data (M_RLT: 0)	Common memory Area 1 data top address: Depends on the EUT class * Classes 3 and 4: 256 * Class 5: 256 * Classes 6 and 7: 0
				Common memory Area 1 data size: Depends on the EUT class * Classes 3 and 4: 128 * Class 5: 256 * Classes 6 and 7: To be calculated from the number of input points of the slave of the EUT
				Common memory Area 2 data top address: Depends on the EUT class * Classes 3 and 4: 4 096 * Class 5: 1 024 * Classes 6 and 7: 0
				Common memory Area 2 data size: Depends on the EUT class * Classes 3 and 4: 1 024 * Class 5: 1 024 * Classes 6 and 7: To be calculated from the number of input points and output points of the slave of the EUT
				Token watchdog time: 200
				Allowable minimum frame interval time: 15
				Node name: “RenewNode1”
	Response watchdog time (from request frame transmission to response frame reception)		1 s	

Table 112 – Participation node management information parameter read

Test number	V3-031
Major test group	General purpose command server function
Test group	Operation test of single setting tool (TCP)
Test object	Participation node management information parameter read
Test procedure	a) Start the EUT and the test equipment, then start the dummy node. b) The test equipment (setting tool interface) opens TCP connection with the EUT. c) The test equipment (TCP setting tool interface) transmits a participation node management information parameter read frame (request, node number: the EUT). d) The test equipment (TCP setting tool interface) transmits a participation node management information parameter read frame (request, node number: the test equipment). e) The test equipment closes TCP connection with the EUT.

Table 112 – Participation node management information parameter read (continued)

Evaluation criteria		Confirm the followings: a) The EUT transmits the response frames two times for the two request frames. b) The contents of two response frames are normal response (M_RLT: 0),and the contents of data are correct.			
Test necessity identified by the EUT class	Class 1	N			
	Class 2	N			
	Class 3	O (In case TCP command server function implemented)			
	Class 4	O (In case TCP command server function implemented)			
	Class 5	O (In case TCP command server function implemented)			
	Class 6	N			
	Class 7	N			
Setting parameter (node)		EUT (The parameter varies according to the EUT class)	Classes 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	16
				IO allocation setting (Class 4)	optional
			Class 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1 024
				Area 2 data size	1 024
		Test equipment	Classes 3, 4 and 5	Implementation class	3 (Controller)
				Node number	254
				Token watchdog time	50
				Allowable minimum frame interval time	10
				Area 1 data top address	4
				Area 1 data size	4
				Area 2 data top address	64
				Area 2 data size	64

Table 112 – Participation node management information parameter read (continued)

Setting parameter (Test data)	Participation node management information parameter read (Node number: The EUT)	Request frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	Depends on the EUT class * Classes 3 and 4: 1 * Class 5: 100
			TCD	65 025 (Participation node management information parameter read request)
			Data size	4
			Contents of data	Node number: Depends on the EUT class * Classes 3 and 4: 1 * Class 5: 100
		Response frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	Depends on the EUT class * Classes 3 and 4: 1 * Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65 225 (Participation node management information parameter read response)
			Type of response message (M_RLT)	0 (normal)
			Data size (M_RLT: 0)	20
			Contents of data (M_RLT: 0)	Node number: Depends on the EUT class * Classes 3 and 4: 1 * Class 5: 100
				Common memory Area 1 data top address: Depends on the EUT class * Classes 3 and 4: 0 * Class 5: 256
				Common memory Area 1 data size: Depends on the EUT class * Classes 3 and 4: 4 * Class 5: 256
				Common memory Area 2 data top address: Depends on the EUT class * Classes 3 and 4: 0 * Class 5: 1 024
				Common memory Area 2 data size: Depends on the EUT class * Classes 3 and 4: 16 * Class 5: 1 024

Table 112 – Participation node management information parameter read (continued)

Setting parameter (Test data) (continued)	Participation node management information parameter read (Node number: The EUT) (continued)	Response frame (continued)	Contents of data (M_RLT: 0) (continued)	Allowable refresh cycle time: (no evaluation)
				Token watchdog time: (no evaluation)
				Allowable minimum frame interval time: (no evaluation)
				FA link status: (no evaluation)
	Participation node management information parameter read (Node number : The test equipment)	Request frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	Depends on the EUT class * Classes 3 and 4: 1 * Class 5: 100
			TCD	65 025 (Participation node management information parameter read request)
			Data size	4
			Contents of data	254
		Response frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	Depends on the EUT class * Classes 3 and 4: 1 * Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65 225 (Participation node management information parameter read response)
			Type of response message (M_RLT)	0 (normal)
			Data size (M_RLT: 0)	20
			Contents of data (M_RLT: 0)	Node number: 254
				Common memory Area 1 data top address: 4
				Common memory Area 1 data size: 4
				Common memory Area 2 data top address: 64
				Common memory Area 2 data size: 64
				Allowable refresh cycle time: (no evaluation)
				Token watchdog time: 50
				Allowable minimum frame interval time: 10
				FA link status: (no evaluation)
	Response watchdog time (from request frame transmission to response frame reception)		1 s	

Table 113 – Self node management information parameter read

Test number		V3-032		
Major test group		General purpose command server function		
Test group		Operation test of single setting tool (TCP)		
Test object		Self node management information parameter read		
Test procedure		a) Start the EUT and the test equipment, then start the dummy node. b) The test equipment (setting tool interface) opens TCP connection with the EUT. c) The test equipment (TCP setting tool interface) transmits a self node management information parameter read frame (request). d) The test equipment closes TCP connection with the EUT.		
Evaluation criteria		Confirm the followings: a) The EUT transmits a response frame to the request frame. b) The response frame is normal response (M_RLT: 0), and the contents of data are identical to the EUT setting contents.		
Test necessity identified by the EUT class	Class 1	N		
	Class 2	N		
	Class 3	O (In case TCP command server function implemented)		
	Class 4	O (Incase TCP command server function implemented)		
	Class 5	O (In case TCP command server function implemented)		
	Class 6	O (In case TCP command server function implemented)		
	Class 7	O (In case TCP command server function implemented)		
Setting parameter (node)		EUT (The parameter varies according to the EUT class)	Classes 3 and 4	Node number: 1 Token watchdog time: (50) Allowable minimum frame interval time: (10) Area 1 data top address: 0 Area 1 data size: 4 Area 2 data top address: 0 Area 2 data size: 16 Node name: “TargetNode” IO allocation setting (Class 4): optional
			Class 5	Node number: 100 Token watchdog time: (100) Allowable minimum frame interval time: (10) Area 1 data top address: 256 Area 1 data size: 256 Area 2 data top address: 1 024 Area 2 data size: 1 024 Node name: “TargetNode”
			Classes 6 and 7	Node number: 1 Token watchdog time: (50) Allowable minimum frame interval time: (10)

Table 113 – Self node management information parameter read

Setting parameter (node) (continued)	EUT (The parameter varies according to the EUT class) (continued)	Classes 6 and 7 (continued)	Area 1 data top address	0
			Area 1 data size	To be calculated from number of input points of the slave, the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from numbers of input and output points of the slave, the EUT
			Node name	“TargetNode”
	Test equipment (The parameter varies according to the EUT class)	Classes 3, 4 and 5	Implementation class	3 (Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class6	Implementation class	4 (Flexible master)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	Depends on number of output points of the slave of the EUT * 0 point: 0 * 1 point of more: 256
			Area 1 data size	To be calculated from the number of output points of the slave of the EUT
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (Slave setting)	Slave node number: 16#8001 (Flexible setting mode, Node number: 1)
				Input data address: 16#0000 (Area1, Address: 0)
				Input data size: To be calculated the size from number of input points of the slave of the EUT
				Output data address: Depends on number of output points of the slave of the EUT * 0 point: 16#0000 (Area1, Address: 0) * 1 point of more: 16#0100 (Area1, Address: 256)
				Output data size: To be calculated from the number of output points of the slave of the EUT
				Input status address: 16#8000 (Area2, Address: 0)

Table 113 – Self node management information parameter read (continued)

Setting parameter (node) (continued)	Test equipment (The parameter varies according to the EUT class) (continued)	Class 6 (continued)	IO allocation setting (Slave setting) (continued)	Output status address: 16#8400 (Area2, Address: 1024)
		Class 7	Implementation class	3 (Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64
Setting parameter (Test data)	Request frame		Interface	TCP setting tool interface
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 026 (Self node management information parameter read request)
			Data size	0
			Contents of data	NA
	Response frame		Interface	TCP setting tool interface
			Node address of source side (SNA)	Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65 226 (Self node management information parameter read response)
			Type of response message (M_RLT)	0 (normal response)
			Data size	64
			Contents of data	Node number: Depends on the EUT class * Classes 3, 4, 6 and 7: 1 * Class 5: 100
				Common memory Area 1 data top address: Depends on the EUT class * Classes 3, 4, 6 and 7: 0 * Class 5: 256

Table 113 – Self node management information parameter read (continued)

Setting parameter (Test data) (continued)	Response frame (continued)	Contents of data (continued)	Common memory Area 1 data size: Depends on the EUT class * Classes 3 and 4: 4 * Class 5: 256 * Classes 6 and 7: To be calculated from the number of input points of the slave of the EUT
			Common memory Area 2 data top address: Depends on the EUT class * Classes 3, 4, 6 and 7: 0 * Class 5: 1 024
			Common memory Area 2 data size: Depends on the EUT class * Classes 3 and 4: 16 * Class 5: 1 024 * Classes 6 and 7: To be calculated from the number of input points and output points of the slave of the EUT
			Upper layer status: (no evaluation)
			Token watchdog time: (no evaluation)
			Allowable minimum frame interval time: (no evaluation)
			Vender code of node information: Depends on the EUT specification (Confirmed by test executor)
			Manufacturer model name: Depends on the EUT specification (Confirmed by test executor)
			Node name: “TargetNode”
			Protocol type: 128
			FA link status: (no evaluation)
			Status of the self node: (no evaluation)
			Identification of the self node class: The EUT class number
	Response watchdog time (from request frame transmission to response frame reception)	1 s	

Table 114 – Node Reset

Test number		V3-033			
Test large classification		General purpose command server function			
Test classification		Operation test of single setting tool (TCP)			
Test items		Node reset			
Test procedure		a) Start the equipment under test and the test equipment. Then, start the dummy node. b) The test equipment (TCP setting tool interface) opens a TCP connection with the EUT. c) The test equipment (TCP setting tool interface) transmits a node reset frame (request). d) The test equipment closes the TCP connection with the EUT.			
Evaluation criteria		a) Confirm that the equipment under test transmits a response frame for the request frame. b) Confirm the contents of the response frame by the following Classes of the equipment under test: * Class 3, 4, 5: Normal response (M_RLT = 0), not-implemented response (M_RLT = 2), or no response * Class 6, 7: Normal response (M_RLT = 0). c) In the case of normal response, confirm that the equipment under test is temporarily disengaged from the network and rejoined to the network within 10 seconds.			
Test necessity identified by the EUT class	Class 1	N			
	Class 2	N			
	Class 3	O (when implementing the TCP command server function)			
	Class 4	O (when implementing the TCP command server function)			
	Class 5	O (when implementing the TCP command server function)			
	Class 6	O (when implementing the TCP command server function)			
	Class 7	O (when implementing the TCP command server function)			
Setting parameter (node)		Equipment under test (EUT) (Parameters depending on Class)	Classes 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	16
				IO allocation setting (for Class 4)	Optional
			Class 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1 024
				Area 2 data size	1 024
			Classes 6 and 7	Node number	1
				Token watchdog time	(50)

Table 114 – Node Reset (continued)

Setting parameter (node) (continued)	Equipment under test (EUT) (Parameters depending on Class)	Classes 6 and 7 (continued)	Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	Calculated from the number of input points of the slave of the equipment under test (EUT).
			Area 2 data top address	0
			Area 2 data size	Calculated from the number of input and output points of the slave of the equipment under test (EUT).
	Test equipment (Parameters depending on Class of the equipment under test (EUT))	Classes 3, 4, 5	Implementation class	3 (Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Node number	4 (Flexible master)
			Token watchdog time	254
			Allowable minimum frame interval time	50
			Area 1 data top address	10
			Area 1 data size	Depends on the number of output points of the slave of the equipment under test (EUT). * 0 point: 0 * 1 point or more: 256
			Area 2 data top address	Calculated from the number of output points of the slave of the equipment under test (EUT).
			Area 2 data size	1 024
			Node number	1 024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number: 16#8001 (Flexible setting mode, Node number = 1)
				Input data address = 16#0000 (Area 1, Address = 0)
				Input data size = Calculated from the number of input points of the slave of the equipment under test (EUT).
				Output data address = Depends on the number of output points of the slave of the equipment under test (EUT). * 0 point: 16#0000 (Area 1, Address = 0) * 1 point or more: 16#0100 (Area 1, Address = 256)

Table 114 – Node Reset (continued)

Setting parameter (Node) (continued)	Test equipment (Parameters depending on Class of the equipment under test (EUT)) (continued)	Class 6 (continued)	IO allocation setting (slave setting) (continued)	Output data size = Calculated from the number of output points of the slave of the equipment under test (EUT).
				Input status address = 16#8000 (Area 2, Address = 0)
				Output status address = 16#8400 (Area 2, Address = 1024)
		Class 7	Implementation class	3 (Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64
	Dummy nodes		Implementation class	3 (Controller)
			Node number	2
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
Setting parameter (Test data)	Request frame		Interface	TCP setting tool interface
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	Depends on Class of the equipment under test (EUT). * Classes 3, 4, 6, and 7: 1 * Class 5: 100
			TCD	65028 (Node reset request)
			Data size	0
			Contents of data	NA
	Response frame		Interface	TCP setting tool interface
			Node address of source side (SNA)	Depends on Class of the equipment under test (EUT). * Classes 3, 4, 6, and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65228 (Node reset response)

Table 114 – Node Reset (continued)

Setting parameter (Test data) (continued)	Response frame (continued)	Type of response message (M_RLT)	Depends on Class of the equipment under test (EUT). * Classes 3, 4, and 5: 2 (Not-implemented) or 0 (Normal) * Classes 6 and 7: 0 (Normal)
		Data size (M_RLT = 0)	0
		Contents of data	NA
	Response time limit (request frame transmission ~ response frame reception)	1 s	

Table 115 – Network Parameter Read

Test number		V3-034			
Test large classification		General purpose command server function			
Test classification		Operation test of single setting tool (TCP)			
Test items		Network parameter read			
Test procedure		a) Start the equipment under test and the test equipment. b) Open a TCP connection with the equipment under test from the test equipment (TCP setting tool interface). c) Transmit a network parameter read frame (request) from the test equipment (TCP setting tool interface). d) Close the TCP connection with the equipment under test.			
Evaluation criteria		a) Confirm that the equipment under test transmits a response frame for the request frame. b) Confirm that the response frame is normal response (M_RLT = 0), not-implemented response (M_RLT = 2), or no response, and in the case of normal response, confirm that its contents are equivalent to the settings of the equipment under test.			
Test necessity identified by the EUT class	Class 1	N			
	Class 2	N			
	Class 3	O (when implementing the TCP command server function)			
	Class 4	O (when implementing the TCP command server function)			
	Class 5	O (when implementing the TCP command server function)			
	Class 6	O (when implementing the TCP command server function)			
	Class 7	O (when implementing the TCP command server function)			
Setting parameter (node)		Equipment under test (EUT) (Parameters depending on Class)	Class 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	16
				Node name	“TargetNode”
				IO allocation setting (for Class 4)	Optional
			Class 5	Node number	100
				Token watchdog time	(100)

Table 115 – Network Parameter Read (continued)

Setting parameter (Node) (continued)	Equipment under test (EUT) (Parameters depending on Class) (Continued)	Class 5 (continued)	Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1 024
			Area 2 data size	1 024
			Node name	“TargetNode”
		Classes 6 and 7	Node number	1
			token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	Calculated from the number of input points of the slave of the equipment under test (EUT).
			Area 2 data top address	0
			Area 2 data size	Calculated from the number of input and output points of the slave of the equipment under test (EUT).
			Node name	“TargetNode”
	Test equipment (Parameters depending on Class of the equipment under test (EUT)	Classes 3,4 and 5	Implementation class	3 (Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	Depends on the number of output points of the slave of the equipment under test (EUT). * 0 point: 0 * 1 point or more: 256
			Area 1 data size	Calculated from the number of output points of the slave of the equipment under test (EUT).
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, Node number = 1)
				Input data address = 16#0000 (Area 1, Address = 0)

Table 115 – Network Parameter Read (continued)

Setting parameter (Node) (continued)	Test equipment (Parameters depending on Class of the equipment under test (EUT) (Continued)	Class 6 (Continued)	IO allocation setting (slave setting) (Continued)	Input data size = Calculated from the number of input points of the slave of the equipment under test (EUT).
				Output data address = Depends on the number of output points of the slave of the equipment under test (EUT). * 0 point: 16#0000 (Area 1, Address = 0) * 1 point or more: 16#0100 (Area 1, Address = 256)
				Output data size = Calculated from the number of output points of the slave of the equipment under test (EUT).
				Input status address = 16#8000 (Area 2, Address = 0)
				Output status address = 16#8400 (Area 2, Address = 1024)
		Class 7	Implementation class	3 (Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64
Setting parameter (test data)	Request frame		Interface	TCP setting tool interface
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	Depends on Class of the equipment under test (EUT). * Classes 3, 4, 6, and 7: 1 * Class 5: 100
			TCD	65007 (Network parameter read request)
			Data size	0
			Contents of data	NA
	Response frame		Interface	TCP setting tool interface
			Node address of source side (SNA)	Depends on Class of the equipment under test (EUT). * Classes 3, 4, 6, and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65207 (Network parameter read response)
			Type of response message (M_RLT)	0 (Normal) or 2 (Not-implemented)

Table 115 – Network Parameter Read (continued)

Setting parameter (Test data) (continued)	Response Frame (Continued)	Data size (M_RLT = 0)	56
		Contents of data (M_RLT = 0)	Node name = “TargetNode”
			Vender code of node information = Depends on specification of the equipment under test (EUT) (Confirmed by a tester).
			Manufacturer model name of node information = Depends on specification of the equipment under test (EUT) (Confirmed by a tester).
			Depends on Class of the equipment under test (EUT). * Classes 3, 4, 6, and 7: 0 * Class 5: 256
			Area 1 data size = Depends on Class of the equipment under test (EUT). * Classes 3 and 4: 4 * Class 5: 256 * Classes 6 and 7: Calculated from the number of input points of the slave of the equipment under test (EUT).
			Area 2 data top address = Depends on Class of the equipment under test (EUT). * Classes 3, 4, 6, and 7: 0 * Class 5: 1024
			Area 2 data size = Depends on Class of the equipment under test (EUT). * Classes 3 and 4: 16 * Class 5: 1024 * Classes 6 and 7: Calculated from the number of input points of the slave of the equipment under test (EUT).
			Token watchdog time = (No evaluation)
			Allowable minimum frame interval time = (No evaluation)
			Link status = (No evaluation)
			Protocol type = 128
			Upper layer status = (No evaluation)
			Allowable refresh cycle time = (No evaluation)
			Refresh cycle measurement time (current) = (No evaluation)
			Refresh cycle measurement time (maximum) = (No evaluation)
			Refresh cycle measurement time (minimum) = (No evaluation)
	Response time limit (from request frame transmission to response frame reception)	1 s	

Table 116 – Log Data Read

Test number		V3-035			
Test large classification		General purpose command server function			
Test classification		Operation test of single setting tool (TCP)			
Test items		Log data read			
Test procedure		a) Start the equipment under test and the test equipment. b) Open a TCP connection with the equipment under test from the test equipment (TCP setting tool interface). c) Transmit a log data read frame (request) from the test equipment (TCP setting tool interface). d) Close the TCP connection with the equipment under test.			
Evaluation criteria		a) Confirm that the equipment under test transmits a response frame for the request frame. b) Confirm that the response frame is normal response (M_RLT = 0), not-implemented response (M_RLT = 2), or no response, and in the case of normal response, confirm that the total number of reception at the socket part and the total number of transmission at the socket part are not zero (0).			
Test necessity identified by the EUT class	Class 1	N			
	Class 2	N			
	Class 3	O (when implementing the TCP command server function)			
	Class 4	O (when implementing the TCP command server function)			
	Class 5	O (when implementing the TCP command server function)			
	Class 6	O (when implementing the TCP command server function)			
	Class 7	O (when implementing the TCP command server function)			
Setting parameter (Node)		Equipment under test (EUT) (Parameters depending on Class)	Classes 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	16
				IO allocation setting (for Class 4)	Optional
			Class 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1 024
				Area 2 data size	1 024
			Classes 6 and 7	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0

Table 116 – Log Data Read (continued)

Setting parameter (Node) (continued)	Equipment under test (EUT) (Parameters depending on Class) (Continued)	Classes 6 and 7 (Continued)	Area 1 data size	Calculated from the number of input points of the slave of the equipment under test (EUT).
			Area 2 data top address	0
			Area 2 data size	Calculated from the number of input and output points of the slave of the equipment under test (EUT).
	Test equipment (Parameters depending on Class of the equipment under test)	Classes 3, 4 and 5	Implementation class	3 (Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	Calculated from the number of output points of the slave of the equipment under test (EUT). * 0 point: 0 * 1 point or more: 256
			Area 1 data size	Calculated from the number of output points of the slave of the equipment under test (EUT).
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, Node number = 1)
				Input data address = 16#0000 (Area 1, Address = 0)
				Input data size = Calculated from the number of input points of the slave of the equipment under test (EUT).
				Output data address = Depends on the number of output points of the slave of the equipment under test (EUT). * 0 point: 16#0000 (Area 1, Address = 0) * 1 point or more: 16#0100 (Area 1, Address = 256)
				Output data size = Calculated from the number of output points of the slave of the equipment under test (EUT).
				Input status address = 16#8000 (Area 2, Address = 0)
				Output status address = 16#8400 (Area 2, Address = 1024)

Table 116 – Log Data Read (continued)

Setting parameter (Node) (continued)	Test equipment (Parameters depending on Class of the equipment under test) (Continued)	Class 7	Implementation class	3 (Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64
Setting parameter (Test data)	Request frame		Interface	TCP setting tool interface
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	Depends on Class of the equipment under test (EUT). * Classes 3, 4, 6, and 7: 1 * Class 5: 100
			TCD	65013 (Log data read request)
			Data size	0
			Contents of data	NA
	Response frame		Interface	TCP setting tool interface
			Node address of source side (SNA)	Depends on Class of the equipment under test (EUT). * Classes 3, 4, 6, and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65213 (Log data read response)
			Type of response message (M_RLT)	0 (Normal) or 2 (Not-implemented)
			Data size (M_RLT = 0)	512
			Contents of data (M_RLT = 0)	The total number of transmission at the socket part ≠ 0
				The total number of reception at the socket part ≠ 0
	Response time limit (request frame transmission ~ response frame reception)		1 s	

Table 117 – Log Data Clear

<table>
<tr><td colspan="2">Test number</td><td colspan="5">V3-036</td></tr>
<tr><td colspan="2">Test large classification</td><td colspan="5">General purpose command server function</td></tr>
<tr><td colspan="2">Test classification</td><td colspan="5">Operation test of single setting tool (TCP)</td></tr>
<tr><td colspan="2">Test items</td><td colspan="5">Log data clear</td></tr>
<tr><td colspan="2">Test procedure</td><td colspan="5">a) Start the equipment under test and the test equipment.
b) Open a TCP connection with the equipment under test from the test equipment (TCP setting tool interface).
c) Receive a log data clear frame (normal response) and transmit a log data read frame (request) from the test equipment (TCP setting tool interface).
d) Close the TCP connection with the equipment under test.</td></tr>
<tr><td colspan="2">Evaluation criteria</td><td colspan="5">a) Confirm that the equipment under test transmits a response frame for the log data clear request frame from the test equipment.
b) Confirm that the response frame is normal response (M_RLT = 0), not-implemented response (M_RLT = 2), or no response.
c) Confirm that the equipment under test transmits a response frame for the log data read request frame from the test equipment.
d) Confirm that the response frame is normal response (M_RLT = 0), not-implemented response (M_RLT = 2), or no response, and in the case of normal response, confirm that the number of joining is zero (0).</td></tr>
<tr><td rowspan="7">Test necessity identified by the EUT class</td><td>Class 1</td><td colspan="5">N</td></tr>
<tr><td>Class 2</td><td colspan="5">N</td></tr>
<tr><td>Class 3</td><td colspan="5">O (when implementing the TCP command server function)</td></tr>
<tr><td>Class 4</td><td colspan="5">O (when implementing the TCP command server function)</td></tr>
<tr><td>Class 5</td><td colspan="5">O (when implementing the TCP command server function)</td></tr>
<tr><td>Class 6</td><td colspan="5">O (when implementing the TCP command server function)</td></tr>
<tr><td>Class 7</td><td colspan="5">O (when implementing the TCP command server function)</td></tr>
<tr><td colspan="2" rowspan="17">Setting parameter (Node)</td><td rowspan="10">Equipment under test (EUT) (Parameters depending on Class)</td><td rowspan="8">Classes 3 and 4</td><td>Node number</td><td>1</td></tr>
<tr><td>Token watchdog time</td><td>(50)</td></tr>
<tr><td>Allowable minimum frame interval time</td><td>(10)</td></tr>
<tr><td>Area 1 data top address</td><td>0</td></tr>
<tr><td>Area 1 data size</td><td>4</td></tr>
<tr><td>Area 2 data top address</td><td>0</td></tr>
<tr><td>Area 2 data size</td><td>16</td></tr>
<tr><td>IO allocation setting (for Class 4)</td><td>Optional</td></tr>
<tr><td rowspan="9">Class 5</td><td>Node number</td><td>100</td></tr>
<tr><td>Token watchdog time</td><td>(100)</td></tr>
<tr><td>Allowable minimum frame interval time</td><td>(10)</td></tr>
<tr><td>Area 1 data top address</td><td>256</td></tr>
<tr><td>Area 1 data size</td><td>256</td></tr>
<tr><td>Area 2 data top address</td><td>1 024</td></tr>
<tr><td>Area 2 data size</td><td>1 024</td></tr>
</table>

Table 117 – Log Data Clear (continued)

Setting parameter (Node) (continued)	Equipment under test (EUT) (Parameters depending on Class) (Continued)	Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	Calculated from the number of input points of the slave of the equipment under test (EUT).
			Area 2 data top address	0
			Area 2 data size	Calculated from the number of input and output points of the slave of the equipment under test (EUT).
	Test equipment (Parameters depending on Class of the equipment under test)	Classes 3, 4 and 5	Implementation class	3 (Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	Calculated from the number of output points of the slave of the equipment under test (EUT). * 0 point: 0 * 1 point or more: 256
			Area 1 data size	Calculated from the number of output points of the slave of the equipment under test (EUT).
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, Node number = 1)
				Input data address = 16#0000 (Area 1, Address = 0)
				Input data size = Calculated from the number of input points of the slave of the equipment under test (EUT).
				Output data address = Depends on the number of output points of the slave of the equipment under test (EUT). * 0 point: 16#0000 (Area 1, Address = 0) * 1 point or more: 16#0100 (Area 1, Address = 256)

Table 117 – Log Data Clear (continued)

Setting parameter (Node) (continued)	Test equipment (Parameters depending on Class of the equipment under test) (Continued)	Class 6 (Continued)	IO allocation setting (slave setting) (Continued)	Output data size = Calculated from the number of output points of the slave of the equipment under test (EUT).
				Input status address = 16#8000 (Area 2, Address = 0)
				Output status address = 16#8400 (Area 2, Address = 1024)
		Class 7	Implementation class	3 (Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64
Setting parameter (test data)	Log data clear	Request frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	Depends on Class of the equipment under test (EUT). * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65014 (Log data clear request)
			Data size	0
			Contents of data	NA
		Response frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	Depends on Class of the equipment under test (EUT). * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65214 (Log data clear response)
			Type of response message (M_RLT)	0 (Normal) or 2 (Not-implemented)
			Data size (M_RLT = 0)	0
			Contents of data	NA
	Log data read	Request frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	Depends on Class of the equipment under test (EUT). * Classes 3, 4, 6 and 7: 1 * Class 5: 100

Table 117 – Log Data Clear (continued)

Setting parameter (Test data) (continued)	Log data read (Continued)	Request frame (Continued)	TCD	65013 (Log data read request)
			Data size	0
			Contents of data	NA
		Response frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	Depends on Class of the equipment under test (EUT). * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65213 (Log data read response)
			Type of response message (M_RLT)	0 (Normal) or 2 (Not-implemented)
			Data size (M_RLT = 0)	512
			Contents of data (M_RLT = 0)	Number of joining = 0
	Response time limit (request frame transmission ~ response frame reception)		1 s	

Table 118 – Message Echo Back

Test number		V3-037
Test large classification		General purpose command server function
Test classification		Operation test of single setting tool (TCP)
Test items		Message echo back
Test procedure		a) Start the equipment under test and the test equipment. b) Open a TCP connection with the equipment under test from the test equipment (TCP setting tool interface). c) Transmit a message echo back frame (request) from the test equipment (TCP setting tool interface). The contents of data are incremented (+1) by word from 16#11AA. d) Close the TCP connection with the equipment under test.
Evaluation criteria		a) Confirm that the equipment under test transmits a response frame for the request frame. b) Confirm that the response frame is normal response (M_RLT = 0), not-implemented response (M_RLT = 2), or no response, and in the case of normal response, confirm that the contents of data is equivalent to the request data.
Test necessity identified by the EUT class	Class 1	N
	Class 2	N
	Class 3	O (when implementing the TCP command server function))
	Class 4	O (when implementing the TCP command server function)
	Class 5	O (when implementing the TCP command server function)
	Class 6	O (when implementing the TCP command server function)
	Class 7	O (when implementing the TCP command server function)

Table 118 – Message Echo Back (continued)

Setting parameter (Node)	Equipment under test (EUT) (Parameters depending on Class)	Classes 3 and 4	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	0
			Area 2 data size	16
			IO allocation setting (for Class 4)	Optional
		Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1 024
			Area 2 data size	1 024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	Calculated from the number of input points of the slave of the equipment under test (EUT).
			Area 2 data top address	0
			Area 2 data size	Calculated from the number of input and output points of the slave of the equipment under test (EUT).
	Test equipment (Parameters depending on Class of the equipment under test)	Classes 3, 4 and 5	Implementation class	3 (Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	Calculated from the number of output points of the slave of the equipment under test (EUT). * 0 point: 0 * 1 point or more: 256

Table 118 – Message Echo Back (continued)

Setting parameter (Node) (continued)	Test equipment (Parameters depending on Class of the equipment under test) (Continued)	Class 6 (Continued)	Area 1 data size	Calculated from the number of output points of the slave of the equipment under test (EUT).
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, Node number = 1)
				Input data address = 16#0000 (Area 1, Address = 0)
				Input data size = Calculated from the number of input points of the slave of the equipment under test (EUT).
				Output data address = Depends on the number of output points of the slave of the equipment under test (EUT). * 0 point: 16#0000 (Area 1, Address = 0) * 1 point or more: 16#0100 (Area 1, Address = 256)
				Output data size = Calculated from the number of output points of the slave of the equipment under test (EUT).
				Input status address = 16#8000 (Area 2, Address = 0)
				Output status address = 16#8400 (Area 2, Address = 1024)
		Class 7	Implementation class	3 (Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64
Setting parameter (Test data)	Request frame		Interface	TCP setting tool interface
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	Depends on Class of the equipment under test (EUT). * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65015 (Message echo back request)
			Data size	512
			Contents of data	Data incremented (+1) by word from 16#11AA

Table 118 – Message Echo Back (continued)

Setting parameter (Test data) (continued)	Response frame	Interface	TCP setting tool interface
		Node address of source side (SNA)	Depends on Class of the equipment under test (EUT). * Classes 3, 4, 6 and 7: 1 * Class 5: 100
		Node address of destination side (DNA)	254
		TCD	65215 (Message echo back response)
		Type of response message (M_RLT)	0 (Normal) or 2 (Not-implemented)
		Data size (M_RLT = 0)	512
		Contents of data (M_RLT = 0)	Data incremented (+1) by word from 16#11AA
	Response time limit (request frame transmission ~ response frame reception)	1 s	

Table 119 – Byte Block Read, Byte Block Write

Test number	V3-038
Test large classification	General purpose command server function
Test classification	Operation test of single setting tool (TCP)
Test items	Byte block read, byte block write
Test procedure	a) Start the equipment under test and the test equipment. b) Open a TCP connection with the equipment under test from the test equipment (TCP setting tool interface). c) Transmit a byte block write frame (request) from the test equipment (TCP setting tool interface). The contents of data are incremented (+1) by word from 16#11AA. d) Receive a byte block write frame (normal response) from the equipment under test and transmit a byte block read frame (request) from the test equipment (TCP setting tool interface). e) Close the TCP connection with the equipment under test.
Evaluation criteria	a) Confirm that the equipment under test transmits a byte block write frame (response) for the byte block write request frame from the test equipment. b) Confirm that the response frame is normal response (M_RLT = 0), not-implemented response (M_RLT = 2), or no response. c) Confirm that the equipment under test transmits a byte block read frame (response) for the byte block read request frame from the test equipment. d) Confirm that the response frame is normal response (M_RLT = 0), not-implemented response (M_RLT = 2), or no response, and in the case of normal response, confirm that the contents of data is equivalent to the write data.

Table 119 – Byte Block Read, Byte Block Write (continued)

Test necessity identified by the EUT class	Class 1	N			
	Class 2	N			
	Class 3	O (when implementing the TCP command server function)			
	Class 4	O (when implementing the TCP command server function)			
	Class 5	O (when implementing the TCP command server function)			
	Class 6	O (when implementing the TCP command server function)			
	Class 7	O (when implementing the TCP command server function)			
Setting parameter (Node)		Equipment under test (EUT) (Parameters depending on Class)	Classes 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	16
				IO allocation setting (for Class 4)	Optional
			Class 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1 024
				Area 2 data size	1 024
			Classes 6 and 7	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	Calculated from the number of input points of the slave of the equipment under test (EUT).
				Area 2 data top address	0
				Area 2 data size	Calculated from the number of input and output points of the slave of the equipment under test (EUT).
		Test equipment (Parameters depending on Class of the equipment under test)	Classes 3, 4 and 5	Implementation class	3 (Controller)
				Node number	254
				Token watchdog time	50
				Allowable minimum frame interval time	10
				Area 1 data top address	4
				Area 1 data size	4
				Area 2 data top address	64
				Area 2 data size	64
			Class 6	Implementation class	4 (Flexible master)
				Node number	254

Table 119 – Byte Block Read, Byte Block Write (continued)

Setting parameter (Node) (continued)	Test equipment (Parameters depending on Class of the equipment under test) (Continued)	Class 6 (Continued)	Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	Calculated from the number of output points of the slave of the equipment under test (EUT). * 0 point: 0 * 1 point or more: 256
			Area 1 data size	Calculated from the number of output points of the slave of the equipment under test (EUT).
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, Node number = 1)
				Input data address = 16#0000 (Area 1, Address = 0)
				Input data size = Calculated from the number of input points of the slave of the equipment under test (EUT).
				Output data address = Depends on the number of output points of the slave of the equipment under test (EUT). * 0 point: 16#0000 (Area 1, Address = 0) * 1 point or more: 16#0100 (Area 1, Address = 256)
				Output data size = Calculated from the number of output points of the slave of the equipment under test (EUT).
				Input status address = 16#8000 (Area 2, Address = 0)
				Output status address = 16#8400 (Area 2, Address = 1024)
		Class 7	Implementation class	3 (Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64
Setting parameter (Test data)	Byte block write	Request frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	254

Table 119 – Byte Block Read, Byte Block Write (continued)

Setting parameter (Test data) (continued)	Byte block write (Continued)	Request frame (Continued)	Node address of destination side (DNA)	Depends on Class of the equipment under test (EUT). * Classes 3, 4, 6 and 7: 1 Class 5: 100
			TCD	65004 (Byte block write request)
			Data size	Same as the size of virtual address space
			Virtual address space	Depends on the specification of the equipment under test. (Input using testing tool window.)
			Size of virtual address space	Depends on the specification of the equipment under test. (Input using testing tool window.)
			Contents of data	Data incremented (+1) by word from 16#11AA
		Response frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	Depends on Class of the equipment under test (EUT). * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65204 (Byte block write response)
			Type of response message (M_RLT)	0 (Normal) or 2 (Not-implemented)
			Data size (M_RLT = 0)	0
			Virtual address space	Depends on the specification of the equipment under test. (Same as the virtual address space of write request)
			Size of virtual address space	Depends on the specification of the equipment under test. (Same as the size of virtual address space of write request)
			Contents of data	NA
	Byte block read	Request frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	Depends on Class of the equipment under test (EUT). * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65003 (Byte block read request)
			Data size	0
			Virtual address space	Depends on the specification of the equipment under test. (Same as the virtual address space of write request)
			Size of virtual address space	Depends on the specification of the equipment under test. (Same as the size of virtual address space of write request)
			Contents of data	NA

Table 119 – Byte Block Read, Byte Block Write (continued)

			Interface	TCP setting tool interface
Setting parameter (Test data) (continued)	Byte block read (Continued)	Response frame (Continued)	Node address of source side (SNA)	Depends on Class of the equipment under test (EUT). * Classes 3, 4, 6 and 7: 1 Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65203 (Byte block read response)
			Type of response message (M_RLT)	0 (Normal) or 2 (Not-implemented)
			Data size (M_RLT = 0)	Depends on the specification of the equipment under test. (Same as the size of virtual address space)
			Virtual address space	Depends on the specification of the equipment under test. (Same as the virtual address space of read request)
			Size of virtual address space	Depends on the specification of the equipment under test. (Same as the size of virtual address space of read request)
			Contents of data (M_RLT = 0)	Data incremented (+1) by word from 16#11AA
	Response time limit (request frame transmission ~ response frame reception)		1 s	

Table 120 – Word Block Read, Word Block Write

Test number		V3-039			
Test large classification		General purpose command server function			
Test classification		Operation test of single setting tool (TCP)			
Test items		Word block read, word block write			
Test procedure		a) Start the equipment under test and the test equipment. b) Open a TCP connection with the equipment under test from the test equipment (TCP setting tool interface). c) Transmit a word block write frame (request) from the test equipment (TCP setting tool interface). The contents of data are incremented (+1) by word from 16#11AA. d) Receive a word block write frame (normal response) from the equipment under test and transmit a word block read frame (request) from the test equipment (TCP setting tool interface). e) Close the TCP connection with the equipment under test.			
Evaluation criteria		a) Confirm that the equipment under test transmits a word block write frame (response) for the word block write request frame from the test equipment. b) Confirm that the response frame is normal response (M_RLT = 0), not-implemented response (M_RLT = 2), or no response. c) Confirm that the equipment under test transmits a word block read frame (response) for the word block read request frame from the test equipment. d) Confirm that the response frame is normal response (M_RLT = 0), not-implemented response (M_RLT = 2), or no response, and in the case of normal response, confirm that the contents of data is equivalent to the write data.			
Test necessity identified by the EUT class	Class 1	N			
	Class 2	N			
	Class 3	O (when implementing the TCP command server function)			
	Class 4	O (when implementing the TCP command server function)			
	Class 5	O (when implementing the TCP command server function)			
	Class 6	O (when implementing the TCP command server function)			
	Class 7	O (when implementing the TCP command server function)			
Setting parameter (Node)		Equipment under test (EUT) (Parameters depending on Class)	Classes 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	16
				IO allocation setting (for Class 4)	Optional
			Class 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1 024
				Area 2 data size	1 024
			Classes 6 and 7	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)

Table 120 – Word Block Read, Word Block Write (continued)

Setting parameter (Node) (continued)	under test (EUT) (Parameters depending on Class) (continued)	Classes 6 and 7 (continued)	Area 1 data top address	0
			Area 1 data size	Calculated from the number of input points of the slave of the equipment under test (EUT)
			Area 2 data top address	0
			Area 2 data size	Calculated from the number of input and output points of the slave of the equipment under test (EUT)
	Test equipment (Parameters depending on Class of the equipment under test)	Classes 3, 4 and 5	Implementation class	3 (Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	Calculated from the number of output points of the slave of the equipment under test (EUT). * 0 point: 0 * 1 point or more: 256
			Area 1 data size	Calculated from the number of output points of the slave of the equipment under test (EUT).
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1

Table 120 – Word Block Read, Word Block Write (continued)

Setting parameter (Node) (continued)	Test equipment (Parameters depending on Class of the equipment under test) (continued)	Class 6 (continued)	IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, Node number = 1)
				Input data address = 16#0000 (Area 1, Address = 0)
				Input data size = Calculated from the number of input points of the slave of the equipment under test (EUT)
				Output data address = Depends on the number of output points of the slave of the equipment under test (EUT) * 0 point: 16#0000 (Area 1, Address = 0) * 1 point or more: 16#0100 (Area 1, Address = 256)
				Output data size = Calculated from the number of output points of the slave of the equipment under test (EUT)
				Input status address = 16#8000 (Area 2, Address = 0)
				Output status address = 16#8400 (Area 2, Address = 1024)
		Class 7	Implementation class	3 (Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64
Setting parameter (Test data)	Word block write	Request frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	Depends on Class of the equipment under test (EUT) * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65006 (word block write request
			Data size	The size of virtual address space multiplied by 2
			Virtual address space	Depends on the specification of the equipment under test. (Input using testing tool window.)
			Size of virtual address space	Depends on the specification of the equipment under test. (Input using testing tool window.)

Table 120 – Word Block Read, Word Block Write (continued)

Setting parameter (Test data) (continued)	Word block write (continued)	Request frame (Continued)	Contents of data	Data incremented (+1) by word from 16#11AA
		Response frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	Depends on Class of the equipment under test (EUT). * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65206 (word block write response)
			Type of response message (M_RLT)	0 (Normal) or 2 (Not-implemented)
			Data size (M_RLT = 0)	0
			Virtual address space	Depends on the specification of the equipment under test. (Same as the virtual address space of write request)
			Size of virtual address space	Depends on the specification of the equipment under test. (Same as the size of virtual address space of read request)
			Contents of data	NA
	Word block read	Request frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	Depends on Class of the equipment under test (EUT) * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65005 (word block read request)
			Data size	0
			Virtual address space	Depends on the specification of the equipment under test. (Same as the virtual address space of write request)
			Size of virtual address space	Depends on the specification of the equipment under test. (Same as the size of virtual address space of write request)
			Contents of data	NA
		Request frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	Depends on Class of the equipment under test (EUT) * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65205 (word block read response)
			Type of response message (M_RLT)	0 (Normal) or 2 (Not-implemented)
			Data size (M_RLT = 0)	Depends on the specification of the equipment under test. (The size of virtual address space multiplied by 2)
			Virtual address space	Depends on the specification of the equipment under test. (Same as the virtual address space of read request)

Table 120 – Word Block Read, Word Block Write (continued)

Setting parameter (Test data) (continued)	Word block read (Continued)	Request frame (Continued)	Size of virtual address space	Depends on the specification of the equipment under test. (Same as the size of the virtual address space of read request)
			Contents of data (M_RLT = 0)	Data incremented (+1) by word from 16#11AA
	Response time limit (request frame transmission ~ response frame reception)		1 s	

Table 121 – Network Parameter Write

Test number		V3-040
Test large classification		General purpose command server function
Test classification		Operation test of single setting tool (TCP)
Test items		Network parameter write
Test procedure		a) Start the equipment under test and the test equipment. Then, start the dummy node. b) Open a TCP connection with the equipment under test from the test equipment (TCP setting tool interface). c) Transmit a network parameter write frame (request) from the test equipment (TCP setting tool interface). NOTE: For Classes 3 and 4, disengage from the network and then rejoin the network to change the address and size. For Classes 5, 6 and 7, change only the node name and do not disengage from the network. d) Close the TCP connection with the equipment under test. e) For Classes 5, 6 and 7, transmit a network parameter read message (request) from the test equipment.
Evaluation criteria		a) Confirm that the equipment under test transmits a response frame for a request frame. b) Confirm that the response frame is normal response (M_RLT = 0), not-implemented response (M_RLT = 2), or no response. c) In the case of normal response, confirm the following conditions depending on Class: * Classes 3 and 4,: Confirm that the equipment under test is rejoined to the network within 10 seconds. * Classes 5, 6 and 7: Confirm that the equipment under test transmits a response frame for the network parameter read message (request) from the test equipment. d) Confirm the following conditions depending on Class: * Classes 3 and 4: Confirm that the contents of participation request header after rejoining are equivalent to the contents of data (C_AD1, C_SZ1, C_AD2, C_SZ2, node name) set by the request. * Classes 5, 6 and 7: Confirm that the contents of the network parameter read message (response) are equivalent to the contents of data (node name) set by the network parameter write frame (request).
Test necessity identified by the EUT class	Class 1	N
	Class 2	N
	Class 3	O (when implementing the TCP command server function)
	Class 4	O (when implementing the TCP command server function)
	Class 5	O (when implementing the TCP command server function)
	Class 6	O (when implementing the TCP command server function)
	Class 7	O (when implementing the TCP command server function)

Table 121 – Network Parameter Write (continued)

Setting parameter (Node)	Equipment under test (EUT) (Parameters depending on Class)	Classes 3 and 4	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	0
			Area 2 data size	16
			Node name	“TargetNode”
			IO allocation setting (for Class 4)	Optional
		Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1 024
			Area 2 data size	1 024
			Node name	“TargetNode”
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	Calculated from the number of input points of the slave of the equipment under test (EUT).
			Area 2 data top address	0
			Area 2 data size	Calculated from the number of input and output points of the slave of the equipment under test (EUT).
			Node name	“TargetNode”
	Test equipment (Parameters depending on Class of the equipment under test)	Classes 3, 4 and 5	Implementation class	3 (Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	254
			Token watchdog time	50

Table 121 – Network Parameter Write (continued)

Setting parameter (Node) (continued)	Test equipment (Parameters depending on Class of the equipment under test) (Continued)	Class 6 (Continued)	Allowable minimum frame interval time	10
			Area 1 data top address	Calculated from the number of output points of the slave of the equipment under test (EUT). * 0 point: 0 * 1 point or more: 256
			Area 1 data size	Calculated from the number of output points of the slave of the equipment under test (EUT).
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, Node number = 1)
				Input data address = 16#0000 (Area 1, Address = 0)
				Input data size = Calculated from the number of input points of the slave of the equipment under test (EUT).
				Output data address = Depends on the number of output points of the slave of the equipment under test (EUT). * 0 point: 16#0000 (Area 1, Address = 0) * 1 point or more: 16#0100 (Area 1, Address = 256)
				Output data size = Calculated from the number of output points of the slave of the equipment under test (EUT).
				Input status address = 16#8000 (Area 2, Address = 0)
				Output status address = 16#8400 (Area 2, Address = 1024)
		Class 7	Implementation class	3 (Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64

Table 121 – Network Parameter Write (continued)

Setting parameter (node) (continued)	Dummy node		Implementation class	3 (Controller)
			Node number	2
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
Setting parameter (Test data)	Network parameter write	Request frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	Depends on Class of the equipment under test (EUT). * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65008 (network parameter write request)
			Data size	0
			Contents of data	Setting parameter flag = Depends on Class of the equipment under test (EUT). * Classes 3 and 4: 3 * Classes 5, 6 and 7: 2
				Area 1 data top address = 256
				Area 1 data size = 128
				Area 2 data top address = 4096
				Area 2 data size = 1024
				Node name = “RenewNode1”
		Response frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	Depends on Class of the equipment under test (EUT). * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65208 (network parameter write response)
			Type of response message (M_RLT)	0 (Normal) or 2 (Not-implemented)
			Data size (M_RLT = 0)	0
			Contents of data	NA
	Response time limit (request frame transmission ~ response frame reception)		1 s	

Table 121 – Network Parameter Write (continued)

Setting parameter (Test data) (continued)	Network parameter read	Transmission message	Interface	FL-net message
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	Depends on Class of the equipment under test (EUT). * Classes 6 and 7: 1 * Class 5: 100
			TCD	65007 (network parameter read request)
			Data size	0
			Contents of data	NA
		Incoming message	Interface	FL-net message
			Node address of source side (SNA)	Depends on Class of the equipment under test (EUT) * Classes 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65207 (network parameter read response)
			Type of response message (M_RLT)	0 (Normal)
			Data size (M_RLT = 0)	56
			Contents of data (M_RLT = 0)	Node name = “RenewNode1”
				Vender code of node information = (No evaluation)
				Manufacturer model name of node information = (No evaluation)
				Area 1 data top address = Depends on Class of the equipment under test (EUT). * Class 5: 256 * Classes 6 and 7: 0
				Area 1 data size = Depends on Class of the equipment under test (EUT). * Class 5: 256 * Classes 6 and 7: Calculated from the number of input points of the slave of the equipment under test (EUT)
				Area 2 data top address = Depends on Class of the equipment under test (EUT). * Class 5: 1024 * Classes 6 and 7: 0
				Area 2 data size = Depends on Class of the equipment under test (EUT). * Class 5: 1024 * Classes 6 and 7: Calculated from the number of input and output points of the slave of the equipment under test (EUT).
				Token watchdog time = (No evaluation)
				Allowable minimum frame interval time = (No evaluation)
				Link status = (No evaluation)

Table 121 – Network Parameter Write (continued)

Setting parameter (Test data) (continued)	Network parameter read (Continued)	Incoming message (Continued)	Contents of data (M_RLT = 0) (Continued)	Protocol type = 128
				Upper layer status = (No evaluation)
				Allowable refresh cycle time = (No evaluation)
				Refresh cycle measurement time (Current) = (No evaluation)
				Refresh cycle measurement time (Maximum) = (No evaluation)
				Refresh cycle measurement time (Minimum) = (No evaluation)

Table 122 – Profile Read

Test number		V3-041		
Test large classification		General purpose command server function		
Test classification		Operation test of single setting tool (TCP)		
test items		Profile read		
Test procedure		a) Start the equipment under test and the test equipment. b) Open a TCP connection with the equipment under test from the test equipment (TCP setting tool interface). c) Transmit a profile read frame (request) from the test equipment (TCP setting tool interface). d) Close the TCP connection with the equipment under test.		
Evaluation criteria		a) Confirm that the equipment under test transmits a response frame for a request frame. b) Confirm that the response frame is normal response (M_RLT = 0), not-implemented response (M_RLT = 2), or no response, and in the case of normal response, confirm that the contents of data is equivalent to the settings of the equipment under test.		
Test necessity identified by the EUT class	Class 1	N		
	Class 2	N		
	Class 3	O (when implementing the TCP command server function)		
	Class 4	O (when implementing the TCP command server function)		
	Class 5	O (when implementing the TCP command server function)		
	Class 6	O (when implementing the TCP command server function)		
	Class 7	O (when implementing the TCP command server function)		
Setting parameter (Node)		Equipment under test (EUT) (Parameters depending on Class)	Classes 3 and 4	Node number: 1
				Token watchdog time: (50)
				Allowable minimum frame interval time: (10)
				Area 1 data top address: 0
				Area 1 data size: 4
				Area 2 data top address: 0
				Area 2 data size: 16
				IO allocation setting (for Class 4): Optional

Table 122 – Profile Read (continued)

Setting parameter (Node) (continued)	Equipment under test (EUT) (Parameters depending on Class) (Continued)	Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1 024
			Area 2 data size	1 024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	Calculated from the number of input points of the slave of the equipment under test (EUT).
			Area 2 data top address	0
			Area 2 data size	Calculated from the number of input and output points of the slave of the equipment under test (EUT).
	Test equipment (Parameters depending on Class of the equipment under test)	Classes 3, 4 and 5	Implementation class	3 (Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	Depends on Class of the equipment under test (EUT). * 0 point: 0 * 1 point or more: 256
			Area 1 data size	Calculated from the number of output points of the slave of the equipment under test (EUT).
			Area 2 data top address	1 024
			Area 2 data size	1 024

Table 122 – Profile Read (continued)

Setting parameter (Node) (continued)	Test equipment (Parameters depending on Class of the equipment under test) (Continued)	Class 6 (Continued)	IO allocation setting (number of control slaves)	1
				Slave node number = 16#8001 (Flexible setting mode, Node number = 1)
				Input data address = 16#0000 (Area 1, Address = 0)
				Input data size = Calculated from the number of input points of the slave of the equipment under test (EUT).
				Output data address = Depends on the number of output points of the slave of the equipment under test (EUT). * 0 point: 16#0000 (Area 1, Address = 0) * 1 point or more: 16#0100 (Area 1, Address = 256)
				Output data size = Calculated from the number of output points of the slave of the equipment under test (EUT).
				Input status address = 16#8000 (Area 2, Address = 0)
				Output status address = 16#8400 (Area 2, Address = 1024)
		Class 7	Implementation class	3 (Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64
Setting parameter (Test data)	Request frame		Interface	TCP setting tool interface
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	Depends on Class of the equipment under test (EUT). * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65011 (profile read request)
			Data size	0
			Contents of data	NA
	Response frame		Interface	TCP setting tool interface
			Node address of source side (SNA)	Depends on Class of the equipment under test (EUT). * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65211 (profile read response)

Table 122 – Profile Read (continued)

Setting parameter (Test data) (continued)	Response frame (Continued)	Type of response message (M_RLT)	0 (Normal) or 2 (Not-implemented)
		Data size (M_RLT = 0)	Depends on the specification of the equipment under test. (Confirmed by a tester.)
		Contents of data (M_RLT = 0)	Depends on the specification of the equipment under test. (Confirmed by a tester.)
	Response time limit (request frame transmission ~ response frame reception)	1 s	

Table 123 – Operation Command, Stop Command

Test number	V3-042
Test large classification	General purpose command server function
Test classification	Operation test of single setting tool (TCP)
Test items	Operation command, Stop command
Test procedure	a) Start the equipment under test and the test equipment. b) Open a TCP connection with the equipment under test from the test equipment (TCP setting tool interface). c) Transmit a stop command frame (request) from the test equipment (TCP setting tool interface). d) Transmit an operation command frame (request) from the test equipment (TCP setting tool interface). e) Receive the operation command frame (normal response) from the equipment under test and transmit the stop command frame (request) from the test equipment (TCP setting tool interface). f) Close the TCP connection with the equipment under test.
Evaluation criteria	a) Confirm that the equipment under test transmits an operation command frame (response) for an operation command request frame from the test equipment. b) Confirm that the response frame is normal response (M_RLT = 0), not-implemented response (M_RLT = 2), or no response. c) In the case of normal response, confirm that the equipment under test is running, i.e., a ULS (upper layer status) RUN flag is set to 1. d) Confirm that the equipment under test transmits a stop command frame (response) for a stop command request frame from the test equipment.

Table 123 – Operation Command, Stop Command (continued)

Evaluation criteria (continued)		e) Confirm that the response frame is normal response (M_RLT = 0), not-implemented response (M_RLT = 2), or no response. f) In the case of normal response, confirm that the equipment under test is stopped, i.e., a ULS (upper layer status) RUN flag is set to 0.			
Test necessity identified by the EUT class	Class 1	N			
	Class 2	N			
	Class 3	O (when implementing the TCP command server function)			
	Class 4	O (when implementing the TCP command server function)			
	Class 5	O (when implementing the TCP command server function)			
	Class 6	O (when implementing the TCP command server function)			
	Class 7	O (when implementing the TCP command server function)			
Setting parameter (Node)		Equipment under test (EUT) (Parameters depending on Class)	Classes 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	16
				IO allocation setting (for Class 4)	Optional
			Class 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1 024
				Area 2 data size	1 024
			Classes 6 and 7	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	Calculated from the number of input points of the slave of the equipment under test (EUT).
				Area 2 data top address	0
				Area 2 data size	Calculated from the number of input and output points of the slave of the equipment under test (EUT).
		Test equipment (Parameters depending on Class of the equipment under test)	Classes 3, 4 and 5	Implementation class	3 (Controller)
				Node number	254
				Token watchdog time	50
				Allowable minimum frame interval time	10
				Area 1 data top address	4

Table 123 – Operation Command, Stop Command (continued)

Setting parameter (Node) (continued)	Test equipment (Parameters depending on Class of the equipment under test) (Continued)	Classes 3, 4 and 5 (Continued)	Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	Depends on the number of output points of the slave of the equipment under test (EUT). * 0 point: 0 * 1 point or more: 256
			Area 1 data size	Calculated from the number of output points of the slave of the equipment under test (EUT).
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, Node number = 1)
				Input data address = 16#0000 (Area 1, Address = 0)
				Input data size = Calculated from the number of input points of the slave of the equipment under test (EUT).
				Output data address = Depends on the number of output points of the slave of the equipment under test (EUT). * 0 point: 16#0000 (Area 1, Address = 0) * 1 point or more: 16#0100 (Area 1, Address = 256)
				Output data size = Calculated from the number of output points of the slave of the equipment under test (EUT).
				Input status address = 16#8000 (Area 2, Address = 0)
				Output status address = 16#8400 (Area 2, Address = 1024)
		Class 7	Implementation class	3 (Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64

Table 123 – Operation Command, Stop Command (continued)

Setting parameter (Test data)	Operation command	Request frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	Depends on Class of the equipment under test (EUT). * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65010 (operation command request)
			Data size	0
			Contents of data	NA
		Response frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	Depends on Class of the equipment under test (EUT). * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65210 (operation command response)
			Type of response message (M_RLT)	0 (Normal) or 2 (Not-implemented)
			Data size (M_RLT = 0)	0
			Contents of data	NA
	Stop command	Request frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	Depends on Class of the equipment under test (EUT). * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65009 (stop command request)
			Data size	0
			Contents of data	NA
		Response frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	Depends on Class of the equipment under test (EUT). * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65209 (stop command response)
			Type of response message (M_RLT)	0 (Normal) or 2 (Not-implemented)
			Data size (M_RLT = 0)	0
			Contents of data (M_RLT = 0)	NA
	Response time limit (request frame transmission ~ response frame reception)		1 s	

f) Operation test of double setting tools (TCP)

Table 124 – IO Allocation Setting (Lock Confirmation), Read

Test number	V3-043
Test large classification	General purpose command server function
Test classification	Operation test of double setting tools (TCP)
Test items	IO allocation setting (lock confirmation), read
Test procedure	a) Start the equipment under test and the test equipment. b) Open two (2) TCP connections with the equipment under test from the test equipment (TCP setting tool interface). c) Transmit the 1st IO allocation setting frame (request, setting number = 1 / number of control slaves = 2) from the test equipment (1st TCP setting tool interface, hereinafter called “TCP setting tool A”). d) Receive the 1st IO allocation setting frame (response) from the equipment under test and transmit the 2nd IO allocation setting frame (request, setting number = 1 / number of control slaves = 3) from the test equipment (2nd TCP setting tool interface, hereinafter called “TCP setting tool B”). e) Receive the 2nd IO allocation setting frame (response) from the equipment under test and transmit the 3rd IO allocation setting frame (request, setting number = 2 / number of control slaves = 2) from the TCP setting tool A. f) Receive the 3rd IO allocation setting frame (response) from the equipment under test and transmit the 1st IO allocation read frame (request, setting number = 1) from the TCP setting tool A. g) Receive the 1st IO allocation read frame (response) from the equipment under test and transmit the 2nd IO allocation read frame (request, setting number = 2) from the TCP setting tool A. h) Close the TCP connections with the equipment under test.
Evaluation criteria	a) Confirm that the equipment under test transmits the 1st IO allocation setting response frame for the 1st IO allocation setting request frame from the TCP setting tool A. b) Confirm the contents of the 1st IO allocation setting response frame by the following Classes of the equipment under test: * Classes 3 (flexible master function implemented) and 4: Normal response (M_RLT = 0) * Class 3 (flexible master function not-implemented): Normal response (M_RLT = 0), not-implemented response (M_RLT = 2), or no response NOTE: In the case of normal response, confirm that the contents of data are correct. c) Confirm that the equipment under test transmits the 2nd IO allocation setting response frame for the 2nd IO allocation setting request frame from the TCP setting tool B. d) Confirm the contents of the 2nd IO allocation setting response frame by the following Classes of the equipment under test: * Classes 3 (flexible master function implemented) and 4: Error response (M_RLT = 1) * Class 3 (flexible master function not-implemented): Error response (M_RLT = 1), not-implemented response (M_RLT = 2), or no response NOTE: In the case of error response, confirm that the result of the response data = error (16#02) and the information = locked by exclusive control (16#04). e) Confirm that the equipment under test transmits the 3rd IO allocation response frame for the 3rd IO allocation setting request frame from the TCP setting tool A.

Table 124 – IO Allocation Setting (Lock Confirmation), Read (continued)

<table>
<tr><td colspan="2">Evaluation criteria (continued)</td><td colspan="4">f) Confirm the contents of the 3rd IO allocation setting response frame by the following Classes of the equipment under test:
* Classes 3 (flexible master function implemented) and 4: Normal response (M_RLT = 0)
* Class 3 (flexible master function not-implemented): Normal response (M_RLT = 0), not-implemented response (M_RLT = 2), or no response
NOTE: In the case of normal response, confirm that the contents of data are correct.
g) Confirm that the equipment under test transmits the 1st IO allocation read response frame for the 1st IO allocation read request frame from the TCP setting tool A.
h) Confirm the contents of the 1st IO allocation read response frame by the following Classes of the equipment under test:
* Classes 3 (flexible master function implemented) and 4: Normal response (M_RLT = 0)
* Class 3 (flexible master function not-implemented): Normal response (M_RLT = 0), not-implemented response (M_RLT = 2), or no response
NOTE: In the case of normal response, confirm that the contents of data are equivalent to the settings made by the TCP setting tool A.
i) Confirm that the equipment under test transmits the 2nd IO allocation read response frame for the 2nd IO allocation read request frame from the TCP setting tool A.
j) Confirm the contents of the 2nd IO allocation read response frame by the following Classes of the equipment under test:
* Classes 3 (flexible master function implemented) and 4: Normal response (M_RLT = 0)
* Class 3 (flexible master function not-implemented): Normal response (M_RLT = 0), not-implemented response (M_RLT = 2), or no response
NOTE: In the case of normal response, confirm that the contents of data are equivalent to the settings made by the TCP setting tool A.
k) Confirm that the equipment under test transmits the solicitation frame according to the settings made by the TCP setting tool A.</td></tr>
<tr><td rowspan="7">Test necessity identified by the EUT class</td><td>Class 1</td><td colspan="4">N</td></tr>
<tr><td>Class 2</td><td colspan="4">N</td></tr>
<tr><td>Class 3</td><td colspan="4">O (when implementing the TCP command server function)</td></tr>
<tr><td>Class 4</td><td colspan="4">O (when implementing the TCP command server function)</td></tr>
<tr><td>Class 5</td><td colspan="4">N</td></tr>
<tr><td>Class 6</td><td colspan="4">N</td></tr>
<tr><td>Class 7</td><td colspan="4">N</td></tr>
<tr><td colspan="2" rowspan="8">Setting parameter (Node)</td><td rowspan="8">Equipment under test(EUT)</td><td rowspan="8">Classes 3 and 4</td><td>Node number</td><td>1</td></tr>
<tr><td>Token watchdog time</td><td>(50)</td></tr>
<tr><td>Allowable minimum frame interval time</td><td>(10)</td></tr>
<tr><td>Area 1 data top address</td><td>256</td></tr>
<tr><td>Area 1 data size</td><td>16</td></tr>
<tr><td>Area 2 data top address</td><td>1 024</td></tr>
<tr><td>Area 2 data size</td><td>64</td></tr>
<tr><td>IO allocation setting (for Class 4)</td><td>Optional</td></tr>
</table>

Table 124 – IO Allocation Setting (Lock Confirmation), Read (continued)

Setting parameter (Node) (continued)	Test equipment	Classes 3 and 4	Implementation class	3 (Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
Setting parameter (Test data)	1st IO allocation setting	Request frame	Interface	TCP setting tool A
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	1
			TCD	65018 (IO allocation setting request)
			Data size	24
			Contents of data	Setting number = 1
				Number of control slaves (total) = 2
				Lock ID = 0
				Lock timeout setting value = 4
				Slave node number = 16#800C (Flexible setting mode, Node number = 12)
				Input data address = 16#0080 (Area 1, Address = 128)
				Input data size = 4
				Output data address = 16#0100 (Area 1, Address = 256)
				Input data size = 8
				Input status address = 16#8200 (Area 2, Address = 512)
				Output status address = 16#8400 (Area 2, Address = 1024)
		Response frame	Interface	TCP setting tool A
			Node address of source side (SNA)	1
			Node address of destination side (DNA)	254
			TCD	65218 (IO allocation setting response)
			Type of response message (M_RLT)	Depends on Class of the equipment under test (EUT). * Class 3 (flexible master function not-implemented): 0 (Normal) or 2 (Not-implemented) * Classes 3 (flexible master function implemented) and 4: 0 (Normal)

Table 124 – IO Allocation Setting (Lock Confirmation), Read (continued)

Setting parameter (Test data) (continued)	1st IO allocation setting (Continued)	Response frame (Continued)	Data size (M_RLT = 0)	8
			Contents of data (M_RLT = 0)	Result = 1 (continue)
				Information = (No evaluation)
				Lock ID = other than 0
	2nd IO allocation setting	Request frame	Interface	TCP setting tool B
			Node address of source side (SNA)	253
			Node address of destination side (DNA)	1
			TCD	65018 (IO allocation setting request)
			Data size	24
			Contents of data	Setting number = 1
				Number of control slaves (total) = 3
				Lock ID = 0
				Lock timeout setting value = 6
				Slave node number = 16#8032 (Flexible setting mode, Node number = 50)
				Input data address = 16#00A0 (Area 1, Address = 160)
				Input data size = 4
				Output data address = 16#010C (Area 1, Address = 268)
				Output data size = 4
				Input status address = 16#8258 (Area 2, Address = 600)
				Output status address = 16#8430 (Area 2, Address = 1072)
		Response frame	Interface	TCP setting tool B
			Node address of source side (SNA)	1
			Node address of destination side (DNA)	253
			TCD	65218 (IO allocation setting response)
			Type of response message (M_RLT)	Depends on Class of the equipment under test (EUT). * Class 3 (flexible master function not-implemented): 1 (Error) or 2 (Not-implemented) * Classes 3 (flexible master function implemented) and 4: 1 (Error)
			Data size (M_RLT = 0)	8
			Contents of data (M_RLT = 0)	Result = 2 (error)
				Information = 4 (locked by exclusive control)
				Lock ID = (No evaluation)

Table 124 – IO Allocation Setting (Lock Confirmation), Read (continued)

Setting parameter (Test data) (continued)	3rd IO allocation setting	Request frame	Interface	TCP setting tool A
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	1
			TCD	65018 (IO allocation setting request)
			Data size	24
			Contents of data	Setting number = 2
				Number of control slaves (total) = 2
				Lock ID = Same as that of the 1st IO allocation setting response frame
				Lock timeout setting value = 4
				Slave node number = 16#8064 (Flexible setting mode, Node number = 100)
				Input data address = 16#008C (Area 1, Address = 140)
				Input data size = 6
				Output data address = 16#0108 (Area 1, Address = 264)
				Output data size = 8
				Input status address = 16#8220 (Area 2, Address = 544)
				Output status address = 16#8420 (Area 2, Address = 1056)
		Response frame	Interface	TCP setting tool A
			Node address of source side (SNA)	1
			Node address of destination side (DNA)	254
			TCD	65218 (IO allocation setting response)
			Type of response message (M_RLT)	Depends on Class of the equipment under test (EUT). * Class 3 (flexible master function not-implemented): 0 (Normal) or 2 (Not-implemented) * Classes 3 (flexible master function implemented) and 4: 0 (Normal)
			Data size (M_RLT = 0)	8
			Contents of data (M_RLT = 0)	Result = 0 (Normal)
				Information = (No evaluation)
				Lock ID = Same as that of the 1st IO allocation setting response frame

Table 124 – IO Allocation Setting (Lock Confirmation), Read (continued)

Setting parameter (Test data) (continued)	1st IO allocation read	Request frame	Interface	TCP setting tool A
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	1
			TCD	65019 (IO allocation read request)
			Data size	4
			Contents of data	Setting number = 1
		Response frame	Interface	TCP setting tool A
			Node address of source side (SNA)	1
			Node address of destination side (DNA)	254
			TCD	65219 (IO allocation read response)
			Type of response message (M_RLT)	Depends on Class of the equipment under test (EUT). * Class 3 (flexible master function not-implemented): 0 (Normal), 2 (Not-implemented) * Classes 3 (flexible master function implemented) and 4: 0 (Normal)
			Data size (M_RLT = 0)	20
			Contents of data (M_RLT = 0)	Setting number = 1
				Number of control slaves (total) = 2
				Slave node number = 16#800C (Flexible setting mode, Node number = 12)
				Input data address = 16#0080 (Area 1, Address = 128)
				Input data size = 4
				Output data address = 16#0100 (Area 1, Address = 256)
				Output data size = 8
				Input status address = 16#8200 (Area 2, Address = 512)
				Output status address = 16#8400 (Area 2, Address = 1024)
	2nd IO allocation read	Request frame	Interface	TCP setting tool A
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	1
			TCD	65019 (IO allocation read request)
			Data size	4
			Contents of data	Setting number = 2

Table 124 – IO Allocation Setting (Lock Confirmation), Read (continued)

Setting parameter (Test data) (continued)	2nd IO allocation read (Continued)	Response frame	Interface	TCP setting tool A
			Node address of source side (SNA)	1
			Node address of destination side (DNA)	254
			TCD	65219 (IO allocation read response)
			Type of response message (M_RLT)	Depends on Class of the equipment under test (EUT). * Class 3 (flexible master function not-implemented): 0 (Normal) or 2 (Not-implemented) * Classes 3 (flexible master function implemented) and 4: 0 (Normal)
			Data size (M_RLT = 0)	20
			Contents of data (M_RLT = 0)	Setting number = 2
				Number of control slaves (total) = 2
				Slave node number = 16#8064 (Flexible setting mode, Node number = 100)
				Input data address = 16#008C (Area 1, Address = 140)
				Input data size = 6
				Output data address = 16#0108 (Area 1, Address = 264)
				Output data size = 8
				Input status address = 16#8220 (Area 2, Address = 544)
				Output status address = 16#8420 (Area 2, Address = 1056)
	Solicitation frame		Node address of source side (SNA)	1
			TCD	65017 (solicitation)
			Data size	32
			Contents of data (1st node)	Slave node number = 16#800C (Flexible setting mode, Node number = 12)
				Input data address = 16#0080 (Area 1, Address = 128)
				Input data size = 4
				Output data address = 16#0100 (Area 1, Address = 256)
				Output data size = 8
				Input status address = 16#8200 (Area 2, Address = 512)
				Output status address = 16#8400 (Area 2, Address = 1024)
				Lock ID = 1

Table 124 – IO Allocation Setting (Lock Confirmation), Read (continued)

Setting parameter (Test data) (continued)	Solicitation frame (continued)	Contents of data (2nd node)	Slave node number = 16#8064 (Flexible setting mode, Node number = 100)
			Input data address = 16#008C (Area 1, Address = 140)
			Input data size = 6
			Output data address = 16#0108 (Area 1, Address = 264)
			Output data size = 8
			Input status address = 16#8220 (Area 2, Address = 544)
			Output status address = 16#8420 (Area 2, Address = 1056)
			Lock ID = 1
	Response time limit (request frame transmission ~ response frame reception)	1 s	

Table 125 – IO Allocation Setting (Lock Timeout), Read

Test number	V3-044
Test large classification	General purpose command server function
Test classification	Operation test of double setting tools (TCP)
Test items	IO allocation setting (lock timeout), read
Test procedure	a) Start the equipment under test and the test equipment. b) Open two (2) TCP connections with the equipment under test from the test equipment (TCP setting tool interface). c) Transmit the 1st IO allocation setting frame (request, setting number = 1 / number of control slaves = 2) from the test equipment (1st TCP setting tool interface, hereinafter called “TCP setting tool A”). d) Receive the 1st IO allocation setting frame (response) from the equipment under test and transmit the 2nd IO allocation setting frame (request, setting number = 1 / number of control slaves = 3) from the test equipment (2nd TCP setting tool interface, hereinafter called “TCP setting tool B”). e) When the lock timeout period has elapsed after sending the 1st IO allocation frame, transmit the 3rd IO allocation setting frame (request, setting number = 2 / number of control slaves = 2) from the TCP setting tool A. f) Receive the 3rd IO allocation setting frame (response) from the equipment under test and transmit the 4th IO allocation setting frame (request, setting number = 1 / number of control slaves = 1) from the TCP setting tool B. g) Receive the 4th IO allocation setting frame (response) from the equipment under test and transmit the IO allocation read frame (request, setting number = 1) from the TCP setting tool B. h) Close the TCP connections with the equipment under test.

Table 125 – IO Allocation Setting (Lock Timeout), Read (continued)

Evaluation criteria	a) Confirm that the equipment under test transmits the 1st IO allocation setting response frame for the 1st IO allocation setting request frame from the TCP setting tool A. b) Confirm the contents of the 1st IO allocation setting response frame by the following Classes of the equipment under test: * Classes 3 (flexible master function implemented) and 4: Normal response (M_RLT = 0) * Class 3 (flexible master function not-implemented): Normal response (M_RLT = 0), not-implemented response (M_RLT = 2), or no response NOTE: In the case of normal response, confirm that the contents of data are correct. c) Confirm that the equipment under test transmits the 2nd IO allocation setting response frame for the 2nd IO allocation setting request frame from the TCP setting tool B. d) Confirm the contents of the 2nd IO allocation setting response frame by the following Classes of the equipment under test: * Classes 3 (flexible master function implemented) and 4: Error response (M_RLT = 1) * Class 3 (flexible master function not-implemented): Error response (M_RLT = 1), not-implemented response (M_RLT = 2), or no response NOTE: In the case of error response, confirm that the result of the response data = error (16#02) and the information = locked by exclusive control (16#04). e) Confirm that the equipment under test transmits the 3rd IO allocation response frame for the 3rd IO allocation setting request frame from the TCP setting tool A. f) Confirm the contents of the 3rd IO allocation setting response frame by the following Classes of the equipment under test: * Classes 3 (flexible master function implemented) and 4: Error response (M_RLT = 1) * Class 3 (flexible master function not-implemented): Error response (M_RLT = 1), not-implemented response (M_RLT = 2), or no response

Table 125 – IO Allocation Setting (Lock Timeout), Read (continued)

<table>
<tr><td colspan="2">Evaluation criteria (continued)</td><td colspan="5">NOTE: In the case of error response, confirm that the result of the response data = error (16#02) and the information = exclusive lock timeout (16#05).
g) Confirm that the equipment under test transmits the 4th IO allocation setting response frame for the 4th IO allocation setting request frame from the TCP setting tool B.
h) Confirm the contents of the 4th IO allocation setting response frame by the following Classes of the equipment under test:
* Classes 3 (flexible master function implemented) and 4: Normal response (M_RLT = 0)
* Class 3 (flexible master function not-implemented): Normal response (M_RLT = 0), not-implemented response (M_RLT = 2), or no response
NOTE: In the case of normal response, confirm that the contents of data are correct.
i) Confirm that the equipment under test transmits the IO allocation read response frame for the IO allocation read request frame from the TCP setting tool B.
j) Confirm the contents of the IO allocation read response frame by the following Classes of the equipment under test:
* Classes 3 (flexible master function implemented) and 4: Normal response (M_RLT = 0)
* Class 3 (flexible master function not-implemented): Normal response (M_RLT = 0), not-implemented response (M_RLT = 2), or no response
NOTE: In the case of normal response, confirm that the contents of data are equivalent to the settings made by the TCP setting tool B.
k) Confirm that the equipment under test transmits the solicitation frame according to the settings made by the TCP setting tool B.</td></tr>
<tr><td rowspan="7">test necessity identified by the EUT class</td><td>Class 1</td><td colspan="5">N</td></tr>
<tr><td>Class 2</td><td colspan="5">N</td></tr>
<tr><td>Class 3</td><td colspan="5">O (when implementing the TCP command server function)</td></tr>
<tr><td>Class 4</td><td colspan="5">O (when implementing the TCP command server function)</td></tr>
<tr><td>Class 5</td><td colspan="5">N</td></tr>
<tr><td>Class 6</td><td colspan="5">N</td></tr>
<tr><td>Class 7</td><td colspan="5">N</td></tr>
<tr><td colspan="2" rowspan="16">Setting parameter (Node)</td><td rowspan="8">Equipment under test (EUT)</td><td rowspan="8">Classes 3 and 4</td><td>Node number</td><td>1</td></tr>
<tr><td>Token watchdog time</td><td>(50)</td></tr>
<tr><td>Allowable minimum frame interval time</td><td>(10)</td></tr>
<tr><td>Area 1 data top address</td><td>256</td></tr>
<tr><td>Area 1 data size</td><td>16</td></tr>
<tr><td>Area 2 data top address</td><td>1 024</td></tr>
<tr><td>Area 2 data size</td><td>64</td></tr>
<tr><td>IO allocation setting (for Class 4)</td><td>Optional</td></tr>
<tr><td rowspan="8">Test equipment</td><td rowspan="8">Classes 3 and 4</td><td>Implementation class</td><td>3 (Controller)</td></tr>
<tr><td>Node number</td><td>254</td></tr>
<tr><td>Token watchdog time</td><td>50</td></tr>
<tr><td>Allowable minimum frame interval time</td><td>10</td></tr>
<tr><td>Area 1 data top address</td><td>4</td></tr>
<tr><td>Area 1 data size</td><td>4</td></tr>
<tr><td>Area 2 data top address</td><td>64</td></tr>
<tr><td>Area 2 data size</td><td>64</td></tr>
</table>

Table 125 – IO Allocation Setting (Lock Timeout), Read (continued)

Setting parameter (Test data)	1st IO allocation setting	Request frame	Interface	TCP setting tool A
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	1
			TCD	65018 (IO allocation setting request)
			Data size	24
			Contents of data	Setting number = 1
				Number of control slaves (total) = 2
				Lock ID = 0
				Lock timeout setting value = 4
				Slave node number = 16#800C (Flexible setting mode, Node number = 12)
				Input data address = 16#0080 (Area 1, Address = 128)
				Input data size = 4
				Output data address = 16#0100 (Area 1, Address = 256)
				Input data size = 8
				Input status address = 16#8200 (Area 2, Address = 512)
				Output status address = 16#8400 (Area 2, Address = 1024)
		Response frame	Interface	TCP setting tool A
			Node address of source side (SNA)	1
			Node address of destination side (DNA)	254
			TCD	65218 (IO allocation setting response)
			Type of response message (M_RLT)	Depends on Class of the equipment under test (EUT) * Class 3 (flexible master function not-implemented): 0 (Normal) or 2 (Not-implemented) * Classes 3 (flexible master function implemented) and 4: 0 (Normal)
			Data size (M_RLT = 0)	8
			Contents of data (M_RLT = 0)	Result = 1 (continue)
				Information = (No evaluation)
				Lock ID = other than 0

Table 125 – IO Allocation Setting (Lock Timeout), Read (continued)

Setting parameter (Test data) (continued)	2nd IO allocation setting	Request frame	Interface	TCP setting tool B
			Node address of source side (SNA)	253
			Node address of destination side (DNA)	1
			TCD	65018 (IO allocation setting request)
			Data size	24
			Contents of data	Setting number = 1
				Number of control slaves (total) = 3
				Lock ID = 0
				Lock timeout setting value = 6
				Slave node number = 16#8032 (Flexible setting mode, Node number = 50)
				Input data address = 16#00A0 (Area 1, Address = 160)
				Input data size = 4
				Output data address = 16#010C (Area 1, Address = 268)
				Output data size = 4
				Input status address = 16#8258 (Area 2, Address = 600)
				Output status address = 16#8430 (Area 2, Address = 1072)
		Response frame	Interface	TCP setting tool B
			Node address of source side (SNA)	1
			Node address of destination side (DNA)	253
			TCD	65218 (IO allocation setting response)
			Type of response message (M_RLT)	Depends on Class of the equipment under test (EUT) * Class 3 (flexible master function not-implemented): 1 (Error) or 2 (Not-implemented) * Classes 3 (flexible master function implemented) and 4: 1 (Error)
			Data size (M_RLT = 1)	8
			Contents of data (M_RLT = 1)	Result = 2 (error)
				Information = 4 (locked by exclusive control)
				Lock ID = (No evaluation)

Table 125 – IO Allocation Setting (Lock Timeout), Read (continued)

Setting parameter (Test data) (continued)	3rd IO allocation setting	Request frame	Interface	TCP setting tool A
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	1
			TCD	65018 (IO allocation setting request)
			Data size	24
			Contents of data	Setting number = 2
				Number of control slaves (total) = 2
				Lock ID = Same as that of the 1st IO allocation setting response frame
				Lock timeout setting value = 4
				Slave node number = 16#8064 (Flexible setting mode, Node number = 100)
				Input data address = 16#008C (Area 1, Address = 140)
				Input data size = 6
				Output data address = 16#0108 (Area 1, Address = 264)
				Input data size = 8
				Input status address = 16#8220 (Area 2, Address = 544)
				Output status address = 16#8420 (Area 2, Address = 1056)
		Response frame	Interface	TCP setting tool A
			Node address of source side (SNA)	1
			Node address of destination side (DNA)	254
			TCD	65218 (IO allocation setting response)
			Type of response message (M_RLT)	Depends on Class of the equipment under test (EUT) * Class 3 (flexible master function not-implemented): 1 (Error) or 2 (Not-implemented) * Classes 3 (flexible master function implemented) and 4: 1 (Error)
			Data size (M_RLT = 1)	8
			Contents of data (M_RLT = 1)	Result = 2 (error)
				Information = 5 (exclusive lock timeout)
				Lock ID = (No evaluation)

Table 125 – IO Allocation Setting (Lock Timeout), Read (continued)

Setting parameter (Test data) (continued)	4th IO allocation setting	Request frame	Interface	TCP setting tool B
			Node address of source side (SNA)	253
			Node address of destination side (DNA)	1
			TCD	65018 (IO allocation setting request)
			Data size	24
			Contents of data	Setting number = 1
				Number of control slaves (total) = 1
				Lock ID = 0
				Lock timeout setting value = 6
				Slave node number = 16#8064 (Flexible setting mode, Node number = 100)
				Input data address = 16#008C (Area 1, Address = 140)
				Input data size = 6
				Output data address = 16#0104 (Area 1, Address = 260)
				Output data size = 12
				Input status address = 16#8210 (Area 2, Address = 528)
				Output status address = 16#8410 (Area 2, Address = 1040)
		Response frame	Interface	TCP setting tool B
			Node address of source side (SNA)	1
			Node address of destination side (DNA)	253
			TCD	65218 (IO allocation setting response)
			Type of response message (M_RLT)	Depends on Class of the equipment under test (EUT) * Class 3 (flexible master function not-implemented): 0 (Normal) or 2 (Not-implemented) * Classes 3 (flexible master function implemented) and 4: 0 (Normal)
			Data size (M_RLT = 0)	8
			Contents of data (M_RLT = 0)	Result = 0 (normal)
				Information = (No evaluation)
				Lock ID = other than 0

Table 125 – IO Allocation Setting (Lock Timeout), Read (continued)

Setting parameter (Test data) (continued)	IO allocation read	Request frame	Interface	TCP setting tool B
			Node address of source side (SNA)	253
			Node address of destination side (DNA)	1
			TCD	65019 (IO allocation read request)
			Data size	4
			Contents of data	Setting number = 1
		Response frame	Interface	TCP setting tool B
			Node address of source side (SNA)	1
			Node address of destination side (DNA)	253
			TCD	65219 (IO allocation read response)
			Type of response message (M_RLT)	Depends on Class of the equipment under test (EUT) * Class 3 (flexible master function not-implemented): 0 (Normal) or 2 (Not-implemented) * Classes 3 (flexible master function implemented) and 4: 0 (Normal)
			Data size (M_RLT = 0)	20
			Contents of data (M_RLT = 0)	Setting number = 1
				Number of control slaves (total) = 1
				Slave node number = 16#8064 (Flexible setting mode, Node number = 100)
				Input data address = 16#008C (Area 1, Address = 140)
				Input data size = 6
				Output data address = 16#0104 (Area 1, Address = 260)
				Output data size = 12
				Input status address = 16#8210 (Area 2, Address = 528)
				Output status address = 16#8410 (Area 2, Address = 1040)

Table 125 – IO Allocation Setting (Lock Timeout), Read (continued)

Setting parameter (Test data) (continued)	Solicitation frame	Node address of source side (SNA)	1
		TCD	65017 (Solicitation)
		Data size	16
		Contents of data	Slave node number = 16#8064 (Flexible setting mode, Node number = 100)
			Input data address = 16#008C (Area 1, Address = 140)
			Input data size = 6
			Output data address = 16#0104 (Area 1, Address = 260)
			Output data size = 12
			Input status address = 16#8210 (Area 2, Address = 528)
			Output status address = 16#8410 (Area 2, Address = 1040)
			Lock ID: 1
	Response time limit (request frame transmission ~ response frame reception)	1 s	

Table 126 – IO Allocation Setting (Unlock), Read

Test number	V3-045
Test large classification	General purpose command server function
Test classification	Operation test of double setting tools (TCP)
Test items	IO allocation setting (unlock), read
Test procedure	a) Start the equipment under test and the test equipment. b) Open two (2) TCP connections with the equipment under test from the test equipment (TCP setting tool interface). c) Transmit the 1st IO allocation setting frame (request, setting number = 1 / number of control slaves = 2) from the test equipment (1st TCP setting tool interface, hereinafter called “TCP setting tool A”). d) Receive the 1st IO allocation setting frame (response) from the equipment under test and transmit the 2nd IO allocation setting frame (request, unlock) from the TCP setting tool A. e) Receive the 2nd IO allocation setting frame (response) from the equipment under test and transmit the 3rd IO allocation setting frame (request, setting number = 1 / number of control slaves = 1) from the test equipment (2nd TCP setting tool interface, hereinafter called “TCP setting tool B”).

Table 126 – IO Allocation Setting (Unlock), Read (continued)

Test procedure (continued)		f) Receive the 3rd IO allocation setting frame (response) from the equipment under test and transmit the IO allocation read frame (request, setting number = 1) from the TCP setting tool B. g) Close the TCP connections with the equipment under test.
Evaluation criteria		a) Confirm that the equipment under test transmits the 1st IO allocation setting response frame for the 1st IO allocation setting request frame from the TCP setting tool A. b) Confirm the contents of the 1st IO allocation setting response frame by the following Classes of the equipment under test: * Classes 3 (flexible master function implemented) and 4: Normal response (M_RLT = 0) * Class 3 (flexible master function not-implemented): Normal response (M_RLT = 0), not-implemented response (M_RLT = 2), or no response NOTE: In the case of normal response, confirm that the contents of data are correct. c) Confirm that the equipment under test transmits the 2nd IO allocation setting response frame for the 2nd IO allocation setting request frame from the TCP setting tool A. d) Confirm the contents of the 2nd IO allocation setting response frame by the following Classes of the equipment under test: * Classes 3 (flexible master function implemented) and 4: Normal response (M_RLT = 0) * Class 3 (flexible master function not-implemented): Normal response (M_RLT = 0), not-implemented response (M_RLT = 2), or no response NOTE: In the case of normal response, confirm that the contents of data are correct. e) Confirm that the equipment under test transmits the 3rd IO allocation setting response frame for the 3rd IO allocation setting request frame from the TCP setting tool A. f) Confirm the contents of the 3rd IO allocation setting response frame by the following Classes of the equipment under test: * Classes 3 (flexible master function implemented) and 4: Normal response (M_RLT = 0) * Class 3 (flexible master function not-implemented): Normal response (M_RLT = 0), not-implemented response (M_RLT = 2), or no response NOTE: In the case of normal response, confirm that the contents of data are correct. g) Confirm that the equipment under test transmits the IO allocation read response frame for the IO allocation read request frame from the TCP setting tool B. h) Confirm the contents of the IO allocation read response frame by the following Classes of the equipment under test: * Classes 3 (flexible master function implemented) and 4: Normal response (M_RLT = 0) * Class 3 (flexible master function not-implemented): Normal response (M_RLT = 0), not-implemented response (M_RLT = 2), or no response NOTE: In the case of normal response, confirm that the contents of data are equivalent to the settings made by the TCP setting tool B. i) Confirm that the equipment under test transmits the solicitation frame according to the settings made by the TCP setting tool B.
Test necessity identified by the EUT class	Class 1	N
	Class 2	N
	Class 3	O (when implementing the TCP command server function)
	Class 4	O (when implementing the TCP command server function)
	Class 5	N
	Class 6	N
	Class 7	N

Table 126 – IO Allocation Setting (Unlock), Read (continued)

Setting parameter (Node)	Equipment under test (EUT)	Classes 3 and 4	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	16
			Area 2 data top address	1 024
			Area 2 data size	64
			IO allocation setting (for Class 4)	Optional
	Test equipment	Classes 3 and 4	Implementation class	3 (Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
Setting parameter (Test data)	1st IO allocation setting	Request frame	Interface	TCP setting tool A
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	1
			TCD	65018 (IO allocation setting request)
			Data size	24
			Contents of data	Setting number = 1
				Number of control slaves (total) = 2
				Lock ID = 0
				Lock timeout setting value = 4
				Slave node number = 16#800C (Flexible setting mode, Node number = 12)
				Input data address = 16#0080 (Area 1, Address = 128)
				Input data size = 4
				Output data address = 16#0100 (Area 1, Address = 256)
				Input data size = 8
				Input status address = 16#8200 (Area 2, Address = 512)
				Output status address = 16#8400 (Area 2, Address = 1024)

Table 126 – IO Allocation Setting (Unlock), Read (continued)

Setting parameter (Test data) (continued)	1st IO allocation setting (Continued)	Request frame	Interface	TCP setting tool A
			Node address of source side (SNA)	1
			Node address of destination side (DNA)	254
			TCD	65218 (IO allocation setting response)
			Type of response message (M_RLT)	Depends on Class of the equipment under test (EUT) * Class 3 (flexible master function not-implemented): 0 (Normal) or 2 (Not-implemented) * Classes 3 (flexible master function implemented) and 4: 0 (Normal)
			Data size (M_RLT = 0)	8
			Contents of data (M_RLT = 0)	Result = 1 (continue)
				Information = (No evaluation)
				Lock ID = other than 0
	2nd IO allocation setting	Request frame	Interface	TCP setting tool A
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	1
			TCD	65018 (IO allocation setting request)
			Data size	24
			Contents of data	Setting number = 16#FFFF
				Number of control slaves (total) = 16#FFFF
				Lock ID = Same as that of the 1st IO allocation setting response frame
				Lock timeout setting value = 4
				Slave node number = 0
				Input data address = 0
				Input data size = 0
				Output data address = 0
				Output data size = 0
				Input status address = 0
				Output status address = 0
		Response frame	Interface	TCP setting tool A
			Node address of source side (SNA)	1
			Node address of destination side (DNA)	254
			TCD	65218 (IO allocation setting response)

Table 126 – IO Allocation Setting (Unlock), Read (continued)

Setting parameter (Test data) (continued)	2nd IO allocation setting (Continued)	Response frame (continued)	Type of response message (M_RLT)	Depends on Class of the equipment under test (EUT) * Class 3 (flexible master function not-implemented): 0 (Normal) or 2 (Not-implemented) * Classes 3 (flexible master function implemented) and 4: 0 (Normal)
			Data size (M_RLT = 0)	8
			Contents of data (M_RLT = 0)	Result = 0 (normal)
				Information = (No evaluation)
				Lock ID = (No evaluation)
	3rd IO allocation setting	Request frame	Interface	TCP setting tool B
			Node address of source side (SNA)	253
			Node address of destination side (DNA)	1
			TCD	65018 (IO allocation setting request)
			Data size	24
			Contents of data	Setting number = 1
				Number of control slaves (total) = 1
				Lock ID = 0
				Lock timeout setting value = 2
				Slave node number = 16#8032 (Flexible setting mode, Node number = 50)
				Input data address = 16#00A0 (Area 1, Address = 160)
				Input data size = 4
				Output data address = 16#0108 (Area 1, Address = 264)
				Output data size = 4
				Input status address = 16#8258 (Area 2, Address = 600)
				Output status address = 16#8420 (Area 2, Address = 1056)
		Response frame	Interface	TCP setting tool B
			Node address of source side (SNA)	1
			Node address of destination side (DNA)	253
			TCD	65218 (IO allocation setting response)
			Type of response message (M_RLT)	Depends on Class of the equipment under test (EUT) * Class 3 (flexible master function not-implemented): 0 (Normal), 2 (Not-implemented) * Classes 3 (flexible master function implemented) and 4: 0 (Normal)

Table 126 – IO Allocation Setting (Unlock), Read (continued)

Setting parameter (Test data) (continued)	3rd IO allocation setting (Continued)	Response frame (continued)	Data size (M_RLT = 0)	8
			Contents of data (M_RLT = 0)	Result = 0 (normal)
				Information = (No evaluation)
				Lock ID = other than 0
	IO allocation read	Request frame	Interface	TCP setting tool B
			Node address of source side (SNA)	253
			Node address of destination side (DNA)	1
			TCD	65019 (IO allocation read request)
			Data size	4
			Contents of data	Setting number = 1
		Response frame	Interface	TCP setting tool B
			Node address of source side (SNA)	1
			Node address of destination side (DNA)	253
			TCD	65219 (IO allocation read response)
			Type of response message (M_RLT)	Depends on Class of the equipment under test (EUT) * Class 3 (flexible master function not-implemented): 0 (Normal) or 2 (Not-implemented) * Classes 3 (flexible master function implemented) and 4: 0 (Normal)
			Data size (M_RLT = 0)	20
			Contents of data (M_RLT = 0)	Setting number = 1
				Number of control slaves (total) = 1
				Slave node number = 16#8032 (Flexible setting mode, Node number = 50)
				Input data address = 16#00A0 (Area 1, Address = 160)
				Input data size = 4
				put data address = 16#0108 (Area 1, Address = 264)
				Output data size = 4
				Input status address = 16#8258 (Area 2, Address = 600)
				Output status address = 16#8420 (Area 2, Address = 1056)
	Solicitation frame		Node address of source side (SNA)	1
			TCD	65017 (Solicitation)
			Data size	16

Table 126 – IO Allocation Setting (Unlock), Read (continued)

Setting parameter (Test data) (continued)	Solicitation frame (continued)	Contents of data	Slave node number = 16#8032 (Flexible setting mode, Node number = 50)
			Input data address = 16#00A0 (Area 1, Address = 160)
			Input data size = 4
			put data address = 16#0108 (Area 1, Address = 264)
			Output data size = 4
			Input status address = 16#8258 (Area 2, Address = 600)
			Output status address = 16#8420 (Area 2, Address = 1056)
			Lock ID = 1
	Response time limit (request frame transmission ~ response frame reception)	1 s	

Table 127 – Token Retention Time Measurement Start/End

<table>
<tr><td colspan="2">Test number</td><td colspan="4">V3-046</td></tr>
<tr><td colspan="2">Test large classification</td><td colspan="4">General purpose command server function</td></tr>
<tr><td colspan="2">Test classification</td><td colspan="4">Operation test of double setting tools (TCP)</td></tr>
<tr><td colspan="2">Test items</td><td colspan="4">Token retention time measurement start/end</td></tr>
<tr><td colspan="2">Test procedure</td><td colspan="4">a) Start the equipment under test and the test equipment. Then, start the dummy node.
b) Open two (2) TCP connections with the equipment under test from the test equipment (TCP setting tool interface).
c) Transmit the 1st token retention time measurement start request frame from the test equipment (1st TCP setting tool interface, hereinafter called “TCP setting tool A”).
d) Disengage the test equipment from the network. (Stop sending the token frame.)
e) Rejoin the test equipment to the network.
f) After 10 seconds from rejoining to the network, transmit the 2nd token retention time measurement start request frame from the other test equipment (2nd TCP setting tool interface, hereinafter called “TCP setting tool B”).
g) After 60 seconds from receiving the 2nd token retention time measurement start response frame from the equipment under test, transmit the 1st token retention time measurement end request frame from the TCP setting tool A.
h) Receive the 1st token retention time measurement end response frame from the equipment under test and transmit the 2nd token retention time measurement end request frame from the TCP setting tool B.
i) Close the TCP connections with the equipment under test.</td></tr>
<tr><td colspan="2">Evaluation criteria</td><td colspan="4">a) Confirm that the equipment under test transmits the 1st token retention time measurement start response frame for the 1st token retention time measurement start request frame from the TCP setting tool A.
b) Confirm that the 1st token retention time measurement start response frame is normal response (M_RLT = 0).
c) Confirm that the equipment under test transmits the 2nd token retention time measurement start response frame for the 2nd token retention time measurement start request frame from the TCP setting tool B.
d) Confirm that the 2nd token retention time measurement start response frame is normal response (M_RLT = 0).
e) Confirm that the equipment under test transmits the 1st token retention time measurement end response frame for the 1st token retention time measurement end request frame from the TCP setting tool A.
f) Confirm that the 1st token retention time measurement end response frame is normal response (M_RLT = 0) and its contents are as follows:
* Number of tokens during measuring the token retention time ≠ 0
g) Confirm that the equipment under test transmits the 2nd token retention time measurement end response frame for the 2nd token retention time measurement end request frame from the TCP setting tool B.
h) Confirm that the 2nd token retention time measurement end response frame is normal response (M_RLT = 0) and its contents are equivalent to the 2nd end response data.</td></tr>
<tr><td rowspan="7">Test necessity identified by the EUT class</td><td>Class 1</td><td colspan="4">N</td></tr>
<tr><td>Class 2</td><td colspan="4">N</td></tr>
<tr><td>Class 3</td><td colspan="4">O (when implementing the TCP command server function)</td></tr>
<tr><td>Class 4</td><td colspan="4">O (when implementing the TCP command server function and command server load measurement function)</td></tr>
<tr><td>Class 5</td><td colspan="4">O (when implementing the TCP command server function and command server load measurement function)</td></tr>
<tr><td>Class 6</td><td colspan="4">O (when implementing the TCP command server function and command server load measurement function)</td></tr>
<tr><td>Class 7</td><td colspan="4">O (when implementing the TCP command server function and command server load measurement function)</td></tr>
<tr><td colspan="2" rowspan="3">Setting parameter (node)</td><td rowspan="3">Equipment under test (EUT) (Parameters depending on Class)</td><td rowspan="3">Classes 3 and 4</td><td>Node number</td><td>1</td></tr>
<tr><td>Token watchdog time</td><td>(50)</td></tr>
<tr><td>Allowable minimum frame interval time</td><td>(10)</td></tr>
</table>

Table 127 – Token Retention Time Measurement Start/End (continued)

Setting parameter (Node) (continued)	Equipment under test (EUT) (Parameters depending on Class) (Continued)	Classes 3 and 4	Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	0
			Area 2 data size	16
			IO allocation setting (for Class 4)	Optional
		Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1 024
			Area 2 data size	1 024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	Calculated from the number of input points of the slave of the equipment under test (EUT).
			Area 2 data top address	0
			Area 2 data size	Calculated from the number of input and output points of the slave of the equipment under test (EUT).
	Test equipment (Parameters depending on Class of the equipment under test (EUT))	Classes 3, 4 and 5	Implementation class	3 (Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (Flexible master)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	Depends on the number of output points of the slave of the equipment under test (EUT). * 0 point: 0 * 1 point or more: 256
			Area 1 data size	Calculated from the number of output points of the slave of the equipment under test (EUT).
			Area 2 data top address	1 024
			Area 2 data size	1 024

Table 127 – Token Retention Time Measurement Start/End (continued)

Setting parameter (Node) (continued)	Test equipment (Parameters depending on Class of the equipment under test (EUT)) (continued)	Class 6 (continued)	IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, Node number = 1)
				Input data address = 16#0000 (Area 1, Address = 0)
				Input data size = Calculated from the number of input points of the slave of the equipment under test (EUT).
				Output data address = Depends on the number of output points of the slave of the equipment under test (EUT). * 0 point: 16#0000 (Area 1, Address = 0) * 1 point or more: 16#0100 (Area 1, Address = 256)
				Output data size = Calculated from the number of output points of the slave of the equipment under test (EUT).
				Input status address = 16#8000 (Area 2, Address = 0)
				Output status address = 16#8400 (Area 2, Address = 1024)
		Class 7	Implementation class	3 (Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64
	Dummy node		Implementation class	3 (Controller)
			Node number	2
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
Setting parameter (Test data)	1st token retention time measurement start	Request frame	Interface	TCP setting tool A
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	Depends on Class of the equipment under test (EUT). * Classes 3, 4, 6 and 7: 1 * Class 5: 100

Table 127 – Token Retention Time Measurement Start/End (continued)

Setting parameter (Test data) (continued)	1st token retention time measurement start (continued)	Request frame (continued)	TCD	65020 (token retention time measurement start request)
			Data size	0
			Contents of data	NA
		Response frame	Interface	TCP setting tool A
			Node address of source side (SNA)	Depends on Class of the equipment under test (EUT). * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65220 (token retention time measurement start response)
			Type of response message (M_RLT)	0 (normal)
			Data size (M_RLT = 0)	0
			Contents of data	NA
	2nd token retention time measurement start (continued)	Request frame	Interface	TCP setting tool B
			Node address of source side (SNA)	253
			Node address of destination side (DNA)	Depends on Class of the equipment under test (EUT). * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65020 (token retention time measurement start request)
			Data size	0
			Contents of data	NA
		Response frame	Interface	TCP setting tool B
			Node address of source side (SNA)	Depends on Class of the equipment under test (EUT). * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	253
			TCD	65220 (token retention time measurement start response)
			Type of response message (M_RLT)	0 (normal)
			Data size (M_RLT = 0)	0
			Contents of data	NA
	1st token retention time measurement end	Request frame	Interface	TCP setting tool A
			Node address of source side (SNA)	254

Table 127 – Token Retention Time Measurement Start/End (continued)

Setting parameter (Test data) (continued)	1st token retention time measurement end (continued)	Request frame (continued)	Node address of destination side (DNA)	Depends on Class of the equipment under test (EUT). * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65021 (token retention time measurement end request)
			Data size	0
			Contents of data	NA
		Response frame	Interface	TCP setting tool A
			Node address of source side (SNA)	Depends on Class of the equipment under test (EUT). * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65221 (token retention time measurement end response)
			Type of response message (M_RLT)	0 (normal)
			Data size (M_RLT = 0)	76
			Contents of data (M_RLT = 0)	Number of tokens during measuring the token retention time ≠ 0
	2nd token retention time measurement end	Request frame	Interface	TCP setting tool B
			Node address of source side (SNA)	253
			Node address of destination side (DNA)	Depends on Class of the equipment under test (EUT). * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65021 (token retention time measurement end request)
			Data size	0
			Contents of data	NA
		Response frame	Interface	TCP setting tool B
			Node address of source side (SNA)	Depends on Class of the equipment under test (EUT). * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	253
			TCD	65221 (token retention time measurement end response)
			Type of response message (M_RLT)	0 (normal)
			Data size (M_RLT = 0)	76

Table 127 – Token Retention Time Measurement Start/End (continued)

Setting parameter (Test data) (continued)	2nd token retention time measurement end (continued)	Response frame (continued)	Contents of data (M_RLT = 0)	Token retention measurement time = (Same as the 1st end response time)
				Number of tokens during measuring the token retention time = (Same as that of the 1st end response)
	Response time limit (request frame transmission ~ response frame reception)		1 s	

Table 128 – General Purpose Communication Data Sender Log Measurement Start/End

Test number	V3-047
Test large classification	General purpose command server function
Test classification	Operation test of double setting tools (TCP)
Test items	General purpose communication data sender log measurement start/end
Test procedure	a) Start the equipment under test and the test equipment. b) Open two (2) TCP connections with the equipment under test from the test equipment (TCP setting tool interface). c) Transmit the 1st general purpose communication data sender log measurement start request frame from the test equipment (1st TCP setting tool interface, hereinafter called “TCP setting tool A”). d) After 10 seconds from receiving the 1st general purpose communication data sender log measurement start response frame from the equipment under test, transmit the 1st general purpose communication data from the TCP setting tool A. e) Transmit the 2nd general purpose communication data sender log measurement start request frame from the other test equipment (2nd TCP setting tool interface, hereinafter called “TCP setting tool B”). f) Receive the 2nd general purpose communication data sender log measurement start response frame from the equipment under test, and transmit the 2nd general purpose communication data from the TCP setting tool B. g) After 60 seconds from receiving the 2nd general purpose communication data sender log measurement start response frame from the equipment under test, transmit the 1st general purpose communication data sender log measurement end request frame from the TCP setting tool A. h) Receive the 2nd general purpose communication data sender log measurement end response frame from the equipment under test, and transmit the 2nd general purpose communication data sender log measurement end request frame from the TCP setting tool B. i) Close the TCP connections with the equipment under test.

Table 128 – General Purpose Communication Data Sender Log Measurement Start/End (continued)

Evaluation criteria	a) Confirm that equipment under test transmits the 1st general purpose communication data sender log measurement start response frame for the 1st general purpose communication data sender log measurement start request frame from the TCP setting tool A. b) Confirm that the 1st general purpose communication data sender log measurement start response frame is normal response (M_RLT = 0). c) Confirm that the equipment under test transmits the 2nd general purpose communication data sender log measurement start response frame for the 2nd general purpose communication data sender log measurement start request frame from the TCP setting tool B. d) Confirm that the 2nd general purpose communication data sender log measurement start response frame is normal response (M_RLT = 0). e) Confirm that the equipment under test transmits the 1st general purpose communication data sender log measurement end response frame for the 1st general purpose communication data sender log measurement end request frame from the TCP setting tool A. f) Confirm that the 1st general purpose communication data sender log measurement end response frame is normal response (M_RLT = 0). g) Confirm that the equipment under test transmits the 2nd general purpose communication data sender log measurement end response frame for the 2nd general purpose communication data sender log measurement end request frame from the TCP setting tool B. h) Confirm that the 2nd general purpose communication data sender log measurement end response frame is normal response (M_RLT = 0) and its contents are equivalent to the 1st end response data.

Table 128 – General Purpose Communication Data Sender Log Measurement Start/End (continued)

Test necessity identified by the EUT class	Class 1	N			
	Class 2	N			
	Class 3	O (when implementing the TCP command server function)			
	Class 4	O (when implementing the TCP command server function and command server load measurement function)			
	Class 5	O (when implementing the TCP command server function and command server load measurement function)			
	Class 6	O (when implementing the TCP command server function and command server load measurement function)			
	Class 7	O (when implementing the TCP command server function and command server load measurement function)			
Setting parameter (Node)		Equipment under test (EUT) (Parameters depending on Class)	Classes 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	4
				Area 2 data top address	0
				Area 2 data size	16
				IO allocation setting (for Class 4)	Optional
			Class 5	Node number	100
				Token watchdog time	(100)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	256
				Area 1 data size	256
				Area 2 data top address	1 024
				Area 2 data size	1 024
			Classes 6 and 7	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	0
				Area 1 data size	Calculated from the number of input points of the slave of the equipment under test (EUT).
				Area 2 data top address	0
				Area 2 data size	Calculated from the number of input and output points of the slave of the equipment under test (EUT).
		Test equipment (Parameters depending on Class of the equipment under test (EUT))	Classes 3, 4 and 5	Implementation class	3 (Controller)
				Node number	254
				Token watchdog time	50
				Allowable minimum frame interval time	10
				Area 1 data top address	4
				Area 1 data size	4
				Area 2 data top address	64
				Area 2 data size	64
			Class 6	Implementation class	4 (Flexible master)
				Node number	254

Table 128 – General Purpose Communication Data Sender Log Measurement Start/End (continued)

Setting parameter (Node) (continued)	Test equipment (Parameters depending on Class of the equipment under test (EUT)) (Continued)	Class 6 (Continued)	Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	Depends on the number of output points of the slave of the equipment under test (EUT). * 0 point: 0 * 1 point or more: 256
			Area 1 data size	Calculated from the number of output points of the slave of the equipment under test (EUT).
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (Flexible setting mode, Node number = 1)
				Input data address = 16#0000 (Area 1, Address = 0)
				Input data size = Calculated from the number of input points of the slave of the equipment under test (EUT).
				Output data address = Depends on the number of output points of the slave of the equipment under test (EUT). * 0 point: 16#0000 (Area 1, Address = 0) * 1 point or more: 16#0100 (Area 1, Address = 256)
				Output data size = Calculated from the number of output points of the slave of the equipment under test (EUT).
				Input status address = 16#8000 (Area 2, Address = 0)
				Output status address = 16#8400 (Area 2, Address = 1024)
		Class 7	Implementation class	3 (Controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64

Table 128 – General Purpose Communication Data Sender Log Measurement Start/End (continued)

Setting parameter (Test data)	1st general purpose communication data sender log measurement start	Request frame	Interface	TCP setting tool A
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	Depends on Class of the equipment under test (EUT). * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65022 (general purpose communication data sender log measurement start request)
			Data size	0
			Contents of data	NA
		Response frame	Interface	TCP setting tool A
			Node address of source side (SNA)	Depends on Class of the equipment under test (EUT). * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65222 (general purpose communication data sender log measurement start response)
			Type of response message (M_RLT)	0 (normal)
			Data size (M_RLT = 0)	0
			Contents of data	NA
	1st general purpose communication data	Pattern 1	Interface	TCP
			Source IP address	192.168.250.254
			Destination IP address	Depends on Class of the equipment under test (EUT). * Classes 3, 4, 6 and 7: 192.168.250.1 * Class 5: 192.168.250.100
			Source port number	55 003
			Destination port number	55 000
			Data	Optional
			Number of transmissions	1
		Pattern 2	Interface	UDP
			Source IP address	1.2.3.4
			Destination IP address	1.2.3.255
			Source port number	10 000
			Destination port number	10 001
			Data	Optional
			Number of transmissions	2
	2nd general purpose communication data sender log measurement start	Request frame	Interface	TCP setting tool B
			Node address of source side (SNA)	253
			Node address of destination side (DNA)	Parameters depending on Class of the equipment under test (EUT): * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65022 (general purpose communication data sender log measurement start request)
			Data size	0
			Contents of data	NA

Table 128 – General Purpose Communication Data Sender Log Measurement Start/End (continued)

Setting parameter (Test data) (continued)	2nd general purpose communication data sender log measurement start (continued)	Response frame	Interface	TCP setting tool B
			Node address of source side (SNA)	Parameters depending on Class of the equipment under test (EUT): * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	253
			TCD	65222 (general purpose communication data sender log measurement start response)
			Type of response message (M_RLT)	0 (normal)
			Data size (M_RLT = 0)	0
			Contents of data	NA
	2nd general purpose communication data	Pattern *N* (*N* = 1 to 6)	Interface	TCP
			Source IP address	192.168.250.(248＋*N*)
			Destination IP address	Depends on Class of the equipment under test (EUT) * Classes 3, 4, 6 and 7: 192.168.250.1 * Class 5: 192.168.250.100
			Source port number	54 998＋*N*
			Destination port number	54 998＋*N*
			Data	Optional
			Number of transmissions	*N*
		Pattern 7	Interface	UDP
			Source IP address	1.2.3.4
			Destination IP address	1.2.3.255
			Source port number	10 000
			Destination port number	10 001
			Data	Optional
			Number of transmissions	10
		Pattern 8	Interface	UDP
			Source IP address	192.168.0.254
			Destination IP address	192.168.0.255
			Source port number	55 001
			Destination port number	55 000
			Data	Optional
			Number of transmissions	9
		Pattern 9	Interface	UDP
			Source IP address	192.168.250.125
			Destination IP address	192.168.250.255
			Source port number	55 002

Table 128 – General Purpose Communication Data Sender Log Measurement Start/End (continued)

Setting parameter (Test data) (continued)	2nd general purpose communication data (continued)	Pattern 9 (continued)	Destination port number	55 001
			Data	Optional
			Number of transmissions	8
		Pattern 10	Interface	UDP
			Source IP address	123.45.6.78
			Destination IP address	123.45.6.255
			Source port number	55 000
			Destination port number	55 003
			Data	Optional
			Number of transmissions	7
		Pattern 11	Interface	TCP
			Source IP address	192.168.250.200
			Destination IP address	Depends on Class of the equipment under test (EUT). * Classes 3, 4, 6 and 7: 192.168.250.1 * Class 5: 192.168.250.100
			Source port number	55 003
			Destination port number	55 000
			Data	Optional
			Number of transmissions	6
	1st general purpose communication data sender log measurement end	Request frame	Interface	TCP setting tool A
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	Parameters depending on Class of the equipment under test (EUT): * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65023 (general purpose communication data sender log measurement end request)
			Data size	0
			Contents of data	NA
		Response frame	Interface	TCP setting tool A
			Node address of source side (SNA)	Parameters depending on Class of the equipment under test (EUT): * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65223 (general purpose communication data sender log measurement end response)
			Type of response message (M_RLT)	0 (normal)

Table 128 – General Purpose Communication Data Sender Log Measurement Start/End (continued)

Setting parameter (Test data) (continued)	1st general purpose communication data sender log measurement end (continued)	Response frame (Continued)	Data size (M_RLT = 0)	84
			Contents of data (M_RLT = 0)	Optional (No evaluation)
	2nd general purpose communication data sender log measurement end	Request frame	Interface	TCP setting tool B
			Node address of source side (SNA)	253
			Node address of destination side (DNA)	Parameters depending on Class of the equipment under test (EUT): * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65023 (general purpose communication data sender log measurement end request)
			Data size	0
			Contents of data	NA
		Response frame	Interface	TCP setting tool B
			Node address of source side (SNA)	Parameters depending on Class of the equipment under test (EUT). * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	253
			TCD	65223 (general purpose communication data sender log measurement end response)
			Type of response message (M_RLT)	0 (normal)
			Data size (M_RLT = 0)	84
			Contents of data (M_RLT = 0)	General purpose communication data sender log measurement time: Same as that of the 1st end response
				IP1: Same as that of the 1st end response
				IP1 receiving counter: Same as that of the 1st end response
				IP2: Same as that of the 1st end response
				IP2 receiving counter: Same as that of the 1st end response
				IP3: Same as that of the 1st end response
				IP3 receiving counter: Same as that of the 1st end response
				IP4: Same as that of the 1st end response
				IP4 receiving counter: Same as that of the 1st end response
				IP5: Same as that of the 1st end response

Table 128 – General Purpose Communication Data Sender Log Measurement Start/End (continued)

Setting parameter (Test data) (continued)	2nd general purpose communication data sender log measurement end (continued)	Response frame (continued)	Contents of data (M_RLT = 0) (Continued)	IP5 receiving counter: Same as that of the 1st end response
				IP6: Same as that of the 1st end response
				IP6 receiving counter: Same as that of the 1st end response
				IP7: Same as that of the 1st end response
				IP7 receiving counter: Same as that of the 1st end response
				IP8: Same as that of the 1st end response
				IP8 receiving counter: Same as that of the 1st end response
				IP9: Same as that of the 1st end response
				IP9 receiving counter: Same as that of the 1st end response
				IP10: Same as that of the 1st end response
				IP10 receiving counter: Same as that of the 1st end response
	Response time limit (request frame transmission ~ response frame reception)		1 s	

g) Operation test of double setting tools (coexisting UDP and TCP)

Table 129 – IO Allocation Setting (Lock Confirmation), Read

Test number	V3-048
Test large classification	General purpose command server function
Test classification	Operation test of double setting tools (coexisting UDP and TCP)
Test items	IO allocation setting (lock confirmation), read
Test procedure	a) Start the equipment under test and the test equipment. b) Open the TCP connection with the equipment under test from the test equipment (TCP setting tool interface). c) Transmit the 1st IO allocation setting frame (request, setting number = 1 / number of control slaves = 2) from the test equipment (UDP setting tool interface). d) Receive the 1st IO allocation setting frame (response) from the equipment under test and transmit the 2nd IO allocation setting frame (request, setting number = 1 / number of control slaves = 3) from the TCP setting tool interface. e) Receive the 2nd IO allocation setting frame (response) from the equipment under test and transmit the 3rd IO allocation setting frame (request, setting number = 2 / number of control slaves = 2) from the UDP setting tool interface. f) Receive the 3rd IO allocation setting frame (response) from the equipment under test and transmit the 1st IO allocation read frame (request, setting number = 1) from the UDP setting tool interface. g) Receive the 1st IO allocation read frame (response) from the equipment under test and transmit the 2nd IO allocation read frame (request, setting number = 2) from the UDP setting tool interface. h) Close the TCP connection with the equipment under test.

Table 129 – IO Allocation Setting (Lock Confirmation), Read (continued)

Evaluation criteria	a) Confirm that the equipment under test transmits the 1st IO allocation setting response frame for the 1st IO allocation setting request frame from the UDP setting tool interface. b) Confirm the contents of the 1st IO allocation setting response frame by the following Classes of the equipment under test: * Classes 3 (flexible master function implemented) and 4: Normal response (M_RLT = 0) * Class 3 (flexible master function not-implemented): Normal response (M_RLT = 0), not-implemented response (M_RLT = 2), or no response NOTE: In the case of normal response, confirm that the contents of data are correct. c) Confirm that the equipment under test transmits the 2nd IO allocation setting response frame for the 2nd IO allocation setting request frame from the TCP setting tool interface. d) Confirm the contents of the 2nd IO allocation setting response frame by the following Classes of the equipment under test: * Classes 3 (flexible master function implemented) and 4: Error response (M_RLT = 1) * Class 3 (flexible master function not-implemented): Error response (M_RLT = 1), not-implemented response (M_RLT = 2), or no response NOTE: In the case of error response, confirm that the result of the response data = error (16#02) and the information = locked by exclusive control (16#04). e) Confirm that the equipment under test transmits the 3rd IO allocation setting response frame for the 3rd IO allocation setting request frame from the UDP setting tool interface. f) Confirm the contents of the 3rd IO allocation setting response frame by the following Classes of the equipment under test: * Classes 3 (flexible master function implemented) and 4: Normal response (M_RLT = 0) * Class 3 (flexible master function not-implemented): Normal response (M_RLT = 0), not-implemented response (M_RLT = 2), or no response NOTE: In the case of normal response, confirm that the contents of data are correct. g) Confirm that the equipment under test transmits the 1st IO allocation read response frame for the 1st IO allocation read request frame from the UDP setting tool interface. h) Confirm the contents of the 1st IO allocation read response frame by the following Classes of the equipment under test: * Classes 3 (flexible master function implemented) and 4: Normal response (M_RLT = 0) * Class 3 (flexible master function not-implemented): Normal response (M_RLT = 0), not-implemented response (M_RLT = 2), or no response NOTE: In the case of normal response, confirm that the contents of data are equivalent to the settings made by the UDP setting tool interface. i) Confirm that the equipment under test transmits the 2nd IO allocation read response frame for the 2nd IO allocation read request frame from the UDP setting tool interface. j) Confirm the contents of the 2nd IO allocation read response frame by the following Classes of the equipment under test: * Classes 3 (flexible master function implemented) and 4: Normal response (M_RLT = 0) * Class 3 (flexible master function not-implemented): Normal response (M_RLT = 0), not-implemented response (M_RLT = 2), or no response NOTE: In the case of normal response, confirm that the contents of data are equivalent to the settings made by the UDP setting tool interface. k) Confirm that the equipment under test transmits the solicitation frame according to the settings made by the UDP setting tool interface.

Table 129 – IO Allocation Setting (Lock Confirmation), Read (continued)

Test necessity identified by the EUT class	Class 1	N			
	Class 2	N			
	Class 3	O (when implementing the TCP command server function)			
	Class 4	O (when implementing the TCP command server function)			
	Class 5	N			
	Class 6	N			
	Class 7	N			
Setting parameter (Node)		Equipment under test (EUT)	Classes 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	256
				Area 1 data size	16
				Area 2 data top address	1 024
				Area 2 data size	64
				IO allocation setting (for Class 4)	Optional
		Test equipment	Classes 3 and 4	Implementation class	3 (Controller)
				Node number	254
				Token watchdog time	50
				Allowable minimum frame interval time	10
				Area 1 data top address	4
				Area 1 data size	4
				Area 2 data top address	64
				Area 2 data size	64
Setting parameter (Test data)		1st IO allocation setting	Request frame	Interface	UDP setting tool interface
				Node address of source side (SNA)	254
				Node address of destination side (DNA)	1
				TCD	65018 (IO allocation setting request)
				Data size	24
				Contents of data	Setting number = 1
					Number of control slaves (total) = 2
					Lock ID = 0
					Lock timeout setting value = 4
					Slave node number = 16#800C (Flexible setting mode, Node number = 12)
					Input data address = 16#0080 (Area 1, Address = 128)

Table 129 – IO Allocation Setting (Lock Confirmation), Read (continued)

Setting parameter (Test data) (continued)	1st IO allocation setting (Continued)	Request frame (continued)	Contents of data (Continued)	Input data size = 4
				Output data address = 16#0100 (Area 1, Address = 256)
				Output data size = 8
				Input status address = 16#8200 (Area 2, Address = 512)
				Output status address = 16#8400 (Area 2, Address = 1024)
		Response frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	1
			Node address of destination side (DNA)	254
			TCD	65218 (IO allocation setting response)
			Type of response message (M_RLT)	Depends on Class of the equipment under test (EUT). * Class 3 (flexible master function not-implemented): 0 (Normal) or 2 (Not-implemented) * Classes 3 (flexible master function implemented) and 4: 0 (Normal)
			Data size (M_RLT = 0)	8
			Contents of data (M_RLT = 0)	Result = 1 (continue)
				Information = (No evaluation)
				Lock ID = other than 0
	2nd IO allocation setting	Request frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	253
			Node address of destination side (DNA)	1
			TCD	65018 (IO allocation setting request)
			Data size	24
			Contents of data	Setting number = 1
				Number of control slaves (total) = 3
				Lock ID = 0
				Lock timeout setting value = 6
				Slave node number = 16#8032 (Flexible setting mode, Node number = 50)
				Input data address = 16#00A0 (Area 1, Address = 160)
				Input data size = 4
				Output data address = 16#010C (Area 1, Address = 268)
				Output data size = 4

Table 129 – IO Allocation Setting (Lock Confirmation), Read (continued)

Setting parameter (Test data) (continued)	2nd IO allocation setting (Continued)	Request frame (continued)	Contents of data (Continued)	Input status address = 16#8258 (Area 2, Address = 600)
				Output status address = 16#8430 (Area 2, Address = 1072)
		Response frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	1
			Node address of destination side (DNA)	253
			TCD	65218 (IO allocation setting response)
			Type of response message (M_RLT)	Depends on Class of the equipment under test (EUT). * Class 3 (flexible master function not-implemented): 1 (Error) or 2 (Not-implemented) * Classes 3 (flexible master function implemented) and 4: 1 (Error)
			Data size (M_RLT = 0)	8
			Contents of data (M_RLT = 0)	Result = 2 (error)
				Information = 4 (locked by exclusive control)
				Lock ID = (No evaluation)
	3rd IO allocation setting	Request frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	1
			TCD	65018 (IO allocation setting request)
			Data size	24
			Contents of data	Setting number = 2
				Number of control slaves (total) = 2
				Lock ID = Same as that of the 1st allocation setting response frame
				Lock timeout setting value = 4
				Slave node number = 16#8064 (Flexible setting mode, Node number = 100)
				Input data address = 16#008C (Area 1, Address = 140)
				Input data size = 6
				Output data address = 16#0108 (Area 1, Address = 264)
				Input data size = 8
				Input status address = 16#8220 (Area 2, Address = 544)
				Output status address = 16#8420 (Area 2, Address = 1056)

Table 129 – IO Allocation Setting (Lock Confirmation), Read (continued)

Setting parameter (Test data) (continued)	3rd IO allocation setting (Continued)	Response frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	1
			Node address of destination side (DNA)	254
			TCD	65218 (IO allocation setting response)
			Type of response message (M_RLT)	Depends on Class of the equipment under test (EUT). * Class 3 (flexible master function not-implemented): 0 (Normal) or 2 (Not-implemented) * Classes 3 (flexible master function implemented) and 4: 0 (Normal)
			Data size (M_RLT = 0)	8
			Contents of data (M_RLT = 0)	Result = 0 (normal)
				Information = (No evaluation)
				Lock ID = Same as that of the 1st IO allocation setting response frame
	1st IO allocation read	Request frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	1
			TCD	65019 (IO allocation read request)
			Data size	4
			Contents of data	Setting number = 1
		Response frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	1
			Node address of destination side (DNA)	254
			TCD	65219 (IO allocation read response)
			Type of response message (M_RLT)	Depends on Class of the equipment under test (EUT). * Class 3 (flexible master function not-implemented): 0 (Normal) or 2 (Not-implemented) * Classes 3 (flexible master function implemented) and 4: 0 (Normal)
			Data size (M_RLT = 0)	20
			Contents of data (M_RLT = 0)	Setting number = 1
				Number of control slaves (total) = 2
				Slave node number = 16#800C (Flexible setting mode, Node number = 12)

Table 129 – IO Allocation Setting (Lock Confirmation), Read (continued)

Setting parameter (Test data) (continued)	1st IO allocation read (Continued)	Response frame (Continued)	Contents of data (M_RLT = 0) (Continued)	Input data address = 16#0080 (Area 1, Address = 128)
				Input data size = 4
				Output data address = 16#0100 (Area 1, Address = 256)
				Input data size = 8
				Input status address = 16#8200 (Area 2, Address = 512)
				Output status address = 16#8400 (Area 2, Address = 1024)
	2nd IO allocation read	Request frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	1
			TCD	65019 (IO allocation read request)
			Data size	4
			Contents of data	Setting number = 2
		Response frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	1
			Node address of destination side (DNA)	254
			TCD	65219 (IO allocation read response)
			Type of response message (M_RLT)	Depends on Class of the equipment under test (EUT). * Class 3 (flexible master function not-implemented): 0 (Normal) or 2 (Not-implemented) * Classes 3 (flexible master function implemented) and 4: 0 (Normal)
			Data size (M_RLT = 0)	20
			Contents of data (M_RLT = 0)	Setting number = 2
				Number of control slaves (total) = 2
				Slave node number = 16#8064 (Flexible setting mode, Node number = 100)
				Input data address = 16#008C (Area 1, Address = 140)
				Input data size = 6
				Output data address = 16#0108 (Area 1, Address = 264)
				Input data size = 8

Table 129 – IO Allocation Setting (Lock Confirmation), Read (continued)

Setting parameter (Test data) (continued)	2nd IO allocation read (Continued)	Response frame (Continued)	Contents of data (M_RLT = 0) (Continued)	Input status address = 16#8220 (Area 2, Address = 544)
				Output status address = 16#8420 (Area 2, Address = 1056)
	Solicitation frame		Node address of source side (SNA)	1
			TCD	65017 (solicitation)
			Data size	32
			Contents of data (1st node)	Slave node number = 16#800C (Flexible setting mode, Node number = 12)
				Input data address = 16#0080 (Area 1, Address = 128)
				Input data size = 4
				Output data address = 16#0100 (Area 1, Address = 256)
				Input data size = 8
				Input status address = 16#8200 (Area 2, Address = 512)
				Output status address = 16#8400 (Area 2, Address = 1024)
				Lock ID = 1
			Contents of data (2nd node)	Slave node number = 16#8064 (Flexible setting mode, Node number = 100)
				Input data address = 16#008C (Area 1, Address = 140)
				Input data size = 6
				Output data address = 16#0108 (Area 1, Address = 264)
				Input data size = 8
				Input status address = 16#8220 (Area 2, Address = 544)
				Output status address = 16#8420 (Area 2, Address = 1056)
				Lock ID = 1
	Response time limit (request frame transmission ~ response frame reception)		1 s	

Table 130 – IO allocation setting (lock timeout)/read

Test number	V3-049
Major test group	General purpose command server function
Test group	Operation test of double setting tools (coexisting UDP and TCP)
Test object	IO allocation setting(lock timeout)/read
Test procedure	a) Start the EUT, and start the test equipment. b) Open the TCP connection from the test equipment (setting tool interface) to the EUT. c) Transmit IO allocation setting frame (first time) (request, setting number = 1 / number of control slaves = 2) from the test equipment (UDP setting tool interface). d) After receive IO allocation setting frame (first time) (response) from the EUT, transmit IO allocation setting frame (second time) (request, setting number = 1 / number of control slaves = 3) from the test equipment (TCP setting tool interface). e) Transmit IO allocation setting frame (third time) (request, setting number = 2 / number of control slaves = 2) from the test equipment (TCP setting tool interface) after lock timed out by transmit IO allocation setting frame (first time) from the test equipment (UDP setting tool interface). f) After receive IO allocation setting frame (third time) (response) from the EUT, transmit IO allocation setting frame (fourth time) (request, setting number = 1 / number of control slaves = 1) from the test equipment (TCP setting tool interface). g) After receive IO allocation setting frame (fourth time) (response) from the EUT, transmit IO allocation read frame (request, setting number = 1) from the test equipment (TCP setting tool interface). h) Close the TCP connection with the EUT.
Evaluation criteria	a) Confirm that the EUT transmit the IO allocation setting response frame (first time) in response to IO allocation setting request frame (first time) from the test equipment (UDP setting tool interface). b) Confirm the contents of IO allocation setting response frame (first time) (Criteria are different depending on the class of the EUT). * Classes 3 (flexible master function implemented) and 4 : confirm normal response (M_RLT = 0). * Class 3 (flexible master function not-implemented) : confirm normal response (M_RLT = 0), not-implemented response (M_RLT = 2) or no response. NOTE: In the case of normal response, confirm that the contents of the data are correct. c) Confirm that the EUT transmit the IO allocation setting response frame (second time) in response to IO allocation setting request frame (second time) from the test equipment (TCP setting tool interface).

Table 130 – IO allocation setting (lock timeout)/read (continued)

<table>
<tr><td colspan="2">valuation criteria (continued)</td><td colspan="4">d) Confirm the contents of IO allocation setting response frame (second time) (Criteria are different depending on the class of the EUT).
* Classes 3 (flexible master function implemented) and 4 : confirm abnormal response (M_RLT = 1).
* Class 3 (flexible master function not-implemented) : confirm abnormal response (M_RLT = 1), not-implemented response (M_RLT = 2) or no response.
NOTE: In the case of abnormal response, confirm that the result of response data is abnormal (16#02) and the information is locked by exclusive control (16#04).
e) Confirm that the EUT transmit the IO allocation setting response frame (third time) in response to IO allocation setting request frame (third time) from the test equipment (UDP setting tool interface).
f) Confirm the contents of IO allocation setting response frame (third time) (Criteria are different depending on the class of the EUT).
* Classes 3 (flexible master function implemented) and 4 : confirm abnormal response (M_RLT = 1).
* Class 3 (flexible master function not-implemented) : confirm abnormal response (M_RLT = 1), not-implemented response (M_RLT = 2) or no response.
NOTE: In the case of abnormal response, confirm that the result of response data is abnormal (16#02) and the information is exclusive lock timed out (16#05).
g) Confirm that the EUT transmit the IO allocation setting response frame (fourth time) in response to IO allocation setting request frame (fourth time) from the test equipment (TCP setting tool interface).
h) Confirm the contents of IO allocation setting response frame (fourth time) (Criteria are different depending on the class of the EUT).
* Classes 3 (flexible master function implemented) and 4 : confirm normal response (M_RLT = 0).
* Class 3 (flexible master function not-implemented) : confirm normal response (M_RLT = 0), not-implemented response (M_RLT = 2) or no response.
NOTE: In the case of normal response, confirm that the contents of the data are correct.
i) Confirm that the EUT transmit the IO allocation read frame (response) in response to IO allocation read request frame from the test equipment (TCP setting tool interface).
j) Confirm the contents of IO allocation read frame (response) (Criteria are different depending on the class of the EUT).
* Classes 3 (flexible master function implemented) and 4 : confirm normal response (M_RLT = 0).
* Class 3 (flexible master function not-implemented) : confirm normal response (M_RLT = 0), not-implemented response (M_RLT = 2) or no response.
NOTE: In the case of normal response, confirm that the data content is equal to the settings from the TCP setting tool interface.
k) Confirm that the EUT transmit a solicitation frame that based on the settings from TCP setting tool interface.</td></tr>
<tr><td rowspan="7">Test necessity identified by the EUT class</td><td>Class 1</td><td colspan="4">N</td></tr>
<tr><td>Class 2</td><td colspan="4">N</td></tr>
<tr><td>Class 3</td><td colspan="4">O (when implement the TCP command server function)</td></tr>
<tr><td>Class 4</td><td colspan="4">O (when implement the TCP command server function)</td></tr>
<tr><td>Class 5</td><td colspan="4">N</td></tr>
<tr><td>Class 6</td><td colspan="4">N</td></tr>
<tr><td>Class 7</td><td colspan="4">N</td></tr>
<tr><td colspan="2" rowspan="3">Setting parameters (node)</td><td rowspan="3">EUT</td><td rowspan="3">Classes 3 and 4</td><td>Node number</td><td>1</td></tr>
<tr><td>Token watchdog time</td><td>(50)</td></tr>
<tr><td>Allowable minimum frame interval time</td><td>(10)</td></tr>
</table>

Table 130 – IO allocation setting (lock timeout)/read (continued)

Setting parameters (node) (continued)	EUT (continued)	Classes 3 and 4 (continued)	Area 1 data top address	256
			Area 1 data size	16
			Area 2 data top address	1 024
			Area 2 data size	64
			IO allocation setting (for class 4)	optional
	Test equipment	Classes 3 and 4	Implementation class	3 (controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
Setting parameters (test data)	IO allocation setting (first time)	Request frame	Interface	UDP setting tool interface
			Node number of source side (SNA)	254
			Node number of destination side (DNA)	1
			TCD	65 018 (IO allocation setting request)
			Data size	24
			Contents of data	Setting number = 1
				Number of control slaves (total) = 2
				Lock ID = 0
				Lock timeout setting value = 4
				Slave node number = 16#800C (flexible setting mode, node number = 12)
				Input data address = 16#0080 (area 1, address = 128)
				Input data size = 4
				Output data address = 16#0100 (area 1, address = 256)
				Output data size = 8
				Input status address = 16#8200 (area 2, address = 512)
				Output status address = 16#8400 (area 2, address = 1 024)

Table 130 – IO allocation setting (lock timeout)/read (continued)

Setting parameters (test data) (continued)	IO allocation setting (first time) (continued)	Response frame	Interface	UDP setting tool interface
			Node number of source side (SNA)	1
			Node number of destination side (DNA)	254
			TCD	65 218 (IO allocation setting response)
			Type of response message (M_RLT)	By the class of the EUT * Class 3 (flexible master function not-implemented) : 0 (normal) or 2 (not-implemented) * Classes 3 (flexible master function implemented) and 4 : 0 (normal)
			Data size (for M_RLT = 0)	8
			Contents of data (for M_RLT = 0)	Result = 1 (continue)
				Information = (no evaluation)
				Lock ID = not 0
	IO allocation setting (second time)	Request frame	Interface	TCP setting tool interface
			Node number of source side (SNA)	253
			Node number of destination side (DNA)	1
			TCD	65 018 (IO allocation setting request)
			Data size	24
			Contents of data	Setting number = 1
				Number of control slaves (total) = 3
				Lock ID = 0
				Lock timeout setting value = 6
				Slave node number = 16#8032 (flexible setting mode, node number = 50)
				Input data address = 16#00A0 (area 1, address = 160)
				Input data size = 4
				Output data address = 16#010C (area 1, address = 268)
				Output data size = 4
				Input status address = 16#8258 (area2, address = 600)
				Output status address = 16#8430 (area2, address = 1 072)

Table 130 – IO allocation setting (lock timeout)/read (continued)

Setting parameters (test data) (continued)	IO allocation setting (second time) (continued)	Response frame	Interface	TCP setting tool interface
			Node number of source side (SNA)	1
			Node number of destination side (DNA)	253
			TCD	65 218 (IO allocation setting response)
			Type of response message (M_RLT)	By the class of the EUT * Class 3 (flexible master function not-implemented) : 1 (abnormal) or 2 (not-implemented) * Classes 3 (flexible master function implemented) and 4 : 1 (abnormal)
			Data size (for M_RLT = 1)	8
			Contents of data (for M_RLT = 1)	Result = 2 (abnormal)
				Information = 4 (locked by exclusive control)
				Lock ID = (no evaluation)
	IO allocation setting (third time)	Request frame	Interface	UDP setting tool interface
			Node number of source side (SNA)	254
			Node number of destination side (DNA)	1
			TCD	65 018 (IO allocation setting request)
			Data size	24
			Contents of data	Setting number = 2
				Number of control slaves (total) = 2
				Lock ID = Equivalent to the lock ID response frame IO allocation setting (first time)
				Lock timeout setting value = 4
				Slave node number = 16#8064 (flexible setting mode, node number = 100)
				Input data address = 16#008C (area 1, address = 140)
				Input data size = 6
				Output data address = 16#0108 (area 1, address = 264)
				Output data size = 8
				Input status address = 16#8220 (area2, address = 544)
				Output status address = 16#8420 (area2, address = 1 056)

Table 130 – IO allocation setting (lock timeout)/read (continued)

Setting parameters (test data) (continued)	IO allocation setting (third time) (continued)	Response frame	Interface	UDP setting tool interface
			Node number of source side (SNA)	1
			Node number of destination side (DNA)	254
			TCD	65 218 (IO allocation setting response)
			Type of response message (M_RLT)	By the class of the EUT * Class 3 (flexible master function not-implemented) : 1 (abnormal) or 2 (not-implemented) * Classes 3 (flexible master function implemented) and 4 : 1 (abnormal)
			Data size (for M_RLT = 1)	8
			Contents of data (for M_RLT = 1)	Result = 2 (abnormal)
				Information = 5 (exclusive lock timed out)
				Lock ID = (no evaluation)
	IO allocation setting (fourth time)	Request frame	Interface	TCP setting tool interface
			Node number of source side (SNA)	253
			Node number of destination side (DNA)	1
			TCD	65 018 (IO allocation setting request)
			Data size	24
			Contents of data	Setting number = 1
				Number of control slaves (total) = 1
				Lock ID = 0
				Lock timeout setting value = 6
				Slave node number = 16#8064 (flexible setting mode, node number = 100)
				Input data address = 16#008C (area 1, address = 140)
				Input data size = 6
				Output data address = 16#0104 (area 1, address = 260)
				Output data size = 12
				Input status address = 16#8210 (area2, address = 528)
				Output status address = 16#8410 (area2, address = 1 040)

Table 130 – IO allocation setting (lock timeout)/read (continued)

Setting parameters (test data) (continued)	IO allocation setting (fourth time) (continued)	Response frame	Interface	TCP setting tool interface
			Node number of source side (SNA)	1
			Node number of destination side (DNA)	253
			TCD	65 218 (IO allocation setting response)
			Type of response message (M_RLT)	1
			Data size (for M_RLT = 0)	8
			Contents of data (for M_RLT = 0)	Result = 0 (normal)
				Information = (no evaluation)
				Lock ID = not 0
	IO allocation read	Request frame	Interface	TCP setting tool interface
			Node number of source side (SNA)	253
			Node number of destination side (DNA)	1
			TCD	65 019 (IO allocation read request)
			Data size	4
			Contents of data	Setting number = 1
		Response frame	Interface	TCP setting tool interface
			Node number of source side (SNA)	1
			Node number of destination side (DNA)	253
			TCD	65 219 (IO allocation read response)
			Type of response message (M_RLT)	By the class of the EUT * Class 3 (flexible master function not-implemented) : 0 (normal) or 2 (not-implemented) * Classes 3 (flexible master function implemented) and 4 : 0 (normal)
			Data size (for M_RLT = 0)	20
			Contents of data (for M_RLT = 0)	Setting number = 1
				Number of control slaves (total) = 1
				Slave node number = 16#8064 (flexible setting mode, node number = 100)

Table 130 – IO allocation setting (lock timeout)/read (continued)

Setting parameters (test data) (continued)	IO allocation read (continued)	Response frame (continued)	Contents of data (for M_RLT = 0) (continued)	Input data address = 16#008C (area 1, address = 140)
				Input data size = 6
				Output data address = 16#0104 (area 1, address = 260)
				Output data size = 12
				Input status address = 16#8210 (area 2, address = 528)
				Output status address = 16#8410 (area 2, address = 1 040)
	Solicitation frame		Node number of source side (SNA)	1
			TCD	65 017 (solicitation)
			Data size	16
			Contents of data	Slave node number = 16#8064 (flexible setting mode, node number = 100)
				Input data address = 16#008C (area 1, address = 140)
				Input data size = 6
				Output data address = 16#0104 (area 1, address = 260)
				Output data size = 12
				Input status address = 16#8210 (area 2, address = 528)
				Output status address = 16#8410 (area 2, address = 1 040)
				Lock ID = 1
	Response time limit (request frame transmission - response frame reception)		1 s	

Table 131 – IO allocation setting (unlock)/read

Test number	V3-050
Major test group	General purpose command server function
Test group	Operation test of double setting tools (coexisting UDP and TCP)
Test object	IO allocation setting (unlock)/read
Test procedure	a) Start the EUT, and start the test equipment. b) Open the TCP connection from the test equipment (setting tool interface) to the EUT. c) Transmit IO allocation setting frame (first time) (request, setting number = 1 / number of control slaves = 2) from the test equipment (UDP setting tool interface). d) After receive IO allocation setting frame (first time) (response) from the EUT, transmit IO allocation setting frame (second time) (request, unlock) from the test equipment (UDP setting tool interface). e) After receive IO allocation setting frame (second time) (response) from the EUT, transmit IO allocation setting frame (third time) (request, setting number = 1 / number of control slaves = 1) from the test equipment (TCP setting tool interface). f) After receive IO allocation setting frame (third time) (response) from the EUT, transmit IO allocation read frame (request, setting number = 1) from the test equipment (TCP setting tool interface). g) Close the TCP connection with the EUT.
Evaluation criteria	a) Confirm that the EUT transmit the IO allocation setting response frame (first time) in response to IO allocation setting request frame (first time) from the test equipment (UDP setting tool interface). b) Confirm the contents of IO allocation setting response frame (first time) (Criteria are different depending on the class of the EUT). * Classes 3 (flexible master function implemented) and 4 : confirm normal response (M_RLT = 0). * Class 3 (flexible master function not-implemented) : confirm normal response (M_RLT = 0), not-implemented response (M_RLT = 2) or no response. NOTE: In the case of normal response, confirm that the contents of the data are correct. c) Confirm that the EUT transmit the IO allocation setting response frame (second time) in response to IO allocation setting request frame (second time) from the test equipment (UDP setting tool interface). d) Confirm the contents of IO allocation setting response frame (second time) (Criteria are different depending on the class of the EUT). * Classes 3 (flexible master function implemented) and 4 : confirm normal response (M_RLT = 0). * Class 3 (flexible master function not-implemented) : confirm normal response (M_RLT = 0), not-implemented response (M_RLT = 2) or no response. NOTE: In the case of normal response, confirm that the contents of the data are correct. e) Confirm that the EUT transmit the IO allocation setting response frame (third time) in response to IO allocation setting request frame (third time) from the test equipment (TCP setting tool interface). f) Confirm the contents of IO allocation setting response frame (third time) (Criteria are different depending on the class of the EUT). * Classes 3 (flexible master function implemented) and 4 : confirm normal response (M_RLT = 0). * Class 3 (flexible master function not-implemented) : confirm normal response (M_RLT = 0), not-implemented response (M_RLT = 2) or no response. NOTE: In the case of normal response, confirm that the contents of the data are correct. g) Confirm that the EUT transmit the IO allocation read frame (response) in response to IO allocation read request frame from the test equipment (TCP setting tool interface).

Table 131 – IO allocation setting (unlock)/read (continued)

Evaluation criteria (continued)		h) Confirm the contents of IO allocation read frame (response) (Criteria are different depending on the class of the EUT). * Classes 3 (flexible master function implemented) and 4 : confirm normal response (M_RLT = 0). * Class 3 (flexible master function not-implemented) : confirm normal response (M_RLT = 0), not-implemented response (M_RLT = 2) or no response. NOTE: In the case of normal response, confirm that the data content is equal to the settings from the TCP setting tool interface. i) Confirm that the EUT transmit a solicitation frame that based on the settings from TCP setting tool interface.			
Test necessity identified by the EUT class	Class 1	N			
	Class 2	N			
	Class 3	O (when implementing the TCP command server function)			
	Class 4	O (when implementing the TCP command server function)			
	Class 5	N			
	Class 6	N			
	Class 7	N			
Setting parameters (node)		EUT	Classes 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	256
				Area 1 data size	16
				Area 2 data top address	1 024
				Area 2 data size	64
				IO allocation setting (for class 4)	optional
		Test equipment	Classes 3 and 4	Implementation class	3 (controller)
				Node number	254
				Token watchdog time	50
				Allowable minimum frame interval time	10
				Area 1 data top address	4
				Area 1 data size	4
				Area 2 data top address	64
				Area 2 data size	64
Setting parameters (test data)		IO allocation setting (first time)	Request frame	Interface	UDP setting tool interface
				Node number of source side (SNA)	254
				Node number of destination side (DNA)	1
				TCD	65 018 (IO allocation setting request)
				Data size	24

Table 131 – IO allocation setting (unlock)/read (continued)

Setting parameters (test data) (continued))	IO allocation setting (first time) (continued)	Request frame (continued)	Contents of data	Setting number = 1
				Number of control slaves (total) = 2
				Lock ID = 0
				Lock timeout setting value = 4
				Slave node number = 16#800C (flexible setting mode, node number = 12)
				Input data address = 16#0080 (area 1, address = 128)
				Input data size = 4
				Output data address = 16#0100 (area 1, address = 256)
				Output data size = 8
				Input status address = 16#8200 (area 2, address = 512)
				Output status address = 16#8400 (area 2, address = 1 024)
		Response frame	Interface	UDP setting tool interface
			Node number of source side (SNA)	1
			Node number of destination side (DNA)	254
			TCD	65 218 (IO allocation setting response)
			Type of response message (M_RLT)	By the class of the EUT * Class 3 (flexible master function not-implemented) : 0 (normal) or 2 (not-implemented) * Classes 3 (flexible master function implemented) and 4 : 0 (normal)
			Data size (for M_RLT = 0)	8
			Contents of data (for M_RLT = 0)	Result = 1 (continue)
				Information = (no evaluation)
				Lock ID = not 0
	IO allocation setting (second time)	Request frame	Interface	UDP Setting tool interface
			Node number of source side (SNA)	254
			Node number of destination side (DNA)	1
			TCD	65 018 (IO allocation setting request)
			Data size	24
			Contents of data	Setting number = 16#FFFF
				Number of control slaves (total) = 16#FFFF
				Lock ID = Equivalent to the lock ID response frame IO allocation setting (first time)

Table 131 – IO allocation setting (unlock)/read (continued)

Setting parameters (test data) (continued)	IO allocation setting (second time) (continued)	Request frame (continued)	Contents of data (continued)	Lock timeout setting value = 4
				Slave node number = 0
				Input data address = 0
				Input data size = 0
				Output data address = 0
				Output data size = 0
				Input status address = 0
				Output status address = 0
		Response frame	Interface	UDP setting tool interface
			Node number of source side (SNA)	1
			Node number of destination side (DNA)	254
			TCD	65 218 (IO allocation setting response)
			Type of response message (M_RLT)	By the class of the EUT * Class 3 (flexible master function not-implemented) : 0 (normal) or 2 (not-implemented) * Classes 3 (flexible master function implemented) and 4 : 0 (normal)
			Data size (for M_RLT = 0)	8
			Contents of data (for M_RLT = 0)	Result = 0 (normal)
				Information = (no evaluation)
				Lock ID = (no evaluation)
	IO allocation setting (third time)	Request frame	Interface	TCP setting tool interface
			Node number of source side (SNA)	253
			Node number of destination side (DNA)	1
			TCD	65 018 (IO allocation setting request)
			Data size	24
			Contents of data	Setting number = 1
				Number of control slaves (total) = 1
				Lock ID = 0
				Lock timeout setting value = 2
				Slave node number = 16#8032 (flexible setting mode, node number = 50)
				Input data address = 16#00A0 (area 1, address = 160)
				Input data size = 4

Table 131 – IO allocation setting (unlock)/read (continued)

Setting parameters (test data) (continued)	IO allocation setting (third time) (continued)	Request frame (continued)	Contents of data (continued)	Output data address: 16#0108 (area 1, address = 264)
				Output data size: 4
				Input status address = 16#8258 (area 2, address = 600)
				Output status address = 16#8420 (area 2, address = 1 056)
		Response frame	Interface	TCP setting tool interface
			Node number of source side (SNA)	1
			Node number of destination side (DNA)	253
			TCD	65 218 (IO allocation setting response)
			Type of response message (M_RLT)	By the class of the EUT * Class 3 (flexible master function not-implemented) : 0 (normal) or 2 (not-implemented) * Classes 3 (flexible master function implemented) and 4 : 0 (normal)
			Data size (for M_RLT = 0)	8
			Contents of data (for M_RLT = 0)	Result = 0 (normal)
				Information = (no evaluation)
				Lock ID = not 0
	IO allocation read	Request frame	Interface	TCP setting tool interface
			Node number of source side (SNA)	253
			Node number of destination side (DNA)	1
			TCD	65 019 (IO allocation read request)
			Data size	4
			Contents of data	Setting number = 1
		Response frame	Interface	TCP setting tool interface
			Node number of source side (SNA)	1
			Node number of destination side (DNA)	253
			TCD	65 219 (IO allocation read response)
			Type of response message (M_RLT)	By the class of the EUT * Class 3 (flexible master function not-implemented) : 0 (normal) or 2 (not-implemented) * Classes 3 (flexible master function implemented) and 4 : 0 (normal)

Table 131 – IO allocation setting (unlock)/read (continued)

Setting parameters (test data) (continued)	IO allocation read (continued)	Response frame (continued)	Data size (for M_RLT = 0)	20
			Contents of data (for M_RLT = 0)	Setting number = 1
				Number of control slaves (total) = 1
				Slave node number = 16#8032 (flexible setting mode, node number = 50)
				Input data address = 16#00A0 (area 1, address = 160)
				Input data size = 4
				Output data address =16#0108 (area 1, address = 264)
				Output data size = 4
				Input status address = 16#8258 (area 2, address = 600)
				Output status address = 16#8420 (area 2, address = 1 056)
	Solicitation frame		Node number of source side (SNA)	1
			TCD	65 017 (solicitation)
			Data size	16
			Contents of data	Slave node number = 16#8032 (flexible setting mode, node number = 50)
				Input data address = 16#00A0 (area 1, address = 160)
				Input data size = 4
				Output data address = 16#0108 (area 1, address = 264)
				Output data size = 4
				Input status address = 16#8258 (area 2, address = 600)
				Output status address = 16#8420 (area 2, address = 1 056)
				Lock ID = 1
	Response time limit (request frame transmission - response frame reception)		1 s	

Table 132 – Token retention time measurement start/end

Test number		V3-051
Major test group		General purpose command server function
Test group		Operation test of double setting tools (coexisting UDP and TCP)
Test object		Token retention time measurement start/end
Test procedure		a) Start the EUT, and start the test equipment. Continue, start the dummy node. b) Open the TCP connection from the test equipment (setting tool interface) to the EUT. c) Transmit token retention time measurement start frame (first time) (request) from the test equipment (UDP setting tool interface). d) Disengage from the network the test equipment (stop the transmission of the token frame). e) Rejoin the network the test equipment. f) 10 s after the test equipment rejoin the network, transmit start frame of token retention time measuring (second time) (request) from the test equipment (TCP setting tool interface). g) 60 s after receive start frame of token retention time measuring (second time) (response) from the EUT, transmit end frame of token retention time measuring (second time) (request) from the test equipment (UDP setting tool interface). h) After receive end frame of token retention time measuring (first time) (response) from the EUT, transmit end frame of token retention time measuring (second time) (request) from the test equipment (TCP setting tool interface). i) Close the TCP connection with the EUT.
Evaluation criteria		a) Confirm that the EUT transmit the start (first time) response frame in response to request transmission of start (first time) from the test equipment (UDP setting tool interface). b) Confirm that start (first time) response frame is normal response (M_RLT = 0). c) Confirm that the EUT transmit the start (second time) response frame in response to request transmission of start (second time) from the test equipment (TCP setting tool interface). d) Confirm that start (second time) response frame is normal response (M_RLT = 0). e) Confirm that the EUT transmit the end (first time) response frame in response to request transmission of end (first time) from the test equipment (UDP setting tool interface). f) Confirm that end (first time) response frame is normal response (M_RLT = 0) and the contents of data is as follows: * number of tokens during measuring the token retention time = not 0 g) g) Confirm that the EUT transmit the end (second time) response frame in response to request transmission of end (second time) from the test equipment (TCP setting tool interface). h) h) Confirm that end (second time) response frame is normal response (M_RLT = 0) and the contents of data is equal to end (first time) response data.
Test necessity identified by the EUT class	Class 1	N
	Class 2	N
	Class 3	O (when implementing the TCP command server function)
	Class 4	O (when implementing the TCP command server function and command server load measurement function)
	Class 5	O (when implementing the TCP command server function and command server load measurement function)
	Class 6	O (when implementing the TCP command server function and command server load measurement function)
	Class 7	O (when implementing the TCP command server function and command server load measurement function)

Table 132 – Token retention time measurement start/end (continued)

Setting parameters (node)	EUT (By class, different parameters)	Classes 3 and 4	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	0
			Area 2 data size	16
			IO allocation setting (for class 4)	Optional
		Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1 024
			Area 2 data size	1 024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	Calculated from the number of input points of the slave of the EUT
			Area 2 data top address	0
			Area 2 data size	Calculated from the number of input points of the slave and the number of output points of slave of the EUT
	Test equipment (By the class of EUT, different parameters)	Classes 3, 4 and 5	Implementation class	3 (controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64

Table 132 – Token retention time measurement start/end (continued)

Setting parameters (node) (continued)	Test equipment (By the class of EUT, different parameters) (continued)	Class 6	Implementation class	4 (flexible master)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	By the number of output points of the slave of the EUT * 0 point : 0 * more than 1 point : 256
			Area 1 data size	Calculated from the number of output points of the slave of the EUT
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (flexible setting mode, node number = 1)
				Input data address = 16#0000 (area 1, address = 0)
				Input data size = Calculated from the number of input points of the slave of the EUT
				Output data address = by the number of output points of the slave of the EUT * 0 point : 16#0000 (area 1, address = 0) * more than 1 point : 16#0100 (area 1, address = 256)
				Output data size = Calculated from the number of output points of the slave of the EUT
				Input status address = 16#8000 (area 2, address = 0)
				Output status address = 16#8400 (area 2, address = 1 024)

Table 132 – Token retention time measurement start/end (continued)

Setting parameters (node) (continued)	Test equipment (By the class of EUT, different parameters) (continued)	Class 7	Implementation class	3 (controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64
	Dummy node		Implementation class	3 (controller)
			Node number	2
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
Setting parameters (test data)	Token retention time measurement start (first time)	Request frame	Interface	UDP setting tool interface
			Node number of source side (SNA)	254
			Node number of destination side (DNA)	By the class of the EUT * Classes 3, 4, 6 and 7 : 1 * Class 5 : 100
			TCD	65 020 (token retention time measurement start request)
			Data size	0
			Contents of data	NA
		Response frame	Interface	UDP setting tool interface
			Node number of source side (SNA)	By the class of the EUT * Classes 3, 4, 6 and 7 : 1 * Class 5 : 100
			Node number of destination side (DNA)	254
			TCD	65 220 (token retention time measurement start response)
			Type of response message (M_RLT)	0 (normal)
			Data size (for M_RLT = 0)	0
			Contents of data	NA

Table 132 – Token retention time measurement start/end (continued)

Setting parameters (test data) (continued)	Token retention time measurement start (second time)	Request frame	Interface	TCP setting tool interface
			Node number of source side (SNA)	253
			Node number of destination side (DNA)	By the class of the EUT * Classes 3, 4, 6 and 7 : 1 * Class 5 : 100
			TCD	65 020 (token retention time measurement start request)
			Data size	0
			Contents of data	NA
		Response frame	Interface	TCP setting tool interface
			Node number of source side (SNA)	By the class of the EUT * Classes 3, 4, 6 and 7 : 1 * Class 5 : 100
			Node number of destination side (DNA)	253
			TCD	65 220 (token retention time measurement start response)
			Type of response message (M_RLT)	0 (normal)
			Data size (for M_RLT = 0)	0
			Contents of data	NA
	Token retention time measurement end (first time)	Request frame	Interface	UDP setting tool interface
			Node number of source side (SNA)	254
			Node number of destination side (DNA)	By the class of the EUT * Classes 3, 4, 6 and 7 : 1 * Class 5 : 100
			TCD	65 021 (Token retention time measurement end request)
			Data size	0
			Contents of data	NA
		Response frame	Interface	UDP setting tool interface
			Node number of source side (SNA)	By the class of the EUT * Classes 3, 4, 6 and 7 : 1 * Class 5 : 100
			Node number of destination side (DNA)	254
			TCD	65 221 (Token retention time measurement end response)
			Type of response message (M_RLT)	0 (normal)
			Data size (for M_RLT = 0)	76
			Contents of data (for M_RLT = 0)	number of tokens during measuring the token retention time = not 0

Table 132 – Token retention time measurement start/end (continued)

Setting parameters (test data) (continued)	Token retention time measurement end (second time)	Request frame	Interface	TCP setting tool interface
			Node number of source side (SNA)	253
			Node number of destination side (DNA)	By the class of the EUT * Classes 3, 4, 6 and 7 : 1 * Class 5 : 100
			TCD	65 021 (Token retention time measurement end request)
			Data size	0
			Contents of data	NA
		Response frame	Interface	TCP setting tool interface
			Node number of source side (SNA)	By the class of the EUT * Classes 3, 4, 6 and 7 : 1 * Class 5 : 100
			Node number of destination side (DNA)	253
			TCD	65 221 (Token retention time measurement end response)
			Type of response message (M_RLT)	0 (normal)
			Data size (for M_RLT = 0)	76
			Contents of data (for M_RLT = 0)	measuring time for token retention time = (equal to the first end response)
				number of tokens during measuring the token retention time (equal to the first end response)
	Response time limit (request frame transmission - response frame reception)		1 s	

Table 133 – General purpose communication data sender log measurement start/end

Test number		V3-052
Major test group		General purpose command server function
Test group		Operation test of double setting tools (coexisting UDP and TCP)
Test object		General purpose communication data sender log measurement start/end
Test procedure		a) Start the EUT, and start the test equipment. b) Open the TCP connection from the test equipment (setting tool interface) to the EUT. c) Transmit general purpose communication data sender log measurement start frame (first time) (request) from the test equipment (UDP setting tool interface). d) 10 s after receive general purpose communication data sender log measurement start frame (first time) (response) from the EUT, transmit general purpose communication data (first time) from the test equipment. e) Transmit general purpose communication data sender log measurement start frame (second time) (request) from the test equipment (TCP setting tool interface). f) After receive general purpose communication data sender log measurement start frame (second time) (response) from the EUT, transmit general purpose communication data (second time) from the test equipment. g) 60 s after receive general purpose communication data sender log measurement start frame (second time) (response) from the EUT, transmit general purpose communication data sender log measurement end frame (first time) (request) from the test equipment (UDP setting tool interface). h) After receive general purpose communication data sender log measurement end frame (second time) (response) from the EUT, transmit general purpose communication data sender log measurement end frame (second time) (request) from the test equipment (TCP setting tool interface). i) Close the TCP connection with the EUT.
Evaluation criteria		a) Confirm that the EUT transmit the start (first time) response frame in response to request transmission of start (first time) from the test equipment (UDP setting tool interface). b) Confirm that start (first time) response frame is normal response (M_RLT = 0). c) Confirm that the EUT transmit the start (second time) response frame in response to request transmission of start (second time) from the test equipment (TCP setting tool interface). d) Confirm that start (second time) response frame is normal response (M_RLT = 0). e) Confirm that the EUT transmit the end (first time) response frame in response to request transmission of end (first time) from the test equipment (UDP setting tool interface). f) Confirm that end (first time) response frame is normal response (M_RLT = 0). g) Confirm that the EUT transmit the end (second time) response frame in response to request transmission of end (second time) from the test equipment (TCP setting tool interface). h) Confirm that end (second time) response frame is normal response (M_RLT = 0) and the contents of data is equal to end (first time) response data.
Test necessity identified by the EUT class	Class 1	N
	Class 2	N
	Class 3	O (when implementing the TCP command server function)
	Class 4	O (when implementing the TCP command server function and command server load measurement function)
	Class 5	O (when implementing the TCP command server function and command server load measurement function)
	Class 6	O (when implementing the TCP command server function and command server load measurement function)
	Class 7	O (when implementing the TCP command server function and command server load measurement function)

Table 133 – General purpose communication data sender log measurement start/end (continued)

Setting parameters (node)	EUT (By class, different parameters)	Classes 3 and 4	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	0
			Area 2 data size	16
			IO allocation setting (for class 4)	Optional
		Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1 024
			Area 2 data size	1 024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	Calculated from the number of input points of the slave of the EUT
			Area 2 data top address	0
			Area 2 data size	Calculated from the number of input points of the slave and the number of output points of slave of the EUT
	Test equipment (By the class of EUT, different parameters)	Classes 3, 4 and 5	Implementation class	3 (controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	64
			Area 2 data size	64
		Class 6	Implementation class	4 (flexible master)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10

Table 133 – General purpose communication data sender log measurement start/end (continued)

Setting parameters (node) (continued)	Test equipment (By the class of EUT, different parameters) (continued)	Class 6 (continued)	Area 1 data top address	Depends on number of output points of the slave * 0 point : 0 * 1 point or more: 256
			Area 1 data size	To be calculated from the number of output points of the slave
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (flexible setting mode, node number = 1)
				Input data address = 16#0000 (area 1, address = 0)
				Input data size = Calculated from the number of input points of the slave of the EUT
				Output data address = by the number of output points of the slave of the EUT * 0 point : 16#0000 (area 1, address = 0) * more than 1 point : 16#0100 (area 1, address = 256)
				Output data size = Calculated from the number of output points of the slave of the EUT
				Input status address = 16#8000 (area 2, address = 0)
				Output status address = 16#8400 (area 2, address = 1 024)
		Class 7	Implementation class	3 (controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64
Setting parameters (test data)	General purpose communication data sender log measurement start (The first time)	request frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	According to the EUT class: * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			TCD	65 022(general purpose communication data sender log measurement start request)
			Data size	0
			Contents of data	NA

Table 133 – General purpose communication data sender log measurement start/end (continued)

Setting parameters (test data) (continued)	General purpose communication data sender log measurement start (The first time) (continued)	response frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	According to the EUT class: * Classes 3, 4, 6 and 7: 1 * Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65 222(general purpose communication data sender log measurement start response)
			Type of response message (M_RLT)	0(normal)
			Data size (M_RLT = 0)	0
			Contents of data	NA
	General purpose communication data (The first time)	Pattern 1	Interface	TCP
			Source IP address	192.168.250.254
			Destination IP address	According to the EUT class: * Classes 3, 4, 6 and 7: 192.168.250.1 * Class 5: 192.168.250.100
			Source port number	55 003
			Destination port number	55 000
			Data	optional
			Number of transmissions	1 time
		Pattern 2	Interface	UDP
			Source IP address	1.2.3.4
			Destination IP address	1.2.3.255
			Source port number	10 000
			Destination port number	10 001
			Data	optional
			Number of transmissions	2 times
	General purpose communication data sender log measurement start (The second time)	request frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	253
			Node address of destination side (DNA)	The parameter varies according to the EUT class * Classes 3, 4, 6 and 7:1 * Class 5: 100
			TCD	65 022(General purpose communication data sender log measurement start request)
			Data size	0
			Contents of data	NA

Table 133 – General purpose communication data sender log measurement start/end (continued)

Setting parameters (test data) (continued)	General purpose communication data sender log measurement start (The second time) (continued)	response frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	The parameter varies according to the EUT class * Classes 3, 4, 6 and 7:1 * Class 5: 100
			Node address of destination side (DNA)	253
			TCD	65 222(general purpose communication data sender log measurement start response)
			Type of response message (M_RLT)	0(normal)
			Data size (M_RLT = 0)	0
			Contents of data	NA
	General purpose communication data (The second time)	Pattern *N* (*N*: 1～6)	Interface	TCP
			Source IP address	192.168.250.(248＋*N*)
			Destination IP address	According to the EUT class: * Classes 3, 4, 6 and 7: 192.168.250.1 * Class 5: 192.168.250.100
			Source port number	54 998＋*N*
			Destination port number	54 998＋*N*
			Data	optional
			Number of transmissions	*N* times
		Pattern 7	Interface	UDP
			Source IP address	1.2.3.4
			Destination IP address	1.2.3.255
			Source port number	10 000
			Destination port number	10 001
			Data	optional
			Number of transmissions	10 times
		Pattern 8	Interface	UDP
			Source IP address	192.168.0.254
			Destination IP address	192.168.0.255
			Source port number	55 001
			Destination port number	55 000
			Data	optional
			Number of transmissions	9 times
		Pattern 9	Interface	UDP
			Source IP address	192.168.250.125
			Destination IP address	192.168.250.255
			Source port number	55 002
			Destination port number	55 001
			Data	optional
			Number of transmissions	8 times

Table 133 – General purpose communication data sender log measurement start/end (continued)

Setting parameters (test data) (continued)	General purpose communication data (The second time) (continued)	Pattern 10	Interface	UDP
			Source IP address	123.45.6.78
			Destination IP address	123.45.6.255
			Source port number	55 000
			Destination port number	55 003
			Data	optional
			Number of transmissions	7 times
		Pattern 11	Interface	TCP
			Source IP address	192.168.250.200
			Destination IP address	According to the EUT class: * Classes 3, 4, 6 and 7:. 192.168.250.1 * Class 5: 192.168.250.100
			Source port number	55 003
			Destination port number	55 000
			Data	optional
			Number of transmissions	6 times
	General purpose communication data sender log measurement end (The first time)	request frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	254
			Node address of destination side (DNA)	The parameter varies according to the EUT class * Classes 3, 4, 6 and 7:1 * Class 5: 100
			TCD	65 023(General purpose communication data sender log measurement stop request)
			Data size	0
			Contents of data	NA
		response frame	Interface	UDP setting tool interface
			Node address of source side (SNA)	The parameter varies according to the EUT class * Classes 3, 4, 6 and 7:1 * Class 5: 100
			Node address of destination side (DNA)	254
			TCD	65 223(General purpose communication data sender log measurement stop response)
			Type of response message (M_RLT)	0(normal)
			Data size (M_RLT = 0)	84
			Contents of data (M_RLT = 0)	optional (no evaluation)

Table 133 – General purpose communication data sender log measurement start/end (continued)

Setting parameters (test data) (continued)	General purpose communication data sender log measurement stop (The second time)	request frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	253
			Node address of destination side (DNA)	The parameter varies according to the EUT class * Classes 3, 4, 6 and 7:1 * Class 5: 100
			TCD	65 023(General purpose communication data sender log measurement stop request)
			Data size	0
			Contents of data	NA
		response frame	Interface	TCP setting tool interface
			Node address of source side (SNA)	The parameter varies according to the EUT class * Classes 3, 4, 6 and 7:1 * Class 5: 100
			Node address of destination side (DNA)	253
			TCD	65 223(General purpose communication data sender log measurement stop response)
			Type of response message (M_RLT)	0(normal)
			Data size (M_RLT = 0)	84
			Contents of data (M_RLT = 0)	Measuring time for general purpose communication data sender log:(Identical to the first stop response)
				IP1: (Identical to the first stop response)
				IP1 receiving counter: (Identical to the first stop response)
				IP2: (Identical to the first stop response)
				IP2 receiving counter: (Identical to the first stop response)
				IP3: (Identical to the first stop response)
				IP3 receiving counter: (Identical to the first stop response)
				IP4: (Identical to the first stop response)
				IP4 receiving counter: (Identical to the first stop response)
				IP5: (Identical to the first stop response)
				IP5: receiving counter: (Identical to the first stop response)
				IP6: (Identical to the first stop response)

Table 133 – General purpose communication data sender log measurement start/end (continued)

Setting parameters (test data) (continued)	General purpose communication data sender log measurement stop (The second time) (continued)	response frame (continued)	Contents of data (M_RLT = 0) (continued)	IP6 receiving counter: (Identical to the first stop response)
				IP7: (Identical to the first stop response)
				IP7 receiving counter: (Identical to the first stop response)
				IP8: (Identical to the first stop response)
				IP8 receiving counter: (Identical to the first stop response)
				IP9: (Identical to the first stop response)
				IP9 receiving counter: (Identical to the first stop response)
				IP10: (Identical to the first stop response)
				IP10 receiving counter: (Identical to the first stop response)
	Response time limit (request frame transmission ～ response frame reception)		1 s	

6.6.11 Device Level Network Functions

Device level network functions are tested as described in Table 134 to Table 159.

a) Slaves in fixed setting mode Slaves in fixed setting mode are tested as in Table 134 to Table 137.

Table 134 – Slave status, actual slave type, and simple setting area

Test No.		V3-053
Major test group		Device level network function
Test group		Slave in fixed setting mode
Test objects		Slave status, actual slave type, and simple setting area
Test procedure		a) Start the EUT (fixed slave), and then start the test equipment (fixed master). Subsequently, start the dummy node (controller). b) Disengage the test equipment from the network (stop sending token frames). c) Re-join the test equipment to the network. d) Disengage dummy node from the network (stop sending token frames).
evaluation criteria		a) Confirm the values of actual slave type and simple setting area in the input status area of the EUT by referring to the common memory. b) Check the common memory values to confirm that the slave status value in the input status area of the EUT is No Master (4) at the time of test procedure b). c) Check the common memory values to confirm that the slave status value in the input status area of the EUT is not No Master (4) at the time of test procedure c). d) Check the common memory values to confirm that the slave status value in the input status area of the EUT is not No Master (4) at the time of test procedure d).
Test necessity identified by the EUT class	Class 1	N
	Class 2	N
	Class 3	N
	Class 4	N
	Class 5	N
	Class 6	O (when implementing the fixed slave function.)
	Class 7	R

Table 134 – Slave status, actual slave type, and simple setting area (continued)

Setting parameter (node)	EUT (fixed slave)	Node number	1
		Token watchdog time	(50)
		Allowable minimum frame interval time	(10)
		Area 1 data top address	0
		Area 1 data size	Calculate from the number of input slave points in EUT.
		Area 2 data top address	0
		Area 2 data size	Calculate from the number of input slave points and output slave points in EUT.
	Test equipment	Implementation class	5 (Fixed master)
		Node number	100
		Token watchdog time	(100)
		Allowable minimum frame interval time	(10)
		Area 1 data top address	256
		Area 1 data size	256
		Area 2 data top address	1 024
		Area 2 data size	1 024
	dummy node	Implementation class	3(Controller)
		Node number	2
		Token watchdog time	50
		Allowable minimum frame interval time	10
		Area 1 data top address	0
		Area 1 data size	0
		Area 2 data top address	0
		Area 2 data size	0
Setting parameters (test data)	Master output (Output from test equipment to EUT)	Output data (For #1)	Optional
		Remote control area (For #1)	16#0001 (Remote operation)
		Specified slave type (For #1)	Calculate from the number of input slave points and output slave points in EUT.
		Simple setting area (For #1)	Master node number instructions: 16#00(default)
			Slave operating instructions: 16#0000
			Master specified area: All 0
		Reserved area (For #1)	All 0
	Slave output (Output from EUT to test equipment)	Input data	(no evaluation)
		Slave status	Confirm according to evaluation criteria.
		Actual slave type	Calculate from the number of input slave points and output slave points in EUT.
		Simple setting area	Master node number: 100
			Slave operation setting confirmation status: 16#0000
			Master specified area: All 0
		General-purpose status area	(no evaluation)

Table 135 – IO output upon disengagement of the master

<table>
<tr><td colspan="2">Test No.</td><td colspan="3">V3-054</td></tr>
<tr><td colspan="2">Major test group</td><td colspan="3">Device level network function</td></tr>
<tr><td colspan="2">Test group</td><td colspan="3">Slave in fixed setting mode</td></tr>
<tr><td colspan="2">Test objects</td><td colspan="3">IO output upon disengagement of the master</td></tr>
<tr><td colspan="2">Test procedure</td><td colspan="3">a) Start the EUT (fixed slave), and then start the test equipment (fixed master). Subsequently, start the dummy node (controller).
b) In the test equipment, assign a value (excluding “0”) for the data output to the EUT.
c) In the test equipment, set the IO output value for the EUT upon slave operation instructions—disengagement of the master in the output status area to Clear (0).
d) Disengage the test equipment from the network (stop transmitting token frames).
e) Re-join the test equipment to the network.
f) In the test equipment, set the IO output value for the EUT upon slave operation instructions—disengagement of the master in the output status area to Hold (1).
g) Disengage the test equipment from the network (stop transmitting token frames).</td></tr>
<tr><td colspan="2">Evaluation criteria</td><td colspan="3">a) Check the EUT to confirm that the output data in the EUT is receiving any value different than “0” at the time of test procedure b).
b) In test procedure c), check the common memory values to confirm that IO output upon slave operation setting confirmation status—disengagement of the master in the input status area of the EUT is Clear (0).
c) Check the EUT to confirm that the output data in the EUT is receiving “0” at the time of test procedure d).
d) Check the EUT to confirm that the output data in the EUT is receiving any value different than “0” at the time of test procedure e).
e) In test procedure f), check the common memory values to confirm that the IO output upon slave operation setting confirmation status—disengagement of the master in the input status area of the EUT is Hold (1).
f) Check the EUT to confirm that the output data in the EUT is receiving any value different than “0” at the time of test procedure g).</td></tr>
<tr><td rowspan="7">Test necessity identified by the EUT class</td><td>Class 1</td><td colspan="3">N</td></tr>
<tr><td>Class 2</td><td colspan="3">N</td></tr>
<tr><td>Class 3</td><td colspan="3">N</td></tr>
<tr><td>Class 4</td><td colspan="3">N</td></tr>
<tr><td>Class 5</td><td colspan="3">N</td></tr>
<tr><td>Class 6</td><td colspan="3">O (in case that Fixed slave function is implemented and that number of the output slave points is equal to or more than one.)</td></tr>
<tr><td>Class 7</td><td colspan="3">O (in case that the output slave points are more than 1 point.)</td></tr>
<tr><td colspan="2" rowspan="10">Setting parameters (node)</td><td rowspan="6">EUT (Fixed slave)</td><td>Node number</td><td>1</td></tr>
<tr><td>Token watchdog time</td><td>(50)</td></tr>
<tr><td>Allowable minimum frame interval time</td><td>(10)</td></tr>
<tr><td>Area 1 data top address</td><td>0</td></tr>
<tr><td>Area 1 data size</td><td>Calculate from the number of input slave points in EUT.</td></tr>
<tr><td>Area 2 data top address</td><td>0</td></tr>
<tr><td>Area 2 data size</td><td>Calculate from the number of input slave points and output slave points in EUT.</td></tr>
<tr><td rowspan="4">Test equipment</td><td>Implementation class</td><td>5 (Fixed master)</td></tr>
<tr><td>Node number</td><td>100</td></tr>
<tr><td>Token watchdog time</td><td>(100)</td></tr>
<tr><td>Allowable minimum frame interval time</td><td>(10)</td></tr>
</table>

Table 135 – IO output upon disengagement of the master (continued)

Setting parameters (node) (continued)	Test equipment (continued)	Area 1 data top address	256
		Area 1 data size	256
		Area 2 data top address	1 024
		Area 2 data size	1 024
	dummy node	Implementation class	3 (controller)
		Node number	2
		Token watchdog time	50
		Allowable minimum frame interval time	10
		Area 1 data top address	0
		Area 1 data size	0
		Area 2 data top address	0
		Area 2 data size	0
Setting parameters (test data)	Master output (Output from test equipment to EUT)	Output data (For #1)	Optional except zero (0)
		Remote control area (For #1)	16#0001 (Remote operation)
		Specified slave type (For #1)	Calculate from the number of input slave points and output slave points in EUT.
		Simple setting area (For #1)	Master node number instructions: 16#00(default)
			Slave operating instructions: Depends on the test procedure: * Test procedure c): 16#0000 * Test procedure f): 16#0001
			Master specified area: All 0
		Reserved area (For #1)	All 0
	Slave output (Output from EUT to test equipment)	Input data	(no evaluation)
		Slave status	(no evaluation)
		Actual slave type	(no evaluation)
		Simple setting area	Master node number: (no evaluation)
			Slave operation setting confirmation status: Depends on the evaluation criteria: * Evaluation criteria b): 16#0000 * Evaluation criteria e): 16#0001
			Master specified area: (no evaluation)
		General-purpose status area	(no evaluation)

Table 136 – IO output upon remote control flag OFF

<table>
<tr><td colspan="2">Test No.</td><td colspan="3">V3-055</td></tr>
<tr><td colspan="2">Major test group</td><td colspan="3">Device level network function</td></tr>
<tr><td colspan="2">Test group</td><td colspan="3">Slave in fixed setting mode</td></tr>
<tr><td colspan="2">Test objects</td><td colspan="3">IO output upon remote control flag OFF</td></tr>
<tr><td colspan="2">Test procedure</td><td colspan="3">a) Start the EUT (fixed slave), and then start the test equipment (fixed master).
b) In the test equipment, set the remote control flag for the EUT to Remote Operation (1).
c) In the test equipment, assign any value other than “0” to data output to the EUT.
d) In the test equipment, set the IO output value for the EUT upon slave operation instructions—remote control flag OFF in the output status area to Clear (0).
e) In the test equipment, set the remote control flag for the EUT to Remote Stop (0).
f) In the test equipment, set the remote control flag for the EUT to Remote Operation (1).
g) In the test equipment, set the IO output value for the EUT upon slave operation instructions—remote control flag OFF in the output status area to Hold (1).
h) In the test equipment, set the remote control flag for the EUT to Remote Stop (0).</td></tr>
<tr><td colspan="2">Evaluation criteria</td><td colspan="3">a) Check the EUT to confirm that the output data in the EUT is receiving any value different than “0” at the time of test procedure c).
b) In test procedure d), check the common memory values to confirm that the IO output value upon slave operation setting confirmation status—remote control flag OFF in the input status area of the EUT is Clear (0).
c) Check the EUT to confirm that the output data in the EUT is receiving “0” at the time of test procedure e).
d) Check the EUT to confirm that the output data in the EUT is receiving any value different than “0” at the time of test procedure f).
e) In test procedure g), check the common memory values to confirm that the IO output value upon slave operation setting confirmation status—remote control flag OFF in the input status area of the EUT is Hold (1).
f) Check the EUT to confirm that the output data in the EUT is receiving any value different than “0” at the time of test procedure h).</td></tr>
<tr><td rowspan="7">Test necessity identified by the EUT class</td><td>Class 1</td><td colspan="3">N</td></tr>
<tr><td>Class 2</td><td colspan="3">N</td></tr>
<tr><td>Class 3</td><td colspan="3">N</td></tr>
<tr><td>Class 4</td><td colspan="3">N</td></tr>
<tr><td>Class 5</td><td colspan="3">N</td></tr>
<tr><td>Class 6</td><td colspan="3">O (in case that Fixed slave function is implemented and that number of the output slave points is equal to or more than one.)</td></tr>
<tr><td>Class 7</td><td colspan="3">O (in case that the output slave points are more than 1 point.)</td></tr>
<tr><td colspan="2" rowspan="7">Setting parameters (node)</td><td rowspan="7">EUT
(Fixed slave)</td><td>Node number</td><td>1</td></tr>
<tr><td>Token watchdog time</td><td>(50)</td></tr>
<tr><td>Allowable minimum frame interval time</td><td>(10)</td></tr>
<tr><td>Area 1 data top address</td><td>0</td></tr>
<tr><td>Area 1 data size</td><td>Calculate from the number of input slave points in EUT.</td></tr>
<tr><td>Area 2 data top address</td><td>0</td></tr>
<tr><td>Area 2 data size</td><td>Calculate from the number of input slave points and output slave points in EUT.</td></tr>
</table>

Table 136 – IO output upon remote control flag OFF (continued)

Setting parameters (node) (continued)	Test equipment	Implementation class	5 (Fixed master)
		Node number	100
		Token watchdog time	(100)
		Allowable minimum frame interval time	(10)
		Area 1 data top address	256
		Area 1 data size	256
		Area 2 data top address	1 024
		Area 2 data size	1 024
Setting parameters (test data)	Master output (Output from test equipment to EUT)	Output data (For #1)	Optional except zero (0)
		Remote control area (For #1)	Depends on the test procedure: * Test procedures b) and f): 16#0001 * Test procedures e) and h): 16#0000
		Specified slave type (For #1)	Calculate from the number of input slave points and output slave points in EUT.
		Simple setting area (For #1)	Master node number instructions: 16#00 (default)
			Slave operating instructions: Depends on the test procedure: * Test procedure d): 16#0000 * Test procedure g): 16#0002
			Master specified area: All 0
		Reserved area (For #1)	All 0
	Slave output (Output from EUT to test equipment)	Input data	(no evaluation)
		Slave status	(no evaluation)
		Actual slave type	(no evaluation)
		Simple setting area	Master node number: (no evaluation)
			Slave operation setting confirmation status: Depends on the evaluation criteria: * Evaluation criteria b): 16#0000 * Evaluation criteria e): 16#0002
			Master specified area: (no evaluation)
		General-purpose status area	(no evaluation)

Table 137 – IO input upon remote control flag OFF

Test No.		V3-056		
Major test group		Device level network function		
Test group		Slave in fixed setting mode		
Test objects		IO input upon remote control flag OFF		
Test procedure		a) Start the EUT (fixed slave), and then start the test equipment (fixed master). b) In the test equipment, set the remote control flag for the EUT to Remote Operation (1). c) Assign any value (when IO input is available) to the input data of the EUT. d) In the test equipment, set the IO input value for the EUT upon slave operation instructions—remote control flag OFF in the output status area to Clear (0). e) In the test equipment, set the remote control flag for the EUT to Remote Stop (0). f) In the test equipment, set the remote control flag for the EUT to Remote Operation (1). g) In the test equipment, set the IO input value for the EUT upon slave operation instructions—remote control flag OFF in the output status area to Hold (1). h) In the test equipment, set the remote control flag for the EUT to Remote Stop (0).		
Evaluation criteria		a) In test procedure d), check the common memory values to confirm that the IO input value upon slave operation setting confirmation status—remote control flag OFF in the input status area of the EUT is Clear (0). b) Check the EUT to confirm whether input data in the EUT is not receiving the value when IO input is available (cleared) at the time of test procedure e). c) Check the EUT to confirm whether the input data in the EUT is receiving the value assigned in test procedure c) when the IO input is available at the time of test procedure f). d) In test procedure g), check the common memory values to confirm that the IO input value upon slave operation setting confirmation status—remote control flag OFF in the input status area of the EUT is Hold (1). e) Check the EUT to confirm whether the input data in the EUT is receiving the value assigned in test procedure c) when the IO input is available at the time of test procedure h).		
Test necessity identified by the EUT class	Class 1	N		
	Class 2	N		
	Class 3	N		
	Class 4	N		
	Class 5	N		
	Class 6	O (in case that Fixed slave function is implemented and that number of the input slave points is equal to or more than one.)		
	Class 7	O (in case that the input slave points are more than 1 point.)		
Setting parameters (node)		EUT (Fixed slave)	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	Calculate from the number of input slave points in EUT.
			Area 2 data top address	0
			Area 2 data size	Calculate from the number of input slave points and output slave points in EUT.
		Test equipment	Implementation class	5 (Fixed master)
			Node number	100
			Token watchdog time	(100)

Table 137 – IO input upon remote control flag OFF (continued)

Setting parameters (node) (continued)	Test equipment (continued)	Allowable minimum frame interval time	(10)
		Area 1 data top address	256
		Area 1 data size	256
		Area 2 data top address	1 024
		Area 2 data size	1 024
Setting parameters (test data)	Master output (Output from test equipment to EUT)	Output data (For #1)	optional except zero (0)
		Remote control area (For #1)	Depends on the test procedure: * Test procedures b) and f): 16#0001 * Test procedures e) and h): 16#0000
		Specified slave type (For #1)	Calculate from the number of input slave points and output slave points in EUT.
		Simple setting area (For #1)	Master node number instructions: 16#00(default)
			Slave operating instructions: Depends on the test procedure: * Test procedure d): 16#0000 * Test procedure g): 16#0004
			Master specified area: All 0
		Reserved area (For #1)	All 0
	Slave output (Output from EUT to test equipment)	Input data	Depends on the evaluation criteria: * Evaluation criteria c) and e): Value upon IO effective * Evaluation criteria b): Value appropriate to Clear
		Slave status	(no evaluation)
		Actual slave type	(no evaluation)
		Simple setting area	Master node number: (no evaluation)
			Slave operation setting confirmation status: Depends on the evaluation criteria: * Evaluation criteria b): 16#0000 * Evaluation criteria e): 16#0004
			Master specified area: (no evaluation)
		General-purpose status area	(no evaluation)

b) Mater in fixed setting mode Master in fixed setting mode are tested as in Table 138 and Table 139.

Table 138 – Input and output data

Test No.	V3-057
Major test group	Device level network function
Test group	Master in fixed setting mode
Test objects	Input and output data
Test procedure	a) Start the EUT (fixed master), and then start the test equipment (fixed slave). b) From the EUT, change the output data to the test equipment. c) Change the input data into the test equipment.
Evaluation criteria	a) Check the common memory values to confirm whether test procedure b) changed the output data from the EUT to the test equipment. b) Check the EUT to confirm whether test procedure c) changed the input data to the EUT.

Table 138 – Input and output data (continued)

Test necessity identified by the EUT class	Class 1	N		
	Class 2	N		
	Class 3	N		
	Class 4	O (when implementing the fixed master function.)		
	Class 5	R		
	Class 6	N		
	Class 7	N		
Setting parameters (node)		EUT (Fixed master)	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1 024
			Area 2 data size	1 024
			slave setting (#11)	Number of input points of the slave: 96
				Number of output points of the slave: 32
		Test equipment	Implementation class	7(Fixed slave)
			Node number	11
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	40
			Area 1 data size	8
			Area 2 data top address	160
			Area 2 data size	32
			Number of input points of the slave	96
			Number of output points of the slave	32
Setting parameters (test data)		Master output (Output from the EUT to the test equipment)	Output data (Common memory area 1: 16#0128 to 16#012F)	Optional
			Remote control area (Common memory area 2: 16#04A0)	16#0001 (Remote run)
			Specified slave type (Common memory area 2: 16#04A1, 16#04B1)	(no evaluation)
			Simple setting area (Common memory area 2: 16#04A2 to 16#04A9)	Master node number instructions: 16#00 (default)
				Slave operating instructions: (no evaluation)
				Master specified area: (no evaluation)
			Reserved area (Common memory area 2: 16#04AA to 16#04AF)	(no evaluation)

Table 138 – Input and output data (continued)

Setting parameters (test data) (continued)	Slave output (Output from the test equipment to the EUT)	Input data (Common memory area 1: 16#0028～16#002F)	Optional
		Slave status (Common memory area 2: 16#00A0)	Optional(depending on status of the test equipment)
		Actual slave type (1) (Common memory area 2: 16#00A1)	16#9FFF * Output slave (Used, subsequent area not used, 32 points) * Input slave(Used, subsequent area used, 64 points)
		Actual slave type (2) (Common memory area 2: 16#00B1)	16#009F * Output slave (not used, subsequent area not used, 0 points) * Input slave (Used, subsequent area not used, 32 points)
		Simple setting area (Common memory area 2: 16#00A2 to 16#00A9)	Master node number: 100
			Slave operation setting confirmation status: Return of the master output value.
			Master specified area: Return of the master output value.
		General-purpose status area (Common memory area2: 16#00AA to 16#00AF)	All zero (0)

Table 139 – Output status

Test No.	V3-058
Major test group	Device level network function
Test group	Master in fixed setting mode
Test objects	Output status
Test procedure	a) Start the EUT (fixed master), and then start the test equipment (fixed slave). b) In the EUT, set the remote control for the test equipment to Remote Operation (1). c) In the EUT, set the remote control for the test equipment to Remote Stop (0). d) In the EUT, set the IO output for the test equipment upon slave operation instructions—disengagement of the master to Clear (0) (considering the case requiring the EUT to restart, wait for the EUT to join). e) In the EUT, set the IO output for the test equipment upon slave operation instructions—disengagement of the master to Hold (1) (considering the case requiring the EUT to restart, wait for the EUT to join). f) In the EUT, set the IO output for the test equipment upon slave operation instructions—remote control flag OFF to Clear (0) (considering the case requiring the EUT to restart, wait for the EUT to join). g) In the EUT, set the IO output for the test equipment upon slave operation instructions—remote control flag OFF to Hold (1) (considering the case requiring the EUT to restart, wait for the EUT to join). h) In the EUT, set the IO input for the test equipment upon slave operation instructions—remote control flag OFF to Clear (0) (considering the case requiring the EUT to restart, wait for the EUT to join).

Table 139 – Output status (continued)

Test procedure (continued)		i) In the EUT, set the IO input for the test equipment upon slave operation instructions—remote control flag OFF to Hold (1) (considering the case requiring the EUT to restart, wait for the EUT to join).		
Evaluation criteria		a) Check whether the specified slave type and master node number are correct in the output status area of the EUT. b) Check the common memory values to confirm whether the remote control area in the output status area of the EUT is Remote Operation (1) at the time of test procedure b). c) Check the common memory values to confirm whether the remote control area in the output status area of the EUT is Remote Stop (0) at the time of test procedure c). d) Check the common memory values to confirm whether the IO output upon slave operation instructions—disengagement of the master in the output status area of the EUT is Clear (0) at the time of test procedure d). e) Check the common memory values to confirm whether the IO output upon slave operation instructions—disengagement of the master in the output status area of the EUT is Hold (1) at the time of test procedure e). f) Check the common memory values to confirm whether the IO output upon slave operation instructions—remote control flag OFF in the output status area of the EUT is Clear (0) at the time of test procedure f). g) Check the common memory values to confirm whether the IO output upon slave operation instructions—remote control flag OFF in the output status area of the EUT is Hold (1) at the time of test procedure g). h) Check the common memory values to confirm whether the IO input upon slave operation instructions—remote control flag OFF in the output status area of the EUT is Clear (0) at the time of test procedure h). i) Check the common memory values to confirm whether the IO input upon slave operation instructions—remote control flag OFF in the output status area of the EUT is Hold (1) at the time of test procedure i).		
Test necessity identified by the EUT class	Class 1	N		
	Class 2	N		
	Class 3	N		
	Class 4	O (when implementing the fixed master function.)		
	Class 5	R		
	Class 6	N		
	Class 7	N		
Setting parameters (node)		EUT (Fixed master)	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1 024
			Area 2 data size	1 024
			期待slave setting(#11)	Number of input points of the slave: 96
				Number of output points of the slave: 32
		Test equipment	Implementation class	7 (Fixed slave)
			Node number	11
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	40
			Area 1 data size	8
			Area 2 data top address	160

Table 139 – Output status (continued)

Setting parameters (node) (continued)	Test equipment (continued)	Area 2 data size	32
		Number of input points of the slave	96
		Number of output points of the slave	32
Setting parameters (test data)	Master output (Output from the EUT to the test equipment)	Output data (Common memory area 1: 16#0128 to 16#012F)	Optional
		Remote control area (Common memory area 2: 16#04A0)	Depends on the test procedure: * Test procedure b): D0: 1 (Remote run) * Test procedure c): D0: 0 (Remote stop)
		Specified slave type (1) (Common memory area 2: 16#04A1)	16#9FFF * Output slave (Used, subsequent area not used, 32 points) * Input slave (Used, subsequent area used, 64 points)
		Specified slave type (2) (Common memory area 2: 16#04B1)	16#009F * Output slave (not used, subsequent area not used, 0 points) * Input slave (Used, subsequent area not used, 32 points)
		Simple setting area (Common memory area 2: 16#04A2 to 16#04A9)	Master node number instructions: 16#00 (default)
			Slave operating instructions: Depends on the test procedure: * Test procedure d): D0: 0 (IO output upon disengagement of the master: Clear) * Test procedure e): D0: 1 (IO output upon disengagement of the master: Hold) * Test procedure f): D1: 0 (IO output upon remote control flag OFF: Clear) * Test procedure g): D1: 1 (IO output upon remote control flag OFF: Hold) * Test procedure h): D2: 0 (IO input upon remote control flag OFF: Clear) * Test procedure i): D2: 1 (IO input upon remote control flag OFF: Hold)
			Master specified area: (no evaluation)
		Reserved area (Common memory area 2: 16#04AA to 16#04AF)	(no evaluation)
	Slave output (Output from the test equipment to the EUT)	Input data (Common memory area 1: 16#0028 to 16#002F)	Optional
		Slave status (Common memory area 2: 16#00A0)	Optional (depending on status of the test equipment)

Table 139 – Output status (continued)

Setting parameters (test data) (continued)	Slave output (Output from the test equipment to the EUT) (continued)	Actual slave type (1) (Common memory area 2: 16#00A1)	16#9FFF * Output slave (Used, subsequent area not used, 32 points) * Input slave (Used, subsequent area used, 64 points)
		Actual slave type (2) (Common memory area 2: 16#00B1)	16#009F * Output slave (not used, subsequent area not used, 0 points) * Input slave (Used, subsequent area not used, 32 points)
		Simple setting area (Common memory area2: 16#00A2 to 16#00A9)	Master node number: 100
			Slave operation setting confirmation status: Return of the master output value.
			Master specified area: Return of the master output value.
		General-purpose status area (Common memory area2: 16#00AA to 16#00AF)	All zero (0)

c) Slaves in flexible setting mode Slaves in flexible setting mode are tested as in Table 140 through Table 152.

Table 140 – New participation operation 1

Test No.		V3-059		
Major test group		Device level network function		
Test group		Slave in flexible setting mode		
Test objects		New participation operation 1		
Test procedure		a) Start the EUT (flexible slave). b) Check the frames in the test equipment.		
Evaluation criteria		Confirm that the EUT transmits no frames.		
Test necessity identified by the EUT class	Class 1	N		
	Class 2	N		
	Class 3	N		
	Class 4	N		
	Class 5	N		
	Class 6	R		
	Class 7	N		
Setting parameters (node)		EUT (Flexible slave)	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave in the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the number of input points and output points of the slave in the EUT
		Test equipment	—	

Table 140 – New participation operation 1 (continued)

Setting parameters (test data)	—

Table 141 – New participation operation 2

Test No.		V3-060		
Major test group		Device level network function		
Test group		Slave in flexible setting mode		
Test objects		New participation operation 2		
Test procedure		a) Start the EUT (flexible slave). b) Start the test equipment (controller), without activating the flexible master function.		
Evaluation criteria		Confirm that the EUT transmits no frames.		
Test necessity identified by the EUT class	Class 1	N		
	Class 2	N		
	Class 3	N		
	Class 4	N		
	Class 5	N		
	Class 6	R		
	Class 7	N		
Setting parameters (node)		EUT (Flexible slave)	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave in the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave in the EUT
		Test equipment	Implementation class	3 (Controller)
			Node number	85
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
Setting parameters (test data)		—		

Table 142 – New participation operation 3

Test No.		V3-061		
Major test group		Device level network function		
Test group		Slave in flexible setting mode		
Test objects		New participation operation 3		
Test procedure		a) Start the EUT (flexible slave). b) Start the test equipment (flexible master linked with the EUT)		
Evaluation criteria		a) Confirm that, after transmitting solicitation frames from the test equipment, the EUT transmits participation request frames. b) Confirm that the EUT joins the network. c) Confirm that the slave status value in the input status area of the EUT is Running (3).		
Test necessity identified by the EUT class	Class 1	N		
	Class 2	N		
	Class 3	N		
	Class 4	N		
	Class 5	N		
	Class 6	R		
	Class 7	N		
Setting parameters (node)		EUT (Flexible slave)	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave in the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave in the EUT
		Test equipment	Implementation class	4 (Flexible master)
			Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number: 16#8001 (Flexible setting mode, Node number: 1)
				Input data address: 16#0000 (Area 1, address: 0)
				Input data size: To be calculated from the number of input points of the slave in the EUT

Table 142 – New participation operation 3 (continued)

Setting parameters (node) (continued)	Test equipment (continued)	IO allocation setting (slave setting) (continued)	output data address: Depends on the number of output points of the slave in the EUT * 0 point: 16#0000 (Area 1, address: 0) * 1 point or more: 16#0100 (Area 1, address: 256)
			output data size: To be calculated from the number of the output points of the slave in the EUT
			Input status address: 16#8000 (Area 2, address: 0)
			Output status address: 16#8400 (Area 2, address: 1 024)
Setting parameters (test data)	—		

Table 143 – New participation operation 4

Test No.		V3-062	
Major test group		Device level network function	
Test group		Slave in flexible setting mode	
Test objects		New participation operation 4	
Test procedure		a) Start the EUT (flexible slave). b) Start the test equipment (flexible master not linked with the EUT [flexible slave]).	
Evaluation criteria		Confirm that the EUT transmits no frames.	
Test necessity identified by the EUT class	Class 1	N	
	Class 2	N	
	Class 3	N	
	Class 4	N	
	Class 5	N	
	Class 6	R	
	Class 7	N	
Setting parameters (node)		EUT (Flexible slave)	Node number: 1
			Token watchdog time: (50)
			Allowable minimum frame interval time: (10)
			Area 1 data top address: 0
			Area 1 data size: To be calculated from the number of input points of the slave in the EUT
			Area 2 data top address: 0
			Area 2 data size: To be calculated from the numbers of input and output points of the slave in the EUT
		Test equipment	Implementation class: 4 (Flexible master)
			Node number: 100
			Token watchdog time: (100)
			Allowable minimum frame interval time: (10)

Table 143 – New participation operation 4 (continued)

Setting parameters (node) (continued)	Test equipment (continued)	Area 1 data top address	256
		Area 1 data size	256
		Area 2 data top address	1 024
		Area 2 data size	1 024
		IO allocation setting (number of control slaves)	1
		IO allocation setting (slave setting)	Slave node number: 16#8002 (Flexible setting mode, Node number: 2)
			Input data address: 16#0000 (Area 1, address: 0)
			Input data size: To be calculated from the number of input points of the slave in the EUT
			output data address: Depends on the number of output points of the slave in the EUT * 0 point: 16#0000 (Area 1, address: 0) * 1 point or more: 16#0100 (Area 1, address: 256)
			output data size: To be calculated from the number of the output points of the slave in the EUT
			Input status address: 16#8000 (Area 2, address: 0)
			Output status address: 16#8400 (Area 2, address: 1 024)
Setting parameters (test data)	—		

Table 144 – Participation to operating network 1

Test No.		V3-063
Major test group		Device level network function
Test group		Slave in flexible setting mode
Test objects		Participation to operating network 1
Test procedure		a) Start the dummy node (controller). After its operation becomes stable, start the test equipment (controller). b) Start the EUT (flexible slave).
Evaluation criteria		Confirm that the EUT transmits no frames.
Test necessity identified by the EUT class	Class 1	N
	Class 2	N
	Class 3	N
	Class 4	N
	Class 5	N
	Class 6	R
	Class 7	N

Table 144 – Participation to operating network 1 (continued)

Setting parameters (node)	EUT (Flexible slave)	Node number	1
		Token watchdog time	(50)
		Allowable minimum frame interval time	(10)
		Area 1 data top address	0
		Area 1 data size	To be calculated from the number of input points of the slave in the EUT
		Area 2 data top address	0
		Area 2 data size	To be calculated from the numbers of input and output points of the slave in the EUT
	Test equipment	Implementation class	3 (Controller)
		Node number	100
		Token watchdog time	50
		Allowable minimum frame interval time	10
		Area 1 data top address	256
		Area 1 data size	4
		Area 2 data top address	1 024
		Area 2 data size	16
	Dummy node	Implementation class	3 (Controller)
		Node number	2
		Token watchdog time	50
		Allowable minimum frame interval time	10
		Area 1 data top address	0
		Area 1 data size	0
		Area 2 data top address	0
		Area 2 data size	0
Setting parameters (test data)	—		

Table 145 – Participation to operating network 2

Test No.	V3-064
Major test group	Device level network function
Test group	Slave in flexible setting mode
Test objects	Participation to operating network 2
Test procedure	a) Start the dummy node (controller). After its operation becomes stable, start the test equipment (flexible master linked with the EUT). b) Start the EUT (flexible slave).
Evaluation criteria	a) Confirm that, after transmitting solicitation frames from the test equipment, the EUT transmits participation request frames. b) Confirm that the EUT joins the network. c) Confirm that the slave status value in the input status area of the EUT is Running (3).

Table 145 – Participation to operating network 2 (continued)

Test necessity identified by the EUT class	Class 1	N		
	Class 2	N		
	Class 3	N		
	Class 4	N		
	Class 5	N		
	Class 6	R		
	Class 7	N		
Setting parameters (node)		EUT (Flexible slave)	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	To be calculated from the number of input points of the slave in the EUT
			Area 2 data top address	0
			Area 2 data size	To be calculated from the numbers of input and output points of the slave in the EUT
		Test equipment	Implementation class	4 (Flexible master)
			Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number: 16#8001 (Flexible setting mode, Node number: 1)
				Input data address: 16#0000 (Area 1, address: 0)
				Input data size: To be calculated from the number of input points of the slave in the EUT
				output data address: Depends on the number of output points of the slave in the EUT * 0 point: 16#0000 (Area 1, address: 0) * 1 point or more: 16#0100 (Area 1, address: 256)
				output data size: To be calculated from the number of the output points of the slave in the EUT
				Input status address: 16#8000 (Area 2, address: 0)
				Output status address: 16#8400 (Area 2, address: 1 024)

Table 145 – Participation to operating network 2 (continued)

Setting parameters (node) (continued)	Dummy node	Implementation class	3 (Controller)
		Node number	2
		Token watchdog time	50
		Allowable minimum frame interval time	10
		Area 1 data top address	0
		Area 1 data size	0
		Area 2 data top address	0
		Area 2 data size	0
Setting parameters (test data)	—		

Table 146 – Participation to operating network 3

Test number		V3-065		
Major test group		Device level network function		
Test group		Slave in flexible setting mode		
Test objects		Participation to operating network 3		
Test procedure		a) Start the dummy node (controller). After the dummy node is in stable operation, start the test equipment (flexible master which does not correspond to the EUT). b) Start the EUT (flexible slave).		
Evaluation criteria		Confirm that the EUT does not send any frame.		
Test necessity identified by the EUT class	Class 1	N		
	Class 2	N		
	Class 3	N		
	Class 4	N		
	Class 5	N		
	Class 6	R		
	Class 7	N		
Setting parameter (node)		Equipment under test (EUT) (flexible slave)	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	Calculated from the number of input slave points in the EUT.
			Area 2 data top address	0
			Area 2 data size	Calculated from the number of input slave points and output slave points in the EUT.
		Test equipment	Implementation class	4 (Flexible master)
			Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1 024

Table 146 – Participation to operating network 3 (continued)

Setting parameter (node) (continued)	Test equipment (continued)	Area 2 data size	1 024
		IO allocation setting (number of control slaves)	1
		IO allocation setting (slave setting)	Slave node number = 16#8002 (flexible setting mode, node number = 2)
			Input data address = 16#0000 (Area 1, address = 0)
			Input data size = Calculated from the number of input slave points in the EUT.
			Output data address = depends on the number of output slave points in the EUT. * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
			Output data size = Calculated from the number of output slave points in the EUT.
			Input status address = 16#8000 (Area2, address = 0)
			Output status address = 16#8400 (Area2, address = 1 024)
	Dummy node	Implementation class	3(controller)
		Node number	3
		Token watchdog time	50
		Allowable minimum frame interval time	10
		Area 1 data top address	0
		Area 1 data size	0
		Area 2 data top address	0
		Area 2 data size	0
Setting parameter (Test data)	—		

Table 147 – Disengagement/re-join of flexible master

Test number	V3-066
Major test group	Device level network function
Test group	Slave in flexible setting mode
Test objects	Disengagement/re-join of flexible master
Test procedure	a) Start the dummy node (controller). After the dummy node is in stable operation, start the test equipment (flexible master corresponding to the EUT). b) Start the EUT (flexible slave). c) Disengage the test equipment from the network (Stop sending the token frame.) d) Re-join the test equipment to the network.
Evaluation criteria	a) Confirm that the EUT does not disengage from the network by the test procedure c). b) Confirm that the EUT does not disengage from the network by the test procedure d).

Table 147 – Disengagement/re-join of flexible master (continued)

Test necessity identified by the EUT class	Class 1	N		
	Class 2	N		
	Class 3	N		
	Class 4	N		
	Class 5	N		
	Class 6	R		
	Class 7	N		
Setting parameter (node)		Equipment under test (EUT) (flexible slave)	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	Calculated from the number of input slave points in the EUT.
			Area 2 data top address	0
			Area 2 data size	Calculated from the number of input slave points and output slave points in the EUT.
		Test equipment (flexible master)	Implementation class	4 (flexible master)
			Node number	100
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = Calculated from the number of input slave points in the EUT.
				Output data address = Depends on the number of output slave points in the EUT. * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = Calculated from the number of output slave points in the EUT.
				Input status address = 16#8000 (Area2, address = 0)
				Output status address = 16#8400 (Area2, address = 1 024)

Table 147 – Disengagement/re-join of flexible master (continued)

Setting parameter (node) (continued)	Dummy node (controller)	Implementation class	3 (controller)
		Node number	2
		Token watchdog time	50
		Allowable minimum frame interval time	10
		Area 1 data top address	0
		Area 1 data size	0
		Area 2 data top address	0
		Area 2 data size	0
Setting parameter (Test data)	—		

Table 148 – Solicitation frame during link establishment

Test number		V3-067	
Major test group		Device level network function	
Test group		Slave in flexible setting mode	
Test objects		Solicitation frame during link establishment	
Evaluation criteria		a) Start the dummy node (controller). After the dummy node is in stable operation, start the test equipment (flexible master corresponding to the EUT) b) Start the EUT (flexible slave). c) Transmit a solicitation frame same setting value from the test equipment (same master). d) Transmit a solicitation frame with a different setting value, from the test equipment (same master). e) Transmit a solicitation frame with another different setting value, from the test equipment (different master).	
Evaluation criteria		a) Confirm the EUT does not disengage from the network by the test procedure c). b) Confirm the EUT disengages from the network by the test procedure d), and joins based on the setting value in the solicitation frame. c) Confirm the EUT does not disengage from the network by the test procedure e).	
Test necessity identified by the EUT class	Class 1	N	
	Class 2	N	
	Class 3	N	
	Class 4	N	
	Class 5	N	
	Class 6	R	
	Class 7	N	
Setting parameter (node)		Equipment under test (EUT) (flexible slave)	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	Calculated from the number of input slave points in the EUT.
			Area 2 data top address	0
			Area 2 data size	Calculated from the number of input slave points and output slave points in the EUT.

Table 148 – Solicitation frame during link establishment (continued)

Setting parameter (node) (continued)	Test equipment	Implementation class	4 (flexible master)
		Node number	100
		Token watchdog time	(100)
		Allowable minimum frame interval time	(10)
		Area 1 data top address	256
		Area 1 data size	256
		Area 2 data top address	1 024
		Area 2 data size	1 024
		IO allocation setting (number of control slaves)	1
		IO allocation setting (slave setting)	Slave node number = 16#8001 (flexible setting mode node number = 1)
			Input data address = 16#0000 (Area 1, address = 0)
			Input data size = Calculated from the number of input slave points in the EUT.
			Output data address = Depends on the number of output slave points in the EUT. * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
			Output data size = Calculated from the number of output slave points in the EUT.
			Input status address = 16#8000 (Area2, address = 0)
			Output status address = 16#8400 (Area2, address = 1 024)
	Dummy node	Implementation class	3 (controller)
		Node number	2
		Token watchdog time	50
		Allowable minimum frame interval time	10
		Area 1 data top address	0
		Area 1 data size	0
		Area 2 data top address	0
		Area 2 data size	0
Setting parameter (Test data)	Solicitation frame (the same setting value from the same master)	Node address of source side	100
		TCD	65 017 (Solicitation)
		Data size	16
		Contents of data	Slave node number = 16#8001 (flexible setting mode node number = 1)
			Input data address=16#0000 (Area 1, address = 0)

Table 148 – Solicitation frame during link establishment (continued)

Setting parameter (Test data) (continued)	Solicitation frame (the same setting value from the same master) (continued)	Contents of data (continued)	Input data size = Calculated from the number of input slave points in the EUT.
			Output data address = Depends on the number of output slave points in the EUT. * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
			Output data size = Calculated from the number of output slave points in the EUT.
			Input status address = 16#8000 (Area2, address = 0)
			Output status address = 16#8400 (Area2, address = 1 024)
			Lock ID = 100
	Solicitation frame (the different setting value from the same master)	Node address of source side	100
		TCD	65 017 (Solicitation)
		Data size	16
			Slave node number = 16#8001 (flexible setting mode node number = 1)
			Input data address = 16#0000 (Area 1, address = 0)
			Input data size = Calculated from the number of input slave points in the EUT.
			Output data address = Depends on the number of output slave points in the EUT. * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
			Output data size = Calculated from the number of output slave points in the EUT.
			Input status address = 16#8010 (Area2, address = 16)
			Output status address = 16#8400 (Area2, address = 1 024)
			Lock ID = 100
	Solicitation frame (the other different setting value from the different master)	Node address of source side	2
		TCD	65 017 (Solicitation)
		Data size	16
			Slave node number = 16#8001 (flexible setting mode, node number = 1)
			Input data address = 16#0000 (Area 1, address = 0)

Table 148 – Solicitation frame during link establishment (continued)

Setting parameter (Test data) (continued)	Solicitation frame (the other different setting value from the different master) (continued)	Data size (continued)	Input data size = Calculated from the number of input slave points in the EUT.
			Output data address = Depends on the number of output slave points in the EUT. * 0 point: 16#0000 (Area 1, address=0) * 1 point or more: 16#0100 (Area 1, address = 256)
			Output data size = Calculated from the number of output slave points in the EUT.
			Input status address = 16#8000 (Area2, address = 0)
			Output status address = 16#8480 (Area2, address = 1 152)
			Lock ID = 2

Table 149 – Slave status, actual slave type and simple setting confirmation area

Test number		V3-068	
Major test group		Device level network function	
Test group		Slave in flexible setting mode	
Test objects		Slave status, actual slave type and simple setting confirmation area	
Test procedure		a) Start the EUT (flexible slave) and the test equipment (flexible master corresponding to the EUT). Then, start the dummy node (controller). b) Disengage the test equipment from the network (Stop sending the token frame). c) Re-join the test equipment to the network. d) Disengage the dummy node from the network (Stop sending token frame).	
Evaluation criteria		a) Confirm the actual slave type and simple setting confirmation area in the EUT input status area using the common memory value. b) Confirm using the common memory value that the slave status value in the EUT input status area is set to “No master (4)” by the test procedure b). c) Confirm using the common memory value that the slave status value in the EUT input status area is set to other than “No master (4)” by the test procedure c). d) Confirm using the common memory value that the slave status value in the EUT input status area is set to other than “No master (4)” by the test procedure d).	
Test necessity identified by the EUT class	Class 1	N	
	Class 2	N	
	Class 3	N	
	Class 4	N	
	Class 5	N	
	Class 6	R	
	Class 7	N	
Setting parameter (node)		Equipment under test (EUT) (flexible slave)	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0

Table 149 – Slave status, actual slave type and simple setting confirmation area (continued)

Setting parameter (node) (continued)	Equipment under test (EUT) (flexible slave) (continued)	Area 1 data size	Calculated from the number of input slave points in the EUT.
		Area 2 data top address	0
		Area 2 data size	Calculated from the number of input slave points and output slave points in the EUT.
	Test equipment	Implementation class	4 (flexible master)
		Node number	100
		Token watchdog time	(100)
		Allowable minimum frame interval time	(10)
		Area 1 data top address	256
		Area 1 data size	256
		Area 2 data top address	1 024
		Area 2 data size	1 024
		IO allocation setting (number of control slaves)	1
		IO allocation setting (slave setting)	Slave node number = 16#8001 (flexible setting mode node number = 1)
			Input data address = 16#0000 (Area 1, address = 0)
			Input data size = Calculated from the number of input slave points in the EUT.
			Output data address = Depends on the number of output slave points in the EUT. * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
			Output data size = Calculated from the number of output slave points in the EUT.
			Input status address = 16#8000 (Area2, address = 0)
			Output status address = 16#8400 (Area2, address = 1 024)
	Dummy node	Implementation class	3 (controller)
		Node number	2
		Token watchdog time	50
		Allowable minimum frame interval time	10
		Area 1 data top address	0
		Area 1 data size	0
		Area 2 data top address	0
		Area 2 data size	0

Table 149 – Slave status, actual slave type and simple setting confirmation area (continued)

Setting parameter (Test data)	Master output (Output from test equipment to EUT)	Output data (Common memory area 1 : 16#100~)	All 0
		Remote control area (Common memory area 2 : 16#0400)	16#0001 (Remote operation)
		Specified slave type (Common memory area 2 : 16#0401 + 16 × *N*) Note: *N* the range depending on the number of input/output points on the EUT	Calculated from the number of input slave points and output slave points in the EUT.
		Simple setting area (Common memory area 2 : 16#0402 to 16#0409)	Master node number instructions = 16#00 (default)
			Slave operating instructions = 16#0000
			Master specified area = All 0
		Reserved area (Common memory area 2 : 16#040A to 16#040F)	All 0
	Slave output (Output from EUT to test equipment)	Input data (Common memory area 1 : 16#0000 ~)	no evaluation
		Slave status (Common memory area 2 : 16#0000)	Depends on the evaluation criteria.
		Actual slave type (Common memory area 2 : 16#0001 + 16 × *N*) Note: *N* = the range depending on the number of input/output points on the EUT	Calculated from the number of input slave points and output slave points in the EUT.
		Simple setting area (Common memory area 2 : 16#0002 to 16#0009)	Master node number = 100
			Slave operation setting confirmation status = 16#0000
			Master specified area = All 0
		General-purpose status area (Common memory area 2 : 16#000A to 16#000F)	no evaluation

Table 150 – IO output upon disengagement of the master

<table>
<tr><td colspan="2">Test number</td><td colspan="3">V3-069</td></tr>
<tr><td colspan="2">Major test group</td><td colspan="3">Device level network function</td></tr>
<tr><td colspan="2">Test group</td><td colspan="3">Slave in flexible setting mode</td></tr>
<tr><td colspan="2">Test objects</td><td colspan="3">IO output upon disengagement of the master</td></tr>
<tr><td colspan="2">Test procedure</td><td colspan="3">a) Start the EUT (flexible slave) and the test equipment (flexible master). Then, start the dummy node (controller).
b) Set the output data for the EUT to a value other than “zero(0)” using the test equipment.
c) Set the value of IO output upon disengagement of the master at the slave operating instructions within the output status area for the EUT to “clear(0)” on the test equipment.
d) Disengage the test equipment from the network. (Stop sending the token frame.)
e) Re-join the test equipment to the network.
f) Set the value of IO output upon disengagement of the master at the slave operating instructions within the output status area for the EUT to “hold(1)” on the test equipment.
g) Disengage the test equipment from the network. (Stop sending the token frame.)</td></tr>
<tr><td colspan="2">Evaluation criteria</td><td colspan="3">a) Confirm on the EUT that the output data in the EUT is a value other than zero (0) by the test procedure b).
b) Confirm using the common memory value that the value of IO output upon disengagement of the master at the slave operation setting confirmation status within the input status area in the EUT becomes “clear(0)” by the test procedure c).
c) Confirm on the EUT that the output data in the EUT is zero (0) by the test procedure d).
d) Confirm on the EUT that the output data in the EUT is a value other than zero (0) by the test procedure e).
e) Confirm using the common memory value that the value of IO output upon disengagement of the master at the slave operation setting confirmation status within the input status area in the EUT becomes “hold(1)” by the test procedure f).
f) Confirm on the EUT that the output data in the EUT is a value other than zero (0) by the test procedure g).</td></tr>
<tr><td rowspan="7">Test necessity identified by the EUT class</td><td>Class 1</td><td colspan="3">N</td></tr>
<tr><td>Class 2</td><td colspan="3">N</td></tr>
<tr><td>Class 3</td><td colspan="3">N</td></tr>
<tr><td>Class 4</td><td colspan="3">N</td></tr>
<tr><td>Class 5</td><td colspan="3">N</td></tr>
<tr><td>Class 6</td><td colspan="3">O (in case that the output slave points are more than 1 point.)</td></tr>
<tr><td>Class 7</td><td colspan="3">N</td></tr>
<tr><td colspan="2" rowspan="10">Setting parameter (node)</td><td rowspan="6">Equipment under test (EUT) (flexible slave)</td><td>Node number</td><td>1</td></tr>
<tr><td>Token watchdog time</td><td>(50)</td></tr>
<tr><td>Allowable minimum frame interval time</td><td>(10)</td></tr>
<tr><td>Area 1 data top address</td><td>0</td></tr>
<tr><td>Area 1 data size</td><td>Calculated from the number of input slave points in the EUT.</td></tr>
<tr><td>Area 2 data top address</td><td>0</td></tr>
<tr><td>Area 2 data size</td><td>Calculated from the number of input slave points and output slave points in the EUT.</td></tr>
<tr><td rowspan="4">Test equipment</td><td>Implementation class</td><td>4 (flexible master)</td></tr>
<tr><td>Node number</td><td>100</td></tr>
<tr><td>Token watchdog time</td><td>(100)</td></tr>
<tr><td>Allowable minimum frame interval time</td><td>(10)</td></tr>
</table>

Table 150 – IO output upon disengagement of the master (continued)

Setting parameter (Node) (continued)	Test equipment (continued)	Area 1 data top address	256
		Area 1 data size	256
		Area 2 data top address	1 024
		Area 2 data size	1 024
		IO allocation setting (number of control slaves)	1
		IO allocation setting (slave setting)	Slave node number = 16#8001 (flexible setting mode, node number = 1)
			Input data address = 16#0000 (Area 1, address = 0)
			Input data size = Calculated from the number of input slave points in the EUT.
			Output data address = Depends on the number of output slave points in the EUT. * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
			Output data size = Calculated from the number of output slave points in the EUT.
			Input status address = 16#8000 (Area2, address = 0)
			Output status address = 16#8400 (Area2, address = 1 024)
	Dummy node	Implementation class	3 (controller)
		Node number	2
		Token watchdog time	50
		Allowable minimum frame interval time	10
		Area 1 data top address	0
		Area 1 data size	0
		Area 2 data top address	0
		Area 2 data size	0
Setting parameter (Test data)	Master output (Output from test equipment to EUT)	Output data (Common memory area 1 : 16#100~)	Any value except zero (0)
		Remote control area (Common memory area 2 : 16#0400)	16#0001 (Remote run)
		Specified slave type (Common memory area 2 : 16#0401 + 16 × *N*) Note: *N* = the range depending on the number of input/output points on the EUT.	Calculated from the number of input slave points and output slave points in the EUT.

Table 150 – IO output upon disengagement of the master (continued)

Setting parameter (Test data) (continued)	Master output (Output from test equipment to EUT) (continued)	Simple setting area (Common memory area 2 : 16#0402 to 16#0409)	Master node number instructions = 16#00 (default)
			Slave operating instructions = Depends on the test procedure. * Test procedure c): 16#0000 * Test procedure f): 16#0001
			Master specified area = All 0
		Reserved area (Common memory area 2 : 16#040A to 16#040F)	All 0
	Slave output (Output from EUT to test equipment)	Input data (Common memory area 1 : 16#0000~)	(no evaluation)
		Slave status (Common memory area 2 : 16#0000)	(no evaluation)
		Actual slave type (Common memory area 2 : 16#0001 + 16 × *N*) Note: *N* = the range depending on the number of input/output points on the EUT.	(no evaluation)
		Simple setting area (Common memory area 2 : 16#0002 to 16#0009)	Master node number = (no evaluation)
			Slave operation setting confirmation status = Depends on the evaluation criteria. * evaluation criteria b): 16#0000 * evaluation criteria e): 16#0001
			Master specified area = (no evaluation)
		General-purpose status area (Common memory area 2 : 16#000A to 16#000F)	(no evaluation)

Table 151 – IO output upon remote control flag OFF

Test number		V3-070		
Major test group		Device level network function		
Test group		Slave in flexible setting mode		
Test objects		IO output upon remote control flag OFF		
Test procedure		a) Start the EUT (flexible slave) and the test equipment (flexible master corresponding to the EUT). b) Set the remote control flag for the EUT to the “remote run (1)” using the test equipment. c) Set the output data for the EUT to a value other than zero (0) using the test equipment. d) Set the IO output value upon remote control flag OFF of the slave operating instructions in the output status area for the EUT to “clear (0)” using the test equipment. e) Set the remote control flag for the EUT to “remote stop (0)” using the test equipment. f) Set the remote control flag for the EUT to “remote run (1)” using the test equipment. g) Set the IO output value upon remote control flag OFF of the slave operating instructions in the output status area for the EUT to “hold (1)” using the test equipment. h) Set the remote control flag for the EUT to “remote stop (0)” using the test equipment.		
Evaluation criteria		a) Confirm on the EUT that the output data in the EUT is a value other than zero (0) by the test procedure c). b) Confirm using the common memory value that the IO output value upon remote control flag OFF of the slave operation setting confirmation status in the input status area of the EUT is “cleared (0)” by the test procedure d). c) Confirm on the EUT that the output data in the EUT is zero (0) by the test procedure e). d) Confirm on the EUT that the output data in the EUT is a value other than zero (0) by the test procedure f). e) Confirm using the common memory value that the IO output value upon remote control flag OFF of the slave operation setting confirmation status in the input status area of the EUT is “held (1)” by the test procedure g). f) Confirm on the EUT that the output data in the EUT is a value other than zero (0) by the test procedure h).		
Test necessity identified by the EUT class	Class 1	N		
	Class 2	N		
	Class 3	N		
	Class 4	N		
	Class 5	N		
	Class 6	O (in case that the output slave points are more than 1 point.)		
	Class 7	N		
Setting parameter (Node)		Equipment under test (EUT) (flexible slave)	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	Calculated from the number of input slave points in the EUT.
			Area 2 data top address	0
			Area 2 data size	Calculated from the number of input slave points and output slave points in the EUT.
		Test equipment	Implementation class	4 (flexible master)
			Node number	100
			Token watchdog time	(100)

Table 151 – IO output upon remote control flag OFF (continued)

Setting parameter (Node) (continued)	Test equipment (continued)	Allowable minimum frame interval time	(10)
		Area 1 data top address	256
		Area 1 data size	256
		Area 2 data top address	1 024
		Area 2 data size	1 024
		IO allocation setting (number of control slaves)	1
		IO allocation setting (slave setting)	Slave node number = 16#8001 (flexible setting mode, node number=1)
			Input data address = 16#0000 (Area 1, address = 0)
			Input data size = Calculated from the number of input slave points in the EUT.
			Output data address = Depends on the number of output slave points in the EUT. * 0 point: 6#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
			Output data size = Calculated from the number of output slave points in the EUT.
			Input status address = 16#8000 (Area2, address = 0)
			Output status address = 16#8400 (Area2, address = 1 024)
Setting parameter (Test data)	Master output (Output from test equipment to EUT)	Output data (Common memory area 1 : 16#100~)	Any value except zero (0)
		Remote control area (Common memory area 2 : 16#0400)	Depended on the test procedure. * Test procedure b), f) : 16#0001 (Remote run) * Test procedure e), h) : 16#0000 (Remote stop)
		Specified slave type (Common memory area 2 : 16#0401 + 16 × *N*) Note: *N* = the range depending on the number of input/output points on the EUT	Calculated from the number of input slave points and output slave points in the EUT.

Table 151 – IO output upon remote control flag OFF (continued)

Setting parameter (Test data) (continued)	Master output (Output from test equipment to EUT) (continued)	Simple setting area (Common memory area 2 : 16#0402 to 16#0409)	Master node number instructions = 16#00 (default)
			Slave operating instructions = Depends on the test procedure. * Test procedure d): 16#0000 * Test procedure g): 16#0002
			Master specified area = All 0
		Reserved area (Common memory area 2 : 16#040A to 16#040F)	All 0
	Slave output (Output from EUT to test equipment)	Input data (Common memory area 1 : 16#0000~)	(no evaluation)
		Slave status (Common memory area 2 : 16#0000)	(no evaluation)
		Actual slave type (Common memory area 2 : 16#0001＋16×*N*) Note: *N* = the range depending on the number of input/output points on the EUT.	(no evaluation)
		Simple setting area (Common memory area 2 : 16#0002 to 16#0009)	Master node number = (no evaluation)
			Slave operation setting confirmation status = Depends on the evaluation criteria. * evaluation criteria b): 16#0000 * evaluation criteria e): 16#0002
			Master specified area = (no evaluation)
		General-purpose status area (Common memory area 2 : 16#000A to 16#000F)	(no evaluation)

Table 152 – IO input upon remote control flag OFF

Test number		V3-071		
Major test group		Device level network function		
Test group		Slave in flexible setting mode		
Test objects		IO input upon remote control flag OFF		
Test procedure		a) Start the EUT (flexible slave) and the test equipment (flexible master corresponding to the EUT). b) Set the remote control flag for the EUT to “remote run (1)” using the test equipment. c) Set the input data in the EUT to any value (a value for the valid IO input). d) Set the IO input value upon remote control flag OFF of the slave operating instructions in the output status area for the EUT to “clear (0)” using the test equipment. e) Set the remote control flag for the EUT to “remote stop (0)” using the test equipment. f) Set the remote control flag for the EUT to “remote run (1)” using the test equipment. g) Set the IO input value upon remote control flag OFF of the slave operating instructions in the output status area for the EUT to “hold (1)” using the test equipment. h) Set the remote control flag for the EUT to “remote stop(0)” using the test equipment.		
Evaluation criteria		a) Confirm using the common memory value that the IO input value upon remote control flag OFF of the slave operation setting confirmation status in the EUT input status area is “cleared (0)” by the test procedure d). b) Confirm on the EUT that the input data in the EUT is cleared (not the value for the valid IO input) by the test procedure e). c) Confirm on the EUT that the input data in the EUT is the value specified in the test procedure c) by the test procedure f). d) Confirm using the common memory value that the IO input value upon remote control flag OFF of the slave operation setting confirmation status in the EUT input status area is “cleared (0)” by the test procedure d). e) Confirm on the EUT that the input data in the EUT is a value specified in the test procedure c) by the test procedure h).		
Test necessity identified by the EUT class	Class 1	N		
	Class 2	N		
	Class 3	N		
	Class 4	N		
	Class 5	N		
	Class 6	O (in case that the input slave points are more than 1 point.)		
	Class 7	N		
Setting parameter (Node)		Equipment under test (EUT) (flexible slave)	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	Calculated from the number of input slave points in the EUT.
			Area 2 data top address	0
			Area 2 data size	Calculated from the number of input slave points and output slave points in the EUT.
		Test equipment	Implementation class	4 (flexible master)
			Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)

Table 152 – IO input upon remote control flag OFF (continued)

Setting parameter (Node) (continued)	Test equipment (continued)	Area 1 data top address	256
		Area 1 data size	256
		Area 2 data top address	1 024
		Area 2 data size	1 024
		IO allocation setting (number of control slaves)	1
		IO allocation setting (slave setting)	Slave node number = 16#8001 (flexible setting mode, node number = 1)
			Input data address = 16#0000 (Area 1, address = 0)
			Input data size = Calculated from the number of input slave points in the EUT.
			Output data address = Depends on the number of output slave points in the EUT. * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
			Output data size = Calculated from the number of output slave points in the EUT.
			Input status address = 16#8000 (Area2, address = 0)
			Output status address = 16#8400 (Area2, address = 1 024)
Setting parameter (Test data)	Master output (Output from test equipment to EUT)	Output data (Common memory area 1: 16#100 and above)	Any value except zero (0)
		Remote control area (Common memory area 2: 16#0400)	Depends on the test procedure. * Test procedure b) and f): 16#0001 (Remote run) * Test procedure e) and h): 16#0000 (Remote stop)
		Specified slave type (Common memory area 2 : 16#0401 + 16 × *N*) Note: *N* = the range depending on the number of input/output points on the EUT	Calculated from the number of input slave points and output slave points in the EUT.
		Simple setting area (Common memory area 2 : 16#0402 to 16#0409)	Master node number instructions = 16#00 (default)
			Slave operating instructions = Depends on the test procedure. * Test procedure d): 16#0000 * Test procedure g): 16#0004
			Master specified area = All 0

Table 152 – IO input upon remote control flag OFF (continued)

Setting parameter (Test data) (continued)	Master output (Output from test equipment to EUT) (continued)	Reserved area (Common memory area 2: 16#040A to 16#040F)	All 0
	Slave output (Output from EUT to test equipment)	Input data (Common memory area 1: 16#0000 and above)	Depends on the evaluation criteria. * evaluation criteria c) and e): a value when IO input is valid. * evaluation criteria b): a value of “clear”.
		Slave status (Common memory area 2: 16#0000)	(no evaluation)
		Actual slave type (Common memory area 2: 16#0001 + 16 × *N*) Note: *N* = the range depending on the number of input/output points on the EUT.	(no evaluation)
		Simple setting area (Common memory area 2: 16#0002 to 16#0009)	Master node number = (no evaluation)
			Slave operation setting confirmation status = Depends on the evaluation criteria. * evaluation criteria b): 16#0000 * evaluation criteria e): 16#0004
			Master specified area = (no evaluation)
		General-purpose status area (Common memory area 2: 16#000A to 16#000F)	(no evaluation)

d) **Master in flexible setting mode:** The master in flexible setting mode is tested as described in Tables 153 through 159.

Table 153 – Joining operation 1

Test number		V3-072
Major test group		Device level network function
Test group		Master in flexible setting mode
Test objects		Joining operation 1
Test procedure		a) Start the EUT (flexible master). b) Check the frame using the test equipment. c) Test the following two patterns using a setting value of Pattern 1 and Pattern 2, respectively.
Evaluation criteria	Pattern 1	Confirm that the EUT transmits one solicitation frame (1 200 ± 2) ms after sending the trigger frame.
	Pattern 2	Confirm that the EUT transmits two solicitation frames (1 200 ± 2) ms after sending the trigger frame, and that the transmission interval of the solicitation frames is (5 ± 2) ms.

Table 153 – Joining operation 1 (continued)

Test necessity identified by the EUT class	Class 1	N			
	Class 2	N			
	Class 3	O (when implementing the flexible master function.)			
	Class 4	R			
	Class 5	N			
	Class 6	N			
	Class 7	N			
Setting parameter (Node)		Equipment under test (EUT) (flexible master)	Pattern 1	Node number	100
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	256
				Area 1 data size	40
				Area 2 data top address	1 024
				Area 2 data size	160
			Pattern 2	Node number	254
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	256
				Area 1 data size	200
				Area 2 data top address	2 048
				Area 2 data size	1 600
		Test equipment			NA
Setting parameter (Test data)		IO allocation setting (EUT)	Pattern 1	Number of control slaves	10
				Slave setting (*N* = 0 to 9)	Slave node number = 16#8001 + *N* (flexible setting mode, node number = *N* + 1)
					Input data address = 16#0000 + (4 × *N*) (Area 1, address = 0 + 4 × *N*)
					Input data size = 4
					Output data address = 16#0100 + (4 × *N*) (Area 1, address = 256 + 4 × *N*)
					Output data size = 4
					Input status address =16#8000 + (16×*N*) (Area2, address = 0 + 16×*N*)
					Output status address = 16#8400 + (16 × *N*) (Area2, address =1 024 + 16 × *N*)
			Pattern 2	Number of control slaves	100
				Slave setting(*N* = 0 through 99)	Slave node number = 16#8063 + *N* (flexible setting mode, node number = *N* + 99)
					Input data address = 16#0000 + (2 × *N*) (Area 1, address = 0 + 2 × *N*)

Table 153 – Joining operation 1 (continued)

Setting parameter (Test data) (continued)	IO allocation setting (EUT) (continued)	Pattern 2 (continued)	Slave setting (*N* = 0 through 99) (continued)	Input data size=2
				Output data address = 16#0100 + (2 × *N*) (Area 1, address = 256 + 2 × *N*)
				Output data size = 2
				Input status address = 16#8000 + (16 × *N*) (Area2, address = 0 + 16 × *N*)
				Output status address = 16#8800 + (16 × *N*) (Area2, address = 2 048 + 16 × *N*)
	Solicitation frame	Pattern 1	Node address of source side (SNA)	100
			TCD	65 017 (Solicitation)
			Data size	160
			Contents of data (*N* = 0 through 9)	Slave node number = 16#8001 + *N* (flexible setting mode, node number = *N* + 1)
				Input data address = 16#0000 + (4 × *N*) (Area 1, address = 0 + 4 × *N*)
				Input data size = 4
				Output data address = 16#0100 + (4 × *N*) (Area 1, address = 256 + 4 × *N*)
				Output data size = 4
				Input status address = 16#8000 + (16 × *N*) (Area2, address = 0 + 16 × *N*)
				Output status address = 16#8400 + (16 × *N*) (Area2, address = 1 024 + 16 × *N*)
				Lock ID = 100
		Pattern 2 (1st frame)	Node address of source side (SNA)	254
			TCD	65 017 (Solicitation)
			Data size	1 024
			Contents of data (*N* = 0 through 63)	Slave node number = 16#8063 + *N* (flexible setting mode, node number = *N* + 99)
				Input data address = 16#0000 + (2 × *N*) (Area 1, address = 0 + 2 × *N*)
				Input data size = 2
				Output data address = 16#0100 + (2 × *N*) (Area 1, address = 256 + 2×*N*)
				Output data size = 2
				Input status address = 16#8000 + (16 × *N*) (Area2, address = 0 + 16 × *N*)

Table 153 – Joining operation 1 (continued)

Setting parameter (Test data) (continued)	Solicitation frame (continued)	Pattern 2 (1st frame) (continued)	Contents of data (*N* = 0 through 63) (continued)	Output status address = 16#8800 + (16 × *N*) (Area2, address = 2 048 + 16 × *N*)
				Lock ID = 254
		Pattern 2 (2nd frame)	Node address of source side (SNA)	254
			TCD	65 017 (Solicitation)
			Data size	576
			Contents of data (*N* = 64 through 99)	Slave node number = 16#8063 +*N* (flexible setting mode, node number = *N* + 99)
				Input data address = 16#0000 + (2 × *N*) (Area 1, address = 0 + 2 × *N*)
				Input data size = 2
				Output data address = 16#0100 + (2 × *N*) (Area 1, address = 256 + 2 × *N*)
				Output data size = 2
				Input status address = 16#8000 + (16 × *N*) (Area2, address = 0 + 16 × *N*)
				Output status address = 16#8800 + (16 × *N*) (Area2, address = 2 048 + 16 × *N*)
				Lock ID = 254

Table 154 – Joining operation 2

Test number		V3-073
Major test group		Device level network function
Test group		Master in flexible setting mode
Test objects		Joining operation 2
Test procedure		a) Start the test equipment (controller) and the EUT (flexible master). b) Conduct tests using two setting patterns: Pattern 1 and Pattern 2, respectively.
Evaluation criteria	Pattern 1	a) Confirm that the EUT joins in the network. b) Confirm that the EUT transmits one solicitation frame. c) Confirm that the solicitation frame transmission cycle is more than 7200 ms.
	Pattern 2	a) Confirm that the EUT joins in the network. b) Confirm that the EUT transmits the 1st solicitation frame and the 2nd solicitation frame alternately. c) Confirm that the solicitation frame transmission cycle is more than 7200 ms.
Test necessity identified by the EUT class	Class 1	N
	Class 2	N
	Class 3	O (when implementing the flexible master function.)
	Class 4	R
	Class 5	N
	Class 6	N
	Class 7	N

Table 154 – Joining operation 2 (continued)

Setting parameter (Node)	Equipment under test (EUT) (flexible master)	Pattern 1	Node number	100
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	40
			Area 2 data top address	1 024
			Area 2 data size	160
		Pattern 2	Node number	254
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	200
			Area 2 data top address	2 048
			Area 2 data size	1 600
	Test equipment		Implementation class	3 (controller)
			Node number	85
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
Setting parameter (Test data)	IO allocation setting(EUT)	Pattern 1	Number of control slaves	10
			Slave setting (N = 0 through 9)	Slave node number = 16#8001 + N (flexible setting mode, node number = N + 1)
				Input data address = 16#0000 + (4 × N) (Area 1, address = 0 + 4 × N)
				Input data size = 4
				Output data address = 16#0100 + (4 × N) (Area 1, address = 256 + 4 × N)
				Output data size = 4
				Input status address = 16#8000 + (16 × N) (Area2, address = 0 + 16 × N)
				Output status address = 16#8400 + (16 × N) (Area2, address = 1 024 + 16 × N)
		Pattern 2	Number of control slaves	100
			Slave setting (N = 0 through 99)	Slave node number = 16#8063 + N (flexible setting mode, node number = N + 99)

Table 154 – Joining operation 2 (continued)

Setting parameter (Test data) (continued)	IO allocation setting (EUT) (continued)	Pattern 2 (continued)	Slave setting(*N* = 0 through 99) (continued)	Input data address = 16#0000 + (2 × *N*) (Area 1, address = 0 + 2 × *N*)
				Input data size = 2
				Output data address = 16#0100 + (2 × *N*) (Area 1, address = 256 + 2 × *N*)
				Output data size = 2
				Input status address = 16#8000 + (16 × *N*) (Area2, address = 0 + 16 × *N*)
				Output status address = 16#8800 + (16 × *N*) (Area2, address = 2 048 + 16 × *N*)
	Solicitation frame	Pattern 1	Node address of source side (SNA)	100
			TCD	65 017 (Solicitation)
			Data size	160
			Contents of data(*N* = 0 through 9)	Slave node number = 16#8001 + *N* (flexible setting mode, node number = *N* + 1)
				Input data address = 16#0000 + (4 × *N*) (Area 1, address = 0 + 4 × *N*)
				Input data size = 4
				Output data address = 16#0100 + (4 × *N*) (Area 1, address = 256 + 4 × *N*)
				Output data size = 4
				Input status address = 16#8000 + (16 × *N*) (Area2, address = 0 + 16 × *N*)
				Output status address = 16#8400 + (16 × *N*) (Area2, address = 1 024 + 16 × *N*)
				Lock ID = 100
		Pattern 2 (1st frame)	Node address of source side (SNA)	254
			TCD	65 017 (Solicitation)
			Data size	1 024
			Contents of data (*N* = 0 through 63)	Slave node number = 16#8063 +*N* (flexible setting mode, node number = *N* + 99)
				Input data address = 16#0000 + (2 × *N*) (Area 1, address = 0 + 2 × *N*)
				Input data size = 2
				Output data address = 16#0100 + (2 × *N*) (Area 1, address = 256 + 2 × *N*)
				Output data size = 2

Table 154 – Joining operation 2 (continued)

Setting parameter (Test data) (continued)	Solicitation frame (continued)	Pattern 2 (1st frame) (continued)	Contents of data (*N* = 0 through 63) (continued)	Input status address = 16#8000 + (16 × *N*) (Area2, address = 0 + 16 × *N*)
				Output status address = 16#8800 + (16 × *N*) (Area2, address = 2 048 + 16 × *N*)
				Lock ID = 254
		Pattern 2 (2nd frame)	Node address of source side (SNA)	254
			TCD	65 017 (Solicitation)
			Data size	576
			Contents of data (*N* = 64 through 99)	Slave node number = 16#8063 + *N* (flexible setting mode, node number=*N* + 99)
				Input data address = 16#0000 + (2 × *N*) (Area 1, address = 0 + 2 × *N*)
				Input data size=2
				Output data address = 16#0100 + (2 × *N*) (Area 1, address = 256 + 2 × *N*)
				Output data size = 2
				Input status address = 16#8000 + (16 × *N*) (Area2, address = 0 + 16 × *N*)
				Output status address = 16#8800 + (16 × *N*) (Area2, address = 2 048 + 16 × *N*)
				Lock ID = 254

Table 155 – Joining operation 3

Test number		V3-074
Major test group		Device level network function
Test group		Master in flexible setting mode
Test objects		Joining operation 3
Test procedure		Start the test equipment (flexible slave corresponding to the EUT) and the EUT (flexible master).
Evaluation criteria		a) Confirm that the EUT transmits the solicitation frame (1 200±2) ms after sending the trigger frame. b) Confirm that the EUT transmits the solicitation frame and joins in the network. c) Confirm that the EUT does not send the solicitation frame after joining in the network.
Test necessity identified by the EUT class	Class 1	N
	Class 2	N
	Class 3	O (when implementing the flexible master function)
	Class 4	R
	Class 5	N
	Class 6	N
	Class 7	N

Table 155 – Joining operation 3 (continued)

Setting parameter (Node)	EUT (flexible master)	Node number	100
		Token watchdog time	(50)
		Allowable minimum frame interval time	(10)
		Area 1 data top address	256
		Area 1 data size	40
		Area 2 data top address	4 096
		Area 2 data size	160
	Test equipment	Implementation class	6 (flexible slave)
		Node number	1
		Token watchdog time	50
		Allowable minimum frame interval time	10
		Area 1 data top address	0
		Area 1 data size	4
		Area 2 data top address	0
		Area 2 data size	16
		Number of input points of the slave	64
		Number of output points of the slave	64
Setting parameter (Test data)	IO allocation setting (EUT)	Number of control slaves	1
		Slave setting	Slave node number = 16#8001 (flexible setting mode, node number = 1)
			Input data address = 16#0000 (Area 1, address = 0)
			Input data size = 4
			Output data address = 16#0100 (Area 1, address = 256)
			Output data size = 4
			Input status address = 16#8000 (Area2, address = 0)
			Output status address = 16#9000 (Area2, address = 4 096)
	Solicitation frame	Node address of source side (SNA)	100
		TCD	65 017 (Solicitation)
		Data size	16
		Contents of data	Slave node number = 16#8001 (flexible setting mode, node number = 1)
			Input data address = 16#0000 (Area 1, address = 0)
			Input data size = 4
			Output data address = 16#0100 (Area 1, address = 256)
			Output data size = 4
			Input status address = 16#8000 (Area2, address = 0)

Table 155 – Joining operation 3 (continued)

Setting parameter (Test data) (continued)	Solicitation frame (continued)	Contents of data (continued)	Output status address = 16#9000 (Area2, address = 4 096)
			Lock ID = 100

Table 156 – Disengagement/re-join of flexible slave 1

Test number		V3-075		
Major test group		Device level network function		
Test group		Master in flexible setting mode		
Test objects		Disengagement/re-join of flexible slave 1		
Test procedure		a) Start the test equipment (flexible slave corresponding to the EUT) and the EUT (flexible master). b) Disengage the test equipment from the network (Stop sending the token frame.) c) Re-join the test equipment to the network.		
Evaluation criteria		a) Confirm that the EUT disengages from the network and transmits the trigger frame by the test procedure b). b) Confirm that the EUT transmits the solicitation frame in (1 200±2) ms after sending the trigger frame. c) Confirm that the EUT transmits the solicitation frame and re-joins the network.		
Test necessity identified by the EUT class	Class 1	N		
	Class 2	N		
	Class 3	O (when implementing the flexible master function)		
	Class 4	R		
	Class 5	N		
	Class 6	N		
	Class 7	N		
Setting parameter (Node)		EUT (flexible master)	Node number	100
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	40
			Area 2 data top address	4 096
			Area 2 data size	160
		Test equipment	Implementation class	6 (flexible slave)
			Node number	1
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	0
			Area 2 data size	16
			Number of input points of the slave	64
			Number of output points of the slave	64

Table 156 – Disengagement/re-join of flexible slave 1 (continued)

Setting parameter (Test data)	IO allocation setting (EUT)	Number of control slaves	1
		Slave setting	Slave node number = 16#8001 (flexible setting mode, node number = 1)
			Input data address = 16#0000 (Area 1, address = 0)
			Input data size = 4
			Output data address = 16#0100 (Area 1, address = 256)
			Output data size = 4
			Input status address = 16#8000 (Area2, address = 0)
			Output status address = 16#9000 (Area2, address = 4 096)
	Solicitation frame	Node address of source side (SNA)	100
		TCD	65 017 (Solicitation)
		Data size	16
		Contents of data	Slave node number = 16#8001 (flexible setting mode, node number = 1)
			Input data address = 16#0000 (Area 1, address = 0)
			Input data size = 4
			Output data address = 16#0100 (Area 1, address = 256)
			Output data size = 4
			Input status address = 16#8000 (Area2, address = 0)
			Output status address = 16#9000 (Area2, address = 4 096)
			Lock ID = 100

Table 157 – Disengagement/re-join of flexible slave 2

Test number	V3-076
Major test group	Device level network function
Test group	Master in flexible setting mode
Test objects	Disengagement/re-join of flexible slave 2
Test procedure	a) Start the dummy node (controller). After the dummy node is in stable operation, start the test equipment (flexible slave corresponding to the EUT). b) Start the EUT (flexible master). c) Disengage the test equipment from the network. (Stop sending the token frame.) d) Re-join the test equipment to the network.
Evaluation criteria	a) Confirm that the EUT does not disengage from the network by the test procedure c). b) Confirm that the EUT receives the token frame and transmits the solicitation frame. c) Confirm that the EUT does not transmit any solicitation frame, in the situation that the test equipment join the network after the EUT transmits the solicitation frame.

Table 157 – Disengagement/re-join of flexible slave 2 (continued)

Test necessity identified by the EUT class	Class 1	N		
	Class 2	N		
	Class 3	O (when implementing the flexible master function)		
	Class 4	R		
	Class 5	N		
	Class 6	N		
	Class 7	N		
Setting parameter (Node)		EUT (flexible master)	Node number	100
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	40
			Area 2 data top address	4 096
			Area 2 data size	160
		Test equipment	Implementation class	6 (flexible slave)
			Node number	1
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	0
			Area 2 data size	16
			Number of input points of the slave	64
			Number of output points of the slave	64
		Dummy node	Implementation class	3 (controller)
			Node number	130
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	4
			Area 1 data size	4
			Area 2 data top address	16
			Area 2 data size	16
Setting parameter (Test data)		IO allocation setting (EUT)	Number of control slaves	1
			Slave setting	Slave node number = 16#8001 (flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = 4

Table 157 – Disengagement/re-join of flexible slave 2 (continued)

Setting parameter (Test data) (continued)	IO allocation setting (EUT) (continued)	Slave setting (continued)	Output data address = 16#0100 (Area 1, address = 256)
			Output data size = 4
			Input status address = 16#8000 (Area2, address = 0)
			Output status address = 16#9000 (Area2, address = 4 096)
	Solicitation frame	Node address of source side (SNA)	100
		TCD	65 017 (Solicitation)
		Data size	16
		Contents of data	Slave node number = 16#8001 (flexible setting mode, node number = 1)
			Input data address = 16#0000 (Area 1, address = 0)
			Input data size = 4
			Output data address = 16#0100 (Area 1, address = 256)
			Output data size = 4
			Input status address = 16#8000 (Area2, address = 0)
			Output status address = 16#9000 (Area2, address = 4 096)
			Lock ID = 100

Table 158 – Input and output data

Test number		V3-077
Major test group		Device level network function
Test group		Master in flexible setting mode
Test objects		Input and output data
Test procedure		a) Start the EUT (flexible master) and the test equipment (flexible slave). b) Change the output data for the test equipment using the EUT. c) Change the input data of the test equipment.
Evaluation criteria		a) Confirm by checking the common memory value that the output data of the EUT for the test equipment has been changed by the test procedure b). b) Confirm on the EUT that the input data in the EUT has been changed by the test procedure c).
Test necessity identified by the EUT class	Class 1	N
	Class 2	N
	Class 3	O (when implementing the flexible master function.)
	Class 4	R
	Class 5	N
	Class 6	N
	Class 7	N

Table 158 – Input and output data (continued)

Setting parameter (Node)	EUT (flexible master)	Node number	100
		Token watchdog time	(50)
		Allowable minimum frame interval time	(10)
		Area 1 data top address	256
		Area 1 data size	40
		Area 2 data top address	4 096
		Area 2 data size	160
	Test equipment (flexible slave)	Implementation class	6 (flexible slave)
		Node number	1
		Token watchdog time	50
		Allowable minimum frame interval time	10
		Area 1 data top address	0
		Area 1 data size	4
		Area 2 data top address	0
		Area 2 data size	16
		Number of input points of the slave	64
		Number of output points of the slave	64
Setting parameter (Test data)	IO allocation setting (EUT)	Number of control slaves	1
		Slave setting	Slave node number = 16#8001 (flexible setting mode, node number = 1)
			Input data address = 16#0000 (Area 1, address = 0)
			Input data size = 4
			Output data address = 16#0100 (Area 1, address = 256)
			Output data size = 4
			Input status address = 16#8000 (Area2, address = 0)
			Output status address = 16#9000 (Area2, address = 4 096)
	Solicitation frame	Node address of source side (SNA)	100
		TCD	65 017 (Solicitation)
		Data size	16
		Contents of data	Slave node number = 16#8001 (flexible setting mode, node number = 1)
			Input data address = 16#0000 (Area 1, address = 0)
			Input data size = 4
			Output data address = 16#0100 (Area 1, address = 256)
			Output data size = 4

Table 158 – Input and output data (continued)

Setting parameter (Test data) (continued)	Solicitation frame (continued)	Contents of data (continued)	Input status address = 16#8000 (Area2, address = 0)
			Output status address = 16#9000 (Area2, address = 4 096)
			Lock ID = 100
	Output (from EUT to test equipment)	Output data (Common memory area 1 : 16#0100 to 16#0103)	Changed to any value by the test procedure b).
		Remote control area (Common memory area 2 : 16#1000)	16#0001 (Remote run)
		Specified slave type (Common memory area 2 : 16#1001)	Any value (no evaluation)
		Simple setting area (Common memory area 2 : 16#1002 to 16#1009)	Master node number instructions = Any value (no evaluation)
			Slave operating instructions = Any value (no evaluation)
			Master specified area = Any value (no evaluation)
		Reserved area (Common memory area 2 : 16#100A to 16#100F)	Any value (no evaluation)
	Input (from test equipment to EUT)	Input data (Common memory area 1 : 16#0000 to 16#0003)	Changed to any value except zero (0) by the test procedure c).
		Slave status (Common memory area 2 : 16#0000)	Any value (depending on the test equipment status)
		Actual slave type (Common memory area 2 : 16#0001)	16#BFBF * Output slave (Used, subsequent area not used, 64 points) * Input slave (Used, subsequent area not used, 64 points)
		Simple setting area (Common memory area 2 : 16#0002 to 16#0009)	Master node number = 100
			Slave operation setting confirmation status = Return of the master output value.
			Master specified area = Return of the master output value.
		General-purpose status area (Common memory area 2 : 16#000A to 16#000F)	All 0

Table 159 – Output status

Test number	V3-078
Major test group	Device level network function
Test group	Master in flexible setting mode
Test objects	Output status
Test procedure	a) Start the EUT (flexible master) and the test equipment (flexible slave). b) Set the remote control for the test equipment to the “remote run (1)” using the EUT. c) Set the remote control for the test equipment to the “remote stop (0)” using the EUT. d) Set the slave operating instructions/the IO output upon disengagement of the master for the test equipment to “clear (0)” using the EUT. (Wait for the EUT to join, considering the possibility of restarting the EUT.) e) Set the slave operating instructions/the IO output upon disengagement of the master for the test equipment to “hold (1)” using the EUT. (Wait for the EUT to join, considering the possibility of restarting the EUT.) f) Set the slave operating instructions/the IO output upon remote control flag OFF for the test equipment to “clear (0)” using the EUT. (Wait for the EUT to join, considering the possibility of restarting the EUT.) g) Set the slave operating instructions/the IO output upon remote control flag OFF for the test equipment to “hold (1)” using the EUT. (Wait for the EUT to join, considering the possibility of restarting the EUT.) h) Set the slave operating instructions/the IO input upon remote control flag OFF for the test equipment to “clear (0)” using the EUT. (Wait for the EUT to join, considering the possibility of restarting the EUT.) i) Set the slave operating instructions/the IO input upon remote control flag OFF for the test equipment to “hold (1)” using the EUT. (Wait for the EUT to join, considering the possibility of restarting the EUT.)
Evaluation criteria	a) Confirm that the specified slave type and the master node number within the EUT output status area are correct. b) Confirm by checking the common memory value that the remote control area within the EUT output status area is set to “remote run (1)” by the test procedure b). c) Confirm by checking the common memory value that the remote control area within the EUT output status area is set to “remote stop (0)” by the test procedure c). d) Confirm by checking the common memory value that the slave operating instructions/IO output upon disengagement of the master within the EUT output status area is clear (0) by the test procedure d). e) Confirm by checking the common memory value that the slave operating instructions/IO output upon disengagement of the master within the EUT output status area is hold (1) by the test procedure e). f) Confirm cy checking the common memory value that the slave operating instructions/IO output upon remote control flag OFF within the EUT output status area is clear (0) by the test procedure f). g) Confirm by checking the common memory value that the slave operating instructions/IO output upon remote control flag OFF within the EUT output status area is hold (1) by the test procedure g). h) Confirm by checking the common memory value that the slave operating instructions/IO input upon remote control flag OFF within the EUT output status area is clear (0) by the test procedure h). i) Confirm by checking the common memory value that the slave operating instructions/IO input upon remote control flag OFF within the EUT output status area is hold (1) by the test procedure i).

Table 159 – Output status (continued)

Test necessity identified by the EUT class	Class 1	N		
	Class 2	N		
	Class 3	O (when implementing the flexible master function.)		
	Class 4	R		
	Class 5	N		
	Class 6	N		
	Class 7	N		
Setting parameter (Node)		EUT (flexible master)	Node number	100
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	40
			Area 2 data top address	4 096
			Area 2 data size	160
		Test equipment (flexible slave)	Implementation class	6 (flexible slave)
			Node number	1
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	0
			Area 2 data size	16
Setting parameter (Test data)		IO allocation setting(EUT)	Number of control slaves	1
			Slave setting	Slave node number = 16#8001 (flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = 4
				Output data address = 16#0100 (Area 1, address = 256)
				Output data size = 4
				Input status address = 16#8000 (Area 2, address = 0)
				Output status address = 16#9000 (Area 2, address = 4 096)
		Solicitation frame	Node address of source side (SNA)	100
			TCD	65 017 (Solicitation)
			Data size	16
			Contents of data	Slave node number = 16#8001 (flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = 4

Table 159 – Output status (continued)

Setting parameter (Test data) (continued)	Solicitation frame (continued)	Contents of data (continued)	Output data address = 16#0100 (Area 1, address = 256)
			Output data size = 4
			Input status address = 16#8000 (Area2, address = 0)
			Output status address = 16#9000 (Area2, address = 4 096)
			Lock ID = 100
	Output (from EUT to test equipment)	Output data (Common memory area 1: 16#0100 to 16#0103)	Any value (no evaluation)
		Remote control area (Common memory area 2: 16#1000)	Depends on the test procedure. * Test procedure b): Bit 0 = 1 (Remote run) * Test procedure c): Bit 0 = 0 (Remote stop)
		Specified slave type (Common memory area 2: 16#1001)	16#BFBF * Output slave (Used, subsequent area not used, 64 points) * Input slave (Used, subsequent area not used, 64 points)
		Simple setting area (Common memory area 2: 16#1002 to 16#1009)	Master node number instructions = 00
			Slave operating instructions = Depends on the test procedure. * Test procedure d): Bit 0 = 0 (IO output upon disengagement of the master = clear) * Test procedure e) : Bit 0 = 1 (IO output upon disengagement of the master = hold) * Test procedure f): Bit 1 = 0 (IO output upon remote control flag OFF = clear) * Test procedure g) : Bit 1 = 1 (IO output upon remote control flag OFF = hold) * Test procedure h) : Bit 2 = 0 (IO input upon remote control flag OFF = clear) * Test procedure i) : Bit 2 = 1 (IO input upon remote control flag OFF = hold)
			Master specified area = Any value (no evaluation)
		Reserved area (Common memory area 2: 16#100A to 16#100F)	Any value (no evaluation)
	Input (from test equipment to EUT)	Input data (Common memory area 1: 16#0000 to 16#0003)	All 0
		Slave status (Common memory area 2: 16#0000)	Any value (depending on the status of the test equipment)

Table 159 – Output status (continued)

Setting parameter (Test data) (continued)	Input (from test equipment to EUT) (continued)	Actual slave type (Common memory area 2: 16#0001)	16#BFBF * Output slave (Used, subsequent area not used, 64 points) * Input slave (Used, subsequent area not used, 64 points)
		Simple setting area (Common memory area 2: 16#0002 to 16#0009)	Master node number = 100
			Slave operation setting confirmation status = Return of the master output value.
			Master specified area = Return of the master output value.
		General-purpose status area (Common memory area 2: 16#000A to 16#000F)	All 0

6.7 Performance measurement

The test table of performance measurement is described on the Table 160.

Table 160 – Measurement of the token response time

Test number		V2-076			
Major test group		Performance measurement			
Test group		Performance measurement			
Test objects		Measurement of the token response time			
Test procedure		Start the EUT and the test equipment.			
Evaluation criteria		a) Measure time in units of 0.1 ms from transmission of a token by the test equipment to transmission of the token by the EUT. b) Measure the performance again by changing the node number of the test equipment from Pattern 1 to Pattern 2.			
Test necessity identified by the EUT class	Class 1	R			
	Class 2	R			
	Class 3	R			
	Class 4	R			
	Class 5	R			
	Class 6	R			
	Class 7	R			
Setting parameter (Node)		EUT (The parameters differ depending on the class)	Classes 1, 3 and 4	Node number	1
				Token watchdog time	(50)
				Allowable minimum frame interval time	(10)
				Area 1 data top address	4
				Area 1 data size	4
				Area 2 data top address	64
				Area 2 data size	64
				IO allocation setting (Class 4)	Any value

Table 160 – Measurement of the token response time (continued)

Setting parameter (Node) (continued)	EUT (The parameters differ depending on the class) (continued)	Class 2	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	0
			Area 2 data size	0
		Class 5	Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	256
			Area 1 data size	256
			Area 2 data top address	1 024
			Area 2 data size	1 024
		Classes 6 and 7	Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	0
			Area 1 data size	Calculated from the number of input slave points in the EUT.
			Area 2 data top address	0
			Area 2 data size	Calculated from the number of input slave points and output slave points in the EUT.
	Test equipment pattern 1 (The parameters differ depending on the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (controller)
			Node number	2
			Token watchdog time	50
			Allowable minimum frame interval time	0
			Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	0
			Area 2 data size	64
		Class 6	Implementation class	4 (flexible master)
			Node number	2
			Token watchdog time	50
			Allowable minimum frame interval time	0
			Area 1 data top address	Depends on the number of output slave points in the EUT. * 0 point: 0 * 1 point or more: 256
			Area 1 data size	Calculated from the number of output slave points in the EUT.
			Area 2 data top address	1 024
			Area 2 data size	1 024

Table 160 – Measurement of the token response time (continued)

Setting parameter (Node) (continued)	Test equipment pattern 1 (The parameters differ depending on the EUT class) (continued)	Class 6 (continued)	IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = Calculated from the number of input slave points in the EUT.
				Output data address = Depends on the number of output slave points in the EUT. * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = Calculated from the number of output slave points in the EUT.
				Input status address = 16#8000 (Area2, address = 0)
				Output status address = 16#8400 (Area2, address = 1 024)
		Class 7	Implementation class	3 (controller)
			Node number	2
			Token watchdog time	50
			Allowable minimum frame interval time	0
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64
	Test equipment pattern 2 (The parameters differ depending on the EUT class)	Classes 1, 2, 3, 4 and 5	Implementation class	3 (controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	0
			Area 1 data top address	0
			Area 1 data size	4
			Area 2 data top address	0
			Area 2 data size	64
		Class 6	Implementation class	4 (flexible master)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	0

Table 160 – Measurement of the token response time (continued)

Setting parameter (Node) (continued)	Test equipment pattern 2 (The parameter differ depending on the EUT class) (continued)	Class 6 (continued)	Area 1 data top address	Depends on the number of output slave points in the EUT. * 0 point: 0 * 1 point or more: 256
			Area 1 data size	Calculated from the number of output slave points in the EUT.
			Area 2 data top address	1 024
			Area 2 data size	1 024
			IO allocation setting (number of control slaves)	1
			IO allocation setting (slave setting)	Slave node number = 16#8001 (flexible setting mode, node number = 1)
				Input data address = 16#0000 (Area 1, address = 0)
				Input data size = Calculated from the number of input slave points in the EUT.
				Output data address = Depends on the number of output slave points in the EUT. * 0 point: 16#0000 (Area 1, address = 0) * 1 point or more: 16#0100 (Area 1, address = 256)
				Output data size = Calculated from the number of output slave points in the EUT.
				Input status address = 16#8000 (Area2, address = 0)
				Output status address = 16#8400 (Area2, address = 1-024)
		Class 7	Implementation class	3 (controller)
			Node number	254
			Token watchdog time	50
			Allowable minimum frame interval time	0
			Area 1 data top address	256
			Area 1 data size	4
			Area 2 data top address	1 024
			Area 2 data size	64
Setting parameter (Test data)	—			

7 Interconnectability test

7.1 Test structure

Table 161 and Figures 2 through 7 show the structure of the interconnectability test. The dashed lines in Figures 2 through 7 indicate the machine under test. The test employs the EUT, devices as test equipment, a PC as a setting tool and hubs or switching-hubs (sw-hub). Those devices are selected to configure appropriate structure depending on the EUT class. Category 5e or more UTP cable is used to connect each node and a hub or a switching-hub.

IP addresses of the EUT and the test equipment shall be 192.168.250.(node number), and IP address of the setting tool shall be 192.168.250.254.

The interconnectability test shall be conducted under the general test conditions defined in Table 2. While interconnectability test shall be conducted once for an EUT in general, a class 3 EUT with implementation of the device level network function shall be tested both in the test structures shown in Figures 3 and 4.

* Note: Each test equipment in the figures and the tables may be written as “Tester” for abbreviation.

Table 161 – Test structures for the classes

Class	Test structure
Class 1	Figure 3
Class 2	Figure 3
Class 3 a)	Figure 3
Class 3 b)	Figures 3 and 4
Class 4	Figure 4
Class 5	Figure 5
Class 6	Figure 6
Class 7	Figure 7
Note a) Class 3 (flexible master function not implemented) b) Class 3 (flexible master function implemented)	

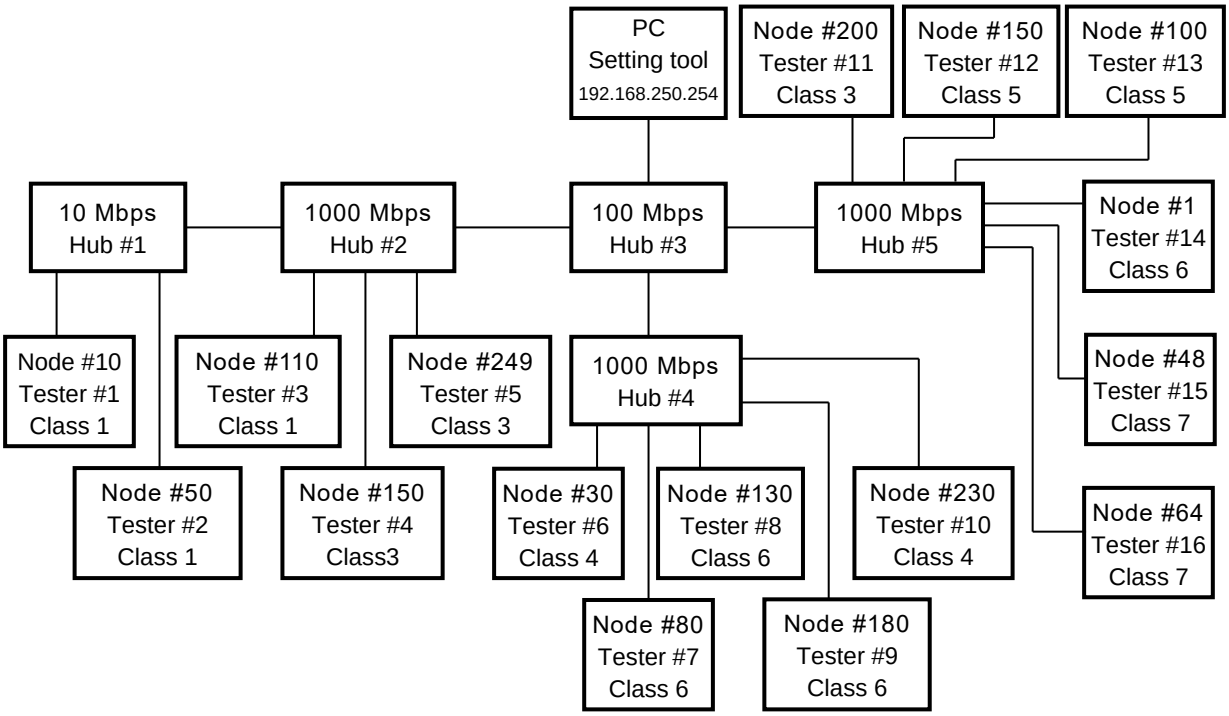


Figure 2 – Overall structure of test equipment for interconnectability test

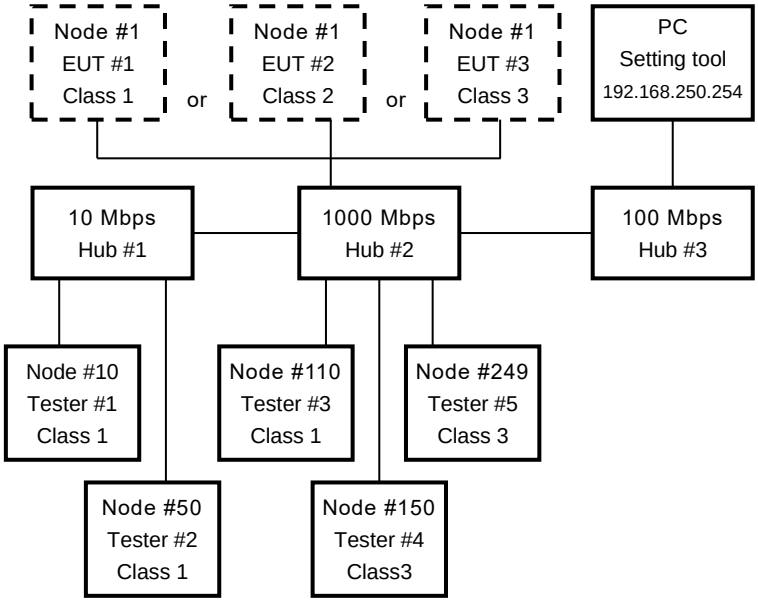


Figure 3 – Structure for interconnectability test 2 (Classes 1, 2 or 3)

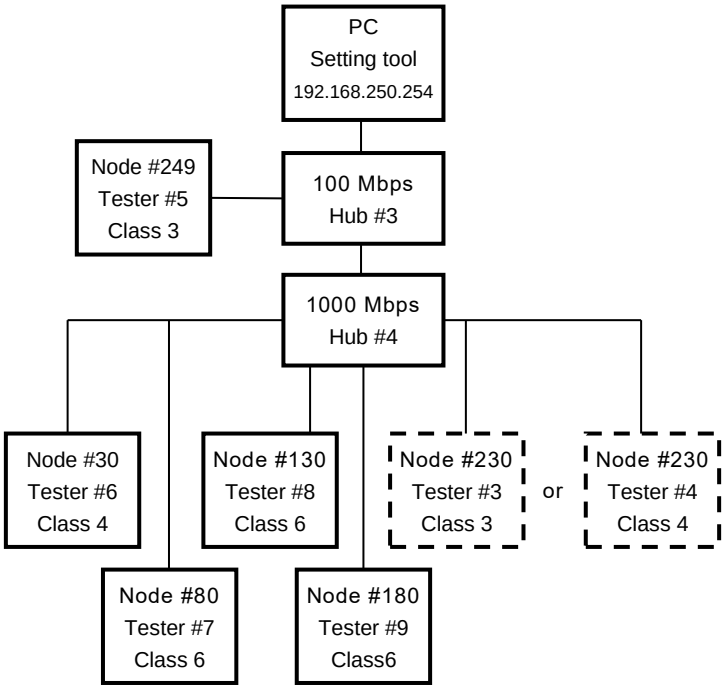


Figure 4 – Structure for interconnectability test 3 (Classes 1, 3 and 4)

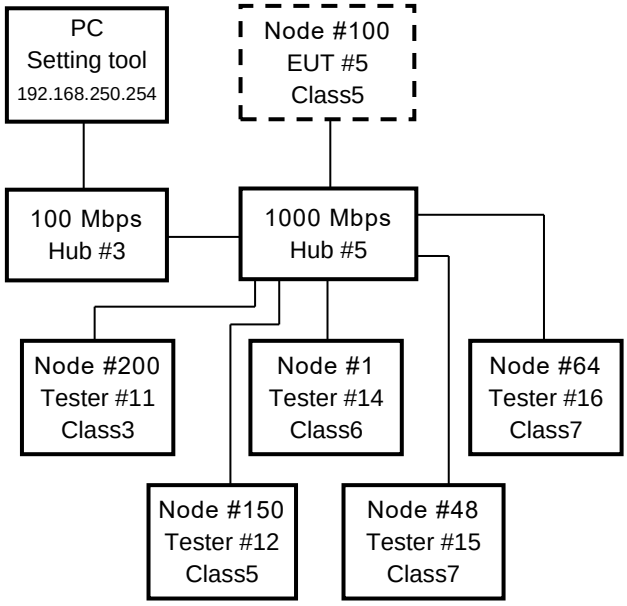


Figure 5 – Structure for interconnectability test 4 (Classes 5)

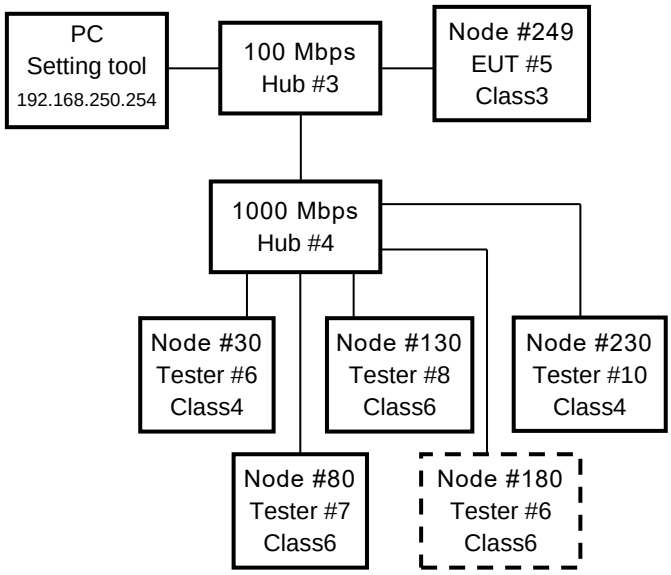


Figure 6 – Structure for interconnectability test 4 (Class 6)

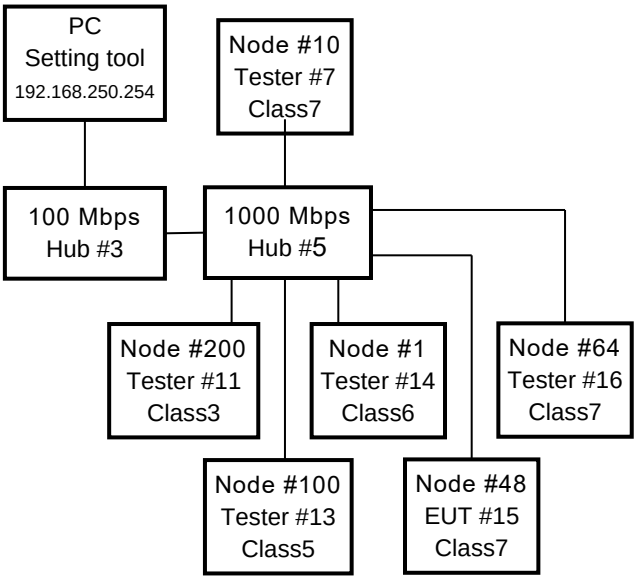


Figure 7 – Structure for interconnectability test 6 (Class 7)

7.2 Test objects

Test objects shown in Table 162 are conducted as the interconnectability test for the corresponding class.

Table 162 – Interconnectability test objects

Implementation class	Cyclic transmission echo back test	Message transmission echo back test	Device level network test	IP superimposition test
Class1	R	R	N	N
Class2	N	R	N	N
Class3 a)	R	R	N	R
Class3 b)	R	R	R	R
Class4	N	R	R	R
Class5	N	R	R	R
Class6	N	R	R	R
Class7	N	R	R	R
R: Partially required N: Not necessary Note a) Class 3 (flexible master function not implemented) b) Class 3 (flexible master function implemented)				

7.3 Basic parameters for testing

7.3.1 Allocation of nodes and common memory

a) Classes 1 and 3 in Table 163 shows allocation of nodes and common memory in the interconnectability test for classes 1 and 3.

Table 163 – Allocation of nodes and common memory in the classes 1 and 3 interconnectability test

Equipment	Node	Class	Node number	Area 1		Area 2	
				Top address	Size	Top address	Size
EUT	EUT #1 or EUT #2	1 or 3	1	16#0000	8	16#0000	64
Testers	Tester #1	1	10	16#0008	8	16#0040	64
	Tester #2	1	50	16#0010	8	16#0080	64
	Tester #3	1	110	16#0018	8	16#00C0	64
	Tester #4	1 3	150	16#0020	8	16#0100	64
	Tester #5	1 3	249	16#0028	8	16#0140	64

b) Class 2 in Table 164 shows allocation of node number and common memory in the interconnectability test for class 2.

Table 164 – Allocation of nodes and common memory in the interconnectability test for class 2

Equipment	Node	Class	Node number	Area 1		Area 2	
				Top address	Size	Top address	Size
EUT	EUT #2	2	1	16#0000	0	16#0000	0
Testers	Tester #1	1	10	16#0008	8	16#0040	64
	Tester #2	1	50	16#0010	8	16#0080	64
	Tester #3	1	110	16#0018	8	16#00C0	64
	Tester #4	1 3	150	16#0020	8	16#0100	64
	Tester #5	1 3	249	16#0028	8	16#0140	64

c) Class 3 (flexible master function implemented) and class 4 in Table 165 shows allocation of nodes and common memory in the interconnectability test for class 3 (device level network function implemented) and class 4.

Table 165 – Allocation of nodes and common memory in the interconnectability test for class 3 and class4

Equipment		Class	Node number	Slave points		Area 1		Area 2	
				Input	Output	Top address	Size	Top address	Size
EUT #3 or EUT #4		3 or 4	230	0	0	16#0000	0	for #130 output data	
								16#11B0	16
								for #130 output status	
								16#11C0	64
								for #180 output data	
								16#1200	15
								for #180 output status	
								16#120F	80
Testers	Tester #5	3	249	0	0	16#0028	8	16#0140	64
	Tester #6	4	30	0	0	16#0000	0	16#1100	80
	Tester #7	6	80	256	256	16#0000	0	16#0400	80
	Tester #8	6	130	256	256	16#0000	0	For input data	
								16#0500	16
								For input status	
								16#0510	64
	Tester #9	6	180	272	240	16#0000	0	For input data	
								16#0600	17
								For input status	
								16#0611	80

d) Class 5 in Table 166 shows major parameters in the interconnectability test for class 5.

Table 166 – Major parameters in the interconnectability test for class 5

Equipment		Class	Node number	Slave points		Area 1		Area 2	
				Input	Output	Top address	Size	Top address	Size
EUT #5		5	100	0	0	16#0100	192 words	16#0400	768 words
Testers	Tester #11	3	200	0	0	16#0000	0 word	16#0800	32 words
	Tester #12	5	150	0	0	16#01C0	64 words	16#0700	256 words
	Tester #14	6*	1	128	64	16#0000	8 words	16#0000	32 words
	Tester #15	7	48	32	48	16#00BC	4 words	16#02F0	16 words
	Tester #16	7	64	64	32	16#00FC	4 words	16#03F0	16 words
Note * Tester #14 operates under fixed slave mode, while its class is 6.									

Master - slave relationships of the device level network as follows:

-- Configuration 1 (Master) EUT #5 - (Slave) test equipment #14 and #15.

-- Configuration 2 (Master) test equipment #12 - (Slave) Test equipment #16.

e) Class 6 in Table 167 shows allocation of nodes and common memory in the interconnectability test for class 6.

Table 167 – Allocation of nodes and common memory in the interconnectability test for class 6

Equipment		Class	Node Number	Slave points		Area 1		Area 2	
				Input	Output	Top address	Size	Top address	Size
EUT #6		6	180	*	*	16#0000	0	For input data	
								16#0600	0～512*
								For input status	
								16#0600 - 0800*	16 - 2 048*
Testers	Tester #5	3	249	0	0	16#0028	8	16#0140	64
	Tester #6	4	30	0	0	16#0000	0	16#1100	80
	Tester #7	6	80	256	256	16#0000	0	16#0400	80
	Tester #8	6	130	256	256	16#0000	0	16#0500	80
	Tester #10	4	230	0	0	16#0000	0	For #130 output data	
								16#11B0	16
								For #130 output status	
								16#11C0	64
								For #180 output data	
								16#1200	0 - 512*
								For #180 output status	
								16#1200 - 1400*	16 - 2 048*
Note * Depends on IO size of EUT #6.									

f) Class 7 in Table 168 shows major parameters in the interconnectability test for class 7.

Table 168 – Major parameters in the interconnectability test for class 7

Equipment		Class	Node number	Slave points		Area 1		Area 2	
				Input	Output	Top address	Size	Top address	Size
EUT #7		7	10	N1a)	N2b)	16#0024	N3c)	16#0090	N4d)
Testers	Tester #11	3	200	0	0	0	0 word	16#0800	32 words
	Tester #13	5	100	0	0	16#0100	256 words	16#0400	1024 words
	Tester #14	6e)	1	128	64	16#0000	8 words	16#0000	32 words
	Tester #15	7	48	32	48	16#00BC	4 words	16#02F0	16 words
	Tester #16	7	64	64	32	16#00FC	4 words	16#03F0	16 words

Note a) "N1" is number of input points of the slave, EUT #7, provided not more than 2 432.
b) "N2" is number of output points of the slave, EUT #7, provided not more than 2 432.
c) "N3" varies depending on number of input points of the slave, EUT #7.
d) "N4" varies depending on numbers of input and output points of the slave, EUT #7.
e) Tester #14 operates under fixed slave mode, while its class is 6.

Master - slave relationship in the device level network is as follows:

-- (Master) test equipment #13 - (Slave) EUT #7, test equipment #14, #15 and #16.

7.3.2 Allocation map of common memory

Allocation map of common memory is as follows:

a) Class 1 and Class 3 in Figure 8 shows allocation map of common memory for each node in the interconnectability test for classes 1 and 3.

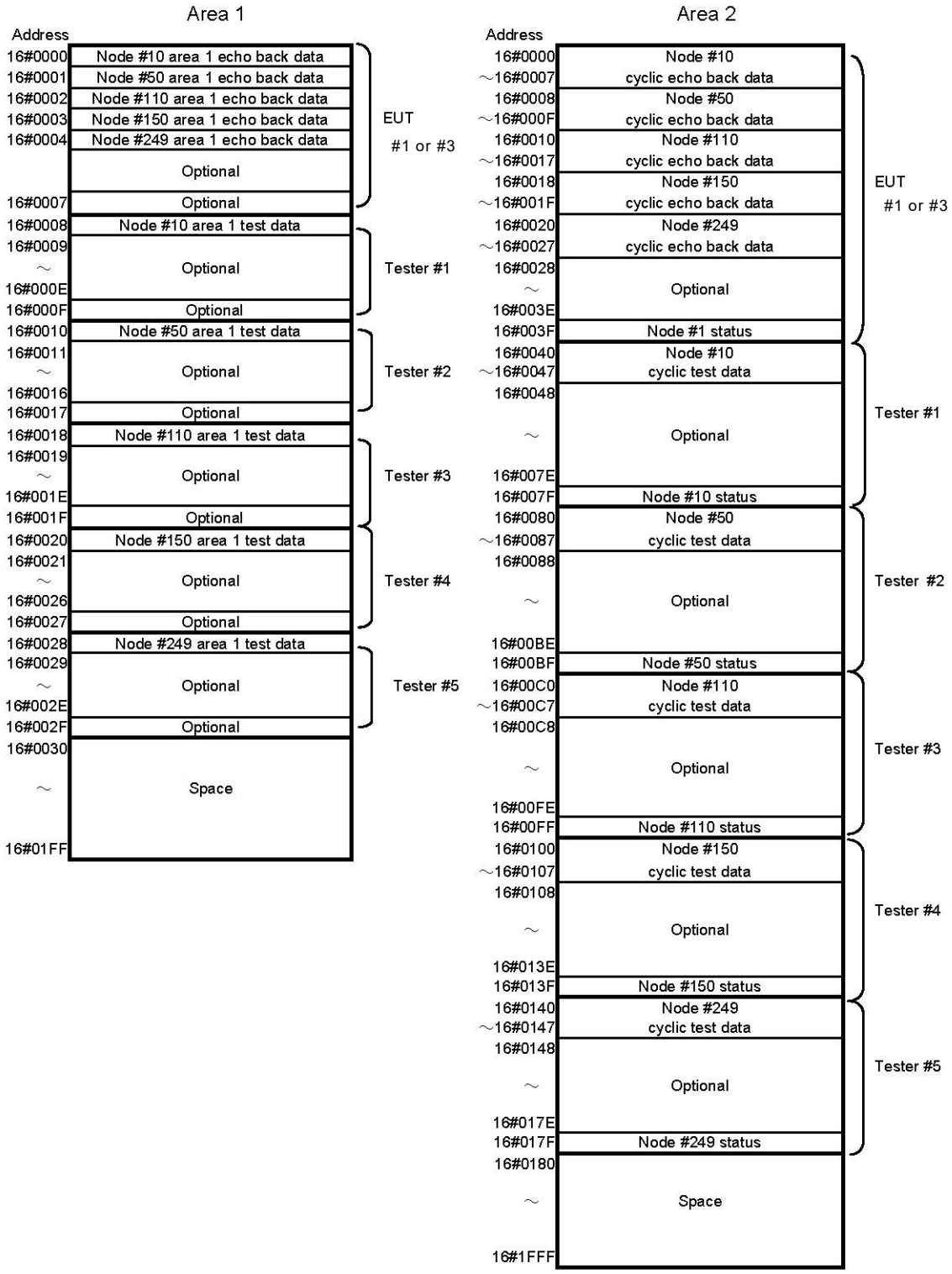


Figure 8 – Allocation map of common memory for classes 1 and 3

b) Class 2 in Figure 9 shows allocation map of common memory for each node in the interconnectability test for class 2.

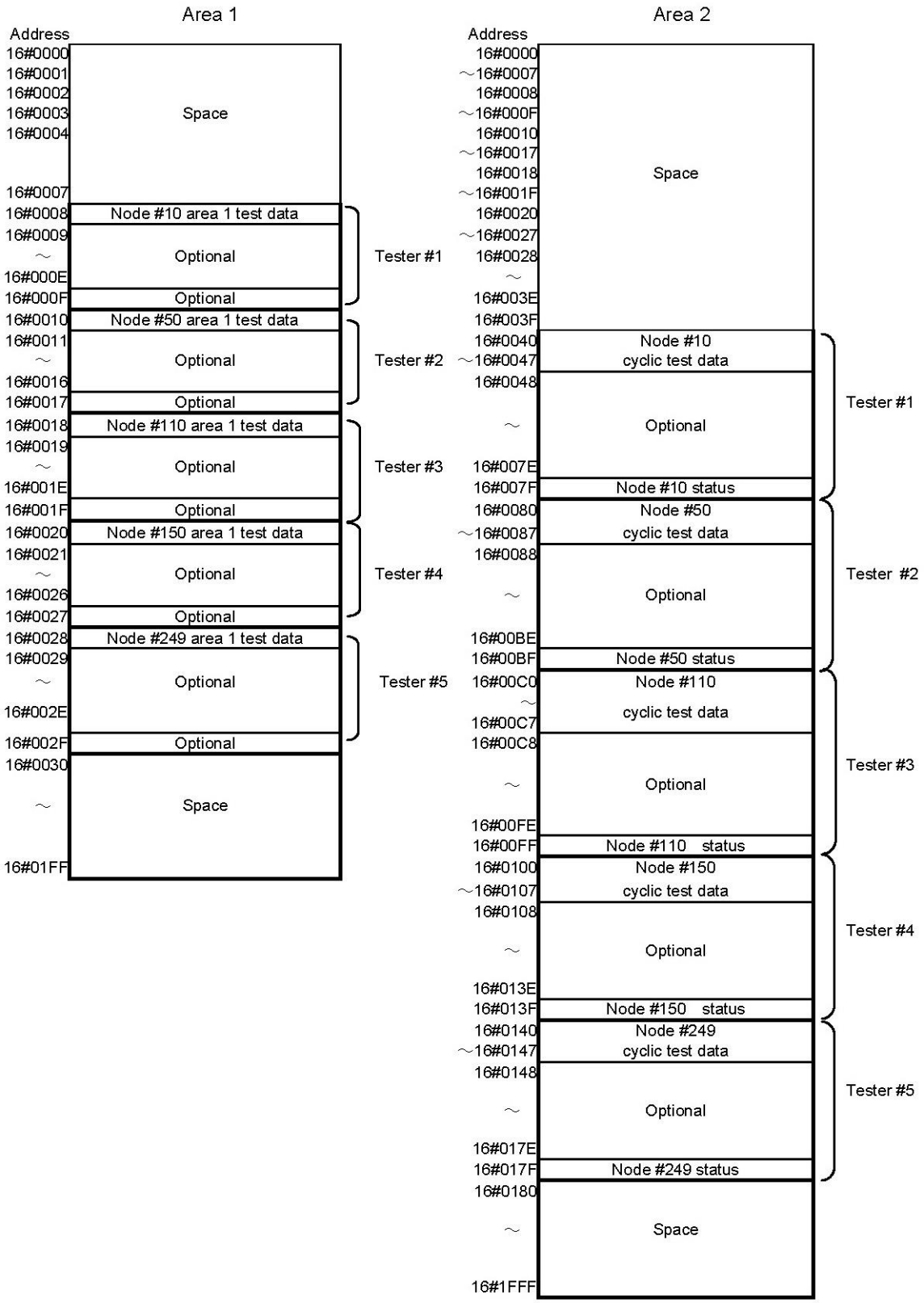


Figure 9 – Allocation map of common memory for class 2

c) Class 3 (flexible master function implemented) and class 4 in Figure 10 shows allocation map of common memory for each node in the interconnectability test for class 3 (flexible master function implemented) and class 4.

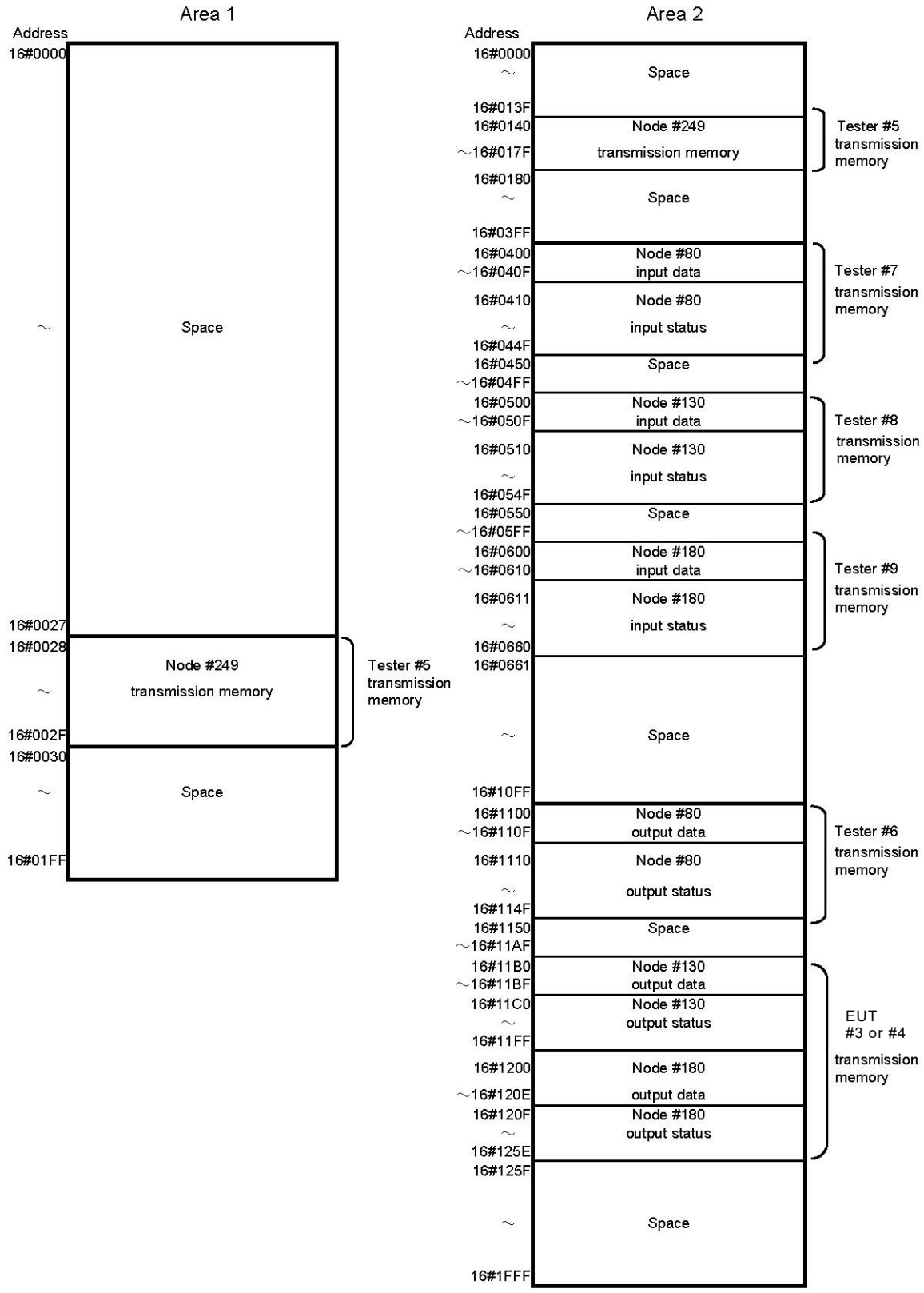


Figure 10 – Allocation map of common memory for classes 3 and 4

d) Class 5 in Figure 11 shows allocation map of common memory for each node in the interconnectability test for class 5.

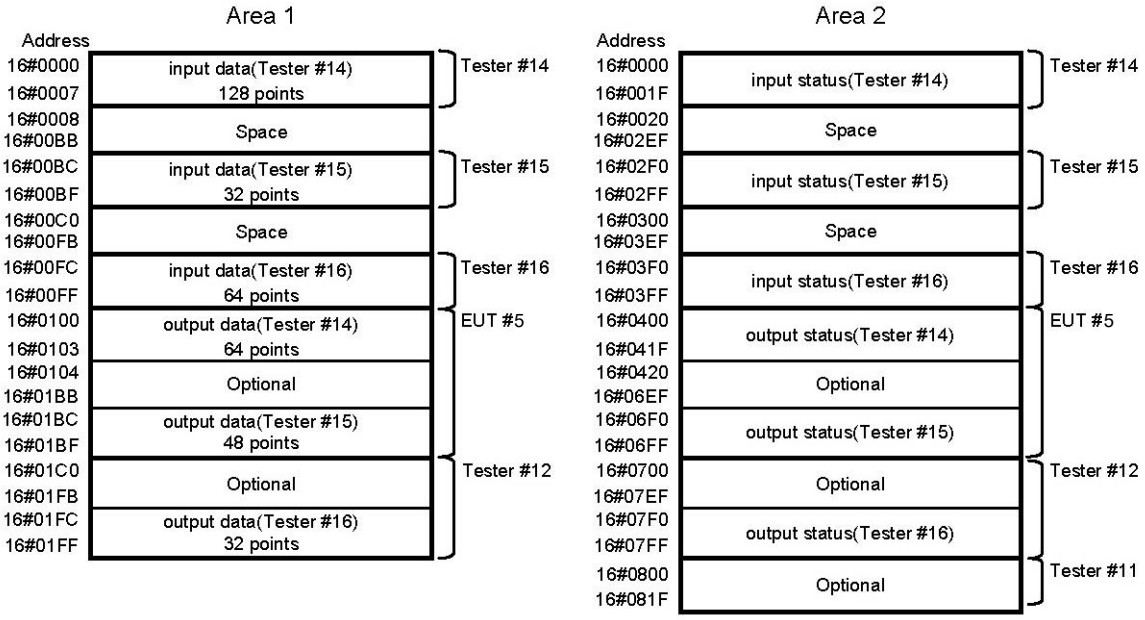


Figure 11 – Allocation map of common memory for class 5

e) Class 6 in Figure 12 shows allocation map of common memory for each node in the interconnectability test for class 6.

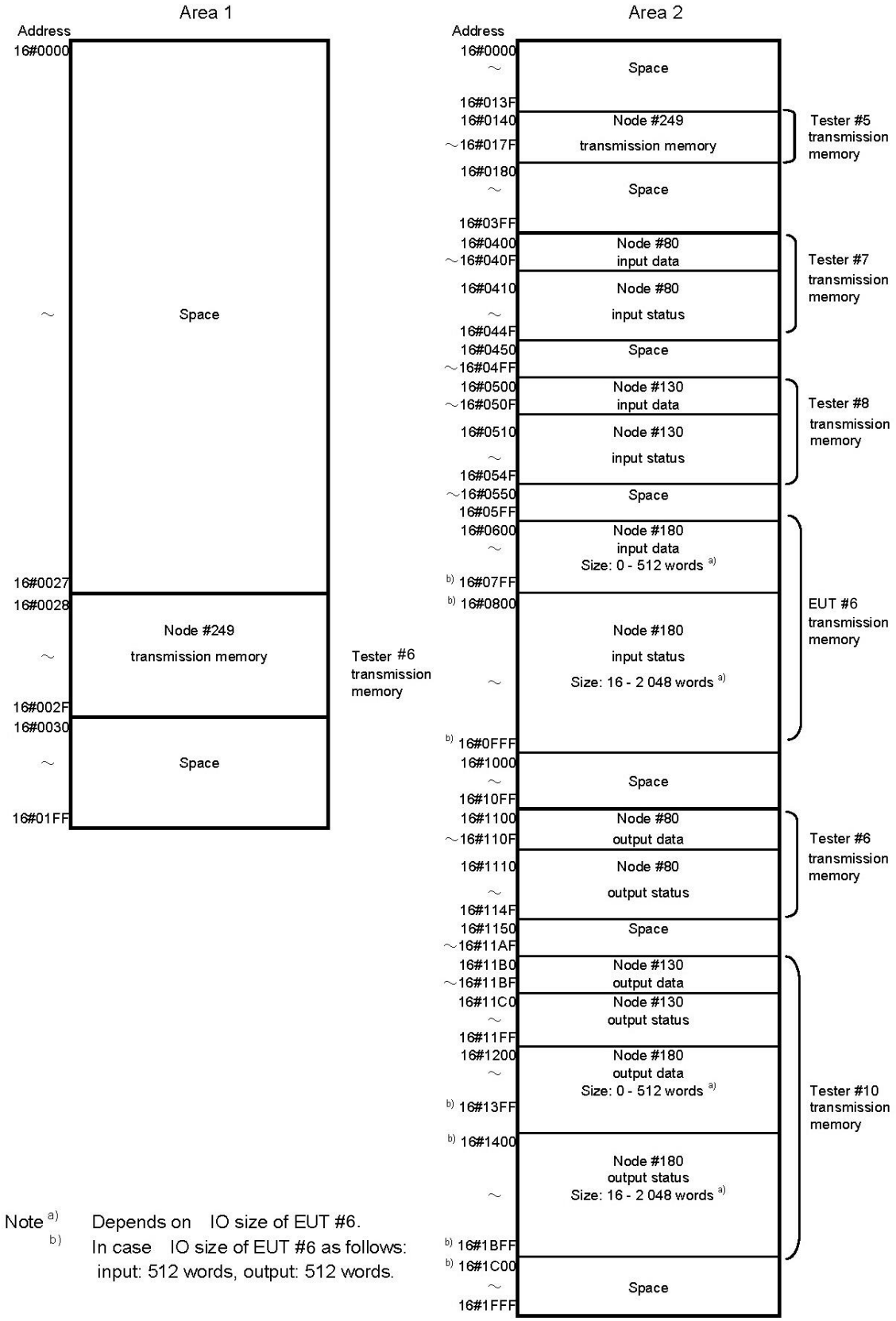
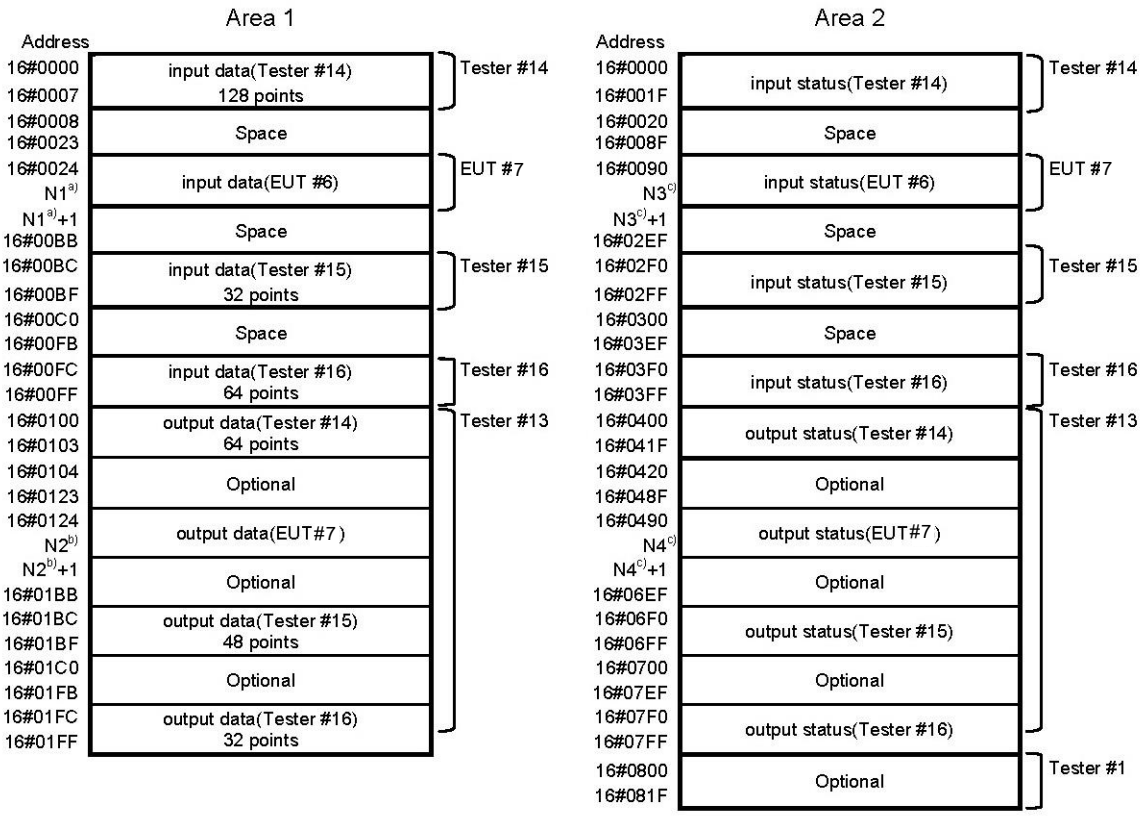


Figure 12 – Allocation map of common memory for class 6

f) Class 7 in Figure 13 shows allocation map of common memory for the interconnectability test for class 7.



Note a) "N1" varies depending on number of input points of the slave, EUT #7.

b) "N2" varies depending on number of output points of the slave, EUT #7.

c) "N3" and "N4" vary depending on number of input and output points of the slave, EUT #7.

Figure 13 – Allocation map of common memory for class 7

7.3.3 Test start

The test shall start as follows.

a) Class 1 and class 3 The interconnectability test for Class 1 and Class 3 starts when the test equipment confirms that “interconnectability test preparation completion flag (TSF)” by which the EUT indicates it is prepared for the interconnectability test is set. The EUT sets the “interconnectability test preparation completion flag (TSF)” to “1” when it is ready for the interconnectability test after starting its operation, and waits for the test equipment to start the test. The test equipment starts the test at the time when it confirms the flag is set, displaying the test start.
The interconnectability test preparation completion flag (TSF) is defined in the node #1 status at address 16#003F of the EUT area 2. Details of the node #1 status are shown in Figure 14. Also the timing of the test start is shown in Figure 15.

Area 2Address 16#003F	2^{15}															2^{0}
	TSF	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Note 1 interconnectability test preparation completion flag (TSF) 1 : complete
0 : under preparation

Note 2 “*” means optional.

Figure 14 – Details of node #1 status

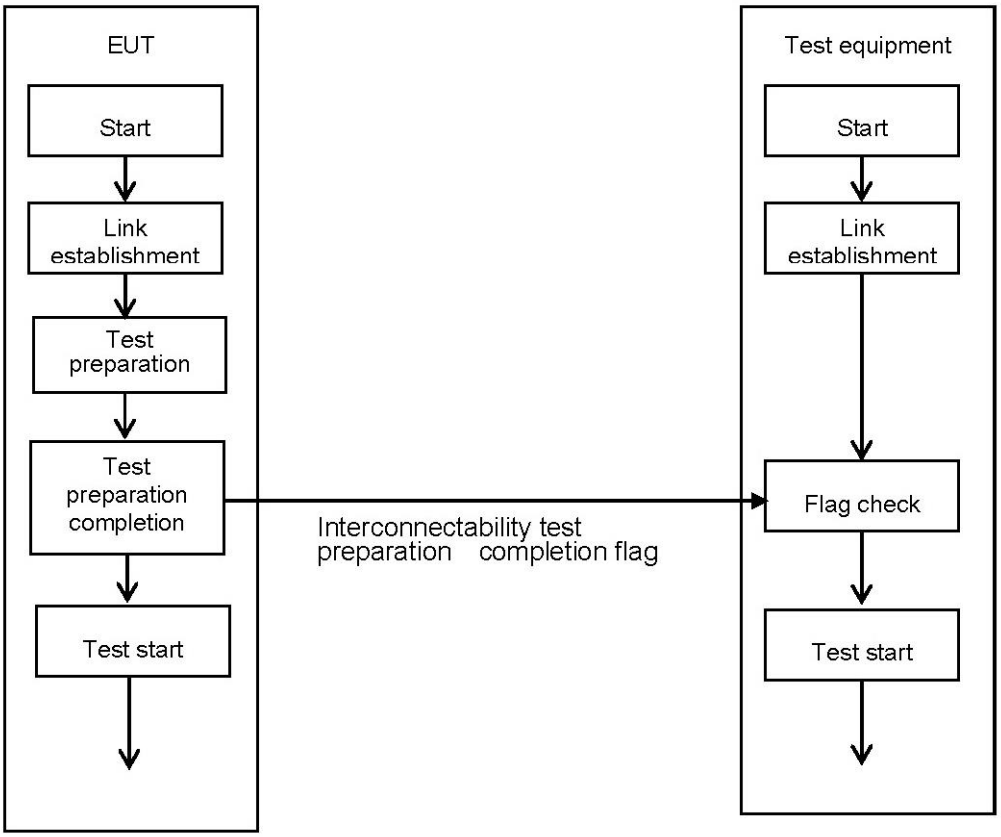


Figure 15 – Test start timing for class 1 and class 3

b) Class 2 The interconnectability test for class 2 starts 10 seconds after the test equipment #1 (node #10) confirms link establishment of all nodes (the EUT and the test equipment #1 through #5). The test equipment #1 displays the test start. Timing of the test starts is shown Figure 16.

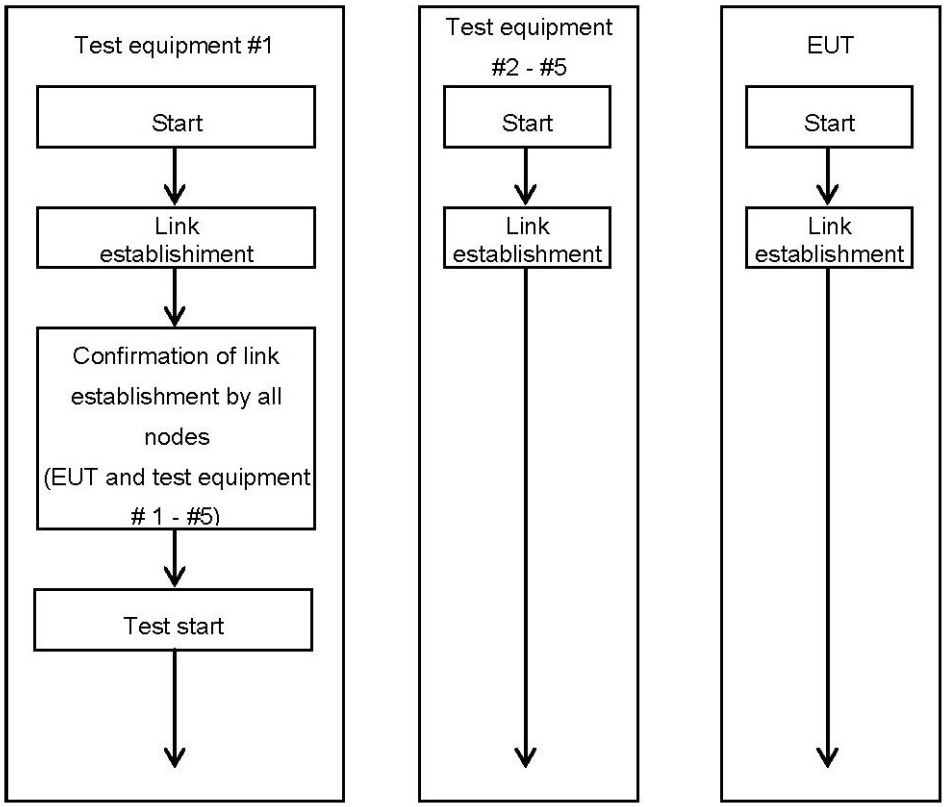


Figure 16 – Timing of test start for Class 2

c) Class 4 and class 6 The interconnectability test for class 4 and class 6 starts 10 seconds after the test equipment #6 (node #30) confirms link establishment of all nodes (the EUT and test equipment #5 and #7 through #10). Test equipment #6 displays the test start. Timing of the test start is shown in Figure 17.

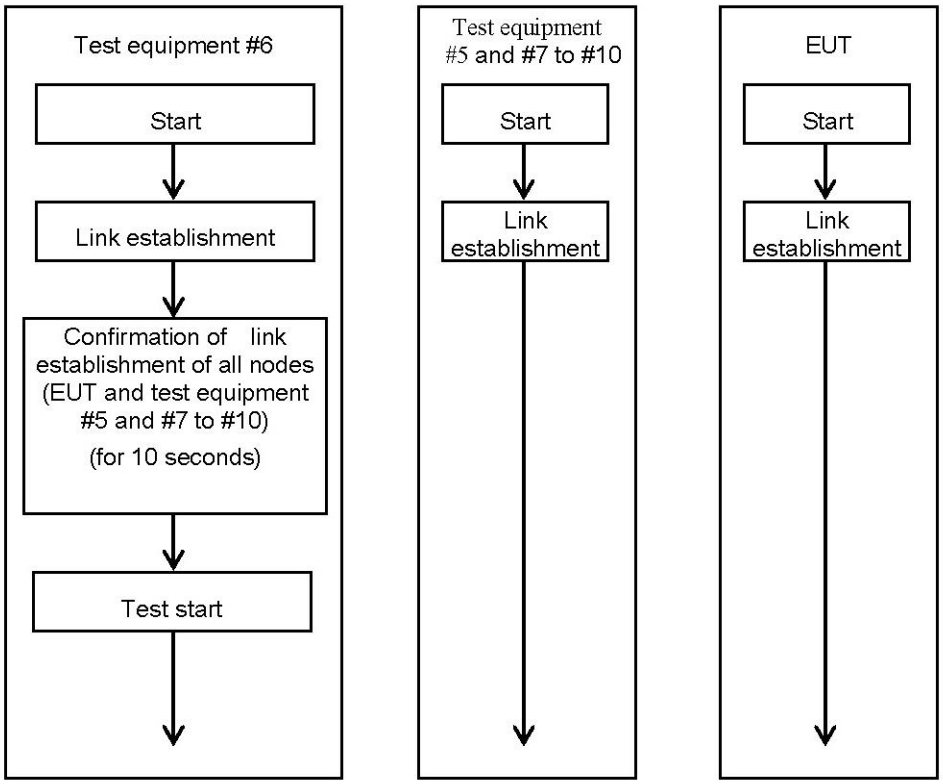


Figure 17 – Timing of test start for class 4 and class 6

d) Class 5 and Class 7 The interconnectability test for class 5 and class 7 starts 10 seconds after the test equipment #11 (node #200) confirms link establishment of all nodes (the EUT and the test equipment). Timing of the test start is shown in Figure 18.

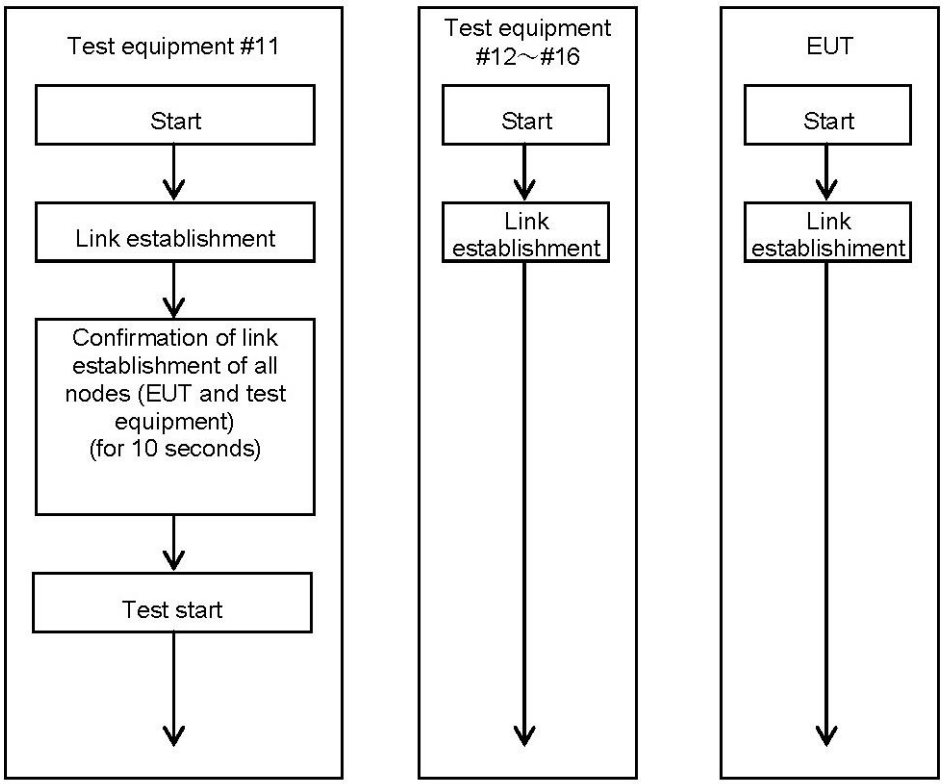


Figure 18 – Timing of test start for class 5 and class 7

7.3.4 Interconnectability message test completion

“Interconnectability test completion flag” is defined to manage test execution right among the test equipment #1 through #5 in message transmission echo back test for class 1, class 2 and class 3. This flag is allocated at the node status in Area 2 of the test equipment.

Table 169 shows address list of the node status in area 2 of the test equipment and Figure 19 shows details of the node status in Area 2 of the test equipment.

Table 169 - Address list of node status in Area 2 of the test equipment

Name of test equipment	Node number	Address
Tester #1	10	16#007F
Tester #2	50	16#00BF
Tester #3	110	16#00FF
Tester #4	150	16#013F
Tester #5	249	16#017F

2^{15}															2^{0}
MTF	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Note 1: Interconnectability message test completion flag (MTF) 1: normal
0: others

Note 2: “*” means optional.

Figure 19 – Details of node status in Area 2 of test equipment

7.4 Cyclic transmission echo back test

Cyclic transmission echo back test shall be executed as follows: test equipment #1 through #5 transmits cyclic data; the EUT sends back the data; and the test equipment #1 through #5 compares the received data with the transmitted data. Hereinafter the test equipment at the cyclic transmission echo bask test means the test equipment #1 through #5.

7.4.1 Test cycle

Test cycle is a unit of repeated operation where the test equipment transmits test data, receives data and compares the latter with the former. Figure 20 shows three phases that consist the test cycle.

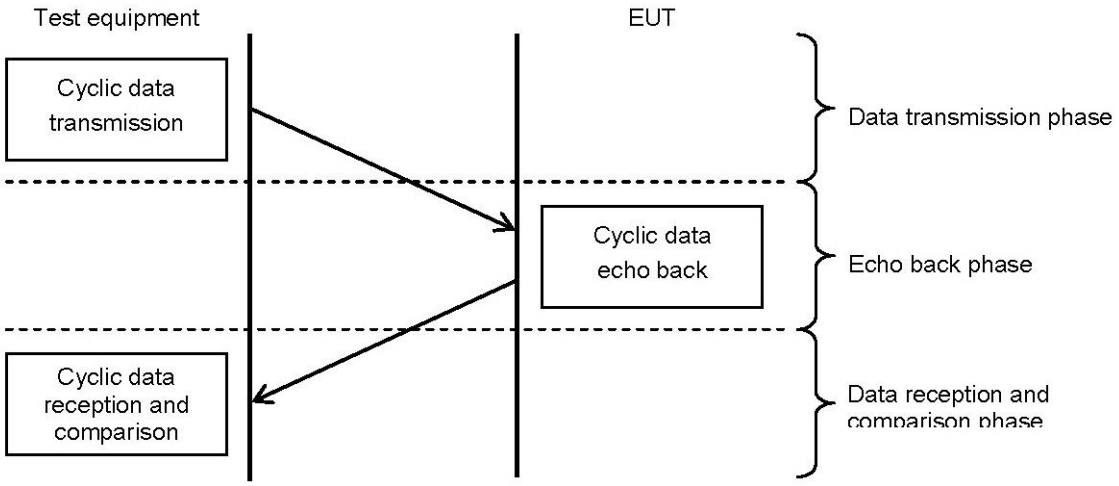


Figure 20 – Three phases of cyclic transmission echo back test cycle

The three phases of cyclic transmission echo back test cycle are as follows:

a) Data transmission phase The test equipment writes transmission data into the test data area in the self node Area 2 shown in Figure 8. The test data is updated on completion of each test cycle. Method to update the test data is optional to each test equipment. However the test data shall be different from the last one.

b) Data echo back phase The EUT transfers or copies the test data from each test equipment into the echo back data area in the self node Area 2 shown in Figure 8.

c) Data reception and comparison phase The test equipment receives the echo back data from the EUT and compares it with the self node test data shown in Figure 8. The comparison shall start one (1) second after it updates the test data considering latency of echo back by the EUT. If result of the comparison is match, the next test cycle starts. If not, comparison error is displayed externally and the test ends.

7.4.2 Flow of echo back data in the cyclic transmission test

Flow of echo back data in the cyclic transmission test is shown in Figure 21.

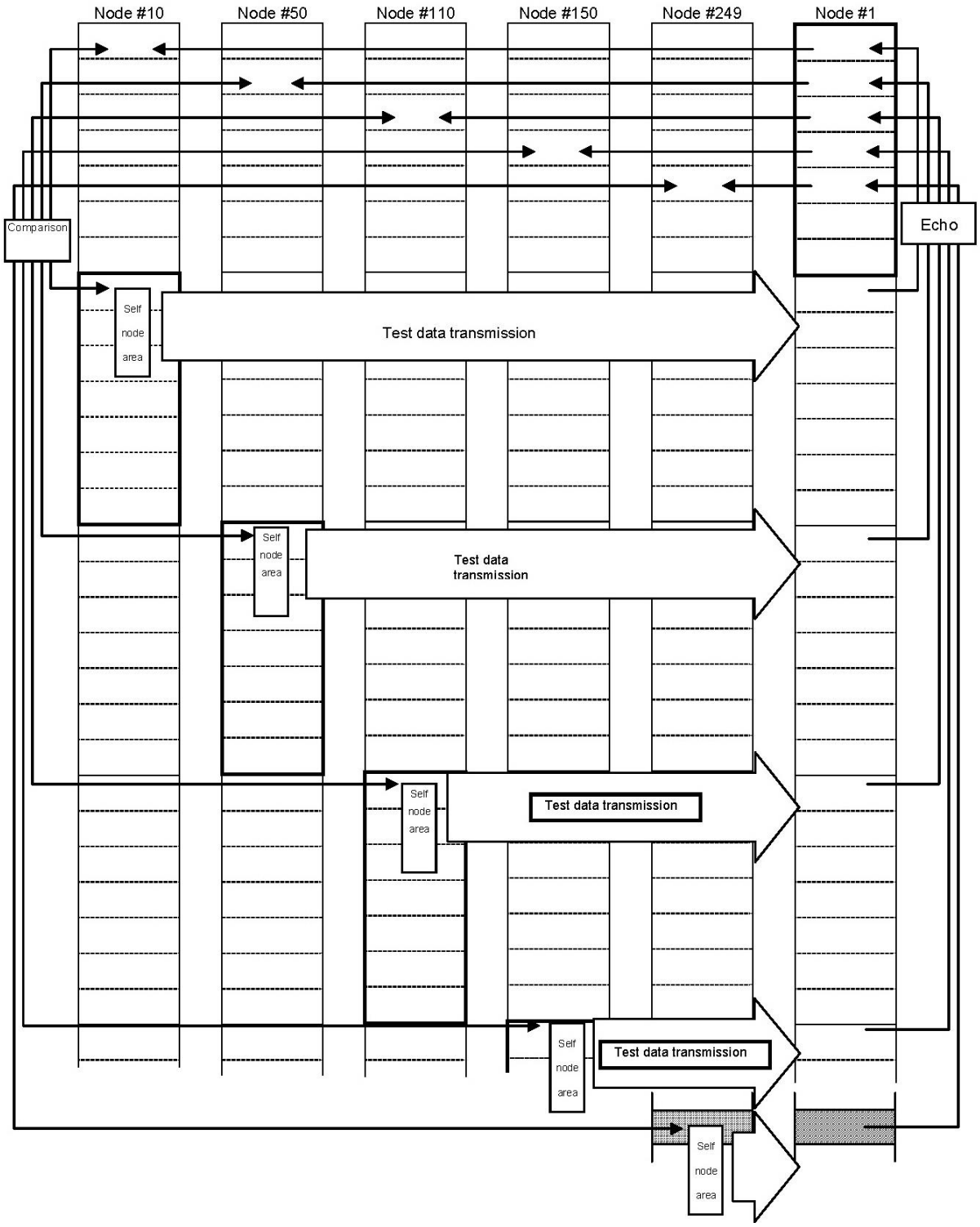


Figure 21 – Flow of cyclic transmission echo back data

7.5 Message transmission echo back test

Message transmission echo back test shall be executed as follows: the test equipment transmits “message echo back request (TCD = 65 015)” to the EUT; the EUT transmits its response (TCD = 65215); the test equipment decides whether the test is successful based on comparison of the response with the request.

For classes 1, 2 and 3, test equipment #1 through #5 executes the message echo back with the EUT; for class 3 with device level network function implemented and classes 4 and 6, test equipment #6 executes the message echo back with the EUT; and for classes 5 and 7, test equipment #11 executes the message echo back with the EUT.

7.5.1 Test cycle

Test cycle is a unit of repeated operation for the message transmission, reception and comparison. Duration of one cycle is 10 seconds. For classes 1, 2 and 3, the execution right of the test shall be transferred to the next test equipment at the end of the each test cycle, as shown in Figure 22; for classes 4 and 6, the execution right shall be always held by test equipment #6; and for classes 5 and 7, the execution right shall be always held by test equipment #11.

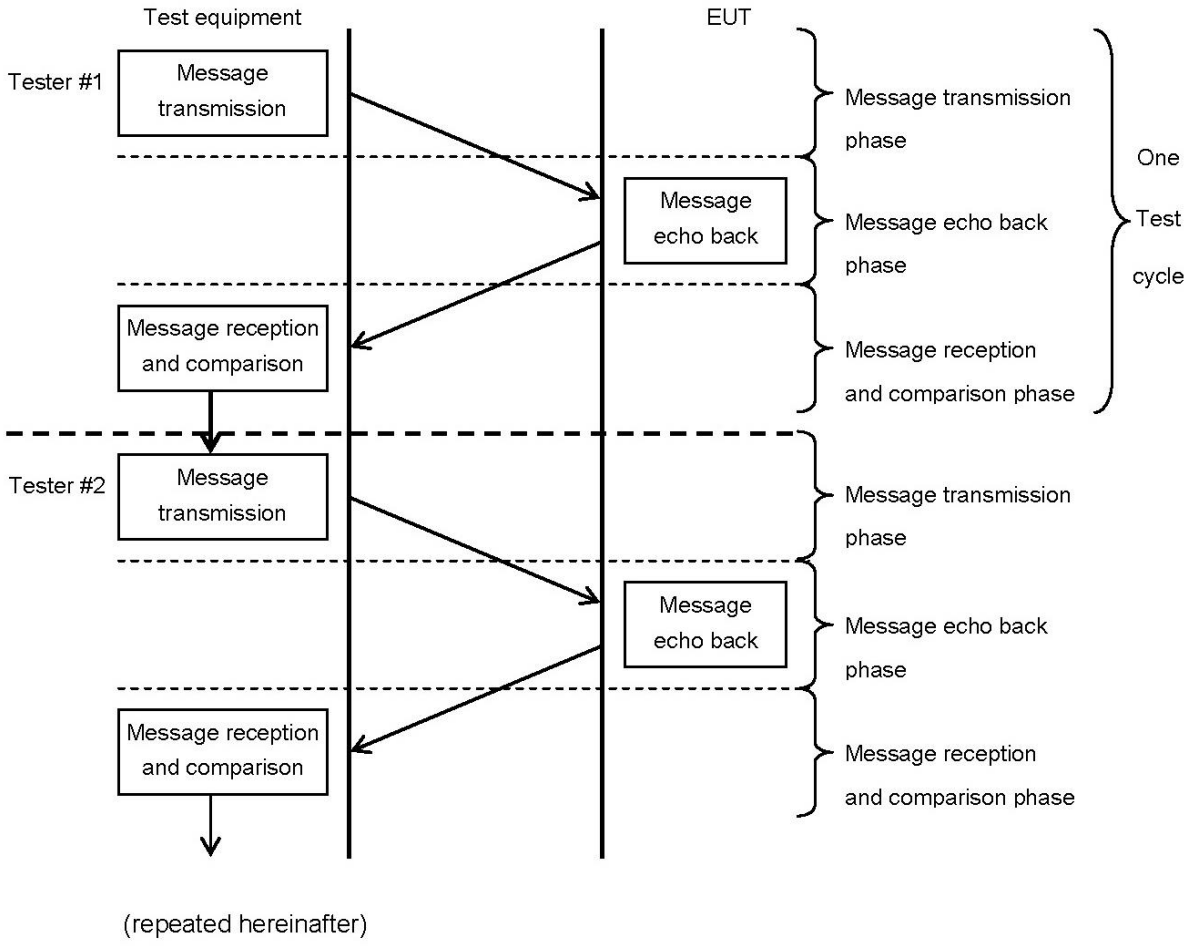


Figure 22 – Three phases of message echo back test cycle

Three phases of the message transmission echo back test cycle shall be as follows:

a) Message transmission phase: The test equipment sets test data at the message data portion of a request message and transmits it. The request message can be transmitted while the self node holds the test execution right. The test data which is 1024 bytes in length shall be updated on completion of each test cycle. Method to update the test data is optional for each test equipment. However the test data shall be different from the last one.

b) Message echo back phase: The EUT transmits the response message to the request message from the test equipment.

c) Message reception and comparison phase: The test equipment receives the response message from the EUT, compares it with the test data of the self node and decides whether the test is successful. Although the data comparison should preferably be done for all of the data, it shall at least be done for the first word, the last word and optional one word in between. If the result of the comparison is match, the next test equipment executes its test after one test cycle time (10 seconds) elapsed. If the result of the comparison is not match, a comparison error is displayed externally and the test ends. Also if the response message cannot be received by the one test cycle time (10 seconds) after the transmission of the request message, the result is error and the test ends.

7.5.2 Flow of message transmission echo back test

Message transmission echo back test for classes 1, 2 and 3 shall be executed as follows: each test equipment executes one test cycle and transfers the test execution right to the next test equipment; each test equipment transmits the request message sequentially to the EUT, receives response message from the EUT and decides the test result based on the comparison. Figure 23 shows the flow of the test.

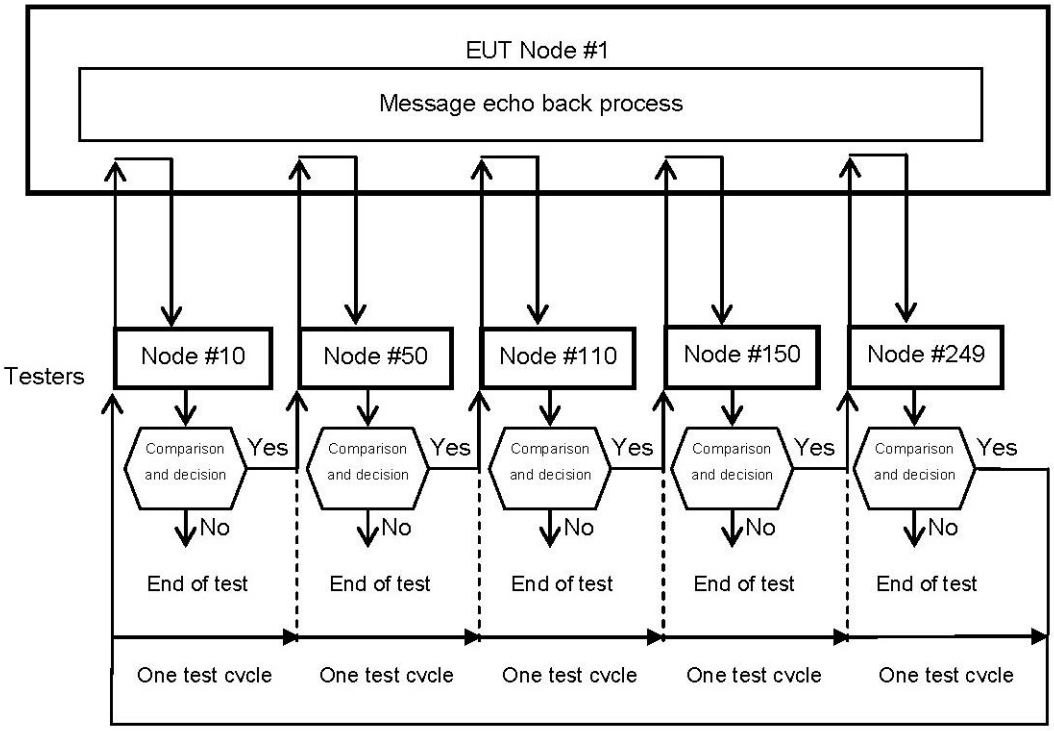


Figure 23 – Flow of message transmission echo back test

7.5.3 Management of the test execution right

Management of the test execution right for classes 1, 2 and 3 shall be as follows:

a) The test equipment that has obtained the test execution right executes the message transmission echo back test to the EUT.

b) On completion of one test cycle, the test equipment sets “interconnectability message test completion flag (MTF)” of test equipment node status as shown Figure 19. The flag shall be kept set until the next test equipment sets its MTF and be reset at this point of time.

c) The next test equipment monitors MTF of the preceding test equipment, recognizes that it obtains the test execution right when the MTF becomes ON and starts its test cycle.

d) The test equipment resets MTF one test cycle time (10 seconds) after it obtains the test execution right in case it detects comparison error.

e) Figure 24 shows transition timing of the test execution right.

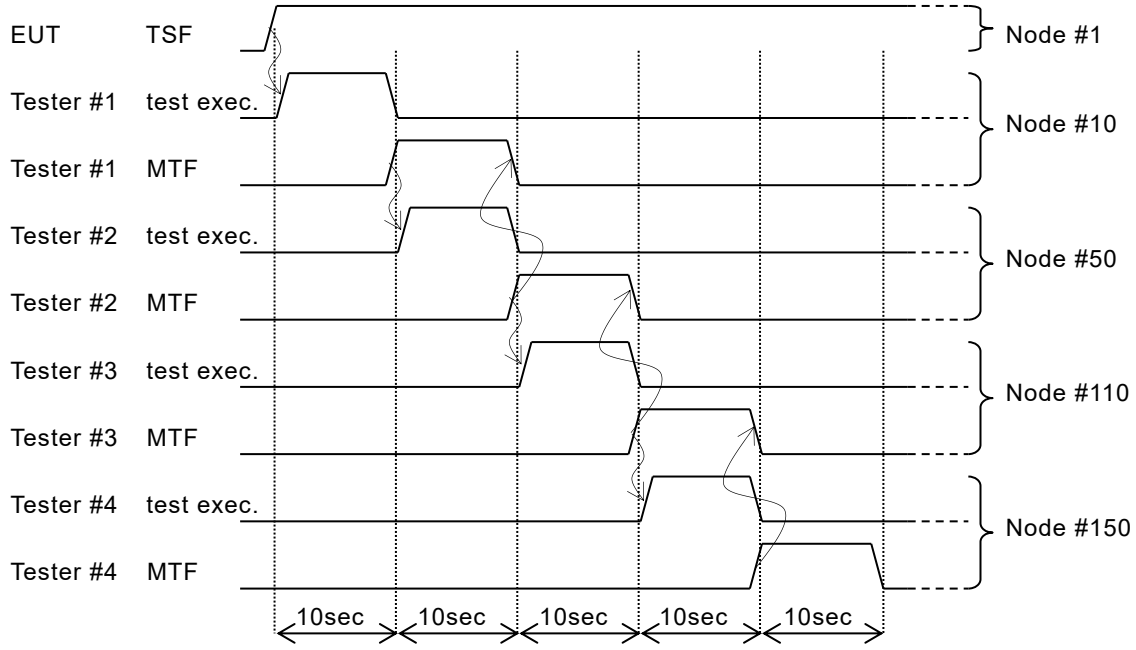


Figure 24 – Transition timing of the test execution right

7.6 Device-level network test

7.6.1 Class 3 (flexible master function implemented), Class 4, and Class 6:

The device-level network test of Class 3 (flexible master function implemented), Class 4, and Class 6 is defined as follows.

a) Master/slave combination: The device-level network test for Class 3 (flexible master function implemented), Class 4, and Class 6 are to be conducted in a multi-master configuration consisting of a combination of test equipment #6 (master) and test equipment #7 (slave), and a combination depending on the class of EUT, as shown in Table 170.

Table 170 – Combination of master/slave

Equipment under test(EUT)				Test equipment	
Class	Function category	EUT No.	Node No.	Test equipment №	Node No.
Class 3	Flexible master	#3	#230	#8, #9	#130, #180
Class 4	Flexible master	#4	#230	#8, #9	#130, #180
Class 6	Flexible slave	#6	#180	#8, #10	#130, #230

b) Class 3 (flexible master function implemented) and Class 4: The device-level network test for Class 3 (flexible master function implemented) and Class 4 verifies the following items with test equipment #6. If any abnormality is detected, the test equipment displays device-level network test error, terminating the test.

Note that no comparison between input and output data is conducted in this test.

1) Add the EUT, test equipment #8 and #9 to the link.

2) Check whether the common memory area for test equipment #8 and #9 is allocated as configured, using solicitation frames sent from the EUT.

3) Check whether the values of the specified slave type and the master node number instructions in the master status area of the EUT are correct.

The parameters in this test are listed in Table 171 and Table 172.

Table 171 – Device level test common memory area settings (Class 3 and Class 4)

Test equipment №	Class	Node number	Top address*	Size
EUT	3, 4	230	16#11B0	175
Test equipment #8	6	130	16#0500	80
Test equipment #9	6	180	16#0600	97
Note* All addresses are in Area 2.				

Table 172 – Device level test parameters for the master status area (Class 3 and Class 4)

Item	Address*	Value
Specified slave type (for test equipment #8)	16#11C1	16#FFFF
	16#11D1	16#FFFF
	16#11E1	16#FFFF
	16#11F1	16#BFBF
Master node number instruction (for test equipment #8)	16#11C2	16#00E6
Specified slave type (for test equipment #9)	16#1210	16#FFFF
	16#1220	16#FFFF
	16#1230	16#FFFF
	16#1240	16#AFFF
	16#1250	16#008F
Master node number instruction (for test equipment #9)	16#1211	16#00E6
Note* All addresses are of Area 2.		

c) Class 6: The device-level network test for Class 6 verifies the following items with test equipment #6. If an abnormality is detected, the test equipment displays the corresponding error in the device-level network test, terminating the test.

Note that no comparison between input and output data is conducted in this test.

1) Add the EUT to the link.

2) Check whether the common memory area for the EUT test is allocated as configured, using solicitation frames sent from test equipment #10.

3) Check whether the values for the slave status and the master node numbers in the slave status area of the EUT are correct.

The parameters in this test are listed in Table 173 and Table 174.

Table 173 – Device level test common area settings (Class 6)

Test equipment No.	Class	Node number	Top address[a)]	Size
EUT	6	180	16#0600	16 through 2560[b)]
Note [a)] The address is of Area 2. [b)] Varies according to the IO size of the EUT.				

Table 174 – Device level test parameters for the master status area (Class 6)

Item	Address[a)]	Value
Slave status (for EUT)	[b)]	16#0001 or 16#0003
Master node number (for EUT)	[b)]	16#00E6
Note [a)] All addresses are of Area 2. [b)] Varies according to the IO size of the EUT.		

7.6.2 Class 5

The device-level network test for Class 5 must verify the following items with test equipment #11. If an abnormality is detected, the test equipment displays the corresponding error in the device-level network test, terminating the test.
Note that no comparison between input and output data is conducted in this test.

a) Add EUT#5 to the link.

b) Check whether the common memory area of the EUT#5 is allocated as configured.

c) Check whether the values for the specified slave type and the master node number instructions in the master status area of the EUT#5 are correct.

The parameters confirmed in this test are listed in Table 175:

Table 175 – Device level test parameters to be confirmed (Class 5)

Item	Address	Value
Specified slave type (for test equipment #14)	16#0401 in Area 2	16#FFBF
	16#0411 in Area 2	16#BF00
Master node number instruction (for test equipment #14)	16#0402 in Area 2	0 or 100
Specified slave type (for test equipment #15)	16#06F1 in Area 2	16#9FAF
Master node number instruction (for test equipment #15)	16#06F2 in Area 2	0 or 100

7.6.3 Class 7

The device-level network test for Class 7 verifies the following items with test equipment #11. If an abnormality is detected, the test equipment displays the corresponding error in the device-level network test , terminating the test.
Note that no comparison between input and output data is conducted in this test.

a) Add EUT#7 to the link.

b) Check whether the common memory area of EUT#7 is allocated as configured.

c) Check whether the values for the slave status and master node number in the slave status area of EUT#7 are correct.

The parameters confirmed in this test are listed in Table 176:

Table 176 – Device level test parameters to be confirmed (Class 7)

Item	Address	Value
Slave status (for EUT#7)	16#0090 in Area 2	1 (stopped) or 3 (running)
Master node number (for EUT#7)	16#0092 in Area 2	100

7.7 IP communication superimposition test

In the IP communication superimposition test, the ECHO command of ICMP protocol is executed

from a setting tool computer to superimpose IP communication for the EUT. With IP communication superimposed, the test checks whether no error is detected in any other tests, while the result of the ECHO command is not judged. For Windows, use the Ping command shown in Figure 25 to conduct the test.

Note 1 Windows is the registered trademark of Microsoft Corporation in the United States and other countries.

Interval time of packet transmission is 1 second.

```
ping -t (IP address of EUT)
```

Figure 25 – Ping command

7.8 Overview of interconnectability test

7.8.1 Class 1 and Class 3

The test table for the Class 1 EUT and Class 3 EUT interconnectability test is defined in Table 177.

Table 177 – Test table for interconnectability test (Class 1 and Class 3)

Major test group	Interconnectability (in case Class 1 EUT and Class 3 EUT)			
Test procedure	a) Start the EUT and the test equipment, then start the network and leave it in operation status (normal status). b) Set the interconnectability test preparation completion flag of the EUT after checking that the EUT is in test preparation completion. c) Execute the Ping command on the setting tool computer to superimpose IP communication to the EUT. Note that this is not conducted for Class 1.			
Evaluation criteria	The normal operation status continues for longer than 2 consecutive hours and no error is displayed for the cyclic echo back test or the message transmission test.			
Setting parameter (node)	EUT #1 or #3		Implementation class	1 or 3 (controller)
			Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	16#0000
			Area 1 data size	8
			Area 2 data top address	16#0000
			Area 2 data size	64
	Test equipment	Test equipment #1	Implementation class	1 (controller)
			Node number	10
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	16#0008
			Area 1 data size	8
			Area 2 data top address	16#0040
			Area 2 data size	64
		Test equipment #2	Implementation class	1 (controller)
			Node number	50
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	16#0010
			Area 1 data size	8
			Area 2 data top address	16#0080
			Area 2 data size	64
		Test equipment #3	Implementation class	1 (controller)
			Node number	110
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	16#0018
			Area 1 data size	8
			Area 2 data top address	16#00C0
			Area 2 data size	64

Table 177 – Test table for interconnectability test (Class 1 and Class 3) (continued)

Setting parameter (node) (continued)	Test equipment (continued)	Test equipment #4	Implementation class	3 (controller)
			Node number	150
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	16#0020
			Area 1 data size	8
			Area 2 data top address	16#0100
			Area 2 data size	64
		Test equipment #5	Implementation class	3 (controller)
			Node number	249
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	16#0028
			Area 1 data size	8
			Area 2 data top address	16#0140
			Area 2 data size	64
Setting parameter (test data)	Transmission data in cyclic transmission	Test equipment #1	Area 1 data top address	16#0008
			Area 1 data size	1
			Area 2 data top address	16#0040
			Area 2 data size	8
			Contents of data	Arbitrary data specified by the test equipment manufacturer (different for each cycle)
		Test equipment #2	Area 1 data top address	16#0010
			Area 1 data size	1
			Area 2 data top address	16#0080
			Area 2 data size	8
			Contents of data	Arbitrary data specified by the test equipment manufacturer (different for each cycle)
		Test equipment #3	Area 1 data top address	16#0018
			Area 1 data size	1
			Area 2 data top address	16#00C0
			Area 2 data size	8
			Contents of data	Arbitrary data specified by the test equipment manufacturer (different for each cycle)
		Test equipment #4	Area 1 data top address	16#0020
			Area 1 data size	1
			Area 2 data top address	16#0100
			Area 2 data size	8
			Contents of data	Arbitrary data specified by the test equipment manufacturer (different for each cycle)

Table 177 – Test table for interconnectability test (Class 1 and Class 3) (continued)

Setting parameter (test data) (continued)	Transmission data in cyclic transmission (continued)	Test equipment #5	Area 1 data top address	16#0028
			Area 1 data size	1
			Area 2 data top address	16#0140
			Area 2 data size	8
			Contents of data	Arbitrary data specified by the test equipment manufacturer (different for each cycle)
	Transmission data in message transmission	Test equipment #1	Node address of source side (SNA)	10
			Node address of destination side (DNA)	1
			TCD	65 015 (message echo back request)
			Data size	512
			Contents of data	Arbitrary data specified by the test equipment manufacturer (different for each cycle)
		Test equipment #2	Node address of source side (SNA)	50
			Node address of destination side (DNA)	1
			TCD	65 015 (message echo back request)
			Data size	512
			Contents of data	Arbitrary data specified by the test equipment manufacturer (different for each cycle)
		Test equipment #3	Node address of source side (SNA)	110
			Node address of destination side (DNA)	1
			TCD	65 015 (message echo back request)
			Data size	512
			Contents of data	Arbitrary data specified by the test equipment manufacturer (different for each cycle)
		Test equipment #4	Node address of source side (SNA)	150
			Node address of destination side (DNA)	1
			TCD	65 015 (message echo back request)
			Data size	512
			Contents of data	Arbitrary data specified by the test equipment manufacturer (different for each cycle)
		Test equipment #5	Node address of source side (SNA)	249
			Node address of destination side (DNA)	1
			TCD	65 015 (message echo back request)

Table 177 – Test table for interconnectability test (Class 1 and Class 3) (continued)

Setting parameter (test data) (continued)	Transmission data in message transmission (continued)	Test equipment #5 (continued)	Data size	512
			Contents of data	Arbitrary data specified by the test equipment manufacturer (different for each cycle)
	Received data in message transmission	Test equipment #1	Node address of source side (SNA)	1
			Node address of destination side (DNA)	10
			TCD	65 215 (message echo back response)
			Data size	512
			Contents of data	Echoes back the contents of the data sent from test equipment #1.
		Test equipment #2	Node address of source side (SNA)	1
			Node address of destination side (DNA)	50
			TCD	65 215 (message echo back response)
			Data size	512
			Contents of data	Echoes back the contents of the data sent from test equipment #2.
		Test equipment #3	Node address of source side (SNA)	1
			Node address of destination side (DNA)	110
			TCD	65 215 (message echo back response)
			Data size	512
			Contents of data	Echoes back the contents of the data sent from test equipment #3.
		Test equipment #4	Node address of source side (SNA)	1
			Node address of destination side (DNA)	150
			TCD	65 215 (message echo back response)
			Data size	512
			Contents of data	Echoes back the contents of the data sent from test equipment #4.
		Test equipment #5	Node address of source side (SNA)	1
			Node address of destination side (DNA)	249
			TCD	65 215 (message echo back response)
			Data size	512
			Contents of data	Echoes back the contents of the data sent from test equipment #5.

7.8.2 Class 2

The test table for the Class 2 EUT interconnectability test is defined in Table 178.

Table 178 – Test table for interconnectability test (Class 2)

Major test group	Interconnectability (if EUT is Class 2)			
Test procedure	a) Start the EUT and the Test equipment, then start the network and leave it in operation status (normal status) b) Using test equipment #1, check for the message displayed which indicates the test has been started.			
Evaluation criteria	The normal operation status continues for longer than 2 consecutive hours and no error is displayed for the message transmission test.			
Setting parameter (node)	EUT #2		Implementation class	2
			Node number	1
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	16#0000
			Area 1 data size	0
			Area 2 data top address	16#0000
			Area 2 data size	0
	Test equipment	Test equipment #1	Implementation class	1 (controller)
			Node number	10
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	16#0008
			Area 1 data size	8
			Area 2 data top address	16#0040
			Area 2 data size	64
		Test equipment #2	Implementation class	1 (controller)
			Node number	50
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	16#0010
			Area 1 data size	8
			Area 2 data top address	16#0080
			Area 2 data size	64
		Test equipment #3	Implementation class	1 (controller)
			Node number	110
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	16#0018
			Area 1 data size	8

Table 178 – Test table for interconnectability test (Class 2) (continued)

Setting parameter (node) (continued)	Test equipment (continued)	Test equipment #3 (continued)	Area 2 data top address	16#00C0
			Area 2 data size	64
		Test equipment #4	Implementation class	3 (controller)
			Node number	150
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	16#0020
			Area 1 data size	8
			Area 2 data top address	16#0100
			Area 2 data size	64
		Test equipment #5	Implementation class	3 (controller)
			Node number	249
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	16#0028
			Area 1 data size	8
			Area 2 data top address	16#0140
			Area 2 data size	64
Setting parameter (test data)	Transmission data in message transmission	Test equipment #1	Node address of source side (SNA)	10
			Node address of destination side (DNA)	1
			TCD	65 015 (message echo back request)
			Data size	512
			Contents of data	Arbitrary data specified by the test equipment manufacturer (different for each cycle)
		Test equipment #2	Node address of source side (SNA)	50
			Node address of destination side (DNA)	1
			TCD	65 015 (message echo back request)
			Data size	512
			Contents of data	Arbitrary data specified by the test equipment manufacturer (different for each cycle)
		Test equipment #3	Node address of source side (SNA)	110
			Node address of destination side (DNA)	1
			TCD	65 015 (message echo back request)
			Data size	512
			Contents of data	Arbitrary data specified by the test equipment manufacturer (different for each cycle)

Table 178 – Test table for interconnectability test (Class 2) (continued)

Setting parameter (test data) (continued)	Transmission data in message transmission (continued)	Test equipment #4	Node address of source side (SNA)	150
			Node address of destination side (DNA)	1
			TCD	65 015 (message echo back request)
			Data size	512
			Contents of data	Arbitrary data specified by the test equipment manufacturer (different for each cycle)
		Test equipment #5	Node address of source side (SNA)	249
			Node address of destination side (DNA)	1
			TCD	65 015 (message echo back request)
			Data size	512
			Contents of data	Arbitrary data specified by the test equipment manufacturer (different for each cycle)
	Received data in message transmission	Test equipment #1	Node address of source side (SNA)	1
			Node address of destination side (DNA)	10
			TCD	65 215 (message echo back response)
			Data size	512
			Contents of data	Echoes back the contents of the data in the message sent from test equipment #1.
		Test equipment #2	Node address of source side (SNA)	1
			Node address of destination side (DNA)	50
			TCD	65 215 (message echo back response)
			Data size	512
			Contents of data	Echoes back the contents of the data in the message sent from test equipment #2.
		Test equipment #3	Node address of source side (SNA)	1
			Node address of destination side (DNA)	110
			TCD	65 215 (message echo back response)
			Data size	512
			Contents of data	Echoes back the contents of the data in the message sent from test equipment #3.
		Test equipment #4	Node address of source side (SNA)	1
			Node address of destination side (DNA)	150

Table 178 – Test table for interconnectability test (Class 2) (continued)

Setting parameter (test data) (continued)	Received data in message transmission (continued)	Test equipment #4 (continued)	TCD	65 215 (message echo back response)
			Data size	512
			Contents of data	Echoes back the contents of the data in the message sent from test equipment #4.
		Test equipment #5	Node address of source side (SNA)	1
			Node address of destination side (DNA)	249
			TCD	65 215 (message echo back response)
			Data size	512
			Contents of data	Echoes back the contents of the data in the message sent from test equipment #5.

7.8.3 Class 3 (flexible master function implemented) and Class 4

The test table for the Class 3 EUT (flexible master function implemented) and Class 4 EUT interconnectability test is defined in Table 179.

Table 179 – Test table for interconnectability test [Class 3 (device level functions implemented) and Class 4]

Major test group	Interconnectability [in case Class 3 EUT (device level functions implemented) and Class 4 EUT]		
Test procedure	a) Start the EUT and the test equipment, then start the network and leave it in operation status (normal status). b) Using test equipment #6, check for the message displayed which indicates the test has been started. c) Execute the Ping command on the setting tool computer to superimpose IP communication for the EUT.		
Evaluation criteria	The normal operation status continues for longer than 2 consecutive hours and no error is displayed for the message transmission echo back test or the device level test.		
Setting parameter (node)	EUT #3 or #4	Implementation class	3 or 4 (flexible master)
		Node number	230
		Token watchdog time	(50)
		Allowable minimum frame interval time	(10)
		Area 1 data top address	16#0000
		Area 1 data size	0
		Area 2 common memory setting	
		For Node #130 output data	
		Area 2 data top address	16#11B0
		Area 2 data size	16
		For Node #130 output status	
		Area 2 data top address	16#11C0
		Area 2 data size	64
		For Node #180 output data	
		Area 2 data top address	16#1200
		Area 2 data size	15
		For Node #180 output status	
		Area 2 data top address	16#120F
		Area 2 data size	80

Table 179 – Test table for interconnectability test [Class 3 (device level functions implemented) and Class 4] (continued)

Setting parameter (node) (continued)	Test equipment	Test equipment #5	Implementation class	3 (controller)
			Node number	249
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	16#0028
			Area 1 data size	8
			Area 2 data top address	16#0140
			Area 2 data size	64
		Test equipment #6	Implementation class	4 (flexible master)
			Node number	30
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	16#0000
			Area 1 data size	0
			Area 2 data top address	16#1100
			Area 2 data size	80
		Test equipment #7	Implementation class	6 (flexible slave)
			Node number	80
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	16#0000
			Area 1 data size	0
			Area 2 data top address	16#0400
			Area 2 data size	80
			Number of IO of a slave	Input: 256; Output: 256
		Test equipment #8	Implementation class	6 (flexible slave)
			Node number	130
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	16#0000
			Area 1 data size	0
			Area 2 data top address	16#0500
			Area 2 data size	80
			Number of IO of a slave	Input: 256; Output: 256
		Test equipment #9	Implementation class	6 (flexible slave)
			Node number	180
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	16#0000

Table 179 – Test table for interconnectability test [Class 3 (device level functions implemented) and Class 4] (continued)

Setting parameter (node) (continued)	Test equipment (continued)	Test equipment #9 (continued)	Area 1 data size	0	
			Area 2 data top address	16#0600	
			Area 2 data size	97	
			Number of IO of a slave	Input: 272; Output: 240	
Setting parameter (test data)	Data sent from master	EUT	Output data (for test equipment #8)	(No evaluation)	
			Remote control area (for test equipment #8)	(No evaluation)	
			Specified slave type (for test equipment #8)	Area 2; 16#11C1 : 16#FFFF	
				Area 2; 16#11D1 : 16#FFFF	
				Area 2; 16#11E1 : 16#FFFF	
				Area 2; 16#11F1 : 16#BFBF	
			Simple setting area (for test equipment #8)	Master node number instruction	16#00E6
				Slave operation instruction	(No evaluation)
				Master command area	(No evaluation)
			Reserved area (for test equipment #8)	(No evaluation)	
			Output data (for test equipment #8)	(No evaluation)	
			Remote control area (for test equipment #9)	(No evaluation)	
			Specified slave type (for test equipment #9)	Area 2; 16#1210 : 16#FFFF	
				Area 2; 16#1220 : 16#FFFF	
				Area 2; 16#1230 : 16#FFFF	
				Area 2; 16#1240 : 16#AFFF	
				Area 2; 16#1250 : 16#008F	
			Simple setting area (for test equipment #9)	Master node number instructions	16#00E6
				Slave operating instructions	(No evaluation)
				Master command area	(No evaluation)
			Reserved area (for test equipment #9)	(No evaluation)	
		Test equipment #6	Output data (for test equipment #7)	(Optional)	
			Remote control area (for test equipment #7)	(Optional)	
			Specified slave type (for test equipment #7)	Area 2; 16#1111 : 16#FFFF	
				Area 2; 16#1121 : 16#FFFF	
				Area 2; 16#1131 : 16#FFFF	
				Area 2; 16#1141 : 16#BFBF	

Table 179 – Test table for interconnectability test [Class 3 (device level functions implemented) and Class 4] (continued)

Setting parameter (test data) (continued)	Data sent from master (continued)	Test equipment #6 (continued)	Simple setting area (for test equipment #7)	Master node number instructions	16#001E
				Slave operation instructions	(Optional)
				Master command area	(Optional)
			Reserved area (for test equipment #7)	(Optional)	
	Data sent from slave	Test equipment #7	Input data	(Optional)	
			Slave status	(Optional)	
			Actual slave type	Area 2; 16#0411 : 16#FFFF	
				Area 2; 16#0421 : 16#FFFF	
				Area 2; 16#0431 : 16#FFFF	
				Area 2; 16#0441 : 16#BFBF	
			Simple setting confirmation area	Master node number	16#001E
				Slave operation setting confirmation status	(Optional)
				Master command area	(Optional)
			General-purpose status area	(Optional)	
		Test equipment #8	Input data	(Optional)	
			Slave status	(Optional)	
			Actual slave type	Area 2; 16#0511 : 16#FFFF	
				Area 2; 16#0521 : 16#FFFF	
				Area 2; 16#0531 : 16#FFFF	
				Area 2; 16#0541 : 16#BFBF	
			Simple setting confirmation area	Master node number	16#00E6
				Slave operation setting confirmation status	(Optional)
				Master command area	(Optional)
			General-purpose status area	(Optional)	
		Test equipment #9	Input data	(Optional)	
			Slave status	(Optional)	
			Actual slave type	Area 2; 16#0612 : 16#FFFF	
				Area 2; 16#0622 : 16#FFFF	
				Area 2; 16#0632 : 16#FFFF	
				Area 2; 16#0642 : 16#AFFF	
				Area 2; 16#0652 : 16#008F	
			Simple setting confirmation area	Master node number	16#00E6
				Slave operation setting confirmation status	(Optional)
				Master command area	(Optional)

Table 179 – Test table for interconnectability test [Class 3 (device level functions implemented) and Class 4] (continued)

Setting parameter (test data) (continued)	Data sent from slave (continued)	Test equipment #9 (continued)	General-purpose status area	(Optional)
	Transmission data in message transmission	Test equipment #6	Node address of source side (SNA)	30
			Node address of destination side (DNA)	230
			TCD	65 015 (message echo back request)
			Data size	512
			Contents of data	Arbitrary data specified by the test equipment manufacturer (different for each cycle)
	Received data in message transmission	Test equipment #6	Node address of source side (SNA)	230
			Node address of destination side (DNA)	30
			TCD	65 215 (message echo back response)
			Data size	512
			Contents of data	Arbitrary data specified by the test equipment manufacturer (different for each cycle)

7.8.4 Class 5

The test table of interconnectability test for EUT of Class 5 is defined in Table 180.

Table 180 – Test table for interconnectability test (Class 5)

Major test group	Interconnectability (when a Class 5 EUT is used)			
Test procedure	a) Start the EUT and the test equipment (5 units), then start the network and leave it in operation status (normal status). b) Using test equipment #11, check for the message displayed which indicates the test has been started. c) Execute the Ping command in the configuration tool computer to superimpose IP communication for the EUT.			
Evaluation criteria	The normal operation status continues for longer than 2 consecutive hours and no error is displayed for the message transmission echo back test or the device level test.			
Setting parameter (node)	EUT #5		Implementation class	5 (fixed master)
			Node number	100
			Token watchdog time	(100)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	16#0100
			Area 1 data size	192
			Area 2 data top address	16#0400
			Area 2 data size	768
	Test equipment	Test equipment #11	Implementation class	3 (controller)
			Node number	200
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	0

Table 180 – Test table for interconnectability test (Class 5) (continued)

Setting parameter (node) (continued)	Test equipment (continued)	Test equipment #11 (continued)	Area 1 data size	0
			Area 2 data top address	16#0800
			Area 2 data size	32
		Test equipment #12	Implementation class	5 (fixed master)
			Node number	150
			Token watchdog time	100
			Allowable minimum frame interval time	10
			Area 1 data top address	16#01C0
			Area 1 data size	64
			Area 2 data top address	16#0700
			Area 2 data size	256
		Test equipment #14	Implementation class	6 (operated in slave operation mode (fixed))
			Node number	1
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	16#0000
			Area 1 data size	8
			Area 2 data top address	16#0000
			Area 2 data size	32
			Number of IO of a slave	Input: 128; Output: 64
		Test equipment #15	Implementation class	7 (fixed slave)
			Node number	48
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	16#00BC
			Area 1 data size	4
			Area 2 data top address	16#02F0
			Area 2 data size	16
			Number of IO of a slave	Input: 32; Output: 48
		Test equipment #16	Implementation class	7 (fixed slave)
			Node number	64
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	16#00FC
			Area 1 data size	4
			Area 2 data top address	16#03F0
			Area 2 data size	16
			Number of IO of a slave	Input: 64; Output: 32

Table 180 – Test table for interconnectability test (Class 5) (continued)

Setting parameter (test data)	Master output	EUT #5	Output data (for test equipment #14)	(No evaluation)
			Remote control area (for test equipment #14)	(No evaluation)
			Specified slave type (for test equipment #14)	16#0401 : 16#FFBF in Area 2 16#0411 : 16#BF00 in Area 2
			Simple setting area (for test equipment #14)	Master node number instructions = 0 or 100
				Slave operation instructions = (No evaluation)
				Master command area = (No evaluation)
			Reserved area (for test equipment #14)	(No evaluation)
			Output data (for test equipment #15)	(No evaluation)
			Remote control area (for test equipment #15)	(No evaluation)
			Specified slave type (for test equipment #15)	16#9FAF
			Simple setting area (for test equipment #15)	Master node number instruction = 0 or 100
				Slave operation instruction = (No evaluation)
				Master command area = (No evaluation)
			Reserved area (for test equipment #15)	(No evaluation)
		Test equipment #12	Output data (for test equipment #16)	(Optional)
			Remote control area (for test equipment #16)	(Optional)
			Specified slave type (for test equipment #16)	16#BF9F
			Simple setting area (for test equipment #16)	Master node number instructions = 150
				Slave operation instructions = (Optional)
				Master command area = (Optional)
			Reserved area (for test equipment #16)	(Optional)
	Slave input	Test equipment #14	Input data	(Optional)
			Slave status	(Optional)
			Actual slave type	16#0001 : 16#FFBF in Area 2 16#0011 : 16#BF00 in Area 2
			Simple setting area	Master node number = 100
				Slave operation setting confirmation status = (Optional)
				Master command area = (Optional)
			General-purpose status area	(Optional)

Table 180 – Test table for interconnectability test (Class 5) (continued)

Setting parameter (test data) (continued)	Slave input (continued)	Test equipment #15	Input data	(Optional)
			Slave status	(Optional)
			Actual slave type	16#9FAF
			Simple setting area	Master node number = 100
				Slave operation setting confirmation status = (Optional)
				Master command area = (Optional)
			General-purpose status area	(Optional)
		Test equipment #16	Input data	(Optional)
			Slave status	(Optional)
			Actual slave type	16#BF9F
			Simple setting area	Master node number = 150
				Slave operation setting confirmation status = (Optional)
				Master command area = (Optional)
			General-purpose status area	(Optional)
	Transmission data in message transmission	Test equipment #11	Node address of source side (SNA)	200
			Node address of destination side (DNA)	100
			TCD	65 015 (message echo back request)
			Data size	1024
			Contents of data	Arbitrary data specified by the test equipment manufacturer (different for each cycle)
	Receipt of message transmission	Test equipment #11	Node address of source side (SNA)	100
			Node address of destination side (DNA)	200
			TCD	65 215 (message echo back response)
			Data size	1024
			Contents of data	Echoes back the contents of the data sent from test equipment #11.

7.8.5 Class 6

The test table for the Class 6 EUT interconnectability test is defined in Table 181.

Table 181 – Test table for interconnectability test (Class 6)

Major test group	Interconnectability (when a Class 6 EUT is used)			
Test procedure	a) Start the EUT and the test equipment then start the network and leave it in operation status (normal status). b) Using test equipment #6, check for the message displayed which indicates the test has been started. c) Execute the Ping command on the configuration tool computer to superimpose IP communication for the EUT.			
Evaluation criteria	The normal operation status continues for longer than 2 consecutive hours and no error is displayed for the device-level network test and the message transmission test.			
Setting parameter (node)	EUT #6		Implementation class	6 (flexible slave)
			Node number	180
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	16#0000
			Area 1 data size	0
			Area 2 common memory setting	
			For input data	
			Area 2 data top address	16#0600
			Area 2 data size	0 to 512 [a)]
			For input status	
			Area 2 data top address	16#0600 to 16#0800 [a)]
			Area 2 data size	16 to 2 048 [a)]
	Test equipment	Test equipment #5	Implementation class	3 (controller)
			Node number	249
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	16#0028
			Area 1 data size	8
			Area 2 data top address	16#0140
			Area 2 data size	64
		Test equipment #6	Implementation class	4 (flexible master)
			Node number	30
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	16#0000
			Area 1 data size	0
			Area 2 data top address	16#1100
			Area 2 data size	80
		Test equipment #7	Implementation class	6 (flexible slave)
			Node number	80
			Token watchdog time	50

Table 181 – Test table for interconnectability test (Class 6) (continued)

Setting parameter (node) (continued)	Test equipment (continued)	Test equipment #7 (continued)	Allowable minimum frame interval time	10
			Area 1 data top address	16#0000
			Area 1 data size	0
			Area 2 data top address	16#0400
			Area 2 data size	80
			Number of IO of a slave	Input: 256; Output: 256
		Test equipment #8	Implementation class	6 (flexible slave)
			Node number	130
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	16#0000
			Area 1 data size	0
			Area 2 data top address	16#0500
			Area 2 data size	80
			Number of IO of a slave	Input: 256; Output: 256
		Test equipment #10	Implementation class	4 (flexible master)
			Node number	230
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	16#0000
			Area 1 data size	0
			Area 2 common memory setting	
			For Node #130 output data	
			Area 2 data top address	16#11B0
			Area 2 data size	16
			For Node #130 output status	
			Area 2 data top address	16#11C0
			Area 2 data size	64
			For Node #180 output data	
			Area 2 data top address	16#1200
			Area 2 data size	0 to 512 [a)]
			For node #130 output status	
			Area 2 data top address	16#1200 to 16#1400 [a)]
			Area 2 data size	16 to 2 048 [a)]
Setting parameter (test data)	Data sent from master	Test equipmen#6	Output data (for test equipment #7)	(Optional)
			Remote control area (for test equipment #7)	(Optional)
			Specified slave type (for test equipment #7)	Area 2; 16#1111 : 16#FFFF
				Area 2; 16#1121 : 16#FFFF
				Area 2; 16#1131 : 16#FFFF
				Area 2; 16#1141 : 16#BFBF

Table 181 – Test table for interconnectability test (Class 6) (continued)

Setting parameter (test data) (continued)	Data sent from master (continued)	Test equipment #6 (continued)	Simple setting area (for test equipment #7)	Master node number instructions	16#001E
				Slave operation instructions	(Optional)
				Master command area	(Optional)
			Reserved area (for test equipment #7)	(Optional)	
		Test equipment #10	Output data (for test equipment #8)	(Optional)	
			Remote control area (for test equipment #8)	(Optional)	
			Specified slave type (for test equipment #8)	Area 2; 16#11C1 : 16#FFFF	
				Area 2; 16#11D1 : 16#FFFF	
				Area 2; 16#11E1 : 16#FFFF	
				Area 2; 16#11F1 : 16#BFBF	
			Simple setting area (for test equipment #8)	Master node number instructions	16#00E6
				Slave operation instructions	(Optional)
				Master command area	(Optional)
			Reserved area (for test equipment #8)	(Optional)	
			Output data (for the EUT)	(Optional)	
			Remote control area (for the EUT)	(Optional)	
			Specified slave type (for the EUT)	a)	
			Simple setting area (for the EUT)	Master node number instructions	16#00E6
				Slave operation instructions	(Optional)
				Master command area	(Optional)
			Reserved area (for the EUT)	(Optional)	
	Data sent from slave	EUT	Input data	(No evaluation)	
			Slave status	16#0001 or 16#0003	
			Actual slave type	a)	
			Simple setting confirmation area	Master node number	16#00E6
				Slave operation setting confirmation status	(No evaluation)
				Master command area	(No evaluation)
			General-purpose status area	(No evaluation)	

Table 181 – Test table for interconnectability test (Class 6) (continued)

Setting parameter (test data) (continued)	Data sent from slave (continued)	Test equipment #7	Input data	(Optional)	
			Slave status	(Optional)	
			Actual slave type	Area 2; 16#0411 : 16#FFFF	
				Area 2; 16#0421 : 16#FFFF	
				Area 2; 16#0431 : 16#FFFF	
				Area 2; 16#0441 : 16#BFBF	
			Simple setting confirmation area	Master node number	16#001E
				Slave operation setting confirmation status	(Optional)
				Master command area	(Optional)
			General-purpose status area	(Optional)	
		Test equipment #8	Input data	(Optional)	
			Slave status	(Optional)	
			Actual slave type	Area 2; 16#0511 : 16#FFFF	
				Area 2; 16#0521 : 16#FFFF	
				Area 2; 16#0531 : 16#FFFF	
				Area 2; 16#0541 : 16#BFBF	
			Simple setting confirmation area	Master node number	16#00E6
				Slave operation setting confirmation status	(Optional)
				Master command area	(Optional)
			General-purpose status area	(Optional)	
	Transmission data in message transmission	Test equipment #6	Node address of source side (SNA)	30	
			Node address of destination side (DNA)	180	
			TCD	65 015 (message echo back request)	
			Data size	512	
			Contents of data	Arbitrary data specified by the test equipment manufacturer (different for each cycle)	
	Received data in message transmission	Test equipment #6	Node address of source side (SNA)	180	
			Node address of destination side (DNA)	30	
			TCD	65 215 (message echo back response)	
			Data size	512	
			Contents of data	Arbitrary data specified by the test equipment manufacturer (different for each cycle)	
Note [a)] This depends on the IO size of the EUT #6.					

7.8.6 Class 7

The test table for the Class 7 EUT interconnectability test is defined in Table 182.

Table 182 – Test table for interconnectability test (Class 7)

Major test group	Interconnectability (incase EUT is Class 7)			
Test procedure	a) Start the EUT and the test equipment (5 units), then start the network and leave it in operation status (normal status). b) Using test equipment #11, check for the message displayed which indicates the test has been started. c) Execute the Ping command on the configuration tool computer to superimpose IP communication for the EUT.			
Evaluation criteria	The normal operation status continues for longer than 2 consecutive hours and no error is displayed for the message transmission echo back test or the device level test.			
Setting parameter (node)	EUT #7		Implementation class	7(Fixed slave)
			Node number	10
			Token watchdog time	(50)
			Allowable minimum frame interval time	(10)
			Area 1 data top address	16#0024
			Area 1 data size	Varies according to the number of input points of the slave of the EUT.
			Area 2 data top address	16#0090
			Area 2 data size	Varies according to the number of input points and output points of the slave of the EUT.
	Test equipment	Test equipment #11	Implementation class	3 (controller)
			Node number	200
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	0
			Area 1 data size	0
			Area 2 data top address	16#0800
			Area 2 data size	32
		Test equipment #13	Implementation class	5 (fixed master)
			Node number	100
			Token watchdog time	100
			Allowable minimum frame interval time	10
			Area 1 data top address	16#0100
			Area 1 data size	256
			Area 2 data top address	16#0400
			Area 2 data size	1024
		Test equipment #14	Implementation class	6 (operating in slave operation mode (fixed))
			Node number	1
			Token watchdog time	50
			Allowable minimum frame interval time	10
			Area 1 data top address	16#0000

Table 182 – Test table for interconnectability test (Class 7) (continued)

Setting parameter (node) (continued)	Test equipment (continued)	Test equipment #14 (continued)	Area 1 data size	8
			Area 2 data top address	16#0000
			Area 2 data size	32
			Number of IO of a slave	Input points: 128, Output points: 64
		Test equipment #15	Implementation class	7 (fixed slave)
			Area 1 data size	48
			Area 2 data top address	50
			Area 2 data size	10
			Area 1 data size	16#00BC
			Area 2 data top address	4
			Area 2 data size	16#02F0
			Area 1 data size	16
			Number of IO of a slave	Input points: 32; Output points: 48
		Test equipment #16	Implementation class	7 (fixed slave)
			Area 1 data size	64
			Area 2 data top address	50
			Area 2 data size	10
			Area 1 data size	16#00FC
			Area 2 data top address	4
			Area 2 data size	16#03F0
			Area 1 data size	16
			Number of IO of a slave	Input points: 64; Output points: 32
Setting parameter (test data)	Master output	Test equipment #13	Output data (for EUT #7)	(Optional)
			Remote control area (for EUT #7)	Set up in accordance with the number of input points and output points of the slave of the EUT
			Specified slave type (for EUT #7)	(Optional)
			Simple setting area (for EUT #7)	Master node number instructions = 16#00 (default)
				Slave operation instructions = (Optional)
				Master command area = (Optional)
			Reserved area (for EUT #7)	(Optional)
			Output data (for test equipment #14)	(Optional)
			Remote control area (for test equipment #14)	(Optional)
			Specified slave type (for test equipment #14)	16#0401 : 16#FFBF in Area 2 16#0411 : 16#BF00 in Area 2
			Simple setting area (for test equipment #14)	Master node number instruction = 16#00 (default)

Table 182 – Test table for interconnectability test (Class 7) (continued)

Setting parameter (test data) (continued)	Master output (continued)	Test equipment #13 (continued)	Simple setting area (for test equipment #14) (continued)	Slave operation instruction = (Optional)
				Master command area = (Optional)
			Reserved area (for test equipment #14)	(Optional)
			Output data (for test equipment #15)	(Optional)
			Remote control area (for test equipment #15)	(Optional)
			Specified slave type (for test equipment #15)	16#9FAF
			Simple setting area (for test equipment #15)	Master node number instruction = 16#00 (default)
				Slave operation instructions = (Optional)
				Master command area = (Optional)
			Reserved area (for test equipment #15)	(Optional)
			Output data (for test equipment #16)	(Optional)
			Remote control area (for test equipment #16)	(Optional)
			Specified slave type (for test equipment #16)	16#BF9F
			Simple setting area (for test equipment #16)	Master node number instructions = 16#00 (default)
				Slave operation instruction = (Optional)
				Master command area = (Optional)
			Reserved area (for test equipment #16)	(Optional)
	Slave input	EUT #7	Input data	(No evaluation)
			Slave status	1 (stopped) or 3 (running)
			Actual slave type	(No evaluation)
			Simple setting area	Master node number = 100
				Slave operation setting confirmation status = (No evaluation)
				Master command area = (No evaluation)
			General-purpose status area	(No evaluation)
		Test equipment #14	Input data	(Optional)
			Slave status	(Optional)
			Actual slave type	16#0001 : 16#FFBF in Area 2 16#0011 : 16#BF00 in Area 2

Table 182 – Test table for interconnectability test (Class 7) (continued)

Setting parameter (test data) (continued)	Slave input (continued)	Test equipment #14 (continued)	Simple setting area	Master node number = 100
				Slave operation setting confirmation status = (Optional)
				Master command area = (Optional)
			General-purpose status area	(Optional)
		Test equipment #15	Input data	(Optional)
			Slave status	(Optional)
			Actual slave type	16#9FAF
			Simple setting area	Master node number = 100
				Slave operation setting confirmation status = (Optional)
				Master command area = (Optional)
			General-purpose status area	(Optional)
		Test equipment #16	Input data	(Optional)
			Slave status	(Optional)
			Actual slave type	16#BF9F
			Simple setting area	Master node number = 100
				Slave operation setting confirmation status = (Optional)
				Master command area = (Optional)
			General-purpose status area	(Optional)
	Transmission data in message transmission	Test equipment #11	Node address of source side (SNA)	200
			Node address of destination side (DNA)	10
			TCD	65 015 (message echo back request)
			Data size	1 024
			Contents of data	Arbitrary data specified by the test equipment manufacturer (different for each cycle)
	Receipt of message transmission	Test equipment #11	Node address of source side (SNA)	10
			Node address of destination side (DNA)	200
			TCD	65 215 (message echo back response)
			Data size	1 024
			Contents of data	Echoes back the contents of the data sent from the test equipment #11.

Reference JIS B 3502 Industrial-process measurement and control - Programmable controllers-Equipment requirements and tests

JEM 1480 : 2012

Testing Specifications for FA Control Network [FL-net] Explanation

This explanation describes items specified in the main body of this standard and matters related to these items. It is not a part of this standard.

1 Purpose and history of establishment and amendment

1.1 Purpose of establishment

This standard was established in 2000 as test specifications to check the FL-net protocol conformance of devices manufactured in accordance with JIS B 3521 (Protocol specification for FA control network standard) or JEM 1479 (Protocol specification for FA control network standard), and to check operation of these devices when used in combination with devices that conform to JEM 1480 (hereinafter called “conforming devices”).

1.2 History of establishment

This standard is based on “FL-net conformance test specification version 1.1(established in Aug./1999)” and “FL-net interconnectability test specification JOP-1010 version 1.0 (established in 2/Aug/2000)” which are settled by the FA Control Committee of FA Open Promotion Council of Manufacturing Science Technical Center (MSTC). In order to establish this standard as a JEM standard, certain parts of the descriptions, namely those related to certification we removed or modified.

This standard is designed to check the services, functions, and operations specified in Protocol specification. The tests are divided into two parts: a conformance test and an interconnectability test. The conformance test is conducted via peer-to-peer communication with an item of test equipment. The interconnectability test checks consecutive operations with multiple items of test equipment connected to the EUT.

1.3 Purpose of revision

This standard was revised in April 1, 2002 along with revision of **JIS B 3521** on which this standard is based.

The JIS B 3521 revision defines new token mode that shall be installed mandatory. In the token mode, data of a token- attached cyclic frame is segregated into a frame with cyclic data and a token-only frame. With the revision, this standard added related test objects and amended details of the test specification and descriptions.

In the 2006 revision, considering market trends for the network products according to JIS X 5252 on which FL-net is based, some of the test structures and the test procedures of this standard were revised to apply with 100 Mbps standard specified in JIS X 5252.

In the 2011 revision, this standard was revised along with the revisions made to JEM 1479.

JEM 1479:2011 allows superimposition of IP packets other than the FL-net protocol, and added device level communication services. The function for communicating general-purpose commands via UDP and TCP was also added to support common general-purpose setting tools. Thus, this standard added a test for checking device level communication and general-purpose command service communication to the conformance test. It also added tests for checking IP communication superimposition and device level communication to the interconnectability test. The interconnectability test has no special test items related to the general-purpose setting tool considering it is good enough that the tool connected to the network is available.

In JEM 1479:2011, Classes 3 to 7 were added as implementation classes to supplement

Classes 1 and 2. Thus, in this standard conformance test objects are defined by class. Because different system structures are assumed for different classes in the interconnectability test, the network configuration with test equipment has also been modified.

The main points of the 2011 revision are as follows:

a) The test tables were drastically enhanced and modified in response to the expanded specifications.

b) The structure of the interconnectability tests was revised and organized by class.

c) The descriptions and language used in this standard were modified or added accordingly.

In the 2012 revision, an increase in the number of classes was made in the 2011 revision. The test tables for Class 1 and Class 2 were modified to improve their compatibility with the previous version of this standard. The other test tables were also amended to correct errors and clarify ambiguous points.

The main points of the 2012 revision are as follows:

a) Slave point ranges were added to the basic parameter ranges of the test (Table 4).

b) The test tables carried over from the previous version (Test No.: V2-xxx) were modified to ensure compatibility.

c) The test tables for 6.4 Conformance Test were modified to clarify ambiguous points.

d) The test tables for 7. Interconnectability Test were also modified to maintain compatibility with Class 1 and 2, and to clarify ambiguous points.

1.4 Overview of 2023 revision

In line with the product trend in the world, we reviewed the related test configuration and test method to support the transmission speed of 1000 Mbps.

2 Major points of revision

The main points of the revision are as follows:

a) 6.1 Structure of conformance test and 7.1 Test structure
In accordance with support for 1000 Mbps, the cables used and the transmission speed were changed. In addition, we standardized the test configuration for each communication speed, and set the test configuration to correspond to the communication speed according to EUT by setting the hub.

3 Scope (Article 1)

In general, the tests for checking the functions and performance of network devices include an environmental test, a hardware test, a conformance test (in which each specification item for a communication protocol is examined), and a test conducted in an environment that resembles a real network configuration, such as an interconnectability test.

The hardware test that checks electrical characteristics of the physical layer is not defined in this standard because the definition of physical layer is outside the scope of JIS B 3521. Neither are the environmental tests (weather endurance test, electrical test, mechanical test, etc.) defined because it is considered to be tested and checked according to the manufacturer’s specification.

It is recommended that the manufacturer follow JIS B 3502 if the EUT is a programmable controller.

4 Contents

4.1 Test objects of conformance test (6.2)

The “test objects” in Table 3 are checked by referring to Tables 7 through 160. Tables 7 through 160 consist of test number, major test group, test group, test objects, test procedure, evaluation criteria, test necessity identified by the EUT class, setting parameters (node), and setting parameters (test data). A test is performed by assigning setting parameters (node) and setting parameters (test data) to the EUT and test equipment, and then by operating the EUT and test equipment in accordance with the test procedure. The test results are judged based on the evaluation criteria by checking the data of the EUT and the test equipment (through the use of peripheral devices, such as the display of the EUT) and the communication frame record on the network.

4.2 Conformance tester (6.4)

The test for checking communication protocols must examine all behavior in normal status and behavior in abnormal status as defined in the respective protocol specifications. One common method used to conduct this check is to establish a peer-to-peer connection between the EUT and an item of test equipment that simulates normal and abnormal statuses. The behavior of the EUT is analyzed and checked, and a report of the results is created. This particular method is defined in this standard.

4.3 Performance measurement (6.7)

The purpose of Table 160 is to measure the time EUT begins to send tokens. No judgment is performed based on the evaluation criteria.

4.4 Interconnectability test (Article 7)

Unlike the conformance test, the interconnectability test does not conduct a check of the communication protocol. Even if a device passes the conformance test, it might still fail to operate properly during actual use due to differences with lower communication layers, different interpretations of ambiguous parts of specifications that cannot be detected in tests, and other factors. The interconnectability test in this standard places the EUT in an environment that resembles a real environment, connecting it to test equipment which has been already verified for conformance, and running consecutive tests. This approach makes it possible to detect the problems described above.