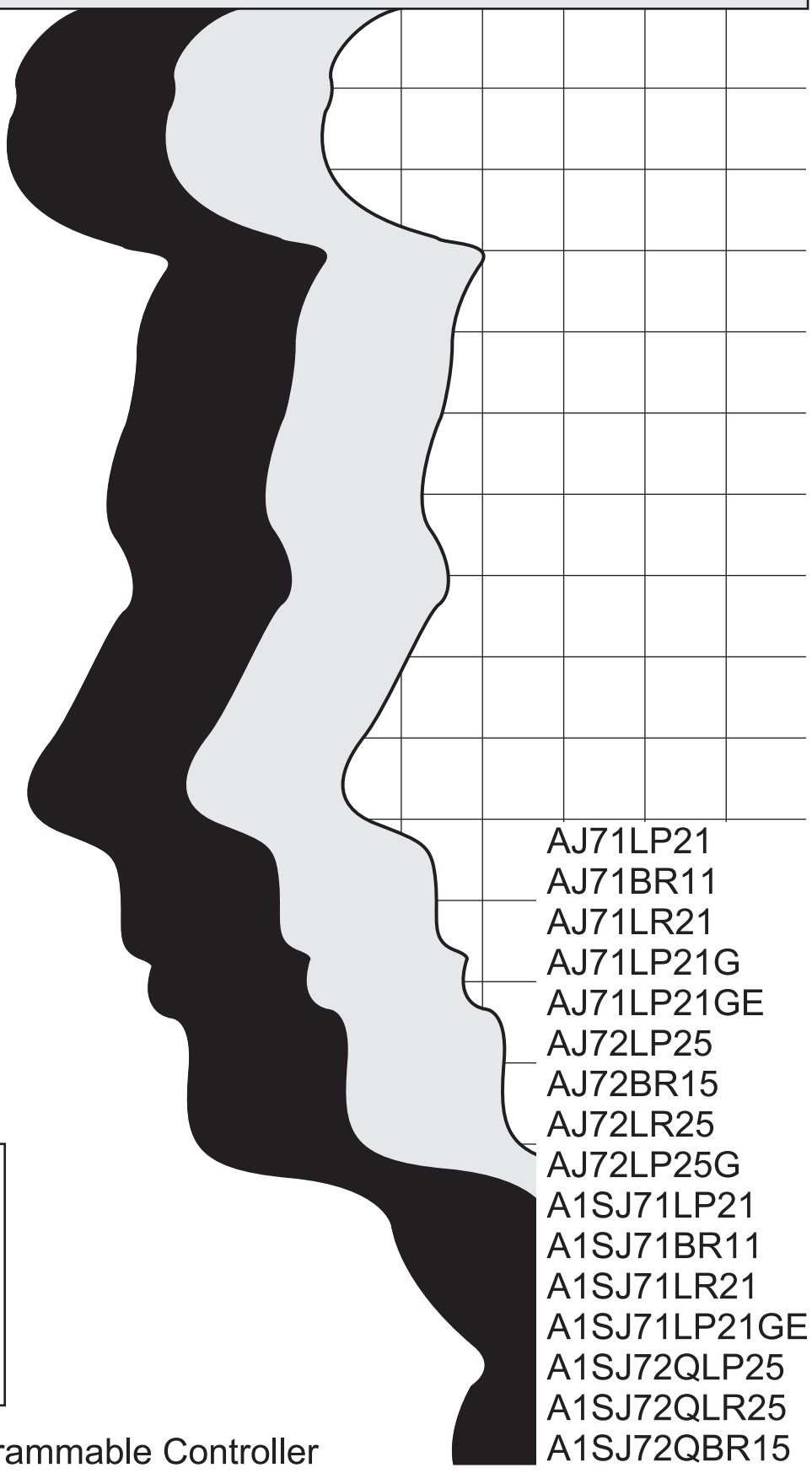
MITSUBISHI

Type MELSECNET/10 Network System (Remote I/O network)

Reference Manual



AJ71LP21
AJ71BR11
AJ71LR21
AJ71LP21G
AJ71LP21GE
AJ72LP25
AJ72BR15
AJ72LR25
AJ72LP25G
A1SJ71LP21
A1SJ71BR11
A1SJ71LR21
A1SJ71LP21GE
A1SJ72QLP25
A1SJ72QLR25
A1SJ72QBR15

MELSEC

Mitsubishi Programmable Controller

• SAFETY PRECAUTIONS •

(Read these precautions before using this product.)

Before using this product, please read this manual and the relevant manuals carefully and pay full attention to safety to handle the product correctly.
The precautions given in this manual are concerned with this product only.
For the safety precautions of the programmable controller system, refer to the user's manual for the CPU module used.
In this manual, the safety precautions are classified into two levels: "⚠WARNING" and "⚠CAUTION".

⚠WARNING	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
⚠CAUTION	Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury or property damage.

Under some circumstances, failure to observe the precautions given under "⚠CAUTION" may lead to serious consequences.
Observe the precautions of both levels because they are important for personal and system safety.

Make sure that the end users read this manual and then keep the manual in a safe place for future reference.

[Design Precautions]

⚠WARNING

- In the case of a communication failure in the network, the status of the error station will be as follows:
  Check the communication status information and configure an interlock circuit in the sequence program to ensure that the entire system will operate safely.
  Failure to do so may result in an accident due to an incorrect output or malfunction.
  (1) The data prior to the error is retained.
  (2) All outputs from remote I/O stations are turned off.

⚠CAUTION

- Do not install the control lines or communication cables together with the main circuit lines or power cables. Keep a distance of 100mm (3.94 inches) or more between them.
  Failure to do so may result in malfunction due to noise.

[Installation Precautions]

⚠CAUTION

- Use the programmable controller in an environment that meets the general specifications in the user's manual for the CPU module used.
  Failure to do so may result in electric shock, fire, malfunction, or damage to or deterioration of the product.
- To mount the AJ71LP21(G), AJ71LR21, AJ71BR11, AJ72LP25(G), AJ72LR25, or AJ72BR15, fully insert the module fixing projection(s) located in the lower part of the module into the hole(s) in the base unit and press the module until it snaps into place.
  Incorrect mounting may cause malfunction, failure, or drop of the module.
  When using the programmable controller in an environment of frequent vibrations, fix the module with a screw.
  Tighten the screw within the specified torque range.
  Undertightening can cause drop of the screw, short circuit or malfunction.
  Overtightening can damage the screw and/or module, resulting in drop, short circuit, or malfunction.
- To mount the A1SJ71LP21, A1SJ71LR21, A1SJ71BR11, A1SJ72QLP25, A1SJ72QLR25, or A1SJ72QBR15, fully insert the module fixing projection(s) located in the lower part of the module into the hole(s) in the base unit and press the module until it snaps into place.
  Not installing the module correctly or not fixing it with the screws could result in malfunction, damage, or drop of some pieces of the product.
  Tighten the screw within the specified torque range.
  Undertightening can cause drop of the screw, short circuit or malfunction.
  Overtightening can damage the screw and/or module, resulting in drop, short circuit, or malfunction.
- Do not directly touch the printed circuit board, the conductive parts and electronic parts of the module.
  Doing so can cause malfunction or failure of the module.
- Before handling the module, touch a grounded metal object to discharge the static electricity from the human body.
  Failure to do so may cause the module to fail or malfunction.
- Shut off the external power supply (all phases) used in the system before mounting or removing the module.
  Failure to do so may result in damage to the product.

[Wiring Precautions]

⚠WARNING

- Shut off the external power supply (all phases) used in the system before wiring.
  Failure to do so may result in electric shock or damage to the product.

⚠CAUTION

- Prevent foreign matter such as dust or wire chips from entering the module.
  Such foreign matter can cause a fire, failure, or malfunction.
- Properly solder the parts of a soldering-type coaxial cable connector. Incomplete soldering may result in malfunction.
- Crimp the parts of a crimping-type coaxial cable connector with proper force at a proper position.
  Failure to do so may cause drop of the cable or malfunction.
- Place the cables in a duct or clamp them.
  If not, dangling cable may swing or inadvertently be pulled, resulting in damage to the module or cables or malfunction due to poor contact.
- When disconnecting the cable from the module, do not pull the cable by the cable part.
  For the cable with connector, hold the connector part of the cable.
  Failure to do so may result in damage to the module or cable or malfunction due to poor contact.

[Startup and Maintenance Precautions]

⚠WARNING

- Do not touch any connector while power is on. Failure to do so may cause malfunction.

⚠CAUTION

- Read this manual thoroughly and confirm the safety before starting online operations instructed from peripheral devices to a CPU module running at another station (especially in the case of program modification, forced output or change of operation status).
  Improper operation may damage machines or cause accidents.
- Do not disassemble or modify the module.
  Doing so may cause failure, malfunction, injury, or a fire.
- Use any radio communication device such as a cellular phone or PHS (Personal Handy-phone System) more than 25cm (9.85 inches) away in all directions from the programmable controller.
  Failure to do so may cause malfunction.
- Shut off the external power supply (all phases) used in the system before mounting or removing the module.
  Failure to do so may cause the module to fail or malfunction.
- Do not touch any terminal while power is on.
  Failure to do so may cause malfunction.
- Shut off the external power supply (all phases) used in the system before cleaning the module or retightening the terminal screws or module mounting screws.
  Failure to do so may cause the module to fail or malfunction.
  Undertightening can cause drop of the screw, short circuit or malfunction.
  Overtightening can damage the screw and/or module, resulting in drop, short circuit, or malfunction.
- Before handling the module, touch a grounded metal object to discharge the static electricity from the human body.
  Failure to do so may cause the module to fail or malfunction.

[Disposal Precautions]

⚠CAUTION

- When disposing of this product, treat it as industrial waste.

• CONDITIONS OF USE FOR THE PRODUCT •

(1) Mitsubishi programmable controller ("the PRODUCT") shall be used in conditions;
i) where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident; and
ii) where the backup and fail-safe function are systematically or automatically provided outside of the PRODUCT for the case of any problem, fault or failure occurring in the PRODUCT.

(2) The PRODUCT has been designed and manufactured for the purpose of being used in general industries.
MITSUBISHI SHALL HAVE NO RESPONSIBILITY OR LIABILITY (INCLUDING, BUT NOT LIMITED TO ANY AND ALL RESPONSIBILITY OR LIABILITY BASED ON CONTRACT, WARRANTY, TORT, PRODUCT LIABILITY) FOR ANY INJURY OR DEATH TO PERSONS OR LOSS OR DAMAGE TO PROPERTY CAUSED BY the PRODUCT THAT ARE OPERATED OR USED IN APPLICATION NOT INTENDED OR EXCLUDED BY INSTRUCTIONS, PRECAUTIONS, OR WARNING CONTAINED IN MITSUBISHI'S USER, INSTRUCTION AND/OR SAFETY MANUALS, TECHNICAL BULLETINS AND GUIDELINES FOR the PRODUCT.
("Prohibited Application")
Prohibited Applications include, but not limited to, the use of the PRODUCT in;
- Nuclear Power Plants and any other power plants operated by Power companies, and/or any other cases in which the public could be affected if any problem or fault occurs in the PRODUCT.
- Railway companies or Public service purposes, and/or any other cases in which establishment of a special quality assurance system is required by the Purchaser or End User.
- Aircraft or Aerospace, Medical applications, Train equipment, transport equipment such as Elevator and Escalator, Incineration and Fuel devices, Vehicles, Manned transportation, Equipment for Recreation and Amusement, and Safety devices, handling of Nuclear or Hazardous Materials or Chemicals, Mining and Drilling, and/or other applications where there is a significant risk of injury to the public or property.

Notwithstanding the above, restrictions Mitsubishi may in its sole discretion, authorize use of the PRODUCT in one or more of the Prohibited Applications, provided that the usage of the PRODUCT is limited only for the specific applications agreed to by Mitsubishi and provided further that no special quality assurance or fail-safe, redundant or other safety features which exceed the general specifications of the PRODUCTs are required. For details, please contact the Mitsubishi representative in your region.

REVISIONS

*The manual number is given on the bottom left of the back cover.

Print Date	*Manual Number	Revision
Sep., 1994	SH (NA) 3509-A	First edition
Nov., 1997	SH (NA) 3509-B	Correction Section 1.6, 2.2, 4.3.2, 7.2.1, 8.2, 10.3 Addition Section 1.4, 11.1
Jul., 2001	SH (NA) 3509-C	Model addition A1SJ71LR21, A1SJ72QLP25, A1SJ72QBR15, A1SJ72QLR25 Correction SAFETY PRECAUTIONS, MANUALS, Section 1.1, 1.2, 1.3.1, 1.4, 1.6, 2.1, 2.2, 2.3.1, 3.1, 3.2.1, 3.2.2, 3.3.1, 3.3.2, 3.4.1, 3.4.2, 3.4.3, 3.4.4, 3.4.6, 4.4.1, 5.1, 6.1, 7, 7.1.3, 7.4, 7.5.1, 7.6.1, 8.2.3, 8.2.4, 9.1.3, 10.1, 10.2.1, 10.2.2, 10.3.1, 10.3.2, 11.1, Addition 3.3.3, 7.6.5, WARRANTY
Jun., 2003	SH (NA) 3509-D	Partial additions SAFETY PRECAUTIONS, Section 3.3.2, 3.3.3, 4.4.1, 4.4.2, 10.3.2, 11.1, 11.2.1, 11.3
Oct., 2004	SH (NA) 3509-E	Partial additions SAFETY PRECAUTIONS, Section 1.2, 1.4, 2.1, 2.2, 2.3.1, 2.3.2, 3.2.1, 3.2.2, 3.3.1, 3.3.2, 3.3.3, 7.5.2, 7.6.5, 10.3.1, 10.3.2, WARRANTY
Mar., 2006	SH (NA) 3509-F	Partial additions SAFETY PRECAUTIONS, Section 1.4, 1.6, 2.3.1, 3.2, 3.3, 3.4, 11.1, APPENDIX 2
Aug., 2006	SH (NA) 3509-G	Partial additions Section 2.1, 2.2, 3.2.1, 3.2.2, 3.3.1, 3.3.3
Jun., 2007	SH (NA) 3509-H	Partial additions Section 3.3.1, 3.3.2, 3.3.3
Mar., 2012	SH (NA) 3509-I	Partial corrections SAFETY PRECAUTIONS, COMPLIANCE WITH THE EMC AND LOW VOLTAGE DIRECTIVES, Section 1.2, 1.4, 1.6, 2.1, 2.3.1, 2.3.2, 3.2.1, 3.3.2, 3.3.3, 4.1.1, 5.2, 7.1.1, 9.1.3, 10.4.2, Appendix 1.6 Addition CONDITIONS OF USE FOR THE PRODUCT

REVISIONS

*The manual number is given on the bottom left of the back cover.

Print Date	*Manual Number	Revision
Jul., 2013	SH (NA) 3509-J	Partial corrections Manuals, Section 1.2, 2.1, 3.3.1, 4.2.2, 5.1.2, 5.2, 5.2.1, 5.2.2, 5.2.3, 5.2.4, Chapter 7, Section 7.6.4, 7.6.5, 8.2.2, 10.3.1, 10.3.2, 10.3.3, 11.1, 11.2, 11.2.4, 11.3, Appendix 2

Japanese Manual Version SH-3503-L

INTRODUCTION

Thank you for choosing the Mitsubishi MELSEC-A Series of General Purpose Programmable Controllers. Please read this manual carefully so that the equipment is used to its optimum. A copy of this manual should be forwarded to the end User.

CONTENTS

How to Use This Manual

This manual describes the system configuration, performance, specifications, functions, programming, etc., of the MELSECNET/10 network system.
The manual is divided into three parts: GUIDANCE (Sections 1 through 5), DETAIL DESCRIPTION (Sections 6 through 11), and the APPENDIX.

GUIDANCE

It is essential to read this part if using a MELSECNET/10 remote I/O network for the first time.

1 GENERAL DESCRIPTION
- This section describes the characteristics of the remote I/O network.

2 SPECIFICATIONS
- This section gives the performance specifications and describes the data link cables.

3 PRE-OPERATION PROCEDURES
- This section describes the procedures and settings prior to establishing the data link.

4 STARTING OPERATION
- This section describes the establishment of a data link using actual system examples.

5 OPERATIONS POSSIBLE AT PERIPHERAL DEVICES
- This section describes the monitoring and testing functions that can be performed from peripheral devices.

DETAIL DESCRIPTION

Read this part when you understand the contents of the GUIDANCE part and need more detailed information in order to design a system or carry out programming.

6 SYSTEM CONFIGURATIONS
- This section describes the device ranges and parameter setting items for configuring a system.

7 FUNCTIONS
- This section describes the functions of the system.

8 LINK DATA SEND/RECEIVE PROCESSING & PROCESSING TIME
- This section describes the methods for send and receive processing using the data link, the time required for processing.

9 NETWORK SETTINGS
- This section describes the parameters set at peripheral devices.

10 PROGRAMMING
- This section describes how to create programs.

11 TROUBLESHOOTING
- This section describes the corrective action to take when faults occur.

Manuals

The manuals relating to MELSECNET/10 network systems and remote I/O networks are indicated below.
Order the manuals indicated in this table if required.

Related Manuals

Manual name	Manual number (model code)
Type MELSECNET/10 Network system (PLC to PLC network) Reference Manual Describes the specifications of the MELSECNET/10 network system (PLC to PLC network), procedures before operation, parameter settings, programming, and troubleshooting. (Sold separately)	IB-66440 (13JE33)
type SW4IVD-GPPA(GPP) Operating Manual Describes parameter settings, network monitor, and network diagnosis. (Included with the product)	IB-66855 (13JL62)
Q Corresponding MELSECNET/H Remote I/O Module Reference Manual (MELSECNET/10 Mode) Describes the operating procedures, system configuration, parameter settings, functions, programming, and troubleshooting of the MELSECNET/H remote I/O module when used in MELSECNET/10 mode. (Sold separately)	SH-081164ENG (13JV30)

COMPLIANCE WITH THE EMC AND LOW VOLTAGE DIRECTIVES

(1) Method of ensuring compliance

To ensure that Mitsubishi programmable controllers maintain EMC and Low Voltage Directives when incorporated into other machinery or equipment, certain measures may be necessary. Please refer to one of the following manuals.

- User's manual for the CPU module used
- User's manual (hardware) for the CPU module or base unit used

(2) Additional measures

To ensure that this product maintains EMC and Low Voltage Directives, please refer to one of the manuals listed under (1).

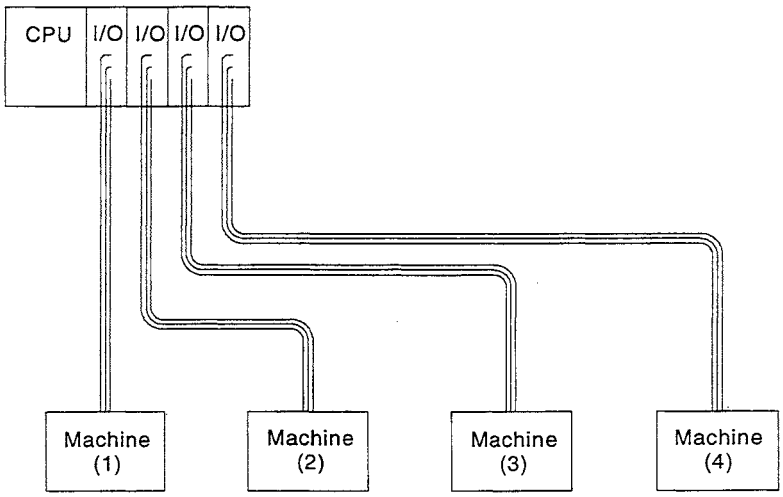
GUIDANCE

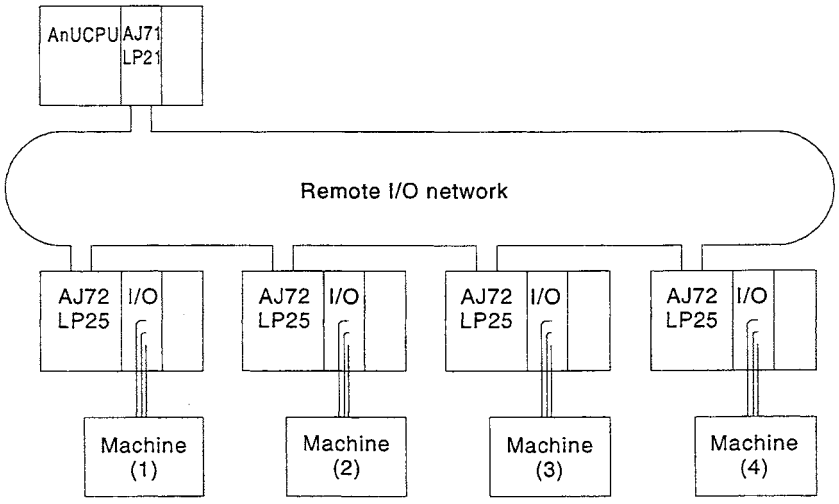
1. GENERAL DESCRIPTION

1.1 What is a Remote I/O Network?

If a machine controlled by a programmable controller is a long way from the programmable controller, the wiring is both troublesome and costly. However, it is possible to reduce the wiring requirements, cut costs, and shorten start-up time by installing the I/O portion close to the machine and connecting it in a remote I/O network.

> Note that a remote I/O network is a network consisting exclusively of remote I/O stations which has an A2ASCPU and AnUCPU as the master station. Stations in a PLC to PLC network cannot be included in the same network.





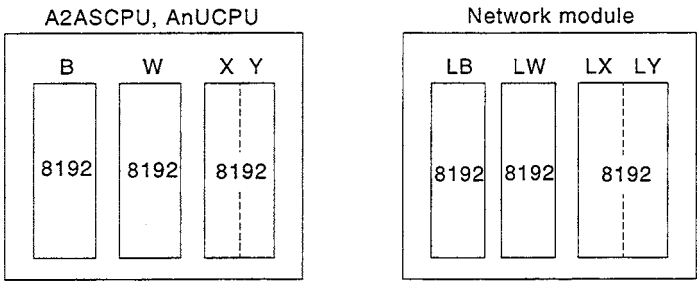
1.2 Features

(1) High-speed communication

At 10 MBPS, the communication speed is as fast as in a PLC to PLC network.

(2) Large link device capacity

(a) There are 8192 points for each type of link device (LB, LW, LX, LY) in the master station.



(b) The maximum number of link points that can be allocated to one remote I/O station is 1600.

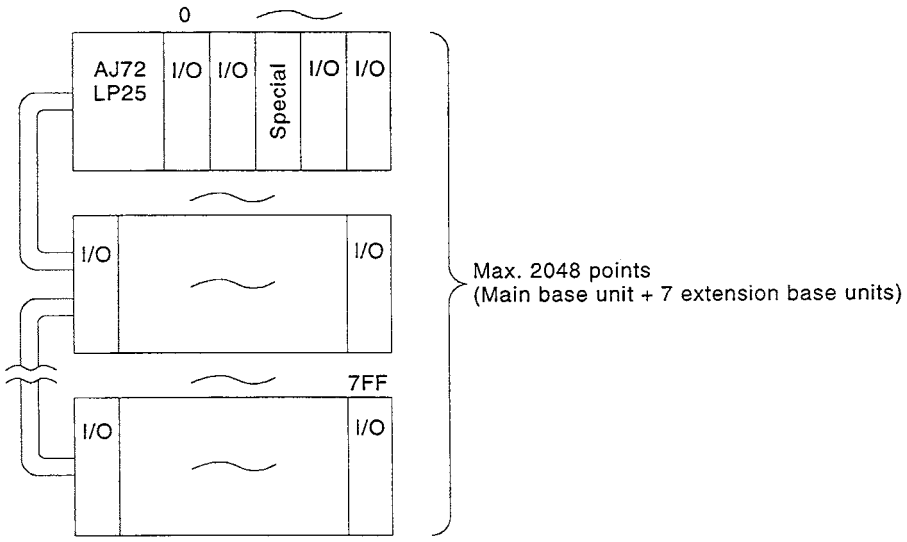
Master station → remote I/O station

$$\frac{LB + LY}{8} + (2 \times LW) \leq 1600 \text{ bites}$$

Master station ← remote I/O station

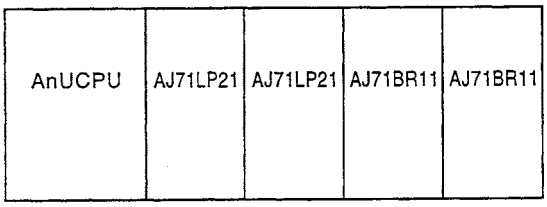
$$\frac{LB + LX}{8} + (2 \times LW) \leq 1600 \text{ bites}$$

(c) The maximum number of I/O points that can be used at one remote I/O station is 2048.



(3) Large-scale systems

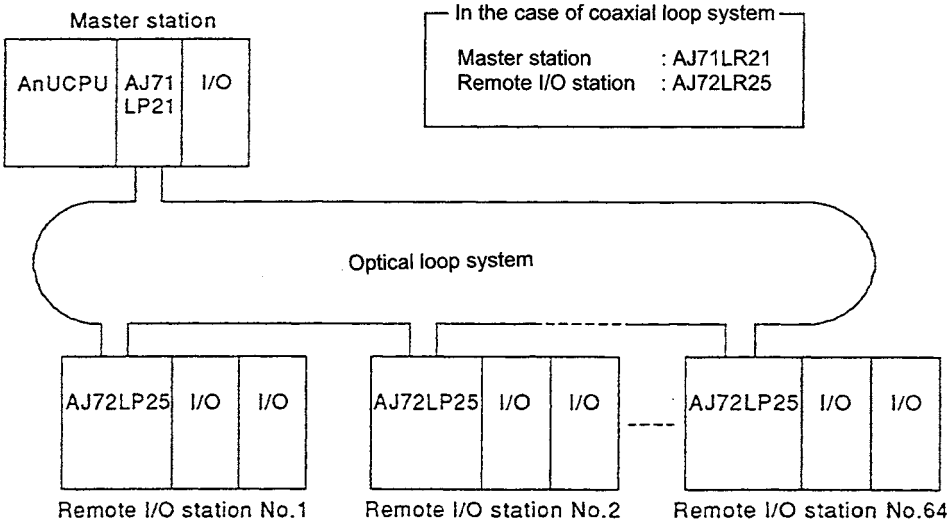
(a) Up to 4 network modules can be installed to one A2ASCPU or AnUCPU.



(b) The optical loop system/coaxial loop system or coaxial bus system can be selected.

1) Optical loop system/coaxial loop system

In the optical loop system, the transmission paths are not affected by noise since fiber-optic cables are used.
In the coaxial loop system, wiring can be performed easily since coaxial cables are used.
Up to 64 remote I/O stations can be connected to one master station.



Optical loop system

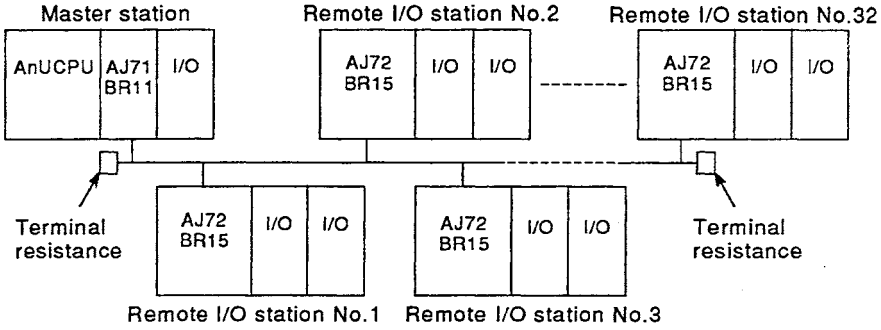
Fiber-Optic Cable	Station-to-Station Distance	Overall Length
SI cable	500 m (1640ft.)	30 km (98425 ft.)
H-PCF cable	1 km (3281 ft.)	
Broad-band H-PCF cable	1 km (3281 ft.)	
QSI cable	1 km (3281 ft.)	
GI cable	2 km (6557 ft.)	

Coaxial loop system

Coaxial cable	Station-to-Station Distance	Overall Length
3C-2V	300 m (984 ft.)	19.2 km (62950 ft.)
5C-2V	500 m (1640 ft.)	30 km (98425 ft.)
5C-FB	500 m (1640 ft.)	30 km (98425 ft.)

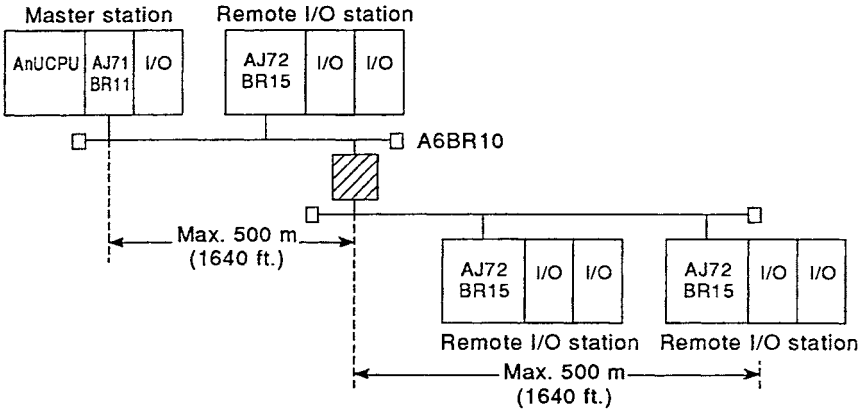
2) Coaxial bus system

Since coaxial cables are used, wiring is easy.
Up to 32 remote I/O stations can be connected to one master station.



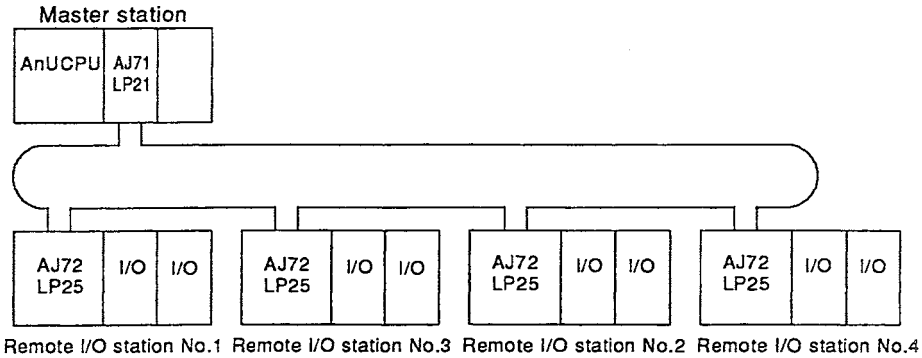
Coaxial Cable	Station-to-Station Distance	Overall Distance
3C-2V	300 m (984 ft.)	300 m (984 ft.)
5C-2V	500 m (1640 ft.)	500 m (1640 ft.)
5C-FB	500 m (1640 ft.)	500 m (1640 ft.)

By using A6BR10/A6BR10-DC repeater units, the station-to-station/overall distance can be increased to a maximum of 2.5 km (8202 ft.)(when 4 modules are used).



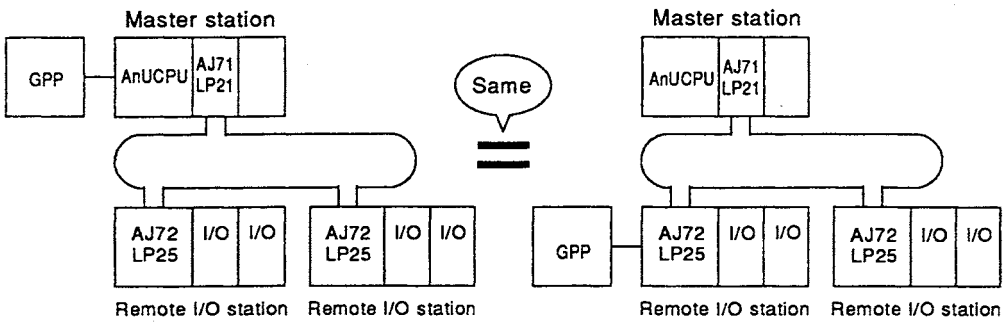
(c) Connections can be made without regard to the station number order.

Stations which are to be added to the system in the future (and whose numbers are therefore skipped) can be registered as reserve stations.



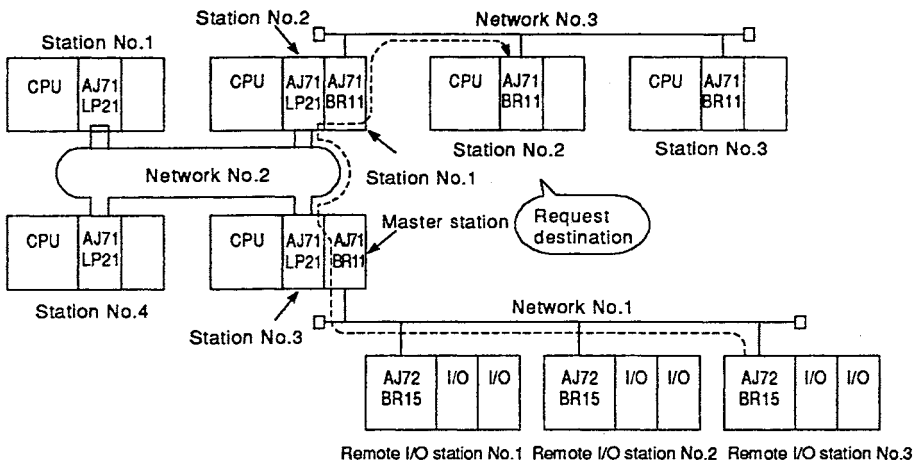
(d) Up to 255 networks, including PLC to PLC networks and remote I/O networks, can be connected.

(4) When a peripheral device is connected to a remote I/O station, device monitoring and testing can be performed in the same way as if it were connected to the master station.



(5) Routing function

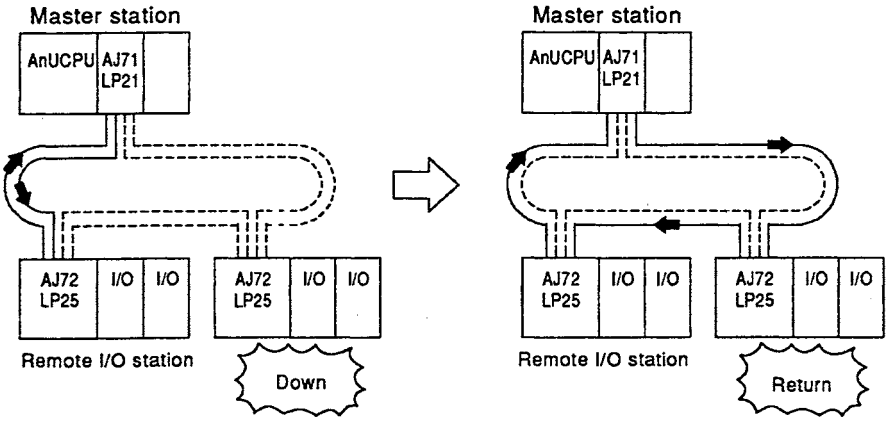
The routing function allows transient transmissions from a remote I/O station to stations in other networks.
For example, in the system configuration shown below, station No.2 of network No.3 (PLC to PLC network) can be accessed from remote I/O station No.3 of network No.1 (remote I/O network).



(6) Perfected RAS functions

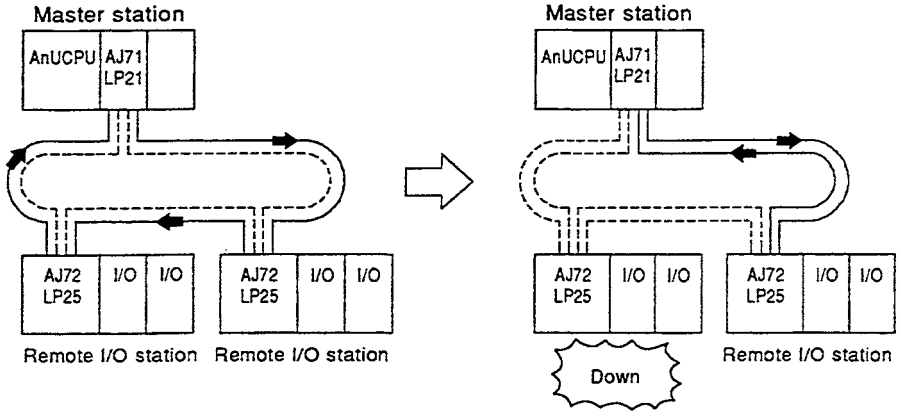
(a) Automatic return function

If a station is disconnected from the link system due to a fault, the automatic return function automatically returns it to the system and resumes data link operation after the fault is remedied.



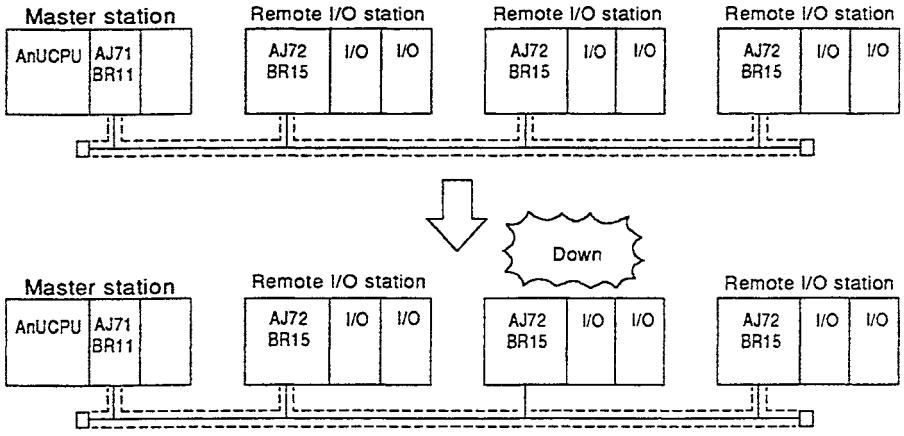
(b) Loopback function

When a station becomes faulty or a cable is disconnected, the faulty part is bypassed by using the forward and reverse loops to maintain the data link with available stations.



(c) Station separation function

When a station is down due to power failure, the station is separated and the data link is executed with the available stations.



(d) Diagnosis functions

- Offline test
  Used to check the hardware and cable connections.
- Online test
  Used to check the connections, switch settings, and parameter settings from a peripheral device.
- Network monitor
  Used to check the data link condition from a peripheral device.

REMARK

Any of the following faults activates the RAS functions.

- Cable disconnection
- Station power-off
- Network setting error
- Error that can be detected by self-diagnostics of CPU module

If the network module has become faulty, the RAS functions may not be activated depending on the fault.

1.3 System Configurations

The system can be configured as a two-tier system or as a multi-tier system

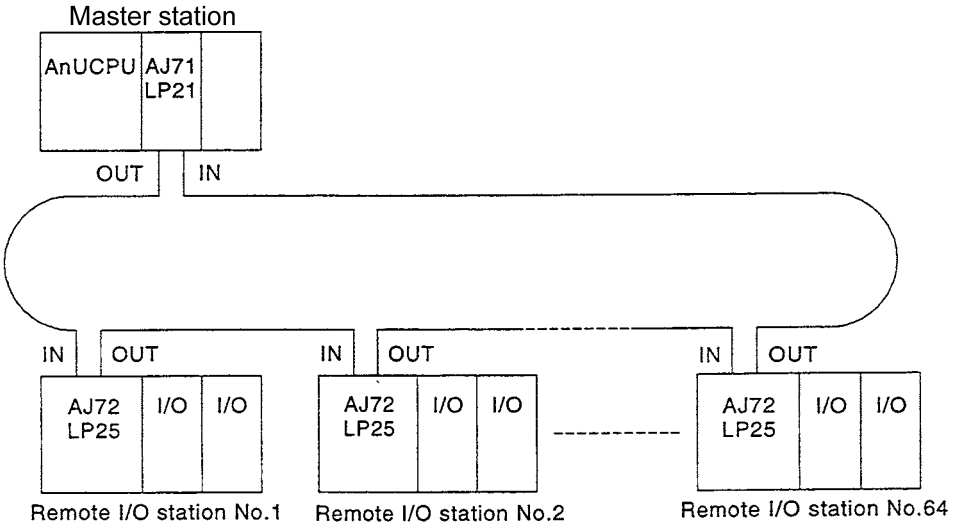
1.3.1 Two-tier system

A two-tier system is a single system in which a network module master station and remote I/O stations are connected by fiber-optic cables or coaxial cables.

(1) Optical loop system

A maximum of 64 remote I/O stations can be connected to a single master station.
The master station CPU must be an A2ASCPU or AnUCPU.

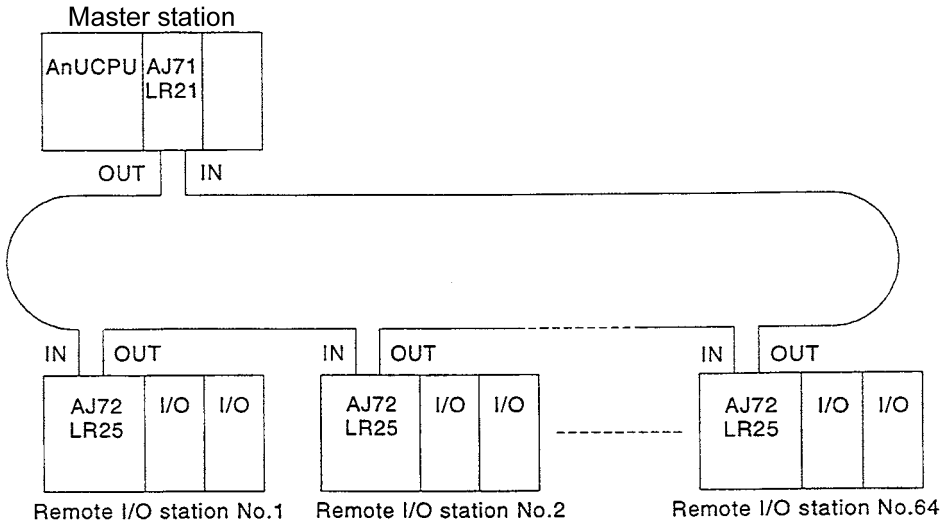
A1SJ71LP21, AJ71LP21, AJ71LP25G, AJ71LP21G
.....Master station (station No.0)
AJ72LP25, AJ72LP25G, A1SJ72QLP25
.....Remote I/O station (station Nos. 1 to 64)



(2) Coaxial loop system

A maximum of 64 remote I/O stations can be connected to a single master station.
The master station CPU must be an A2ASCPU or AnUCPU.

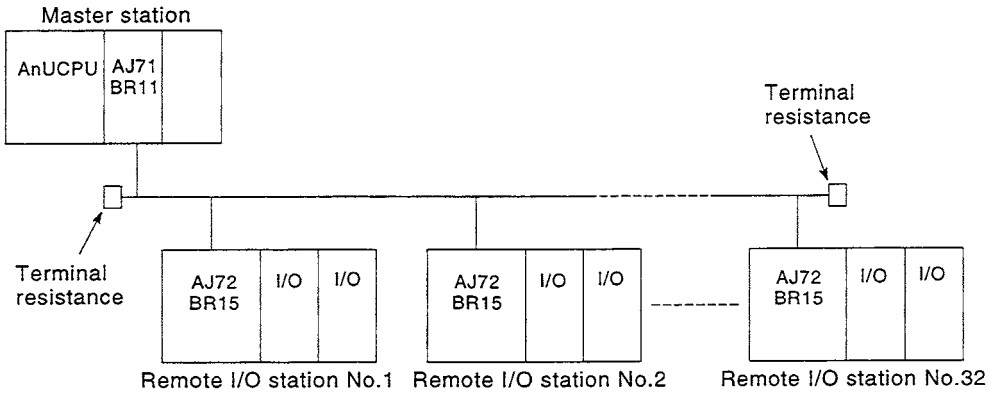
A1SJ71LR21, AJ71LR21.....Master station (station No.0)
AJ72LR25, A1SJ72QLR25.....Remote I/O station (station Nos. 1 to 64)



(3) Coaxial bus system

A maximum of 32 remote I/O stations can be connected to a single master station.
The master station CPU must be an A2ASCPU or AnUCPU.

A1SJ71BR11, AJ71BR11 ..... Master station (station No.0)
AJ72BR15, A1SJ72QBR15 ..... Remote I/O station (station Nos. 1 to 32)

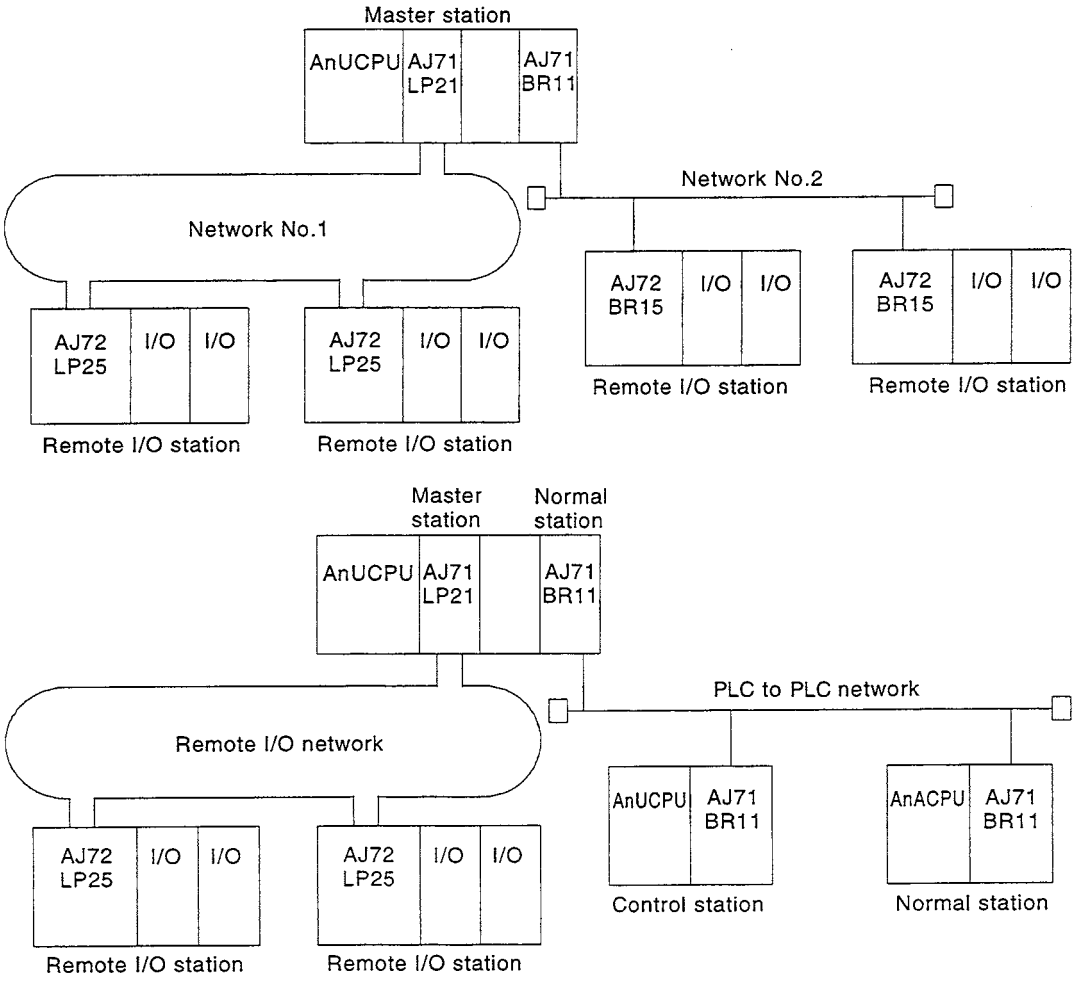


REMARK

The A1SJ72QLP25, A1SJ72QLR25, or A1SJ72QBR15 can be used as a remote I/O station in a remote I/O network where the A2USCPU, AnUCPU runs as a master station. The same functions as those of AJ72LP25, AJ72LR25 and AJ72BR15 are available for any of them. Their performance specifications are also the same except for consumption current and weight.

1.3.2 Multi-tier system

A multi-tier system is a system in which multiple networks are connected.



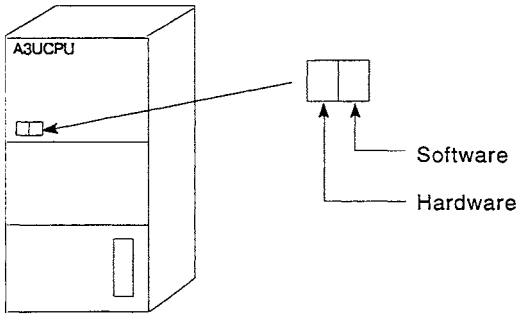
1.4 Products Required for Remote I/O Network

To create a remote I/O network, the following listed below is necessary.

(1) Items composing the master station

Item	Model	Applicable Software Version
CPU module (shown as "AnUCPU" for all)	A2UCPU A2UCPU-S1 A3UCPU A4UCPU	"N" or later * (product released in April 1994 or later)
	A2USCPU A2USCPU-S1	"D" or later * (product released in April 1994 or later)
	A2USHCPU-SI	" A" or later
	Q02CPU-A Q02HCPU-A Q06HCPU-A	"A" or later
Network module	AJ71LP21, A1SJ71LP21 (for optical loop system, SI/QSI cable) AJ71BR11, A1SJ71BR11 (for coaxial bus system) AJ71LP21G, AJ71LP21GE, A1SJ71LP21GE (for optical loop system, GI cable) AJ71LR21, A1SJ71LR21 (for coaxial loop system)	A1SJ71LP21, A1SJ71BR11, AJ71LP21G, AJ71LP21GE, A1SJ71LP21GE, AJ71LR21, A1SJ71LR21 "A" or later AJ71LP21, AJ71BR11 "J" or later *

* How to read a module's version indication.



(2) Items composing remote I/O stations

(a) A series

Item	Model	Remarks
Network module	AJ72LP25 (for optical loop system, SI/QSI cable) AJ72LP25G (for optical loop system, GI cable) AJ72LR25 (for coaxial loop system) AJ72BR15 (for coaxial bus system)	Installed to CPU slot of main base unit.
Main base unit *1	A32B (-S1), A35B, A38B	——
Extension base unit *2	A62B, A65B, A68B	Power supply module required.
	A52B, A55B, A58B	Power supply module not mountable.
Extension cable	AC06B, AC12B, AC30B	——

*1: The A38HB (EU) is not applicable.
*2: Up to 7 extension bases can be used.

(b) AnS series

Item	Model	Remarks
Network module	A1SJ72QLP25 (for optical loop system, SI/QSI cable) A1SJ72QLR25 (for coaxial loop system) A1SJ72QBR15 (for coaxial bus system)	Installed to CPU slot of main base unit.
Main base unit *1	A1S32B, A1S33B, A1S35B, A1S38B	——
Extension base unit *2	A1S65B (-S1), A1S68B (-S1)	Power supply module required.
	A1S52B (-S1), A1S55B (-S1), A1S58B (-S1)	Power supply module not mountable.
Extension cable *3	A1SC01B, A1SC03B, A1SC07B, A1SC12B, A1SC30B, A1SC60B, A1SC05NB, A1SC07NB, A1SC30NB, A1SC50NB	——

*1: The A1S38HB (EU) is not applicable.
*2: Only one extension base can be used. (Use of two extension bases is not allowed.)
*3: The type A1SC□NB is used for connection between a main base unit and an A6□B(-S1)/A5□B(-S1) type extension base unit.

(3) Other items

Item		Model	Applicable Software Version
Peripheral device		A6GPP/A6PHP (using SW[ ] GP-GPPAU) A7PHP, LM700/7500 (using SW[ ] SRXV-GPPA) IBM PC/AT compatible PC (using SW[ ] IVD-GPPA) Windows PC (GX Developer Version [ ] installed)	—
GPP function software package		SW [ ] GP-GPPAU SW [ ] SRXV-GPPA SW [ ] NX-GPPA SW [ ] IVD-GPPA GX Developer Version [ ]	[ ] is 1 or higher. [ ] is 2 or higher. [ ] is 2 or higher. [ ] is 2 or higher. [ ] is 1 or higher.
Link cable Maximum distance indicated in parentheses ( ).	For optical loop system	SI cable (500 m) (1640 ft.) H-PCF cable (1 km) (3281 ft.) Broad-band H-PCF cable (1km) (3281 ft.) QSI cable (1 km) (3281 ft.) GI cable (2 km) (6557ft.)	—
	For coaxial bus/loop system	3C-2V (300 m) (984 ft.) 5C-2V (500 m) (1640 ft.) 5C-FB (500 m) (1640 ft.)	—
Terminal resistances (Required for a 75Ω and coaxial bus system.)		A6RCON-R75	—
F-type connector		One supplied with AJ71BR11, AJ72BR15, A1SJ71BR11 and A1SJ72QBR15	—

1.5 Symbols Used in the Text, Tables, and Figures

(1) Symbols

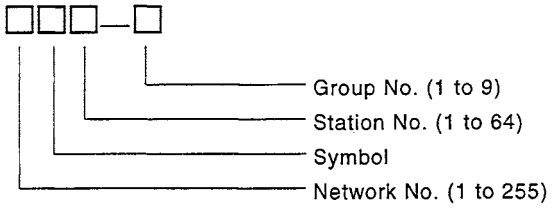
(a) Remote I/O network

Name	Symbol
Master station	MR
Remote I/O station	R

(b) PLC to PLC network

Name		Symbol	
Control station		Mp	..... AnUCPU
Sub-control station		S	..... AnUCPU
Normal station	Can become a sub-control station	Ns	..... AnUCPU
	Cannot become a sub-control station	N	..... AnN/AnACPU

(2) Code format



[Example codes]

1) Remote I/O network, network No.3. master station
→ 3MR

Station No. "0" is not appended to master station codes.

2) Remote I/O network, network No.5, remote I/O station No.1
→ 5R12

1.6 Special Function Modules Available for Remote I/O Stations

Model	Type	Occupied Slots	Number that can be installed	Remarks
AD70	Normal	1	64 (main base + 7 extension bases)	
AD70D			64 (main base + 7 extension bases)	
AD71 (S1/S2 S7)			64 (main base + 7 extension bases)	
AD72		2	32 (main base + 7 extension bases)	
AD75P1/P2/P3-S3		1	32 (main base + 7 extension bases)	
AD75M1/M2/M3			32 (main base + 7 extension bases)	
AD76			64 (main base + 7 extension bases)	
A61LS			64 (main base + 7 extension bases)	
A62LS		2	32 (main base + 7 extension bases)	
AD61 (S1)		1	64 (main base + 7 extension bases)	
A68AD (S2)			64 (main base + 7 extension bases)	
A68ADN			64 (main base + 7 extension bases)	
A616AD			64 (main base + 7 extension bases)	
A60MX			Used in combination with A616AD, A616TD.	
A60MXR				
A616TD			64 (main base + 7 extension bases)	
A616MXT		2	Used in combination with A616TD.	
A62DA (S1)		1	64 (main base + 7 extension bases)	
A616DAV			64 (main base + 7 extension bases)	
A616DAI			64 (main base + 7 extension bases)	
A84AD		2	32 (main base + 7 extension bases)	
A68DAV		1	64 (main base + 7 extension bases)	
A68DAI			64 (main base + 7 extension bases)	
A68RD3			64 (main base + 7 extension bases)	
A68RD4			64 (main base + 7 extension bases)	
AD59 (S1)			64 (main base + 7 extension bases)	
A11VC			64 (main base + 7 extension bases)	
AJ71C21 (S1)			64 (main base + 7 extension bases)	
AJ71C22			64 (main base + 7 extension bases)	
A64BTL		1	64 (main base + 7 extension bases)	
AS50VS		2	32 (main base + 7 extension bases)	
AS50VS-GN			32 (main base + 7 extension bases)	
A1SD70		2	8 (main base + 1 extension bases)	
A1SD71-S2/S7			8 (main base + 1 extension bases)	
A1SD75P1/P2/P3-S3		1	16 (main base + 1 extension bases)	
A1SD75M1/M2/M3			16 (main base + 1 extension bases)	
A1S62LS			16 (main base + 1 extension bases)	
A1SD61			16 (main base + 1 extension bases)	
A1SD62			16 (main base + 1 extension bases)	
A1SD62D (S1)			16 (main base + 1 extension bases)	
A1S64AD			16 (main base + 1 extension bases)	
A1S68AD			16 (main base + 1 extension bases)	
A1S62DA			16 (main base + 1 extension bases)	
A1S68DAV			16 (main base + 1 extension bases)	
A1S68DAI			16 (main base + 1 extension bases)	
A1S62RD3			16 (main base + 1 extension bases)	
A1S62RD4			16 (main base + 1 extension bases)	
A1S68TD			16 (main base + 1 extension bases)	
A1S63ADA			16 (main base + 1 extension bases)	
A1S66ADA			16 (main base + 1 extension bases)	
A1S64TCTT-S1			16 (main base + 1 extension bases)	
A1S64TCTTBW-S1			16 (main base + 1 extension bases)	
A1S64TCRT-S1			16 (main base + 1 extension bases)	
A1S64TCRTBW-S1			16 (main base + 1 extension bases)	
A1S62TCTT-S2			16 (main base + 1 extension bases)	
A1S62TCTTBW-S2			16 (main base + 1 extension bases)	
A1S62TCRT-S2			16 (main base + 1 extension bases)	
A1S62TCRTBW-S2			16 (main base + 1 extension bases)	
A1SD59J-S2			16 (main base + 1 extension bases)	

Type ....Normal : Other than intelligent special function module
Intelligent :Intelligent special function module

Special function modules that cannot be used.

•AD57(S1/S2) •AD58 •AD51FD(S3) •AI61 •AJ71C23(S3) •AJ71AP21/AR21 •AJ71LP21(G/GE)/BR11/LR21 •AJ71AT21B •A1SJ71AP21/AR21 •A1SJ71LP21(GE)/BR11/LR21 •A1SJ71AT21B •A1SI61 •A1SJ71CMO-S3 •AD22-S1 •A1SD21-S1 •A1SJ71SL92N •AD35ID1 •AD35ID2 •A1SD35ID1 •A1SD35ID2 •AJ71PT32-S3 •AJ71T32-S3 •A1SJ71PT32-S3 •A1SJ71T32-S3

Some models have restrictions when installed to the remote I/O station. For details, refer to the user's manual of the corresponding special function module.

Model	Type	Occupied Slots	Number that can be Installed	Remarks
AD57G (S3)	Intelligent	2	2 (total, including other intelligent special function modules)	
AJ71C24 (S3/S6/S8)		1	2 (total, including other intelligent special function modules)	
AJ71UC24			2 (total, including other intelligent special function modules)	
AD51 (S3)		2	2 (total, including other intelligent special function modules) (can be used within the A3H range)	Interrupt programs cannot be used.
AD51H			2 (total, including other intelligent special function modules) (can be used within the A3A range)	
AD51H-S3			2 (total, including other intelligent special function modules)	
AJ71E71-S3		1	2 (total, including other intelligent special function modules) (can be used within the A3A range)	
AJ71E71N3-T, AJ71E71N-B5/B2				
AJ71P41			2 (total, including other intelligent special function modules) (can be used within the A3A range)	
AJ61BT11		1	2 (total, including other intelligent special function modules)	In intelligent mode. (16 modules in I/O mode.)
A1SJ71UC24-R2/R4/PRF		1	2 (total, including other intelligent special function modules) (can be used within the A3A range)	
A1SD51S		2	2 (total, including other intelligent special function modules) (can be used within the A3A range)	Interrupt programs cannot be used.
A1SJ71E71-B5-S3/B2-S3		1	2 (total, including other intelligent special function modules) (can be used within the A3A range)	
A1SJ71E71N3-T, A1SJ71E71N-B5/B2				
A1SJ61BT11		1	2 (total, including other intelligent special function modules)	In intelligent mode. (16 modules in I/O mode.)

Type ....Normal : Other than intelligent special function module
Intelligent :Intelligent special function module

Special function modules that cannot be used.

•AD57(S1/S2) •AD58 •AD51FD(S3) •AI61 •AJ71C23(S3) •AJ71AP21/AR21 •AJ71LP21(G/GE)/BR11/LR21 •AJ71AT21B •A1SJ71AP21/AR21 •A1SJ71LP21(GE)/BR11/LR21 •A1SJ71AT21B •A1SI61 •A1SJ71CMO-S3 •AD22-S1 •A1SD21-S1 •A1SJ71SL92N •AD35ID1 •AD35ID2 •A1SD35ID1 •A1SD35ID2 •AJ71PT32-S3 •AJ71T32-S3 •A1SJ71PT32-S3 •A1SJ71T32-S3

Some models have restrictions when installed to the remote I/O station. For details, refer to the user's manual of the corresponding special function module.

2. SPECIFICATIONS

This section gives the specifications of network performance and cables. For general specifications, refer to the manual for the programmable controller CPU used in the network system.

2.1 Performance Specifications

Table 2.1 gives the performance specifications of the network system.

Table 2.1 Performance Specifications

Item		Optical Loop System (SI, QSI cable)		Coaxial Bus System	
		AJ71LP21, A1SJ71LP21	AJ72LP25, A1SJ72QLP25	AJ71BR11, A1SJ71BR11	AJ72BR15, A1SJ72QBR15
Maximum number of link points per network	LX/LY	8192 points			
	LB	8192 points			
	LW	8192 points			
Maximum number of link points per station		Master station → Remote I/O station $\left\{\frac{LY+LB}{8}+(2\times LW)\right\} \leq 1600$ bytes		Remote I/O station → Master station $\left\{\frac{LX+LB}{8}+(2\times LW)\right\} \leq 1600$ bytes	
Maximum number of I/O points per remote station		———	X+Y≤2048 point *3	———	X+Y≤2048 point *3
Communication speed		20 MBPS (multiplexing)/10 MBPS		10 MBPS	
Communication method		Token ring method		Token bus method	
Synchronizing method		Frame synchronous communication			
Coding method		NRZI coding (Non Return to Zero Inverted)		Manchester coding	
Type of transmission channel		Duplex loop		Single bus	
Transmission format		Conforms to HDLC (frame type)			
Maximum number of networks		255 (The sum total of PLC to PLC network and remote I/O network)			
Number of stations available for a network		65 stations (master station: 1, remote I/O stations: 64)		33 stations (master station: 1, remote I/O stations: 32)	
Overall length of a network (Inter station distance)		30 km (Inter station distance: SI cable: 500m (1640 ft.); H-PCF cable, broadband H-PCF cable or QSI cable: 1km (3281 ft.))		3C-2V	300 m (984 ft.) (Inter station distance : 300 m (984 ft.))*1
				5C-2V	500 m (1640 ft.) (Inter station distance : 500 m (1640 ft.))*1
				5C-FB	500 m (1640 ft.) (Inter station distance : 500 m (1640 ft.))*1
Connection cable		Fiber-optic cable (obtained by user)*4		Coaxial cable (obtained by user)	
Applicable connector		Two-core optical connector plug (obtained by user) F06/F08 or equivalent (JIS C5975/5977 compliant)		3C-2V connector plug 5C-2V connector plug 5C-FB connector plug (obtained by user)	
Error control method		Retry by CRC ($X^{16}+X^{12}+X^5+1$) and time out			
RAS functions		• Loopback in case of error detection or cable disconnection. (available with optical/coaxial loop system only) • Self-diagnosis function of link line. • Error detection by using special link relays and registers. • Network monitor and diagnostic functions			
Transient transmission		• Monitoring with peripheral modules, program uploading and downloading			
Current consumption (5 VDC)		0.65 A	AJ72LP25: 0.8 A A1SJ72QLP25: 0.52 A	0.8 A	AJ72BR15: 0.9 A A1SJ72QBR15: 0.7 A

Table 2.1 Performance Specifications (Continued)

Item	Optical Loop System (SI, QSI cable)		Coaxial Bus System	
	AJ71LP21, A1SJ71LP21	AJ72LP25, A1SJ72QLP25	AJ71BR11, A1SJ71BR11	AJ72BR15, A1SJ72QBR15
Weight	AJ71LP21: 0.31 kg *2 A1SJ71LP21: 0.18 kg	AJ72LP25: 0.53 kg A1SJ72QLP25: 0.4 kg	AJ71BR11: 0.45 kg A1SJ71BR11: 0.33 kg	AJ72BR15: 0.60 kg A1SJ72QBR15: 0.43 kg
Number of occupying I/O points	32 points	———	32 points	———

*1 There are restrictions to the distance between stations, being determined according to the type of cable and number of stations. See sections 3.3.1, 3.3.2 and 3.3.3.

*2 The weight of the AJ71LP21 of hardware version P or earlier is 0.45kg.
The weight of the A1SJ71LP21 of hardware version F or earlier is 0.33kg.

*3 For the A1SJ72QLP25, A1SJ72QBR25, and A1SJ72QLR25, X+Y ≦ 1024.

*4 SI fiber-optic cables (former type: A-2P-□) take different station-to-station distances according to the type (L or H type). See Section 3.3.1.

Table 2.1 Performance Specifications (continued)

Item		Optical Loop System (GI cable)		Coaxial Loop System	
		AJ71LP21G, AJ71LP21GE, A1SJ71LP21GE	AJ72LP25G, AJ72LP25GE	AJ71LR21, A1SJ71LR21	AJ72LR25, A1SJ72QLR25
Maximum number of link points per network	LX/LY	8192 points			
	LB	8192 points			
	LW	8192 points			
Maximum number of link points per station		Master station → Remote I/O station $\left\{\frac{LY+LB}{8}+(2\times LW)\right\} \leq 1600$ bytes		Remote I/O station → Master station $\left\{\frac{LX+LB}{8}+(2\times LW)\right\} \leq 1600$ bytes	
Maximum number of I/O points per remote station		———	X+Y≤2048 point	———	X+Y≤2048 point*3
Communication speed		20 MBPS (multiplexing)/10 MBPS			
Communication method		Token ring method			
Synchronizing method		Frame synchronous communicaiton			
Coding method		NRZI coding (Non Return to Zero Inverted)		Manchester coding	
Type of transmission channel		Duplex loop		Duplex loop	
Transmission format		Conforms to HDLC (frame type)			
Maximum number of networks		255 (The sum total of PLC to PLC network and remote I/O network)			
Number of stations connecated to a network		65 stations (master station: 1 ; remote I/O stations: 64)			
Overall length of a network (Inter station distance)		30 km (Inter station distance: 2 km (6553 ft.) when GI cable is used)		3C-2V	19.2 km (62950 ft.) (Inter station distance : 300 m (984 ft.))
				5C-2V	30 km (98360 ft.) (Inter station distance : 500 m (1640 ft.))
				5C-FB	30 km (98360 ft.) (Inter station distance : 500 m (1640 ft.))
Error control method		Retry by CRC ($X^{16}+X^{12}+X^5+1$) and time out			
RAS functions		• Loopback in case of error detection or cable disconnection. (available with optical/coaxial loop system only) • Self-diagnosis function of link line. • Error detection by using special link relays and registers. • Network monitor and diagnostic functions			
Transient transmission		• Monitoring with peripheral modules, program uploading and downloading			
Current consumption (5 VDC)		0.65 A	0.8 A	AJ71LR21: 1.20 A A1SJ71LR21: 1.14 A	AJ72LR25: 1.3 A A1SJ72QLR25: 1.24 A
Weight		AJ71LP21G, *5 AJ71LP21GE: 0.31 kg A1SJ71LP21GE: 0.18 kg	0.53 kg	AJ71LR21: 0.45 kg A1SJ71LR21: 0.30 kg	AJ72LR25: 0.60 kg A1SJ72QLR25: 0.42 kg
Number of occupying I/O points		32 points	———	32 points	———

*5 The weight of the AJ71LP21G of hardware version K or earlier is 0.45kg.
The weight of the AJ71LP21GE of hardware version F or earlier is 0.45kg.
The weight of the A1SJ71LP21GE of hardware version B or earlier is 0.33kg.

2.2 Optical fiber cable specifications

The following is the specifications for the optical fiber cable used in the MELSECNET/H loop system. Check and confirm that proper cable is used.
These optical fiber cables and connectors are specially-designed products and available from MITSUBISHI ELECTRIC SYSTEM & SERVICE CO. LTD. (Related catalogues are also available.)
MITSUBISHI ELECTRIC SYSTEM & SERVICE CO. LTD. also provides installation service. For details, please consult your local Mitsubishi representative.

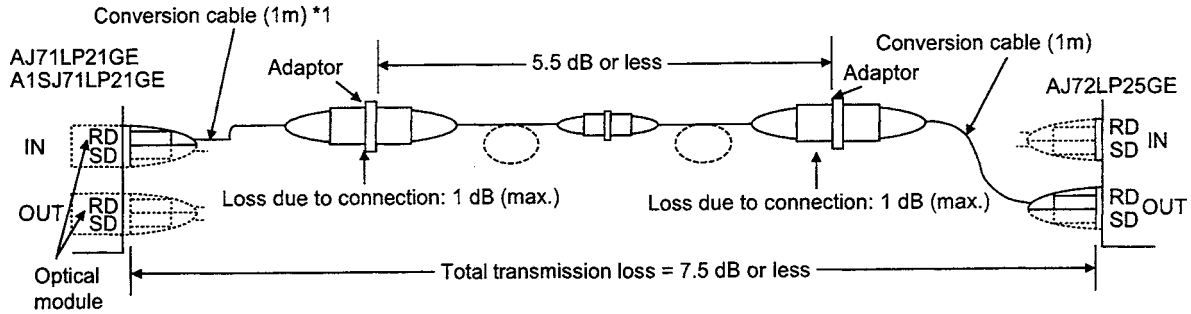
Table2.2 Optical fiber cable specifications

Item	SI (Multi-particulate glass)	H-PCF (Plastic-clad)	Broad-band H-PCF (Plastic-clad)	QSI (Quartz glass)	GI-50/125 (Quartz glass)	GI-62.5/125 (Quartz glass)
Interstation distance	500m	1km	1km	1km	2km	2km
Transmission loss	12dB/km	6dB/km	5dB/km	5.5dB/km	3dB/km	3dB/km
Core diameter	200μm	200μm	200μm	185μm	50μm	62.5μm
Clad diameter	220μm	250μm	250μm	230μm	125μm	125μm
Primary membrane	250μm	—	—	250μm	—	—
Applicable connector	F06/F08 or equivalent (Conformed to JIS C5975/5977)					

REMARK

Prepare the following types of optical cables.
A type: Cable for connection inside control panel.
B type: Cable for connections between outside control panels.
C type: Cable for outdoor connections.
D type: Cable for outdoor connections that have been reinforced.
There are special cables available for moveable applications and resistance to heat.
Contact your MITSUBISHI ELECTRIC SYSTEM & SERVICE CO. LTD. for details.

(1) Transmission loss of GI-62.5/125 optical fiber cable



*1: Conversion cable

Conversion Type	Cable
CA type↔FC type	AGE-1P-CA/FC1.5M-A
CA type↔ST type	AGE-1P-CA/ST1.5M-A
CA type↔SMA type	AGE-1P-CA/SMA1.5M-A

Available from: Mitsubishi Electric Europe GmbH

2.3 Coaxial Cable

This section gives the specifications of a coaxial cable used for the coaxial data link.

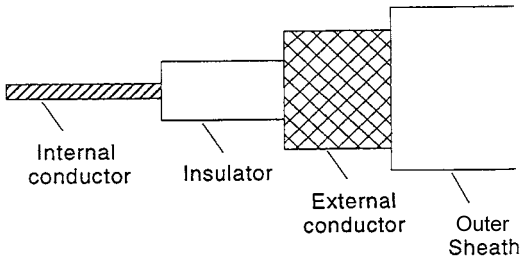
Use the following high frequency coaxial cables:

- 3C-2V (JIS C 3501 compliant)
- 5C-2V (JIS C 3501 compliant)
- 5C-FB (JIS C 3502 compliant)

2.3.1 Coaxial cable

Table 2.3 gives the specifications of a coaxial cable.
Select coaxial cables that meet the operating ambient temperature (0 to 55 °C) shown in the general specifications of the programmable controller.

Table 2.3 Coaxial Cable

Item	3C-2V	5C-2V	5C-FB
Structure			
Cable diameter	5.4 mm (0.21 inches)	7.4 mm (0.29 inches)	7.7 mm (0.3 inches)
Allowable bending radius	22 mm (0.87 inches) or more	30 mm (1.18 inches) or more	30 mm (1.18 inches) or more
Diameter of internal conductor	0.5 mm (0.02 inches) (annealed copper wire)	0.8 mm (0.03 inches) (annealed copper wire)	1.05 mm (0.04 inches) (annealed copper wire)
Diameter of insulator	3.1 mm (0.12 inches) (polyethylene)	4.9 mm (0.19 inches) (polyethylene)	5.0 mm (0.19 inches) (polyethylene)
Diameter of external conductor	3.8 mm (0.15 inches) (single annealed copper wire mesh)	5.6 mm (0.22 inches) (single annealed copper wire mesh)	5.7 mm (0.22 inches) (aluminum foil tape and annealed copper wire mesh)
Applicable connector plug	3C-2V connector plug The following connector plugs are recommended: • BNC-P-3-NiCAu*1 (manufactured by DDK Ltd.) • BCP-C3B*2 (manufactured by Canare Electric Co., Ltd.)	5C-2V connector plug The following connector plugs are recommended: • BNC-P-5-NiCAu*1 (manufactured by DDK Ltd.) • BCP-C5B*2 (manufactured by Canare Electric Co., Ltd.)	5C-FB connector plug BCP-C5FA*2 (manufactured by Canare Electric Co., Ltd.) is recommended.

*1: This connector plug is a soldering-type connector plug.
*2: This connector plug is a crimping-type connector plug.

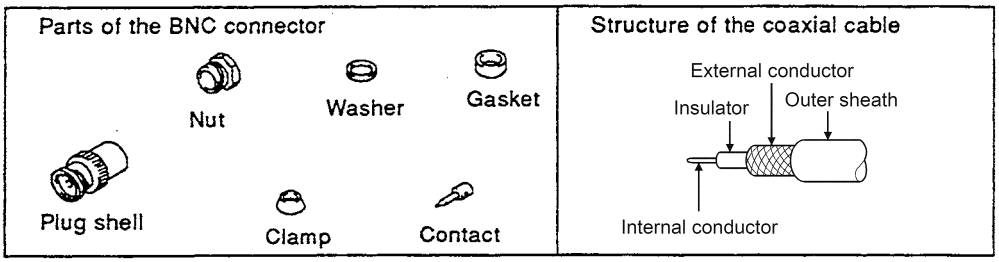
2.3.2 Connector for a coaxial cable

The following explains the structure and how to connect a BNC connector to the coaxial cable.

(1) Using a BNC connector manufactured by DDK Ltd.
The following explains how to connect the BNC-P-3-NiCAu or BNC-P-5-NiCAu to the cable.

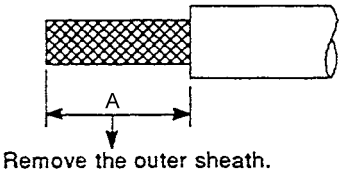
⚠CAUTION ● Correctly solder the parts of a coaxial cable connector. Incomplete soldering may result in malfunction.

(a) Structure of the BNC connector and coaxial cable



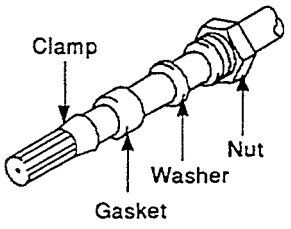
(b) How to connect the BNC connector and the coaxial cable

1) Remove the outer sheath of the end of the coaxial cable as shown below.

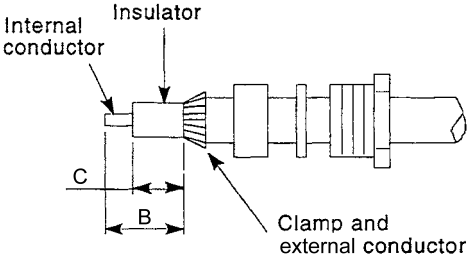


Cable	A
3C-2V	15mm (0.59 inches)
5C-2V, 5C-2V-CCY	10mm (0.39 inches)

2) Slip a nut, a washer, a gasket, and a clamp on the coaxial cable as shown below, and loosen the external conductor.

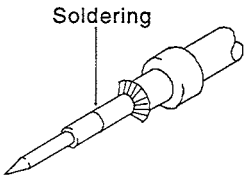


3) Cut the external conductor, insulator, and internal conductor to specified dimensions shown below.
Cut the external conductor and extend it over the end of the clamp.

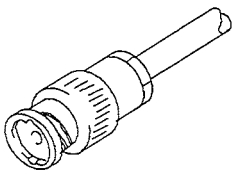


Cable	B	C
3C-2V	6mm (0.24 inches)	3mm (0.12 inches)
5C-2V, 5C-2V-CCY	7mm (0.28 inches)	5mm (0.20 inches)

(d) Solder the contact to the tip of the internal conductor.



(e) Insert the contact assembly in the plug shell, and engage the plug shell with the nut.

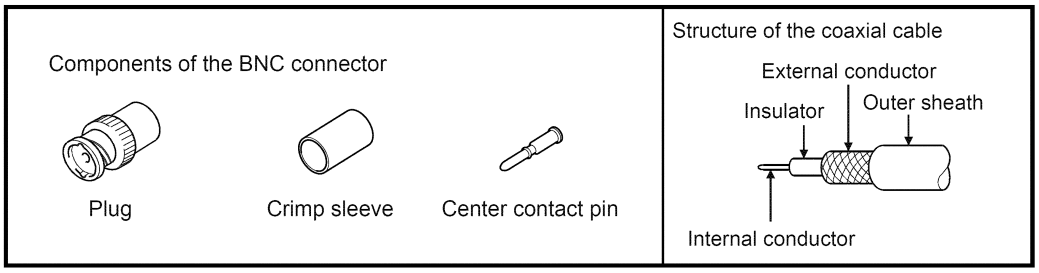


IMPORTANT

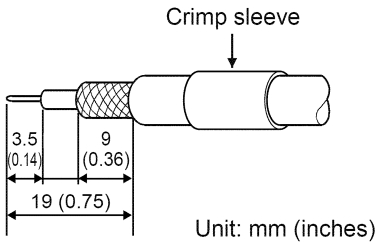
(1) Note the following precautions when soldering the internal conductor and contact.
- Make sure that the solder does not bead up at the soldered section.
- Make sure there are no gaps between the connector and cable insulator or they do not cut into each other.
- Perform soldering quickly so the insulator does not become deformed.

(2) Before connecting or disconnecting the coaxial connector, touch a grounded metal object to discharge the static electricity from the human body. Failure to do so may result in a module malfunction.

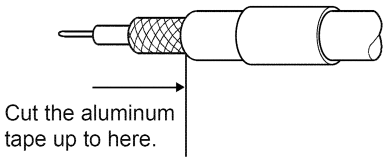
(2) Using a BNC connector manufactured by Canare Electric Co., Ltd.
The following explains how to connect the BCP-C3B, BCP-C5B, or BCP-C5FA to the cable.
(a) Structure of the BNC connector and coaxial cable



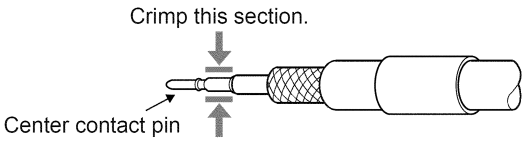
(b) How to connect the BNC connector and the coaxial cable
1) Thread a coaxial cable through a crimp sleeve as shown in the figure below.



When using a cable with aluminum tape, cut the tape as shown in the figure below.
When cutting the tape, make a clean cut, without leaving any stray pieces or loose strands. Failure to do so may cause a short circuit or result in an improper crimp.

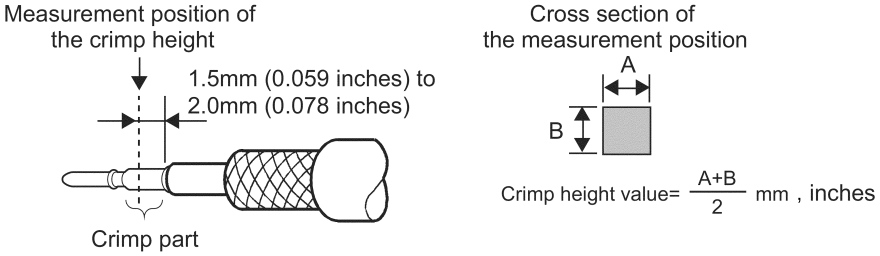


2) Insert a center contact pin into the internal conductor. Crimp the pin using a crimp tool to seal the gap between the center contact pin and the insulator.

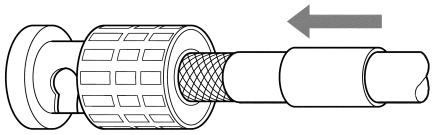


POINT
(1) Use a crimp tool specified for a BNC connector. (2) Do not crimp the junction of the insulator and the center contact pin. (3) Horizontally insert the center contact pin into the insulator and crimp the pin. If the pin is on the tilt, straight it.

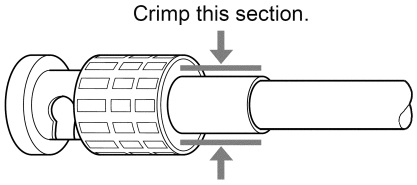
3) After the crimp, check the crimp height of the crimp part. When the crimp height at the measurement position is between 1.4mm (0.055 inches) and 1.5mm (0.059 inches), the pin is properly crimped.
If the crimp height is not between 1.4mm (0.055 inches) and 1.5mm (0.059 inches), adjust the crimp tool and crimp the center contact pin again.



4) Hold the root of the coaxial cable and fully insert the cable into a plug. After inserting the cable, pull it lightly to check that the center contact pin is fixed.
Move the crimp sleeve until it contacts with the plug.



5) Crimp the crimp sleeve using the crimp tool with attention paid to the orientations of the crimp tool and connector.
Do not pull the cable when crimping the sleeve.



POINT
Before connecting or disconnecting the coaxial connector, touch a grounded metal object to discharge the static electricity from the human body. Failure to do so may result in a module malfunction.

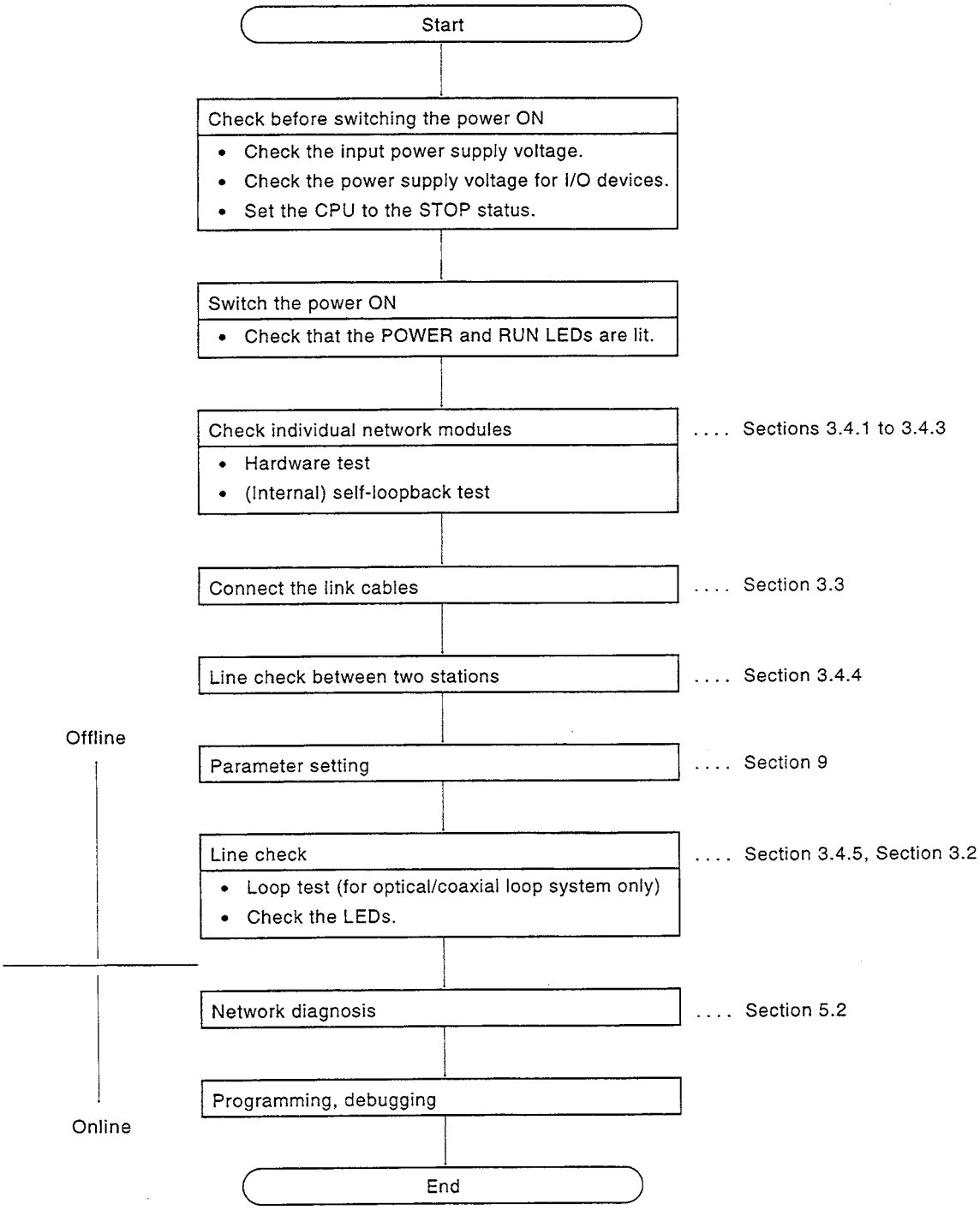
MEMO

3. PRE-OPERATION PROCEDURES

This section describes the procedures, settings, connections and tests required to establish a data link.

3.1 Pre-Operation Procedure

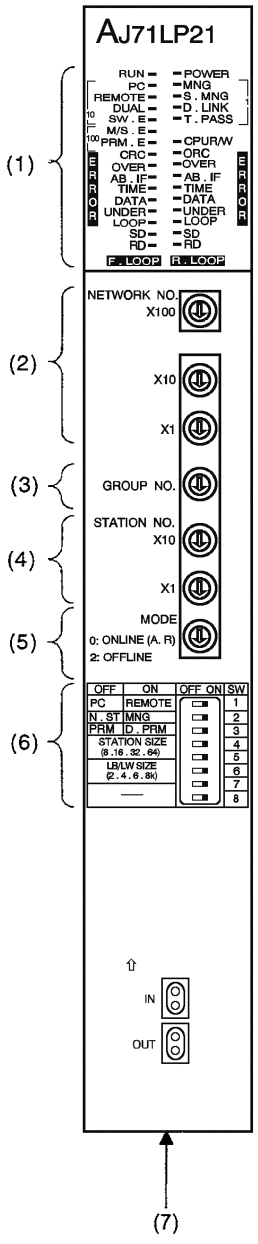
The following flow chart shows the procedures leading to the establishment of a data link.



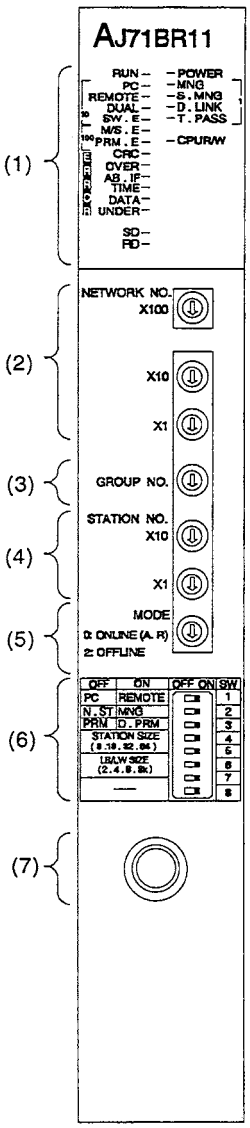
3.2 Names and Settings of External Parts

3.2.1 Master station (AJ71LP21 (G,GE), AJ71BR11, AJ71LR21, A1SJ71LP21 (GE), A1SJBR11, A1SJ71LR21)

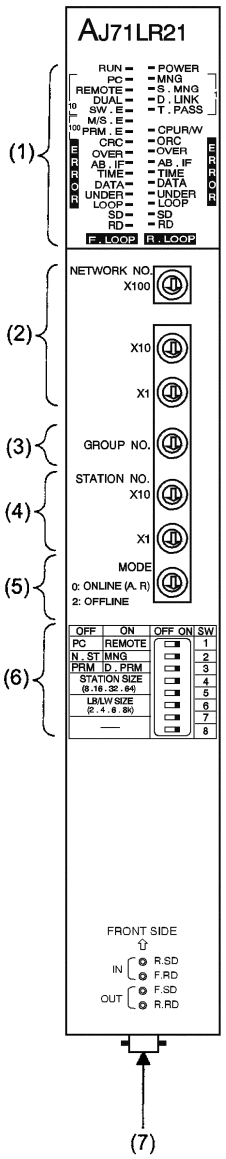
(1) AJ71LP21 (G,GE)



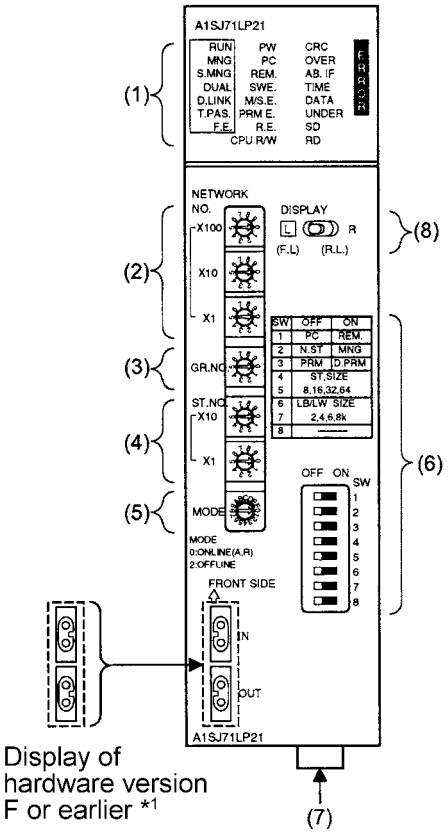
(2) AJ71BR11



(3) AJ71LR21

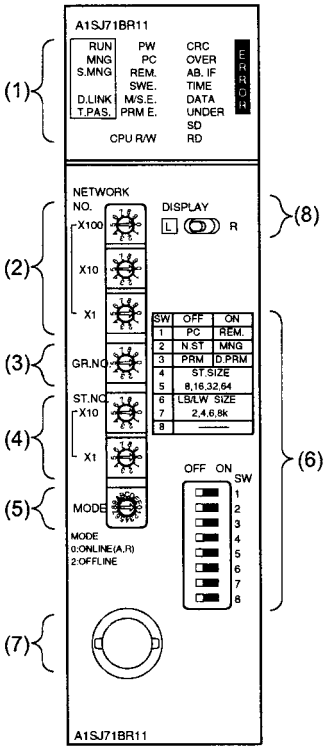


(4) A1SJ71LP21 (GE)

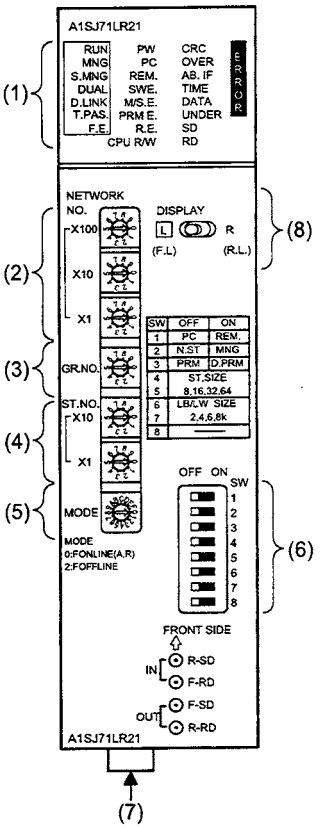


Display of hardware version F or earlier *1

(5) A1SJ71BR11



(6) A1SJ71LR21



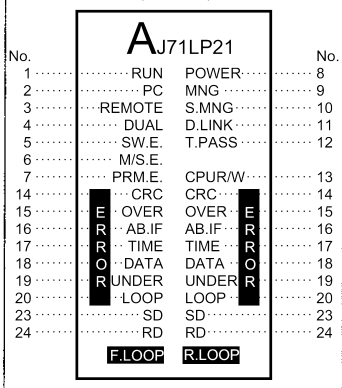
*1: A1SJ71LP21GE is hardware version B or earlier.

Table 3.1 Names of Parts and Settings

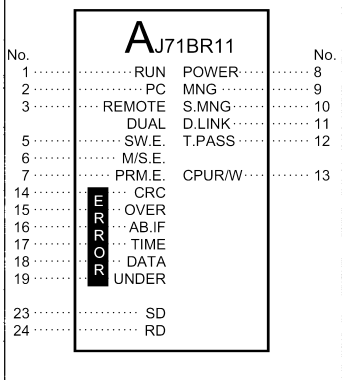
No.	Name	Description

(1) LED

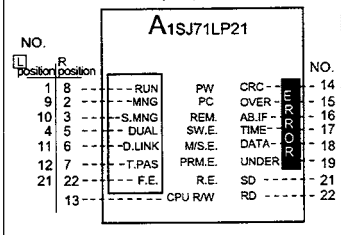
AJ71LP21(G, GE)/AJ71LR21



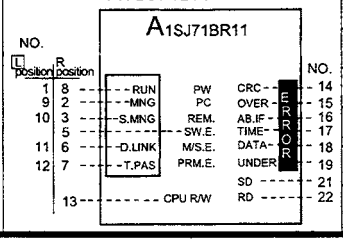
AJ71BR11



A1SJ71LP21 (GE)/A1SJ71LR21



A1SJ71BR11

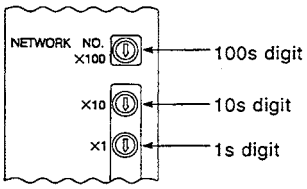
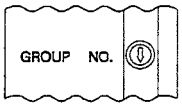


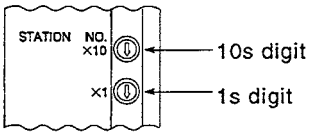
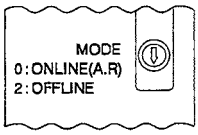
No.	Name	State	Description
1	RUN	Lit	Normal state
		Unlit	WDT error, SP. UNIT ERROR
2	PC		Setting for a PLC to PLC network is made. (SW1: OFF)
3	REMOTE		Setting for a remote I/O network is made. (SW1: ON)
4	DUAL		Multiplexing being executed. (Unlit: Multiplexing not executed.)
5	SW.E		Switch settings with (2) to (6) have abnormality.
6 *1	M/S.E		Two same station numbers or two master stations are set in a network.
7	PRM.E		The network refresh parameter settings are duplicated (when more than one module is installed).
8	POWER		Power is supplied. (Unlit: Power is not supplied.)
9	MNG		Set as a master station.
10	S.MNG		———
11	D.LINK		Data link is operative. (Unlit: Data link is inoperative.)
12	T.PASS		Baton passing being executed. (Transient transmission possible)
13	CPU R/W	Lit	Communicating with the CPU.
14	CRC		Code check error in received data. <Causes> Timing when the station which is sending data to a specific station is set off-line, hardware fault, cable fault, noise, etc.
15	OVER		Processing of received data delayed. <Causes> Hardware fault, cable fault, noise, etc.
16	AB. IF		• "1"s in the number larger than specified are received consecutively. • Received data length is shorter than specified. <Causes> Timing when the station which is sending data to a specific station is set off-line, WDT setting is too short, cable fault, noise, etc.
17	TIME		Data link WDT error. <Causes> WDT setting is too short, cable fault, noise, etc.
18	DATA		Abnormal data larger than 2 kbytes are received. <Causes> Cable fault, noise, etc.
19	UNDER		Internal processing of send data is not at constant intervals. <Causes> Hardware fault
20	LOOP		The forward or reverse loop is faulty. (F.E.: F loop error, R.E.: R loop error) <Causes> Power to the adjacent station is OFF. Cable breakage or not connected, etc.
21	F.E.		
22	R.E.		
23	SD	Dimly lit	Data being transmitted.
24 *2	RD		Data being transmitted.

*1..... The M/S.E LED may not light depending on the line or cable connections even if station No. or control station is duplicated in a network.
Execute the setting confirmation test of the online test as well as visual check.

*2..... When using an AJ71BR11/A1SJ71BR11, if there are no terminal resistances RD may be lit all the time, regardless of whether the data link is operative; this does not mean that there is a network module error.

Table 3.1 Names of Parts and Settings (Continued)

<table>
<tr><th>No.</th><th>Name</th><th colspan="3">Description</th></tr>
<tr><td>(2)
*3</td><td>Network number setting switches
 
</td><td colspan="3">Setting of network number (Factory setting: 001)
<Setting range>
1 to 255: Network number
Other than 1 to 255: Setting error (SW.E LED is lit.) ... Offline status</td></tr>
<tr><td>(3)
*3</td><td>Group number setting switch
 
</td><td colspan="3">Setting of group number (Factory setting: 0)
<Setting> range
Not used

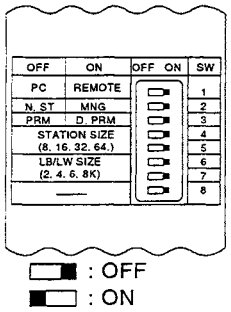
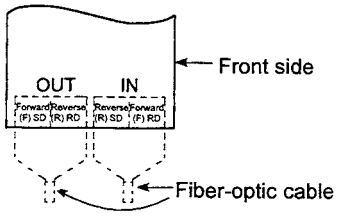
(ignored)</td></tr>
<tr><td>(4)
*3</td><td>Station number setting switches
 
</td><td colspan="3">Setting of station number (Factory setting: 01)
<Setting range>
0: Master station
Other than 0: Setting error (SW.E LED is lit.)</td></tr>
<tr><td>(5)
*3</td><td>Mode select switch
 
</td><td colspan="3">Setting of mode (Factory setting: 0)</td></tr>
<tr><td></td><td></td><td>Mode</td><td>Name</td><td>Description</td></tr>
<tr><td></td><td></td><td>0</td><td>On-line
(Automatic on-line return is set.)</td><td>Automatic on-line return during data link is enabled.</td></tr>
<tr><td></td><td></td><td>1</td><td colspan="2">Unusable (An SW.E error occurs if these are set.)</td></tr>
<tr><td></td><td></td><td>2</td><td>Off-line</td><td>Host station is set off-line.</td></tr>
<tr><td></td><td>*4</td><td>3</td><td>Test mode 1</td><td>Loop test (Forward loop)</td></tr>
<tr><td></td><td></td><td>4</td><td>Test mode 2</td><td>Loop test (Reverse loop)</td></tr>
<tr><td></td><td></td><td>5</td><td>Test mode 3</td><td>Station-to-station test (Master station)</td></tr>
<tr><td></td><td></td><td>6</td><td>Test mode 4</td><td>Station-to-station test (Slave station)</td></tr>
<tr><td></td><td></td><td>7</td><td>Test mode 5</td><td>Self-loopback test</td></tr>
<tr><td></td><td></td><td>8</td><td>Test mode 6</td><td>Internal self-loopback test</td></tr>
<tr><td></td><td></td><td>9</td><td>Test mode 7</td><td>Hardware test</td></tr>
<tr><td></td><td></td><td>A</td><td>————</td><td>Unusable</td></tr>
<tr><td></td><td></td><td>B</td><td>————</td><td>Unusable</td></tr>
<tr><td></td><td></td><td>C</td><td>————</td><td>Unusable</td></tr>
<tr><td></td><td>*5</td><td>D</td><td>Test mode 8</td><td>Network number confirmation
(LED indication)</td></tr>
<tr><td></td><td></td><td>E</td><td>————</td><td>Unusable</td></tr>
<tr><td></td><td></td><td>F</td><td>Test mode</td><td>Station number confirmation
(LED indication)</td></tr>
</table>

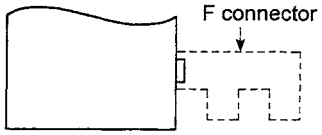
*3..... After changing settings, reset the ACPU.

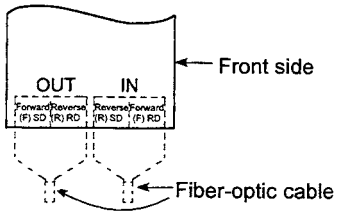
*4..... In the case of AJ71BR11/A1SJ71BR11, an SW.E error occurs if these are set.

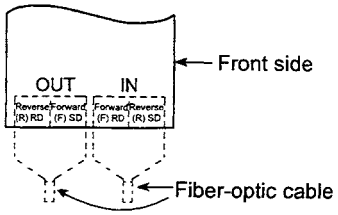
*5..... Resetting of the ACPU is not necessary for mode settings D and F.
These tests can be performed on AJ71LP21, AJ71BR11, AJ71LR21, AJ71LP21G and AJ71LP21GE.

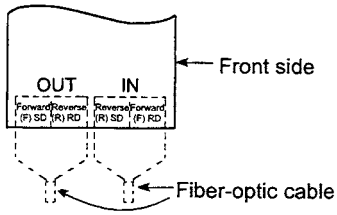
Table 3.1 Names of Parts and Settings (Continued)

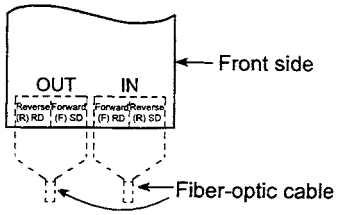
<table>
<tr><th>No.</th><th>Name</th><th colspan="4">Description</th></tr>
<tr><td>(6)
*6</td><td>Condition setting switches
 
</td><td colspan="4">Setting of operating conditions (Factory setting: all set to OFF)
<table>
<tr><th>SW</th><th>Description</th><th>OFF</th><th>ON</th></tr>
<tr><td>1</td><td>Network type</td><td>PLC to PLC network (PC)</td><td>Remote I/O network (REMOTE)</td></tr>
<tr><td>2</td><td>Station type</td><td rowspan="6">Setting not necessary</td><td rowspan="6"></td></tr>
<tr><td>3</td><td>Parameters</td></tr>
<tr><td>4</td><td rowspan="2">Number of stations</td></tr>
<tr><td>5</td></tr>
<tr><td>6</td><td rowspan="2">Total number of B/W points</td></tr>
<tr><td>7</td></tr>
<tr><td>8</td><td>Not used</td><td>Always OFF</td><td></td></tr>
</table></td></tr>
<tr><td>(7)</td><td>Connector</td><td colspan="4">Connect fiber optic cables to an AJ71LP21 (G,GE)/A1SJ71LP21 (GE), an F connector to an AJ71BR11/A1SJ71BR11, and a coaxial cable to an AJ71LR21/A1SJ71LR21.
AJ71LP21(G,GE)
 

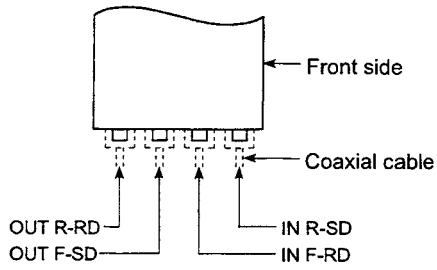
AJ71BR11/A1SJ72QBR15
 

A1SJ71LP21
Hardware version G or later
 

Hardware version F or later
 

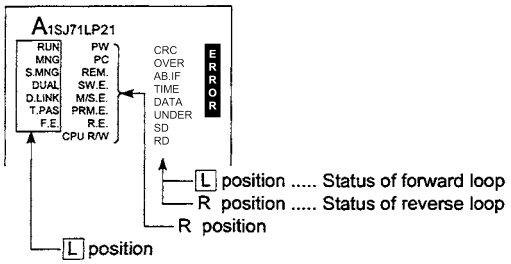
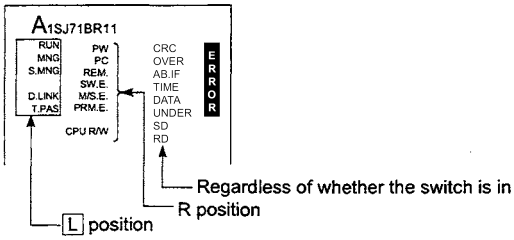
A1SJ71LP21GE
Hardware version C or later
 

Hardware version B or later
 

AJ71LR21/A1SJ71LR21
 
</td></tr>
</table>

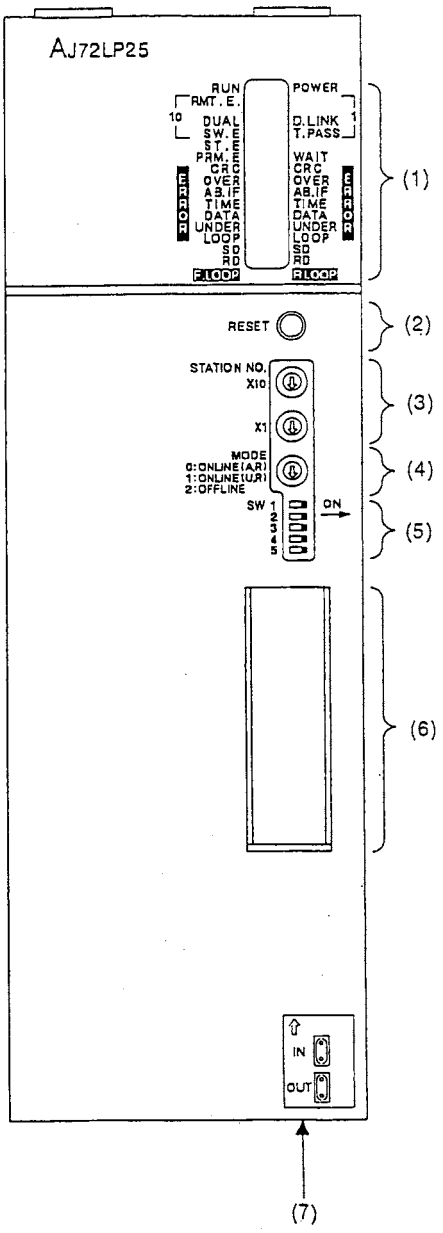
*6..... Reset the ACPU if the setting has been changed while the power of the ACPU is ON.

Table 3.1 Names of Parts and Settings (Continued)

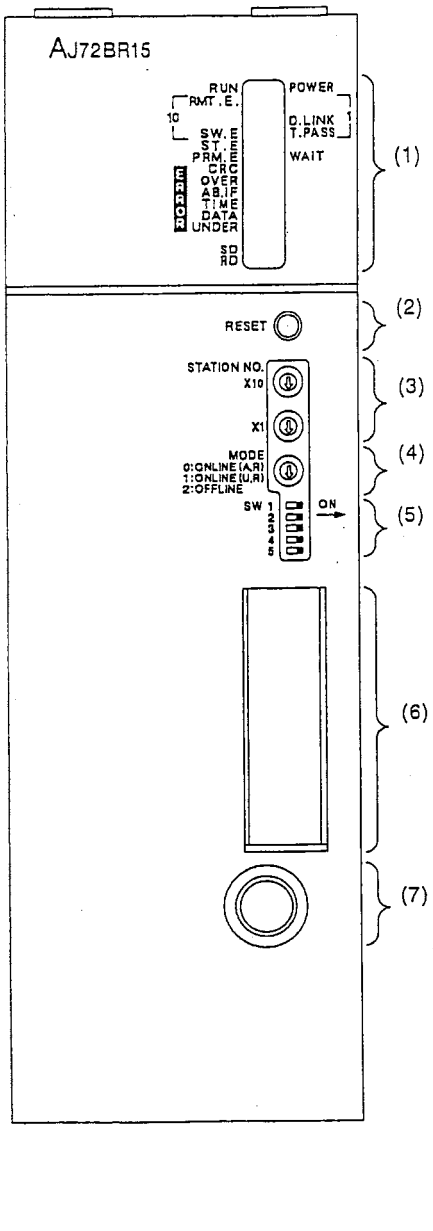
No.	Name	Description
(8)	LED indication select switch A1SJ71LP21 (GE)/A1SJ71LR21 DISPLAY L R (F.L.) (R.L.) A1SJ71BR11 DISPLAY L R	Used to select between the LED indications.   *CPU R/W is displayed regardless of the switch position.

3.2.2 Remote I/O station (AJ72LP25 (G,GE), AJ72BR15, AJ72LR25, A1SJ72QLP25, A1SJ72QLR25, A1SJ72QBR15)

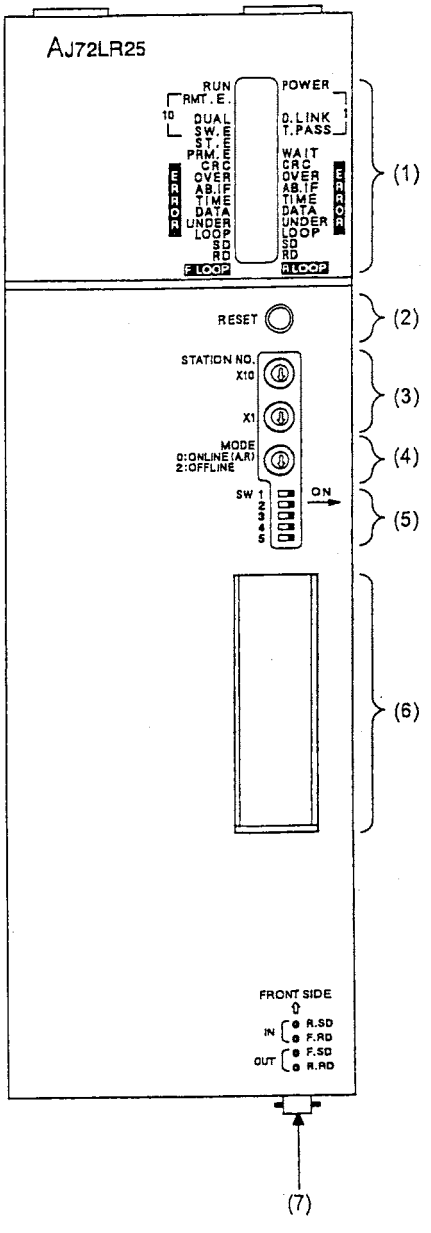
(1) AJ72LP25 (G)



(2) AJ72BR15

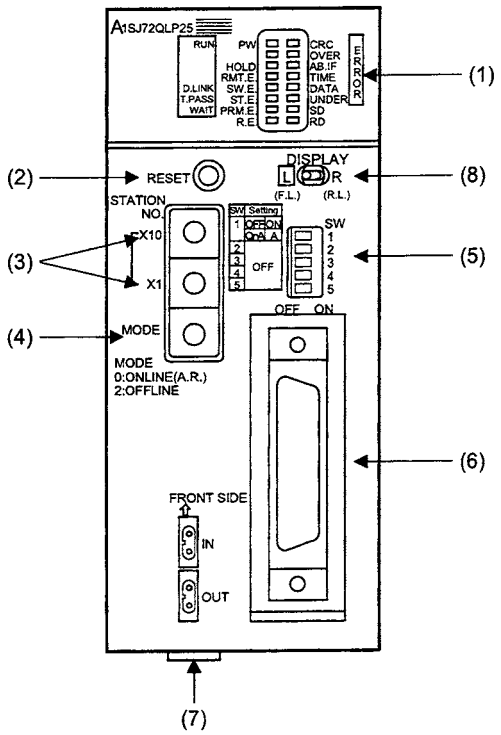


(3) AJ72LR25

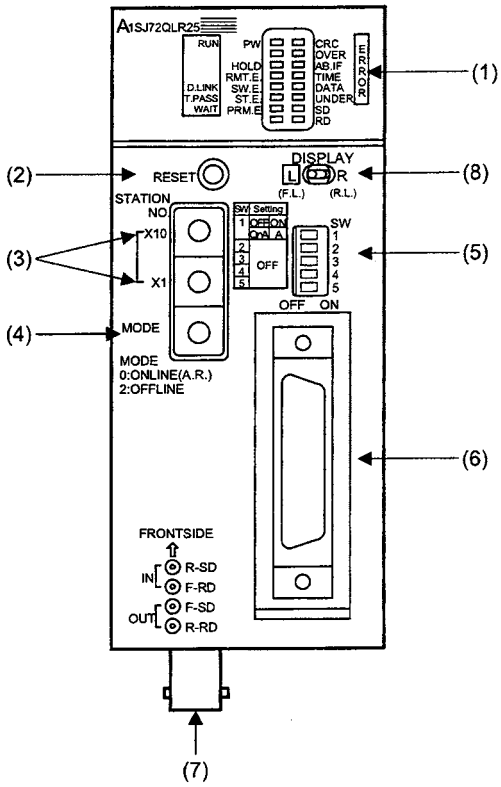


* Do not touch the DIP switches on the printed circuit board at the side face of the module.

(4) A1SJ72QLP25



(5) A1SJ72QLR25



(6) A1SJ72QBR15

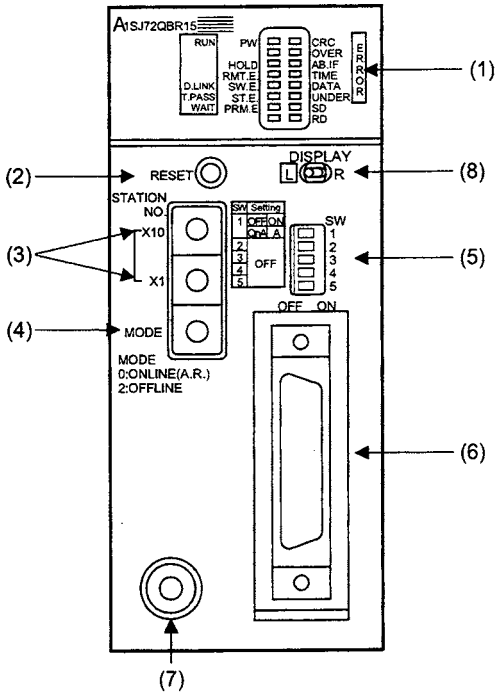
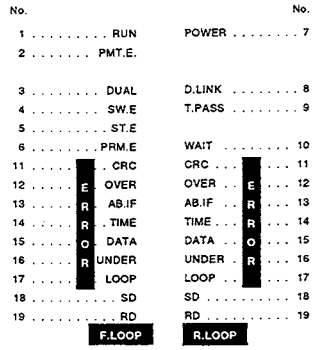


Table 3.2 Names of Parts and Settings

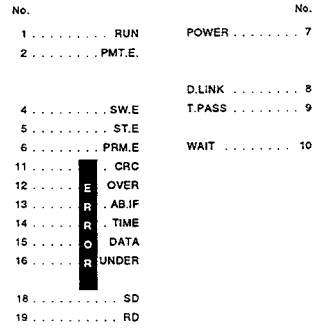
No.	Name	Description

(1) LED

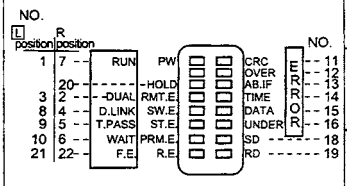
AJ72LP25 (G,GE)/AJ72LR25



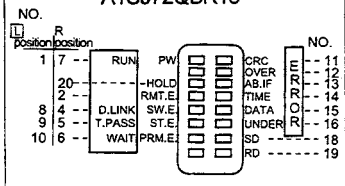
AJ72BR15



A1SJ72QLP25/A1SJ72QLR25



A1SJ72QBR15

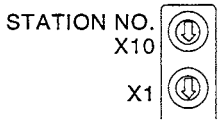
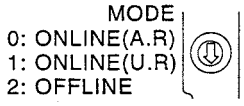
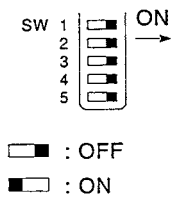


No.	Name	State	Description
1	RUN	Lit	Normal state
		Unlit	WDT error, SP. UNIT ERROR
2	RMT.E.	Lit	Blown fuse, I/O verification error (host station)
3	DUAL		Multiplex transmission being executed. (Unlit: Multiplex transmission not executed.)
4	SW.E		Switch settings of (3) and (4) are abnormal.
5 *1	ST.E		Two same station numbers or two master stations are set in a network.
6	PRM.E		• I/O allocations abnormal • Insufficient LB/LW points (special function module) • Parameters received from the master station are abnormal
7	POWER		Power is supplied. (Unlit: Power is not supplied.)
8	D.LINK		Data link is operative. (Unlit: Data link is inoperative.)
9	T.PASS		Baton passing being executed. (Transient transmission possible)
10	WAIT		Waiting for communication with a special function module
11	CRC		Code check error in received data. <Causes> Timing of disconnection of data-sending station, hardware fault, cable fault, noise, etc.
12	OVER		Processing of received data delayed. <Causes> Hardware fault, cable fault, noise, etc.
13	AB. IF		• Consecutive "1" more than specified is received. • Received data length is shorter than specified. <Causes>Timing of disconnection of data-sending station, WDT setting is too short, cable fault, noise, etc.
14	TIME		Data link WDT times out. <Causes> WDT setting is too short, cable fault, noise, etc.
15	DATA		Abnormal data larger than 2 kbytes are received. <Causes> Cable fault, noise, etc.
16	UNDER		Internal processing of send data is not at constant intervals. <Causes> Hardware fault
17	LOOP		The forward or reverse loop is faulty. (F.E.: F loop error, R.E.: R loop error) <Causes> Power to the adjacent station is OFF. Cable breakage or not connected, etc.
21	F.E		
22	R.E		
18	SD	Dimly lit	Data being transmitted.
19 *2	RD		Data being transmitted.
20	HOLD	Unlit	Lit in Q4AR output hold mode

*1..... "ST.E" may not light up depending on the condition of lines or cable connections even if a station number is duplicated in a network. Execute the setting confirmation test of the online test as well as visual check.

*2..... When no terminal resister is installed to AJ72BR15/A1SJ72QBR15, "RD" may be lit all the time whether data link is operative or not. (This does not indicate any failure of the network module.)

Table 3.2 Names of Parts and Settings (Continued)

<table>
<tr><th>No.</th><th>Name</th><th colspan="3">Description</th></tr>
<tr><td>(2)</td><td>RESET switch
 
</td><td colspan="3">Used to reset the hardware.</td></tr>
<tr><td>(3)
*3</td><td>Station number setting switches
 
</td><td colspan="3">Setting of station number (Factory setting: 01)*4
<Setting range>
1 to 64: Station number
Other than 1 to 64: Setting error (SW.E LED is lit.)</td></tr>
<tr><td>(4)
*3</td><td>Mode select switch
 
</td><td colspan="3">Setting of mode (Factory setting: 0)</td></tr>
<tr><td></td><td></td><td>Mode</td><td>Name</td><td>Description</td></tr>
<tr><td></td><td></td><td>0</td><td>On-line
(Automatic on-line return is set.)</td><td>Automatic on-line return during data link is enabled.</td></tr>
<tr><td></td><td></td><td>1</td><td colspan="2">Unusable (An SW.E error occurs if these are set.)</td></tr>
<tr><td></td><td></td><td>2</td><td>Off-line</td><td>Host station is set off-line.</td></tr>
<tr><td></td><td>*5</td><td>3</td><td>Test mode 1</td><td>Loop test (Forward loop)</td></tr>
<tr><td></td><td></td><td>4</td><td>Test mode 2</td><td>Loop test (Reverse loop)</td></tr>
<tr><td></td><td></td><td>5</td><td>Test mode 3</td><td>Station-to-station test (Master station)</td></tr>
<tr><td></td><td></td><td>6</td><td>Test mode 4</td><td>Station-to-station test (Slave station)</td></tr>
<tr><td></td><td></td><td>7</td><td>Test mode 5</td><td>Self-loopback test</td></tr>
<tr><td></td><td></td><td>8</td><td>Test mode 6</td><td>Internal self-loopback test</td></tr>
<tr><td></td><td></td><td>9</td><td>Test mode 7</td><td>Hardware test</td></tr>
<tr><td></td><td></td><td>A</td><td>————</td><td>Unusable</td></tr>
<tr><td></td><td></td><td>B</td><td>————</td><td>Unusable</td></tr>
<tr><td></td><td></td><td>C</td><td>————</td><td>Unusable</td></tr>
<tr><td></td><td></td><td>D</td><td>————</td><td>Unusable</td></tr>
<tr><td></td><td></td><td>E</td><td>————</td><td>Unusable</td></tr>
<tr><td></td><td>*6</td><td>F</td><td>Test mode 8</td><td>Station number confirmation
(LED indication)</td></tr>
<tr><td>(5)</td><td> 
</td><td colspan="3">Always OFF at SW1 to 5.</td></tr>
</table>

*3..... If the setting has been changed while the power to the remote I/O station was ON, reset by using the RESET switch: (2) in the table above.

*4..... The setting range for the AJ72BR15/A1SJ72QBR15 is as follows:

<Setting range>

1 to 32: Station number

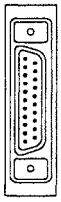
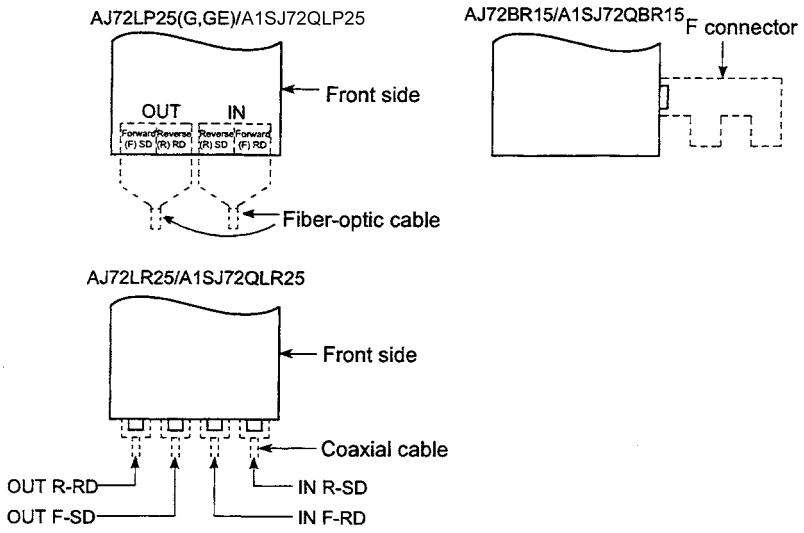
Other than 1 to 32: Setting error

(The SW.E. LED turns ON. It does not turn ON if any of 33 to 64 is set.)

*5..... In the case of AJ72BR15/A1SJ72QBR15, an SW.E. error occurs if these are set.

*6..... "F" does not have to be reset with the RESET switch.
These tests are executable on the AJ72LP25, AJ72BR15, AJ72LR25, AJ72LP25G, and AJ72LP25GE.

Table 3.2 Names of Parts and Settings (Continued)

<table>
<tr><th>No.</th><th>Name</th><th>Description</th></tr>
<tr><td>(6)</td><td>RS-422 interface
  </td><td>Used to connect peripheral devices.
(Available only for peripheral devices using GPP function software package for remote I/O networks (see Section 1.4).)</td></tr>
<tr><td>(7)</td><td>Connector</td><td>Connects fiber optic cable to an AJ72LP25 (G,GE)/A1SJ72QLP25, F connector to an AJ72BR15/A1SJ72QBR15, a coaxial cable to an AJ72LR25/A1SJ72QLR25.
 
</td></tr>
<tr><td>(8)</td><td>Display select switch</td><td>Used to select the CRC to UNDER error indications between the forward and reverse loops and to select between the RUN to F.E. and PW to R.E. indications (factory setting: L position)
<table>
<tr><th>Switch position</th><th>Description</th></tr>
<tr><td>L (F.L.)</td><td>LEDs (CRC through UNDER) indicate the forward loop status and RUN to F.E indications are set to be valid. (PW-to-R.E is NOT valid.)</td></tr>
<tr><td>R (R.L.)</td><td>LEDs (CRC through UNDER) indicate the reverse loop status and PW-to-R.E indications are set to be valid. (RUN-to-F.E is NOT valid.)</td></tr>
</table></td></tr>
</table>

3.3 Connections

3.3.1 Optical loop systems

(1) Precautions on making connections

(a) The usable fiber-optic cable type is determined depending on the interstation distance.

Type		Interstation Distance		
		AJ71LP21 A1SJ71LP21 AJ72LP25 A1SJ72QLP25	AJ71LP21G AJ72LP25G	AJ71LP21GE A1SJ71LP21GE AJ72LP25GE
SI fiber-optic cable (former type: A-2P-□)	L type	500m	Not available	Not available
	H type	300m		
SI fiber-optic cable		500m		
H-PCF fiber-optic cable		1000m		
Broad-band H-PCF fiber-optic cable		1000m		
QSI fiber-optic cable		1000m		
GI-50/125 fiber-optic cable		Not available	2000m	Not available
GI-62.5/125 fiber-optic cable		Not available	Not available	2000m

(b) When using the optical fiber cable, the cable bending radius is limited. For details, check the cable to be used.

(c) When installing the fiber-optic cables, do not touch the cable core of the cable-side and module-side connectors and keep dirt or dust away from it. Hand oil, dust and/or dirt may increase transmission loss, resulting in a data link error.
Also, do not remove the cover from the module connector until an optical fiber cable is connected.

(d) When installing/removing the fiber-optic cable, hold the cable connector by hand directly.

(e) Connect the cable connector and module connector securely until they "click".

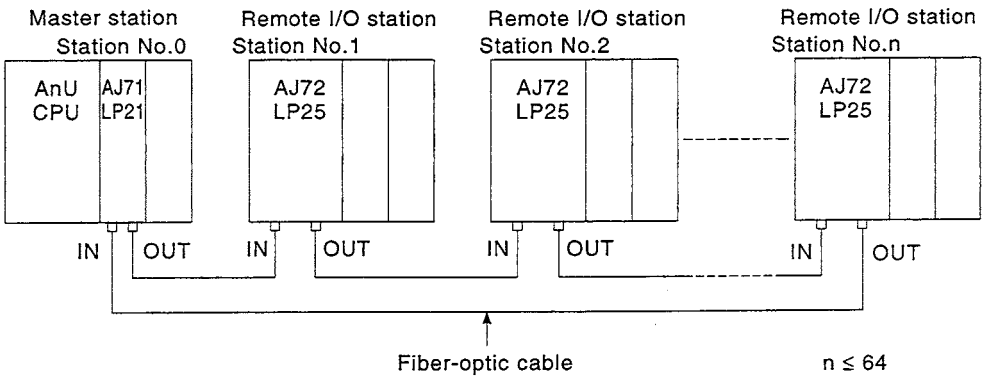
(f) Please wire IN/OUT of the connector for the cable correctly.
Please do loopback test, the set confirmation test, and the bureau order confirmation test after wiring. It might be generated that a baton abnormal passing cannot be generated when miswiring and the downed bureau which cannot do the loopback of an arbitrary bureau do the row again even by the reclosing of the power supply.

(g) Completely turn off the externally supplied power used in the system when connecting or disconnecting the cable.

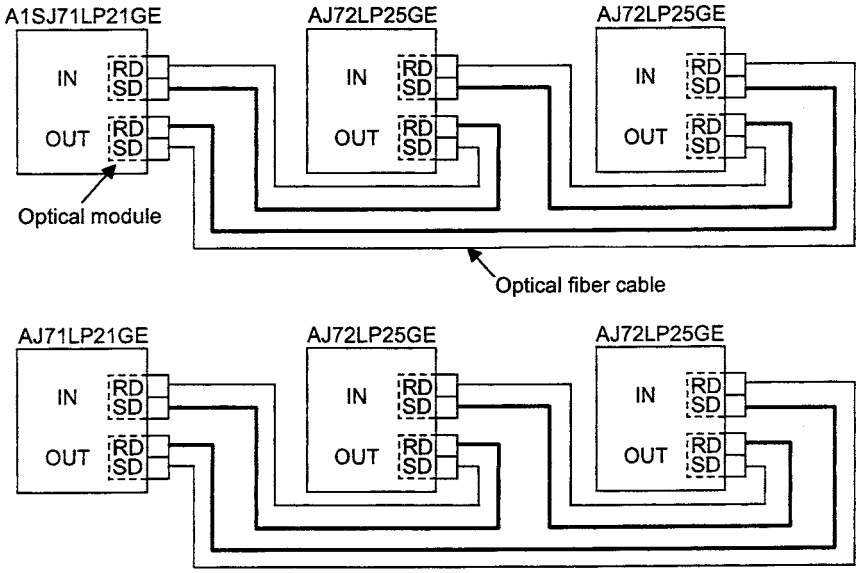
(2) Connection method

Connect fiber-optic cables as shown below.
The connections do not have to follow the station No. order.

(a) AJ71LP21, A1SJ71LP21, AJ72LP25, AJ71LP21G



(b) AJ71LP21GE, A1SJ71LP21GE, AJ72LP25GE

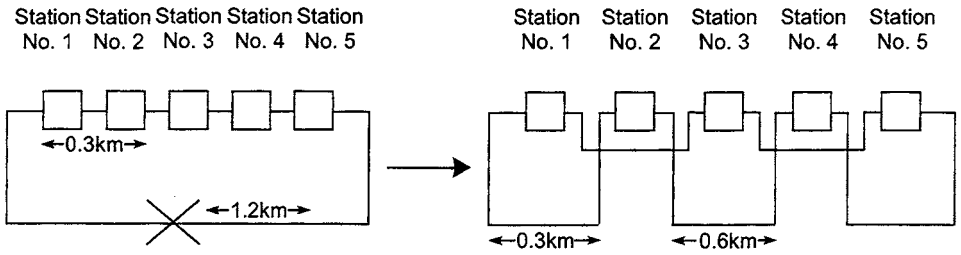


POINT

Designate stations reserved for future use (those included in the total number of stations but not actually connected) as reserved stations. This prevents the stations from being detected as abnormal stations, and it does not affect the link scan time.

REMARK

When the interstation distance exceeds the limit in the optical loop system, changing the connection order of the stations can shorten the distance as shown below.



Connection not allowed between No. 1 and No. 5.

3.3.2 Coaxial loop system

(1) Precautions on connections

(a) Restrictions on the interstation cable length

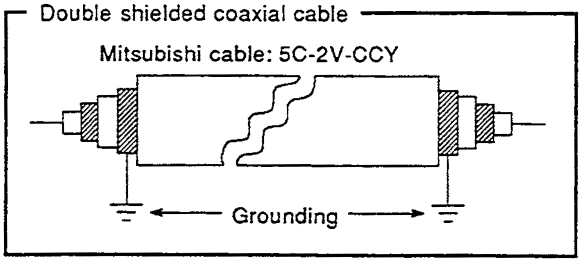
1) For connection between network modules, use the cable length given in the following table depending on the cable type.

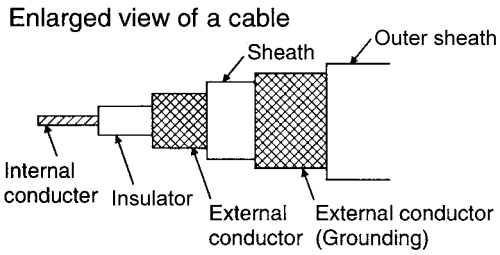
Cable Type	Interstation Cable Length	Overall Distance
3C-2V	300 m	19.2 km
5C-2V	500 m	30.0 km
5C-FB	500 m	30.0 km

(b) Notes on cabling

1) Run coaxial cables at least 100mm away from the other power and control cables.

2) When intensive influence by noise is expected, use of double shielded coaxial cables is recommended.

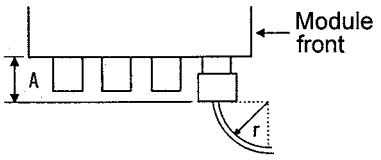




A 5C-2V connector plug can be applied to the double shielded coaxial cable.
Connect the 5V-2C connector plug to the coaxial cable in the inside of the double shielded coaxial cable.
Ground the shield part in the outside of the double shielded coaxial cable as shown above.

(c) Coaxial cables have the following limitations on the bending radius.

Cable Type	Allowable bending radius r [mm] (inch)	Connector A [mm] (inch)
3C-2V	23 (0.91)	35 (1.38)
5C-2V	30 (1.18)	
5C-FB	30 (1.18)	



(d) Do not pull the connected coaxial cable.
Doing so may cause poor contact or cable disconnection.

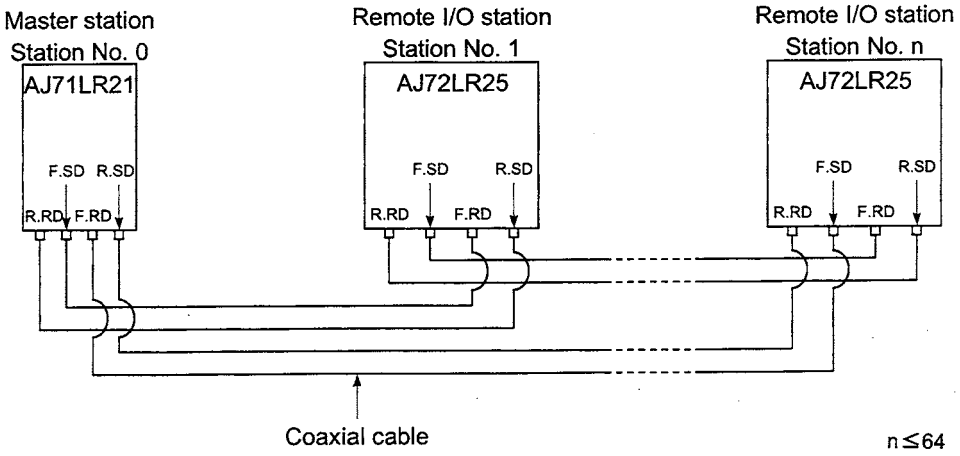
(e) Properly connect the cable with the SD/RD terminal of the connector.
After connection, execute the loopback test, setting confirmation test, and station order confirmation test.
Improper connection may cause a problem such as follows:
- A baton pass error occurs.
- The loopback cannot be performed in an arbitrary station.
- A downed station cannot be returned even after the power is turned on again.

(f) Completely turn off the external power supply used in the system when connecting or disconnecting the cable.

(2) Connection method

Connect coaxial cables as shown below.

They need not be connected in the order of station number.

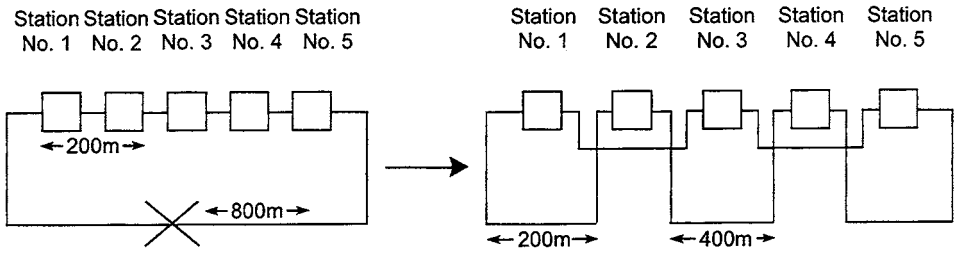


POINT

Designate stations reserved for future use (those included in the total number of stations but not actually connected) as reserved stations. This prevents the stations from being detected as abnormal stations, and it does not affect the link scan time.

REMARKS

When the interstation distance exceeds the limit in the optical loop system, changing the connection order of the stations can shorten the distance as shown below.



Connection not allowed between No. 1 and No. 5.

3.3.3 Coaxial bus system

(1) Precautions for cable connections

(a) The restrictions to the cable lengh

1) To build a coaxial bus system, cables of different lengths must be used according to the total number of stations.
If cables other than those specified below are used, communication errors may occur.

Station-to-station cable length \ Number of stations connected	2 to 9 stations			10 to 33 stations		
Cable type	3C - 2V	5C - 2V	5C - FB	3C - 2V	5C - 2V	5C - FB
0 to 1 m (3.28 ft.)	× (cable less than 1m (3.28 ft.) in length cannot be used.)					
1 (3.28 ft.) to 5 m (16.41 ft.)	○	○	○	○	○	○
5 (16.41 ft.) to 13 m (42.65 ft.)	○	○	○	×	×	×
13 (42.65 ft.) to 17 m (55.78 ft.)	○	○	○	○	○	○
17 (55.78 ft.) to 25 m (82.03 ft.)	○	○	○	×	×	×
25 (82.03 ft.) to 300 m (984.3 ft.)	○	○	○	○	○	○
300 (984.3 ft.) to 500 m (1640.5 ft.)	×	○	○	×	○	○

○: Allowed ×: Not allowed

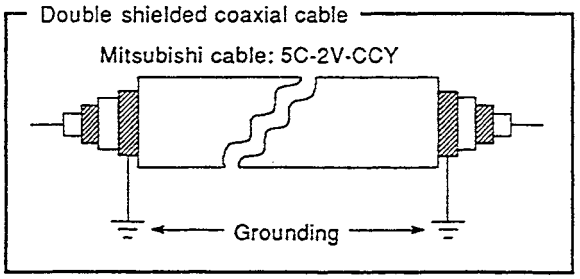
2) If there is a possibility that the number of stations will increase, due to system expansion for example, do the necessary wiring work in advance, taking care to comply with the applicable restrictions.

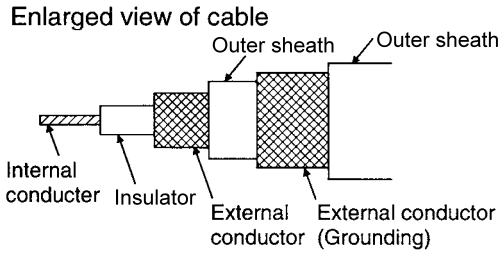
3) When A6BR10/A6BR10-DC repeater units are used, use a cable with the cable length listed in the "10 to 33 stations" column in the table above, regardless of the number of connected stations or number of repeater units.

(b) Cautions on cabling

1) A coaxial cable must be laid providing a 100 mm (3.94 inch) or more clearance to power cables or control cables.

2) Where intensive influence by noise is expected, use of double shielded coaxial cables is recommended.

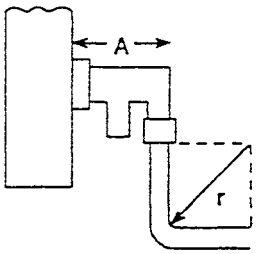




A 5C-2V connector plug can be applied to the double shielded coaxial cable.
Connect the 5V-2C connector plug to the coaxial cable in the inside of the double shielded coaxial cable.
Ground the shield part in the outside of the double shielded coaxial cable as shown above.

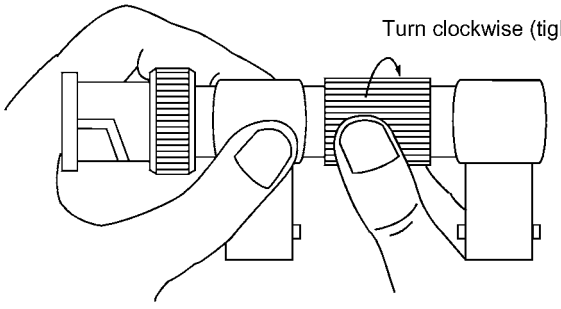
(c) Coaxial cables have the following limitations on the bending radius.

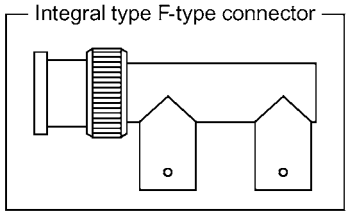
Cable Type	Allowable Bending Radius r [mm] (inch)	Connector A [mm] (inch)
3C-2V	23 (0.91)	50 (1.97)
5C-2V	30 (1.18)	
5C-FB	30 (1.18)	



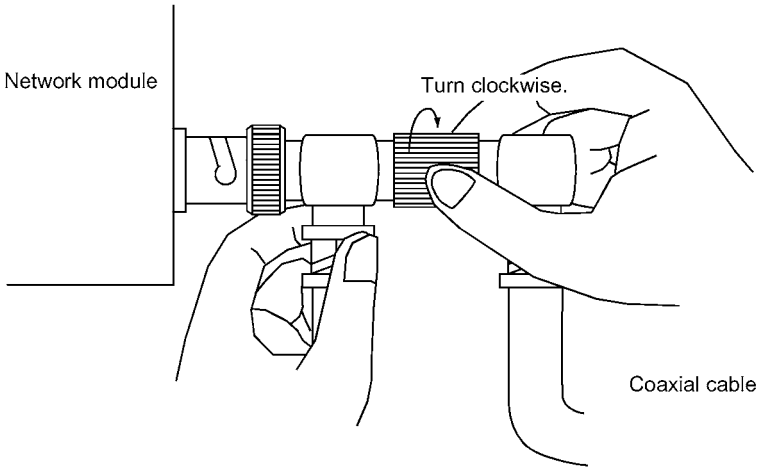
(d) Do not pull the connected coaxial cable.
Contact failure and cable disconnection may occur.

(e) There are integral type and separate type F-type connectors. In the case of the separate type F-type connector, tighten the ring of the connector until the ring is tight before connecting the connector to the network module.
If the ring is loose, a communication error may occur.





After connecting the F-type connector to the network module, retighten its ring periodically.
Retighten it with both hands as shown below.



(f) A white oxide, which may be deposited on the F-type connector depending on the operating environment, is not produced in the fitting portion, causing no functional problems.

(g) Make sure to connect a terminal resistor to both terminal stations of the coaxial bus type network system.

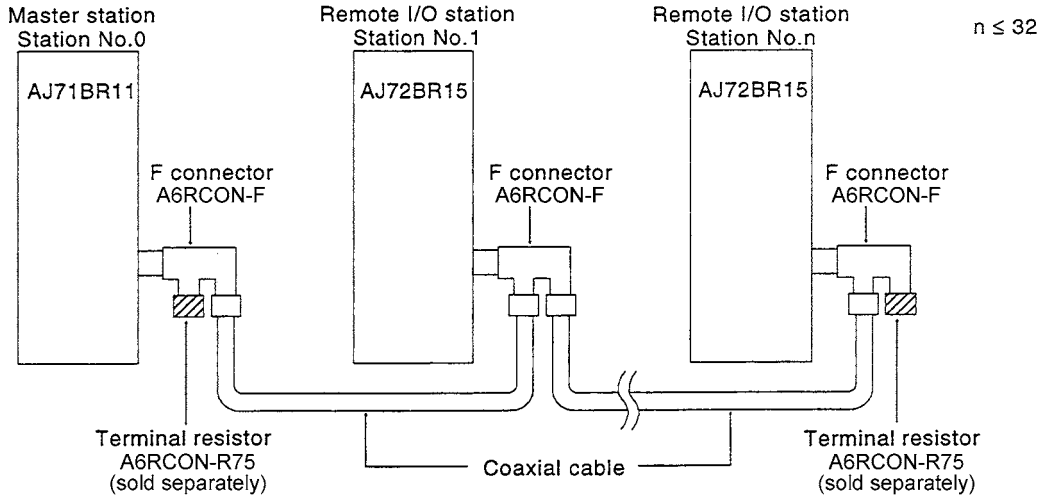
(h) Completely turn off the external power supply used in the system when connecting or disconnecting the cable.

(2) Connection method

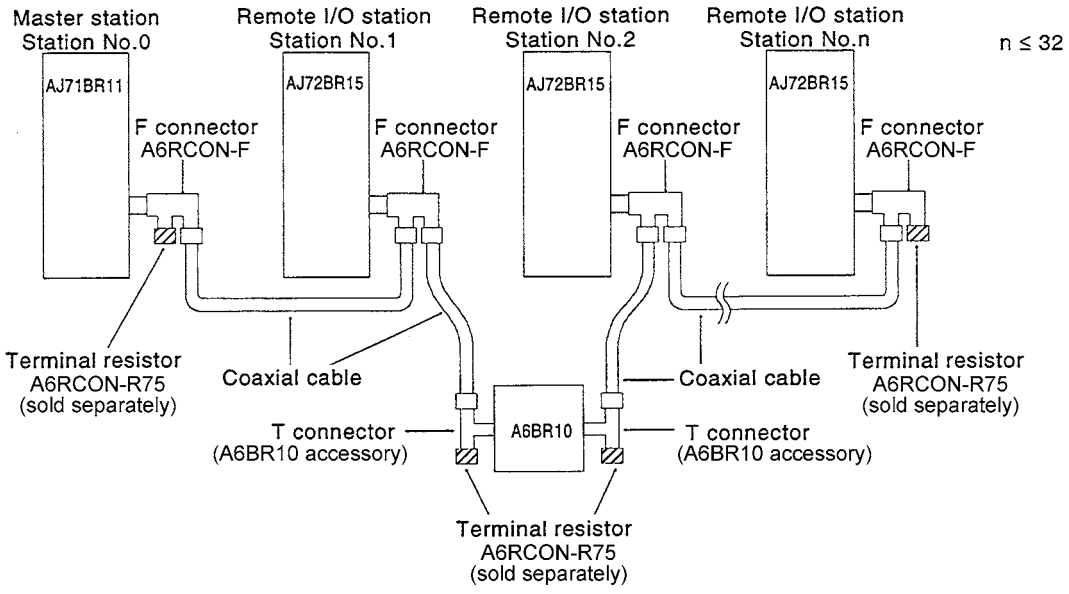
Connect coaxial cables as shown below.
Be sure to connect terminal resistors (sold separately: A6RCON-R75) to both ends.

One F connector (A6RCON-F) is supplied with each module (AJ71BR11, A1SJ71BR11, AJ72BR15, A1SJ72QBR15).

(a) When no repeater unit is used



(b) When a repeater unit is used (serial connection)

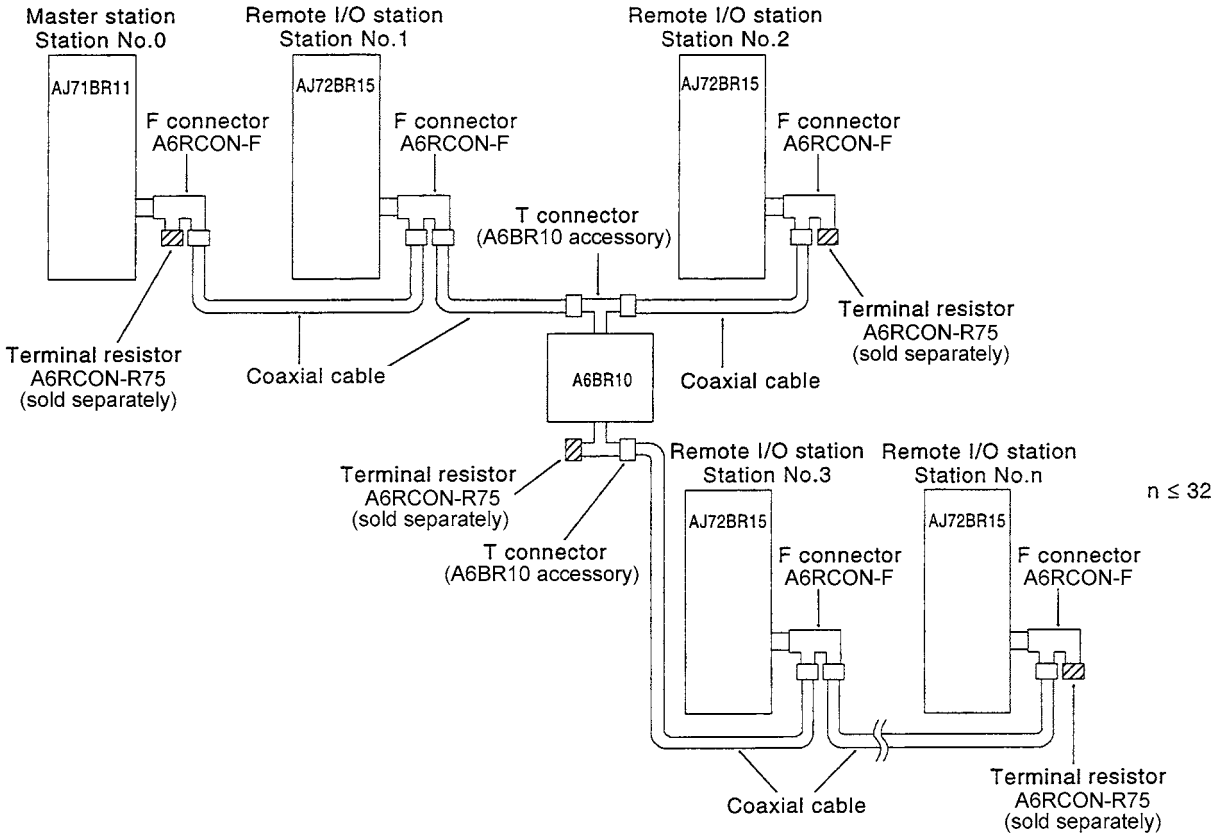


REMARK

For detailed information on the repeater unit (A6BR10), refer to the user's manual supplied with the product.

Repeater Unit for the MELSECNET/10 Coaxial Bus System type
A6BR10/A6BR10-DC User's Manual
IB-66499

(c) When a repeater unit is used (connection including a branch)

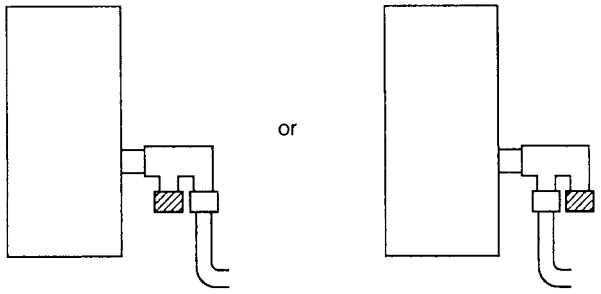


POINT

(1) By setting stations that will be connected in future (stations that are included in the number of stations but not actually connected) as reserved stations, a communication error can be prevented and the link scan time will not be affected.

(2) The two connectors of the F connector are not dedicated to IN and OUT. A coaxial cable can be connected to either of them.

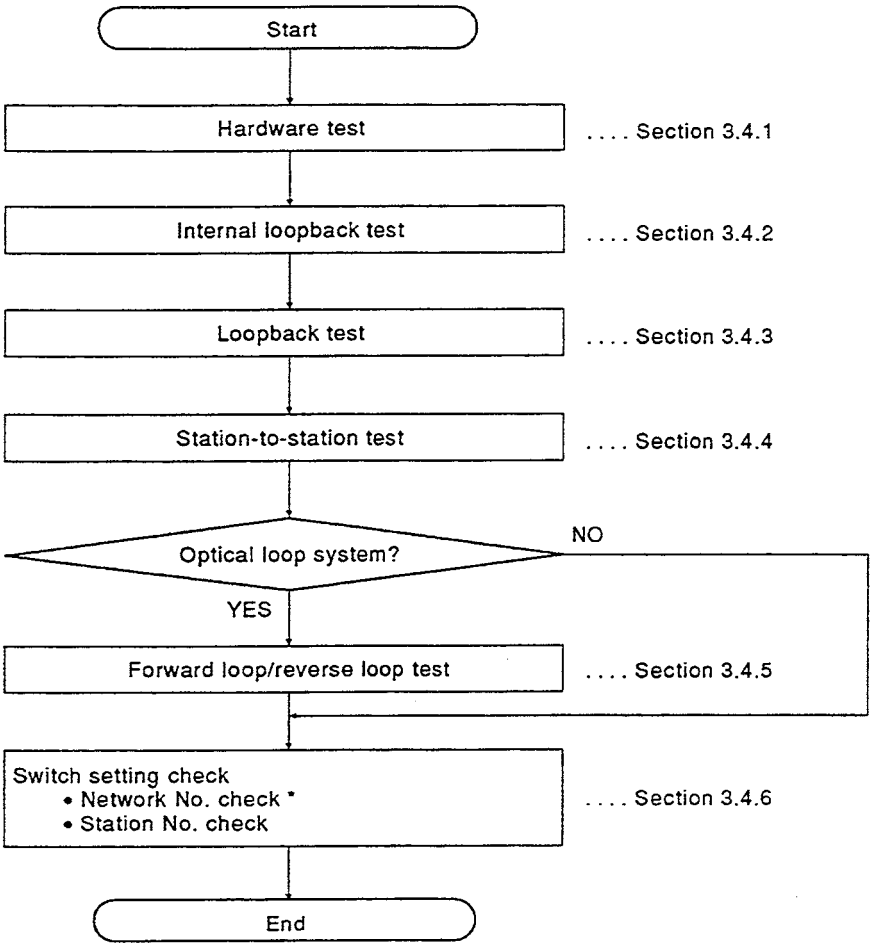
(3) A terminal resistor can be placed on either side of the F connector.



3.4 Checking the Connection with Network Modules

Before operating the data link, check the network modules and the cables. Set the items to be tested by setting the mode select switch on the front face of the network module.

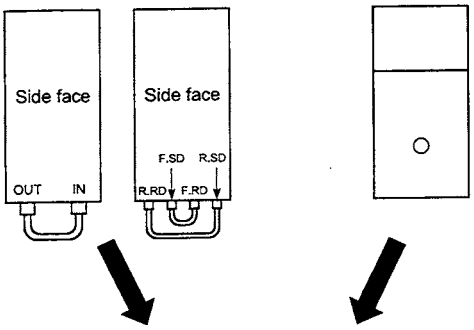
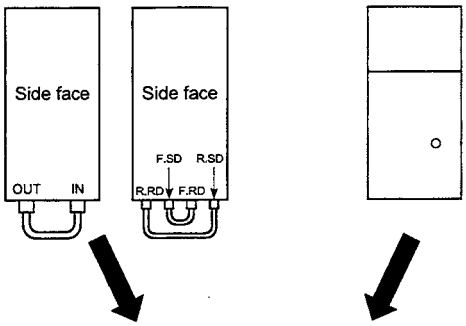
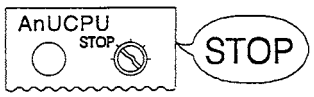
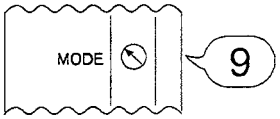
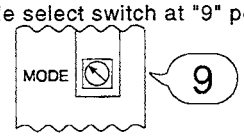
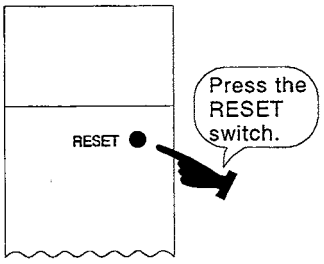
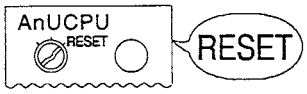
[Test Procedure]



* Not possible for remote I/O stations

3.4.1 Hardware test

Check hardware inside the network module.

<table>
<tr><th colspan="2">Master Station</th><th colspan="2">Remote I/O Station</th></tr>
<tr><td>Optical loop system
Coaxial loop system</td><td>Coaxial bus system</td><td>Optical loop system
Coaxial loop system</td><td>Coaxial bus system</td></tr>
<tr><td>Connect the IN and OUT connectors with a fiber-optic cable.</td><td>Do not connect cables or terminal resistances.</td><td>Connect the IN and OUT connectors with a fiber-optic cable.</td><td>Do not connect cables or terminal resistances.</td></tr>
<tr><td> 
</td><td></td><td> 
</td><td></td></tr>
<tr><td>Set the AnUCPU to the STOP state.
 
</td><td></td><td>Set the mode select switch at "9" position.
 
</td><td></td></tr>
<tr><td>Set the mode select switch at "9" position.
 
</td><td></td><td>Reset the network module.
 
</td><td></td></tr>
<tr><td>Set the AnUCPU to the RESET state.
 
</td><td></td><td></td><td></td></tr>
</table>

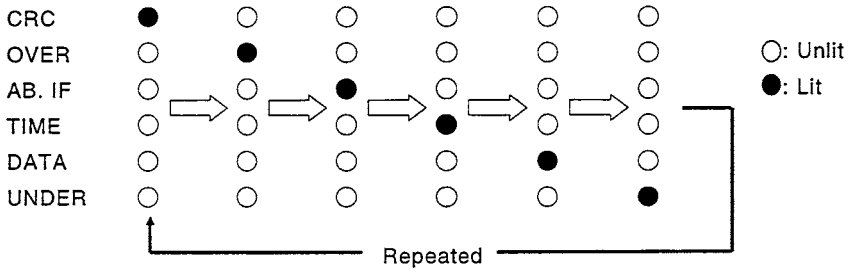
To the next page.

From the previous page.

Hardware test is being executed!

The test results are indicated by the LEDs.

<When normal>
The CRC, OVER, AB.IF, TIME, DATA, and UNDER LEDs light in this order.
When this cycle is repeated 5 or more times the status is normal.



<When abnormal>
For the optical loop system (AJ71LP21, AJ72LP25, A1SJ71LP21, A1SJ72QLP25, AJ71LP21G, AJ72LP25G, AJ71LP21GE, A1SJ71LP21GE, AJ72LP25GE), the coaxial loop system (AJ71LR21, AJ72LR25, A1SJ71LR21, A1SJ72QLR25) and the coaxial bus system (AJ71BR11, AJ72BR15, A1SJ71BR11, A1SJ72QBR15):

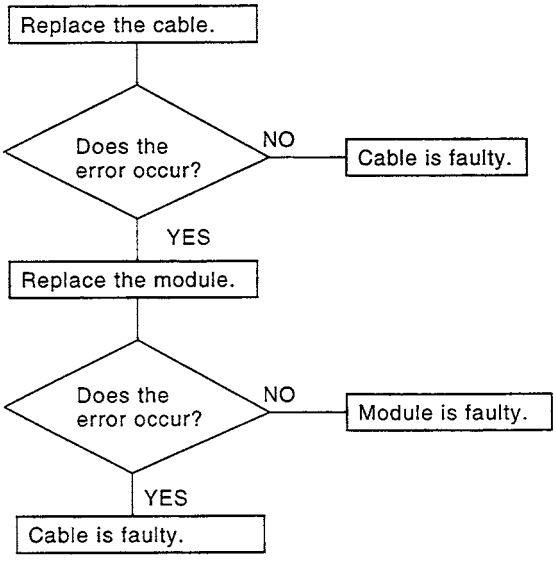
When the following errors occur, corresponding LED will light. Replace the network module.

1) CRC is lit: ROM check error
2) OVER is lit: RAM check error
3) AB.IF is lit: Timer or interrupt function check error

For the optical loop system (AJ71LP21, AJ72LP25, A1SJ71LP21, A1SJ72QLP25, AJ71LP21G, AJ71LP21GE, A1SJ71LP21GE, AJ72LP25G, AJ72LP25GE) only

1) TIME is lit: Forward loop disconnection check error
2) DATA is lit: Reverse loop disconnection check error

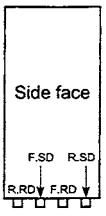
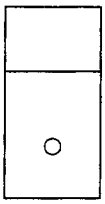
When a light amount check error occurs, locate the cause by following the flow chart given below.

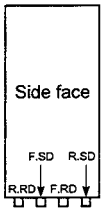
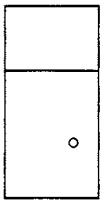
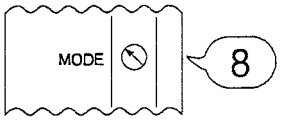
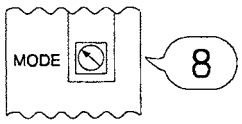
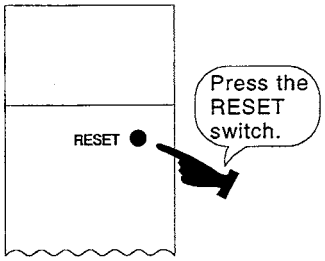


3.4.2 Internal self-loopback test

Check the hardware including the send and receive circuits for transmissions in a single network module.

<table>
<tr><th colspan="2">Master Station</th><th colspan="2">Remote I/O Station</th></tr>
<tr><td>Optical loop system
Coaxial loop system</td><td>Coaxial bus system</td><td>Optical loop system
Coaxial loop system</td><td>Coaxial bus system</td></tr>
<tr><td>Do not connect fiber-optic cables.
Be careful not to allow light to enter the connector of the network module (sensitive to light).</td><td>Do not connect cables or terminal resistances.</td><td>Do not connect fiber-optic cables.
Be careful not to allow light to enter the connector of the network module (sensitive to light).</td><td>Do not connect cables or terminal resistances.</td></tr>
<tr><td> 


</td><td>  </td><td> 


</td><td>  </td></tr>
<tr><td>Set the AnUCPU to the STOP state.
 
</td><td></td><td>Set the mode select switch at "8" position.
 
</td><td></td></tr>
<tr><td>Set the mode select switch at "8" position.
 
</td><td></td><td>Reset the network module.
 
</td><td></td></tr>
<tr><td>Set the AnUCPU to the RESET state.
 
</td><td></td><td></td><td></td></tr>
</table>

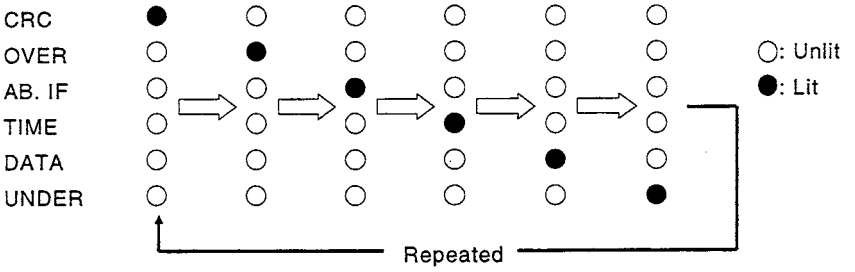
To the next page.

From the previous page.

Internal self-loopback test is being executed!

The test results are indicated by the LEDs.

<When normal>
The CRC, OVER, AB.IF, TIME, DATA, and UNDER LEDs light in this order.
When this cycle is repeated 5 times or more, the status is normal. The LOOP LED is irrelevant to this.



<When abnormal>
For the optical loop system (AJ71LP21, AJ72LP25, A1SJ71LP21, A1SJ72QLP25, AJ71LP21G, AJ72LP25G, AJ71LP21GE, A1SJ71LP21GE, AJ72LP25GE) and the coaxial loop system (AJ71LR21, AJ72LR25, A1SJ71LR21, A1SJ72QLR25)

1) ERROR LED is lit
   • Hardware failure

For the coaxial bus system (AJ71BR11, AJ72BR15, A1SJ71BR11, A1SJ72QBR15)

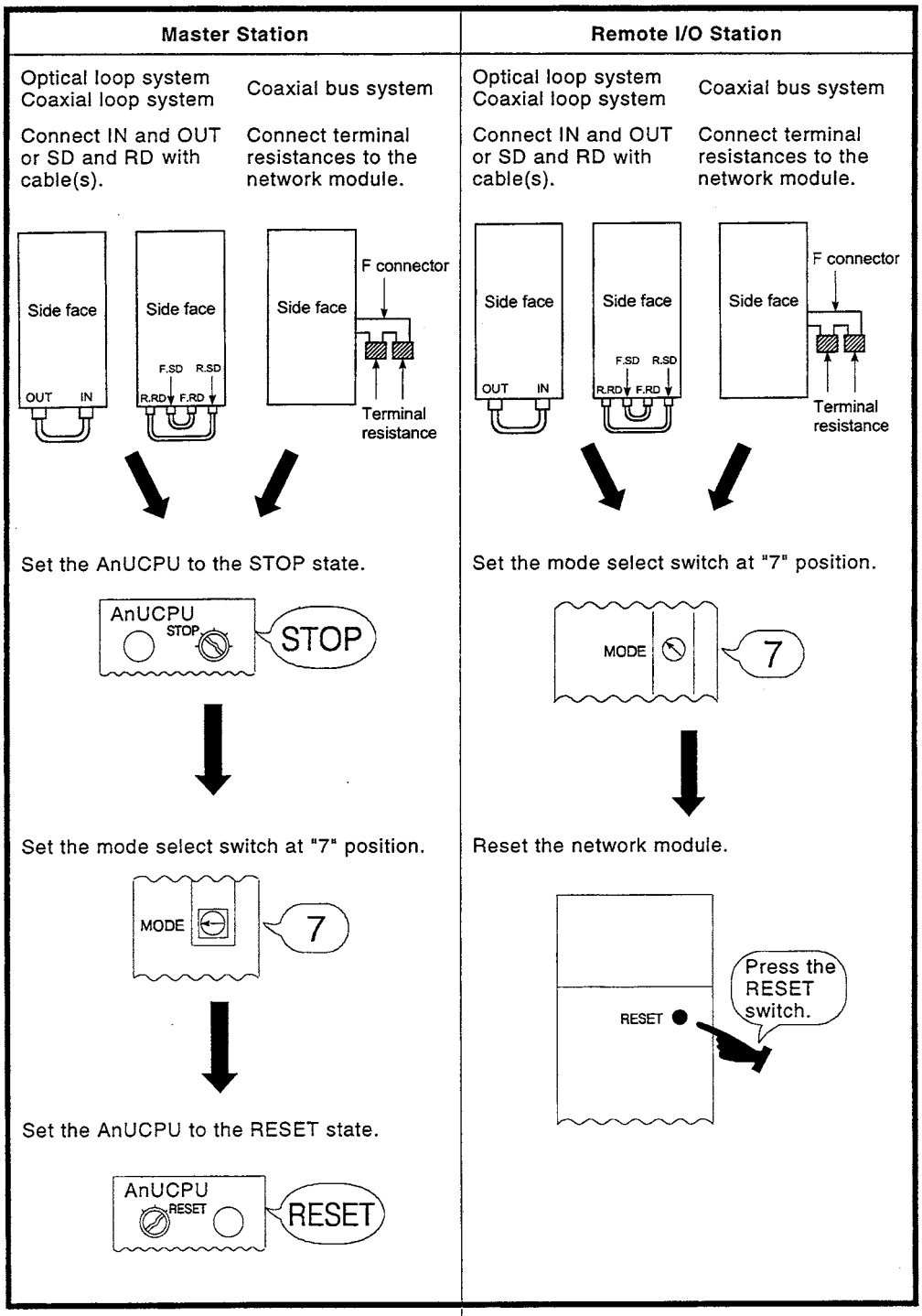
1) ERROR LED is lit
   • Hardware failure

REMARK

When an error occurs in the coaxial bus system, the M/S.E or PRM.E LED other than the ERROR LEDs (CRC, OVER, AB.IF, TIME, DATA, UNDER) may light up.
When asking for repairs of the network module, please inform the state of LEDs.

3.4.3 Self-loopback test

Check hardware including the send and receive circuits for transmissions in a single network module.
Conduct this test to check the cables when the result of the internal self-loopback test is normal.



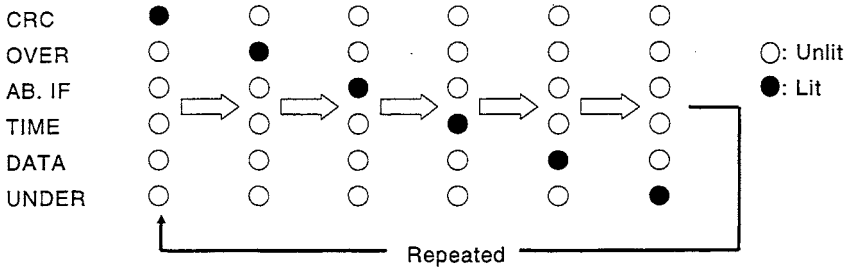
To the next page.

From the previous page.

Self-loopback test is being executed!

The test results are indicated by the LEDs.

<When normal>
The CRC, OVER, AB.IF, TIME, DATA, and UNDER LEDs light in this order.



<When abnormal>
For the optical loop system (AJ71LP21, AJ72LP25, A1SJ71LP21, A1SJ72QLP25, AJ71LP21G, AJ72LP25G, AJ71LP21GE, A1SJ71LP21GE, AJ72LP25GE) and the coaxial loop system (AJ71LR21, AJ72LR25, A1SJ71LR21, A1SJ72QLR25)

1) TIME is lit
   - Forward loop cable is broken.
   - The send and receive sides of the forward loop are not connected with a cable.
   - The forward loop send side is connected to the reverse loop send side, and the forward loop receive side is connected to the reverse loop receive side.

2) DATA is lit:
   - Reverse loop cable is broken.
   - The send and receive sides of the reverse loop are not connected with a cable.

3) CRC, OVER, and AB.IF of the forward and reverse sides flash:
   - Cable is faulty.

4) ERROR LED other than the above is lit:
   - Hardware fault
   - Cable disconnected during the test.
   - Cable broken during the test.

For the coaxial bus system (AJ71BR11, AJ72BR15, A1SJ71BR11, A1SJ72QBR15)

1) TIME is lit:
   - Connector is disconnected.

2) CRC, OVER, and AB.IF flash:
   - Connector is faulty.

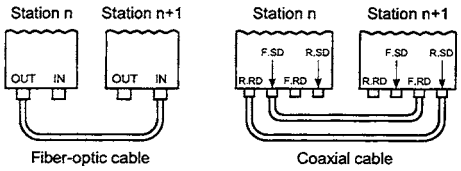
3) ERROR LED other than the above is lit:
   - Hardware fault
   - Connector disconnected during the test.

3.4.4 Station-to-station test

Check the channel between two adjacent stations.

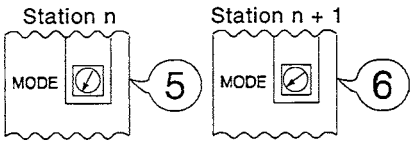
Optical Loop System/Coaxial loop system

Connect IN and OUT of network modules with fiber-optic cable or SD and RD with coaxial cables.



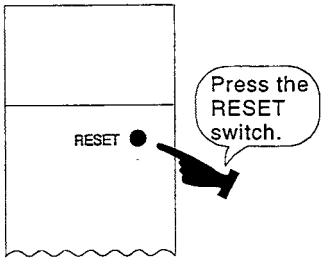
Set the AnUCPU of the master station to the STOP state.

Set the mode select switch at "5 (master station)" and "6 (slave station)".



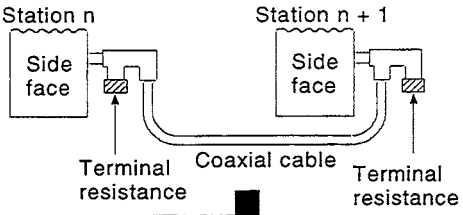
Set the AnUCPU of the master station to the RESET state.

Reset the network module.

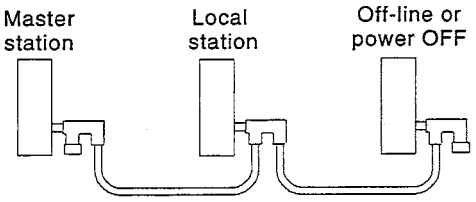


Coaxial Bus System

Connect two adjacent network modules with a coaxial cable.



<Precaution>
To conduct a station-to-station test when three or more stations are connected to a coaxial bus, set the stations which are not tested to off-line or turn the power to those stations OFF.



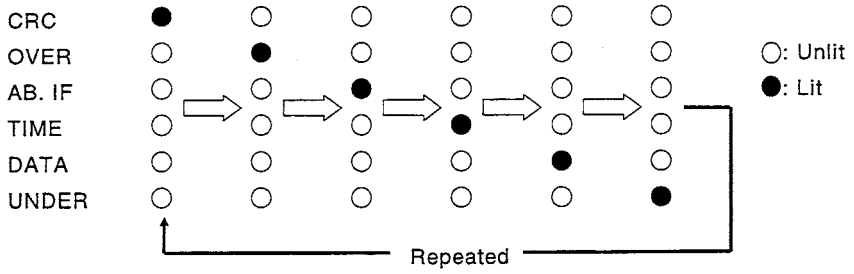
To the next page.

From the previous page.

Station-to-station test is executed!

The test results are indicated by the LEDs.

<When normal>
The CRC, OVER, AB.IF, TIME, DATA, and UNDER LEDs light in this order.
When this cycle is repeated 5 times or more, the status is normal.



<When abnormal>
For the optical loop system (AJ71LP21, AJ72LP25, A1SJ71LP21, A1SJ72QLP25, AJ71LP21G, AJ72LP25G, AJ71LP21GE, A1SJ71LP21GE, AJ72LP25GE) and the coaxial loop system (AJ71LR21, AJ72LR25, A1SJ71LR21, A1SJ72QLR25)

1) TIME is lit:
- Forward loop cable is broken.
- The send and receive sides of the forward loop are not connected with a cable.
- The forward loop send side is connected to the reverse loop send side, and the forward loop receive side is connected to the reverse loop receive side.

2) DATA is lit:
- Reverse loop cable is broken.
- The send and receive sides of the reverse loop are not connected with a cable.

3) CRC, OVER, and AB.IF of the master station flash:
- Cable is faulty.

4) ERROR LED other than the above is lit:
- Hardware fault
- Cable disconnected during the test.
- Cable broke during the test.

For the coaxial bus system (AJ71BR11, AJ72BR15, A1SJ71BR11, A1SJ72QBR15)

1) TIME is lit:
- Cable is broken.

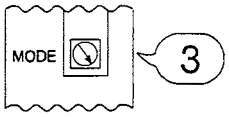
2) CRC, OVER, and AB.IF flash:
- Cable is faulty.

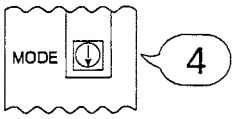
3) ERROR LED other than the above is lit:
- Hardware fault
- Cable disconnected during the test.
- Cable broke during the test.

3.4.5 Forward loop/reverse loop test (Optical loop system only)

Check the channel after connecting all stations with fiber-optic cables.

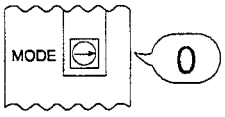
Forward Loop System	Reverse Bus System
Set the mode select switch of the testing station at "3".	Set the mode select switch of the testing station at "4".





Set the AnUCPU to the STOP state.

Set the mode select switch of the stations other than the testing station at "0"

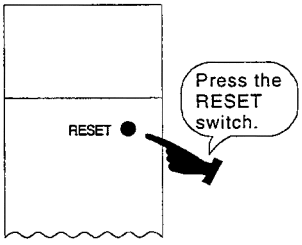


Reset the AnUCPU or network module of the station being tested.

Master station

Or

Remote I/O station



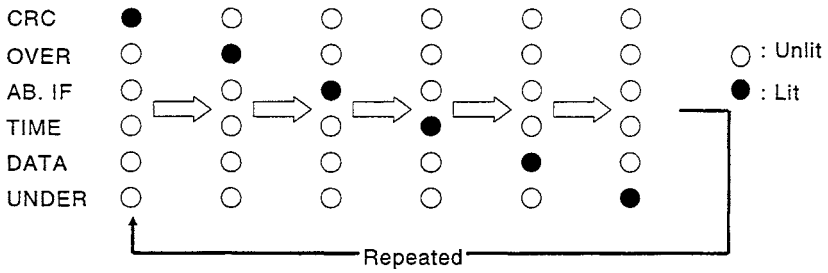
To the next page.

From the previous page.

Forward loop / reverse loop test is executed!

The test results are indicated by the LEDs.

<When normal>
The CRC, OVER, AB.IF, TIME, DATA, and UNDER LEDs light in that order.



<When abnormal>

1) TIME, DATA, and UNDER LEDs of the forward and reverse loop sides flash:
   - Either the fiber-optic cable or other stations have fault, and the loopback operation is executed.
2) CRC, OVER, and AB.IF of the forward and reverse loop sides flash:
   - Cable is faulty.
3) TIME and DATA LEDs of the forward and reverse loop sides flash:
   - Incorrect connections. Check the cable connections at the stations before and after the station where the error occurred.

POINT

When a fault is found by the forward / reverse loop test, check the loop by executing a reverse / forward loop operation or loopback operation.

3.4.6 Checking switch settings

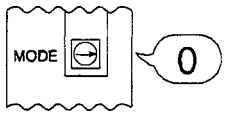
Check the numbers with the LEDs on the front side of the network module.

REMARK

This test cannot be made on the A1SJ71LP21, A1SJ71BR11, A1SJ71LR21, A1SJ71LP21GE, A1SJ72QLP25, A1SJ72QBR15, and A1SJ72QLR25.

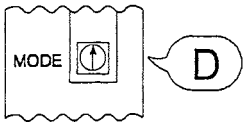
Network Number (Master Station Only)	Station Number

Set the mode select switch of the network module to "0".

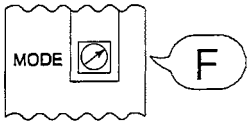


Switch the power ON.

Set the mode select switch of the network module at "D".

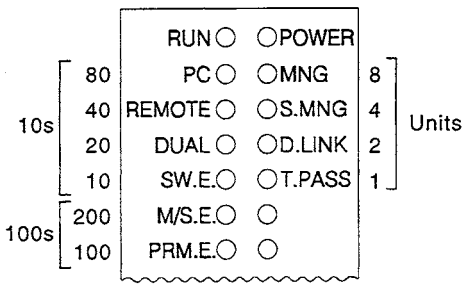


Set the mode select switch of the network module at "F".

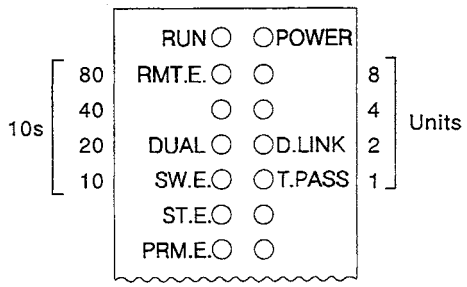


Confirm the settings with the LEDs.

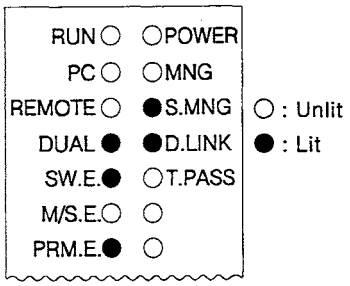
<Master station>



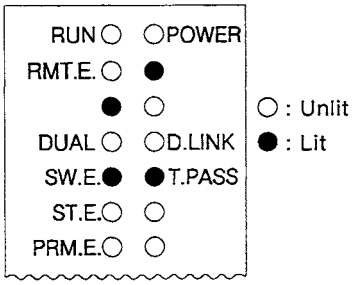
<Remote I/O station>



Example: Master station whose network number is 136



Example: Remote I/O station whose network number is 59



4. STARTING OPERATION

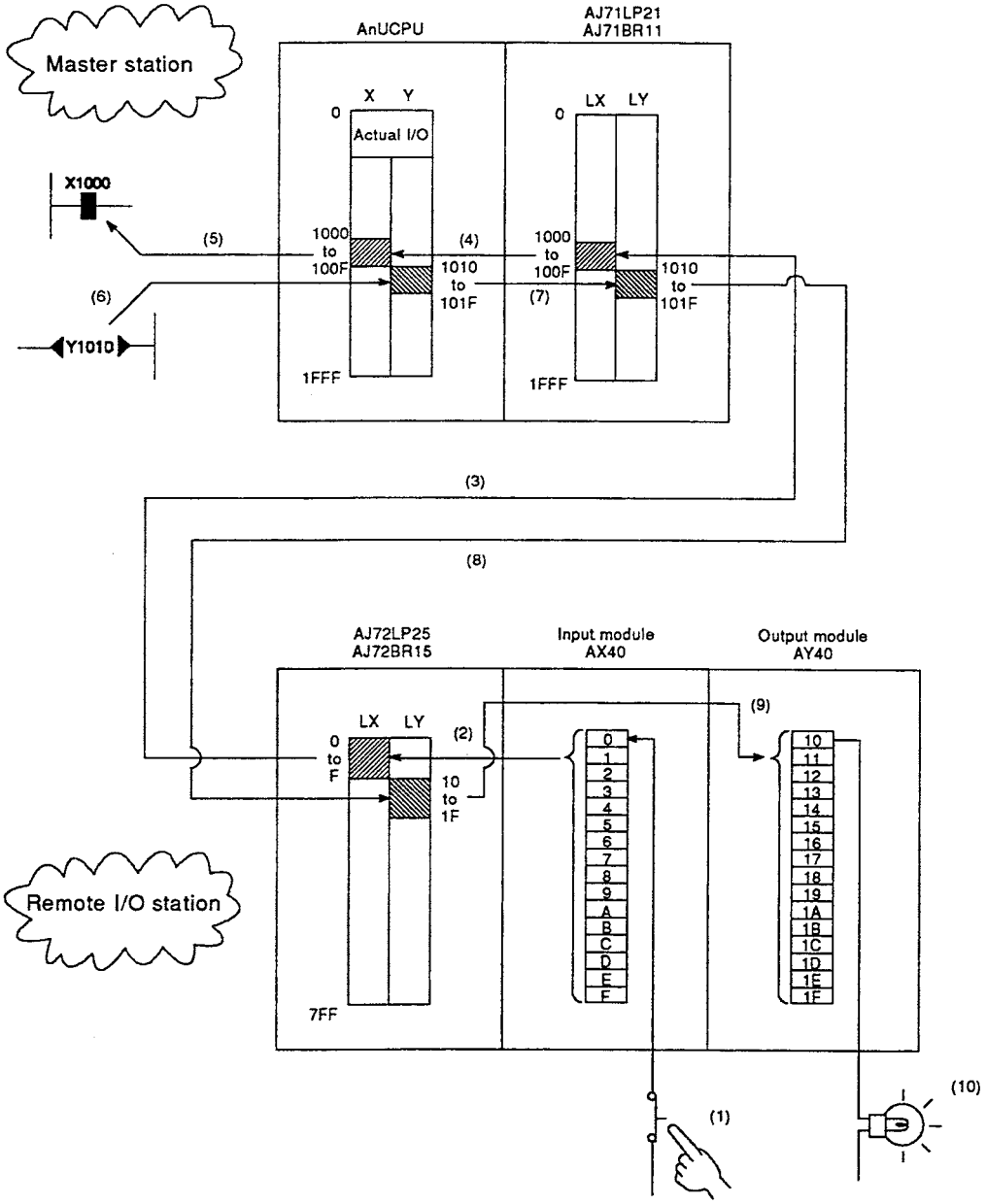
This section describes how remote I/O network communications are executed in a simple system.
When applying the following program examples to the actual system, make sure to examine the applicability and confirm that it will not cause system control problems.

4.1 Communicating with an I/O Module

The preparatory steps for communication with an I/O module are explained here by referring to an actual system example.

4.1.1 Preparing for communication

An outline of communication with an I/O module is presented below.



[Input]

(1) X00 of the input module turns ON.

(2) The input module information is transferred to the remote I/O network module (AJ72LP25/AJ72BR15).

(3) The remote I/O station information is transferred to the network module (AJ71LP21/AJ71BR11) of the master station via a fiber-optic cable or coaxial cable.

(4) The information of the master station's network module (AJ71LP21/AJ71BR11) is transferred to the AnUCPU.

(5) X1000 in the sequence program turns ON.

[Output]

(6) The sequence program switches Y1010 ON.

(7) The information of the AnUCPU is transferred to the network module (AJ71LP21/AJ71BR11) of the master station.

(8) The information of the master station's network module (AJ71LP21/AJ71BR11) is transferred to the network module (AJ72LP25/AJ72BR15) of the remote I/O station via a fiber-optic cable or coaxial cable.

(9) The information of the network module (AJ72LP25/AJ72BR15) in the remote I/O station is transferred to the output module.

(10) Y10 of the output module turns ON.

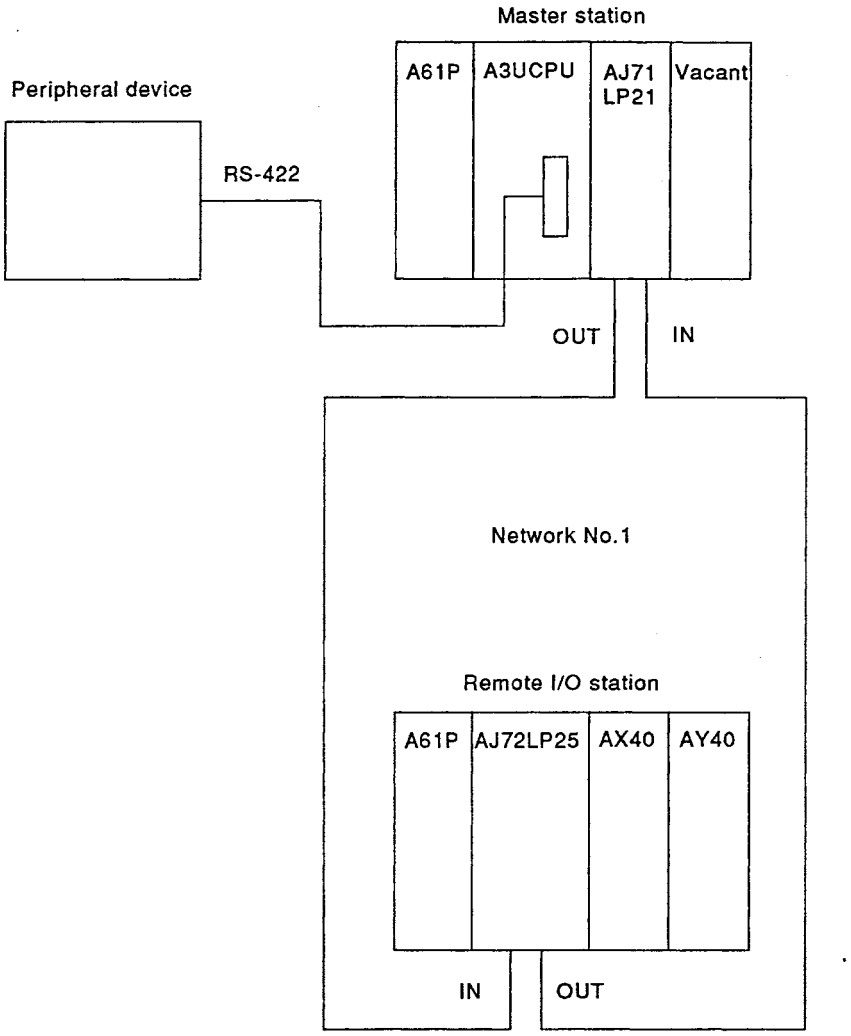
REMARK

The "network refresh parameters" are used to set relationships between the AnUCPU and network module such as those in (4) and (7).
The "common parameters" are used to set relationships between network modules, such as those in (3) and (8).

4.1.2 Actual communication

This section describes the preparation for communication with an I/O module in the system configuration shown below.

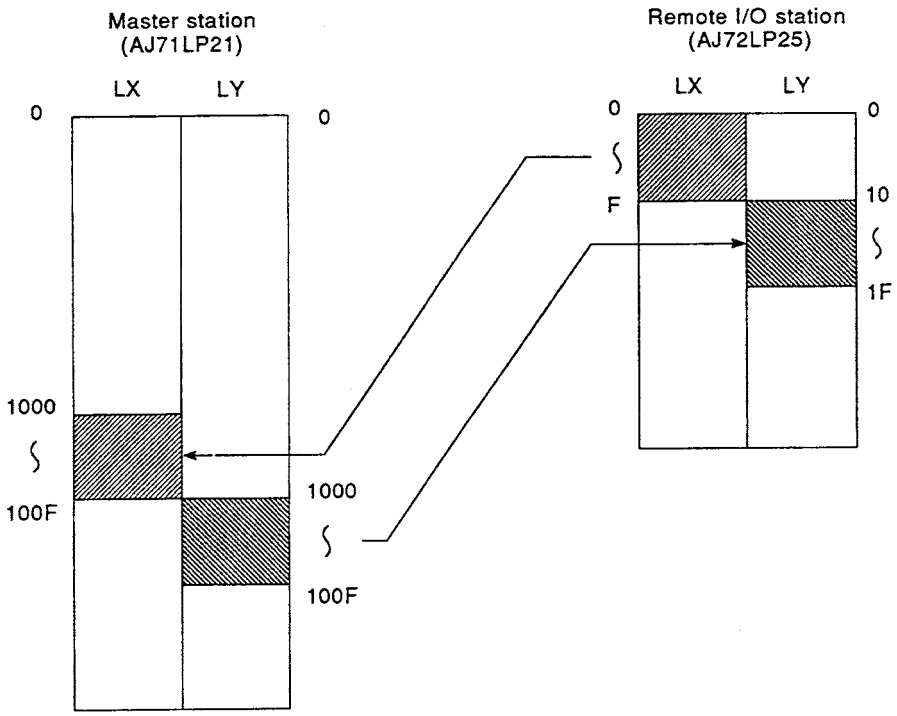
[System configuration]



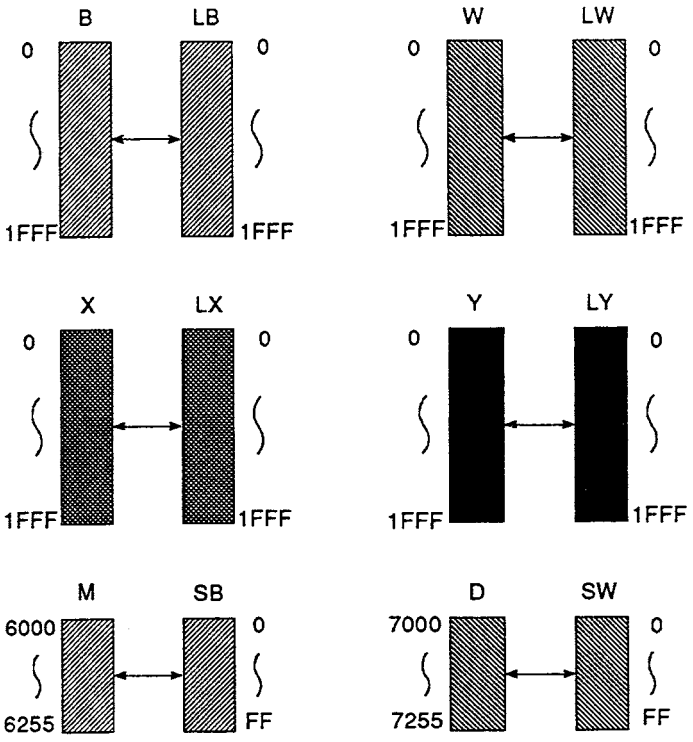
(1) Parameters to be set

Set the parameters indicated below.

(a) Common parameters

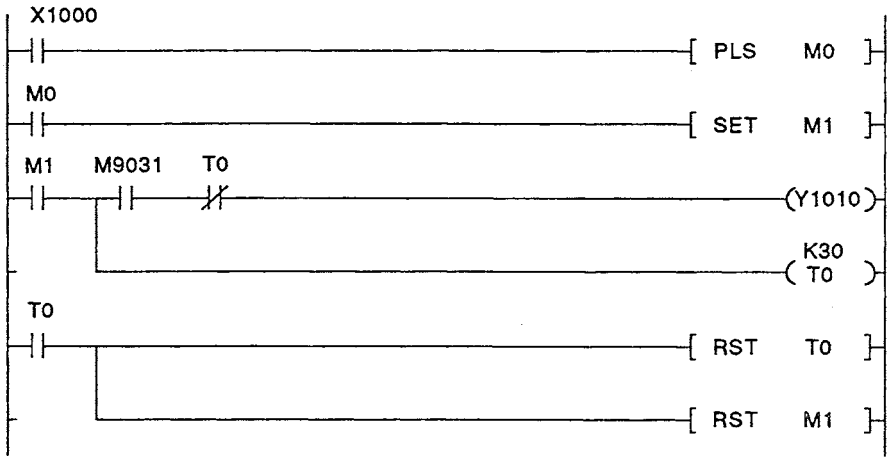


(b) Network refresh parameters



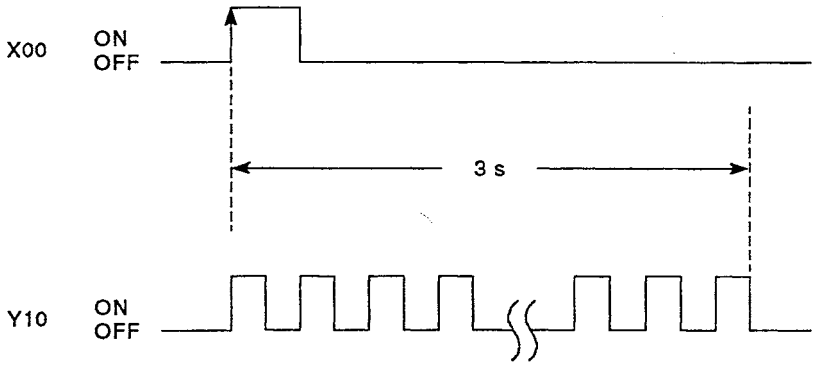
(2) Program

Write the following program to the A3UCPU and check that communication is executed normally.



[Operation timing]

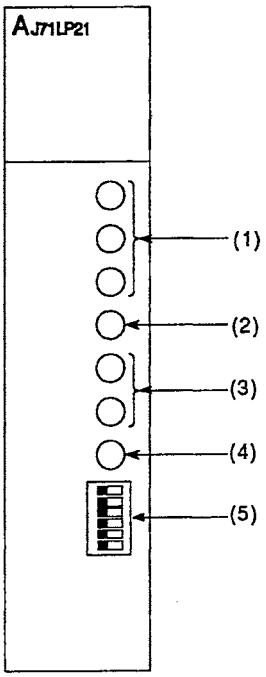
When X00 of the AX40 of the remote I/O station turns ON, Y10 of the AY40 of the remote I/O station flashes for 3 s.



(3) Network module settings

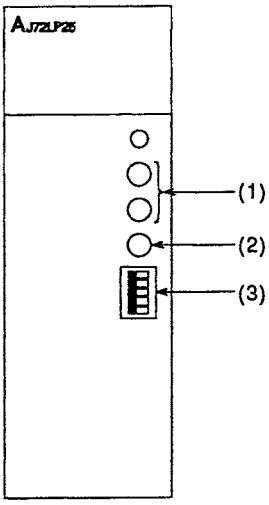
Make the appropriate settings at the master station and the network modules in the remote I/O stations.

(a) Master station (AJ71LP21)



	Item		Setting
(1)	NETWORK No.	x 100	0
		x 10	0
		x 1	1
(2)	GROUP No.		0
(3)	STATION No.	x 10	0
		x 1	0
(4)	MODE		0
(5)	OFF	ON	—
	PC	REMOTE	ON
	N.ST	MNG	OFF
	PRM	D.PRM	OFF
	STATION SIZE (8,16,32,64)		OFF
			OFF
	LB/LW SIZE (2,4,6,8 k)		OFF
			OFF
	—		OFF

(b) Remote I/O station (AJ72LP25)



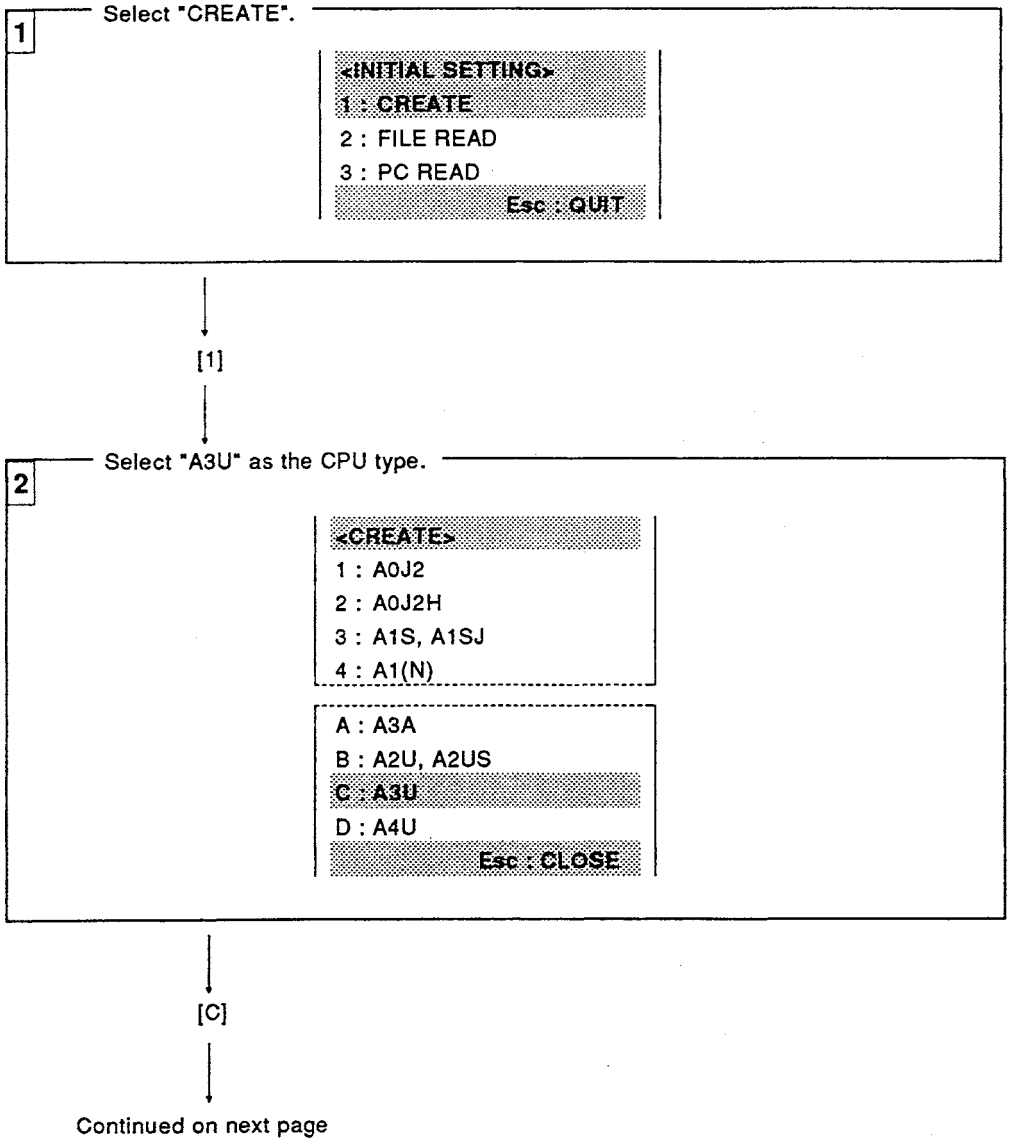
	Item		Setting
(1)	STATION No.	x 10	0
		x 1	1
(2)	MODE		0
(3)	SW	1	OFF
		2	OFF
		3	OFF
		4	OFF
		5	OFF

(4) Setting parameters/creating a program at a peripheral device, and writing to the CPU

In order to operate the data link, parameters have to be set in the CPU of the master station from a peripheral device.
The parameter settings to be made are listed in the table below.

Item	Setting
Number of modules	◎
Network refresh parameters	O
Common/remote I/O parameters	◎
Station specific parameters	x
I/O allocations	Δ
Transfer parameters for data link	x

◎ : Must always be set
O : Change if necessary (default setting is provided)
Δ : Set if necessary
x : Setting not possible



Continued on next page

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3 Choose to perform file setting.

SET FILE?

YES NO

[Enter]

4 Set a file name.

<CREATE>
SYSTEM [C] [ ]
COMMENT [ ]
SUB-SYSTEM [ ]
COMMENT [ ]
COMMENT (GPP) [ ]
Esc : CLOSE

[Enter] (If the drive is other than C, enter the drive name and then press [Enter].)

[R] [E] [M] [O] [T] [E] [Enter]

[Enter] (No COMMENT)

[N] [E] [T] [W] [O] [R] [K] [1] [Enter]

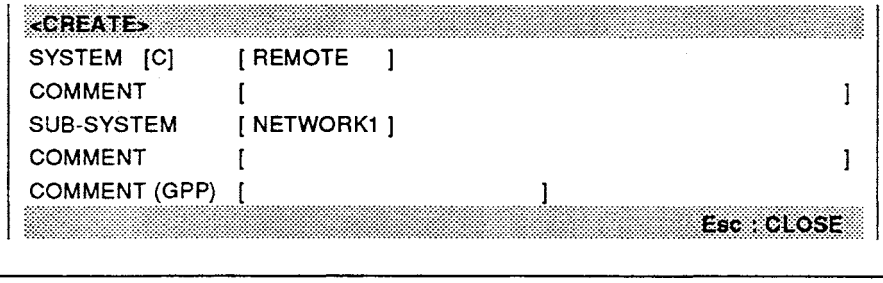
[Enter] (No COMMENT)

[Enter] (No COMMENT (GPP))

Continued on next page

Continued from previous page

5 The file name is set.

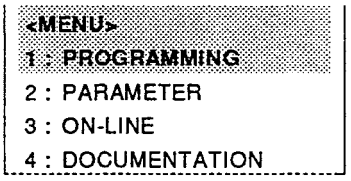


[Enter]

6 Choose to write to the file.

[Enter]

7 Select "PARAMETER".



[2]

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8 Select "NETWORK/LINK".

<PARAMETER>
1 : MEMORY CAPACITY
2 : LATCH RANGE
3 : NETWORK/LINK
4 : I/O ALLOCATION
5 : AUXILIARY

[3]

9 Select "DATA LINK PARAM.".

<NETWORK/LINK>
1 : DATA LINK PARAM.
2 : ROUTING PARAMETER
Esc : CLOSE

[1]

10 Set the number of modules settings.

<MODULES>

NO OF MODULES(1-4) [ ]

MODULE NO. ACCESSED BY GPP [ ]

	MODULE 1	MODULE 2	MODULE 3	MODULE 4
I/O NO.	[ ]	[ ]	[ ]	[ ]
NETWORK MODULE TYPE				
NETWORK NO.	[ ]	[ ]	[ ]	[ ]

End : SET Esc : CLOSE

Continued on next page

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[1] [Enter]

[1] [Enter]

[Enter]

[4]

[1] [Enter]

11 The number of modules have now been set.

<MODULES>

NO OF MODULES(1-4) [1]

MODULE NO. ACCESSED BY GPP [1]

	MODULE 1	MODULE 2	MODULE 3	MODULE 4
I/O NO.	[00]	[ ]	[ ]	[ ]
NETWORK MODULE TYPE	MELSECNET/10 RMT. MASTER			
NETWORK NO.	[1]	[ ]	[ ]	[ ]

End : SET Esc : CLOSE

[End]

Continued on the next page

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12 Set the common/remote I/O parameter settings.

<COMMON PARAM. (MELSECNET/10) REMOTE I/O> PARAM. NAME.

MODULE NO.
1

REFRESH PARAMETER Size
LB ↔B(1) 0000–1FFF 8192
LB ↔B(2) –
LW↔W(1) 0000–1FFF 8192
LW↔W(2) –

NO. OF STN.	LINK WDT * 10 ms
	200

REMOTE I/O STN. NO.	M→R	M←R	M→R	M←R
	LB	LB	LW	LW
	–	–	–	–
	–	–	–	–
	–	–	–	–
	–	–	–	–
	–	–	–	–
	–	–	–	–
	–	–	–	–

Page Up/Page Down MODULE CHANGE : Shift + F1, F2, F3, F4 End : CHECK & SET Esc CLOSE

[1] [Enter] (Total number of link stations)

[F9] [Enter] (Change to the LX/LY setting)

[1] [0] [1] [0] [→] [1] [0] [1] [F] [→]

[1] [0] [→] [1] [F] [→]

[1] [0] [0] [0] [→] [1] [0] [0] [F] [→]

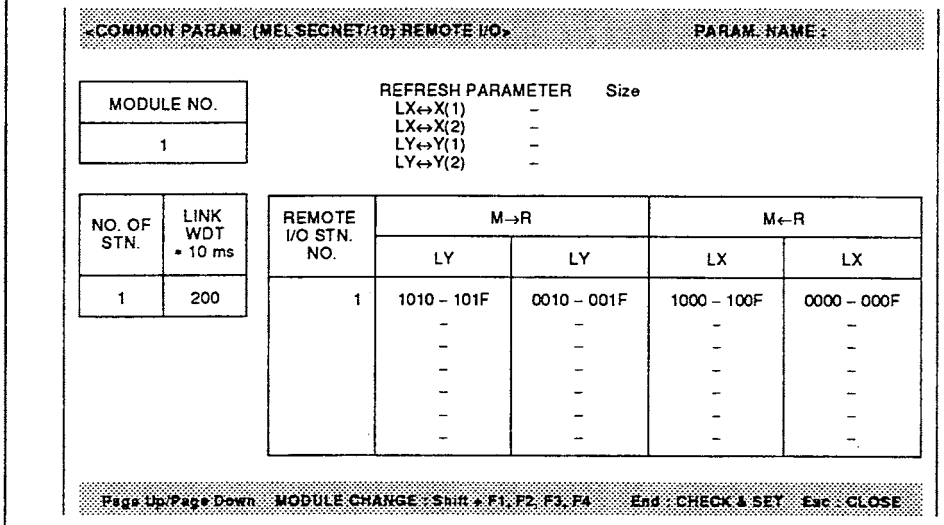
[0] [→] [F]

[End] (Check)

Continued on next page

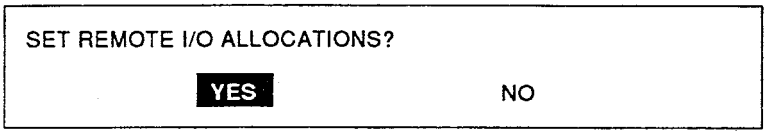
Continued from the previous page

13 The common/remote I/O parameters have now been set.



[End] (Setting completed)

14 The remote I/O allocations are NOT set.



[→] (NO)

[Enter]

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15 Check the settings for the network parameter.

<NETWORK PARAMETER>

NET MODULE SETTING	1

O : MUST BE SET. @ : ALREADY SET.
? : IF WHEN NECESSARY. * : ALREADY SET.

NETWORK PARAMETER CAPACITY 4KB	1 MODULE NET/10(R)			
NETWORK REFRESH PARAMETER	@			
MELSECNET II	X			
COMMON/REMOTE I/O PARAM.	@			
STATION NATIVE PARAMETER	X			
I/O ALLOCATION	?			
TRANSFER PARAMETER	X			

End : CHECK/SET Esc : CLOSE

[Enter]

16 Change the network refresh parameter.

<NETWORK REFRESH PARAMETER>

OTHER MODULES

LB↔B TRANSFER 1:1000 – 1FFF
2:
3:
4:

1			

<LB↔B TRANS>

SET SOURCE LB NUMBER, DESTINATION B NUMBER(UNITS OF 16).

[PAGE 1] NETWORK MODULE 1

MELSECNET/10(RMT MAST)	I/O NO. 00	NETWORK NO. 1

LB↔B	LB	[0000]↔B	[0000]	SIZE[2000]HPOINTS
LW↔W	LW	[0000]↔W	[0000]	SIZE[2000]HPOINTS
LX↔X	LX	[0000]↔X	[0000]	SIZE[0000]HPOINTS
LY↔Y	LY	[0000]↔Y	[0000]	SIZE[0000]HPOINTS
SB COPIED TO	SB	[000]↔DEST. [Y]	[1C00]	SIZE [100]HPOINTS
SW COPIED TO	SW	[000]↔DEST. [D]	[7168]	SIZE [100]HPOINTS
ERROR HISTORY	RETAIN			

CHANGE MODULE WITH Shift + F1, F2, F3, F4 KEYS End : SET Esc : CLOSE

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[↓] [↓] [→] [→]

[2] [0] [0] [0] [↓]

[2] [0] [0] [0] [↓] [←] [←]

[M] [↓] [6] [0] [0] [0] [↓]

[7] [0] [0] [0]

17 The network refresh parameters have now been changed.

<NETWORK REFRESH PARAMETER>

OTHER MODULES

SW COPIED TO 1:D7168 – D7423
2:
3:
4:

1			

[PAG E 1] NETWORK MODULE 1

<SW TRANS. DEV.>

SPECIFY SOURCE SW, DESTINATION DEVICE, IT'S NO. AND TRANSFER SIZE.

AVAILABLE DEVICES T, C, D, W

MELSECNET/10(RMT MAST)	I/O NO. 00	NETWORK NO. 1
LB↔B	LB [0000]↔B [0000]	SIZE[2000]HPOINTS
LW↔W	LW [0000]↔W [0000]	SIZE[2000]HPOINTS
LX↔X	LX [0000]↔X [0000]	SIZE[2000]HPOINTS
LY↔Y	LY [0000]↔Y [0000]	SIZE[2000]HPOINTS
SB COPIED TO	SB [000]↔DEST. [M] [6000]	SIZE [100]HPOINTS
SW COPIED TO	SW [000]↔DEST. [D] [7000]	SIZE [100]HPOINTS
ERROR HISTORY	RETAIN	

CHANGE MODULE WITH Shift + F1, F2, F3, F4 KEYS. End : SET Esc : CLOSE

[End] (Setting completed)

[End] (Completion of setting of network parameters)

[Esc] [Esc] (Return to the menu)

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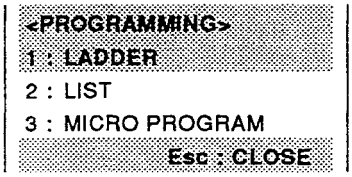
Continued from the previous page

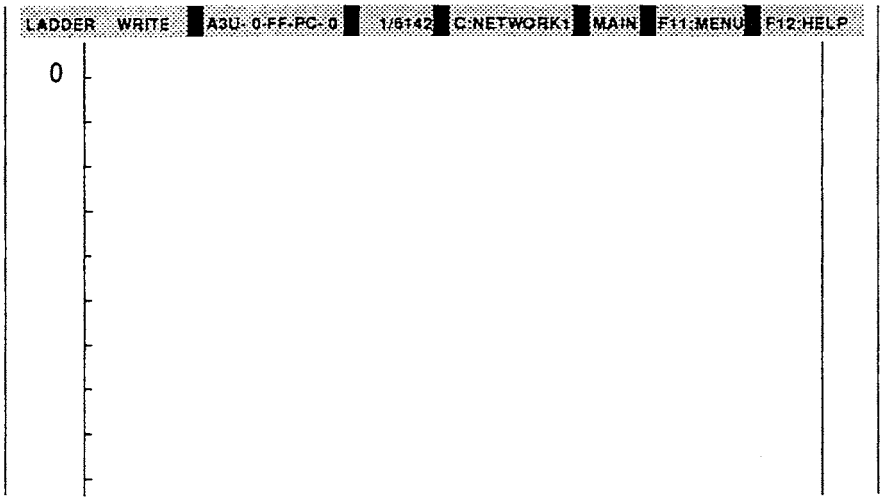
[1]

18 Select "LADDER".



[1]

19 Create the program.



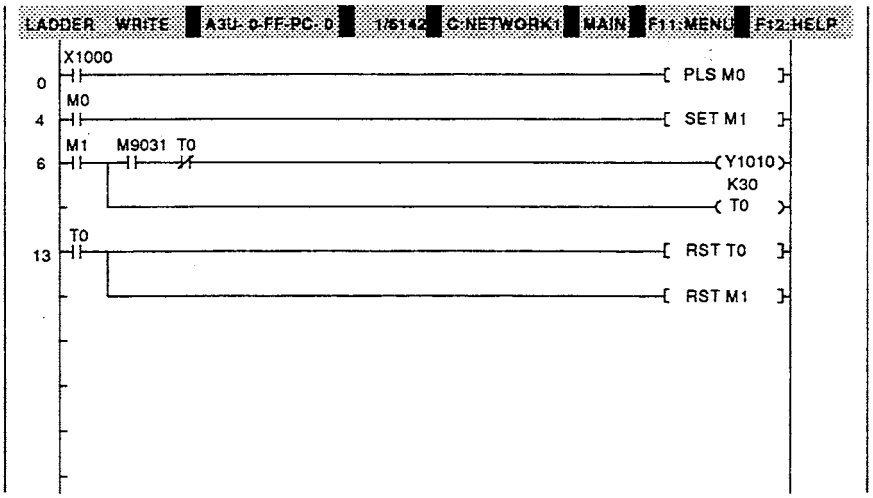
Enter the program in Section 4.1.2 (2).

Press [F4] (convert) while holding down [Shift].

Continued on the next page

Continued from the previous page

20 The program has now been created.



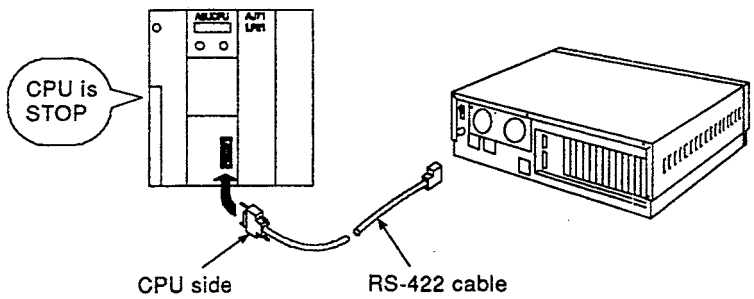
[F11] (Opens the menu)

[3] (Online)

[1] (PC)

[2] (Write)

21 Connect the CPU to the peripheral device.



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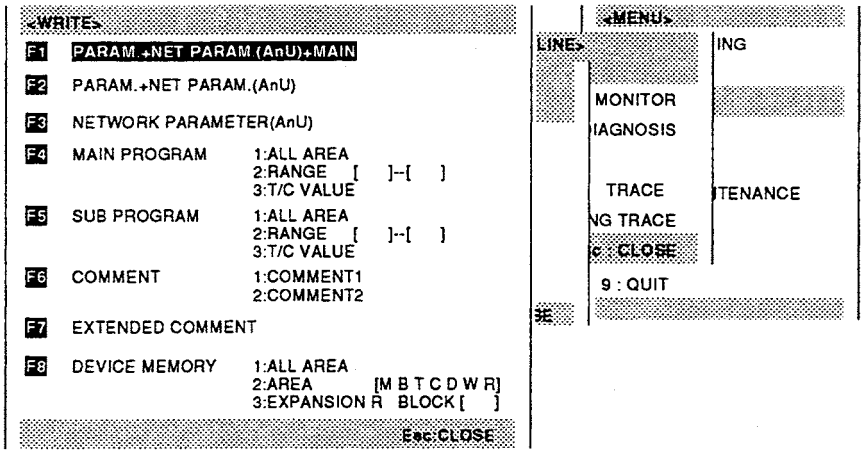
Continued from the previous page

22 Write the data to the CPU.



[Enter]

23 Execute writing.

[Enter]

Continued on the next page

Continued from the previous page

24 Check the program.

CHECK SEQUENCE PROGRAM?

YES NO

[Enter]

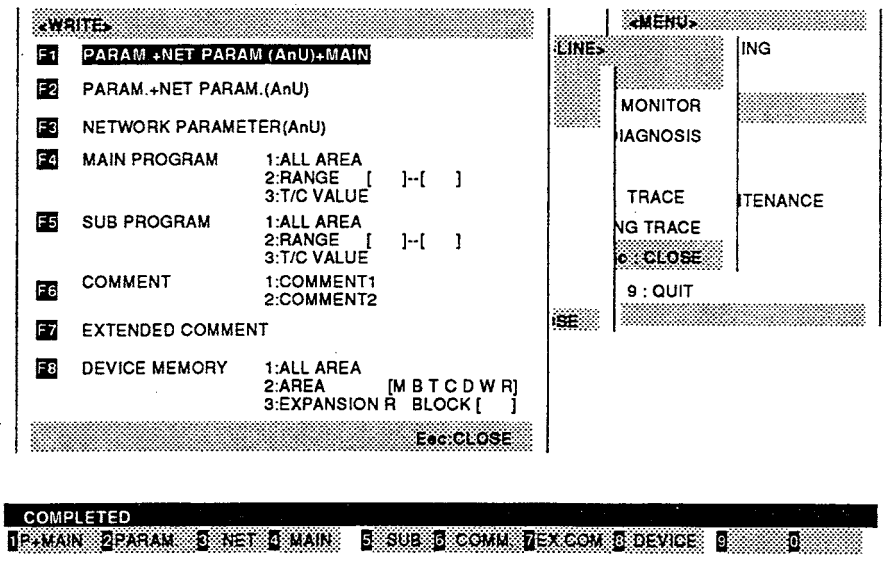
25 Verify the data.

VERIFY?

YES NO

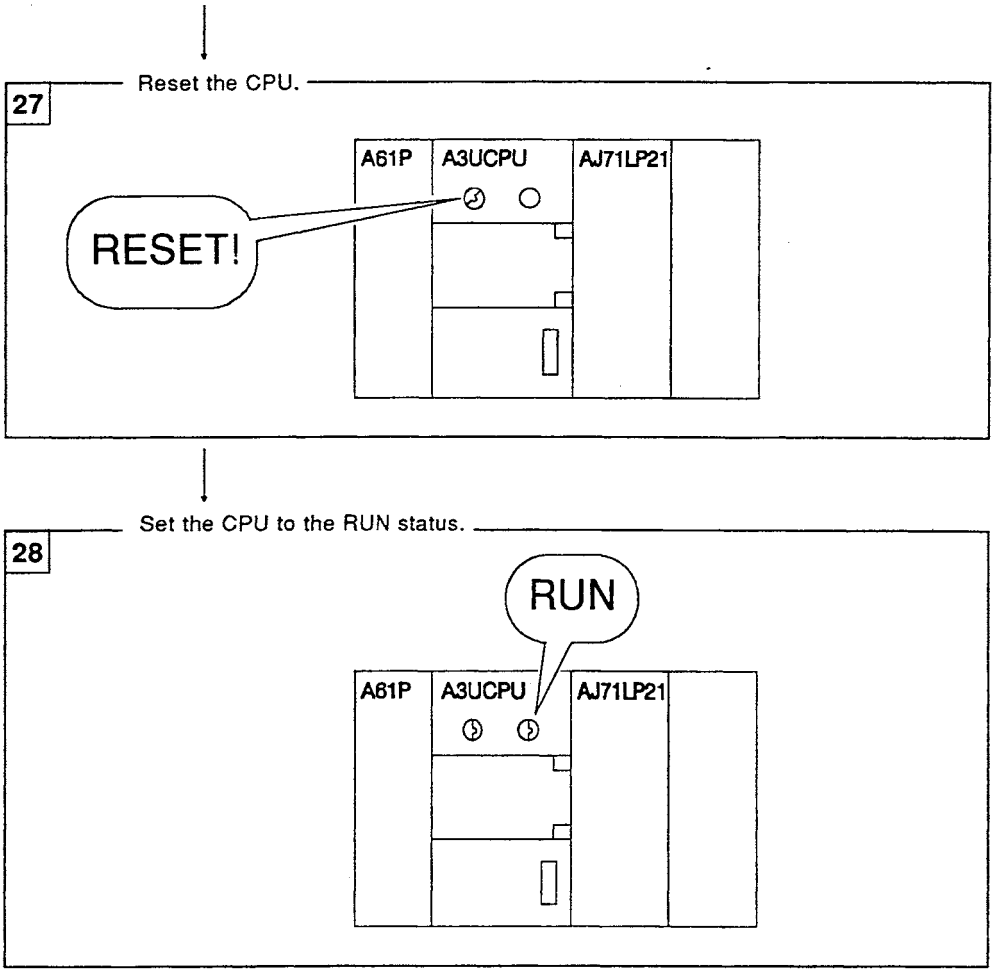
[Enter]

26 Writing to the CPU has now been completed.



Continued on next page

Continued from the previous page



(5) Check the data link conditions

Check the data link conditions by checking the network module LEDs and the sequence program.

(a) Checking the status of the LEDs

Check the LED statuses of the master station and the remote I/O station.

1) Master station (AJ71LP21)

O: Unlit ●: Lit

LED Name	When Normal	LED Name	When Normal
RUN	●	POWER	●
PC	O	MNG	●
REMOTE	●	S.MNG	O
DUAL	O	D.LINK	●
SW.E.	O	T.PASS	●
M/S.E.	O	——	——
PRM.E.	O	CPU R/W	●(dimly lit)
CRC	O	CRC	O
OVER	O	OVER	O
AB.IF	O	AB.IF	O
TIME	O	TIME	O
DATA	O	DATA	O
UNDER	O	UNDER	O
LOOP	O	LOOP	O
SD	●(dimly lit)	SD	O
RD	●(dimly lit)	RD	●(dimly lit)

Note that these statuses depend on the loop status.

2) Remote station (AJ72LP25)

O: Unlit ●: Lit

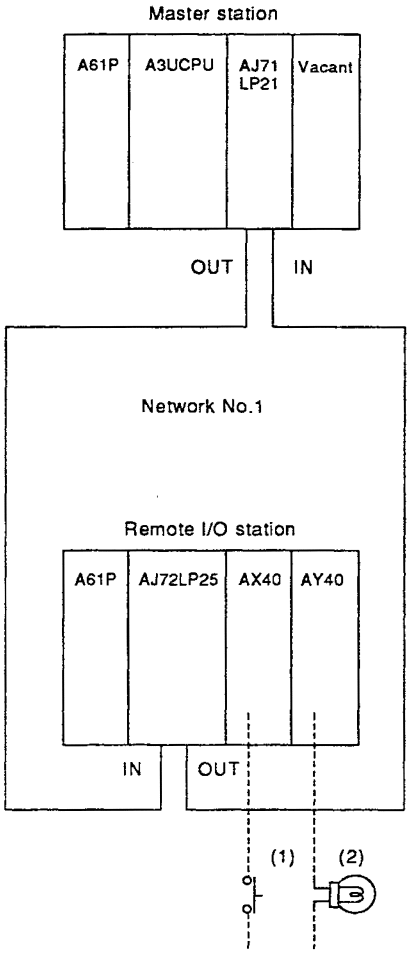
LED Name	When Normal	LED Name	When Normal
RUN	●	POWER	●
ERROR	O	——	——
——	——	——	——
DUAL	O	D.LINK	●
SW.E.	O	T.PASS	●
ST.E.	O	——	——
PRM.E.	O	WAIT	O
CRC	O	CRC	O
OVER	O	OVER	O
AB.IF	O	AB.IF	O
TIME	O	TIME	O
DATA	O	DATA	O
UNDER	O	UNDER	O
LOOP	O	LOOP	O
SD	●(dimly lit)	SD	O
RD	●(dimly lit)	RD	●(dimly lit)

Note that these statuses depend on the loop status.

(b) Checking the sequence program

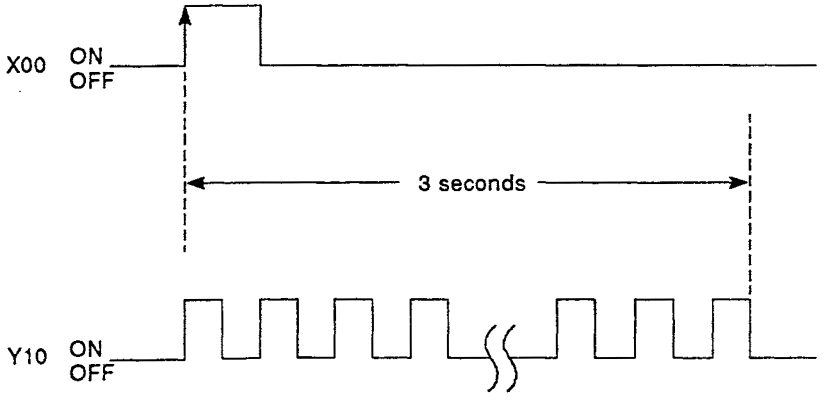
Check if the program written to the programmable controller CPU operates normally.

[System configuration]



[Operation check]

When (1)X00 of the input module (AX40) of the remote I/O station turns ON, (2)Y10 of the output module turns alternately ON and OFF for 3 seconds.

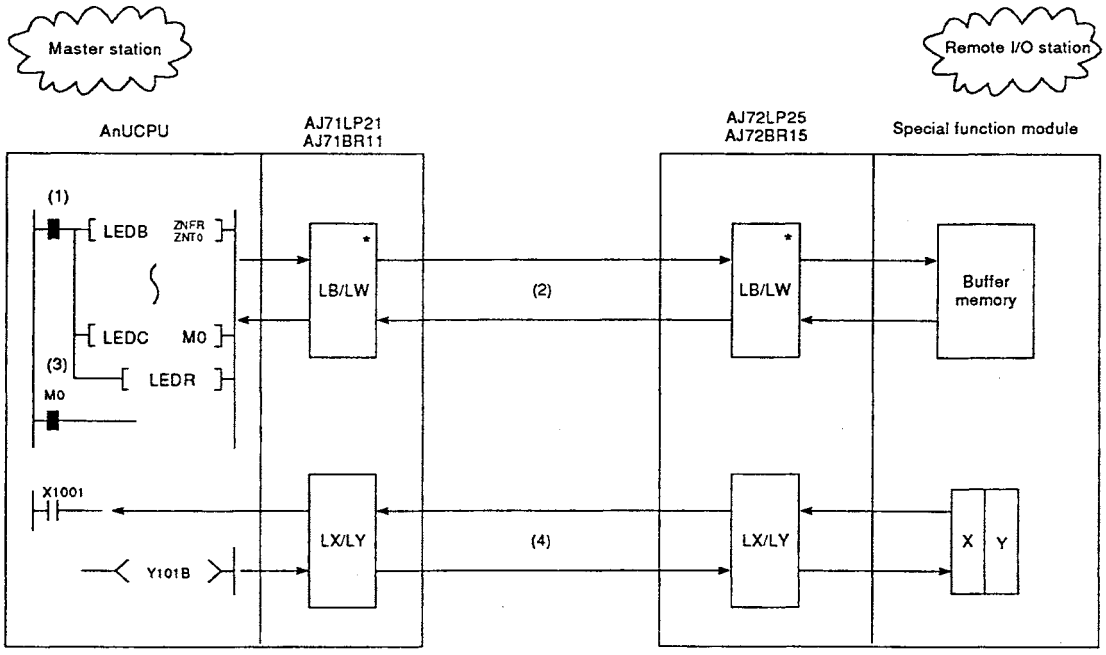


4.2 Communicating with a Special Function Module

The preparatory steps for communication with a special function module are explained here by referring to an actual system example.

4.2.1 Preparing for communication

An outline of communication with a special function module is presented below.



[Buffer memory]

(1) When a ZNFR/ZNTO instruction is executed.

(2) ZNFR .... The buffer memory data is written to W devices.

ZNTO .... The data in the W devices is written to the buffer memory.

(3) On completion of the ZNFR/ZNTO instruction the completion signal (M0) comes ON for 1 scan.

* .... LB devices are used for handshake processing when an instruction is executed.
LW devices are used for handshake processing and for data reading/writing when an instruction is executed.

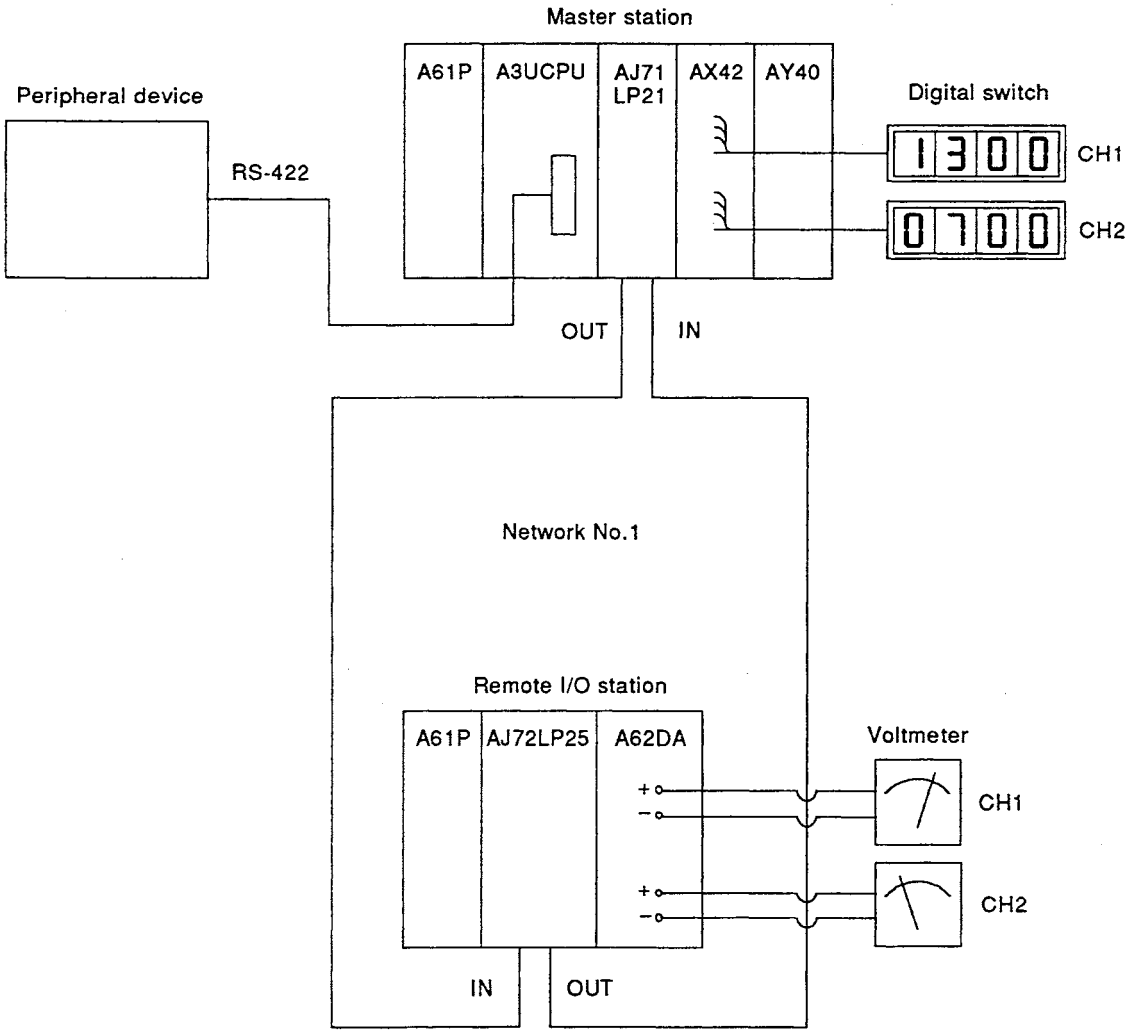
[Input/output]

(4) X/Y communications are executed in the same way as communications with an I/O module.

4.2.2 Actual communication

This section describes the preparation for communication with a special function module in the system configuration shown below.

[System configuration]

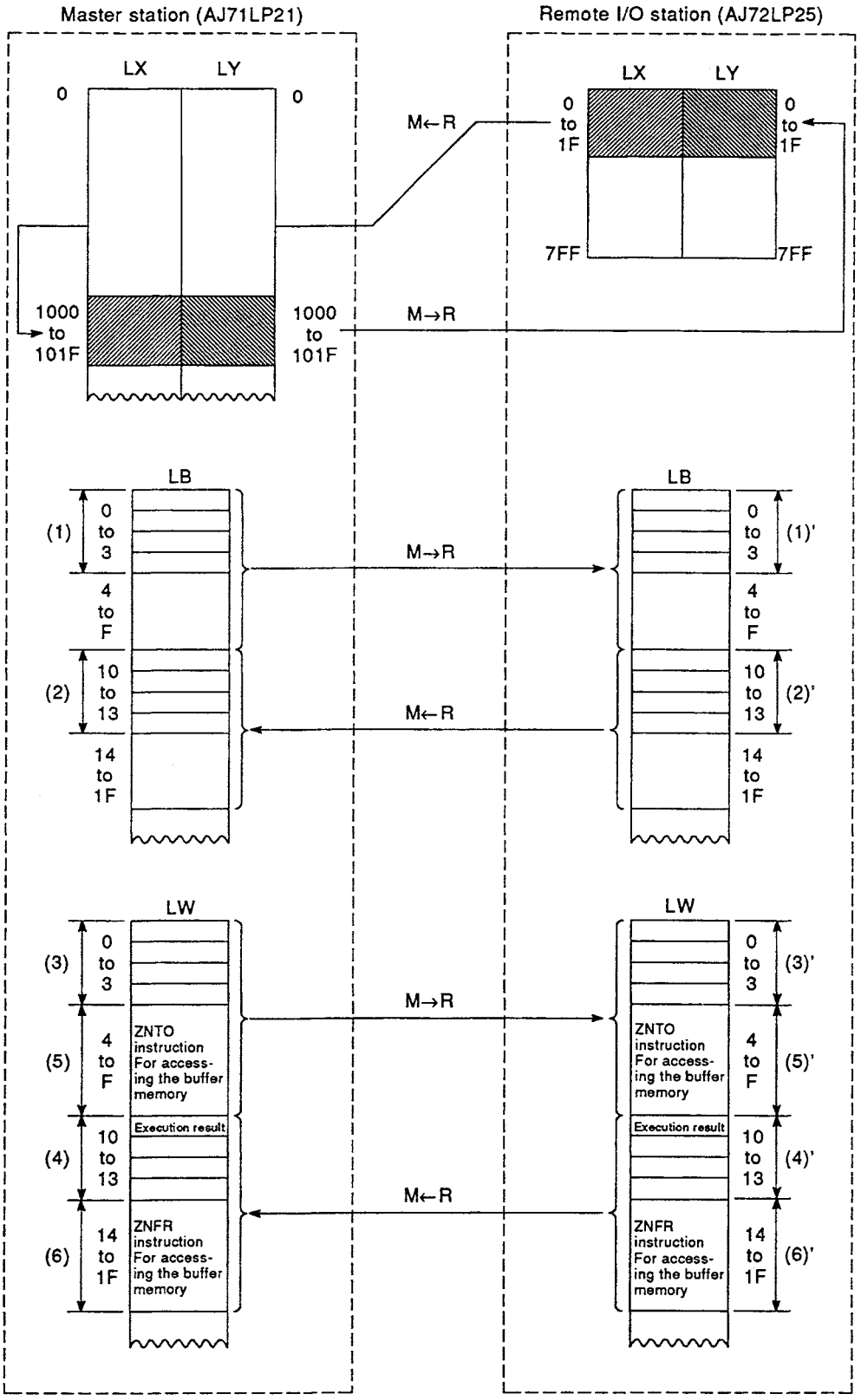


A62DA ... Digital to analog converter module (2-channel)
This module must be one that handles voltage only.

(1) Parameters to be set

Set the parameters indicated below.

(a) Common parameters



(1) to (4), (1)' to (4)' .... Required for each special function module for handshake use.

M→R		M←R	
LB*1	LW	LB*1	LW*2
4 points/module	4 points/module	4 points/module	4 points/module

*1 : Note that LB devices are set in 16-point units.

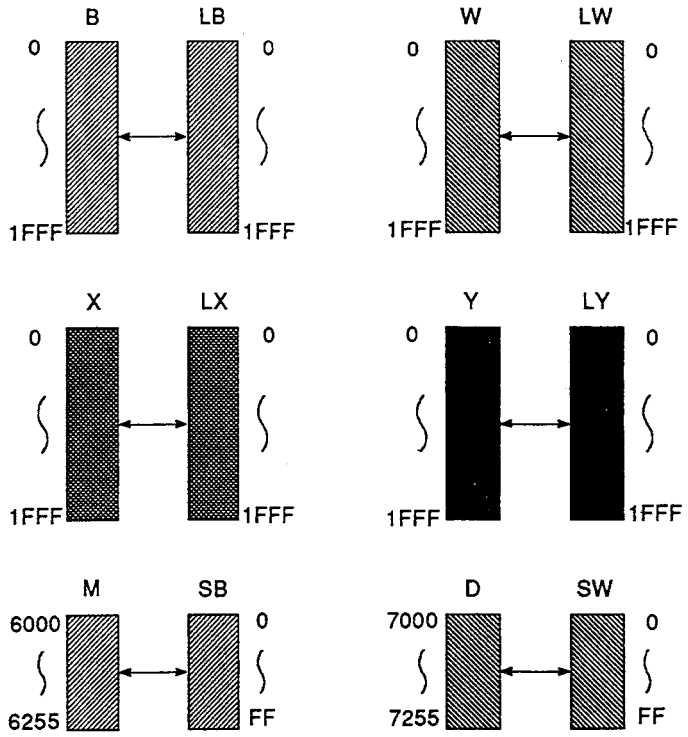
*2 : The result of execution of the ZNTO/ZNFR instruction is stored in the first M←R LW point (in this example, LW10). (See Section 11.1)

(5), (6), (5)', (6)' .... The LW devices can be set in 1 point units; set the number of points that matches the size of the special function module's buffer memory.

POINT

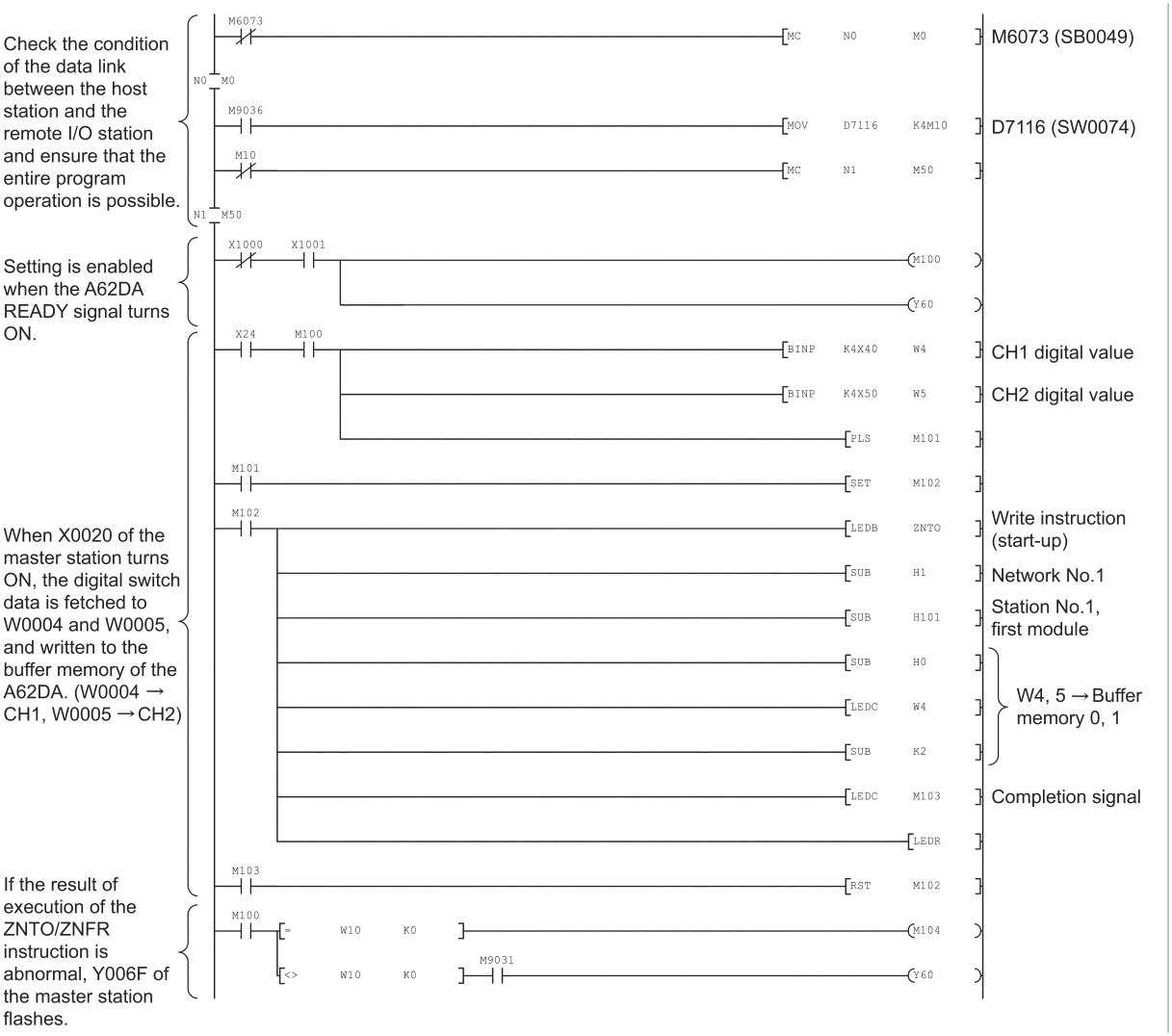
Even if only one LB or LW point is set, it is checked whether there is a sufficient number of points for handshake processing use for the special function module that is installed.
If the number of points is found to be insufficient, a "PRM.E." error occurs.
If no points at all are set this check is not performed.

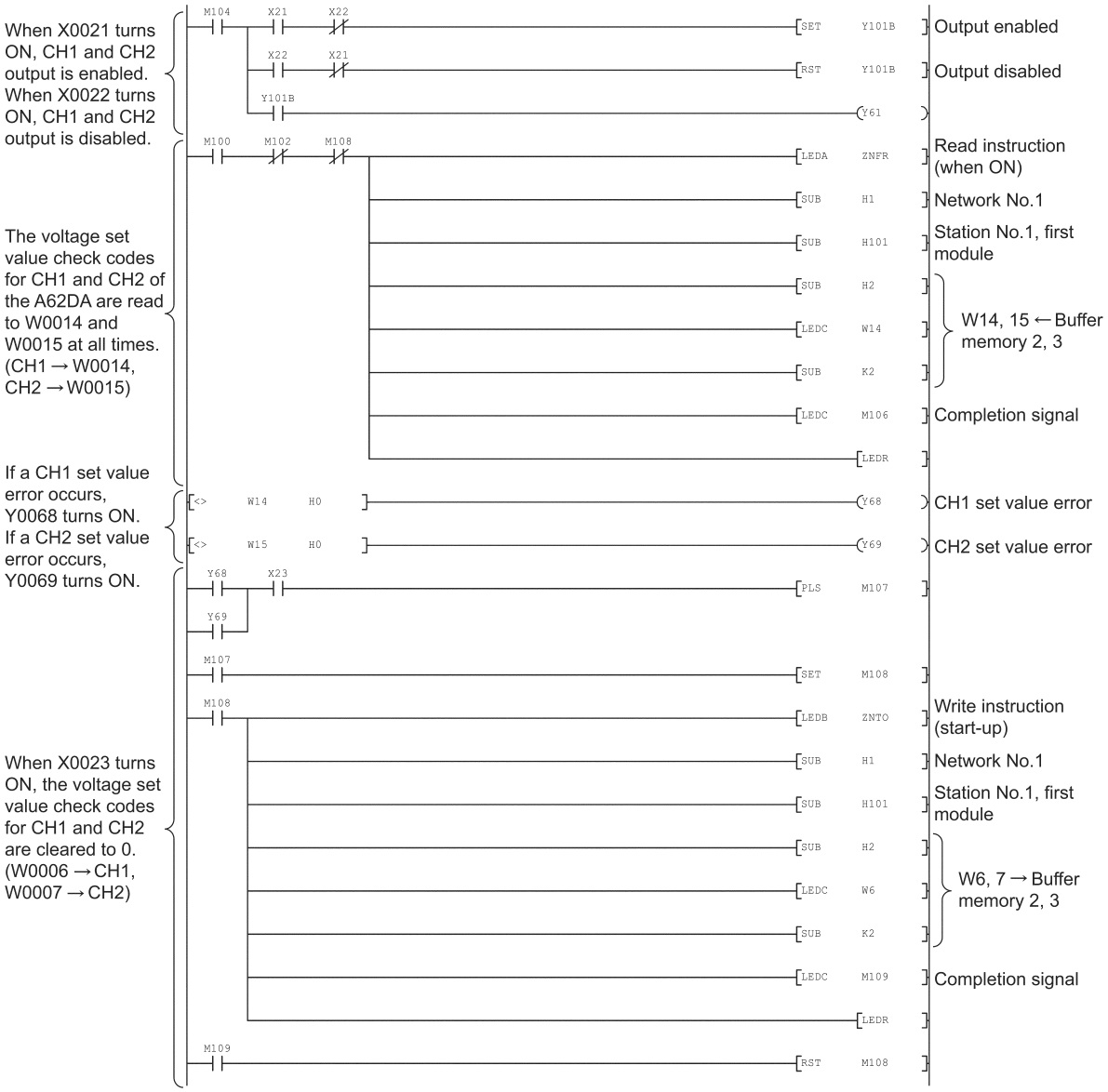
(b) Network refresh parameters

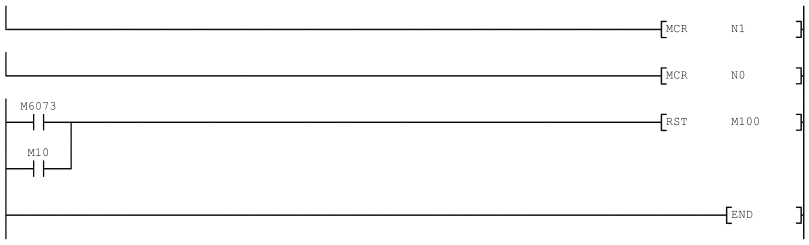


(2) Program

Write the following program to the A3UCPU and check that communication is performed normally.



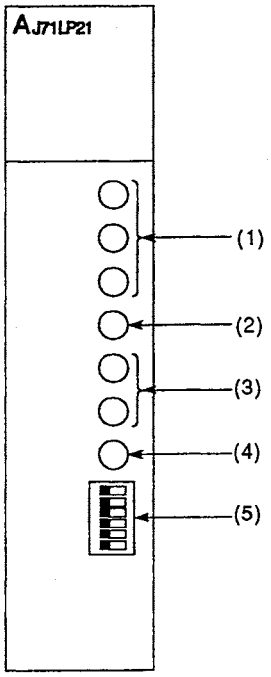

When X0021 turns ON, CH1 and CH2 output is enabled. When X0022 turns ON, CH1 and CH2 output is disabled.
The voltage set value check codes for CH1 and CH2 of the A62DA are read to W0014 and W0015 at all times. (CH1 → W0014, CH2 → W0015)
If a CH1 set value error occurs, Y0068 turns ON. If a CH2 set value error occurs, Y0069 turns ON.
When X0023 turns ON, the voltage set value check codes for CH1 and CH2 are cleared to 0. (W0006 → CH1, W0007 → CH2)
M104 X21 X22
SET Y101B
Output enabled
X22 X21
RST Y101B
Output disabled
Y101B
Y61
M100 M102 M108
LEDA ZNFR
Read instruction (when ON)
SUB H1
Network No.1
SUB H101
Station No.1, first module
SUB H2
LEDC W14
SUB K2
W14, 15 ← Buffer memory 2, 3
LEDC M106
Completion signal
LEDR
<> W14 H0
Y68
CH1 set value error
<> W15 H0
Y69
CH2 set value error
Y68 X23
PLS M107
Y69
M107
SET M108
M108
LEDB ZNTO
Write instruction (start-up)
SUB H1
Network No.1
SUB H101
Station No.1, first module
SUB H2
LEDC W6
SUB K2
W6, 7 → Buffer memory 2, 3
LEDC M109
Completion signal
LEDR
M109
RST M108


MCR N1
MCR N0
M6073
M10
RST M100
END

(3) Setting the network modules

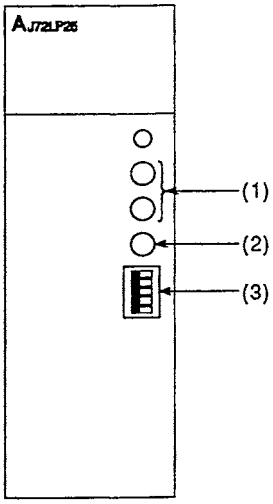
Set the master station and remote I/O station network modules.

(a) Master station (AJ71LP21)



	Item		Setting
(1)	NETWORK No.	x 100	0
		x 10	0
		x 1	1
(2)	GROUP No.		0
(3)	STATION No.	x 10	0
		x 1	0
(4)	MODE		0
(5)	OFF	ON	—
	PC	REMOTE	ON
	N.ST	MNG	OFF
	PRM	D.PRM	OFF
	STATION SIZE (8,16,32,64)		OFF
			OFF
	LB/LW SIZE (2,4,6,8 k)		OFF
			OFF
	—		OFF

(b) Remote I/O station (AJ72LP25)



	Item		Setting
(1)	STATION No.	x 10	0
		x 1	1
(2)	MODE		0
(3)	SW	1	OFF
		2	OFF
		3	OFF
		4	OFF
		5	OFF

(4) Setting parameters/creating a program, and writing to the CPU, at a peripheral device

In order to operate the data link, parameters have to be set in the CPU of the master station from a peripheral device.
The parameter settings to be made are listed in the table below.

Item	Setting
Number of modules	◎
Network refresh parameters	O
Common/remote I/O parameters	◎
Station specific parameters	x
I/O allocations	Δ
Transfer parameters for data link	x

◎ : Must always be set
O : Change if necessary (default setting is provided)
Δ : Set if necessary
x : Setting not possible

Details of the operation from switching the peripheral device power ON to "data link parameters" are not given here. See Section 4.1.2, items 1 through 12 for this information.

1 Set the "MODULES"

<MODULES>

NO OF MODULES(1-4) [ ]

MODULE NO. ACCESSED BY GPP [ ]

	MODULE 1	MODULE 2	MODULE 3	MODULE 4
I/O NO.	[ ]	[ ]	[ ]	[ ]
NETWORK MODULE TYPE				
NETWORK NO.	[ ]	[ ]	[ ]	[ ]

End : SET Esc : CLOSE

Continued on the next page

Continued from the previous page

[1] [Enter]

[1] [Enter]

[Enter]

[4]

[1] [Enter]

2 The number of modules have now been set.

<MODULES>

NO OF MODULES(1-4) [1]

MODULE NO. ACCESSED BY GPP [1]

	MODULE 1	MODULE 2	MODULE 3	MODULE 4
I/O NO.	[00]	[ ]	[ ]	[ ]
NETWORK MODULE TYPE	MELSECNET/10 RMT. MASTER			
NETWORK NO.	[1]	[ ]	[ ]	[ ]

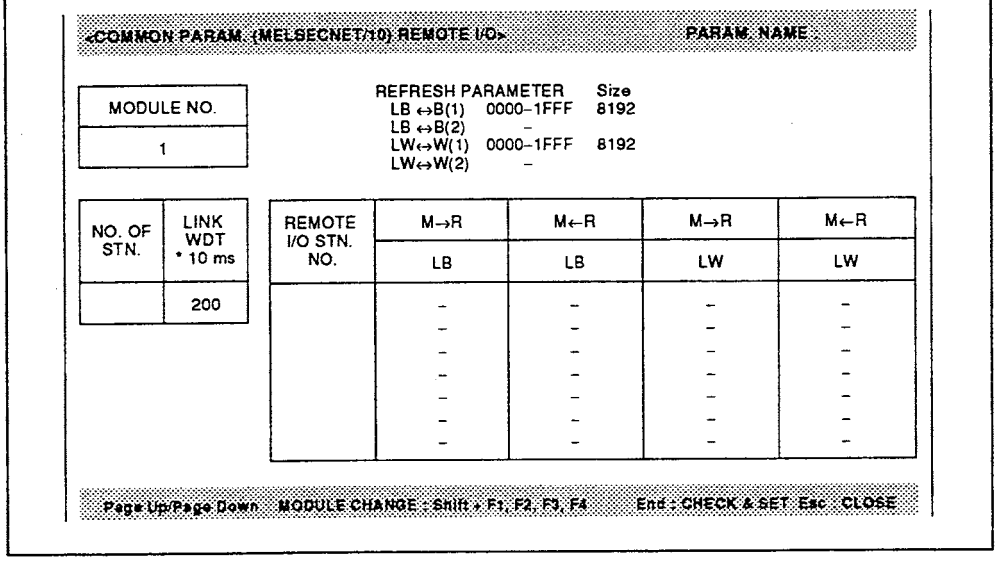
End : SET Esc : CLOSE

[End]

Continued on the next page

Continued from the previous page

3 Set the common/remote I/O parameter settings.



[1] [Enter] (Total number of link stations)

[0] [→] [F] [→] [1] [0] [→] [1] [F]

[0] [→] [F] [→] [1] [0] [→] [1] [F]

[F9] [Enter] (Change to the LX/LY setting)

[1] [0] [0] [0] [→] [1] [0] [1] [F] [→]

[0] [→] [1] [F] [→]

[1] [0] [0] [0] [→] [1] [0] [1] [F] [→]

[0] [→] [1] [F] [→]

[End]

Continued on next page

Continued from the previous page

4 The common/remote I/O parameters have now been set.

<COMMON PARAM. (MELSECNET/10) REMOTE I/O> PARAM. NAME :

MODULE NO.
1

REFRESH PARAMETER Size
LX↔X(1) –
LX↔X(2) –
LY↔Y(1) –
LY↔Y(2) –

NO. OF STN.	LINK WDT * 10 ms
1	200

REMOTE I/O STN. NO.	M→R		M←R	
	LY	LY	LX	LX
1	1000 – 101F	0000 – 001F	1000 – 101F	0000 – 001F
	–	–	–	–
	–	–	–	–
	–	–	–	–
	–	–	–	–
	–	–	–	–
	–	–	–	–

Page Up/Page Down MODULE CHANGE : Shift + F1, F2, F3, F4 End : CHECK & SET Esc : CLOSE

[End]

5 The remote I/O allocations are NOT set.

SET REMOTE I/O ALLOCATIONS?

YES NO

[→] (NO)

[Enter]

Continued on the next page

Continued from the previous page

6 Check the settings for the network parameter.

<NETWORK PARAMETER>

NET MODULE SETTING	1

O : MUST BE SET. @ : ALREADY SET.
? : IF WHEN NECESSARY.* : ALREADY SET.

NETWORK PARAMETER CAPACITY 4KB	1 MODULE NET/10(R)			
NETWORK REFRESH PARAMETER	@			
MELSECNET II	X			
COMMON/REMOTE I/O PARAM.	@			
STATION NATIVE PARAMETER	X			
I/O ALLOCATION	?			
TRANSFER PARAMETER	X			

End : CHECK/SET Esc : CLOSE

[Enter]

7 Change the network refresh parameter.

<NETWORK REFRESH PARAMETER>

OTHER MODULES

LB↔B TRANSFER 1:1000 - 1FFF
2:
3:
4:

1			

<LB↔B TRANS>

SET SOURCE LB NUMBER, DESTINATION B NUMBER(UNITS OF 16).

[PAG E 1] NETWORK MODULE 1

MELSECNET/10(RMT MAST)	I/O NO. 00	NETWORK NO. 1

LB↔B	LB	[0000]↔B	[0000]	SIZE[2000]HPOINTS
LW↔W	LW	[0000]↔W	[0000]	SIZE[2000]HPOINTS
LX↔X	LX	[0000]↔X	[0000]	SIZE[0000]HPOINTS
LY↔Y	LY	[0000]↔Y	[0000]	SIZE[0000]HPOINTS
SB COPIED TO	SB	[000]↔DEST. [Y]	[1C00]	SIZE [100]HPOINTS
SW COPIED TO	SW	[000]↔DEST. [D]	[7168]	SIZE [100]HPOINTS
ERROR HISTORY	RETAIN			

CHANGE MODULE WITH Shift + F1, F2, F3, F4 KEYS. End : SET Esc : CLOSE

Continued on next page

Continued from the previous page

[↓] [↓] [→] [→]

[2] [0] [0] [0] [↓]

[2] [0] [0] [0] [↓] [←] [←]

[M] [→] [6] [0] [0] [0] [↓]

[7] [0] [0] [0]

8 The network refresh parameters have now been changed.

<NETWORK REFRESH PARAMETER>

OTHER MODULES

SW COPIED TO 1:D7168 – D7423
2:
3:
4:

1			

[PAGE 1] NETWORK MODULE 1

<SW TRANS. DEV>

SPECIFY SOURCE SW, DESTINATION DEVICE, IT'S NO. AND TRANSFER SIZE.

AVAILABLE DEVICES T, C, D, W

MELSECNET/10(RMT MAST)	I/O NO. 00	NETWORK NO. 1
LB↔B	LB [0000]↔B [0000]	SIZE[2000]HPOINTS
LW↔W	LW [0000]↔W [0000]	SIZE[2000]HPOINTS
LX↔X	LX [0000]↔X [0000]	SIZE[2000]HPOINTS
LY↔Y	LY [0000]↔Y [0000]	SIZE[2000]HPOINTS
SB COPIED TO	SB [000]↔DEST. [M] [6000]	SIZE [100]HPOINTS
SW COPIED TO	SW [000]↔DEST. [D] [7000]	SIZE [100]HPOINTS
ERROR HISTORY	RETAIN	

CHANGE MODULE WITH Shift + F1, F2, F3, F4 KEYS End : SET Esc : CLOSE

[End] (Setting completed)

[End] (Completion of setting of network refresh parameters)

[Esc] [Esc] (Return to the menu)

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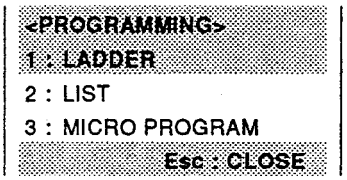
[1]

9 Select "LADDER".



[1]

10 Create the program.

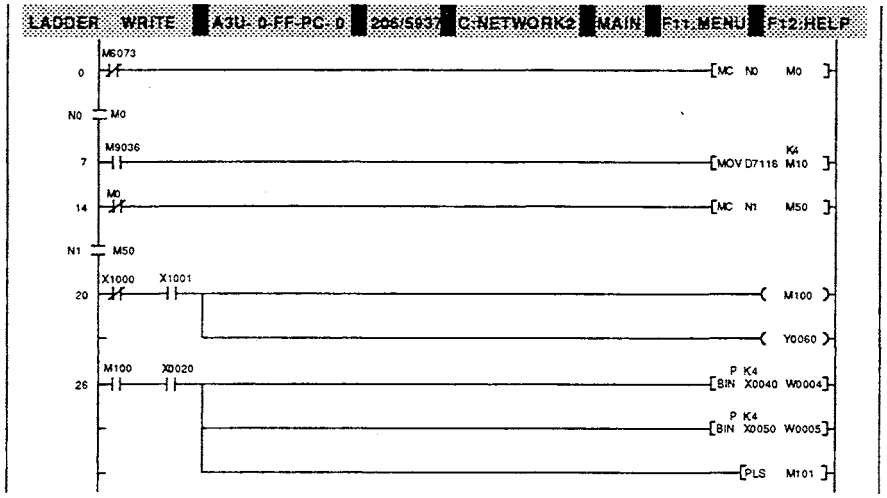
Enter the program in Section 4.2.2 (2).

Press [F4] (convert) while holding down [Shift].

Continued on the next page

Continued from the previous page

11 The program has now been created.



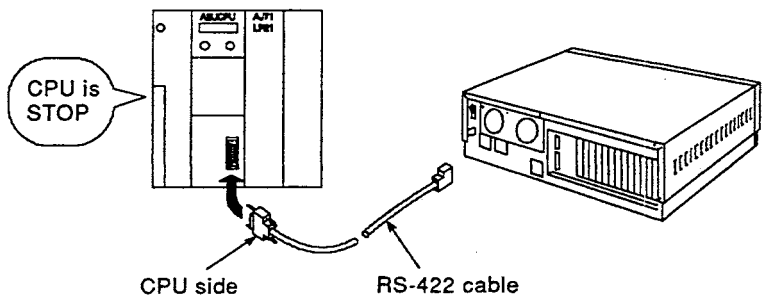
[F11] (Opens the menu)

[3] (Online)

[1] (PC)

[2] (Write)

12 Connect the CPU to the peripheral device.



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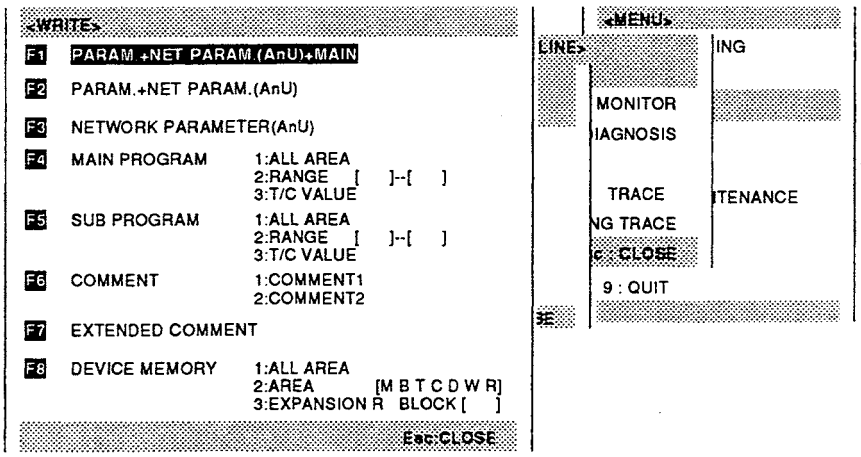
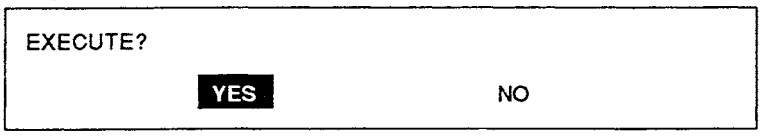
13 Write the data to the CPU.



[Enter]

14 Execute writing.



[Enter]

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15 Check the program.

CHECK SEQUENCE PROGRAM?

YES NO

[Enter]

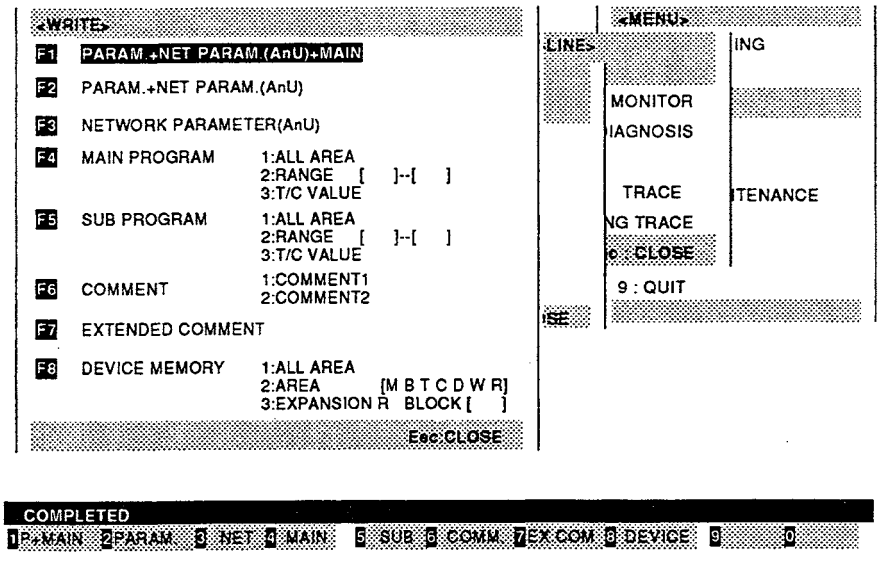
16 Verify the data.

VERIFY?

YES NO

[Enter]

17 Writing to the CPU has now been completed.



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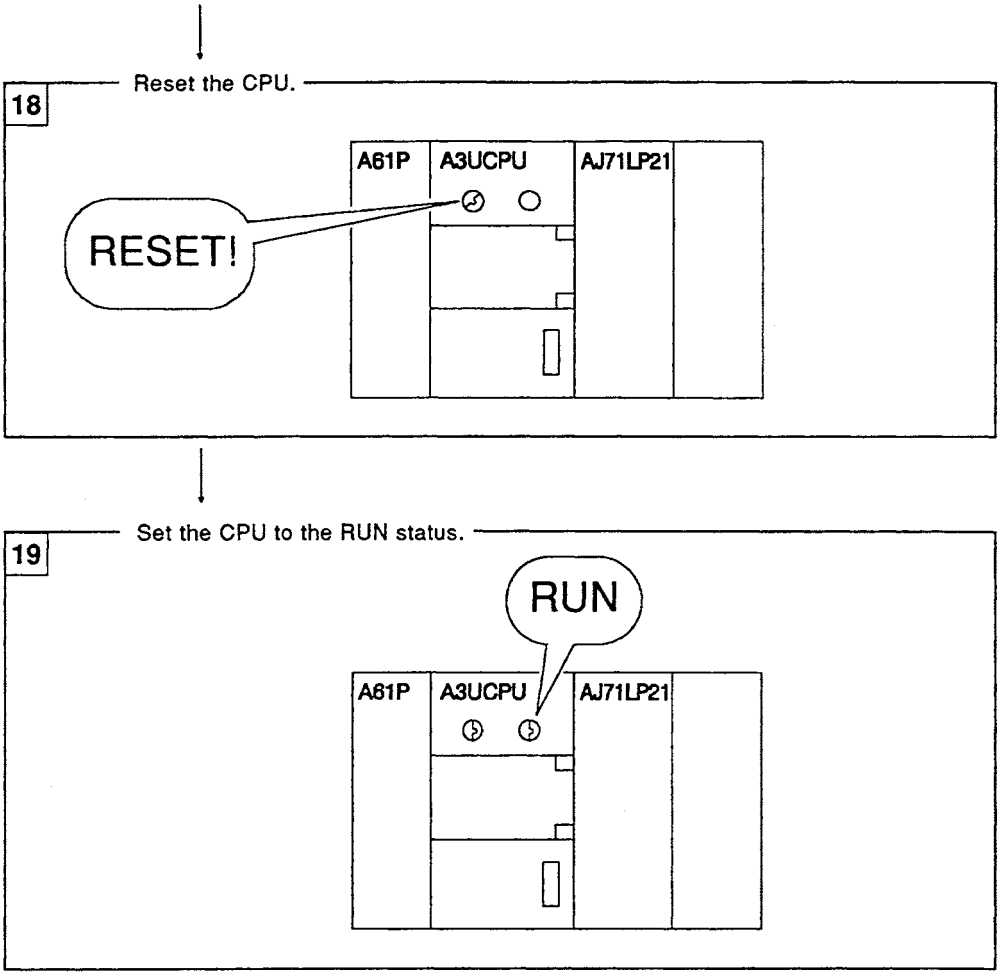


(5) Check the data link conditions

Check the data link conditions by checking the network module LEDs and the sequence program.

(a) Checking the status of the LEDs

Check the LED statuses of the master station and the remote I/O station.

1) Master station (AJ71LP21)

O: Unlit ●: Lit

LED Name	When Normal	LED Name	When Normal
RUN	●	POWER	●
PC	O	MNG	●
REMOTE	●	S.MNG	O
DUAL	O	D.LINK	●
SW.E.	O	T.PASS	●
M/S.E.	O	——	——
PRM.E.	O	CPU R/W	●(dimly lit)
CRC	O	CRC	O
OVER	O	OVER	O
AB.IF	O	AB.IF	O
TIME	O	TIME	O
DATA	O	DATA	O
UNDER	O	UNDER	O
LOOP	O	LOOP	O
SD	●(dimly lit)	SD	O
RD	●(dimly lit)	RD	●(dimly lit)

Note that these statuses depend on the loop status.

2) Remote station (AJ72LP25)

O: Unlit ●: Lit

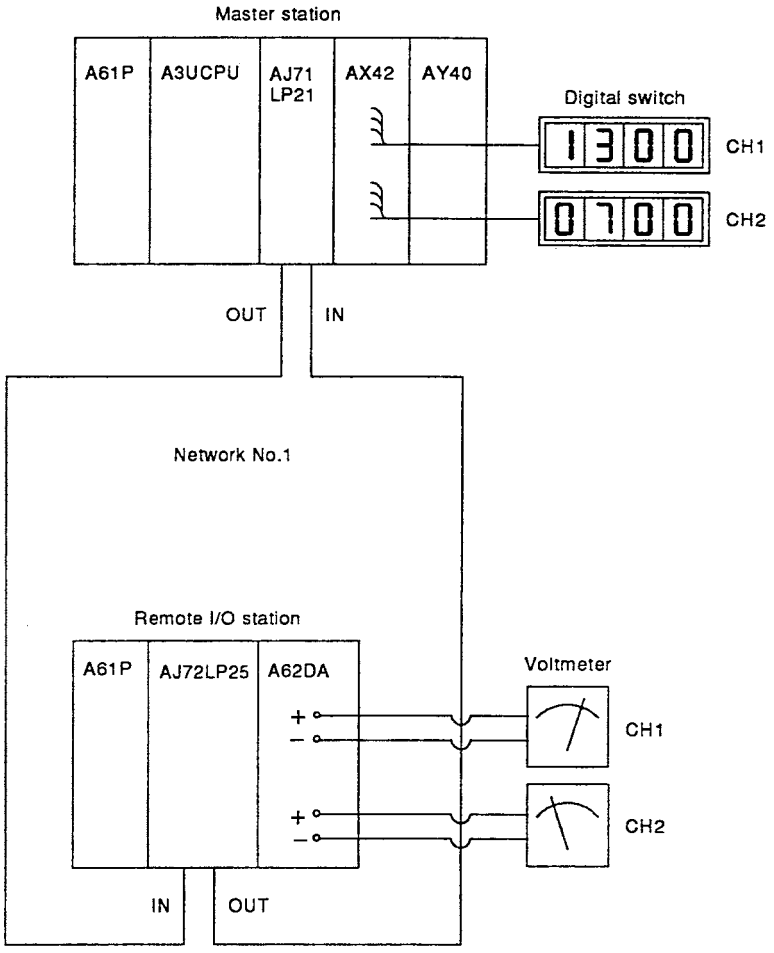
LED Name	When Normal	LED Name	When Normal
RUN	●	POWER	●
ERROR	O	——	——
——	——	——	——
DUAL	O	D.LINK	●
SW.E.	O	T.PASS	●
ST.E.	O	——	——
PRM.E.	O	WAIT	O
CRC	O	CRC	O
OVER	O	OVER	O
AB.IF	O	AB.IF	O
TIME	O	TIME	O
DATA	O	DATA	O
UNDER	O	UNDER	O
LOOP	O	LOOP	O
SD	●(dimly lit)	SD	O
RD	●(dimly lit)	RD	●(dimly lit)

Note that these statuses depend on the loop status.

(b) Checking the sequence program

Check if the program written to the programmable controller CPU operates normally.

[System configuration]



[Operation check]

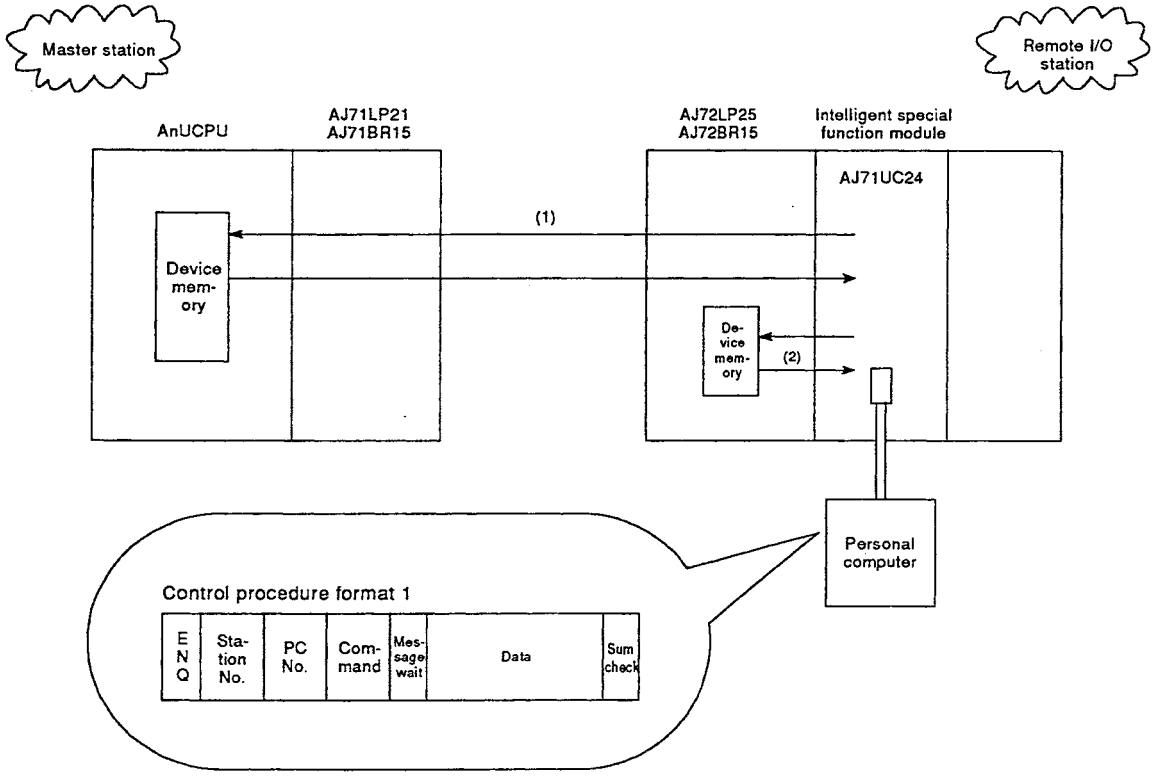
1) Y0060 is lit when the A62DA module is normal.
2) The digital switch (CH1: X0040 to 4F, CH2: X0050 to 5F) values are fetched using X0020 and written to addresses 0 to 1 of the A62DA buffer memory.
3) X0021 lights, enabling CH1/CH2 output, and Y0061 lights.
4) X0022 lights, disabling CH1/CH2 output, and Y0061 goes out.
5) If a value outside the range −2000 to 2000 is set as a CH1 digital switch value, Y0068 lights.
6) If a value outside the range −2000 to 2000 is set as a CH2 digital switch value, Y0069 lights.
7) If the result of execution of the ZNTO/ZNFR instruction is abnormal, Y006F flashes.

4.3 Communication Using an Intelligent Special Function Module

This section describes communication when using an intelligent special function module.

4.3.1 Preparing for communication

An outline of communication using an intelligent special function module is presented below.
The example presented here shows the case when an AJ71UC24 computer link module is used.



(1) When "0" (master station) is set as the PC No.

All devices in the master station's AnUCPU can be accessed.

(2) When "FF" (host station) is set as the PC No.

The devices of the network modules (AJ72LP25/AJ72BR15) shown below can be accessed.

X ..... 2048 points (X000 to 7FF)
Y ..... 2048 points (Y000 to 7FF)
B ..... 8192 points (B000 to 1FFF)
W ..... 8192 points (W000 to 1FFF)
M ..... 512 points (M0 to 511 device points are used instead of addresses SB0000 to 01FF)
D ..... 512 points (D0 to 511 device points are used instead of SW0000 to 01FF)
Special M ..... 256 points (M9000 to 9255)
Special D ..... 256 points (D9000 to 9255)

4.3.2 Precautions when using intelligent special function modules

This section describes the precautions to be taken when using an intelligent special function module installed at a remote I/O station.

(1) A maximum of two intelligent special function modules can be installed at one remote I/O station.

(2) The range of devices that can be accessed at the host station differs according to the model.

Device	Accessible Range		
	A3UCPU or Equivalent	A3HCPU or Equivalent	A3ACPU or Equivalent
X	0 to 7FF	0 to 7FF	0 to 7FF
Y	0 to 7FF	0 to 7FF	0 to 7FF
B	0 to 1FFF	0 to 3FF	0 to FFF
W	0 to 1FFF	0 to 3FF	0 to FFF
M*	0 to 511	0 to 511	0 to 511
D*	0 to 511	0 to 511	0 to 511
Special M	9000 to 9255	9000 to 9255	9000 to 9255
Special D	9000 to 9255	9000 to 9255	9000 to 9255

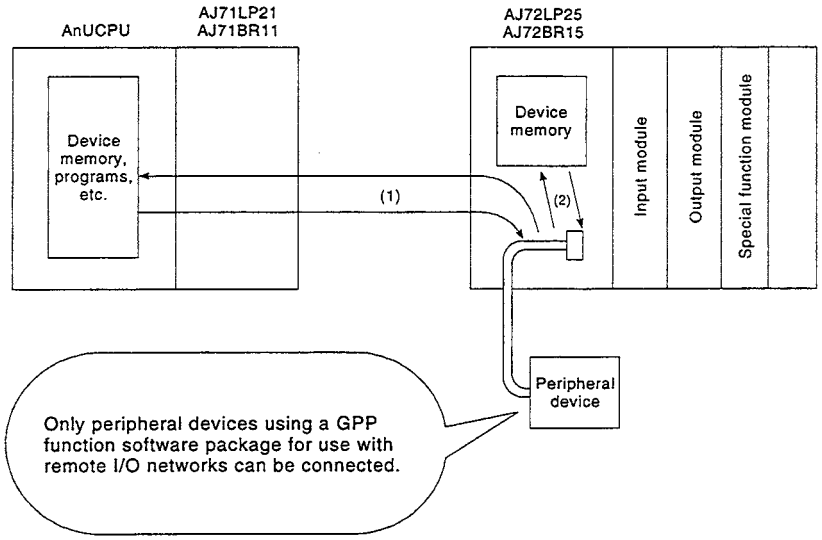
* ..... Devices for substituting SB/SW
A3UCPU or equivalent ... AJ71UC24
A3ACPU or equivalent ... AJ71C24-S6
AJ71C24-S8
AD51H(S3) etc.
A3HCPU or equivalent ... AJ71C24-S3
AD51(S3) etc.

4.4 Communication Using a Peripheral Device

This section describes communication when using a peripheral device.

4.4.1 Preparing for communication

An outline of communication using a peripheral device is presented below.



(1) When "0" (master station) is set as the PC No.

All devices in the master station's AnUCPU can be accessed.

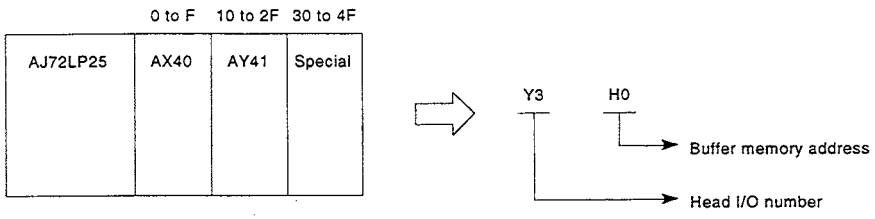
(2) When "FF" (host station) is set as the PC No.
(This function cannot be set on GX Developer.)

The devices of the network modules (AJ72LP25/AJ72BR15) shown below can be accessed.

X ..... 2048 points (X000 to 7FF)
Y ..... 2048 points (Y000 to 7FF)
B ..... 8192 points (B0000 to 1FFF)
W ..... 8192 points (W0000 to 1FFF)
M ..... 512 points (M0 to 511 device points are used instead of addresses SB0000 to 01FF)
D ..... 512 points (D0 to 511 devices points are used instead of SW0000 to 01FF)
Special M ..... 256 points (M9000 to 9255)
Special D ..... 256 points (D9000 to 9255)

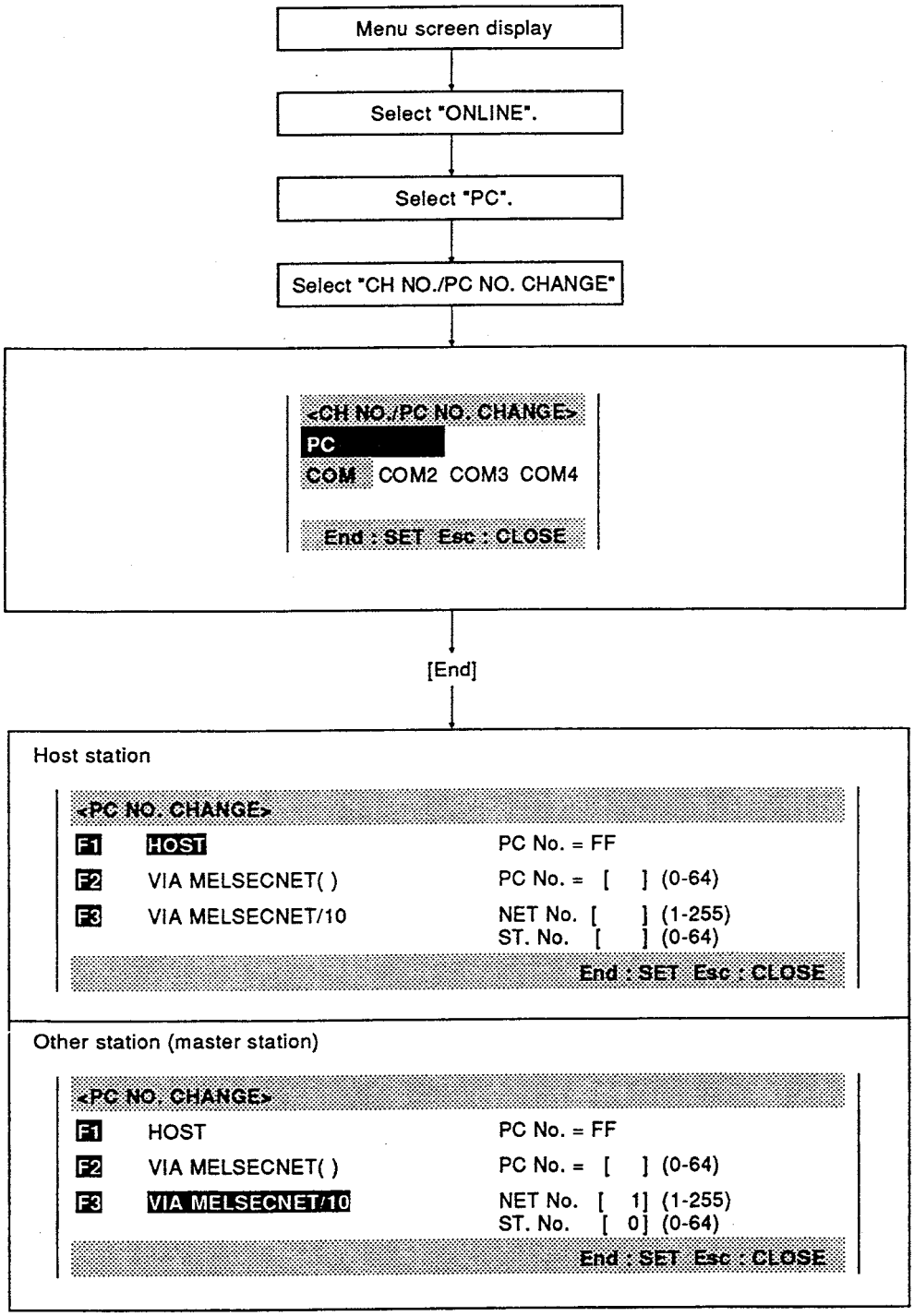
It is also possible to access the buffer memory of the special function module.
The address setting is the same as for a programmable controller CPU.

Example:



4.4.2 PC No. setting method

This section describes how to set the "PC No." from a peripheral device.
(In this example, SW□IVD-GPPA is used on the peripheral device.)



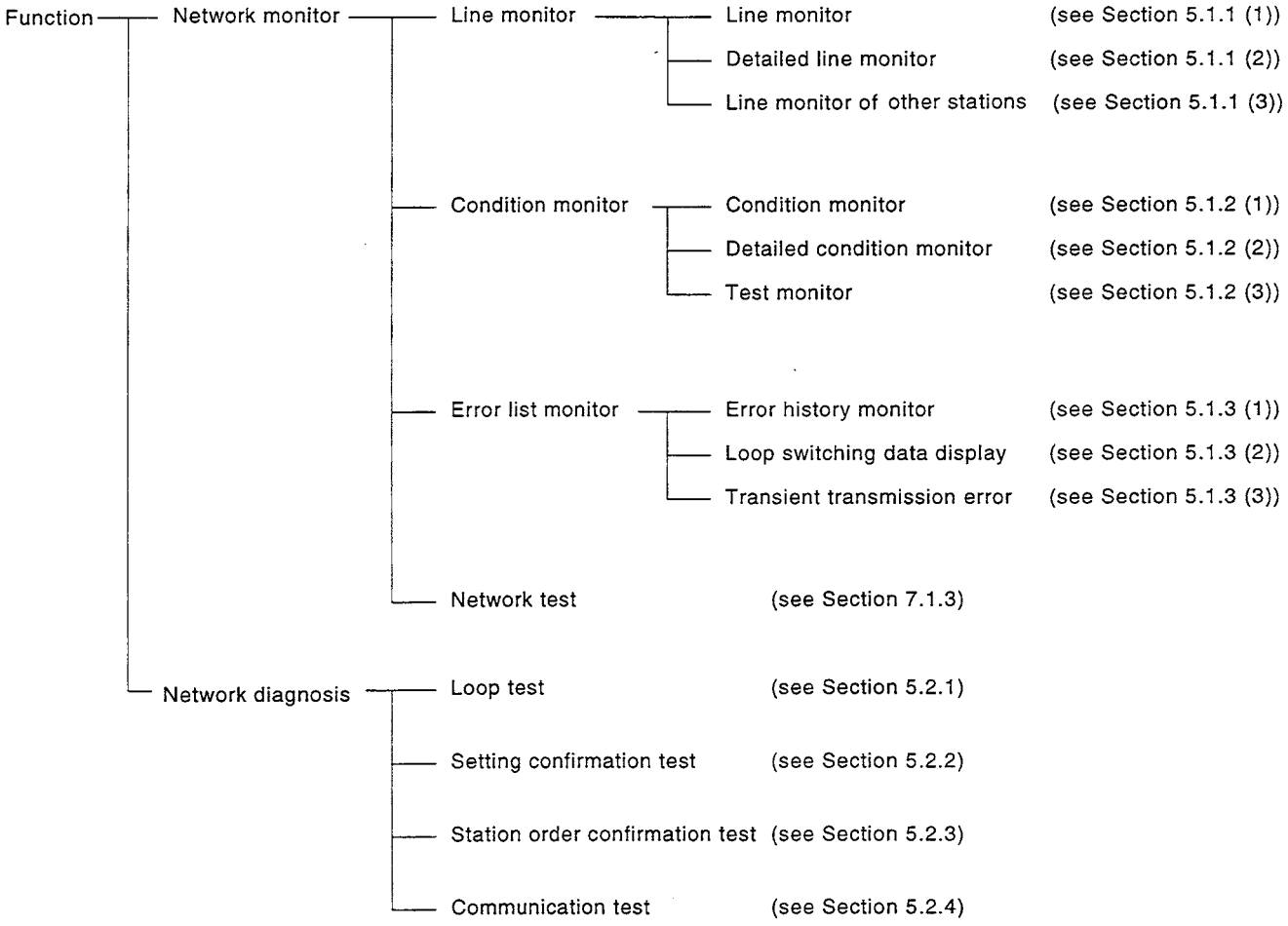
MEMO

5. OPERATIONS POSSIBLE AT PERIPHERAL DEVICES

The following operations are possible at a peripheral device:

(1) "Network monitoring", which allows the conditions of the network to be ascertained at a glance.

(2) "Network diagnosis", which allows the network conditions to be checked, for example during start-up.



REMARKS

(1) SB[ ][ ][ ][ ] and SW[ ][ ][ ][ ], which will be encountered in the explanations in Section 5.1 "Network Monitor", refer to the special relays (SB) and special registers (SW) used for monitoring.
The network monitor function is not available during offline test (the data cannot be displayed correctly).

(2) When accessing a remote I/O station from a peripheral device, use SW[]IVD-GPPA. GX Developer cannot be used to access the remote I/O station.

5.1 Network Monitor

5.1.1 Line monitor

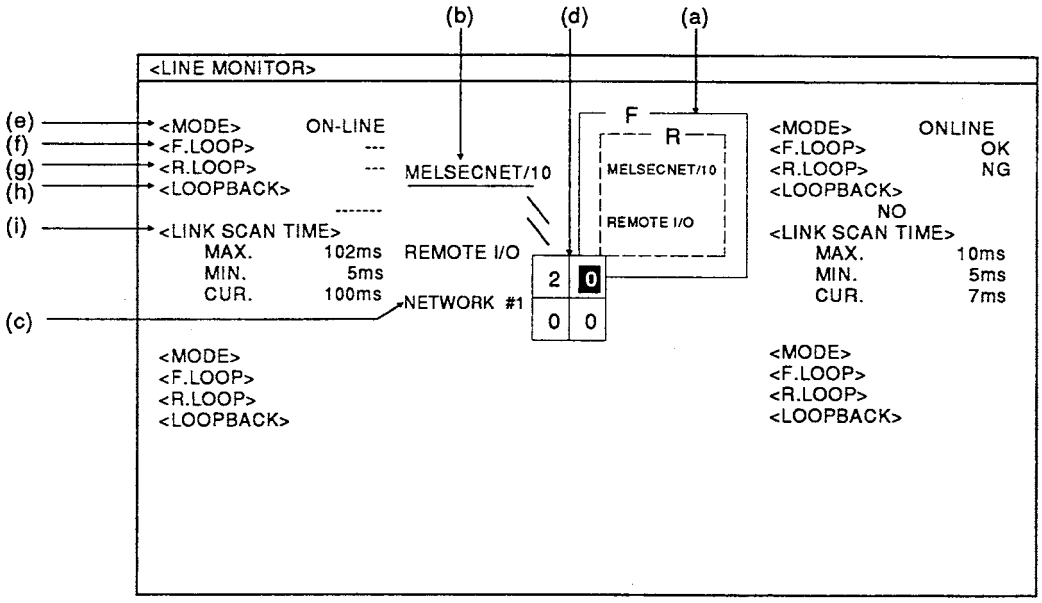
The conditions of the line, data link, CPU, and parameters used with a network to which a peripheral device is connected can be checked.

(1) Checking the line condition and link scan time (Line monitor)

The condition of the network can be checked with a network diagram.

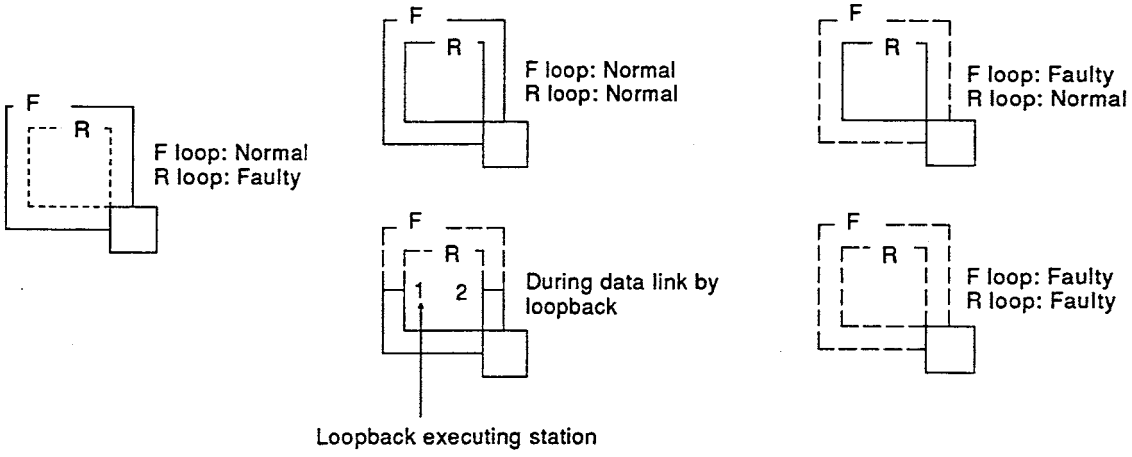
Check points in the screen

- Mode
- F/R loop condition
- Loopback condition
- Link scan time



(a) Line condition ..... The condition of the loop and bus is displayed.

- Optical loop system



• Coaxial bus system

The same display is given regardless of the condition of the cable.

(b) Network type ..... The type of the network is displayed. (SB0040)
- MELSECNET/10 PC to PC network
- MELSECNET/10 remote I/O network

(c) Network number .... Network number is displayed. (SW0040)

(d) Station number ..... The host station number is displayed. (SW0042)
The master station is highlighted. (SB0044)

(e) MODE..... Mode of the host station is displayed. (SW0043)
- ON-LINE —— Automatic on-line return is set.
- OFF-LINE —— Station-to-station test (master)
  Station-to-station test (slave)
  Self-loopback test
  Self-loopback test (internal)
  Forward loop test
  Reverse loop test

  Only the master station can execute monitoring.

(f) F. LOOP..... The forward loop condition is displayed. (SB0091)
- OK: Normal
- NG: Faulty

"--" is displayed when the bus system is monitored.

(g) R. LOOP..... The reverse loop condition is displayed. (SB0095)
- OK: Normal
- NG: Faulty

"--" is displayed when the bus system is monitored.

(h) LOOPBACK..... The loopback executing condition is displayed. (SW0090)
- OK
- NO

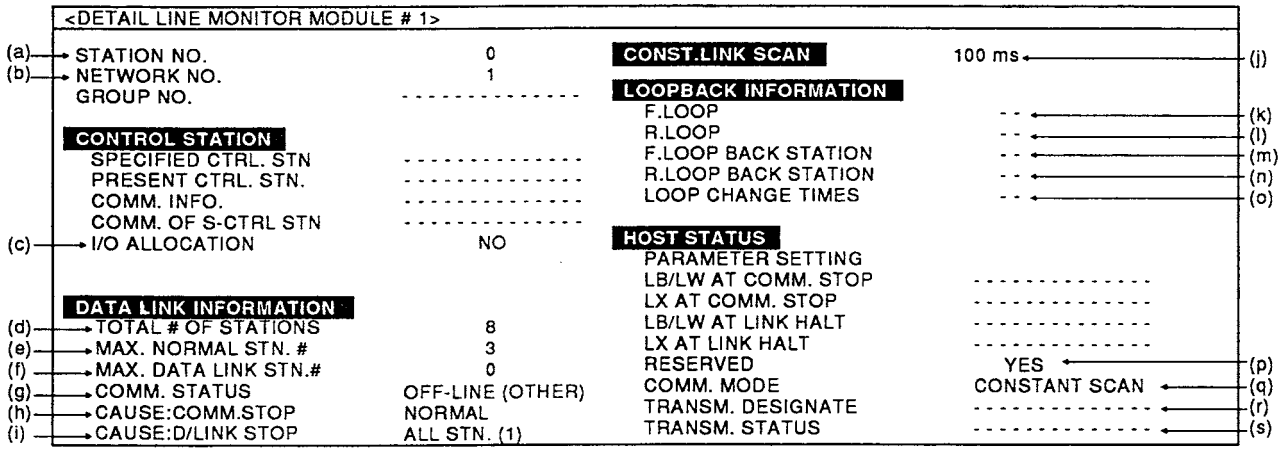
"------" is displayed when the bus system is monitored.

(i) LINK SCAN TIME ... The maximum, minimum, and current values of the link scan time of the host station are displayed. (SW006B/SW006C/SW006D)

(2) Checking the condition of the master station and data link (Detailed line monitor)

Check points in the screen

- Host station number, network number, group number
- Settings and operating condition of the master station
- Data link data
- Constant link scan
- F/R loops and loopback condition
- Parameter settings with the host station



(a) STATION NO. .....The host station number is displayed. (SW0042)

(b) NETWORK NO. .....The network number of the host station is displayed. (SW0040)

(c) I/O ALLOCATION .....The I/O allocations are displayed.

- YES
- NO

(d) TOTAL NUMBER OF LINK STATIONS .....The "total number of link stations + 1" set in the common parameters is displayed. (SW0059)

(e) MAXIMUM NORMAL STATION NUMBER ..The maximum station number which is normally executing baton passing (transient transmission possible). (SW005A)
The T.PASS LED is lit.

(f) MAXIMUM DATA LINK STATION NUMBER .....The maximum station number which is normally executing data link (cyclic and transient transmissions). (SW005B)
The D.LINK and T.PASS LEDs are lit.

(g) COMMUNICATION STATUS .... Communication condition of the host station is displayed. (SW0047)

- DATA LINKING
- OFF-LINE (OTHER) ..... Cyclic transmission is stopped by another station.
- OFF-LINE (HOST) ..... Cyclic transmission is stopped by the host station.
- TOKEN (NO AREA) ..... The B/W/X/Y send areas are not set with the host station.
- TOKEN (AB. PARAM.) ..... There is a parameter error with the host station.
- TOKEN (NO.RECV) ..... Common parameters are not yet received.
- DISCONNECT (NO. BT) ..... Station numbers overlap. Cable is not connected.
- DISCONNECT (AB. LINE) ..... Cable is not connected.
- TEST BEING EXECUTED ..... On-line or off-line test is being executed.

(h) CAUSE OF COMMUNICATION STOP ..... Cause of communication stop (transient transmission) at the host station is displayed. (SW0048)

- NORMAL
- TOKEN DUPLICAL .. More than one baton has been received.
- ONLINE TESTING... On-line test is being executed.
- DUPLICATED STN .. The station numbers overlap.
- DUPLICATED CTRL ..... More than one control station is set.
- OTHERS (error code) ..... Refer to the error codes list.
- OFFLINE TEST ..... Off-line test is being executed.
- TOKEN ERASE
- INITIAL STATUS
- DELINKING
- LINE TROUBLE
- RECV. RETRY ERR
- SEND RETRY ERR
- SHIFT CTRL STN
- OFFLINE
- NO BATON (HOST)

(i) CAUSE OF DATA LINK STOP .....Cause of data link stop (cyclic transmission) at the host station is displayed. (SW0049)

- NORMAL
- STAT20N ( ) .....Cyclic transmission is stopped by another station.
- HOST-STN. INSTR. .....Cyclic transmission is stopped by the host station.
- ALL STN. ( ) .....Cyclic transmission at all stations is stopped.
- NO PARAMETER ...Parameters are not yet received.
- ABNORMAL PARAM. .....There is a parameter error.
- PARAM. UNMATCHED .....There is a matching error between common parameters and station specific parameters.
- I/O ALOC. UNMATCH .....The I/O allocation with the remote I/O network has an error.
- OTHERS (error code) .....Refer to the error codes list.
- COM. INTERRUPT

(j) CONSTANT LINK SCAN .....Set conditions of constant link scan are displayed. (SW0068)

(k) F. LOOP .....The F loop condition is displayed. (SB0099, SW0090)

- NORMAL
- LOOPBACK
- NO DATA-LINK

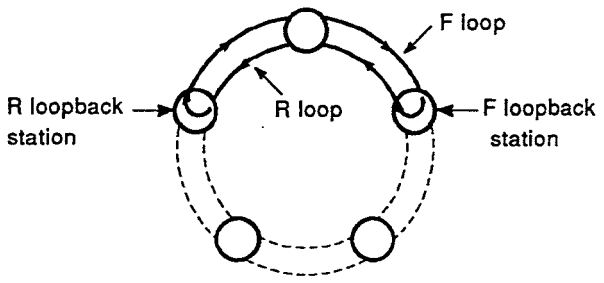
"--" is displayed when the bus system is monitored.

(l) R. LOOP .....The R loop condition is displayed. (SB009A, SW0090)

- NORMAL
- LOOPBACK
- NO DATA-LINK

"--" is displayed when the bus system is monitored.

(m) F. LOOPBACK STATION .....The loopback station number in the F loop is displayed. (SW0099)
"--" is displayed when the bus system is monitored.



(n) R. LOOPBACK STATION .....The loopback station number in the R loop is displayed. (SW009A)
"--" is displayed when the bus system is monitored.

(o) LOOP CHANGE TIMES .....The number of times of loop switching and loopback operations is displayed. (SW00CE)
"--" is displayed when the bus system is monitored.

(p) RESERVED .....The set condition of reserve station is displayed. (SB0064)

- YES
- NO

(q) COMMUNICATION MODE ....The link scan condition is displayed. (SB0068)

- NORMAL MODE
- CONSTANT SCAN

(r) TRANSMISSION DESIGNATE .....The setting condition of multiplex transmission is displayed. (SB0069)

- NORMAL
- DUPLEX

"----------" is displayed when the bus system is monitored.

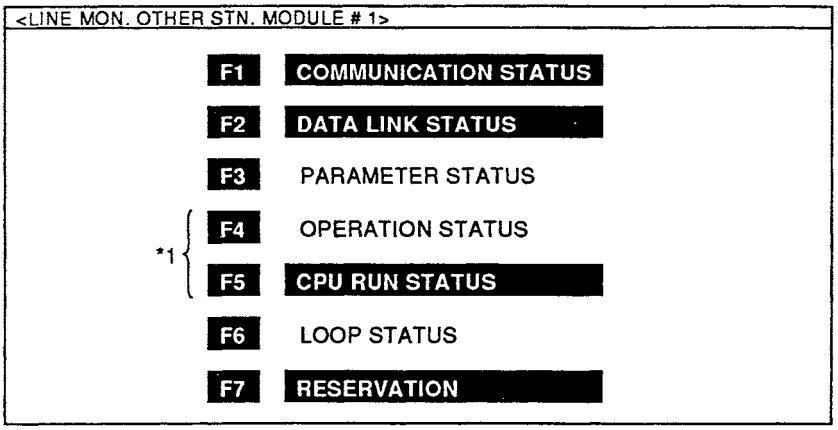
(s) TRANSMISSION STATUS .....The condition of multiplex transmission is displayed. (SB006A)

- NORMAL...
- DUPLEX...

"----------" is displayed when the bus system is monitored.

(3) Checking the condition of communication, data link, CPU, and loop (Line monitor of another station)

The condition of the communication, data link, CPU, parameters, loop, and reserve stations at each station can be checked.



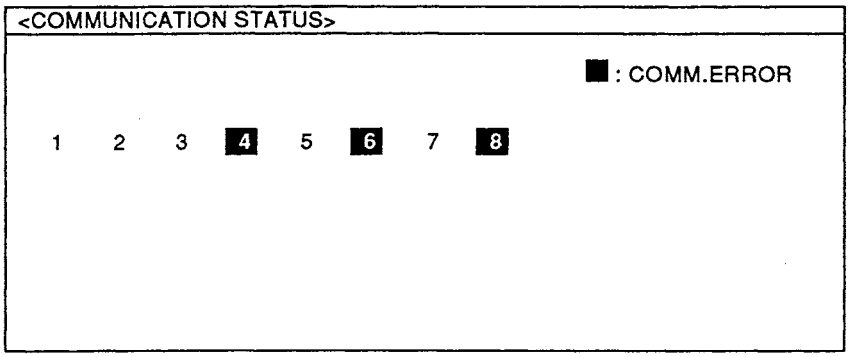
Indication of items F1 to F4 and F6 shown above is highlighted when there is a faulty station, that of F5 is highlighted when there is a STOP station, and that of F7 is highlighted when there is a reserve station.

*1... These are not relevant in the case of a remote I/O network ("CANNOT SELECT." is displayed).

(a) Communication condition of each station: [F1]

The condition of transient transmission is displayed. (SW0070 to 73)
The condition display is given for the total number of link stations set with the common parameter.

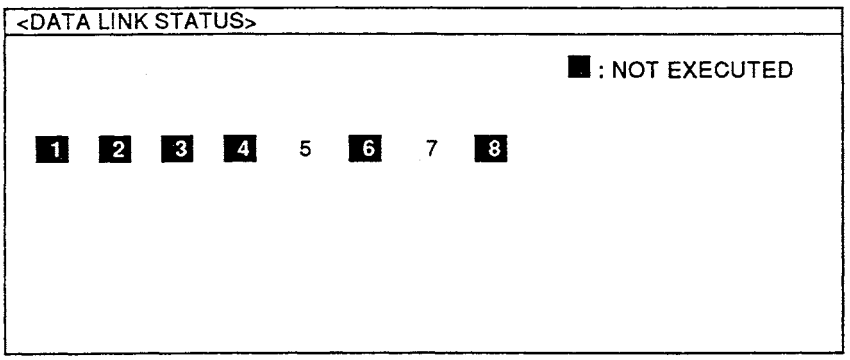
Normal display ..... Normal station, reserve station
Highlighted ..... Faulty station



(b) Data link condition of each station: [F2]

The condition of cyclic transmission and transient transmission is displayed. (SW0074 to 77)
The condition display is given for the total number of link stations set with the common parameter.

Normal display ..... Normal station, reserve station
Highlighted ..... Faulty station



(c) Parameter condition of each station: [F3]

1) The parameter communication condition is displayed. (SW0078 to 7B)

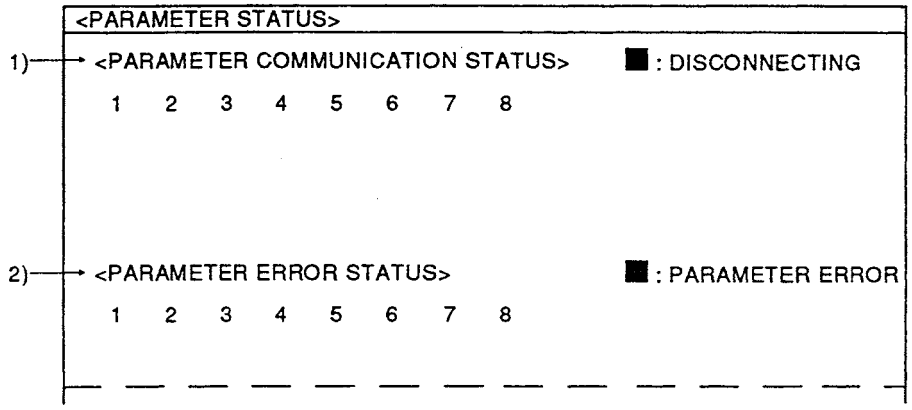
The condition display is given for the total number of link stations set with the common parameter.

Normal display ..... Other than during parameter communication, reserve station
Highlighted ..... During parameter communication

2) The parameter condition is displayed. (SW007C to 7F)

The condition display is given for the total number of link stations set with the common parameter.

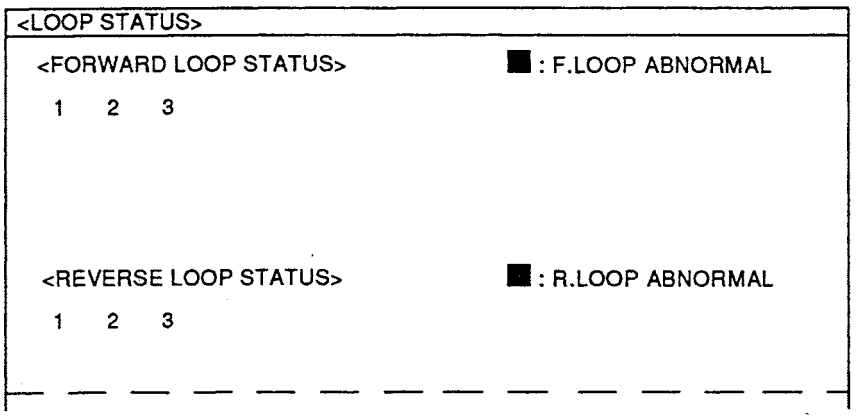
Normal display ..... Parameter normal, reserve station, non-connected station
Highlighted ..... Parameter error



(d) Loop condition of each station (Optical loop system only): [F6]

The forward/reverse loop condition is displayed.
(SW0091 to 94, SW0095 to 98)
The condition display is given for the total number of link stations set with the common parameter.

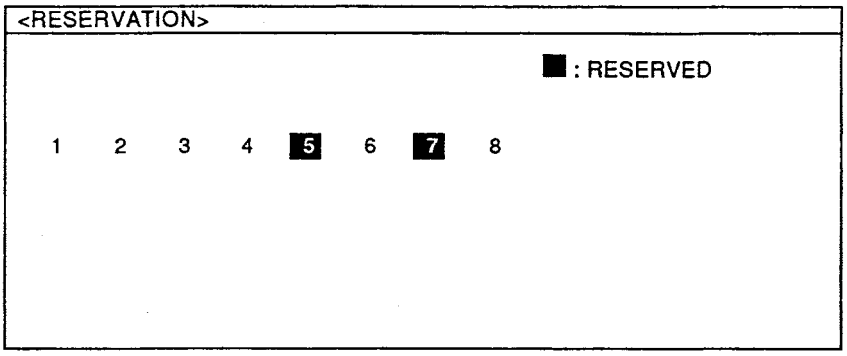
Normal display ..... Normal, reserve station
Highlighted ..... Faulty, non-connected station



(e) Reserve designation of each station: [F7]

The reserve station designating condition is displayed.
The condition display is given for the total number of link stations set with the common parameter.

Normal display ..... Non-reserved station
Highlighted ..... Reserved station



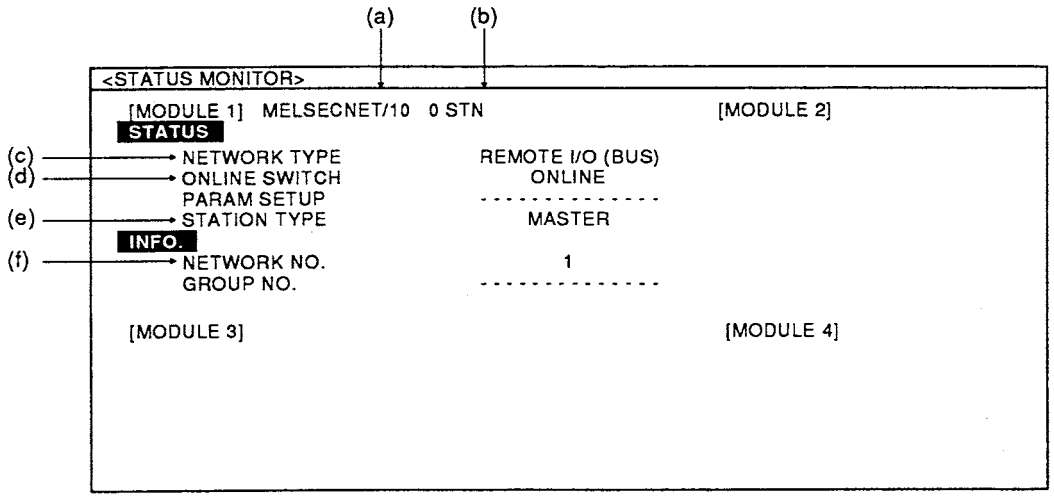
5.1.2 Condition monitor

The switch and parameter settings and conditions of data link, on-line/off-line test, etc. of the host station can be checked.

(1) Checking the module conditions of the host station (Condition monitor)

Check points in the screen

- Network type
- Mode
- Station setting
- Network number



(a) MODULE TYPE .....The type of module of the host station is displayed.

- MELSECNET/10

(b) STATION NUMBER ...The host station number is displayed. (SW0042)

(c) NETWORK TYPE .....The type of the network of the host station is displayed. (SB0040, SW0046)

- PC NET (LOOP)
- PCNET (BUS)
- REMOTE I/O (LOOP)
- REMOTE I/O (BUS)

(d) ONLINE SWITCH .....The mode select switch condition of the host station is displayed. (SW0043)

- ONLINE
- NO ONLINE (master station only)

(e) STATION TYPE .....The station type setting with the host station is displayed. (SB0044)

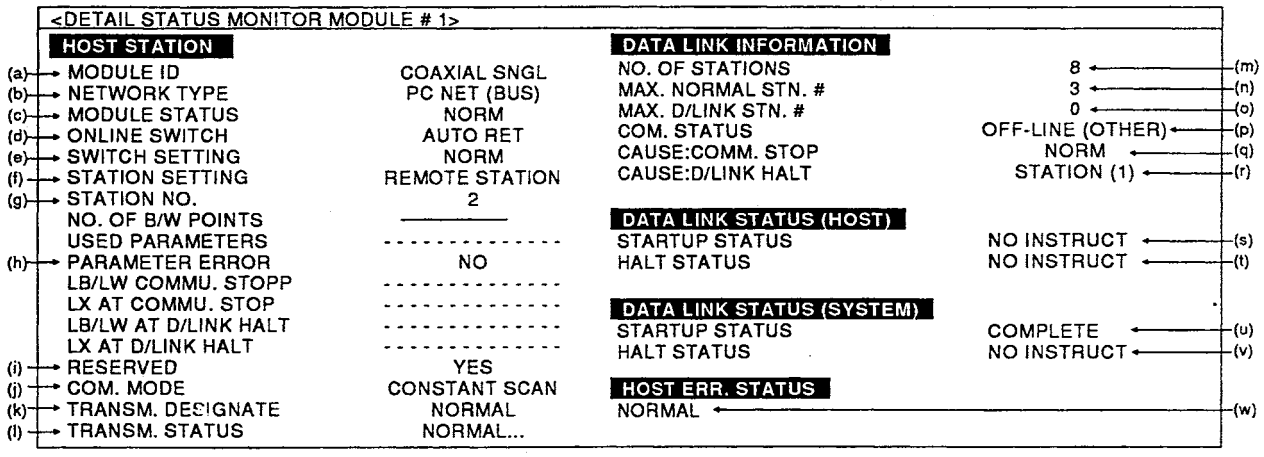
- MASTER
- REMOTE STATION

(f) NETWORK NUMBER ..The network number of the host station is displayed. (SW0040)

(2) Checking the switch and parameter settings and data link condition of the host station (Detailed condition monitor)

Check points in the screen

- Switch setting
- Parameter settings
- Data link condition
- Data link start/stop condition



(a) MODULE ID..... The type of the module is displayed. (SW0046)

Left	Right
Optical	Single
Coaxial	Duplex

(b) NETWORK TYPE ..... The type of network is displayed. (SB0040, SW0046)

- PC NET (LOOP)
- PC NET (BUS)
- REMOTE I/O (LOOP)
- REMOTE I/O (BUS)

(c) MODULE STATUS .... The communication status between the network module and the CPU module is displayed.

- NORMAL
- (error code)

(d) ONLINE SWITCH .....The mode select switch condition is displayed. (SW0043)

- AUTO RET
- NON AUTO RET
- OFFLINE
- LOOP TEST (MASTER)
- LOOP TEST (SUB.)
- STN. TEST (MASTER)
- STN. TEST (SLAVE)
- HOST-LOOPBACK TEST
- HOST-LOOPBACK (INTNL)

(e) SWITCH SETTING ....The switch setting conditions of the module are displayed. (SB0045, SW0045)

- NORMAL
- (error code)

(f) STATION SETTING ...The station type is displayed. (SB0044)

- MASTER
- REMOTE STATION

(g) STATION NUMBER ...The station number is displayed. (SW0042)

(h) PARAMETER ERROR .....The error condition of the parameter set with the host station is displayed. (SW0055)

(i) RESERVED .....The set condition of reserve station is displayed. (SB0064)

- YES
- NO

(j) COMMUNICATION MODE ....The link scan condition is displayed. (SB0068)

- NORMAL MODE
- CONSTANT SCAN

(k) TRANSMISSION DESIGNATE .....The setting condition of multiplex transmission is displayed. (SB0069)

- NORMAL
- DUPLEX

"----------" is displayed when the bus system is monitored.

(l) TRANSMISSION STATUS .....The condition of multiplex transmission is displayed.(SB006A)

- NORMAL...
- DUPLEX...

"----------" is displayed when the bus system is monitored.

(m) NUMBER OF STATIONS ..... The total number of link stations set with the common parameter is displayed.

(n) MAX. NORMAL STATION NUMBER ..... The maximum station number which is normally executing baton passing (transient transmission possible). (SW005A)
The T.PASS LED is lit.

(o) MAX. DATA LINK STATION NUMBER ..... The maximum station number which is normally executing data link (cyclic and transient transmissions). (SW005B)
The D.LINK and T.PASS LEDs are lit.

(p) COMMUNICATION STATUS ..... Communication condition of the host station is displayed. (SW0047)

- DATA LINKING
- OFF-LINE (OTHER) ..... Cyclic transmission is stopped by an other station.
- OFF-LINE (HOST) ..... Cyclic transmission is stopped by the host station.
- TOKEN (NO AREA) ..... The B/W/X/Y send areas are not set with the host station.
- TOKEN (AB. PARAM.) ..... There is a parameter error with the host station.
- TOKEN (NO.RECV) ..... Common parameters are not yet received.
- DISCONNECT (NO. BT) ..... Station numbers overlap. Cable is not connected.
- DISCONNECT (AB. LINE) ..... Cable is not connected.
- TEST BEING EXECUTED ..... On-line or off-line test is being executed.

(q) CAUSE OF COMMUNICATION STOP ..... Cause of communication stop (transient transmission) at the host station is displayed. (SW0048)

- NORMAL
- TOKEN DUPLICAL ..... More than one baton has been received.
- ONLINE TESTING ..... On-line test is being executed.
- DUPLICATED STN ..... The station numbers overlap.
- DUPLICATED CTRL ..... More than one control station is set.
- OFFLINE TEST ..... Off-line test is being executed.
- OTHERS (error code) ..... Refer to the error codes list.
- TOKEN ERASE
- INITIAL STATUS
- DELINKING
- LINE TROUBLE
- RECV. RETRY ERR
- SEND RETRY ERR

- SHIFT CTRL STN
- OFFLINE
- NO BATON (HOST)

(r) CAUSE OF DATA LINK HALT ..... Cause of data link stop (cyclic transmission) at the host station is displayed. (SW0049)

- NORMAL
- STAT20N ( ) ..... Cyclic transmission is stopped by other station.
- HOST-STN. INSTR. ..... Cyclic transmission is stopped by the host station.
- ALL STN. ( ) ..... Cyclic transmission at all stations is stopped.
- NO PARAMETER ... Parameters are not yet received.
- ABNORMAL PARAM. ..... There is a parameter error.
- PARAM. UNMATCHED ..... There is a matching error between common parameters and station specific parameters.
- I/O ALOC. UNMATCH ..... The I/O allocation with the remote I/O network has an error.
- OTHERS (error code) ..... Refer to the error codes list.
- COM. INTERRUPT

(s) STARTUP STATUS ... The cyclic start condition from the host station to the host station is displayed. (SB0000, SB004C, SB004D, SW004D)

- NO INSTRUCT
- INCOMPLETE
- COMPLETE
- ERROR (error code)

(t) HALT STATUS ..... The cyclic stop condition from the host station to the host station is displayed. (SB0001, SB004E, SB004F, SW004F)

- NO INSTRUCT
- INCOMPLETE
- COMPLETE
- ERROR (error code)

(u) STARTUP STATUS ... The cyclic start condition from the host station to the system is displayed. (SB0002, SB0050, SB0051, SW0051)

- NO INSTRUCT
- INCOMPLETE
- COMPLETE
- ERROR (error code)

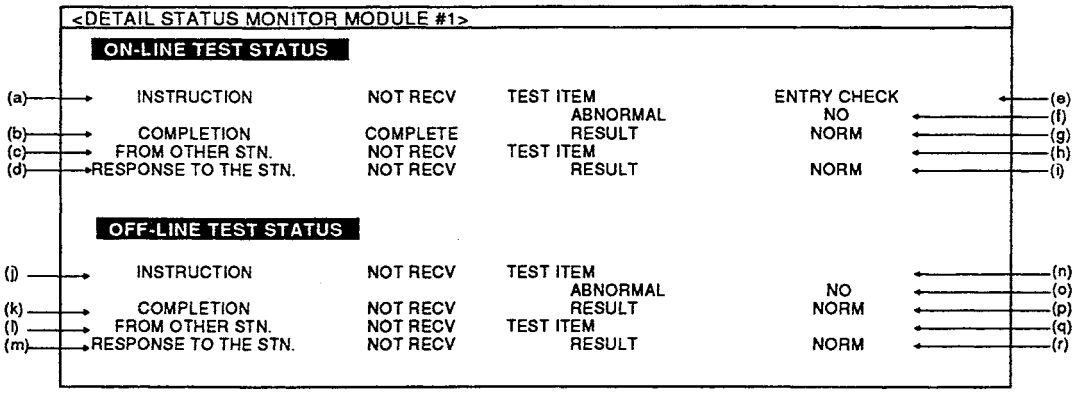
(v) HALT STATUS .....The cyclic stop condition from the host station to the system is displayed. (SB0003, SB0052, SB0053, SW0053)

- NO INSTRUCT
- INCOMPLETE
- COMPLETE
- ERROR (error code)

(w) HOST ERROR STATUS .....The host station condition and the slot No. when the error occurred are displayed. (SW004B, SW004C)

- NORMAL
- ERROR (error code)
- ERROR SLOT NO

(3) Checking the on-line/off-line test conditions of the host station (Test monitor)



(a) INSTRUCTION .....The on-line test designation condition of the host station is displayed. (SB00A8)

- NOT RECV
- RECEIVED

(b) COMPLETION .....The on-line test end condition of the host station is displayed. (SB00A9)

- NOT RECV
- COMPLETE

(c) FROM OTHER STATION .....The on-line test response setting condition of the host station is displayed. (SB00AA)

- NOT RECV
- RECEIVED

(d) RESPONSE TO THE STATION .....The on-line test response end condition of the host station is displayed. (SB00AB)

- NOT RECV
- COMPLETE

(e) TEST ITEM .....The execution items when the host station is on the on-line test request side are displayed. (SW00A8)

- LOOP CHECK
- ENTRY CHECK
- ORDER CHECK
- COM. CHECK

(f) ABNORMAL .....The error station number found in the test is displayed. (SW00AB)

(g) RESULT .....The test result when the host station is on the test request side is displayed. (SW00A9)

(h) TEST ITEM .....The execution items when the host station is on the on-line test response side are displayed. (SW00AA)

- LOOP CHECK
- ENTRY CHECK
- ORDER CHECK
- COM. CHECK

(i) RESULT .....The test result when the host station is on the test response side is displayed. (SW00AB)

(j) INSTRUCTION .....The off-line test designation condition of the host station is displayed. (SB00AC)

- NOT RECV
- RECEIVED

(k) COMPLETION .....The off-line test end condition of the host station is displayed. (SB00AD)

- NOT RECV
- COMPLETE

(l) FROM OTHER STATION .....The off-line test response setting condition of the host station is displayed. (SB00AE)

- NOT RECV
- RECEIVED

(m) RESPONSE TO THE STATION .....The off-line test response end condition of the host station is displayed. (SB00AF)

- NOT RECV
- COMPLETE

(n) TEST ITEM .....The execution items when the host station is on the off-line test request side are displayed. (SW00AC)

- F. LOOP TEST
- R. LOOP TEST
- STN. TEST (MASTER)
- STN. TEST (SLAVE)
- HOST-LP.BACK TEST

Only the master station can execute monitor.

(o) ABNORMAL .....The error station number found in the test is displayed. (SW00AC)

(p) RESULT .....The test result when the host station is on the test request side is displayed. (SW00AD)

(q) TEST ITEM .....The execution items when the host station is on the off-line test respond side are displayed. (SW00AE)

- F. LOOP TEST
- R. LOOP TEST
- STN. TEST (MASTER)
- STN. TEST (SLAVE)
- HOST-LP.BACK TEST

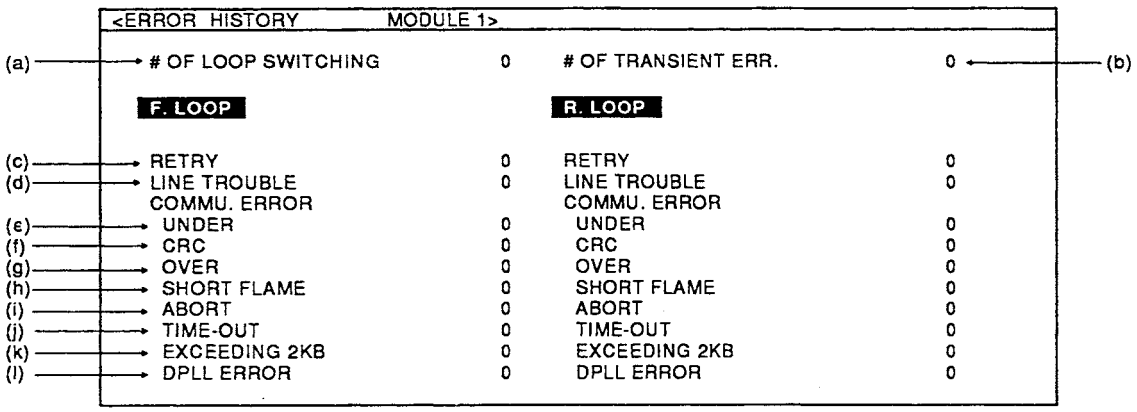
Only the master station can execute monitor.

(r) RESULT .....The test result when the host station is on the test respond side is displayed. (SW00AF)

5.1.3 Error list monitor

The lists of loop errors, communication errors, and transient transmission errors can be checked.

(1) Checking the accumulated number of times of line errors (Error list monitor)



(a) NUMBER OF LOOP SWITCHING ...The number of times of loop switching and loopback operations is displayed. (SW00CE)

(b) NUMBER OF TRNSIENT ERROR .....The number of times of occurrences of the transient transmission errors is displayed. (SW00EE)

(c) RETRY .....The number of times of retries (retransmission when communication is not successful) is displayed. (SW00C8, SW00C9)

(d) LINE TROUBLE .....The number of times of occurrences of the line errors is displayed. (SW00CC, SW00CD)

(e) UNDER .....The number of times of occurrences of the UNDER errors is displayed. (SW00B8, SW00C0)

(f) CRC .....The number of times of occurrences of the CRC errors is displayed. (SW00B9, SW00C1)

(g) OVER .....The number of times of occurrences of the OVER errors is displayed. (SW00BA, SW00C2)

(h) SHORT FRAME .....The number of times of occurrences of the short frame errors (data text is too short) is displayed. (SW00BB, SW00C3)

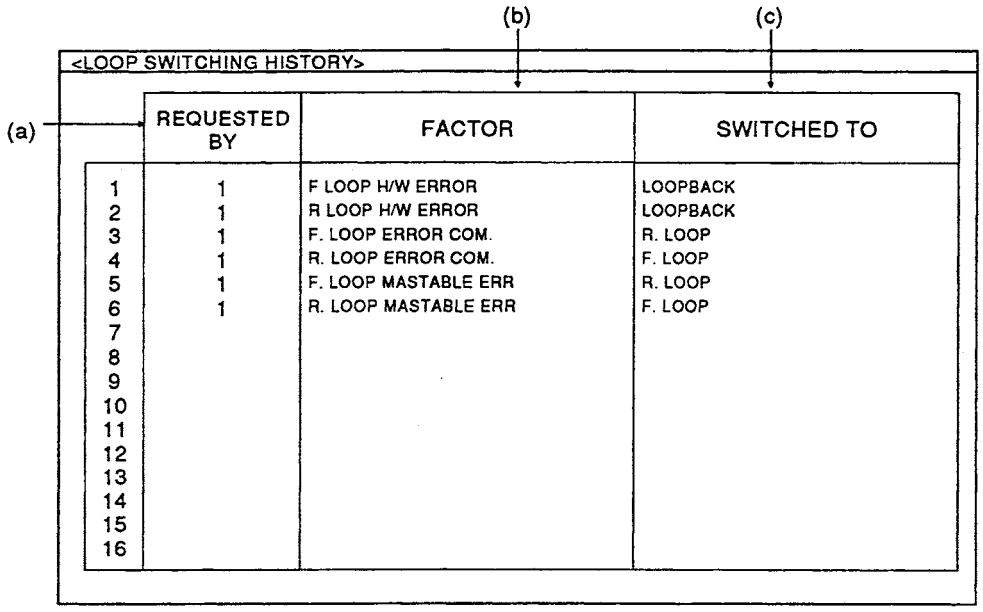
(i) ABORT .....The number of times of occurrences of the AB.IF errors is displayed. (SW00BC, SW00C4)

(j) TIME-OUT .....The number of times of occurrences of the TIME errors is displayed. (SW00BD, SW00C5)

(k) EXCEEDING 2 KBYTE .....The number of times of occurrences of the DATA errors is displayed. (SW00BE, SW00C6)

(l) DPLL ERROR .....The number of times of occurrences of the DPLL errors (data cannot be correctly recognized for synchronization or modulation) is displayed. (SW00BF, SW00C7)

(2) Checking the factors for loop switching (Loop switching data display)



(a) REQUESTED BY .....The station number which requests loop switching or loopback is displayed. (SW00E0 to E7)

(b) FACTOR .....The factor for executing loop switching or loopback is displayed. (SW00D0 to DF)

- RETURN INSTR.
- F.LOOP H/W ERROR ..... Cable or optical module is faulty.
- R.LOOP H/W ERROR .....
- F. LOOP ERROR COM. .... Forced error for executing loopback.
- R. LOOP ERROR COM. ...
- F. LOOP MASTABLE ERR ..... Normal and abnormal conditions repeat alternately and communication condition is instable.
- R. LOOP MASTABLE ERR ...
- F.LOOP SEQ-LIN ERR
- R.LOOP SEQ-LIN ERR

(c) SWITCHED TO .....The condition of data link after loop switching is displayed. (SW00D0 to DF)

- DUPLEX .....Returned to the initial state.
- F. LOOP
- R. LOOP
- LOOPBACK

(3) Checking errors occurred with transient transmission (Transient transmission error)

Error factors are stored in SW00F0 to FF.
Refer to the error codes list for details.

<TRANSIENT ERROR>

	ERR. CODE	ERROR TYPE
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		

(4) Clearing error history contents

(a) →	F1	RETRY COUNTER CLEAR
(b) →	F2	COMM. ERROR COUNTER CLEAR
(c) →	F3	FORWARD TRANSM. ERROR CLEAR
(d) →	F4	REVERSE TRANSM. ERROR CLEAR
(e) →	F5	LOOP SWITCH COUNTER CLEAR
(f) →	F6	TRANSIENT TRANSMISSION ERROR CLEAR

(a) RETRY COUNTER CLEAR .....Clears item (c) in Section 5.1.3 (1). (SB0005)

(b) COMMUNICATION ERROR COUNTER CLEAR ....Clears items (e) through (l) in Section 5.1.3 (1). (SB0006)

(c) FORWARD TRANSMISSION ERROR CLEAR .....Clears item (d) in Section 5.1.3 (1). (SB0007)

(d) REVERSE TRANSMISSION ERROR CLEAR .....Clears item (d) in Section 5.1.3 (1). (SB0008)

(e) LOOP SWITCH COUNTER CLEAR .....Clears item (a) in Section 5.1.3 (1) and item (b) in Section 5.1.3 (2). (SB0009)

(f) TRANSIENT TRANSMISSION ERROR CLEAR .....Clears item (c) in Section 5.1.3. (SB000A)

5.2 Network Diagnosis

By using the network diagnosis function of a peripheral device, line conditions can easily be checked and diagnosed. Testing can be performed from any station, regardless of whether it is a master station or a remote I/O station.
This function permits diagnosis while the network module is online if trouble occurs while the system is operating.
For details on the operation and screen displays for each function, refer to the Operating Manual for the GPP function.

Item	Optical Loop System	Coaxial Bus System	Data Link Condition (Cycle Transmission/ Transient Transmission)
Loop test	O	x	Suspended
Setting confirmation test	O	O	Suspended
Station order confirmation test	O	x	Suspended
Communication test	O	O	Run

O: Execution possible x: Execution impossible

POINTS

(1) Perform the online test that requires a temporarily interruption of the data link at system start-up.
When performing the test while the system is operating, check that the following conditions will not cause problems.

(a) The data link stops due to the online test.

(b) Reset of any station or operating status change (RUN/STOP) cannot be executed.
(The change may cause an error completion of the diagnostics.)

(2) Perform the setting confirmation test, station order confirmation test, and communication test after confirming that the line condition is normal by performing a loop test.

5.2.1 Loop test (Optical loop system only)

When the optical loop cable connections are completed, check the forward and reverse loops. The loopback executing station can also be checked during the loopback operation.
For example, in the system condition shown in Fig. 5.1 below, when the loop test is conducted by using a peripheral device connected to $1M_R$, the monitor screen shown in Fig. 5.2 below is displayed indicating that 1R4 is faulty, and 1R3 and 1R1 are executing loopback operation.

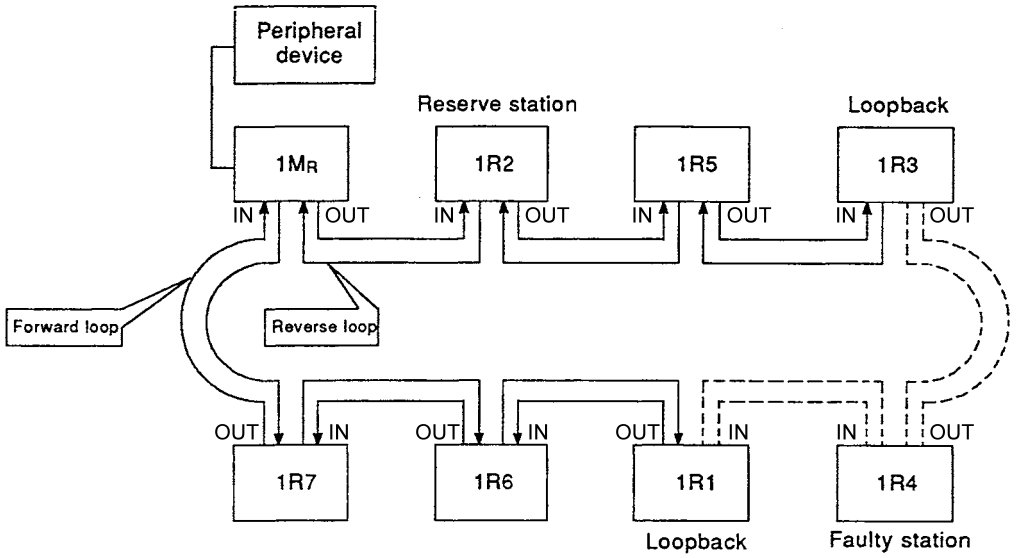


Fig. 5.1 System Condition

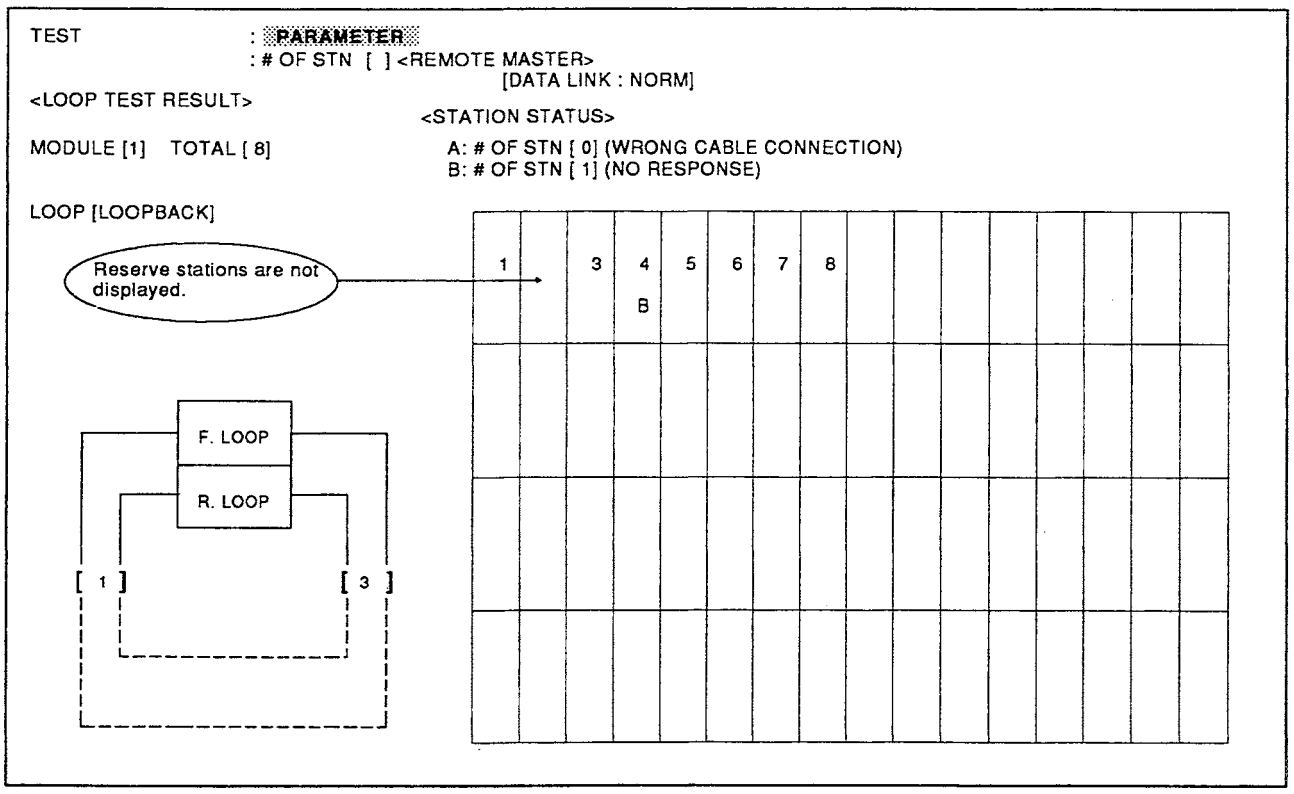


Fig. 5.2 Loop Test Display Screen

5.2.2 Setting confirmation test

This test checks the switch settings of a network module.

For example, in the system condition shown in Fig. 5.3 below, when the setting confirmation test is conducted by using a peripheral device connected to $1M_R$, the monitor screen shown in Fig. 5.4 below is displayed, and the set conditions of each station can be checked.

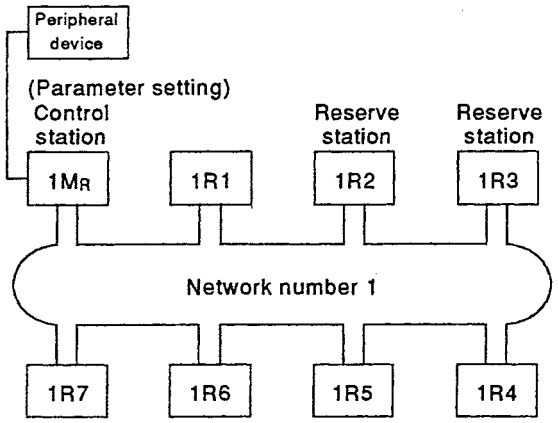


Fig. 5.3 System Condition

<REMOTE I/O> TEST : PARAMETER / # OF STN [ ] MASTER STN: [ ]
MODULE [1] HOST STN # [1] NETWORK # [1] CTRL STN # [1] TOTAL [8]

(STN. #)	1	2	3	B 4	5	6	7	8								
(NETWORK #)	E	--	--	--	--	--	--	--								
(GROUP #)	--	D	D	--	--	--	--	--								
(STN. #)																
(NETWORK #)																
(GROUP #)																
(STN. #)																
(NETWORK #)																
(GROUP #)																
(STN. #)																
(NETWORK #)																
(GROUP #)																

A: CTRL STN DUPLIX B: STN DUPLIX C: NETWORK # ER D: RESERVED E: ABNORMAL

Fig. 5.4 Setting Confirmation Test Display Screen

5.2.3 Station order confirmation test

Station numbers in an optical loop system can be checked.
The following checks can be done according to the loop condition (displayed on the test result screen as shown in Fig. 5.6 on the next page):

Loop Condition	Display Contents
Forward and reverse loops	Station numbers connected in the forward loop direction and those connected in the reverse loop direction both beginning with the host station.
Forward loop	Station numbers connected in the forward loop direction beginning with the host station.
Reverse loop	Station numbers connected in the reverse loop direction beginning with the host station.
Loopback	Station numbers connected in the forward loop direction beginning with the host station.

For example, in the system condition shown in Fig. 5.5 below, when the station order confirmation test is conducted by using a peripheral device connected to $1M_R$, the monitor screen shown in Fig. 5.6 below is displayed indicating the station numbers connected in the forward loop direction are executing the loopback operation.

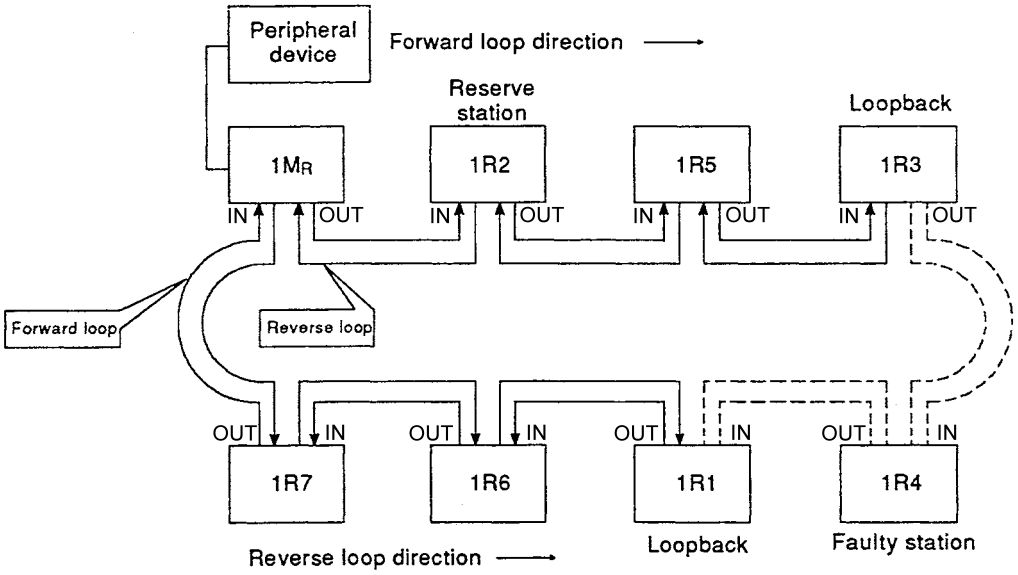


Fig. 5.5 System Condition

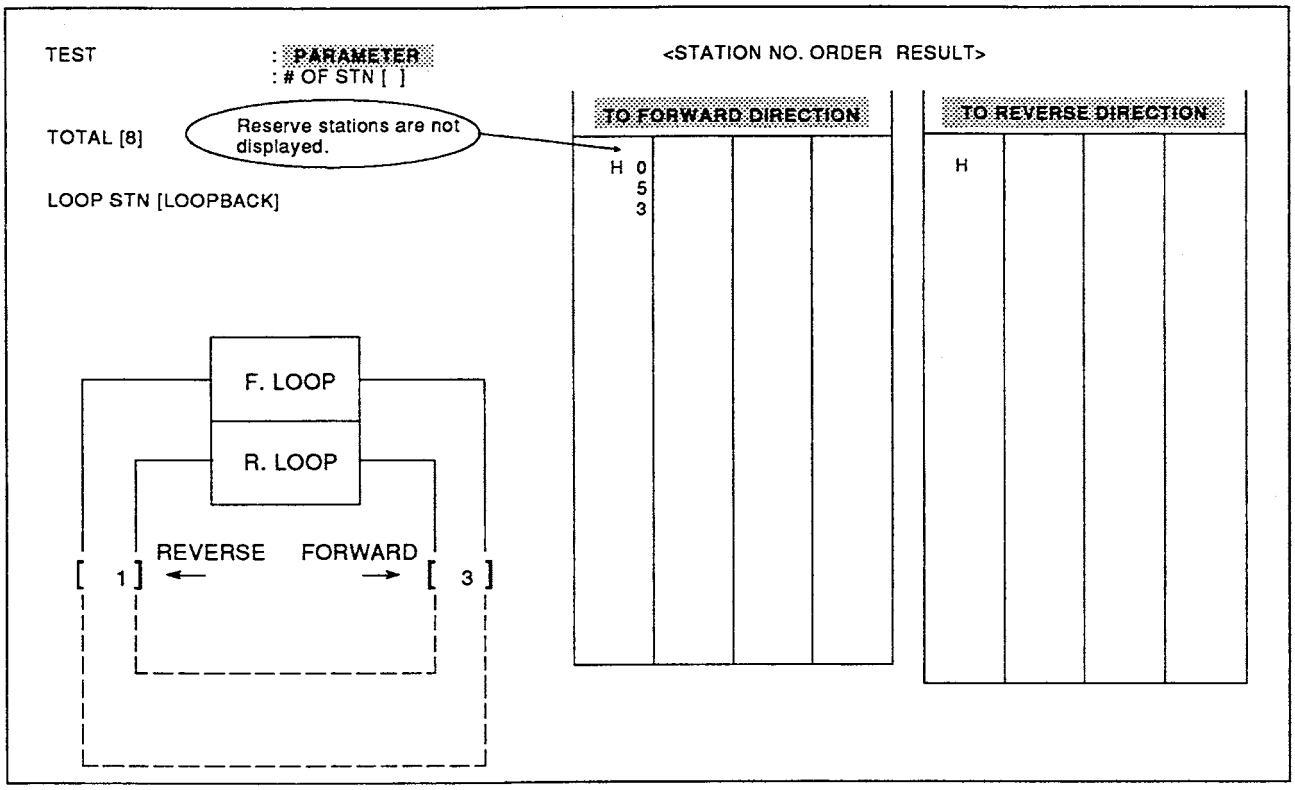


Fig. 5.6 Station Order Confirmation Test Display Screen

5.2.4 Communication test

This test checks whether communications are normally performed between the host station and the destination (specified with the network number and station number). Also, when the destination is in other network, the relay network number and station number are displayed during this test so that the routing parameter settings can be checked.
For example, in the system condition shown in Fig. 5.7 below, when the communication test is conducted by using a peripheral device connected to 1R1 in network number 1 to 4Ns6 in network number 4, the monitor screen shown in Fig. 5.8 below is displayed indicating that the routing parameters are not correctly set.

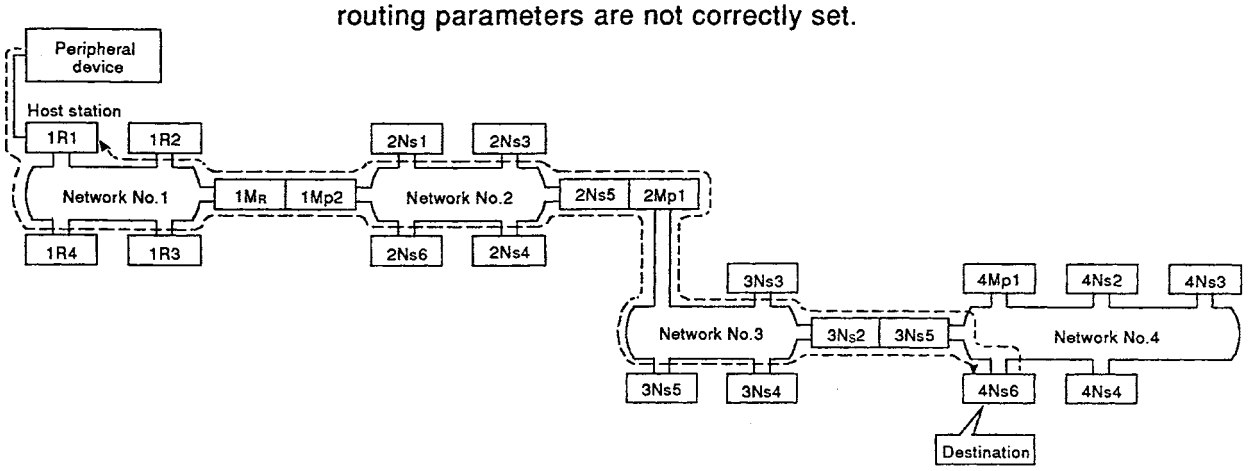


Fig. 5.7 System Condition

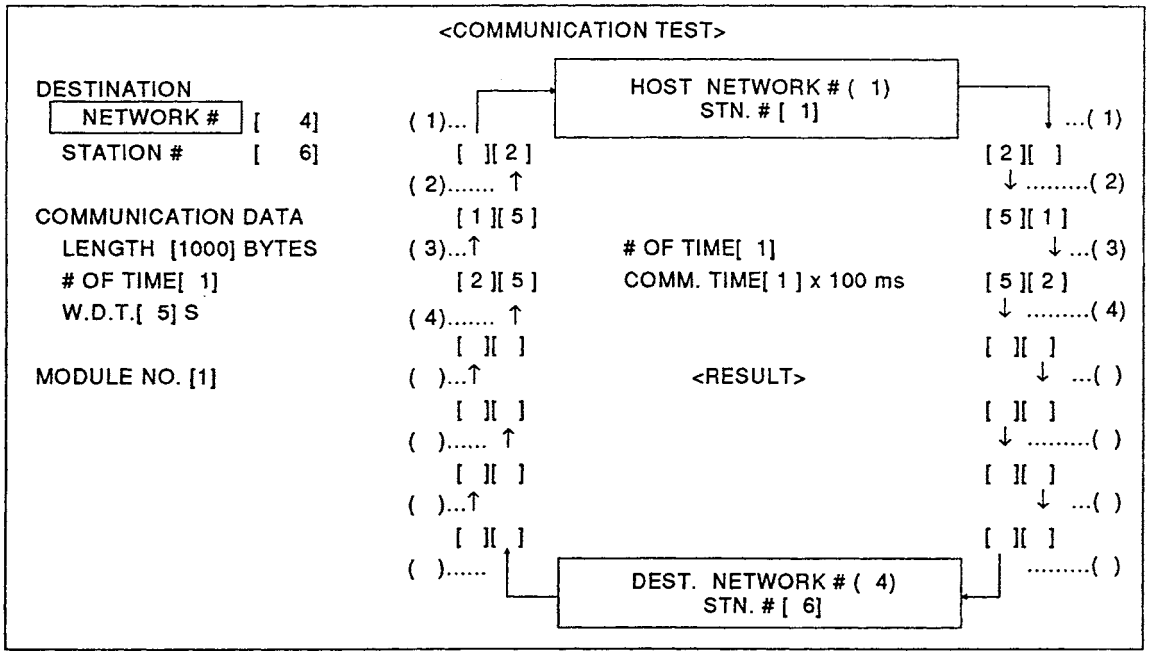


Fig. 5.8 Communication Test Display Screen

If the routing parameter settings are incorrect, "PC COMMUNICATION ERROR" is displayed and no communication test result is displayed.

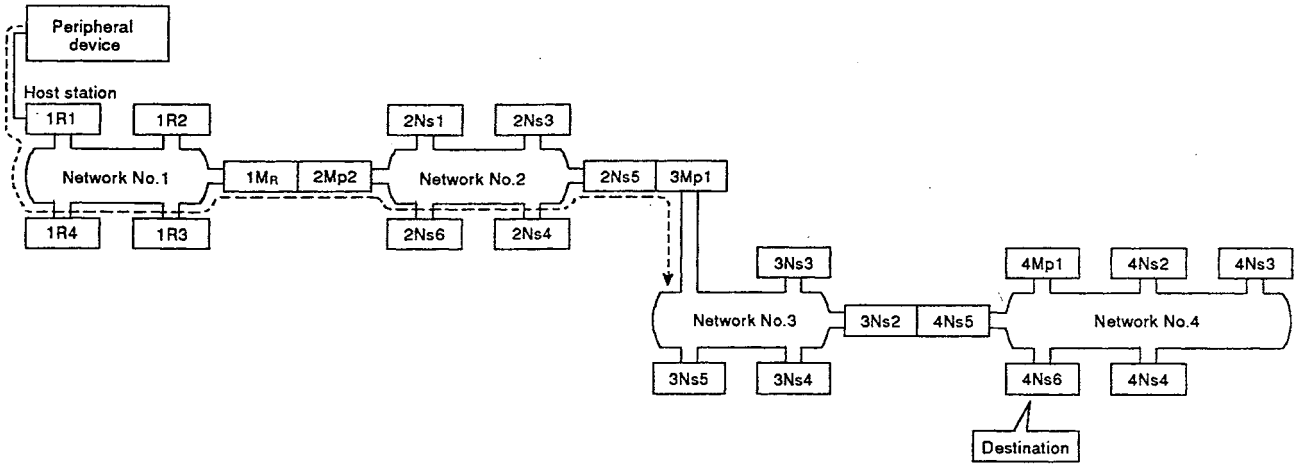


Fig. 5.9 System Condition

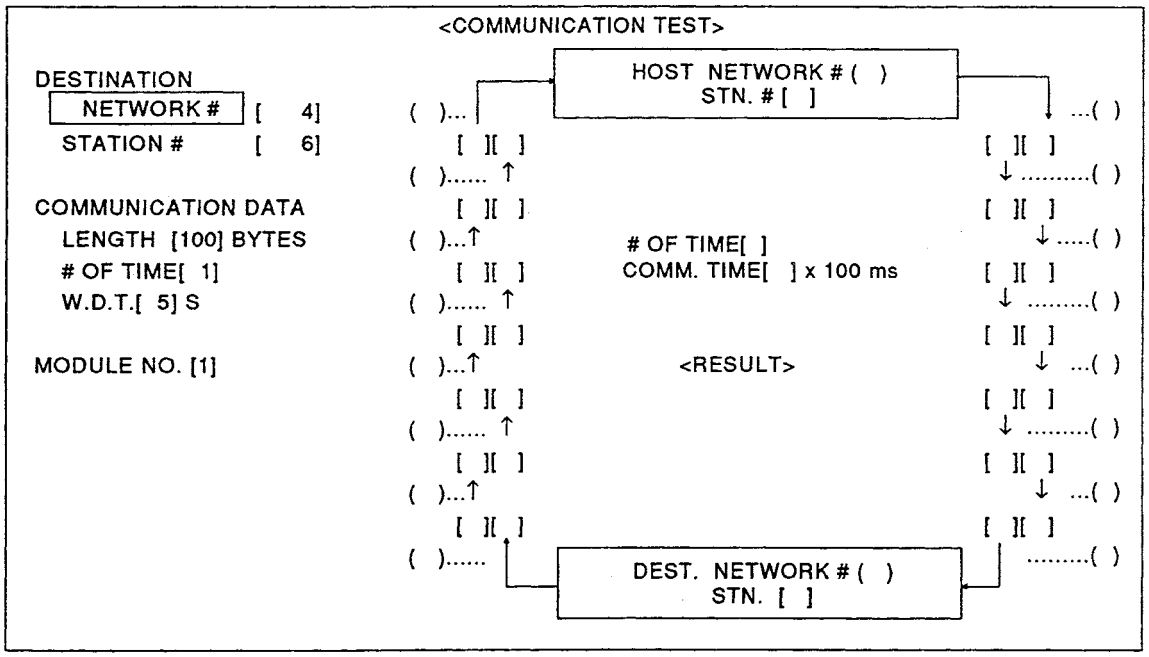


Fig. 5.10 Communication Test Display Screen

MEMO

DETAIL DESCRIPTION

6. SYSTEM CONFIGURATIONS

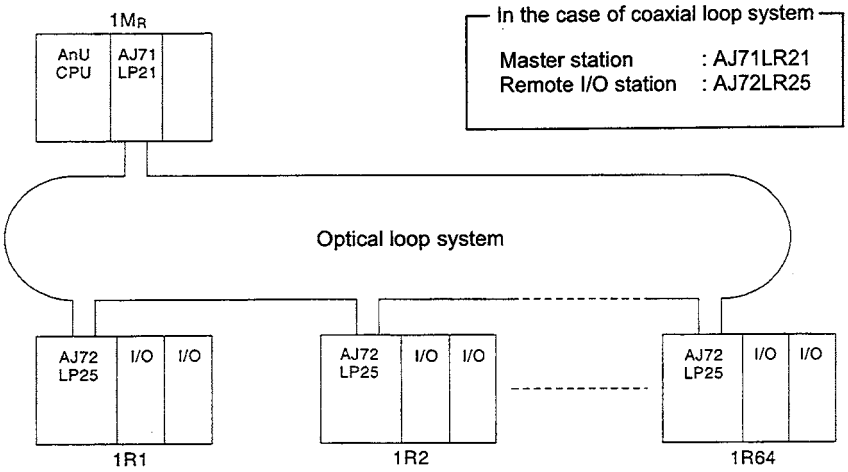
This section describes the configurations, usable device ranges, and parameter setting items, for each system.

6.1 Two-Tier System

(1) System configuration

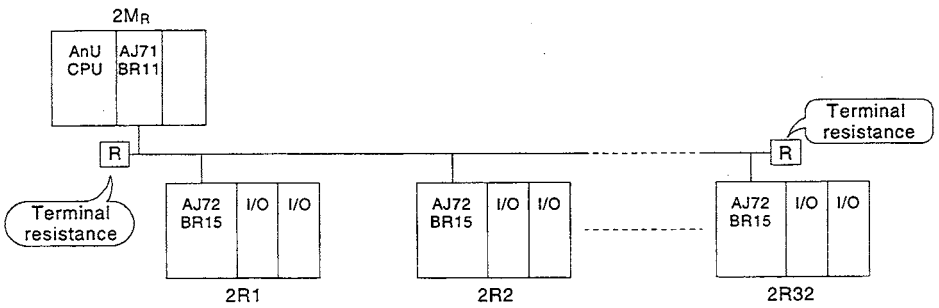
(a) Optical loop system/Coaxial loop system

A maximum of 64 remote I/O stations can be connected to a single master station.
The master station CPU must be an AnUCPU.



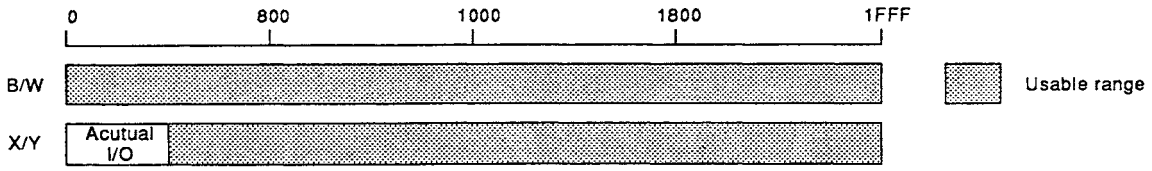
(b) Coaxial bus system

A maximum of 32 remote I/O stations can be connected to a single master station.
The master station CPU must be an AnUCPU.



(2) Usable device ranges

All of B/W 0 to 1FFF (8192 points) can be used.
As for the X/Y ranges, the range after actual I/O points (the I/O device number ranges in which I/O modules and special function modules are actually installed) in 0 to 1FFF (8192 points) can be used.



(3) Parameter setting items

Set the parameters at the master station.

Item	Setting	Reference Section
Number of modules	◎	Section 9.1.1
Network refresh parameters	◎ *1	Section 9.1.2
Common parameters	◎	Section 9.1.3
Station specific parameters	—	——
Transfer parameters for data link	—	——
Routing parameters	x	——

◎ : Must always be set
— : Set if necessary
X : Setting not possible

*1 : Default value is not set in LX/LY. Set network refresh parameters.

(4) Maximum number of link points per remote I/O station

Master station → Remote I/O station

$$\frac{LB+LY}{8}+(2\times LW)\leq 1600 \text{ bytes}$$

Remote I/O station → Master station

$$\frac{LB+LX}{8}+(2\times LW)\leq 1600 \text{ bytes}$$

6.2 Multi-Tier System

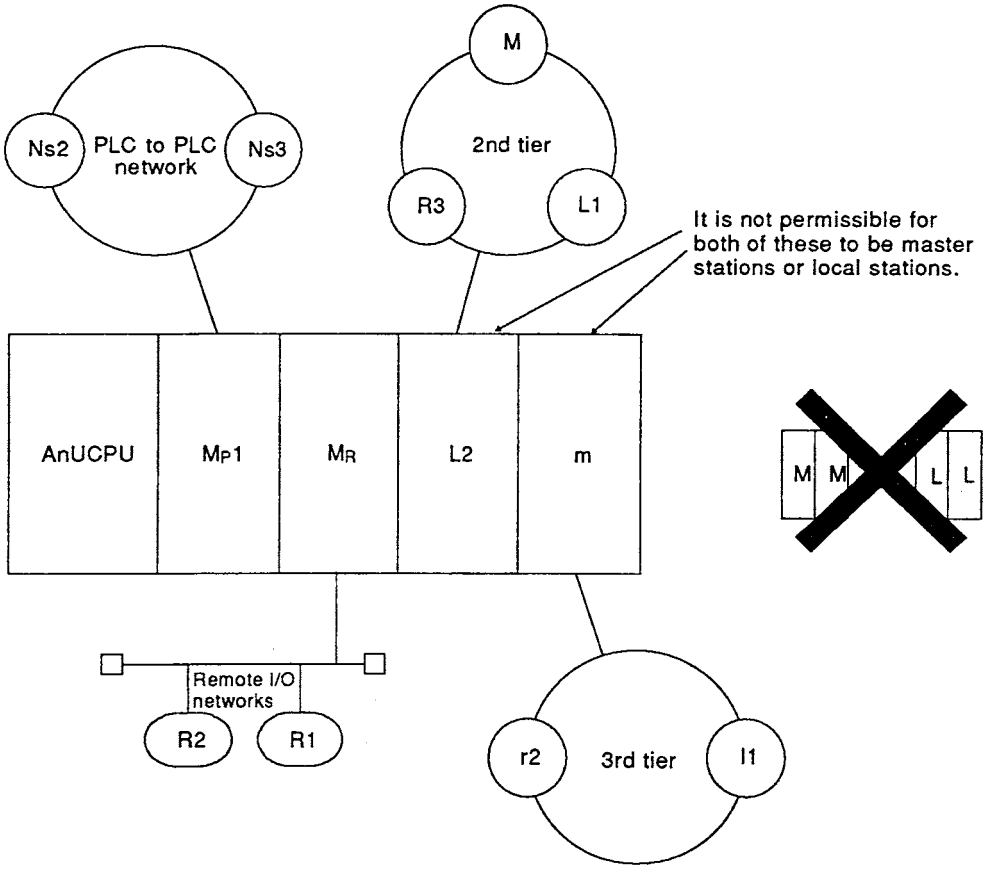
A multi-tier system is a system in which multiple network modules (AJ71LP21/BR11) and data link modules (AJ71AP21/AR21) are mounted to an AnUCPU.

(1) The numbers of modules indicated below can be mounted to an AnUCPU.

- 4 network modules max.
- 2 data link modules max.

] Total of 4 modules

(2) If multiple modules are installed, as in the system example shown below, care is required when setting the parameter settings.



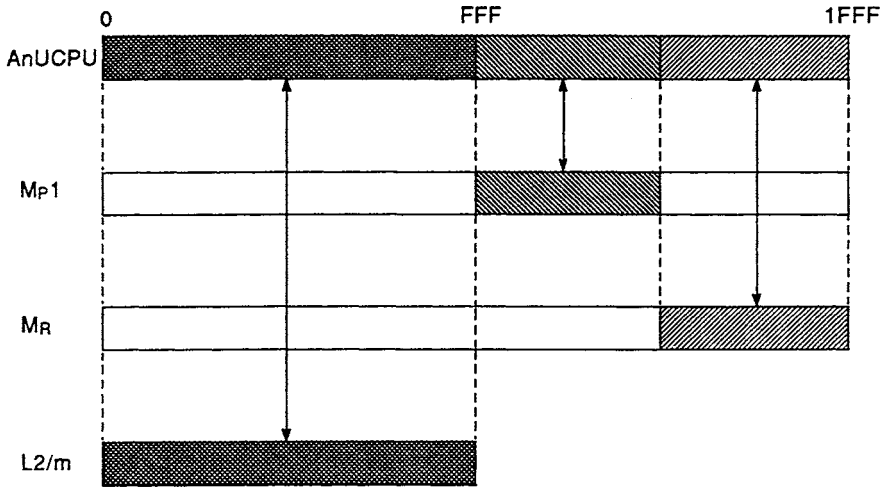
- MELSECNET
- MELSECNET/10 PLC to PLC network
- MELSECNET/10 Remote I/O network

] Each of these networks operate independently

[Concept for parameter settings]

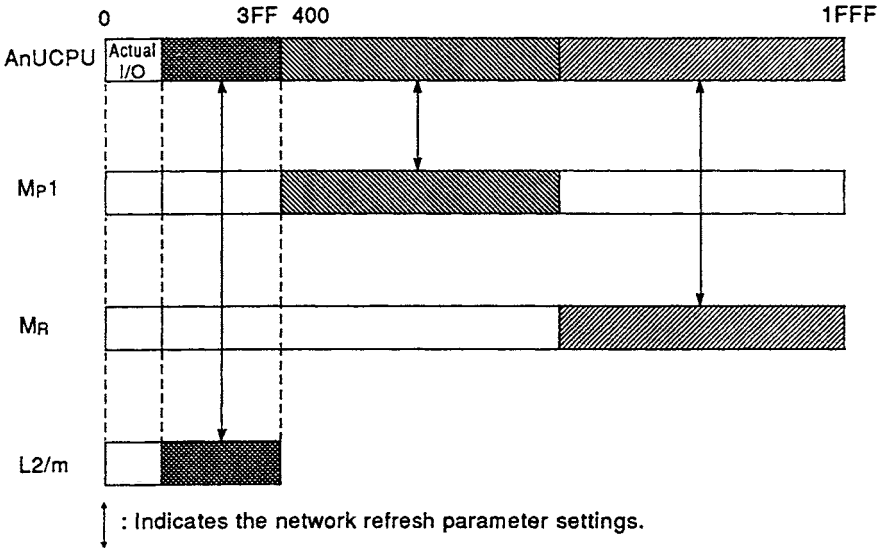
(a) B/W settings

An AnUCPU has 8192 B/W points, a network module 8192 B/W points, and a data link module 4096 B/W points.
Accordingly, the B/W allocations must be made within the device range of the AnUCPU, as shown below.



(b) X/Y settings

An AnUCPU has 8192 X/Y points, a network module 8192 X/Y points, and a data link module 2048 X/Y points.
Accordingly, the X/Y allocations must be made within the device range of the AnUCPU, as shown below.



(c) Parameter setting items

The parameter settings that have to be made for each station are shown below.

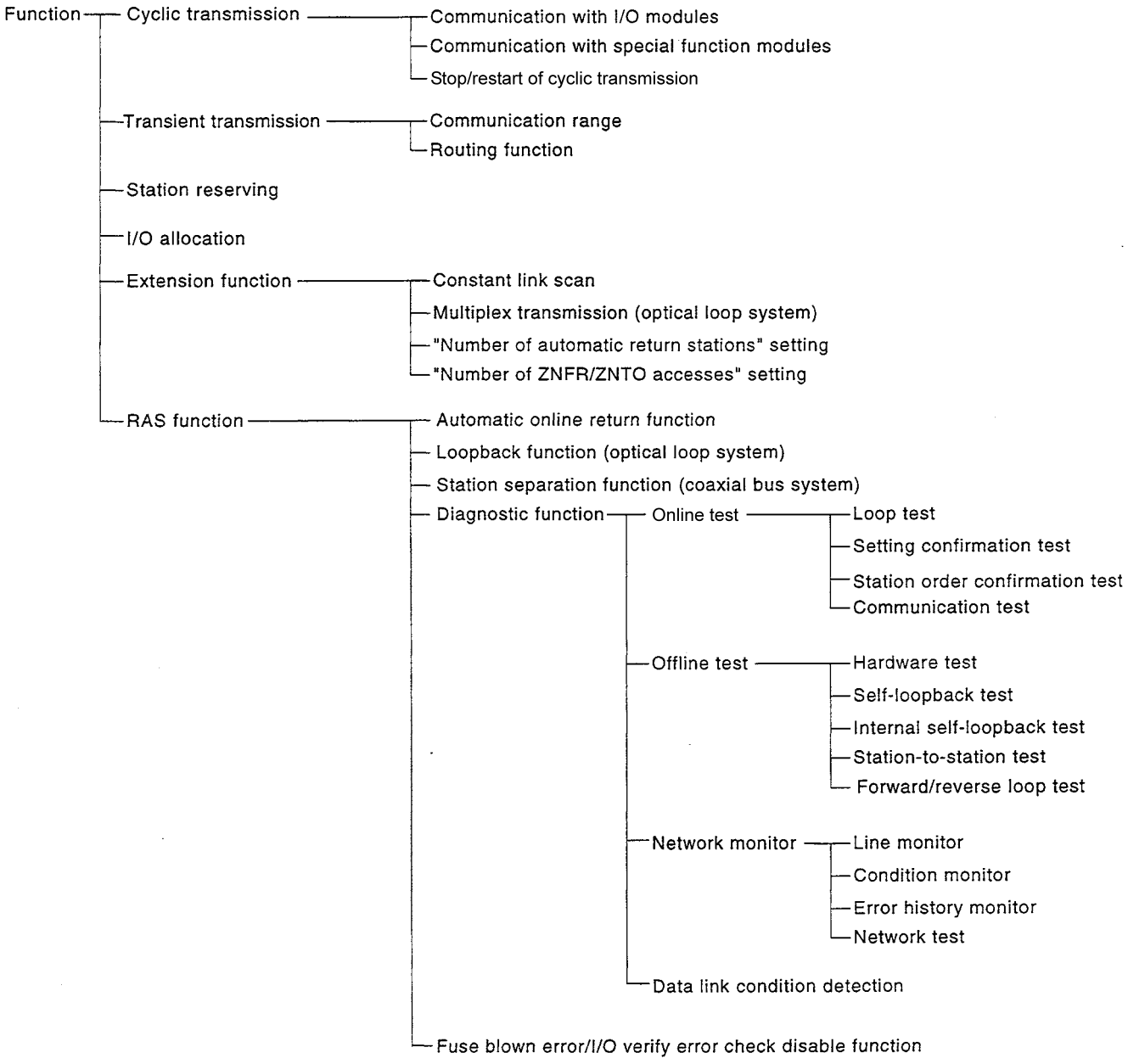
Setting Item	Mp(Ns) Station	MR Station	L Station	m Station
Number of modules	◎			
Network refresh parameters	O*1	◎*1	x	O
Common parameters	◎ (x)	◎	x	x
MELSECNET parameters	x	x	x	◎
Station specific parameters	Δ	x	x	x
Transfer parameters for data link	Δ	x	Δ	Δ

◎: Must always be set
O: Change if necessary (default setting is provided in accordance with the number of modules setting)
Δ: Set if necessary
x: Setting not possible

*1: Default value is not set in LX/LY. Set network refresh parameters.

7. FUNCTIONS

This section describes the functions of the MELSECNET/10 remote I/O system.
The function list is given below.

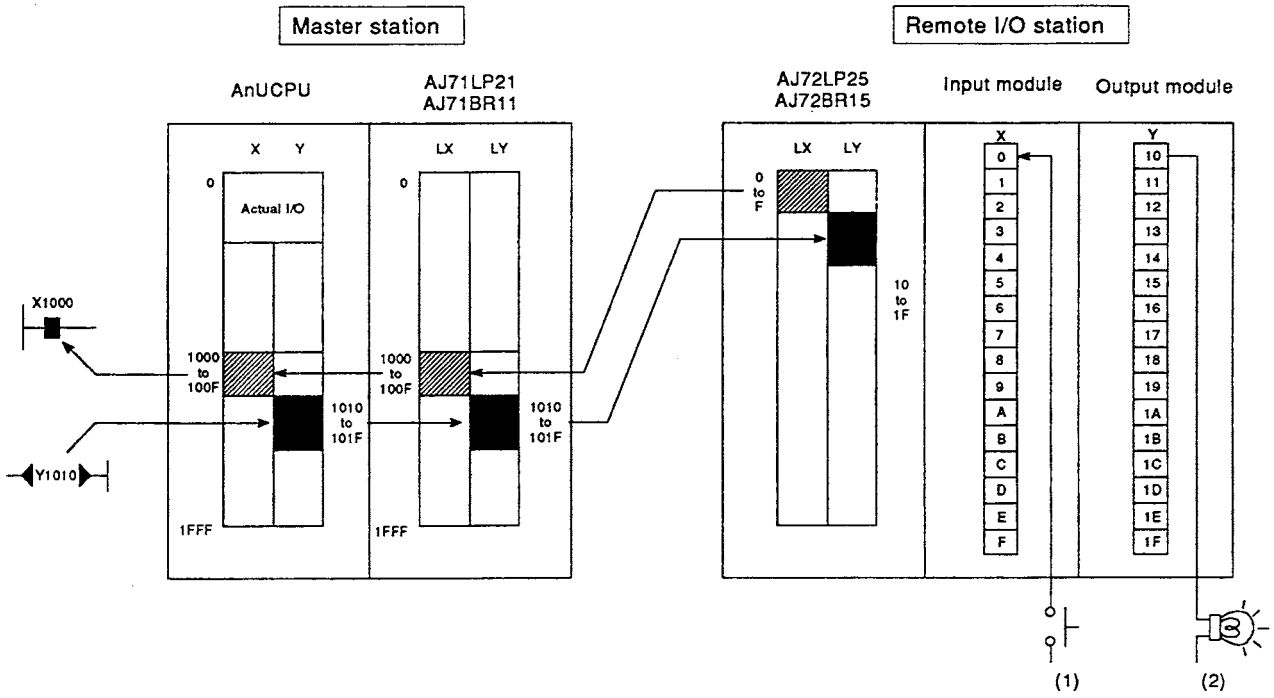


7.1 Cyclic Transmission Function

The cyclic transmission function is a function whereby data is periodically communicated between the master station and remote I/O stations.

7.1.1 Communication with an I/O module

It is possible to communicate with an I/O module by using X/Y (LX/LY) devices.

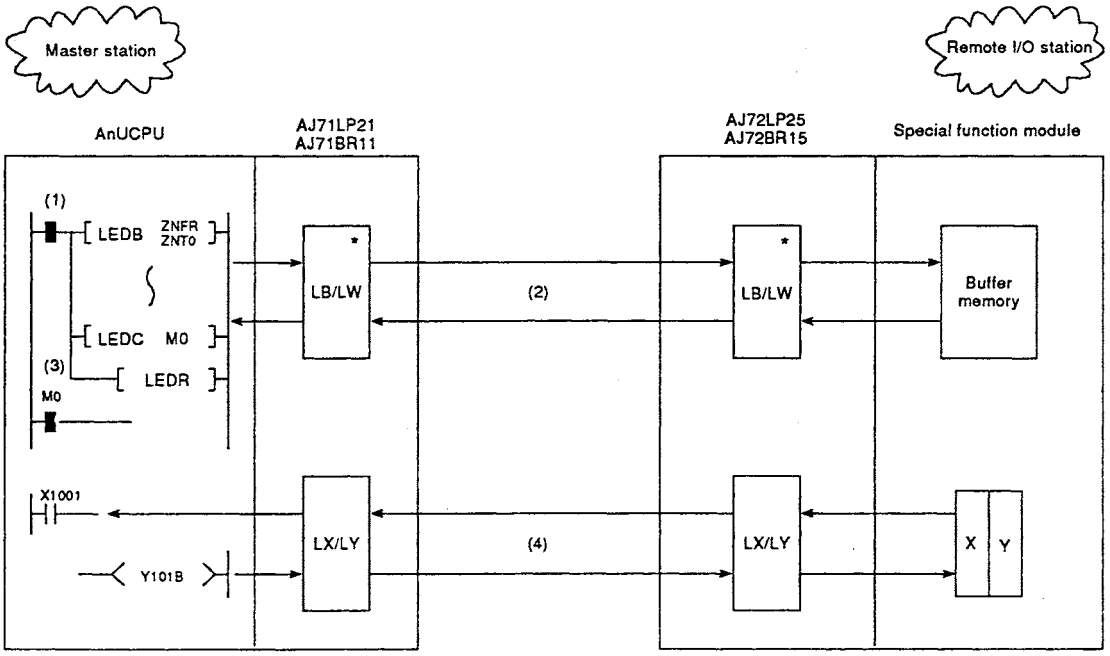


(1) When X00 of the input module at the remote I/O station turns ON, X1000 of the master station turns ON.

(2) When Y1010 of the master station turns ON, Y10 of the output unit at the remote I/O station turns ON.

7.1.2 Communication with a special function module

It is possible to communicate with a special function module by using X/Y (LX/LY) and B/W (LB/LW) devices.



[Buffer memory]

(1) When a ZNFR/ZNTO instruction is executed...

(2) ZNFR .... The buffer memory data is written to W devices.

ZNTO .... The data in the W devices is written to the buffer memory.

(3) On completion of the ZNFR/ZNTO instruction the completion signal (M0) comes ON for 1 scan.

* .... LB devices are used for handshake processing when an instruction is executed.
LW devices are used for handshake processing and for data reading/writing when an instruction is executed.

[Input/output]

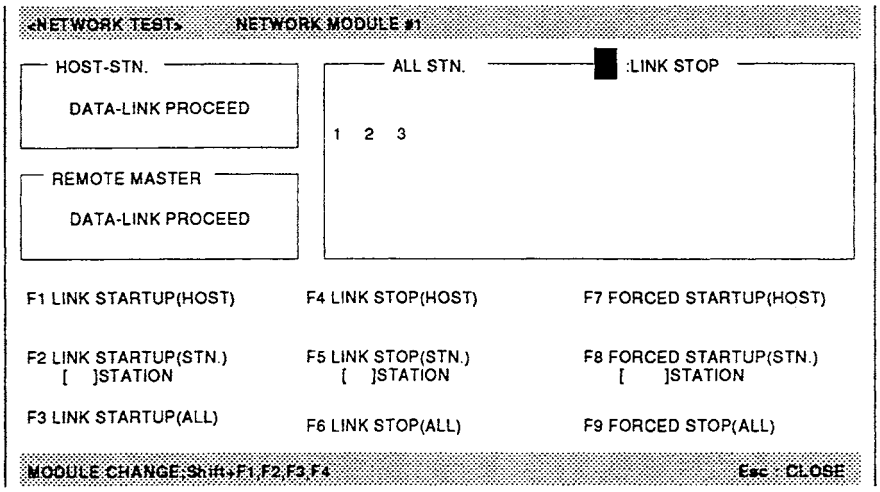
(4) X/Y communications are executed in the same way as communications with an I/O module.

7.1.3 Stop/restart function

Stop/restart of cyclic transmission is executed from a peripheral device.

(1) Method for stop/restart

Stop/restart is executed using the "network test" function of the network monitor.

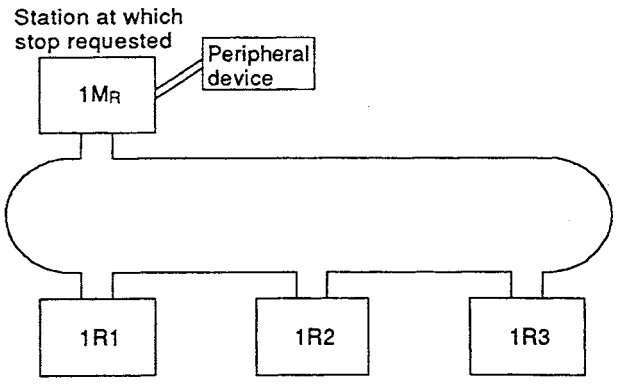


(2) Operation for stop/restart

In the case of a remote I/O network, all stations within the same network are stopped/restarted.
It is not possible to stop/restart individual stations.

(a) Stop

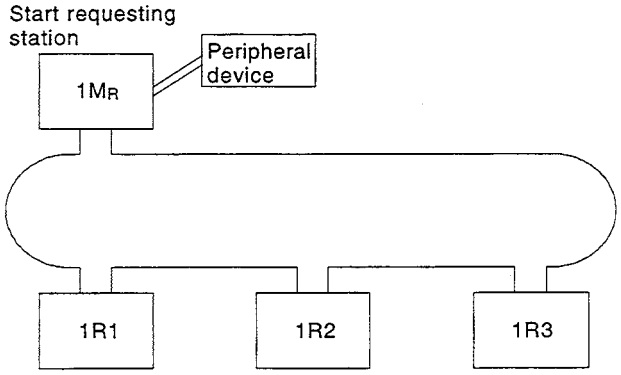
Cyclic transmission is stopped at all stations (including the host station). ([F6] key)



(b) Start

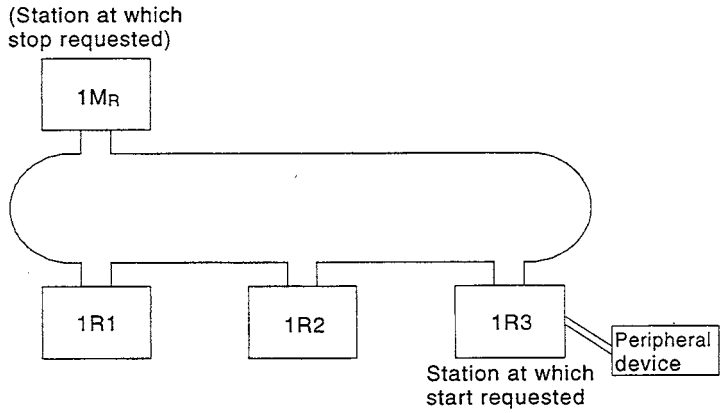
1) Start (link start)

The network system can be started by a request of the station from which the stop was requested. ([F3] key)



2) Forced start (forced link start)

The network system can be started by a request of any station other than the stop-requested station. ([F9] key)



POINT

(1) All stations are treated as stations at which communication is stopped.
(2) The station in the offline mode does not change its operation even if a link stop/restart is executed.
Since there is no response from the station in the offline mode, no error is detected in the source station of start request.

7.2 Transient Transmission Function

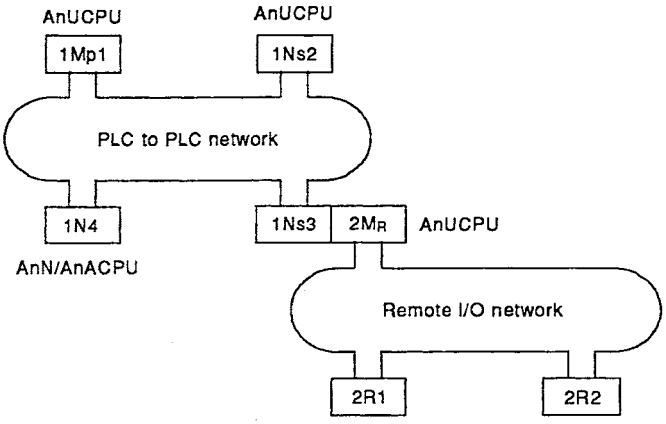
The transient transmission function is a function whereby communication is executed only when there has been a communication request.
The request source for transient transmission can be either of the following:

- A peripheral device
- A special function module (one that can specify communication destinations such as AJ71UC24 and AD51H(S3) modules)

7.2.1 Communication range

The master station (MR) can communicate with all remote I/O stations (R) and all stations (Mp, Ns, N) in a PLC to PLC network.
A remote I/O station (R) can communicate with the master station (MR) and all stations (Mp, Ns, N) in a PLC to PLC network.
Communication between remote I/O stations is not possible.

[Example system configuration]



Transient Transmission Range

Request Source \ Request Destination	1Mp1	1Ns2	1Ns3 / 2MR	1N4	2R1	2R2
1Mp1	Host station	O	*1	O	O *5	O *5
1Ns2	O	Host station	*1	O	O *5	O *5
1Ns3 *3 / 2MR	O	O	Host station	O	O	O
1N4	*4	x	x	Host station	x	x
2R1	O	O	*2	O	Host station	x
2R2	O	O	*2	O	x	Host station

O : Possible
x : Not possible
*1 : Possible by specifying 1Ns3 (network No.1, station No.3)
*2 : Possible by specifying 2MR (network No.2, station No.0)
*3 : Same even if a control station (Mp)
*4 : Possible by specifying PC No.0 via MELSECNET(II)
*5 : Routing parameters must be set.

Note: An error (buffer full error: F222) may occur if transient communications from multiple stations (4 or more) are concentrated at one station.
Ensure that there is a sufficient interval between transient transmissions.

7.2.2 Routing function

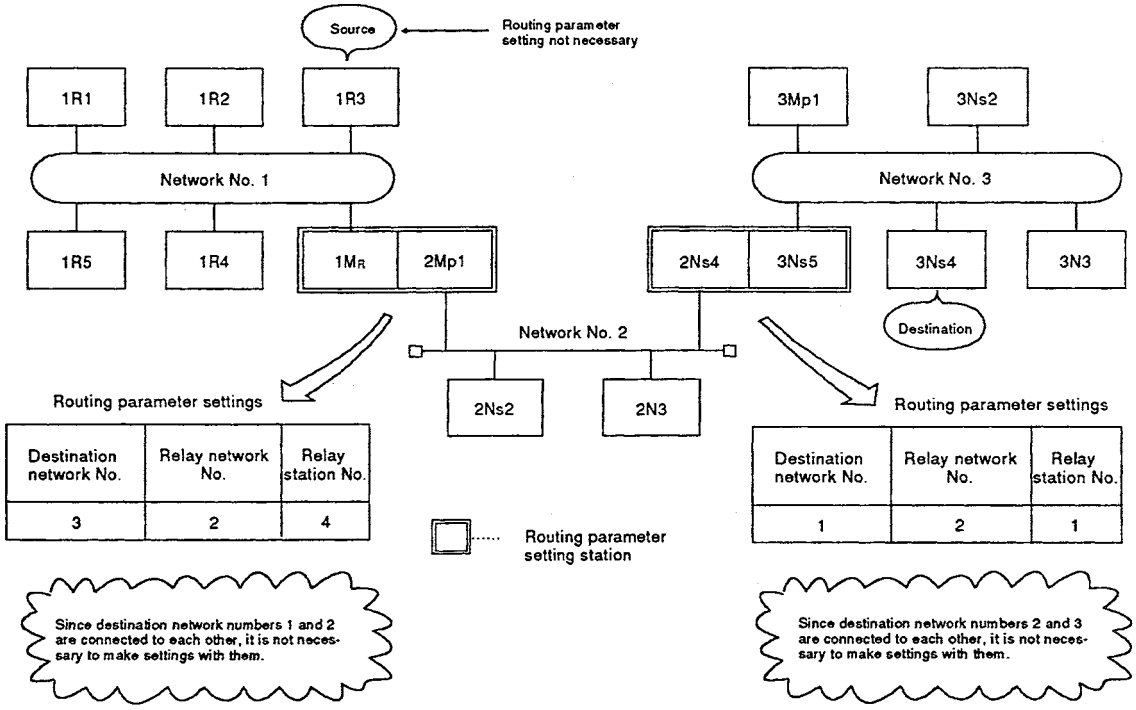
The routing function allows an AnUCPU station to execute transient transmission to a station in another network.
To use the routing function, it is necessary to set the "routing parameters" so that the network number corresponds to the station which serves as the bridge.
The routing function via MELSECNET(II) cannot be used.

(1) The routing parameters need to be set at the AnUCPU request source and relay stations.

(a) The relay station needs settings for accessing from the request source to the destination and that from the destination to the request source.

(b) The destination does not need settings.

For example, to execute transient transmission from 1R3 to 3Ns4, the routing parameters need to be set at the AnUCPU in $1M_R$, 2Mp1, 2Ns4, and 3Ns5 which serve as the bridges.



(2) Up to 64 "destination network numbers" can be set with the AnUCPU.

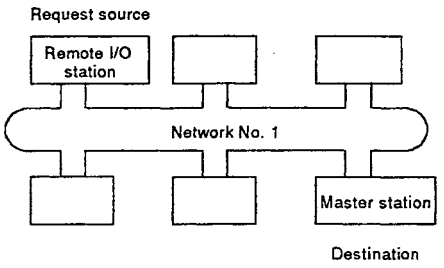
When the host station is the request source or when making access to other stations via the host station, a total of 64 network numbers can be used with the routing function.

(3) Positions and contents of routing parameter settings

The positions and contents of routing parameter settings for transient transmission vary according to the type of system.

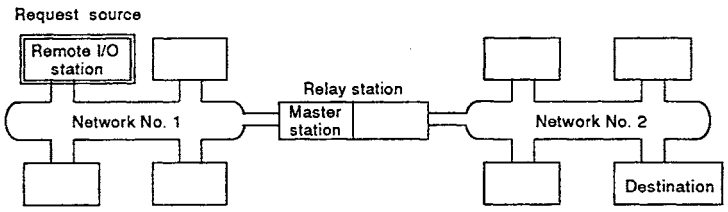
(a) Two-tier system

It is not necessary to set the routing parameter.



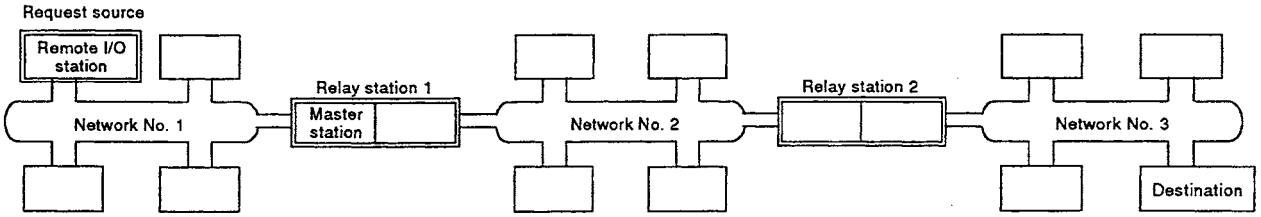
(b) Multi-tier system 1... Two networks

It is not neccessary to set the routing parameter.



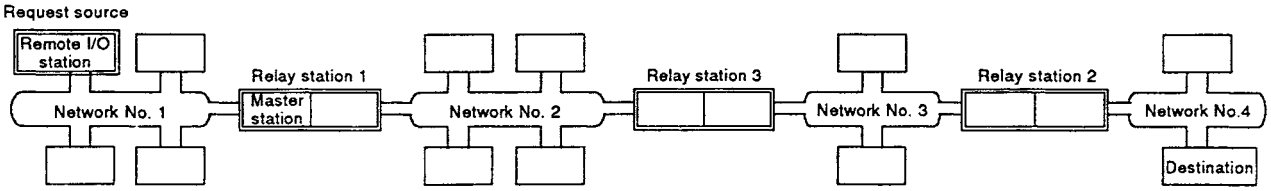
(c) Multi-tier system 2... Three networks

Set the routing parameter at the relay stations.
Make settings at the request source for accessing the destination (network number 3).
Make settings at relay station 1 for accessing the destination (network number 3).
Make settings at relay station 2 for accessing the request source (network number 1).



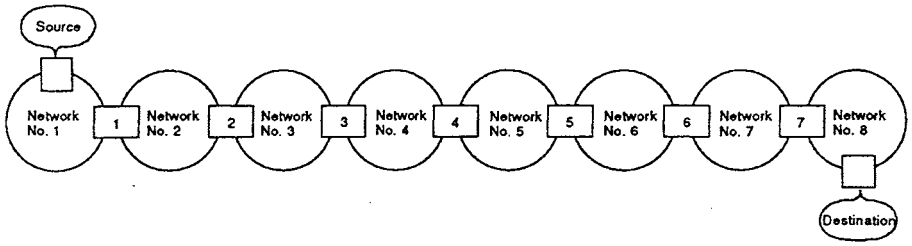
(d) Multi-tier system 3 . . . Four networks or more

Set the routing parameter at the relay stations.
Make settings at the request source for accessing the destination (network number 4).
Make settings at relay station 1 (closest to the source) for accessing the destination (network number 4).
Make settings at relay station 2 (closest to the destination) for accessing the request source (network number 1).
Make settings at relay station 3 (other than relay stations 1 and 2) for accessing the destination (network number 4) and the request source (network number 1).

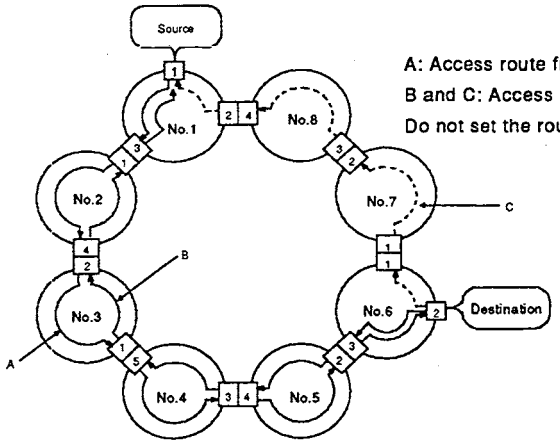


POINTS

(1) The routing function can use up to seven relay stations as shown below.



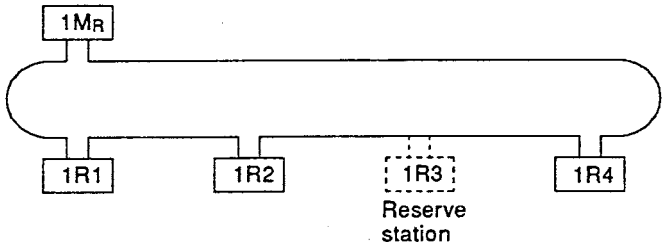
(2) When networks are connected in a loop as shown below, set the routing parameter so that the same relay stations are used for accessing the destination and for accessing the source.
Do not set the routing parameter in which the access route makes one turn around the loop.



A: Access route from the source to the destination
B and C: Access route from the destination to the source
Do not set the routing parameter to make the access route C.

7.3 Reserve Station Function

The reserve station function permits stations that are to be connected in the future (i.e. stations that are included in the number of stations but are not actually connected) to be set so that they are not treated as faulty stations.
Since the "reserve stations" are not treated as faulty, they have no effect on link scan time.
Reserve stations are set in the common parameters (see Section 9.1.3).



<COMMON PARAM. (MELSECNET/10) REMOTE I/O> PARAM. NAME :

MODULE NO.
1

REFRESH PARAMETER		Size
LX↔X(1)	0000–1FFF	8192
LX↔X(2)	–	
LY↔Y(1)	0000–1FFF	8192
LY↔Y(2)	–	

NO. OF STN.	LINK WDT * 10 ms
4	200

REMOTE I/O STN. NO.		M→R		M←R	
		LY	LY	LX	LX
	1	1000 – 102F	0000 – 002F	1130 – 115F	0000 – 002F
	2	1250 – 128F	0050 – 008F	1200 – 124F	0000 – 004F
RSV.	3	1300 – 134F	0000 – 004F	1330 – 13CF	0030 – 00CF
	4	1420 – 143F	0020 – 003F	1400 – 141F	0000 – 001F
		–	–	–	–
		–	–	–	–
		–	–	–	–

Page Up/Page Down: MODULE CHANGE Shift + F1, F2, F3, F4 End: CHECK & SET Esc: CLOSE

7.4 I/O Allocation

By registering the configurations of the remote I/O stations, this function allows you to:

- Save I/O points (16 points) provided for a vacant slot.
- Reserve I/O points of vacant slots for future use.

The setting for this function is entered on the "Remote I/O Allocation" screen. (See Section 9.1.4.)

Three rules for I/O allocation

1) Setting should be done individually for each remote I/O station. Enter "0" as the number of modules for remote stations where no I/O points are to be allocated.
2) The parameter setting item, "I/O Location" of the master station CPU is for setting of the master station only. The I/O allocation of remote I/O stations should be set in "Remote I/O Allocation" of the network parameter settings.
3) When setting for a special function module, be sure to make it consistent with that of "actually mounted special function module".

(1) I/O allocation setting example

The I/O allocations in this example are made on the basis of the system configuration shown below.

[Module configuration]

A61P	AJ72LP25	Input 32 points	Output 16 points	Special 32 points	Vacant 16 points	Input 16 points

[I/O allocations]

Set the vacant slot as 0 points.

<REMOTE I/O ALLOCATION>

NETWORK

#1 REMOTE MASTER NETWORK # 1
I/O NO. 00 # OF ALL STN. 1

STN. NO.	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SLOT NO.	5															
STN. NO.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SLOT NO.																
STN. NO.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SLOT NO.																
STN. NO.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SLOT NO.																

End : CHECK & SET Esc : CLOSE

<REMOTE I/O ALLOCATION>

COMMON PARAMETER LX 1000-105F LY 1020-104F NEWORK MODULE NO. 1

	1ST															
SLOT NO.	0	1	2	3	4											
I/O MODULE	X32	Y16	F32	S 0	X16											
SLOT NO.																
I/O MODULE																
SLOT NO.																
I/O MODULE																
SLOT NO.																
I/O MODULE																

VACANCY (S)
1: 0PT. 2: 16PT. 3: 32PT. 4: 48PT. 5: 64PT.
X (X)
6: 16PT. 7: 32PT. 8: 48PT. 9: 64PT.
Y (Y)
A: 16PT. B: 32PT. C: 48PT. D: 64PT.
S-MOLULE (F)
E: 16PT. F: 32PT. G: 48PT. H: 64PT.

Page Up / Page Down End : CHECK & SET Esc : CLOSE

(2) Precautions on I/O allocations

(a) Relationship between mounted modules and I/O allocations

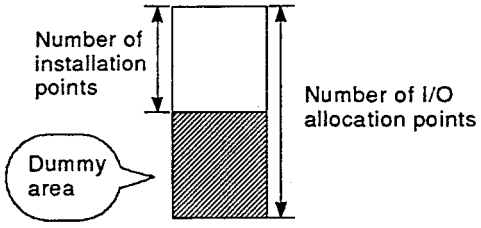
The operating status differs according to the combination of I/O allocations and mounted modules.
The table below covers the various combinations.

I/O Allocation \ Mounted Module	Input	Output	Special	Vacant
None	O	O	O	*3
Vacant	—	—	—	*4
Input	O *1	—	x	*4
Output	O *1	O *1	x	*4
Special	x	x	O *2	—

O : Normal operation
—: Failure to operate
x : Failure to operate (if parameter error occurs → PRM.E. LED lights)
*1 : The number of installation points is different from the number of I/O allocation points.

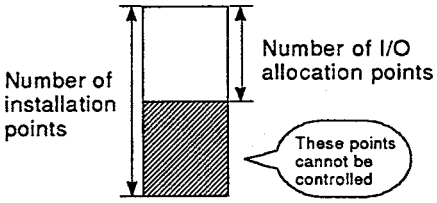
i) Number of installation points < Number of I/O allocation points

The excess I/O allocation points beyond the number of installation points are treated as dummy (idle) points.



ii) Number of installation points > number of I/O allocation points

The installation points beyond those covered by the number of I/O allocation points cannot be controlled.



*2: This only applies when the number of installation points and number of I/O allocation points are equal.
If the numbers of points are different, the system will not operate normally.

*3: Treated as 16 points.

*4: The application differs according to the I/O allocation.

- Vacant .....Used to set "0" points for the vacant slot.
- Input/output ...Used to reserve points for mounting an input/output module in the future.

(b) Common parameter settings

Set the common parameters in accordance with the module information set using I/O allocation, as shown in the example below.
If the parameter settings are made on the basis of the actual module installation status, the system will not operate normally.

[Module configuration]

		0 to 3F	40 to 5F	60 to 6F	70 to 8F	90 to AF
A61P	AJ72LP25	Input 64 points	Output 32 points	Vacant 16 points	Special 32 points	Output 32 points

[I/O allocations]

Set "0" points for vacant slots

	0 to 3F	40 to 5F		60 to 7F	80 to 9F	
Slot No.	0	1	2	3	4	
I/O module	X64	Y32	S 0	F32	Y32	
	← X →					
	← Y →					

[Common parameters]

REMOTE I/O STN. NO.	M → R		M ← R	
	LY	LY	LX	LX
1	1040–109F	0040-009F	1000-107F	0000-007F
	–	–	–	–
	–	–	–	–
	–	–	–	–
	–	–	–	–

7.5 Extension Function

The extension function permits the extension of MELSECNET/10 functions.
This function is set using the "extension setting" in the common parameters.

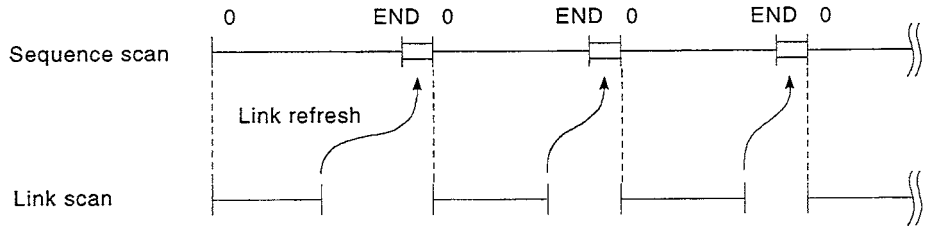
```
<EXTENDED SET>

CONSTANT LINK SCAN                [ 1]ms  (0-500)
MAX. # OF RECONNECTION STN.       [ 2]STATION  (1-16)
DUPLEX COMMUNICATION               [0]  0:NO  1:YES
ACCESSED ZNFR/ZNTO                [64]     (1-64)

                                  End : SET  Esc : CLOSE
```

7.5.1 Constant link scan function

The constant link scan function prevents the fluctuation of the link scan time due to the transient transmission function and noise, keeping it constant.
If the response time to a transient request is long, setting the constant link scan function may be effective to shorten the response time.
Set the constant link scan time to "(link scan time when all stations are normal) + 4 ms or longer".
The default is 0 ms (constant link scan function not effective).

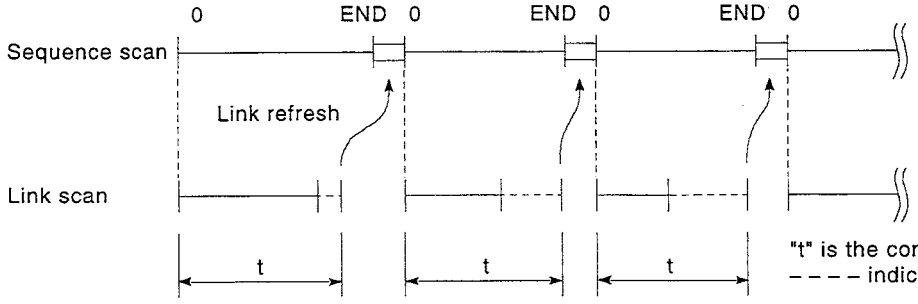
(1) No constant link scan setting (set 0 ms)

Since the link scan is executed repeatedly, the link scan time is the time actually required for the link scans.



(2) Constant link scan setting made (set between 1 and 500 ms)

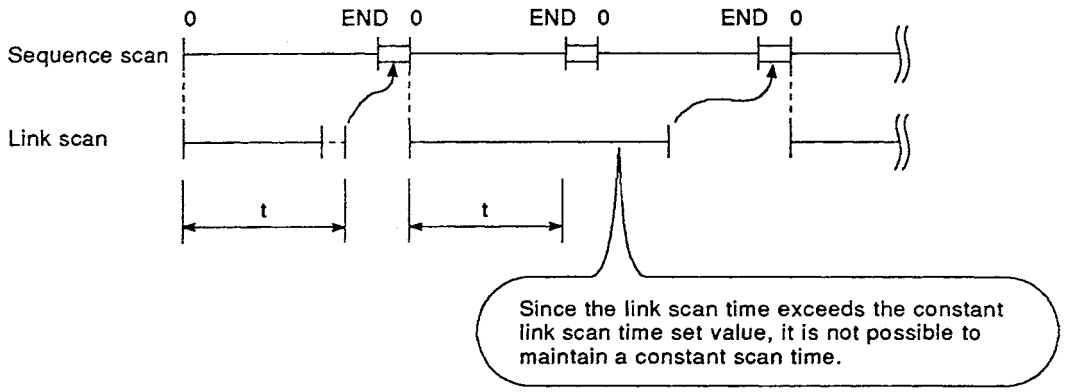
(a) Provided that the time actually required for the link scan is shorter than the constant link scan set value, the link scan time is kept constant.



(b) Note that if the time actually required for the link scan is longer than the constant link scan set value, processing will be done in the required link scan time and it will not be possible to maintain the constant link scan time.

Such a situation can arise in the following cases:

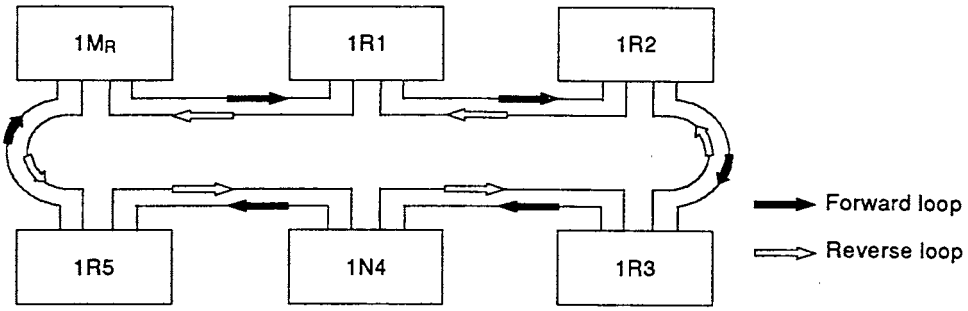
1) When the network control station starts up.
2) When a station goes down or is reset.
3) When the line is unstable (communication is sometimes possible and sometimes not).
4) When the loop is switched (optical loop systems only).
5) When a cable has been disconnected (coaxial bus systems only).



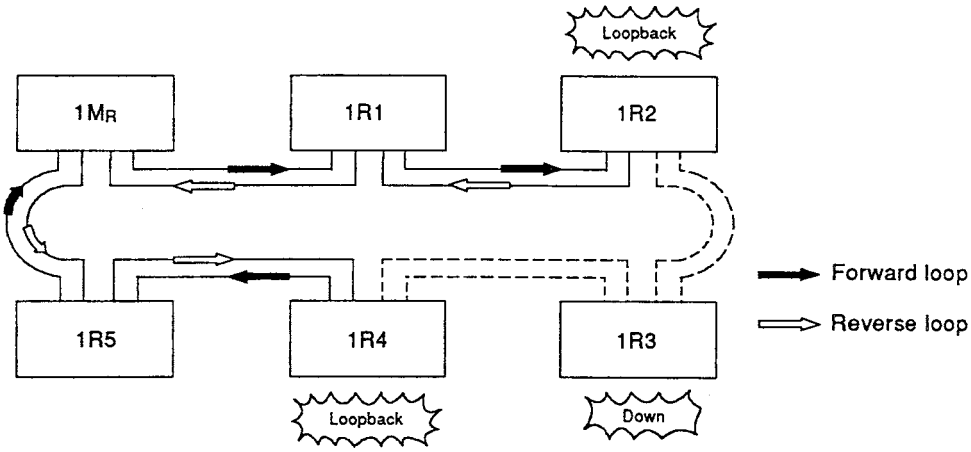
7.5.2 Multiplex transmission function (Optical/coaxial loop system)

The multiplex transmission function allows a high speed transmission using a duplex channel (forward and reverse loops) in an optical/coaxial loop system.
To use this function, make settings with the "expansion setting" of the common parameter.

(1) The multiplex transmission function uses both loops to execute efficient and high speed transmissions.



(2) When an error occurs in the transmission channel during multiplex transmission, either the forward loop or the reverse loop is used to execute normal or loopback operation for continued data link.
The transmission speed in that case is 10 MBPS.



REMARK

The multiplex transmission function is effective in reducing the link scan time when the total number of link stations is 16 or more and the link device size allocated with the common parameter is 2048 bytes or more.
The link scan time becomes 1.1 to 1.3 times shorter when compared with that when the multiplex transmission function is not used.
If the multiplex transmission function is used in the configuration where the number of connected stations or the assigned link devices is less than the above, the link scan time may be increased compared to the case where the function is not used.

7.5.3 Number of online return stations setting function

The number of online return stations setting function allows the number of stations that can be returned to the online status during one link scan to be set.
Setting multiple stations enables more than one faulty station to be returned to the online status during one link scan.
However, the link scan time will be increased (max. 12 ms x number of stations, normally 3 ms x number of stations).
The default setting is two stations. The setting range is 1 to 16 stations.

7.5.4 Number of ZNFR/ZNTO accesses setting function

The number of ZNFR/ZNTO accesses setting function enables setting of the number of modules in one remote I/O station for which instructions can be executed in one scan.
This function can be set to prevent the scan time from being prolonged.
The default setting is 64. The setting range is 1 to 64.

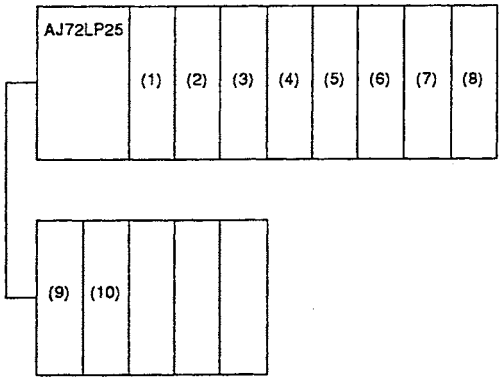
Example: When "3" is set for the number of ZNFR/ZNTO accesses setting function

(a) The data for the ZNFR/ZNTO instruction execution is arranged in the order of modules.

(b) The numbers of special function modules that have executed ZNFR/ZNTO instructions are recorded in a pointer.

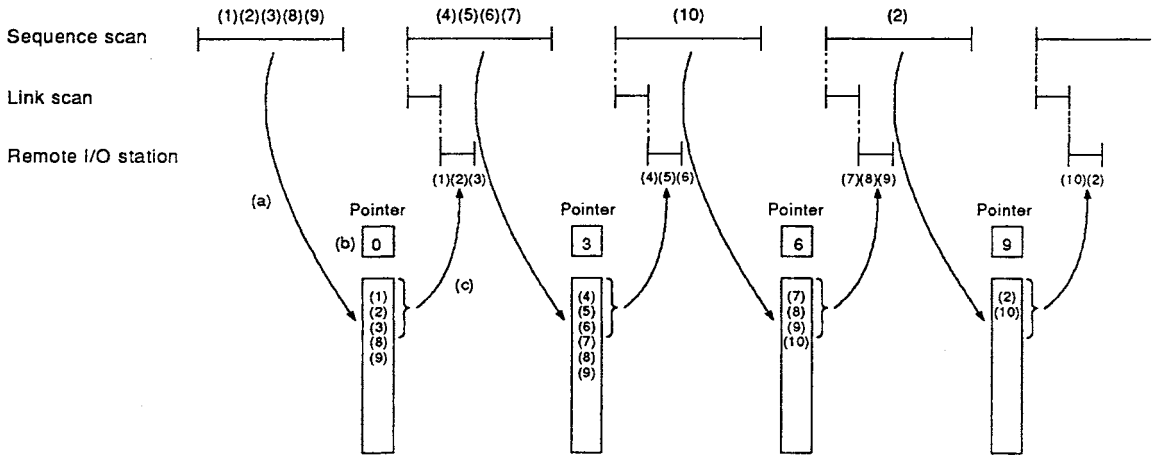
(c) ZNFR/ZNTO instructions for 3 special function modules after the one indicated by the pointer are executed.

<System configuration>



(1) through (10) are special function modules.

<ZNFR/ZNTO instruction execution>



POINT

Execution of subsequent ZNFR/ZNTO instructions for the same special function module is ignored until the previous processing has finished (until the completion signal comes ON).

7.6 RAS Function

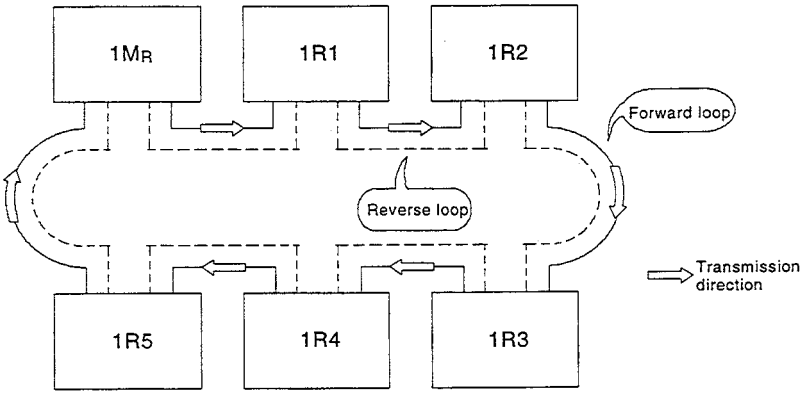
The RAS function stands for Reliability, Availability, and Serviceability. This is referred to as comprehensive usability of automated equipment.

7.6.1 Loopback function (Optical/coaxial loop system)

The optical/coaxial loop system uses a duplex channel. When an error or fault occurs in the channel, the erroneous or faulty part is bypassed by switching the forward and reverse loops or by executing loopback operation to maintain the data link with the available stations.

(1) When normal

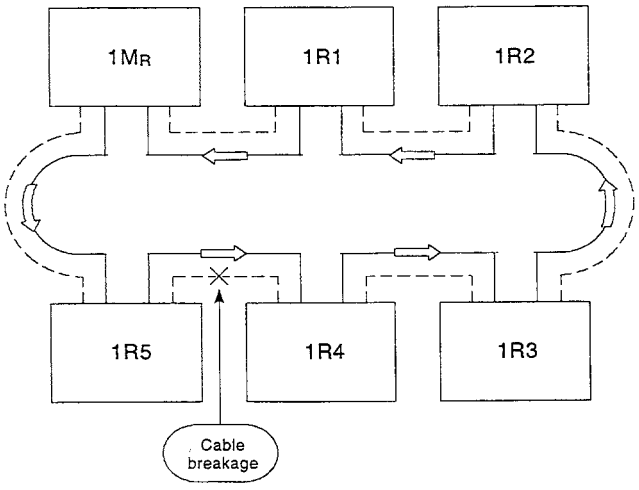
Either the forward loop or the reverse loop is used for data link.



(2) When abnormal

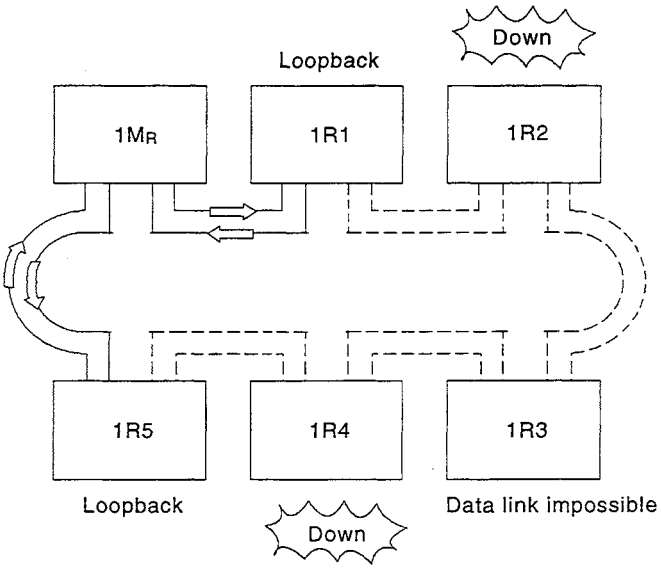
(a) Forward loop (reverse loop) is faulty

The reverse (forward) loop is used to continue data link.



(b) Stations are down

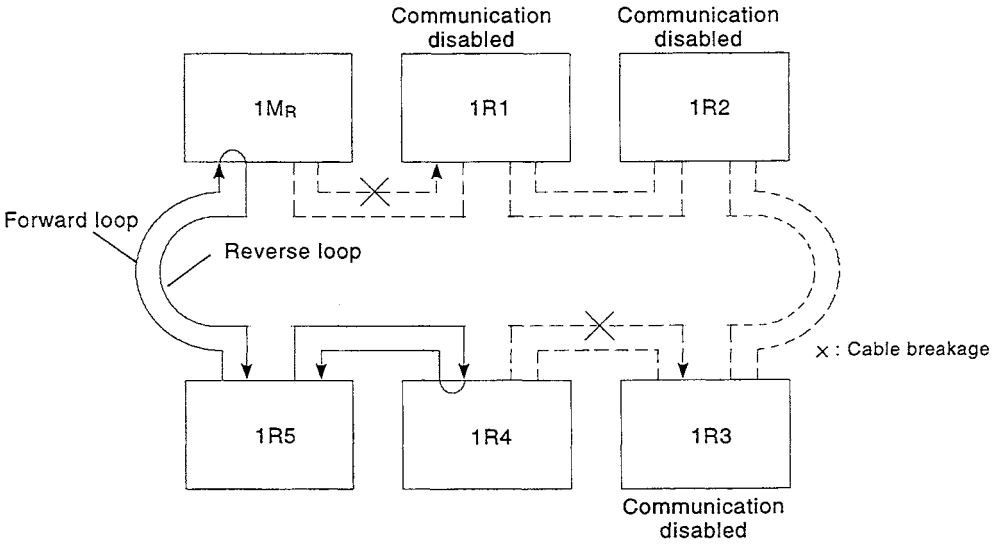
Halted stations are excepted and data link is continued.
When two or more stations are down, the stations between the halted stations are also excluded from data link.



(3) Precautions for using the optical/coaxial loop system

(a) When a cable is connected or disconnected, the loop may sometimes be switched.

(b) When the loopback operation is executed due to cable breakage, both the forward and reverse loops may be normally operated depending on the conditions of the cable breakage.
When a forward loop cable between stations 1MR and 1R1 and a reverse loop cable between stations 1R3 and 1R4 breaks, data link is continued among stations, 1MR, 1R5 and 1R4 (as shown below).
Since the receive side cables of the loopback stations (reverse loop of 1MR and forward loop of 1R4) in the 1MR-1R5-1R4 loop are normal, both the forward and reverse loops are normal.



(4) If the network module has become faulty, the loopback function may not be performed depending on the fault. In that case, the data link may stop.
Identify the faulty network module in the following method.

(a) Check the LEDs (RUN LED off, ERROR LED on) of all network modules for a faulty indication.

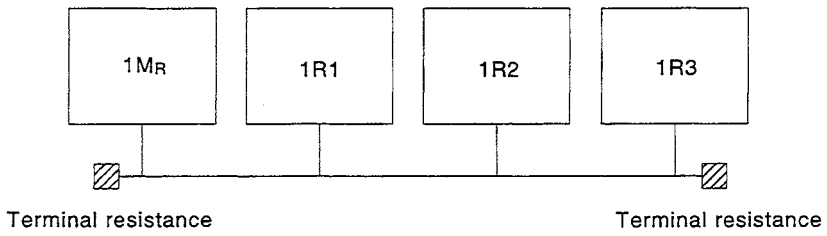
(b) Power off all stations and power them on one by one, starting from the control station. At that time, check up to which station a normal data link is performed.

Replace the faulty network module and make sure that the data link is restored to normal.

7.6.2 Station separation function (Coaxial bus system)

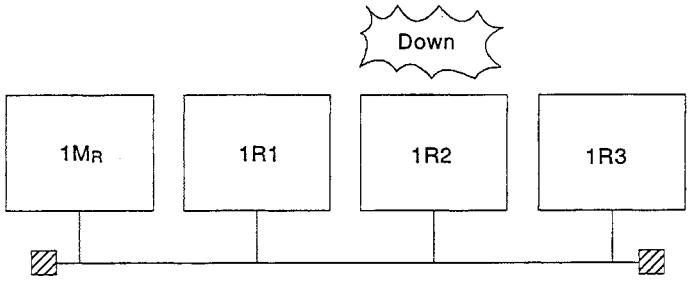
When a station is down due to power failure, the station is separated and data link is executed with the available stations.

(1) When normal



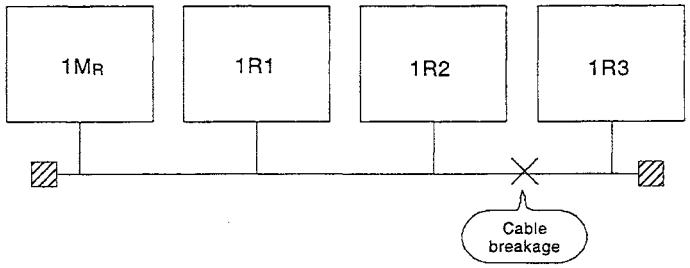
(2) When abnormal

Down station is excluded and data link is continued.



POINT

When the cable is disconnected, terminal resistance is also disconnected and data link becomes impossible.

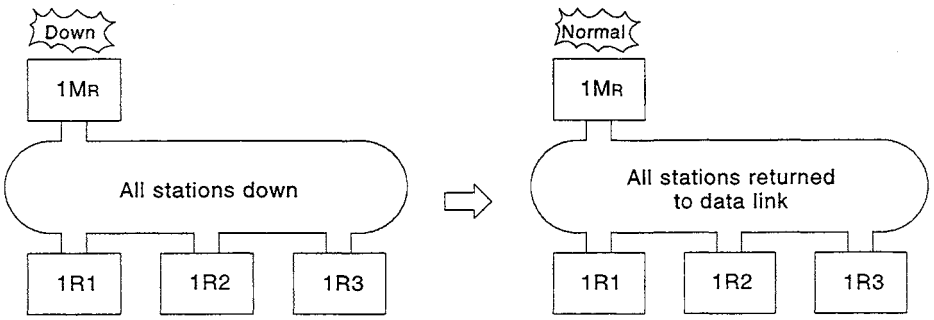


7.6.3 Automatic online return function

The automatic online return function allows stations that have been disconnected from the data link to be automatically returned to it when they recover normal status.
To use this function, set the mode select switch of the network module to "0".

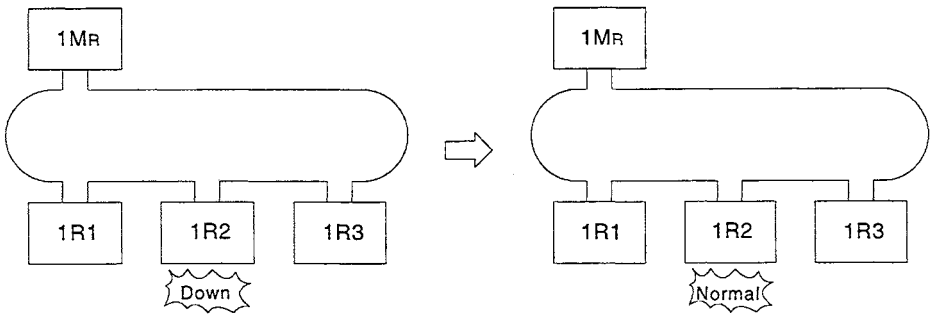
(1) When the master station goes down

If the master station goes down, all stations go down. However, transient transmission is possible at those stations whose T.PASS LED is lit.
When the master station recovers normal status, all stations are returned to the data link.



(2) When a remote I/O station goes down

Only the remote I/O station that has gone down is disconnected.
The remote I/O module is returned to the data link when it recovers normal status.



7.6.4 Diagnosis function

The diagnosis function allows confirmation of MELSECNET/10 line conditions and network module switch settings.

(1) Offline diagnosis

By setting a network module to the test mode, the hardware, data link cable wiring, etc., can be checked during system start-up.
For the test method, see Section 3.4.

(2) Online diagnosis

The network diagnosis function of a peripheral device allows the line conditions, network module settings, etc., to be checked easily.
If trouble occurs while the system is operating, diagnosis can be performed while the network module is still online.
For the test method, see Section 5.2.

(3) Network monitor

The network monitor function of a peripheral device allows the line conditions, data link conditions, etc., to be checked easily.
Monitoring is performed using the special relays (SB) and special registers (SW) that store the data link conditions.
For the test method, see Section 5.1.

(4) Data link condition detection function

This function allows the data link conditions to monitored easily from a peripheral device.
The data link conditions are stored in the special relays (SB) and special registers (SW) of the network module.
The stored data link conditions can also be used for interlock signals in a sequence program.
For details on the contents of the special relays (SB) and special registers (SW), see Section 10.

7.6.5 Fuse blown error/I/O verify error check disable function (error clear function)

This function disables a check for a fuse blown error (*1) or I/O verify error at a remote I/O station on the remote I/O network of a MELSECNET/10 network system.
The setting of this function allows the fuse blown error or I/O verify error detected by the remote I/O station to be cleared from the master station side program.

REMARK

*1: When the remote I/O station is the AnS series, it detects the external supply power OFF of the output module as a fuse blown error.

(1) Function explanation

(a) When the remote I/O station is the AnS series, it detects a fuse blown error if the external supply power of the output module at the remote I/O station is switched OFF during network system operation.
Since the error check of the remote I/O station can be disabled by turning ON the corresponding special relay at the master station before powering OFF the external supply, the master station can continue operation without any error.

(b) If the fuse blown error/I/O verify error is detected at the remote I/O station, turning ON the corresponding special relay allows the master station to clear the error of the remote I/O station and continue operation.

(2) Compatible module

For the remote master/remote I/O station, use this function in combination with the network modules later than the following version.
If using the network module earlier than the following version, this function is not applicable.

Remote master station	Hardware version	Software version
AJ71LP21	M or N	A
AJ71LP21G	H or J	A
AJ71LP21GE	E or F	K
AJ71LR21	E	P
AJ71BR11	J	A
A1SJ71LP21	D	R
A1SJ71LP21GE	A	K
A1SJ71LR21	A	D
A1SJ71BR11	F	R

Remote I/O station	Hardware version	Software version
AJ72LP25	E	R
AJ72LP25G	F	R
AJ72LP25GE	D	J
AJ72LR25	C	L
AJ72BR15	F	R
A1SJ72QLP25	B	L
A1SJ72QLR25	A	E
A1SJ72QBR15	D	L

(3) Related special relay SB

By operating the corresponding special relay SB indicated in the following table, the master station clears the fuse blown error or I/O verify error of the remote I/O station.

SB000D (13) *4	Fuse blown error check/clear	Clears the fuse blown error detected by the remote I/O station, or disables a check for a fuse blown error at the remote I/O station. OFF: Clear command disable, error check enable. ON : Clear command enable, error check disable. (Valid when ON)
SB000E (14) *4	I/O verify error check/clear	Clears the I/O verify error detected by the remote I/O station, or disables a check for an I/O verify error at the remote I/O station. OFF: Clear command disable, error check enable. ON : Clear command enable, error check disable. (Valid when ON)

(4) Precautions for using the special relays

(a) In consideration of the transmission delay time from the master station to the remote I/O station, turn ON SB000D and SB000E for more than two seconds.

(b) The remote I/O station and module where the error will be cleared cannot be specified for SB000D and SB000E. The special relays are made valid for all the remote I/O stations and modules on the network.

(5) Operating procedure

The following is the procedure to disable a fuse blown error check at the remote I/O station when the external supply power of the A1S series output module on the remote I/O station is switched OFF/ON.

(a) Turn ON SB000D (Y1C0D) at the master station to "disable" the fuse blown error check of the remote I/O station.

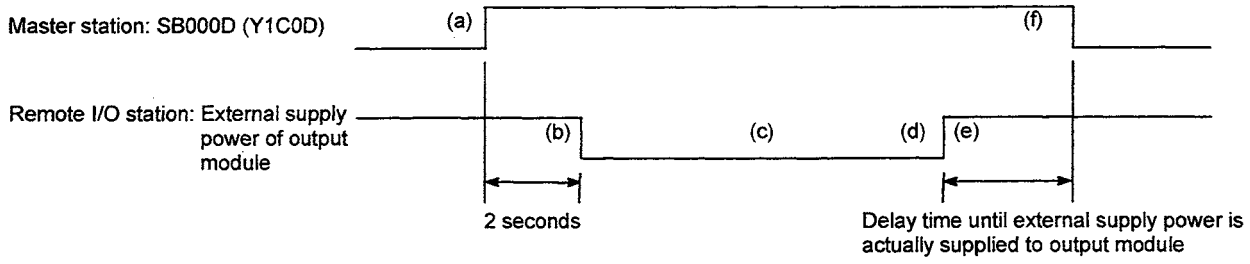
(b) Two seconds after turning ON SB000D, switch OFF the external supply power of the output module on the remote I/O station.

(c) Take a necessary action for the remote I/O station (e.g. output module replacement, wiring repair).

(d) After completion of the action taken for the remote I/O station, switch ON the external supply power of the output module on the remote I/O station.

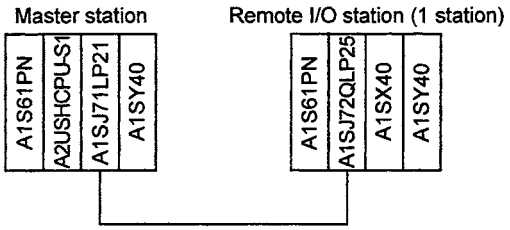
(e) In response to the output Y for switching ON the external supply power, hold SB000D from turning OFF to make the delay time elapsed until the external supply power is actually supplied to the output module.

(f) After the waiting time has elapsed, turn OFF SB000D to return the fuse blown error check of the remote I/O station to "Enable".

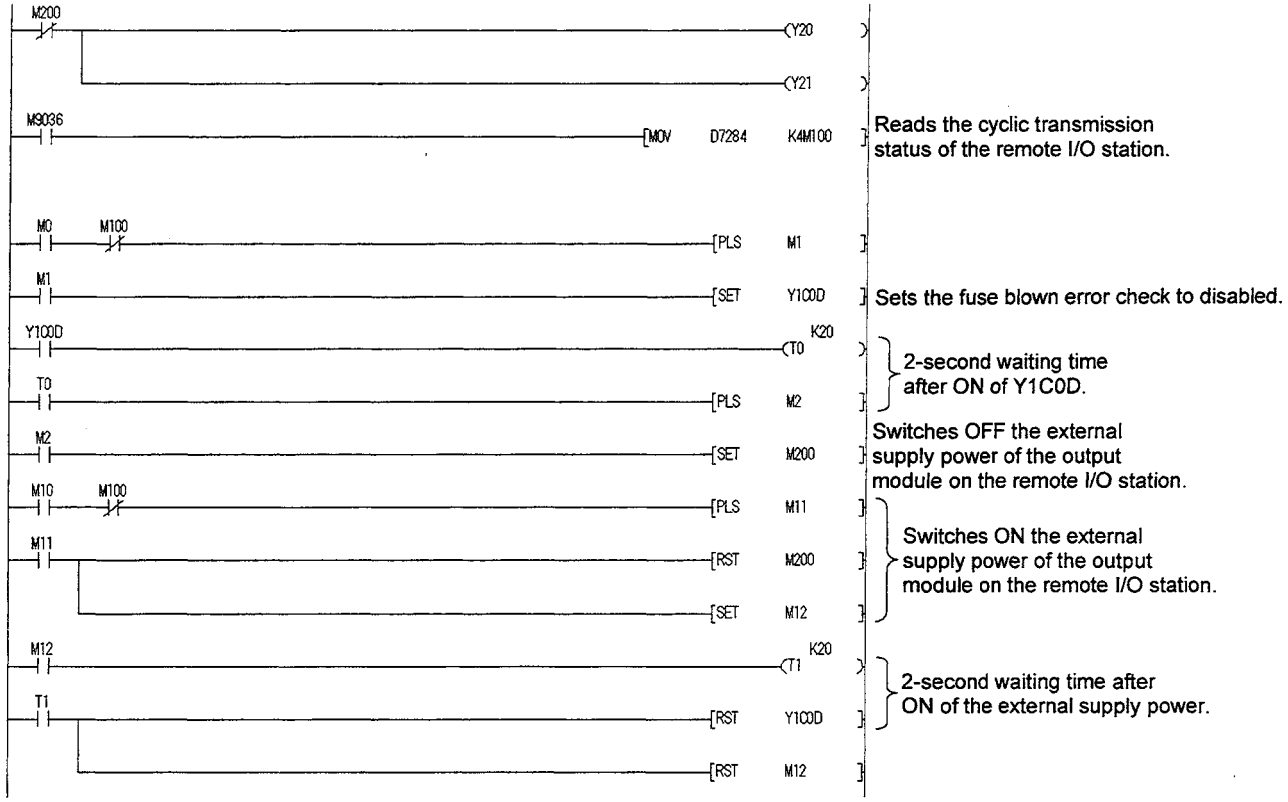


(6) Program example

(a) System configuration



(b) Program example



8. LINK DATA SEND/RECEIVE PROCESSING & PROCESSING TIME

This section describes the methods for sending/receiving data, and the processing time, in a MELSECNET/10 remote I/O network.

8.1 Link Data Send/Receive Processing

8.1.1 Outline of send/receive processing

In a MELSECNET/10 remote I/O network, a data link with remote I/O stations is established by setting the number of stations, device ranges, etc., at the AnUCPU of the master station.
Described here is the data send/receive processing in such a data link.

Send/receive processing involves "link refresh" and "link scan" processing.

(1) Link refresh

This is the processing in which data is exchanged between the AnUCPU and a network module.

(a) The devices sent to the remote I/O station (Y, LY) are written from the device memory storage area of the AnUCPU to the refresh data storage area of the network module.
The devices received from the remote I/O station (X, LX) are read from the refresh data storage area of the network module to the device memory storage area of the AnUCPU.

(b) The range of devices subject to link refresh is determined by the network refresh parameters and the common parameters. (See Section 9.1.2)

(c) Link refresh is executed in the AnUCPU's END processing.

(2) Link scan

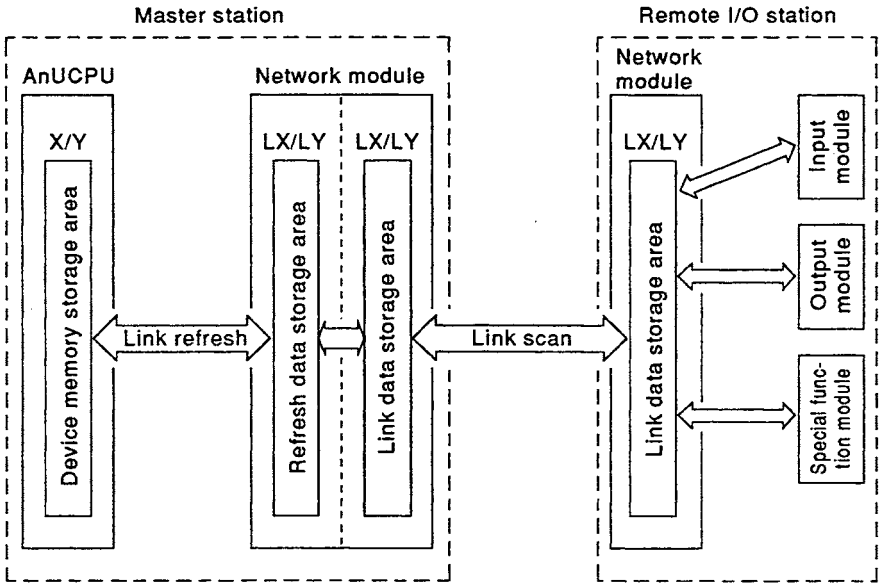
This is the processing in which data is exchanged between a network module of a master station and a network module of a remote I/O station.

(a) The link device range allocated in the common parameters is continually communicated between the master station and remote I/O stations.

(b) When one link scan has been completed, data is exchanged between the refresh data storage area and the link data storage area.

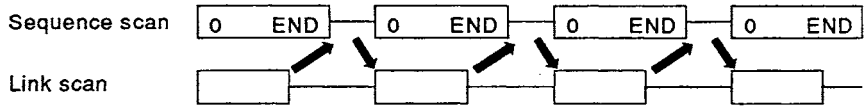
(c) The data communication is synchronized with the AnUCPU sequence scan.

[Flow of communicated data]

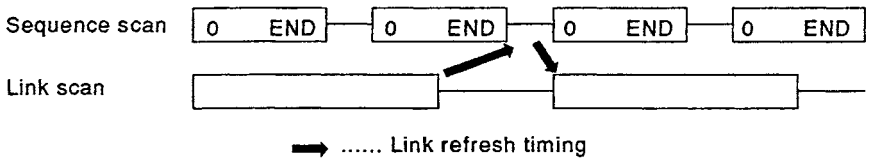


(3) Relationship between sequence scan and link scan

(a) Sequence scan > Link scan

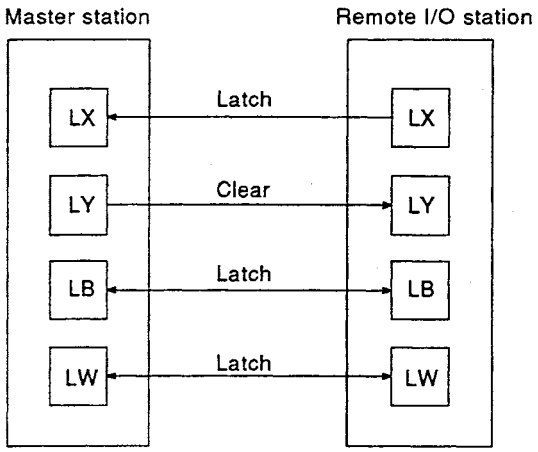


(b) Sequence scan < Link scan



8.1.2 Link data when there are faulty stations or stations where communication is stopped

If a communication error occurs, or communication stops, at a station while the data link is operating, the data of the LX, LB and LW devices that has been received from the station is latched.



8.1.3 Data link condition and programmable controller CPU status

In the master station programmable controller CPU statuses indicated below, the data link is temporarily stopped.

(1) When the mode is switched from STOP to RUN.

(2) When the system is RESET.

8.2 Transmission Delay Time

8.2.1 X/Y communication

The transmission delay time for X/Y communication is determined from the following three times by using the formulae presented below:

- Sequence program scan time in the master station
- Link refresh time (see Section 8.2.3)
- Link scan time (see Section 8.2.4)

[X transmission delay time (T_{DX})]

[Sequence scan (Sm) > Link scan (LS)]

$$T_{DX} = \underline{(Sm + \alpha m)} - LS + RS \times 2 \text{ [ms]}$$

[Sequence scan (Sm) < Link scan (LS)]

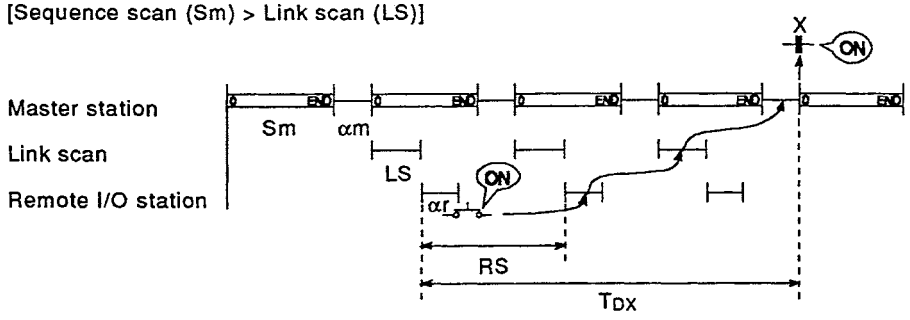
$$T_{DX} = \underline{\left\{ (Sm + \alpha m) \times \left(\frac{LS + \alpha r}{Sm + \alpha m} \right)^{*1} \right\}} - LS + RS \times 2 - \alpha r \text{ [ms]}$$

Note: The parts underlined with lines are different.

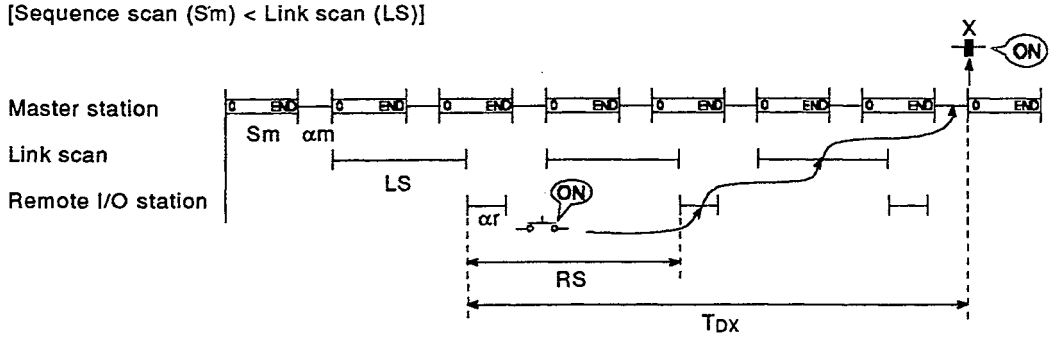
Sm : Sequence program scan time in the master station
αm : Link refresh time for master station *2
αr : Link refresh time for a remote I/O station *2
LS : Link scan time
RS : Link scan time for a remote I/O station

*1 Decimal fractions are rounded up
*2 This is the total for the number of network modules installed.

[Sequence scan (Sm) > Link scan (LS)]



[Sequence scan (Sm) < Link scan (LS)]



[Y transmission delay time (T_{DY})]

[Sequence scan (Sm) > Link scan (LS)]

$$T_{DY} = \underline{(Sm + \alpha m)} + LS + \alpha r \ [ms]$$

[Sequence scan (Sm) < Link scan (LS)]

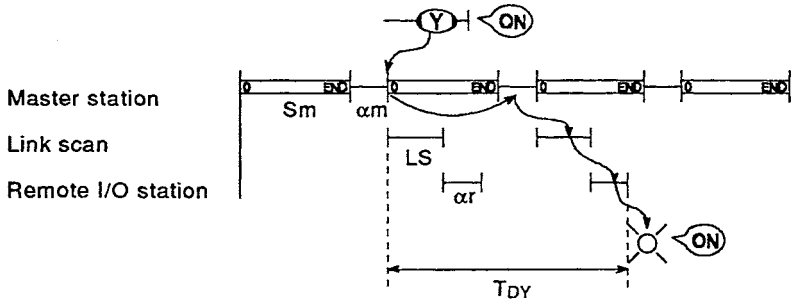
$$T_{DY} = \underline{\left\{ (Sm + \alpha m) \times \left(\frac{LS + \alpha r}{Sm + \alpha m} \right)^{*1} \right\}} + LS + \alpha r \ [ms]$$

Note: The parts underlined with lines are different.

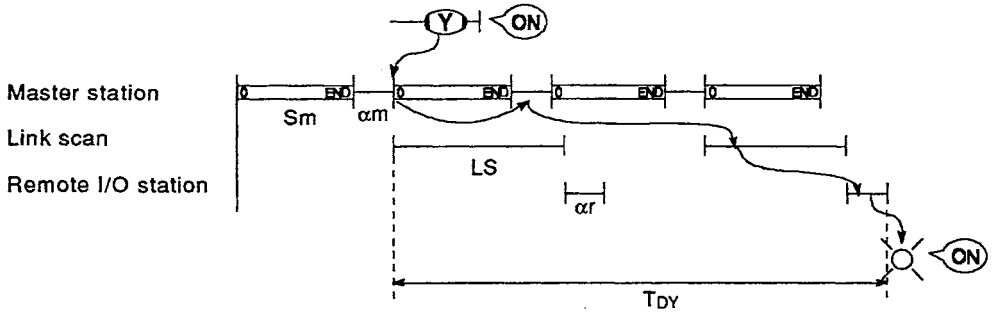
Sm : Sequence program scan time in the master station
αm : Link refresh time for master station *2
αr : Link refresh time for a remote I/O station *2
LS : Link scan time

*1 Decimal fractions are rounded up
*2 This is the total for the number of network modules installed.

[Sequence scan (Sm) > Link scan (LS)]



[Sequence scan (Sm) < Link scan (LS)]



8.2.2 ZNFR/ZNTO instructions

The transmission delay time for ZNFR/ZNTO instructions is determined from the following three times by using the formulae presented below:

- Sequence program scan time in the master station
- Link refresh time (see Section 8.2.3)
- Link scan time (see Section 8.2.4)

[Instruction transmission delay time (M_D)]

[Sequence scan(Sm) > Link scan(LS)]

$$M_D = \underline{(Sm + \alpha m)} + 4 + Sm \ [ms]$$

[Sequence scan(Sm) < Link scan(LS)]

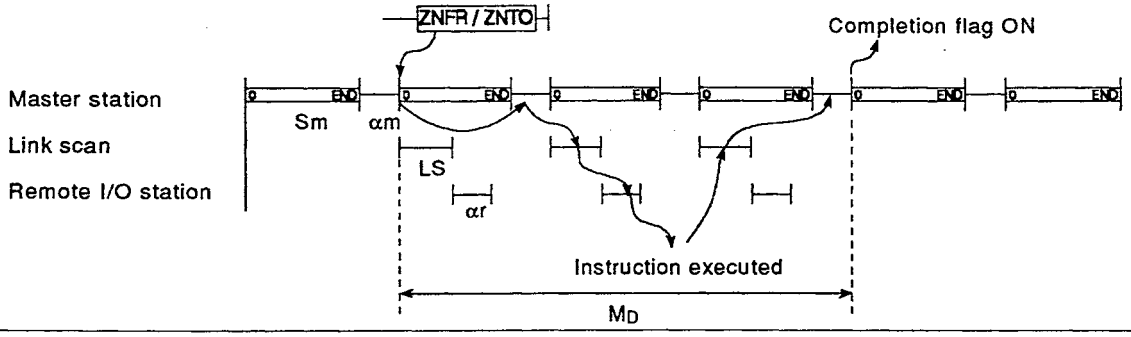
$$M_D = \underline{\left\{ (Sm + \alpha m) \times \left(\frac{LS + \alpha r}{Sm + \alpha m} \right)^{*1} \right\}} \times 4 + Sm \ [ms]$$

Note: The parts underlined with lines are different.

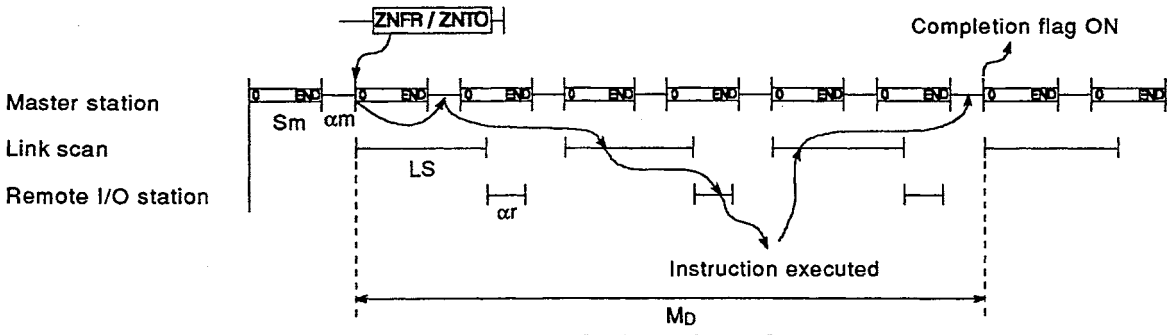
Sm : Sequence program scan time in the master station
αm : Link refresh time for master station *2
αr : Link refresh time for a remote I/O station *2
LS : Link scan time

*1 Decimal fractions are rounded up
*2 This is the total for the number of network modules installed.

[Sequence scan (Sm) > Link scan (LS)]



[Sequence scan (Sm) < Link scan (LS)]



8.2.3 Link refresh time

The link refresh time (extension of the END processing time in the CPU) is determined from the following two factors by using the formulae presented below:

- Number of allocated link device points
- CPU type used

[Link scan time for master station (αm)]

$$am = KM1 + KM2 \times \left(\frac{B + X + Y + SB + (W + SW) \times 16}{8} \right) \quad [ms]$$

B : Total number of link relay (B) points used by all stations *2
W : Total number of link register (W) points used by all stations *2
X : Total number of link input (X) points used by all stations *2
Y : Total number of link output (Y) points used by all stations *2
SB : Number of link special relay (SB) points
SW : Number of special link register (SW) points
KM1, KM2 : Constants

	KM1*1	KM2
A2UCPU(S1) A2ASCPU(S1)	3.2	0.0023
A3U, A4UCPU	2.4	0.0023
A2USHCPU-SI	1.5	0.0023
Q02CPU-A	1.3	0.0023
Q02H, Q06HCPU-A	0.6	0.0023

*1 1 ms is added for each additional network module.
*2 This is the total, counting from the start device to the last device of those used.
(Unused areas within this range are counted in the point total.)

[Refresh time for a remote I/O station (αr)]

$$\alpha r = \left(\frac{X + Y}{8} \right) \times 0.000375 \quad [ms]$$

X : Number of link input (X) points used in the host station
Y : Number of link output (Y) points used in the host station

8.2.4 Link scan time

(1) The link scan time in the master station is determined from the following two factors by using the formulae presented below:

- Number of allocated link device points
- Number of connected stations

[Link scan time for the master station (LS)]

$$LS = KB + (0.75 \times \text{total number of stations}) \times \left(\frac{B + X + Y + (W \times 16)}{8} \times 0.001 \right)$$

$$+ KR + \left(\frac{Br + Xr + (Wr \times 16)}{8} \times 0.000375 \right) + (T \times 0.001) \quad [ms]$$

B : Total number of link relay (B) points used by all stations (master station + all remote I/O stations)*1
W : Total number of link register (W) points used by all stations (master station + all remote I/O stations) *1
X : Total number of link input (X) points used by all stations *1
Y : Total number of link output (Y) points used by all stations *1
Br : Total number of link relay (B) points used by each remote I/O station *2
Wr : Total number of link register (W) points used by each remote I/O station *2
Xr : Total number of link input (X) points used by each remote I/O station *2
T : Maximum number of bytes sent by transient transmission in one link scan *3
KB, KR : Constants

*1 M → R, M ← R settings
*2 M ← R settings
*3 If there are simultaneous transient transmissions from multiple stations, this is the total for all of them.

Number of Remote I/O Stations	1 to 8	9 to 16	17 to 24	25 to 32	33 to 40	41 to 48	49 to 56	57 to 64
KB	4.0	4.5	4.9	5.3	5.7	6.2	6.6	7.0
KR	3.9	3.1	2.6	2.3	1.7	1.1	0.6	0.0

(2) Remote I/O stations

The link scan time for remote stations is determined from the following three factors by using the formulae presented below:

- Sequence program scan time in the master station
- Link refresh time
- Number of allocated link device points
- Number of stations connected

[Link scan time for remote stations (RS)]

[Sequence scan (Sm) < Link scan (LS)]

RS = LS + Sm + αm [ms]

[Sequence scan (Sm) > Link scan (LS)]

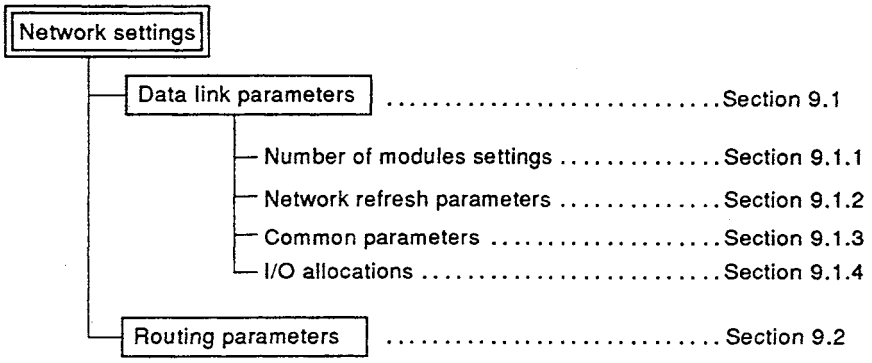
RS = Sm + αm [ms]

Sm : Sequence program scan time in the master station
αm : Link refresh time for the master station *1
LS : Link scan time

*1 This is the total for the number of network modules installed.

9. NETWORK SETTINGS

In order to operate a MELSECNET/10 network, the network settings (parameter settings) have to be set in the AnUCPU of the master station from a peripheral device.
There are the following types of parameter:



REMARK

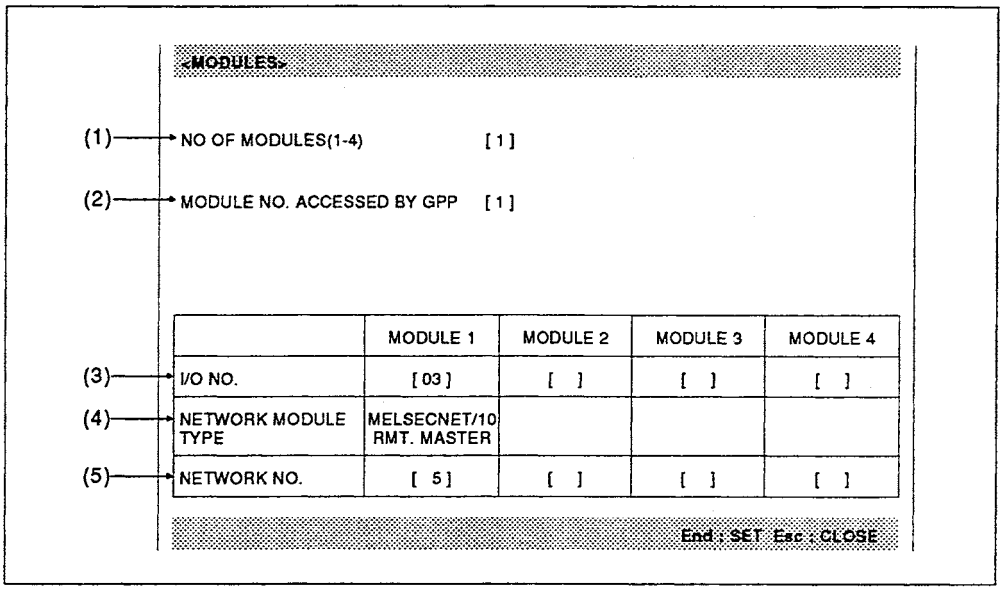
For details on the operations for setting each type of parameter from a peripheral device, see the Operating Manual for the GPP function software package.

9.1 Data Link Parameters

These parameters are set in order to execute communications using the B/W and X/Y devices.

9.1.1 Number of modules settings

Information on the modules mounted to the AnUCPU is set in these settings.



Number of Modules Setting Screen

(1) NUMBER OF MODULES

[Purpose]

Set the number of network modules (MELSECNET/10) or data link modules (MELSECNET(II)) mounted to the AnUCPU here.

[Setting range]

1 to 4 (modules)

(2) MODULE NO. ACCESSED BY GPP

[Purpose]

Set the module number for a network whose station will be accessed from a peripheral device (SW4GP-GPPA, for example) or special function module (AJ71C24-S8, for example) that is not compatible with the AnUCPU here.
Note however, that if there is a MELSECNET (II) module, the MELSECNET (II) station will be accessed regardless of the effective module number setting.

[Setting range]

1 to 4 (module No.)

(3) I/O NO.

[Purpose]

Set the head input number (upper two digits of three-digit hexadecimal number) for the mounted network modules (MELSECNET/10) or data link modules (MELSECNET (II)) here.
For example, if the I/O numbers are X/Y030 to 04F, set "03".

[Setting range]

A2ASCPU(S1) : 00 to 3F
A2UCPU(S1) : 00 to 3F
A3UCPU : 00 to 7F
A4UCPU : 00 to FF

(4) NETWORK MODULE TYPE

[Purpose]

Set the type of network module (MELSECNET/10) or data link module (MELSECNET (II)) mounted here.

[Setting range]

1 : MELSECNET/10 (DEFAULT PARAMETER)
2 : MELSECNET/10 (CONTROL STATION)
3 : MELSECNET/10 (NORMAL STATION)
4 : MELSECNET/10 (REMOTE MASTER STATION)
5 : MELSECNET II (MASTER STATION)
6 : MELSECNET II (LOCAL STATION)

(5) NETWORK NO.

[Purpose]

Set the network numbers of the network modules (MELSECNET/10) here.
Match this setting with the setting of the network No. setting switch of the network module.

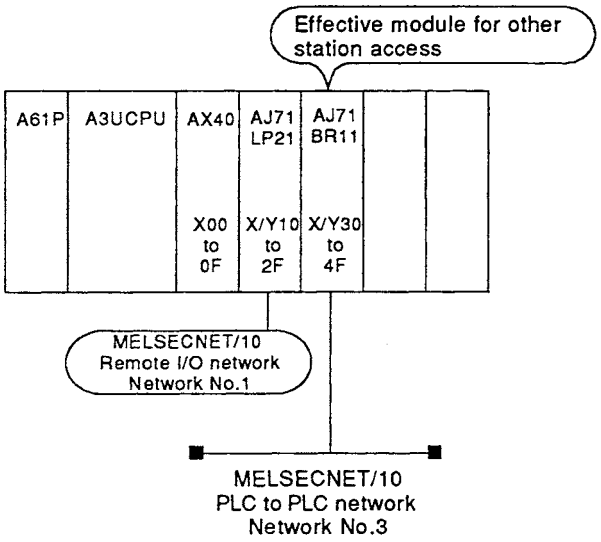
[Setting range]

1 to 255

[Setting example]

Setting the parameters for the system configuration shown below.

<System configuration>



<Parameter setting screen>

<MODULES>

NO OF MODULES(1-4) [2]

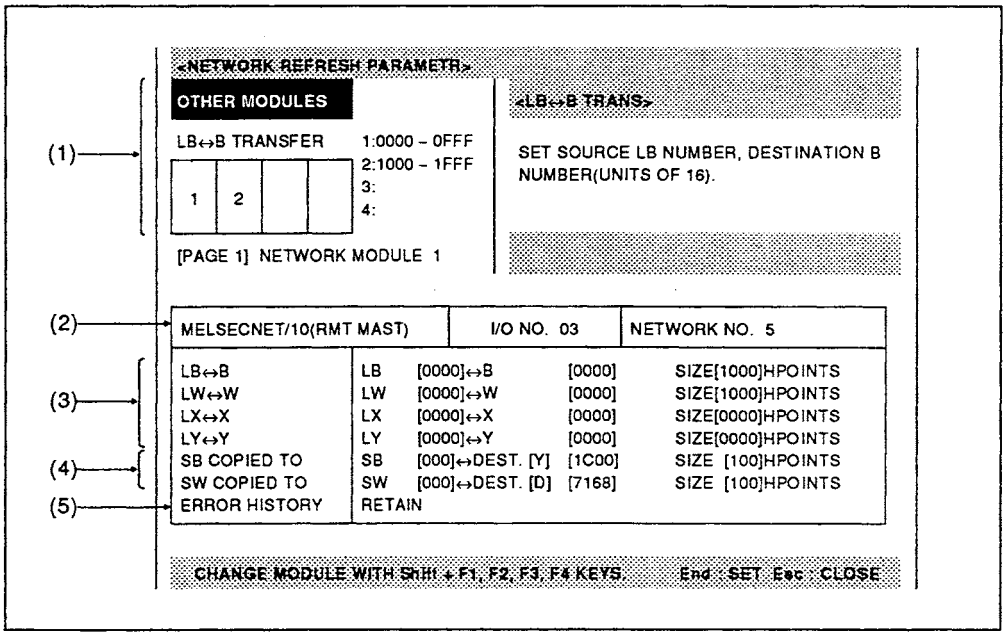
MODULE NO. ACCESSED BY GPP [2]

	MODULE 1	MODULE 2	MODULE 3	MODULE 4
I/O NO.	[01]	[03]	[ ]	[ ]
NETWORK MODULE TYPE	MELSECNET/10 RMT. MASTER	MELSECNET/10 CONTROL STN.		
NETWORK NO.	[1]	[3]	[ ]	[ ]

End : SET Esc : CLOSE

9.1.2 Network refresh parameters

These parameters set the relationship between the network module link devices (LB, LW, LX, LY) and data link condition storage devices (SB, SW), and the AnUCPU devices.



Network Refresh Parameter Setting Screen

(1) OHER MODULES

[Purpose]

Informs the user of the settings for each item at each module.

(2) MODULES

[Purpose]

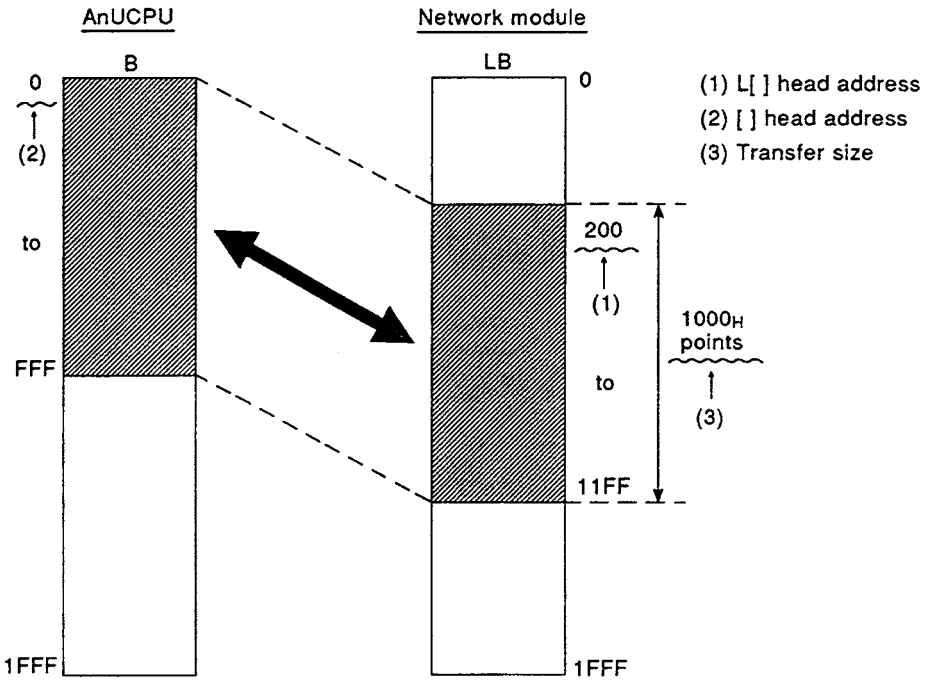
The information set in "MODULES" is displayed here.

(3) L[ ] ↔ [ ] TRANSFER

[Purpose]

Set the correspondence between the network module link devices (LB, LW, LX, LY) and the AnUCPU link devices (B, W, X, Y) here.

[Setting range]

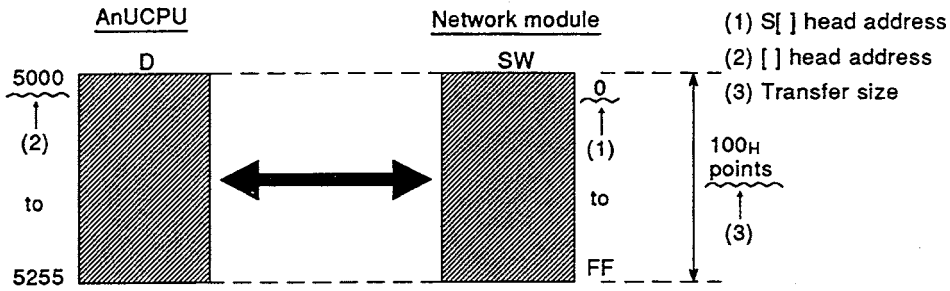


(4) SB COPIED TO, SW COPIED TO

[Purpose]

Set the correspondence between the network module data link condition storage devices (SB, SW) and the AnUCPU devices (X, Y, M, L, S, B, T, C, D, W) here.

[Setting range]



SB device data can be transferred to X/Y/M/L/S/B/F contacts, and T/C/D/W current values.
SW device data can be transferred to T/C/D/W current values.

(5) ERROR HISTORY

[Purpose]

Set the status of the transient transmission error history for SW00F0 to SW00FF here.

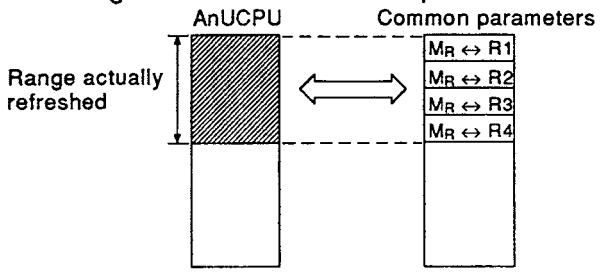
[Setting range]

RETAIN : The oldest information is stored.
OVERWRITE : The newest information is stored.

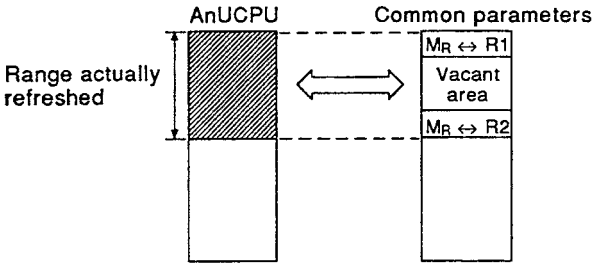
POINT

(1) Relationship with "network refresh parameters" and "common parameters"
In the AnUCPU, only the range where the network refresh parameters and common parameters overlap each other is refreshed.

(a) The range set with the common parameters is refreshed.



(b) The vacant area is also refreshed.



(2) When setting network parameters, make sure there is no overlap with the allocations for the following:

- Actual I/O (the number of I/O points allocated to actually installed modules)
- MELSECNET
- MELSECNET/MINI automatic refresh settings
- MELSECNET/10 (PLC to PLC network)

(3) Default values
Default values are automatically set for the network refresh parameters when the number of modules settings are set (see table 10.1). Depending on the circumstances, it may be necessary to change these default settings.

- Note that LX/LY are not set in the default values. (However, in the case of MELSECNET (II), LX/LY0000 to 07FF X/Y0000 to 07FF are set.)
- When a MELSECNET (II) module is mounted, its setting is "module No.1" regardless of the module No. set in the number of modules settings.
- If two MELSECNET (II) modules are mounted they are treated as one module.
- MELSECNET (II) data link information is stored in M/D9200 to 9255 of the AnUCPU.

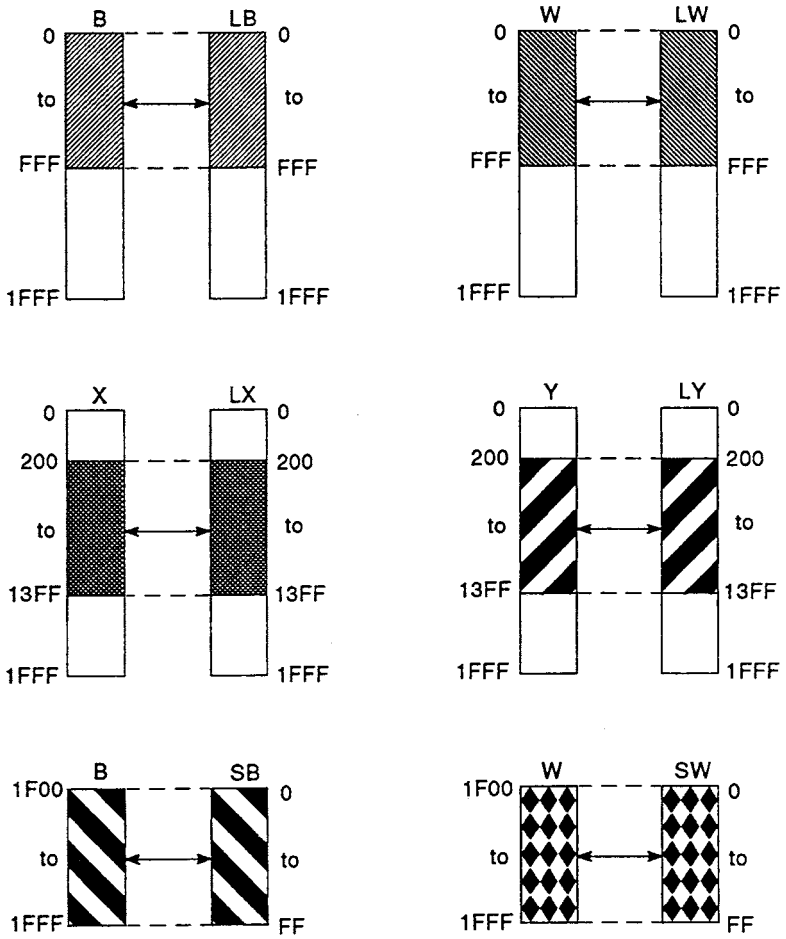
Table 10.1 Default Values for Network Refresh Parameters

Module / Number Mounted	Module No.1	Module No.2	Module No.3	Module No.4
1	LB/LW0 to 1FFF → B/W0 to 1FFF SB0 to FF → Y1C00 to 1CFF SW0 to FF → D7168 to 7423	———	———	———
2	LB/LW0 to FFF → B/W0 to FFF SB0 to FF → Y1C00 to 1CFF SW0 to FF → D7168 to 7423	LB/LW1000 to 1FFF → B/W1000 to 1FFF SB0 to FF → Y1D00 to 1DFF SW0 to FF → D7424 to 7679	———	———
3	LB/LW0 to 7FF → B/W0 to 7FF SB0 to FF → Y1C00 to 1CFF SW0 to FF → D7168 to 7423	LB/LW800 to FFF → B/W800 to FFF SB0 to FF → Y1D00 to 1DFF SW0 to FF → D7424 to 7679	LB/LW1000 to 17FF → B/W1000 to 17FF SB0 to FF → Y1E00 to 1EFF SW0 to FF → D7680 to 7935	———
4	LB/LW0 to 7FF → B/W0 to 7FF SB0 to FF → Y1C00 to 1CFF SW0 to FF → D7168 to 7423	LB/LW800 to FFF → B/W800 to FFF SB0 to FF → Y1D00 to 1DFF SW0 to FF → D7424 to 7679	LB/LW1000 to 17FF → B/W1000 to 17FF SB0 to FF → Y1E00 to 1EFF SW0 to FF → D7680 to 7935	LB/LW800 to 1FFF → B/W1800 to 1FFF SB0 to FF → Y1F00 to 1FFF SW0 to FF → D7936 to 8191

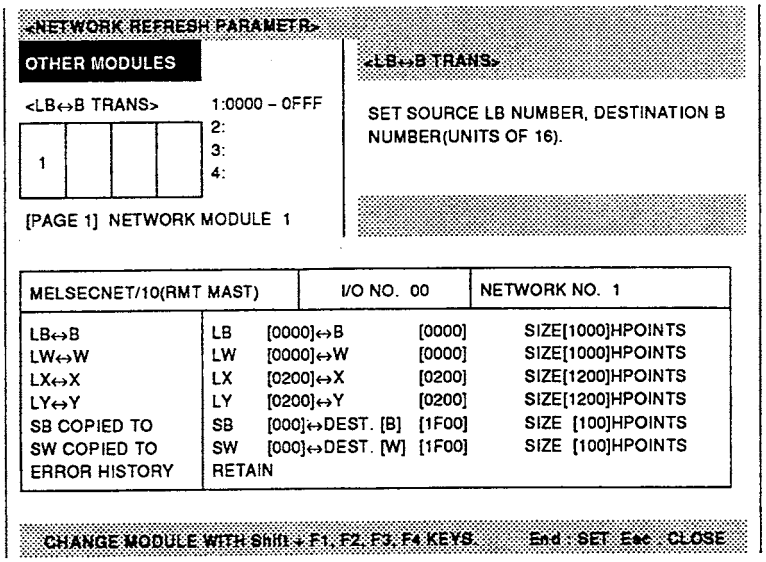
[Setting example]

Setting the parameters for the refresh ranges indicated below.
It is assumed that one network module is mounted.

<Refresh range>



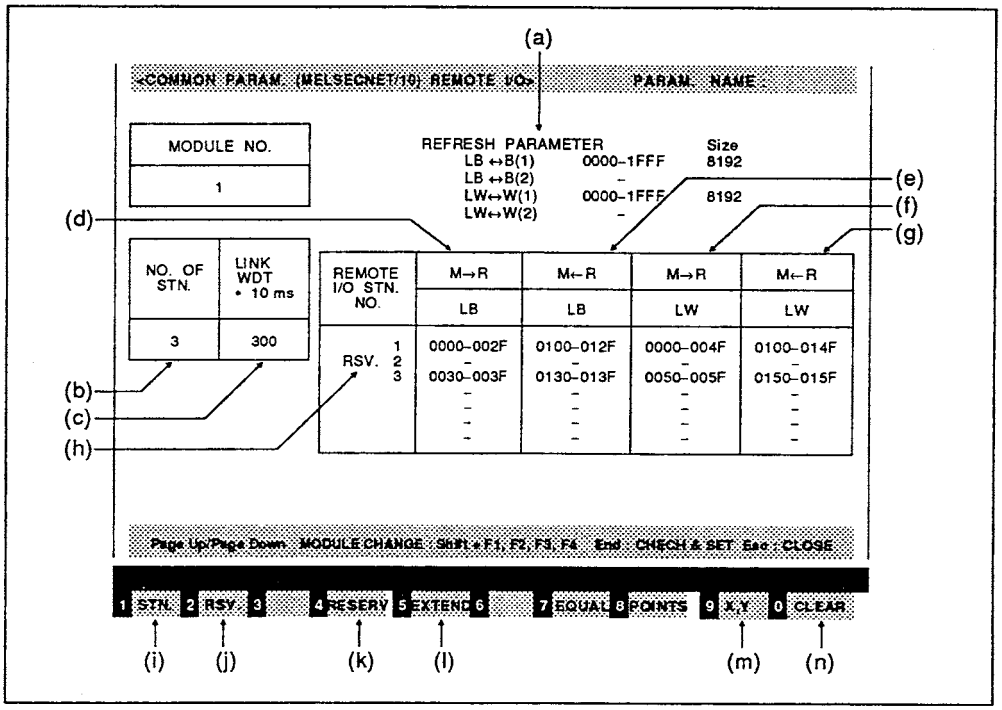
<Parameter setting screen>



9.1.3 Common parameters

These parameters set conditions such as link device ranges for communication with the I/O modules/special function modules in each remote I/O station.

(1) LB/LW settings



Common Parameters Setting Screen

(a) REFRESH PARAMETER

[Purpose]

The network refresh parameter settings are displayed here.

(b) NUMBER OF STATIONS

[Purpose]

Set the number of remote I/O stations here.

[Setting range]

Optical loop system : 1 to 64
Coaxial bus system : 1 to 32

(c) LINK WDT

[Purpose]

Set the time within which it will be judged whether or not communication between the master station and a remote I/O station is normal here.
If the link scan time is longer than the W.D.T., communication is judged to be abnormal and communication is stopped.

[Setting range]

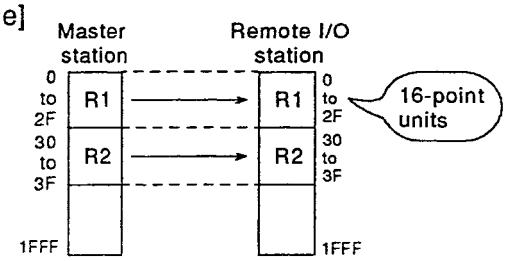
10 to 4000 ms (set in 10 ms units)

(d) M→R LB

[Purpose]

Set to define the area for the handshake data required to execute communications with the buffer memory of a special function module using ZNFR/ZNTO instructions.
Set the range of LB data sent from the "master station" to the "remote I/O station".

[Setting range]

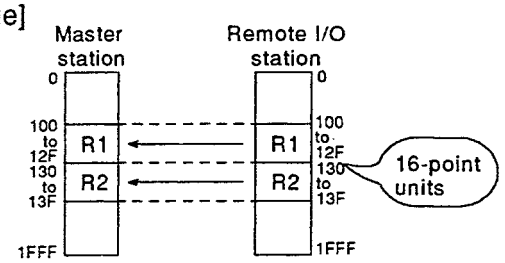


(e) M←R LB

[Purpose]

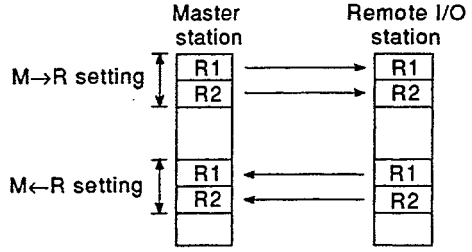
Set to define the area for the handshake data required to execute communications with the buffer memory of a special function module using ZNFR/ZNTO instructions.
Set the range of LB data sent from the "remote I/O station" to the "master station".

[Setting range]



POINT

Set LB/LW device points so that the addresses will be consecutive in the M → R and M ← R areas respectively.

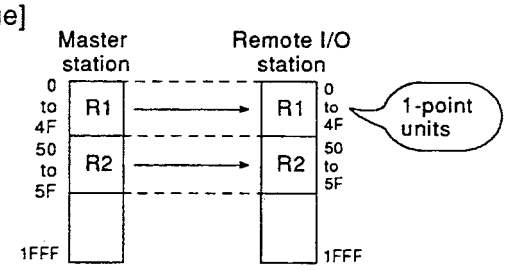


(f) M→R LW

[Purpose]

Set to define the area for the handshake data, and the area for storing the ZNTO instruction data, which are required to execute communication with the buffer memory of a special function module using ZNFR/ZNTO instructions.
Set the range of LW data sent from the "master station" to the "remote I/O station".

[Setting range]

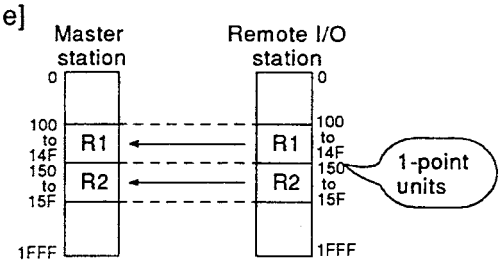


(g) M←R LW

[Purpose]

Set to define the area for the handshake data, and the area for storing the ZNFR instruction data, which are required to execute communication with the buffer memory of a special function module using ZNFR/ZNTO instructions.
Set the range of LW data sent from the "remote I/O station" to the "master station".

[Setting range]



(h) RSERVED

[Purpose]

Displayed where reserve stations have been set.

(i) STATIONS (F1 key)

[Purpose]

Used to correct the setting for the number of remote I/O stations.

(j) RSERVE (F2 key)

[Purpose]

Used to set a station as a reserve station.
The station set is the one whose remote I/O station No. is selected with the cursor when the key is pressed.
Each time the F2 key is pressed, the station status switches between "RSV." and "not reserved" (no display).

(k) RESERVE (F4 key)

[Purpose]

Used to set reserve stations in a list.
Each time the Enter key is pressed the station status switches between "reserved" (highlighted display) and "not reserved" (normal display). The ■ display indicates that a station is reserved.

<RESERVE STATION>

1	■2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32
33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56
57	58	59	60	61	62	63	64

End : SET Esc : CLOSE

(l) EXTEND (F5 key)

<EXTENDED SET>

CONSTANT LINK SCAN	[1]ms (0-500)	1)
MAX. # OF RECONNECTION STN.	[2]STATION (1-16)	2)
DUPLEX COMMUNICATION	[0] 0:NO 1:YES	3)
ACCESSED ZNFR/ZNTO	[64] (1-64)	4)

End : SET Esc : CLOSE

1) CONSTANT LINK SCAN

[Purpose]

Set in order to keep the link scan time constant.

[Setting range]

0 ms : Constant link scan function not executed.

1 to 500 ms : Constant link scan function executed in accordance with the set time.

2) MAX. NUMBER OF RECONNECTION STATIONS

[Purpose]

Set the number of faulty stations that can be returned to the data link in one scan here.

[Setting range]

1 to 16 stations (default value : 2 stations)

3) DUPLEX COMMUNICATION

[Purpose]

Set whether or not the multiplex transmission function is executed here.
This item cannot be set if the setting for the total number of link stations is 4 or greater.

[Setting range]

0 : Not executed 1 : Executed (default : not executed)

4) ACCESSED ZNFR/ZNTO

[Purpose]

Sets the number of ZNFR/ZNTO instructions that can be executed in 1 scan.
This setting is made to prevent the transmission delay time from being prolonged.

[Setting range]

1 to 64 (default : 64)

(m) X, Y (F9 key)

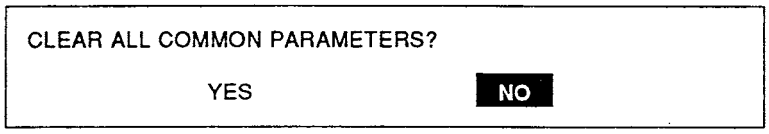
[Purpose]

Used to switch between setting screens.

(n) CLEAR (F10 key)

[Purpose]

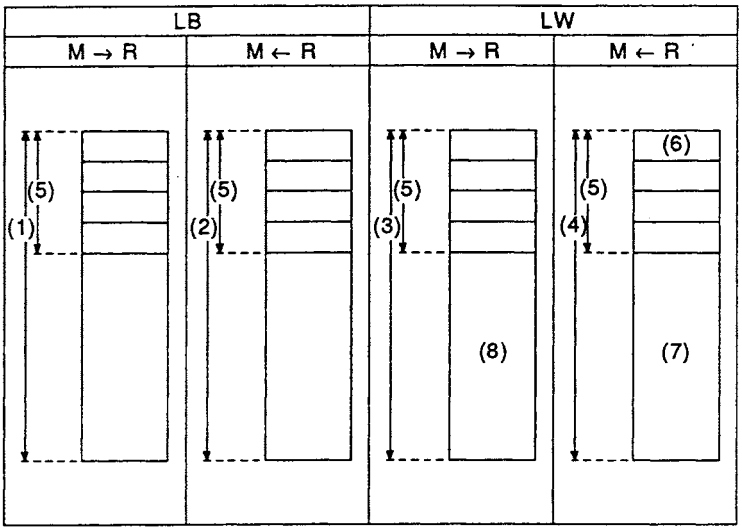
Used to delete all the data that has been set.



LB/LW setting method

This section describes the LB/LW setting method.

[Situation when there is one special function module]



(1) The first 4 points (5) from the head of the ranges ((1) to (4)) set in the common parameters are automatically used for the handshake processing for ZNFR/ZNTO instructions.

(2) Set the M → R and M ← R ranges ((1) and (2), (3) and (4)) for LB/LW while ensuring that there is no overlap.

(3) The ZNFR/ZNTO instruction execution result is stored in the first point (6) for LW M ← R handshake processing use.

Normal : 0
Error : Error code (see Section 11.1)

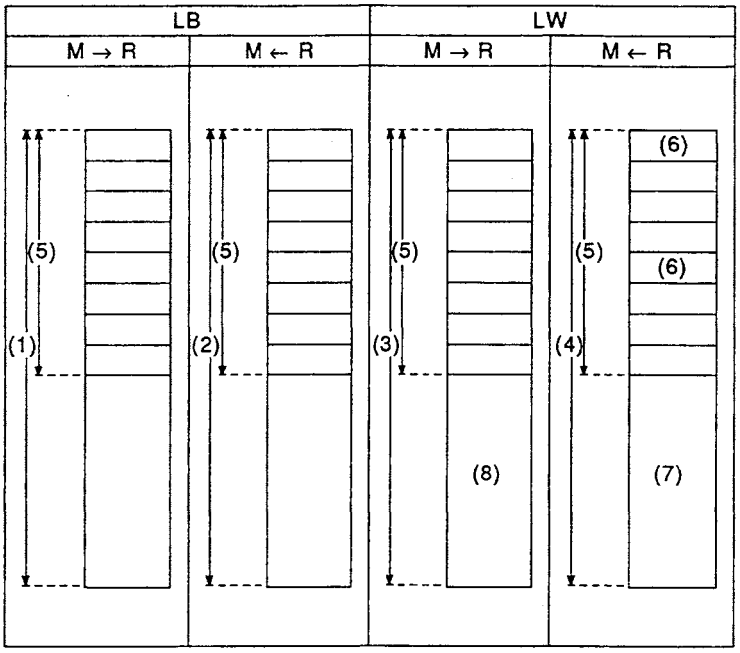
(4) The range (7) following the points for LW M ← R handshake processing use (5) is used to store the data read from the buffer memory using the ZNFR instruction.

(5) The range (8) following the points for LW M → R handshake processing use (5) is used to store the data to be written to the buffer memory using the ZNTO instruction.

POINT

When setting the LB/LW ranges, be sure to allocate a sufficient number of points (for handshake use) for the mounted special function modules. If the set number of points is insufficient, a "PRM.E." error will occur.

[Situation when there are two or more special function modules]



(1) The "number of special function modules x 4 points" (5) from the head of the ranges ((1) to (4)) set in the common parameters are automatically used for the handshake processing for ZNFR/ZNTO instructions.

(2) Set M → R and M ← R ranges ((1) and (2), (3) and (4)) for LB/LW while ensuring that there is no overlap.

(3) The ZNFR/ZNTO instruction execution result is stored in the first point (6) for LW M ← R handshake processing use.

Normal : 0
Error : Error code (see Section 11.1)

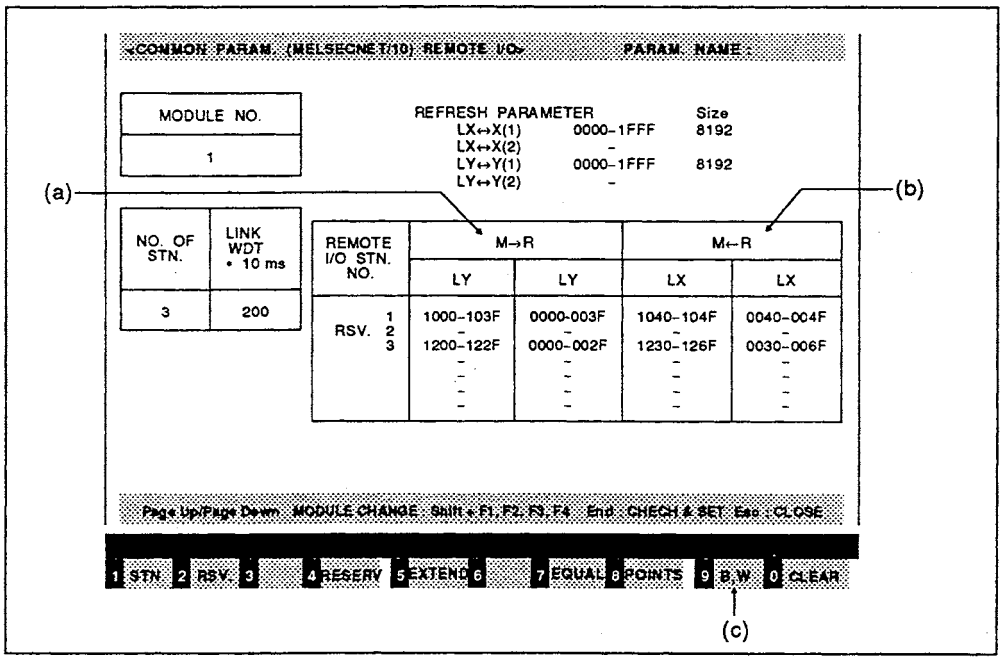
(4) The range (7) following the points for LW M ← R handshake processing use (5) is used to store the data read from the buffer memory using the ZNFR instruction.

(5) The range (8) following the points for LW M → R handshake processing use (5) is used to store the data to be written to the buffer memory using the ZNTO instruction.

POINT

When setting the LB/LW ranges, be sure to allocate a sufficient number of points (for handshake use) for the mounted special function modules. If the set number of points is insufficient, a "PRM.E." error will occur.

(2) LX/LY settings



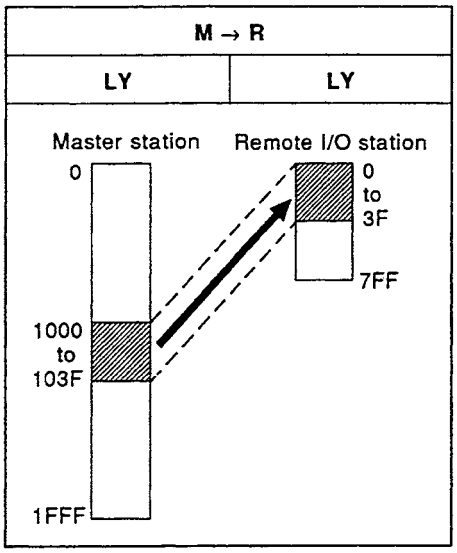
Common Parameter Setting Screen

(a) M→R LY

[Purpose]

Set the LY range for the master station and remote I/O stations.

[Setting range]

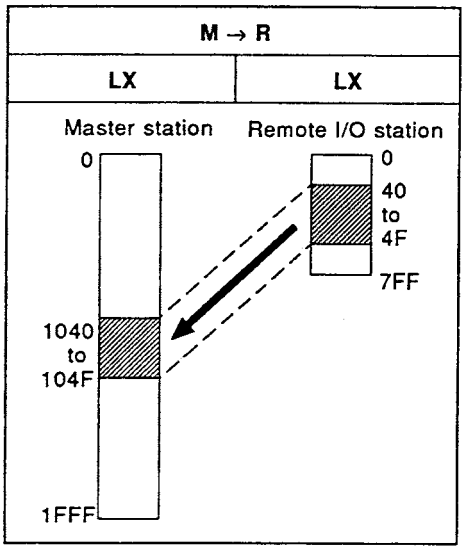


(b) M←R LX

[Purpose]

Set the LX ranges for the master station and remote I/O stations.

[Setting range]



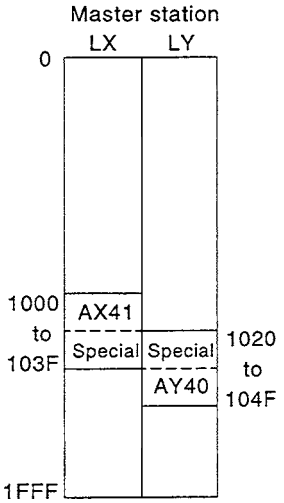
(c) B,W (F9 key)

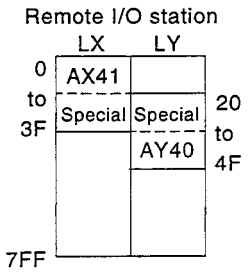
[Purpose]

Used to switch between setting screens.

LX/LY setting method

Make the master station settings while the modules are installed at the remote I/O stations.





Remote I/O system configuration

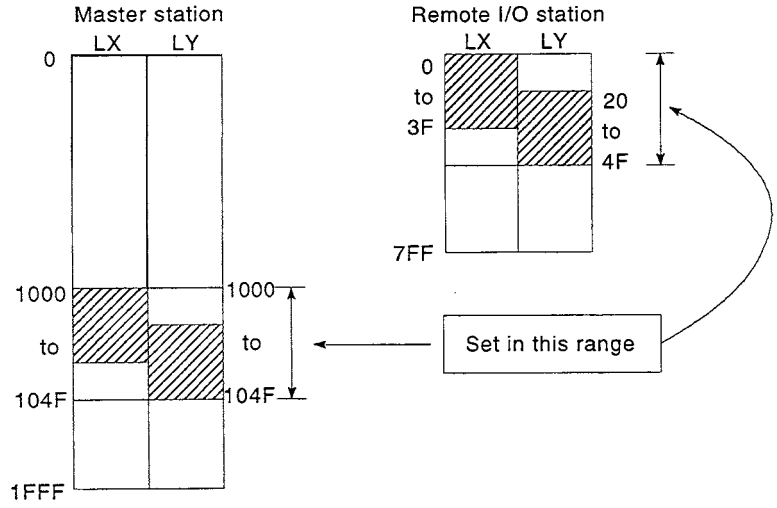
AJ72 LP25	AX41	Special (32 points)	AY40
	X0 to 1F	X/Y20 to 3F	Y40 to 4F

[Precautions on setting]

(1) Make sure that either the inputs (LX) or outputs (LY) at the remote I/O station side start from "0".

[Simple setting]

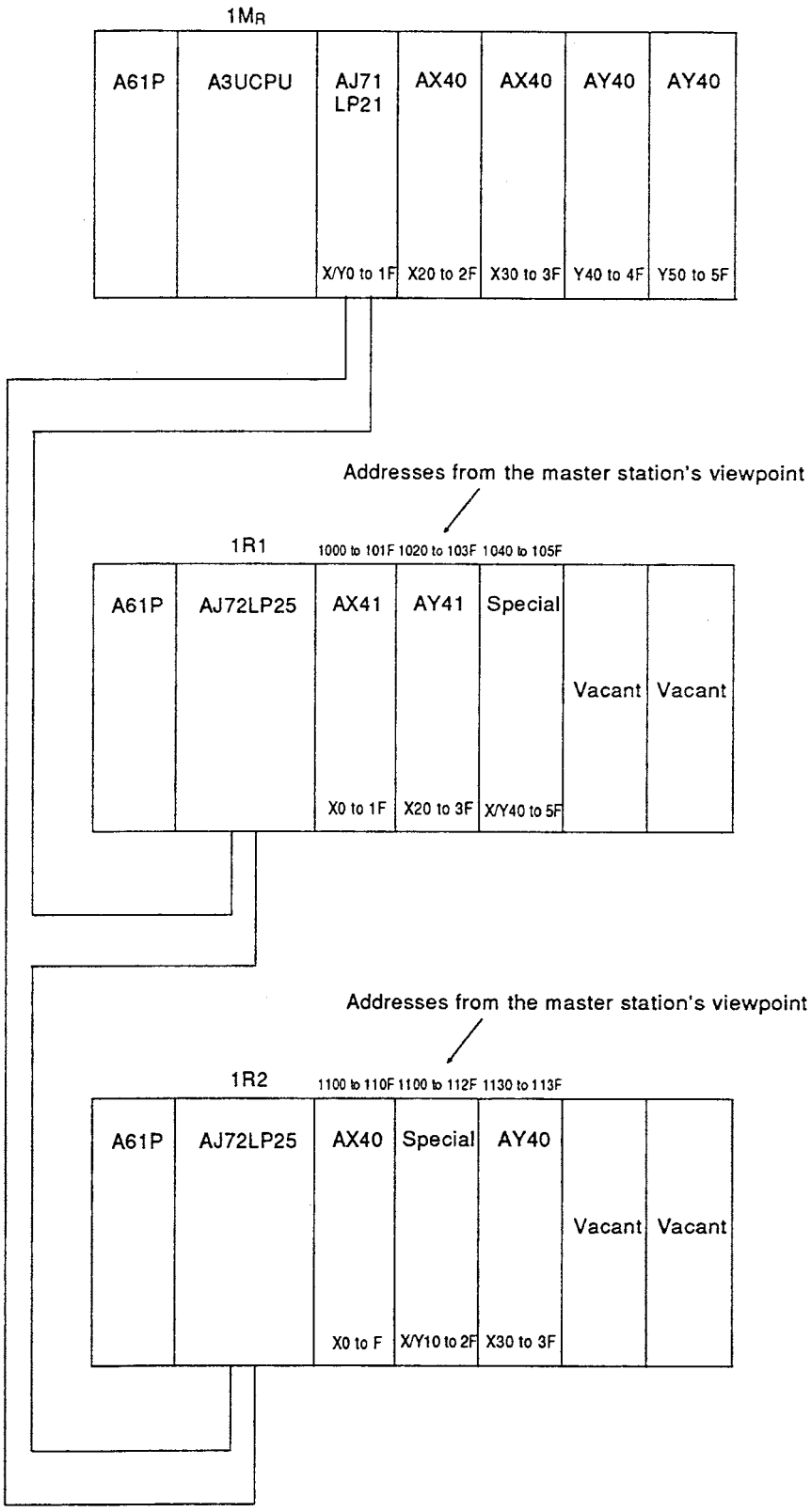
If the settings are made in the same size of I/O range as already used, the likelihood of setting errors is reduced. However, note that this increases the number of link points used.



[Setting example]

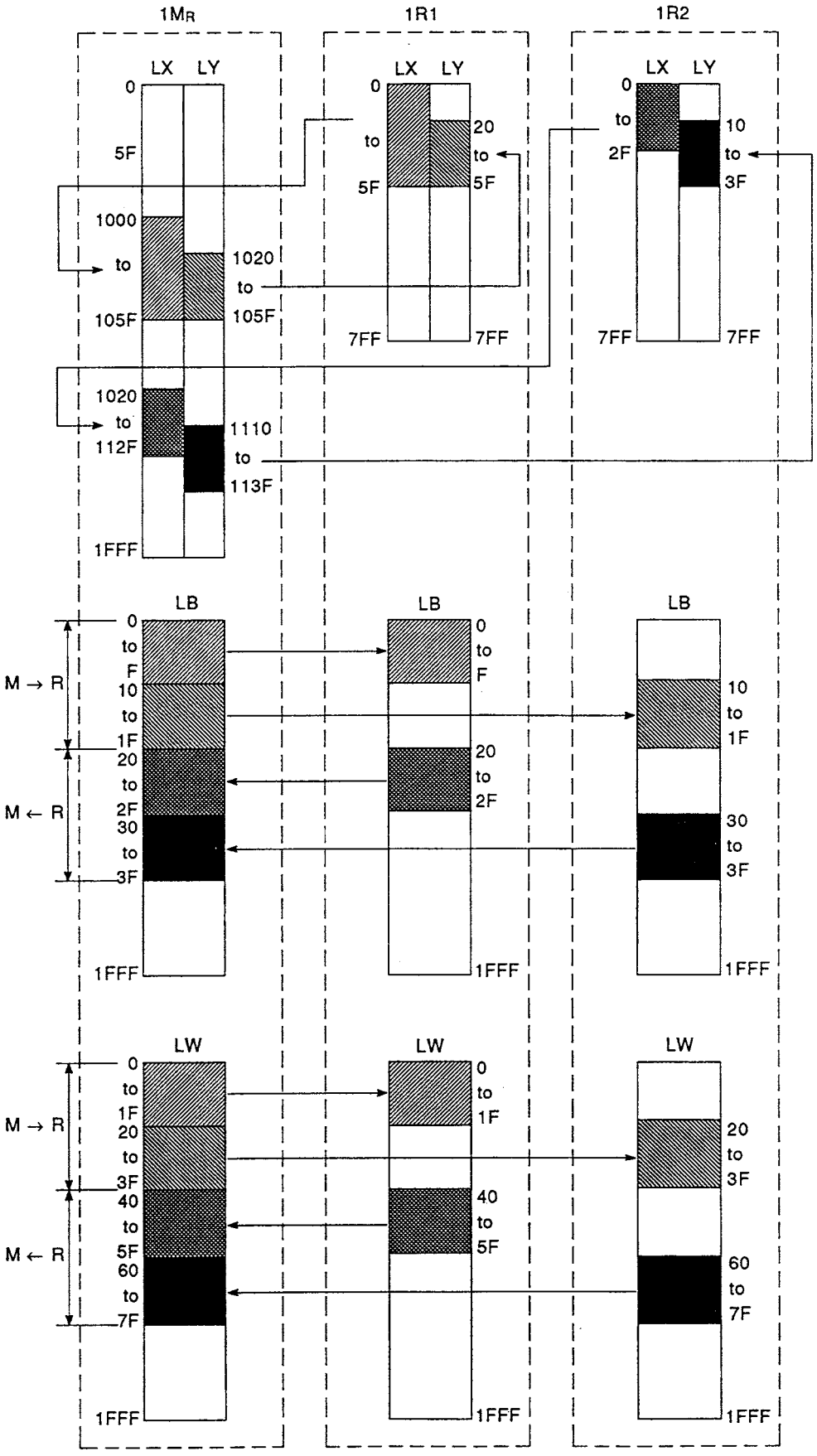
Setting the parameters for the system configuration and allocations shown below.

<System configuration>



* The special function module must be one that occupies 32 points.

<Allocations>



<Parameter setting screen>

<COMMON PARAM. (MELSECNET/10) REMOTE I/O> PARAM. NAME:

MODULE NO.
1

REFRESH PARAMETER

		Size
LX↔X(1)	0000-1FFF	8192
LX↔X(2)	-	
LY↔Y(1)	0000-1FFF	8192
LY↔Y(2)	-	

NO. OF STN.	LINK WDT • 10 ms
2	200

REMOTE I/O STN. NO.	M→R		M←R	
	LY	LY	LX	LX
1	1020-105F	0020-005F	1000-105F	0000-005F
2	1110-113F	0010-003F	1100-112F	0000-002F
	-	-	-	-
	-	-	-	-
	-	-	-	-
	-	-	-	-
	-	-	-	-

Page Up/Page Down: MODULE CHANGE Shift + F1, F2, F3, F4: End CHECH & SET Esc: CLOSE

<COMMON PARAM. (MELSECNET/10) REMOTE I/O> PARAM. NAME:

MODULE NO.
1

REFRESH PARAMETER

		Size
LB ↔B(1)	0000-1FFF	8192
LB ↔B(2)	-	
LW↔W(1)	0000-1FFF	8192
LW↔W(2)	-	

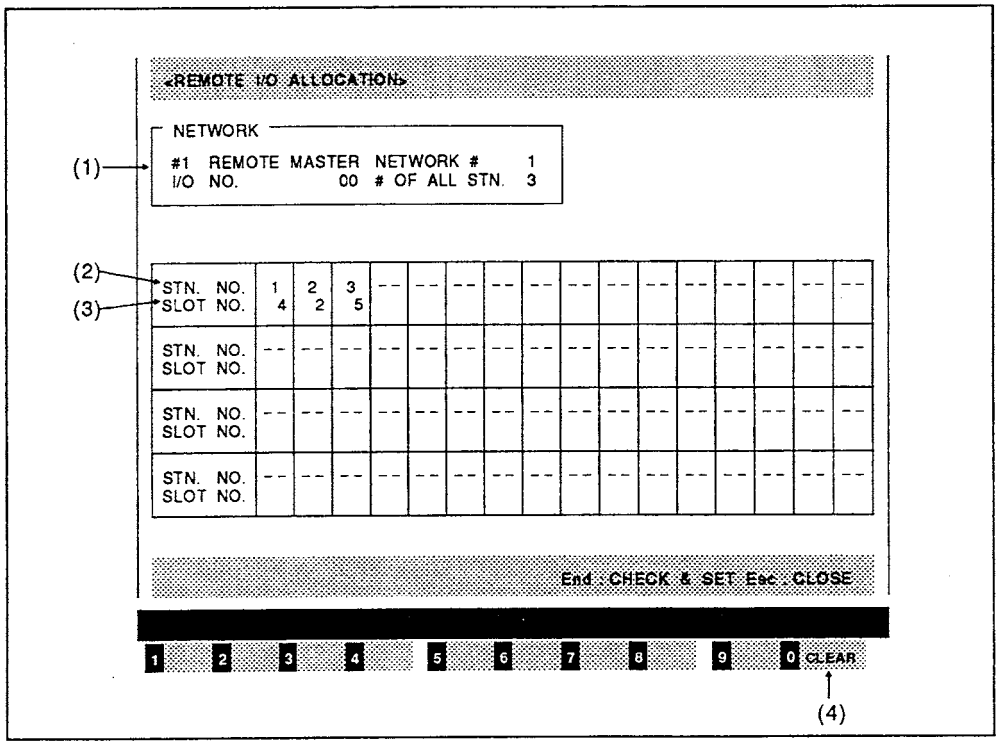
NO. OF STN.	LINK WDT • 10 ms
2	300

REMOTE I/O STN. NO.	M→R	M←R	M→R	M←R
	LB	LB	LW	LW
1	0000-000F	0020-002F	0000-001F	0040-005F
2	0010-001F	0030-003F	0020-003F	0060-007F
	-	-	-	-
	-	-	-	-
	-	-	-	-
	-	-	-	-
	-	-	-	-

Page Up/Page Down: MODULE CHANGE Shift + F1, F2, F3, F4: End CHECH & SET Esc : CLOSE

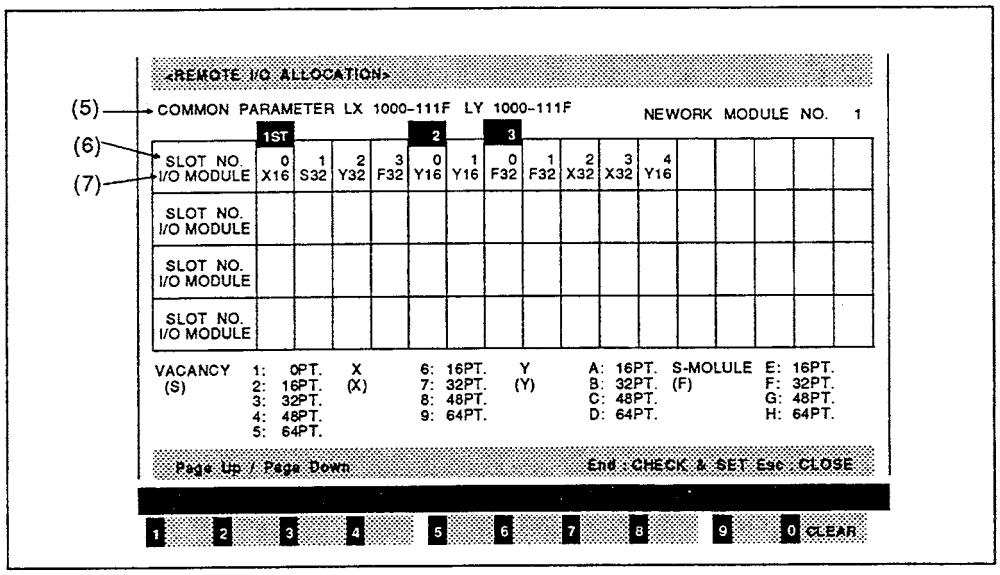
9.1.4 I/O allocations

If there are one or more vacant slots, make reserve settings in the module information in advance so that the I/O numbers will not be shifted if other modules are mounted later, and to save I/O points.
Also, set the I/O allocations for each remote I/O station individually; it is not necessary to set them for all stations.



Remote I/O Allocation (slot No. setting) Screen

Press the [End] key!



Remote I/O Allocation Screen

(1) NETWORK

[Purpose]

The information for the station for which I/O allocations are to be made is displayed here.

(2) STATION NO.

[Purpose]

A number of numbers corresponding to the "total number of link stations" set in the common parameters are displayed here.

(3) SLOT NO.

[Purpose]

Set the number of slots occupied by the modules for which I/O points are to be allocated here.

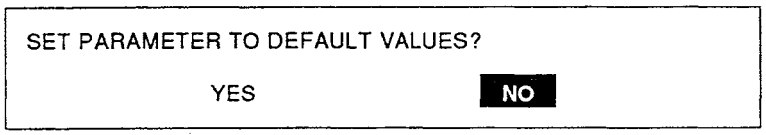
[Setting range]

0 to 64
(set "0" for the stations for which no I/O allocations are to be made)

(4) CLEAR (F10 key)

[Purpose]

Used to delete the data set on the displayed screen.



(5) COMMON PARAMETER

[Purpose]

The remote I/O station LX/LY statuses set in the common parameters are displayed here.

(6) SLOT NO.

[Purpose]

Slot numbers corresponding to the set number of points are displayed here.

(7) I/O MODULE

[Purpose]

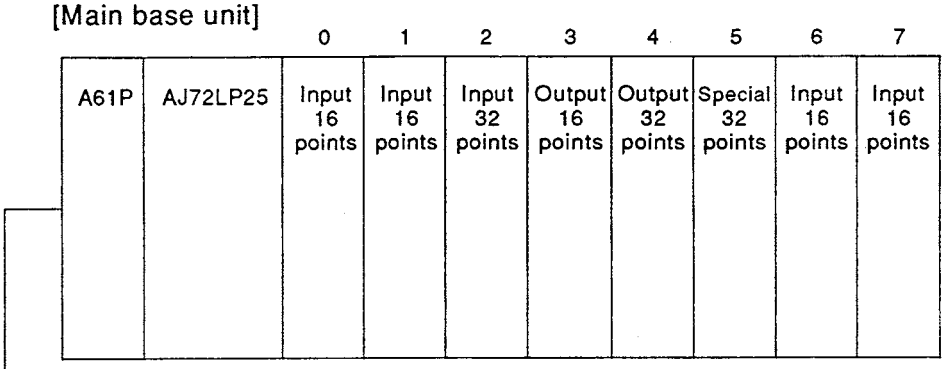
Set the module information for each slot here.
Select the settings from the list provided (1 to 9, A to H).

[Setting example]

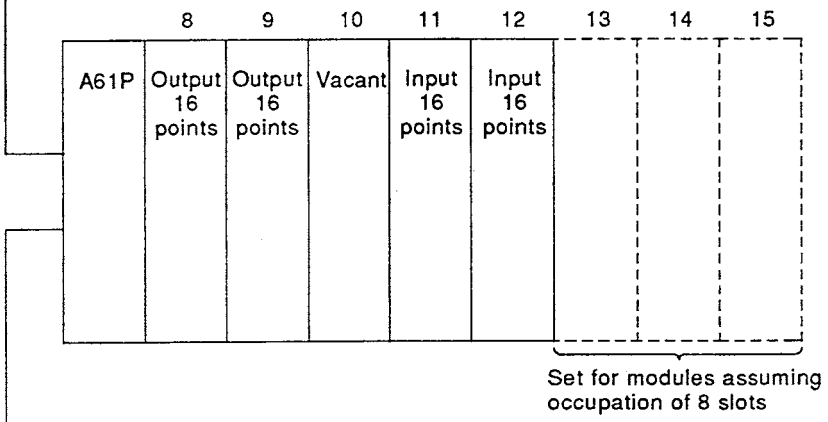
Setting the parameters for the remote I/O station configuration shown below.

<System configuration>

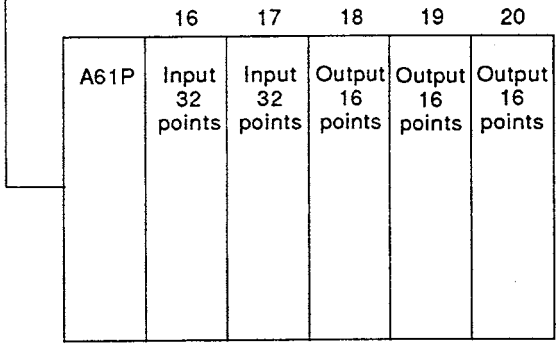
[Main base unit]



[Extension base unit 1]

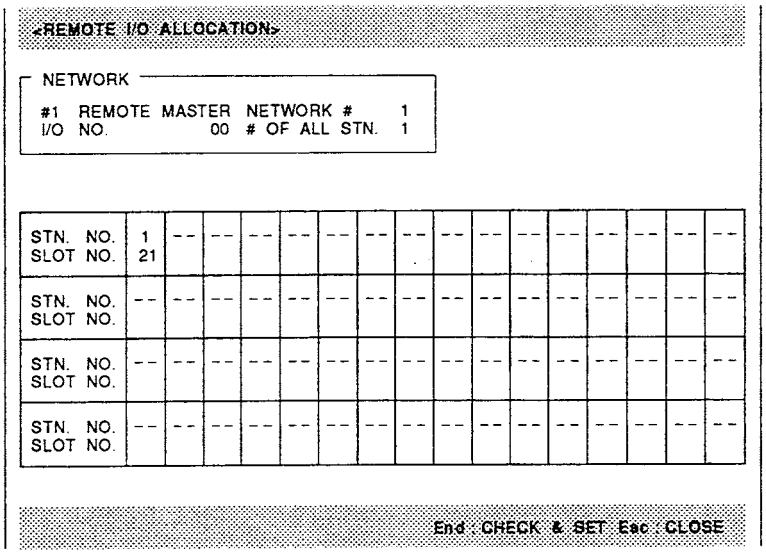


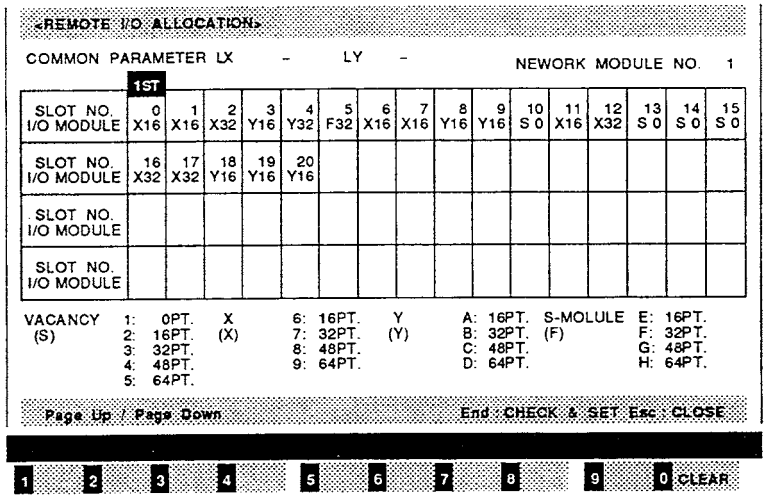
[Extension base unit 2]



* Set "vacant, 0 points" for the vacant slots (10, 13 to 15).

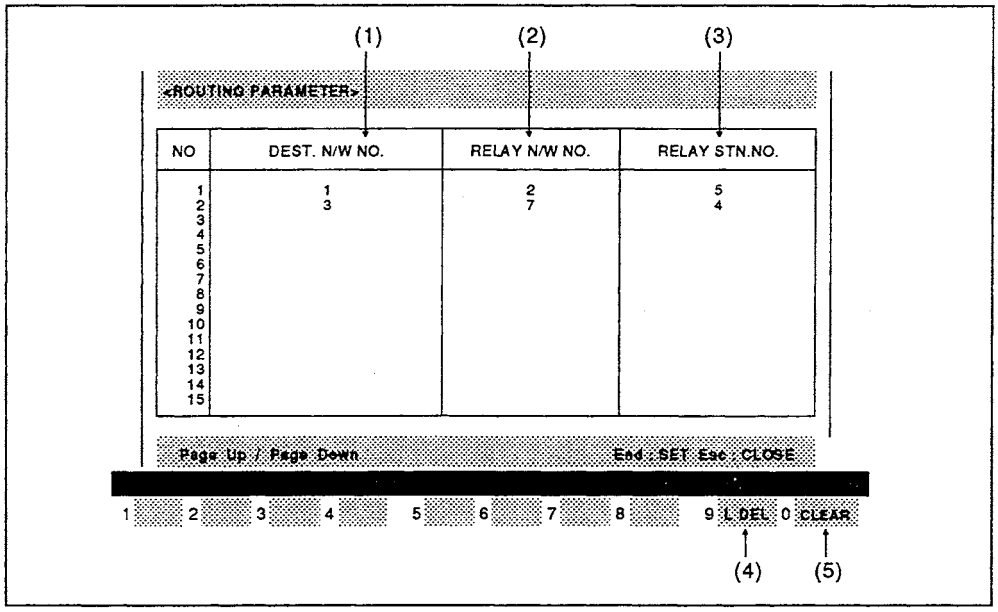
<Parameter setting screen>





9.2 Routing Parameters

These parameters are set to enable transient transmission to stations in other networks.



Routing Parameter Setting Screen

(1) DESTINATION NETWORK NO.

[Purpose]

Set the network No. of the network where the request destination station is located.
Up to 64 settings can be made.

(2) RELAY NETWORK NO.

[Purpose]

Set the network No. of the first network on the route leading to the network in which the request destination station is located. (Network No. of the network to which the host station is connected).

(3) RELAY STATION NO.

[Purpose]

Set the station No. of the relevant station in the first network on the route leading to the network in which the request destination is located.

(4) L DEL (F9 key)

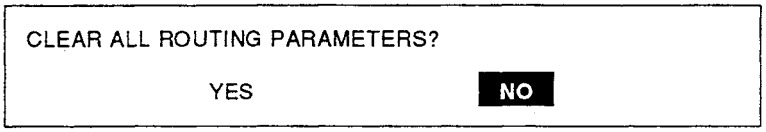
[Purpose]

Used to delete the setting on the line where the cursor is located.

(5) CLEAR (F10 key)

[Purpose]

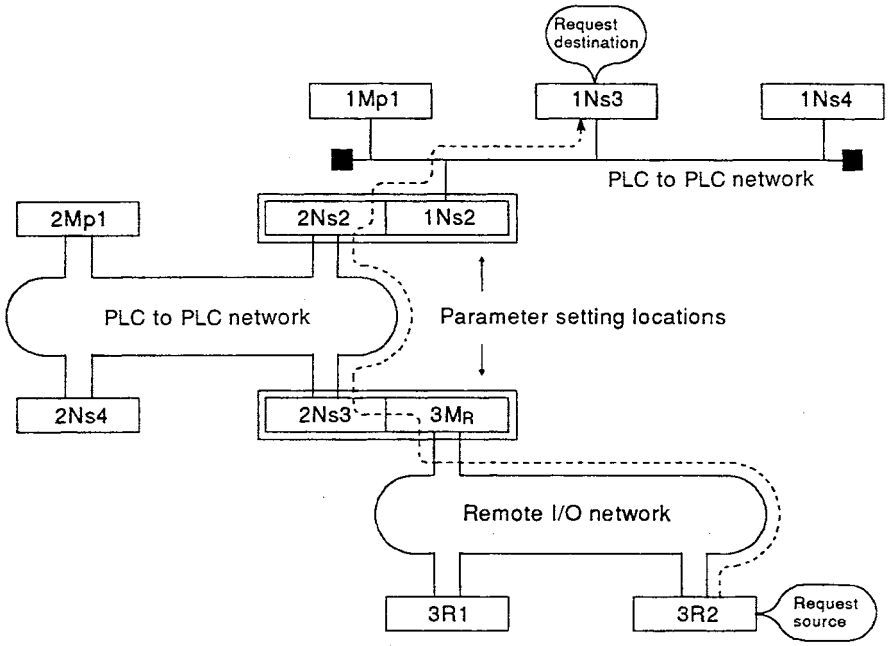
Used to delete all the set routing parameters.



[Setting example]

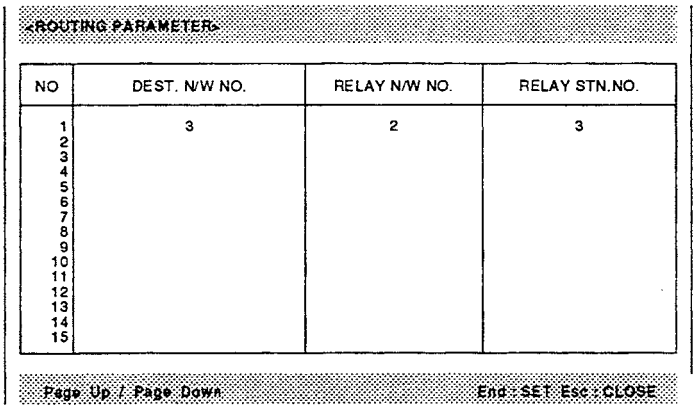
Setting the parameters for the system configuration shown below.

<System configuration>



<Parameter setting screen>

(a) Setting for 1Ns2/2Ns2



(b) Setting for 2Ns3/3M_R

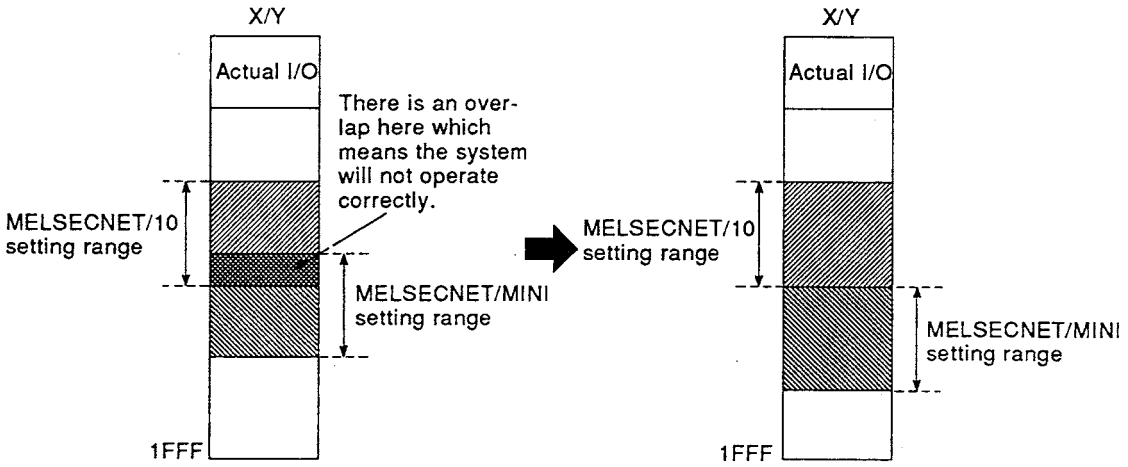
<ROUTING PARAMETER>

NO	DEST. N/W NO.	RELAY N/W NO.	RELAY STN.NO.
1	1	2	2
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

Page Up / Page Down End : SET Esc : CLOSE

9.3 Precautions when the System Includes Networks Other than Remote I/O Networks

If multiple network modules (MELSECNET/10), data link modules (MELSECNET (II)), MELSEC/MINI master modules, etc., are mounted to one AnUCPU, care is required to ensure that the parameter setting ranges do not overlap each other or the actual I/O range.



Related items:

- Actual I/O
- MELSECNET local stations
- MELSECNET remote stations
- MELSECNET/MINI automatic refresh
- MELSECNET/10 PLC to PLC network
- MELSECNET/10 remote I/O network

10. PROGRAMMING

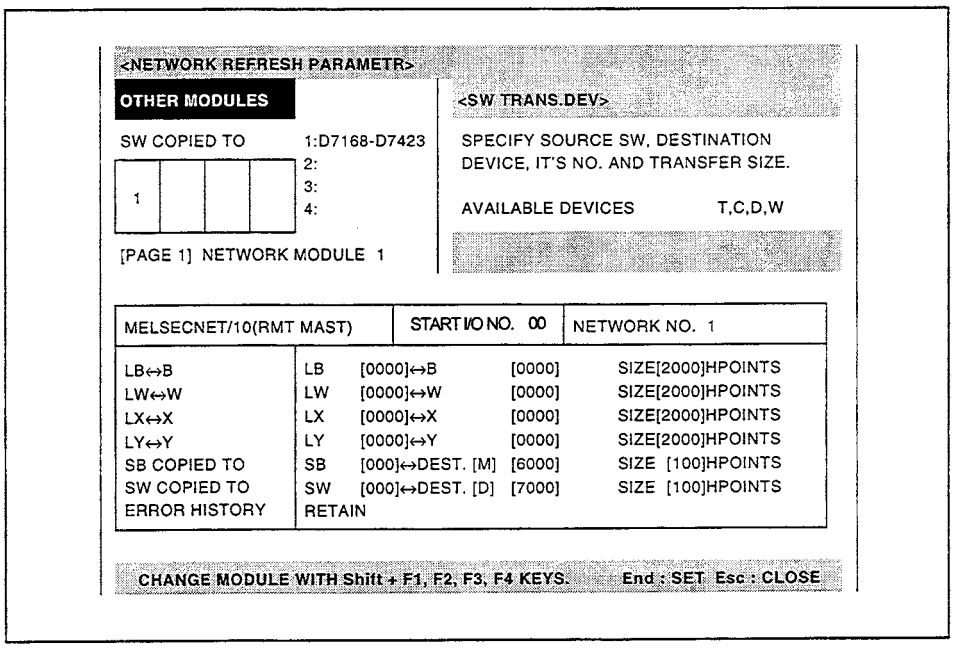
This section describes the master station program and special relays/registers required to operate the data link.
When applying the following program examples to the actual system, make sure to examine the applicability and confirm that it will not cause system control problems.

10.1 Precautions Relating to Programming

When operating a data link with remote I/O stations, observe the following points.

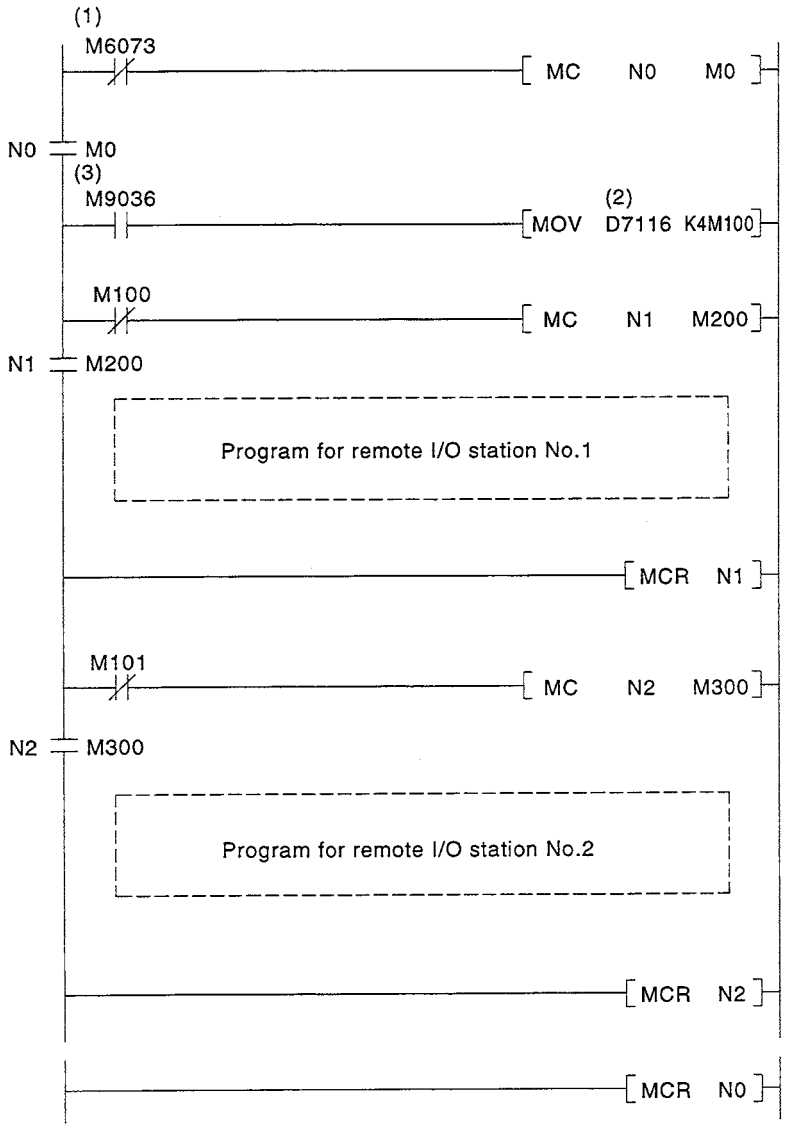
(1) Create a program in which interlocks are established according to the condition of the data link between the remote I/O stations and the host station (master station).

In this case, the refresh parameters have been set as shown below.



With the above refresh parameter setting, the following interlock signals can be used in the program.

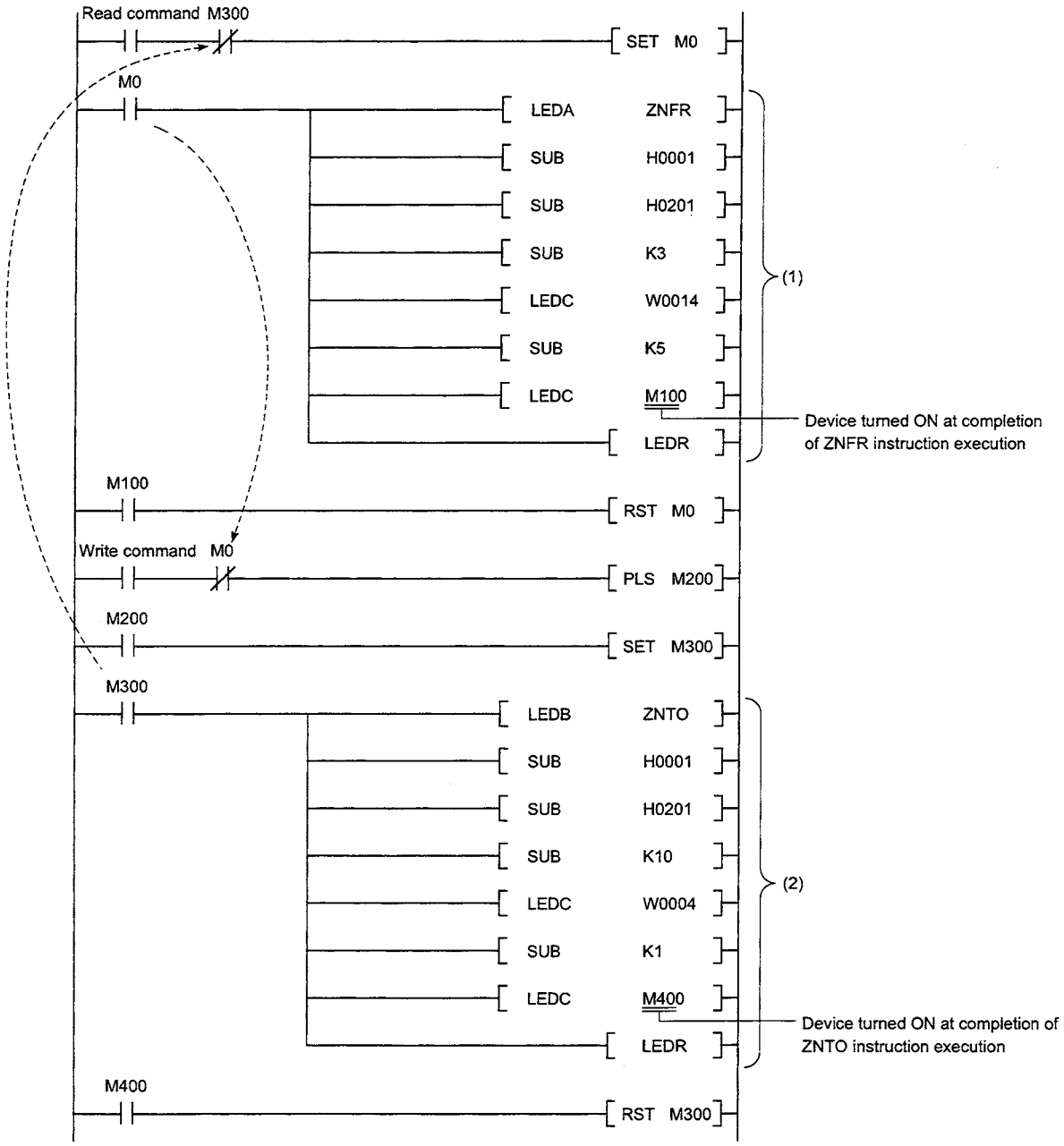
(1) M6073 ..... SB0049 (Master station cyclic transmission status)
(2) D7116 ..... SW0074 (Cyclic transmission status for each remote I/O station)
(3) M9036 ..... Always ON


(1)
M6073
MC N0 M0
N0 M0
(3)
M9036
(2)
MOV D7116 K4M100
M100
MC N1 M200
N1 M200
Program for remote I/O station No.1
MCR N1
M101
MC N2 M300
N2 M300
Program for remote I/O station No.2
MCR N2
MCR N0

(2) If two or more ZNFR/ZNTO instructions are executed with respect to the same special function module in a remote I/O station, write the program so that a mutual interlock is established between the two (so that an instruction can only be executed when execution of the other instruction has been completed).

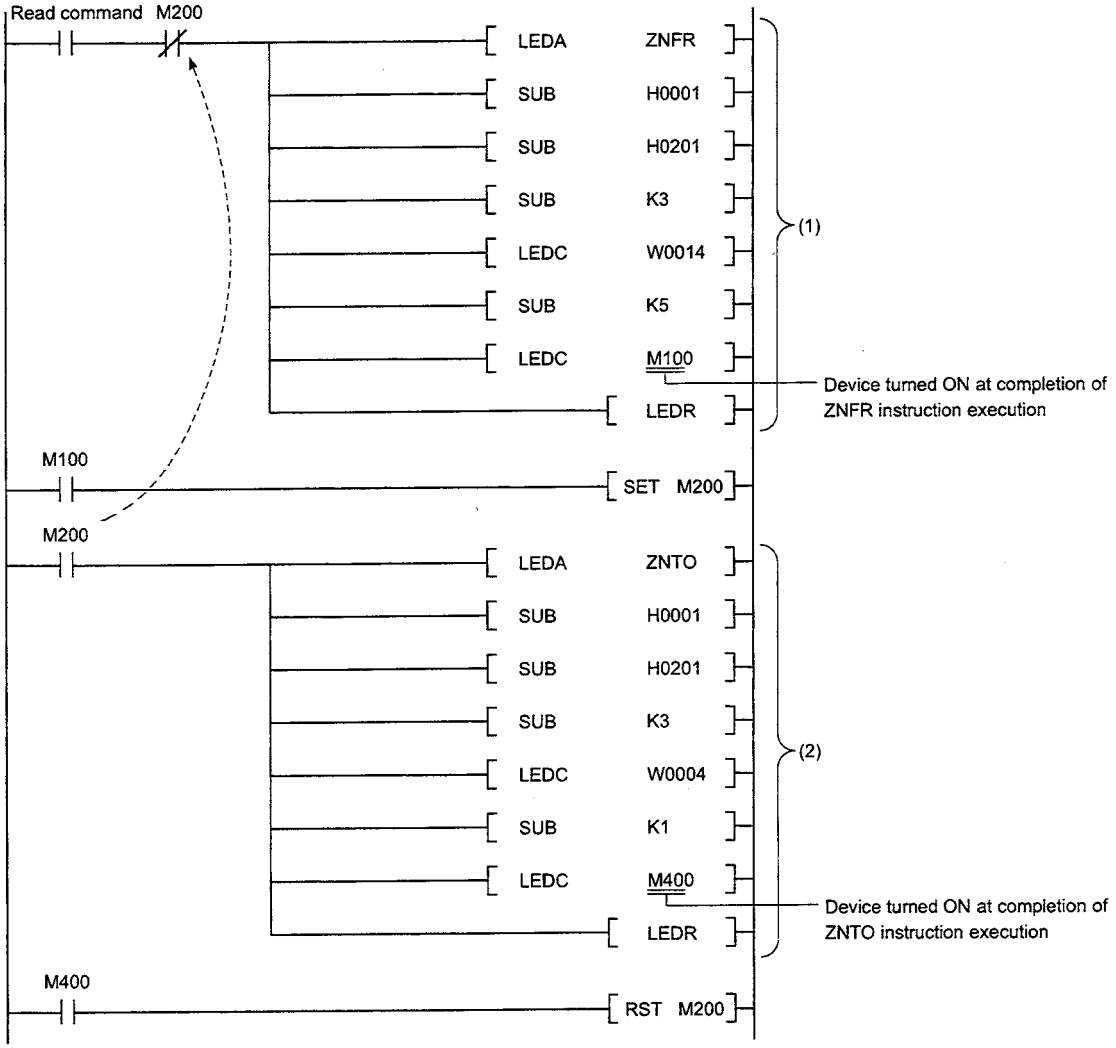
(a) Example of alternate execution of ZNFR and ZNTO instructions

[(1) Executed when ON (normally) (2) Executed at start-up]



(b) Example of sequential execution of ZNFR and ZNTO instructions

[(1) Executed when ON (normally) (2) Executed when ON (normally)]

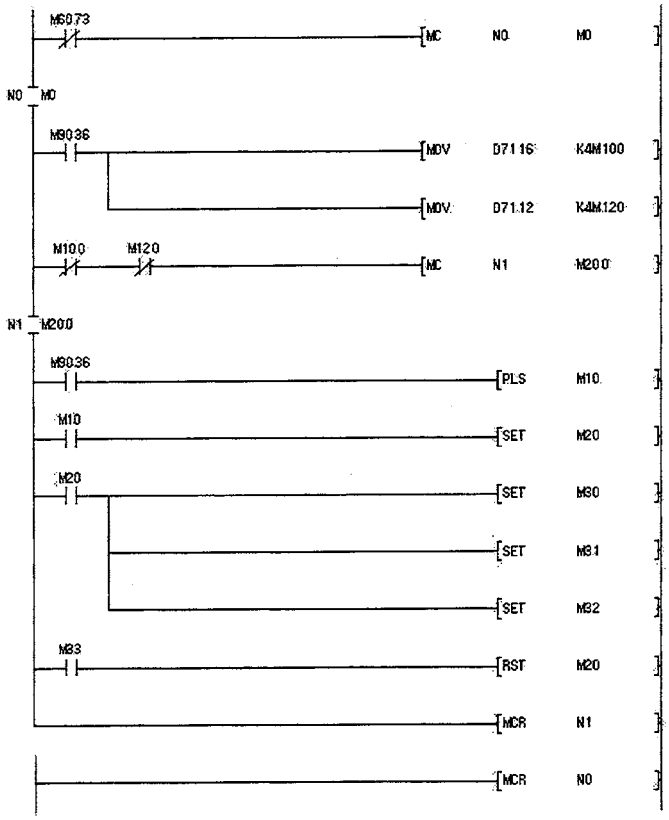


(3) If initial settings have been made in the program for the buffer memory of a special function module on a remote I/O station, design the program by which, when only the remote I/O station is reset (when power is switched OFF or the reset switch of the network module on the remote I/O station is turned ON), the reset status will be detected at the master station and initial settings will be made to the special function module again.
Initial setting are made to a special function module when:
(a) Sampling cycle or request for setting data set is set on the A/D converter, A616AD.
(b) The number of channels or average processing specification is set on the AD converter, A68AD.

Whether the remote I/O station has been reset or not can be checked using the baton passing status at each station (SW0070 to SW0073) of the link special registers.

SW0070 to SW00d73 are assigned to D7112 to 7119 in the network refresh parameters. When using devices of the baton passing status at each station and cyclic transmission status at each station in a program, develop them in the bit devices M, L, etc. using the MOV instruction.

Program example for making initial settings to the special function module at remote I/O station No. 1.



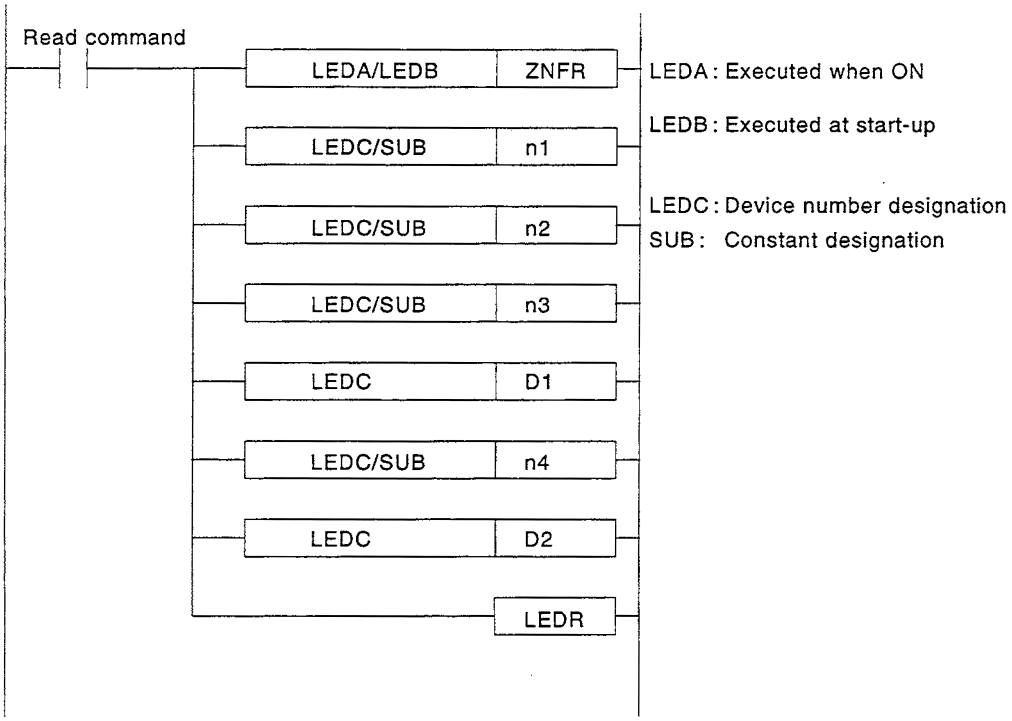
10.2 Reading/Writing Data from/to Special Function Module's Buffer Memory

This section describes the instructions (ZNFR/ZNTO) used to read and write the data in the buffer memories of special function modules at remote I/O stations.

10.2.1 Reading data from buffer memory (ZNFR instruction)

The ZNFR instruction can be used in a MELSECNET/10 network system (remote I/O network) only. It is not available for a PLC to PLC network.

[Instruction format]



Item	Details	Setting Range
n1	Network No.	1 to 255
n2	Station No. and position (1st, 2nd, 3rd, etc.) of the special function module H L Station No. | Position	——
n3	Buffer memory head address	——
D1	Head No. of the link registers (W) used to store read data	——
n4	Number of words of data to be read	1 to 256
D2	Bit device No. switched ON on completion of execution	Y, M, L, S, B*1

*1: The range not used by the network can be set for B.

For n1, n2, n3 and n4, specify a prefix "K[ ][ ]" for decimal setting or "H[ ][ ]" for hexadecimal setting.

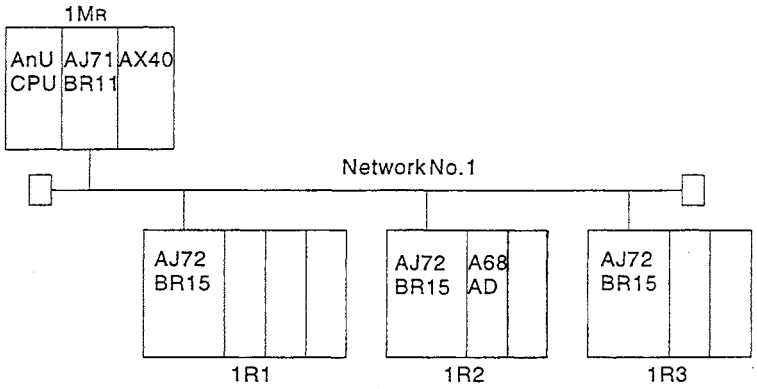
(Example) Decimal: K10, hexadecimal: HA

[Program example 1]

When X20 is ON, the data addressed 10 to 14 in the buffer memory of the special function module (A68AD) placed in the 1st position of 1R2 are read out to W0014 to W0018.

It is assumed that one special function module only is placed at 1R2.

(1) System configuration



(2) Common parameters

Remote I/O Station No.	M→R	M←R	M→R	M←R
	LB	LB	LW	LW
1	—	—	—	—
2	0000 to 000F	0010 to 001F	0000 to 000F	0010 to 001F
3	—	—	—	—

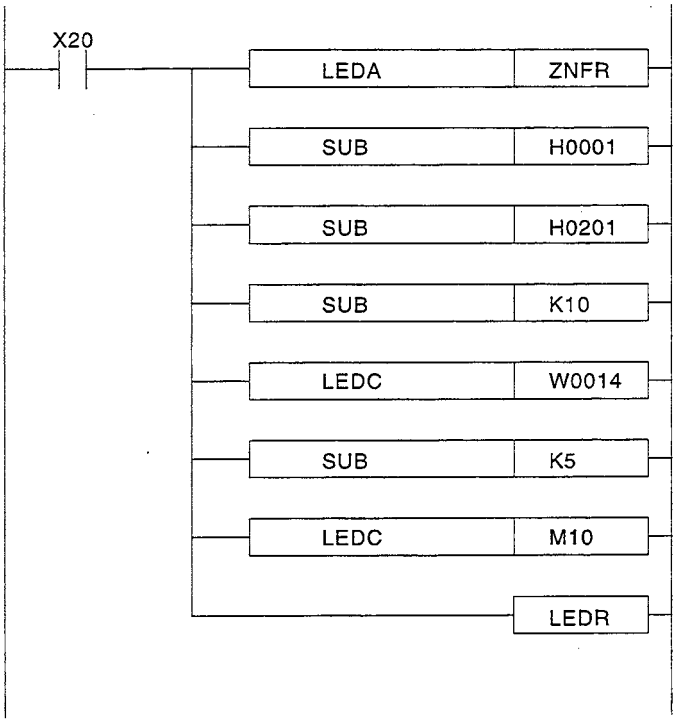
(3) Handshake device range for the ZNFR instruction used by the system

LB		LW	
M→R2	M←R2	M→R2	M←R2
0000 to 0003	0010 to 0013	0000 to 0003	0010 to 0013

(4) Device range available for the ZNFR instruction

LB		LW	
M→R2	M←R2	M→R2	M←R2
Unusable	Unusable	Unusable	0014 to 001F

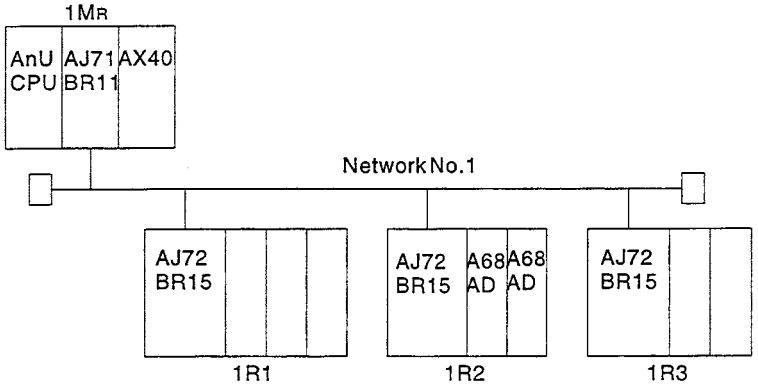
(5) Program


X20
LEDA
ZNFR
SUB
H0001
SUB
H0201
SUB
K10
LEDC
W0014
SUB
K5
LEDC
M10
LEDR

[Program example 2]

When X20 is ON, the data addressed 10 to 14 in the buffer memory of the special function module (A68AD) placed in the 1st position of 1R2 are read out to W0028 to W002C. Also, when X21 is ON, the data addressed 15 to 17 in the buffer memory of the special function module (A68AD) placed in the 2nd position of 1R2 are read out to W002D to W002F.
In this case, it is assumed that only 2 special function modules are placed at 1R2.

(1) System configuration



(2) Common parameters

Remote I/O Station No.	M→R	M←R	M→R	M←R
	LB	LB	LW	LW
1	—	—	—	—
2	0000 to 001F	0020 to 003F	0000 to 001F	0020 to 003F
3	—	—	—	—

(3) Handshake device range for the ZNFR instruction used by the system

LB		LW	
M→R2	M←R2	M→R2	M←R2
0000 to 0007	0020 to 0027	0000 to 0007	0020 to 0027

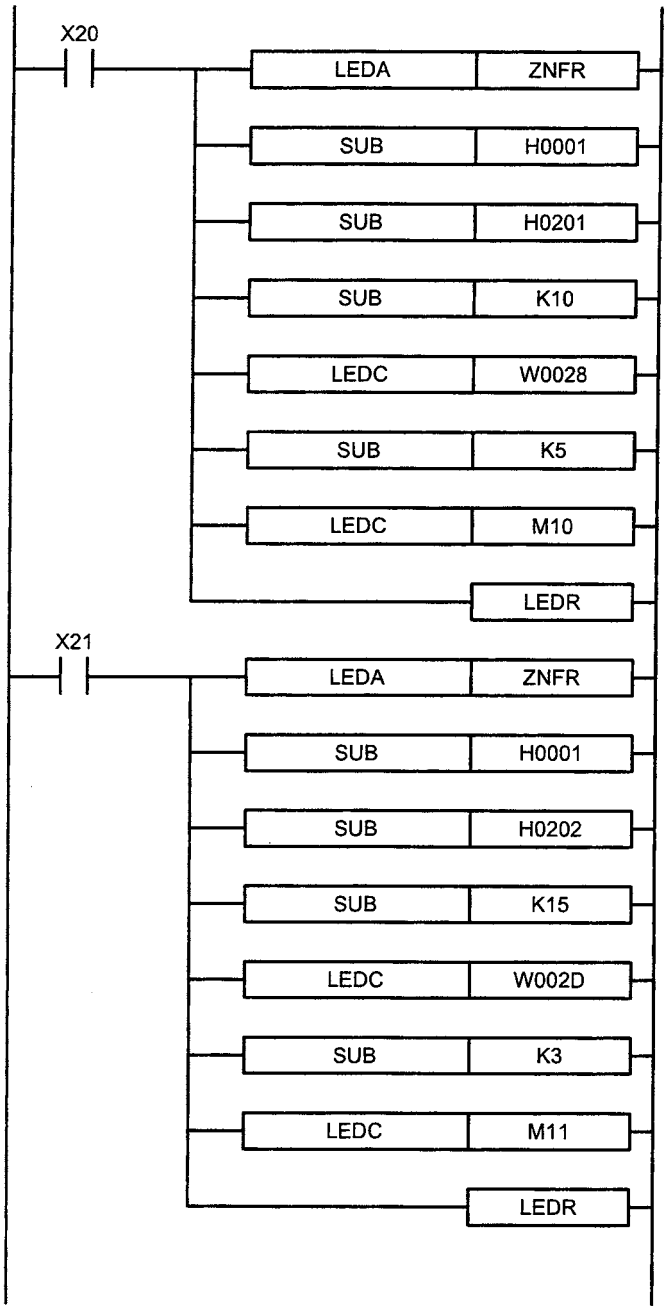
*For the handshake devices used by the system, the number of points calculated by the following expression is required, starting from the head device number of the device set in the common parameter.

Number of handshake device points =
4 points × number of special function modules mounted on remote I/O station

(4) Device range available for the ZNFR instruction

LB		LW	
M→R2	M←R2	M→R2	M←R2
Not available	Not available	Not available	0028 to 003F

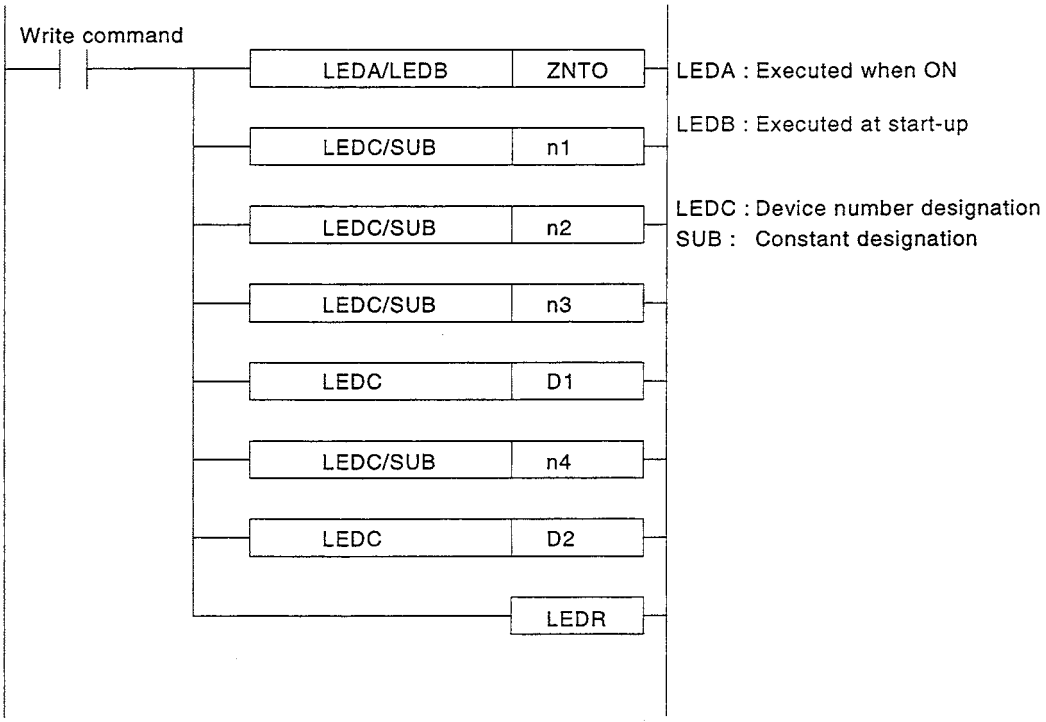
(5) Program


X20
LEDA
ZNFR
SUB
H0001
SUB
H0201
SUB
K10
LEDC
W0028
SUB
K5
LEDC
M10
LEDR
X21
LEDA
ZNFR
SUB
H0001
SUB
H0202
SUB
K15
LEDC
W002D
SUB
K3
LEDC
M11
LEDR

10.2.2 Writing data to buffer memory (ZNTO instruction)

The ZNTO instruction can be used in the MELSECNET/10 network system (remote I/O network) only. It is not available for the PLC to PLC network.

[Instruction format]



Item	Details	Setting Range
n1	Network No.	1 to 255
n2	Station No. and position (1st, 2nd, 3rd, etc.) of the special function module H L Station No. | Position	——
n3	Buffer memory head address	——
D1	Head No. of the link registers (W) used to store data to be written	——
n4	Number of words of data to be written	1 to 256
D2	Bit device No. switched ON for 1 scan on completion of execution	Y, M, L, S, B*1

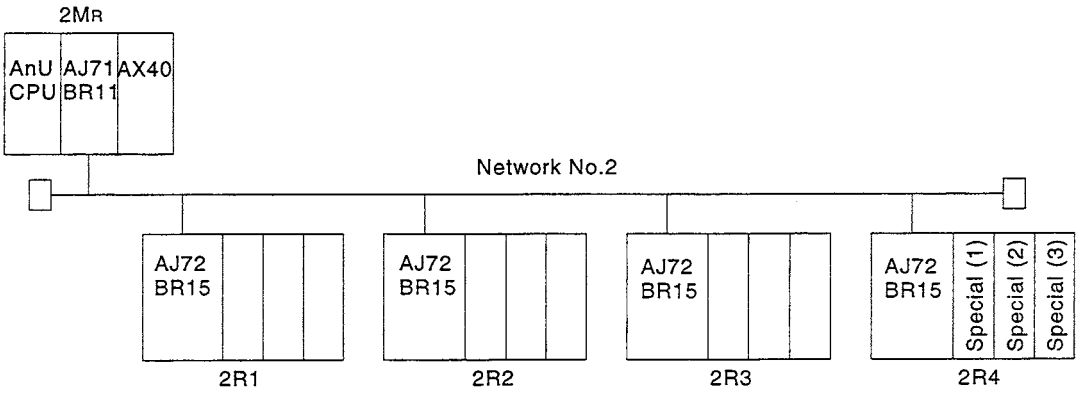
*1: The range not used by the network can be set for B.

[Program example]

When X20 is ON, the data of W012C to W012F are written to the buffer memory addresses 0 to 3 of the special function module mounted in the 2nd place of the 2R4.

In this case, it is assumed that 3 special function modules are placed at 2R4.

(1) System configuration



(2) Common parameters

Remote I/O Station No.	M→R	M←R	M→R	M←R
	LB	LB	LW	LW
1	—	—	—	—
2	—	—	—	—
3	—	—	—	—
4	0100 to 010F	0110 to 011F	0100 to 011F	0120 to 013F

(3) Handshake device range for the ZNTO instruction used by the system

LB		LW	
M→R2	M←R2	M→R2	M←R2
0100 to 010B	0110 to 0113	0100 to 010B	0120 to 012B

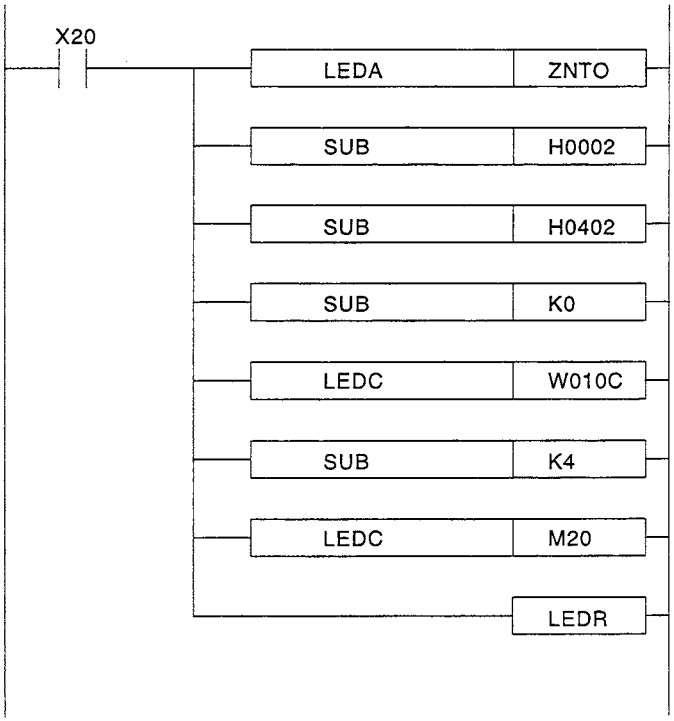
*For the handshake devices used by the system, the number of points calculated by the following expression is required, starting from the head device number of the device set in the "Common Parameters".

Number of handshake device points =
4 points × number of special function modules mounted on remote I/O station

(4) Device range available for the ZNTO instruction

LB		LW	
M→R2	M←R2	M→R2	M←R2
Not available	Not available	010C to 010F	Not available

(5) Program


X20
LEDA
ZNTO
SUB
H0002
SUB
H0402
SUB
K0
LEDC
W010C
SUB
K4
LEDC
M20
LEDR

10.3 Special Link Relays (SB)/Registers (SW)

In a network module, the data link conditions are stored in special relays (SB) and special registers (SW).
SB/SW devices are used by the "network monitor" function of peripheral devices. Refer to Section 5 for details on the device numbers used for the individual items in the monitor screen.
At the master station, the SB/SW data is transferred to the AnUCPU in accordance with the network refresh parameters and it can therefore be used in sequence programs.
At a remote I/O station, SB/SW0000 to 00FF are transferred to M/D0 to 255.

10.3.1 Special link relays (SB)

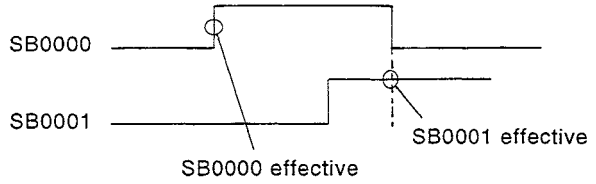
Data link relays are switched ON and OFF in accordance with a variety of factors during data link operation. Table 10.1 lists the special link relays.
The figures in parentheses in the "Number" column are in decimal notation.

Table 10.1 List of Special Link Relays

Number	Name	Function	Device Use Possible?			
			Master Station		Remote I/O Station	
			Optical/ coaxial Loop	Coaxial Bus	Optical/ coaxial Loop	Coaxial Bus
SB0000 (0) *1 *3	Link start (host station)	Restarts cyclic transmission at the host station. OFF: Start not designated ON: Start designated (at leading edge) *2	O	O	O	O
SB0001 (1) *1 *3	Link stop (host station)	Stops cyclic transmission at the host station. OFF: Stop not designated ON: Stop designated (at leading edge) *2	O	O	O	O
SB0002 (2) *1 *3	System link start	Restarts cyclic transmission in accordance with the contents of SW0000 to SW0004. OFF: Stop not designated ON: Stop designated (at leading edge) *2	O	O	O	O
SB0003 (3) *1 *3	System link stop	Stops cyclic transmission in accordance with the contents of SW0000 to SW0004. OFF: Stop not designated ON: Stop designated (at leading edge) *2	O	O	O	O
SB0005 (5)	Retry frequency clear	Clears the retry frequency (SW00C8, SW00C9) to zero. OFF: Clearance not designated ON: Clearance designated (effective while ON)	O	O	O	O
SB0006 (6) *1	Communi-cation error count clear	Clears the communication error count (SW00B8 to SW00C7) to zero. OFF: Clearance not designated ON: Clearance designated (effective while ON)	O	O	O	O

*1 Used in the network test at peripheral devices.

*2 SB000 to SB003 become effective when a single point is switched ON.



*3 Valid only when SB0047 is off. When it turns on (error), the last data are retained.

Table 10.1 List of Special Link Relays (Continued)

Number	Name	Function	Device Use Possible?			
			Master Station		Remote I/O Station	
			Optical/ coaxial Loop	Coaxial Bus	Optical/ coaxial Loop	Coaxial Bus
SB0007 (7)	Forward loop transmission error clear	Clears the forward loop line error detection count (SW00CC). OFF : Clearance not designated ON : Clearance designated (effective while ON)	O	X	O	X
SB0008 (8)	Reverse loop transmission error clear	Clears the reverse loop line error detection count (SW00CD). OFF : Clearance not designated ON : Clearance designated (effective while ON)	O	X	O	X
SB0009 (9) *4	Loop switching count clear	Clears the loop switching count (SW00CE to E7) to zero. OFF : Clearance not designated ON : Clearance designated (effective while ON)	O	X	O	X
SB000A (10)	Transient transmission error clear	Clears transient transmission errors (SW00EE, SW00EF) to zero. OFF : Clearance not designated ON : Clearance designated (effective while ON)	O	O	O	O
SB000B (11)	Transient transmission error area setting	Specifies whether transient transmission errors (SB00F0 to FF) are overwritten or preserved. OFF : Overwrite ON : Hold	O	O	O	O
SB000D (13) *5	Fuse blown error clear/check	Clears the fuse blown error detected by the remote I/O station, or disables a check for a fuse blown error at the remote I/O station. OFF : Clear command disabled, error check enabled. ON : Clear command enabled, error check disabled. (Valid when ON)	O	O	X	X
SB000E (14) *5	I/O verify error clear/check	Clears the I/O verify error detected by the remote I/O station, or disables a check for an I/O verify error at the remote I/O station. OFF : Clear command disabled, error check enabled. ON : Clear command enabled, error check disabled. (Valid when ON)	O	O	X	X
SB0020 (32)	Module status	Displays the communication status between the network module and the CPU module. OFF : Normal ON : Error	O	O	X	X
SB0040 (64)	Network type (host station)	Indicates the type of network set using the switches on the host station network module. OFF : PLC to PLC network ON : Remote I/O network	O	O	O	O
SB0043 (67)	Online switch (host station)	Indicates the mode set using the switches on the host station network module. OFF : Online (mode setting = 0 or 1) ON : Other than online (mode setting not 0 or 1)	O	O	O	O
SB0044 (68)	Station setting (host station)	Indicates the station type set using the switches on the host station network module. OFF : Normal station ON : Control station	O	O	O	O
SB0047 (71)	Baton passing status	Indicates the baton passing status of the host station. OFF : Normal ON : Error	O	O	O	O
SB0048 (72) *3	Control station status (host station)	Indicates the station that controls baton passing (transient transmission enabled status). OFF: Remote I/O station ON: Master station (SB0044 is ON) Remote I/O station (SB0044 is OFF)	O	O	O	O
SB0049 (73)	Cyclic transmission status	Indicates the cyclic transmission status at the host station. OFF: Normal ON: Error (Set after refresh is completed)	O	O	O	O

*3 Valid only when SB0047 is off. When it turns on (error), the last data are retained.
*4 SB0009 must remain ON until SW00CE becomes "0".
*5 Made valid when SB0049 is OFF (data link being executed).

Table 10.1 List of Special Link Relays (Continued)

Number	Name	Function	Device Use Possible?			
			Master Station		Remote I/O Station	
			Optical/ coaxial Loop	Coaxial Bus	Optical/ coaxial Loop	Coaxial Bus
SB0049 (73)	Cyclic transmission status	Indicates the cyclic transmission status at the host station. OFF: Normal ON: Error (Set after refresh is completed)	O	O	O	O
SB004B (75) *3	Host station CPU status	Indicates the CPU status of the host station. OFF: Normal ON: Error	O	O	X	X
SB004C (76) *3	Cyclic transmission start reception status	Indicates the cyclic transmission start reception status. OFF: Start signal not received (SB0000 is OFF) ON: Start signal received (SB0000 is ON)	O	O	O	O
SB004D (77) *3	Cyclic transmission start completion status	Indicates the cyclic transmission start completion status. OFF: Not completed (SB0000 is OFF) ON: Start completed (SB0000 is ON)	O	O	O	O
SB004E (78) *3	Cyclic transmission stop reception status	Indicates the cyclic transmission stop reception status. OFF: Stop signal not received (SB0001 is OFF) ON: Stop signal received (SB0001 is OFF)	O	O	O	O
SB004F (79) *3	Cyclic transmission stop completion status	Indicates the cyclic transmission stop completion status. OFF: Stop not completed (SB0001 is OFF) ON: Stop completed (SB0001 is ON)	O	O	O	O
SB0050 (80) *3	Cyclic transmission start reception status	Indicates the cyclic transmission start reception status. OFF: Start signal not received (SB0002 is OFF) ON: Start signal received (SB0002 is ON)	O	O	O	O
SB0051 (81) *3	Cyclic transmission start completion status	Indicates the cyclic transmission start completion status. OFF: Not completed (SB0002 is OFF) ON: Start completed (SB0002 is ON)	O	O	O	O
SB0052 (82) *3	Cyclic transmission stop reception status	Indicates the cyclic transmission stop reception status. OFF: Stop signal not received (SB0003 is OFF) ON: Stop signal received (SB0003 is OFF)	O	O	O	O
SB0053 (83) *3	Cyclic transmission stop completion status	Indicates the cyclic transmission stop completion status. OFF: Stop not completed (SB0003 is OFF) ON: Stop completed (SB0003 is ON)	O	O	O	O
SB0054 (84)	Parameter reception status	Indicates the parameter reception status. OFF: Reception completed ON: Not received	O	O	O	O
SB0055 (85)	Received parameter error	Indicates the status of the received parameter. OFF: Parameter normal ON: Parameter error	O	O	O	O
SB0056 (86) *3	Communi-cation data	Indicates the transient transmission status. OFF: Transient transmission by the control status ON: Transient transmission by a sub-control station	O	O	O	O
SB0058 (88)	Operation designation at fault of (multiplexed) remote master station	Indicates the status of designating cyclic transmission when the (multiplexed) remote master station fails. ON: Cyclic transmission not made when remote master station fails	O	O	O	O
SB0064 (100)	Reserve station setting	Indicates whether a reserve station has been set. (Effective when SB0049 is OFF) OFF: No reserve station set ON: Reserve station(s) set OFF when SW0064 to 67 are all "0".	O	O	O	O

*3 Valid only when SB0047 is off. When it turns on (error), the last data are retained.

Table 10.1 List of Special Link Relays (Continued)

Number	Name	Function	Device Use Possible?			
			Master Station		Remote I/O Station	
			Optical/ coaxial Loop	Coaxial Bus	Optical/ coaxial Loop	Coaxial Bus
SB0068 (104)	Communi-cation mode	Indicates the link scan mode (status set in the common parameter extension setting). (Effective when SB0049 is OFF) OFF: Normal mode ON: Constant scan mode	O	O	O	O
SB0069 (105)	Transmission setting	Indicates the transmission specification in the common parameter extension settings. (Effective when SB0049 is OFF) OFF: Normal transmission specified ON: Multiplex transmission specified	O	X	O	X
SB006A (106) *3	Transmission condition	Indicates the transmission condition. OFF: Normal transmission in progress ON: Multiplex transmission in progress	O	X	O	X
SB0070 (112) *3	Baton passing status at each station	Indicates the baton passing status at each station. (Reserve stations and stations with the highest and higher station numbers are not applicable.) OFF: All stations normal ON: Error at one or more stations OFF when SW0070 to 73 are all "0".	O	O	O	O
SB0071 (113) *3	Baton pass status of the remote master station	Indicates the baton pass status of the master station. (Including when there is an online loop test.) OFF : Master station baton pass normal. ON : Master station baton pass error.	X	X	O	O
SB0074 (116) *3	Cyclic transmission status at each station	Indicates the cyclic transmission status at each station. (Reserve stations and stations with the highest and higher station numbers are not applicable.) OFF: Data link executed at all stations ON: Data link not executed at one or more stations OFF when SW0074 to 77 are all "0".	O	O	O	O
SB0075 (117) *3	Master station cyclic transmission status	Indicates the cyclic transmission status at the master station. OFF : Normal ON : Error	X	X	O	O
SB0078 (120) *3	Parameter communi-cation status at each station	Indicates the parameter communication status at each station. (Reserve stations and stations with the highest and higher station numbers are not applicable.) OFF: Parameter communication not in progress ON: Parameter communication in progress OFF when SW0078 to 7B are all "0".	O	O	X	X
SB007C (124) *3	Parameter status at each station	Indicates the parameter status at each station. OFF: Parameter error at one or more stations ON: No parameter error at any station OFF when SW007C to 7F are all "0".	O	O	X	X
SB0080 (128) *3	CPU status at each station	Indicates the remote I/O station status at each station. (including the host station) OFF: All stations normal ON: One or more faulty stations (Including fuse blown error and I/O verify error) OFF when SW0080 to 83 are all "0".	O	O	O	O
SB0085 (133) *3	Master station CPU status	Indicates the master station CPU status. OFF:RUN, STEP RUN ON: STOP, PAUSE	X	X	O	O
SB0090 (144)	Host station loop status	Indicates the loop status of the host station. OFF: Normal ON: Error OFF when SW0090 is "0".	O	X	O	X

*3 Valid only when SB0047 is off. When it turns on (error), the last data are retained.

Table 10.1 List of Special Link Relays (Continued)

Number	Name	Function	Device Use Possible?			
			Master Station		Remote I/O Station	
			Optical/ coaxial Loop	Coaxial Bus	Optical/ coaxial Loop	Coaxial Bus
SB0091 (145) *3	Forward loop status	Indicates the status of stations connected in a forward loop. OFF: All stations normal ON: One or more faulty stations OFF when SW0091 to 94 are all OFF.	O	X	O	X
SB0092 (146) *3	Master station forward loop status	Indicates the forward loop status of the master station. OFF : Normal ON : Error	X	X	O	X
SB0095 (149) *3	Reverse loop status	Indicates the status of stations connected in a reverse loop. OFF: All stations normal ON: One or more faulty stations OFF when SW0095 to 98 are all OFF.	O	X	O	X
SB0096 (150) *3	Master station reverse loop status	Indicates the reverse loop status of the master station. OFF : Normal ON : Error	X	X	O	X
SB0099 (153) *3	Forward loop loopback	Indicates loopback statuses in the system's forward loop. OFF: Loopback not executed ON: Executed at one or more stations (data identifying the stations stored in SW0099)	O	X	O	X
SB009A (154) *3	Reverse loop loopback	Indicates loopback statuses in the system's reverse loop. OFF: Loopback not executed ON: Executed at one or more stations (data identifying the stations stored in SW009A)	O	X	O	X
SB00A8 (168)	Online test designation	Indicates whether or not an online test is designated. OFF: Not designated ON: Designated	O	O	O	O
SB00A9 (169)	Online test completion	Indicates whether or not an online test is completed. OFF: Not completed ON: Completed	O	O	O	O
SB00AA (170)	Online test response designation	Indicates the online test response status. OFF: No response received ON: Response received	O	O	O	O
SB00AB (171)	Online test completion status	Indicates the completion status of the online test. OFF: Completed without response ON: Completed with response	O	O	O	O
SB00AC (172)	Offline test designation	Indicates whether or not an offline test is designated. OFF: Not designated ON: Designated	O	O	O	O
SB00AD (173)	Offline test completion	Indicates whether or not an offline test is completed. OFF: Not completed ON: Completed	O	O	O	O
SB00AE (174)	Offline testing Response designation	Indicates the response status for offline test. OFF: No response ON: Response	O	O	O	O
SB00AF (175)	Offline testing Response end	Indicates the response status for offline test end. OFF: No response end ON: Response end	O	O	O	O
SB00EE (238)	Transient error	Indicates the error status for transient transmission. OFF: No error ON: Error	O	O	O	O

*3 Valid only when SB0047 is off. When it turns on (error), the last data are retained.

10.3.2 Special link registers (SW)

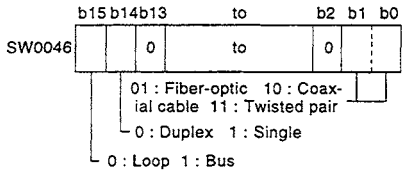
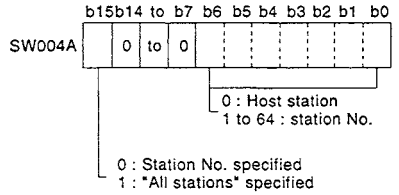
The special link registers are used to store data link information in numerical form.
The locations and causes of errors can be determined by monitoring these registers.
Table 10.2 lists the special link registers. The figures in parentheses in the "Number" column are in decimal notation.

Table 10.2 List of Special Link Registers

Number	Name	Function	Device Use Possible?			
			Master Station		Remote I/O Station	
			Optical/ coaxial Loop	Coaxial Bus	Optical/ coaxial Loop	Coaxial Bus
SW0000 (0) *1	Data link stop/start designation details	Sets the stations that stop and restart the data link. 00H: Host station 01H: All stations 02H: Designated station 41H: Group 1 to 49H: Group 9 80H: Host station (forced stop/restart) 81H: All stations (forced stop/restart) 82H: Designated station (forced stop/restart) C1H: Group 1 (forced stop/restart) to C9H: Group 9 (forced stop/restart)	O	O	O	O
SW0001 (1) • SW0002 (2) • SW0003 (3) • SW0004 (4) *1	Data link stop/start designation details	Set if "designated station" is specified (i.e., if 02H or 82H is set for SW0000). Set the bit that corresponds to the station that will stop/restart the data link to "1". 0: data link stop/restart instruction is invalid. 1: data link stop/restart instruction is valid. b15 b14 b13 b12 to b4 b3 b2 b1 b0 SW0001: 16 15 14 13 to 5 4 3 2 1 SW0002: 32 31 30 29 to 21 20 19 18 17 SW0003: 48 47 46 45 to 37 36 35 34 33 SW0004: 64 63 62 61 to 53 52 51 50 49 The figures 1 to 64 in the table are station numbers.	O	O	O	O
SW0020 (32)	Module status	Stores the communication status between the network module and the CPU module. 0: Normal Other than 0: Error codes are stored. (Refer to the user's manual for the CPU module used.)	O	O	X	X
SW0040 (64)	Network No.	Stores the network number of the host station. Range: 1 to 255	O	O	O	O
SW0042 (66)	Station No.	Stores the station number of the host station. Range: 1 to 64 (Master station: 7DH)	O	O	O	O
SW0043 (67)	Online switch	Stores the mode switch status of the host station. Range: 0H to FH	O	O	O	O
SW0044 (68)	Station setting	Stores the statuses of the condition setting switches of the host station. 0: OFF 1: ON b15 to b8 b7 b6 b5 b4 b3 b2 b1 b0 SW0044: 0 to 0 8 7 6 5 4 3 2 1 Numbers 1 to 8 in the table are the switch numbers.	O	O	O	O
SW0045 (69)	Setting error	Stores the host station switch settings. 0 : Normal	O	O	O	O

*1 Used in the network test at peripheral devices.

Table 10.2 List of Special Link Registers (Continued)

Number	Name	Function	Device Use Possible?			
			Master Station		Remote I/O Station	
			Optical/ coaxial Loop	Coaxial Bus	Optical/ coaxial Loop	Coaxial Bus
SW0046 (70)	Module classification	Stores the type of network module at the host station. 	O	O	O	O
SW0047 (71)	Baton passing status	Stores the baton passing status of the host station. 0 : Data link in progress 1 : Data link stopped (designation from another station) 2 : Data link stopped (designation from host station) 3 : Baton passing executed (parameter received (no transmission area in the host)) 4 : Baton passing executed (parameter error) 5 : Baton passing executed (parameters not received) 6 : Disconnection (no baton passing) 7 : Disconnection (line error) 11_H: Loop test 12_H: Setting confirmation test 13_H: Station order confirmation test 14_H: Communication test $1F_H$: Offline test FF_H: Resetting in progress	O	O	O	O
SW0048 (72)	Cause of data link transmission stoppage	Stores information on the cause for a stop in baton passing (transient transmission enabled status). 0: Normal communication 1: Offline 2: Offline test More than 3: Stop cause (See Section 11.1)	O	O	O	O
SW0049 (73)	Cyclic transmission stop cause	Stores the cause of a cyclic transmission stop at the host station 0 : Normal 1 : Stop designation issued 2 : No common parameters 3 : Common parameter error 6 : Communication suspension	O	O	O	O
SW004A (74) *2	Cyclic transmission stop request station	Stores the station that stopped cyclic transmission at the host station. (Effective when SW0049 is "1") 	O	O	O	O
SW004B (75)	Host station CPU status	Stores the CPU status of the host station 0 : Normal 1 or more : Error (See Section 11.1)	O	O	O	O

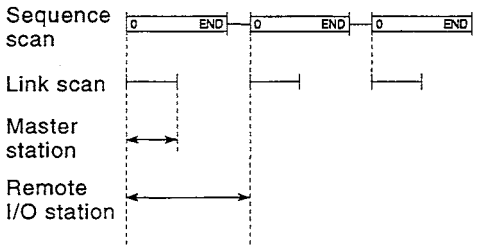
*2 Valid only when SB0047 is off. When it turns on (error), the last data are retained.

Table 10.2 List of Special Link Registers (Continued)

Number	Name	Function	Device Use Possible?			
			Master Station		Remote I/O Station	
			Optical/ coaxial Loop	Coaxial Bus	Optical/ coaxial Loop	Coaxial Bus
SW004C (76)	Host station CPU error slot No.	Stores the slot No. where a host station error occurred. Only effective when SW004B is other than "0".	X	X	O	O
SW004D (77) *2	Data link start condition (host station)	Stores the result when data link operation has started. 0: Normal More than 1: Error (See Section 11.1)	O	O	O	O
SW004F (79) *2	Data link stop condition (host station)	Stores the result when data link operation has stopped. 0: Normal More than 1: Error (See Section 11.1)	O	O	O	O
SW0051 (81) *2	Data link start condition (system)	Stores the result when data link operation has started. 0: Normal More than 1: Error (See Section 11.1)	O	O	O	O
SW0053 (83) *2	Data link stop status (system)	Stores the result when data link operation has stopped. 0: Normal More than 1: Error (See Section 11.1)	O	O	O	O
SW0055 (85)	Parameters	Stores the parameter status. 0: Parameters normal More than 1: Parameter error (refer to the error codes)	O	O	O	O
SW0056 (86) *2	Current master station	Stores the station number of the station controlling baton passing $7D_H$: Master station No. Other than 7DH : Control station No.	O	O	O	O
SW0057 (87)	Designated master station	$7D_H$: Master station No. 0 : Master station error	O	O	O	O
SW0059 (89)	Total number of link stations	Stores the highest station number set in the parameters. Range: 1 to 64 ("64" if no parameter setting)	O	O	O	O
SW005A (90)	Max. normal baton passing stations	Stores the highest station number in the number of stations that can execute baton passing normally. Range: 1 to 64	O	O	O	O
SW005B (91) *2	Max. cyclic transmission stations	Stores the highest station number in the maximum number of stations that can execute cyclic transmission. Range: 1 to 64	O	O	O	O
SW0064 (100) • SW0065 (101) • SW0066 (102) • SW0067 (103)	Reserve station specification	Stores information on the stations set as reserve stations. 0: Not reserve station 1: Reserve station Becomes effective when SB0049 is OFF. b15 b14 b13 b12 to b4 b3 b2 b1 b0 SW0064: 16 15 14 13 to 5 4 3 2 1 SW0065: 32 31 30 29 to 21 20 19 18 17 SW0066: 48 47 46 45 to 37 36 35 34 33 SW0067: 64 63 62 61 to 53 52 51 50 49 The figures 1 to 64 in the table are station numbers.	O	O	O	O

*2 Valid only when SB0047 is off. When it turns on (error), the last data are retained.

Table 10.2 List of Special Link Registers (Continued)

<table>
<tr><th rowspan="3">Number</th><th rowspan="3">Name</th><th rowspan="3">Function</th><th colspan="4">Device Use Possible?</th></tr>
<tr><th colspan="2">Master Station</th><th colspan="2">Remote I/O Station</th></tr>
<tr><th>Optical/ coaxial Loop</th><th>Coaxial Bus</th><th>Optical/ coaxial Loop</th><th>Coaxial Bus</th></tr>
<tr><td>SW0068 (104)</td><td>Communi-cation mode</td><td>Stores the constant link scan setting.
0: No setting stored
1 to 500: Set time (ms)
Becomes effective when SB0049 is OFF.</td><td>O</td><td>O</td><td>O</td><td>O</td></tr>
<tr><td>SW006B (107) *2</td><td>Max. link scan time</td><td rowspan="3">Stores the maximum value, minimum value, and current value for the link scan time. (Units: ms) These values are different for the master station and remote I/O stations.
  </td><td>O</td><td>O</td><td>O</td><td>O</td></tr>
<tr><td>SW006C (108) *2</td><td>Min. link scan time</td><td>O</td><td>O</td><td>O</td><td>O</td></tr>
<tr><td>SW006D (109) *2</td><td>Current link scan time</td><td>O</td><td>O</td><td>O</td><td>O</td></tr>
<tr><td>SW0070 (112)
•
SW0071 (113)
•
SW0072 (114)
•
SW0073 (115) *2</td><td>Baton passing status at each station</td><td>Indicates the baton passing status at each station (including the host station).
<Online>
0: Normal (including stations with the "highest" and higher station numbers, and reserve stations)
1: Error
<Offline>
0: Normal
1: Error (including stations with the "highest" and higher station numbers, and reserve stations)
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0070</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0071</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0072</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0073</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>The figure 1 to 64 in the table are station numbers.</td><td>O</td><td>O</td><td>O</td><td>O</td></tr>
<tr><td>SW0074 (116)
•
SW0075 (117)
•
SW0076 (118)
•
SW0077 (119) *2</td><td>Cyclic transmission status at each station</td><td>Stores the cyclic transmission status at each station (including the host station).
0: Cyclic transmission in progress (including stations with the highest and higher station numbers, and reserve stations)
1: Cyclic transmission not executed
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0074</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0075</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0076</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0077</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>The figures 1 to 64 in the table are station numbers.</td><td>O</td><td>O</td><td>O</td><td>O</td></tr>
</table>

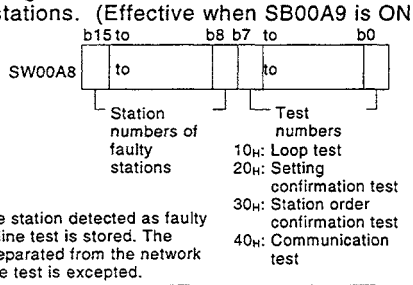
*2 Valid only when SB0047 is off. When it turns on (error), the last data are retained.

Table 10.2 List of Special Link Registers (Continued)

<table>
<tr><th rowspan="3">Number</th><th rowspan="3">Name</th><th rowspan="3">Function</th><th colspan="4">Device Use Possible?</th></tr>
<tr><th colspan="2">Master Station</th><th colspan="2">Remote I/O Station</th></tr>
<tr><th>Optical/ coaxial Loop</th><th>Coaxial Bus</th><th>Optical/ coaxial Loop</th><th>Coaxial Bus</th></tr>
<tr><td>SW0078 (120)
•
SW0079 (121)
•
SW007A (122)
•
SW007B (123)
*2</td><td>Parameter communi-cation status at each station</td><td>Stores the parameter communication status at each station.
0: Parameter communication not in progress (including stations with the "highest" and higher station numbers, and reserve stations)
1: Parameter communication in progress
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0078</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0079</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW007A</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW007B</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>The figures 1 to 64 in the table are station numbers.</td><td>O</td><td>O</td><td>X</td><td>X</td></tr>
<tr><td>SW007C (124)
•
SW007D (125)
•
SW007E (126)
•
SW007F (127)
*2</td><td>Parameter error status at each station</td><td>Stores the parameter status at each station.
0: Parameters normal (including stations with the "highest" and higher station numbers, and reserve stations)
1: Parameter error
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW007C</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW007D</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW007E</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW007F</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>The figures 1 to 64 in the table are station numbers.</td><td>O</td><td>O</td><td>X</td><td>X</td></tr>
<tr><td>SW0080 (128)
•
SW0081 (129)
•
SW0082 (130)
•
SW0083 (131)
*2</td><td>Remote I/O station status</td><td>Stores the statuses of the remote I/O stations (including the host station).
0: Normal (including stations with the "highest" and higher station numbers, and reserve stations)
1 : Error
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0080</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0081</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0082</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0083</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>The figures 1 to 64 in the table are station numbers.</td><td>O</td><td>O</td><td>O</td><td>O</td></tr>
<tr><td>SW0090 (144)</td><td>Loopback information</td><td>Stores information on the loop status at the host station.
0: Loop normal
1: Forward loop error
2: Reverse loop error
3: Loopback
4: Data link disabled</td><td>O</td><td>X</td><td>O</td><td>X</td></tr>
</table>

*2 Valid only when SB0047 is off. When it turns on (error), the last data are retained.

Table 10.2 List of Special Link Registers (Continued)

<table>
<tr><th rowspan="3">Number</th><th rowspan="3">Name</th><th rowspan="3">Function</th><th colspan="4">Device Use Possible?</th></tr>
<tr><th colspan="2">Master Station</th><th colspan="2">Remote I/O Station</th></tr>
<tr><th>Optical/ coaxial Loop</th><th>Coaxial Bus</th><th>Optical/ coaxial Loop</th><th>Coaxial Bus</th></tr>
<tr><td>SW0091 (145)
•
SW0092 (146)
•
SW0093 (147)
•
SW0094 (148)
*2</td><td>Forward loop status at each station</td><td>Stores the forward loop status at each station (including the host station).
0: Normal (including stations with the "highest" and higher station numbers, and reserve stations)
1: Error
The status stored for disconnected stations is the status when the disconnection occurred.
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0091</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0092</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0093</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0094</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>The figures 1 to 64 in the table are station numbers.</td><td>O</td><td>X</td><td>O</td><td>X</td></tr>
<tr><td>SW0095 (149)
•
SW0096 (150)
•
SW0097 (151)
•
SW0098 (152)</td><td>Reverse loop status at each station</td><td>Stores the reverse loop status at each station (including the host station).
0: Normal (including stations with the "highest" and higher station numbers, and reserve stations)
1: Error
The status stored for disconnected stations is the status when the disconnection occurred.
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0095</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0096</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0097</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0098</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>The figures 1 to 64 in the table are station numbers.</td><td>O</td><td>X</td><td>O</td><td>X</td></tr>
<tr><td>SW0099 (153)</td><td>Loopback stations (forward loop)</td><td>Stores the station numbers of stations at which loopback is executed in a forward loop.
Range: 1 to 64 (master station : 7DH)</td><td>O</td><td>X</td><td>O</td><td>X</td></tr>
<tr><td>SW009A (154)</td><td>Loopback stations (reverse loop)</td><td>Stores the station numbers of stations at which loopback is executed in a reverse loop.
Range: 1 to 64 (master station : 7DH)</td><td>O</td><td>X</td><td>O</td><td>X</td></tr>
<tr><td>SW00A8 (168)</td><td>Online test items / faulty stations (at requesting station)</td><td>Stores information on the online test items at the requesting station and the station numbers of faulty stations. (Effective when SB00A9 is ON.)
 
</td><td>O</td><td>O</td><td>O</td><td>O</td></tr>
<tr><td>SW00A9 (169)</td><td>Online test results (at requesting station)</td><td>Stores the online test results for the requesting station. (Effective when SB00A9 is ON.)
0: Test normal
More than 1: Test error details</td><td>O</td><td>O</td><td>O</td><td>O</td></tr>
</table>

*2 Valid only when SB0047 is off. When it turns on (error), the last data are retained.

Table 10.2 List of Special Link Registers (Continued)

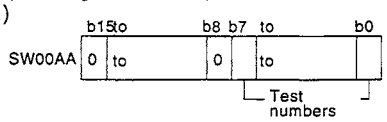
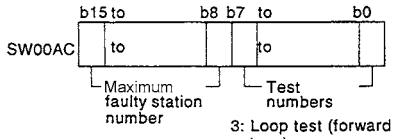
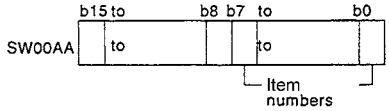
Number	Name	Function	Device Use Possible?			
			Master Station		Remote I/O Station	
			Optical/ coaxial Loop	Coaxial Bus	Optical/ coaxial Loop	Coaxial Bus
SW00AA (170)	Online test items (at responding stations)	Stores information on the online tests executed at the responding stations. (Effective when SB00AB is ON.)  10_H: Loop test 20_H: Setting confirmation test 30_H: Station order confirmation test 40_H: Communication test	O	O	O	O
SW00AB (171)	Online test result (at responding stations)	Stores the online test result for responding stations. (Effective when SB00AB is ON.) 0: Test normal More than 1: Test error details (see Section 11.1)	O	O	O	O
SW00AC (172)	Offline test items / faulty stations (at requesting station)	Stores information on the offline tests executed at the requesting station and the station numbers of faulty stations. (Effective when SB00AD is ON). Stations disconnected from the network are not included among the faulty stations because there is no response. Any given station number (0 to 64, 7DH) is saved in the maximum faulty station number (b8 to b15) for the loop test.  3: Loop test (forward loop) 4: Loop test (reverse loop) 5: Station to station test (master station) 6: Station to station test (slave station) 7: Self-loopback test 8: Internal self-loopback test	O	O	O	O
SW00AD (173)	Offline test results (at requesting station)	Stores the offline test results for the requesting station. (Effective when SB00AD is ON.) 0: Test normal More than 1: Test error details (See Section 11.1)	O	O	O	O
SW00AE (174)	Off-line testing Execution item (Response side)	Stores the request-side offline test items and error stations. (Enabled when SB00AF is on.) When station breaks from network, it is not included with error stations because there is no response.  3: Loop test (forward loop) 4: Loop test (reverse loop)	O	O	O	O
SW00AF (175)	Off-line testing results (Response side)	Stores results of request-side offline test. (Enabled when SB00AF is on.) 0: Test normal Other than 0: Test error content (see the error codes in Section 11.1)	O	O	O	O

Table 10.2 List of Special Link Registers (Continued)

<table>
<tr><th rowspan="3">Number</th><th rowspan="3">Name</th><th rowspan="3">Function</th><th colspan="4">Device Use Possible?</th></tr>
<tr><th colspan="2">Master Station</th><th colspan="2">Remote I/O Station</th></tr>
<tr><th>Optical/ coaxial Loop</th><th>Coaxial Bus</th><th>Optical/ coaxial Loop</th><th>Coaxial Bus</th></tr>
<tr><td>SW00B0 (176) • SW00B1 (177) • SW00B2 (178) • SW00B3 (179) *2</td><td>Multiplex transmission status (1)</td><td>Stores each station's forward loop usage status during multiplex transmission.
0: Uses other than the forward loop
1: Uses the forward loop
<table>
<tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr>
<tr><td>SW00B0</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr>
<tr><td>SW00B1</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr>
<tr><td>SW00B2</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr>
<tr><td>SW00B3</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr>
</table>
Numbers 1 to 64 in the above table indicate the station numbers.</td><td>O</td><td>O</td><td>O</td><td>O</td></tr>
<tr><td>SW00B4 (180) • SW00B5 (181) • SW00B6 (182) • SW00B7 (183) *2</td><td>Multiplex transmission status (2)</td><td>Stores each station's reverse loop usage status during multiplex transmission.
0: Uses other than the reverse loop
1: Uses the reverse loop
<table>
<tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr>
<tr><td>SW00B4</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr>
<tr><td>SW00B5</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr>
<tr><td>SW00B6</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr>
<tr><td>SW00B7</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr>
</table>
Numbers 1 to 64 in the above table indicate the station numbers.</td><td>O</td><td>O</td><td>O</td><td>O</td></tr>
<tr><td>SW00B8 (184) *3</td><td>UNDER on the forward loop side/coaxial bus UNDER</td><td>Accumulates and stores the number of "UNDER" errors on the forward loop side for the optical/coaxial loop, or the number of "UNDER" errors of the coaxial bus for the coaxial bus.
Other than 0: Number of errors</td><td>O</td><td>O</td><td>O</td><td>O</td></tr>
<tr><td>SW00B9 (185) *3</td><td>CRC on the forward loop side/coaxial bus CRC</td><td>Accumulates and stores the number of "CRC" errors on the forward loop side for the optical/coaxial loop, or the number of "CRC" errors of the coaxial bus for the coaxial bus.
Other than 0: Number of errors</td><td>O</td><td>O</td><td>O</td><td>O</td></tr>
<tr><td>SW00BA (186) *3</td><td>OVER on the forward loop side/coaxial bus OVER</td><td>Accumulates and stores the number of "OVER" errors on the forward loop side for the optical/coaxial loop, or the number of "OVER" errors of the coaxial bus for the coaxial bus.
Other than 0: Number of errors</td><td>O</td><td>O</td><td>O</td><td>O</td></tr>
<tr><td>SW00BB (187) *3</td><td>Short frame on the forward loop side/coaxial bus short frame</td><td>Accumulates and stores the number of "short frame" errors on the forward loop side for the optical/coaxial loop, or the number of "short frame" errors of the coaxial bus for the coaxial bus.
Other than 0: Number of errors</td><td>O</td><td>O</td><td>O</td><td>O</td></tr>
<tr><td>SW00BC (188) *3</td><td>Abort on the forward loop side (AB, IF)/coaxial bus abort (AB. IF)</td><td>Accumulates and stores the number of "AB. IF" errors on the forward loop side for the optical/coaxial loop, or the number of "AB. IF" errors of the coaxial bus for the coaxial bus.
Other than 0: Number of errors</td><td>O</td><td>O</td><td>O</td><td>O</td></tr>
<tr><td>SW00BD (189) *3</td><td>Timeout on the forward loop side (TIME)/coaxial bus timeout (TIME)</td><td>Accumulates and stores the number of "TIME" errors on the forward loop side for the optical/coaxial loop, or the number of "TIME" errors of the coaxial bus for the coaxial bus.
Other than 0: Number of errors</td><td>O</td><td>O</td><td>O</td><td>O</td></tr>
<tr><td>SW00BE (190) *3</td><td>Receiving 2k bytes or more on forward loop side (DATA)/coaxial bus receiving 2k bytes or more (DATA)</td><td>Accumulates and stores the number of "DATA" errors on the forward loop side for the optical/coaxial loop, or the number of "DATA" errors of the coaxial bus for the coaxial bus.
Other than 0: Number of errors</td><td>O</td><td>O</td><td>O</td><td>O</td></tr>
</table>

*2 Valid only when SB0047 is off. When it turns on (error), the last data are retained.

*3 SW00B8 to C7 are reset by switching SB0006 ON.
When the count for SW00B8 to 00C7 (UNDER, CRC, etc.) changes a little at a time over a long period, there is no problem.
When rapid counting occurs during a short period (for example during monitoring by a peripheral device), there may be a problem in the cable.

Table 10.2 List of Special Link Registers (Continued)

Number	Name	Function	Device Use Possible?			
			Master Station		Remote I/O Station	
			Optical/ coaxial Loop	Coaxial Bus	Optical/ coaxial Loop	Coaxial Bus
SW00BF (191) *3	DPLL error on the forward loop side/coaxial bus DPLL error	Accumulates and stores the number of "DPLL" errors on the forward loop side for the optical/coaxial loop, or the number of "DPLL" errors of the coaxial bus for the coaxial bus. Other than 0: Number of errors	O	O	O	O
SW00C0 (192) *3	Reverse loop UNDER	Stores the cumulative total of UNDER errors for the reverse loop. More than 0 : Error count	O	O	O	O
SW00C1 (193) *3	Reverse loop CRC	Stores the cumulative total of CRC errors for the reverse loop. More than 0 : Error count	O	O	O	O
SW00C2 (194) *3	Reverse loop OVER	Stores the cumulative total of OVER errors for the reverse loop. More than 0 : Error count	O	O	O	O
SW00C3 (195) *3	Reverse loop short frame	Stores the cumulative total of "short frame" errors for the reverse loop. More than 0 : Error count	O	O	O	O
SW00C4 (196) *3	Reverse loop abort (AB. IF)	Stores the cumulative total of "AB. IF" errors for the reverse loop. More than 0 : Error count	O	O	O	O
SW00C5 (197) *3	Reverse loop time out (TIME)	Stores the cumulative total of "TIME" errors for the reverse loop. More than 0 : Error count	O	O	O	O
SW00C6 (198) *3	Reverse loop 2 kbytes error receive (DATA)	Stores the cumulative total of "DATA" errors for the reverse loop. More than 0 : Error count	O	O	O	O
SW00C7 (199) *3	Reverse loop DPLL error	Stores the cumulative total of DPLL errors for the reverse loop. More than 0 : Error count	O	O	O	O
SW00C8 (200) *4	Number of retries on the forward loop side/coaxial bus retries error	Accumulates and stores the number of retries on the forward loop side for the optical/coaxial loop, or the number of retries of the coaxial bus for the coaxial bus. Other than 0: Number of errors	O	O	O	O
SW00C9 (201) *4	Reverse loop retry frequency	Stores the cumulative total of transmission retries in the reverse loop. More than 0 : Error count	O	O	O	O
SW00CC (204) *5	Forward loop line error count	Stores the cumulative total of errors detected in the forward loop line. More than 0 : Line error detection count	O	X	O	X
SW00CD (205) *6	Reverse loop line error count	Stores the cumulative total of errors detected in the reverse loop line. More than 0 : Line error detection count	O	X	O	X
SW00CE (206) *7	Loop switching frequency	Stores the cumulative total of loop switches made. More than 0 : Loop switching count	O	X	O	X
SW00CF (207) *7	Loop switching data pointer	Stores the pointer that sets the next loop switching data.	O	X	O	X

*3 SW00B8 to C7 are reset by switching SB0006 ON.
When the count for SW00B8 to 00C7 (UNDER, CRC, etc.) changes a little at a time over a long period, there is no problem.
When rapid counting occurs during a short period (for example during monitoring by a peripheral device), there may be a problem in the cable.

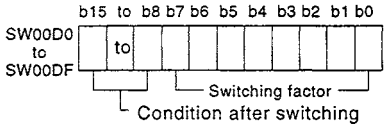
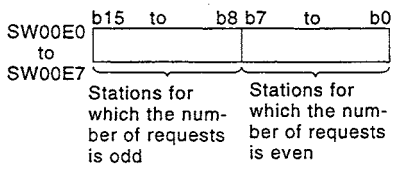
*4 The count may show a number of errors when the power is switched on or off due to resetting but this does not indicate a fault.
If the retry frequency before the data link was started is not required it can be cleared by using SB0005.

*5 SW00CC is reset by switching SB0007 ON.

*6 SW00CD is reset by switching SB0008 ON.

*7 SW00CE to E7 are reset by switching SB0009 ON.

Table 10.2 List of Special Link Registers (Continued)

Number	Name	Function	Device Use Possible?			
			Master Station		Remote I/O Station	
			Optical/ coaxial Loop	Coaxial Bus	Optical/ coaxial Loop	Coaxial Bus
SW00D0 (208) to SW00DF (223) *7	Loop switching data	Stores the cause of loop switching and the condition after loop switching. A setting in the common parameters determines whether this data is overwritten or preserved.  <Switching factor> The bit corresponding to the relevant error is set to "1". All "0" : Normal recovery b0 : Forward loop hardware error b1 : Reverse loop hardware error b2 : Forward loop forced error b3 : Reverse loop forced error b4 : Forward loop continuous communication error b5 : Reverse loop continuous communication error b6 : Forward loop continuous line error b7 : Reverse loop continuous line error <Condition after switching> 0 : Duplex transmission 1 : Data link by forward loop 2 : Data link by reverse loop 3 : Data link by loopback	O	X	O	X
SW00E0 (224) to SW00E7 (231) *7 *8	Switching request station	Stores the station number of the station that requested the loop switch.  	O	O	O	O
SW00EE (238) *9	Transient transmission error	Stores the cumulative total of transient transmission errors. More than 0 : Error count	O	O	O	O
SW00EF (239) *9	Transient transmission error pointer	Stores the pointer for storing the data for the next transient transmission error.	O	O	O	O
SW00F0 (240) to SW00FF (255) *2	Transient transmission error history	Stores the transient transmission error codes. (See Section 11.1)	O	O	O	O

*2 Valid only when SB0047 is off. When it turns on (error), the last data are retained.

*7 SW00CE to E7 are reset by switching SB0009 ON.

*8 The loop switching request is made by the station that detects the loop error first, which means that a station other than one of those at either end of the loop may be stored as the loop switching request station.

*9 SW00EE to EF are reset by switching SW000A ON.

10.3.3 Effective SB/SW devices during the offline test

Almost all SB/SW devices become ineffective during the offline test, but those indicated below are effective. However, they are only effective at the master station.

Effective SB/SW		Mode Setting Switch		
		3	4	5 to 8
SB	00AC	O	O	O
	00AD	O	O	O
SW	0047	x	x	O
	0048	x	x	O
	0049	x	x	O
	0070 to 73	O	O	x
	00AC	O	O	O
	00AD	O	O	O

O : effective x : ineffective

10.4 Special Relays (M) and Special Registers (D) for Remote I/O Stations

This section describes the special relays (M9000 upward) and special registers (D9000 upward) of the remote I/O stations.
Special relays and special registers can be monitored, switched ON/OFF, and have data set in them, from peripheral devices.

10.4.1 Special relays (M)

Table 10.3 Special Relays

Number	Name	Function
M9000 *1	Fuse blown	OFF : Normal ON : There is an output module with a blown fuse (remains ON even after the output module has returned to the normal status if not reset).
M9002 *1	I/O module verify error	OFF : Normal ON : I/O verify error (I/O module status different from the status entered when power switched ON → module is not mounted securely). (Remains ON even after return to the normal status if not reset.)
M9008 *1	Self-diagnostic error	OFF : Normal ON : Error detected (error code stored in D9008) (Remains ON even after return to the normal status if not reset.)
M9084	Error check setting	OFF : Error check executed (check for blown fuses, I/O module verify errors) ON : Error check not executed
M9094	I/O change flag	OFF : Not changed ON : Changed (The I/O module can be changed by switching M9094 ON after the head I/O number of the new module has been set in D9094.)

*1 The RMT.E. LED lights.

10.4.2 Special registers (D)

Table 10.4 Special Registers

<table>
<tr><th>Number</th><th>Name</th><th>Function</th></tr>
<tr><td>D9000</td><td>Blown fuse module No.
(Effective when M9000 is ON)</td><td>Stores the head I/O number of the module in which a fuse has blown.
If a fuse has blown in more than one output module, the lowest head I/O number is stored.
(Example: output module Y50 to 6F → "50H" (hexadecimal) is stored)</td></tr>
<tr><td>D9002</td><td>I/O module verify error module number
(Effective when M9002 is ON)</td><td>Stores the head I/O number of the module for which an I/O module verify error has occurred.
If there is more than one output module, the lowest head I/O number is stored.
(Example: output module Y50 to 6F → "50H" (hexadecimal) is stored)</td></tr>
<tr><td>D9008</td><td>Self-diagnostic error number
(Effective when M9008 is ON)</td><td>Stores the error numbers of self-diagnostic errors. (See Table 10.5)</td></tr>
<tr><td>D9010</td><td>Error slot number</td><td>Stores the slot number of the slot in which a module for which a self-diagnostic error has occurred is mounted.</td></tr>
<tr><td>D9014</td><td>I/O control mode</td><td>Stores the I/O control mode.
3 = I/O in refresh mode</td></tr>
<tr><td>D9015</td><td>Operating state</td><td>Stores the operating state of the remote I/O station CPU.
1 = STOP</td></tr>
<tr><td>D9072</td><td>PC communication check</td><td>Area used to perform a communication check with remote I/O station CPUs in the self-loopback test of a computer link module.</td></tr>
<tr><td>D9091</td><td>Self-diagnostic detailed error numbers</td><td>Stores the detailed error numbers of self-diagnostic errors.
(See Table 10.5)</td></tr>
<tr><td>D9094</td><td>New I/O module head I/O number</td><td>The head I/O number of an I/O module mounted/removed in the online status is set in this device.
(Example: I/O module occupying Y50 to 6F → "50H" (hexadecimal) is set)</td></tr>
<tr><td>D9100
to
D9107</td><td>Fuse blown error modules</td><td>Stores the output module number (in units of 16 points) where a fuse has been blown in bit pattern (When the module number has been set by parameter, the set number is stored). 0 to 7F0 in the table are I/O numbers.
<table>
<tr><th></th><th>F</th><th>E</th><th>D</th><th>C</th><th>B</th><th>A</th><th>9</th><th>8</th><th>7</th><th>6</th><th>5</th><th>4</th><th>3</th><th>2</th><th>1</th><th>0</th></tr>
<tr><td>D9100</td><td>F0</td><td>E0</td><td>D0</td><td>C0</td><td>B0</td><td>A0</td><td>90</td><td>80</td><td>70</td><td>60</td><td>50</td><td>40</td><td>30</td><td>20</td><td>10</td><td>0</td></tr>
<tr><td>D9101</td><td>1F0</td><td>1E0</td><td>1D0</td><td>1C0</td><td>1B0</td><td>1A0</td><td>190</td><td>180</td><td>170</td><td>160</td><td>150</td><td>140</td><td>130</td><td>120</td><td>110</td><td>100</td></tr>
<tr><td>D9102</td><td>2F0</td><td>2E0</td><td>2D0</td><td>2C0</td><td>2B0</td><td>2A0</td><td>290</td><td>280</td><td>270</td><td>260</td><td>250</td><td>240</td><td>230</td><td>220</td><td>210</td><td>200</td></tr>
<tr><td>D9103</td><td>3F0</td><td>3E0</td><td>3D0</td><td>3C0</td><td>3B0</td><td>3A0</td><td>390</td><td>380</td><td>370</td><td>360</td><td>350</td><td>340</td><td>330</td><td>320</td><td>310</td><td>300</td></tr>
<tr><td>D9104</td><td>4F0</td><td>4E0</td><td>4D0</td><td>4C0</td><td>4B0</td><td>4A0</td><td>490</td><td>480</td><td>470</td><td>460</td><td>450</td><td>440</td><td>430</td><td>420</td><td>410</td><td>400</td></tr>
<tr><td>D9105</td><td>5F0</td><td>5E0</td><td>5D0</td><td>5C0</td><td>5B0</td><td>5A0</td><td>590</td><td>580</td><td>570</td><td>560</td><td>550</td><td>540</td><td>530</td><td>520</td><td>510</td><td>500</td></tr>
<tr><td>D9106</td><td>6F0</td><td>6E0</td><td>6D0</td><td>6C0</td><td>6B0</td><td>6A0</td><td>690</td><td>680</td><td>670</td><td>660</td><td>650</td><td>640</td><td>630</td><td>620</td><td>610</td><td>600</td></tr>
<tr><td>D9107</td><td>7F0</td><td>7E0</td><td>7D0</td><td>7C0</td><td>7B0</td><td>7A0</td><td>790</td><td>780</td><td>770</td><td>760</td><td>750</td><td>740</td><td>730</td><td>720</td><td>710</td><td>700</td></tr>
</table>
For the module whose output points exceeds 16 points, all bits corresponding to the output module number (in units of 16 points) included in the output points occupied by the module turn on.
(Ex.) When a 64-point module is on the slot 0, b0 to b3 will turn on by blown fuse detection.

The bit data will not be automatically cleared even after the module returns to normal. Clear the data using a program.</td></tr>
</table>

Table 10.4 Special Registers (Continued)

<table>
<tr><th>Number</th><th>Name</th><th>Function</th></tr>
<tr><td>D9116
to
D9123</td><td>I/O module verify error modules</td><td>
Stores the I/O module number (in units of 16 points) when the I/O module different from that of the I/O module information registered at power-on is detected (When the module number has been set by parameter, the set number is stored). 0 to 7F0 in the table are I/O numbers.
<table>
<tr><th></th><th>F</th><th>E</th><th>D</th><th>C</th><th>B</th><th>A</th><th>9</th><th>8</th><th>7</th><th>6</th><th>5</th><th>4</th><th>3</th><th>2</th><th>1</th><th>0</th></tr>
<tr><td>D9116</td><td>F0</td><td>E0</td><td>D0</td><td>C0</td><td>B0</td><td>A0</td><td>90</td><td>80</td><td>70</td><td>60</td><td>50</td><td>40</td><td>30</td><td>20</td><td>10</td><td>0</td></tr>
<tr><td>D9117</td><td>1F0</td><td>1E0</td><td>1D0</td><td>1C0</td><td>1B0</td><td>1A0</td><td>190</td><td>180</td><td>170</td><td>160</td><td>150</td><td>140</td><td>130</td><td>120</td><td>110</td><td>100</td></tr>
<tr><td>D9118</td><td>2F0</td><td>2E0</td><td>2D0</td><td>2C0</td><td>2B0</td><td>2A0</td><td>290</td><td>280</td><td>270</td><td>260</td><td>250</td><td>240</td><td>230</td><td>220</td><td>210</td><td>200</td></tr>
<tr><td>D9119</td><td>3F0</td><td>3E0</td><td>3D0</td><td>3C0</td><td>3B0</td><td>3A0</td><td>390</td><td>380</td><td>370</td><td>360</td><td>350</td><td>340</td><td>330</td><td>320</td><td>310</td><td>300</td></tr>
<tr><td>D9120</td><td>4F0</td><td>4E0</td><td>4D0</td><td>4C0</td><td>4B0</td><td>4A0</td><td>490</td><td>480</td><td>470</td><td>460</td><td>450</td><td>440</td><td>430</td><td>420</td><td>410</td><td>400</td></tr>
<tr><td>D9121</td><td>5F0</td><td>5E0</td><td>5D0</td><td>5C0</td><td>5B0</td><td>5A0</td><td>590</td><td>580</td><td>570</td><td>560</td><td>550</td><td>540</td><td>530</td><td>520</td><td>510</td><td>500</td></tr>
<tr><td>D9122</td><td>6F0</td><td>6E0</td><td>6D0</td><td>6C0</td><td>6B0</td><td>6A0</td><td>690</td><td>680</td><td>670</td><td>660</td><td>650</td><td>640</td><td>630</td><td>620</td><td>610</td><td>600</td></tr>
<tr><td>D9123</td><td>7F0</td><td>7E0</td><td>7D0</td><td>7C0</td><td>7B0</td><td>7A0</td><td>790</td><td>780</td><td>770</td><td>760</td><td>750</td><td>740</td><td>730</td><td>720</td><td>710</td><td>700</td></tr>
</table>
For the module whose I/O points exceeds 16 points, all bits corresponding to the I/O module number (in units of 16 points) included in the I/O points occupied by the module turn on.
(Ex.) When a 64-point module is on the slot 0, b0 to b3 will turn on by error detection.

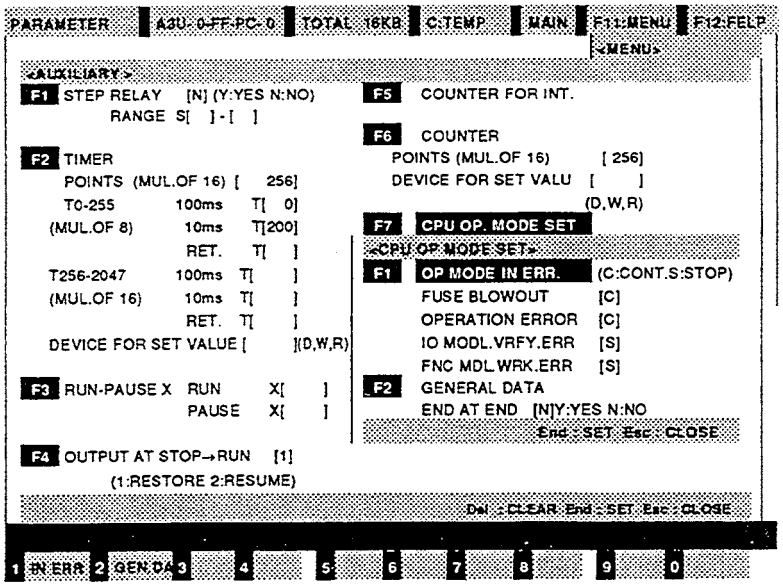
The bit data will not be automatically cleared even after the module returns to normal. Clear the data using a program.
</td></tr>
</table>

Table 10.5 Error Codes

D9008 (Hex.)	D9091 (Hex.)	Name	Description	Operating Status *1	
				Cyclic	I/O
11	111	I/O allocation error	There is a mistake in the I/O allocations.	STOP	RUN
*2	112 113	Insufficient number of LB/LW points	The number of LB/LW points set in the common parameters is insufficient for the number of special function modules.		
31 *3	311	I/O module verify error	An I/O module verify error has occurred.	Depends on the master station	
32 *3	321	Fuse blown error	A fuse blown error has occurred.		
43 *3	431	Illegal interrupt	An interrupt has been attempted from a module other than an intelligent special function module.	RUN	STOP
44	441	Number of mounted intelligent special function modules error	Two or more special function modules are installed.		
*3	442	Special function module sum check error	A check sum value verify error has occurred with respect to a special function module compatible with the AnUCPU.		

*1.... Operating status

STOP: I/O modules/special function modules cannot be accessed.
RUN : Forced output from a peripheral device is possible by using the test mode.
Depends on the master station: Depends on the STOP/RUN setting in the AnUCPU parameters



[Operating method] MENU → 2: PARAMETER → 5: AUXILIARY → [F7] CPU OP. MODE SET

*2 .... The PRM.E. LED lights.
*3 .... The RMT.E. LED lights.

11. TROUBLESHOOTING

To increase the system reliability, quick and proper system restoration in case of any trouble is essential as well as correct system activation. This chapter describes how to locate the faulty area and what corrective actions should be taken.

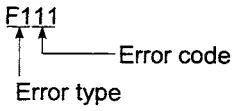
11.1 Error Codes

When transient transmission from a peripheral device or computer link module results in failure, an error code (hexadecimal) is returned to the request source (ZNFR/ZNTO instructions, the peripheral device or computer link module, etc.). Table 11.1 shows the meanings and corrective actions corresponding to each error code.

REMARK

When the GPP function software package is used to monitor the network, the error No. of the transient transmission error can be checked on the error history monitor display screen. In this case, note that the error No. displayed on the error history monitor display screen is divided into the error code and error type.
The first two digits of the error No. represent the error type, and the last two digits show the error code.

<Example> • Error No.



• Error history monitor display screen

	Error code	Error type
1	11	MAC
2		

As the error type, any of the following items will be displayed according to the value.

○ CPU module (from 4000 on) ○ MAC (from F100 on) ○ LLC (from F200 on)
○ Application layer (from F700 on) ○ Network control station (from F800 on)
○ Relay (from F900 on) ○ Remote station (from FA00 on)
○ Test (from FD00 on) ○ A/Q conversion (from FE00 on)
○ FA controller (from F101 on)

Table 11.1 Error Code List

Error Code	Meaning	Corrective Action
4000 to 4FFF	(Error detected by the CPU module)	Take measures referring to the troubleshooting section of the CPU module User's Manual.
F101	Initial status	Wait until SB0047 (baton passing status)/SB0049 (data link status) is OFF (normal).
F102	Initial status	
F103	Initial status (online test in progress)	
F104	Control station/sub-control station shift status	
F105	Initial status	
F106	Control station/sub-control station shift status	
F107	Baton passing error (baton missing)	• Make SB0047 (baton pass status)/SB0049 (data link status) OFF (normal). • Check for cable fault, cable disconnection, no termination termination resistor connection, noise and wiring mistake. • Perform a setting confirmation test to check the network station setting status for overlapping station numbers, control station overlapping or like.
F108	Baton passing error (baton duplicated)	

Table 11.1 Error Code List (Continued)

Error Code	Meaning	Corrective Action
F109	Initial status (online test in progress)	Wait until SB0047 (baton passing status)/SB0049 (data link status) is OFF (normal).
F10A	Initial status (online test/offline test in progress)	
F10B	Station number duplicated	Correct the station numbers.
F10C	Control station duplicated	Correct the control station setting.
F10D	Offline status	Set to online.
F10E	Receive error retry "over"	Check for cable faults, hardware faults, noise, miswiring, failure to connect a terminal resistor (in the case of a bus), setting of the same station number twice, and setting of more than one control station.
F10F	Transmission error retry "over"	
F110	Time out error	
F111	Error at relevant station	Review the status of the relevant station and review the switch settings (check if there is a parameter error and check that the relevant station is set correctly at the master station).
F112	Loop status error	Check for cable faults, hardware faults, noise, miswiring, setting of the same station number twice, and setting of more than one control station.
F113	Transmission failure	Retry after waiting for a while. If the second attempt also results in failure, check for cable faults, hardware faults, noise, miswiring, failure to connect a terminal resistor (in the case of a bus), setting of the same station number twice, and setting of more than one control station. Review the parameters and switch settings. (Check if there is a parameter error and check that the relevant station is set correctly at the control station.)
F114	Transmission failure	Retry after waiting for a while. If the second attempt also results in failure, check for cable faults, hardware faults, noise, miswiring, failure to connect a terminal resistor (in the case of a bus), setting of the same station number twice, and setting of more than one control station.
F115	Improper function code	Check for faulty cables, faulty hardware, incorrect wiring, duplication of station numbers, and duplication of control stations.
F116	Delayed online processing	
F117	Transmission failure	Check for cable faults, hardware faults, noise, failure to connect a terminal resistor (in the case of a bus), and miswiring.
F118	Initial status (baton regeneration)	Wait until SB0047 (baton passing status)/SB0049 (data link status) is OFF (normal).
F11A	Transmission failure (duplex loop transmission stopped)	Retry after waiting a while.
F11B	Disconnection	Review the parameter and switch settings (check if there is a parameter error and check that the relevant station is set correctly at the control station). Check for cable faults, hardware faults, noise, miswiring, setting of the same station number twice, and setting of more than one control station.
F11C	System error	The hardware of the network module is faulty. Please consult your local Mitsubishi representative.
F11F	Initial status (no baton for the host station)	Review the parameter and switch settings (check if there is a parameter error and check that the relevant station is set correctly at the control station).
F120	Destination station specification error	Check for faulty cables, faulty hardware, incorrect wiring, absence of terminating resistor (in the case of the bus), and duplication of station numbers, control stations, and remote master stations.
F122	Transmission failure (in the case of a bus)	Check for disconnection or looseness of the coaxial cable, failure to connect a terminal resistor, and cable faults.

Table 11.1 Error Code List (Continued)

Error Code	Meaning	Corrective Action
F220 F221	System error	The hardware of the network module is faulty. Please consult your local Mitsubishi representative.
F222	No vacancy in the receive buffer ("buffer full" error)	Retry after waiting a while. If the second attempt also results in an error, review the total number of transient transmissions in the system and the communication interval, and check for errors at the destination CPU such as absence of receive processing (END processing).
F701	Designated station No. error • (When sending data: Attempt made to send data to station "0". When receiving data: A message not intended for the host station has been received.) • An attempt was made to send data to the master station but it was down.	Correct the destination station number.
F702	Destination station No. error (ZNWR instruction) (The destination station number is outside the applicable range; i.e. it is "65" or higher.)	Correct the destination station number.
F703	Destination group No. error (ZNWR instruction) (The destination group number is outside the applicable range; i.e. 10 (8AH) or higher has been specified.)	Correct the destination group number.
F705	Destination CPU error (destination hardware error)	Check the destination CPU.
F706	Received data error	The cable is faulty, or The hardware of the network module is faulty. If a communication error has occurred, review the cable. If not, the hardware of the network module is faulty. Please consult your local Mitsubishi representative.
F707	Number of relay stations error (A destination outside the applicable relay range has been designated; there are 8 or more relay stations.)	Set appropriate destination stations. Review the system.
F708	Receiving group number error	Review the group number of the target station.
F709	Network No. error when receiving (the received network number is not correct)	Review the network number.
F70A	System error	The cable is faulty, or the hardware of the network module is faulty. If a communication error has occurred, review the cable. If not, the hardware of the network module is faulty. Please consult your local Mitsubishi representative.
F70B	Response waiting time out	Retry after waiting a while.
F70C F70D	System error	The cable is faulty, or the hardware of the network module is faulty. If a communication error has occurred, review the cable. If not, the hardware of the network module is faulty. Please consult your local Mitsubishi representative.
F781	System error	The hardware of the CPU or network module is faulty. Please consult your local Mitsubishi representative.
F782	Connection target specification error	Check if C24 connection or CC-Link connection is specified for access to other stations. If the setting is correct, the hardware of the CPU or network module is faulty. Please consult your local Mitsubishi representative.
F783	System error	The hardware of the network module is faulty. Please consult your local Mitsubishi representative.

Table 11.1 Error Code List (Continued)

Error Code	Meaning	Corrective Action
F800	Mode switching error	Correct the hardware switch settings.
F801	Network No. error	
F802	Group number error	
F803	Station No. error	
F804	DIP switch error	
F805	System error	The hardware of the network module is faulty. Please consult your local Mitsubishi representative.
F808		
F809		
F80A		
F80B		
F811		
F812		
F820	Link parameter error	Change the network type of the normal station to that of the control station. Create and write new network parameters to the PLC. If the error recurs, the hardware of the CPU or network module is faulty. Please consult your local Mitsubishi representative.
F821	Station-specific parameter error	Review station-specific parameters. Set common parameters≥station-specific parameters for the sending range of the host station. If no station-specific parameters are set, the hardware of the CPU or network module is faulty. Please consult your local Mitsubishi representative.
F822	System error	The hardware of the CPU or network module is faulty. Please consult your local Mitsubishi representative.
F823	Parameter matching error (The transmission range for each station is smaller in the common parameters than in the station specific parameters.)	Correct the common parameters or the station specific parameters at each station.
F825	CPU parameter check error	Rewrite the network parameters for the control station to the PLC. If the error recurs, the hardware of the CPU or network module is faulty. Please consult your local Mitsubishi representative.
F826	Time conveyor error (The parameters at the host station are older than the parameters received from the sub-control station.)	Review the parameters at the sub-control station and/or reset the host station.
F827	No automatic return	Execute processing with no automatic return function.
F828	Control station shift function not set	Execute processing on the understanding that there is no control station shift function.
F830	System error	The hardware of the CPU or network module is faulty. Please consult your local Mitsubishi representative.
F831		
F832	Start rejected (Start attempted under conditions that do not allow starting)	If all stations are stopped, start all stations. Do not perform an automatic start if there is a stop designation from another station.
F833	Key word error (Start executed from a station other than a stopped station.)	Execute the start from a stopped station. Execute a forced start.
F834	System error	The cable is faulty, or the hardware of the network module is faulty. If a communication error has occurred, review the cable. If not, the hardware of the network module is faulty. Please consult your local Mitsubishi representative.
F835		
F836		
F837	Retry frequency "over"	Check the status of the control station. (Has it been reset, or has an error occurred, part way through?)

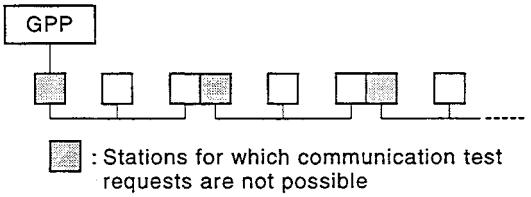
Table 11.1 Error Code List (Continued)

Error Code	Meaning	Corrective Action
F838	Time out of corresponding timer (SW0056 is "0")	Check the status of the control station. (Has it been reset, or has an error occurred, part way through?)
F839	Communication impossible (SW0056 is "0")	Remedy the cause of the disconnection.
F83A	SW0000 request is outside the applicable range.	Correct the data of SW0000.
F901	System error	The hardware of the network module is faulty. Please consult your local Mitsubishi representative.
F902	Routing count error	When the routing function is used to connect multiple network systems, transmission from the request source should be made within eight network systems (within seven relay stations).
F903	System error	The hardware of the CPU or network module is faulty. Please consult your local Mitsubishi representative.
F904		
F905	System error	The hardware of the network module is faulty. Please consult your local Mitsubishi representative.
F906	Relay destination CPU error	Check the relay destination CPU. (Destination hardware error)
F981	System error	The hardware of the network module is faulty. Please consult your local Mitsubishi representative.
F982	Received transient transmission data cannot be processed.	Check for incorrect target station and relay station numbers. (The CPU module or network module of the target station or relay station that requested the transient transmission does not support the requested function.)
FA20	Master station routing parameter error	Correct the master station routing parameters.
FA21	Network No., station No., or module No. setting error	Correct the network No., station No. or module No.
FA22	Master station error	Set the routing parameters
FA25	ZNFR/ZNTO execution error (Buffer memory address designation, number of points designation error)	Correct the ZNFR/ZNTO instruction
FA26	Special function module handshake error	Make sure that the ZNFR/ZNTO instruction is executed with respect to a special function module.
FA30	I/O allocation error	Correct the I/O allocations
FA31	LB/LW allocation error	Correct the common parameters (LB/LW)
FA32	Illegal allocation error	Check the mounted modules.
FA33	Number of mounted intelligent special function modules error	Mount a maximum of two.
FA34	Special function module sum check error	Check the special function module. → Change it.
FA35	I/O module verify error	Check if the module is mounted securely.
FA36	Fuse blown error	Check the output module.
FC01	System error	The hardware of the network module is faulty. Please consult your local Mitsubishi representative.
FC02		
FC03		
FD01	CRC error (offline test)	Retry. (However, if errors occur frequently, check for cable faults, hardware faults, noise, failure to connect a terminal resistor (in the case of a bus), and miswiring.)
FD02	Overrun error (offline test)	
FD03	AB.IF error (offline test)	
FD04	TIME error (offline test)	
FD05	Data error (offline test)	
FD06	Underrun error (offline test)	
FD07	Transmission failure	Retry. (However, if errors occur frequently, check for cable faults, hardware faults, noise, failure to connect a terminal resistor (in the case of a bus), and miswiring.)

Table 11.1 Error Code List (Continued)

Error Code	Meaning	Corrective Action
FD08	Transmission failure (in the case of a bus)	Check for disconnection or looseness of the coaxial cable, failure to connect a terminal resistor, and cable faults.
FD09	Loop status changes during data link operation (offline loop test)	Retry. (Do not execute loop switching part way through.) However, if the problem occurs frequently, check the line and wiring.
FD0A	Communication unstable (offline loop test)	Retry. (However, if errors occur frequently, check for cable faults, hardware faults, noise, failure to connect a terminal resistor (in the case of a bus), and looseness.)
FD0B	Wiring error (offline loop test)	Check the wiring.
FD0C	System error	There is a problem with the hardware of the network module. Please consult your local Mitsubishi representative.
FD11	"Test in progress" error	Execute the operation after the test instigated by another station is completed.
FD12	Disconnection error	Remedy the cause of the disconnection.
FD13	Number of stations abnormal error • Online test in accordance with parameter designations was executed when parameters have not been received. • Online test was executed while the total number of link stations, or number of stations, set in the common parameters was a value smaller than the host station number.	• Execute online test after setting the total number of link stations in the common parameters. • Designate a station number that is the same as or higher than the host station station number. Or execute online test from a station number than is equal to or lower than the designated number of stations.
FD14	System error	The hardware of the network module is faulty. Please consult your local Mitsubishi representative.
FD15		
FD16	Online test retry over	Check for cable fault, cable disconnection, noise and wiring mistake.
FD17	System error	The hardware of the network module is faulty. Please consult your local Mitsubishi representative.
FD18		
FD19		
FD1A	Same station number allocated twice	Check the stations to which the station number is allocated and correct the problem.
FD1B	"Test stopped" error	A station executing a test has been stopped during test execution, for example by resetting. There is a faulty station on the line.
FD1C	Test stopped by loop switching	Retry. (Do not execute loop switching part way through.) However, if the problem occurs frequently, check the line and wiring.
FD1D	System error	The hardware of the network module is faulty. Please consult your local Mitsubishi representative.
FD1E	Test impossible with bus type used	Perform a test that is possible with the bus type being used.
FD31	Duplicated online test request (Online test requests made simultaneously)	Wait until one online test operation has finished before requesting another one.
FD32	System error	The hardware of the network module is faulty. Please consult your local Mitsubishi representative.
FD33		
FD35	Time out while waiting for response	Retry after waiting a while. Check the status of the relevant station and the line.
FD36	Time out while waiting for correspondence	
FD38	Text duplication error	
FD39	Test request destination is the host station (communication test)	Change the test request destination.

Table 11.1 Error Code List (Continued)

Error Code	Meaning	Corrective Action
FD3A	Test request destination is an inapplicable station (communication test)	The station for which the test request was designated is not an acceptable one.  : Stations for which communication test requests are not possible
FE20	Data error (A station whose CPU is stopped and which cannot process the data has been designated.)	Correct the routing parameters or change the stopped station to an AnUCPU.
FE21	LRDP/LWTP device range error	Check the device range at the communicating CPU. The ZNRD/ZNWR instruction was executed for the AnN/AnA/AnS(H)CPU.
FE22	AnUCPU request error	Error such as data length error
FF01	System error	The hardware of the network module is faulty. Please consult your local Mitsubishi representative.
FF03		
FF04		
FF05		
FF06		
FF10		
FF11		
FF12		
FF13		
FF20		
FF21		
FF22		
FF30		
FF31		
FF32		
FF33		
FF34		
FF40		
FF80		

11.2 Troubleshooting

This section describes simple troubleshooting procedures.
If a problem occurs during data link operation, check the link status using the following steps in the order they are presented here.

(1) Check the status of the line and the status of other stations by performing network monitoring at a peripheral device (see Section 5.1).

(2) Check the lit/unlit status of the LEDs on the network module at the station at which the communication error has occurred (see Section 3.2).

(3) Perform the online test using a peripheral device and check the line status and switch settings (see Section 5.2).

REMARK

In order to ensure fast and complete recovery from problems that occur during data link operation, it is important to check the hardware settings of the network module and the connection of the data link cables on starting up the system.
Carry out the procedures described in Chapter 3 "PRE-OPERATION PROCEDURE": hardware settings of the network module, connection of the data link cables, and offline tests (hardware test, internal self-loopback test, station-to-station test, and forward/reverse loop test).

11.2.1 Points to check first

Point to Check	Check Method
Monitor the communication status at each of the stations from a peripheral device using the network monitoring function.	Check the status of the CPU module at the station at which the communication error occurred, the status of the network module, and the loop status of each module, to determine the site of the error.
Is the "POWER" LED of the power supply module of the station at which the error occurred lit?	If the "POWER" LED is not lit, check the supply voltage to the power supply module, and check for insufficient power supply capacity, overvoltage, and failure of the power supply module.
Is the "RUN" LED of the CPU module lit?	If the "RUN" LED is not lit or is flashing, read the error code at a peripheral device and take the corrective action appropriate for the error. (For information on the meanings of error codes and the corrective action to take, refer to the users' manual for the CPU module.)
Is the lit/unlit status of the LEDs on the network module normal?	Check the lit/unlit status of the "RUN", "SW.E", "M/S.E", "PRM.E", etc., LEDs and take appropriate action if an error is indicated. (See section 11.3.) If the "T. PASS" LED turns ON and OFF or is instable, check the following since the line status is assumed to be instable. 1) Check that the connector is not nearly disconnected and the cable is not nearly broken. 2) Check that the cable used is as determined in the specifications. 3) Check that the overall distance and interstation distance are as determined in the specifications.

11.2.2 Troubleshooting when data link is disabled throughout the system

Point to Check	Check Method
Monitor the communication status at each device using the network monitoring function.	Check the status of the line by performing a network diagnosis loop test from a peripheral device (this applies only in the case of a fiber-optic loop system). Check the CPU module and network module at the station at which the error occurred. Check the network module and data link cable by performing a self-loopback test and station to station test in offline testing to determine the location of the line error. Check if all the stations in the data link are stopped.
Have the network link parameters been set at the master station?	Check by reading the network parameters from the CPU module of the master station.
Is there a mistake in the switch settings of the network module at the master station?	Check the network No. setting switch, station No. setting switch, mode setting switch, condition setting switches, etc.
Is the link watch dog time setting appropriate?	Set the link watch dog time to 2000 ms and check if data link is possible.
Is the master station down?	Check the lit/unlit status of the LEDs on the network module of the master station.

11.2.3 Troubleshooting when the data link is disabled at a specific station

Point to Check	Check Method
Monitor the communication status at each station.	Check stations at which a communication error has occurred, and the loop status, by performing line monitoring using the network monitoring function at a peripheral device. In the case of a fiber-optic loop system, check the line status and the communication status at each station using the loop test of the network diagnosis function at a peripheral device.
Is the network module at the station at which the communication error has occurred normal?	Check if an error or failure has occurred at the CPU module or network module of the station at which the communication error occurred.
Is the network module the cause of the loop error? Or is the data link cable the cause?	Check if the network module is normal by executing a self-loopback test in offline testing. Check if the data link cable is normal by executing a station to station test in offline testing.
Are there any mistakes in the network parameters of the master station?	Check that, in the common parameter settings, the setting for the total number of stations in the link is the highest station number or a higher number, and that stations which cannot communicate are set as reserve stations.
Are the network parameters at the station at which the error has occurred normal?	Read the network parameters from the CPU module at the station at which the communication error occurred and check if the "set number of modules" settings and network refresh parameters are set correctly.
Are there any mistakes in the network module switch settings?	Check the network No. setting switch, the station number setting switch, the mode setting switch, and the condition setting switches.
Has any data link cable been disconnected?	Perform the line monitoring or loop test in Network diagnostics of peripheral device to check the wiring status.

11.2.4 Troubleshooting when the communicated data is abnormal

(1) Abnormal cyclic transmission data

Point to Check	Check Method
Is the sequence program error-free?	Set the CPU modules at the master station to the STOP status, switch the link devices of the master station ON and OFF using test operation at a peripheral device, and check if the data is transmitted to the remote I/O station. If data is transmitted normally, correct the sequence program. If data is not transmitted normally, review the network parameters of the master station and self station.
Are there any mistakes in the network refresh parameter settings of the master station?	Check the settings of the network refresh parameters and the station specific parameters, and check which ranges of LB/LW/LX/LY devices used by the sequence program the ranges of LB/LW/LX/LY devices received from the master station are stored in.

(2) Abnormal transient transmission

Point to Check	Check Method
Does an error occur when cyclic transmission is executed?	Check the error code generated on execution of transient transmission and take the action indicated in the error code table in Section 11.1.
Are there any mistakes in the routing parameter settings?	Check the settings using the communication test of the online test from a peripheral device.

11.3 LEDs on the Network Module

This section describes the LEDs that light on occurrence of an error during data link operation.

Display	Error Detection Status	Possible Causes
RUN	Not lit	A hardware error has occurred in the network module. An error has occurred in the CPU module.
SW.E.	Lit	The network No. setting switch has been set to a value outside the range 1 to 255. The station No. setting switch at the master station has been set to a value other than "0". The station No. setting switch at a remote I/O station has been set to a value outside the range 1 to 64. The mode setting switch has been set to an unusable position.
M/S.E.	Lit	It has been detected that the same station number has been set twice, or more than one master station has been set, in one network.
PRM.E.	Lit	There is an error in the I/O allocations. The number of LB/LW points is insufficient for the special function modules. There is an error in the parameters received from the master station.
D.LINK	Not lit	Cyclic transmission has been stopped by stopping data link operation from a peripheral device or by executing an online test etc. T.PASS is not lit.
T.PASS	Not lit	The station cannot participate in baton passing and transient transmission is therefore impossible. Communication has been stopped by a line error.
CRC	Lit	A code check is performed on the received data to determine if there is an error or not. An error occurs in the event of a cable fault, noise, etc.
OVER	Lit	Received data has overwritten the previous set of data before it could be processed. A hardware error has occurred in the receiving circuitry of the network module.
AB.IF	Lit	"1" bits have been received continuously in a frame of received data and the stipulated data length has been exceeded, or the data length of the received data is shorter than stipulated. Short watchdog time setting, cable fault, noise, etc. caused the error.
TIME	Lit	Baton passing has not reached the host station within the set watchdog time. Short watchdog time setting, cable fault, noise, etc. caused the error.
DATA	Lit	Error code data has been received. A cable fault, noise, etc. caused the error.
UNDER	Lit	Internal processing of send data is not being performed at regular intervals. A hardware error has occurred in the sending circuitry of the network module.
LOOP	Lit	The F.LOOP LED turns on when the following error occurs in the forward loop line. ・ The power supply to stations that are adjacent to the host station and send data to it is switched off. ・ A hardware error occurs in the forward loop sending circuitry. ・ The forward loop data link cable is not connected or broken. ・ A hardware error occurs in the forward loop receiving circuitry of the host station. The R.LOOP LED turns on when the following error occurs in the reverse loop line. ・ The power supply to stations that are adjacent to the host station and send data to it is switched off. ・ A hardware error occurs in the reverse loop sending circuitry. ・ The reverse loop data link cable is not connected or broken. ・ A hardware error occurs in the reverse loop receiving circuitry of the host station.
RMT.E.	Lit	An I/O module verify error or fuse blown error has occurred.
ST.E.	Lit	It has been detected that the same station has been set twice in one network.

POINT

Refer to the following if the "T. PASS" LED turns ON and OFF or is instable.
<Cause>
It is assumed that the line status is instable.
<Corrective action>
1) Check that the connector is not nearly disconnected and the cable is not nearly broken.
2) Check that the cable used is as determined in the specifications.
3) Check that the overall distance and interstation distance are as determined in the specifications.

APPENDICES

APPENDIX 1 NETWORK PARAMETER SETTING SHEETS

When the MELSECNET/10 parameters are set at a peripheral device, filling in these forms provides a convenient record of the settings.
The configuration of these forms differs somewhat from that of the setting screens actually displayed by the peripheral device.

1.1 "Number of Modules" Settings

SET NUMBER OF MODULES

NO OF NETWORK MODULES (1-4) [ ]

MODULE NO. ACCESSED BY GPP [ ]

	MODULE 1	MODULE 2	MODULE 3	MODULE 4
I/O NO.	[ ]	[ ]	[ ]	[ ]
NETWORK MODULE TYPE	[ ]	[ ]	[ ]	[ ]
	1 : MELSECNET/10 (DEFAULT PARAMETER) 4 : MELSECNET/10 (REMOTE I/O MASTER) 2 : MELSECNET/10 (CONTROL STATION) 5 : MELSECNET II (MASTER STATION) 3 : MELSECNET/10 (NORMAL STATION) 6 : MELSECNET II (LOCAL STATION)			
NETWORK NO.	[ ]	[ ]	[ ]	[ ]

1.2 Network Refresh Parameters

NETWORK REFRESH PARAMETER OF MELSECNET/10

NETWORK MODULE [ ]

LB ↔ B	LB [ ] ↔ B	[ ]	SIZE [ ] HPOINTS	
LW ↔ W	LW [ ] ↔ W	[ ]	SIZE [ ] HPOINTS	
LX ↔ X	LX [ ] ↔ X	[ ]	SIZE [ ] HPOINTS	
LY ↔ Y	LY [ ] ↔ Y	[ ]	SIZE [ ] HPOINTS	
SB COPIED TO	SB [ ] ↔ DEST. [ ] [ ]		SIZE [ ] HPOINTS	
SW COPIED TO	SW [ ] ↔ DEST. [ ] [ ]		SIZE [ ] HPOINTS	
HISTORY	[ ] 0: RETAIN 1 : OVERWRITE			

1.3 Common Parameters (MELSECNET/10), Remote I/O Network

(1) LB/LW settings

LB/LW settings

MODULE NO.

NO. OF STN.	LINK WDT * 10ms

RESERVE	REMOTE I/O STN. NO.	M → R LB	M ← R LB	M → R LW	M ← R LW
	1	—	—	—	—
	2	—	—	—	—
	3	—	—	—	—
	4	—	—	—	—
	5	—	—	—	—
	6	—	—	—	—
	7	—	—	—	—
	8	—	—	—	—
	9	—	—	—	—
	0	—	—	—	—

If the station number is a two-digit one, write the extra digit in the box enclosed by a dotted line.
The highest station number is 64.
Circle the station numbers of reserve stations.

(2) LX/LY settings

SETTING THE LX/LY TRANSMISSION RANGES IN EACH STATION

MODULE NO.

NO. OF STN.	LINK WDT * 10ms

I/O MASTER

RESERVE	REMOTE I/O STN. NO.	M → R LB	M ← R LB	M → R LW	M ← R LW
	1	—	—	—	—
	2	—	—	—	—
	3	—	—	—	—
	4	—	—	—	—
	5	—	—	—	—
	6	—	—	—	—
	7	—	—	—	—
	8	—	—	—	—
	9	—	—	—	—
	0	—	—	—	—

If the station number is a two-digit one, write the extra digit in the box enclosed by a dotted line.
The highest station number is 64.
Circle the station numbers of reserve stations.

(3) Extension settings

EXTENSION SETTINGS

			Default values
CONSTANT LINK SCAN	[ ]	ms(0-500)	....[0] ms
MAX. # OF RECONNECTION STN.	[ ]	STATION(1-16)	....[2] stations
DUPLEX COMMUNICATION	[ ]	0:NO 1:YES	....[0]
ACCESSED ZNFR/ZNTO	[ ]	(1-64)	....[64]

1.4 I/O Allocations

(1) Number of slots setting

Number of slots setting

STATION NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
NUMBER OF SLOTS																
STATION NO.	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
NUMBER OF SLOTS																
STATION NO.	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
NUMBER OF SLOTS																
STATION NO.	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64
NUMBER OF SLOTS																

(2) Module settings

Module settings

STATION NO.															
SLOT NO.															
I/O MODULE															
STATION NO.															
SLOT NO.															
I/O MODULE															
STATION NO.															
SLOT NO.															
I/O MODULE															
STATION NO.															
SLOT NO.															
I/O MODULE															

VACANCY	X (X)	Y (Y)	MODULE (F)
S 0	X 0	Y 0	F16
S16	X16	Y16	F32
S32	X32	Y32	F48
S48	X48	Y48	F64
S64	X64	Y64	

1.5 Routing Parameters

Routing parameters

No.	DEST. N/W NO.	RELAY N/W NO.	RELAY STATION NO.
[ ]1			
[ ]2			
[ ]3			
[ ]4			
[ ]5			
[ ]6			
[ ]7			
[ ]8			
[ ]9			
[ ]0			

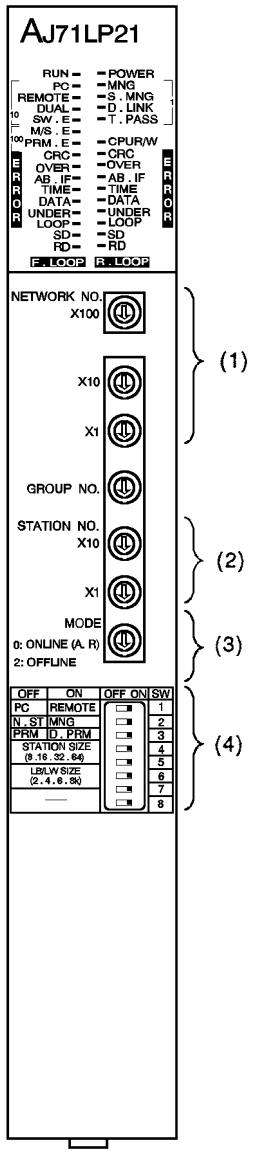
If the number to be entered in the No. column is a two-digit one, fill in the box [ ].

1.6 Network Module Settings

(1) Master station

NETWORK MODULE SETTINGS

Front view



(1) Network No.setting switch setting range
X100 [ ] . . . . . Setting range: 0 to 2
X10 [ ] . . . . . Setting range: 0 to 9
X1 [ ] . . . . . Setting range: 0 to 9

(2) Station No. setting range
X10 [ ] . . . . . Setting range: 0 to 6
X1 [ ] . . . . . Setting range: 0 to 9

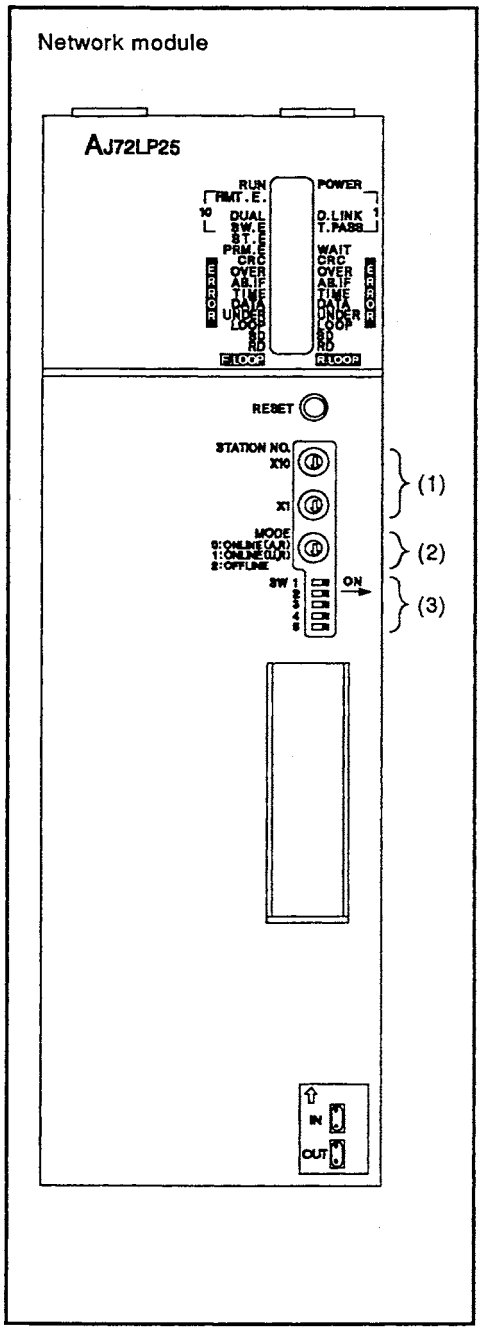
(3) Mode setting switch
[ ] . . . . . Setting range: 0 to F

(4) Condition setting switch

SW	ON/OFF condition	OFF	ON
1	[ ]	PLC to PLC network	Remote I/O network
2	[ ]	All OFF	
3	[ ]		
4	[ ]		
5	[ ]		
6	[ ]		
7	[ ]		
8	[ ]		

(2) Remote I/O station

NETWORK MODULE SETTINGS



(1)Station No. setting switch (STATION No.)

X10 [ ] ..... Setting range: 0 to 6
X1 [ ] ..... Setting range: 0 to 9

(2) Mode setting switch (MODE)
[ ] ..... Setting range: 0 to F

(3) All OFF

APPENDIX 2 GLOSSARY

A

A6BR10(DC)
See the definition for "Coaxial repeater unit".

AB.IF
Error that occurs if a greater number of ones ("1") than stipulated are received consecutively, or if the receive data length is too short. [p3-4, p3-9, p11-10]

AJ72LP25/AJ72BR15/AJ72LR25
Modules required at the remote I/O stations of a remote I/O network. AJ72LP25 is used in optical loop systems, AJ72BR15 is used in coaxial bus systems and AJ72LR25 is used in coaxial loop systems.

AnUCPU X, Y, B, W.
A programmable controller CPU essential for constructing a MELSECNET/10 system. It has 8192 points for each of the following devices: X, Y, B, W.

Automatic return function
A function whereby stations that have been disconnected due to a fault are automatically returned to the data link when the fault is remedied. [p7-22]

B

Baton passing
The right to send data.
The right to execute a cyclic transmission or transient transmission is conceded once per link scan.

C

Coaxial bus system
A system that uses coaxial buses. [p1-8, p3-16]

Coaxial cable
A link cable essential for the construction of coaxial bus systems. There are three types: 3C-2V, 5C-2V, and 5C-FB. [p2-4]

Coaxial repeater unit
A unit that can be used to extend the distance of a coaxial bus system (up to 500 m). Since up to 4 units can be used in one network, the maximum total extension distance of one network is 2.5 km. [p3-16]

Common parameters
Parameters used to set the number of stations, the ranges of devices that can be sent by each station, etc. [p9-10]

Communication test
One of the offline tests, in which transient transmission and the routing parameters are checked. [p5-30]

Condition monitor
Display of host station switch/parameter settings, data link and test information, etc., using a peripheral device. [p5-12]

Constant link scan function
A function that enables the link scan time to be kept constant. [p7-14]

CPU R/W
Indicates communication with the programmable controller CPU. [p3-4]

CRC
Receive data code check error.
[p3-4, p3-9, p11-11]

Cyclic transmission function
Function whereby communication is executed between the stations of a PLC to PLC network, or between the master station and remote I/O stations of remote I/O network.
B, W, X, and Y devices are used. [p7-2]

D

DATA
Indicates an error when 2 kbytes or more of erroneous data have been received.
[p3-4, p3-9, p11-11]

Data link module
Modules required at each station in order to establish a MELSECNET or MELSECNET/B data link.

D.LINK
Indicates operation of a data link. [p3-4, p3-9, p11-11]

DUAL
Indicates execution of multiplex transmission. [p3-4]

— E —

Error history monitor
Display of an error history for loop/communication/transient transmissions using a peripheral device. [p5-21]

— F —

Faulty station
A station that is completely incapable of data link operation because the power supply is OFF. [p8-3]

5C-2V, 5C-FB
See the definition of "Coaxial cable". Lengths up to 500 m can be used.

Fiber-optic cable
A link cable essential for the construction of optical loop systems. [p2-3]

Forward/reverse loop tests
One of the offline tests, in which the entire line is tested. [p3-29]

— G —

GPP function software package
Software that is loaded in a peripheral device to enable programming, monitoring, etc. [p1-11]

— H —

Hardware test
One of the offline tests, in which a hardware test including the send/receive circuits is performed. [p3-21]

— I —

Intelligent special function module
A module that executes interrupt processing with respect to the programmable controller CPU. [p1-12]

Internal self-loopback test
One of the offline tests, in which a hardware test including the send/receive circuits is performed. [p3-23]

I/O allocation
The setting of module information for each remote I/O station. [p7-11, p9-23]

— L —

LB/LW/LX/LY
See the definition for "Link device".

Line monitor
Display of line/data link/CPU/parameter information using a peripheral device. [p5-2]

Link cable
A cable used to connect network modules and operate a data link. There are two types: fiber-optic cables and coaxial cables. [p2-3]

Link device
Link devices are the devices used to operate a data link. At the programmable controller CPU side they are called B/W/X/Y and at the network module side LB/LW/LX/LY.

Link refresh module side LB/LW/LX/LY.
Processing in which data is exchanged between an AnUCPU and a network module. [p8-1]

Link scan
Processing in which data is exchanged between network modules. [p8-1]

LOOP
Indicates a forward loop (F.LOOP) or reverse loop (R.LOOP) error. [p3-4, p3-9, p11-11]

Loopback
Looping back in order to operate the data link while bypassing faulty stations. [p7-19]

Loop test
One of the online tests, in which the loop status is checked. Can only be used in an optical loop system. [p5-26]

— M —

Master station
A station that acts as a control source in the remote I/O network. Parameters must be set for this station. [p1-7]

MNG
Indicates that the station has been set as the control station or master station. [p3-4]

Module setting
Setting the module information of remote I/O stations for which I/O allocations are to be made. [p7-11, p9-23]

M/S.E.
The control station/master station or a station No. is duplicated. [p3-4, p11-11]

Multiplex transmission function
A function, usable only in optical loop systems in which both forward and reverse loops are normal, whereby the transmission speed can be increased. [p7-16]

Multi-tier system
A system in which more than one network is connected. [p1-9, p6-3]

— N —

Network diagnosis
See the definition of "Online test".

Network module
A type of module required at each station in order to establish a MELSECNET/10 data link. [p1-10]

Network monitor
Display of the network statuses using a peripheral device. [p5-1]

Network refresh parameters
Parameters used to set the correspondence between the devices of network modules (LX/LY/LB/LW/SB/SW) and the devices of the programmable controller CPU (X/Y/B/W/M...). [p9-5]

Network setting
Setting of the parameters required for data link operation by using a peripheral device. [p9-1]

Number of modules settings
Settings that set the information for the network modules and data link modules mounted to the AnUCPU. [p9-2]

Number of online return stations setting function
Function that allows the number of stations that can be returned to the online status in one link scan to be set. [p7-17]

— O —

Offline test
A test in which a network module is set to the test mode, a network module hardware test is performed and the data link cable wiring etc. is checked. [p3-20]

Online test
A test in which the line status and network module settings are checked using a peripheral device. [p5-25]

Optical loop system
A system that uses fiber-optic cables. [p1-7, p3-12]

OVER
Indicates that receive data processing is delayed. [p3-4, p3-9, p11-11]

— P —

Peripheral device
Equipment used for programming, monitoring, storage, etc. [p1-11]

PLC to PLC network
Network comprised exclusively of stations that have programmable controller CPUs.

POWER
Indicates a module's power supply status. [p3-4, p3-9]

PRM.E.
Indicates an error in the parameter settings. [p3-4, p3-9, p11-11]

Programmable controbller
Indicates that a PLC to PLC network has been set. [p3-4]

— Q —

QSI fiber-optic cable
Cables made of quartz glass that can be used over a maximum distance of 1km, twice that possible with SI fiber-optic cables. [p2-3]

— R —

RD
Indicates that data is being received. [p3-4, p3-9, p11-11]

REMOTE
Indicates that a remote I/O network has been set. [p3-4]

Remote I/O network
A network comprised exclusively of remote I/O stations. [p1-1]

Remote I/O station
A station controlled by a master station. [p1-7]

Reserve station
Set in order to avoid the problem of station to be connected in the future (which is included in the number of stations but is not actually connected) being treated as a faulty station. [p7-10]

RMT.E.
Blown fuse, I/O module verify error. [p3-9, p11-11]

Routing function
A function that allows transient transmission to stations in other networks. The routing parameters must be set to use this function. [p7-7]

Routing parameters
Parameters that must be set to use the routing function. [p7-7, p9-27]

RUN
Indicates the normal/error status of a module. [p3-4, p3-9, p11-11]

— S —

SB/SW
See the definition for "Special link relays (SB)/special link registers (SW)".

SD
Indicates that data is being sent. [p3-4, p3-9]

Self-loopback test
One of the offline tests, in which a hardware test including send/receive circuits and cables is performed. [p3-25]

Setting confirmation test
One of the online tests, in which the switch settings of each station are checked. [p5-27]

SI fiber-optic cables
Made of multicomponent glass. There are two types: H type and L type. [p2-3]

Slot setting
Setting of the number of remote I/O station slots for which I/O allocations are to be made. [p7-11, p9-23]

S.MNG
Indicates that the station has been switched to a sub-control station. [p3-4]

Special link relays (SB)/special link registers (SW)
Devices that store the statuses of the data link. [p10-14]

Special relays (M)/special registers (D)
Devices that store the statuses of the host station in a remote I/O station.

Station order confirmation test
One of the online tests, used to confirm the station numbers of connected stations. Can only be used in an optical loop system. [p5-28]

Station separation function
Function whereby a station that has gone down in a coaxial bus system can be isolated from the link and data link operation continued by using the operational stations. [p7-22]

Station-to-station test
One of the offline tests, used to test communication between two stations. [p3-27]

ST.E.
Indicates that a station No. is duplicated. [p3-9, p11-11]

Suspended station
A station at which cyclic transmission is stopped but transient transmission is still possible. [p8-3]

SW.E.
Indicates an error in a module's switch settings. [p3-4, p3-9, p11-11]

T

Terminal resistance
An essential component in the construction of a coaxial bus system (2 required per network). [p1-11, p3-18]

3C-2V
See the definition of "Coaxial cable". Lengths up to 300 m can be used.

TIME
Indicates that a data link watchdog timer has timed out. [p3-4, p3-9, p11-11]

Total number of link stations
In a PLC to PLC network, the total number of stations (control station + normal stations.) In a remote I/O network, the number of remote I/O stations. [p9-10]

T.PASS
See the definition for "Baton passing".

Transient transmission function
A function whereby communication is only executed when there is a request. [p7-6]

Transmission delay time
The time taken for data to be transmitted from the master station to a remote I/O station, or from a remote I/O station to the master station. [p8-4]

Two-tier system
A single network. [p1-7, p6-1]

U

UNDER
Indicates that the internal processing for receive data is not at fixed intervals. [p3-4, p3-9, p11-11]

W

WAIT
Waiting for communication with a special function module.

W.D.T.
The time used to determine whether or not the data link is operating normally. [p9-11]

Z

ZNFR/ZNTO
Special instructions used to read data from/write data to the buffer memories of special function modules at remote I/O stations. [p4-23, p10-3]

MEMO

WARRANTY

Please confirm the following product warranty details before using this product.

1. Gratis Warranty Term and Gratis Warranty Range

If any faults or defects (hereinafter "Failure") found to be the responsibility of Mitsubishi occurs during use of the product within the gratis warranty term, the product shall be repaired at no cost via the sales representative or Mitsubishi Service Company.

However, if repairs are required onsite at domestic or overseas location, expenses to send an engineer will be solely at the customer's discretion. Mitsubishi shall not be held responsible for any re-commissioning, maintenance, or testing on-site that involves replacement of the failed module.

[Gratis Warranty Term]

The gratis warranty term of the product shall be for one year after the date of purchase or delivery to a designated place. Note that after manufacture and shipment from Mitsubishi, the maximum distribution period shall be six (6) months, and the longest gratis warranty term after manufacturing shall be eighteen (18) months. The gratis warranty term of repair parts shall not exceed the gratis warranty term before repairs.

[Gratis Warranty Range]

(1) The range shall be limited to normal use within the usage state, usage methods and usage environment, etc., which follow the conditions and precautions, etc., given in the instruction manual, user's manual and caution labels on the product.

(2) Even within the gratis warranty term, repairs shall be charged for in the following cases.

1. Failure occurring from inappropriate storage or handling, carelessness or negligence by the user. Failure caused by the user's hardware or software design.
2. Failure caused by unapproved modifications, etc., to the product by the user.
3. When the Mitsubishi product is assembled into a user's device, Failure that could have been avoided if functions or structures, judged as necessary in the legal safety measures the user's device is subject to or as necessary by industry standards, had been provided.
4. Failure that could have been avoided if consumable parts (battery, backlight, fuse, etc.) designated in the instruction manual had been correctly serviced or replaced.
5. Failure caused by external irresistible forces such as fires or abnormal voltages, and Failure caused by force majeure such as earthquakes, lightning, wind and water damage.
6. Failure caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.
7. Any other failure found not to be the responsibility of Mitsubishi or that admitted not to be so by the user.

2. Onerous repair term after discontinuation of production

(1) Mitsubishi shall accept onerous product repairs for seven (7) years after production of the product is discontinued. Discontinuation of production shall be notified with Mitsubishi Technical Bulletins, etc.

(2) Product supply (including repair parts) is not available after production is discontinued.

3. Overseas service

Overseas, repairs shall be accepted by Mitsubishi's local overseas FA Center. Note that the repair conditions at each FA Center may differ.

4. Exclusion of loss in opportunity and secondary loss from warranty liability

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation of damages caused by any cause found not to be the responsibility of Mitsubishi, loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products, special damages and secondary damages whether foreseeable or not, compensation for accidents, and compensation for damages to products other than Mitsubishi products, replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

5. Changes in product specifications

The specifications given in the catalogs, manuals or technical documents are subject to change without prior notice.

Type MELSECNET/10 Network System (Remote I/O network)

Reference Manual

MODEL	NET/10-RMTI/O-R-E
MODEL CODE	13JE72
SH(NA)-3509-J(1307)MEE	

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