MELSEC QnA Series

Programmable Logic Controller

Reference Manual

QnA/Q4AR

MELSECNET/10 Network System

01 10 1996
IB(NA)-66690
Version A

● SAFETY PRECAUTIONS ●

(Read these precautions before using.)

When using Mitsubishi equipment, thoroughly read this manual and the associated manuals introduced in this manual. Also pay careful attention to safety and handle the module properly.

These precautions apply only to Mitsubishi equipment. Refer to the CPU module user's manual for a description of the PC system safety precautions.

These ● SAFETY PRECAUTIONS ● classify the safety precautions into two categories: "DANGER" and "CAUTION".

DANGER	**Procedures which may lead to a dangerous condition and cause death or serious injury if not carried out properly.**
⚠CAUTION	**Procedures which may lead to a dangerous condition and cause superficial to medium injury, or physical damage only, if not carried out properly.**

Depending on circumstances, procedures indicated by **⚠CAUTION** may also be linked to serious results. In any case, it is important to follow the directions for usage.

Store this manual in a safe place so that you can take it out and read it whenever necessary. Always forward it to the end user.

DANGER

[Design Precautions]

- When there are communication problems with the data link, the communication problem station will enter the following condition.
  Build an interlock circuit into the sequence program that will make sure the system operates safely by using the communication state information.
  Not doing so could result in erroneous output or erroneous operation.
  (1) For the data link data, the data prior to the communication error will be held.
  (2) The remote I/O station will turn all output off.
  However, when the output hold is set for the Q4ARCPU (for the independent system) and A6RAF (for the duplex system), the output state prior to the communication error is maintained.
  When using a module that has a function of outputting externally via a remote I/O station, be careful. The remote I/O modules (*AJ72QLP25 and AJ72QBR15) that can maintain output require a software version "G" or later.
- For a QnA(R)CPU and AnUCPU compound system, absolutely do not execute the transient transmissions indicated below, which cannot be executed from the QnA(R)CPU to another AnUCPU station.
  The AnUCPU in which the transmission was executed results in MAIN CPU DOWN or WDT ERROR, and the operation may stop.
  (1) GPPQ
  - Remote operation (such as remote RUN, STOP, PAUSE, and RESET)
  - Clock setting
  - Online mode device testing

  (2) Link dedicated instruction (SEND, READ, SREAD, WRITE, SWRITE, and REQ)

⚠CAUTION

[Design Precautions]

- Do not bunch the control wires or communication cables with the main circuit or power wires, or install them close to each other.
  They should be installed 100mm (3.9 inch) or more from each other.
  Not doing so could result in noise that would cause erroneous operation.

⚠CAUTION

[Installation Precautions]

- Use the PC in an environment that meets the general specifications contained in this manual. Using this PC in an environment outside the range of the general specifications could result in electric shock, fire, erroneous operation, and damage to or deterioration of the product.
- Install so that the pegs on the bottom of the module fit securely into the base module peg holes. Tighten the module terminal screws by the specified torque. Not installing the module correctly or tightening the screws to the terminal base could result in erroneous operation, damage, or pieces of the product falling.

DANGER

[Wiring Precautions]

- Completely turn off the external power when installing or placing wiring. Not completely turning off all power could result in electric shock or damage to the product.

⚠CAUTION

[Wiring Precautions]

- When wiring in the PC, be sure that it is done correctly by checking the product's rated voltage and the terminal layout. Connecting a power supply that is different from the rating or incorrectly wiring the product could result in fire or damage.
- Tighten the terminal screws with the specified torque. If the terminal screws are loose, it could result in short circuits, fire, or erroneous operation.
- Be sure there are no foreign substances such as sawdust or wiring debris inside the module. Such debris could cause fires, damage, or erroneous operation.
- Solder the coaxial cable connector properly. Incomplete soldering may cause a malfunction.
- Do not pull the coaxial cable when the cable is connected to the module. It may result in damage to the module.

⚠DANGER

[Startup and Maintenance Precautions]

- Do not touch the terminals while power is on. Doing so could cause shock or erroneous operation.
- Turn the power off when cleaning the module or tightening the terminal screws. Conducting these operations when the power is on could result in electric shock.

⚠CAUTION

[Startup and Maintenance Precautions]

- Before conducting operations such as changing the program while the module is operating, force output, run, stop, pause, etc., be sure to thoroughly read the manual and take due consideration for safety. Operation mistakes could cause damage to the equipment and other problems.
- Do not disassemble or modify the modules. Doing so could cause trouble, erroneous operation, injury, or fire.
- Turn the power off when removing a module. Trying to remove the module while the power is on could damage the module or result in erroneous operation.

⚠CAUTION

[Disposal Precautions]

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

Revisions

* The manual number is noted at the lower left of the back cover.

Print Date	*Manual Number	Revision
Oct. 1996	IB (NA)-66690-A	First printing

INTRODUCTION

Thank you for choosing a Mitsubishi MELSEC-QnA Series General Purpose Programmable Controller.
Before using your new PC, please read this manual thoroughly to gain an understanding of its functions so you can use it properly.
Please forward a copy of this manual to the end user.

Table of Contents

Simplex Network Section

Duplex Network Section

Troubleshooting Section

About This Manual

The following are manuals related to this product.
Request for the manuals as needed according to the chart below.

Related Manuals

Manual Name	Manual No. (Type code)
Q4ARCPU Overview Manual Describes the concept of the system (process control and duplex system) using Q4ARCPU. (Sold separately)	IB66606 (13JF10)
Q4ARCPU User's Manual Describes the Q4ARCPU performance, functions, and usage. Also describes power supply, memory cards, base-module specifications, and usage. (Sold separately)	IB66685 (13J852)
QnACPU Programming Manual (Fundamental Edition) Describes the programming methods, device names, parameters, and program types necessary to create a program. (Sold separately)	IB-66614 (13JF46)
QnACPU Programming Manual (Common Instruction Edition) Describes the sequence instruction, basic instruction, and application instruction usage methods. (Sold separately)	IB-66615 (13JF47)
QnACPU Programming Manual (Special-Function Module Edition) Describes the special-function module's dedicated instructions. (Sold separately)	IB-66616 (13JF48)
SW□NX-GPPQ, SW□IVD-GPPQ GPP Function Operating Manual (Offline Edition) Describes offline functions such as the programming method, print out method, and file maintenance. (included)	IB-66617 (13JF49)
SW□NX-GPPQ, SW□IVD-GPPQ GPP Function Operating Manual (Online Edition) Describes online functions such as monitor methods and debugging methods. (included)	IB-66618 (13JF50)

Reading This Manual

This manual is comprised of four sections, as shown below.

Usage for the "backup mode" is described only for the Q4ARCPU duplex system. The separate mode is not described.

Common Section

- Chapter 1: Overview
  Describes the characteristics of MELSECNET/10.
- Chapter 2: System Configuration
  Describes the system that can be configured.
- Chapter 3: Specifications
  Describes the MELSECNET/10 performance specifications, and data link cable specifications.
- Chapter 4: Settings and Procedures Before System Operation
  Describes the network module settings and connections before making the data link.
- Chapter 5: Network Monitoring
  Describes the network monitoring performed with peripheral devices.
- Chapter 6: Link Data Communication Processing and Processing Time
  Describes the link data communication processing and processing time.

Simplex Network Section

- Chapter 7: Let's Grasp the MELSECNET/10 Image!
  Using examples, the network module and parameter settings are described.
- Chapter 8: Function
  Describes the functions for the simplex network.
- Chapter 9: Parameter Setting
  Describes the setting method for each parameter.
- Chapter 10: Programming
  Describes the programming method for each system.

Duplex Network Section

Includes only the content related to duplex network. Items that are the same as for simplex network are not included. Refer to the simplex network section as necessary.

- Chapter 11: Let's Grasp the Duplex Network Image!
  Using examples, network module and parameter setting methods are described.
- Chapter 12: Function
  Describes the functions specifically for duplex system.
- Chapter 13: Parameter Setting
  Describes the setting method for each parameter.
- Chapter 14: Programming
  Describes the programming method for each system.

Troubleshooting Section

- Chapter 15: Troubleshooting
  Describes the processing method when trouble occurs.

Differences Between Q4ARCPU and QnACPU

The Q4ARCPU has the same performance and functions as the Q4ACPU, but has the following additional functions:

(1) Duplex CPU

(2) High speed real number operation

(3) Hold/clear selection for external output when an operation stop error occurs.

Using the MELSECNET/10 for the First Time

What is the MELSECNET/10 Network System?

The MELSECNET/10 performs the data link (data communication) between "PC CPU ↔ PC CPU" and "PC CPU ↔ remote I/O station".

What is Data Link?

Data link is to communicate with each station using link-dedicated instruction and link registers (B, W, X and Y).

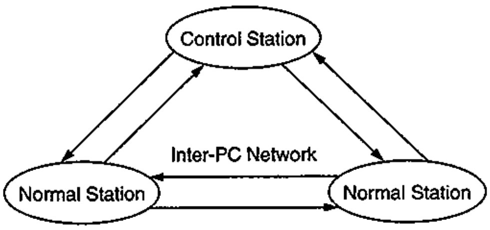
Data link

- Cyclic transmission (function to communicate with each station periodically)

[Inter-PC network]

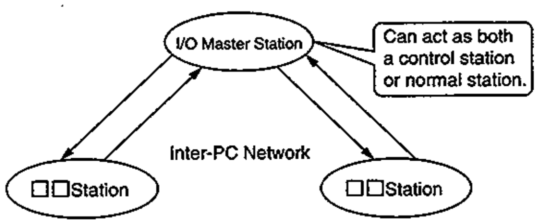
[B/W communication]

N:N All stations can communicate with all stations.



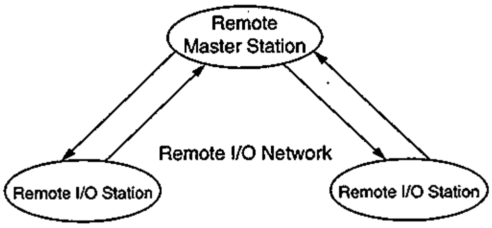
[X/Y communication]

1:N Communication can be performed only for specific stations.



[Remote I/O network]

Communication can be performed with the buffer memory for the special function module installed into the remote I/O stations by B/W, and the I/O signals by X/Y.



- Transient transmission (function to communicate only when requested)
  - Peripheral device
  - Instruction

Basic MELSECNET/10 Terminology

Control Station .... A station is necessary in the inter-PC network, and sets parameters for the data link.

Normal Station .... A station that receives parameters from the control station and performs the operation.

Remote Master Station....... A station is necessary in the remote I/O network, and sets parameters for the data link.

Remote I/O Station.......... A station controlled by the remote master station.

I/O Master Station........... A station controlling the X/Y communication in the inter-PC network.

Network................... A system performing the data link.

Remote Submaster Station.... For Multiple Master Systems: A station that controls the remote I/O station in case the multiple-remote master station is down.

For Parallel Master Systems: A station that controls the remote I/O station in the same manner as the parallel-remote master station.

Parameter................. Necessary to perform a data link. Set with a peripheral device.

Simplex Network............ A network composed of independent systems (configured with one CPU) for all network stations.

Duplex Network............. A network composed of at least one Q4ARCPU duplex system station.

Control System............. A system that actually controls the system.

Standby System .... A system that stands by to continue control in case the control system goes down.

QnA(R)CPU .... The general name used when all CPU types of Q4ARCPU and QnACPU (Q2ACPU, Q2ACPU-S1, Q3ACPU, and Q4ACPU) are referreed to.

QnACPU.................. The generic name used when Q2ACPU, Q2ACPU-S1, Q3ACPU and Q4ACPU are referred to.

Q4ARCPU................. Name used when only Q4ARCPU is used.

Backup Mode .... A mode that enables the switch from the control system to the standby system for the Q4ARCPU duplex system.

Separate Mode............. A mode to perform maintenance in the Q4ARCPU duplex system.

Independent System......... A system configured with one CPU.

Duplex System .... A system configured with two Q4ARCPUs.

Common Section

Items that are common in both simplex and duplex networks, such as some QnA/Q4AR MELSECNET/10 characteristics, system configurations, performance specifications and procedures prior to operation, are described in this section.

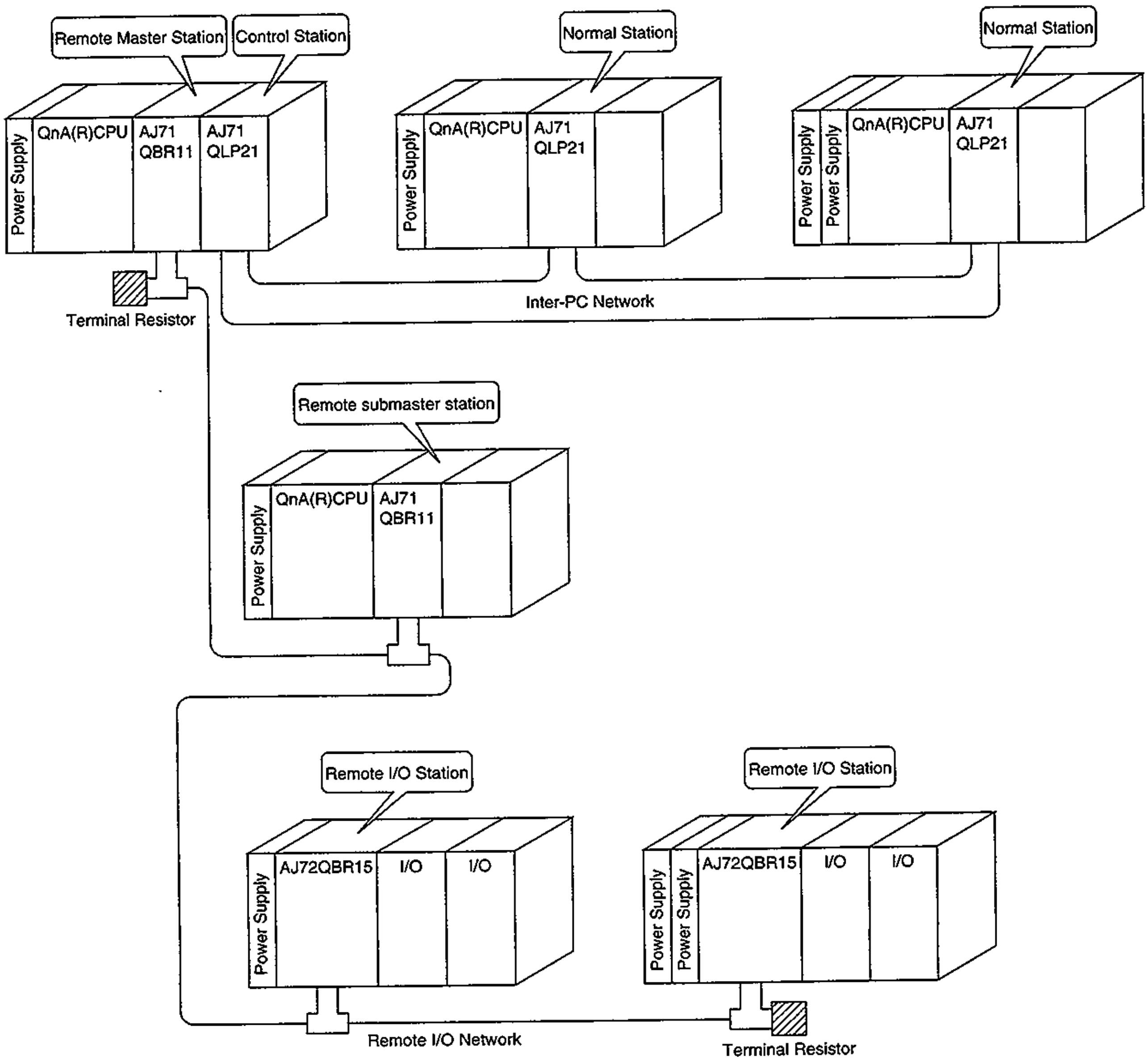
1 Overview

The MELSECNET/10 network system has the following:

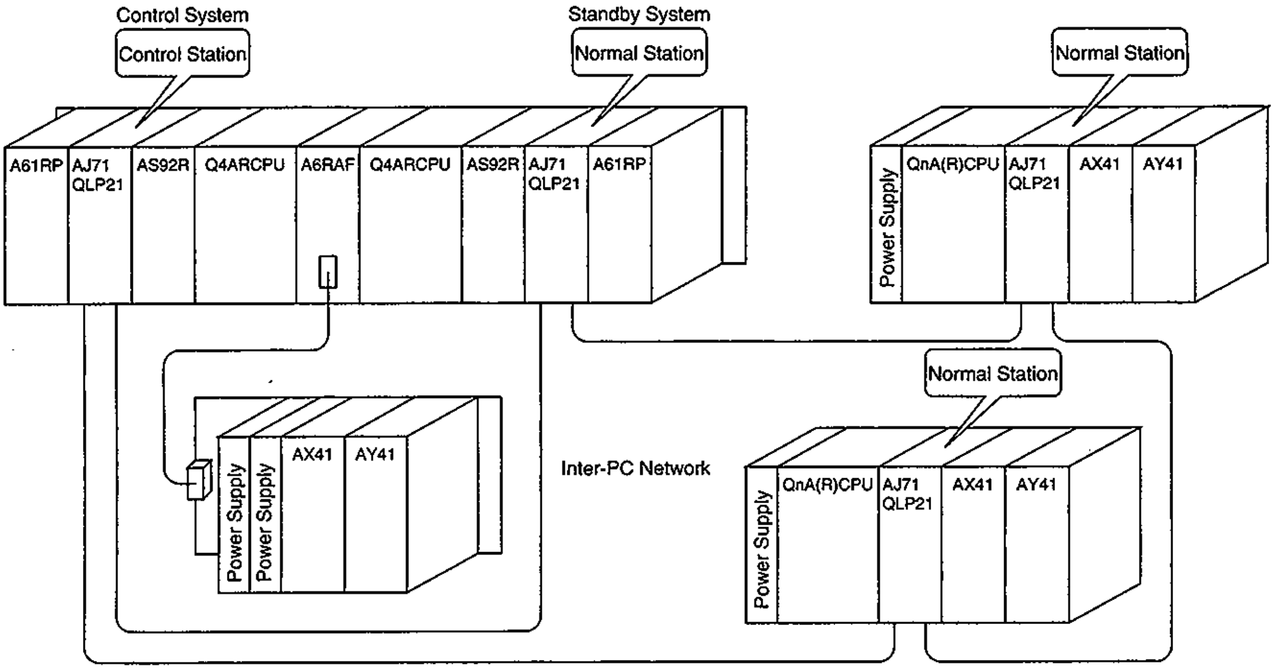
- Inter-PC Network communicating between "PC CPU's".
- Remote I/O Network communicating between the PC CPU and remote I/O network.

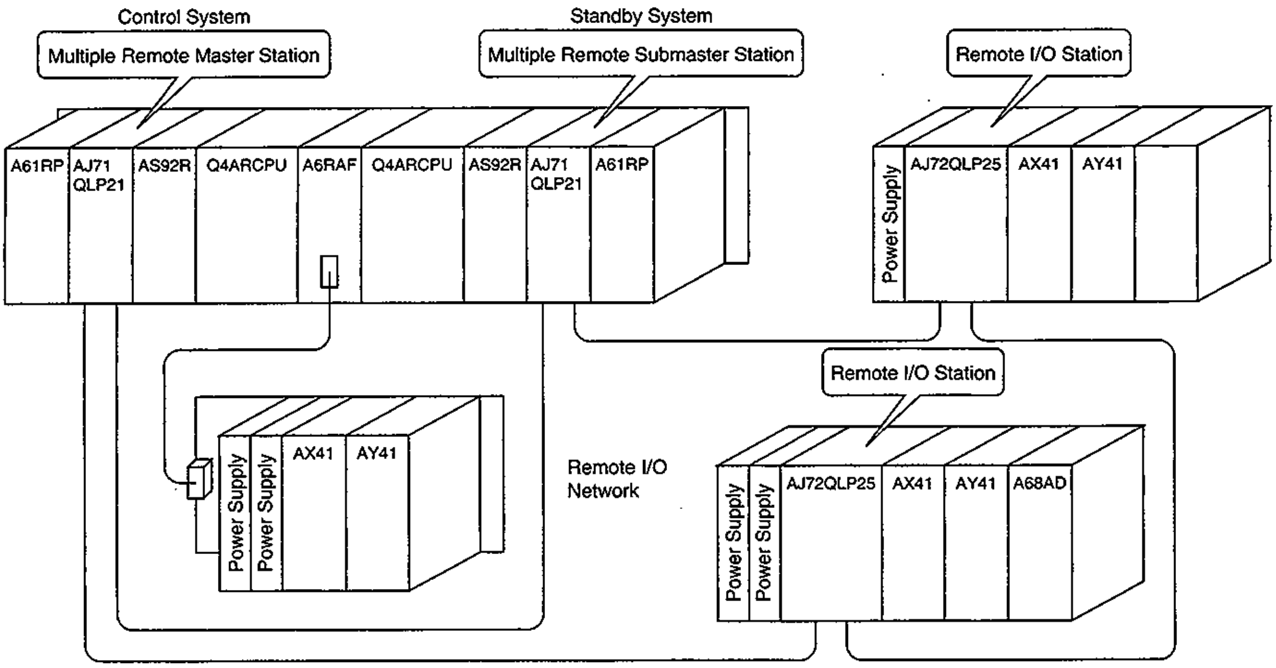
The inter-PC network and remote I/O network are each dedicated networks. The remote I/O stations cannot exist in the inter-PC networks nor can inter-PC network stations (control station and normal station) exist in the remote I/O network.

The system below configures the inter-PC network by the optical loop system, and the remote I/O network by the coaxial bus system.



The following system configures the inter-PC network duplex network and remote I/O network duplex network (multiple master system).





1.1 Simplex Network Characteristics

1.1.1 Inter-PC network and remote I/O network common characteristics

(1) High speed communication

(a) The communication speed is 10 MBPS.

(b) Approximately 20 MBPS communication can be performed in the loop system by the multiplex transmission function (during forward/reverse loop normal operation).

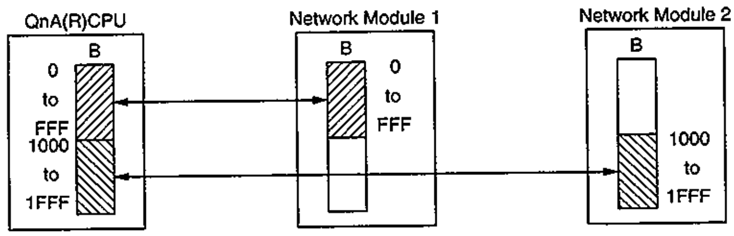
(2) Large capacity link device

There are 8,192 points for the link relay (B), link register (W) and I/O (X/Y), which are the network module (AJ71QLP21 (S) and AJ71QBR11) link devices.
QnA(R)CPU also has 8,192 points for link device the link relay (B), link register (W) and I/O (X/Y).

(3) Large scale system configurations are possible.

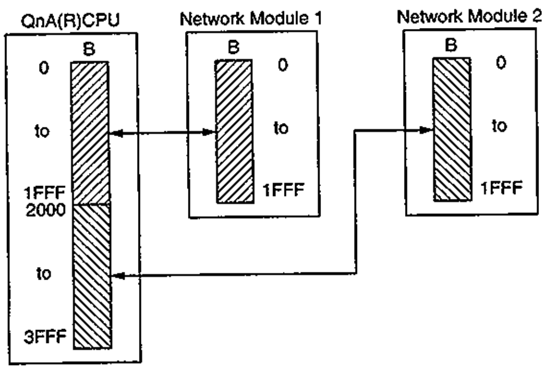
(a) Up to four network modules can be installed into one QnA(R) CPU.
When network modules are installed, the following usages can be possible:

1) When using link devices within a total of 8,192 points, they can be all allocated to the QnA(R)CPU link device.



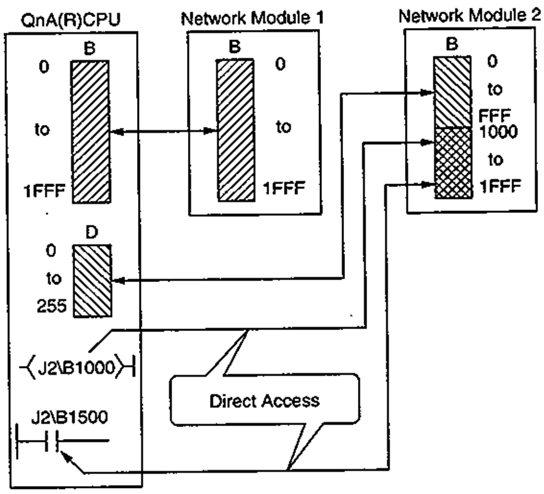
2) When using link devices over a total of 8,192 points, there are three methods to refresh to the QnA(R)CPU.
- Increase the points of link devices for the QnA(R)CPU, and allocate the devices.
- Allocate devices outside the link devices.
- Perform direct access.

[Increase the points of QnA(R)CPU devices]



With the "device setting" in the peripheral device (SW□-GPPQ) parameter mode, the QnA(R)CPU B/W points can be increased.

[Allocate devices outside the link devices, and perform direct access]



(b) With the inter-PC network and remote I/O network, the optical loop system or coaxial bus system can be selected.

1) The optical system has a long station to station length and total extension length. Moreover, there are no noise effects in the transmission.

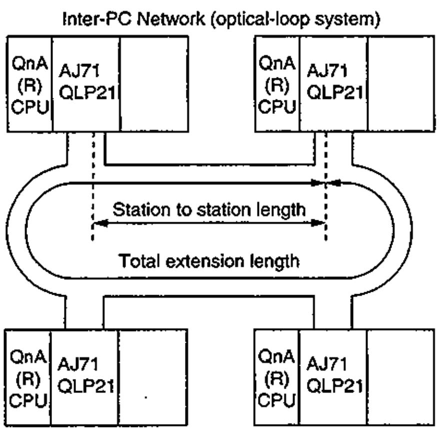
Station to station/total extension distance according to cable type

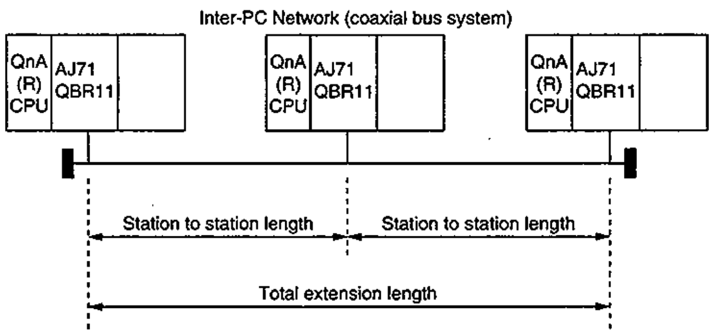
Cable		Station to station	Total extension
SI cable (old)	H Type	300m (984.3ft.)	30km (18.64miles)
	L Type	500m (1641ft.)	
SI cable (New)		500m (1641ft.)	
QSI cable		1km (3281ft.)	

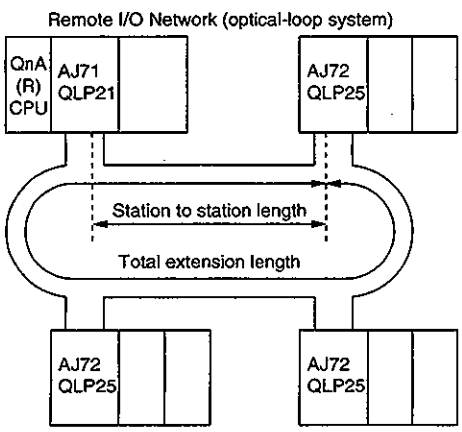
2) Wiring is simple in a coaxial bus system.
However, there are station cable length restrictions, depending on the number of connected stations. (Refer to Section 4.3.2.)

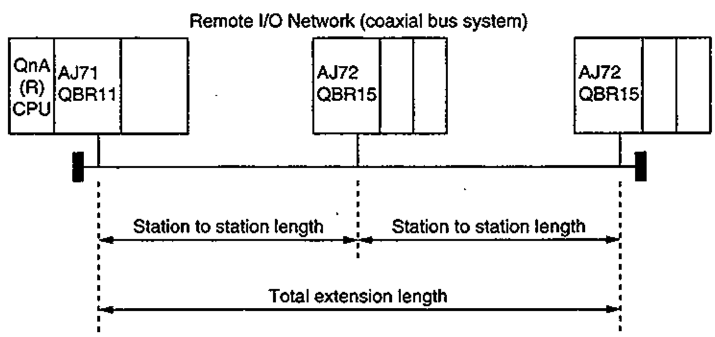
Station to station/total extension length

Cable	Station to station	Total extension
3C-2V	300m (984.3ft.)	300m (984.3ft.)
5C-2V	500m (1641ft.)	500m (1641ft.)

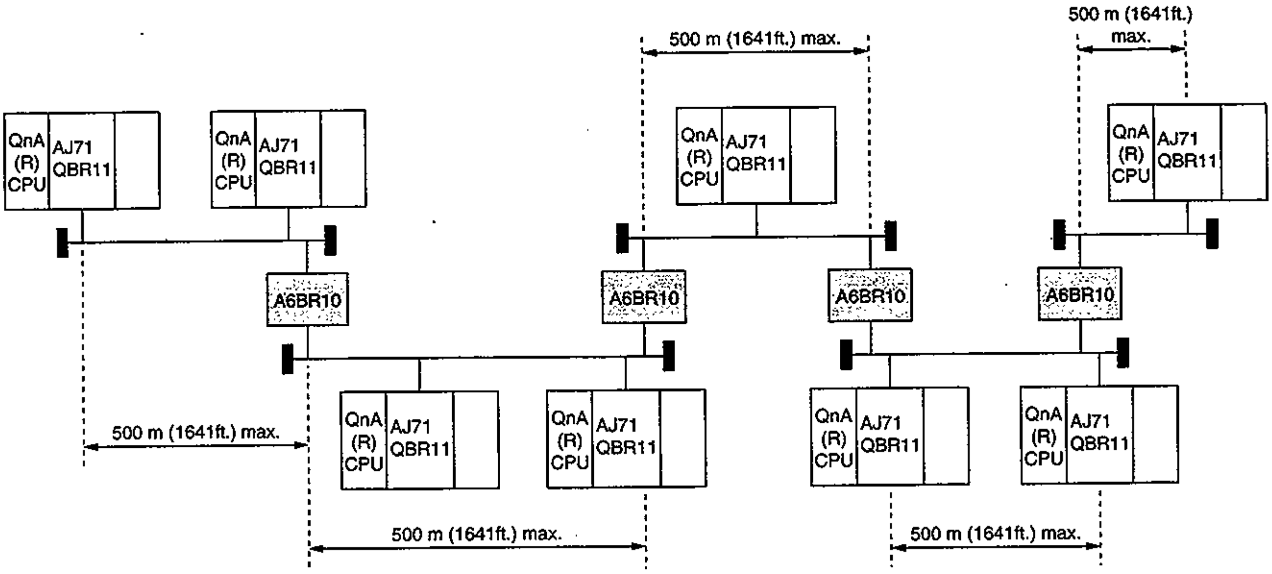








3) In the case of coaxial bus system, using the A6BR10/A6BR10-DC type repeater module, the maximum station to station/total extension length can be 2.5 km (using four units).

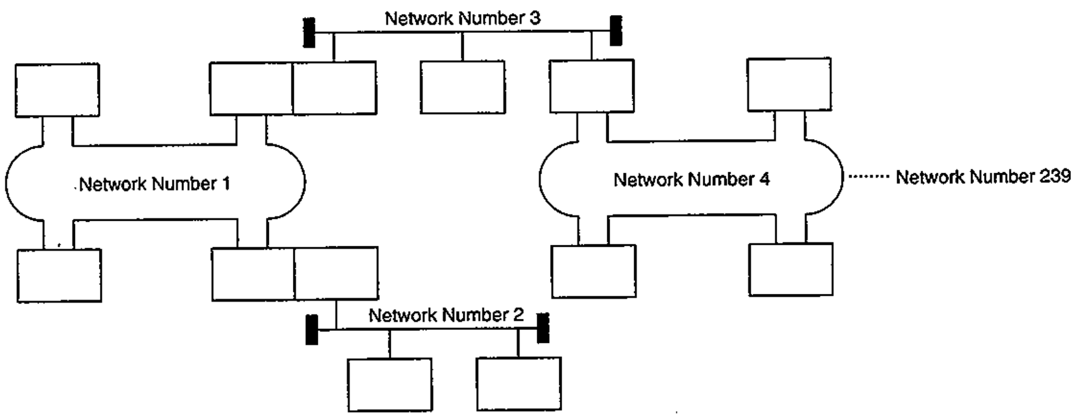


(c) The number of stations that can be connected will differ for the optical-loop system and the coaxial bus system.

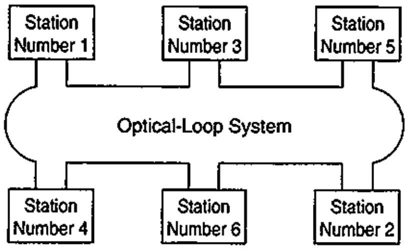
	Optical loop system	Coaxial bus system
Inter-PC network	64 Stations (Control station: 1 Normal station: 63)	32 Stations (Control station: 1 Normal station: 31)
Remote I/O network	65 Stations (Remote master station: 1 Remote I/O station: 64*)	33 Stations (Remote master station: 1 Remote I/O station: 32*)

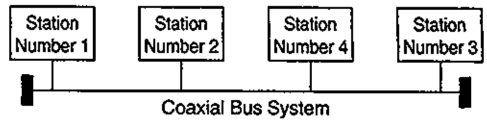
* In a multiple/parallel master system, the multiple/parallel-remote submaster station occupies one station, so there will be one less station for the remote I/O.

(d) A maximum of 239 networks can be set as a system.



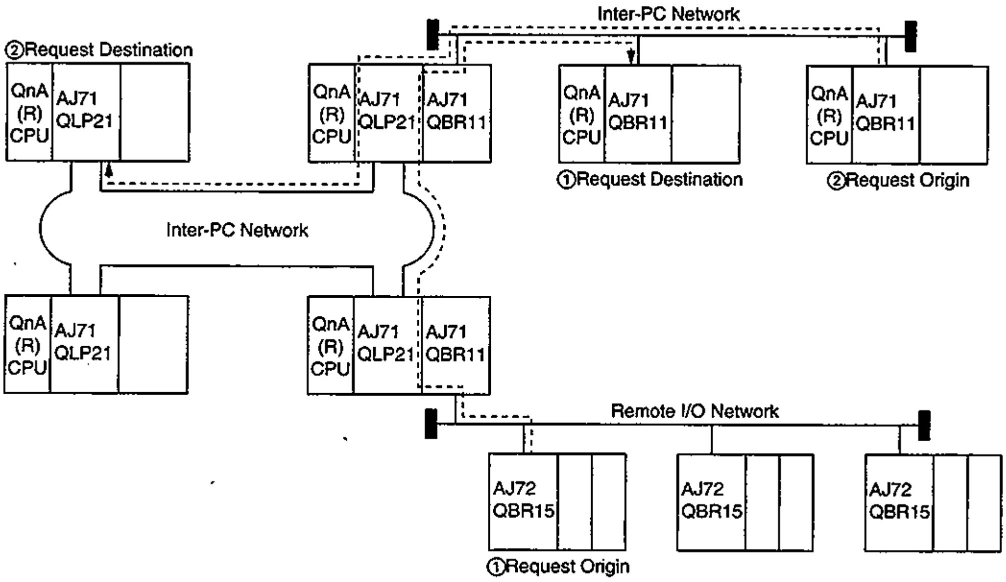
(e) Connections can be made regardless of station numbers.





(4) Transient transmission to other network stations (routing function)

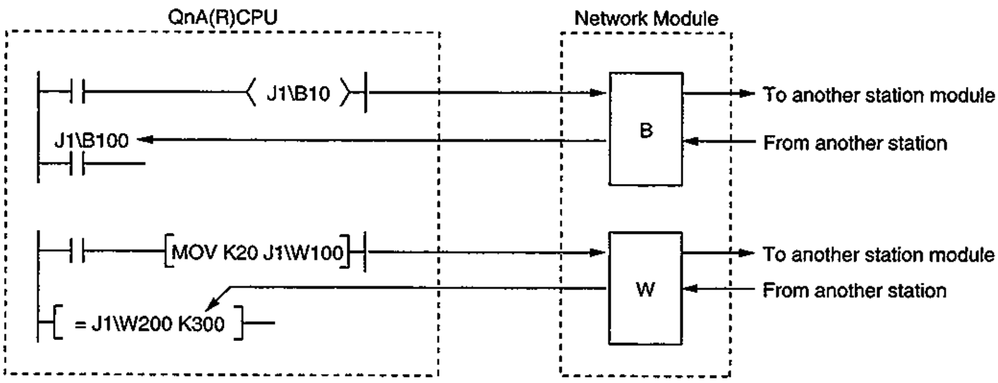
In a system with multiple networks (a multilayer), transient transmissions can be performed to other network stations.



(5) Link device direct access

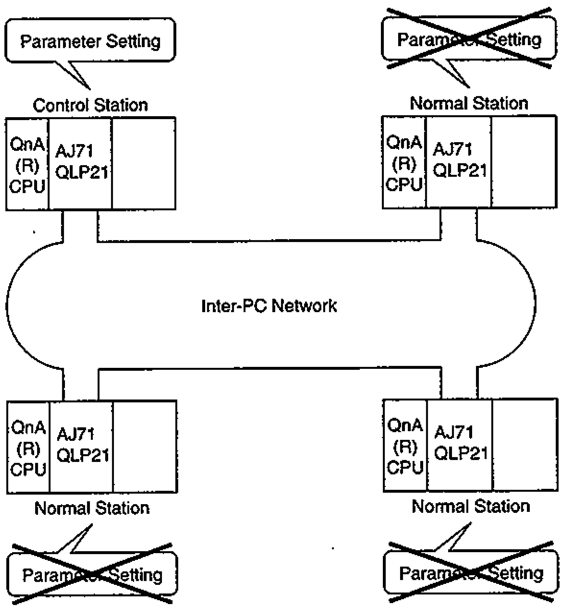
Regardless of the PC CPU link refresh, network module link devices (B, W, X, Y, SB, and SW) can be read/written directly with the sequence program.

Therefore, transmission delay time caused by link refresh can be minimized.



(6) Enabling QnA(R)CPU to have default values for the parameters minimises the parameter setting items.

For example, only the parameter setting to the control station is needed for the inter-PC network below.



By setting the common parameters (to set the device range for each station transmission) in the control station by the default parameters of the network module, the parameter setting is not required for other stations.

(7) Cables used for the MELSECNET and MELSECNET/10 for AnU can be used.

(8) Reserved Station Specification

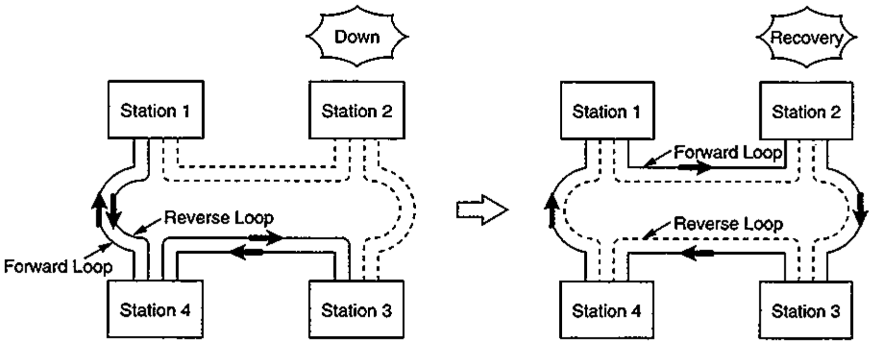
Stations to be connected in the future (included in the station count, but not actually connected) can be reserved. This avoids communication errors, and does not affect the link scan time.

(9) Fulfilled RAS function

Data link relibility is improved with the auto recovery function, loop back function, network monitoring and network diagnosis.

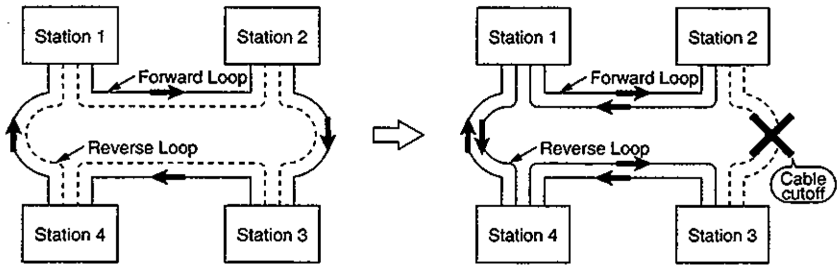
(a) Auto recovery function

When the network is stopped due to an error, the network is automatically restarted when the station in which the error has occurred is back to normal operation.



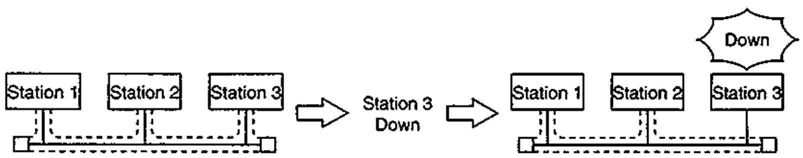
(b) Loop back function (optical loop system)

Cuts off the areas in which the cable are disconnected or the station in which an error has occurred using the forward loop/reverse loop, performs the data link with only the stations that can operate normally.



(c) Station cutoff function (coaxial bus system)

Cuts off the station that is down due to power off, etc and performs the data links with stations that can operate normally.



(d) Diagnostic function

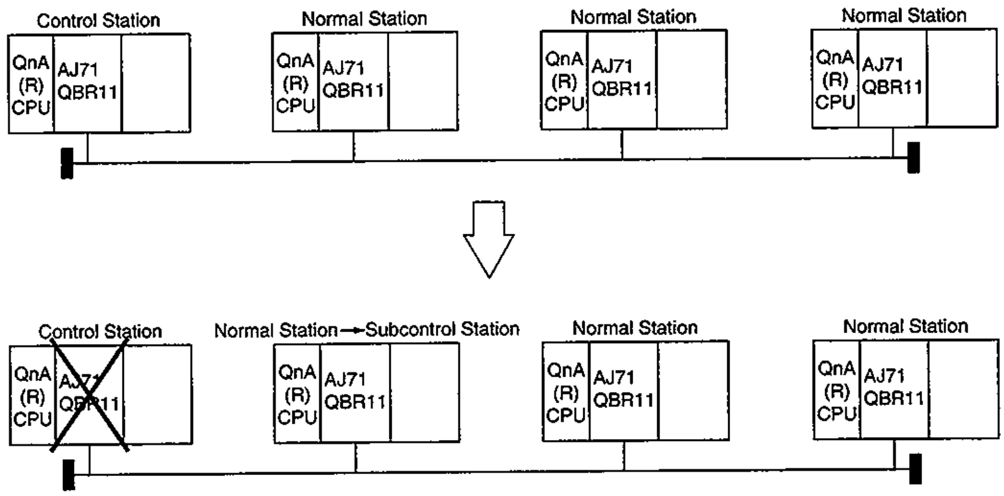
Hardware, cable connections and settings related to the data link can be checked by network monitoring/network diagnostics with a peripheral device and by offline diagnosis with the network module's switch setting.

The RAS function stands for "Reliability, Availability and Serviceability," and describes the total ease of use in automated facilities.

1.1.2 PC network characteristics

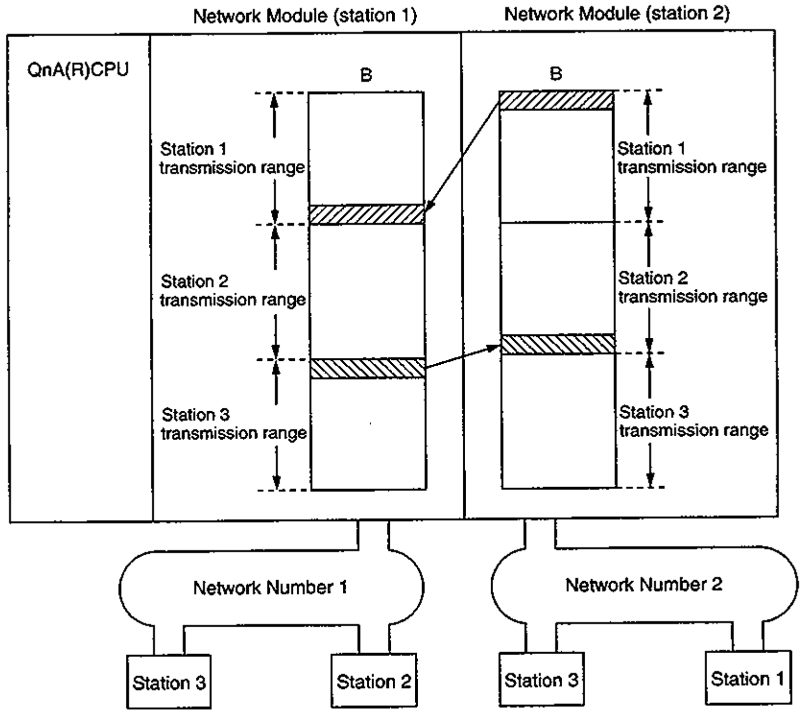
(1) Preventing the network from going down due to a control station failure

When the error occurs in the network control station, a normal station acts as the control station (subcontrol station) and continues the data link.



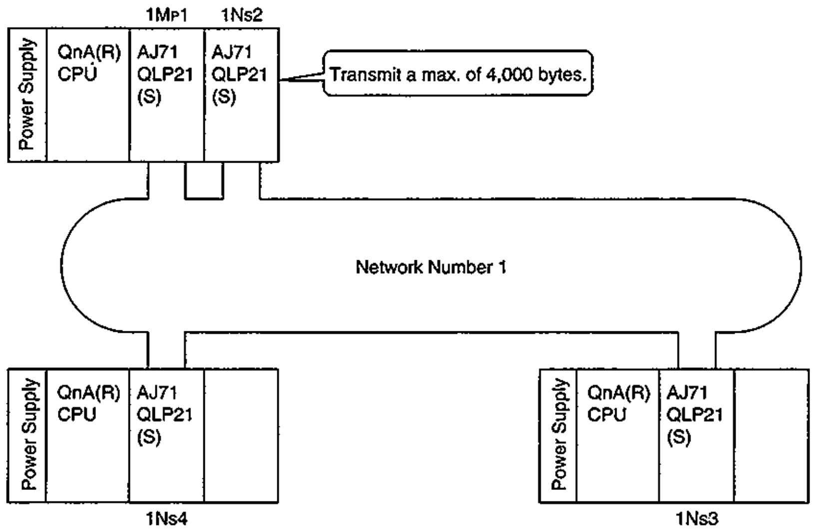
(2) Data transmission between networks

The data link transmission function enables data (B/W) transmission to other networks.



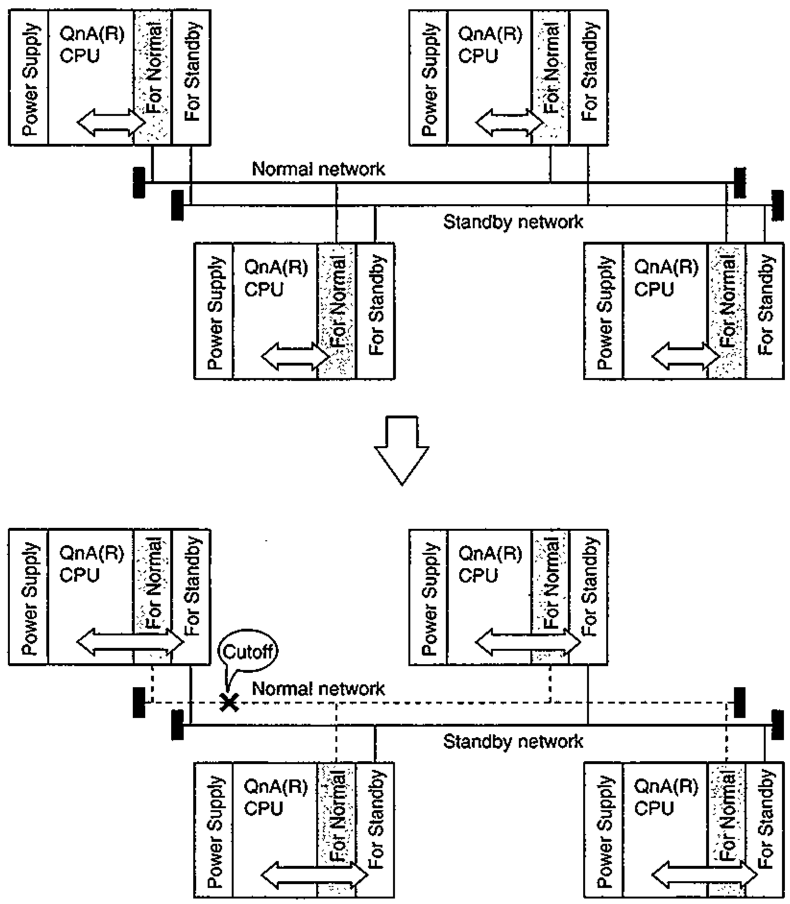
(3) Increase the points of links for one station

By installing network modules with the same network number to one QnA(R) CPU, the link points as much as "cards x 2,000 (bytes)" can be transmitted.



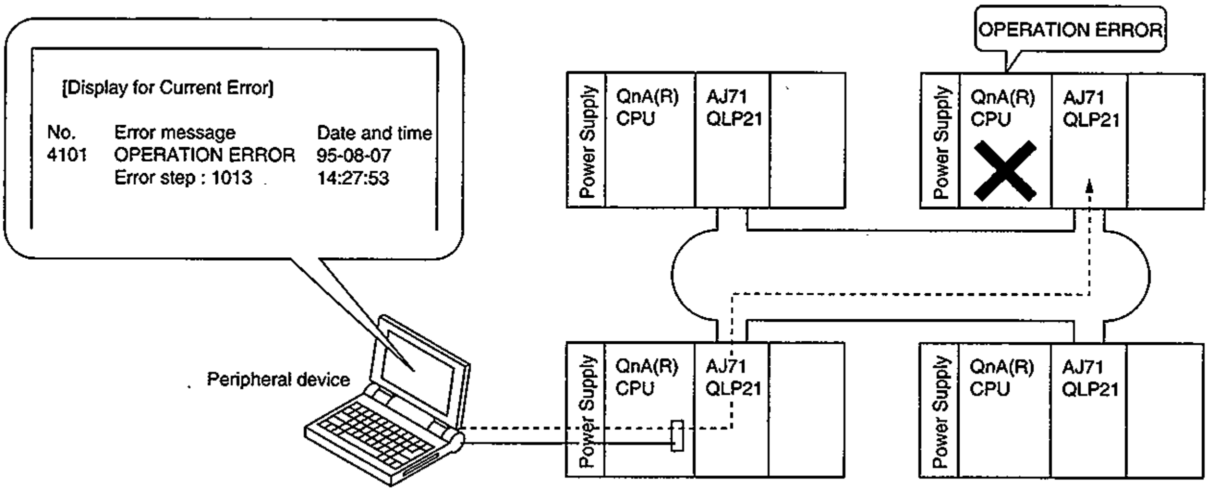
(4) Simplified network duplexing

Install two network modules to each PC CPU. When an error occurs in the normal network due to module failure, the data link continues by switching to the standby network's link data refresh. (Refresh is switched in the program.)

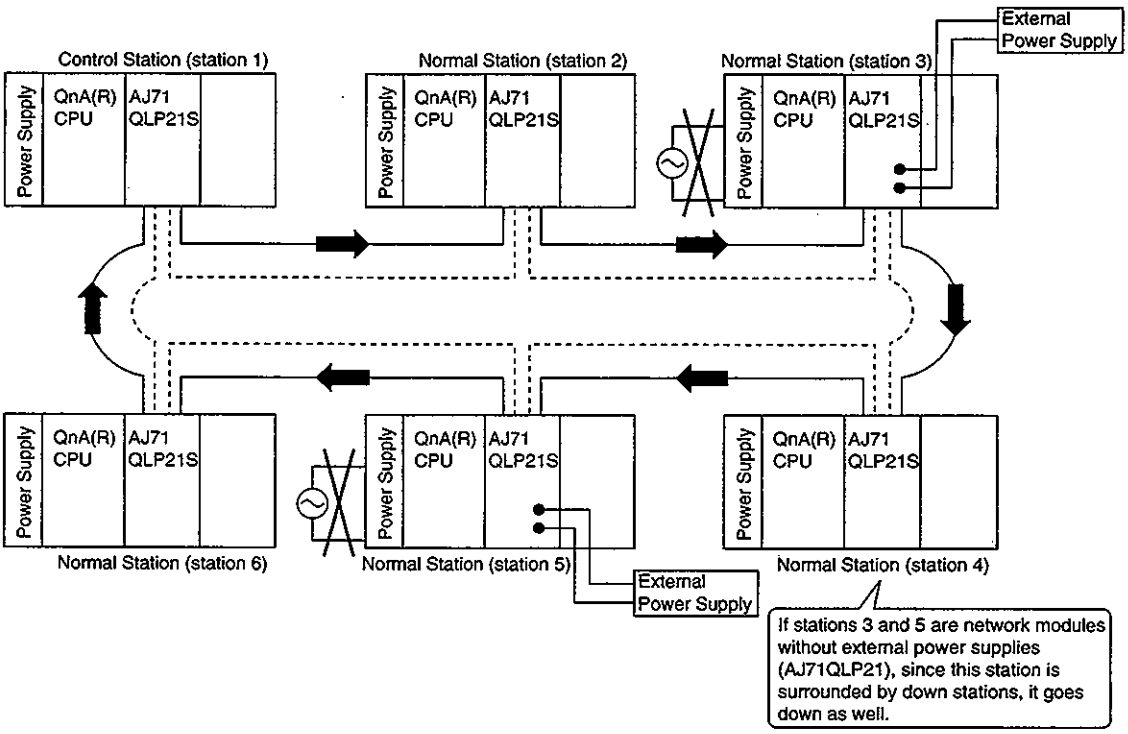


(5) **Transient transmission is possible even when a PC CPU error occurs.**
Even if an error that causes the PC CPU to stop occurs during system operation, since the network module is normal, transient transmission can continue.

The status of the PC CPU in which an error has occurred can be checked from another station.



(6) **Preventing a station from going down by external power supply.**
When multiple stations are down in a loop system, the data link can continue for a station between the downed stations. Loopbacks can be prevented, so the link's scan time is stabilized. (AJ71LP21S is a network module that can supply external power supply.)

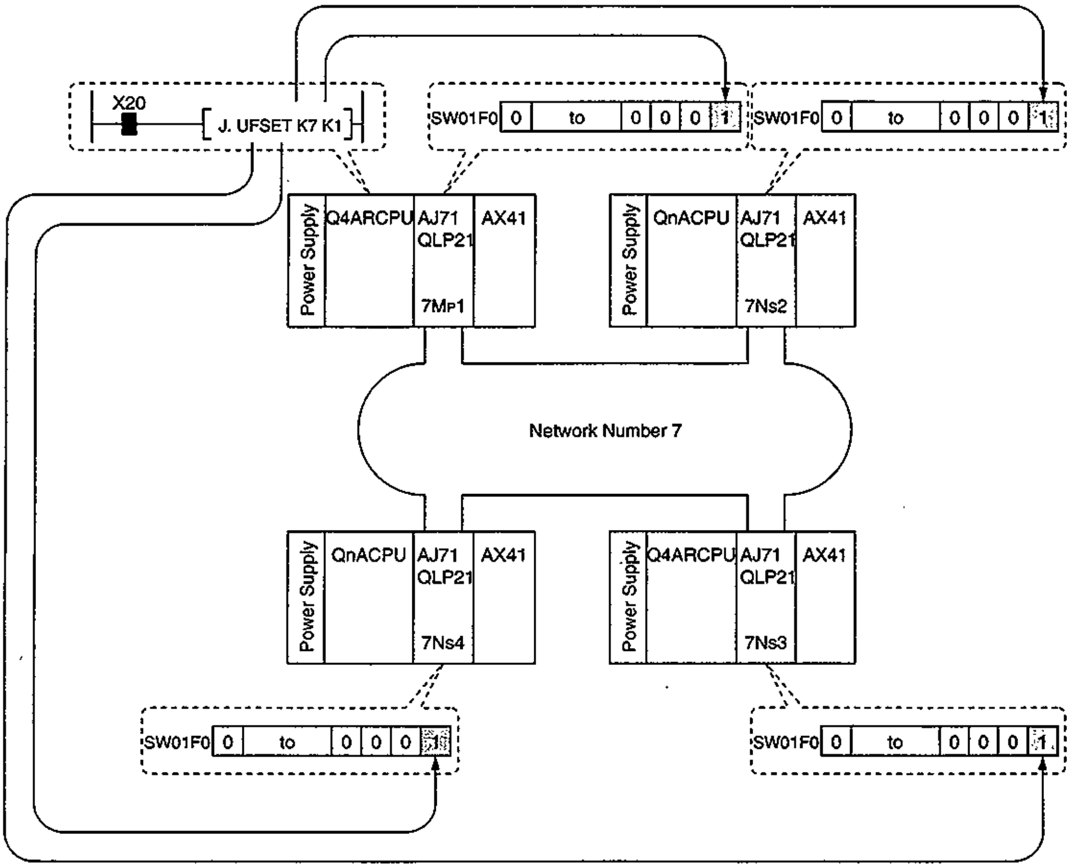


(7) **AnU/AnA/AnNCPU stations can coexist for usage.**

(8) **Bit data transmission to other stations is possible without using link relay (B) (user flag).**
Using the user flag control instruction (UFSET, UFRST, and UFOUT), and turning the bit corresponding to each station on and off for link special registers (SW01F0 to 01F3), any control data for the host can be transmitted.

However, the stations that can execute user flag control instructions are only Q4ARCPU + network module station (software version "H" and later).

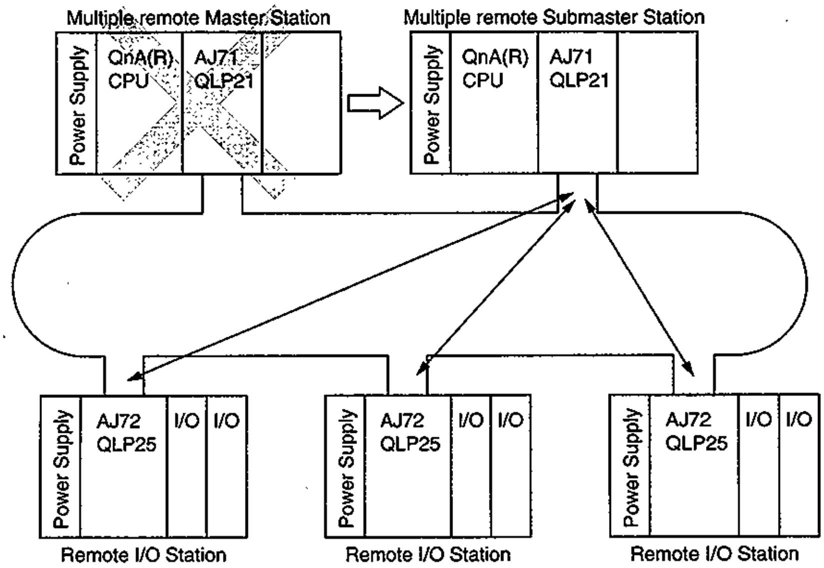
(Example)
When the UFSET instruction is executed at station 1, bit 0 (corresponding to station 1) turns on for SW01F0 of all stations.



1.1.3 Remote I/O network characteristics

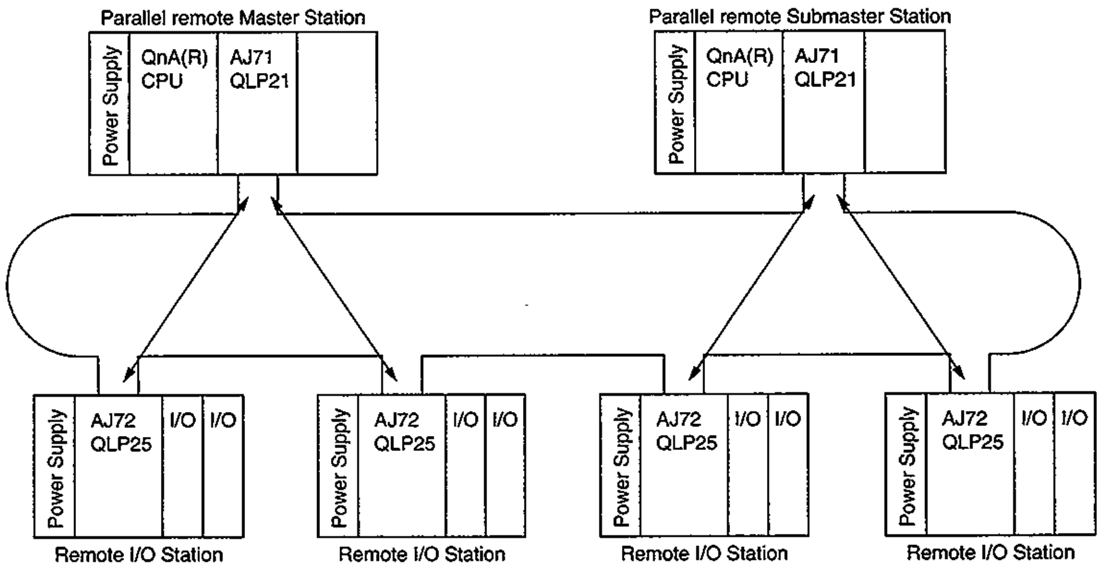
(1) Multiple master

By having a multiple remote master station and multiple remote submaster station, the multiple remote submaster station can continue the data link even if the multiple remote master station goes down. Even if the multiple remote master station recovers to normal operation, control from the multiple remote submaster station continues.



(2) Parallel master

The parallel remote master station control and parallel remote submaster station control can be configured to the same line, so wiring costs can be reduced.
<u>The parallel remote master station and parallel remote submaster station cannot control the same remote I/O station.</u>



(3) The AnU remote I/O station (AJ72LP25 and AJ72BR15) can be used. However, the remote I/O station that is controlled from the parallel remote submaster station will be excluded.

1.2 Duplex Network Characteristics

Describes the characteristics pertaining only to the duplex system

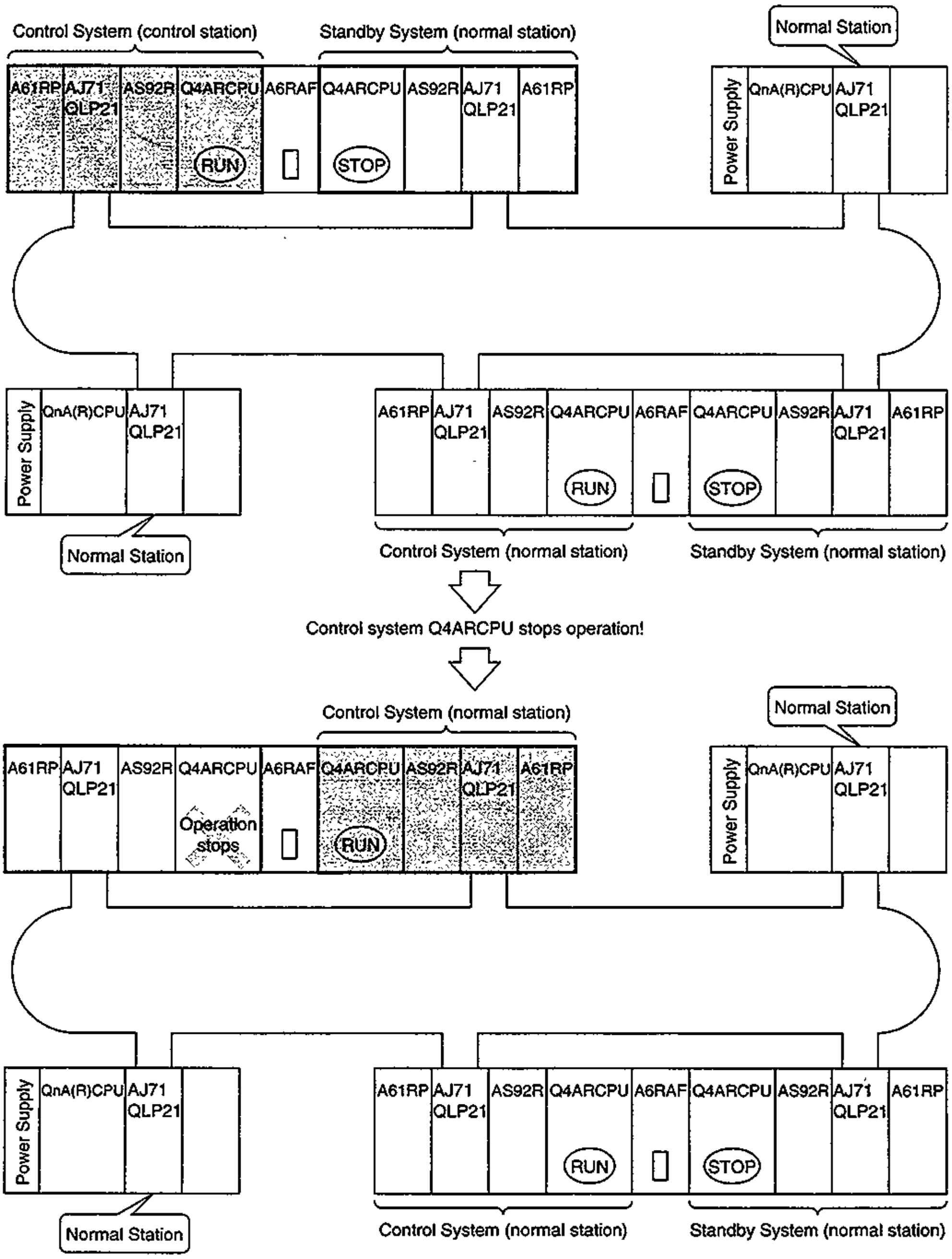
1.2.1 Inter-PC network

(1) Operation can continue even when a CPU/network error occurs.

Even if a control CPU or network error occurs, control switches automatically to the standby system, so the operation can continue.

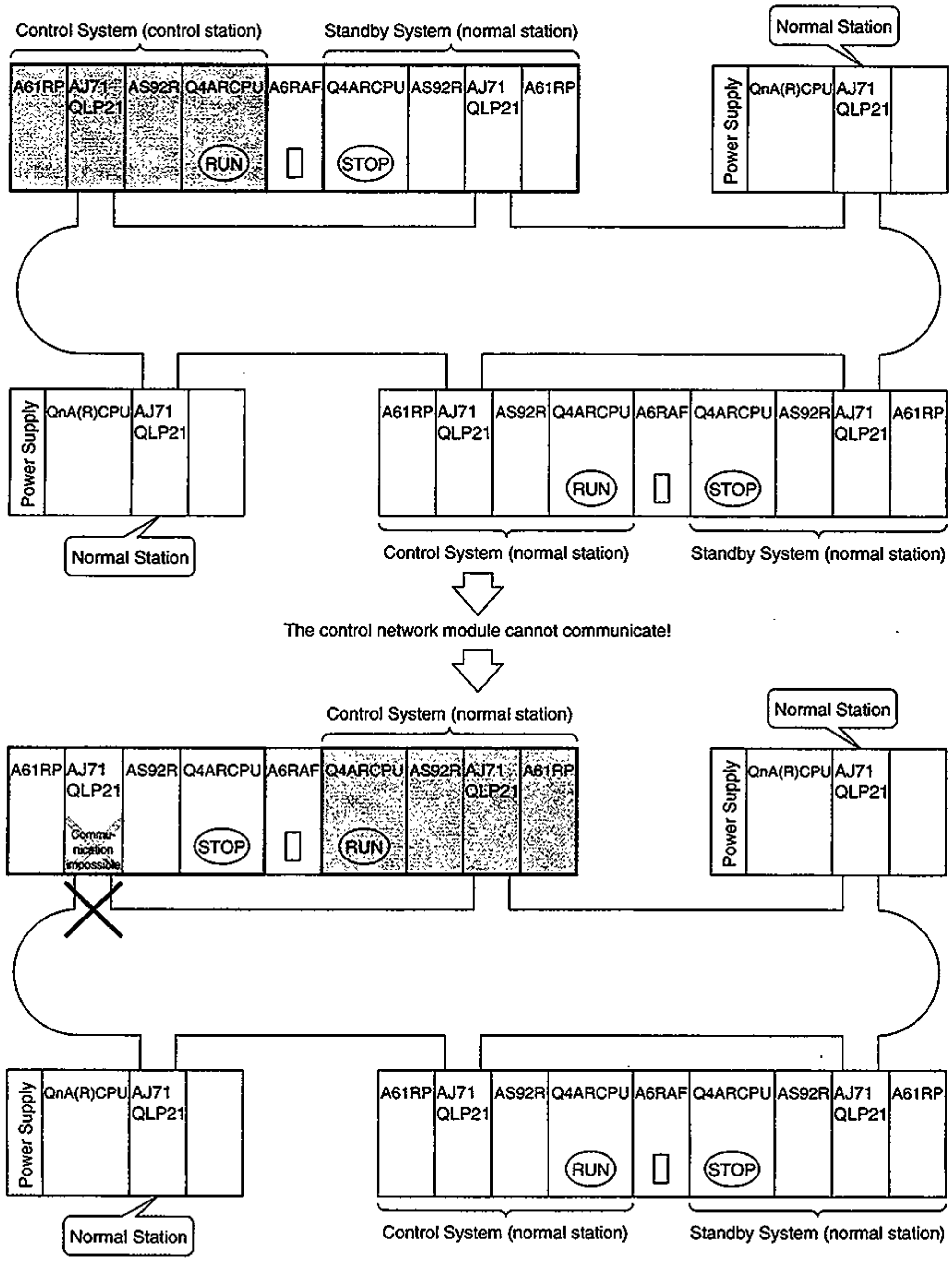
(a) When CPU error occurs

When the control Q4ARCPU stops the operation due to an error, the standby Q4ARPCU and network module continue system operation.



(b) When a network error occurs

When communications cannot be performed for the control system network module, even if the control Q4ARCPU is normal, the standby system Q4ARCPU and network module continue system operation.

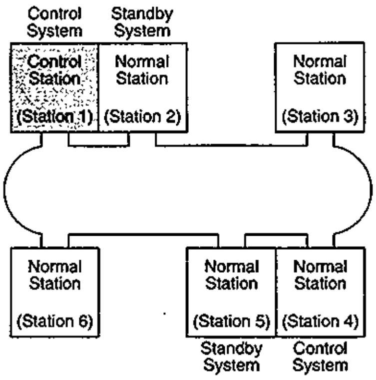


(2) **Cyclic transmission continuation**

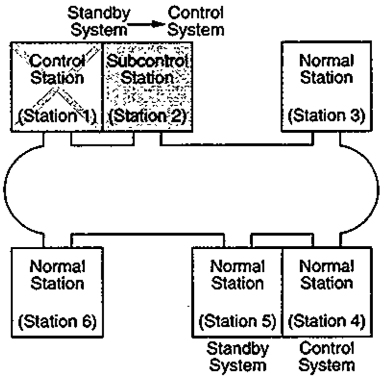
For simplex network, when the control station recovers while the data link is being performed at the subcontrol station, the data link will be controlled by control station again, and the data link is stopped temporarily.

However, if the control station resides in the duplex system, even if the control station recovers while the data link is being performed at the subcontrol station, the data link will not be switched as long as the control station does not go down.

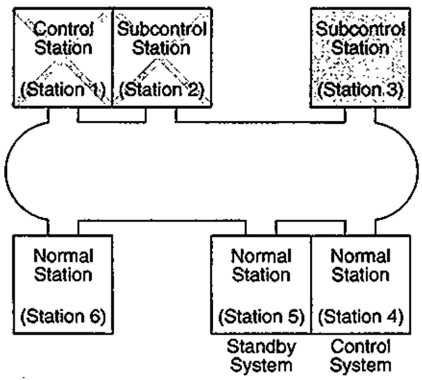
(1) The control system station 1 is the control station.



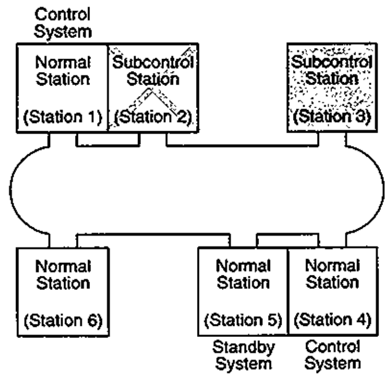
(2) If the control station goes down, station number 2 becomes the subcontrol station.



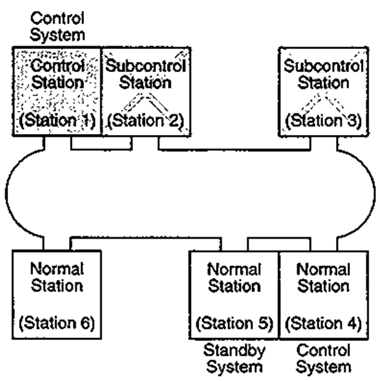
(3) When station number 2 control station goes down, station number 3 becomes the subcontrol station.



(4) Even if station number 1 recovers, station number 3 remains as the subcontrol station. (Station number 1 is treated as a normal station.)



(5) When station number 3 subcontrol station goes down, station number 1 recovers to the control station



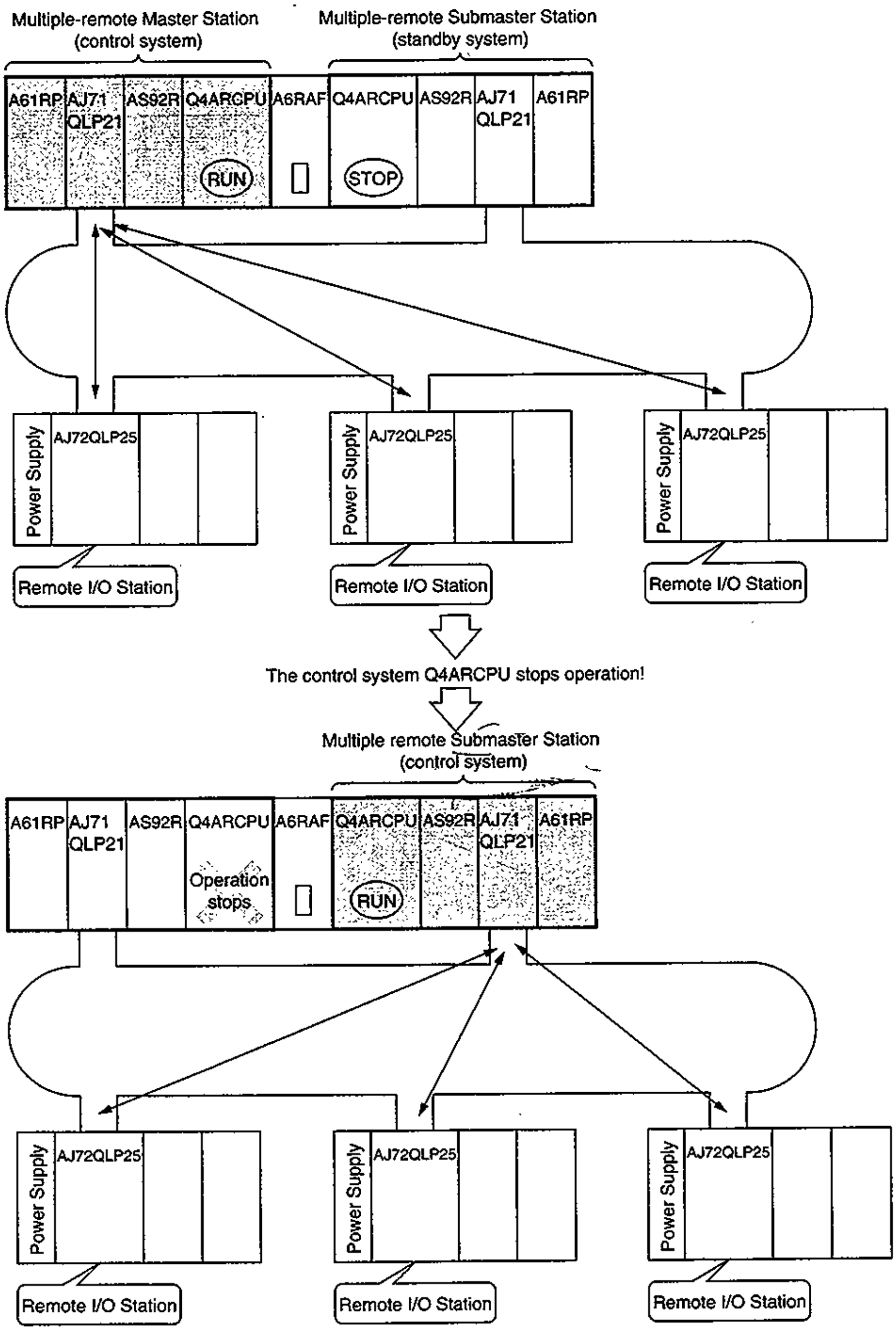
1.2.2 Remote I/O network

(1) Operation can continue even when a PCU/network error occurs.

Even if a control CPU or network error occurs, control switches automatically to the standby system, so the operation can continue.

(a) When CPU error occurs

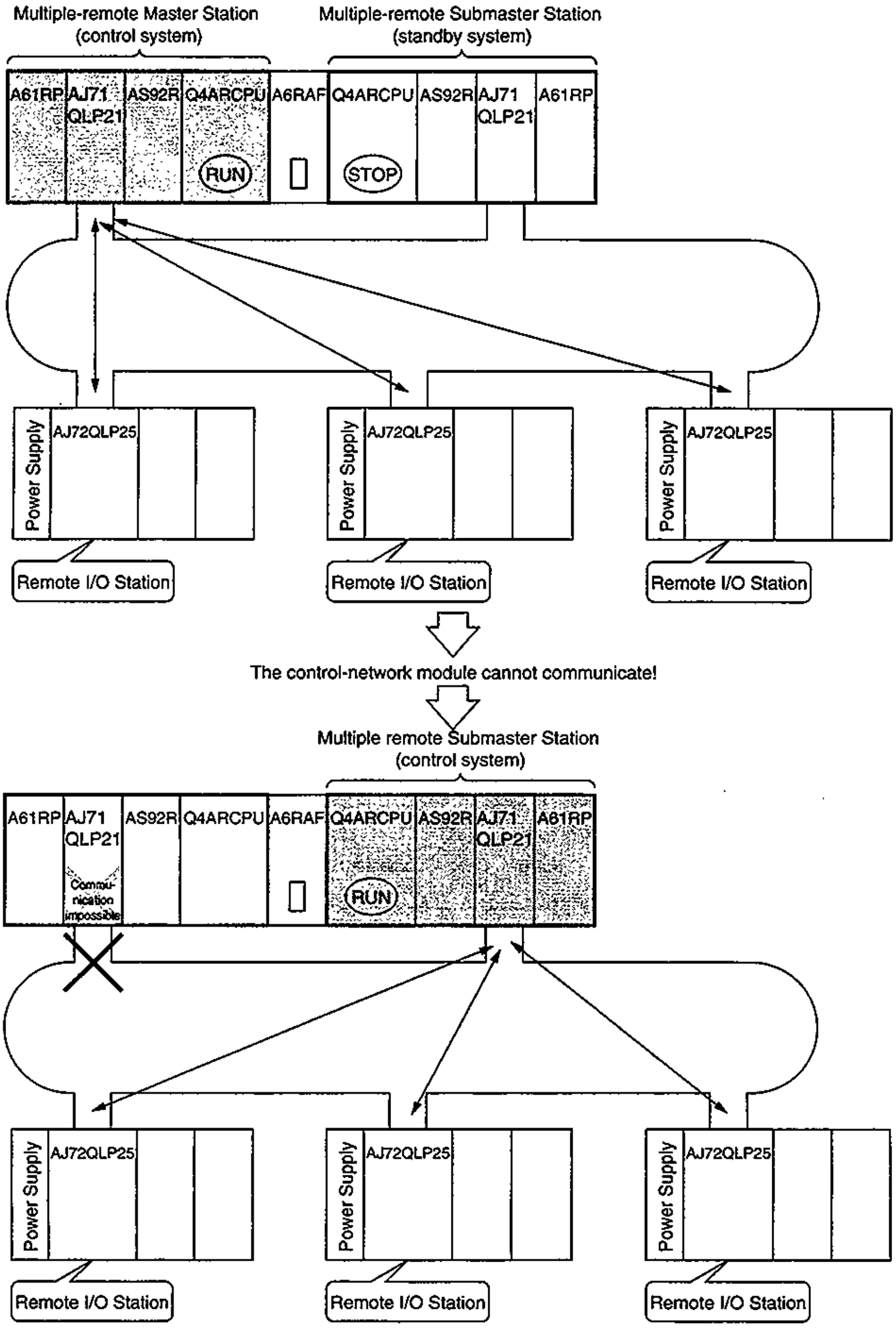
When the control Q4ARCPU stops the operation due to an error, the standby Q4ARPCU and network module continue system operation.



Point
Start up with the multiple remote master station as the control system and multiple remote submaster station as the standby system.

(b) When network error occurs

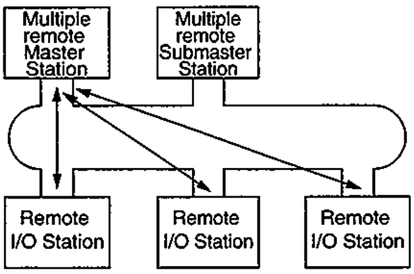
When communications are not possible with the control system network module, even if the control system Q4ARCPU is normal, the operation continues with the standby system Q4ARCPU and network module.



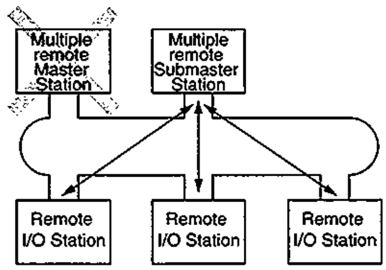
(2) Cyclic transmission continuation

(a) For single layer networks, even if the multiple remote master station recovers while data link is being performed with the multiple remote submaster station, the multiple remote master station cannot participate in the data link. If the multiple remote submaster station goes down, the data link goes down.

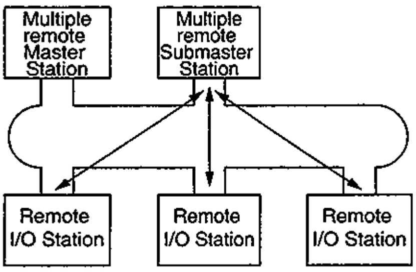
(1) Data link is performed with the multiple remote master station.



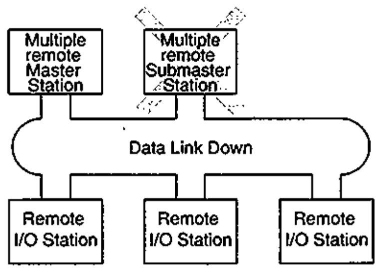
(2) When the multiple remote master station goes down, the data link continues with the multiple layer remote submaster station.



(3) Even if the multiple remote master station recovers, the data link continues with the multiple remote submaster station.

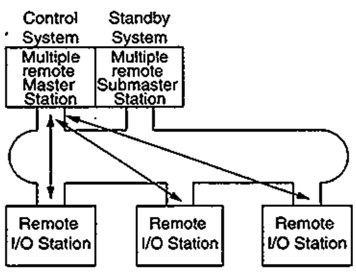


(4) If the multiple remote submaster station goes down, the data link goes down as well.

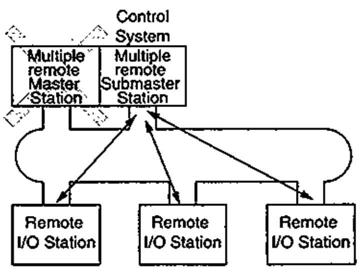


(b) For duplex network, when the multiple remote master station recovers while data link is being performed with multiple remote submaster station, the master station participates in the data link as the standby system (receives data from the remote I/O station).
Even if the multiple remote submaster station goes down, the multiple remote master station continues the data link.

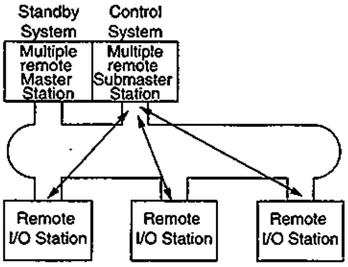
(1) Data link is performed with the multiple remote master station.



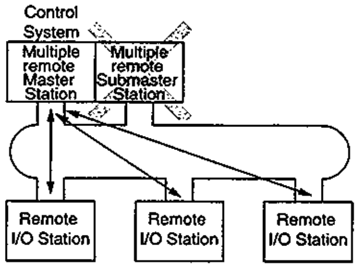
(2) When the multiple remote master station goes down, the data link continues with the multiple remote submaster station.



(3) Even if the multiple remote master station recovers, the data link continues with the multiple remote submaster station.



(4) When the multiple remote submaster station goes down, the data link continues with the multiple remote master station.



1.3 Abbreviations in the Text, Tables and Figures

(1) Abbreviation

(a) Inter-PC network

Name		Abbreviation	Applicable CPU
Control station		M_P	QnA(R)CPU, AnUCPU
Subcontrol station		S	QnA(R)CPU, AnUCPU
Normal station	A station that can be a subcontrol station	N_S	QnA(R)CPU, AnUCPU
	A station that cannot be a subcontrol station	N	AnACPU, AnNCPU, AnSCPU

(b) Remote I/O network

Name	Abbreviation
Remote master station	M_R
Remote I/O station	R
Multiple remote master station	DM_R
Multiple remote submaster station	DSM_R
Parallel remote master station	PM_R
Parallel remote submaster station	PSM_R

(2) Entry format

□□□-□

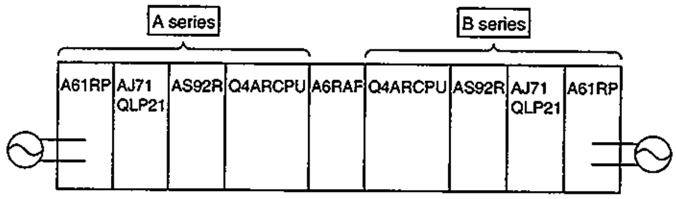
- Group Number (1 to 9)
- Station Number (1 to 64)
- Abbreviation
- Network Number (1 to 239)

[Example]

1) Inter-PC network, network number 3, control station, station 18 . . . . $3M_P18$
2) Remote I/O network, network number 15, multiple remote submaster station, station 4 . . . . $15DSM_R4$
3) Remote I/O network, network number 37, remote I/O station, station 26 . . . . 37R26

1.4 Defining the Control System and Standby System

The control system and standby system of the duplex system are defined by the order of when the power supply was turned on.

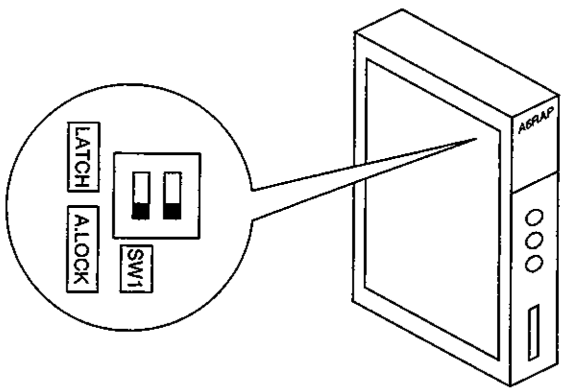


The status of the A series and B series with the power supply on state are shown below:

A and B series status with power supply on state

	When power supply is turned on with the inappropriate timing		When the power supply is turned on at the same time*	
	A series B series	A series B series	A-series fixed mode	Previous control system latch mode
A series	Control system	Standby system	Control system	Operates in the previous operation state
B series	Standby system	Control system	Standby system	

*: Set with the DIP switch (SW1) on the bus switching module's (A6RAF) side surface.



A. LOCK ······· A-series fixed mode
LATCH ········ Previous control-system latch mode

1.5 PC CPU and Network Module Combinations

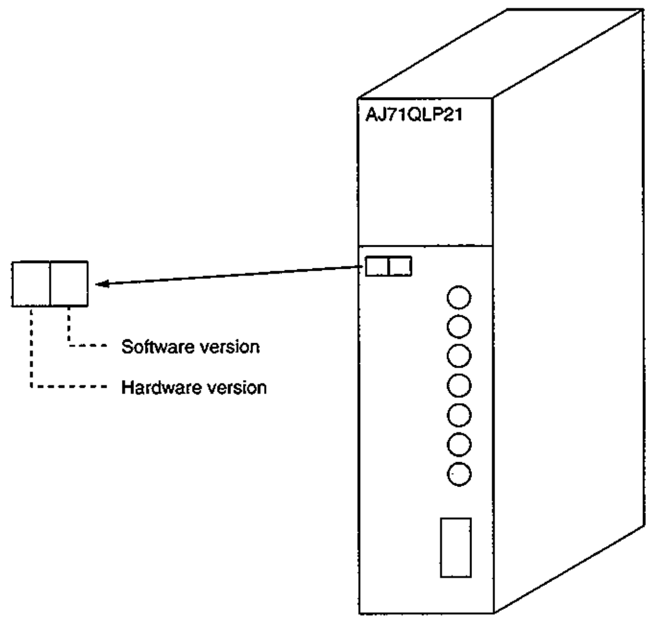
The PC CPU and network module allowable combinations are shown below:

PC CPU \ Network module		AJ71QLP21 AJ71QLP21S AJ71QBR11 Software version "H" and later	AJ71QLP21 AJ71QLP21S AJ71QBR11 Software version "G" and before	AJ71LP21 AJ71BR11	A1SJ71LP21 A1SJ71BR11
Q4ARCPU	Duplex System	○	×	×	×
	Independent System	○	△*1*2	×	×
QnACPU		△*1*3	△*1*2	×	×
AnUCPU		×	×	△*1*2	×
AnNCPU AnACPU		×	×	△*1*2	×
A2USCPU		×	×	△1*2*4	△1*2
AnSCPU		×	×	△1*2*4	△*1*2

○: Can be used without restrictions
△: Can be used
×: Cannot be used
*1: Cannot be set to the duplex network control station (because the pairing setting cannot be made)
*2: A user flag cannot be used
*3: Can check only the user flags (SB01F0, SW01F0 to 01F3)
*4: Can be used when using the A series extension base

Checking the network module's software version

The version is displayed on a sticker below the LED on the front surface of the network module.



1.6 Remote I/O Module

Depending on the product version for the remote I/O module (AJ72QLP25 and AJ72QBR15), there may not be an "output hold function."

Remote I/O module		Output hold functions
AJ72QLP25 AJ72QBR15	Software version "G" or later	○
	Software version "F" or before	×
AJ72LP25 AJ72BR15		×

The output hold function maintains the output status when an error occurs with the master station in the remote I/O network. (Refer to Section 8.9 for details.)

Point

The master station PC CPU must be Q4ARCPU and the network module (AJ71QLP21 or AJ71QBR11) must use software version "H" or later.

2 System Configuration

Describes the system that can be configured in the inter-PC network and remote I/O network.

2.1 Simplex Network

2.1.1 Inter-PC network

This section describes the inter-PC network's system configuration.

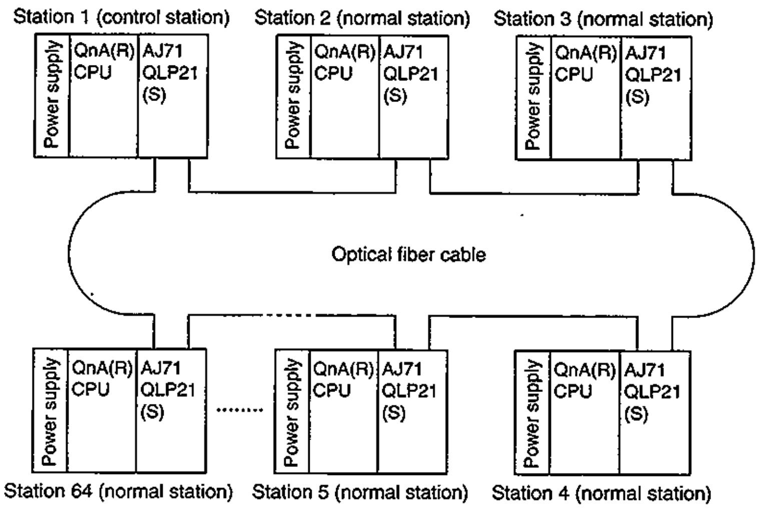
(1) Double layer system

A double layer system is a system in which the control station and normal station are connected with optical fiber cable/coaxial cable.

(a) System configuration

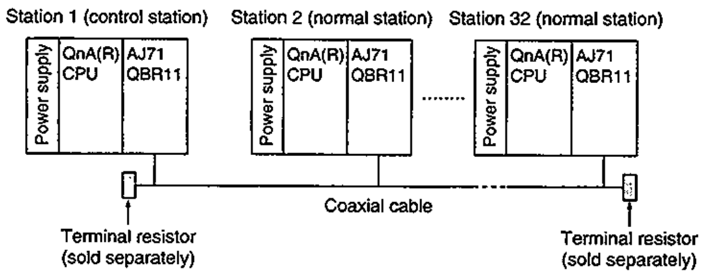
1) Optical loop system

With sixty four comprising one control station and 63 normal stations can be connected. The control station can be set regardless of the station number. In the system shown below, station 1 is set as the control system.



2) Coaxial bus system

Thirty two modules comprising one control station and 31 normal stations can be connected. The control station can be set regardless of the station number. In the system shown below, station number 1 is set as the control system.



(b) Parameter setting items
The parameter setting items for the control station (MP) and normal station (Ns) are shown in Table 2.1.

Table 2.1 Parameter setting items

<table>
<tr><th colspan="2" rowspan="2">Setting Items</th><th colspan="2">Control station (MP)</th><th rowspan="2">Normal station (Ns)</th><th rowspan="2">Reference</th></tr>
<tr><th>Default parameter</th><th>Common parameter</th></tr>
<tr><td colspan="2">Number of modules setting</td><td rowspan="3">△</td><td rowspan="4">●</td><td rowspan="3">△</td><td>Section 9.2</td></tr>
<tr><td rowspan="3">Network settings</td><td>First I/O number</td><td rowspan="3">Section 9.3</td></tr>
<tr><td>Network number</td></tr>
<tr><td>Total link (slave) stations</td><td>×</td><td>×</td></tr>
<tr><td colspan="2">Network refresh parameter</td><td>△</td><td>△</td><td>△</td><td>Section 9.4</td></tr>
<tr><td colspan="2">Common parameter</td><td>×</td><td>●</td><td>×</td><td>Section 9.5</td></tr>
<tr><td colspan="2">Station specific parameter</td><td>△</td><td>△</td><td>△</td><td>Section 9.6</td></tr>
<tr><td colspan="2">I/O allocation</td><td>×</td><td>×</td><td>×</td><td>—</td></tr>
<tr><td colspan="2">Inter data link transfer parameter</td><td>×</td><td>×</td><td>×</td><td>—</td></tr>
<tr><td colspan="2">Routing parameter</td><td>×</td><td>×</td><td>×</td><td>—</td></tr>
</table>

●: Setting mandatory △: Set as necessary ×: Setting not necessary

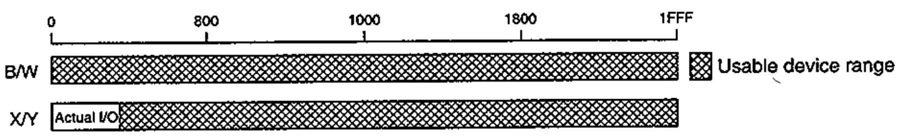
(c) Network module setting items
The network module setting items for the control station (MP) and normal station (Ns) are shown in Table 2.2.

Table 2.2 Network module setting items

<table>
<tr><th colspan="2" rowspan="2">Setting Items</th><th colspan="2">Control station (MP)</th><th rowspan="2">Normal station (Ns)</th><th rowspan="2">Reference</th></tr>
<tr><th>Default parameter</th><th>Common parameter</th></tr>
<tr><td colspan="2">Network number</td><td>●</td><td>●</td><td>●</td><td rowspan="9">Section 4.2.1</td></tr>
<tr><td colspan="2">Group number</td><td>△</td><td>△</td><td>△</td></tr>
<tr><td colspan="2">Station number</td><td>●</td><td>●</td><td>●</td></tr>
<tr><td colspan="2">Mode</td><td>● (0)</td><td>● (0)</td><td>● (0)</td></tr>
<tr><td rowspan="5">Condition settings</td><td>Network type (SW1)</td><td>OFF</td><td>OFF</td><td>OFF</td></tr>
<tr><td>Station type (SW2)</td><td>ON</td><td>ON</td><td>OFF</td></tr>
<tr><td>Parameter used (SW3)</td><td>ON</td><td>OFF</td><td>×</td></tr>
<tr><td>Number of stations (SW4, 5)</td><td>△</td><td>×</td><td>×</td></tr>
<tr><td>Total B/W points (SW6,7)</td><td>△</td><td>×</td><td>×</td></tr>
</table>

●: Setting mandatory △: Set as necessary ×: Setting not necessary

(d) Usable device range
B/W can use all 0 to 1FFF (8192 points).
X/Y can use the range after the actual I/O (the device range where the unit is actually installed) in 0 to 1FFF (8192 points).

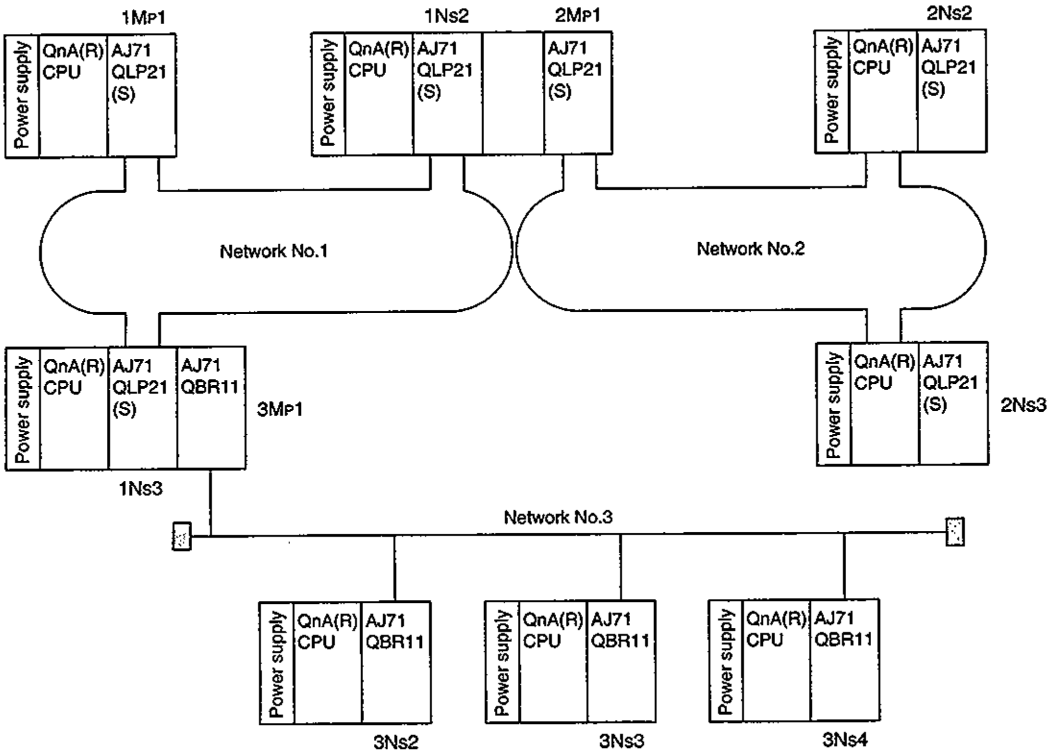


(2) Multilayer system

A multilayer system is a system to which several networks are connected.
Be sure to set the network numbers so that they do not overlap. They can be set to any numbers within the range of 1 to 239 as long as they do not overlap.
A maximum of four network module can be installed in QnA(R)CPU.

(a) System configuration

The following is an example of a system configured with three networks.



(b) Parameter setting items
The parameter setting items for the control station (MP) and normal station (Ns) are shown in Table 2.3.

Table 2.3 Parameter setting items

<table>
<tr><th colspan="2" rowspan="3">Setting items</th><th colspan="3">Multiple module installed CPUs</th><th colspan="3">Single module installed CPU</th><th rowspan="3">Reference</th></tr>
<tr><th colspan="2">Control station (MP)</th><th rowspan="2">Normal station (Ns)</th><th colspan="2">Control station (MP)</th><th rowspan="2">Normal station (Ns)</th></tr>
<tr><th>Default parameter</th><th>Common parameter</th><th>Default parameter</th><th>Common parameter</th></tr>
<tr><td colspan="2">Number of modules setting</td><td rowspan="3">△</td><td rowspan="4">●</td><td rowspan="3">△</td><td rowspan="3">△</td><td rowspan="4">●</td><td rowspan="3">△</td><td>Section 9.2</td></tr>
<tr><td rowspan="3">Network settings</td><td>First I/O number</td><td rowspan="3">Section 9.3</td></tr>
<tr><td>Network number</td></tr>
<tr><td>Total link (slave)stations</td><td>×</td><td>×</td><td>×</td><td>×</td></tr>
<tr><td colspan="2">Network refresh parameter</td><td>△</td><td>△</td><td>△</td><td>△</td><td>△</td><td>△</td><td>Section 9.4</td></tr>
<tr><td colspan="2">Common parameter</td><td>×</td><td>●</td><td>×</td><td>×</td><td>●</td><td>×</td><td>Section 9.5</td></tr>
<tr><td colspan="2">Station specific parameter</td><td>△</td><td>△</td><td>△</td><td>△</td><td>△</td><td>△</td><td>Section 9.6</td></tr>
<tr><td colspan="2">I/O allocation</td><td>×</td><td>×</td><td>×</td><td>×</td><td>×</td><td>×</td><td>—</td></tr>
<tr><td colspan="2">Inter data link transfer parameter*</td><td>△</td><td>△</td><td>△</td><td>×</td><td>×</td><td>×</td><td>Section 9.8</td></tr>
<tr><td colspan="2">Routing parameter*</td><td>△</td><td>△</td><td>△</td><td>△</td><td>△</td><td>△</td><td>Section 9.9</td></tr>
</table>

●: Setting mandatory △: Set as necessary ×: Setting not necessary *: Setting for CPU

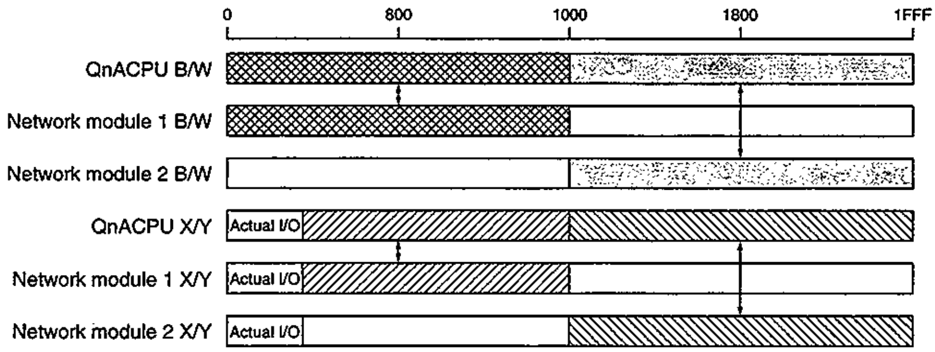
(c) Network module setting items
The network module setting items for the control station (MP) and normal station (Ns) are shown in Table 2.4.

Table 2.4 Network module setting items

<table>
<tr><th colspan="2" rowspan="3">Setting items</th><th colspan="3">Multiple module installed CPUs</th><th colspan="3">Single module installed CPU</th><th rowspan="3">Reference</th></tr>
<tr><th colspan="2">Control station (MP)</th><th rowspan="2">Normal station (Ns)</th><th colspan="2">Control station (MP)</th><th rowspan="2">Normal station (Ns)</th></tr>
<tr><th>Default parameter</th><th>Common parameter</th><th>Default parameter</th><th>Common parameter</th></tr>
<tr><td colspan="2">Network number</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td rowspan="9">Section 4.2.1</td></tr>
<tr><td colspan="2">Group number</td><td>△</td><td>△</td><td>△</td><td>△</td><td>△</td><td>△</td></tr>
<tr><td colspan="2">Station number</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td></tr>
<tr><td colspan="2">Mode</td><td>● (0)</td><td>● (0)</td><td>● (0)</td><td>● (0)</td><td>● (0)</td><td>● (0)</td></tr>
<tr><td rowspan="5">Condition settings</td><td>Network type (SW1)</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td></tr>
<tr><td>Station type (SW2)</td><td>ON</td><td>ON</td><td>OFF</td><td>ON</td><td>ON</td><td>OFF</td></tr>
<tr><td>Parameter used (SW3)</td><td>ON</td><td>OFF</td><td>×</td><td>ON</td><td>OFF</td><td>×</td></tr>
<tr><td>Number of stations (SW4, 5)</td><td>△</td><td>×</td><td>×</td><td>●</td><td>×</td><td>×</td></tr>
<tr><td>Total B/W points (SW6, 7)</td><td>△</td><td>×</td><td>×</td><td>●</td><td>×</td><td>×</td></tr>
</table>

●: Setting mandatory △: Set as necessary ×: Setting not necessary

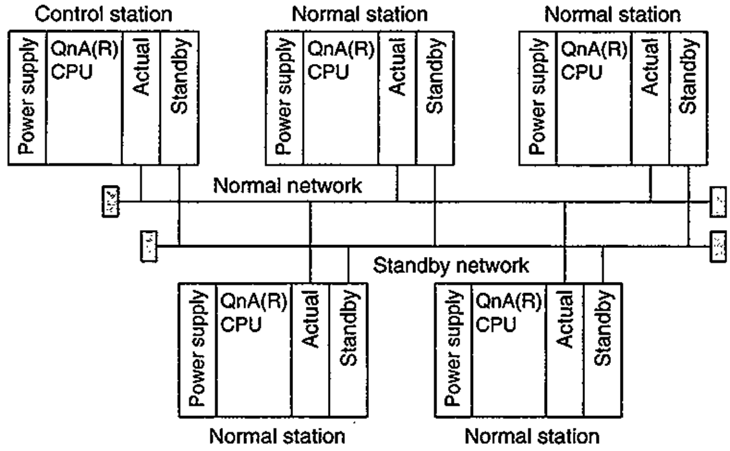
(d) Usable device range
B/W can use all 0 to 1FFF (8192 points). However, each network module will divide the range.
X/Y can use the range after the actual I/O (the device range where the module is actually installed) in 0 to 1FFF (8,192 points). However, it is necessary to allocate the range to be used in each network.



(3) Simplified duplex system

The simplified duplex system has "normal" and "standby" network modules installed to each PC CPU. Even if the normal network is down, the refresh is switched to the standby network's link data, and the data link can continue.

(a) System configuration
A coaxial bus system example is shown below:



Point
Set the normal and standby networks that have different network numbers.

(b) Parameter setting items

The parameter setting items for the control station (MP) and normal station (NS) are shown in Table 2.5.

Table 2.5 Parameter setting items

Setting Items		Control station (MP)			Normal station (NS)		Reference
		For normal		For standby	For normal	For standby	
		Default parameter	Common parameter				
Number of modules setting		●	●	●	●	●	Section 9.2
Network settings	First I/O number						Section 9.3
	Network number						
	Total link (slave)stations	×		×	×	×	
Network refresh parameter		△	△	×	△	×	Section 9.4
Common parameter		×	●	×	×	×	Section 9.5
Station-specific parameter		△	△	×	△	×	Section 9.6
I/O allocation		×	×	×	×	×	—
Inter data link transfer parameter*		△	△	×	×	×	Section 9.8
Routing parameter*		△	△	×	△	×	Section 9.9

●: Setting mandatory △: Set as necessary ×: Setting not necessary *: Setting for CPU

(c) Network-module setting items

The network module setting items for the control station (MP) and normal station (NS) are shown in Table 2.6.

Table 2.6 Network module setting items

Setting items		Control station (MP)			Normal station (NS)		Reference
		For normal		For standby	For normal	For standby	
		Default parameter	Common parameter				
Network number		●	●	●*	●	●*	Section 4.2.1
Group number		△	△	Same as that for normal	△	Same as that for normal	
Station number		●	●		●		
Mode		● (0)	● (0)		● (0)		
Condition settings	Network type (SW1)	OFF	OFF		OFF		
	Station type (SW2)	ON	ON		OFF		
	Parameter used (SW3)	ON	OFF		×		
	Number of stations (SW4, 5)	△	×		×		
	Total B/W points (SW6, 7)	△	×		×		

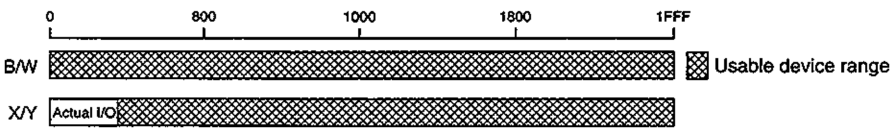
●: Setting mandatory △: Set as necessary ×: Setting not necessary

*: Set different network number from normal.

(d) Usable device range

B/W can use all 0 to 1FFF (8192 points).

X/Y can use the range after the actual I/O (device range where the module is actually installed) in 0 to 1FFF (8192 points).



(4) **Component devices**

The necessary components to construct inter-PC network are shown below:

Table 2.7 List of system equipment for inter-PC network

Items		Type Name	Remark
PC CPU (for control station/normal station)		Q4ARCPU Q2ACPU Q2ACPU-S1 Q3ACPU Q4ACPU	————
Network module (for control station/normal station/standby station)		Optical-loop system AJ71QLP21 AJ71QLP21S (possible to supply an external power supply) For coaxial bus system AJ71QBR11	————
Data link cable The numbers in parentheses indicate the distance that can be used.	For optical loop system	SI cable (500 m) (1641ft.) QSI cable (1 km) (3281ft.)	————
	For coaxial bus system	3C-2V (300m) (984.3ft.) 5C-2V (500m) (1641ft.)	————
Terminal resistor (Necessary for coaxial bus system)		A6RCON-R75 BNC-TMP-05 (75) (manufactured by Hirose Electric, Co., Ltd.)*	Sold separately (not included in the network module)
F-shaped connector		BNC(75)-LLA-PJJ (manufactured by Hirose Electric, Co., Ltd.)*	One module included in the AJ71QBR11
Software package (peripheral device)		SW□NX-GPPQ (for PC 9800 series) SW□IVD-GPPQ (for DOS/V PC)	————

* Contact the following for inquiries:

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(Seifu Bldg, 3rd Floor)
TEL(052)951-0133 FAX(052)951-1940

2.1.2 Remote I/O network

The remote I/O network system configuration:

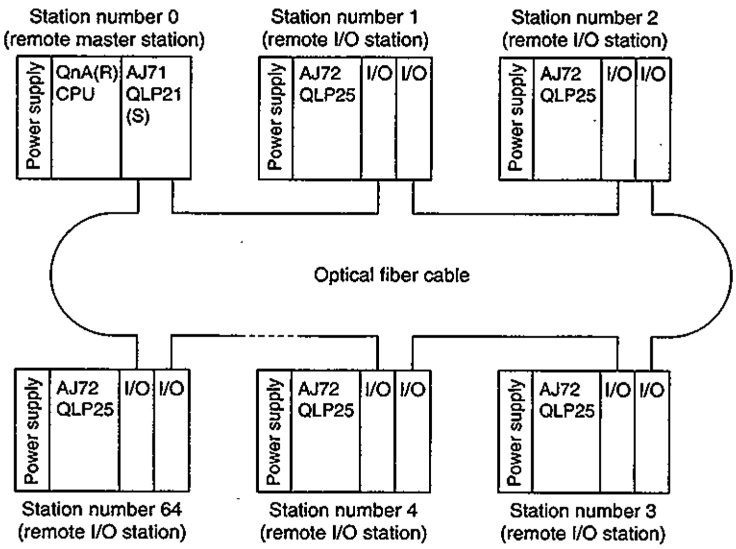
(1) Double layer system

A double layer system is a single system in which the master station and remote I/O station are connected by optical fiber cable/coaxial cable.

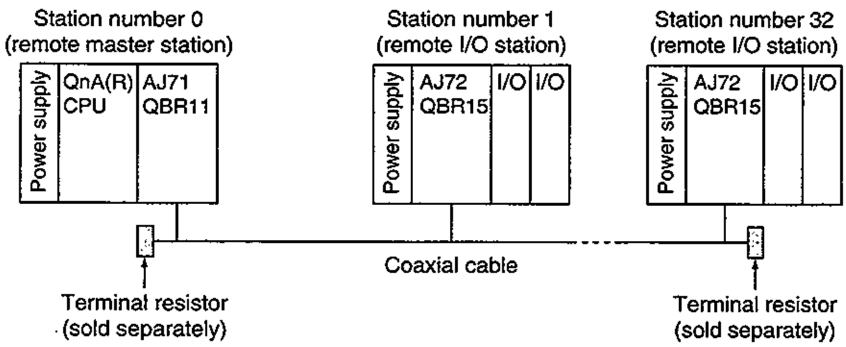
(a) System configuration

1) Optical loop system

Up to 64 remote I/O stations can be connected to a single remote master station.
Be sure to set the remote master station to station number 0.



2) Up to 32 remote I/O stations can be connencted to a single remote master station.
Be sure to set the remote master station to station number 0.



(b) Parameter setting items

The parameter setting items for remote master station (M_R) are shown in Table 2.8.

Table 2.8 Parameter setting items

Setting items		Remote master station (M_R)	Reference
Number of modules setting		●	Section 9.2
Network settings	First I/O number	●	Section 9.3
	Network number		
	Total link (slave) stations		
Network refresh parameter		●*	Section 9.4
Common parameter		●	Section 9.5
Station-specific parameter		×	—
I/O allocation		△	Section 9.7
Inter data link transfer parameter		×	—
Routing parameter		×	—

●: Setting mandatory △: Set as necessary ×: Setting not necessary

* For X/Y refresh range setting

(c) Network module setting items

The network module setting items for remote master station (M_R) and normal station (Ns) are shown in Table 2.9.

Table 2.9 Network module setting items

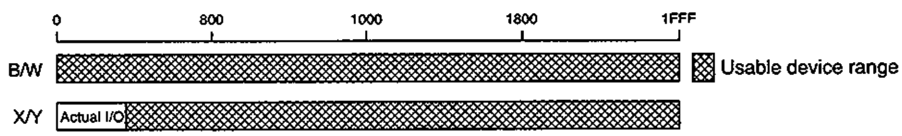
Setting items		Remote master station (M_R)	Remote I/O station (R)	Reference
Network number		●	×	Section 4.2
Group number		×	×	
Station number		Station 0	Station 1to 64	
Mode		●	●	
Condition settings (Remote master station)	Network type (SW1)	ON	—	
	Station type (SW2)	×		
	Parameter used (SW3)	×		
	Number of stations (SW4, 5)	×		
	Total B/W points (SW6,7)	×		
Condition settings (Remote I/O station)	Peripheral device type (SW1)	—	OFF: For QnA ON: For A	

●: Setting mandatory △: Set as necessary ×: Setting not necessary

(d) Usable device range

B/W can use all 0 to 1FFF (8192 points).

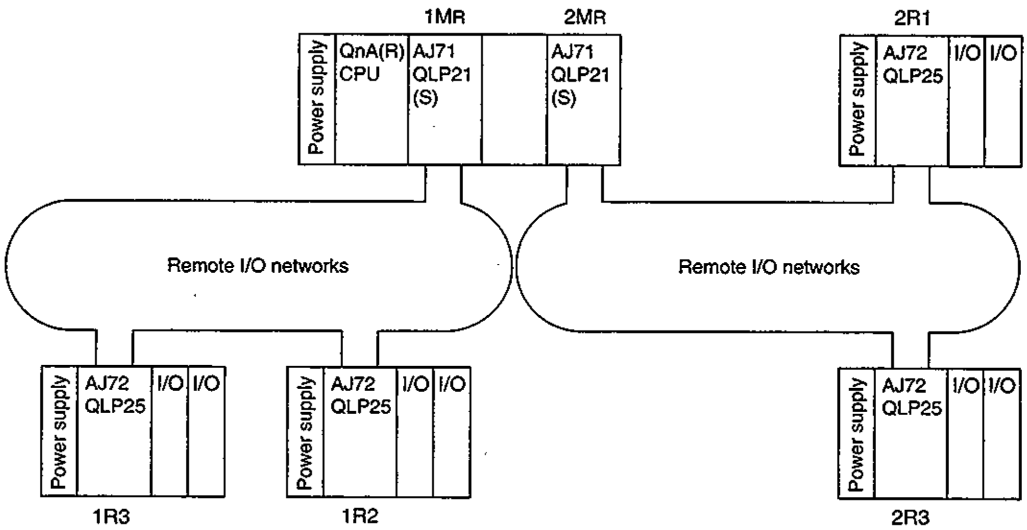
X/Y can use the range after the actual I/O (the device range where the unit is actually installed) in 0 to 1FFF (8192 points).



(2) Multilayer system

A multilayer system is a system to which several networks are connected.
Be sure to set the network numbers so that they do not overlap. They can be set to any numbers within the range of 1 to 239 as long as they do not overlap.
A maximum of four network Modules may be installed in QnA (R) CPU.

(a) System configuration
Two remote I/O networks are connected.



(b) Parameter setting items

The parameter setting items for remote master station (M_R) items are shown in Table 2.10.

Table 2.10 Parameter setting items

Setting Items		Remote master station (M_R)	Reference
Number of modules setting		●	Section 9.2
Network settings	First I/O number	●	Section 9.3
	Network number		
	Total link (slave) stations		
Network refresh parameter		●*	Section 9.4
Common parameter		●	Section 9.5
Station-specific parameter		×	—
I/O allocation		△	Section 9.7
Inter data link transfer parameter		×	—
Routing parameter		△	Section 9.9

●: Setting mandatory △: Set as necessary ×: Setting not necessary

* For X/Y refresh range setting

(c) Network module setting items

The network module setting items for the remote master station (M_R) and remote I/O station (R) are shown in Table 2.11.

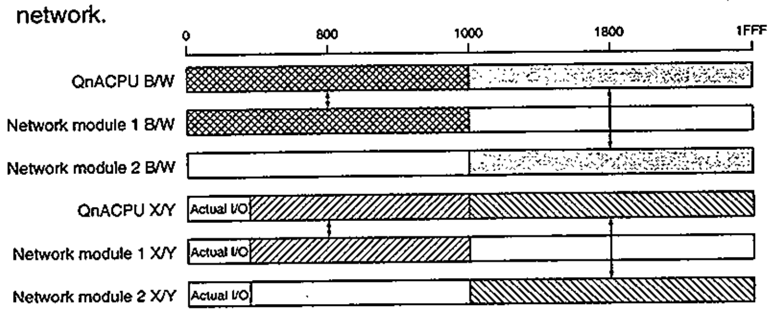
Table 2.11 Network module setting items

Setting Items		Remote master station (M_R)	Remote I/O station (R)	Reference
Network number		●	×	Section 4.2
Group number		×	×	
Station number		Station 0	Station 1to 64	
Mode		●	●	
Condition settings (Remote master station)	Network type (SW1)	ON	—	
	Station type (SW2)	×		
	Parameter used (SW3)	×		
	Number of stations (SW4, 5)	×		
	Total B/W points (SW6,7)	×		
Condition settings (Remote I/O station)	Peripheral device type (SW1)	—	OFF: For QnA ON: For A	

●: Setting mandatory △: Set as necessary ×: Setting not necessary

(d) Usable device range

B/W can use all of 0 to 1FFF (8192 points). However, each network module will divide the range. X/Y can use range after the actual I/O (the device range where the module is actually installed) in 0 to 1FFF (8192 points). However, it is necessary to allocate the range that will be used in each network.



(3) Multiple master system

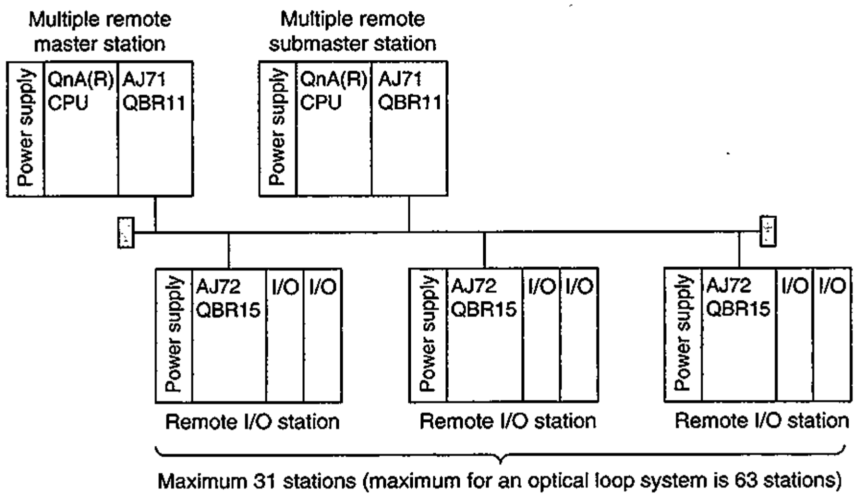
Multiple master system is a system that allows the multiple remote submaster to control the remote I/O station when the multiple remote master station is down.

The control by the multiple remote submaster station remains the same even when the multiple remote master station recovers to normal status.

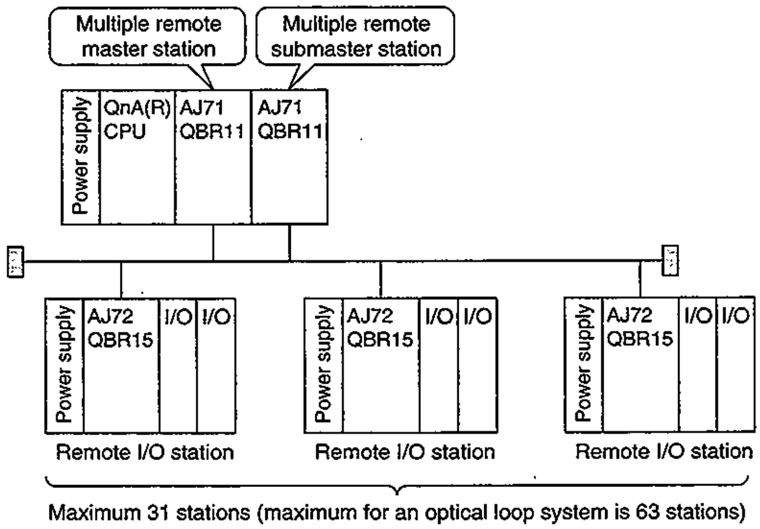
The following indicates the case with the coaxial bus system.

(a) System configuration

1) When the "multiple remote master station" and the "multiple remote submaster station" exist in different PC CPUs.



2) When "multiple remote master station" and the "multiple remote submaster station" both exist in a PC CPU



(b) Parameter setting items

The parameter setting items for the multiple remote master station (DMR) and multiple-remote submaster station (DSMR) are shown in Table 2.12.

Table 2.12 Parameter setting items

Setting items		Multiple remote master station (DMR)	Multiple remote submaster station (DSMR)	Reference
Number of modules setting		●	●	Section 9.2
Network settings	First I/O number			Section 9.3
	Network number			
	Total link (slave) stations		×	
Network refresh parameter		●*	●*	Section 9.4
Common parameter		●	×	Section 9.5
Station-specific parameter		×	×	—
I/O allocation		△	×	Section 9.7
Inter data link transfer parameter		×	×	—
Routing parameter		△	△	Section 9.9

y: Setting mandatory △: Set as necessary ×: Setting not necessary
* For X/Y refresh range setting

(c) Network module setting items

The network module setting items for the multiple remote master station (DMR), multiple remote submaster station (DSMR) and remote I/O station (R) are shown in Table 2.13.

Table 2.13 Network module setting items

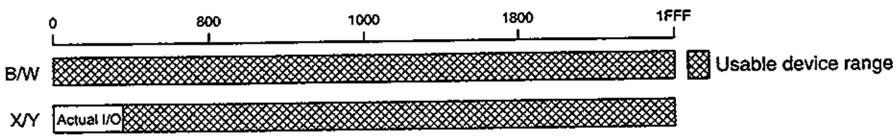
Setting items		Multiple remote master station (DMR)	Remote I/O station (DSMR)	Remote I/O station (R)	Reference
Network number		●	●	×	Section 4.2
Group number		×	×	×	
Station number		Station 0	Station 1to 64	Station 1 to 64	
Mode		●	●	●	
Condition settings (Remote master station)	Network type (SW1)	ON	ON	—	
	Station type (SW2)	×	OFF		
	Parameter used (SW3)	×	×		
	Number of stations (SW4, 5)	×	×		
	Total B/W points (SW6,7)	×	×		
Condition settings (Remote I/O station)	Peripheral device type (SW1)	—	—	OFF: For QnA ON: For A	

●: Setting mandatory △: Set as necessary ×: Setting not necessary

(d) Usable device range

B/W can use all 0 to 1FFF (8192 points).

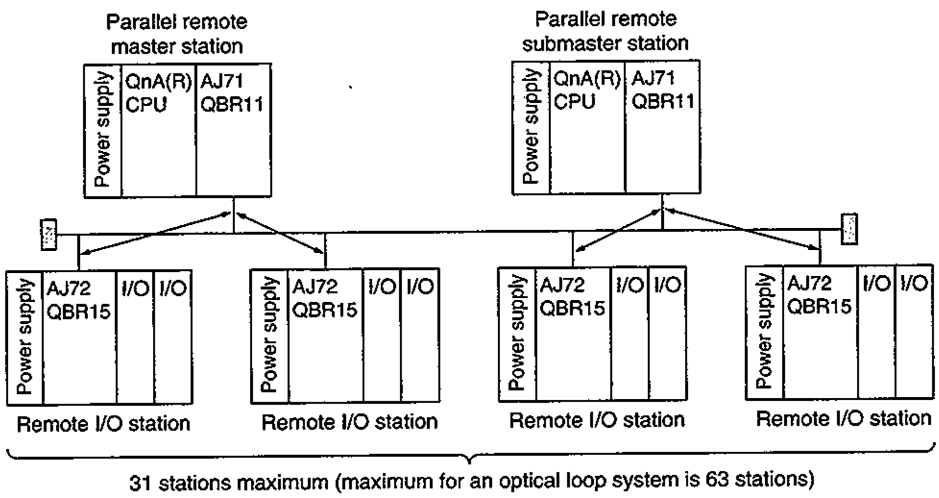
X/Y can use the range after the actual I/O (the device range where the module is actually installed) in 0 to 1FFF (8192 points).



(4) Parallel master system

A parallel master system is a system in which the parallel remote master station and parallel submaster station control each remote I/O system separately.
The following is an example of a coaxial bus system:

(a) System configuration



Point
The parallel remote submaster station cannot communicate with remote I/O module for AnU (AJ72LP25, AJ72BR15).

(b) Parameter setting items

The parameter setting items for parallel remote master station (PMR) and parallel remote submaster station (PSMR) are shown in Table 2.14.

Table 2.14 Parameter setting items

Setting items		Multiple remote master station (PMR)	Multiple remote submaster station (PSMR)	Reference
Number of modules setting		●	●	Section 9.2
Network settings	First I/O number	●	●	Section 9.3
	Network number	●	●	Section 9.3
	Total link (slave) stations	●	×	Section 9.3
Network refresh parameter		●*	●*	Section 9.4
Common parameter		●	×	Section 9.5
Station specific parameter		×	×	—
I/O allocation		△	×	Seciton 9.7
Inter data link transfer parameter		×	×	—
Routing parameter		△	△	Section 9.9

●: Setting mandatory △: Set as necessary ×: Setting not necessary

* For X/Y refresh range setting

(c) Network module setting items

The network module setting items for parallel remote master station (PMR), parallel remote submaster station (PSMR) and remote I/O station (R) are shown in Table 2.15.

Table 2.15 Network module setting items

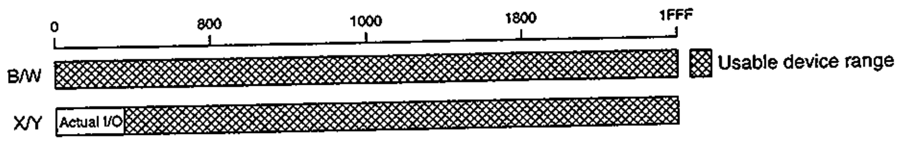
Setting Items		Parallel remote master station (PMR)	Parallel remote submaster station (PSMR)	Remote I/O station (R)	Reference
Network number		●	●	×	Section 4.2
Group number		×	×	×	Section 4.2
Station number		Station 0	Station 1to 64	Station 1 to 64	Section 4.2
Mode		●	●	●	Section 4.2
Condition settings (Remote master station)	Network type (SW1)	ON	ON	—	Section 4.2
	Station type (SW2)	×	ON	—	Section 4.2
	Parameter used (SW3)	×	×	—	Section 4.2
	Number of stations (SW4, 5)	×	×	—	Section 4.2
	Total B/W points (SW6,7)	×	×	—	Section 4.2
Condition settings (Remote I/O station)	Peripheral device type (SW1)	—	—	OFF: For QnA ON: For A	Section 4.2

●: Setting mandatory △: Set as necessary ×: Setting not necessary

(d) Usable device range

B/W can use all of 0 to 1FFF (8192 points).

X/Y can use the range after the actual I/O (the device range where the module is actually installed) in 0 to 1FFF (8192 points).



(5) Component devices

The necessary components to construct a remote I/O network are shown below:

Table 2.16 List of system equipment for remote I/O network

Items		Type Name	Remark
PC CPU (for remote master station/multiple remote master station/parallel remote master station/multiple remote submaster station/parallel remote submaster station)		Q4ARCPU Q2ACPU Q2ACPU-S1 Q3ACPU Q4ACPU	————
Network module for remote master station		Optical loop system AJ71QLP21 AJ71QLP21S (possible to supply an external power supply) For coaxial bus system AJ71QBR11	Output-hold supported software version "H" or later
Network module for remote I/O station		AJ72QLP25 (for optical loop system) AJ72QBR15 (for coaxial bus system)	Output hold supported software version "G" or later
Data link cable The numbers in parentheses indicate the distance that can be used.	For optical loop system	SI cable (500 m) (1641ft.) QSI cable (1 km) (3281ft.)	————
	For coaxial bus system	3C-2V (300m) (984.3ft.) 5C-2V (500m) (1641ft.)	————
Terminal resistor (Necessary for coaxial bus system)		A6RCON-R75 BNC-TMP-05 (75) (manufactured by Hirose Electric, Co., Ltd.)*	Sold separately (not included in the network module)
F-shaped connector		BNC(75)-LLA-PJJ (manufactured by Hirose Electric, Co., Ltd.)*	One module included in the AJ71QBR11, AJ71QBR15
Software package (Peripheral device)		SW□NX-GPPQ (for PC 9800 series) SW□IVD-GPPQ (for DOS/V PC)	————

* Contact the following for inquiries:

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Nagoya Marketing Division
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TEL(052)951-0133 FAX(052)951-1940

(6) Special function module that can be used with the remote I/O station

The special function module that can be used with the remote I/O station (AJ72QLP25, AJ72QBR15) are shown in the table below.

Model	Classification	Occupied slot	Possible number of modules that can be installed	Remark
AD70	Normal	1	64 units (base + extension 7 stages)	
AD70D			64 units (base + extension 7 stages)	
AD71 (S1/S2/S7)			64 units (base + extension 7 stages)	
AD72		2	32 units (base + extension 7 stages)	
AD75P1/P2/P3		1	64 units (base + extension 7 stages)	
AD76			64 units (base + extension 7 stages)	
A61LS			64 units (base + extension 7 stages)	
A62LS		2	32 units (base + extension 7 stages)	
AD61 (S1)		1	64 units (base + extension 7 stages)	
A68AD (S2)			64 units (base + extension 7 stages)	
A68ADN			64 units (base + extension 7 stages)	
A616AD			64 units (base + extension 7 stages)	
A60MX			Use with A616AD and A616TD	
A60MXR				
A616TD			64 units (base + extension 7 stages)	
A616MXT		2	Use with A616TD	
A62DA (S1)		1	64 units (base + extension 7 stages)	
A616DAV			64 units (base + extension 7 stages)	
A616DAI			64 units (base + extension 7 stages)	
A84AD		2	32 units (base + extension 7 stages)	
A68DAV		1	64 units (base + extension 7 stages)	
A68DAI (S1)			64 units (base + extension 7 stages)	
A68RD3			64 units (base + extension 7 stages)	
A68RD4			64 units (base + extension 7 stages)	
AD59 (S1)			64 units (base + extension 7 stages)	
A11VC			64 units (base + extension 7 stages)	
AJ71C21 (S1)			64 units (base + extension 7 stages)	
AJ71C22 (S1)			64 units (base + extension 7 stages)	
AD57G (S3)	Intelligent	2	2 units (total after combining it with other intelligent special function modules)	
AJ71C24 (S3/S6/S8)		1	6 units (total after combining it with other intelligent special function modules)	
AJ71UC24			6 units (total after combining it with other intelligent special function modules)	
AJ71QC24 (R2/R4)	Normal		64 units (base + extension 7 stages)	
AD51 (S3)	Intelligent	2	6 units (total after combining it with other intelligent special function modules) (Use within the range of A3H)	The program interrupt cannot be used.
AD51H			6 units (total after combining it with other intelligent special function modules) (Use within the range of A3A)	
AD51H-S3			6 units (total after combining it with other intelligent special function modules)	
AJ71E71		1	6 units (total after combining it with other intelligent special function modules) (Use within the range of A3A)	
AJ71QE71	Normal		3 units	
AJ71P41	Intelligent		6 units (total after combining it with other intelligent special function modules) (Use within the range of A3H)	

Classification Normal: Other than special function module

Interigent: Special function module

Cannot be used

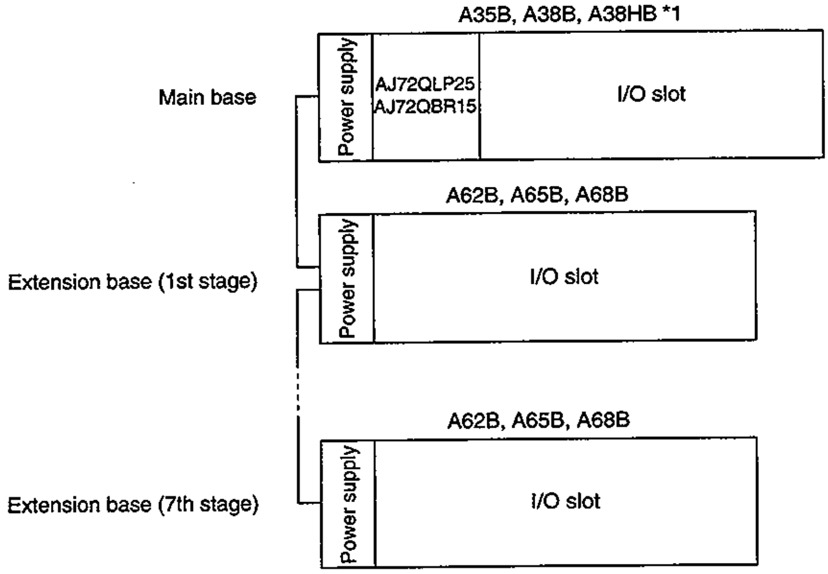
- AD57 (S1/S2)
- AD58
- AD51FD (S3)
- AI61
- AJ71C23
- AJ71PT32-S3
- AJ71AP21
- AJ71AR21
- AJ71AT21B
- AJ71QLP21 (S)
- AJ71QBR11
- AJ71LP21
- AJ71BR11
- AJ71D1-R4
- AJ71D2-R4

(7) **Remote I/O station system configuration**

Up to seven extension base stages can be connected.

"A power supply duplex base (A37RHB, A68RB)" can be used for the main base and extension base.

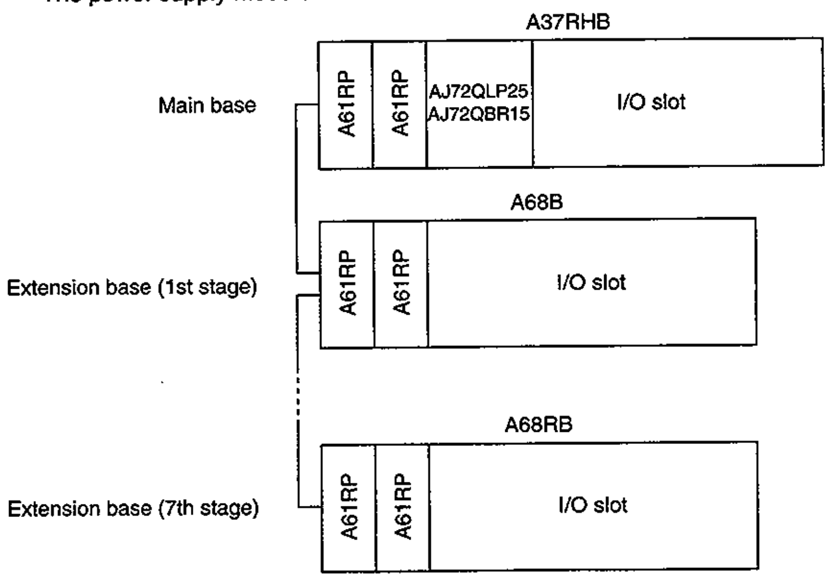
[Main base and extension base structure]



*1: Using the A38HB will not increase the speed.

[Power supply duplex main base and extension base structure]

The power supply module uses A61RP.



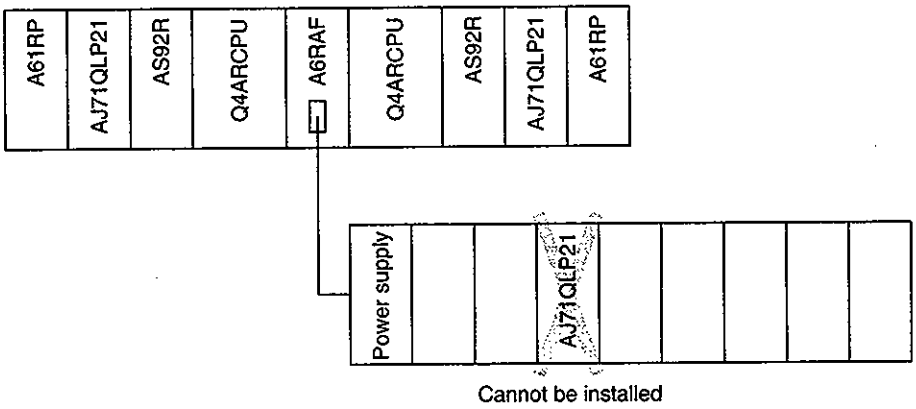
*2: Using the A37RHB will not increase the speed.

2.2 Duplex Network

Describes the inter-PC network and the remote I/O network system configuration for the duplex network

2.2.1 Precautions for the system configuration

A network module (AJ71QLP21, AJ71QLP21S, AJ71QBR11) cannot be installed on the Q4ARCPU duplex system's extension base.



2.2.2 Inter-PC network

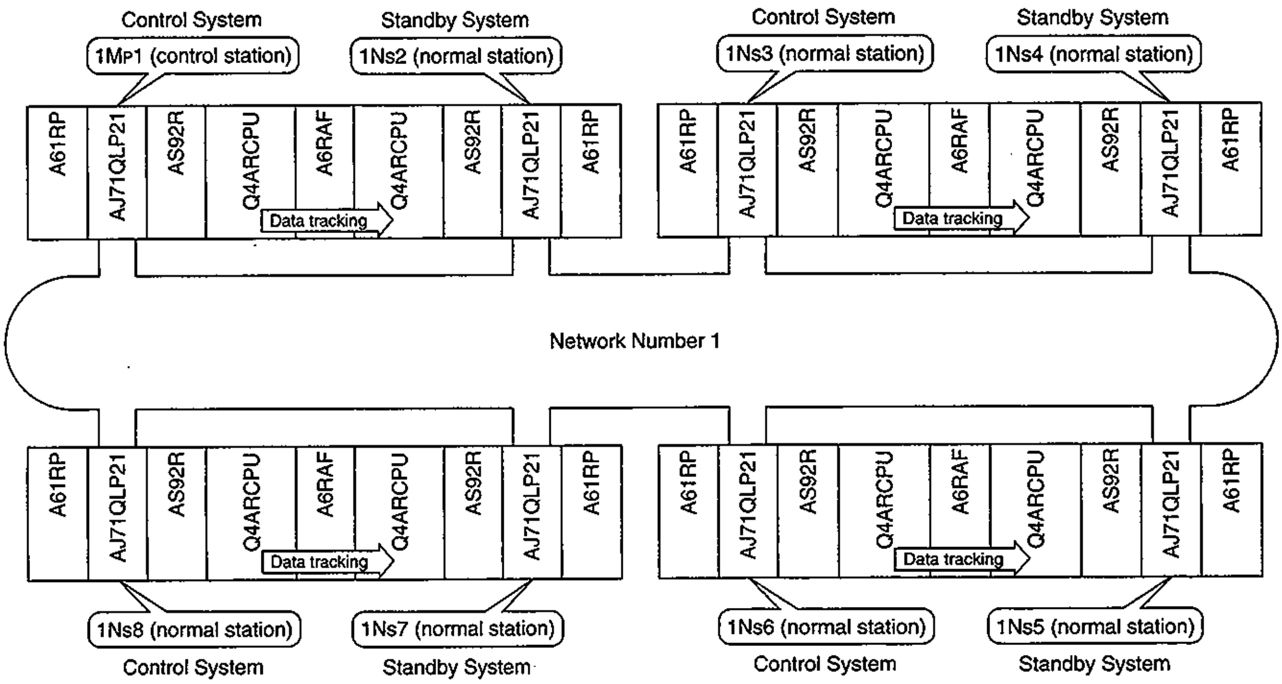
Describes the inter-PC network system configuration.

(1) All networks are Q4ARCPU duplex system

(a) System configuration

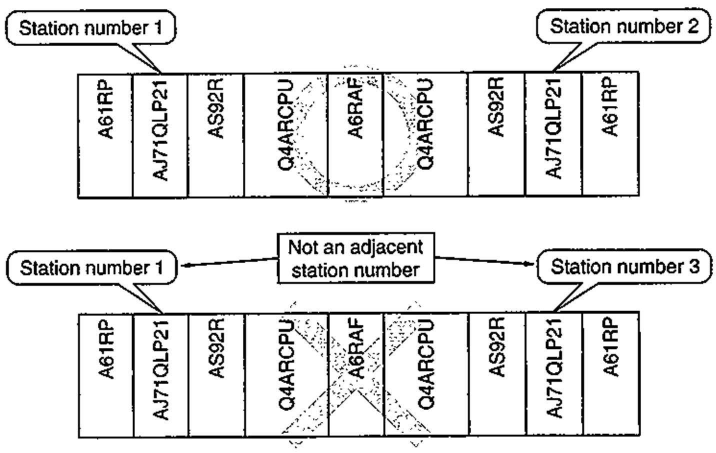
Sixty four units comprising one control station and 63 normal stations can be connected for an optical loop system. (Thirty two stations comprising one control station and 31 normal stations can be connected for a coaxial bus system.)

In addition, any station number can be set to the control station.



Point

Be sure to set the station numbers next to each other (such as 1 and 2, or 3 and 4). Failure to do so may result in incorrect settings of pairings needed for the duplex system. In addition, pairing setting of station number 64 and 1 can not be set.



(b) Parameter setting items
The parameter setting items for the control station (Mp) and normal station (Ns) are shown in Table 2.17.

Table 2.17 Parameter setting items

Setting items		Control station (MP) Default parameter	Control station (MP) Common parameter	Normal station (Ns)	Reference
Number of modules setting		The duplex system cannot operate with the default parameter settings.	●	△	Section 9.2
Network settings	First I/O number		●	△	Section 9.3
	Network number		●	△	Section 9.3
	Total link (slave) stations		●	×	Section 9.3
Network refresh parameter			△	△	Section 9.4
Common parameter			●	×	Section 13.2
Station specific parameter			△	△	Section 9.6
I/O allocation			×	×	—
Inter data link transfer parameter			×	×	—
Routing parameter			×	×	—
Pairing setting (sequence program)			●	×	Section 14.4
Tracking setting (sequence program)			●	●	—

●: Setting mandatory △: Set as necessary ×: Setting not necessary

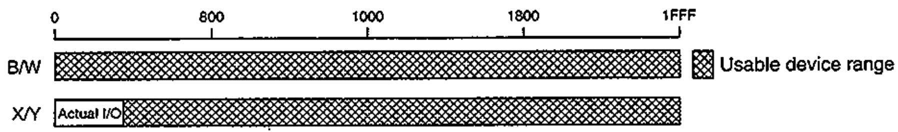
(c) Network module setting items
The network module setting items for the control station (Mp) and normal station (Ns) are shown in Table 2.18.

Table 2.18 Network module setting items

Setting items		Control station (MP) Default parameter	Control station (MP) Common parameter	Normal station (Ns)	Reference
Network number		The duplex system cannot operate with the default parameter settings.	●	●	Section 4.2.1
Group number			△	△	
Station number			●	●	
Mode			●	●	
Condition settings	Network type (SW1)		OFF	OFF	
	Station type (SW2)		ON	OFF	
	Parameter used (SW3)		OFF	×	
	Number of stations (SW4, 5)		×	×	
	Total B/W points (SW6,7)		×	×	

●: Setting mandatory △: Set as necessary ×: Setting not necessary

(d) Usable device range
B/W can use all 0 to 1FFF (8192 points).
X/Y can use the range after the actual I/O (the device range where the module is actually installed) in 0 to 1FFF (8192 points).

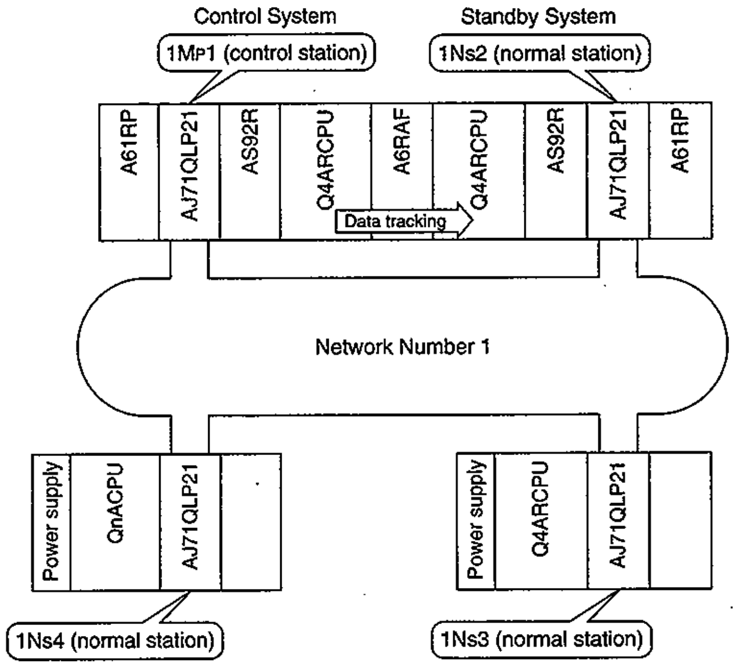


(2) When Q4ARCPU duplex system, Q4ARCPU simplex system and QnACPU coexist

(a) When the Q4ARCPU duplex system is the control station

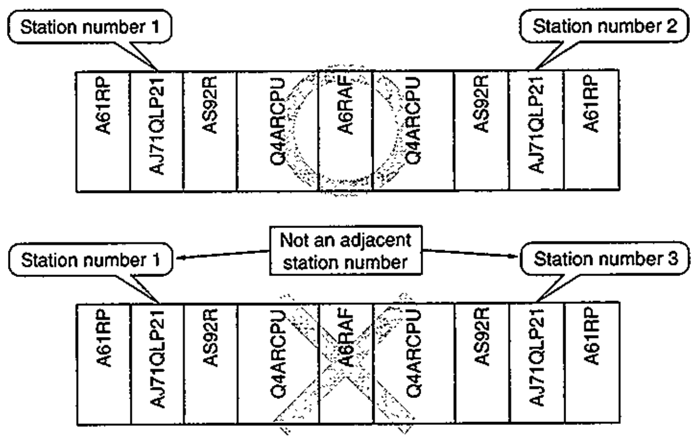
1) System configuration

Sixty four units comprising one control station and 63 normal stations may be connected for an optical loop system. (Thirty two stations comprising one control station and 31 normal stations can be connected for a coaxial bus system.)



Point

Be sure to set the station numbers next to each other (such as 1 and 2, or 3 and 4). Failure to do so may result in incorrect settings of pairings needed for the duplex system. In addition, pairing setting of station number 64 and 1 can not be set.



2) Parameter setting items
The parameter setting items for control station (MP) and the normal station (Ns) are shown in Table 2.19.

Table 2.19 Parameter setting items

Setting items		Control station (MP) Default parameter	Control station (MP) Common parameter	Normal station (Ns)	Reference
Number of modules setting		The duplex system cannot operate with the default parameter settings.	●	△	Section 9.2
Network settings	First I/O number		●	△	Section 9.3
	Network number		●	△	Section 9.3
	Total link (slave) stations		●	×	Section 9.3
Network refresh parameter			△	△	Section 9.4
Common parameter			●	×	Section 13.2
Station specific parameter			△	△	Section 9.6
I/O allocation			×	×	—
Inter data link transfer parameter			×	×	—
Routing parameter			×	×	—
Pairing setting (sequence program)			●	×	Section 14.4
Tracking setting (sequence program)			Necessary for both duplex systems		—

●: Setting mandatory △: Set as necessary ×: Setting not necessary

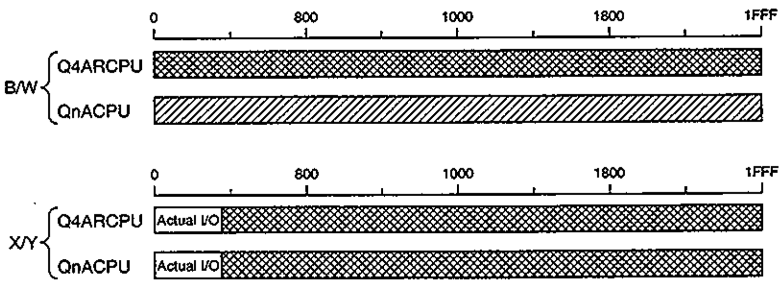
3) Network module setting items
The network module setting items Control station (MP) and normal station (Ns) are shown in Table 2.20.

Table 2.20 Network module setting items

Setting items		Control station (MP) Default parameter	Control station (MP) Common parameter	Normal station (Ns)	Reference
Network number		The duplex system cannot operate with the default parameter settings.	●	●	Section 4.2.1
Group number			△	△	
Station number			●	●	
Mode			●	●	
Condition settings	Network type (SW1)		OFF	OFF	
	Station type (SW2)		ON	OFF	
	Parameter used (SW3)		OFF	×	
	Number of stations (SW4, 5)		×	×	
	Total B/W points (SW6,7)		×	×	

●: Setting mandatory △: Set as necessary ×: Setting not necessary

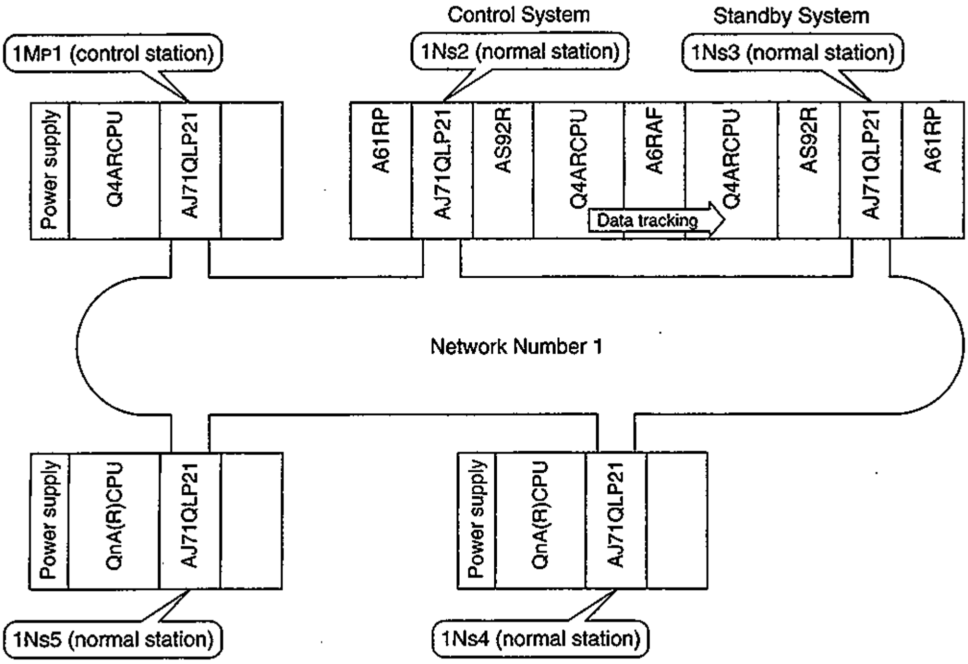
4) Usable device range
B/W can use all of 0 to 1FFF (8192 points).
X/Y can use range after the actual I/O (the device range where the module is actually installed) in 0 to 1FFF (8192 points).



(b) When the single Q4ARCPU system is the control station

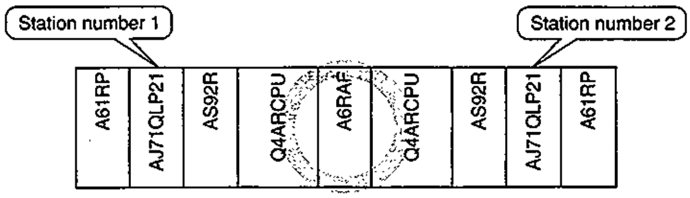
1) System configuration

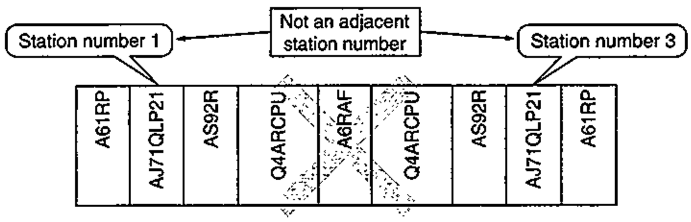
Sixty four units comprising one control station and 63 normal stations can be connected for an optical loop system. (Thirty two stations comprising one control station and 31 normal stations can be connected for a coaxial bus system.)



Point

Be sure to set the station numbers next to each other (such as 1 and 2, or 3 and 4). Failure to do so may result in incorrect settings of pairings needed for the duplex system. In addition, pairing setting of station number 64 and 1 can not be set.





2) Parameter setting items

The parameter setting items for the control station (Mp) and normal station (Ns) are shown in Table 2.21.

Table 2.21 Parameter setting items

Setting items		Control station (MP) Default parameter	Control station (MP) Common parameter	Normal station (Ns)	Reference
Number of modules setting		The duplex system cannot operate with the default parameter settings.	●	△	Section 9.2
Network settings	First I/O number		●	△	Section 9.3
	Network number		●	△	Section 9.3
	Total link (slave) stations		●	×	Section 9.3
Network refresh parameter			△	△	Section 9.4
Common parameter			●	×	Section 13.2
Station specific parameter			△	△	Section 9.6
I/O allocation			×	×	—
Inter data link transfer parameter			×	×	—
Routing parameter			×	×	—
Pairing setting (sequence program)			●	×	Section 14.4
Tracking setting (sequence program)			×	*	—

●: Setting mandatory △: Set as necessary ×: Setting not necessary *: Required in control and standby systems

3) Network module setting items

The network module setting items for the control station (MP) and normal station (Ns) are shown in Table 2.22.

Table 2.22 Network module setting items

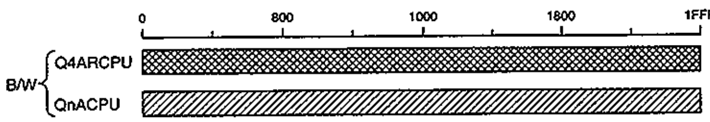
Setting Items		Control station (MP) Default parameter	Control station (MP) Common parameter	Normal station (Ns)	Reference
Network number		The duplex system cannot operate with the default parameter settings.	●	●	Section 4.2.1
Group number			△	△	
Station number			●	●	
Mode			●	●	
Condition settings	Network type (SW1)		OFF	OFF	
	Station type (SW2)		ON	OFF	
	Parameter used (SW3)		OFF	×	
	Number of stations (SW4, 5)		×	×	
	Total B/W points (SW6,7)		×	×	

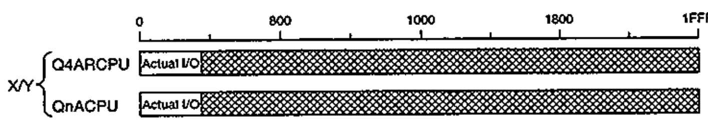
●: Setting mandatory △: Set as necessary ×: Setting not necessary

4) Usable device range

B/W can use all 0 to 1FFF (8192 points).

X/Y can use the range after the actual I/O (the device range where the module is actually installed) in 0 to 1FFF (8192 points).

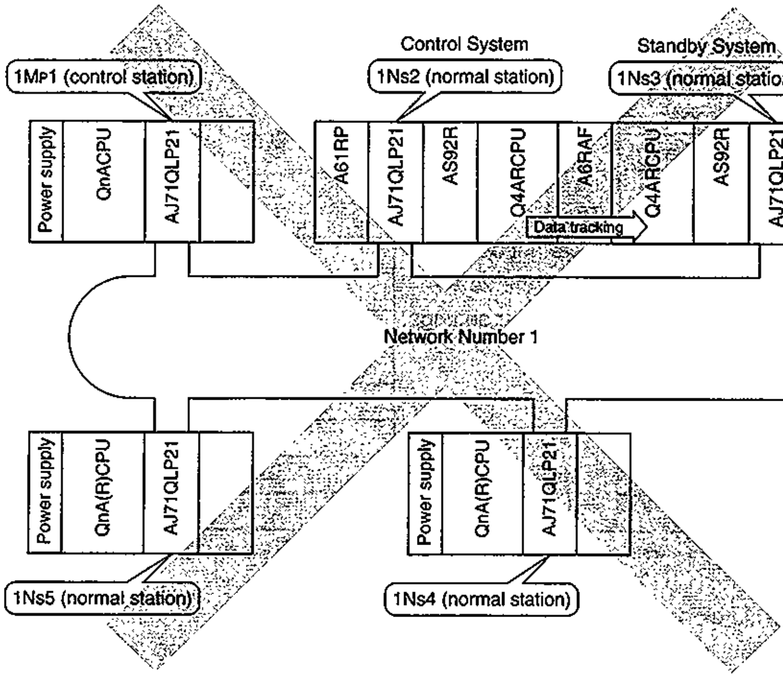




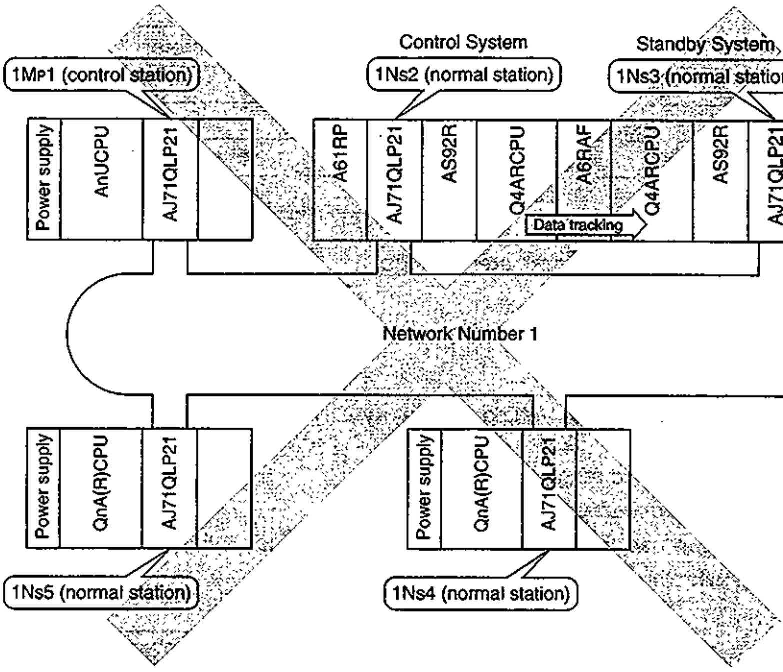
(c) When QnACPU or AnUCPU is the control station

Since QnACPU or AnUCPU does not support pairing settings, they cannot be the control station of the duplex network.

1) When QnACPU is the control station



2) When AnUCPU is the control station



(3) **Component devices**

The necessary components to construct inter-PC network are shown below:

Table 2.23 List of system equipment for inter-PC network

Items		Type Name	Remark
PC CPU		Q4ARCPU	———
Duplex main base module		A32RB (2 I/O slots) A33RB (3 I/O slots)	Includes AS92R (system control module)
Power supply duplex main base module		A37RHB (7 I/O slots)	Equivalent to A38HB
Power supply duplex extension base module		A68RB (8 I/O slots)	———
Bus switching module		A6RAF	———
System control module		AS92R	———
Power supply module with matching function		A61RP	———
Network module (for control station/normal station)		Optical loop system AJ71QLP21 AJ71QLP21S (possible to supply an external power supply) For coaxial bus system AJ71QLP21	Usable if the software version is "H" or later
Data link cable The numbers in parentheses indicate the distance that can be used.	For optical loop system	SI cable (500 m) (1641ft.) QSI cable (1 km) (3281ft.)	Total length: 30 km
	For coaxial bus system	3C-2V (300m) (984.3ft.) 5C-2V (500m) (1641ft.)	Total length: 3C-2V:300m, 5C-2V: 500m
Terminal resistor (Necessary for coaxial bus system)		A6RCON-R75 BNC-TMP-05 (75) (manufactured by Hirose Electric, Co., Ltd.)*	Sold separately (not included in the network module)
F shaped connector		BNC (75)-LLA-PJJ (manufactured by Hirose Electric, Co., Ltd.)*	One module included in the AJ71QBR11, AJ72QBR15
Software package (Peripheral device)		SW□NX-GPPQ (for PC 9800 series) SW□VD-GPPQ (for DOS/V PC)	———

* Contact the following for inquiries:

Main Marketing Office (marketing and overseas marketing office)
5-1-11, Osaki, Shinagawa-ku, Tokyo 141
(Gotanda1 S Bldg, 9th/10th Floors)
TEL(03)3492-2161 FAX(03)3490-9229

Osaka Marketing Division
2-22, Daiyujimachi, Kita-ku, Osaka 530
(Umedayachiyo Bldg, 4th Floor)
TEL(06)312-4661 FAX(06)312-4335

Nagoya Marketing Division
3-21-25, Marunouchi, Naka-ku, Nagoya-shi, 460
(Seifu Bldg, 3rd Floor)
TEL(052)951-0133 FAX(052)951-1940

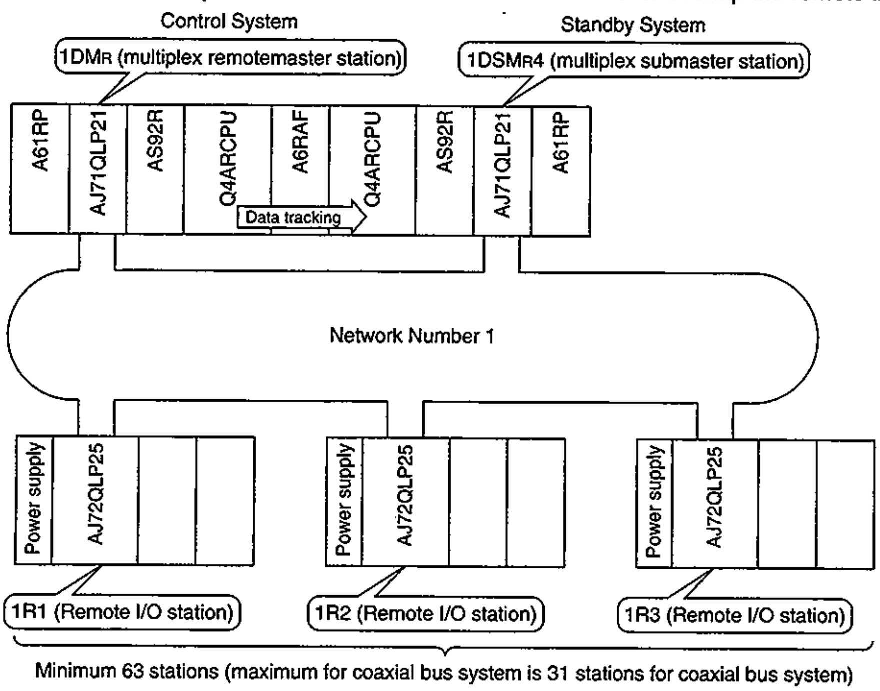
2.2.3 Remote I/O network

Describes the remote I/O network system configuration.

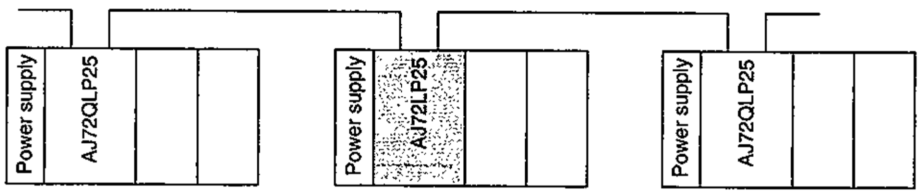
(1) Multiple master system

(a) System configuration

Set the multiple remote submaster station number not to overlap the remote I/O station.



Point
(1) The AnU remote I/O station network modules (AJ72LP25 and AJ72BR15) can be used in combination.



(2) Boot the system so that the multiple remote master station is the control system and multiple remote master station is the standby system.

(b) Parameter setting items

The parameter setting items multiple remote master station (DM_R) and multiple remote submaster station (DSM_R) are shown in Table 2.24.

Unlink inter-PC network, pairing setting (PAIRSET) is not necessary.

Table 2.24 Parameter setting items

Setting Items		Multiple remote master station (DM_R)	Multiple remote submaster station (DSM_R)	Reference
Number of modules setting		●	●	Section 9.2
Network settings	First I/O number	●	●	Section 9.3
	Network number	●	●	Section 9.3
	Total link (slave) stations	●	×	Section 9.3
Network refresh parameter		●*	●*	Section 9.4
Common parameter		●	×	Section 13.2
Station specific parameter		×	×	—
I/O allocation		△	×	Seciton 9.7
Inter data link transfer parameter		×	×	—
Routing parameter		×	×	—
Pairing setting (Sequence program)		×	×	—
Tracking setting (Sequence program)		●	●	—

●: Setting mandatory △: Set as necessary ×: Setting not necessary

* For X/Y refresh range setting

(c) Network module setting items

The network module setting items multiple remote master station (DM_R), multiplex remote submaster station (DSM_R), and remote I/O station (R) are shown in Table 2.25.

Table 2.25 Network module setting items

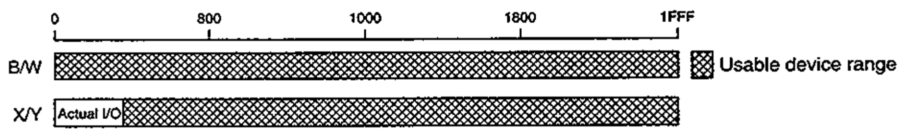
Setting items		Multiple remote master station (DM_R)	Parallel-remote submaster station (DSM_R)	Remote I/O station (R)	Reference
Network number		●	●	—	Section 4.2
Group number		×	×	—	Section 4.2
Station number		Station 0	Station 1to 64	Station 1 to 64	Section 4.2
Mode		●	●	●	Section 4.2
Condition settings	Network type (SW1)	ON	ON	—	Section 4.2
	Station type (SW2)	×	OFF	—	Section 4.2
	Parameter used (SW3)	×	×	—	Section 4.2
	Number of stations (SW4, 5)	×	×	—	Section 4.2
	Total B/W points (SW6,7)	×	×	—	Section 4.2
Condition settings	Peripheral device type (SW1)	—	—	OFF: For QnA ON: For A	Section 4.2

●: Setting mandatory △: Set as necessary ×: Setting not necessary

(d) Usable device range

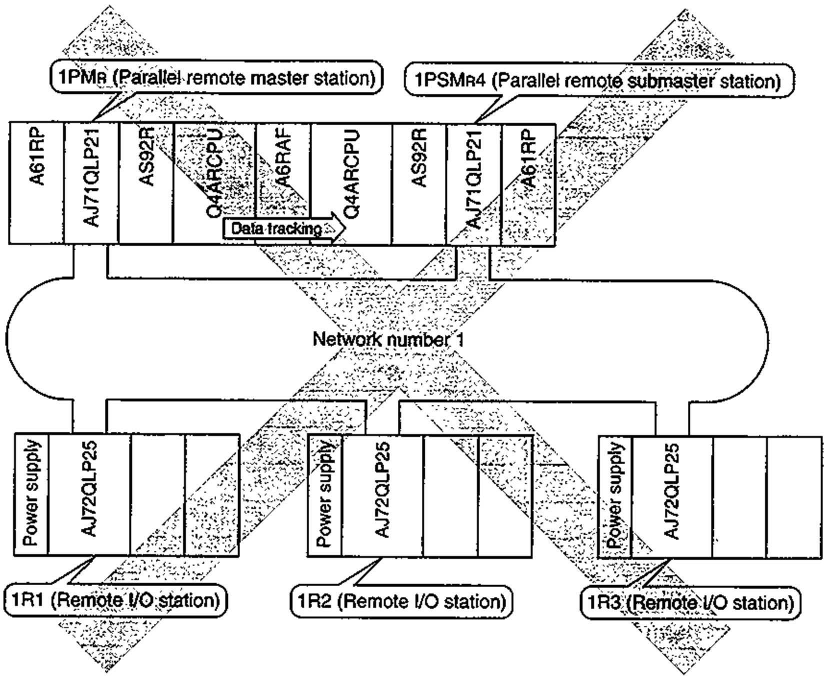
For B/W, all in the range 0 to 1FFF (8192 points) can be used.

For X/Y, the address after the actual I/O (device range where the module is actually installed) in 0 to 1FFF (8192 points) can be used.



(2) Parallel master system

The following system cannot be configured.



(3) Component devices

The necessary components to construct remote I/O network are shown below:

Table 2.23 List of system equipment for inter remote I/O network

Items		Type name	Remark
PC CPU		Q4ARCPU	—
Duplex main base module		A32RB (2 singlesided I/O slots) A33RB (3 singlesided I/O slots)	Includes AS92R (system control unit)
Power supply duplex main base module		A37RHB (7 I/O slots)	Equivalent to A38HB
Power supply duplex extension base module		A68RB (8 I/O slots)	—
Bus switching module		A6RAF	—
System control module		AS92R	—
Power supply module with matching function		A61RP	—
Network module (for multiple remote master station/ multiple remote submaster station)		Optical loop system AJ71QLP21 AJ71QLP21S (possible to supply an external power supply) For coaxial bus system AJ71QLP21	Usable if the software version is "H" or later
Network module for remote I/O station		Optical loop system AJ71QLP25 For coaxial bus system AJ71QBR15	Software (output hold function supported) version is "G" or later
Data link cable The numbers in parentheses indicate the distance that can be used.	For optical loop system	SI cable (500m) (1641ft.) QSI cable (1km) (3281ft.)	Total length: 30 km
	For coaxial bus system	3C-2V (300m) (984.3ft.) 5C-2V (500m) (1641ft.)	Total length 3C-2V: 300m (984.3ft.) 5C-2V: 500m (1641ft.)
Terminal resistor (Necessary for coaxial bus system)		A6RCON-R75 BNC-TMP-05 (75) (manufactured by Hirose Electric, Co., Ltd.)*	Sold separately (not included in the network module)
F shaped connector		BNC (75)-LLA-PJJ (manufactured by Hirose Electric, Co., Ltd.)*	One unit included in the AJ71QBR11, AJ72QBR15
Software package (Peripheral device)		SW☐NX-GPPQ (for PC 9800 series) SW☐IVD-GPPQ (for DOS/V PC)	—

* Contact the following for inquiries:

Main Marketing Office (marketing and overseas marketing office)
5-1-11, Osaki, Shinagawa-ku, Tokyo 141
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TEL(03)3492-2161 FAX(03)3490-9229

Osaka Marketing Division
2-22, Daiyujimachi, Kita-ku, Osaka 530
(Umedayachiyo Bldg, 4th Floor)
TEL(06)312-4661 FAX(06)312-4335

Nagoya Marketing Division
3-21-25, Marunouchi, Naka-ku, Nagoya-shi, 460
(Seifu Bldg, 3rd Floor)
TEL(052)951-0133 FAX(052)951-1940

2.3 Compound System

2.3.1 Inter-PC network

The simplex network and duplex network where the AnU/AnA/AnNCPU are compounded are explained below.

(1) Simplex network

Describes systems where the AnU/AnA/AnNCPU are compounded using the following system configuration example:

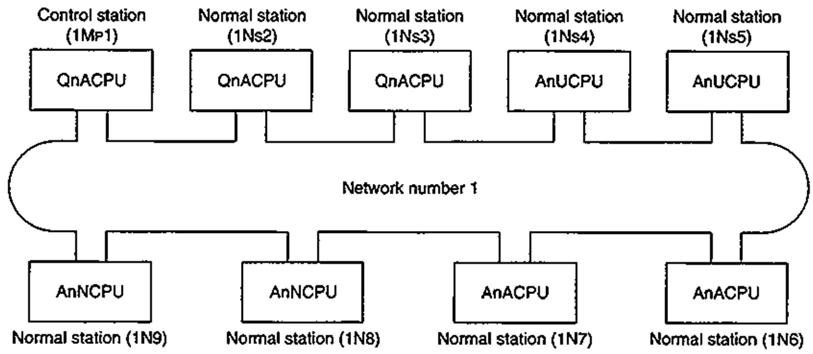


Figure 2.1 System configuration example

(a) PC CPU and network module combination
The network module that can be installed differs depending on the PC CPU.
For QnACPU, AJ71QLP21 (S) and AJ71QBR11 can be installed.
For AnU/AnA/AnNCPU,AJ71LP21 and AJ71BR11 can be installed.

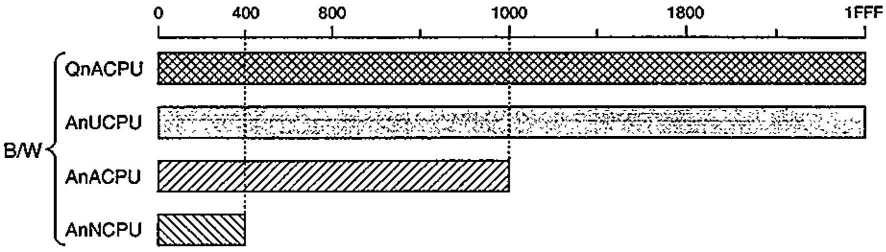
PC CPU \ Network module	AJ71QLP21 (S) AJ71QBR11	AJ71LP21 AJ71BR11	A1SJ71LP21 A1SJ71BR11
QnACPU	○	×	×
AnUCPU AnACPU AnNCPU	×	○	×
A2USCPU	×	△	○
AnSCPU	×	△	○

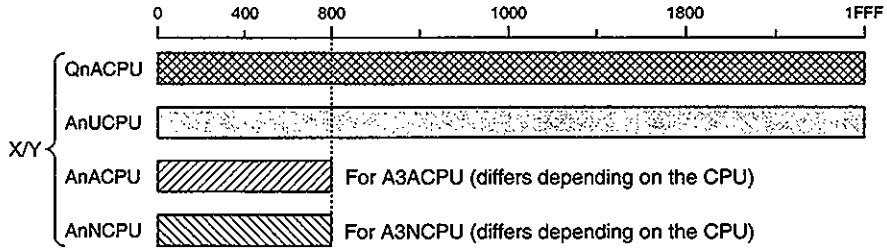
○: Can be installed.
△: Can be installed when using the A series extension base.
×: Cannot be installed.

A2USCPU, AnSCPU, A1SJ71LP21, and A1SJ71BR11 can be installed.
When using the A series extension base, AJ71LP21 and AJ71BR11 can be installed.

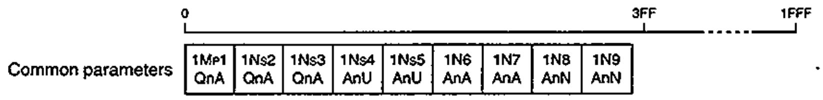
(b) Cyclic Transmission

1) Handled device points differ, depending on the PC CPU.



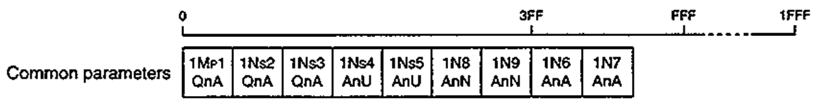


2) To enable all stations to transmit data to all stations, a common parameter (transmission range for each station) must be allocated within the least PC CPU range of all modules that can be handled within the network.
In the system configuration example in Figure 2.1, stations 1N8 and 1N9 can handle the least device points, so the allocation will be in the B/W 0 to 3FF range.
B/W400 to FFF can be used by QnA/AnU/AnACPU.
B/W1000 to 1FFF can be used by QnA/AnUCPU.



Point

When the common parameters are allocated as shown below, the data in stations 1N6 and 1N7 are only transmitted to stations 1Mp1 to 1Ns5, and is not transmitted to stations 1N8 and 1N9.



3) QnA/AnUCPU stations can be set with the X/Y communication I/O master station.
AnA/AnNCPU stations cannot be set as the I/O master station.
The AnA/AnNCPU can perform X/Y communications when "the I/O master station is the control station and is at block 1".
With the system configuration example in Figure 2.1, the details are as shown below:

Communication destination station \ I/O master station		Control station		Normal station							
		1M$_{P}$1 (QnA)		1N$_{S}$2 (QnA)		1N$_{S}$3 (QnA)		1N$_{S}$4 (AnU)		1N$_{S}$5 (AuU)	
		Block1	Block2	Block1	Block2	Block1	Block2	Block1	Block2	Block1	Block2
Control station	1M$_{P}$1 (QnA)	Host	Host	○	○	○	○	○	○	○	○
Normal station	1N$_{S}$2 (QnA)	○	○	Host	Host	○	○	○	○	○	○
	1N$_{S}$3 (QnA)	○	○	○	○	Host	Host	○	○	○	○
	1N$_{S}$4 (AnU)	○	○	○	○	○	○	Host	Host	○	○
	1N$_{S}$5 (AnU)	○	○	○	○	○	○	○	○	Host	Host
	1N6 (AnA)	○	×	×	×	×	×	×	×	×	×
	1N7 (AnA)	○	×	×	×	×	×	×	×	×	×
	1N8 (AnN)	○	×	×	×	×	×	×	×	×	×
	1N9 (AnN)	○	×	×	×	×	×	×	×	×	×

○: Communication possible ×: Communication not possible

(c) Transient transmission

1) Communication range
QnA/AnUCPU stations can communicate with any stations.
AnA/AnNCPU stations can only communicate with the control station of the same network. (Cannot communicate with the subcontrol station.)
For the system configuration example in Figure 2.1, the details are as shown below:

Request origin \ Request destination		Control station	Normal station							
		1M$_{P}$1	1N$_{S}$2	1N$_{S}$3	1N$_{S}$4	1N$_{S}$5	1N6	1N7	1N8	1N9
Control station	1M$_{P}$ (QnA)	Host	○	○	○	○	○	○	○	○
Normal station	1N$_{S}$2 (QnA)	○	Host	○	○	○	○	○	○	○
	1N$_{S}$3 (QnA)	○	○	Host	○	○	○	○	○	○
	1N$_{S}$4 (AnU)	○	○	○	Host	○	○	○	○	○
	1N$_{S}$5 (AnU)	○	○	○	○	Host	○	○	○	○
	1N6 (AnA)	○*	×	×	×	×	Host	×	×	×
	1N7 (AnA)	○*	×	×	×	×	×	Host	×	×
	1N8 (AnN)	○*	×	×	×	×	×	×	Host	×
	1N9 (AnN)	○*	×	×	×	×	×	×	×	Host

○: Communication possible ×: Communication not possible
*: Specify "0" for PC number in the same manner as specifying a master station.

DANGER [Precaution when using transient transmission]

In the system where there is a compound of QnA(R)CPU and AnUCPU, never execute the following transient transmissions which cannot be performed from QnA(R)CPU to AnUCPU of another station.
Such AnUCPU results in "MAIN CPU DOWN" or "WDT ERROR," and may stop operation.

(1) GPPQ
- Remote operation (such as remote RUN, STOP, PAUSE, and RESET)
- Clock setting
- Online mode device test

(2) Link dedicated instructions (SEND, READ, SREAD, WRITE, SWRITE, and REQ)

2) Link dedicated instructions
The executable link dedicated instructions are shown below:

Request destination / Request origin	QnACPU	AnUCPU	AnACPU	AnNCPU
QnACPU	SEND/RECV READ/WRITE REQ ZNRD/ZNWR	ZNRD/ZNWR*1	ZNRD/ZNWR*2	ZNRD/ZNWR*3
AnUCPU	ZNRD/ZNWR*1	ZNRD/ZNWR	ZNRD/ZNWR*2	ZNRD/ZNWR*3
AnACPU	No instruction			
AnNCPU				

*1: Can only access the device range for AnUCPU.
*2: Can only access the device range for AnACPU.
*3: Can only access the device range for AnNCPU.

(d) Parameter setting
The normal stations for QnACPU does not need parameter settings.
The normal stations for AnUCPU require parameter settings.
The parameters for the control stations and normal stations are shown below:

Setting station / Item	Control station	Normal station			
	QnACPU	QnACPU	AnUCPU	AnACPU	AnUCPU
Number of modules	○	△	○	No parameter settings (Setting not enabled)	
Network refresh parameter	△	△	○		
Common parameter	○	×	×		
Station specific parameter	△	△	△		

○: Setting mandatory △: Set as necessary ×: Setting not necessary

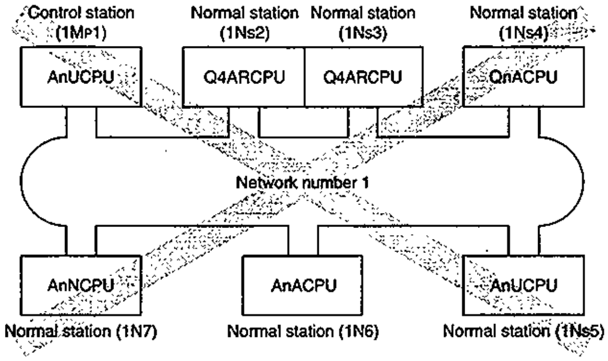
(e) Simplified network duplexing
Simplified network duplexing is not possible for compound systems.

(f) Installing multiple network modules with the same network number
For installing multiple network modules with the same network number QnACPU, the number of links for station can be increased.
AnA/AnNCPU can communicate without any problems.

(g) Network number
In MELSECNET/10 for QnA, the network setting is "1 to 239." The setting from 240 to 255 is not possible.

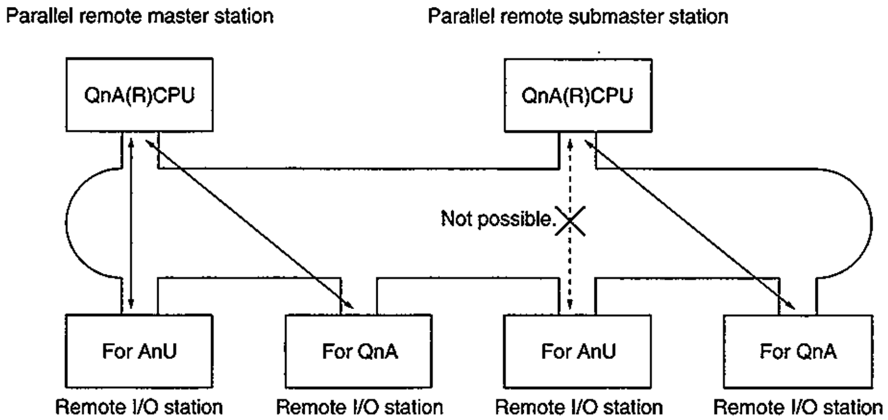
(2) Duplex network

(a) Besides the details stated for the simplex network, AnUCPU cannot be a control station. This is because the pairing setting, which is required for a duplex network, cannot be performed.



2.3.2 Remote I/O network

If the remote I/O for AnU is used with the QnA(R)CPU remote master station, there are restrictions for the parallel master system.
The parallel remote submaster station cannot communicate with the remote I/O for AnU.



Remote I/O station for QnA station AJ72QLP25 and AJ72QBR15
Remote I/O station for AnU station AJ72LP25 and AJ72BR15

2.3.3 MELSECTNET (II) and MELSECNET/B compound systems

(1) QnA(R)CPU connection

The following describes the system which connects MELSECNET/10 (inter-PC network), MELSECNET(II) and MELSECNET/B with QnA(R)CPU.

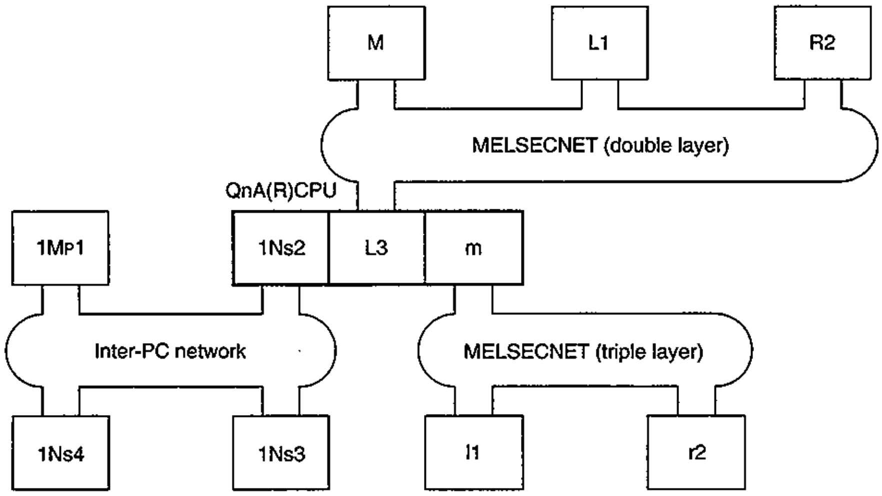


Figure 2.2 System configuration example

(a) MELSECNET/10, and MELSECNET(II), and MELSECNET/B operate independently. MELSECNET/10 data is never transmitted to MELSECNET(II) or MELSECNET/B, and vice versa.

(b) To transmit MELSECNET/10 data to MELSECNET (II) or MELSECNET/B, or to transmit MELSECNET(II) or MELSECNET/B data to MELSECNET/10, use the inter-data link transmission function.

(c) MELSECNET/10 station cannot communicate with MELSECNET(II) or MELSECNET/B station, and vice versa.
For the system configuration example in Figure 2.2, the details are as follows:

		MELSECNET/10				MELSECNET (Double layer)				MELSECNET (triple layer)		
		1MP1	1Ns2	1Ns3	1Ns4	M	L1	R2	L3	m	l1	r2
MELSECNET/10	1MP1	Host	○	○	○	×	×	×	○	○	×	×
	1Ns2	○	Host	○	○	×	×	×	Host	Host	×	×
	1Ns3	○	○	Host	○	×	×	×	○	○	×	×
	1Ns4	○	○	○	Host	×	×	×	○	○	×	×
MELSECNET (Double layer)	M	×	×	×	×	Host	○	○	○	○	×	×
	L1	×	×	×	×	○	Host	×	×	×	×	×
	R2	×	×	×	×	○	×	Host	×	×	×	×
	L3	○	Host	○	○	○	×	×	Host	Host	○	○
MELSECNET (Triple layer)	m	○	Host	○	○	○	×	×	Host	Host	○	○
	l1	×	×	×	×	×	×	×	○	○	Host	×
	r2	×	○	×	×	×	×	×	○	○	×	Host

○: Communication possible ×: Communication not possible

(2) **AnA/AnNCPU connections**

The following describes the system where the MELSECNET/10 (inter-PC network) and MELSECNET(II) are connected with AnA/AnNCPU.

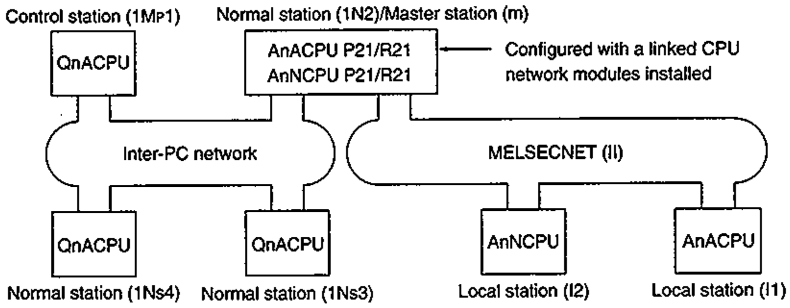
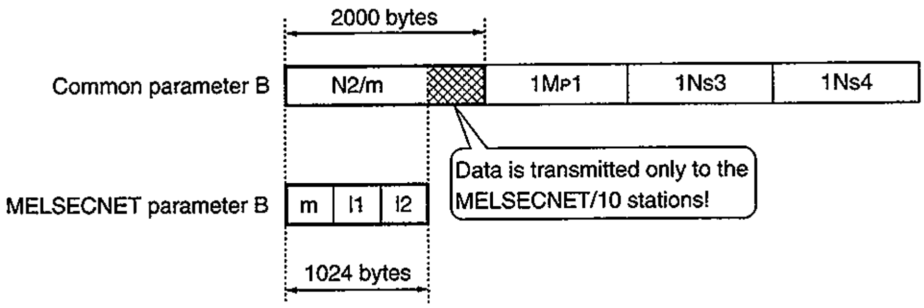


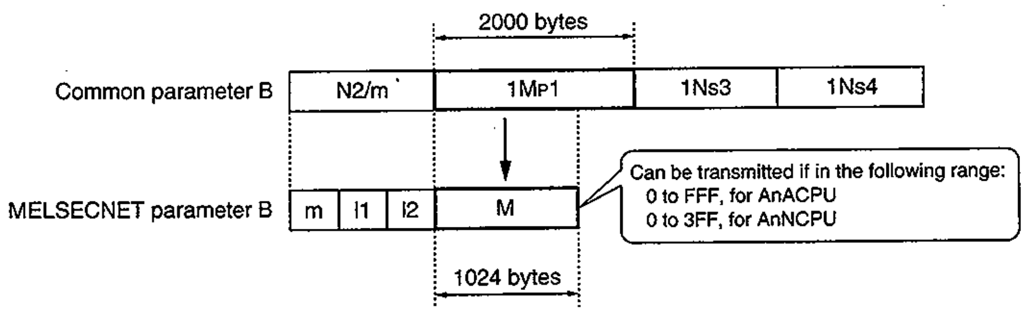
Figure 2.3 System configuration example

(a) There are three layers with the MELSECNET/10 at the top layer and MELSECNET(II) at the bottom layer.
The MELSECNET/10 is the same image as the first half of the MELSECNET II mode.

(b) The N2/m station can allocate a maximum of 2000 bytes for the common parameters and 1024 bytes for the MELSECNET parameters.

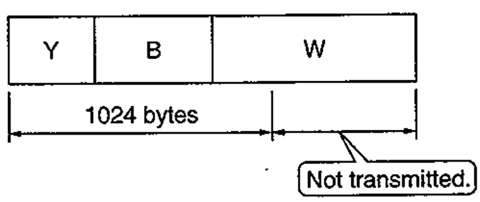


(c) For the control station (1MP1) which is equivalent to the MELSECNET (II) master station, a maximum of 2000 bytes can be allocated, but only a maximum of 1024 bytes can be transmitted to the MELSECNET third layer.

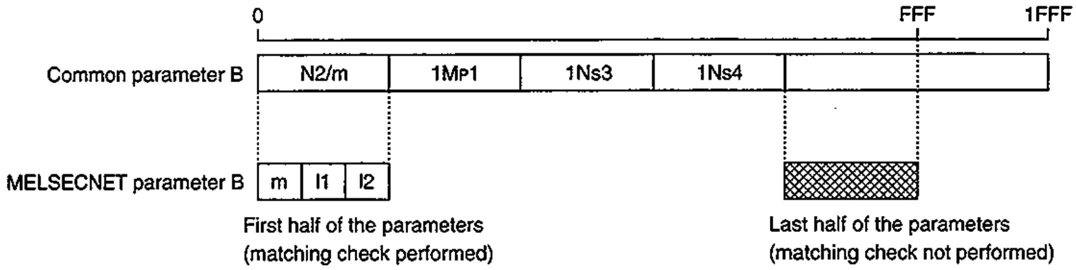


Remark

The 1024 bytes in (b) and (c) are calculated as below:

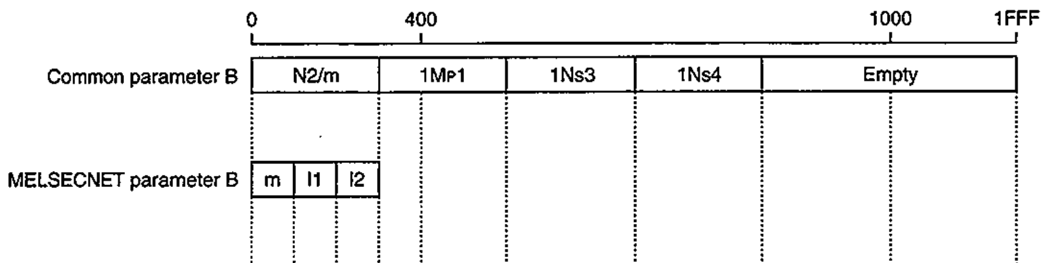


(d) A matching check is performed between the common parameters and MELSECNET mode parameters, first half of parameters for MELSECNET II mode and MELSECNET II compound mode.
The last half of the parameters for the MELSECNET II mode and MELSECNET II compound mode does not perform a matching check. Allocate "final address +1 to FFF" for the MELSECNET/10 common parameters for the last half.



> **What is a matching check?**
> It is a check to make sure that MELSECNET parameter is allocated within a range allocated in common parameter.

[Allocation example]



		m	I1	I2	1MP1	1Ns3	1Ns4	Empty
1MP1		R	R	R	W	R	R	
N2/m [for AnN CPU]		W	R	R	R	Unusable		
	I1	R	W	R	R	Unusable		
	I2	R	R	W	R	Unusable		
N2/m [for AnA CPU]		W	R	R	R			Unusable
	I1	R	W	R	R			Unusable
	I2	R	R	W	R			Unusable
1Ns3		R	R	R	R	W	R	
1Ns4		R	R	R	R	R	W	

R .... Read enabled
W .... Write enabled
▩ .... Can be used as internal memory

> **Point**
> QnACPU or AnUCPU is recommended for the connection between MELSECNET/10 (inter-PC network) and MELSECNET (II).
> This simplifies the network configuration.

3 Specifications

This chapter describes the network system performance specifications.
Refer to the PC CPU User's Manual used in the network system for the general specifications.

3.1 Performance Specifications

The network system performance specifications are shown in Tables 3.1 and 3.2.

Table 3.1 Inter-PC performance specifications

Item		Optical loop system (AJ71QLP21, AJ71QLP21S)	Coaxial bus system (AJ71QBR11)
Max. link points per network	X/Y	8192 points	
	B	8192 points	
	W	8192 points	
Max. link points per station		$\left\{\frac{Y+B}{8} + (2 \times W)\right\} \leq 2000$ bytes	
Communication speed		10 MBPS (equivalent to 20MBPS for multiple transmission)	10 MBPS
Communication method		Token ring	Token bus
Synchronization method		Frame synchronization	
Encoding method		NRZI encoding (Non return to zero inverted)	Manchester encoding
Transmission route format		Duplex loop	Simplex bus
Transmission format		Conform to HDLC (frame format)	
Max. number of networks		239 (total with remote I/O network)	
Max. number of groups		9	
Number of stations for connection per network		64 stations (Control station: 1, Normal station:63)	32 stations (Control station: 1, Normal station: 31)
Total extension distance per network (station to station)		30 km (SI cable/Station to station 500 m (1641 ft.) *1, QSI cable/Station to station 1 km)	3C-2V: 300 m (984.3 ft.) (station to station 300m) *2 5C-2V: 500 m (1641 ft.) (station to station 500m) *2 Can be extended to 2.5 km when used with a repeater module (A6BR10, A6BR10-DC)
Error control method		Retry with CRC ($X^{16}+X^{12}+X^{5}+1$) and overtime	
RAS function		• Loop back function with error detection and cable disconnection (only for optical loop systems) • Host link line check diagnosis function • System fault prevention due to control station migration • Error detection using special relay or register • Network monitor, various types of diagnosis functions	
Transient transmission		• N: N communication (such as monitoring or program backup/download) • ZNRD/ZNWR, SEND/RECV, READ/WRITE, REQ	
Connection cable		SI-200/220 ¦ QSI-185/230	3C-2V or 5C-2V equivalent products
Connector		2 core optical connector plug CA7003	BNC-P-3-Ni-CAU, BNC-P-5-Ni-CAU (manufactured by First Electric Industry, Ltd.) equivalent products
Cable transmission loss		12dB/km max. ¦ 5.5dB/km max.	Conform to JIS C3501 standard
Consumed electric current (5VDC)		0.65 A	0.8 A
External power supply (only for AJ71QLP21S)	Voltage	20.4 to 31.2 VDC	—
	Electric current	0.2 A	
	Applicable wire size	0.75 to 2 mm^2 (0.0012 to 0.0031 $in.^2$)	
	Tightening torque	41.1 N·cm (4 kg·cm)	
Weight		0.45 kg (0.55 kg for AJ71QLP21S)	
I/O points		32 points	
Control → standby switching time		When CPU error: 300 ms, When link cable is disconnected: 3 seconds	

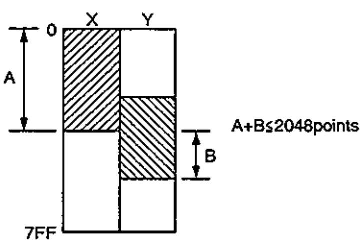
*1. For the conventional optical fiber cables (A-2P-□), the L type has a station to station of 500 m (1641 ft.), and H type has a station to station of 300 m (984.3 ft.).

*2. For the coaxial bus system, there is a restriction on the station to station cable lengths depending on the number of stations connected. Refer to Section 4.3.2.

Table 3.2 Remote I/O network performance specifications

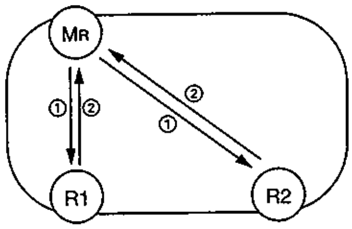
Item		Optical loop system		Coaxial bus system	
		AJ71QLP21 (S)	AJ72QLP25	AJ71QBR11	AJ72QBR15
Max. link points per network	X/Y	8192 points			
	B	8192 points			
	W	8192 points			
Max. link points per station (Refer to next page)		Remote master station/remote submaster station → remote I/O station $\left\{\frac{Y+B}{8}+(2+W)\right\} \le 1600$ bytes		Remote I/O station → remote master station/remote submaster station $\left\{\frac{X+B}{8}+(2+W)\right\} \le 1600$ bytes	
		Remote master station → remote submaster station, remote submaster station → remote master station $\left\{\frac{Y+B}{8}+(2+W)\right\} \le 2000$ bytes			
Max/ I/O points per remote station		—	$X+Y \le 2048$ *3	—	$X+Y \le 2048$ *3
Communication speed		10 MBPS (equivalent to 20MBPS for multiplex transmission)		10 MBPS	
Communication method		Token ring		Token bus	
Synchronization method		Frame synchronization			
Encoding method		NRZI encoding (Non return to zero inverted)		Manchester encoding	
Transmission route format		Duplex loop		Simplex bus	
Transmission format		HDLC conforming (frame format)			
Max. number of networks		239 (total with remote I/O network)			
Number of stations for connection per network		65 stations (Control station: 1, Normal station: 64)		32 stations (Control station: 1, Normal station: 32)	
Total extension distance per network (station to station)		30 km (SI cable Station-to-station 500 m (1641 ft.) *1 QSI cable Station-to-station 1 km)		3C-2V	300 m (984.3 ft.) (station to station 300m) *2
				5C-2V	500 m (1641 ft.) (station to station 500m) *2
				Can be extended to 2.5 km when used a repeater module (A6BR10, A6BR10-DC)	
Error control method		Retry with CRC ($X^{16}+X^{12}+X^{5}+1$) and overtime			
RAS function		• Loop back function with error detection and cable disconnection (only for optical loop systems) • Host link line check diagnosis function • Error detection using special relay or register • Network monitor, diagnosis functions			
Transient transmission		• Program up/download and monitor from a peripheral device • Can use an intelligent special function module • ZNTO/ZNFR instruction			
Connection cable		① SI-200/220	② QSI-185/230	3C-2V, or 5C-2V equivalent products	
Connector		2 core optical connector plug CA7003		BNC-P-3-Ni-CAU, BNC-P-5-Ni-CAU equivalent products (manufactured by First Electric Industry, Ltd.)	
Cable transmission loss		① 12dB/km max.	② 5.5 dB/km max.	Conform to JIS C3501	
Consumed electric current (5VDC)		0.65 A	0.8 A	0.8 A	0.9 A
Weight		0.45 kg	0.53 kg	0.45 kg	0.6 kg
Number of I/O occupied points		32 points	—	32 points	—
Control → standby switching time		When CPU error occurs: 300 ms When link cable is disconnected: 3 secs.			

*1 For the conventional optical fiber cables (A-2P□), the L type has a station to station of 500 m (1641 ft.), and H type has a station-to-station of 300 m (984.3 ft.).
*2 For the coaxial bus system, there is a restriction on the station-to-station cable lengths depending on the number of stations connected. Refer to Section 4.3.2
*3 Only one side is regarded for the points where X and Y are overlapped.



Max. Link points per station

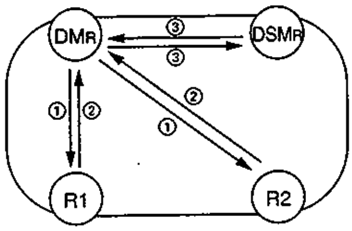
Two layer systems



① $\left\{\frac{Y+B}{8}+(2\times W)\right\}\le 1600$ bytes → Number of points the remote master station can transmit to a remote I/O station

② $\left\{\frac{X+B}{8}+(2\times W)\right\}\le 1600$ bytes → Number of points a remote I/O station can transmit to the remote master station

Multiple master systems



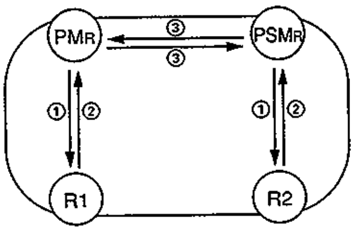
① $\left\{\frac{Y+B}{8}+(2\times W)\right\}\le 1600$ bytes → Number of points the multiple remote master station can transmit to a remote I/O station

② $\left\{\frac{X+B}{8}+(2\times W)\right\}\le 1600$ bytes → Number of points a remote I/O station can transmit to the multiple remote master station

③ $\left\{\frac{Y+B}{8}+(2\times W)\right\}\le 2000$ bytes → Number if points the multiple remote master station can transmit to the multiple remote submaster station, or the multiple remote submaster station can transmit to the multiple remote master station.

*The multiple remote submaster station (DSMR) uses the same parameters as the multiple remote master station (DMR), so operation for these values are not required.

Parallel master systems



① $\left\{\frac{Y+B}{8}+(2\times W)\right\}\le 1600$ bytes → Number of points the parallel remote master station or the parallel remote submaster can transmit station to a remote I/O station.

② $\left\{\frac{X+B}{8}+(2\times W)\right\}\le 1600$ bytes → Number of points the remote I/O station can transmit to the parallel remote master station or the parallel remote submaster station

③ $\left\{\frac{Y+B}{8}+(2\times W)\right\}\le 2000$ bytes → Number of points the parallel remote master station can transmit to the parallel remote submaster station, or that a parallel remote submaster station can transmit to a parallel remote master station.

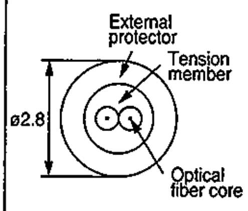
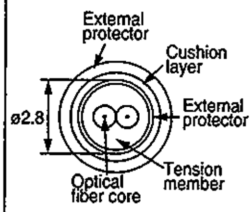
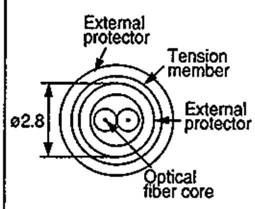
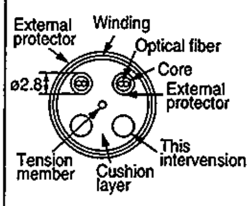
3.2 Optical Fiber Cable Specifications

The optical fiber cable specifications used for the MELSECNET/10 optical loop system is described below.
The optical fiber cable requires a specialized technique for the connector and cable connections as well as special tools. Special connectors are also used. Consult the nearest Mitsubishi Electric Corporation service center, dealer, or branch office and explain the symptom.

3.2.1 Applicable SI optical fiber cable

The SI optical fiber cable specification is shown in Table 3.3.

Table 3.3 SI optical fiber cable specifications

Item	Standard cable for indoor use	Reinforcing cable for indoor use	Standard cable for indoor use	Reinforcing cable for indoor use
Configuration				
Cable diameter	2.8 mm (0.11 inch)	6 mm (0.24 inch)	6 mm (0.24 inch)	11 mm (0.43 inch)
Allowable bending radius	50 mm (1.97 inch) min.	60 mm (2.36 inch) min.	60 mm (2.36 inch) min.	110 mm (4.33 inch) min.
Allowable bending radius — 2.8 diameter area	50 mm (1.97 inch) min.	50 mm (1.97 inch) min.	50 mm (1.97 inch) min.	50 mm (1.97 inch) min.
Allowable bending radius — When cabling	100 mm (3.94 inch) min.	120 mm (4.72 inch) min.	120 mm (4.72 inch) min.	220 mm (8.66 inch) min.
Allowable tension — Cable area	147 N{15kgf}	147 N{15kgf}	147 N{15kgf}	784 N{80kgf}
Allowable tension — Cable area — 2.8 diameter area	147 N{15kgf}	147 N{15kgf}	147 N{15kgf}	147 N{15kgf}
Allowable tension — Connector area	29.4 N{3kgf}			
Ambient temperature	-10 to 70°C		-20 to 70°C	
Transmission loss	12dB km max.			
Transmission band	5MHz·km min.			
Core diameter/clad diameter	200/220 µm (SI type multicomponent glass fiber)			
Primary sheath diameter	250 µm (UV hardening type resin)			
Number of cores	2 cores			2 cores x (1 to 4) lines
Weight	7 kg/km	30 kg/km	30 kg/km	100 kg/km
Applicable connector	2 core optical connector plug (CA 7003)			
Order type	AN-2P-□M-A	AN-2P-□M-B	AN-2P-□M-C	AN-2P-□M-□D

Remark

The following values are entered for the x in the order type in Table 3.3.

- AN-2P-□-M-A
- AN-2P-□M-B
- AN-2P-□M-C
- An-2P-□M-□D

Specifies the length
<Ex.>
When 20 m (65.62 ft.) → AN-2P-20M-A

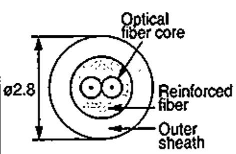
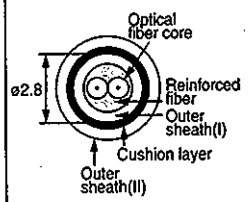
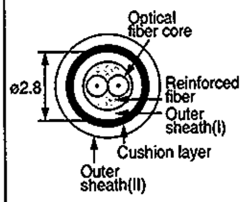
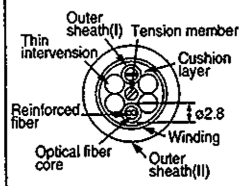
Specifies the number of 2 core cables
<Ex.>
Two 2 core cables and 30 m (98.43 ft.) → AN-2P-30M-2D

The conventional optical fiber cable (A-2P-□) can be used as 500 m (1641 ft.) station to station for L type and 300 m (984 ft.) station to station for H type.

3.2.2 Applicable QSI optical fiber cable

The QSI optical fiber cable specifications are shown in Table 3.4.

Table 3.4 QSI Optical fiber cable specification

Item			Cable for indoor use	Reinforcing cable for indoor use	Reinforcing cable for indoor use	Collective cable for indoor use
Configuration						
Cable diameter			2.8 mm (0.11 inch)	6 mm (0.24 inch)	6 mm (0.24 inch)	14 mm (0.43 inch)
Allowable bending radius			50 mm (1.97 inch) min.	60 mm (2.36 inch) min.	60 mm (2.36 inch) min.	140 mm (5.51 inch) min.
	2.8 diameter area		50 mm (1.97 inch) min.	50 mm (1.97 inch) min.	50 mm (1.97 inch) min.	50 mm (1.97 inch) min.
	When extending		100 mm (3.94 inch) min.	120 mm (4.72 inch) min.	120 mm (4.72 inch) min.	280 mm (11.02 inch) min.
Allowable tension			147 N{15kgf}	147 N{15kgf}	147 N{15kgf}	1568 N{160kgf}
	Cable area	2.8 diameter area	147 N{15kgf}	147 N{15kgf}	147 N{15kgf}	147 N{15kgf}
	Connector area		29.4 N{3kgf}			
Ambient temperature			-10 to 70°C		-10 to 70°C / -20 to 70°C	-20 to 70°C
Transmission loss			5.5 dB/km		5.5 dB/km / 10 dB/km	5.5 dB/km
Transmission band			20 MHz·km min.			
Core diameter/clad diameter			185 μm/ 230 μm (QSI quartz glass fiber)			
Primary sheath diameter			250 μm (UV hardening type resin)			
Number of cores			2 cores			2 cores x (1 to 4) lines
Weight			7 kg/km	30 kg/km	30 kg/km	180 kg/km
Applicable connector			2 core optical connector plug (CA 7003)			
Outer sheath I (cable area)			2.8 mm (0.11 inch) diameter green	2.8 mm (0.11 inch) diameter green	2.8 mm (0.11 inch) diameter green	2.8 mm (0.11 inch) diameter green
Outer sheath II			—	6 mm (0.24 inch) diameter green	6 mm (0.24 inch) diameter black	14 mm (0.43 inch) diameter black
Order type			AQ-2P-□M-A	AQ-2P-□M-B	AQ-2P-□M-C	AQ-2P-□M-□D

Remark

The following values are entered for the box in the order type in Table 3.4

- AQ-2P-□-M-A
- AQ-2P-□M-B
- AQ-2P-□M-C
- AQ-2P-□M-□D

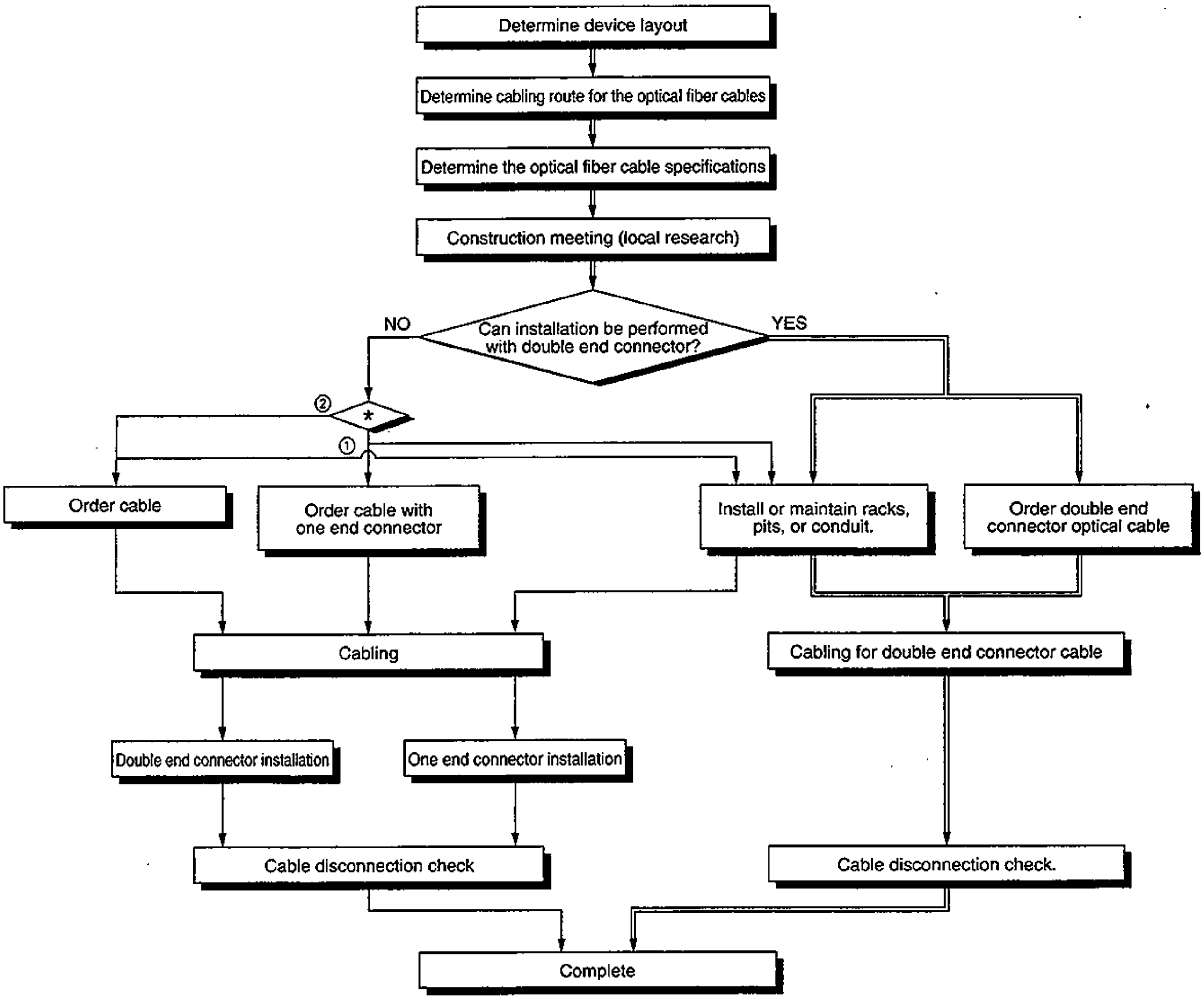
Specifies the length (unit : m (ft.))
<Ex.>
When 20 m (65.62 ft.) → AN-2P-20M-A

Specifies the number of 2 core cables
<Ex.>
Two 2 core cables and 30 m (98.43 ft.) → AQ-2P-30M-2D

3.2.3 Ordering method for the optical fiber cables

(1) The optical fiber cables can be ordered through Mitsubishi Electric Service Centers, Ltd. Contact the service center even when placing the connector after cabling work, depending on the site condition.

(2) Cabling work and optical connector plug connection work flowchart



*① Connector installation work for only one end is required at site.
*② Connector installation work for both end is required at site.

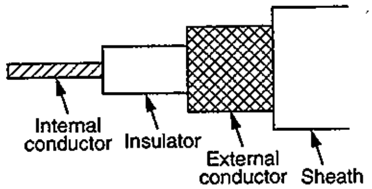
3.3 Coaxial Cable Specifications

The coaxial cable specifications used for the coaxial bus system is described below.
The high frequency coaxial cable "3C-2V' or "5C-2V" (conform to JISC3501 standard) is used for the coaxial cable.

3.3.1 Coaxial cable specification

The coaxial cable specifications are shown in Table 3.5.

Table 3.5 Coaxial cable specifications

Item	3C-2V	5C-2V
Structure		
Cable diameter	5.4 mm (0.21 inch)	7.4 mm (0.30 inch)
Allowable bending radius	22 mm (0.87 inch) min.	30 mm (1.19 inch) min.
Internal conductor diameter	0.5 mm (0.02 inch) (annealed copper wire)	0.8 mm (0.03 inch) (annealed copper wire)
Insulator diameter	3.1 mm (0.12 inch) (polyetherene)	4.9 mm (0.19 inch) (polyetherene)
External confuctor diameter	3.8 mm (0.15 inch) (single annealed copper wire mesh)	5.6 mm (0.22 inch) (single annealed copper wire mesh)
Applicable connector plug	3C-2V connector plus (BNC-P-3-Ni-CAU is recommended.)	5C-2V connector plus (BNC-P-5-Ni-CAU is recommended.)

3.3.2 Coaxial cable connector connections

This section describes the connection methods for the BNC connectors (coaxial cable connector plug) and cables.

(1) BNC connector and coaxial cable structure

The structures of the BNC connector and coaxial cable are shown in Figure 3.1.

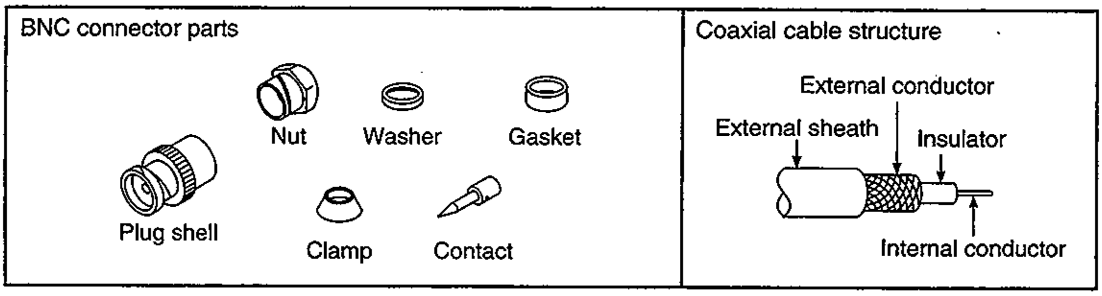
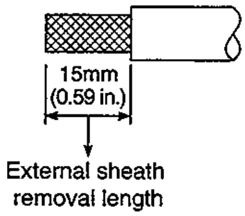


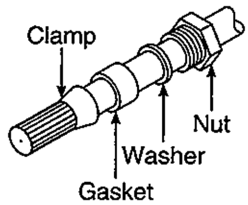
Figure 3.1 BNC Connector and Coaxial Cable Structures

(2) Connection method for BNC connectors and coaxial cables

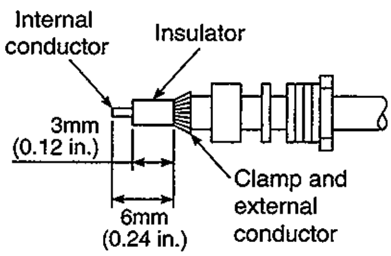
(a) Remove the external sheath of the coaxial cable as shown below:



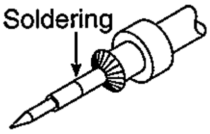
(b) Put the nut, washer, gasket, and clamp through the coaxial cable as shown below, and spread the external conductor.



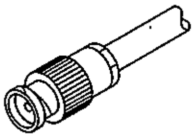
(c) Cut the external conductor, insulator, and internal conductor in the following length:
However, cut the external conductor to the same length as the clamp taper area, and connect with the clamp.



(d) Solder the contact to the internal conductor.



(e) Insert the contact assembly (d) into to the plug shell, and screw the nut to the plug shell.



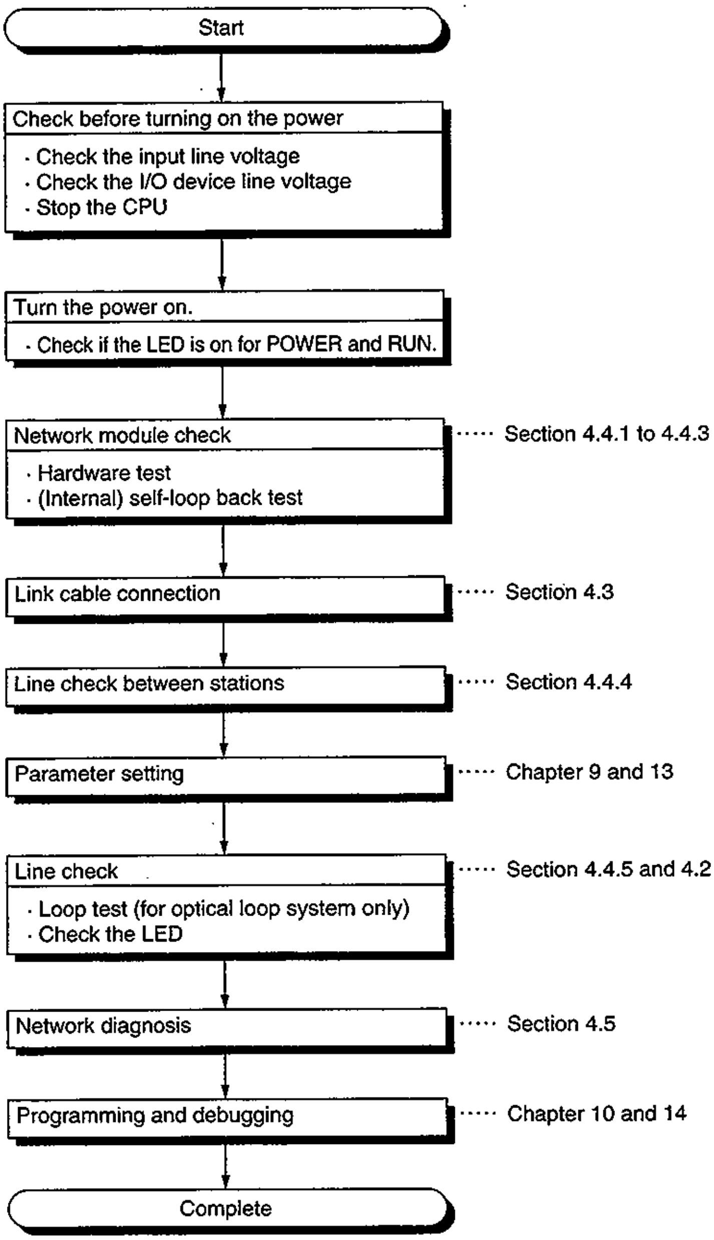
Be cautious of the following when soldering the internal conductor and contact: • Do not make the soldering bumpy. • Do not allow any space between the contact and cable insulation, or do not have them too tight. • Quickly perform the soldering so that the insulation does not change shape.

4 Setting and Procedures Before System Operation

This chapter describes the procedures, setting, connections, and testing to perform data link.

4.1 Procedure before system operation

The procedure to perform data link is shown in the following flowchart below:



4.2 Name and Setting of Each Part

4.2.1 AJ71QLP21 (S), AJ71QBR11 (for control station/normal station/remote master station)

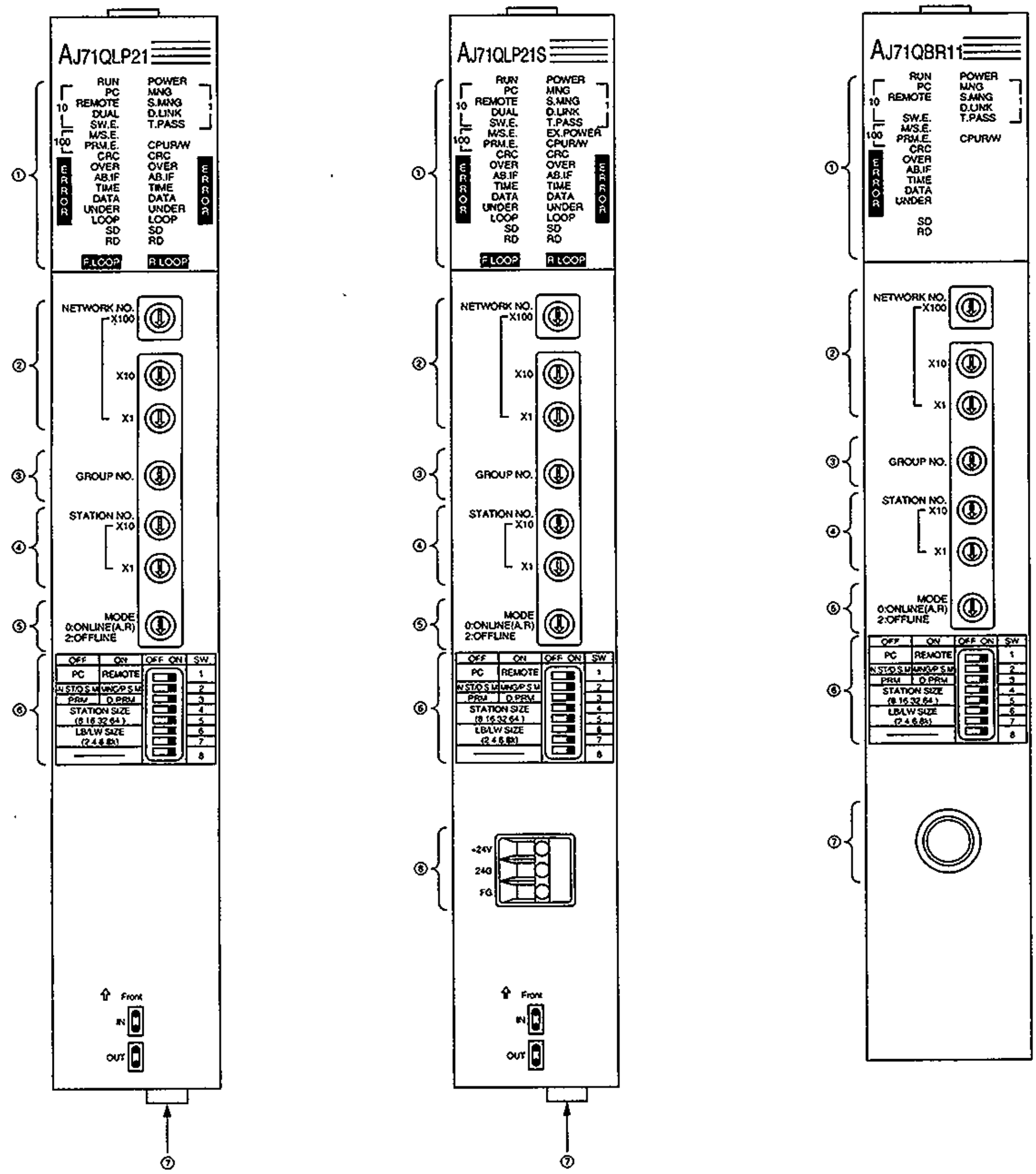
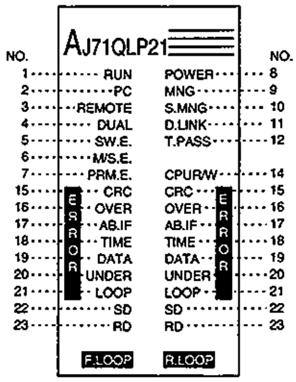
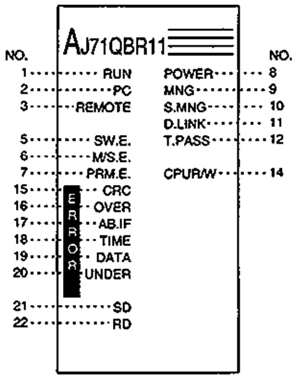
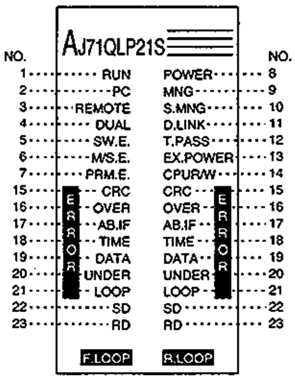


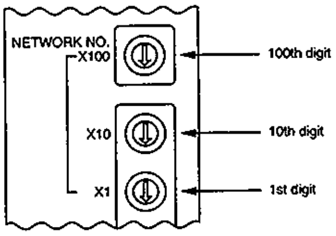
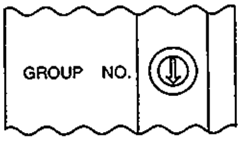
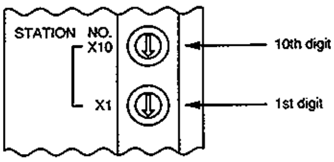
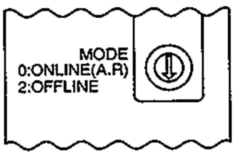
Table 4.1 Name and setting of each part

Number	Name	Details			
		No.	Name	Status	Details
①	LED   	1	RUN	On	Module normal
				Off	WDT error occurred
		2	PC	On	Set in inter-PC network (set SW1 to off.)
		3	REMOTE		Set in remote I/O network (set SW1 to on.)
		4	DUAL		Multiplex transmission execution (off: multiplex transmission not executed)
		5	SW.E		Error in switches ② to ⑥ settings
		6[*1]	M/S.E		Station number or control station/remote master station overlapping on the same network.
		7	PRM.E.		• Network refresh parameter is overlapping when multiple modules are installed. • Matching error in the common parameter and station specific parameter. • Parameter received from the subcontrol station and host (received form the control station) are different.
		8	POWER		Power supply is supplied. (Off: power supply not supplied).
		9	MNG		Operating as control station or remote master station.
		10	S.MNG		Operating as the subcontrol station or remote submaster station.
		11	D.LINK		Data link being performed (off: data link stop)
		12	T.PASS		Participating in baton pass. (Can perform transient transmission.)
		13	EX.POWER		External power (24V) being supplied.
		14	CPU R/W		Communicating with CPU.
		15	CRC		Received data code check error. ause Timing, H/W error, cable error, or noise, etc. which causes the station transmitting the data to the corresponding station to be disconnected state.
		16	OVER		Error when the received data processing is delayed. (Ause) H/W error, cable error, or noise.
		17	AB.IF		• Error when "1" is continuously received over the regulation. • Error when the received data length is short. (Ause) Timing, monitor time is short, cable error, or noise, etc. which causes the station transmitting the data to the corresponding station to be disconnected state.
		18	TIME		Error when the data link monitor timer is set. (Ause) Monitor time is short, cable error, or noise
		19	DATA		Error when more than 2k bytes of erroneous data is received. (Ause) Cable error, noise
		20	UNDER		Error when the internal processing of received data is not at set interval. (Ause) H/W error
		21	LOOP		Forward loop/reverse loop error. (Ause) Neighboring station power is off, cable disconnection or unconnected.
		22	SD	Barely on	Data Transmitting
		23[*2]	RD		Data Transmitting

*1 Even if the station numbers or master stations are overlapped, the M/S.E. LEDs may not light up depending on the line status or cable connection status. Perform physical check and online diagnosis to confirm.

*2 When AJ71QBR11 does not have a terminal resistor, the LEDs may always light up even when not performing a data link. (Not a network module error.)

Table 4.1 Name and setting of each part (continued)

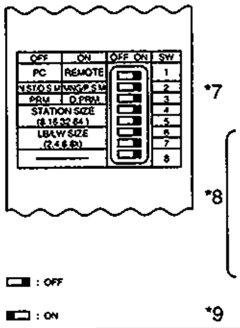
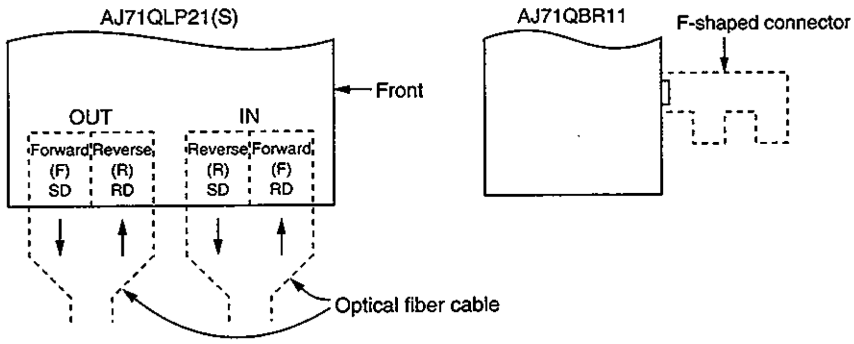
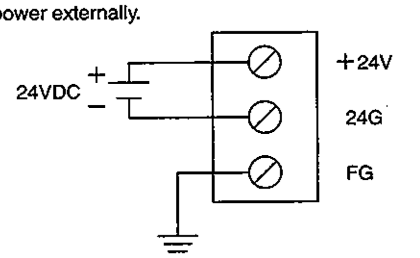
<table>
<tr><th>Number</th><th>Name</th><th>Description</th></tr>
<tr><td>②*3</td><td>Network number setting switch
</td><td>Network number setting (factory setting :001)
<Setting range>
1 to 239: Network number
Other than 1 to 239: Setting error (SW.E. LED on). . . . . . Changes to offline state.</td></tr>
<tr><td>③*3</td><td>Group number setting switch
</td><td>Group number setting (factory setting: 0)
<Setting range>
0: No group specification
1 to 9: Group number
} Valid in inter-PC network</td></tr>
<tr><td>④*3</td><td>Station number setting switch
</td><td>Station number setting (factory setting: 01)
<table>
<tr><th>Type</th><th>Setting</th></tr>
<tr><td>Inter-PC network</td><td>1 to 64: Station number
Other than 1 to 64: Setting error (SW.E. LED on)</td></tr>
<tr><td>Remote I/O network</td><td>0: Remote master station
1 to 64: Remote submaster station
Other than 0 to 64: Setting error (SW.E. LED on)</td></tr>
</table></td></tr>
<tr><td>⑤*3</td><td>Mode setting switch
</td><td>Set the mode (factory setting:0)
<table>
<tr><th></th><th>Mode</th><th>Name</th><th>Description</th></tr>
<tr><td></td><td>0</td><td>Online (auto recovery exists)</td><td>Auto recovery by data link</td></tr>
<tr><td></td><td>1</td><td colspan="2">Cannot use. (Causes SW.E error set.)</td></tr>
<tr><td></td><td>2</td><td>Offline</td><td>Disconnect host</td></tr>
<tr><td>*4</td><td>3</td><td>Test mode 1</td><td>Loop test (forward loop)</td></tr>
<tr><td>*4</td><td>4</td><td>Test mode 2</td><td>Loop test (reverse loop)</td></tr>
<tr><td></td><td>5</td><td>Test mode 3</td><td>Station to station testing (master station)</td></tr>
<tr><td></td><td>6</td><td>Test mode 4</td><td>Station to station testing (slave station)</td></tr>
<tr><td></td><td>7</td><td>Test mode 5</td><td>Self-loopback test</td></tr>
<tr><td></td><td>8</td><td>Test mode 6</td><td>Internal self loop back test</td></tr>
<tr><td></td><td>9</td><td>Test mode 7</td><td>H/W test</td></tr>
<tr><td></td><td>A</td><td>—</td><td>Cannot be used</td></tr>
<tr><td></td><td>B</td><td>—</td><td>Cannot be used</td></tr>
<tr><td></td><td>C</td><td>—</td><td>Cannot be used</td></tr>
<tr><td>*5</td><td>D</td><td>Test mode 8</td><td>Network number check (LED indication)</td></tr>
<tr><td>*5</td><td>E</td><td>Test mode 9</td><td>Group number check (LED indication)</td></tr>
<tr><td>*5</td><td>F</td><td>Test mode 10</td><td>Station number check (LED indication)</td></tr>
</table></td></tr>
</table>

*3 When the setting is changed while the QnA(R)CPU power is on, reset the QnA(R)CPU.

*4 For AJ71QBR11, SW.E. results when set.

*5 Checking can be done when starting up with online (mode 0), and changing the mode setting switch. QnA(R)CPU reset is not necessary.

Table 4.1 Name and setting of each part (continued)

<table>
<tr><th>Number</th><th>Name</th><th>Description</th></tr>
<tr><td>⑥*6</td><td>Condition setting switch
</td><td>Set the operation condition (factory setting: all off)
<table>
<tr><th>SW</th><th>Description</th><th colspan="4">OFF</th><th colspan="4">ON</th></tr>
<tr><td>1</td><td>Network type</td><td colspan="4">Inter-PC network (PC)</td><td colspan="4">Remote I/O network (REMOTE)</td></tr>
<tr><td>2</td><td>Station type</td><td colspan="4">Normal station (N.ST)/multiple remote submaster (D.S.M)</td><td colspan="4">Control station (MNG)/ parallel remote submaster (P.S.M)</td></tr>
<tr><td>3</td><td>Used parameter</td><td colspan="4">Common parameters (PRM)</td><td colspan="4">Default parameter (D.PRM)</td></tr>
<tr><td>4</td><td rowspan="2">Number of stations (valid when SW3 is on.)</td><td>OFF</td><td rowspan="2">8 Stations</td><td>ON</td><td rowspan="2">16 Stations</td><td>OFF</td><td rowspan="2">32 Stations</td><td>ON</td><td rowspan="2">64 Stations</td></tr>
<tr><td>5</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td></tr>
<tr><td>6</td><td rowspan="2">B/W total points (valid when SW3 is on.)</td><td>OFF</td><td rowspan="2">2k points</td><td>ON</td><td rowspan="2">4k points</td><td>OFF</td><td rowspan="2">6k points</td><td>ON</td><td rowspan="2">8k points</td></tr>
<tr><td>7</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td></tr>
<tr><td>8</td><td>Unused</td><td colspan="8">Always off.</td></tr>
</table></td></tr>
<tr><td>⑦</td><td>Connector</td><td>Connect optical fiber cable for AJ71QLP21(S), and F shape connector for AJ71QBR11.
</td></tr>
<tr><td>⑧</td><td>External power supply terminal</td><td>Connect when supplying power externally.
</td></tr>
</table>

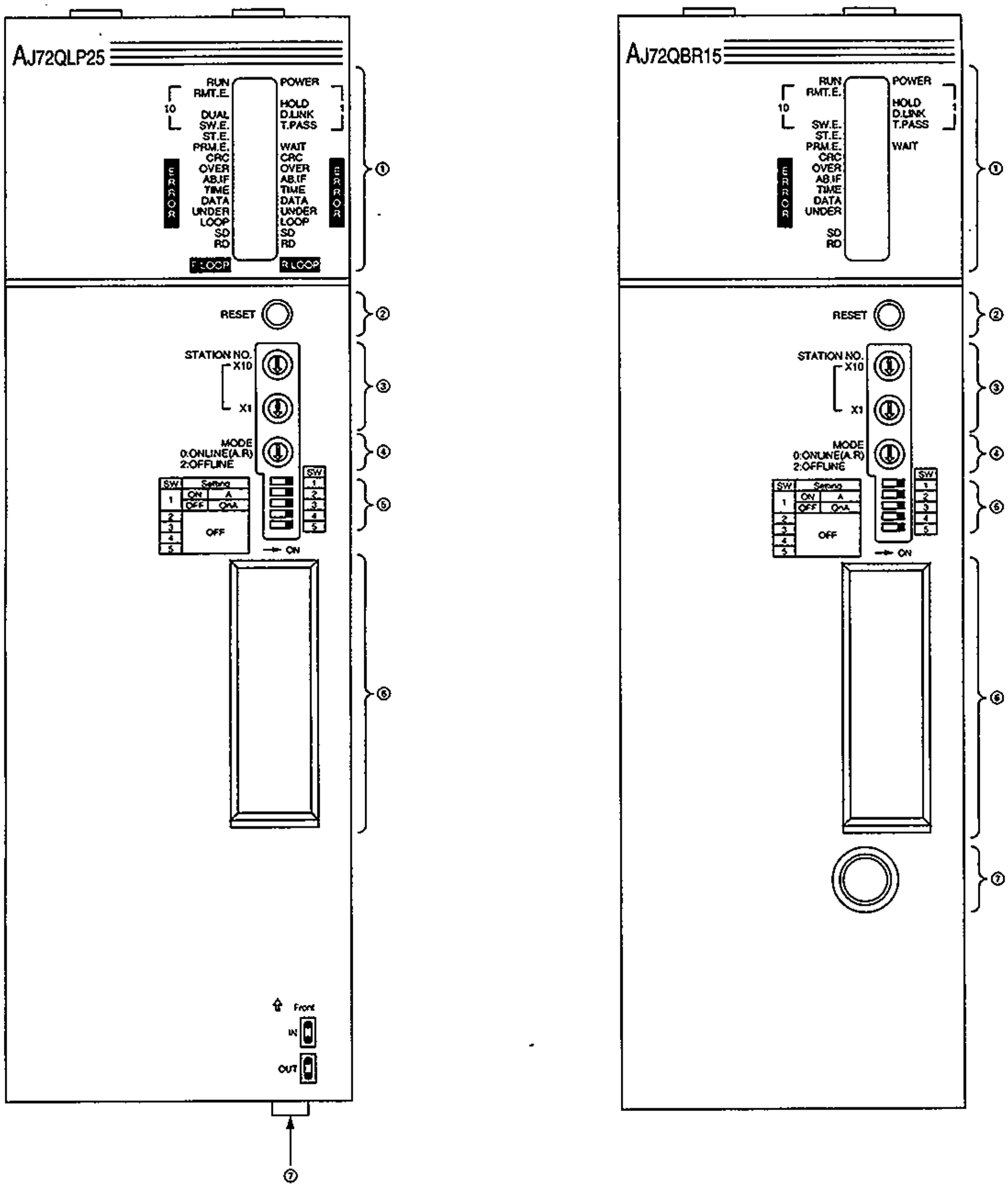
*6 When setting is changed while the QnA(R)CPU power supply is on, reset the QnA(R)CPU.

*7 When used in the remote I/O network, the setting is valid when station number is within 1 to 64. When the station number is "0," it becomes the "remote master station".

*8 Valid when used in the control station in the inter-PC network.
Results in SW.E. when 8 stations or 8K points is set.
(This is because the link points becomes 2176 bytes per station, exceeding the 2000 byte limit.)

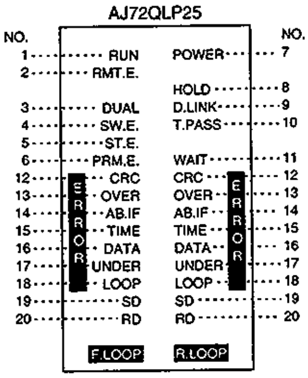
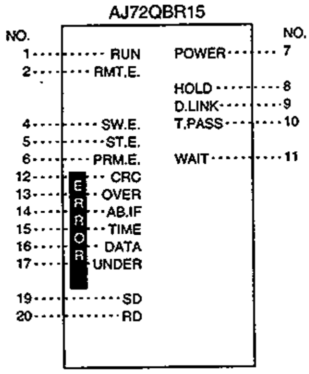
*9 Valid when set to the control station in the inter-PC network.

4.2.2 AJ72QLP25, AJ72QBR15 (for remote I/O station)



Please do not touch dip switch on the base board of module side.

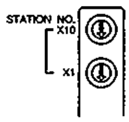
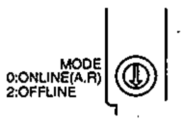
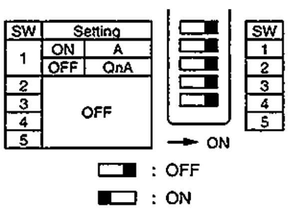
Table 4.2 Name and setting of each part

Number	Name	No.	Name	Status	Details
①	LED AJ72QLP25  AJ72QBR15 	1	RUN	On	Module normal
				Off	WDT error occurred
		2	RMT.E.	On	Fuse section and input/output reference error occurred (host station)
		3	DUAL		Multiplex transmission execution (off: multiplex transmission not executed)
		4	SW.E.		Error in switches ③ and ④ settings
		5[*1]	ST.E.		Station number overlapping on the same network.
		6	PRM.E.		• I/O allocation error • Insufficient points of LB/LW (special function module) • Parameter recieved from the master station has error
		7	POWER		Power supply is supplied. (Off: power not supplied).
		8	HOLD		Output status is kept at the time of communication error (Simplex network) System setting switche number 3 of Q4ARCPU is set hold. (Duplex network) "Hold/Reset mode" of A6RAF is set hold.
		9	D.LINK		Data link being performed (off: data link stop)
		10	T.PASS		Participating in baton pass. (Can perform transient transmission.)
		11	WAIT		The communication with special function module is standby.
		12	CRC		Received data code check error. (Ause) Timing, H/W error, cable error, or noise, etc. which causes the station transmitting the data to the corresponding station to be disconnected state.
		13	OVER		Error when the received data processing is delayed. (Ause) H/W error, cable error, or noise.
		14	AB.IF		• Error when "1" is continuously received over the regulation. • Error when the received data length is short. (Ause) Timing, monitor time is short, cable error, or noise, etc. which causes the station transmitting the data to the corresponding station to be disconnected state.
		15	TIME		Error when the data link monitor timer is set. (Ause) Monitor time is short, cable error, or noise
		16	DATA		Error when more than 2k bytes of erroneous data is received. (Ause) Cable error, noise
		17	UNDER		Error when the internal processing of received data is not at set interval (Ause) H/W error
		18	LOOP		Forward loop/reverse loop error (Ause) Neighboring station power supply is off, cable disconnection or unconnected.
		19	SD	Barely on	Data Transmitting
		20[*2]	RD		Data Transmitting

*1 Even if the station numbers are overlapped, the ST.E. LEDs may not light up depending on the line status or cable connection status. Perform physical check and online diagnosis to confirm.

*2 When AJ72QBR15 does not have a terminal resistor, the LEDs may always light up even when not performing a data link. (Not a network module error.)

Table 4.2 Name and setting of each part (continued)

Number	Name	Description		
②	Reset switch 	Resets the hardware.		
③*3	Station number setting switch 	Station number setting (factory setting: 01) <Setting range> 1 to 64: Station number Other than 1 to 64: Setting error (SW. E. LED on.)		
④*3	Mode setting switch 	Sets the mode (factory setting: 0)		
		Mode	Name	Description
		0	Online (with auto recovery)	Data link with auto recovery
		1	Cannot use (results in SW.E. When set)	
		2	Offline	Disconnects host.
		3	Test mode 1	Loop test (forward loop)
	*4	4	Test mode 2	Loop test (reverse loop)
	*4	5	Test mode 3	Station to station test (master station)
		6	Test mode 4	Station to station test (slave station)
		7	Test mode 5	Self loopback test
		8	Test mode 6	Internal self loop back test
		9	Test mode 7	H/W test
		A	—	Cannot be used.
		B	—	Cannot be used.
		C	—	Cannot be used.
		D	—	Cannot be used.
		E	—	Cannot be used.
	*5	F	Test mode 8	Station number check (LED indication)
⑤*3	Condition setting switch 	Sets the operation condition (Factory setting: all off)		
		SW	OFF	ON
	*6	1	When QnA peripheral device is connected	When A peripheral device is connected
		2	Cannot be used. (Always off.)	
		3	Cannot be used. (Always off.)	
		4	Cannot be used. (Always off.)	
		5	Cannot be used. (Always off.)	

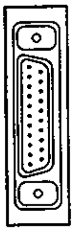
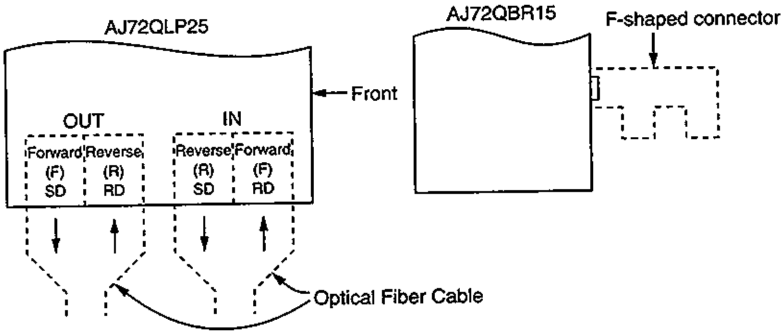
*3 When the setting is changed while the remote I/O station power supply is on, reset using the reset switch in ②.

*4 For AJ72QBR15, SW.E. results when set.

*5 Checking can be done by starting up in online mode (mode 0) and changing the mode setting switch. Reset operation using the reset switch ②) is not necessary.

*6 When QnA peripheral device is connected, communication can be performed with only QnACPU. When A peripheral device is connected, communication can be performed with only the host and ACPU. However, when communicating with the host (remote I/O station), the CPU type see to "A3U".

Table 4.2 Name and setting of each part (continued)

Number	Name	Description
⑥	RS-422 Intrerface 	Connect a peripheral device (refer to ⑤)
⑦	Connector	Connect optical fiber cable for AJ72QLP25, and F shape connector for AJ72QBR15. 

4.3 Connection and station number setting

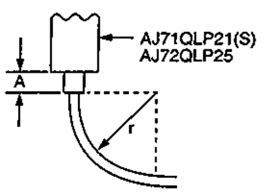
4.3.1 Optical loop system

(1) Precaution when connecting

(a) The optical fiber cable type that can be used differs depending on the station to station distance.

Cable type		Station to station distance
SI cable (old type)	H type	to 300m (984.3ft.)
	L type	to 500m (1641ft.)
SI cable		to 500m (1641ft.)
QSI cable		to 1km

(b) When connecting the optical fiber cable, there are restrictions on cable bending diameter.



Cable type		Allowable bending radius r[mm]	Connector A[mm] CA9003	Connector A[mm] CA7003
SI (old)	Standard for indoor use	50	45	—
	Reinforcement for indoor use	85		
	Standard for outdoor use	85		
	Reinforcement for outdoor use	140		
SI	Standard for indoor use	50	—	30
	Reinforcement for indoor use	60		
	Standard for outdoor use	60		
	Reinforcement for outdoor use	110		
QSI	Indoor use	50		
	Reinforcement for indoor use	60		
	Standard for outdoor use	60		
	Reinforcement for outdoor use	140		

(c) When cabling the optical fiber cable, do not touch the optical fiber core area of the cable connector or module connector, or do not allow any dust particles to form around the core area. If oil from the hand, or dust particles form on the core, the transmission loss is increased and the data link errors may result.

(d) When connecting/disconnecting the optical fiber cable, do so by holding the cable connector area directly with your hand.

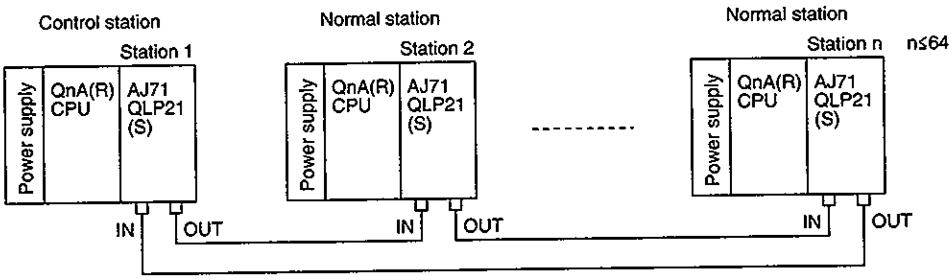
(e) For the cable connector and module connector connection, make sure the connection "snaps" into place.

(2) Inter-PC network

The optical fiber cable is connected in the following manner:

The connection does not have to be performed in the order of station numbers.

The control station does not have to be a specific number.

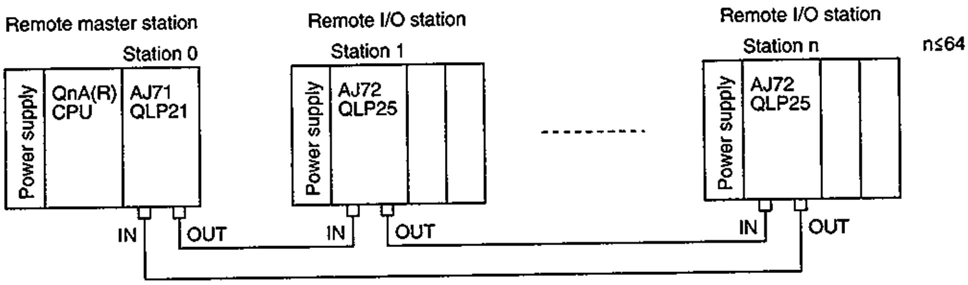


(3) Remote I/O network

The optical fiber cable is connected in the following manner:

The connection does not have to be performed in the order of station numbers.

Be sure to set the remote master station to station "0".



Remote master station: 0
Remote I/O station : 1 to 64

Point
If the station that is to be connected in the future (station included in the station count, but not actually connected) is set as a reserved station, a communication error does not occur at the station, and does not affect the link scan time.

4.3.2 Coaxial bus system

(1) Precaution when connecting

(a) Station to station cable length restriction

1) The cable to connect between network modules must be the following according to the number of stations connected.
When a cable length other than those specified in the table below is used, a communication error may result.

Number of stations connected	Station to station cable length	Total extension distance
2 to 9 stations	1 to 300m (3.281 to 984.3ft.) (3C-2V) 1 to 500m (3.281 to 1640.5ft.) (5C-2V)	300m (984.3ft.) (3C-2V) 500m (1640.5ft.) (5C-2V)
10 to 33 stations	1 to 5m (3.281 to 984.3ft.) (3C-2V, 5C-2V) 13 to 17m (42.65 to 55.8ft.) (3C-2V, 5C-2V) 25 to 300m (82.03 to 984.3ft.) (3C-2V) 25 to 500m (82.03 to 1640.5ft.) (5C-2V)	

2) If there is a possibility that the number of stations may increase due to system extensions, etc., perform the cabling by considering the restrictions.

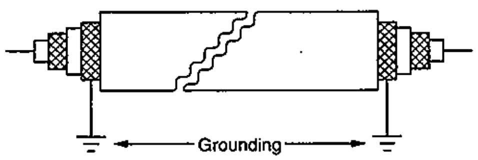
3) When A6BR10/A6BR10-DC repeater modules are used, use the station to station cable length specified in "10 to 33 stations" regardless of the number of connected stations or number of repeater modules.

(b) Precaution when cabling

1) Wire the coaxial cable at least 100mm (3.94inch) away from other power cables and control cables.

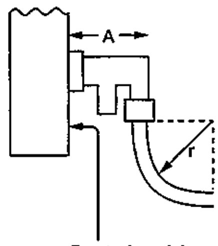
2) Consider using the doublelayered shield coaxial cable for areas with more frequent noise.

Double-layered shielded coaxial cable
Mitsubishi cable ······ 5C-2V-CCY



(c) When connecting a coaxial cable, there are restrictions on the cable 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 (1.19)	



(d) Do not tug on the connected coaxial cable.
This may cause bad connections, loose cables, or module damage.

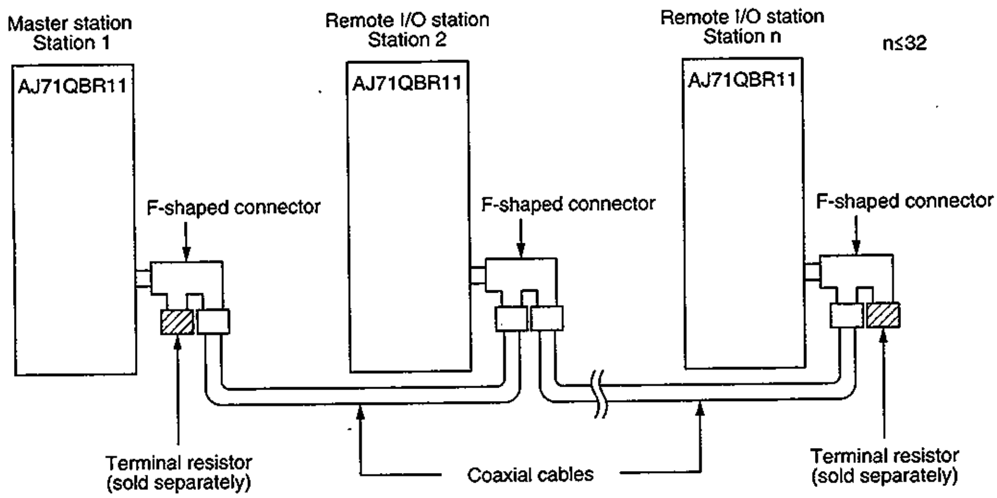
(2) Inter-PC network

The coaxial cable is connected in the following manner:

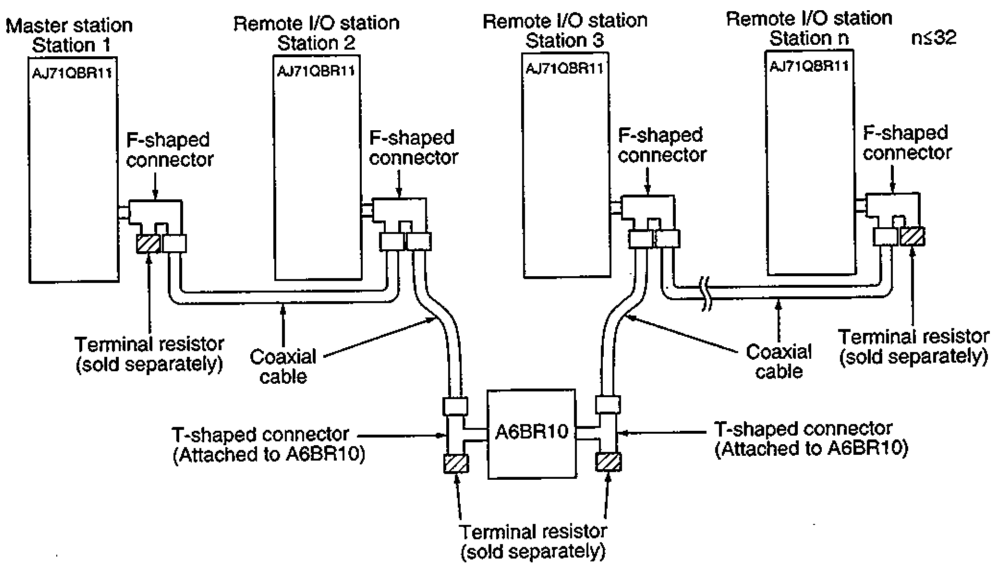
Be sure to connect terminal resistors (sold separately: A6RCON-R75) for both ends.

The F shaped connector is connected to the module.

1) No repeater module



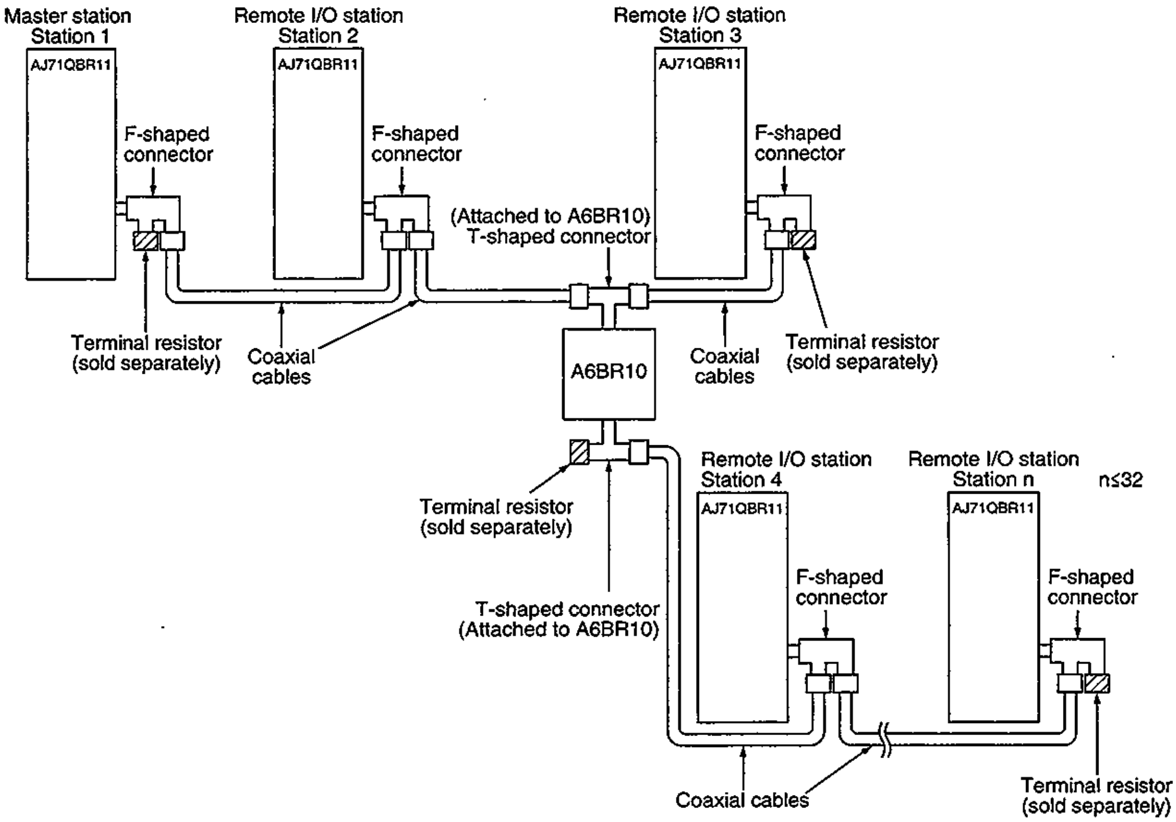
2) Repeater module used (direct connection)



Remark

Refer to the user's manual included in the product for the details of repeater module (A6BR10).
A6BR10/A6BR10-DC MELSECNET/10 Coaxial Bus System Repeater Module User's Manual
IB-66499

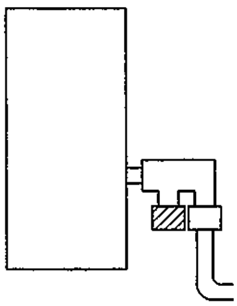
3) Repeater module used (mid branch connection)



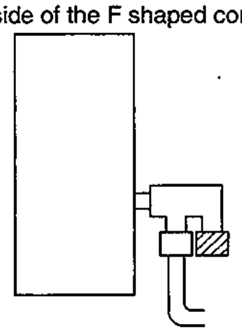
Points

(1) If the station that is to be connected in the future (station included in the station count, but not actually connected) is set as a reserved station, a communication error does not occur for the station, and does not affect the link scan time.

(2) The terminal resistor can be connected to either side of the F shaped connector.



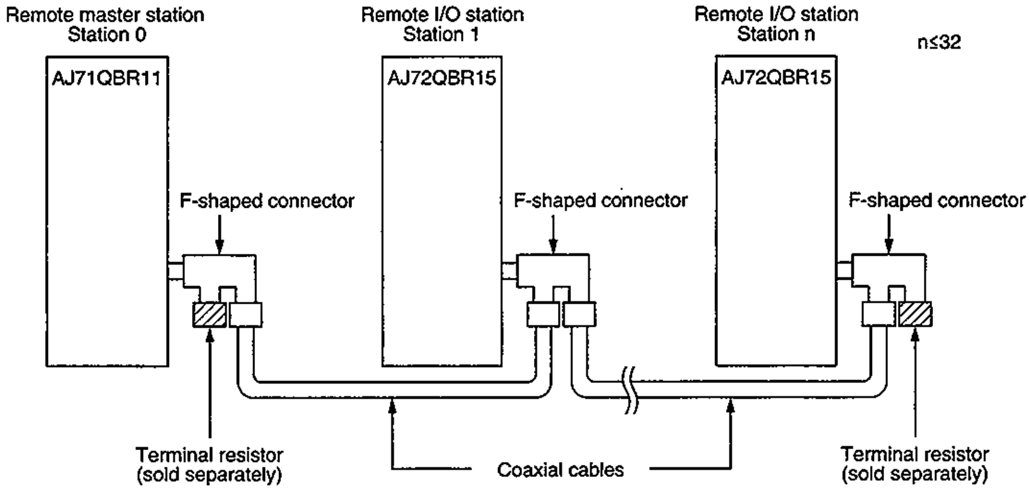
or



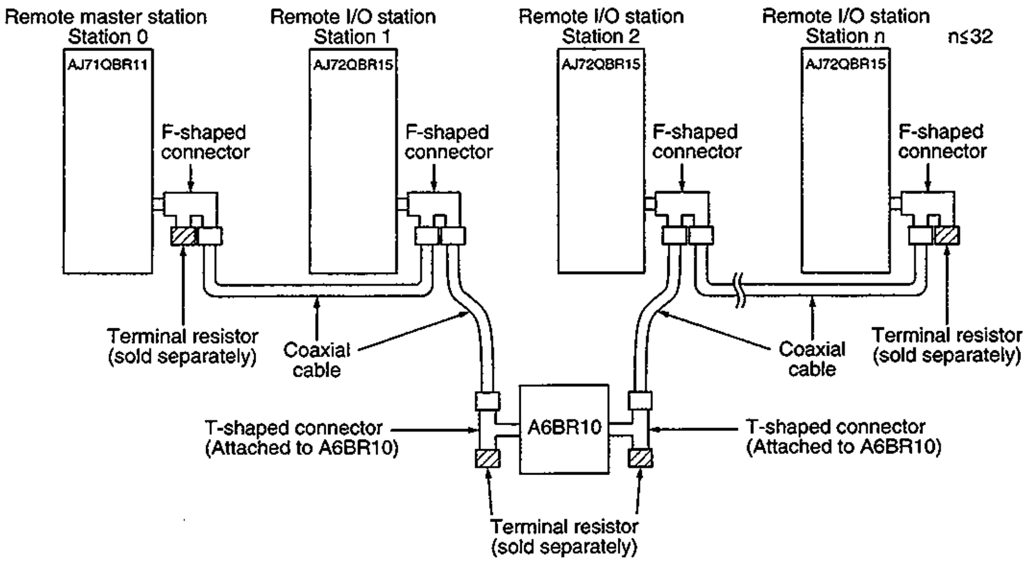
(3) Remote I/O network

The coaxial cable is connected in the following manner:
Be sure to connect terminal resistors (sold separately: A6RCON-R75) for both ends.
The F shaped connector is connected to the module.

1) No repeater module



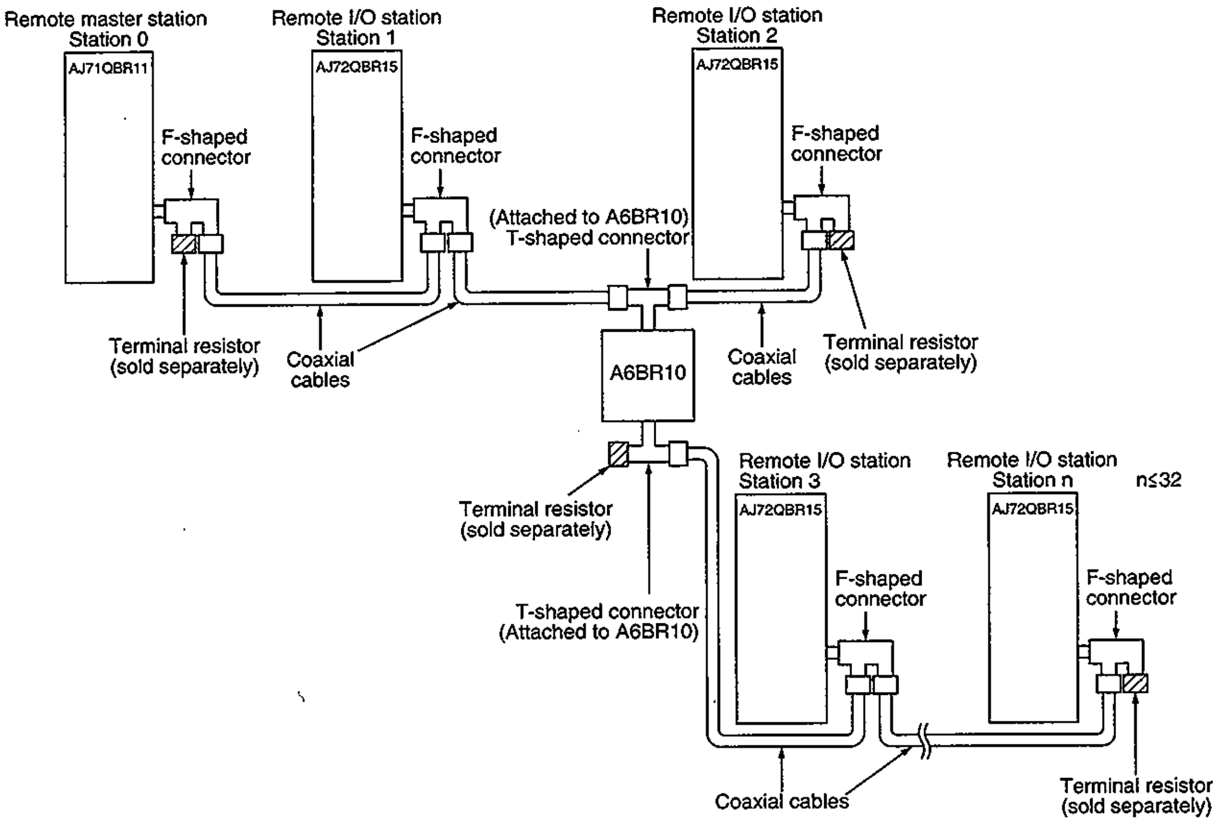
2) Repeater module used (direct connection)



Remark

Refer to the user's manual included in the product for the details of repeater module (A6BR10).
A6BR10/A6BR10-DC MELSECNET/10 Coaxial Bus System Repeater Module User's Manual
IB-66499

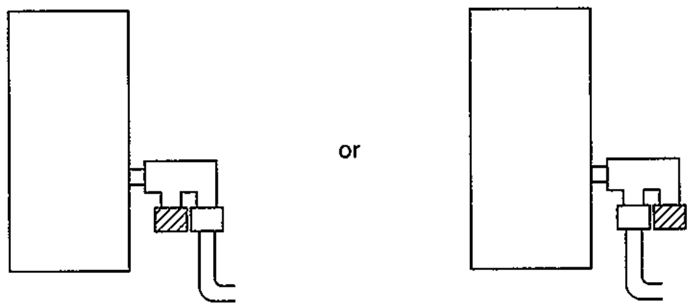
3) Repeater module used (mid branch connection)



Points

(1) If the station that is to be connected in the future (station included in the station count, but not actually connected) is set as a reserved station, a communication error does not occur for the station, and does not affect the link scan time.

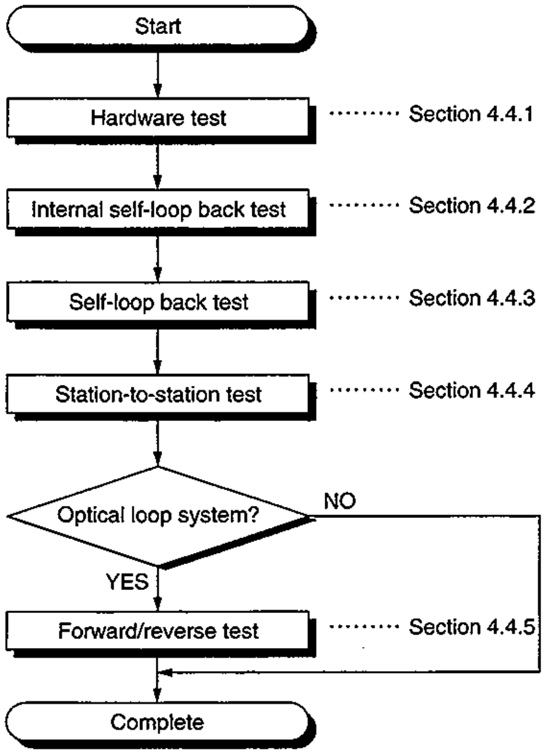
(2) The terminal resistor can be connected to either side of the F shaped connector.



4.4 Network Module Connection Status Check (Offline)

The network module and cable are checked before performing a data link.
The test items are set with the mode setting switch located at the network module front surface.

[Test procedure]

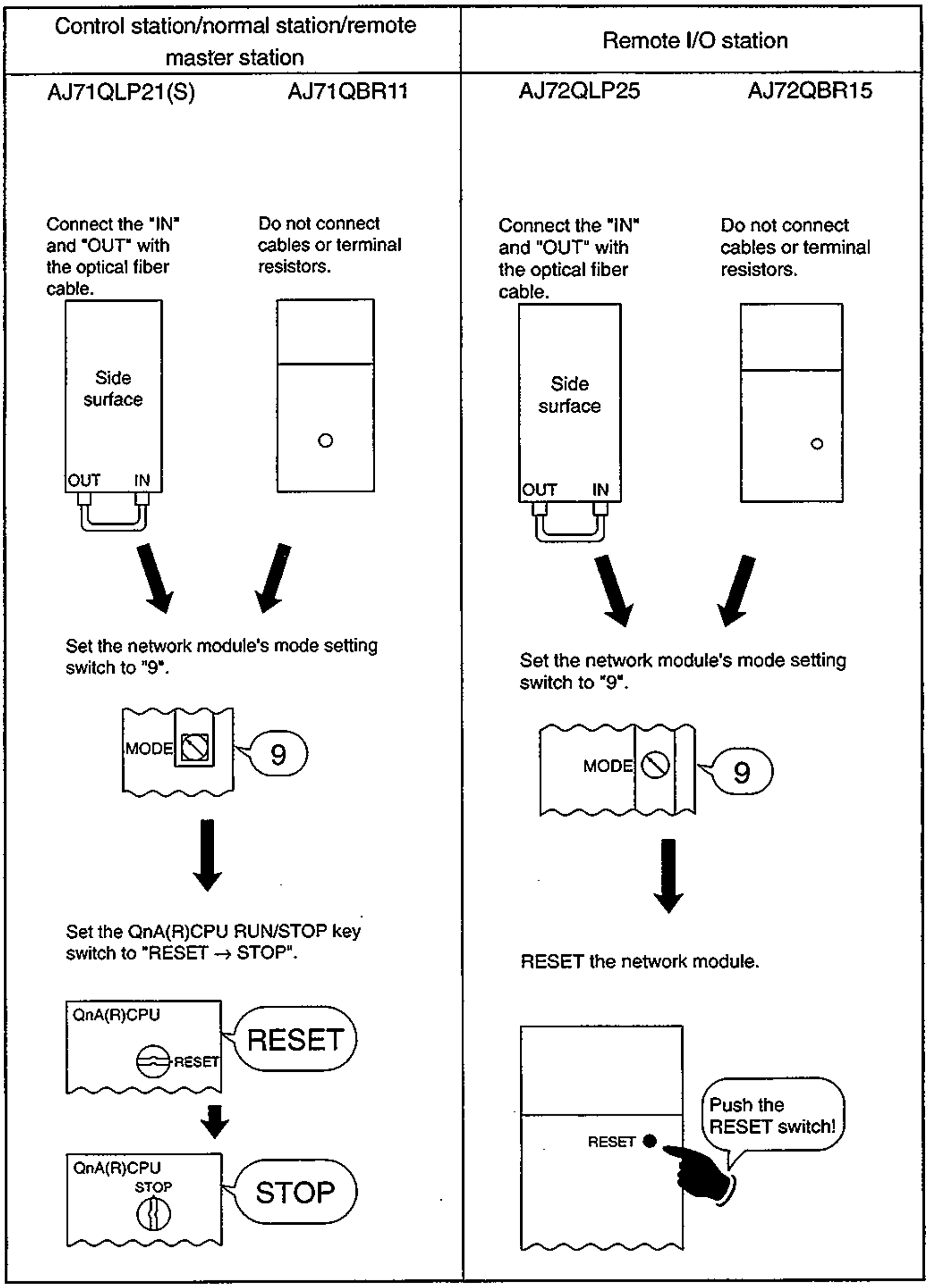


Point

When even one station is switched to test mode (MODE switches 3 to 9) during data link (online), a normal data link cannot be performed.

4.4.1 Hardware testing

The hardware of the network module is checked.



To the next page.

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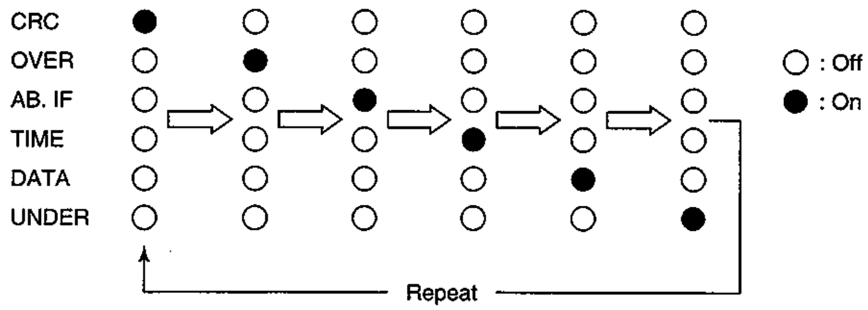
Hardware testing in progress!

The test results are indicated on the LED.

<When normal>

The CRC→OVER→AB.IF→TIME→DATA→UNDER LED turn on in order. When this sequence repeats over five times, the system is normal.



<When there is an error>

Same for optical loop system (AJ71QLP21(S) and AJ72QLP25) and coaxial bus system (AJ71QBR11 and AJ72QBR15)

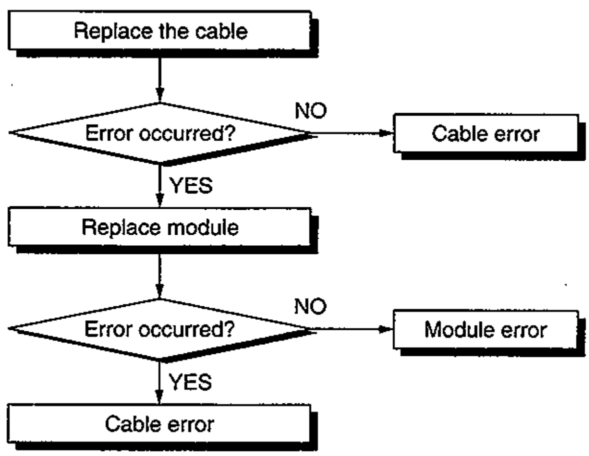
When the following error occurs, the corresponding LED turns on, so replace the module.

① CRC turns on . . . . ROM check error
② OVER turns on . . . . RAM check error
③ AB.IF turns on. . . . . Timer/interrupt function check error

For optical loop system (AJ71QLP21(S) and AJ72QLP25) only

① TIME turns on . . . . Forward loop luminous energy check error
② DATA turns on. . . . . Reverse loop luminous energy check error

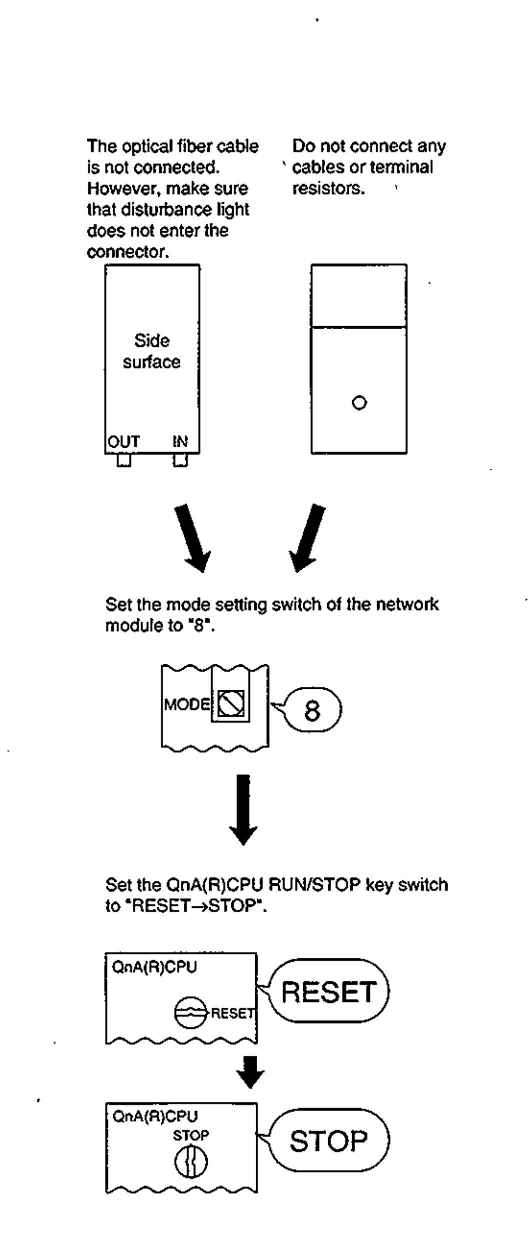
When there is a luminous energy check error, determine the erroneous area using the following flowchart:

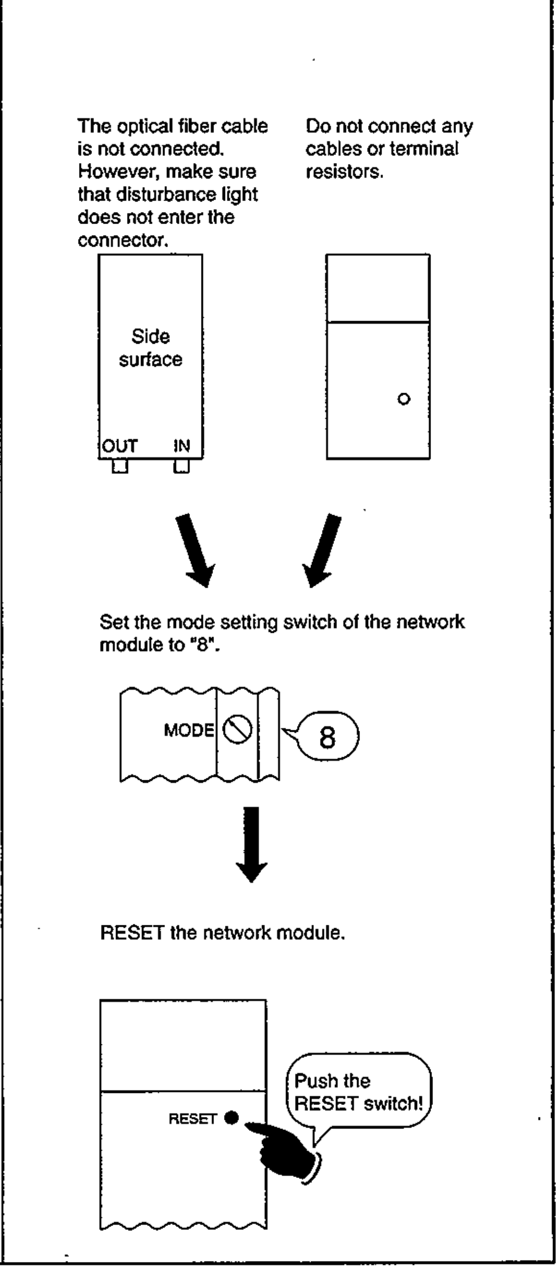


4.4.2 Internal self-loop back testing

This checks the hardware including the transmission system's transmission/receiving circuits of the individual module.

Control station/normal station/remote master station		Remote I/O station	
AJ71QLP21(S)	AJ71QBR11	AJ72QLP25	AJ72QBR15





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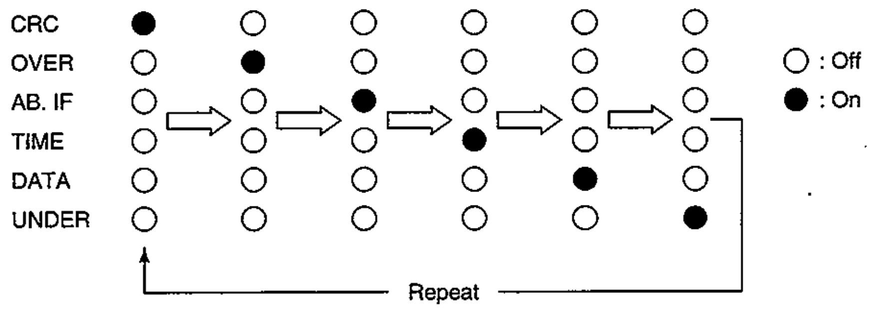
Internal loop back test in progress!

The test results are indicated on the LED.

<When normal>

The CRC→OVER→AB.IF→TIME→DATA→UNDER LED turn on in order. When this sequence repeats over five times, the system is normal.



<When there is an error>

In case of the optical loop system (AJ71QLP21(S) and AJ72QLP25)

When the following error occurs, the corresponding LED turns on, so replace the module.

① ERROR LED turns on. . . . . . . hardware error

In case of the coaxial bus system (AJ71QBR11 and AJ72QBR15)

① ERROR LED turns on. . . . . . . hardware error

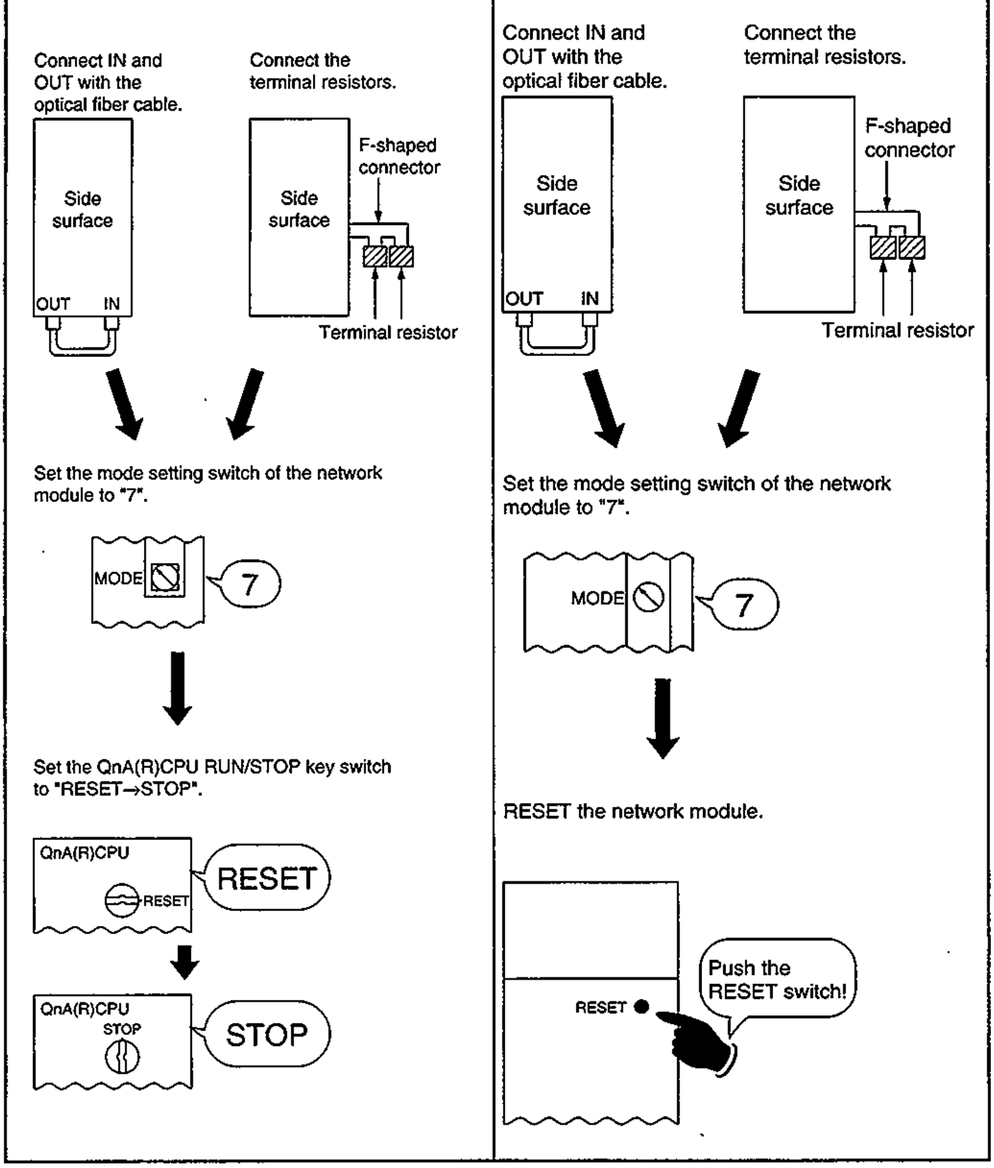
Remark

When an error occurs in the coaxial bus system, LEDs other than ERROR LED (CRC, OVER, AB.IF, TIME, DATA, UNDER) may turn on, such as M/S.E and PRM.E. Report the LED status when requesting module fixing.

4.4.3 Self loop back testing

This checks the hardware including the transmission system's transmission/receiving circuits of the individual module in order to judge the cable conditions when the internal self-loop back testing ended without any problem.

Control station/normal station/remote master station		Remote I/O station	
AJ71QLP21(S)	AJ71QBR11	AJ72QLP25	AJ72QBR15



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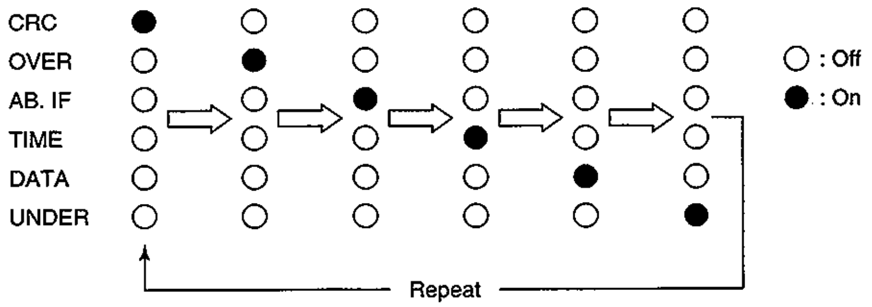
Self loop back testing in progress!

The test results are indicated on the LED.

<When normal>

The CRC→OVER→AB.IF→TIME→DATA→UNDER LED turn on in order. When this sequence repeats over five times, the system is normal.



<When there is an error>

For the optical loop systems (AJ71QLP21(S) and AJ72QLP25)

① "TIME" LEDs turn on
- The forward loop cable is disconnected.
- The transmission side of the forward loop and receiving side is not connected with a cable.
- The transmission side of the forward loop is connected to the reverse loop's transmission side, and the forward loop's receiving side is connected to the reverse loop's receiving side.

② "DATA" LED turns on
- The reverse loop cable is disconnected.
- The reverse loop's transmission side and receiving side is not connected with a cable.

③ "CRC," "OVER" and "AB.IF" LED flash for F.LOOP and R.LOOP
- Bad cable

④ ERROR LEDs other than those stated in ①, ②, and ③ above turns on
- Hardware error
- Cable was removed during the test.
- Cable was disconnected during the test.

For the coaxial bus system (AJ71QBR11 and AJ72QBR15)

① "TIME" LED turn on
- The connector was removed.

② "CRC," "OVER" and "AB.IF" LED flash
- Bad connector

③ ERROR LED other than those stated in ① and ② above turn on
- Hardware error
- Cable was removed during the test.

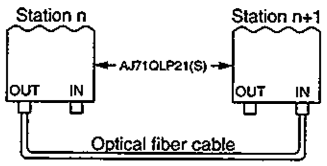
4.4.4 Station to station testing

The line of the two neighboring stations is checked.

(1) Inter-PC network

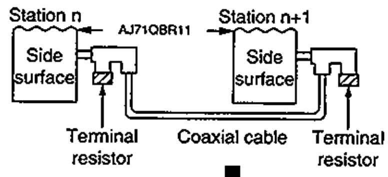
Optical loop system

The network module's IN and OUT are connected with a optical fiber cable.

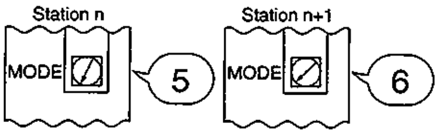


Coaxial bus system

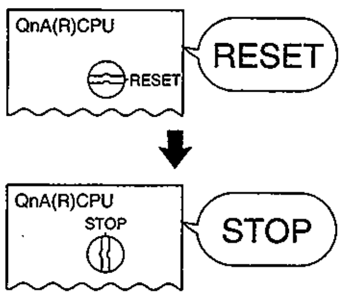
Connect the network module with the coaxial cable.



Set the network module's mode setting switch to "5 (master station)" and "6 (slave station)".

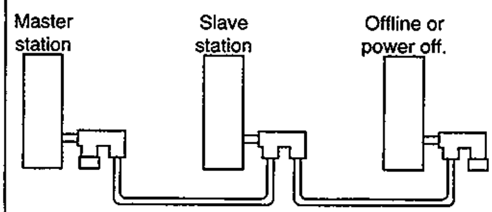


Set the QnA(R)CPU RUN/STOP key switch to "RESET→STOP" starting from the slave station to master station.



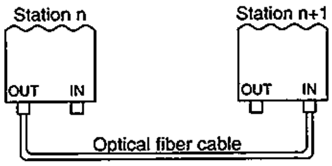
<Precaution when testing>

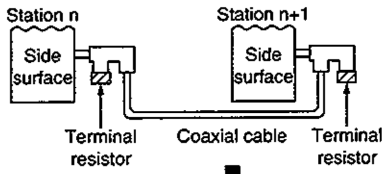
When performing the station to station testing by connecting more than three stations in a coaxial bus system, turn the stations not being tested to offline mode turn off the power supply.



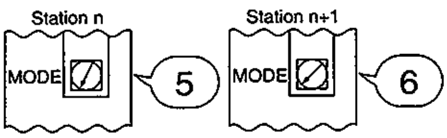
(2) Remote I/O network

Optical loop system	Coaxial bus system
The network module's IN and OUT are connected with a optical fiber cable.	Connect the network module with the coaxial cable.



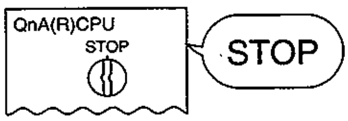


Set the network module's mode setting switch to "5 (master station)" and "6 (slave station)".

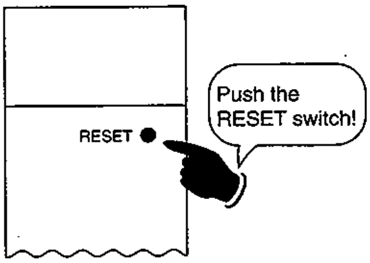


RESET starting with the slave station first and then the master station.

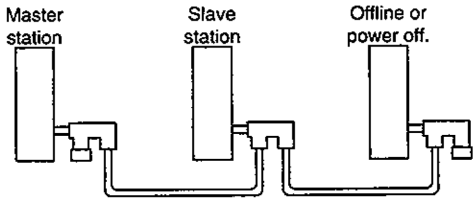
<Remote master station>
Set the QnA(R)CPU RUN/STOP key switch to "RESET→STOP" starting from the slave station to master station.



<Remote I/O station>
RESET the network module.



<Precaution when testing>
When performing the station to station testing by connecting more than three stations in a coaxial bus system, turn the stations not being tested to offline mode turn off the power.



To the next page

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Station to station testing in progress!

The test results are indicated on the LED.

<When normal>

The CRC→OVER→AB.IF→TIME→DATA→UNDER LED turn on in order. When this sequence repeats over five times, the system is normal.

CRC	●	○	○	○	○	○
OVER	○	●	○	○	○	○
AB. IF	○	○	●	○	○	○
TIME	○	○	○	●	○	○
DATA	○	○	○	○	●	○
UNDER	○	○	○	○	○	●

Repeat

○ : Off
● : On

<When there is an error>

For the optical loop systems (AJ71QLP21(S) and AJ72QBR15)

① "TIME" LED turn on
- The forward loop cable is disconnected.
- The transmission side of the forward loop and receiving side is not connected with a cable.
- The transmission side of the forward loop is connected to the reverse loop's transmission side, and the forward loop's receiving side is connected to the reverse loop's receiving side.

② "DATA" LED turns on
- The reverse loop cable is disconnected.
- The reverse loop's transmission side and receiving side is not connected with a cable.

③ "CRC," "OVER" and "AB.IF" LED turn on the main station
- Bad cable

④ ERROR LED other than those stated in ①, ②, and ③ above turns on
- Hardware error
- Cable was removed during the test.
- Cable was disconnected during the test.

For the coaxial bus system (AJ71QBR11 and AJ72QBR15)

① "TIME" LED turn on
- Cable is disconnected.

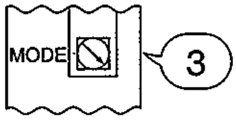
② "CRC," "OVER" and "AB.IF" LED flash
- Bad cable

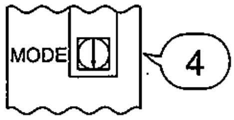
③ ERROR LED other than those stated in ① and ② above turn on
- Hardware error
- Cable was removed during the test.
- Cable was disconnected during the test.

4.4.5 Forward loop/reverse loop testing

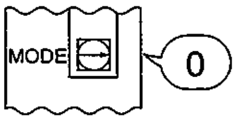
The line is checked after all the stations are connected with the optical fiber cable.

Forward loop testing	Reverse loop test
Set the mode setting switch of the station being tested to "3".	Set the mode setting switch of the station being tested to "4".



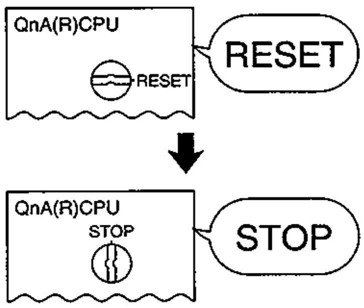


Set the mode setting switch for all other stations not being tested to "0".

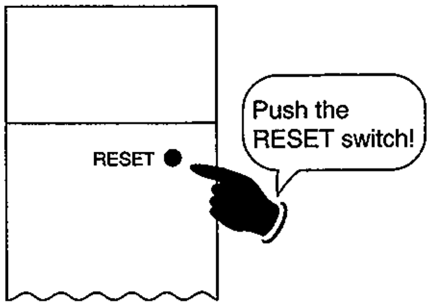


The station being tested is RESET.

<Control station/normal station/remote master station>
The QnA(R)CPU RUN/STOP key switch is set to "RESET → STOP".



<Remote I/O station>
The network module is RESET.



To the next page

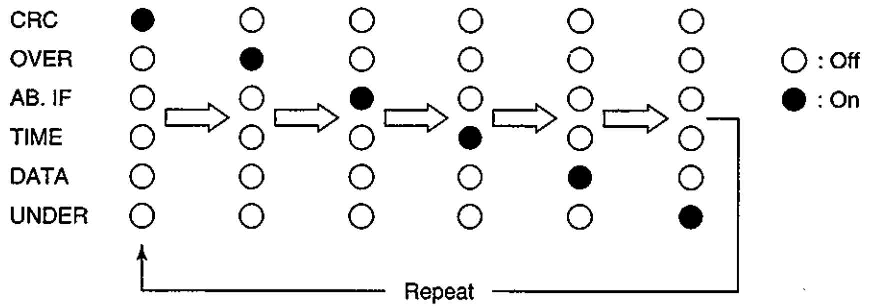
From the previous page

Forward loop/reverse loop testing in progress!

The test results are indicated on the LED.

<When normal>

The CRC→OVER→AB.IF→TIME→DATA→UNDER LEDs turn on in order. When this sequence repeats over five times, the system is normal.



<When there is an error>

① "TIME" "DATA" and "UNDER" LED flash for F.LOOP and R.LOOP
- Loop back is performed as there is an error in optical fiber cable or other station.

② "CRC" "OVER" and "AB.IF" LED flash for F.LOOP and R.LOOP
- Bad cable

③ "TIME" and "DATA" LED flash for F.LOOP and R.LOOP
- Wiring is incorrect. Confirm the cable connections before/after the error.

4.5 Network diagnosis (online)

The line status check or diagnosis can be easily performed by using the peripheral device's network diagnosis function. However, the parameters must be preset.
When problems occur during system operation, this function can be used for diagnosis with the network module remaining online.
For the details of the operation of each function, refer to the GPP function operating manual (online section).

Item	Optical loop system	Coaxial bus system	Data link status (Cyclic transmission and transient transmission)
Loop testing	○	×	Temporary interrupt
Setting check testing	○	○	Temporary interrupt
Station order check testing	○	×	Temporary interrupt
Communication testing	○	○	Continue

○: Can be executed ×: Cannot be executed

Points

(1) Perform the online diagnosis which temporarily interrupts the data link during system startup, etc. When performing the diagnosis during system operation, make sure that there are no problems with the following conditions:
① The data link can be stopped with online diagnosis.
② When each station is not reset or RUN/STOP is not changed.
(Because the online diagnosis may result in an error.)

(2) Perform the setting check testing, station order check testing, and communication testing after performing the loop testing to make sure that the line status is normal.

4.5.1 Loop testing (only for optical loop systems)

(1) Inter-PC network

When the optical loop system cabling is complete, the line testing for forward loop and reverse loop status is performed. When performing a loop back, the loop back station can be checked as well. For example, when a loop testing is performed within a peripheral device connected to station 1 in the system status as shown in Figure 4.1, the monitor screen shown in Figure 4.2 is displayed. Then, the user can check that stations 4 and 2 is performing the loop back because of an error in station 5.

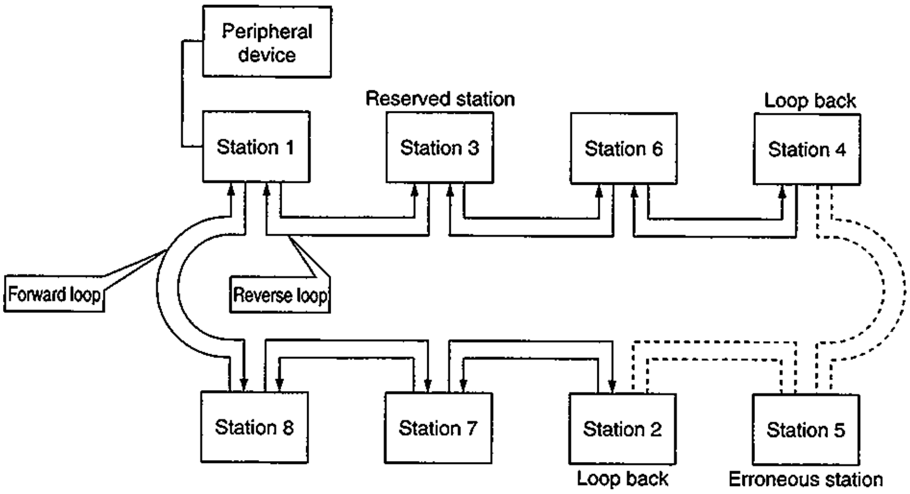


Figure 4.1 System status

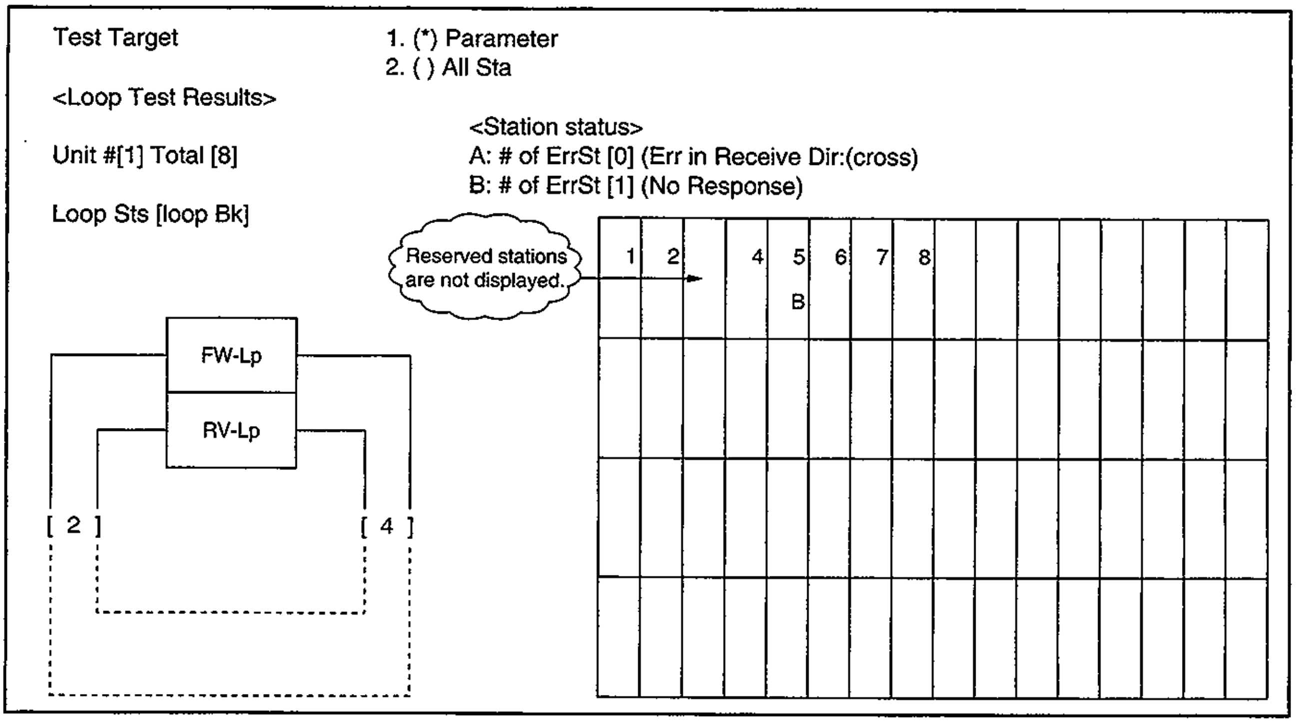


Figure 4.2 Loop testing display

(2) Remote I/O network

When the optical loop system cabling is complete, the line testing for forward loop and reverse loop status is performed. When performing a loop back, the loop back station can be checked as well. For example, when a loop testing is performed within a peripheral device connected to 1MR in the system status as shown in Figure 4.3, the monitor screen shown in Figure 4.4 is displayed. Then, the user can check that 1R3 and 1R1 is performing the loop back because of an error in 1R4.

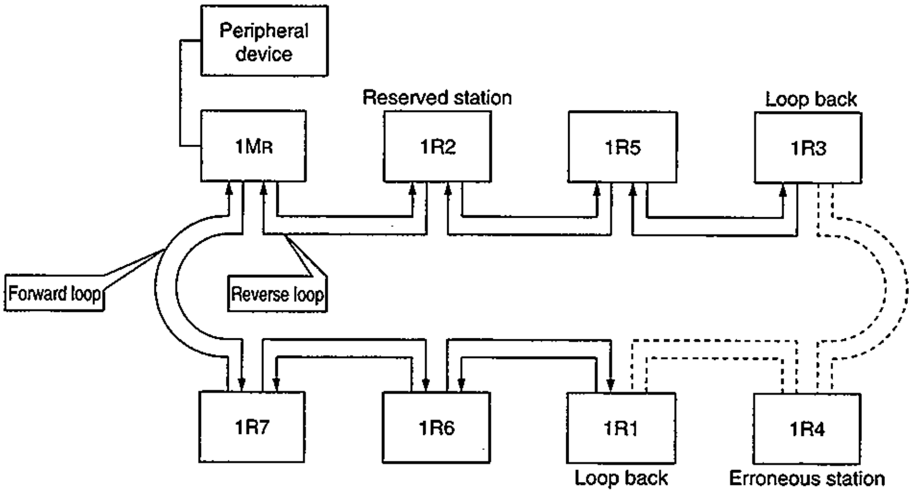


Figure 4.3 System status

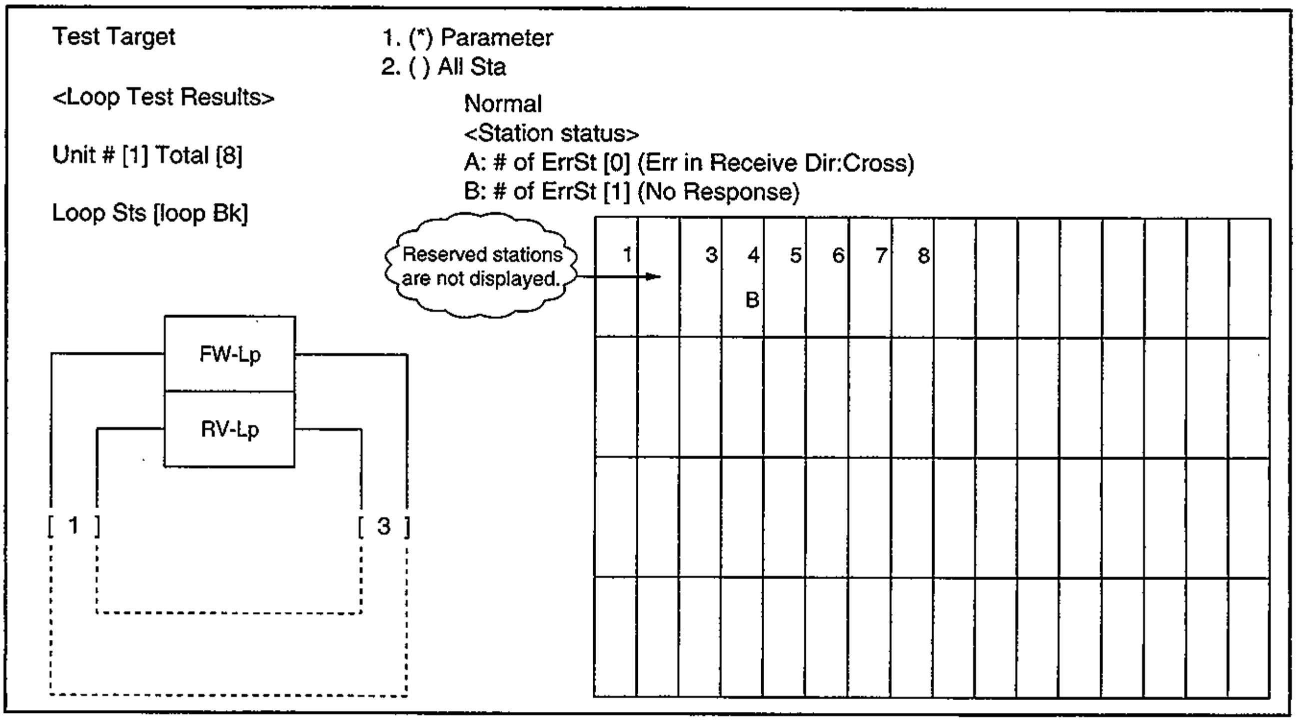


Figure 4.4 Loop testing display

4.5.2 Setting check testing

(1) Internet-PC network

The network module's switch setting can be checked.
There are three types of check items:

① Control station overlap checking
② Station number overlap checking
③ Checking to make sure that the network number set for the station in which the peripheral device is connected is the same network number as set with the host switch.

For example, when performing the setting check testing with the peripheral device connected to station 1 in the system status as shown in Figure 4.5, a monitor screen as shown in Figure 4.6 is displayed, and the setting status for each station can be checked.
Station 6 displays the error where there is a overlapped control station setting. Stations 2, 5, 7, and 8 displays the network number and group number because there are no setting errors.

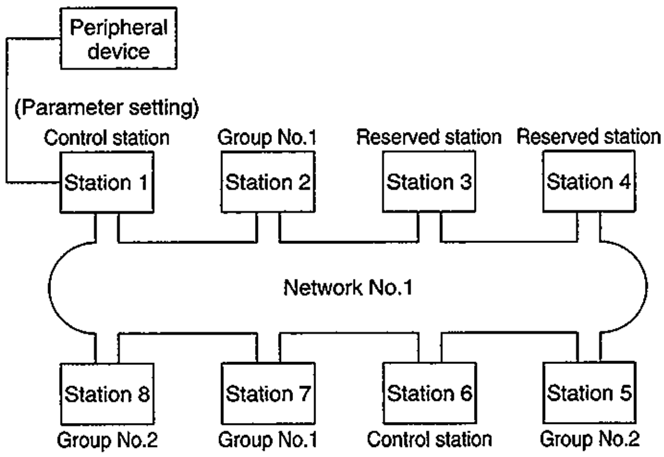


Figure 4.5 System status

Test Target 1 (*) Parameter
2. ( ) All stations

Unit # [1] This Sta'# [1] Network # [1] Ctrl Sta # [1] Total [8]

(Station #)	1	2	3	4	5	6	7	8
(Network #)	1	1			1	1	1	1
(Group #)		1	D	D	2	A	1	2

(Station #)
(Network #)
(Group #)

(Station #)
(Network #)
(Group #)

(Station #)
(Network #)
(Group #)

A: Dupl CtrlSta B: Dupl Sta # C: NW # Err D: Reserved E: Erro F: NW Type Err
G: Duplicate RmtSubMst (Duplex) H: Duplicate RmtSubMst (Parallel)

Figure 4.6 Setting check test display

(2) Remote I/O network

The network module's switch setting can be checked.

For example, when a setting check testing is performed within a peripheral device connected to station 1MR in the system status as shown in Figure 4.7, the monitor screen shown in Figure 4.8 is displayed, and the setting status for each station can be checked.

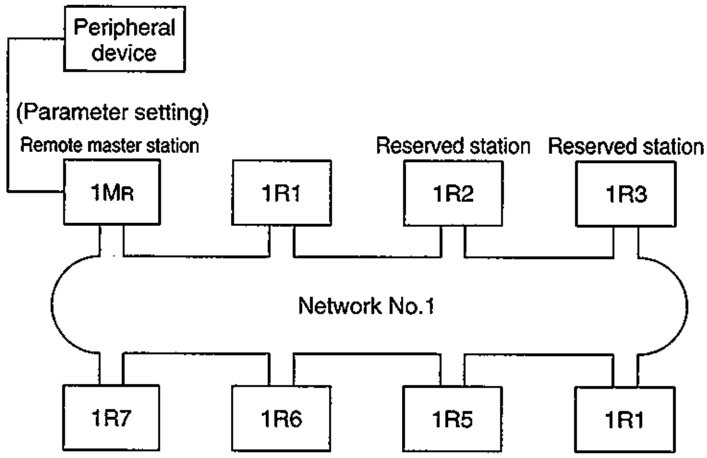


Figure 4.7 System status

```
Test Target                         1 (*) Parameter
                                    2. ( ) All stations
                                              <Remote master station status>
                                                          Normal
Unit # [1] This Sta'# [1] Network # [1] Ctrl Sta # [1] Total [8]
 (Station #)          1  2  3B4  5  6  7  8
 (Network #)        E    --  --  --  --  --  --  --
 (Group #)            --  D  D  --  --  --  --  --
 (Station #)
 (Network #)
 (Group #)
 (Station #)
 (Network #)
 (Group #)
 (Station #)
 (Network #)
 (Group #)

A: Dupl CtrlSta  B: Dupl Sta #  C: NW # Err  D: Reserved  E: Erro  F: NW Type Err
G: Duplicate RmtSubMst (Duplex)  H: Duplicate RmtSubMst (Parallel)
```

Figure 4.8 Setting check test display

4.5.3 Station order check testing (only for optical loop systems)

(1) Inter-PC network

The station numbers connected can be checked in the optical loop systems.
From the loop status system the station order check testing is performed (displayed in the station check test result screen (refer to Figure 4.10)), the connection order that can be checked are as follows:

Loop status	Display details
Forward/reverse loop	The station numbers connected from the host in the forward loop direction, and station numbers connected from the host in the reverse loop direction.
Forward loop	Only the station numbers connected in the forward loop direction from the host.
Reverse loop	Only the station numbers connected in the reverse loop direction from the host.
Loop back	Only the station numbers connected to the forward loop direction from the host.

For example, if the station order check testing is performed via a peripheral device connected to station 1, with the system status as shown in Figure 4.9, the monitor screen shown in Figure 4.10 is displayed. The stations connected in the forward loop direction, and the loop back is being performed by stations 2 and 4 can be checked.

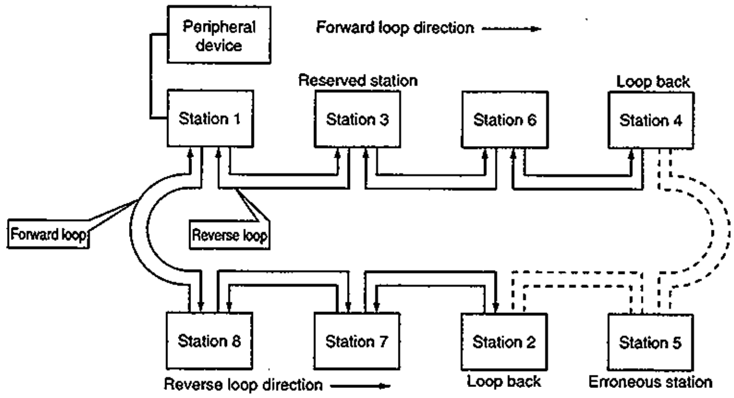


Figure 4.9 System status

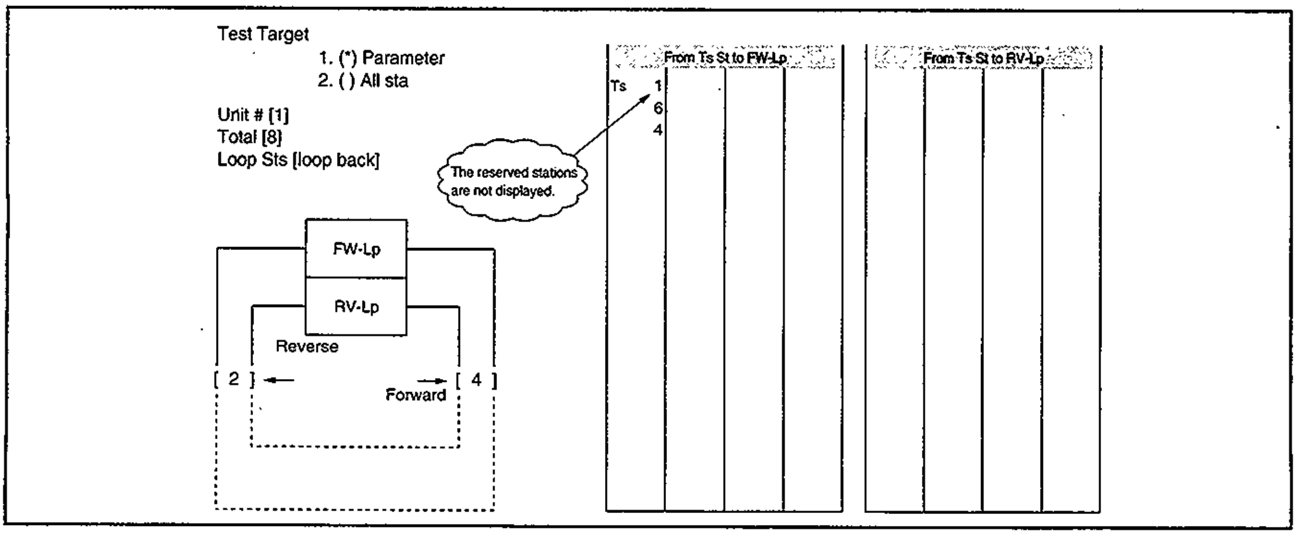


Figure 4.10 Station order check test display

(2) Remote I/O network

The station numbers connected can be checked in the optical loop systems.

From the loop status system the station order check testing is performed (displayed in the station check test result screen (refer to figure 4.12)), the connection order that can be checked are as follows:

Loop status	Display details
Forward/reverse loop	The station numbers connected from the host in the forward loop direction, and station numbers connected from the host in the reverse loop direction.
Forward loop	Only the station numbers connected in the forward loop direction from the host.
Reverse loop	Only the station numbers connected in the reverse loop direction from the host.
Loop back	Only the station numbers connected to the forward loop direction from the host.

For example, if the station order check testing is performed via a peripheral device connected to 1MR, with the system status as shown in figure 4.11, the monitor screen shown in figure 4.12 is displayed. The stations connected in the forward loop direction, and the loop back is being performed can be checked.

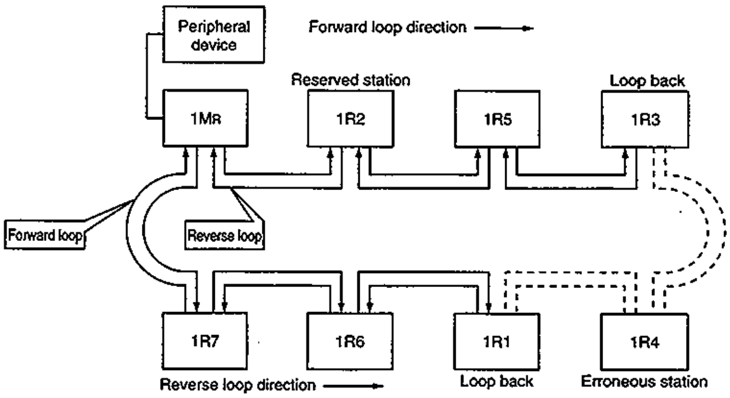


Figure 4.11 System status

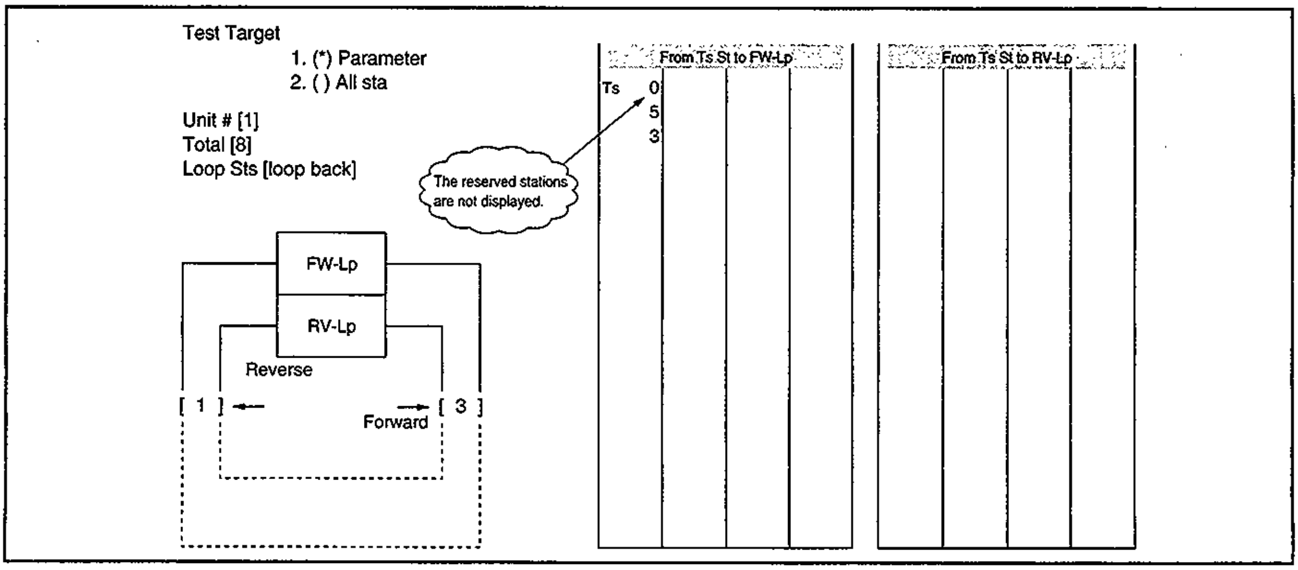


Figure 4.12 Station order check test display

4.5.4 Communication testing

Check to see whether the communication between the host and communication destination (specify the network number and station number) can correctly be performed can be checked. When the communication destination has a different network number, the network number and station number which relays the communication is displayed as well, so whether the routing parameters have been checked correctly can be checked.
When the communication test is performed for the network number 4's 4Ns6 with the peripheral device connected to the network number 1's 1R1 in the system in figure 4.13, the monitor screen shown in figure 4.14 is displayed. And from the routing parameter setting details, the user can check to see that a communication can correctly be performed.

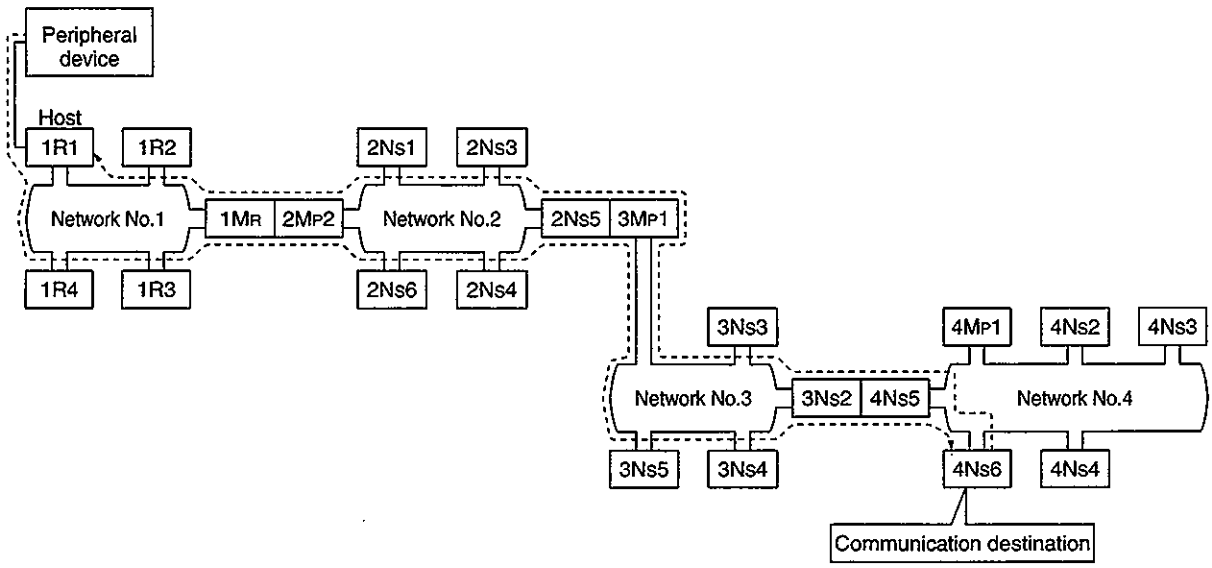


Figure 4.13 System

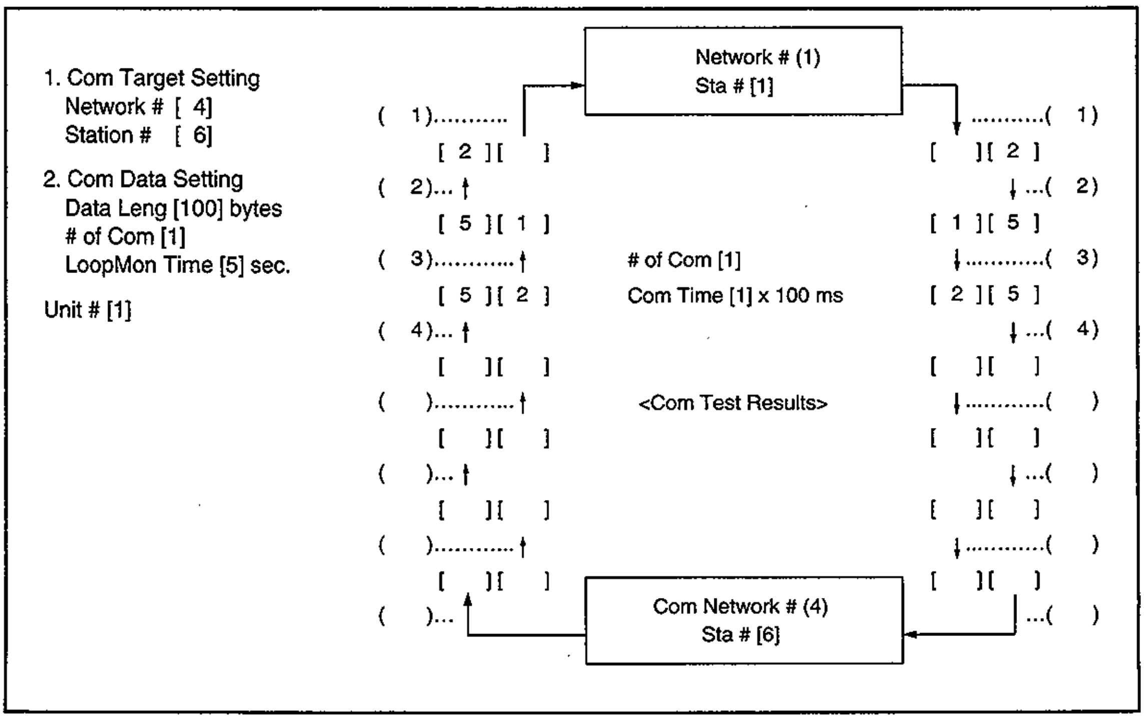


Figure 4.14 Communication test display

If the routing parameter setting is not correct, the "Cannot communicate with PC" message is displayed, and the communication test result is not displayed.

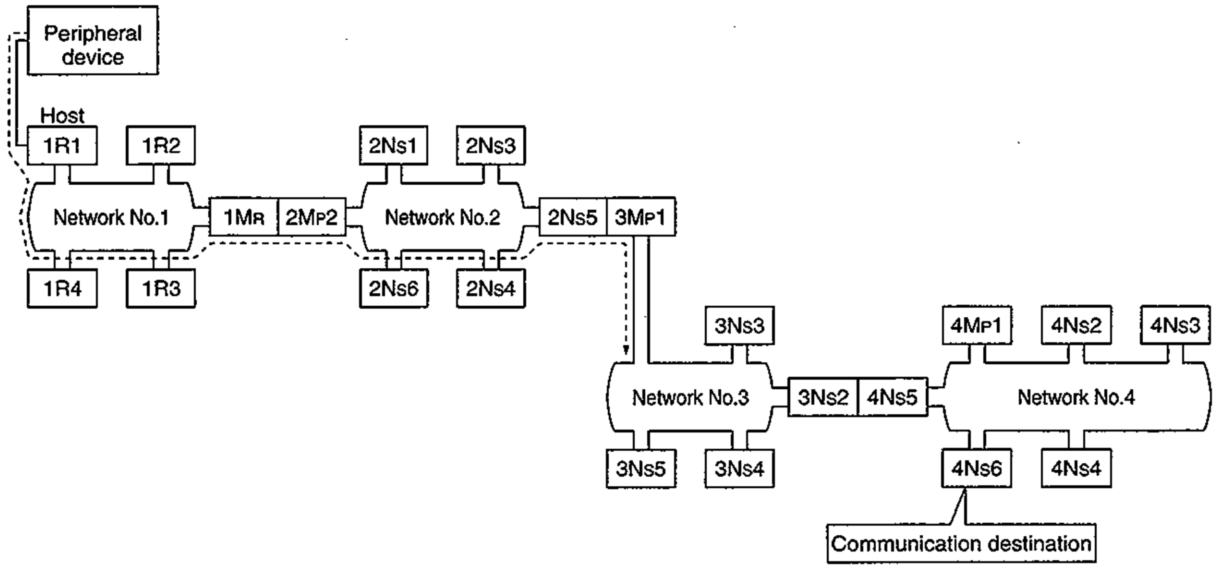


Figure 4.15 System

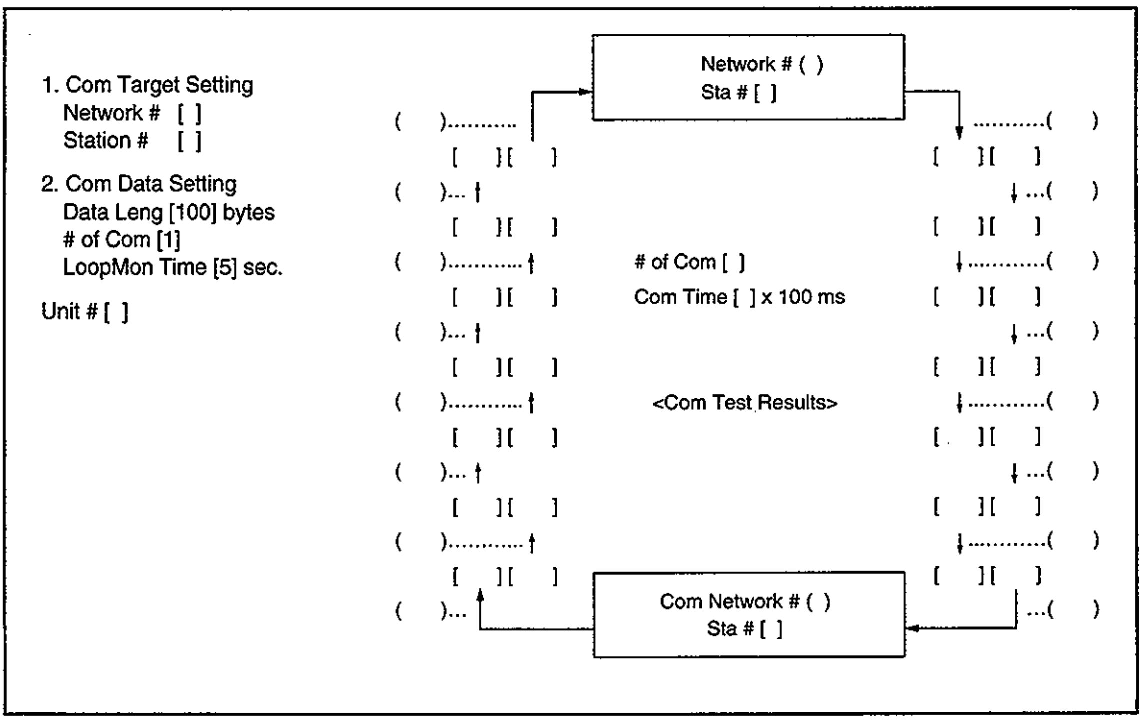


Figure 4.16 Communication test display

5 Network Monitoring

The MELSECNET/10 network status can be checked using the network monitor of the peripheral device. By performing network monitoring when an error occurs, the erroneous station can be found. There are following items in the network monitoring feature:

- Network monitoring
  - Line monitoring
    - Line monitoring (host)
    - Line monitoring details
    - Line monitoring (other stations)
  - Status monitoring
    - Status monitoring
    - Status monitoring details
    - Test monitoring
  - Error history monitoring
    - Error history monitoring
    - Error history monitoring details

In this chapter, the network monitor screens are explained.
Also, SB□□□□ and SW□□□□ shown in the description of each item indicates the special relay (SB)/register (SW) used for the monitoring.

Remark

When the offline testing is performed with the network module, network monitoring cannot be performed. (Cannot display correctly.)

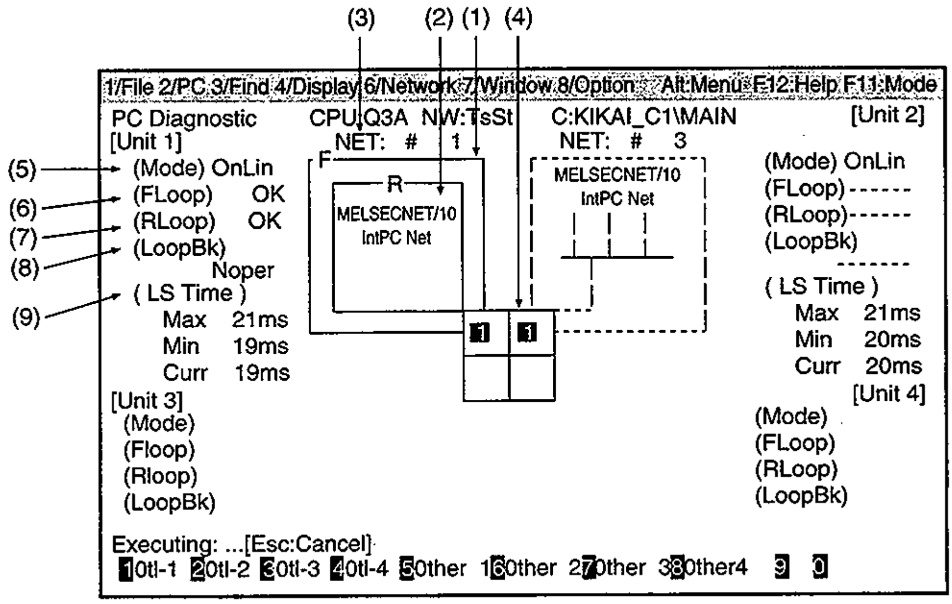
5.1 Line Monitoring (Host)

This can check the status of the line for the network where the peripheral device is connected, data link, CPU, and parameters.

5.1.1 Checking the line status and link scan time (line monitoring (host))

The total network status can be checked by the line figure.

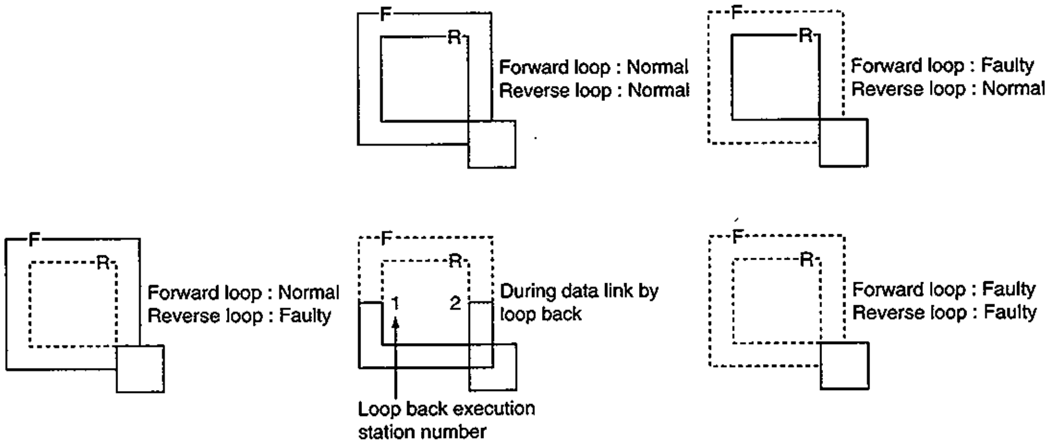
Screen check points
• Mode • F/R loop status • Loop back status • Link scan time



(1) Line status

Displays the status of the loop and bus.

- For the optical loop system



- For coaxial bus systems
  When normal, solid lines are used. When error, dotted lines are used.

(2) Network type

This displays the network type. (SB0040)

- MELSECNET/10 inter-PC network
- MELSECNET/10 remote I/O network

(3) NET number

Displays the network number (SW0040)

(4) Station number

Displays the host station number. (SW0042)
If it is a control station or remote master station, the display is highlighted. (SB0044)

(5) Mode

Displays the host mode. (SW0043)

- Online — With automatic return
- Offline — Station-to-station testing (Master)
  - Station-to-station testing (Slave)
  - Self-loop-back testing
  - Self-loop-back testing (internal)
- Loop testing — Forward loop testing
  - Reverse loop testing

Monitoring can be performed only with control station or remote master station.

(6) F loop

Displays the forward loop status. (SB0091)

- OK: Normal
- NG: Faulty

However, "--" is displayed for bus types.

(7) R loop

Displays the reverse loop status. (SB0095)

- OK: Normal
- NG: Error

However, "--" is displayed for bus types.

(8) Loop back

Displays the execution status for the loop back (SB0099 and SB009A)

- Executing
- Not executed

However, "--" is displayed for bus types.

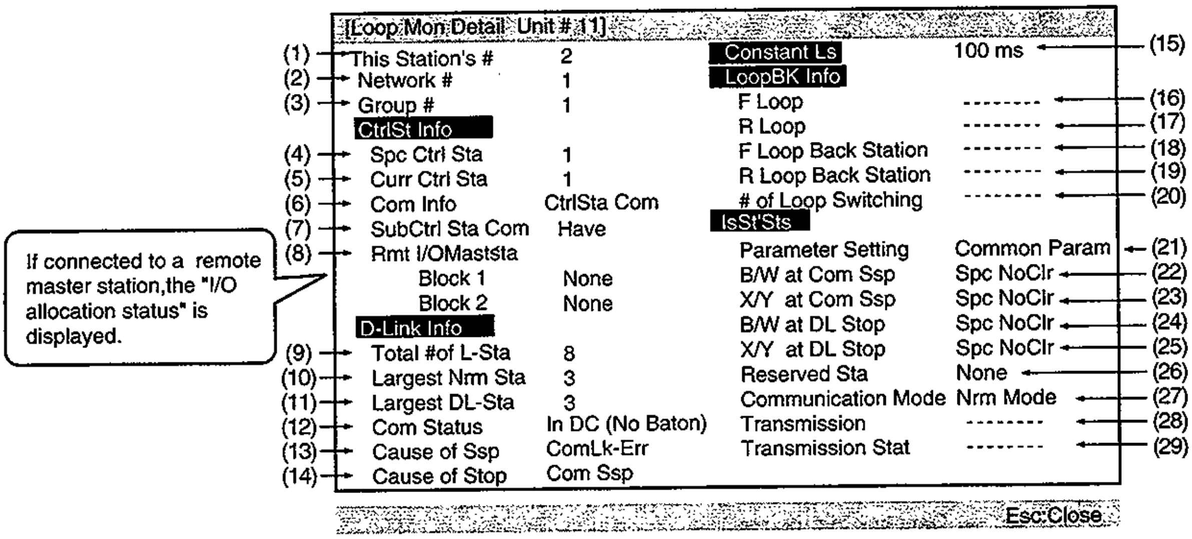
(9) Link scan time

Displays the max./min./current value of the host link scan time. (SW006B/SW006C/SW006D)

Constant link scan	Control station/remote master station	Normal station/remote I/O station
None	Displays the actual max./min./current value.	
Yes	Refer to section 10.7.2.	Constant link scan ± 2ms

5.1.2 Check the control station and data link status (detailed line monitor)

Screen check points
• Host station number, network number, group number
• Control station setting and operation status
• Data link info.
• Constant link scan
• Forward/reverse loops, loop back status
• Host parameter setting status



(1) This Station's #

Displays the host station number. (SW0042)

(2) Network #

Displays the host network number (SW0040)

(3) Group #

Displays the host group number (SW0041)

(4) Spc Ctrl Sta

Displays the station number of the control stations set with the module switch. (SW0057)

(5) Curr Ctrl Sta

Displays the station number of the station actually controlling the network. (SW0056)
However, it does not change when the host communication information stations are down.

(6) Com Info

Displays the station type that controls the network. (SB0056)

- Control station communication
- Subcontrol station communication

When the host is a control station and the host goes down, the display automatically switches to the subcontrol station communication.

(7) SubCtrl Sta Com

Displays whether the communication from the subcontrol station is performed. (SB0058)

- Have
- None

(8) Rmt I/O Mst Sta

Displays the X/Y communication block 1 and block 2's I/O master station numbers. (SB005C, SB005D, SW005C, and SW005D)

The blocks not set display "None".

(9) Total # of L-Sta

Displays the total number of link stations set in the common parameter. (SW0059)

(10) Largest # of L-Sta

Displays the largest number of stations that are performing normal baton pass (can be transient transmission). (SW005A)

For the stations performing normal baton pass, the network module's T.PASS LED is on.

(11) Largest DL-Sta

Displays the largest number of station that is performing normal data link (cyclic transmission and transient transmission). (SW005B)

For the stations performing normal data links, the network module's D.LINK LED is on.

(12) Com Status

The host's communication status is displayed. (SW0047)

- Data link in progress
- Data link stopped (other)
  Cyclic transmission was stopped by other station.
- Data link stopped (host)
  Stopped the cyclic transmission in the host.
- Baton pass execution (No areas)
  No allocation for the host B/W transmission range.
- Baton pass being performed (Parameter error)
  Error in the host station's parameter.
- Baton pass execution (Parameter not received)
  The common parameters have not been received.
- Disconnected (No baton pass)
  Overlapped station numbers or cable disconnected.
- Disconnected (line error)
  Cable is disconnected.
- Test being executed
  Executing online/offline testing.

(13) Cause of Ssp

Displays the cause of the host communication (transient transmission) is suspended. (SW0048)

- Normal
- Baton overlap
  Multiple batons were received.
- Baton pass timeout
  The baton did not return even after the set time.
- Online testing is being executed.
  Online test is being executed.

- Baton pass exists for other station
  The baton pass is being executed at station other than the host.
- Same station number exists
  Station numbers are overlapping.
- Control station overlapping
  The control stations are overlapping.
- Offline testing in progress
  Offline testing is being executed.
- Other (error code)
  Refer to the error code (Section 15.1)

(14) Cause of stop

Displays the cause of the unabled host data link (cyclic transmission). (SW 0049)

- Normal
- Other station specification (station □)
  Station □ stopped the cyclic transmission.
- Host specification
  Host stopped the cyclic transmission.
- All stations specification (station □)
  Station □ stopped all stations' cyclic transmission.
- No parameter
  No parameter was received.
- Parameter error
  The set parameter was erroneous.
- Station specific parameter not matched
  The common parameter and station specific parameter do not match.
- I/O allocation incorrect
  The remote I/O network's I/O allocation is erroneous.
- Other. (error code)
  Refer to the error code (section 15.1)

(15) Constant LS

Displays the setting status of the constant link scan. (SW0068)

(16) F loop

Displays the status of the forward loop. (SB0099, SW0090)

- Normal
- Loop back transmission.
- Data link not possible.

However, "--" is displayed for the bus type.

(17) R loop

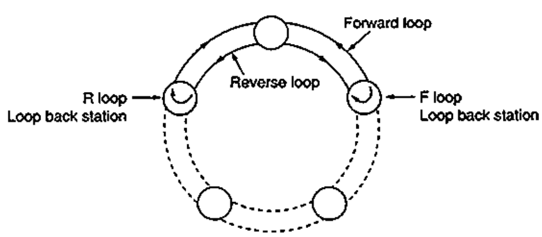
Displays the status for the reverse loop. (SB009A, SW0090)

- Normal
- Loop back transmission.
- Data link not possible.

However, "--" is displayed for the bus type.

(18) F loop back station

Displays the station number of the station performing the loop back at the forward loop. (SW0099)
However, "--" is displayed for the bus type.



(19) R loop back station

Displays the station number of the station performing the loop back for the reverse loop. (SW009A)

However, "--" is displayed for the bus type.

(20) # of loop switching

Displays the number of how many times the loop was switched, or loop back was performed. (SW00CE)

However, "--" is displayed for the bus type.

(21) Parameter setting

Displays the host's parameter setting status. (SB0054, SW0054)

- Common parameters
- Common + specific
- Default parameters
- Default + specific

(22) B/W at Com Ssp

Displays the B/W status when the communication is suspended.

(23) X/Y at Com Ssp

Displays the X/Y status when the communication is suspended.

(24) B/W at DL stop

Displays the B/W status when the data link is stopped.

(25) X/Y at DL stop

Displays the X/Y status when the data link is stopped.

(26) Reserved Sta

Displays the reserved station specification status. (SB0064)

- Yes
- No

(27) Communication mode

Displays the link scan status. (SB0068)

- Normal mode
- Constant link scan

(28) Transmission

Displays the multiplex transmission specification status. (SB0069)

- Normal transmission
- Multiplex transmission

However, "-------" is displayed for the bus type.

(29) Transmission Stat

Displays the multiplex transmission status. (SB006A)

- Normal transmission in progress
- Multiplex transmission in progress

However, "-------" is displayed for the bus type.

5.1.3 Checking the data link, CPU, and loop status for each station (line monitoring (other stations))

The status of the communication, data link, parameters, CPU, loop, reserved stations at each station can be checked.

```
[LoopMon(Other):Unit 1(MNET/10)]

1. ( ) Com Status
2. ( ) Datalink Status
3. ( ) Parameter Sts
4. ( ) CPU Ope Status
5. (*) CPU Run Status
6. ( ) Loop Status
7. ( ) Reserved Sta
8. ( ) Ext power Supply Sts

        Execute(Y)  Cancel(N)

                Space:Select Esc:Close
```

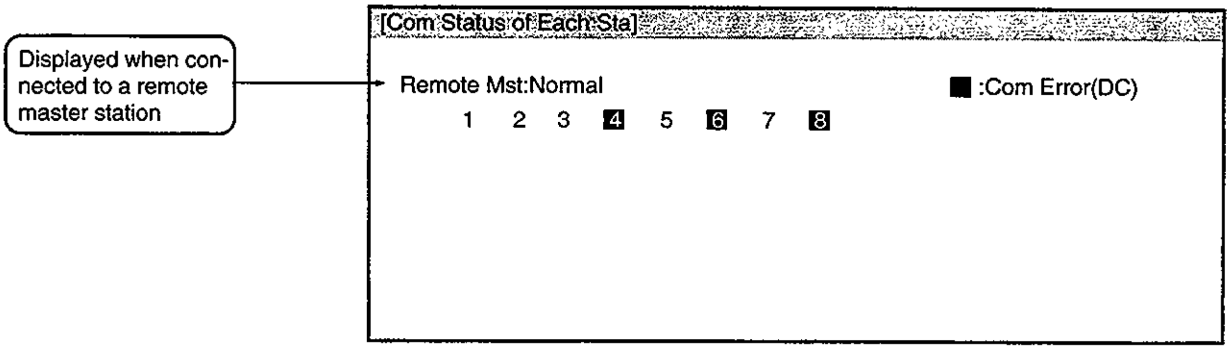
Items 1 through 4 and 6 indicate erroneous stations, 5 is a stopped station, 7 is a reserved station, and 8 is a station with an external power supply. If any of the items exist, the item is highlighted.
For the remote I/O network, items 2 through 5 cannot be selected.

(1) Communication status of each station

The status of the transient transmission is displayed. (SW0070 to 73)

The "total number of linked stations" set in the common parameter is displayed.

- Normal display .... Normal station and reserve stations
- Highlighted .... Error stations

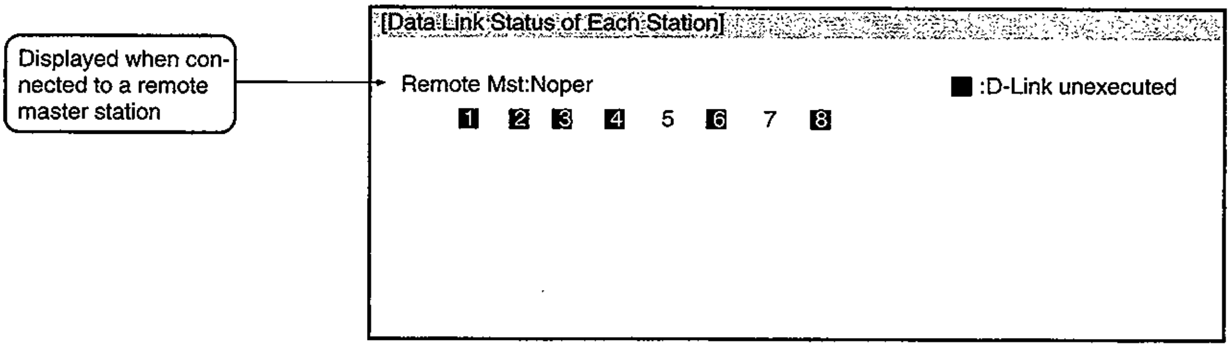


(2) Data link status of each station

Displays the status of the cyclic transmission. (SW0074 to 77)

The "total number of linked stations" set in the common parameter is displayed.

- Normal display .... Normal stations and reserve stations
- Highlighted .... Error stations



(3) Parameter status of each station

(a) Displays the parameter communication status. (SW0078 to 7B)

The "total number of linked stations" set in the common parameter is displayed.

Normal display .... Parameter communication in progress

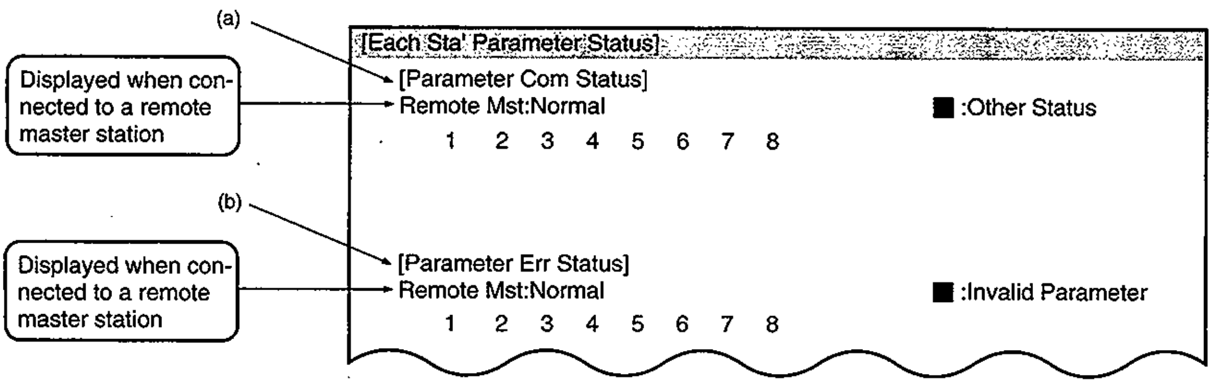
Highlighted .... Parameter communication not being performed, reserve stations

(b) Displays the parameter status (SW007C to 7F)

The "total number of linked stations" set in the common parameter is displayed.

Normal display .... Parameter normal, reserve stations, and non-connected stations

Highlighted .... Parameter error

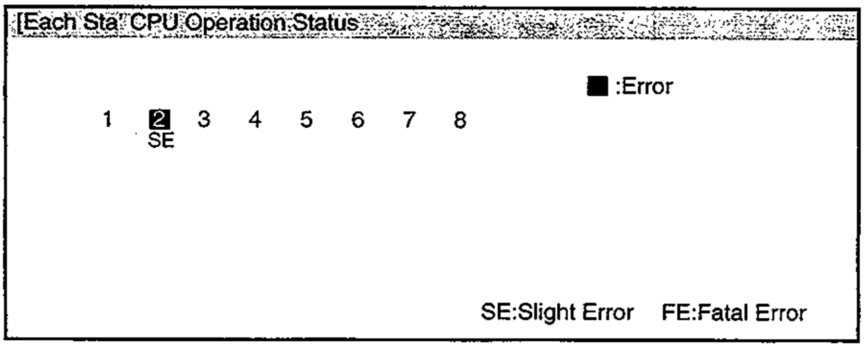


(4) CPU operation status for each station

Displays the CPU operation status. (SW0080 to 83, 88 to 8B)

The "total number of linked stations" set in the common parameter is displayed.

- Normal display .... CPU normal, reserve stations, non-connected stations
- Highlighted .... CPU error
  Minor: Minor error
  Major: Mid/major error



(5) CPU RUN status for each station

Displays the CPU RUN/STOP status. (SW0084 to 87)

If the duplex system's standby system Q4ARCPU is normal, this becomes the key switch status. The "total number of linked stations" set in the common parameter is displayed.

- RUN .... RUN, STEP RUN
- STOP .... STOP, PAUSE, ERROR, non-connected stations

"------" is displayed for reserved stations.

[Each Sta' CPU RUN Status]

1	RUN	17	----------	33	----------	49	----------
2	STOP	18	----------	34	----------	50	----------
3	RUN	19	----------	35	----------	51	----------
4	STOP	20	----------	36	----------	52	----------
5	----------	21	----------	37	----------	53	----------
6	STOP	22	----------	38	----------	54	----------
7	----------	23	----------	39	----------	55	----------
8	STOP	24	----------	40	----------	56	----------

(6) Loop status for each station (only for optical loop system)

Displays the forward/reverse loop status. (SW0091 to 94, SW0095 to 98)

The "total number of linked stations" set in the common parameter is displayed.

- Normal display .... Normal stations and reserve stations
- Highlighted...................... Faulty stations, non-connected stations

[Each Sta' Loop Status]

Displayed when connected to a remote master station → [Forward Loop Status]
Remote Mst:Normal ■ :Error
1 2 3

Displayed when connected to a remote master station → [Reverse Loop Status]
Remote Mst:Normal ■ :Error
1 2 3

(7) Reserved station specification for each station

Displays the setting status for the reserved stations. (SW0064 to 67)

The "total number of linked stations" set in the common parameter is displayed.

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

[Specify Reserved Station]

■ :Reserved Station

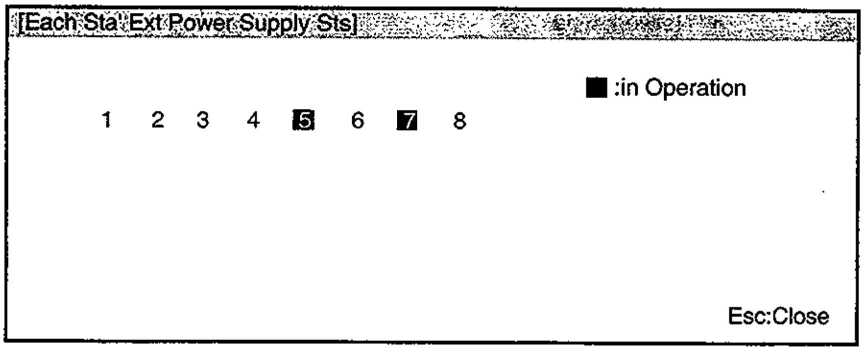
1 2 3 4 5 6 7

(8) External power supply status for each station

Displays whether or not the 24 VDC is applied to the external power supply terminal of AJ71QLP21S. (SW008C to 8F)

The "total number of linked stations" set in the common parameter is displayed.

- Normal display .... 24VDC is not supplied, other than AJ71QLP21S
- Highlighted .... 24VDC is supplied

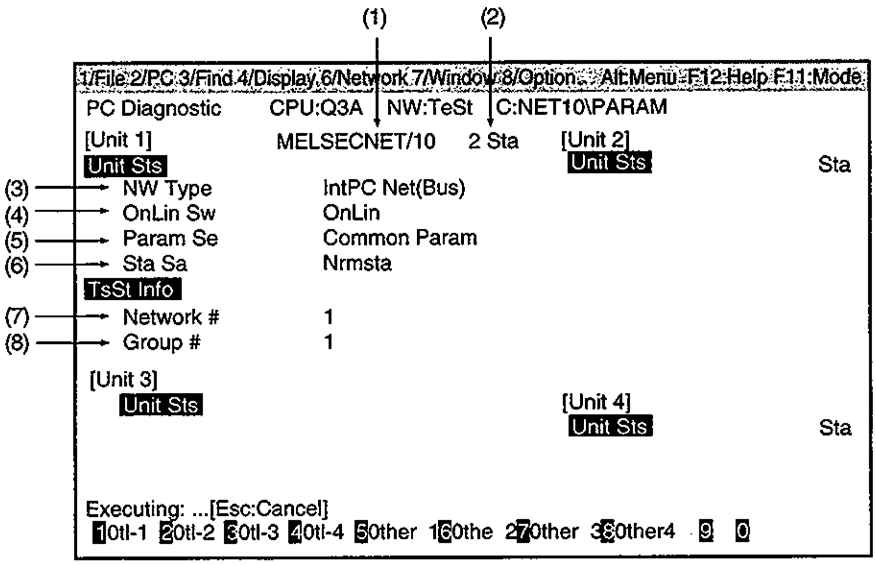


5.2 Status Monitor

Can check the status for the host's switch/parameter setting, data link, online/offline testing.

5.2.1 Check the host's module status (status monitoring)

Check points in the screen
• Network type
• Mode
• Parameter settings
• Station setting
• Network number
• Group number



(1) Module type

Displays the host's module type.

- MELSECNET/10

(2) Station number

Displays the host's station number. (SW0042)

(3) NW Type

Displays the host's network type. (SB0040, SW0046)

- PC net (Loop)
- PC net (Bus)
- Remote I/O net (Loop)
- Remote I/O net (Bus)

(4) OnLin Sw

Displays the mode select switch condition of the host station.(SB0043)

- Online
- Not online

(5) Param Se

Displays the parameter setting of host. (SW0054)

- Common parameter
- Common + specific
- Default parameter
- Default + specific

However, if the common parameters are not received at a normal station, these are left blank.

(6) Sta Sa

Sets the host's station type (SB0044, SB0048)

- Control station
- Normal station
- Subcontrol station
- Master station
- Remote station

(7) Network #

Displays the host's network number (SW0040)

(8) Group #

Displays the hosts' group number (SW0041)

5.2.2 Checking the host's switches/parameters, and data link status (detailed status monitor)

Check points in the screen
- Switch settings
- Parameter setting
- Data link status
- Data link start/stop status
- Link dedicated instructions

[Status Mon Detail Unit # 1]

	This Sta		DL Info		
(1)	Unit Type	Coxl-Sngl	Total # of L-Sta	8	(18)
(2)	Network Type	IntPC Net(Bus)	Lg Nrm Com Sta	3	(19)
(3)	Unit Sts	Normal	Largest DL Sta	0	(20)
(4)	On-Line Sw	OnLin AutoRC(On)	Com Sts	In DC (No Baton)	(21)
(5)	Sw Setting	Normal	Cause of Cm-Ssp	ErrCode(F110)	(22)
(6)	Sta Setting	NrmSta(13)	Cause of Ssp	Com Ssp	(23)
(7)	B/W Total # of Items	2K Pt			
(8)	Parameter Used	Common Param	DL Info(This Sta)		
(9)	Parameter Err	None	Start Status	No Dsgnt	(24)
(10)	B/W at Com Ssp	Spc NoClr	Stop Status	No Dsgnt	(25)
(11)	X/Y at Com Ssp	Spc NoClr	DL Info(System)		
(12)	B/W at DL Stop	Spc NoClr	Start Status	No Dsgnt	(26)
(13)	X/Y at DL Stop	Spc NoClr	Stop Status	No Dsgnt	(27)
(14)	Reserved Sta	None			
(15)	Com Mode	Nrm Mode	Link Ins Exec		
(16)	Specify Trans	--------------	ZNRD	No Per	(28)
(17)	Trans Sts	--------------	ZNWR	No Per	(29)

Ese:Close

(1) Unit Type

Displays the module type. (SW0046)

Left side	Right side
Optical	Single
Coaxial	Duplex

(2) Network Type

Displays the network type. (SB0040, SW0046)
- PC net (Loop)
- PC net (Bus)
- Remote I/O net (Loop)
- Remote I/O net (Bus)

(3) Unit Sts

Displays the module status. (SW0020)
- Normal
- Error code

(4) On-Line Sw

Displays the mode setting switch status. (SW0043)

- Online (with automatic online system)
- Loop test (forward loop)
- Loop test (reverse loop)
- Station-to-station test (master)
- Station-to-station test (slave)
- Self loop back test
- Self loop back test (internal)

(5) Sw Setting

Displays the module switch setting status. (SB0045, SW0045)

- Normal
- Error code

(6) Sta Setting

Displays the station type and number. (SB0044, SW0042)

- Control station (station number)
- Normal station (station number)
- Master station (station number)
- Remote station (station number)

(7) B/W Total # of Items

Displays the B/W total points of the default parameters. (SW0054)
When – is indicated, it is using common parameter.

(8) Parameter Used

Displays the host's parameter settings. (SW0054)

- Common parameter
- Common+specific
- Default parameter
- Default+specific

However, if the common parameters are not received at the normal station, they are blank.

(9) Parameter Err

Displays the error status of the parameters set for the host. (SW0055)

(10) B/W at Com Ssp

Displays the B/W status during communication is suspended.

(11) X/Y at Com Ssp

Displays the X/Y status during communication is suspended.

(12) B/W at DL Stop

Displays the B/W status when the data link is stopped.

(13) X/Y at DL Stop

Displays the X/Y status when the data link is stopped.

(14) Reserved Sta

Displays the reserved station specification status. (SB0064)

- Yes
- None

(15) Com Mode

Displays the link scan status. (SB0068)

- Normal mode
- Constant link scan

(16) Specify Trans

Displays the multiplex transmission specification status. (SB0069)

- Normal transmission
- Multiplex transmission

However, "-----" is displayed for the bus type.

(17) Trans Sts

Displays the multiplex transmission status. (SB006A)

- Normal transmission in progress
- Multiplex transmission in progress

However, "-----" is displayed for the bus type.

(18) Total # of L-Sta

Displays the total number of linked stations set by the common parameter. (SW0059)

(19) Lg Nrm Com Sta

Displays the maximum number of stations that are performing correct baton pass (transient transmission is possible). (SW005A)

Network module's T.PASS LEDs are lit for the stations performing correct baton pass.

(20) Largest DL Sta

Displays the maximum number of stations performing correct data link (cyclic transmission and transient transmission). (SW005B)

The network module's D.LINK LED are lit for the stations performing correct data links.

(21) Com Sts

Displays the host's communication status. (SW0047)

- Data link in progress
- Data link stopped (other)
  Cyclic transmission was stopped by other station.
- Data link stopped (host)
  Cyclic transmission was stopped by host.
- Baton pass being performed (no area)
  No allocation for the host B/W transmission range.
- Baton pass being performed (parameter error)
  Error in the host station's parameters.
- Baton pass being performed (parameter not received)
  The common parameters have not been received.
- Disconnected (No baton pass)
  Station number overlap, cable disconnected
- Disconnected (line error)
  Cable is not connected.
- Test in progress
  Executing online/offline testing.

(22) Cause of Cm-Ssp

Displays the cause of the host communication (transient transmission) is suspended. (SW0048)

- Normal
- Baton overlap
  Multiple batons were received.
- Baton pass timeout
  Baton did not return even after the set time.
- Online testing
  Online testing is being executed.
- Baton pass performed at other stations
  Baton pass is being at station other than the host.
- Same station number exists
  Station numbers are overlapping.
- Control station overlapping
  Control station overlapping.
- Offline test in progress
  Executing an offline testing.
- Misc. (error code)
  Refer to the error codes. (section 15.1)

(23) Cause for Ssp

Displays the cause of the host's data link (cyclic transmission and transient transmission) stopped. (SW0049)

- Normal
- Another station specification (station □)
  Cyclic transmission was stopped from another station (station □).
- Host specification
  Host stopped the cyclic transmission.
- All station specification (station □)
  Station □ stopped the cyclic transmission to all stations.
- No parameters
  Parameters were not received.
- Parameter error
  Error in the parameters set.
- Specific parameter unmatched
  Matching error with the common parameter and station specific parameter
- I/O allocation incorrect
  Remote I/O network's I/O allocation is erroneous.
- Misc. (error code)
  Refer to the error code (Section 15.1).

(24) Start Status

From host to host cyclic startup status is displayed. (SB0000, SB004C, SB004D, and SW004D)

- No specification
- Incomplete
- Complete
- Error (error code)

(25) Stop Status

From host to host cyclic stop status. (SB0001, SB004E, SB004F, and SW004F)

- No specification
- Incomplete
- Complete
- Error (error code)

(26) Start Status

From the host to the system cyclic startup status. (SB0002, SB0050, SB0051, and SW0051)

- No specification
- Incomplete
- Complete
- Error (error code)

(27) Stop Status

From the host to the system cyclic stop status. (SB0003, SB0052, SB0053, and SW0053)

- No specification
- Incomplete
- Complete
- Error (error code)

(28) ZNRD

Displays the execution status of the ZNRD/SEND/RECV/READ/WRITE/REQ instruction by the host. (SB0030, SB0031, and SW0031)

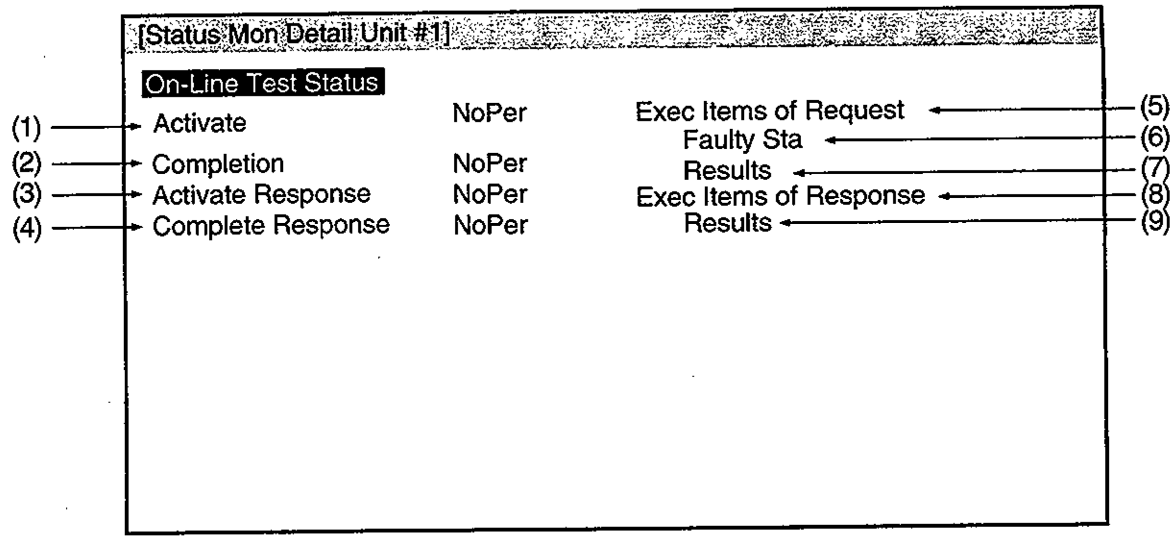
- No specification
- Incomplete
- Complete
- Error (error code)

(29) ZNWR

Displays the execution status of the ZNWR/SEND/RECV/READ/WRITE/REQ instruction by the host. (SB0032, SB0033, and SW0033)

- No specification
- Incomplete
- Complete
- Error (error code)

5.2.3 Checking the host's online testing status (test monitoring)



(1) Activate

Displays the host's online testing designation status. (SB00A8)

- Not executed
- Accepted

(2) Completion

Displays the host's online testing completion status. (SB00A9)

- Not executed
- Accepted

(3) Active Response

Displays the host's online testing response specification. (SB00AA)

- Not executed
- Accepted

(4) Complete Response

Indicates the host's online testing response completion status. (SB00AB)

- Not executed
- Accepted

(5) Exec Items of Request

Displays the execution items when the host is on the online testing request side. (SW00A8)

- Loop testing
- Setting check testing
- Station order check testing
- Communication testing

(6) Faulty Sta

Displays the station number of the faulty station if it exists during test execution. (SW00AB)

(7) **Results**

Displays the test resulsts when the host is on the requestor side. (SW00A9)

(8) **Exec Items of Response**

Displays the execution items when the host is on the online testing response side. (SW00AA)

- Loop testing
- Setting check testing
- Station order check testing
- Communication testing

(9) **Results**

Displays the test results when the host is on the test response side. (SW00AB)

5.3 Error History Monitor

The loop error, communication error, and transient transmission error history can be checked.

5.3.1 Line error accumulation count can be checked for each line (error history monitoring)

[Err History Monitoring Unit #1]

(1)	Loop Switching	0 Times	Transient Trans Err	0 Times	(2)
	Forward Loop		Reverse Loop		
(3)	# of Retries	0 Times	# of Retries	0 Times	
(4)	Com Link Error	0 Times	Com Link Error	0 Times	
	# of Com Errors		# of Com Errors		
(5)	UNDER	0 Times	UNDER	0 Times	
(6)	CRC	0 Times	CRC	0 Times	
(7)	OVER	0 Times	OUER	0 Times	
(8)	Short Frame	0 Times	Short Frame	0 Times	
(9)	Abort	0 Times	Abort	0 Times	
(10)	Time-out	0 Times	Time-out	0 Times	
(11)	Over 2KB Received	0 Times	Over 2KB Received	0 Times	
(12)	DPLL Error	0 Times	DPLL Error	0 Times	

(1) Loop Switching
Displays the number of loop switching or loop back operations. (SW00CE)

(2) Transient Trans Err
Displays the number of errors occurred during the transient transmission. (SW00EE)

(3) # of Retries
Displays the number of retries (retry for communication during communication error). (SW00C8 and SW00C9)

(4) Com Link Error
Displays the number of line error occurrences. (SW00CC and SW00CD)

(5) UNDER
Displays the number of UNDER error occurrences. (SW00B8 and SW00C0)

(6) CRC
Displays the number of CRC error occurrences. (SW00B9 and SW00C1)

(7) OVER
Displays the number of OVER error occurrences. (SW00BA and SW00C2)

(8) Short Frame
Displays the number of short frame (data length too short) error occurrences. (SW00BB and SW00C3)

(9) Abort
Displays the number of AB. IF error occurrences. (SW00BC and SW00C4)

(10) Time-out
Displays the number of TIME error occurrences. (SW00BD and SW00C5)

(11) Over 2KB Received

Displays the number of DATA error occurrences. (SW00BE and SW00C6)

(12) DPLL Error

Displays the number of DPLL error occurrence (data cannot be correctly recognized for sync/modulation). (SW00BF and SW00C7)

5.3.2 Checking the cause for the loop switching transient transmission error status (error history monitoring details)

(1) (2) (3)

```
[Status:Mon:Detail,Unit #1]
[Loop Switching]   Post-Sw Status    Sta Cause     Post-Sw Status
  Sta Cause        LoopBk Trans   9.
1.  1 H/W Err (F)                10.
2.                               11.
3.                               12.
4.                               13.
5.                               14.
6.                               15.
7.                               16.
8.
[Transient Trans Err]
 Err-Code Err-Kind        Err-Code Err-Kind        Err-Code Err-Kind
1.                   7.                      13.
2.                   8.                      14.
3.                   9.                      15.
4.                  10.                      16.
5.                  11.
6.                  12.
```

(4)

(1) Sta

Displays the station number of the station requesting the loop switching or loop back. (Not always adjacent.) (SW00E0 to E7)

(2) Cause

Displays the cause for switching loop or loop back. (SW00D0 to DF)

- Return instr.
- F. loop H/W error — Cable, optical module error
- R. loop H/W error
- F. loop forced error — Error was forced to execute loop back.
- R. loop forced error
- F. loop continuous communication error — Communication unstable from repeating of normal/abnormal.
- R. loop continuous communication error
- F. loop continuous line error
- R. loop continuous line error

(3) Post-SW Status

Displays the data link status after loop switching. (SW00D0 to DF)

- Multiplex transmission — Forward loop/reverse loop normal
- Forward loop transmission
- Reverse loop transmission
- Loop back transmission

(4) Err-code

Displays the error code. (SW00F0 to FF)
Refer to Section 15.1.

6 Link Data Communication Processing and Processing Time

This chapter describes the link data communication method and processing time for the MELSECNET/10 network system.

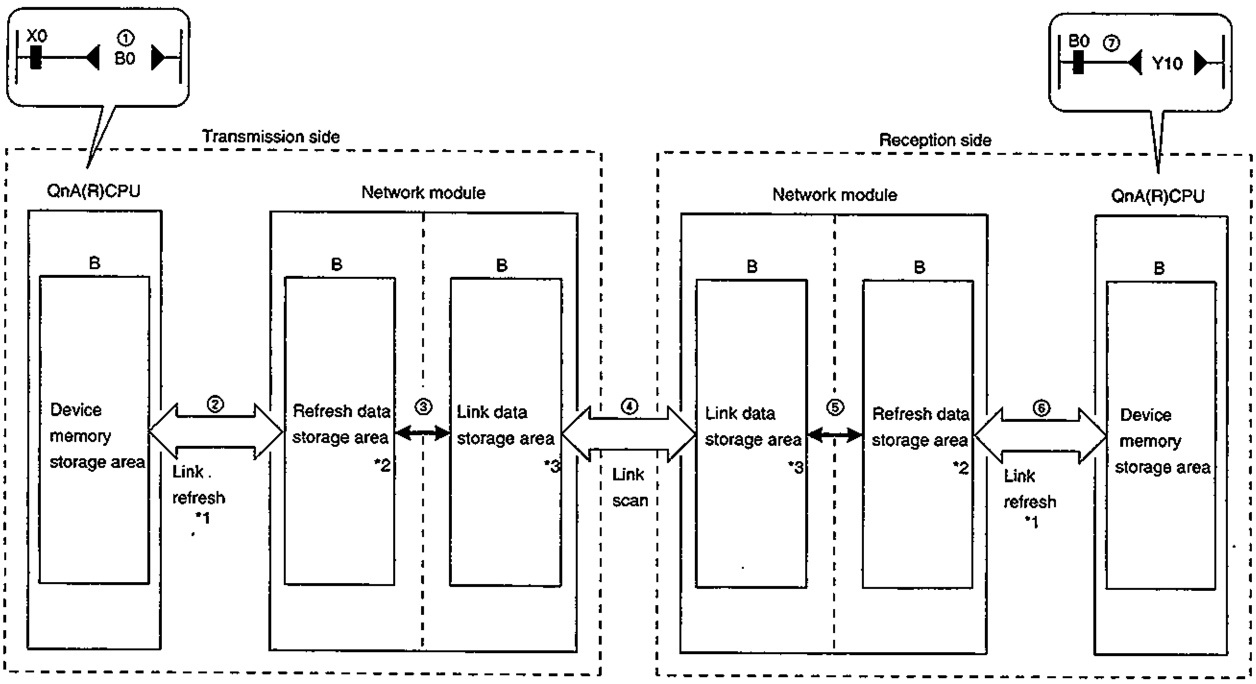
6.1 Inter-PC network

6.1.1 Link data communication processing

(1) Communication processing overview

The inter PC network communciates with B/W/X/Y.
Here, an example with the link relay (B) is explained.

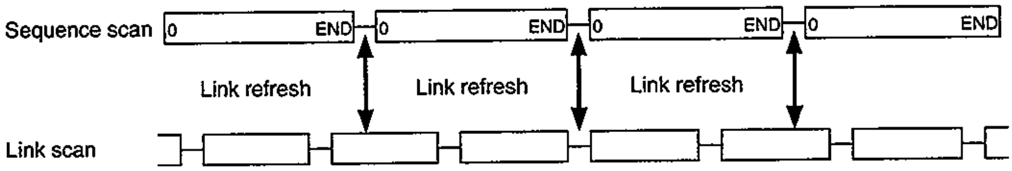
1) The transmission side B0 turns on.
2) With link refresh, the B0 data is stored in the network module's refresh data storage area.
3) The B0 data in the refresh data storage area is stored in the link data storage area.
4) With link scan, the B0 data in the link data storage area is stored in the network module's link data storage area of the reception side.
5) The B0 data in the link data storage area is stored in the refresh data storage area.
6) With link refresh, the B0 data is stored in the QnA(R)CPU device memory storage area.
7) B0 on the reception side turns on.



*1.....Set with the network refresh parameters.
*2.....Set with the station sepcific parameters. (When not set, the common parameter is stored as is.)
*3.....Set with the common parameter.

(2) Link scan and link refresh

The link scan is performed "Rasynchronously" with the QnA(R)CPU sequence scan. The link refresh is performed with the QnA(R)CPU "END processing".



(3) Link data when communication error/communication stop occurs in a station

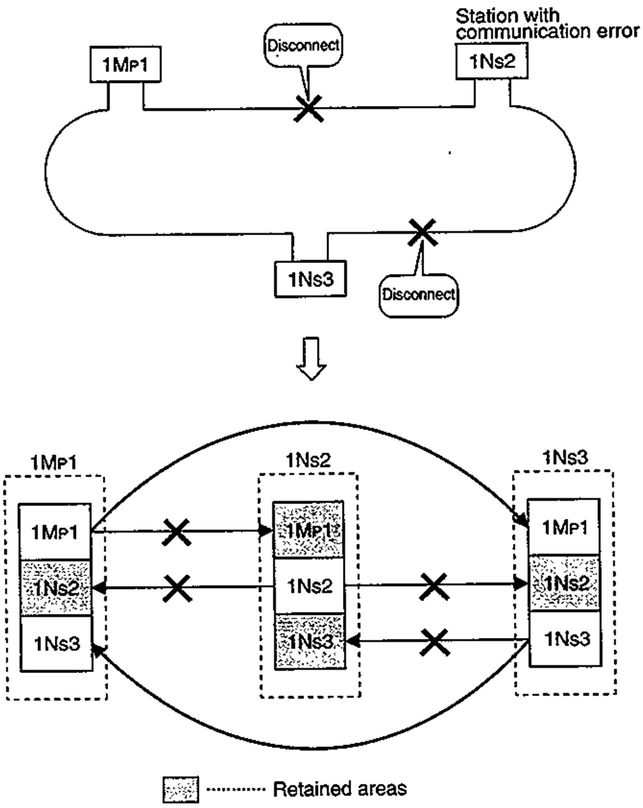
When communication error or communication stop error occurred in a station during data link, the data received from the station in which the communication error or communication stop occurred retains the previous data.

(Communication faulty station refers to a station where the cyclic transmission was stopped by a peripheral device.)

(a) Communication normal station retains the data received from the communication faulty station or communication stopped station.

(b) The data received from another station is retained in the communication stopped station.

[Example] When 1Ns2 results in communication error from cable disconnection.



(4) SB/SW when communication error or communication stop occurs in station

Using the link special relay/register (SB/SW), the status of the station in which communication error/communication stop occurred can be checked.
Use as the interlock in the program.

Link special relay/register details

Link special relay/register	Description	Signal status	
		OFF	**ON**
SB47	Indicates the host's baton pass progress status.	In progress	Stop
SB49	Indicates the host's cyclic transmission status.	Normal	Error
SB70	Indicates all station's (including the host) baton pass progress status. However, the status for the number of stations set in the parameter is checked.	All stations in progress	Stopped station(s) exist
SW70 to 73	Indicates the baton pass progress status of each status. Each bit corresponds to each station's status.	In progress	Stop
SB74	Indicates all station's (including the host) cyclic transmission status. However, the status for the number of stations set in the parameter is checked.	All stations normal	Error station(s) exist
SW74 to 77	Indciates the cyclic transmission status of each station. Each bit corresponds to each station's status.	Normal	Error

6.1.2 Transmission delay time

(1) Double layer system (within the same network) transmission delay time

(a) B/W/X/Y communication

The B/W/X/Y communication transmission delay time is calculated using the following formula:

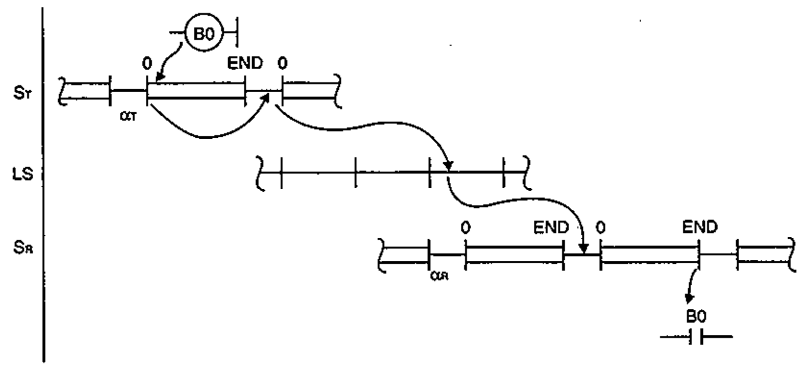
- Sequence program scan time for sending and receiving stations.
- Link refresh
- Link scan time

[B/W/X/Y communication transmission delay time (T_D1)]

$$T_{D1} = S_T + \alpha_T + (LS \times 3) + (S_R \times 2) + \alpha_R \text{ [ms]}$$

S_T : Sequence program scan time at send side
S_R : Sequence program scan time at receive side
α_T : Link refresh time at send side *1
α_R : Link refresh time at receive side *1
LS : Link scan time

*1 : Total network module(s) installed.



(b) ZNRD/ZNWR/SEND/READ/WRITE/REQ instruction communication

The ZNRD/ZNWR/SEND/READ/WRITE/REQ instruction communication transmission delay time is calculated using the following formula:

- Sequence program scan time for sending and receiving stations
- Link refresh
- Link scan time

[Instruction communication transmission delay time (T_D2)]

$$T_{D2} = (S_T \times 2) + (\alpha_T \times 2) + (LS \times 6) + (S_R \times 2) + (\alpha_R \times 2)$$

$$+\left\{\left(\frac{\text{(Same network transientrequest)}}{\text{(Max. transient count)}}\right)^{*1} - 1\right\} \times (LS \times 2) \quad \text{[ms]}$$

S_T : Sequence program scan time at send side

S_R : Sequence program scan time at receive side

α_T : Link refresh time at send side *2

α_R : Link refresh time at receive side *2

LS : Link scan time

Simultaneous transient request :

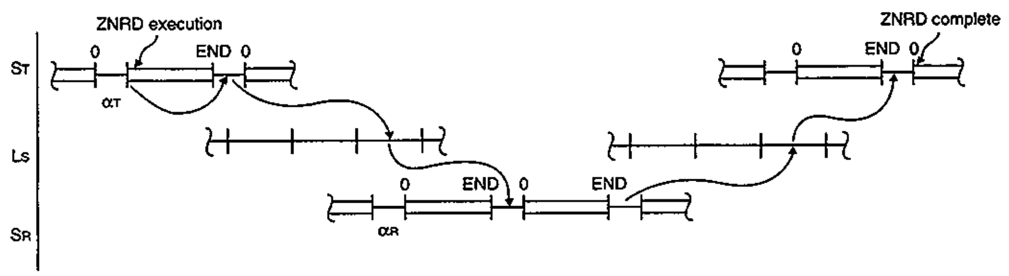
Total numer of transient transmission requests made during one link scan from the stations on the same network.

Max. number of transient communication. :

Maximum number of transient transmissions in one link scan set in the auxiliary setting of the common parameters.

*1 : Rounded up at decimal point.

*2 : Total number of network module(s) installed.



Remark

When executing the transient transmission at the same time from multiple stations, the instruction execution time can be shortened by increasing the set value for the maximum number of transient transmissions for one link scan.

For example, if there are seven stations that execute instruction, modifying the max number of transient transmissions from two (default value) to more than seven shortens the "LS x 6" time.

(c) Link refresh time

The link refresh time (END processing time extension for CPU) is calculated using the following formula:

- Link device allocation points
- Transmission to the extension file register (R, ZR)
- Transmission between data links
- Used CPU type

[Link refresh time (α_T: sending side, α_R: receiving side)]

$$\alpha_T, \alpha_R = KM1 + KM2 \times \left(\frac{B + X + Y + SB + (W \times 16) + (SW \times 16)}{8} \right)$$

$$+ \alpha_E + \alpha_L + ((\text{Number of network modules}) - 1) \quad [\text{ms}]$$

$$\alpha_E = KM3 \times \left(\frac{B + X + Y + (W \times 16)}{8} \right)$$

$$\alpha_L = KM4 + KM5 \times \left(\frac{B + (W \times 16)}{8} \right)$$

B : Total points of the link relays (B) used at all stations *1
W : Total points of the link registers (W) used at all stations *1
X : Total points of the link input (X) used at all stations *1
Y : Total points of the link output (Y) used at all stations *1
(B, W, X, Y: Refer to Section 6.4)
SB : Link special relay (SB) points
SW : Link special register (SW) points
α_E : Extended file register (R, ZR) transmission time *2
α_L : Transfer time between data links *2
KM1, KM2, KM3, KM4, KM5 : Constant

Constant / CPU type	KM1	KM2		KM3	
		Other than A38HB	A38HB *3	Other than A38HB	A38HB *3
Q2ACPU(S1)	2.3	0.00247	0.00125	0.00258	0.00133
Q3ACPU	1.8	0.00232	0.00123	0.00239	0.00131
Q4ACPU, Q4ARCPU	1.0	0.00216	0.00093	0.00228	0.00096

Constant / CPU type	KM4						KM5	
	Other than A38HB			A38HB *3			Other than A38HB	A38HB *3
	2 modules	3 modules	4 modules	2 modules	3 modules	4 modules		
Q2ACPU(S1)	3.2	4.2	5.2	3.0	4.0	5.2	0.00520	0.00289
Q3ACPU	2.6	3.4	4.2	2.4	3.1	3.8	0.00483	0.00257
Q4ACPU, Q4ARCPU	1.6	2.2	2.7	1.3	1.8	2.3	0.00443	0.00187

*1: From the first to last point of the set range (unused areas in between are included in points).
*2: Set to "0" when not used.
*3: When network module is installed at A38HB.

(d) Link scan time

The link scan time is calculated using the following formula:

- Link device allocation points
- Number of stations connected

[Link scan time (LS)]

$$LS = KB + (0.75 \times \text{Total number of stations}) + \left(\frac{B + Y + (W \times 16)}{8} \times 0.001 \right)$$
$$+ (T \times 0.001) + (F \times 4) \ \text{[ms]}$$

KB : Constant

Total number of 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

B : Total points of link relay (B) used at all stations *1
W : Total points of the link registers (W) used at all stations *1
X : Total points of the link input (X) used at all stations *1
Y : Total points of the link output (Y) used at all stations *1
T : Maximum size (no. of bytes) for transient transmission during one link scan. *2
F : Number of recovered stations (only when there is a faulty station)

*1 : From the first to last point of the setting range (unused areas in between are included in the points).
*2 : When transient transmissions occur from multiple stations at the same time, the maximum is the total of them.

(2) Transmission delay time in transmissions between data links

In multilayer systems, the transmission delay time until the data is transmiteed to another network using the data link transmission function can be calculated from the following elements.

(Transmission delay time of data link transmission) = (Processing time from transmission station to midpoint station) + (Processing time from midpoint station to receiving station) – (Midpoint station scan time)

(a) Processing time from sending station to midpoint station

This is the transmission delay time from the station which wrote the data (sending station) to the midpoint station which transmits between data links. In the example shown in Figure 6.1, this is the time to send data from the 1MP1 station to INs3 station. Calculate the value using the formula for the double layer system transmission delay time shown in Section 6.1.2 (1) (a).

(b) Processing time from midpoint station to receiving station.

This is the transmission delay time to send the data received from sending station from the midpoint station to the data receiving station. In the example in Figure 6.1, this is the time to send data from the 2MP1 station to 2Ns3 station.

Calculate the value using the formula method for the double layer system transmission delay time shown in Section 6.1.2 (1) (a).

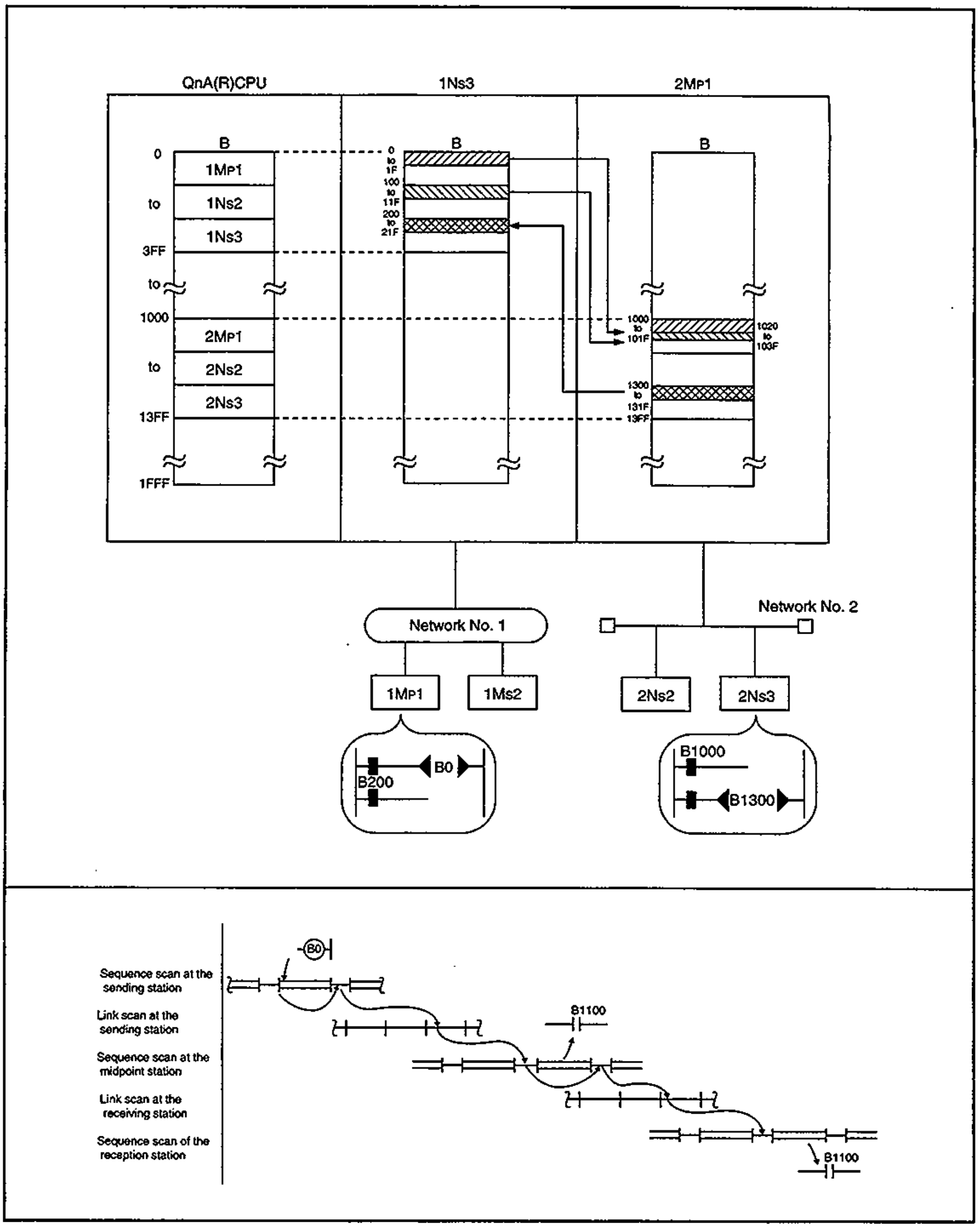


Figure 6.1 Transmission delay in data link transmission

(3) Routing transmission delay time

In double layer systems, the processing time to access another station on another network using the transient transmission instruction can be calculated by adding the following transmission delay elements.

(Routing transmission delay time) =
(Processing time from request origin to midpoint station)
+ (Processing time from the midpoint station to the request destination)

(a) Processing time from the request origin to midpoint station
This is the transmission delay time from the request origin (station which executed the instruction) to the midpoint station to perform the routing. In the example shown in Figure 6.2, this is the time to send data from the 1MP1 station to lNs3 station. Calculate the value using the formula for the double layer system transmission delay time shown in Section 6.1.2 (1) (b).

(b) Processing time from midpoint station to request destination
This is the transmission delay time from the midpoint station to request destination (station to be accessed by instruction). In the example in Figure 6.2, this is the time to transmitted data from the 2MP1 station to 2Ns3 station.
Calculate the value using the formula for the double-layer system transmission delay time shown in Section 6.1.2 (1) (b).

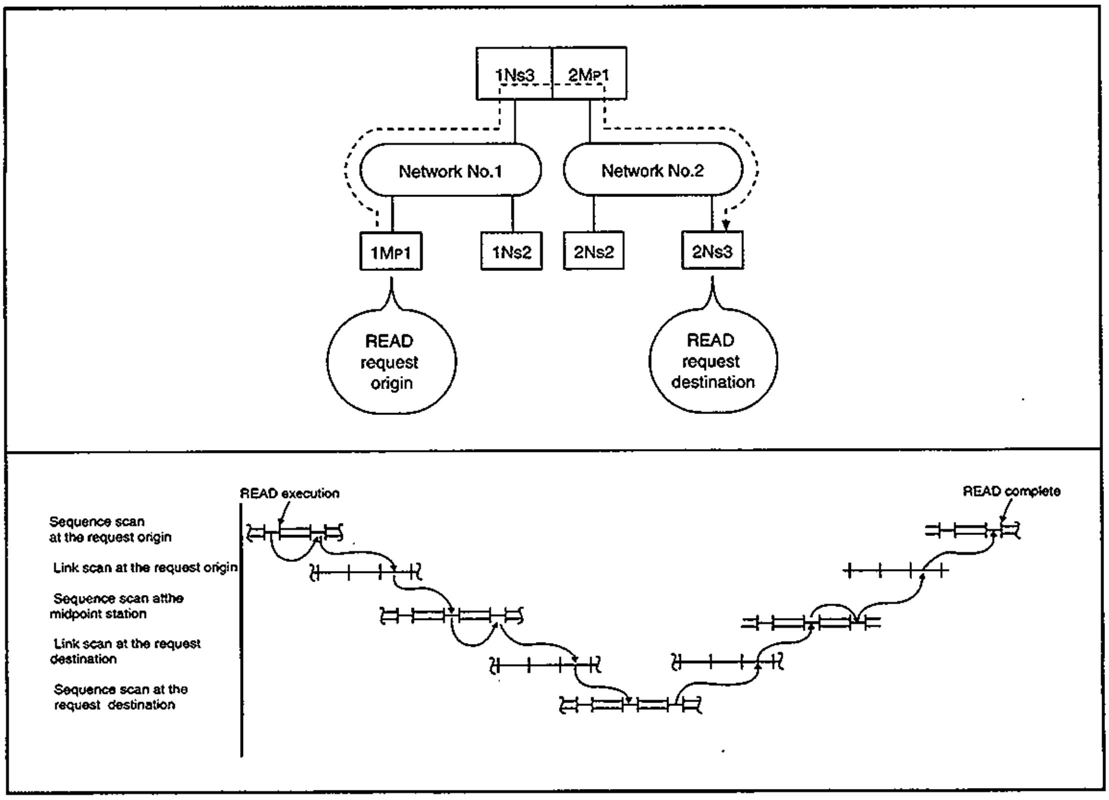


Figure 6.2 Routing transmission delay

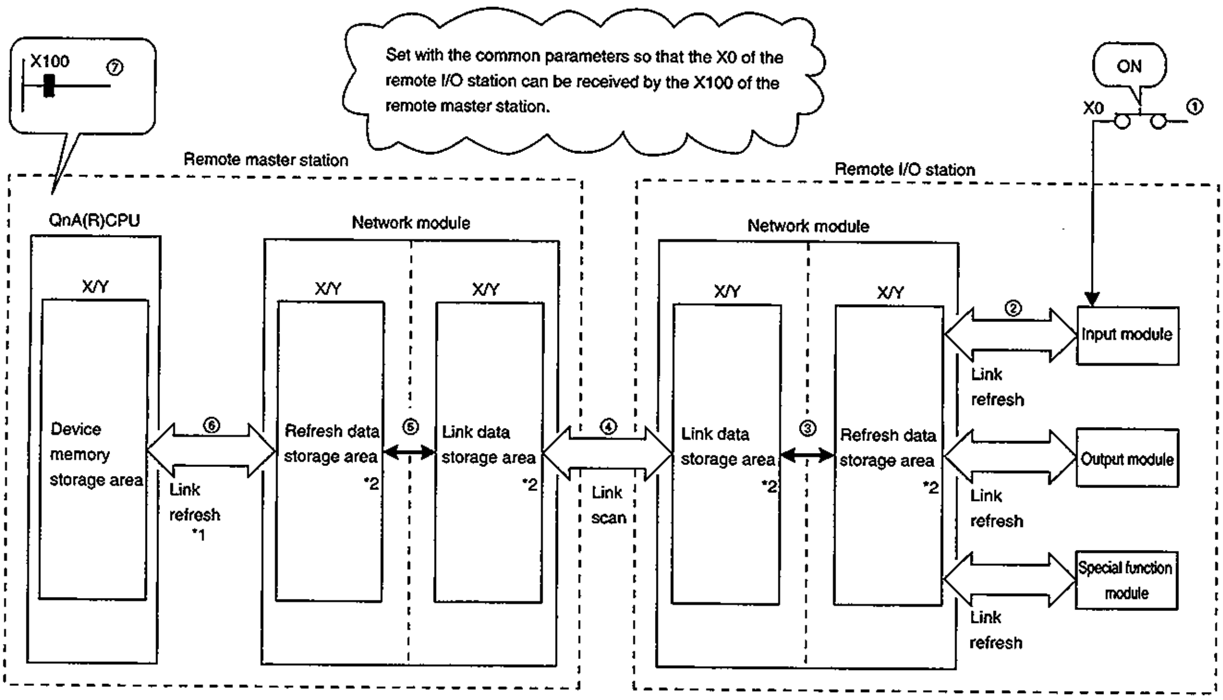
6.2 Remote I/O network

6.2.1 Link data communication processing

(1) Transmission/receiving processing overview

The remote I/O network communicates with X/Y/B/W.
Here, an example for receiving the remote I/O station input (X) is explained.

1) The remote I/O station input (X) turns on.
2) With link refresh, the input data (X) is stored in the network module's refresh data storage area.
3) The input data (X) in the refresh data storage area is stored in the link data storage area.
4) With link scan, the input data (X) in the link data storage area is stored in the link data storage area of the remote master station's network module.
5) The input data (X) in the link data storage area is stored in the refresh data storage area.
6) With link refresh, the imput data (x) is stored in the QnA(R)CPU device memory storage area.
7) X100 of the remote master station turns on.

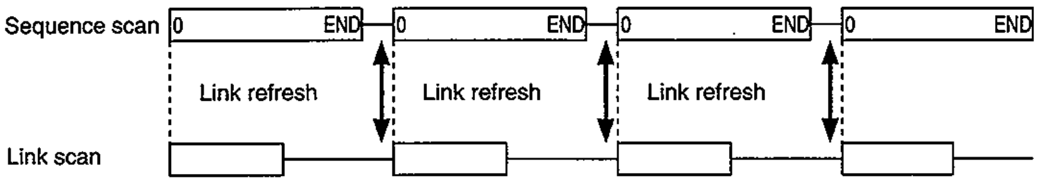


*1.....Set with the network refresh parameters.
*2.....Set with the common parameters.

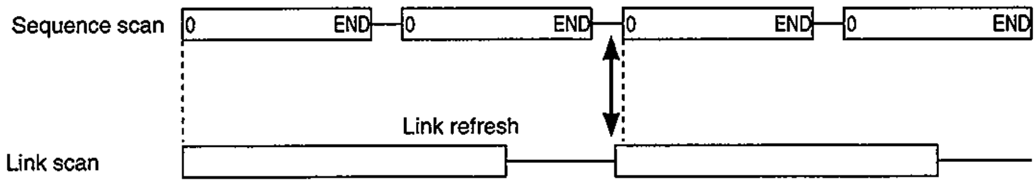
(2) **Link scan and link refresh**

The link scan is performed "synchronously" with the QnA(R)CPU sequence scan. The link refresh is performed with the QnA(R)CPU "END processing".

(a) Sequence scan > Link scan



(b) Sequence scan < Link scan

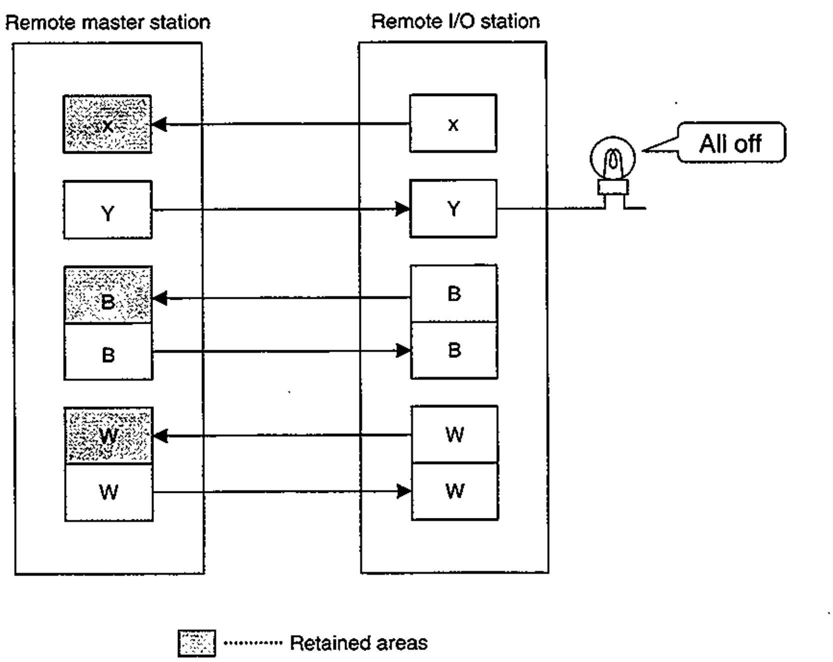


(3) **Link data when communication error/communication stop occurs in station**

When a communication error or communication stop has occurred in the remote I/O station during data link, the data received from the station (X, B, W) with the communication error or stopped communication retains the previous data.

Remote I/O station output (Y) will be all off.

(Station with communication stop refers to stations where the cyclic transmission was stopped by a peripheral device.)



(4) SB/SW when communication error or stopped communication occurs in station

Using the link special relay/register (SB/SW), the occurrence status of the station with the communication error/stopped communication can be checked.

Use as the interlock in the program.

Link special relay/register details

Link special relay/register	Details	Signal status	
		OFF	**ON**
SB47	Indicates the host's baton pass progress status.	In progress	Stop
SB49	Indicates the host's cyclic transmission status.	Normal	Error
SB70	Indicates all station's (including the host) baton pass progress status. However, the status for the number of stations set in the parameter is checked.	All stations in progress	Stopped station(s) exist
SW70 to 73	Indicates the baton pass progress status of each status. Each bit corresponds to each station's status.	In progress	Stop
SB74	Indicates all station's (including the host) cyclic transmission status. However, the status for the number of stations set in the parameter is checked.	All stations normal	Error station(s) exist
SW74 to 77	Indicates the cyclic transmission status of each station. Each bit corresponds to each station's status.	Normal	Error

6.2.2 Transmission delay time

The item names used in (1) to (3) from the next page on, are expressed in abbreviations.
There are times when multiple station types may apply.

<table>
<tr><th>Item name</th><th>Target station type</th></tr>
<tr><td rowspan="5">(1) Remote master station ↔ Remote I/O station</td><td>• Remote master station ↔ Remote I/O station</td></tr>
<tr><td>• Multiple remote master station ↔ Remote I/O station

Caution
Perform calculation by using Sm as the multiple layer remote master station sequence program scan time, and αm as multiple layer remote master station link refresh time.</td></tr>
<tr><td>• Multiple remote submaster station (when there is an error at the multiple remote master station) ↔ Remote I/O station

Caution
Perform calculation by using Sm as sequence program scan time at the multiple remote submaster station, and αm as link refresh time at the multiple remote submaster station.</td></tr>
<tr><td>• Parallel remote master station ↔ Remote I/O station

Caution
Perform calculation by using Sm as sequence program scan time at the parallel remote master station, and αm as link refresh time at the parallel remote master station.</td></tr>
<tr><td>• Parallel remote submaster station (when there is an error at the parallel remote master station) ↔ Remote I/O station

Caution
Perform calculation by using Sm as sequence program scan time at the parallel remote submaster station, and αm as link refresh time at the parallel remote submaster station.</td></tr>
<tr><td>(2) Remote submaster station ↔ Remote I/O station</td><td>Parallel remote submaster station (when there is an error at the parallel remote master station) ↔ Remote I/O station</td></tr>
<tr><td>(3) Remote master station ↔ Remote submaster station</td><td>Multiple remote master station ↔ Multiple remote submaster station
Parallel remote master station ↔ Parallel remote submaster station</td></tr>
</table>

(1) Remote master station ↔ remote I/O station

(a) X/Y communication

The X/Y communication transmission delay time is calculated using the following formula:

- Sequence program scan time at remote master station
- Link refresh time
- Link scan time

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

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

$$T_{DX} = \underline{(Sm + \alpha m)} \times 3 + Sm - LS - \alpha r \ \ [ms]$$

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

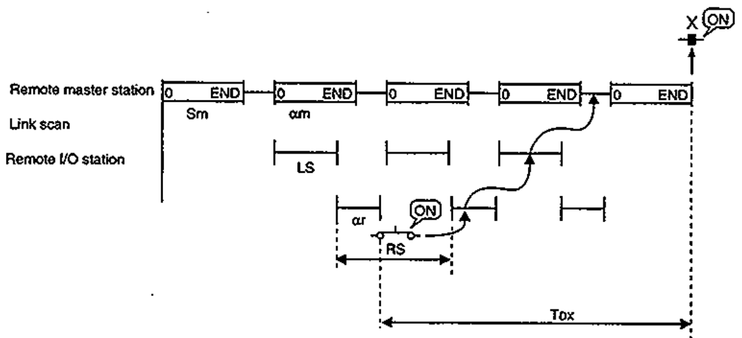
$$T_{DX} = \left\{ \underline{(Sm + \alpha m) \times \left(\frac{LS + \alpha r}{Sm + \alpha m} \right)^{*1}} \right\} \times 3 + Sm - LS - \alpha r \ \ [ms]$$

Wavy line areas are different.

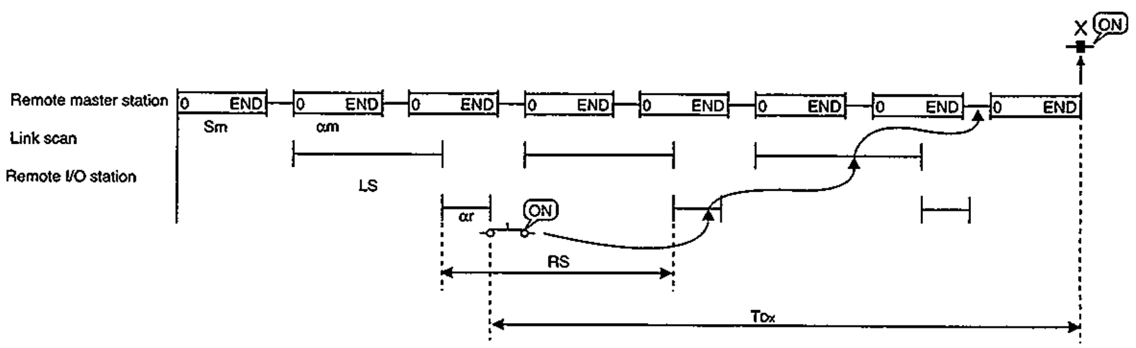
Sm : Sequence program scan time of remote master station
αm : Link refresh time at remote master station *2
αr : Link refresh time at remote I/O station
LS : Link scan time
RS : Link scan time at remote I/O station

*1 : Rounded up at decimal point.
*2 : Total number of network module(s) 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)]

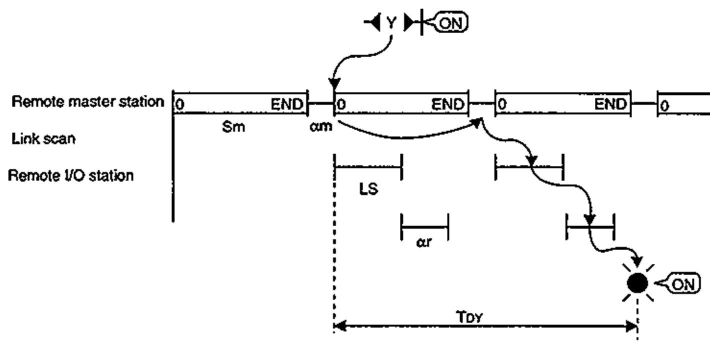
$$T_{DY} = \underline{\left\{ (Sm + \alpha m) \times \left(\frac{LS + \alpha r}{Sm + \alpha m} \right)^{*1} \right\}} + LS - \alpha r \ [ms]$$

Wavy line areas are different.

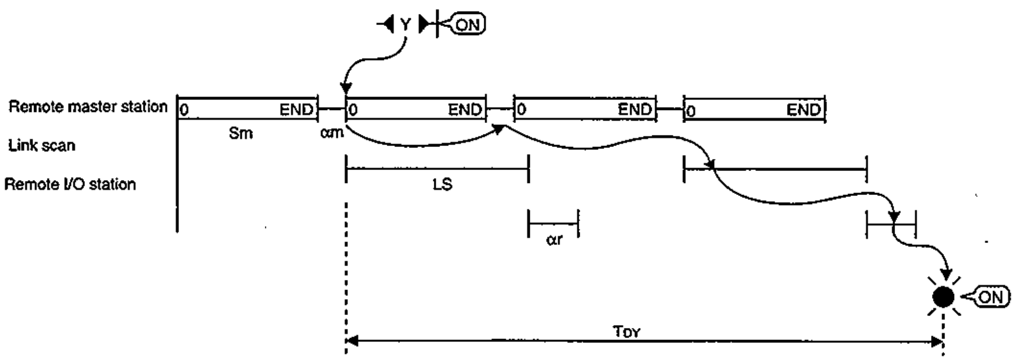
Sm : Sequence program scan time of remote master station
αm : Link refresh time at remote master station *2
αr : Link refresh time at remote I/O station
LS : Link scan time

*1 : Rounded up at decimal point.
*2 : Total number of network module(s) installed.

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



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



(b) ZNFR/ZNTO instructions

The ZNFR/ZNTO instructions transmission delay time is calculated using the following formula:

- Sequence program scan time of remote master station
- Link refresh time
- Link scan time

[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)]

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

Wavy line areas are different.

Sm : Sequence program scan time of remote master station

αm : Link refresh time at remote master station *2

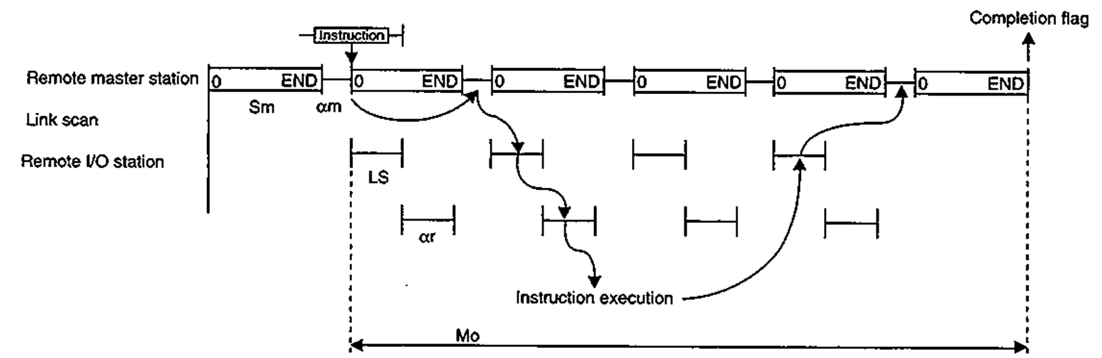
αr : Link refresh time at remote I/O station

LS : Link scan time

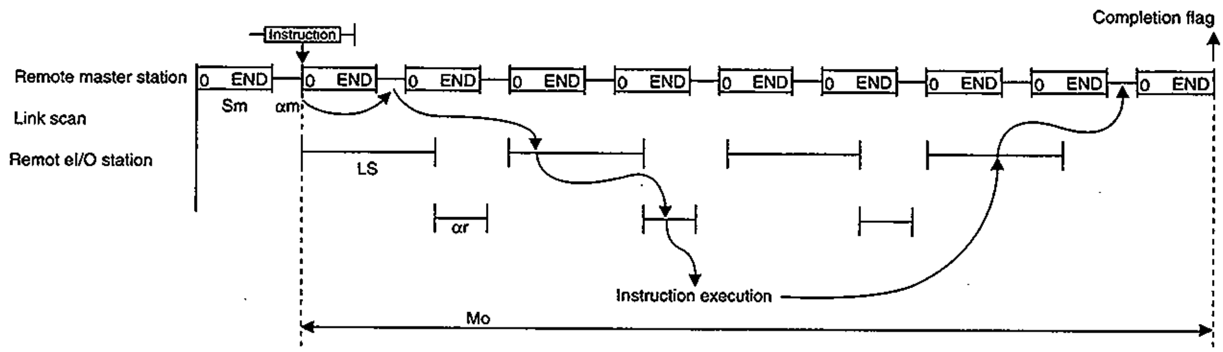
*1 : Rounded up at decimal point.

*2 : Total number of network module(s) installed.

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



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



(2) Remote submaster station ↔ remote I/O station

(a) X/Y communication

The X/Y communication transmission delay time is the calculated using the following formula:

- Sequence program scan time at remote master station
- Sequence program scan time at remote submaster station
- Link refresh time
- Link scan time

[X transmission delay time (TDX)]

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

$$T_{DX} = \underline{(Sm + \alpha m)} \times 2 + (Ss \times 2) + \alpha s - \alpha r \ \ [ms]$$

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

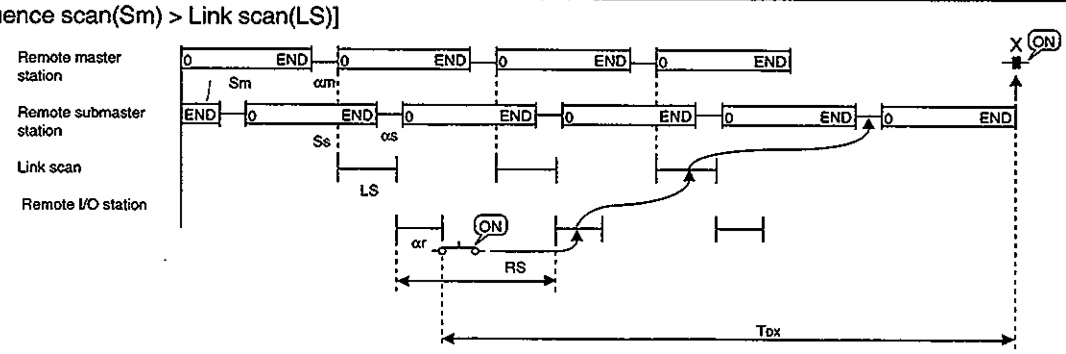
$$T_{DX} = \left\{ \underline{(Sm + \alpha m) \times \left(\frac{LS + \alpha r}{Sm + \alpha m} \right)^{*1}} \right\} \times 2 + (Ss \times 2) + \alpha s - \alpha r \ \ [ms]$$

Wavy line areas are different.

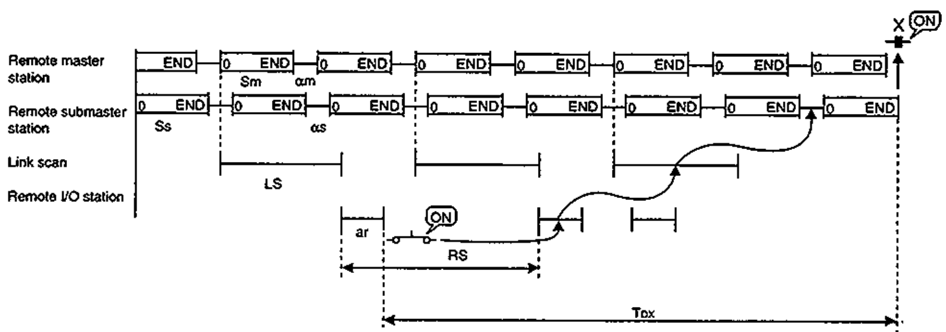
Sm : Sequence program scan time of remote master station
Ss : Sequence program scan time at remote submaster station
αm : Link refresh time at remote master station *2
αs : Link refresh time at remote submaster station *2
αr : Link refresh time at remote I/O station
LS : Link scan time
RS : Link scan time at remote I/O station

*1 : Rounded up at decimal point.
*2 : Total number of network module(s) 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)]

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

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

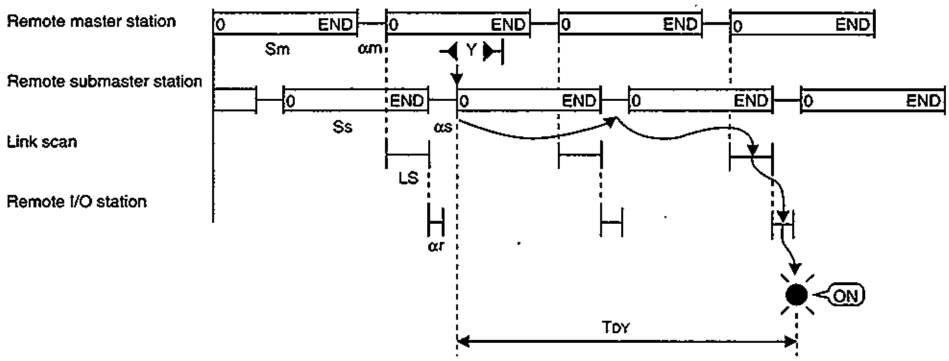
$$T_{DY} = \left\{ \underline{(Sm + \alpha m) \times \left(\frac{LS + \alpha r}{Sm + \alpha m} \right)^{*1}} \right\} + LS + \alpha r + Ss + \alpha s \ \ [ms]$$

Wavy line areas are different.

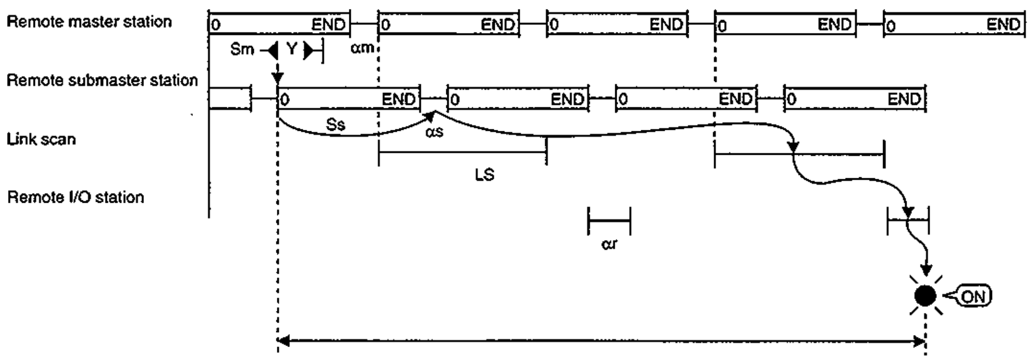
Sm : Sequence program scan time of remote master station
Ss : Sequence program scan time at remote submaster station
αm : Link refresh time at remote master station *2
αs : Link refresh time at remote submaster station *2
αr : Link refresh time at remote I/O station
LS : Link scan time

*1 : Rounded up at decimal point.
*2 : Total number of network module(s) installed.

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



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



(b) ZNFR/ZNTO instruction

The ZNFR/ZNTO instruction transmission delay time uses the formula shown below:

- Sequence program scan time of remote master station
- Sequence program scan time of remote submaster station
- Link refresh time
- Link scan time

[Instruction transmission delay time (M_D)]

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

$$M_D = \underline{(Sm + \alpha m)} \times 3 + LS + \alpha r + (Ss \times 3) + (\alpha s \times 2) \ [ms]$$

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

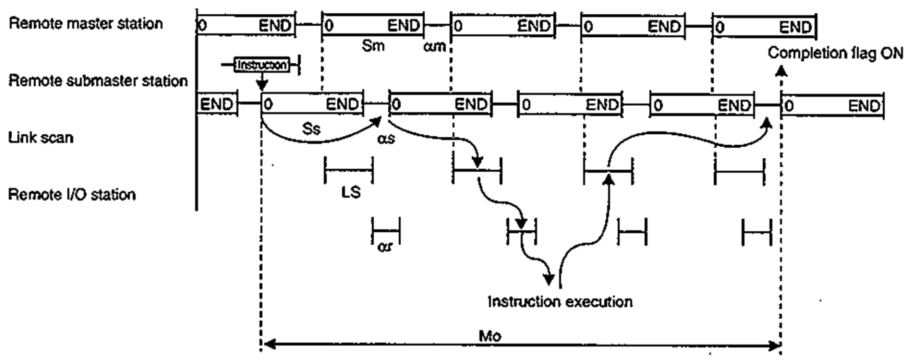
$$M_D = \left\{ \underline{(Sm + \alpha m) \times \left(\frac{LS + \alpha r}{Sm + \alpha m} \right)^{*1}} \right\} \times 3 + LS + \alpha r + (Ss \times 3) + (\alpha s \times 2) \ [ms]$$

Wavy line areas are different.

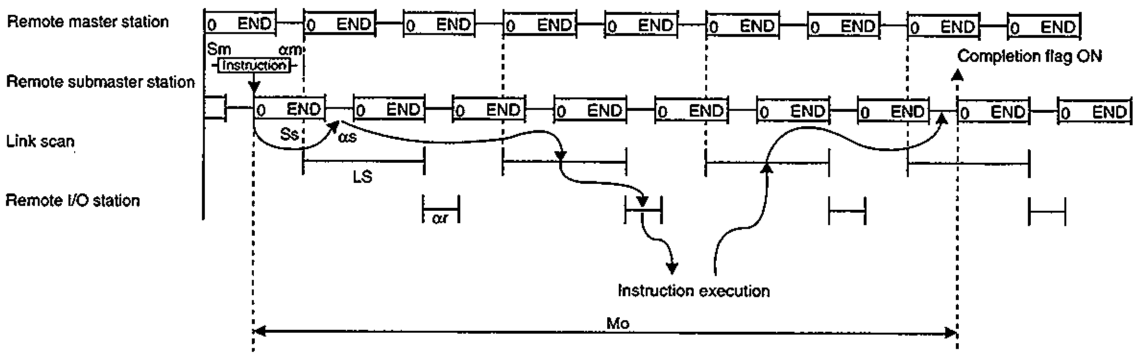
Sm : Sequence program scan time of remote master station
Ss : Sequence program scan time at remote submaster station
αm : Link refresh time at remote master station *2
αs : Link refresh time at remote submaster station *2
αr : Link refresh time at remote I/O station
LS : Link scan time

*1 : Rounded up at decimal point.
*2 : Total number of network module(s) installed.

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



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



(3) Remote master station → remote submaster station

(a) B/W/X/Y communication

The B/W/X/Y communication transmission delay time uses the formula shown below:

- Sequence program scan time of remote master station and remote submaster station
- Link refresh time of remote master station and remote submaster station
- Link refresh time of remote master station

[B/W/X/Y transmission delay time (T_D)]

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

$$T_D = \underline{(Sm + \alpha m)} + LS + (Ss \times 2) + \alpha s \ \text{[ms]}$$

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

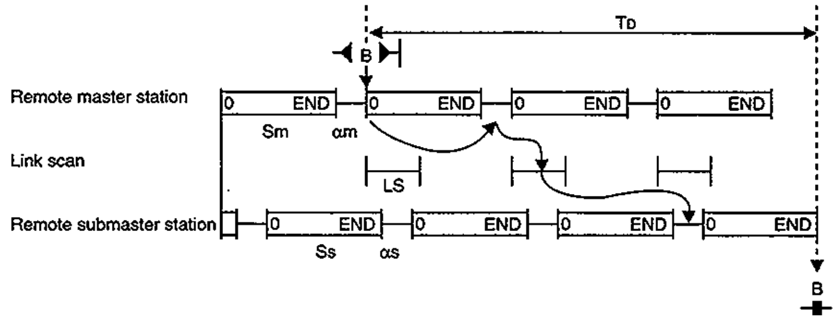
$$T_D = \left\{ \underline{(Sm + \alpha m) \times \left(\frac{LS + \alpha r}{Sm + \alpha m} \right)^{*1}} \right\} + LS + (Ss \times 2) + \alpha s \ \text{[ms]}$$

Wavy line areas are different.

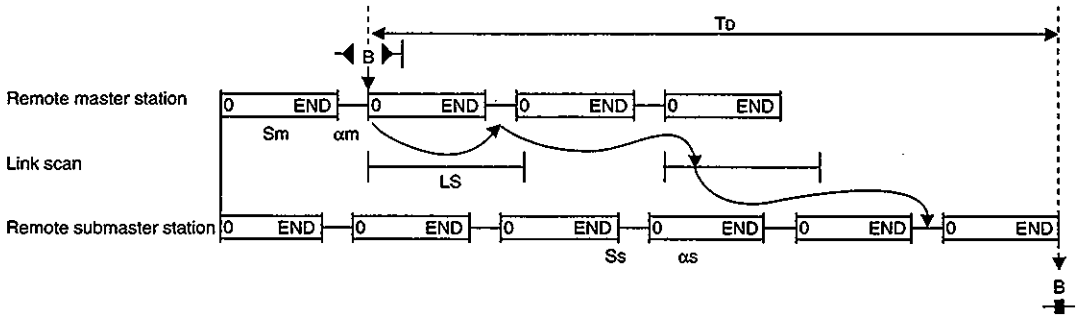
Sm : Sequence program scan time of remote master station
Ss : Sequence program scan time at remote submaster station
αm : Link refresh time at remote master station *2
αs : Link refresh time at remote submaster station *2
LS : Link scan time

*1 : Rounded up at decimal point.
*2 : Total number of network module(s) installed.

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



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



(b) ZNRD/ZNWR/SEND/READ/WRITE/REQ instruction

The ZNRD/ZNWR/SEND/READ/WRITE/REQ instruction transmission delay time uses the calculation method shown below from:

- Sequence program scan time of remote master station and remote submaster station
- Link refresh time of remote master station and remote submaster station
- Link scan time of remote master station

[Command transmission delay time (MD)]

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

$$M_D = \underline{(Sm + \alpha m)} \times 2 + LS + (Ss \times 3) + (\alpha s \times 4) \ \text{[ms]}$$

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

$$M_D = \left\{ \underline{(Sm + \alpha m) \times \left(\frac{LS + \alpha r}{Sm + \alpha m} \right)^{*1}} \right\} \times 2 + LS + (Ss \times 3) + (\alpha s \times 4) \ \text{[ms]}$$

Wavy line areas are different.

Sm : Sequence program scan time of remote master station

Ss : Sequence program scan time at remote submaster station

αm : Link refresh time at remote master station *2

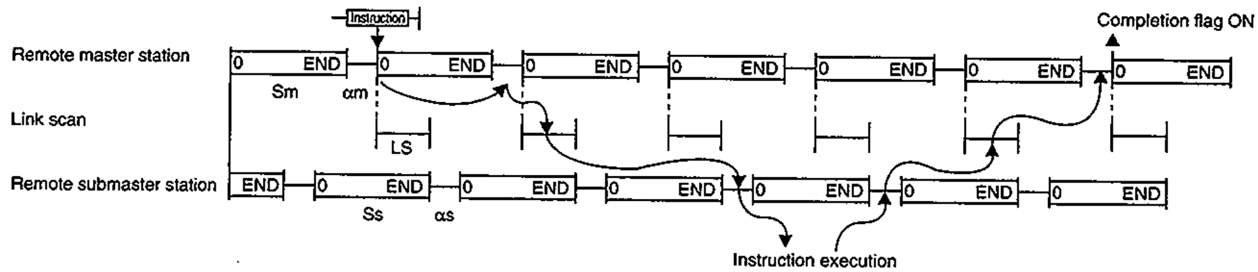
αs : Link refresh time at remote submaster station *2

LS : Link scan time

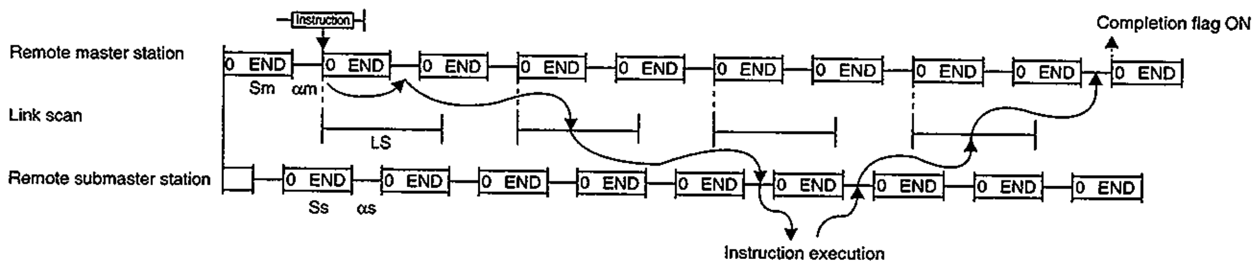
*1 : Rounded up at decimal point.

*2 : Total number of network module(s) installed.

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



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



(4) **Remote submaster station → remote master station**

(a) B/W/X/Y communication

The B/W/X/Y communication transmission delay time uses the formula shown below:

- Sequence program scan time of remote master station and remote submaster station
- Link refresh time of remote master station
- Link refresh time of remote master station

[B/W/X/Y transmission delay time (T_D)]

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

$$T_D = \underline{(Sm + \alpha m)} \times 2 + Sm + Ss \ \ [ms]$$

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

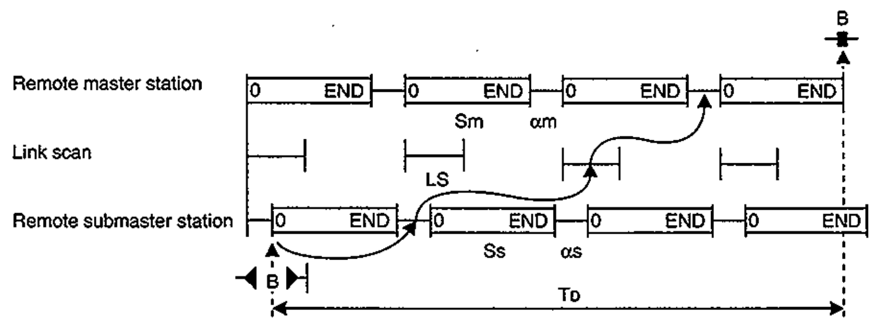
$$T_D = \left\{ \underline{(Sm + \alpha m) \times \left(\frac{LS + \alpha r}{Sm + \alpha m} \right)^{*1}} \right\} \times 2 + Sm + Ss \ \ [ms]$$

Wavy line areas are different.

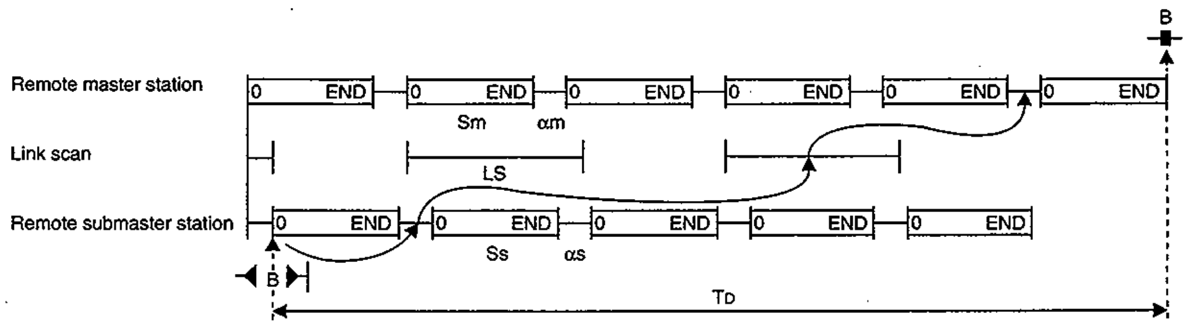
Sm : Sequence program scan time of remote master station
Ss : Sequence program scan time at remote submaster station
αm : Link refresh time at remote master station *2
αs : Link refresh time at remote submaster station *2
LS : Link scan time

*1 : Rounded up at decimal point.
*2 : Total number of network module(s) installed.

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



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



(b) ZNRD/ZNWR/SEND/READ/WRITE/REQ instruction

The ZNRD/ZNWR/SEND/READ/WRITE/REQ instruction transmission delay time uses the calculation method shown below from:

- Sequence program scan time of remote master station and remote submaster station
- Link refresh time of remote master station and remote submaster station
- Link scan time of remote master station

[Instruction transmission delay time (Md)]

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

$$M_D = \underline{(Sm + \alpha m)} \times 3 + LS + (Ss \times 2) + (\alpha s \times 3) \ \text{[ms]}$$

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

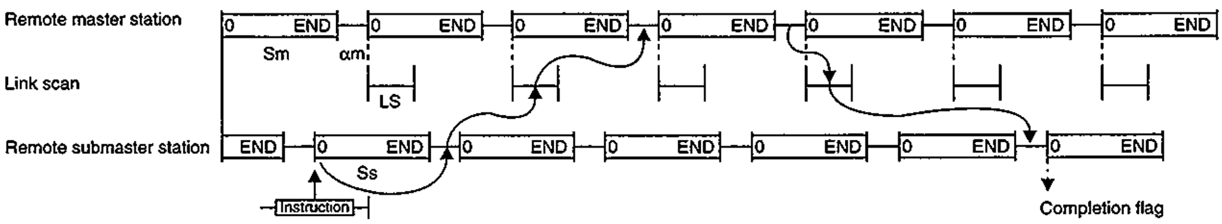
$$M_D = \left\{ \underline{(Sm + \alpha m) \times \left(\frac{LS + \alpha r}{Sm + \alpha m} \right)^{*1}} \right\} \times 3 + LS + (Ss \times 2) + (\alpha s \times 3) \ \text{[ms]}$$

Wavy line areas are different.

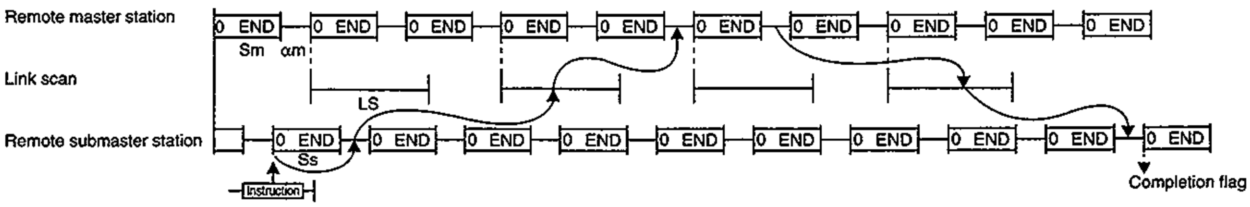
Sm : Sequence program scan time of remote master station
Ss : Sequence program scan time at remote submaster station
αm : Link refresh time at remote master station *2
αs : Link refresh time at remote submaster station *2
LS : Link scan time

*1 : Rounded up at decimal point.
*2 : Total number of network module(s) installed.

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



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



(5) Link refresh time

The link refresh time (END processing time extension at CPU) is calculated using the following formula:

- Link device allocation points
- CPU type used

[Link refresh time (αm, αs) of remote master station and remote submaster station]

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

αm : Remote master station
αs : Remote subsaster station
B : Total points of the link relays (B) used at all stations *1
W : Total points of the link registers (W) used at all stations *1
X : Total points of the link input (X) used at all stations *1
Y : Total points of the link output (Y) used at all stations *1
(B, W, X, Y: Refer to Section 6.4)
SB : Link special relay (SB) points
SW : Link special register (SW) points
KM1, KM2 : Constant

CPU type \ Constant	KM1 *2	KM2	
		Other than A38HB	A38HB *3
Q2ACPU(S1)	2.3	0.00247	0.00125
Q3ACPU	1.8	0.00232	0.00123
Q4ACPU, Q4ARCPU	1.0	0.00216	0.00093

*1: From the first to last of setting range (the unused areas in between are included in the points).
*2: 1ms is added for every network module added.
*3: When network module is installed to A38HB.

[Remote I/O station link refresh time (αr)]

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

X : Input (X) points used by the station
Y : Output (Y) points used by the station

(6) Link scan time

(a) Remote master station

Link scan time at the remote emaster station is calculated using the following formula:

- Link device allocation points
- Number of connected stations

[Remote master station link scan time (LS)]

$$LS = KB + (0.75 \times \text{Total number of stations}) + \left(\frac{B + X + Y + (W \times 16)}{8} \times 0.001\right)$$

$$+ KR + \left(\frac{Br + Xr + (Wr \times 16)}{8} \times 0.000375\right) + (T \times 0.001) \text{ [ms]}$$

B : Total points of the link relays (B) used at all stations *1
W : Total points of the link registers (W) used at all stations *1
X : Total points of the link input (X) used at all stations *1
Y : Total points of the link output (Y) used at all stations *1
Br : Total points of the link relays (B) used at each remote I/O station *2
Wr : Total points of the link registers (W) used at each remote I/O station *2
Xr : Total points of the link input (X) used at each remote I/O station *2
T : Max.size (number of bytes) for transient transmission during one link scan. *3
KB, KR : Constant

*1: M → R, M ← R setting
*2: M ← R setting
*3: When transient transmissions occur from multiple stations at the same time, the maximum is the total 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

(b) Remote I/O station and remote submaster station
The link scan time in the remote station and remote submaster station uses the formula shown below:
- Sequence program scan time of remote master station
- Link refresh time
- Link device allocation points

[Scan time of remote station (RS)]

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

$$RS = LS + Sm + \alpha m \quad [ms]$$

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

$$RS = Sm + \alpha m \quad [ms]$$

Sm : Sequence program scan time of remote master station
αm : Link refresh time at remote master station *1
LS : Link scan time

*1 : Total number of network module(s) installed.

6.3 Transmission Delay Time When Accessing Link Device Directly

This section describes processing time when accessing link devices directly (J□\□).

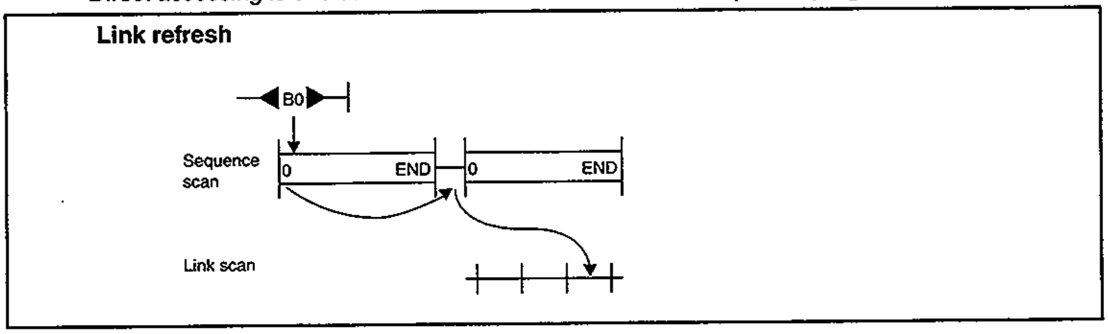
6.3.1 Inter-PC network

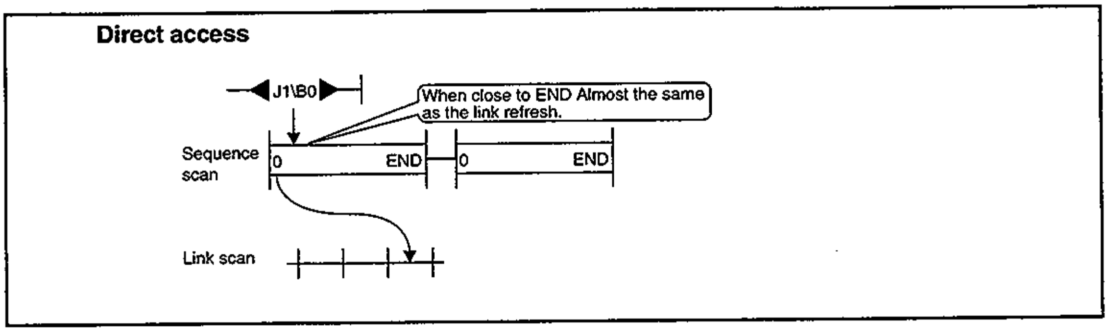
The transmission delay time when the direct accessing is performed in the inter-PC network is described.

(1) Direct access on the sending side

(a) When close to step 0

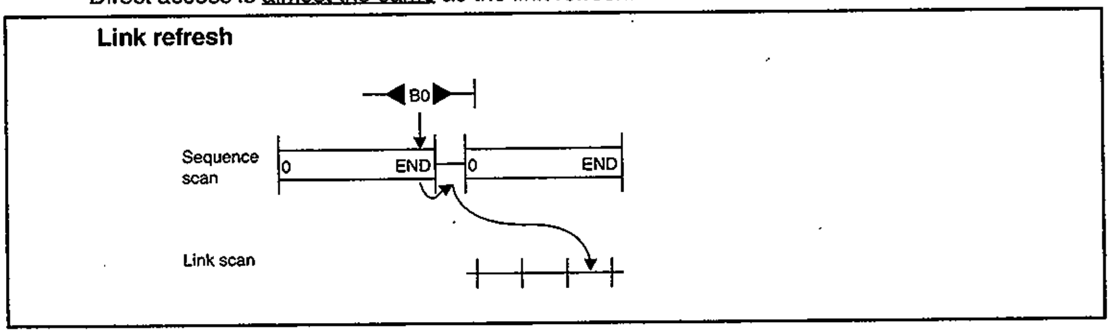
Direct accessing is one scan faster than link refresh in the sequence program.

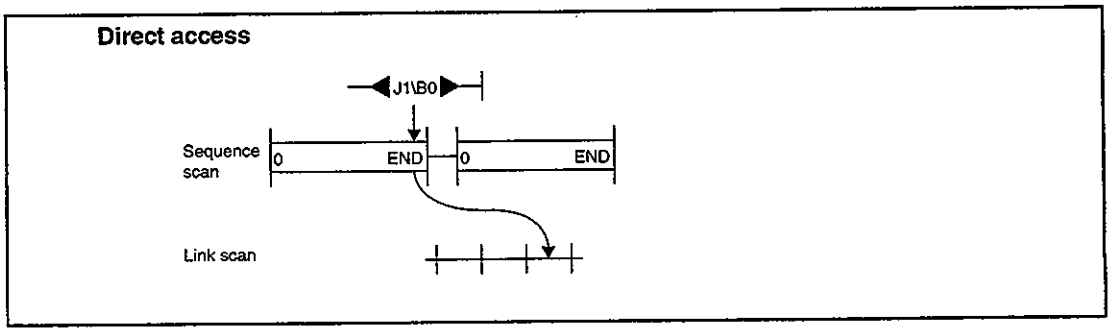




(b) When close to END

Direct access is almost the same as the link refresh.

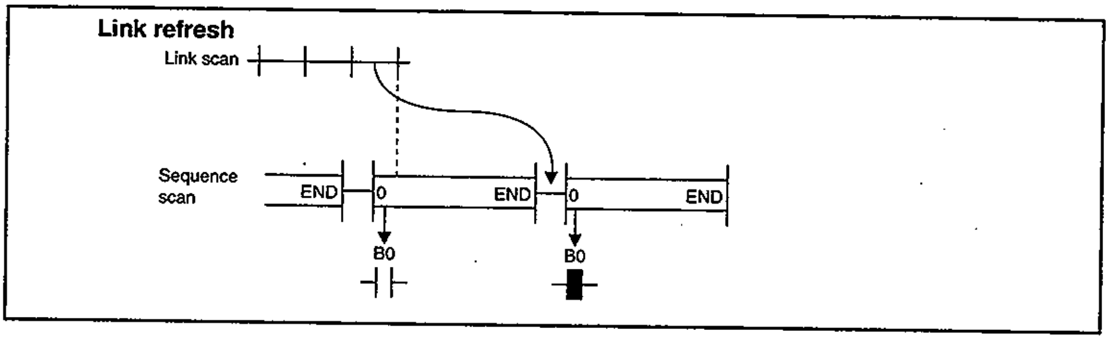


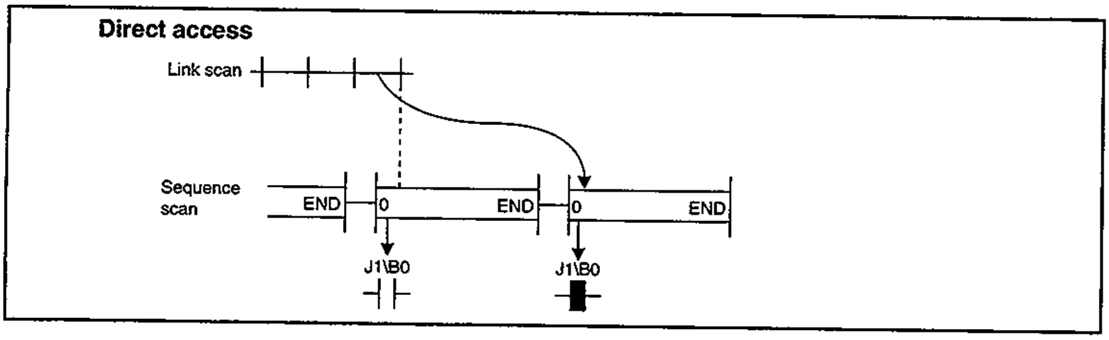


(2) Direct access on the receiving side

(a) When close to step 0

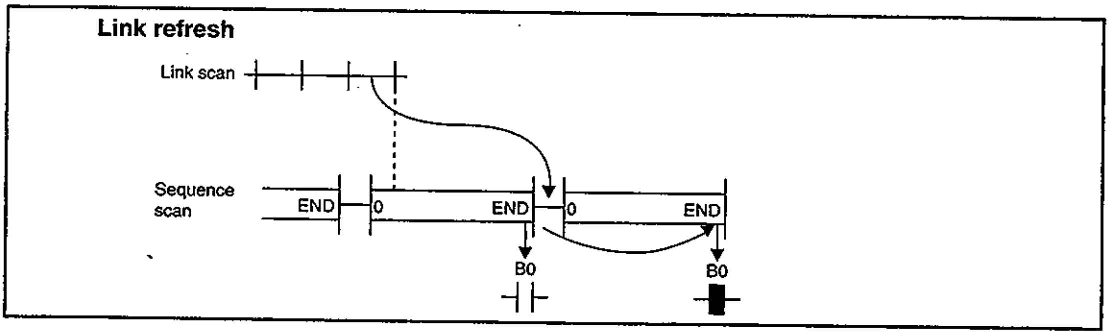
Direct access is almost the same as the link refresh.

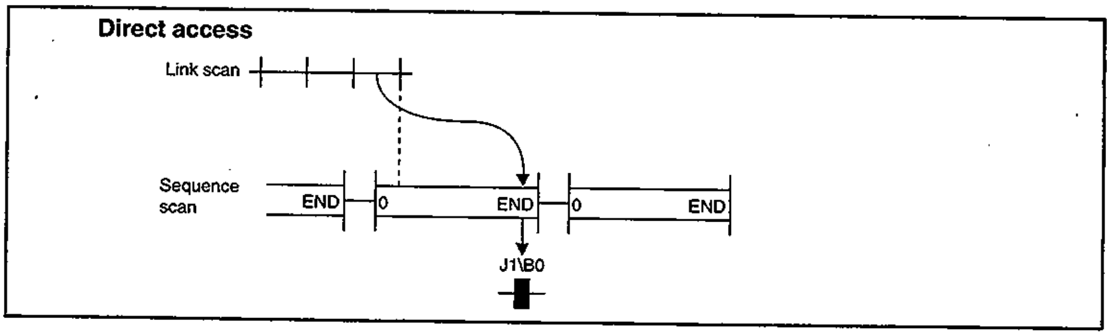




(b) When close to END

Direct accessing is one scan faster than link refresh in the sequence program.



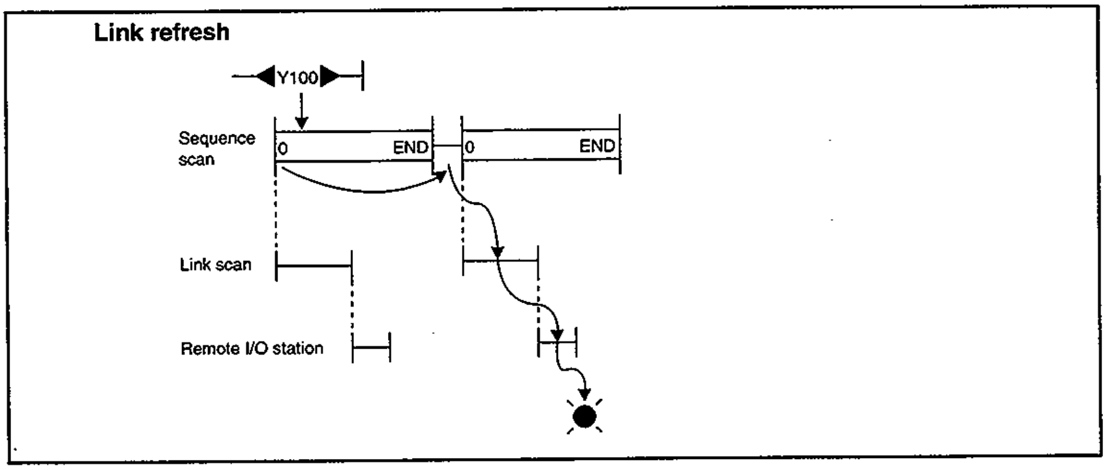


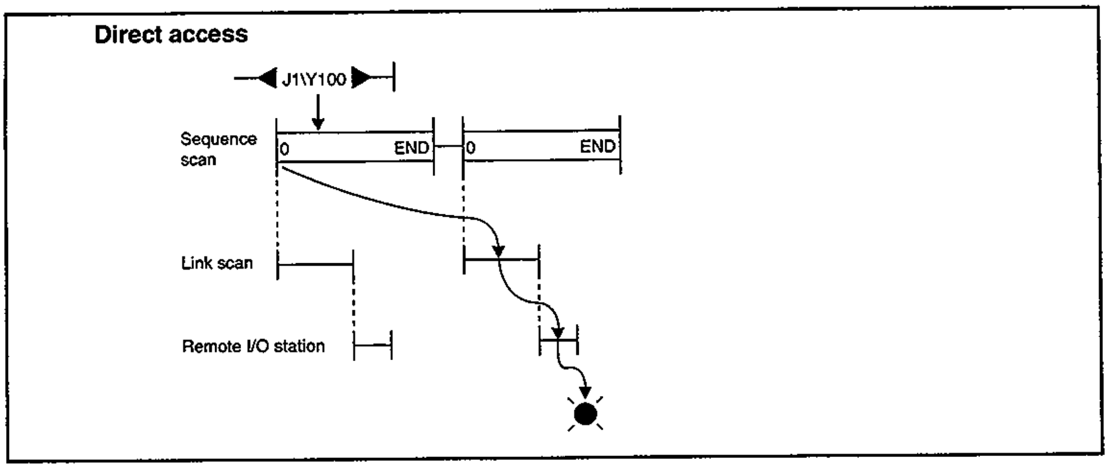
6.3.2 Remote I/O network

This section describes the transmission delay time when direct accessing is performed in the remote I/O network.

(1) Output (Y) direct access

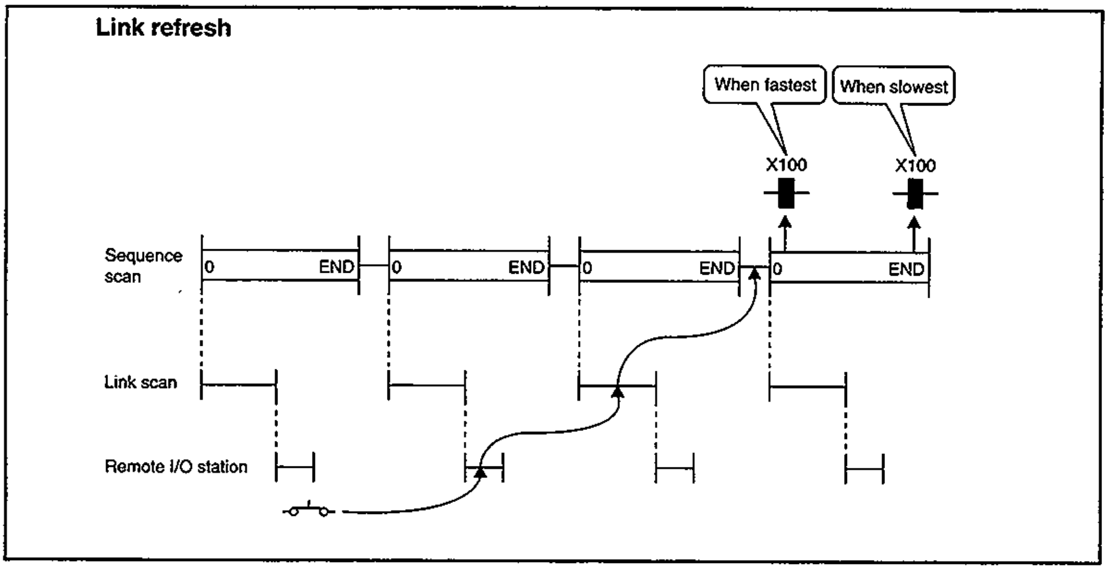
The link refresh and direct accessing are the same.

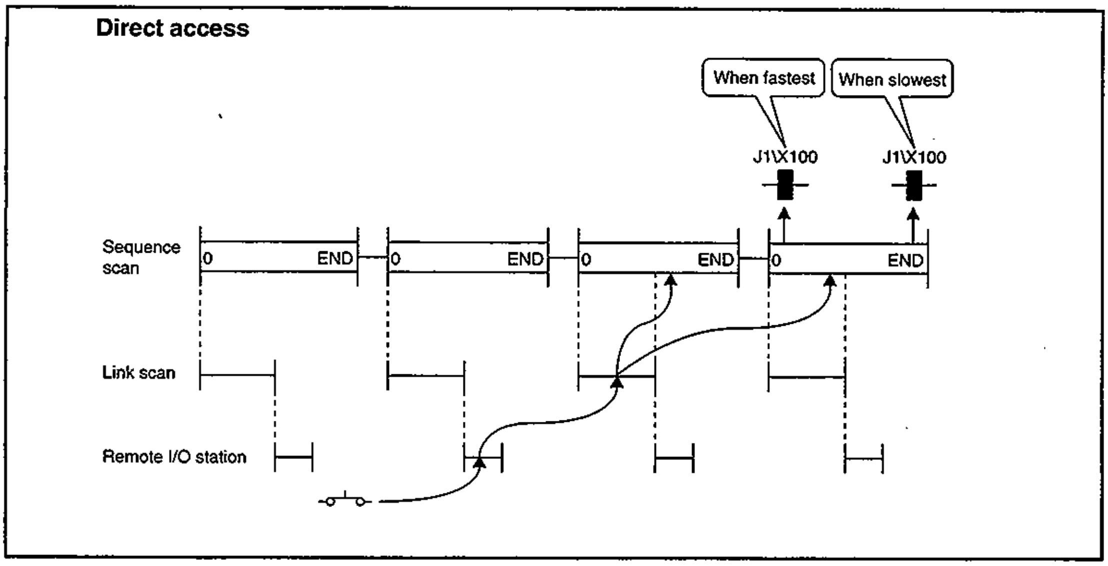




(2) Input (X) direct access

Depending on the timing, the direct accesing can be transmitted one scan faster in the sequence program.



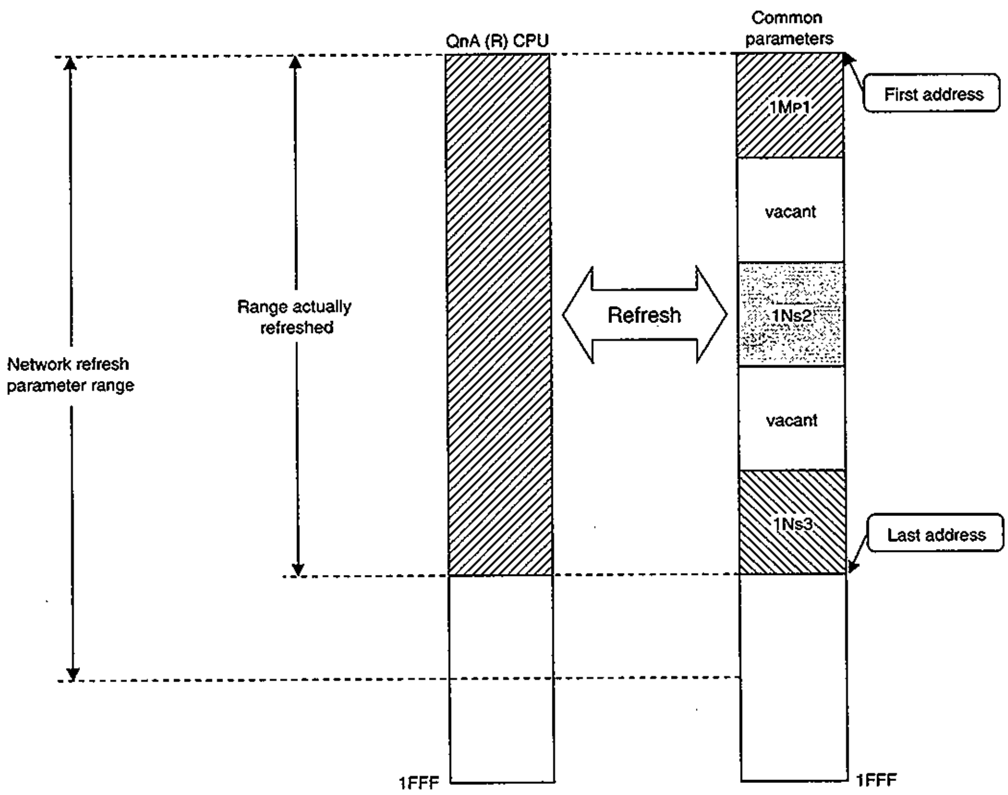


6.4 Minimizing the Link Refresh Time

Using the common parameter/station specific parameter/network refresh parameter settings, the refresh points to QnA(R)CPU can be reduced.
By reducing the refresh points, the link refresh time can be shortened.
Link refresh time can also be shortened by the use of high speed base module (A38HB).
Refer to Section 6.1.2 (1)(C) for inter-PC network, and section 6.2.2 (5) for remote I/O network.

(1) Refresh range (points) concept

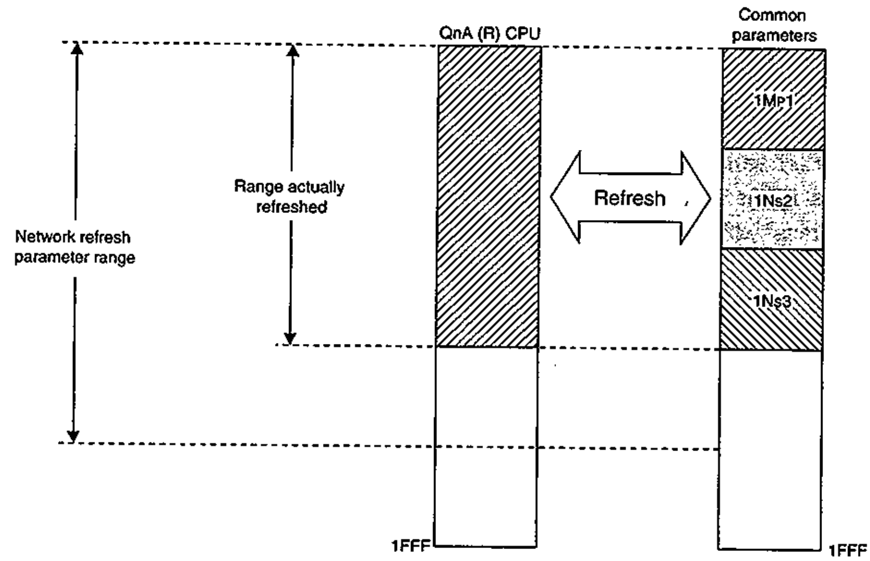
All stations set by the common parameters (1MP1 to 1NS3) ranging from "first address to last address" within the range set by the network refresh parmeter are refreshed.



(2) Reducing the refresh points

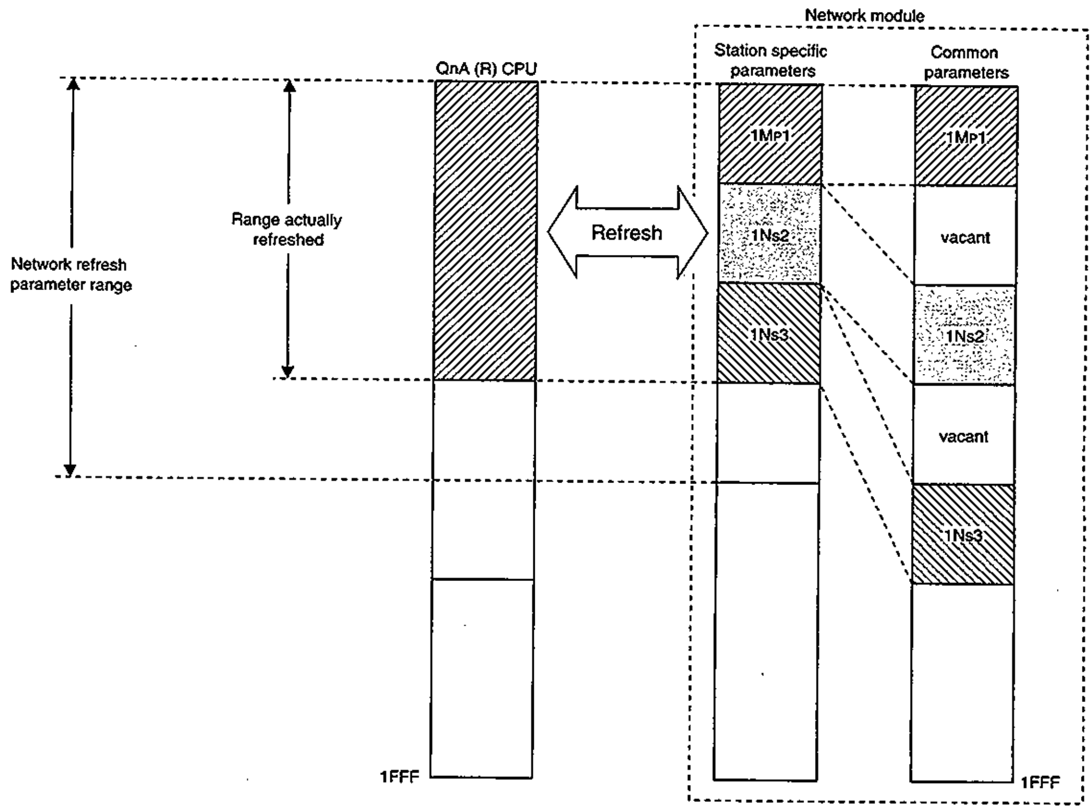
(a) Common parameter setting method

Set the range for each station (1Mp1 to 1Ns3) so that there will not be any open range in between.

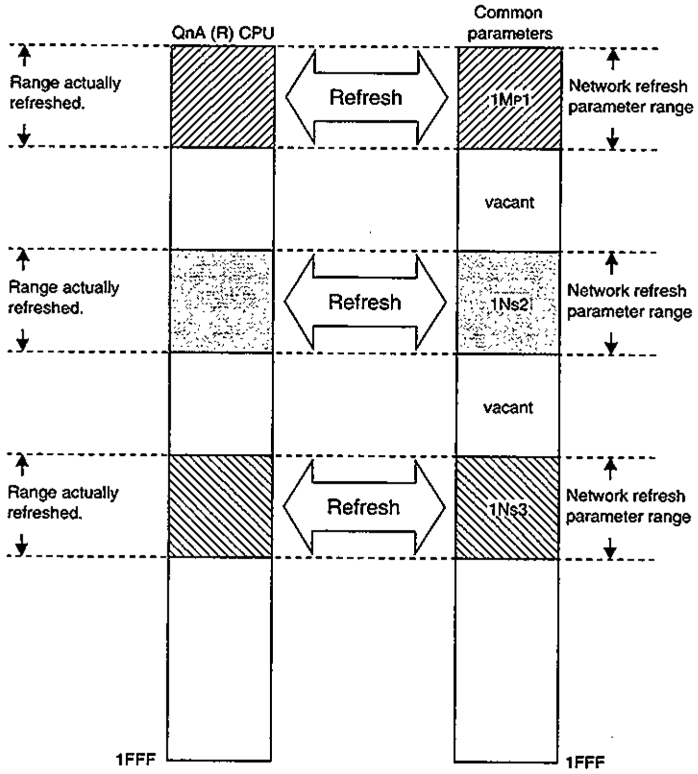


(b) Station specific parameter method (only for inter-PC networks)

Using the station specific parameters, set the range for each station (1Mp1 to 1Ns3) close so that there will not be any open range in between without changing the common parameter setting.



(c) Network refresh parmeter method
B/W can set three refresh ranges and X/Y can set two.
Perform the setting so that only the necessary areas are refreshed.



Simplex Network Section

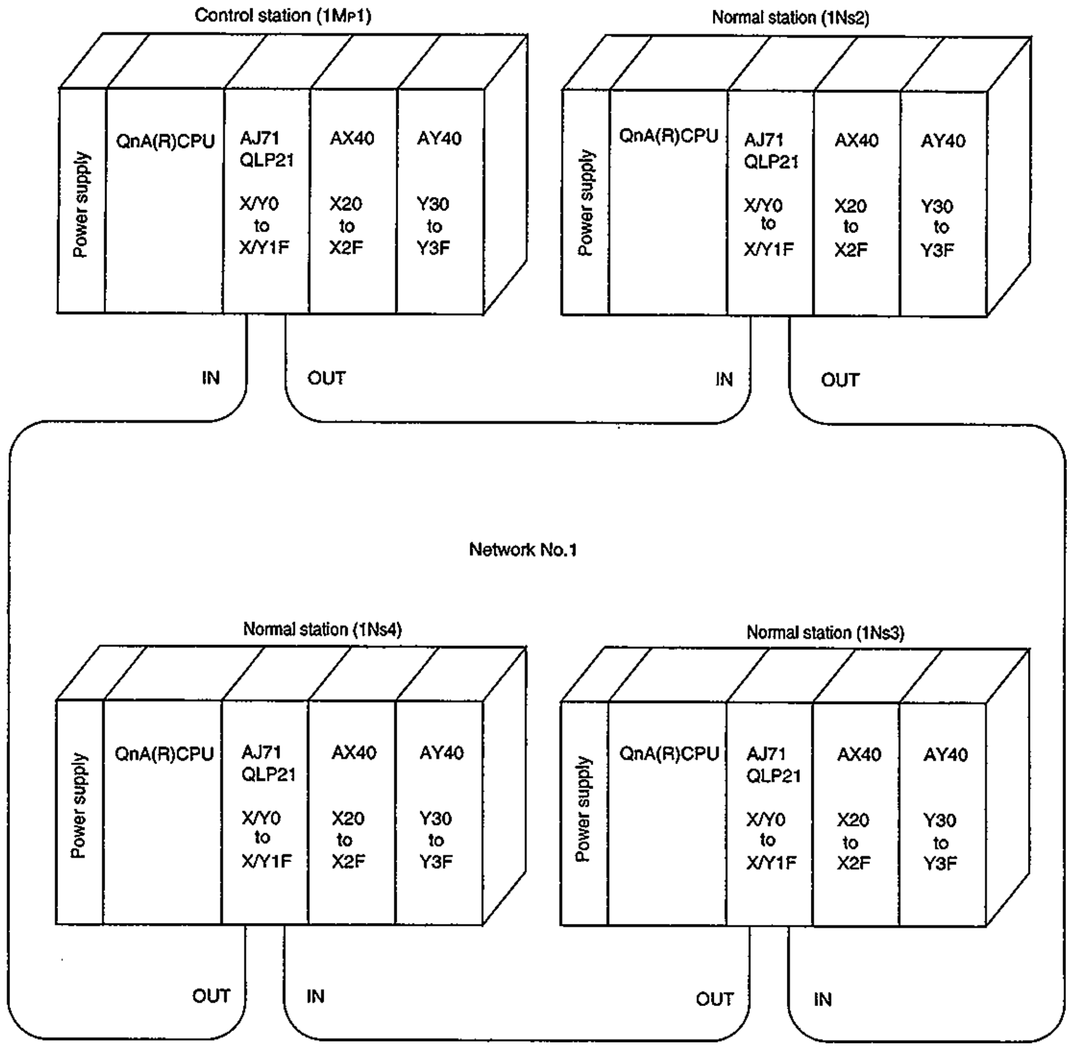
In the simplex network section, the functions, parameter settings and programming methods for the network that does not use the Q4ARCPU duplex system are described.

7 Let's Grasp the MELSECNET/10 Image!

Using an example in inter-PC and remote I/O networks, the switches and parameter settings for data link is described.

7.1 Inter-PC Network (Double-layer System Communication)

The double layer system switch/parameter settings, and the cyclic transmission are described using the system configuration example shown below:



In the example each station has 256 B/W transmission points as shown below:

Transmission range for each station

Station	B	W
1 MP 1	0 to FF	0 to FF
1 Ns 2	100 to 1FF	100 to 1FF
1 Ns 3	200 to 2FF	200 to 2FF
1 Ns 4	300 to 3FF	300 to 3FF

(1) There are two methods to set the cyclic transmission range for each station.

1) Default parameters (setting by switches)
   By setting the number of stations and B/W total points, the range can be set easily.
2) Common parameters (setting by peripheral device)
   The transmission range for each station cab be set according to the system.

(2) The items to set in the peripheral device and network module are shown in Table 7.1.

Table 7.1 Setting details of the peripheral device and network module

Setting item			Default parameter setting		Common parameter setting	
			Control station	Normal station	Control station	Normal station
Peripheral device setting	Number of module setting, network setting		△	△	●	△
	Common parameter		×	×	●	×
	Network refresh parameter		△	△	△	△
	Station specific parameter		△	△	△	△
	I/O allocation		×	×	×	×
	Inter data link transfer parameter		×	×	×	×
	Routing parameter		×	×	×	×
Network module setting	Network number		●	●	●	●
	Group number		△	△	△	△
	Station number		●	●	●	●
	Mode		● (0)	● (0)	● (0)	● (0)
	Condition setting	Network type	OFF	OFF	OFF	OFF
		Station type	ON	OFF	ON	OFF
		Used parameter	ON	OFF	OFF	OFF
		Number of stations	8/16/32/64 stations	OFF	OFF	OFF
		B/W total points	2/4/6/8k points	OFF	OFF	OFF

●: Always set △: Setting mandatory ×: Setting not necessary

Point

While parameter setting was necessary for a normal station for AnUCPU, the QnA(R)CPU, can be operated without parameter setting.

(3) The description order of the double-layer system is shown in the flow chart below.

- Connect the network module of each station with optical fiber cable or coaxial cable.
- ↓
- Set the switches on the front of the network module. — Refer to Sections 7.1.1 (1) and 7.1.2 (1).
- ↓
- Turn on the power supply for each station.
- ↓
- Set the parameters at the peripheral device. (When setting the transmission range for each station with common parameters) — Refer to Sections 7.1.2 (2).
- ↓
- Run the PC CPU.
- ↓
- Check the LEDs on the network module. — Refer to Sections 7.1.1 (2) and 7.1.2 (3).
- ↓
- Check the cyclic transmission. — Refer to Sections 7.1.1 (3) and 7.1.2 (4).

7.1.1 Communication with default parameters

By setting the B/W total points using switches, the transmission range for each station can be set easily. No parameter settings is necessary by peripheral devices for the control/normal stations.

1) The setting is performed using the "condition setting switch (DIP switch)" in front of the network module.
2) The allocation starts from B0/W0 in the station number order. The B/W points for each station according to the number of stations and B/W total points is shown in Table 7.2.

Table 7.2 B/W points for one station

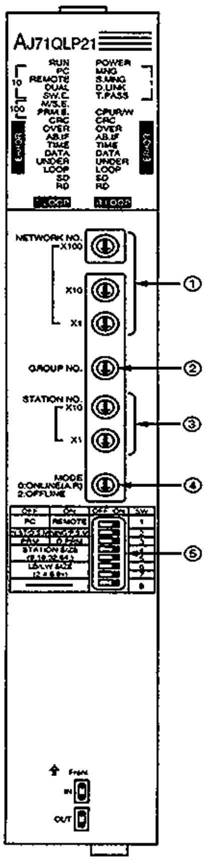
Number of stations \ Total points	2k points (2048 points)	4k points (4096 points)	6k points (6144 points)	8k points (8192 points)
8 stations	256 points	512 points	768 points	Setting error
16 stations	128 points	256 points	384 points	512 points
32 stations	64 points	128 points	192 points	256 points
64 stations	32 points	64 points	96 points	128 points

Since one station must have 256 points, set 2k points for the B/W total points and the 8 stations, which is the closest.

3) Only B/W communications are allowed. X/Y communications cannot be performed.
4) The stations that are not connected are handled as communication faulty stations. (In this example, the number of stations is set to 8, and 4 stations actually exist. So stations 5 to 8 are considered as communication faulty stations.)

(1) Network module setting

The network module requires the following setting



No.	Item			Details	1Mp1	1Ns2	1Ns3	1Ns4
①	NETWORK No.		x100	Network number	0	0	0	0
			x10		0	0	0	0
			x1		1	1	1	1
②	GROUP No.			Group number	0	0	0	0
③	STATION No.		x10	Station number	0	0	0	0
			x1		1	2	3	4
④	MODE			Mode	0	0	0	0
⑤	SW	OFF	ON	—				
	1	PC	REMOTE	Inter-PC network/remote I/O network	OFF	OFF	OFF	OFF
	2	N.ST/D.S.M	MNG/P.S.M	Normal station/control station	ON	OFF	OFF	OFF
	3	PRM	D.PRM	Common parameter/default parameter	ON	OFF	OFF	OFF
	4	STATION SIZE (8, 16, 32, 64)		Total number of stations (valid when SW3 is on)	OFF	OFF	OFF	OFF
	5				OFF	OFF	OFF	OFF
	6	LB/LW SIZE (2, 4, 6, 8K)		LB/LW total points (valid when SW3 is on)	OFF	OFF	OFF	OFF
	7				OFF	OFF	OFF	OFF
	8	—		—	OFF	OFF	OFF	OFF

STATION SIZE

SW5	SW4	Number of stations
OFF	OFF	8
OFF	ON	16
ON	OFF	32
ON	ON	64

LB/LW SIZE

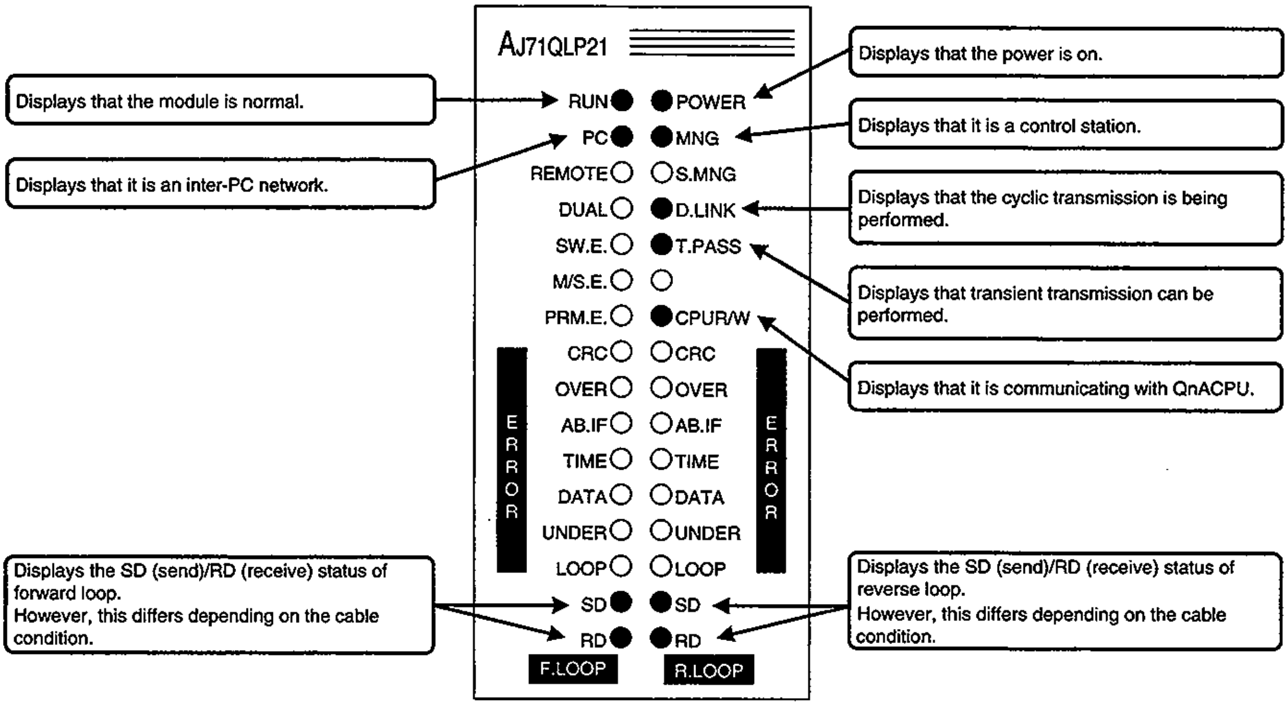
SW7	SW6	Total points
OFF	OFF	2K
OFF	ON	4K
ON	OFF	6K
ON	ON	6K

(2) Check LEDs of the network module

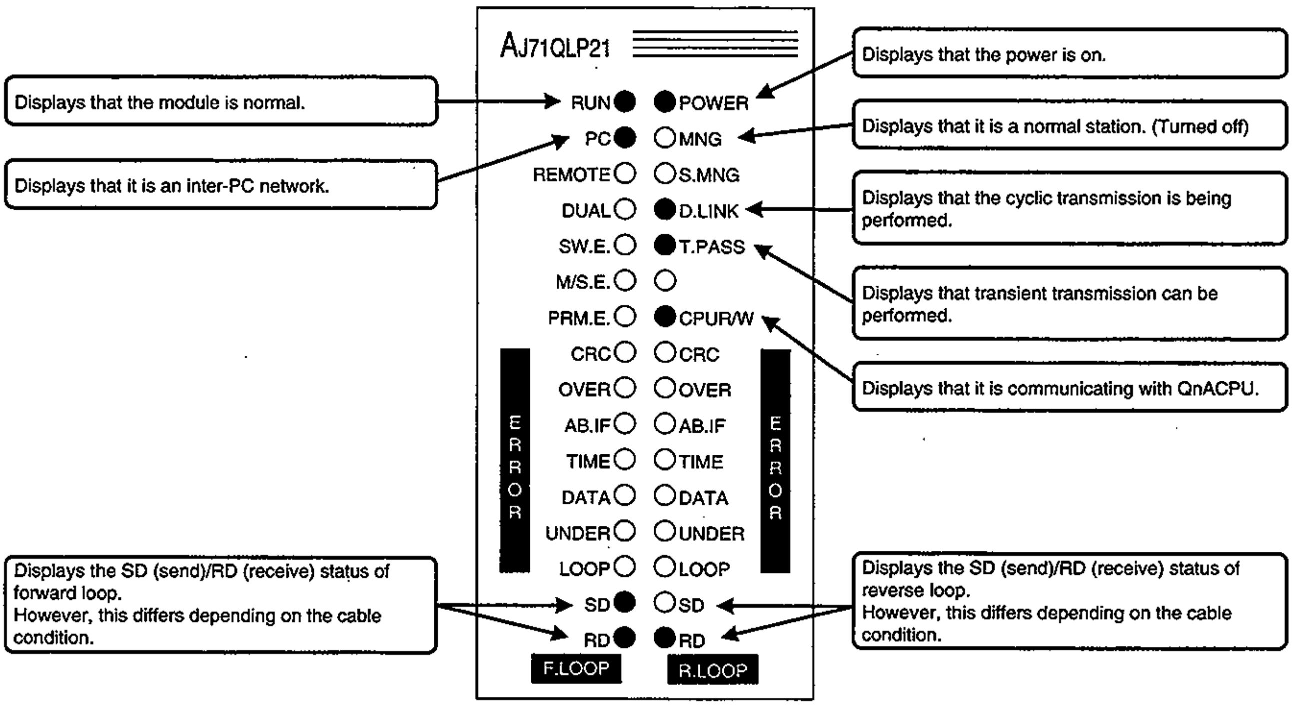
After turning on the power supply, the data link status can be checked with the LED on the front of the network module of the control station/normal station.

The display for the control and normal stations in the normal state are shown below.

(a) Display of remote master station



(b) Display of remote I/O station



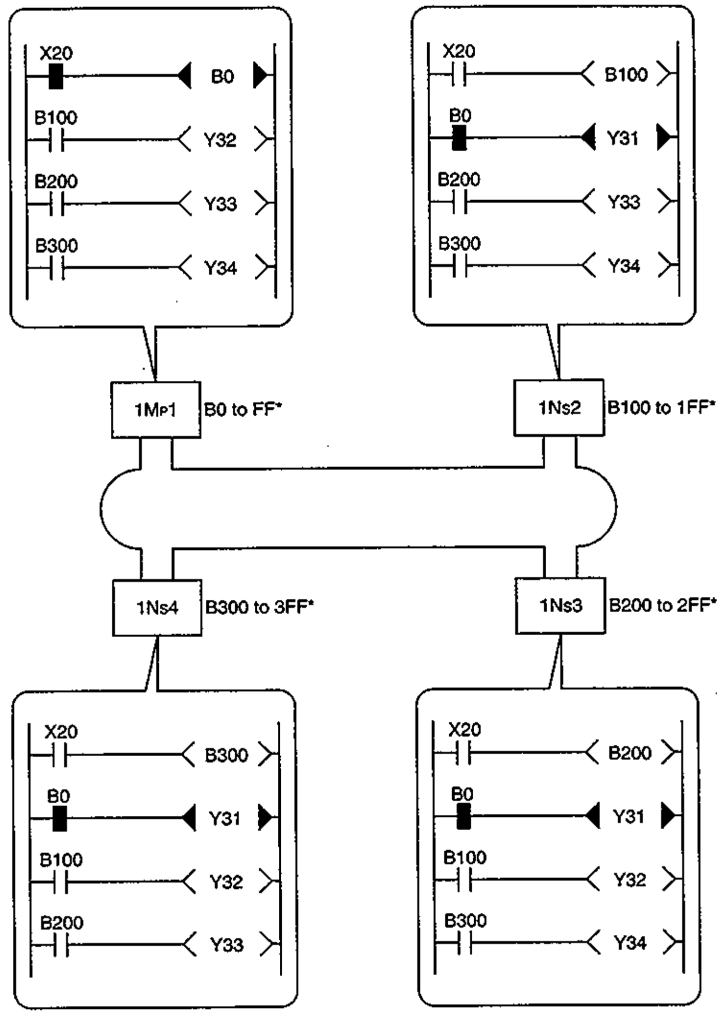
(3) Check the cyclic transmission

Confirm that the data from the data link with B/W is sent to other stations.

(a) Cyclic transmission with link relay (B)

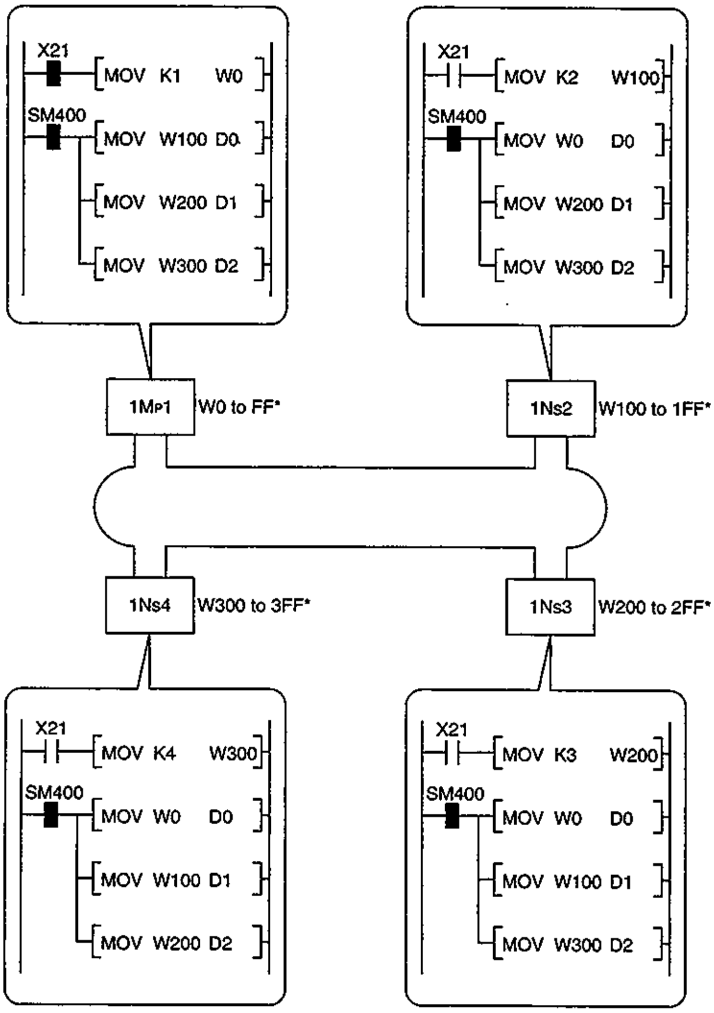
Perform the checking by loading the following program in each QnACPU.

For example, if X20 of 1MP1 is turned on, the contacts of 1Ns2 to 1Ns4 B0 are turned on and output signal Y31 turns on. Similarly, when the link relay (B) of each station is turned on, confirm that the link relay (B) contact of other stations turn on.



* Indicates the device range where transmissions can be performed.

(b) Cyclic transmission with link register (W)
Load the following program to each QnACPU to perform the checking.
For example, if X21 of 1MP1 is turned on, "1" is stored in D0 of 1Ns2 to 1Ns4.
Similarly, confirm that the link register (W) contents of others stations are stored in each station.



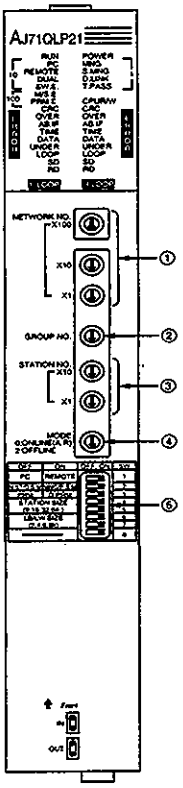
* Indicates the device range where transmissions can be performed.

7.1.2 Communication with common parameters

The send range for each station can be set as you like according to the system. More detailed setting than the default parameters is possible.
The common parameters are set in the control station (1Mp1). No parameter setting by peripheral devices for normal stations is not necessary.

(1) Network module setting

The following is set for the network module:



No.	Item			Details	1Mp1	1Ns2	1Ns3	1Ns4
①	NETWORK No.	×100		Network number	0	0	0	0
		×10			0	0	0	0
		×1			1	1	1	1
②	GROUP No.			Group number	0	0	0	0
③	STATION No.	×10		Station number	0	0	0	0
		×1			1	2	3	4
④	MODE			Mode	0	0	0	0
⑤	SW	OFF	ON	—				
	1	PC	REMOTE	Inter-PC network/remote I/O network	OFF	OFF	OFF	OFF
	2	N.ST/D.S.M	MNG/P.S.M	Normal station/control station	ON	OFF	OFF	OFF
	3	PRM	D.PRM	Common parameter/default parameter	OFF	OFF	OFF	OFF
	4	STATION SIZE (8, 16, 32, 64)		Total number of stations (valid when SW3 is on)	OFF	OFF	OFF	OFF
	5				OFF	OFF	OFF	OFF
	6	LB/LW SIZE (2, 4, 6, 8K)		LB/LW total points (valid when SW3 is on)	OFF	OFF	OFF	OFF
	7				OFF	OFF	OFF	OFF
	8	—		—	OFF	OFF	OFF	OFF

(2) Common parameter settings

This section describes the operation in DOS/V PC operation methods.

1) Startup the GPPQ GPP function software package, and startup the menu.
2) Select "3/ Parameter"
3) Select "Set 7. MELSECNET (II,/10)"
4) Select "No (N)."

Clears parameters and reads Installation status.
All right?
Yes(Y) No(N)

5) Number of modules settings

[# of Units Setting] Label: 7

1. MELSECNET(II,/10)Unit(s) [ ] ← Set the number of the network modules installed here.

1. Unit 1 ( )
2. Unit 2 ( )
3. Unit 3 ( )
4. Unit 4 ( )

← Set the types of the network modules here.

2.Valid Unit at Accessing Other St [1]

Execute(Y) Cancel(N)

Space:Select Esc:Close

[Number of modules setting]

Space → 1 → Enter

Move the cursor to the setting field. / Number of modules / Move the cursor to the type setting field

Continued to the next page

Continued from the previous page

[Type setting for the first module]

Enter — Open the module type setting screen

2 — Control station → Enter — Selection complete

[Unit Type Setting(1)]

1.(*) MELSECNET/10 (Default)
2.( ) MELSECNET/10 (Control Station)
3.( ) MELSECNET/10 (Normal Station)
4.( ) MELSECNET/10 (Remote Master)
5.( ) MELSECNET (Master Station)
6.( ) MELSECNETII Cmp (Master Station)
7.( ) MELSECNETII (Master Station)
8.( ) MELSECNET (Local Station)
9.( ) MELSECNETII Cmp (Local Station)
A.( ) MELSECNETII (Local Station)

B.( ) MELSECNET/10
(Wait /Duplex/Parallel)

Execute(Y) Cancel(N)

Space:Select Esc:Close

[Valid modules for accessing other stations]

↓ ↓ ↓ ↓

2. Move the cursor to a valid module for accessing other station

[# of Units Setting] Label:

1. MELSECNET(II,/10)Unit(s) [1]

1. Unit 1 (MELSECNET/10 (Control))
2. Unit 2 ( )
3. Unit 3 ( )
4. Unit 4 ( )

2.Valid Unit at Accessing Other St [1]

Execute(Y) Cancel(N)

Space:Select Esc:Close

Y (Execute)

6) Network settings

Set the head I/O number of the network module.

Set the network number set with the switch here.

Set the number of stations (control station+normal stations) here.

[Network Setting] Label:

	Unit #1 NET/10 Control	Unit #2	Unit #3	Unit #4
1st I/O#	[ ]	---------	---------	---------
Network#	[ ]	---------	---------	---------
# of Station(slave)	[ ]	---------	---------	---------
Network Refresh Parm	None	---------	---------	---------
Common Parameter	• None	---------	---------	---------
Specific Parameter	None	---------	---------	---------
I/O Allocation	---------	---------	---------	---------
TX Parm For DataLink	---------			
Routing Parameter	None			

• :Must Be Set :If Necessary :Setting Done ∗:For Only Reference
Space:Select Esc:Close

[0] → [Enter] → [1] → [Enter] → [4]

First I/O number — Network number — Total number of linked stations

[Network Setting] Label:

	Unit #1 NET/10 Control	Unit #2	Unit #3	Unit #4
1st I/O#	[10]	---------	---------	---------
Network#	[1]	---------	---------	---------
# of Station(slave)	[4]	---------	---------	---------
Network Refresh Parm	None	---------	---------	---------
Common Parameter	• None	---------	---------	---------
Specific Parameter	None	---------	---------	---------
I/O Allocation	---------	---------	---------	---------
TX Parm For DataLink	---------			
Routing Parameter	None			

• :Must Be Set :If Necessary :Setting Done ∗:For Only Reference
Space:Select Esc:Close

[↓] [↓] → [Enter]

Move the cursor to the common parameters.

7) Common parameters

[Cmm Parm (MELSECNET/10 Control)(BW Set)] Label:

Auxiliary Setting
Link WDT 2000 ms

Network(# 1)
NET/10 Control 1st I/O # 0
Network # 1 # of Sta 4

Station	TX Range of Sta B First	Last	TX Range of Sta W First	Last
1	[ ]	- [ ]	[ ]	- [ ]
2	[ ]	- [ ]	[ ]	- [ ]
3	[ ]	- [ ]	[ ]	- [ ]
4	[ ]	- [ ]	[ ]	- [ ]
	[ ]	- [ ]	[ ]	- [ ]
	[ ]	- [ ]	[ ]	- [ ]
	[ ]	- [ ]	[ ]	- [ ]
	[ ]	- [ ]	[ ]	- [ ]

PgUp:Prev PgDn:Next F3:BW→XY1→XY2→ Esc:Close

↓

0 → F F → 0 → F F Enter

B first B last W First W Last

Set stations 2 through 4 in the same manner so that the screen appears as shown below.

[Cmm Parm (MELSECNET/10 Control)(BW Set)] Label:

Auxiliary Setting
Link WDT 2000 ms

Network(# 1)
NET/10 Control 1st I/O # 0
Network # 1 # of Sta 4

Station	TX Range of Sta B First	Last	TX Range of Sta W First	Last
1	[0]	- [FF]	[0]	- [FF]
2	[100]	- [1FF]	[100]	- [1FF]
3	[200]	- [2FF]	[200]	- [2FF]
4	[300]	- [3FF]	[300]	- [3FF]
	[ ]	- [ ]	[ ]	- [ ]
	[ ]	- [ ]	[ ]	- [ ]
	[ ]	- [ ]	[ ]	- [ ]
	[ ]	- [ ]	[ ]	- [ ]

PgUp:Prev PgDn:Next F3:BW→XY1→XY2→ Esc:Close

↓

Esc

8) Select "Yes (Y)."

Do you want to register the parameter?

Yes(Y) No(N)

---- Registering the common parameters.

9) Network settings
Confirm that the common parameters have "■ set".
No settings are made at the items marked "⊡".

[Network setting] Label:

	Unit #1 NET/10 Control	Unit #2	Unit #3	Unit #4
1st I/O#	[0]	---------	---------	---------
Network#	[1]	---------	---------	---------
# of Station(slave)	[4]	---------	---------	---------
Network Refresh Parm	⊡ None	---------	---------	---------
Common Parameter	■ None	---------	---------	---------
Specific Parameter	⊡ None	---------	---------	---------
I/O Allocation	---------	---------	---------	---------
TX Parm For DataLink	---------			
Routing Parameter	⊡ None			

• :Must Be Set ⊡:If Necessary ■,■:Setting Done ∗:For Only Reference
Space:Select Esc:Close

Esc

10) Select "Yes (Y)."

Do you want to register the parameter?

Yes(Y) No(N)

---- Registering the network settings.

Esc

11) Write the parameters to the QnA(R)CPU. (Set QnA(R)CPU to stop.)

[Alt] → [2]

Menu Select PC

1/File 2/PC 3/Find 4/Disp 5/Edit 6/Monitor 7/Window 8/Option Alt:Menu F12:Help

1/Read...
2/Write...
3/Compare...
4/New...
5/File List...
6/Connection...
7/Remote Operation...
8/Write Option...

[2] (Write)

[Space] [Space] → [N] [E] [T] [1] [0] → [Enter] → [Enter]

Move to file name setting field — File name — Move to comment setting field — No comment

File name must be set

[Write to PC]

Interface RS232C (---------) QnACPU
Target PC Network:0 Station: FF PC Type:Q4A
Target Mem Internal RAM Title [ ]
Name[NET10] Title [ ]
1.File 1.File 1.[*] Parameter
2.Tgt 2.[*] Seq/SFC Prog
1.(*) Whole Range [ ]K Step
2.( ) Step Range [ ]-[ ]
3.[ ] Device Comment 3.( ) Step Range P[ ]-[ ]
4.[ ] Dev Init Value 4.( ) Block Range [ ]-[ ]
5.[ ] Simulation Data
6.[ ] File Register
1.(*) Whole Range
2.( ) Specify ZR[ ]-[ ]
2.Device Mem 1.[ ] Internal 1.(*) Whole Range
2.( ) Specify Detail Range
Execute(Y) Cancel(N)
Ctrl+L:List Ctrl+D=Dir Space:Select Esc:Close

[Y] (Execute)

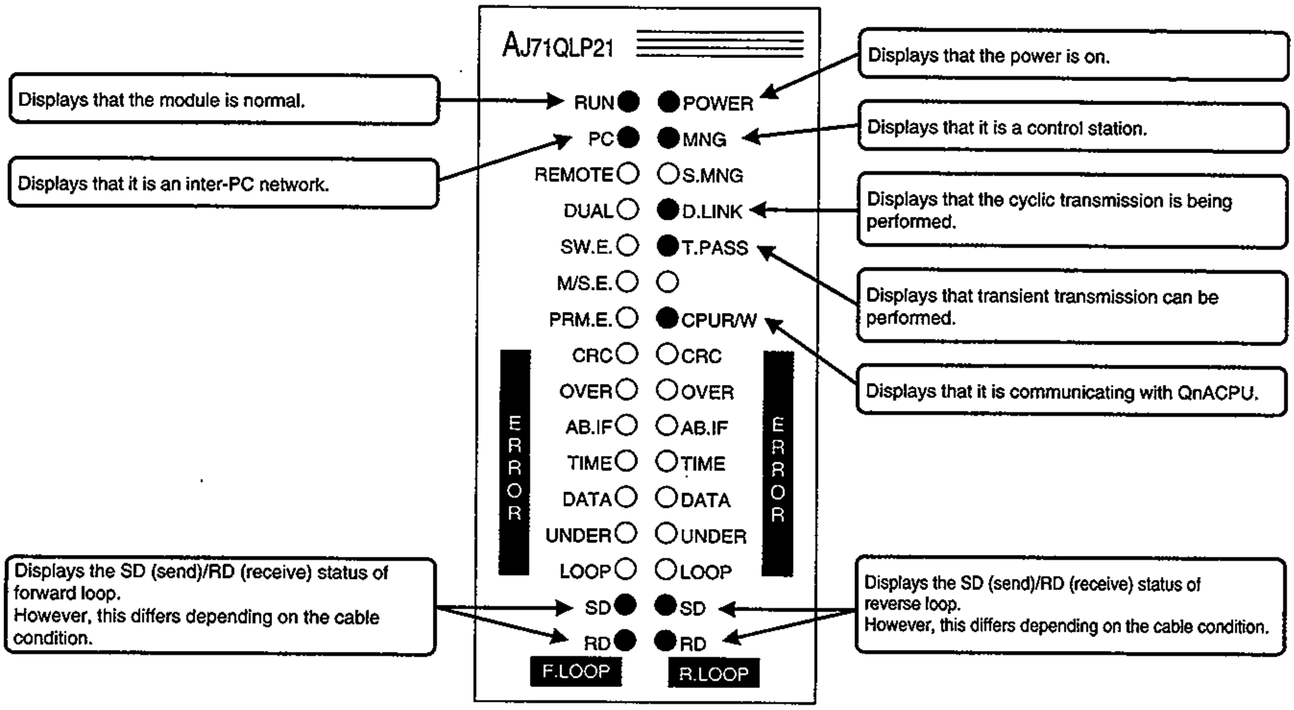
Writing is complete when "Completion" is displayed.

(3) Checking the LEDs of the network module

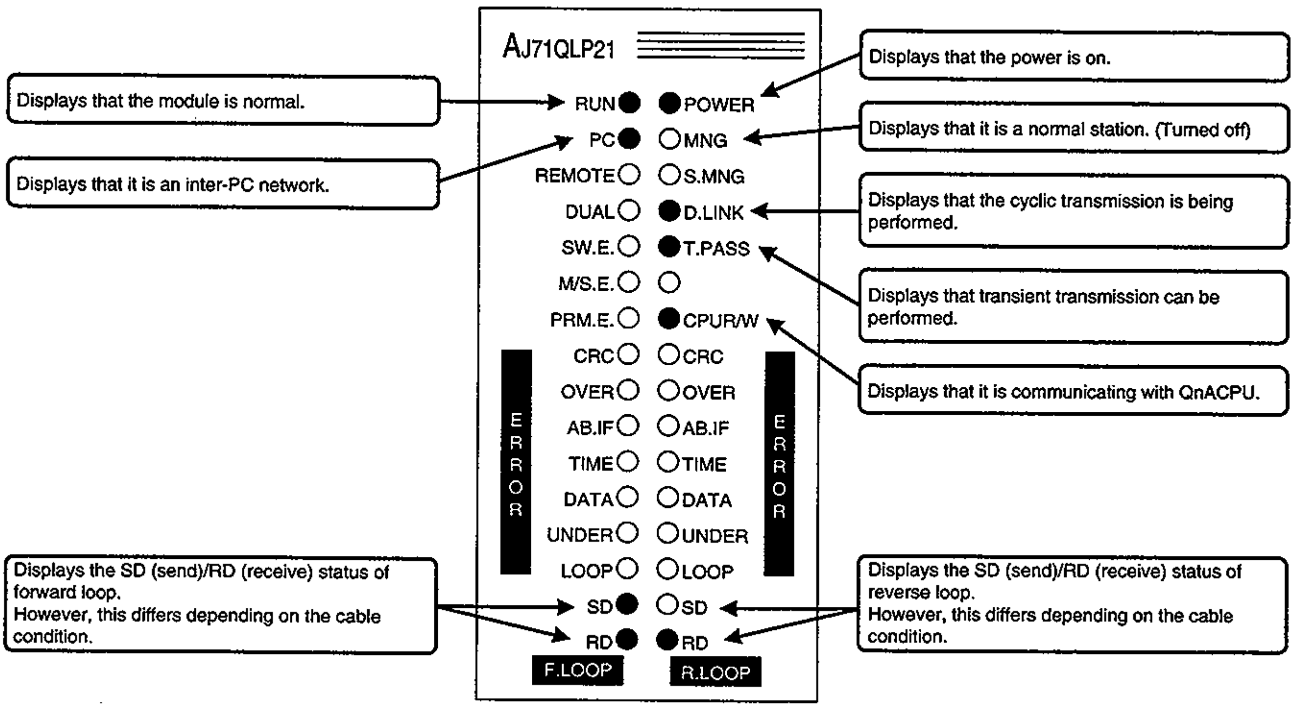
After running QnA(R)CPU, the data link status can be checked with the LEDs on the front of the network module of the control station/normal station.

The display for the control and normal stations in the normal state is shown below:

(a) Control station's display



(b) Normal station's display

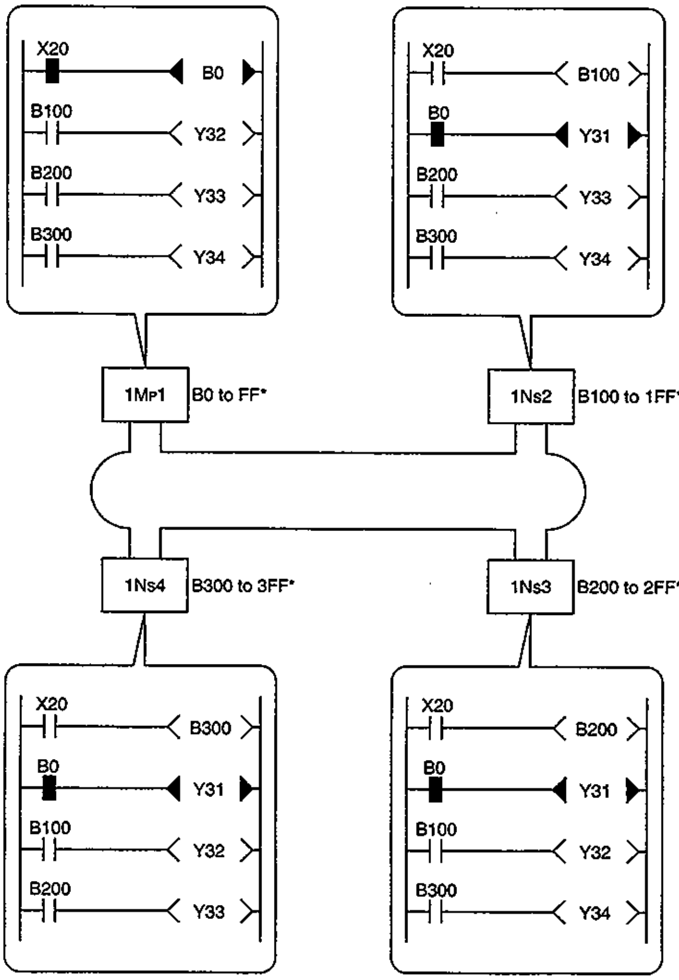


(4) Checking the cyclic transmission

Confirm that the data from the data link with B/W is sent to other stations.

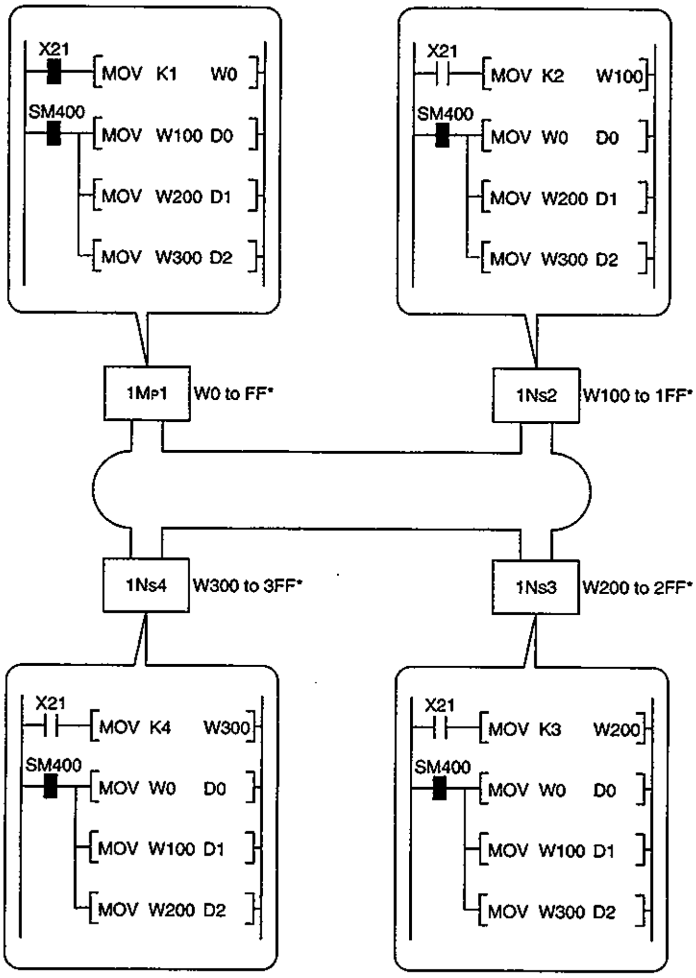
(a) Cyclic transmission with link relay (B)

Perform the checking by loading the following program in each QnA(R)CPU.
For example, if X20 of 1MP1 is turned on, the contacts of 1Ns2 to 1Ns4B0 are turned on and output signal Y31 turns on. Similarly, when the link relay (B) of each station is turned on, confirm that the link relay (B) contact of other stations turn on.



* Indicates the device range where transmissions can be performed.

(b) Cyclic transmission with link register (W)
Load the following program to each QnA(R)CPU to perform the checking.
For example, if X21 of 1Mp1 is turned on, "1" is stored in D0 of 1Ns2 to 1Ns4.
Similarly, confirm that the link register (W) contents of other stations are stored in each station.

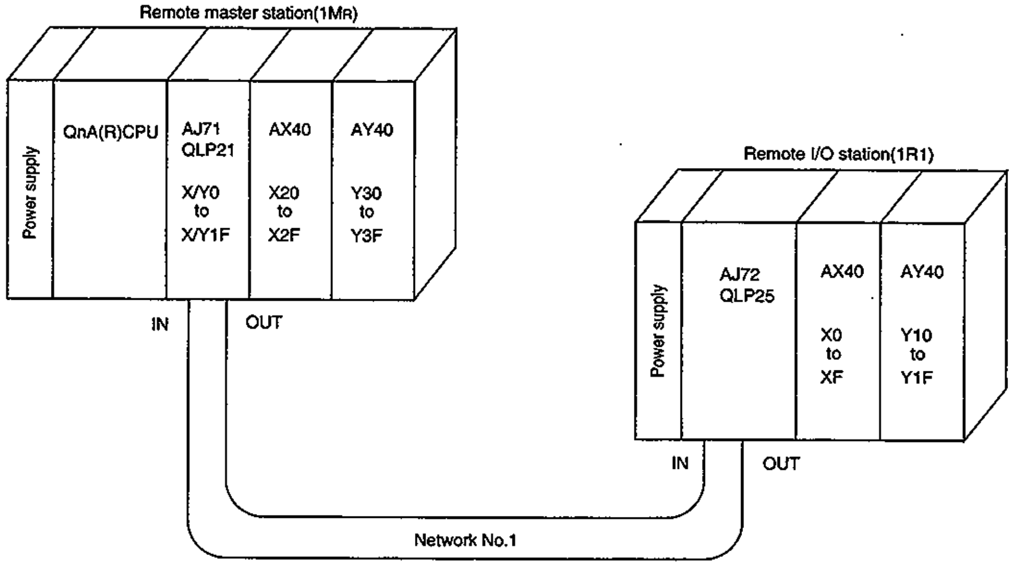


* Indicates the device range where transmissions can be performed.

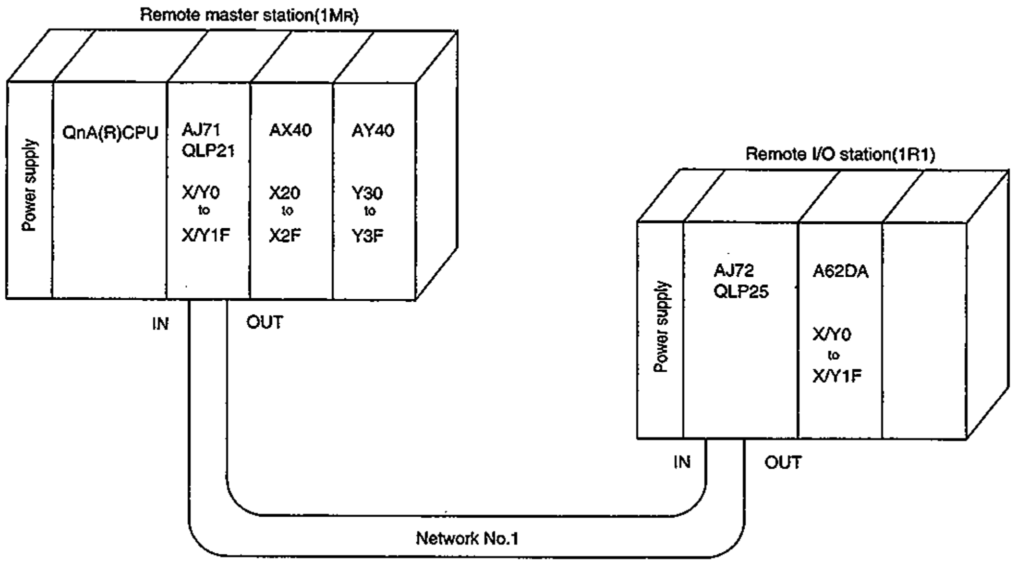
7.2 Remote I/O Network

The remote I/O network switch/parameter settings, I/O module, and special function module communications are described using the following system configuration example.

[System configuration example when communicating with an I/O module]



[System configuration example when communicating with a special function module]



(1) The setting items for the peripheral devices and network modules are shown in Table 7.3.

Table 7.3 Setting details of the peripheral device and network module

Setting Item				Remote master station	Remote I/O station
Peripheral device settings		Number of modules/network setting		●	—
		Common parameter		●	
		Network refresh parameter		△	
		Station specific parameter		×	
		I/O allocation		△	
		Inter-data link transfer parameter		×	
		Routing parameter		×	
Network module settings	Remote master station	Network number		●	—
		Group number		×	
		Station number		●(0)	
		Mode		●(0)	
		Condition setting	Network type	ON	
			Station type	OFF	
			Parameter used	OFF	
			Number of stations	OFF	
			B/W total points	OFF	
	Remote I/O station	Station number		—	●
		Mode			●(0)
		Connected peripheral device			OFF

●: Always set △: Setting mandatory ×: Setting not necessary

(2) The order of description with the remote I/O network is shown in the flowchart below.

Connect the network module of each station with optical fiber cable or coaxial cable.

↓

Set the switches on the front of the network module. — Refer to Sections 7.2.1 (1) and 7.2.2 (2).

↓

Turn on the power supply for each station.

↓

Set the parameters at the peripheral device. — Refer to Sections 7.2.1(2)(3) and section 7.2.2 (2)(3).

↓

Run the PC CPU.

↓

Check LED on the network module. — Refer to Sections 7.2.1 (4) and 7.2.2 (4)

↓

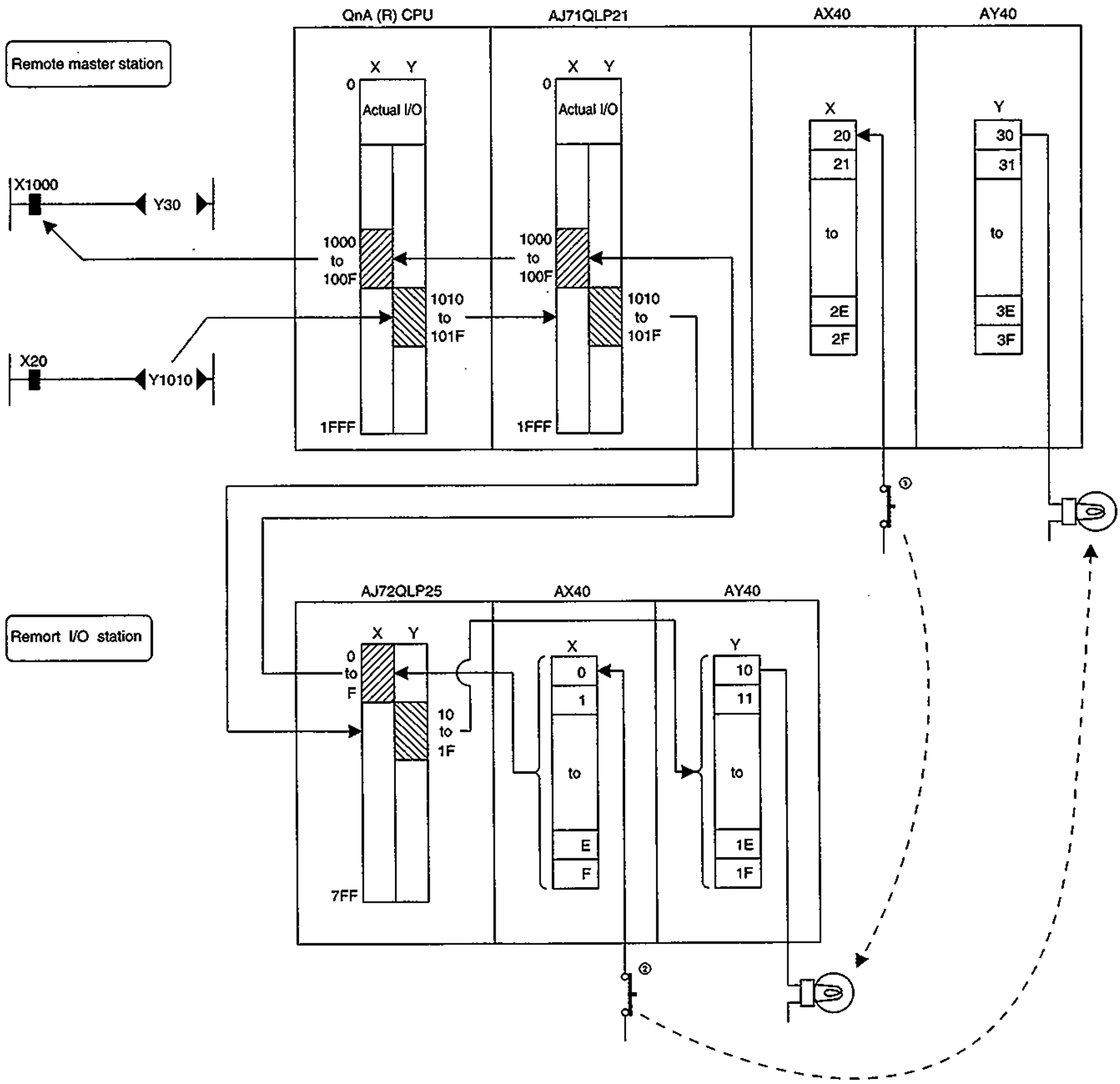
Check the cyclic transmission. — Refer to Sections 7.2.1 (5) and 7.2.2 (5).

7.2.1 Communication with the I/O module

The following types of communications are described:

(1) When X20 of the remote master station's AX40 (input module) is turned on, Y10 of the remote I/O station's AY40 (output module) is turned on.

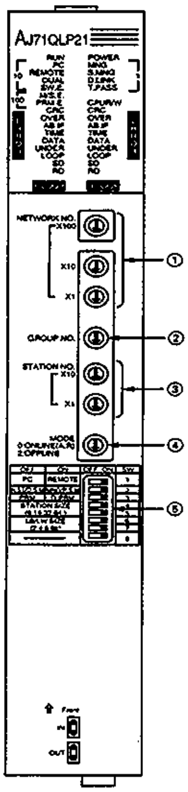
(2) When X10 of the remote station's AX40 (input module) is turned on, Y30 of the remote master station's AY40 (output module) is turned on.



(1) Network module setting

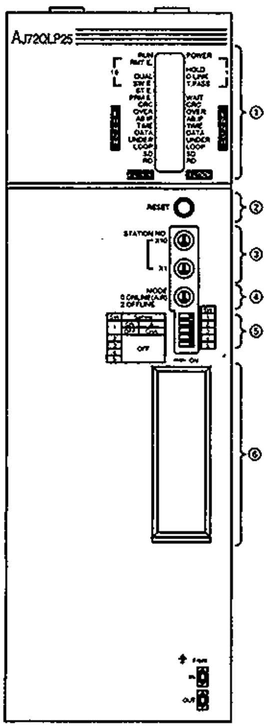
The following is set for the network module.

(a) Remote master station setting



No.	Item			Details	Setting
①	NETWORK No.		×100	Network number	0
			×10		0
			×1		1
②	GROUP No.			Group number (invalid when remote I/O network)	0
③	STATION No.		×10	Station number	0
			×1		0
④	MODE			Mode	0
⑤	SW	OFF	ON	—	
	1	PC	REMOTE	Inter-PC network/remote I/O network	ON
	2	N.ST/D.S.M	MNG/P.S.M	Multiple remote submaster station/ parallel remote submaster station	OFF
	3	PRM	D.PRM	No effets when remote I/O network	OFF
	4	STATION SIZE (8, 16, 32, 64)			OFF
	5				OFF
	6	LB/LW SIZE (2, 4, 6, 8K)			OFF
	7				OFF
	8	—		—	OFF

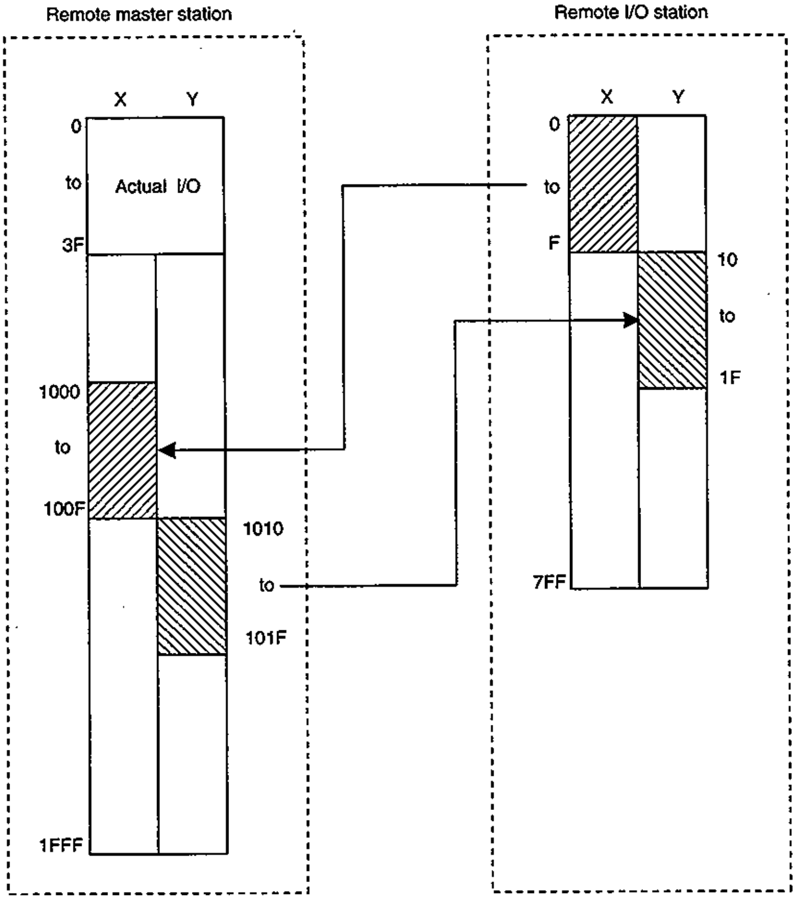
(b) Remote I/O station setting



No.	Item			Details	Setting
①	NETWORK No.		×10	Station number	0
			×1		1
②	MODE			Mode	0
③	SW	OFF	ON	—	
	1	QnA	A	QnACPU peripheral device connection/ACPU peripheral device connection	OFF
	2	—		Always off	OFF
	3				OFF
	4				OFF
	5				OFF

(2) Common parameters

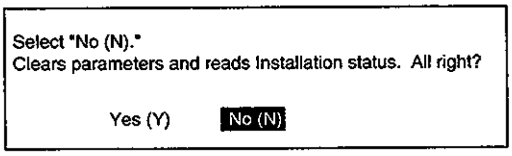
Sets the address in the remote master station to control the remote I/O station.



(3) Parameter setting

The operation method for the DOS/V PC is described.

1) Startup the GPPQ type GPP function software package, and display the menu.
2) Select "3/Parameters."
3) Select "Set 7. MELSECNET(II,/10)."
4) Select "No (N)."



5) Number of modules settings

[# of Units Setting] Label:

1. MELSECNET(II,/10)Unit(s) [ ]

1. Unit 1 ( )
2. Unit 2 ( )
3. Unit 3 ( )
4. Unit 4 ( )

2.Valid Unit at Accessing Other St [1]

Execute(Y) Cancel(N)

Space:Select Esc:Close

Set the number of network modules installed here.

Set the Types of network modules here.

[Number of modules setting]

Space → 1 → Enter

Move the cursor to the setting field. / Number of modules / Move the cursor to the type setting field

[Type setting for the first module]

Enter 4 → Enter

Open the module type setting screen / Remote master / Selection complete

[Unit Type Setting(1)]

1.(*) MELSECNET/10 (Default)
2.( ) MELSECNET/10 (Control Station)
3.( ) MELSECNET/10 (Normal Station)
4.( ) MELSECNET/10 (Remote Master)
5.( ) MELSECNET (Master Station)
6.( ) MELSECNETII Cmp (Master Station)
7.( ) MELSECNETII (Master Station)
8.( ) MELSECNET (Local Station)
9.( ) MELSECNETII Cmp (Local Station)
A.( ) MELSECNETII (Local Station)

B.( ) MELSECNET/10
(Wait /Duplex/Parallel)

Execute(Y) Cancel(N)

Space:Select Esc:Close

[Valid modules for accessing other stations]

↓ ↓ ↓ ↓

2. Move the cursor to a valid module for accessing other station

[# of Units Setting] Label:

1. MELSECNET(II,/10)Unit(s) [1]
   1. Unit 1 (MELSECNET/10 (Remote))
   2. Unit 2 ( )
   3. Unit 3 ( )
   4. Unit 4 ( )

2.Ualid Unit at Accessing Other St [1]

Execute(Y) Cancel(N)

Space:Select Esc:Close

Y (Execute)

6) Network settings

Set the head I/O number of the network module here.

Set the network number set with the switch here.

Set the number of remote I/O stations here.

[Network setting] Label:

	Unit #1 NET/10 Remote	Unit #2	Unit #3	Unit #4
1st I/O#	[ ]	---------	---------	---------
Network#	[ ]	---------	---------	---------
# of Station(Slave)	[ ]	---------	---------	---------
Network Refresh Parm	None	---------	---------	---------
Common Parameter	• None	---------	---------	---------
Specific Parameter	---------	---------	---------	---------
I/O Allocation	None	---------	---------	---------
TX Parm For DataLink	---------			
Routing Parameter	None			

•:Must Be Set :If Necessary ■,■:Setting Done * For Only Reference

Space:Select Esc:Close

0 → Enter → 1 → Enter → 1

First I/O number Network number Total number of linked stations

Continued to the next page

Continued from the previous page

↓

[Network setting] Label

	Unit #1 NET/10 Remote	Unit #2	Unit #3	Unit #4
1st I/O#	[0]	---------	---------	---------
Network#	[1]	---------	---------	---------
# of Station(Slave)	[1]	---------	---------	---------
Network Refresh Parm	None	---------	---------	---------
Common Parameter	• None	---------	---------	---------
Specific Parameter	---------	---------	---------	---------
I/O Allocation	None	---------	---------	---------
TX Parm For DataLink	---------			
Routing Parameter	None			

• :Must Be Set :If Necessary ■,■:Setting Done ∗:For Only Reference

Space:Select Esc:Close

↓

↓ ↓ → Enter

Move the cursor to the common parameter.

7) Common parameters

F3 (Switch setting)

[Cmm Parm (MELSECNET/10Remote)(XYSet)] Label

Auxiliary Setting
Link WDT 2000 ms

Network(# 1)
NET/10 Remote 1st I/O # 0
Network # 1 Slave PC Sta 1

Station	M Station→R Station Y First Last	Y First Last	M Station←R Station X First Last	X First Last
1	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-
	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-
	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-
	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-
	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-
	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-
	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-
	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-

PgUp:Prev PgDn:Next F3:BW→XY→ Esc:Close

1 0 1 0 → 1 0 1 F → 1 0 →
First Y of station M / Last of station M / First Y of station R

1 0 0 0 → 1 0 0 F → 0 Enter
First Y of station M / Last of station M / First Y of station R

[Cmm Parm (MELSECNET/10Remote)(XYSet)] Label

Auxiliary Setting
Link WDT 2000 ms

Network(# 1)
NET/10 Remote 1st I/O # 0
Network # 1 Slave PC Sta 1

Station	M Station→R Station Y First Last	Y First Last	M Station←R Station X First Last	X First Last
1	[1010]-[101F]	[10]- 1F	[1000]-[100F]	[0]- F
	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-
	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-
	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-
	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-
	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-
	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-
	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-

PgUp:Prev PgDn:Next F3:BW→XY→ Esc:Close

Esc

8) Select "Yes (Y)."

Do you want to register the parameter?

Yes(Y) No(N)

Registering the common parameters.

9) Network settings
Confirm that the common parameters are "■ set."

[Network setting] Label

	Unit #1 NET/10 Remote	Unit #2	Unit #3	Unit #4
1st I/O#	[0]	----------	----------	----------
Network#	[1]	----------	----------	----------
# of Station(slave)	[1]	----------	----------	----------
Network Refresh Parm	None	----------	----------	----------
Common Parameter	■ Set	----------	----------	----------
Specific Parameter	----------	----------	----------	----------
I/O Allocation	None	----------	----------	----------
TX Parm For DataLink	----------			
Routing Parameter	None			

•:Must Be Set :If Necessary ■,■:Setting Done *:For Only Reference

Space:Select Esc:Close

↑ Enter

10) Network refresh parameter setting

The X/Y refresh range is not set by default, so the values must be specified.

[Network Refresh Parameter] Label

1

NET/10 Remote 1st I/O # 0 Network # 1	# of TX Device	Link Side First	Last	CPU Side First Device	Last Device
B TX	[8192]	B[0]-B	[1FFF]< >	B [0]	-B [1FFF]
W TX	[8192]	W[0]-W	[1FFF]< >	W [0]	-W[1FFF]
X TX	[0]	X[ ]-X	[ ]< >	X [ ]	-X [ ]
Y TX	[0]	Y[ ]-Y	[ ]< >	Y [ ]	-Y [ ]

Esc:Close

Set as shown below

[Network Refreah Parameter] Label

1

NET/10 Remote 1st I/O # 0 Network # 1	# of TX Device	Link Side First	Last	CPU Side Fiest Device	Last Device
B TX	[8192]	B[0]-B	[1FFF]< >	B [0]	-B [1FFF]
W TX	[8192]	W[0]-W	[1FFF]< >	W [0]	-W[1FFF]
X TX	[8192]	X[0]-X	[1FFF]< >	X [0]	-X [1FFF]
Y TX	[8192]	Y[0]-Y	[1FFF]< >	Y [0]	-Y [1FFF]

Esc:Close

[Esc]

11) Select "Yes (Y)."

Do you want to register the parameter? ---- Registering network refresh parameters.

Yes(Y) No(N)

Confirm that the network setting refresh parameter is set to "■ set".

12) Select "Yes (Y)."

Do you want to register the parameter? ---- Registering network settings.

Yes(Y) No(N)

13) Write the parameters to QnA(R)CPU (set the QnA(R)CPU to STOP).

[Alt] → [2]
Menu Select PC

```
1/File 2/PC 3/Find 4/Disp 5/Edit 6/Monitor 7/Window
     1/Read...
     2/Write...
     3/Compare...
     4/New...
     5/File List...
     6/Connection Setting...
     7/Remote Operation...
     8/Write Option...
```

[2] (Write)

[Space] [Space] → [N] [E] [T] [1] [0] → [Enter] → [Enter]

Move to the file name setting field / File name / Move to the comment setting field / No comment

File name must be set.

```
[Write to PC]
 Interface      RS232C       (---------)       QnACPU
 Target PC      Network:0    Station: FF PC  Type:Q4A
 Target Mem     Internal RAM    Title  [                              ]
 1.File 1.File  Name[NET10  ]   Title  [                              ]
          2.Tgt 1.[*] Parameter
                2.[*] Seq/SFC Prog    1.(*) Whole Range    [     ]K Step
                                      2.( ) Step Range     [     ]-[    ]
                3.[ ] Device Comment  3.( ) Step Range    P[     ]-[    ]
                4.[ ] Dev Init Value  4.( ) Block Range    [     ]-[    ]
                5.[ ] Simulation Data
                6.[ ] File Register   1.(*) Whole Range
                                      2.( ) Specify      ZR[     ]-[    ]
 2.Device Mem   1.[ ] Internal        1.(*) Whole Range
                                      2.( ) Specify Detail Range
                          Execute(Y)   Cancel(N)
                 Ctrl+L:List Ctrl+D=Dir Space:Select Esc:Close
```

[Y] (Execute)

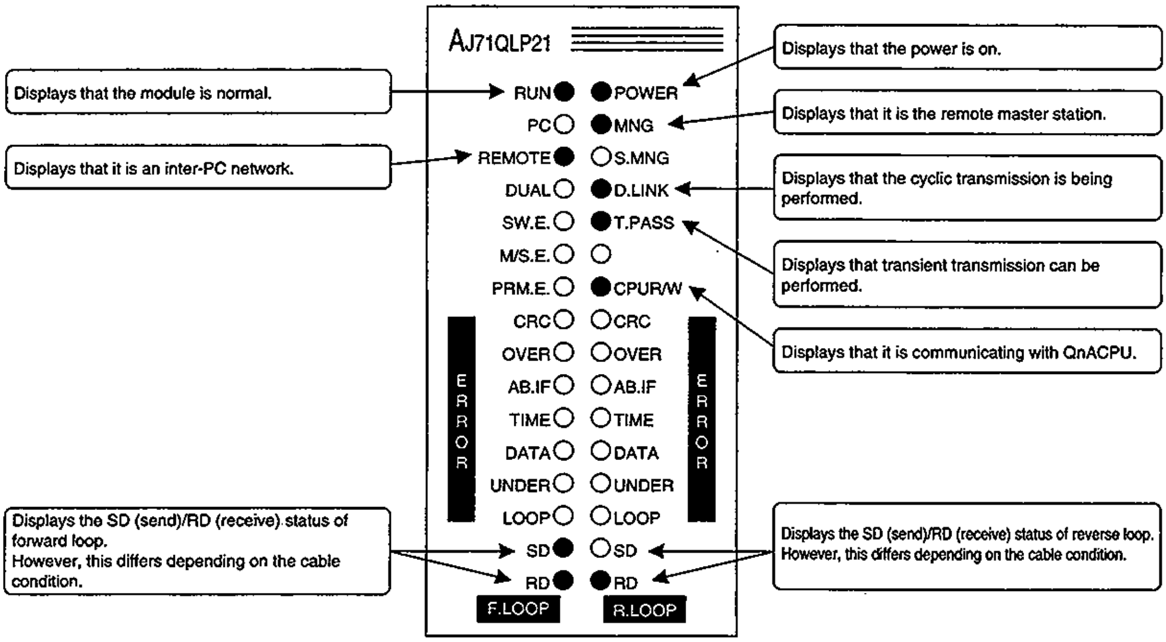
Write is complete when "Completion" is displayed.

(4) **Checking the LEDs of the network module**

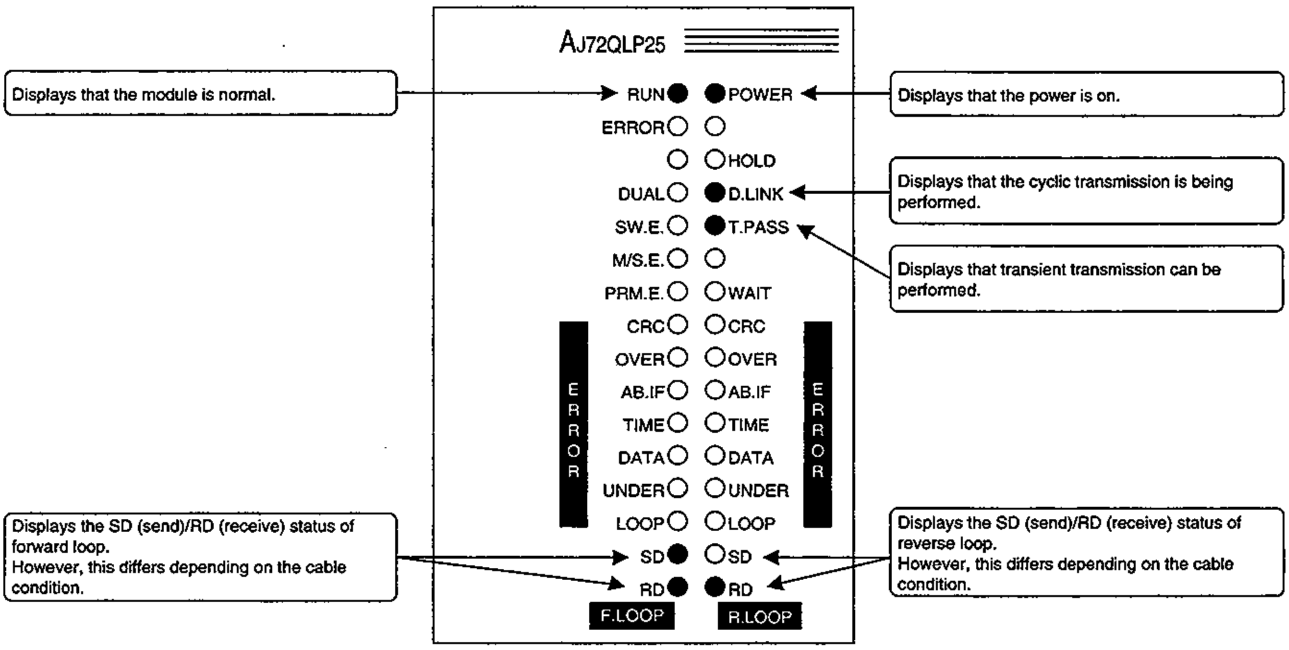
After running QnA(R)CPU, the data link status can be checked with the LEDs on the front of the network modulet of the remote master station/remote I/O station.

The display for the remote master station/remote I/O station in the normal state is shown below:

(a) Display of remote master station

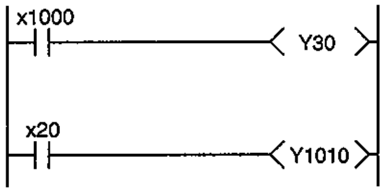


(b) Display of remote I/O



(5) Check the cyclic transmission

Load the following program in the remote master station, and confirm if communication with remote I/O stations can be performed.

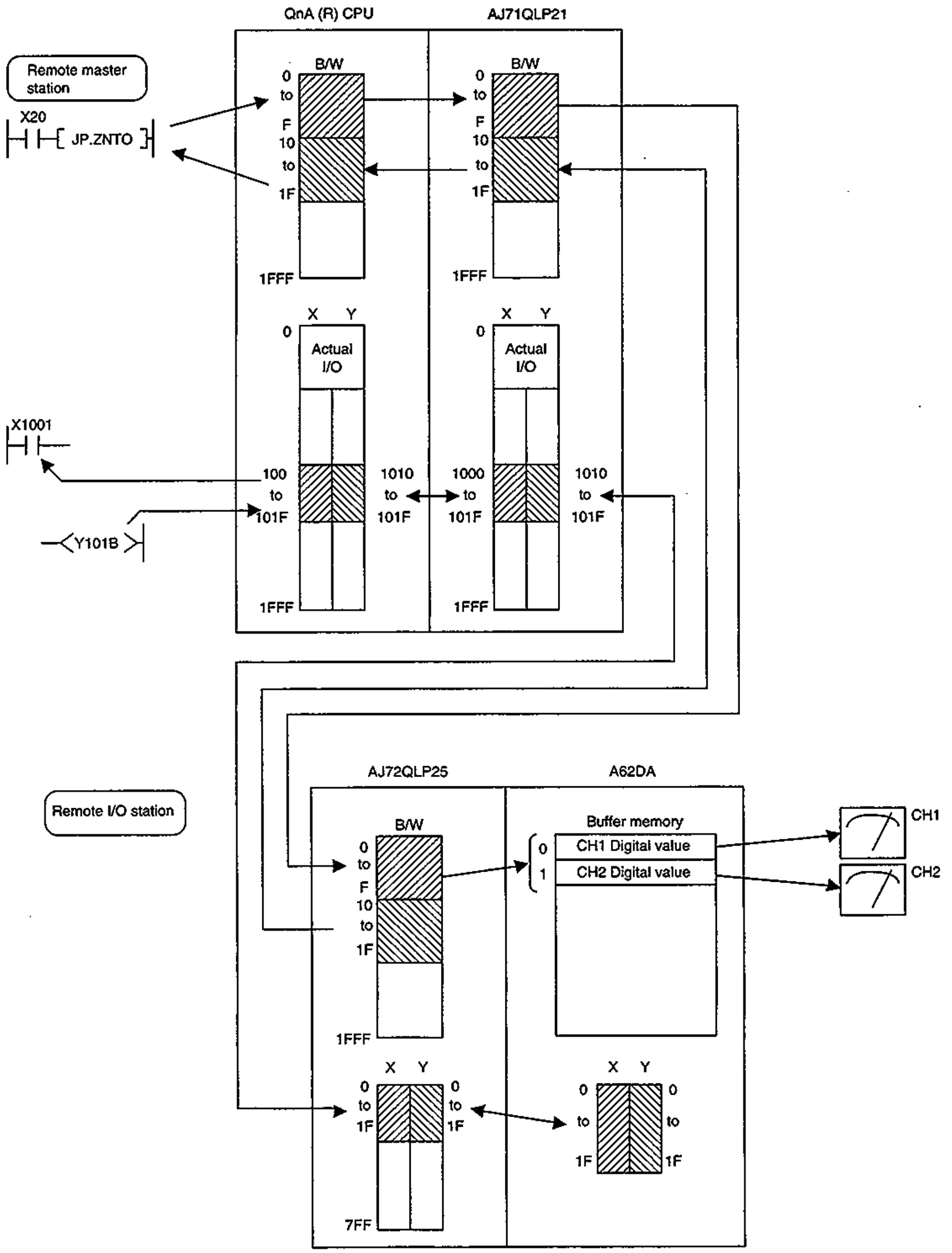


Y30 of remote master station's AY40 turns on when X0 of the remote I/O station's AX40 is turned on.

Y10 of remote I/O station's AY40 turns on when X20 of the remote master station's AX40 turns on.

7.2.2 Communication with the special function module

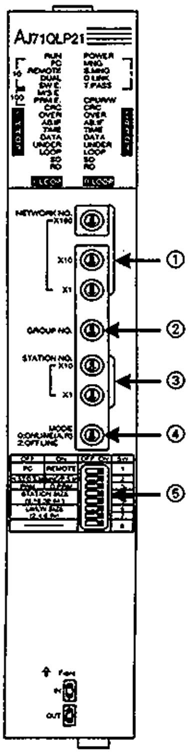
The communication in the following manner is described.
When X20 of the remote master station's AX40 (input module) is turned on, the digital values are written in the buffer addresses 0 to 1 in the remote I/O station's A62DA (special function module), then the voltage is generated.



(1) Network module setting

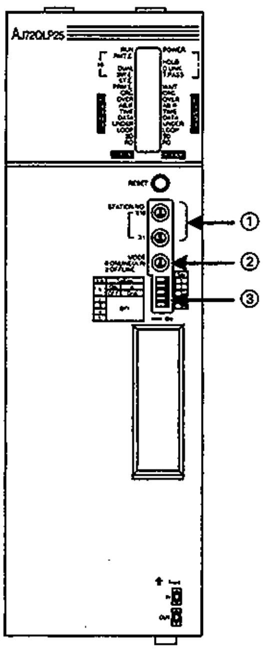
The following is set for the network module.
Setting is same as those for communication with input/output module.

(a) Remote master station setting



No.	Item			Details	Setting
①	NETWORK No.	×100		Network number	0
		×10			0
		×1			1
②	GROUP No.			Group number (invalid when remote I/O network)	0
③	STATION No.	×10		Station number	0
		×1			0
④	MODE			Mode	0
⑤	SW	OFF	ON	—	
	1	PC	REMOTE	Inter-PC network/remote I/O network	ON
	2	N.ST/D.S.M	MNG/P.S.M	Multiple remote submaster station/ parallel remote submaster station	OFF
	3	PRM	D.PRM	No effets when remote I/O network	OFF
	4	STATION SIZE (8, 16, 32, 64)			OFF
	5				OFF
	6	LB/LW SIZE (2, 4, 6, 8K)			OFF
	7				OFF
	8	—		—	OFF

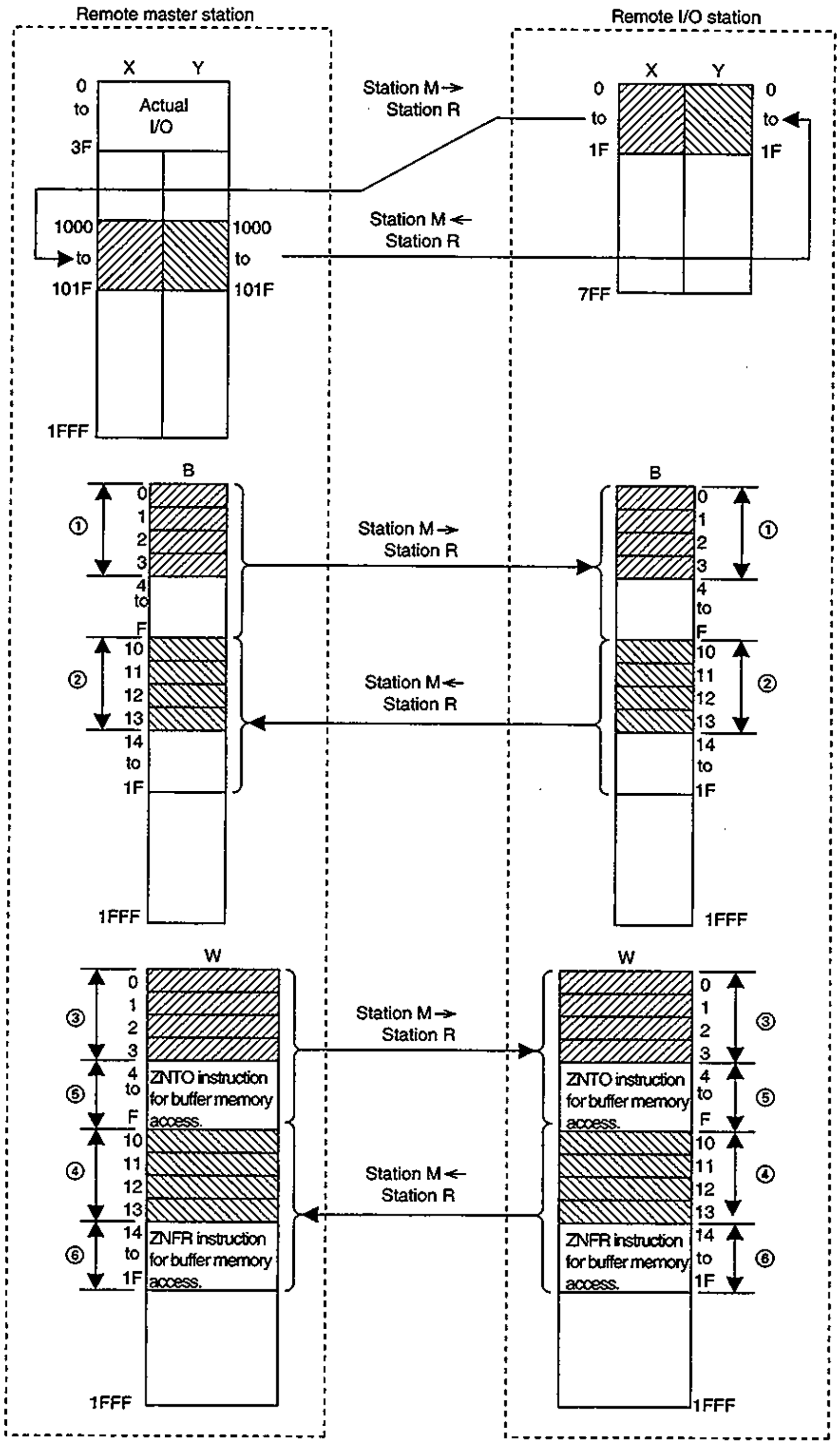
(b) Remote I/O station setting



No.	Item			Details	Setting
①	NETWORK No.	×10		Station number	0
		×1			1
②	MODE			Mode	0
③	SW	OFF	ON	—	
	1	QnA	A	QnACPU peripheral device connection/ACPU peripheral device connection	OFF
	2	—		Always off	OFF
	3				OFF
	4				OFF
	5				OFF

(2) **Common parameters**

Sets the B/W address (handshake and data storage) is to be used for the buffer member read/write by ZNFR/ZNTO instruction, or the address to control the I/O signals.



① to ④, ①' to ④'

These are necessary for handshaking for each special function module.

Station M → Station R		**Station M ← Station R**	
B*1	W	B*1	W
4 points/module	4 points/module	4 points/module	4 points/module

*1: B is set in 16-point module.

⑤, ⑥, ⑤', ⑥'

Necessary for data storage.
W can be set in 1-point modules, so set according to the buffer memory size of the special function module.

Points

If at least one B or W is set, whether enough handshake points exist for the special function modules installed at the remote I/O station is checked.
If the points are insufficient, it results in "PRM.E".
If not set at all, checking is not performed.

(3) Parameter settings

This section describes the operation in DOS/V PC.

1) Startup the GPPQ type GPP function software package, and display the menu.
2) Select "3/Parameters."
3) Select "7. MELSECNET (II, /10)."
4) Select "No (N)."

Clears parameters and reads Installation status. All right?
Yes(Y) No(N)

5) Number of modules setting

[# of Units Setting] Label:

1. MELSECNET(II,/10)Unit(s) [ ]

1. Unit 1 ( )
2. Unit 2 ( )
3. Unit 3 ( )
4. Unit 4 ( )

2.Valid Unit at Accessing Other St [1]

Execute(Y) Cancel(N)

Space:Select Esc:Close

Set the number of network modules installed here.

Set the types of network modules here.

[Setting the number of modules]

Space → 1 → Enter

Move the cursor to the setting field. / Number of modules / Move the cursor to the type setting field

Continued to the next page

Continued from the previous page

[Type setting for the first module]

Enter → 4 → Enter

Open the module type setting screen — Remote master — Selection complete

[Unit Type Setting(1)]

1.(*) MELSECNET/10 (Default)
2.( ) MELSECNET/10 (Control Station)
3.( ) MELSECNET/10 (Normal Station)
4.( ) MELSECNET/10 (Remote Master)
5.( ) MELSECNET (Master Station)
6.( ) MELSECNETII Cmp (Master Station)
7.( ) MELSECNETII (Master Station)
8.( ) MELSECNET (Local Station)
9.( ) MELSECNETII Cmp (Local Station)
A.( ) MELSECNETII (Local Station)

B.( ) MELSECNET/10
(Wait /Duplex/Parallel)

Execute(Y) Cancel(N)

Space:Select Esc:Close

[Valid modules for accessing by other stations]

↓ ↓ ↓ ↓

2. Move the cursor to the valid module for accessing other station

[# of Units Setting] Label:

1. MELSECNET(II,/10)Unit(s) [1]
   1. Unit 1 (MELSECNET/10 (Remote))
   2. Unit 2 ( )
   3. Unit 3 ( )
   4. Unit 4 ( )

2.Ualid Unit at Accessing Other St [1]

Execute(Y) Cancel(N)

Space:Select Esc:Close

Y (Execute)

6) Network settings

Set the head I/O number of the network module here.

Set the network number set with the switch here.

Set the number of remote I/O stations here.

[Network setting] Label

	Unit #1 NET/10 Remote	Unit #2	Unit #3	Unit #4
1st I/O#	[ ]	---------	---------	---------
Network#	[ ]	---------	---------	---------
# of Station(Slave)	[ ]	---------	---------	---------
Network Refresh Parm	None	---------	---------	---------
Common Parameter	• None	---------	---------	---------
Specific Parameter	---------	---------	---------	---------
I/O Allocation	None	---------	---------	---------
TX Parm For DtaLink	---------			
Routing Parameter	None			

• :Must Be Set :If Necessary :Setting Done * For Only Reference

Space:Select Esc:Close

0 → Enter → 1 → Enter → 1

First I/O number / Network number / Total number of linked stations

[Network setting] Label

	Unit #1 NET/10 Remote	Unit #2	Unit #3	Unit #4
1st I/O#	[0]	---------	---------	---------
Network#	[1]	---------	---------	---------
# of Station(Slave)	[1]	---------	---------	---------
Network Refresh Parm	None	---------	---------	---------
Common Parameter	• None	---------	---------	---------
Specific Parameter	---------	---------	---------	---------
I/O Allocation	None	---------	---------	---------
TX Parm For DataLink	---------			
Routing Parameter	None			

• :Must Be Set :If Necessary :Setting Done * For Only Reference

Space:Select Esc:Close

↓ ↓ → Enter

Move the cursor to the common parameters.

7) Common parameters

[Cmm Parm (MELSECNET/10Remote)(BWSet)] Label

Auxiliary Setting
Link WDT 2000 ms

Network(# 1)
NET/10 Remote 1st I/O # 0
Network # 1 Slave PC Sta 1

Station	M Sta→R Sta — B — First Last	M Sta←R Sta — B — First Last	M Sta→R Sta — W — First Last	M Sta←R Sta — W — First Last
1	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]

PgUp:Prev PgDn:Next F3:BW→XY Esc:Close

↓

[0] [→] [F] [→] [1] [0] [→] [1] [F] [→]
B for M→R — B for M←R

[0] [→] [F] [→] [1] [0] [→] [1] [F] [Enter]
W for M -> R — W for M <- R

↓

[Cmm Parm (MELSECNET/10Remote)(BWSet)] Label

Auxiliary Setting
Link WDT 2000 ms

Network(# 1)
NET/10 Remote 1st I/O # 0
Network # 1 Slave PC Sta 1

Station	M Sta→R Sta — B — First Last	M Sta←R Sta — B — First Last	M Sta→R Sta — W — First Last	M Sta←R Sta — W — First Last
1	[0]-[F]	[10]-[1F]	[0]-[F]	[10]-[1F]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]

PgUp:Prev PgDn:Next F3:BW→XY Esc:Close

↓

[F3] (Switch setting)

↓

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[Cmm Parm (MELSECNET/10 Remote)(XY Set)] Label

Auxiliary Setting
Link WDT 2000 ms

Network(# 1)
NET/10 Remote 1st I/O # 10
Network # 1 Slave PC Sta 1

Station	M Station → R Station Y First Last	M Station → R Station Y First Last	M Station ← R Station X First Last	M Station ← R Station X First Last
1	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]

PgUp:Prev PgDn:Next F3:BW->XY-> Esc:Close

1 0 0 0 → 1 0 1 F → 0 →

Y of station M First Y of station R

1 0 0 0 → 1 0 1 F → 0 Enter

X of station M First X of station R

[Cmm Parm (MELSECNET/10 Remote)(XY Set)] Label

Auxiliary Setting
Link WDT 2000 ms

Network(# 1)
NET/10 Remote 1st I/O # 0
Network # 1 Slave PC Sta 1

Station	M Station → R Station Y First Last	M Station → R Station Y First Last	M Station ← R Station X First Last	M Station ← R Station X First Last
1	[1000]-[101F]	[0]- 1F	[1000]-[101F]	[0]- 1F
	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-
	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-
	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-
	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-
	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-
	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-
	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-

PgUp:Prev PgDn:Next F3:BW->XY1->XY2-> Esc:Close

Esc

8) Select "Yes (Y)."

Do you want to register the parameter? ---------- Registering the common parameters.

Yes(Y)   No(N)

9) Network setting
Confirm that the common parameters are " ■ set".
No settings are made at the items marked " □ ".

[Network setting]   Label:

	Unit #1 NET/10 Remote	Unit #2	Unit #3	Unit #4
1st I/O #	[0]	---------	---------	---------
Network #	[1]	---------	---------	---------
# of Station(slave)	[1]	---------	---------	---------
Network Refresh Parm	□ None	---------	---------	---------
Common Parameter	■ Set	---------	---------	---------
Specific Parameter	---------	---------	---------	---------
I/O Allocation	□ None	---------	---------	---------
TX Parm For DataLink	---------			
Routing Parameter	□ None			

• :Must Be Set □:If Necessary ■,■:Setting Done ✻:For Only Reference

Space:Select Esc:Close

[↑] [Enter]

10) Network refresh parameter setting

The X/Y refresh range is not set by default, so values must be specified.

[Network Refresh Parameter] Label

# 1 NET/10 Remote 1st I/O # 0 Network # 1	# of TX Device	Link Side First	Link Side Last	CPU Side First Device	CPU Side Last Device
B TX	[8192]	B[0]	-B[1FFF]	< >B[ ]	-B[1FFF]
W TX	[8192]	W[0]	-W[1FFF]	< >W[ ]	-W[1FFF]
X TX	[0]	X[ ]	-X[ ]	< >X[ ]	-X[ ]
Y TX	[0]	Y[ ]	-Y[ ]	< >Y[ ]	-Y[ ]

Esc:Close

Set as shown below.

[Network Refresh Parameter] Label

# 1 NET/10 Remote 1st I/O # 0 Network # 1	# of TX Device	Link Side First	Link Side Last	CPU Side Fiest Device	CPU Side Last Device
B TX	[8192]	B[0]	-B[1FFF]	< >B[0]	-B[1FFF]
W TX	[8192]	W[0]	-W[1FFF]	< >W[0]	-W[1FFF]
X TX	[8192]	X[0]	-X[1FFF]	< >X[0]	-X[1FFF]
Y TX	[8192]	Y[0]	-Y[1FFF]	< >Y[0]	-Y[1FFF]

Esc:Close

Esc

11) Select "Yes (Y)."

Do you want to register the parameter?

Yes(Y) No(N)

---- Registering the network refresh parameters.

Confirm that the network setting reflesh parameter is set to "■ set".

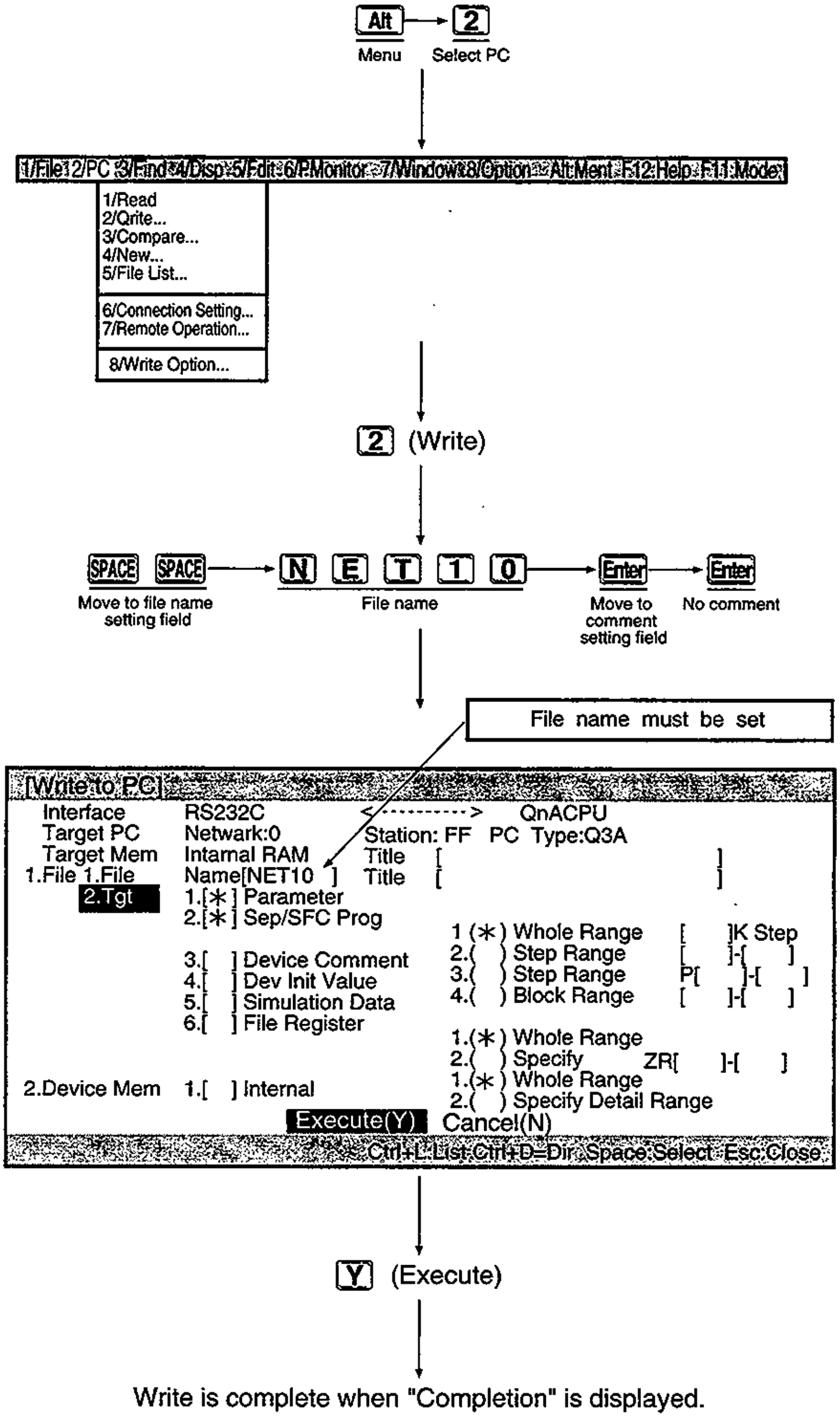
12) Select "Yes (Y)."

Do you want to register the parameter?

Yes(Y) No(N)

---- Registering the network settings

13) Write the parameters to QnA(R)CPU. (Set QnA(R)CPU to STOP.)

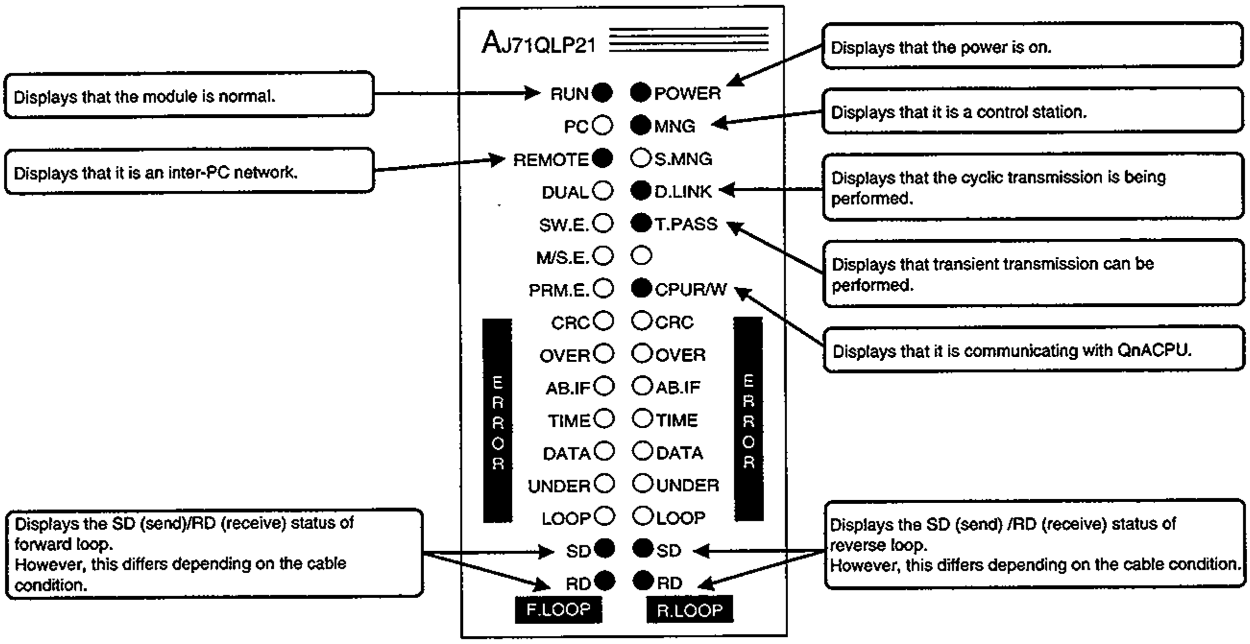


(4) **Checking the LEDs of the network module**

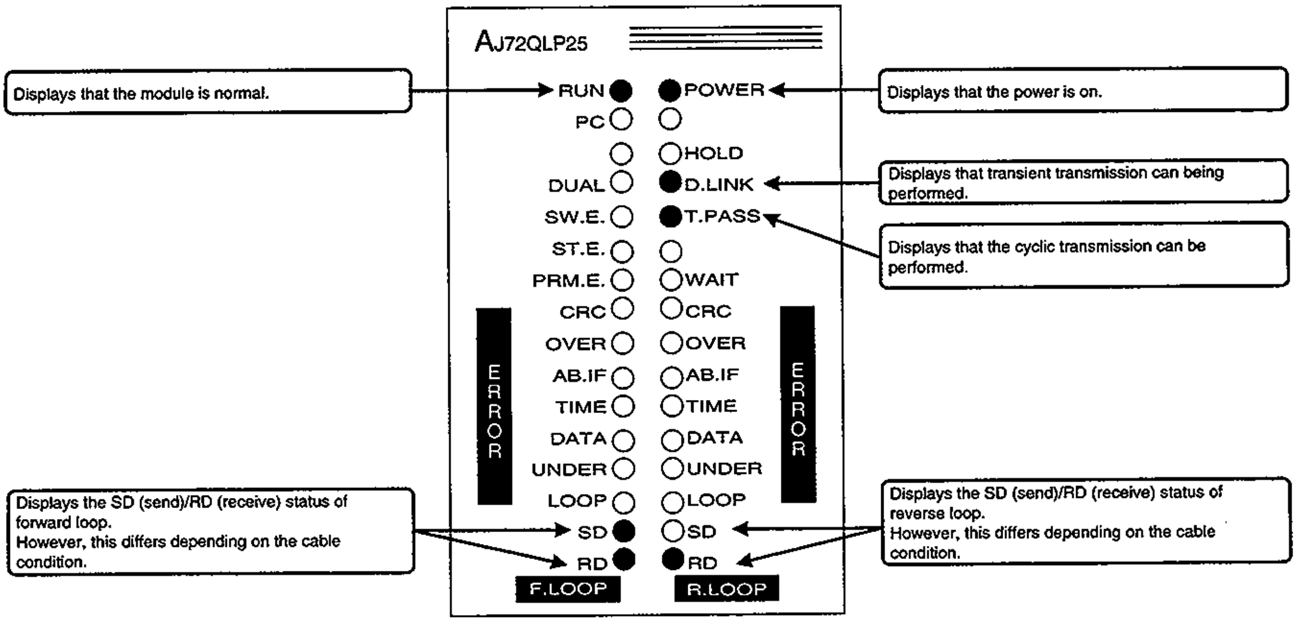
After running QnA(R)CPU, the data link status can be checked with the LEDs on the front of the network module of the remote master station/remote I/O station.

The display for the remote master station/remote I/O station in the normal state are shown below:

(a) Display of remote master station

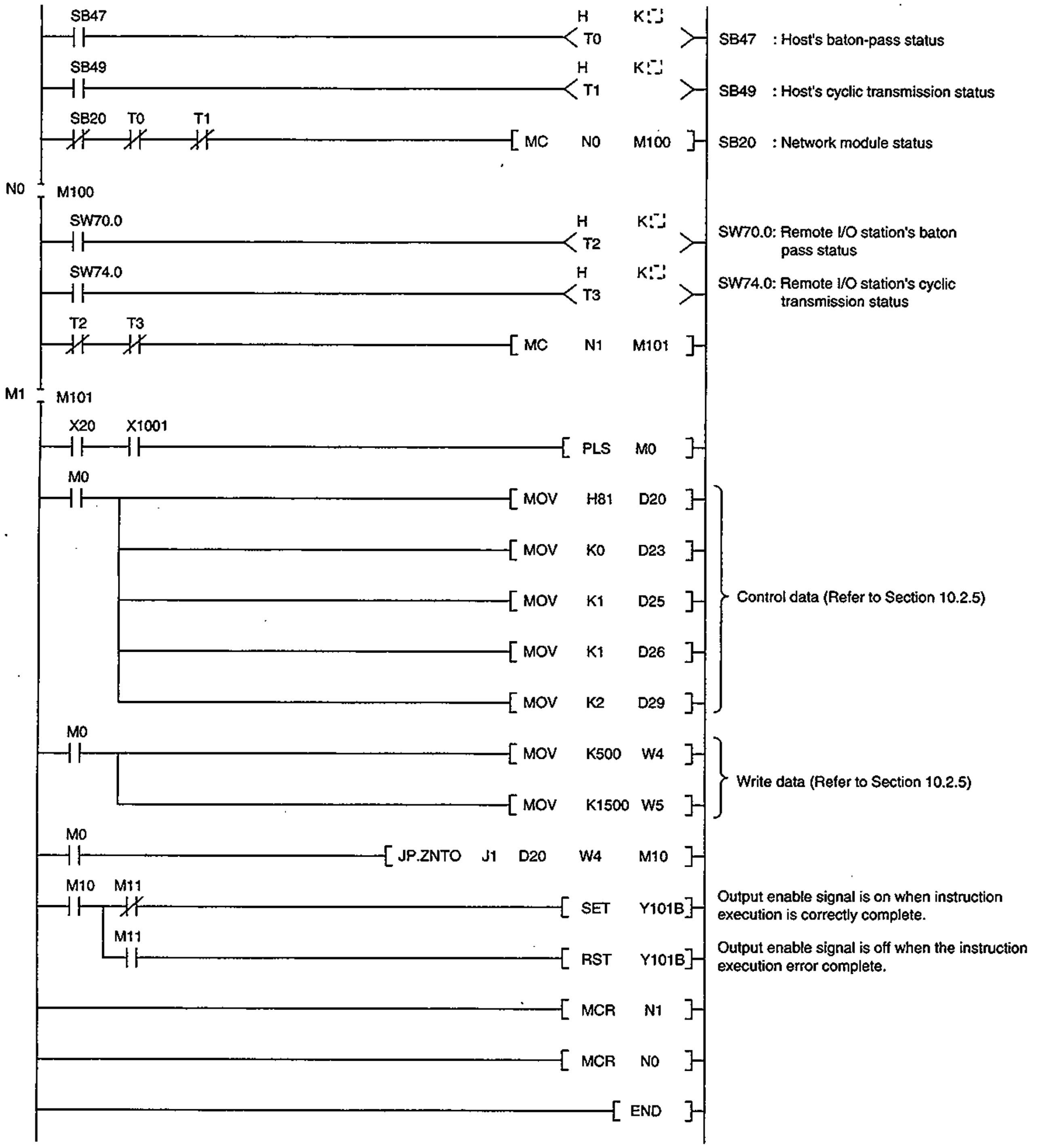


(b) Display of remote I/O



(5) Checking the communication status

Write the following program to the remote master station and check to see if it can communicate with A62DA. Check that turning the X20 of the remote master station AX40on enables to write the digital values to the buffer memory addresses 0 to 1 of the remote I/O station A62DA and voltage is output.



* Constant K☐ of the timer (T0 to T3) while programming should be set with the value approximately five times as mush as the link scan time.

8 Function

The functions of MELSECNET/10 are described.
The functions are listed below:

- Inter-PC network
  - Cyclic Transmission Function
    - Communication by B/W .... Section 8.1.1
    - Communication by X/Y .... Section 8.1.2
    - Stopping/restarting cyclic transmission .... Section 8.1.5
    - Inter data link transfer function .... Section 8.1.6
    - Direct access to the link device .... Section 8.1.7
    - Increasing the send points by installing multiple modules of the same network No. .... Section 8.1.8
    - Default values of network refresh parameters............. Section 8.1.9
  - Transient Transmission Function
    - Communication range .... Section 8.2.1
    - Routing function.................................. Section 8.2.2
    - Group function .... Section 8.2.3
    - Link dedicated instructions .... Section 8.2.4
    - Specifying default network........................... Section 8.2.5
    - Clock setting at stations in the network from peripheral devices .... Section 8.2.6
  - Control Station Transfer Function.. Section 8.3
  - Multiplex Transmission Function (Optical Loop System).......................... Section 8.4
  - Reserve Station Function.. Section 8.5
  - Simplified Network Duplexing (Inter-PC network) .... Section 8.6
  - SB/SW Can Be Used as You Like (User Flags)................................. Section 8.10
  - RAS Function
    - Automatic recovery function .... Section 8.11.1
    - Loop back function................................ Section 8.11.2
    - Preventing stations from going down by using the external power supply (inter-PC network: optical loop system) .... Sectino 8.11.3
    - Station detachment function .... Section 8.11.4
    - Transient transmission is possible when the PC CPU is in fault .... Section 8.11.5
    - Confirming the transient transmission error detection time.... Section 8.11.6
    - Diagnostic function .... Section 8.11.7

- Remote I/O network
  - Cyclic Transmission Function
    - Communication with I/O module .... Section 8.1.3
    - Communication with the special function module .... Section 8.1.4
    - Stopping/restarting cyclic transmission.................. Section 8.1.5
    - Direct access to the link device .... Section 8.1.7
    - Default values of network refresh parameters............. Section 8.1.9
  - Transient Transmission Function
    - Communication range .... Section 8.2.1
    - Routing function.................................. Section 8.2.2
    - Link dedicated instructions .... Section 8.2.4
    - Specifying default network........................... Section 8.2.5
    - Clock setting at stations in the network from peripheral devices .... Section 8.2.6
  - Multiplex Transmission Function (Optical Loop System).......................... Section 8.4
  - Reserve Station Function.. Section 8.5
  - Multiple Master System .... Section 8.7
  - Parallel Master System .... Section 8.8
  - Setting the Remote I/O Station Output Status When the System is Down Due to the Master Station Error .... Section 8.9
  - RAS Function
    - Automatic recovery function .... Section 8.11.1
    - Loop back function (Optical Loop System) .... Section 8.11.2
    - Station detachment function (Coaxial bus system).......... Section 8.11.4
    - Transient transmission is possible when the PC CPU is in fault .... Section 8.11.5
    - Confirming the transient transmission error detection time.... Section 8.11.6
    - Diagnostic function .... Section 8.11.7

8.1 Cyclic Transmission Function

The cyclic transmission function can be used for periodical data transfer between the stations connected to MELSECNET/10 in the same network.

8.1.1 Communication by B/W (Inter-PC network)

This function allows the data to be sent to all the stations connected to MELSECNET/10 by writing the data into the link relay (B) and the link register (W) range which is allocated to the host station by the common parameter or the default parameter of the control station.

The link relay (B) can send/receive ON/OFF information and the link register (W) can send/receive 16-bit data.

For example, the contact B0 of 1Ns2 and 1N3 will be turned ON when B0 of 1Mp1 is turned ON in Figure 6.1.

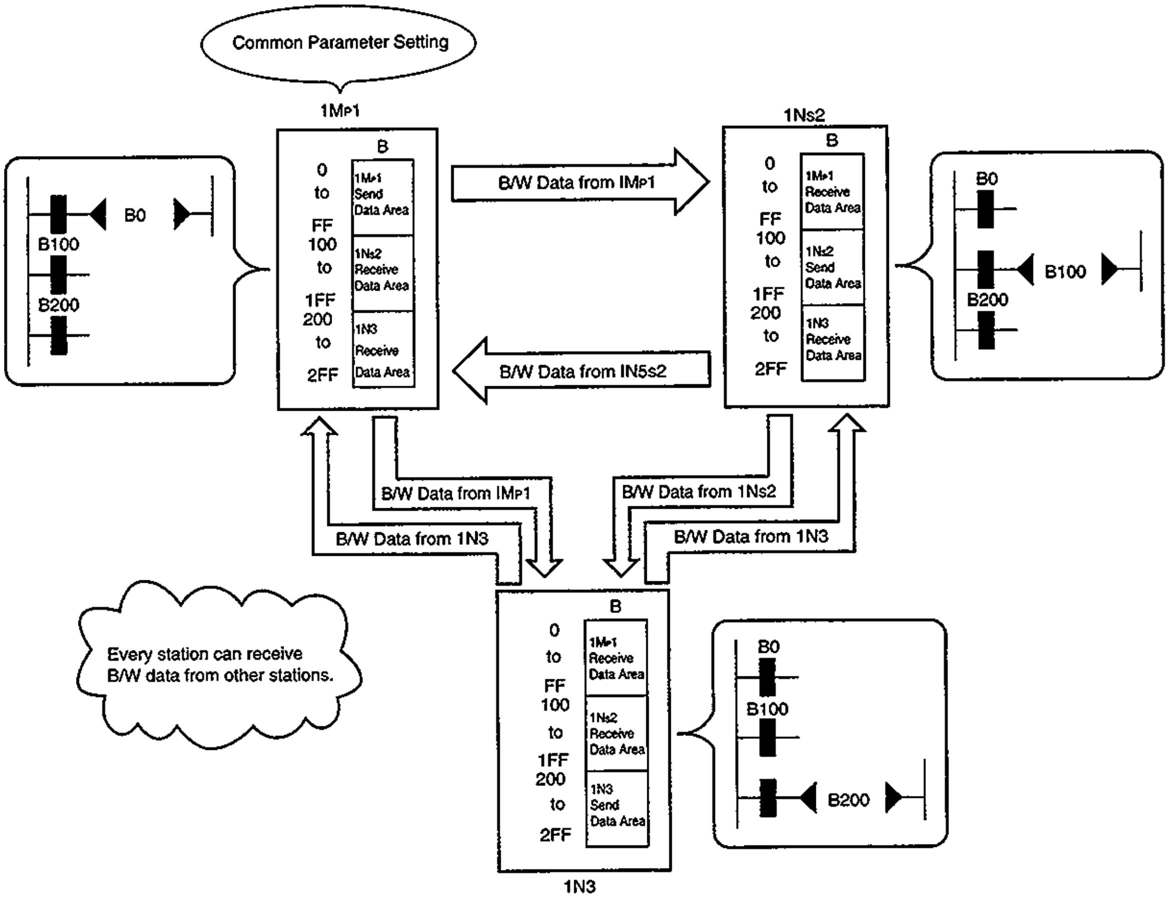


Figure 8.1 Communication by B/W

8.1.2 Communication by X/Y (Inter-PC network)

This function is used for one to one communication between the I/O master station and one of the other stations (maximum of 63 stations for the optical loop system, maximum of 31 stations for the coaxial bus system).
The data communication is performed by using the input (X) and the output (Y) range after the actual I/O range of the host station.
For the X/Y communication, the station number of the I/O master station and the data communication range are set by the common parameters of the control station.
Up to two stations from the stations connected to the network can be set as I/O master station.

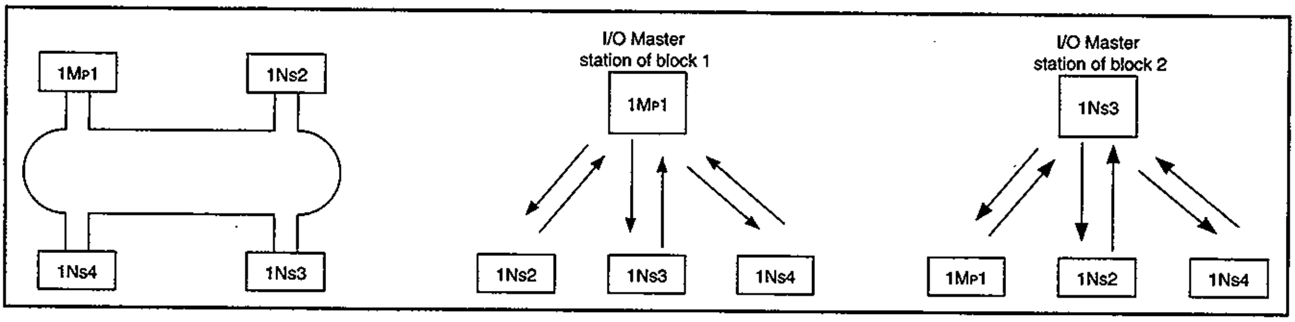


Figure 8.2 I/O Master station

For example, figure 8.3 shows the allocation for the X/Y communication between 1MP1 (I/O master station) and 1NS2, and between 1MP1 (I/O master station) and 1NS3.
When the station 1MP1 turns Y1000 to ON, XA00 of 1NS2 is turned ON. Also, X1200 of 1MP1 is turned ON when 1NS3 changes YC00 to ON.

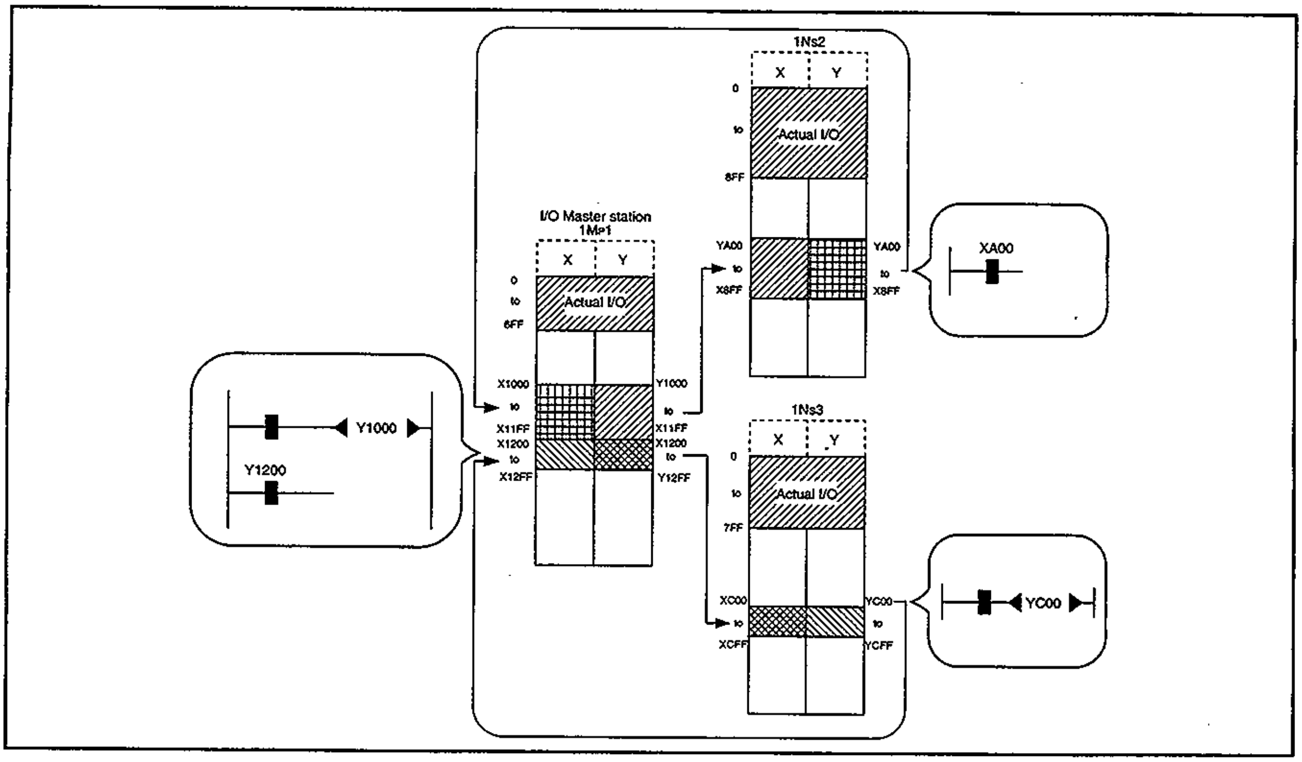


Figure 8.3 Communication by X/Y

Points

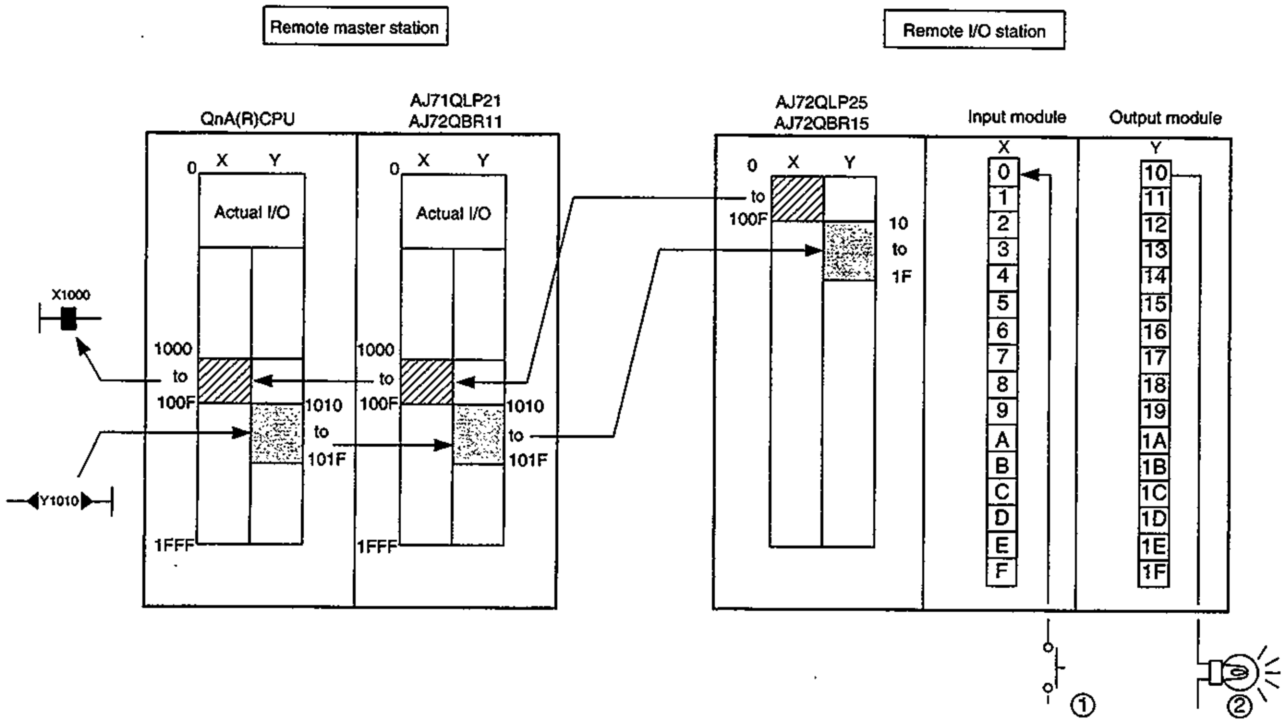
(1) Any QnA(R)/AnUCPU station can be set as I/O master station regardless whether it is a control station or a normal station.
AnN/AnACPU stations can communicate when the I/O master station is <u>a control station and it is in Block 1.</u>

(2) The device range after the actual I/O range of the host station can be used for X/Y communication.
Allocate this range not to overlap especially in the following cases:
(a) When two I/O master stations are set.
(b) When multiple network modules are installed and another network modules also sets the I/O master station.
(c) When the remote I/O station of MELSECNET is allocated.
(d) When the automatic refresh setting of MELSECNET/MINI is allocated.

Actual I/O
Range used by MELSECNET remote I/O
Range used by MELSECNET/MINI automatic refresh
Range for the communication between I/O master station and other stations in another network

8.1.3 Communication with I/O module (Remote I/O network)

The communication with I/O module can be established by using the X/Y devices.

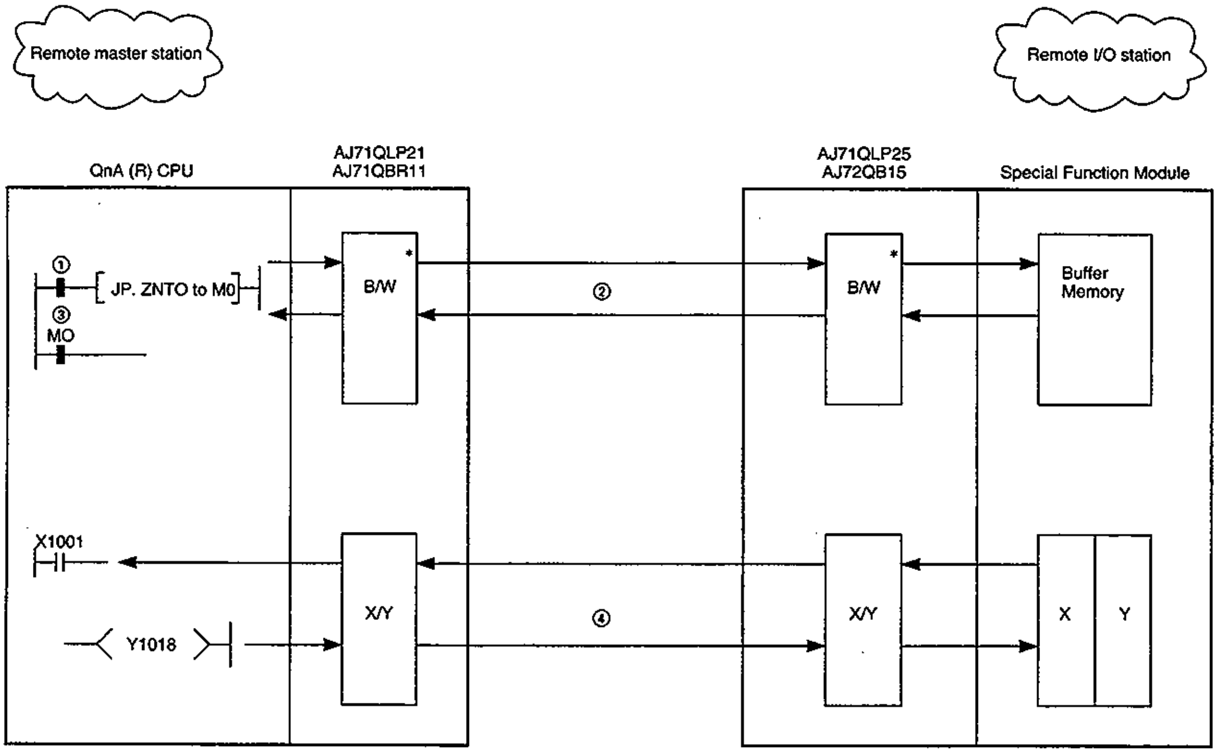


① When X00 of the input module in the remote I/O station is turned ON, X1000 of the remote master station is turned ON.

② When Y1010 of the remote master station is turned ON, Y10 of the output module in the remote I/O station is turned ON.

8.1.4 Communication with the special function module (Remote I/O network)

The communication with the special function module can be established by using the X/Y and B/W device.



[Buffer memory]

① Executes ZNFR/ZNTO instructions.

② ZNFR : Data of the buffer memory is read to W.
ZNTO : Data in W is written into the buffer memory.

③ When the ZNFR/ZNTO instruction is finished, the complete signal (M0) is turned ON for one scan.

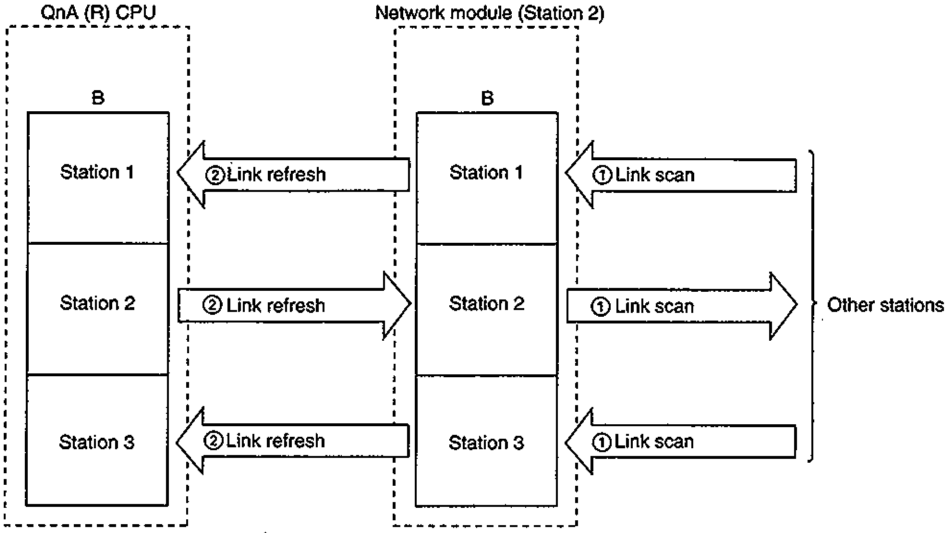
*: B is a device used for handshaking when the instruction is executed.
W is a device used for handshaking and reading/writing data.

[I/O]

④ Same as communication with I/O module for X/Y.

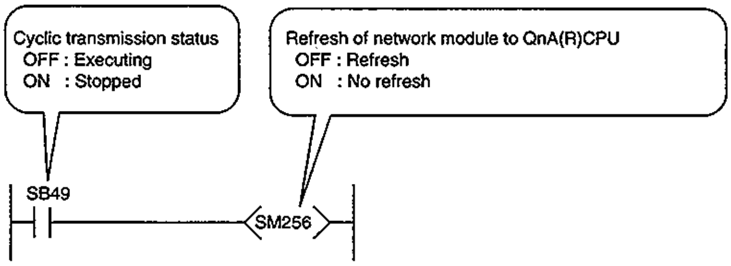
8.1.5 Stopping/restarting cyclic transmission and stopping link refresh

The cyclic transmission can be stopped/restarted by the "network test" of the peripheral device.
This is useful when the data from other stations should not be received or the data from the host station should not be sent, such as during system start-up or debugging.

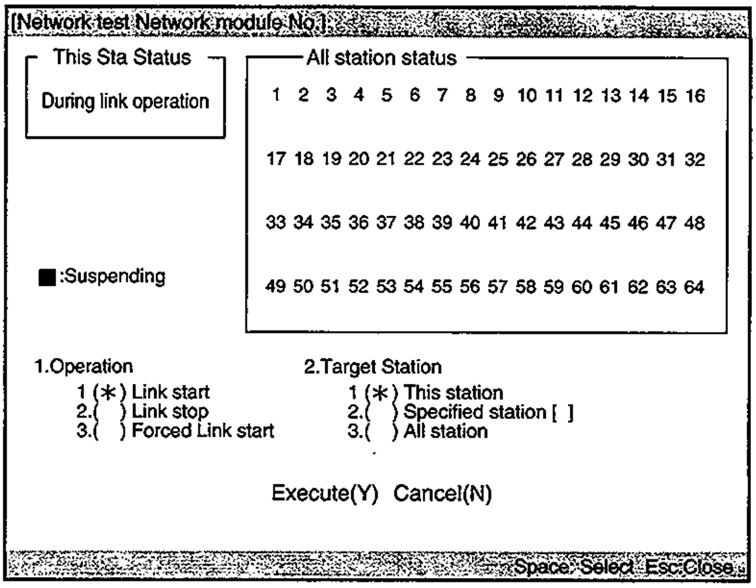


(1) Stop/restart of the cyclic transmission is to stop/restart the data communication (link scan) between the corresponding stations.

(2) Stop/restart of the cyclic transmission does not stop/restart the data communication (link refresh) between QnA(R)CPU and the network module.
It is necessary to stop/restart the link refresh by a sequence program which uses a special relay (SM) of QnA(R)CPU.
As the following program shows, stop/restart of the link refresh is executed depending on the cyclic transmission status (SB49) of the host station.



(3) Refer to SW□NX/IVD-GPPQ type GPP Function Software Package Operating Manual (Online) for operations of the network test.



(4) The combinations of stop/start of the link are shown in the following table:

Start method / Stop method	Link start			Forced link start		
	Host station	Specified station	All stations	Host station	Specified station	All stations
Host station	○	×	×	○	○	○
Specified station	×	○	×	○	○	○
All stations	×	×	○	×	×	○

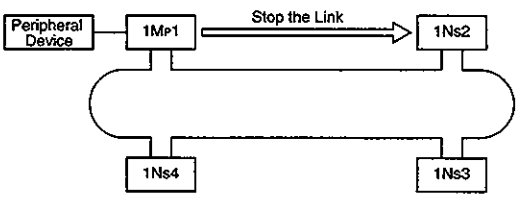
○ : Start is allowed × : Start is not allowed

(1) Start/restart process of the inter-PC network

Following example shows requests from 1MP1 to 1NS2 to stop and start again.

(a) Stop

The link of 1NS2 is stopped by the peripheral device.



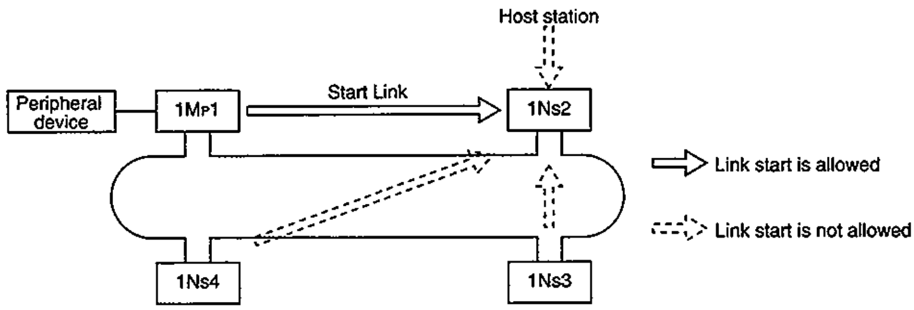
(b) Restart

There are two methods to restart the link of the stopped station, "link start" and "forced link start".

① Link start

Restart of the stopped station (1Ns2) can be done only from the station which stopped the link (1Mp1).

Other stations (the host station, 1Ns3, 1Ns4) cannot start the link.

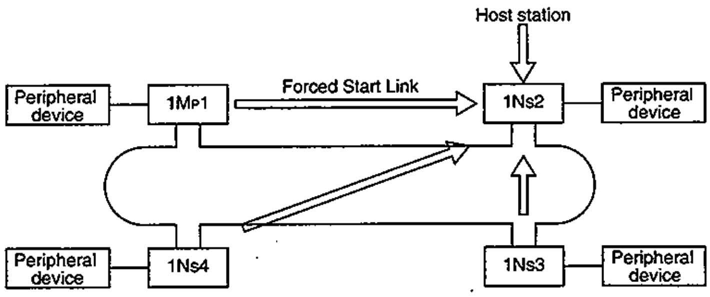


② Forced link start

Stations other than the one which requested the stop (including the host station) can start the link of the stopped station (1Ns2).

This starting method is used when the station which requested the stop is in fault. The host station or other stations can start it independent from the stopped station.

However, forced start of a specific station (host station, specified station) is not possible when all the stations are stopped.

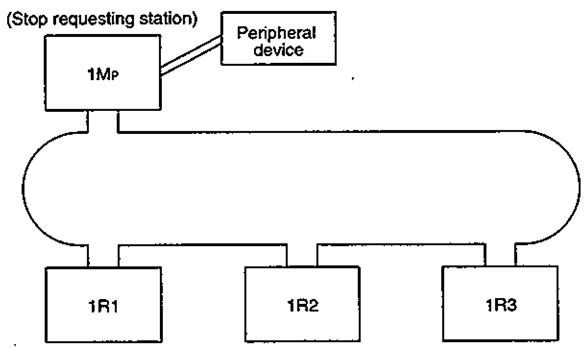


(2) Stop/restart operation of remote I/O network

All the stations (in the same network) can be stopped/restarted on the remote I/O network.
Stop/restart of the individual station is not possible.

(a) Stop

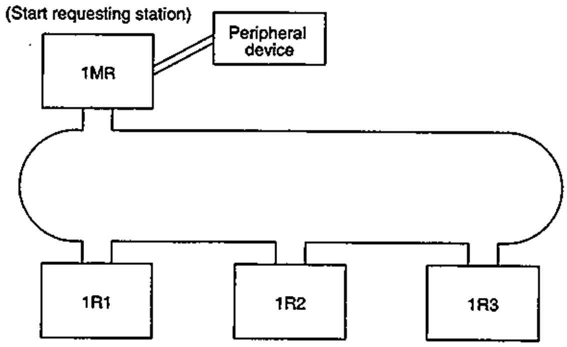
The cyclic transmission of all the stations (including the host station) is stopped.



(b) Restart

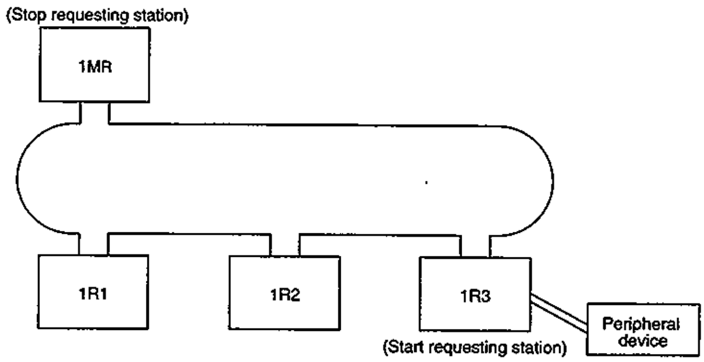
1) Link start

The link can be started from the station which stopped the link.



2) Forced link start

Stations other than the one which stopped the link can also start the link.



Points
(1) The cyclic transmission stop/restart function can stop only the cyclic transmission function. The transient transmission can be continued. (2) The station whose cyclic transmission was stopped will be treated as a stopped station, not a communication faulty station.

8.1.6 Inter data link transfer function

When multiple network modules (data link modules) are installed in one QnA(R)CPU, the data within the data linked device range of each network can be transmitted to another network using this function.
By using this function, there is no need to transfer data by "MOV" instruction, etc. in a sequence program.

(1) In order to use the inter data link transfer function, "the inter data link transfer parameters" must be set.

(2) The link relay (B) and the link register (W) of each network module (data link module) can be used as a device for the inter data link transfer. The link input and the link output (Y) cannot be used for the inter data link transfer.

(3) When the data is transferred, set the data in the host station send data range of the transferring network module.

(4) When the same data is transferred to multiple network numbers, the destination's device range can be set to the same number.
For example, the data received from network No.1 can be transferred to network No.2 and No.3.
Figure 8.4 shows an example of an inter data link transfer between network No.1 and network No.2. Set the inter data link transfer parameter to the intermediate station, QnA(R)CPU. The data B0 which was turned on by the station 1MP1 is received by the intermediate station 1NS3, then that data is transferred to the area (B1000) which is assigned to the intermediate station 2MP1. Thus, the stations 2NS2 and 2NS3 can confirm the B0's ON/OFF status at 1MP1 by checking the data in B1000. However, since B1000 (destination device) of the intermediate station QnA(R)CPU is not turned on, use B0 (origin device) instead.

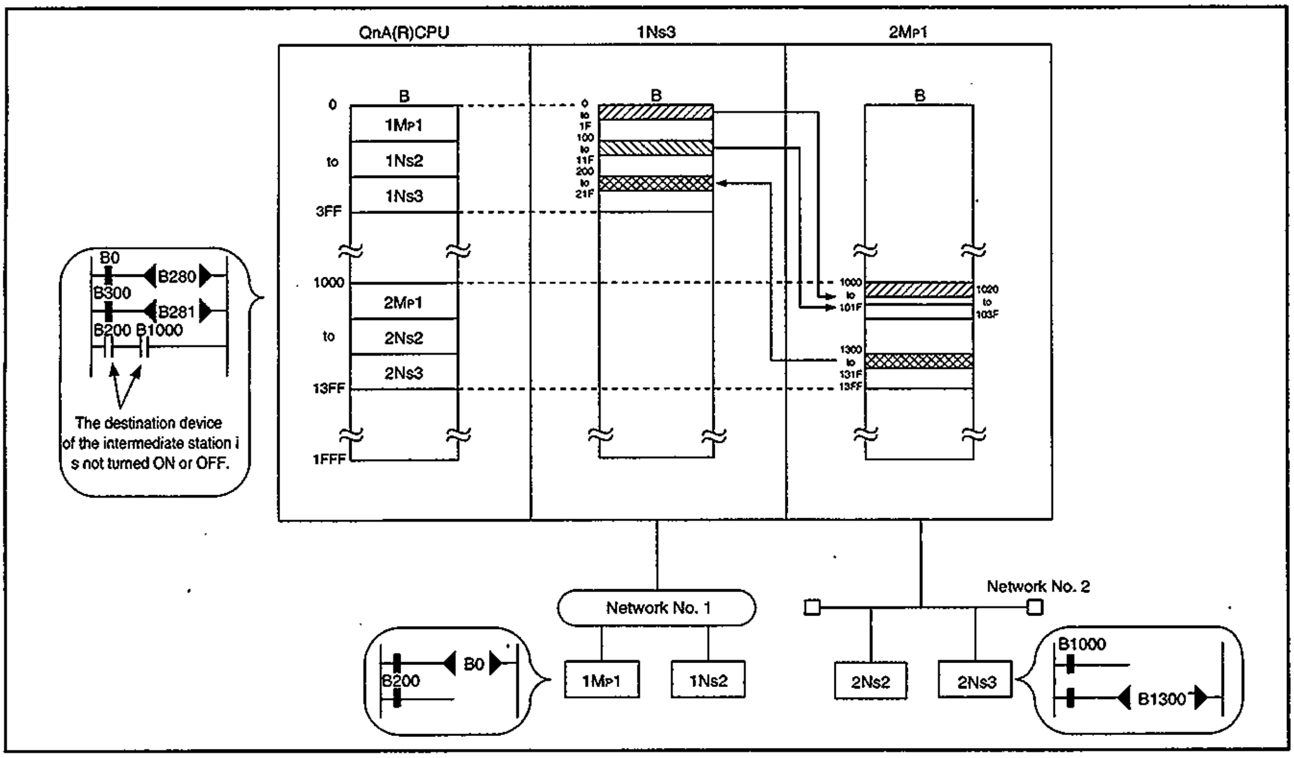


Figure 8.4 Inter Data link transfer function

(5) The possible combinations of the inter data link transfer are shown in table 8.1.
Only the inter-PC network and MELSECNET stations can use the inter data link transfer.
The remote master stations and the standby stations cannot use the inter data link transfer.

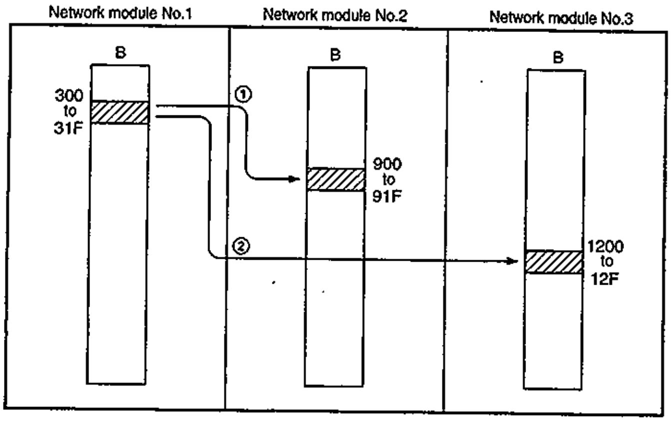
Table 8.1 Source/Destination combinations

Source \ Destination		MELSECNET/10 Control station	MELSECNET/10 Normal station	MELSECNET/10 Remote master station	MELSECNET/10 Standby station	MELSECNET Master station	MELSECNET Local station
MELSECNET/10	Control station	○	○	×	×	○	○
	Normal station	○	○	×	×	○	○
	Remote master station	×	×	×	×	×	×
	Standby station	×	×	×	×	×	×
MELSECNET	Master station	○	○	×	×	×	—
	Local station	○	○	×	×	—	×

○: Allowed ×: Not allowed —: No need to set

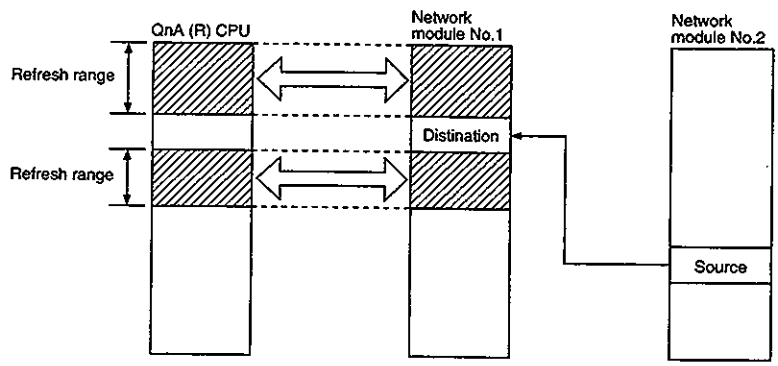
(6) The usable range is 24 for each B/W.

As an example shown below, the area from B300 to 31F of the network module 1 can be transferred to the area from B900 to 91F of the network module 2 and from B1200 to 121F of the network module 3.
In this case, two range settings are necessary.



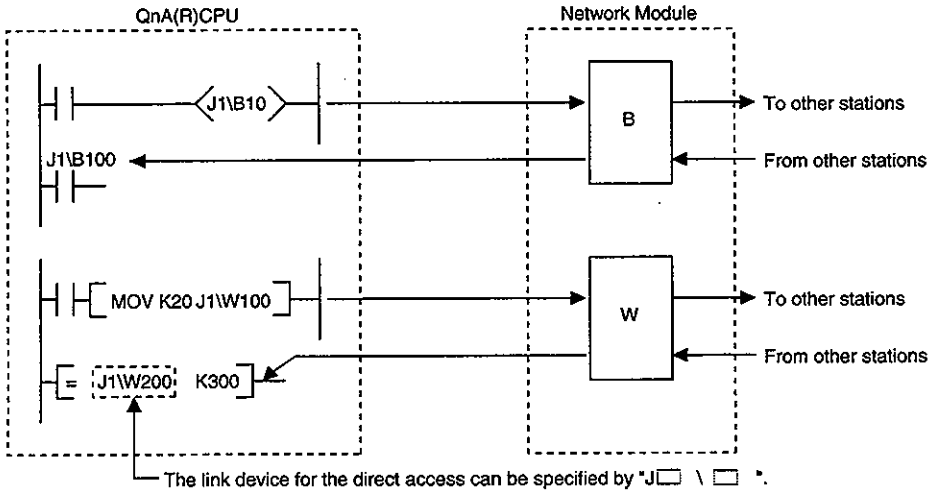
Points

(1) Use the sequence program to supplement the inter data link transfer function.
(2) It is necessary to change the network refresh parameter.
Do not include the destination device range of each network module to the refresh range.
The data cannot be transmitted to other stations correctly.



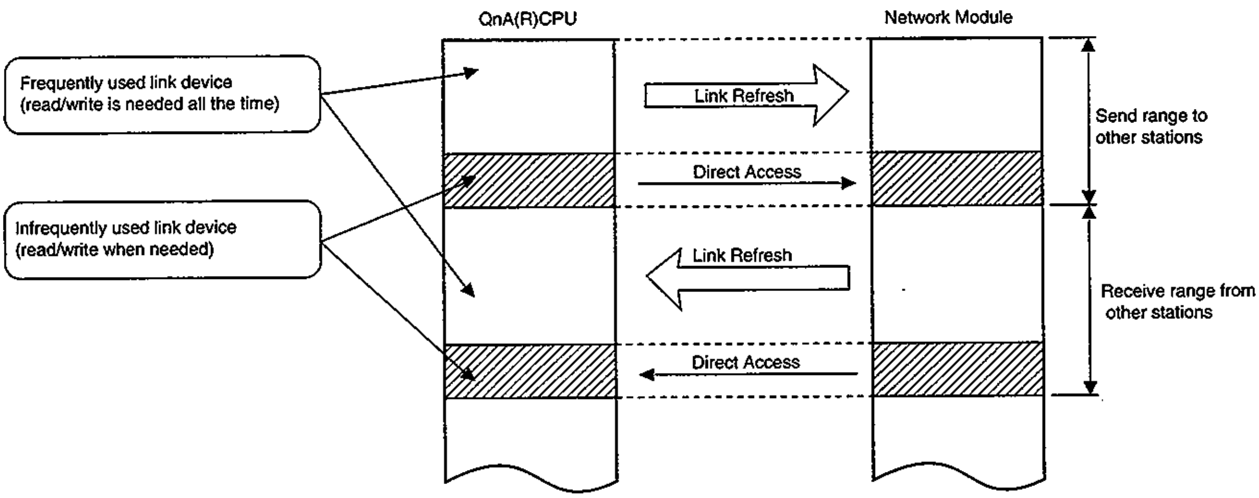
8.1.7 Direct access to the link device

QnA(R)CPU can directly read and write from/to the link device (B, W, X, Y, SB, SW) by the sequence program, regardless of the link refresh of the PC CPU. The link devices which are not included in the link refresh (read/write of the link device between QnA(R)CPU and the network module) range by the network refresh parameter can also be read and written.
By directly accessing the link device, the link refresh time and the transfer delay time can be reduced.



(1) Reducing the link refresh time

Use direct access for the link devices which are not used frequently from the host station, and exclude those devices from the link refresh range to reduce the link refresh time.

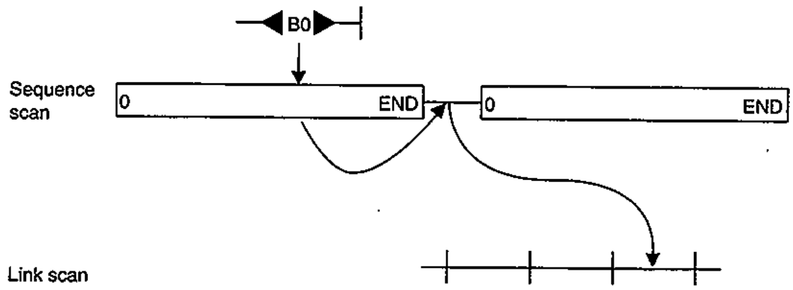


(2) Reducing the transfer delay time of the link device

While the link refresh is done by the END process of QnA(R)CPU, using the direct access can reduce the transfer delay time because the read/write operation is performed directly to the network module when the instruction is executed.
Refer to Section 6.3.2 about the remote I/O network.

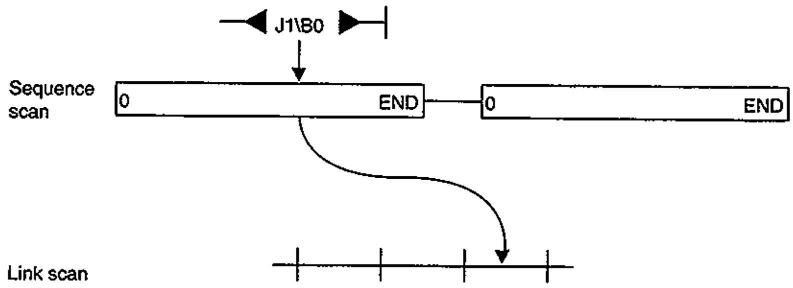
[Normal access]

The link device information is transferred to the link scan by "the END process" of the sequence scan.



[Direct access]

The link device information is transferred to the link scan when the instruction is executed.



(1) J □\ □ specifying method

Specify the network No. and the link device of the unit to read and write.

J□\□

- Link Relay : B0 to 1FFF
- Link Register : W0 to 1FFF
- Link Input : X0 to 1FFF
- Link Output : Y0 to 1FFF
- Link Special Relay : SB0 to 1FF
- Link Special Register : SW0 to 1FF

Network No. : 1 to 239

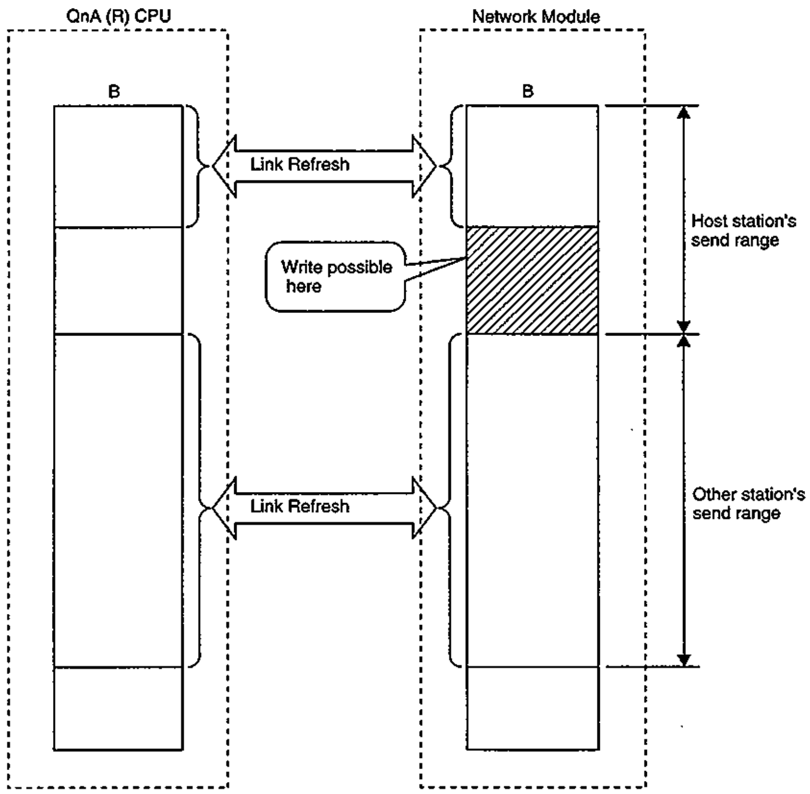
(2) Specified address range of the link device

(a) Read

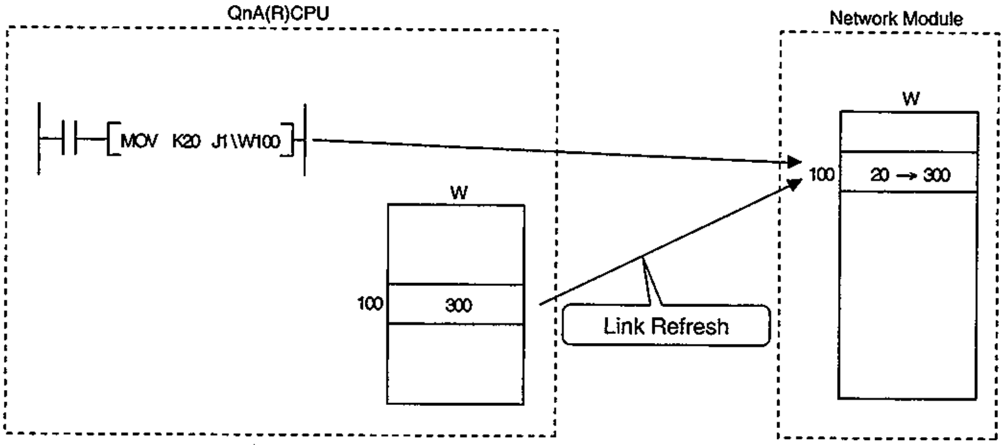
Entire range of the link device address of the network module can be read.

(b) Write

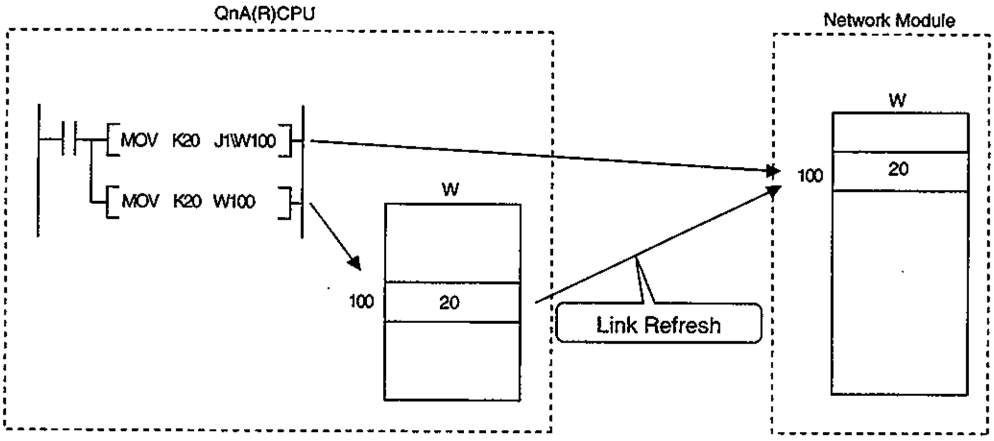
1) Write outside the range specified as the refresh range in the host station's send range.



2) If the address inside of the refresh range is specified, even though the data is written when the instruction is executed, the data in the link device of QnA(R)CPU overwrites the link device of the network module by the link refresh.



When the direct access is used, write the same data to the link device of QnA(R)CPU at the same time. (B, Y, SB, and SW also.)



(3) Difference from the link refresh

The following table lists the difference from the link refresh:

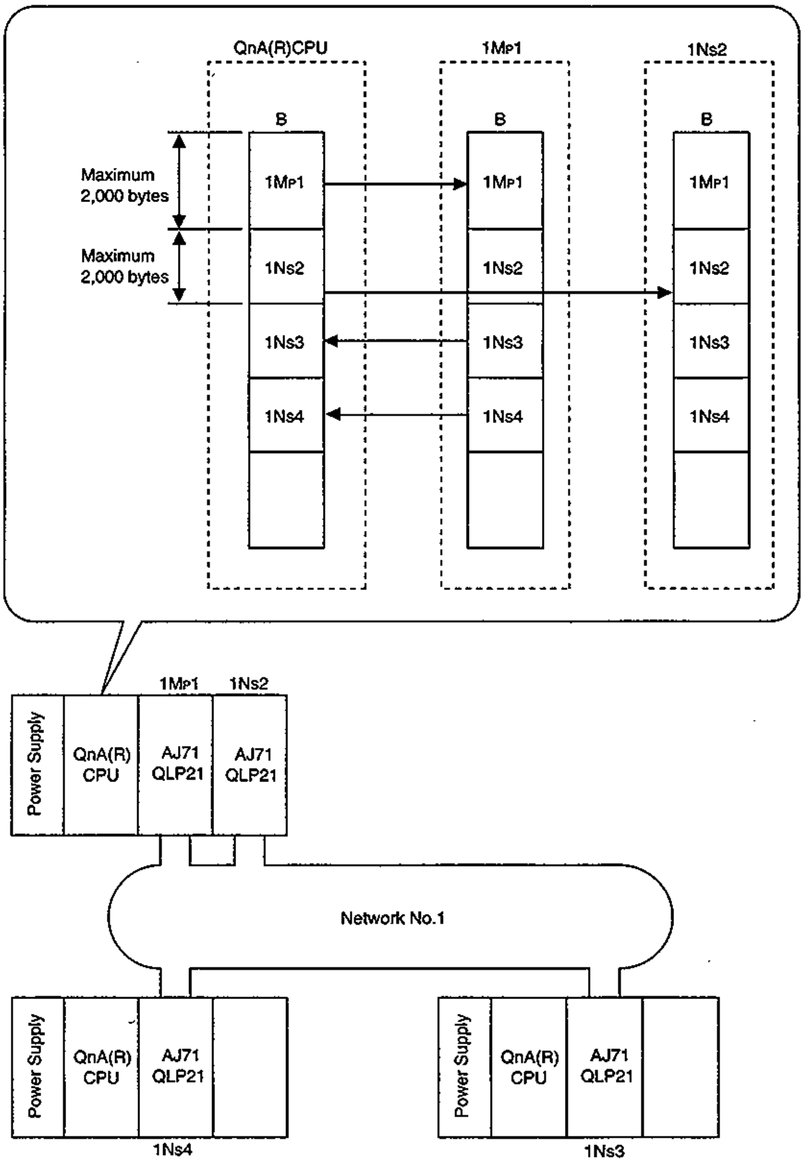
Item	Link refresh	Direct access
Number of steps	1 step	2 steps
Process speed (LD B0)	Fast (0.075 to 0.2µS)	Slow (several tens of µS)
Data reliability	Guaranteed by each station	Guaranteed by each word

Refer to the Programming Manual (Basic) of QnACPU for the details.

8.1.8 Increasing the send points by installing multiple modules of the same network No. (Inter-PC network)

By installing multiple network modules of the same network No. to a single QnA(R)CPU, the send points per station can be increased up to 8000 bytes when four modules are installed.

[Example] In the following example, maximum of 4000 bytes can be sent by 1MP1 and 1NS2.



Points

Be careful with the following conditions when multiple network modules are installed in one QnA(R)CPU.

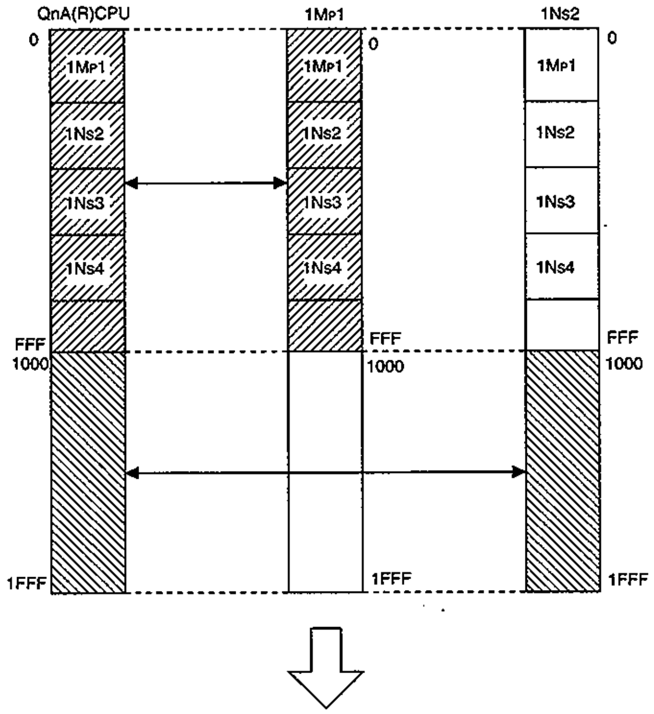
(1) The same station number cannot be used.

(2) No more than one station can be set as control station.

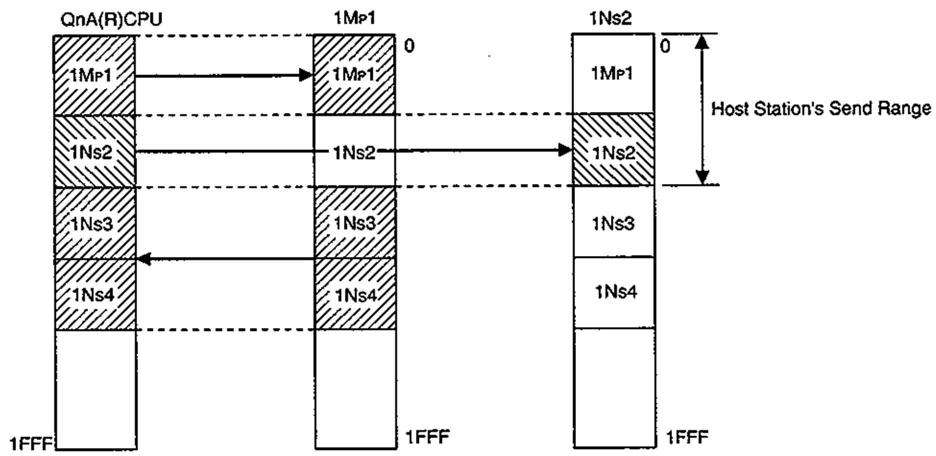
(3) Transient transmission is executed to the "lower number" modules.

(4) It is necessary to change the network refresh parameter setting.

(1) The refresh range is divided equally to each module by default.
(Only 1MP1 range can be sent in this case.)



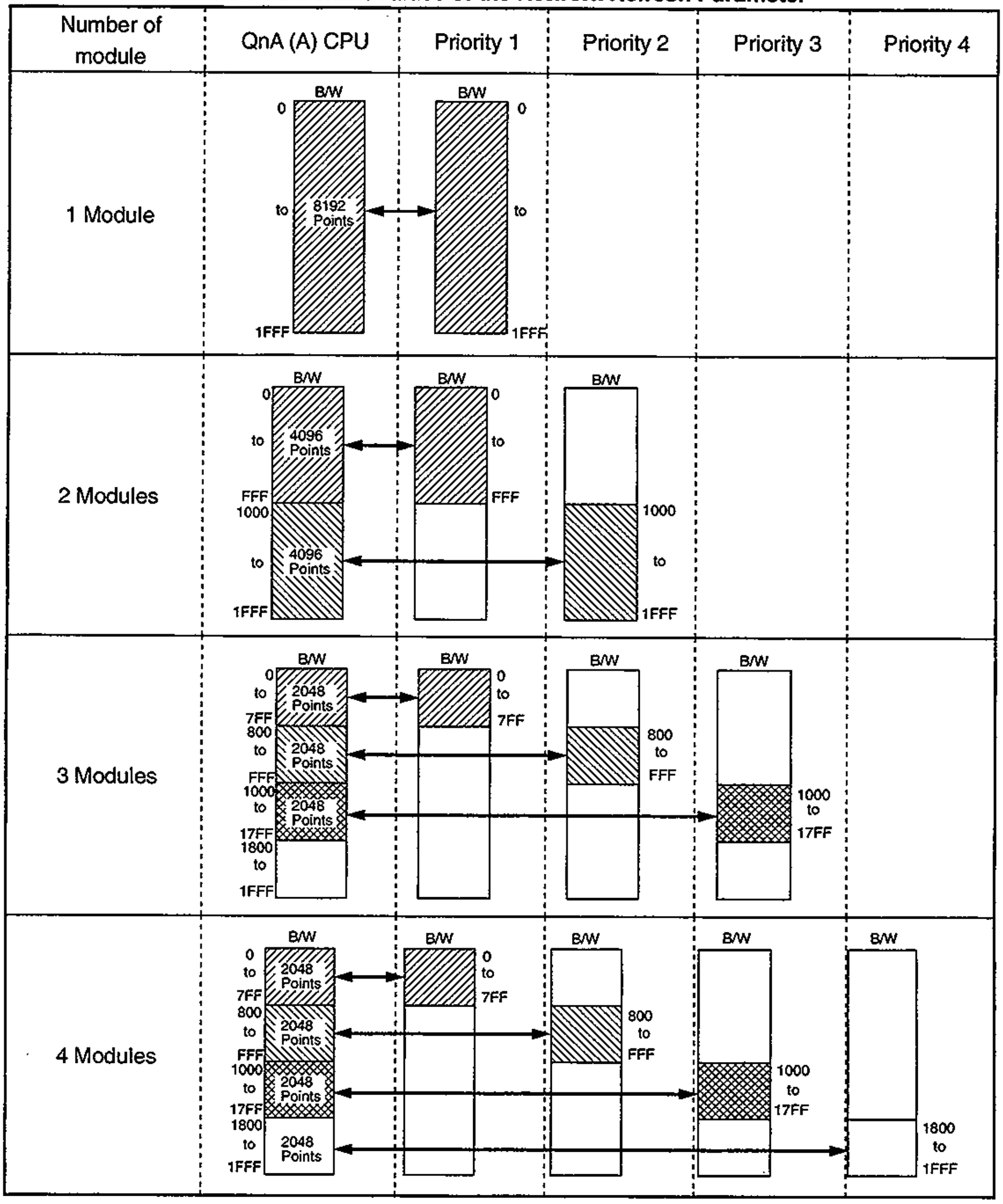
(2) Therefore, the setting has to be changed as follows so that the host station's send range (1MP1, 1NS2) can be refreshed.



8.1.9 Default values of network refresh parameters

The number of parameter setting items for the peripheral device can be minimized by the use of QnA(R)CPU's default values (assigned automatically by CPU) for the network refresh parameters.
If the refresh range is within the range shown in the following table, there is no need to set the network refresh parameter.

Table 8.2 Default Values of the Network Refresh Parameter



Priority 1: MELSECNET(II)
2: First module of MELSECNET/10
3: Second module of MELSECNET/10
4: Third module of MELSECNET/10
5: Fourth module of MELSECNET/10

(2–5) The order of the first I/O number of the network module corresponds to the first to the forth module.

Remark

The normal station has no need to set the MELSECNET/10 parameters (the number of modules, etc.) by the peripheral device when the modification of the network refresh parameter and the setting of the station specific parameters are not needed.

8.2 Transient Transmission Function

The transient transmission function is used to communicate only when a station requests to communicate to another.
The transient transmission request includes link dedicated instructions (ZNRD, ZNWR, SEND, RECV, READ, WRITE, REQ), peripheral devices, special function module, etc.
In addition to the communication with other stations of the same network number(the host station is connected), MELSECNET/10 allows to communicate with the stations of another network number as well.

(1) Transient transmission to the stations within the same network

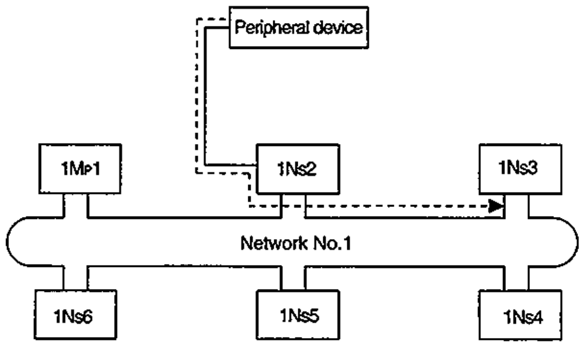


Figure 8.5 Transient transmission

(2) Transient transmission to the stations of another network (routing function)
In this case, routing parameters must be set to the request origin and the relay station.

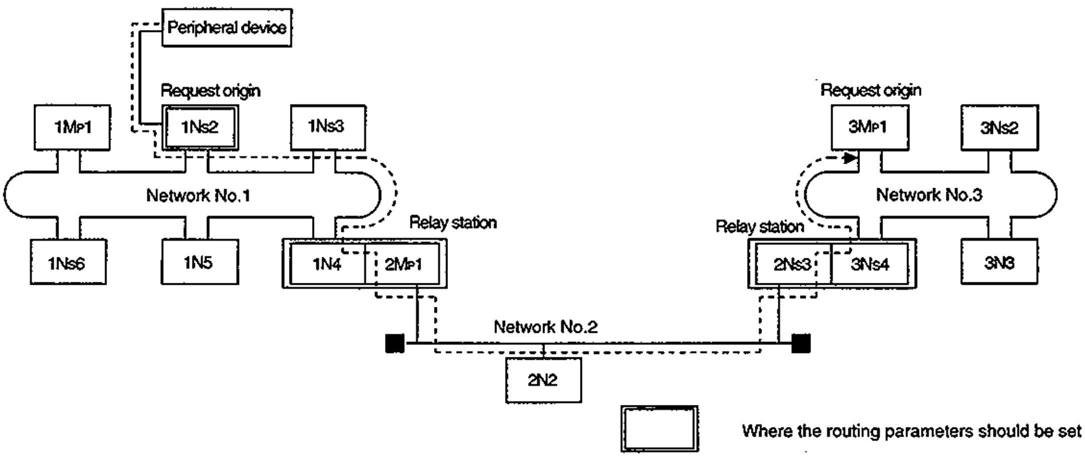


Fig. 8.6 Transient transmission to the stations of another network

DANGER [Precaution when the transient transmission is used]

In a system where QnA(R)CPU and AnUCPU are both used, never use the following transient transmissions which cannot be executed from QnA(R)CPU to AnUCPU of another station.
AnUCPU which executes the transmission might become "MAIN CPU DOWN" or "WDT ERROR", then it might stop the operation.

(1) GPPQ
- Remote Operation (Remote RUN, STOP, PAUSE, RESET, etc.)
- Set clock
- Device test in the online mode

(2) Link dedicated instructions (SEND, READ, SREAD, WRITE, SWRITE, REQ)

8.2.1 Communication range

Feasibility of the transient transmission in the following system configuration is explained.

(1) QnA(R)/AnUCPU station can communicate with any station.

(2) AnN/AnACPU station can communicate only with the control station of the same network No.

(3) Remote I/O stations cannot communicate each other.

[Example of the system configuration]

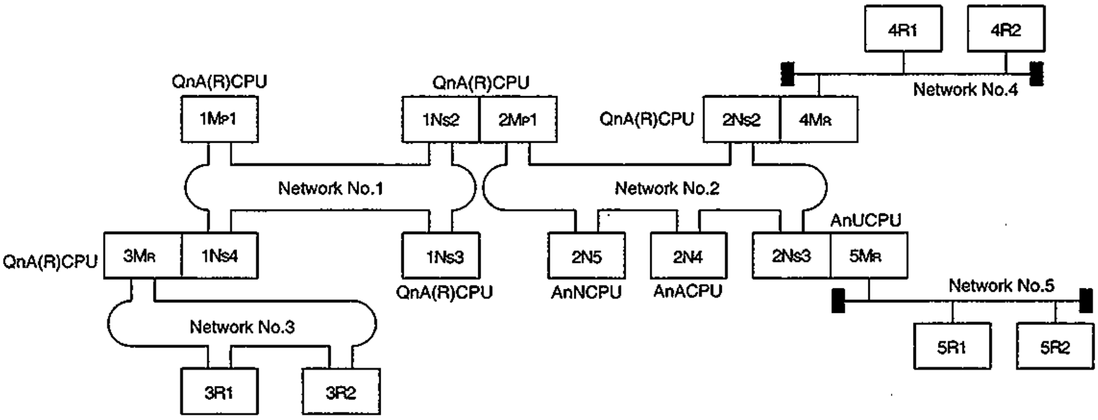


Table 8.2 Transient transmission range

Request Destination / Request Origin		Network No.1				Network No.2					Network No.3			Network No.4			Network No.5		
		1MP1	1NS1	1NS3	1NS4	2MP1	2NS2	2NS3	2N4	2N5	3MR	3R1	3R2	4MR	4R1	4R2	5MR	5R1	5R2
Network No.1	1MP1	Host	○	○	○	*6	*1	*1	*1	*1	*5	*1	*1	*8	*1	*1	*9	*1	*1
	1NS2	○	Host	○	○	Host	○	○	○	○	*5	*1	*1	*3	*1	*1	*4	*1	*1
	1NS3	○	○	Host	○	*6	*1	*1	*1	*1	*5	*1	*1	*8	*1	*1	*9	*1	*1
	1NS4	○	○	○	Host	*6	*1	*1	*1	*1	Host	○	○	*8	*1	*1	*9	*1	*1
Network No.2	2MP1	○	Host	○	○	Host	○	○	○	○	*5	*1	*1	*3	*1	*1	*4	*1	*1
	2NS2	*1	*2	*1	*1	○	Host	○	○	○	*10	*1	*1	Host	○	○	*4	*1	*1
	2NS3	*1	*2	*1	*1	○	○	Host	○	○	*10	*1	*1	*3	*1	*1	Host	○	○
	2N4	×	*2	×	×	○	×	×	Host	×	×	×	×	×	×	×	×	×	×
	2N5	×	*2	×	×	○	×	×	×	Host	×	×	×	×	×	×	×	×	×
Network No.3	3MR	○	○	○	Host	*6	*1	*1	*1	*1	Host	○	○	*8	*1	*1	*9	*1	*1
	3R1	○	○	○	○	*6	*1	*1	*1	*1	○	Host	×	*8	×	×	*9	×	×
	3R2	○	○	○	○	*6	*1	*1	*1	*1	○	×	Host	*8	×	×	*9	×	×
Network No.4	4MR	*1	*2	*1	*1	○	Host	○	○	○	*10	*1	*1	Host	○	○	*4	*1	*1
	4R1	*1	*2	*1	*1	○	*7	○	○	○	*10	×	×	○	Host	×	*4	×	×
	4R2	*1	*2	*1	*1	○	*7	○	○	○	*10	×	×	○	×	Host	*4	×	×
Network No.5	5MR	*1	*2	*1	*1	○	○	Host	○	○	*10	*1	*1	*3	*1	*1	Host	○	○
	5R1	*1	*2	*1	*1	○	○	○	○	○	*10	×	×	*3	×	×	○	Host	×
	5R2	*1	*2	*1	*1	○	○	○	○	○	*10	×	×	*3	×	×	○	×	Host

○: Allowed
×: Not allowed
*1: Allowed by setting the routing parameter
*2: Allowed by specifying 2MP1
*3: Allowed by specifying 2NS2
*4: Allowed by specifying 2NS3
*5: Allowed by specifying 1NS4
*6: Allowed by specifying 1NS2
*7: Allowed by specifying 4MR
*8: Allowed by specifying 2NS2 (Necessary to set the routing parameters)
*9: Allowed by specifying 2NS3 (Necessary to set the routing parameters)
*10: Allowed by specifying 1NS4 (Necessary to set the routing parameters)

> When a peripheral device for "A" is connected to QnA(R)CPU, only the communication with ACPU is allowed. When a peripheral device for "A" is connected to a remote I/O station (AJ72QLP25, AJ72QBR15), the communication with the host station and with ACPU is allowed.

8.2.2 Routing function

The routing function is used for a transient transmission to a station in another network No. in a multilayer system.
In order to execute a routing function, it is necessary to set "routing parameters" so that the network No. corresponds to the station which acts as a bridge.
Routing function via MELSECNET II cannot be used.

(1) The routing parameters need to be set in both the request origin and the relay station.

(a) The request origin needs a setting to reach to the request destination.

(b) The relay station needs a setting in order to reach from the request origin to the request destination and a setting in order to reach from the request destination to the request origin.

(c) No setting is needed for the request destination.
For a transient transmission from 1Ns3 to 3Ns4 in figure 8.5, for example, the routing parameters need to be set in 1Ns3 which executes the transient transmission, also in QnA(R)CPU of 1Ns4 and 2Mp1 as well as in QnA(R)CPU of 2Ns4 and 3Ns5, all of which act as bridges.

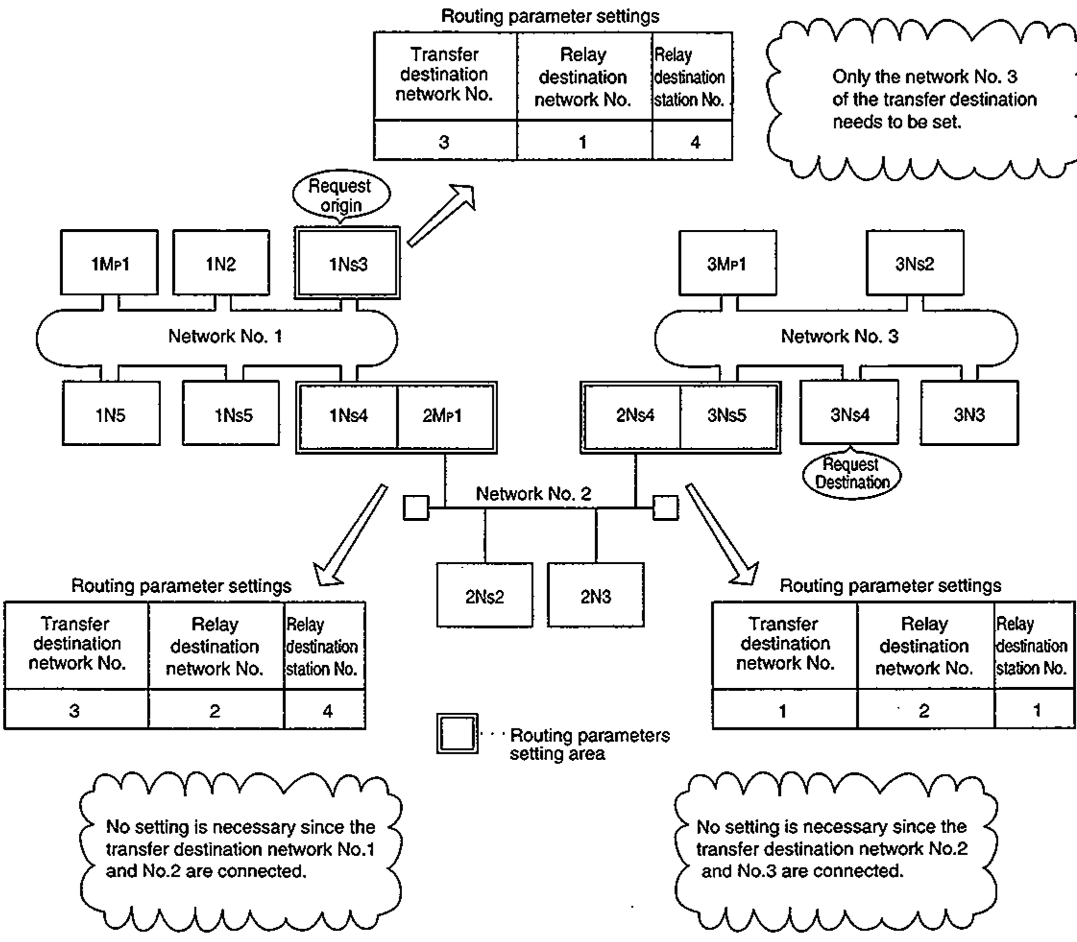


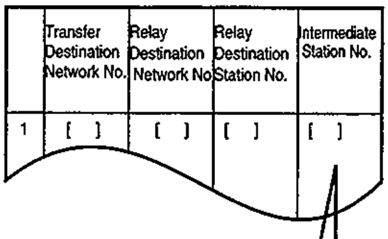
Figure 8.5 Routing function

(2) Maximum of 64 transfer destination network No. can be set to QnA(R)CPU.
The host station can access other stations by becoming a request origin or via the host station using 64 defferent network numbers.
However, more than one (multiple) identical network No. cannot be set for the transfer destination network No.

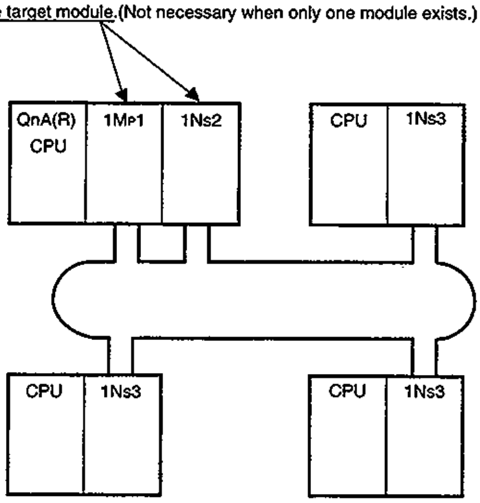
(3) Routing parameter setting procedure

Set the routing parameters as described below:

"In order to reach to the station in the network No.○, it is necessary to go through the station number △ in the network No.□ first."



When multiple modules of the same network No. exist in the PC CPU of the request origin, set the target module.(Not necessary when only one module exists.)



The module 1 becomes the target when not setting

Remark

In the system configuration shown above, if system fault occurs at 1MP1, it is necessary to change [Intermediate station No.] by RTWRITE instruction so that the transient transmission can be executed from 1Ns2.

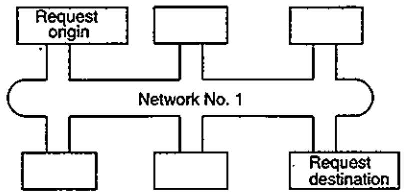
(4) Routing parameter setting area and the contents

(a) When the request origin is control/normal/master station:

When the transient transmission is executed, the routing parameter setting and the contents are different depending on the system.

1) Double layer system

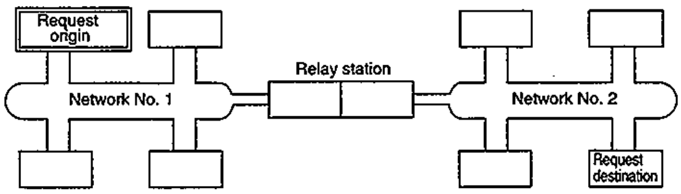
No need to set the routing parameters since it is a transient transmission within the same network.



2) Multilayer system 1: Two networks

Set the routing parameters only to the request origin station.

Set the contents for reaching the request destination (network No.2) to the request origin.



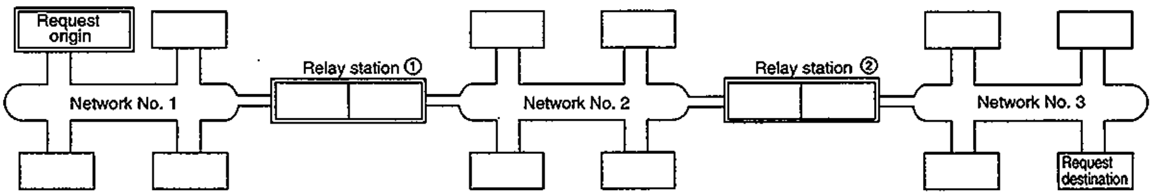
3) Multilayer system 2: Three networks

Set the routing parameters to the request origin and the relay station.

Set the contents for reaching the request destination (network No.3) to the request origin.

Set the contents for reaching the request destination (network No.3) to the relay station 1.

Set the contents for reaching the request destination (network No.1) to the relay station 2.



4) Multilayer system 3: Four or more networks

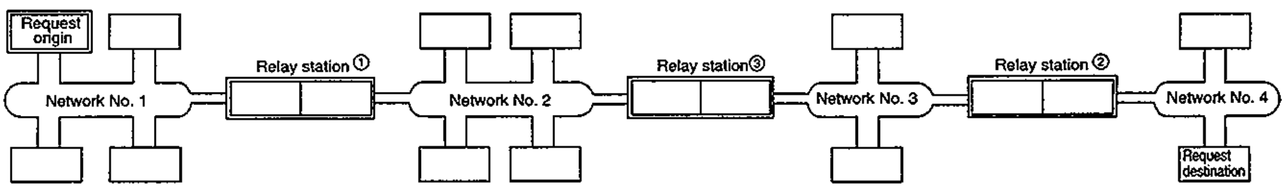
Set the routing parameters to the request origin and the relay station.

Set the contents for reaching the request destination (network No.4) to the request origin.

Set the contents for reaching the request destination (network No.4) to the relay station ① (a relay station closest to the request destination).

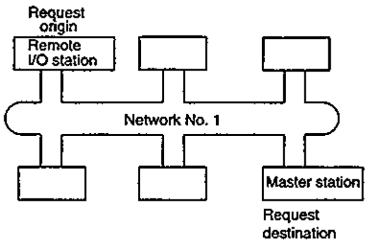
Set the contents for reaching the request origin (network No.1) to the relay station 2 (a relay station closest to the request destination).

Set the contents for reaching the request destination (network No.4) and the request origin (network No.1) into the relay station ③ (relay stations other than ① and ②).

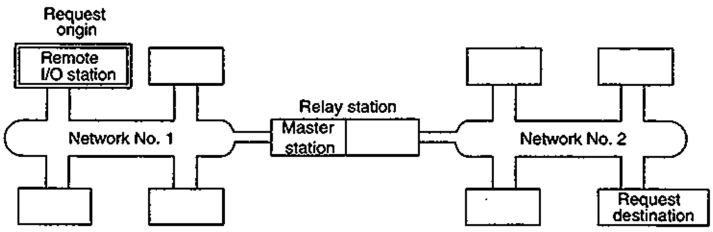


(b) When the request origin is a remote I/O station:
When the transient transmission is executed, the routing parameter setting and the contents are different depending on the system.

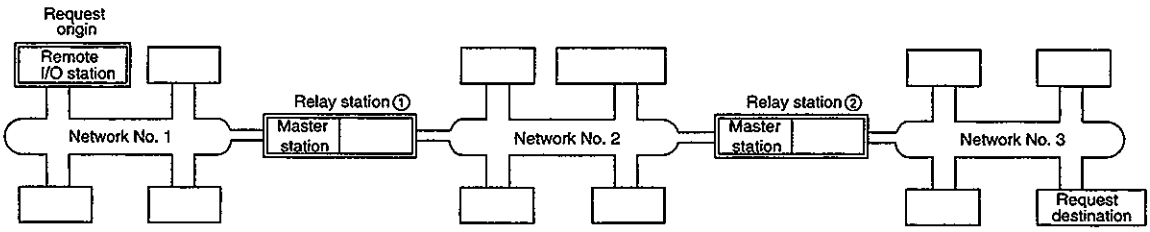
1) Double layer system
No need to set the routing parameters.



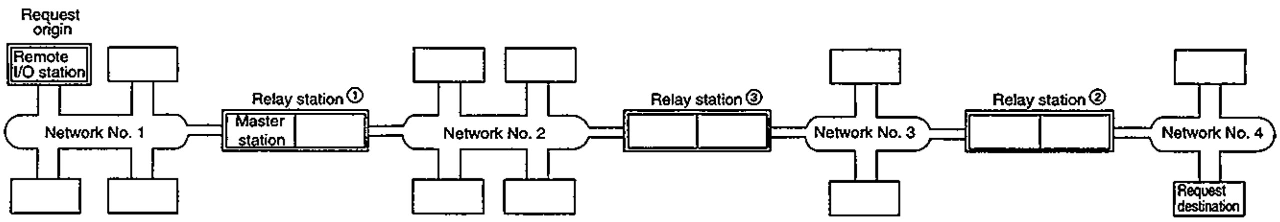
2) Multilayer system 1: Two networks
No need to set the routing parameters.



3) Multilayer system 2: Three networks
Set the routing parameters to the relay station.
Set the contents for reaching the request destination (network No.3) to the relay station ①.
Set the contents for reaching the request destination (network No.1) to the relay station ②.

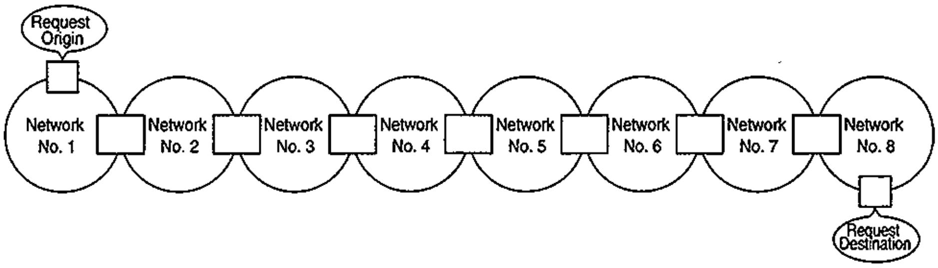


4) Multilayer system 3: Four or more networks
Set the routing parameters to the relay station.
Set the contents for reaching the request destination (network No.4) to the request origin.
Set the contents for reaching the request destination (network No.4) to the relay station ① (a relay station closest to the request origin).
Set the contents for reaching the request origin (network No.1) to the relay station ② (a relay station closest to the request destination).
Set the contents for reaching the request destination (network No.④) and the request origin (network No.1) to the relay station ③ (relay stations other than ① and ②).



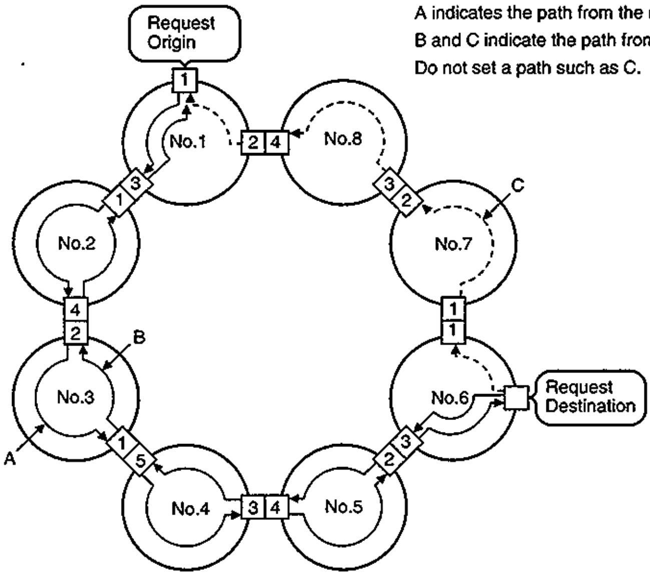
Points

(1) Maximum of seven stations can be used for relay by the routing function.

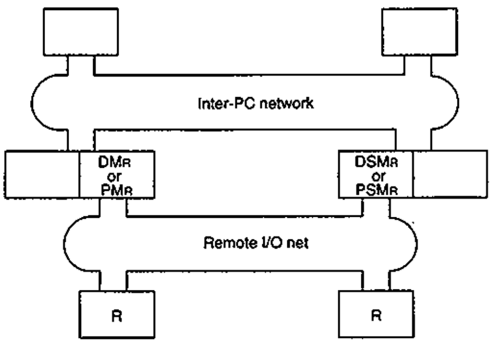


(2) When a network is connected as a loop as shown in the following example, make sure that the communication goes via the same relay station for both "sending from the request origin to the request destination" and "returning from the request destination to the request origin." Do not set a route by which the round trip path goes around the circle.

A indicates the path from the request origin to the request destination.
B and C indicate the path from the request destination to the request origin.
Do not set a path such as C.



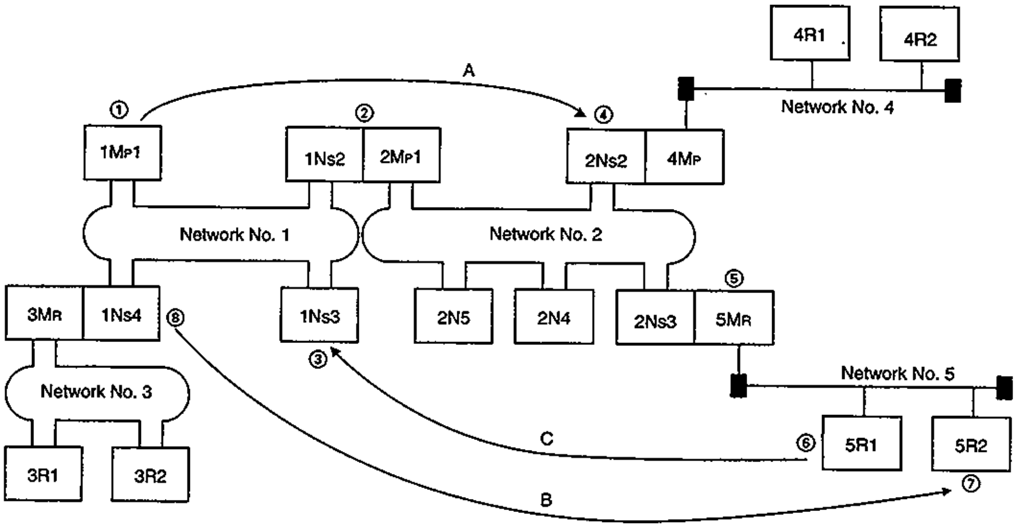
(3) To access from a remote I/O station to another network in a multiple master system or a parallel master system, the routing method is different depending on the status of the master station.



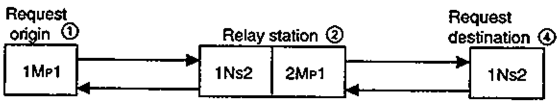
Status of DMR PMR	Status of DSMR PSMR	Intermediate station
Normal	Normal	DMR PMR
Normal	Error	DMR PMR
Error	Normal	DSMR PSMR
Error	Error	×

[Example]

The routing parameter settings (A to C) for the system configuration in Section 8.2.1 is explained below.



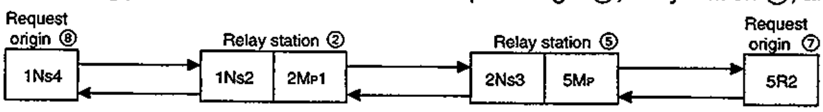
(1) From a station in the inter-PC network to a station in the inter-PC network (A)
The routing parameters must be set in the request origin 1.



	NO.	Transfer destination network No.	Relay destination network No.	Relay destination station No.	Intermediate station no.
Request origin ①	1	[2]	[1]	[2] station	[1] station

· · · · It has to go through the station No.2 of the network No.1 in order to reach the network No.2.
Request Origin -> Request Destination

(2) From a station in the inter-PC network to a remote I/O station (B)
The routing parameters must be set in the request origin ⑧, relay station ②, and the relay station ⑤.



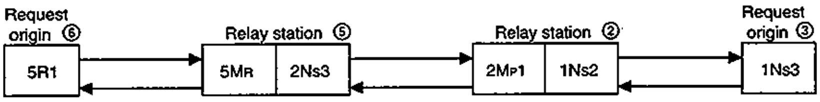
	NO.	Transfer destination network No.	Relay destination network No.	Relay destination station No.	Intermediate station No.
Request origin ⑧	1	[5]	[1]	[2] station	[ ] station
Relay station ②	1	[6]	[2]	[3] station	[ ] station
Relay station ⑤	1	[1]	[2]	[1] station	[ ] station

· · · · It has to go through the station No.2 of the network No.1 in order to reach the network No.5.
(Request destination -> Request destination)

· · · · It has to go through the station No.2 of the network No.1 in order to reach the network No.5.(Request Destination -> Request Destination)

· · · · It has to go through the station No.1 of the network No.2 in order to reach the network No.1.
(Request destination <- Request origin)

(3) From a remote I/O station to a station in the inter-PC network (C)
The routing parameters must be set in the relay station ⑤ and in the relay station ②.

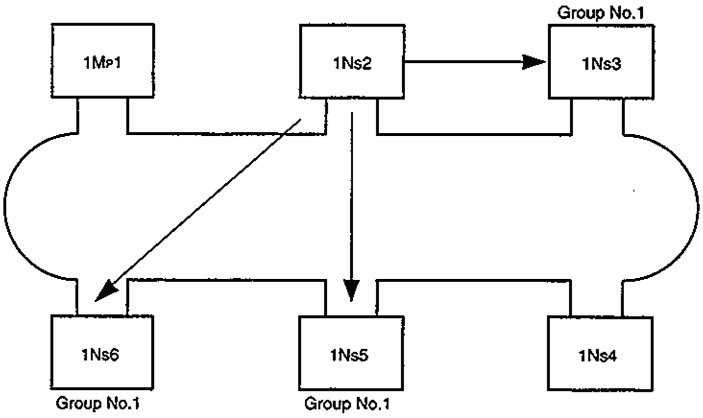


	NO.	Transfer destination network No.	Relay destination network No.	Relay destination station No.	Intermediate station No.	
Request origin ⑤	1	[1]	[2]	[1] station	[ ] station	It is necessary to go through the station No.1 of the network No.2 in order to reach the network No.1. (Request Destination → Request Origin)
Relay station ②	1	[5]	[2]	[3] station	[ ] station	It is necessary to go through the station No.3 of the network No.2 in order to reach the network No.5. (Request Destination ← Request Destination)

8.2.3 Group function (inter-PC network only)

Group function performs a transient transmission to more than one specified stations.
One network can be divided into multiple (maximum of 9) groups.
"Group No. Setting Switch" on the front panel of the network module can be used for setting.

[Example] The transient transmission is performed to 1Ns3, 1Ns5, and 1Ns6 in the following example:



Transient transmission to a specified group	
1) ZNWR instruction	Write to another station's word device (Refer to Section 10.2.1)
2) SEND instruction	Send data (Refer to Section 10.2.2)
3) WRITE instruction	Write to another station's word device (Refer to Section 10.2.3)
4) REQ instruction	Request transient transmission to another station (Refer to Section 10.2.4)
5) Clock set	Peripheral device (Refer to Section 8.2.10)
6) Remote operations (RUN, STOP, etc.)	Peripheral device

[Precaution when the transient transmission is executed with the group function]

The confirmation of a normal execution is not available when the transient transmission with the group function is executed. Also, "Receive Buffer Full (Error code:F222)" might occur if it is executed continuously. It is recommended to test (debug) the transmission with a sufficient interval between the executions for a continuous transmission.

8.2.4 Link dedicated instructions

The link dedicated instructions which allow communication with other stations include the following. Refer to Chapter 10 for the details of the instructions and programming.

Instruction	Contents	Inter-PC network	Remote I/O network	Reference section
SEND	Send data.	○	△	Section 10.2.1
RECV	Receive data.	○	△	
READ	Read data from a word device of another station.	○	△	Section 10.2.2
WRITE	Write data to a word device of another station.	○	△	
REQ	Execute remote RUN/STOP, read/write of the clock data.	○	△	Section 10.2.3
ZNRD	Read data from a word device of another station.	○	△	Section 10.2.4
ZNWR	Write data to a word device of another station.	○	△	
ZNFR	Read data from a special function module buffer memory of a remote I/O station.	×	○	Section 10.2.5
ZNTO	Write data to a special function module buffer memory of a remote I/O station.	×	○	

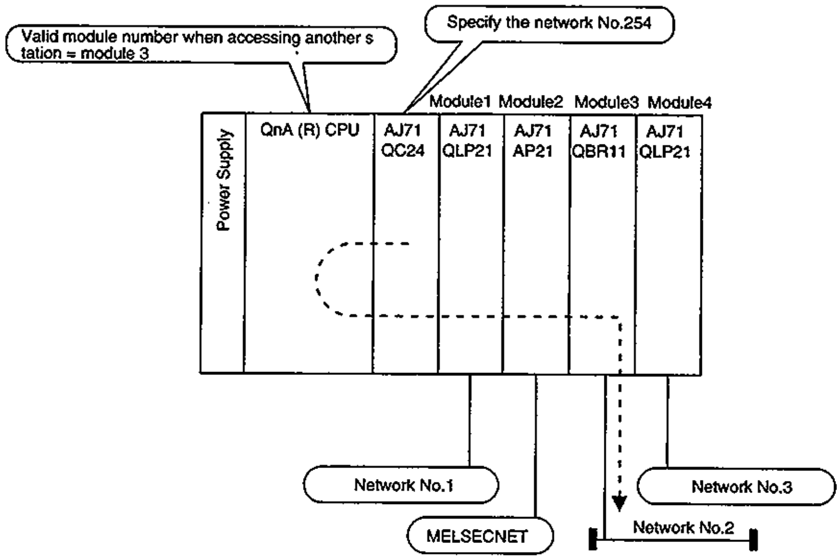
○: Allowed ×: Not allowed

△: Allowed between a multiple remote master station and a multiple remote submaster station, and between a parallel remote master station and a parallel remote submaster station.

8.2.5 Specifying default network

It is possible to communicate with a network that is set as "valid module number when accessing another station" by the parameter when the target network No. of the intelligent special function module is set to "254(FEH)".

[Example] In the following example, AJ71QC24 can communicate with the stations in the network No.2.



8.2.6 Clock setting at stations in the network from peripheral devices

The peripheral devices can set "clock" at a QnA(R)CPU station connected in the network.
The clocks at more than one station can be set at once by specifying all stations or a group of stations.
This function cannot be executed with stations other than QnA(R)CPU stations.

As listed below, there are three ways to specify the stations whose clocks are to be set.

① Stations set for target CPU (refer to Remark) of the connection specification

② Stations in the network set for target CPU (refer to Remark) of the connection specification

③ Group No. stations in the network set for target CPU (refer to Remark) of the connection specification

```
[Time Setting]
1. Date   Input          Current        ——— Set date/time
2. Time   [96-05-25]     96-05-21
          [10:50:00]     09:54:21       ——— Current PC CPU date/time
3. Station to Execute
   1. (*) Current Station               ——— ①
   2. ( ) All Stations                  ——— ②
   3. ( ) Specified Group[ ]            ——— ③

   Execute(Y)   Cancel(N)
                                 Esc:Close
```

Remark

The connection specification screen is shown below.

```
[Connection Setting]
1. PDT Side Interface            3. Target CPU
   1. (*) COM1                      1. (*) This Station
   2. ( ) COM2                      2. ( ) Via MELSECNET(II) [ ] Sta
   3. ( ) COM3                      3. ( ) Via MELSECNET/10
                                           Network # [    ]-[    ] Sta
2. PC Side Interface             4. ( ) Target Memory
   1. (*) Via QnACPU                1. (*) Internal RAM
   2. ( ) Via Serial Com For QnA    2. ( ) IC Memory Card A(RAM)
                                    3. ( ) IC Memory Card A(ROM)
                                    4. ( ) IC Memory Card B(RAM)
                                    5. ( ) IC Memory Card B(ROM)
                                 5.Com Time Chech Interval Setting
                     Execute(Y)   Cancel(N)
                                          Space:Select  Esc:Close
```

DANGER [Precaution when setting the clock]

In systems where QnA(R)CPU and AnUCPU are both used, never set the clock on AnUCPU from QnA(R)CPU. If such a clock setting is attempted, the relevant AnUCPU will go into a "MAIN CPU DOWN" or "WDT ERROR" status and operation will stop.

8.3 Control Station Transfer Function

Even if the control station (the station where the common parameters are registered) goes down, the data link can be maintained by transfering subcontrol station function to another normal station.

(1) Only Q4ARCPU, QnACPU, and AnUCPU can become a subcontrol station.

(2) Among the stations whose data links are operating normally, a station with "the lowest station" number becomes the subcontrol station.

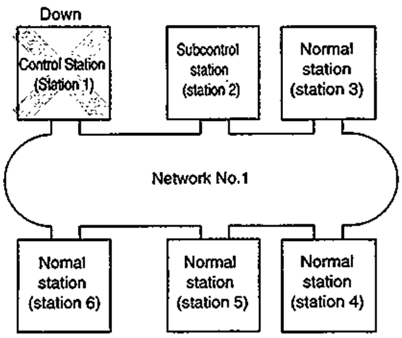
(3) The data link halts temporarily while the control station is transferred.
During the data link halt the status just before the halt will be kept.

(4) All the stations will be treated as communication faulty stations during the halt.

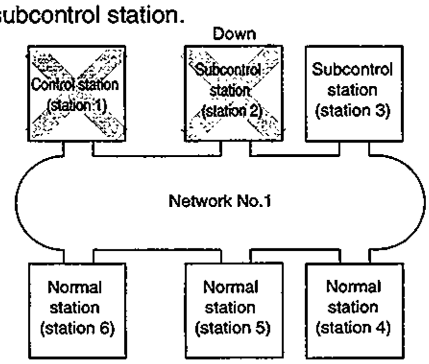
(5) It is possible to set to disable control station transfer, (making it system fail status) even if the control station goes down using the "auxiliary setting" of the common parameters.

(6) The process of the control station transfer is as follows.

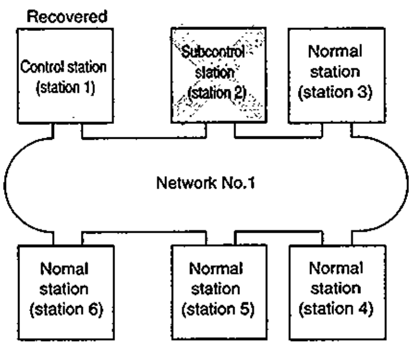
(1) When the control station goes down, Station 2 becomes the subcontrol station.



(2) When the subcontrol station (station 2) goes down, the station 3 becomes the subcontrol station.



(3) When the station 1 recovers, it becomes the control station again.
The station 3 returns to be a normal station.



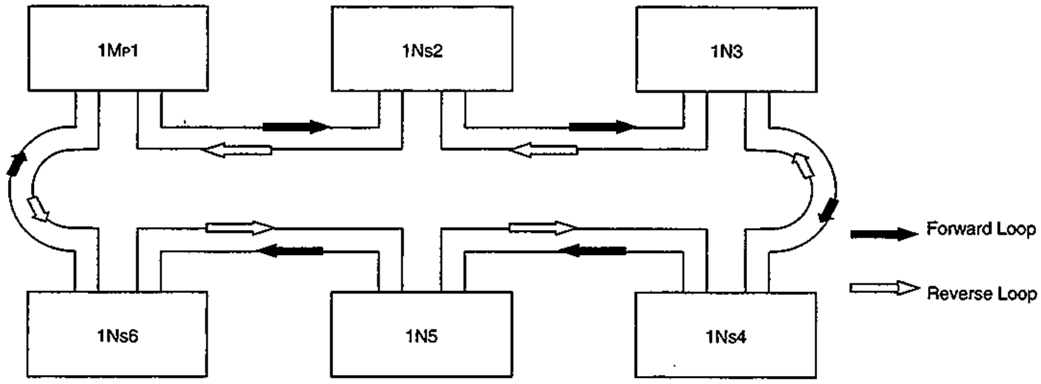
Remarks

1) The control station is not transferred when the cyclic transmission is stopped (refer to Section 8.1.5) by the peripheral device.
2) The control station can be transferred to a normal station whose cyclic transmission is stopped by the peripheral device.

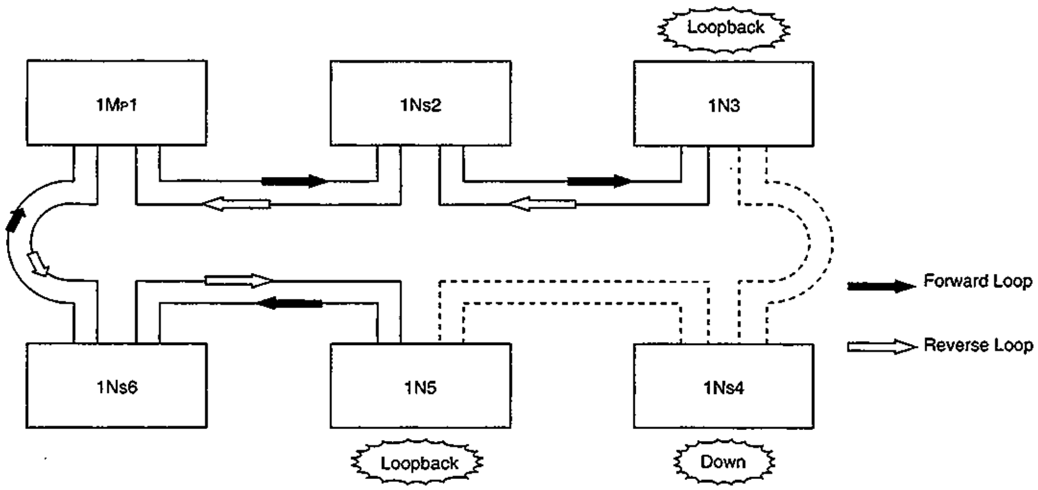
8.4 Multiplex Transmission Function (Optical Loop System)

The multiplex transmission function is used for a fast communication using duplex transmission path (forward loop and reverse loop) of the optical loop system.
"Auxiliary setting" of the common parameters is required to use the multiplex transmission function.
However, total of four or more stations have to be linked to set for using this function.

(1) Using the multiplex transmission function, a high speed communication is performed by making use of both loops.



(2) If an error occurs while the multiplex transmission function is used, the data link continues by using only one of the forward or reverse loop, or by switching to a loopback communication. The communication speed is 10MBPS, however.
When the communication path recovers to a normal operation, the multiplex transmission function resumes.

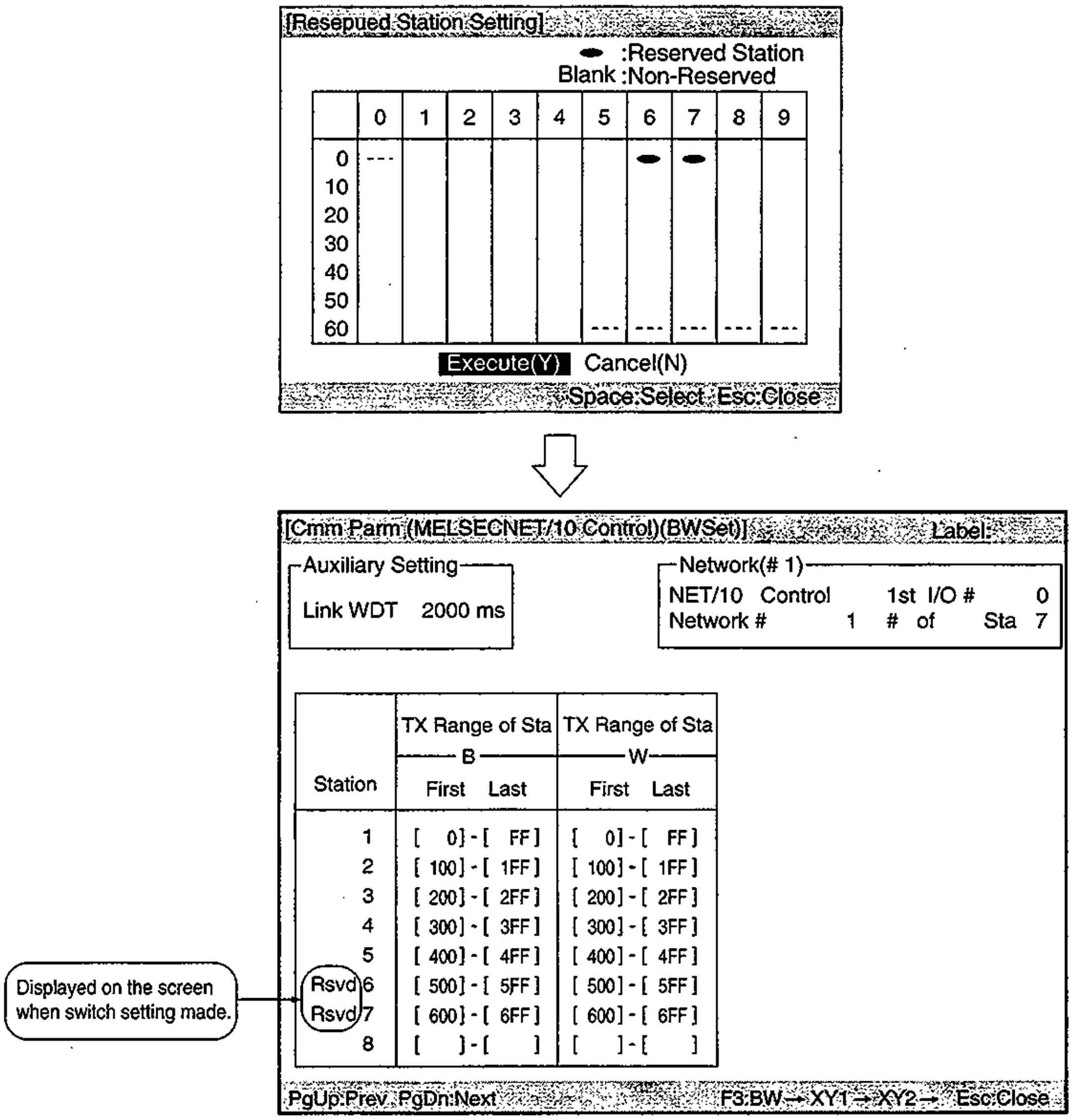


Remark

The multiplex transmission function contributes to reduce the link scan time when 16 or more stations are connected and the link device is allocated for 2,048 bytes or more by the common parameter. Compared with the speed when the multiplex transmission function is not used, the link scan speed becomes about 1.1 to 1.3 times faster.

8.5 Reserve Station Function

The reserve station function is used so that stations which will be connected in the future (stations that are included in the number but are not actually connected) are not treated as communication faulty stations.
Since they are not communication faulty stations, they have no effect on the link scan time.



8.6 Simplified Network Duplexing (Inter-PC network)

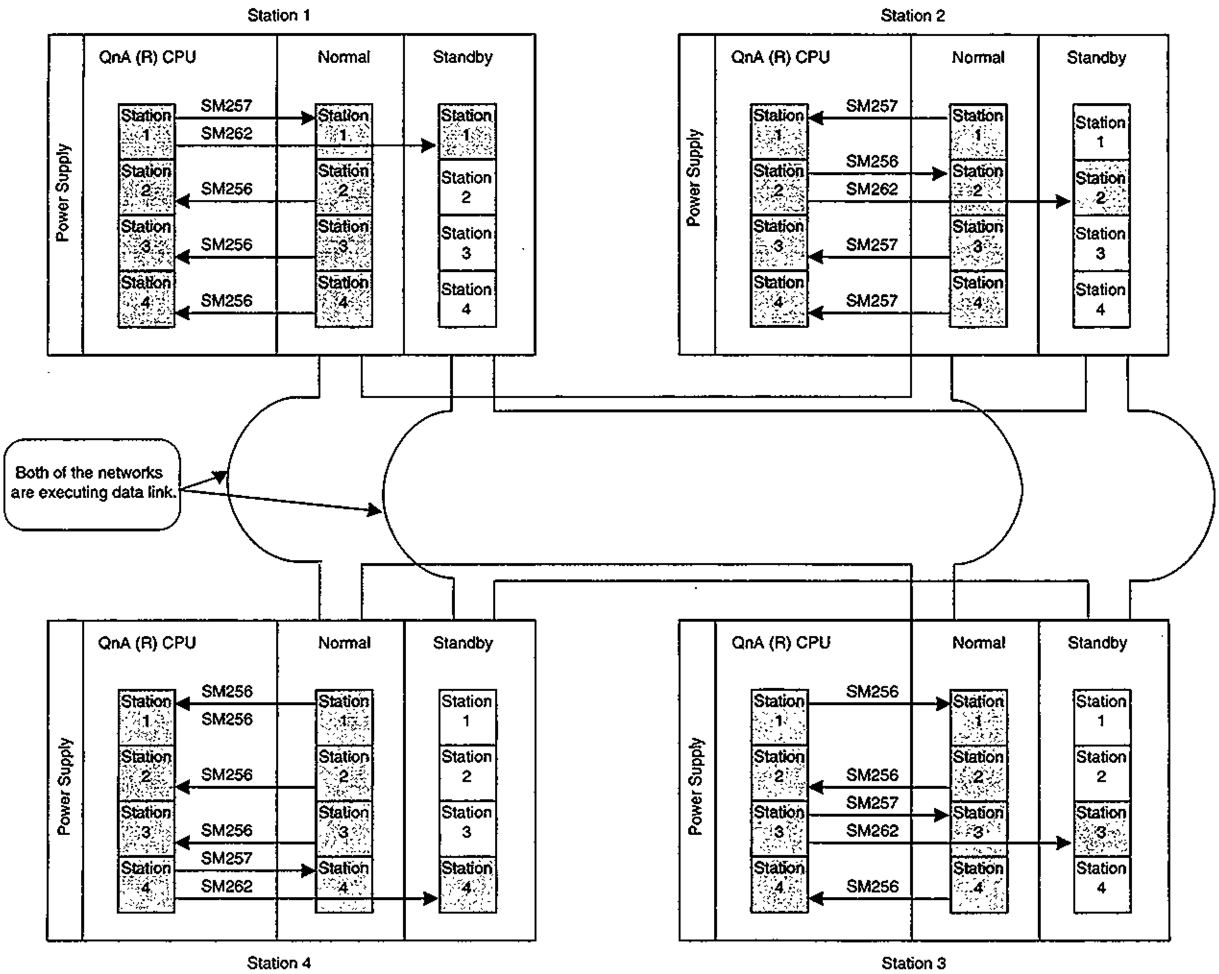
If two network modules, one for normal use and another for standby, are installed in each QnA(R)CPU, the data link can continue by using the link data refresh on the standby network when a failure such as the wire breakage occurs in the normal network.
Refer to Section 10.3 about the programming.

(1) The switching between the normal and backup module is performed by a sequence program that selects the normal or backup network module to be refreshed by QnA(R)CPU.
In the program, get the data link status (SB74, SW74 to 77) of each station, then refresh the standby network module when a failure is detected on the normal network side.

(2) Set different network numbers to the normal and standby networks.

[Normal network in normal operation]
At the startup time the ON/OFF of the special relay (SM) is controlled by QnA(R)CPU.

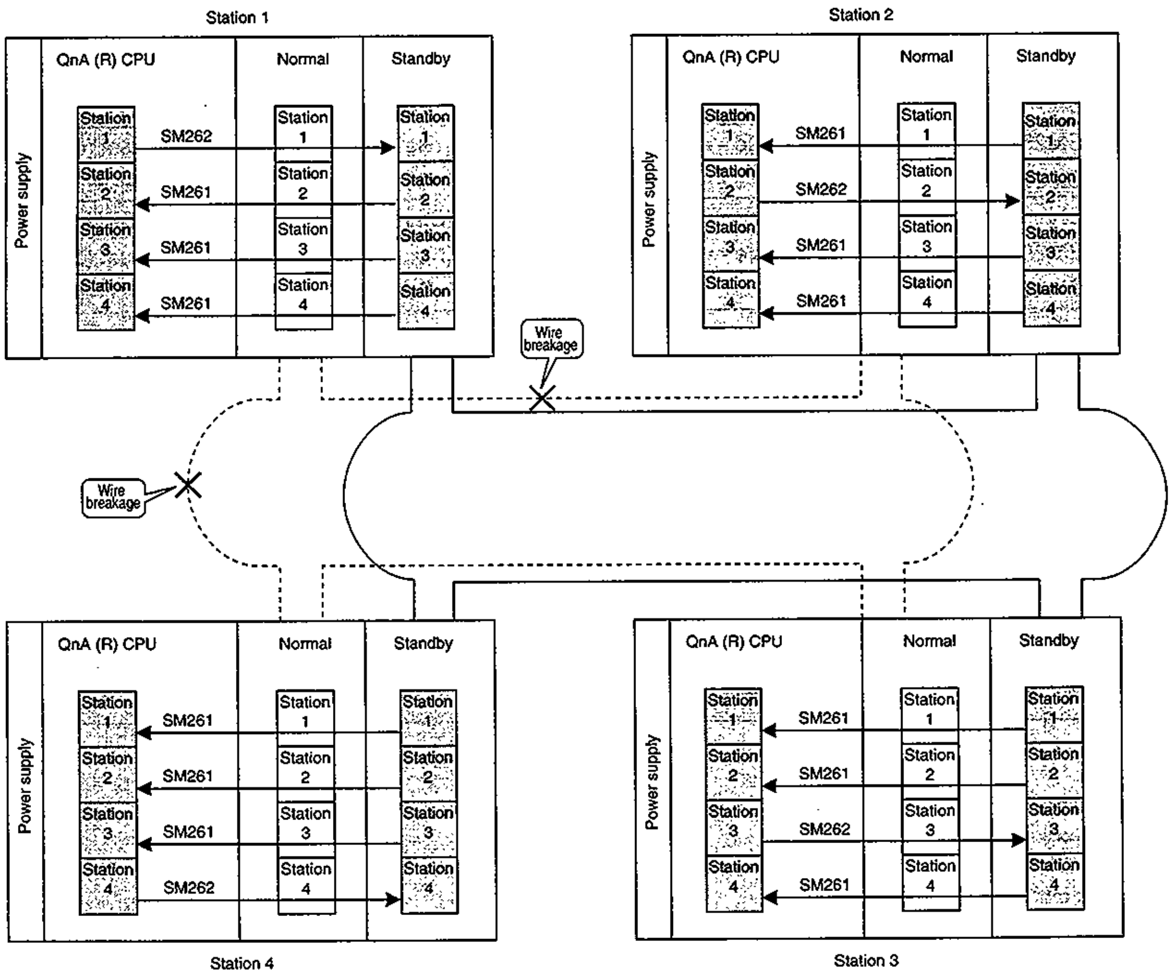
Signal		Status	Remarks
Module 1	SM255 (Normal/Standby selection)	OFF (Normal)	Controlled by CPU
	SM256 (Refresh network module → QnA(R)CPU)	OFF (Refresh)	Controlled by user (controlled by CPU at the beginning)
	SM257 (Refresh network module ← QnA(R)CPU)	OFF (Refresh)	
Module 2	SM260 (Normal/Standby selection)	ON (Standby)	Controlled by CPU
	SM261 (Refresh network module → QnA(R)CPU)	ON (No refresh)	Controlled by user (controlled by CPU at the beginning)
	SM262 (Refresh network module ← QnA(R)CPU)	OFF (Refresh)	



[Normal network in faulty operation]

QnA(R)CPU does not control the special relay (SM) automatically. Control the special relay (SM) by the sequence program.

Signal		Status	Remarks
Module 1	SM255 (Normal/Standby selection)	OFF (Normal)	Controlled by CPU
	SM256 (Refresh network module → QnA(R)CPU)	ON (No refresh)	Controlled by user (controlled by CPU at the beginning)
	SM257 (Refresh network module ← QnA(R)CPU)	ON (No refresh)	
Module 2	SM260 (Normal/Standby selection)	ON (Standby)	Controlled by CPU
	SM261 (Refresh network module → QnA(R)CPU)	OFF (Refresh)	Controlled by user (controlled by CPU at the beginning)
	SM262 (Refresh network module ← QnA(R)CPU)	OFF (Refresh)	



8.7 Multiple Master System (Remote I/O Network)

By setting a multiple remote master station and a multiple remote submaster station, the multiple remote submaster station automatically takes over and controls the remote I/O station when the multiple remote master station goes down.

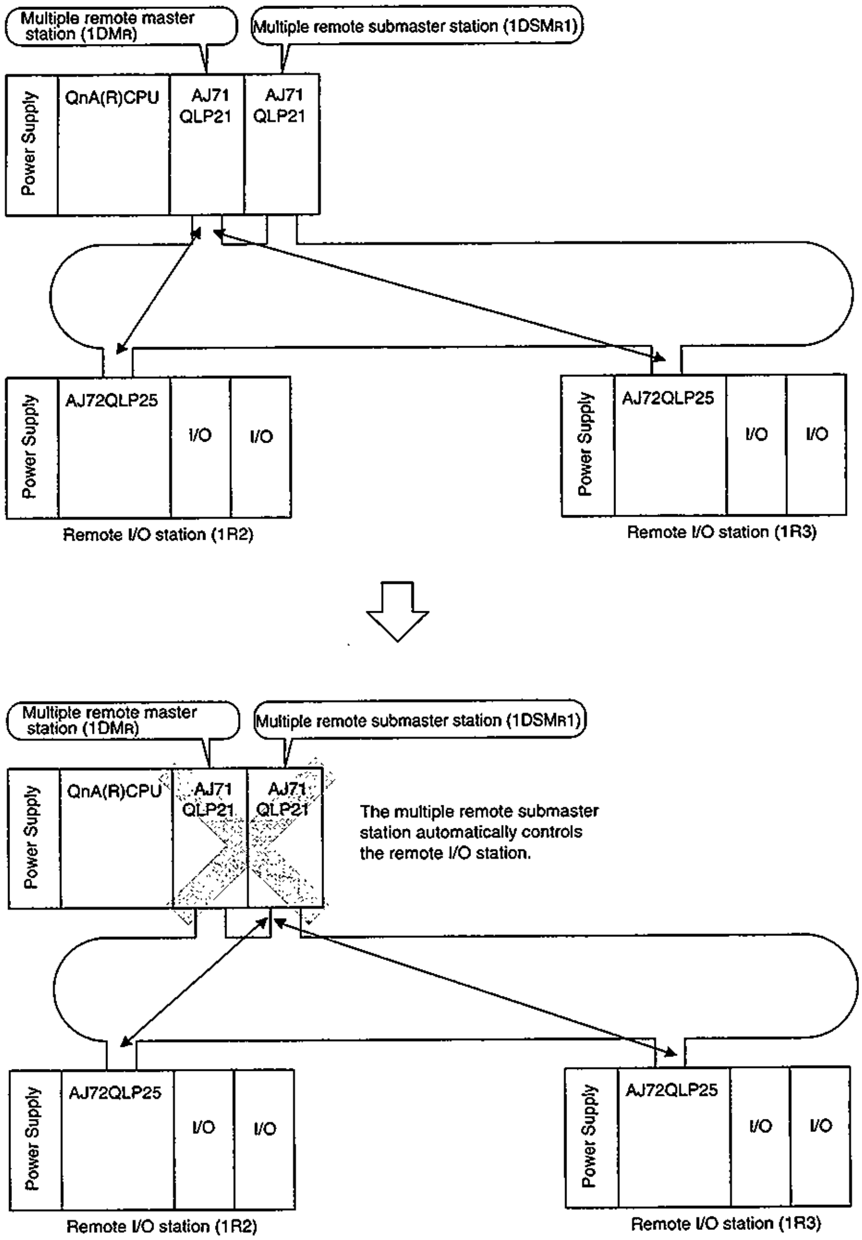
The multiple remote submaster station continues to control even if the multiple remote master station recovers to the normal operation.

The data link stops when both of the multiple remote master and the submaster stations fail.

(1) **When the multiple remote master station and the multiple remote submaster station are installed in the same PC CPU:**

(a) The network module can be backed up.

(b) The multiple remote submaster station automatically controls the remote I/O station when the network module of the multiple remote master station fails. (The remote I/O station cannot be controlled when the power is off or when QnA(R)CPU fails.)



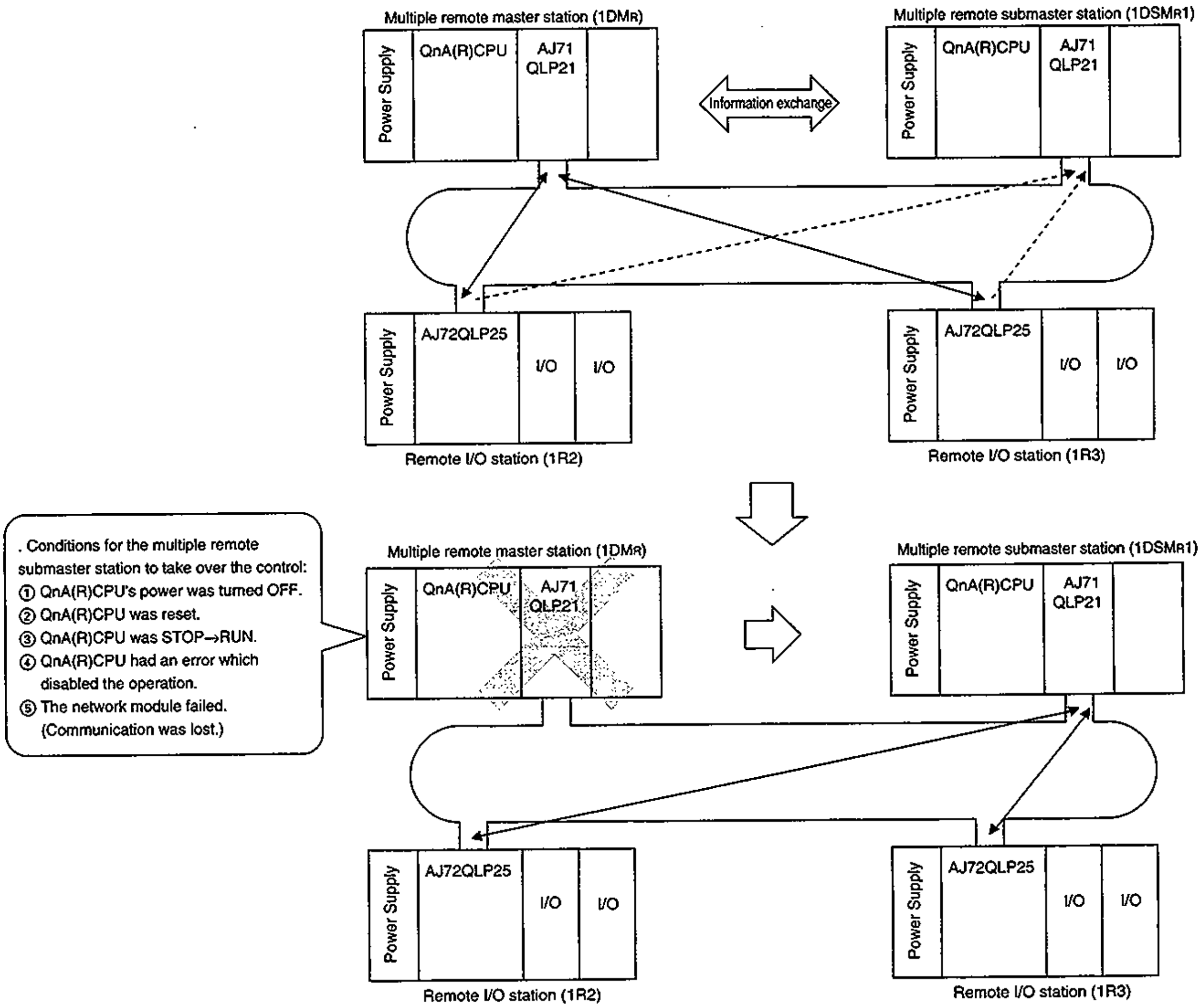
(2) When the multiple remote master station and the multiple remote submaster station are installed in separate PC CPU:

(a) The power supply, CPU, and the network module can be backed up.
The I/O module and the special function module of the multiple remote master station can't be backed up.

(b) The multiple remote submaster station automatically controls the remote I/O station when the multiple remote master station fails.

(c) The multiple remote submaster station is always receiving data (from R station to M station: X, R, W) transmitted from the remote I/O station even when the multiple remote master station is operating normally.

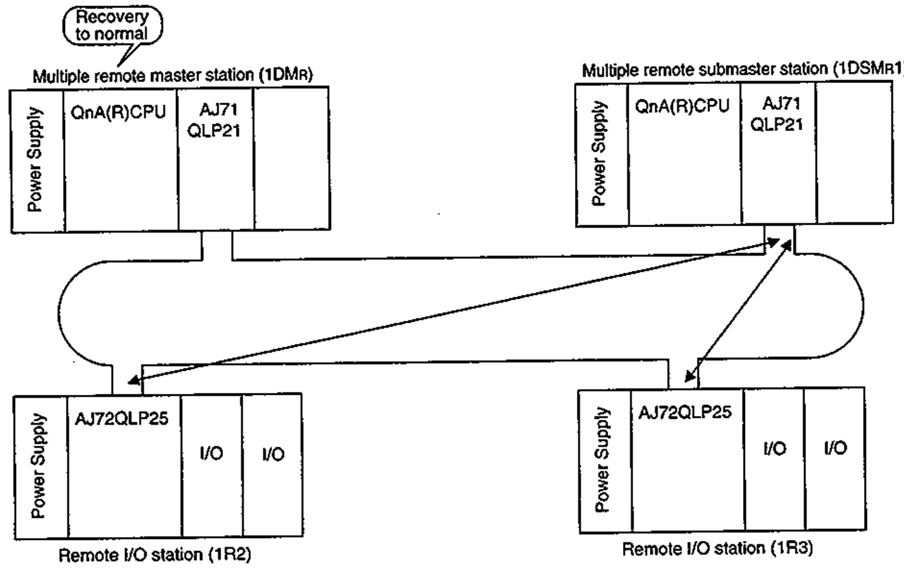
(d) Since the multiple remote master station and the multiple remote submaster station exist in separate PC CPU, it is necessary to exchange information between the multiple remote master and submaster stations so that the remote I/O station can be controlled continuously when the multiple remote submaster station takes over the control. (The information exchange is performed in the same way as that for the inter-PC network.)



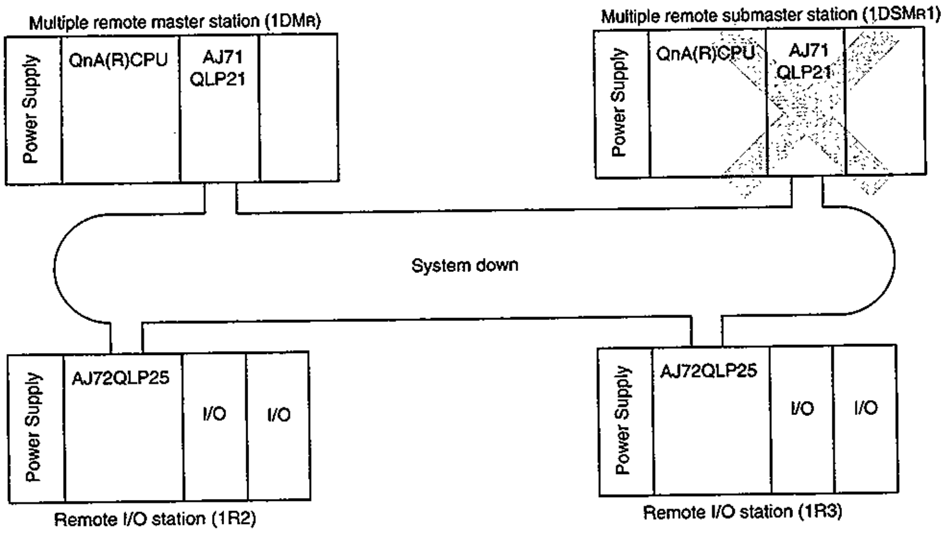
Caution

Startup the multiple remote submaster station lastly (after the data link between the multiple remote master station and the remote I/O station is established).

(e) The multiple remote master station cannot participate in the data link even if it recovers to the normal operation.



(f) The system goes down when the multiple remote submaster station fails.
All the output points of the remote I/O turn off.



Points

Follow the procedure below to return the control of the remote I/O station to the multiple remote master station while the submaster station is in control.

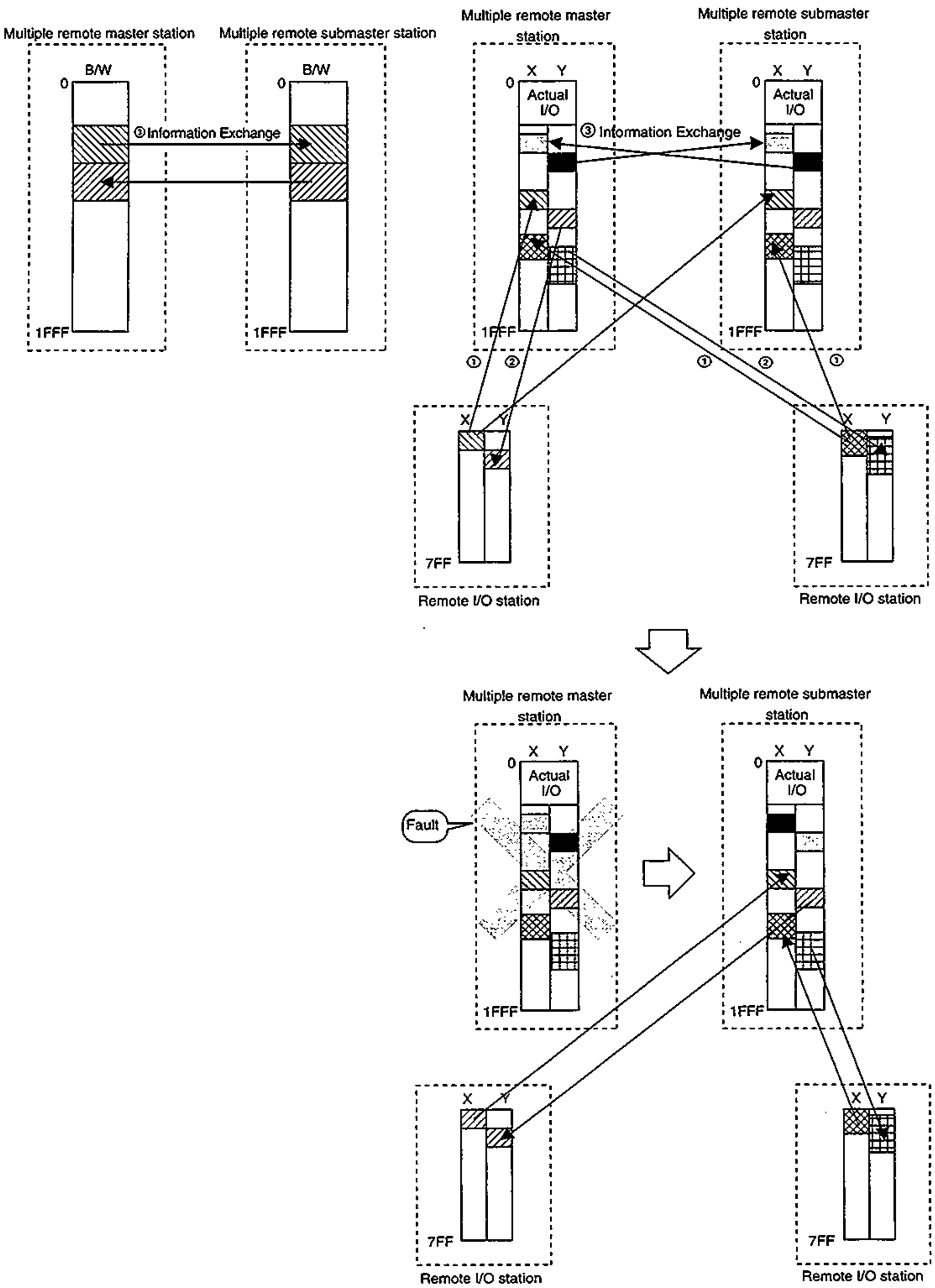
1) Turn off, then on the power of the multiple remote submaster station.
2) Turn off, then on the power of the multiple remote master station.

(g) Communication between the multiple remote master/submaster station and the remote I/O station

① Input (X) can be transferred to both of the multiple remote master and submaster stations.

② Output (Y) is normally controlled from the multiple remote master station. When the multiple remote master station goes down, it can be controlled from the multiple remote submaster station.

③ The information is exchanged between the multiple remote master and multiple remote submaster stations so that the remote I/O can be continuously controlled by B/W/X/Y.



Points

(1) The multiple remote master station (DM_R) and the multiple remote submaster station (DSM_R) can be distinguished by the station number setting and the condition setting switch.
- Multiple remote master station (DM_R) ...... Station No.:0
  Condition setting switch SW1:ON
- Multiple remote Submaster station (DSM_R) .. Station No.:1 to 64 (Overlapping with the remote I/O station is not allowed.)
  Condition setting switch SW1: ON, SW2: OFF

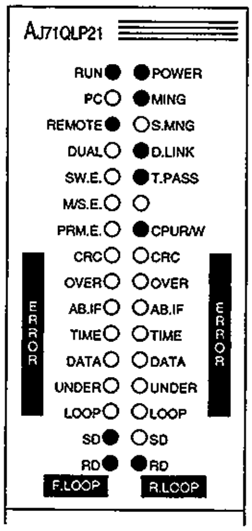
(2) Since a multiple remote submaster station is counted as one station, the number of remote I/O stations will be as follows:
- Optical loop system..................... 63 stations
- Coaxial bus system..................... 31 stations

(3) LED display on the multiple remote master and multiple remote submaster stations

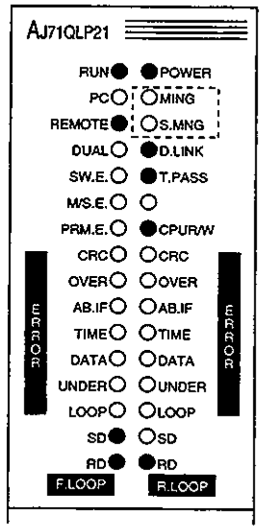
LED display on the network module can be used to confirm which of the multiple remote master station or the multiple remote submaster station is controlling the remote I/O station.

(a) When the multiple remote master station is controlling the remote I/O:
"MNG" and "S.MNG" of the multiple remote submaster station are turned off.

[Multiple remote master station]

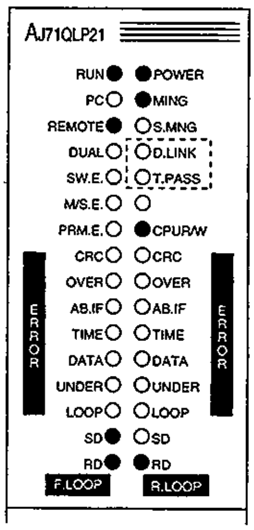


[Multiple remote submaster station]

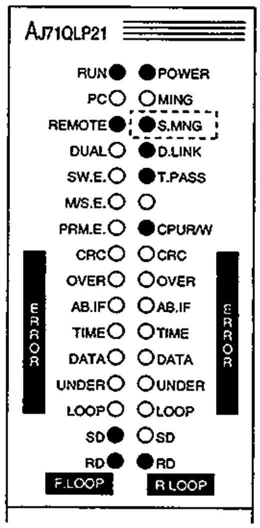


(b) When the multiple remote submaster station is controlling the remote I/O:
"D.LINK" and "T.PASS" of the multiple remote master station are turned off, and "S.MNG" of the multiple remote submaster station is turned on.

[Multiple remote master station]



[Multiple remote submaster station]

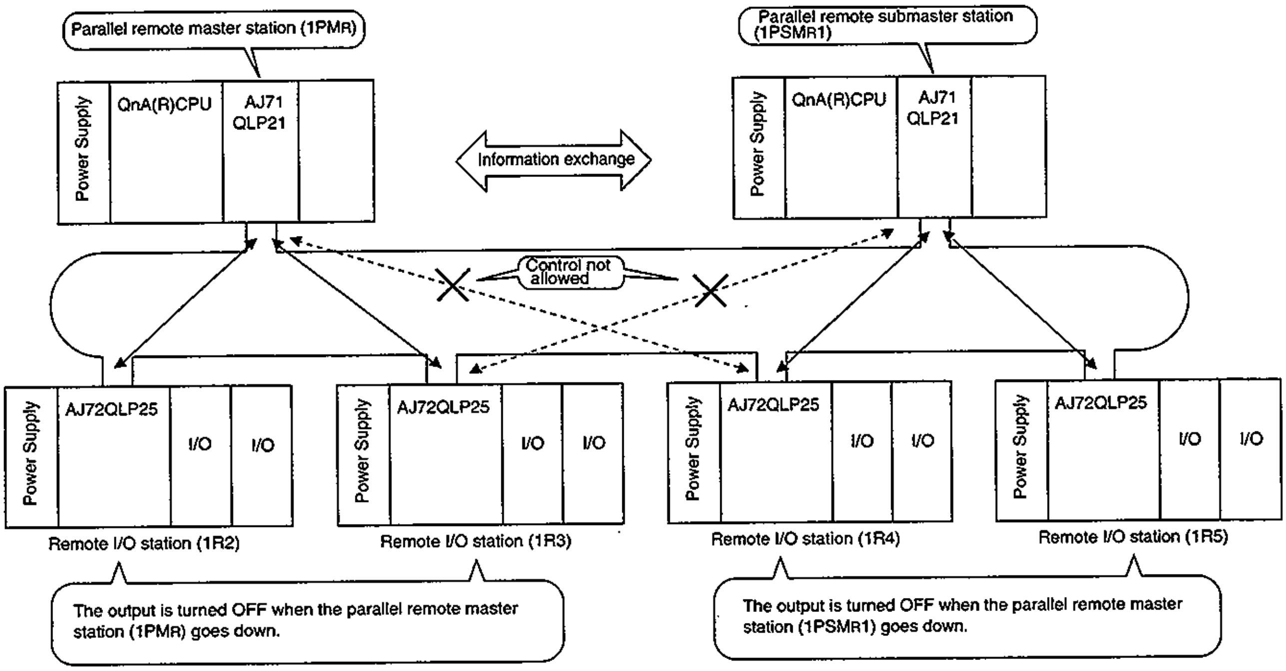


8.8 Parallel Master System (Remote I/O Network)

The use of this system reduces wiring cost. Because the data link cable of two remote I/O systems are shared. The load of the remote master station is also reduced.

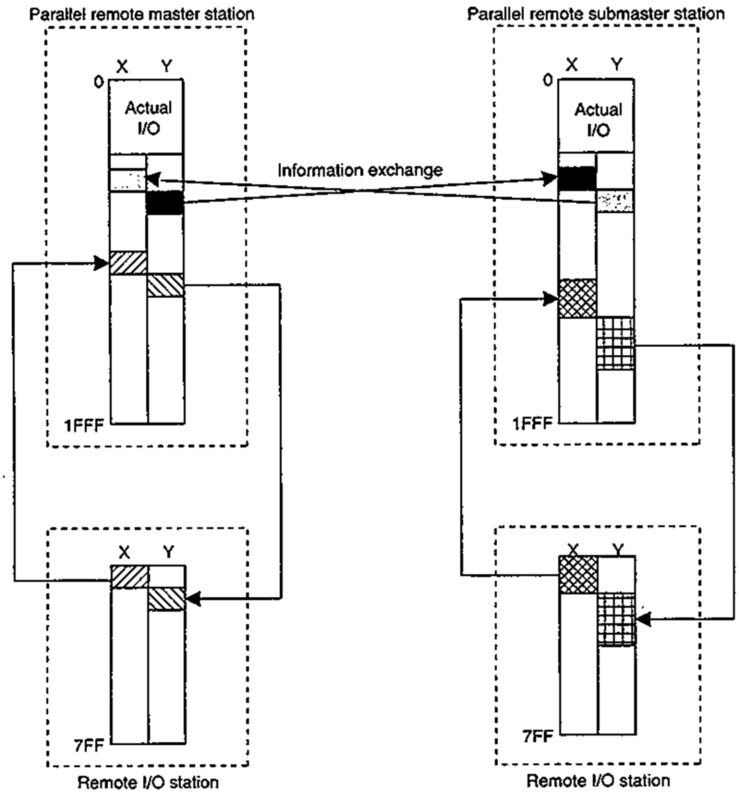
(1) The parallel remote master station and the parallel remote submaster station cannot control the same remote I/O station.

(2) The information can be exchanged between the parallel remote master station and the parallel remote submaster station.

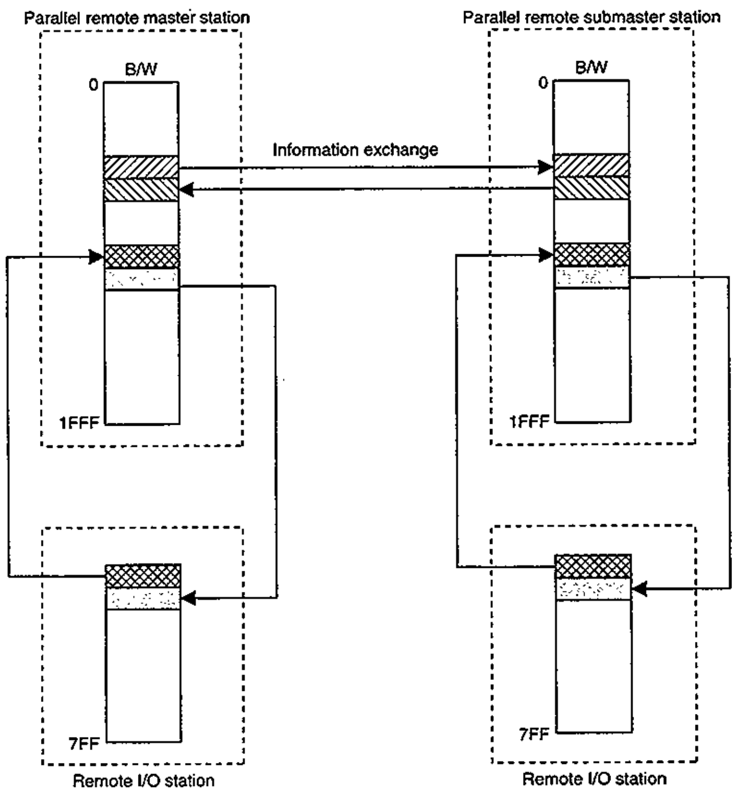


(3) Communication between parallel remote master/submaster station and the remote I/O station

(a) X/Y communication



(b) B/W communication



Points

(1) The parallel remote master station (PM_R) and the parallel remote submaster station (PSM_R) can be distinguished by the station number setting and the condition setting switches.

- Parallel remote master station (PM_R)....... Station No.:0
Condition setting switch SW1:ON
- Parallel remote submaster station (PSM_R)... Station No.:1 to 64 (Overlapping with the remote I/O station is not allowed.)
Condition setting switch SW1: ON, SW2: OFF

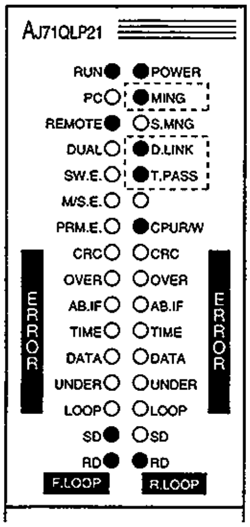
(2) Since a parallel remote submaster station is counted as one station, the number of remote I/O stations that can be controlled by the parallel remote master station (PM_R) and parallel remote submaste station (PSM_R) will be as follows:

- Optical loop system..................... 63 stations
- Coaxial bus system..................... 31 stations

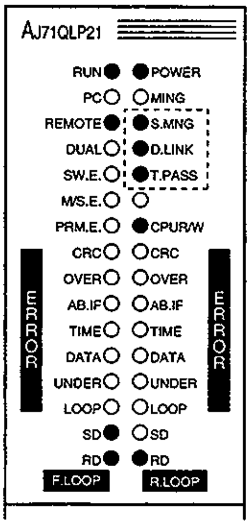
(4) LED display on the parallel remote master and parallel remote submaster stations

The status of the remote I/O control by the parallel remote master and parallel remote submaster stations can be checked by the LED display on the network module.

(a) Parallel remote master station
"MNG", "D.LINK", and "T.PASS" are turned on during the remote I/O control.



(b) Parallel remote submaster station
"S.MNG", "D.LINK", and "T.PASS" are turned on during the remote I/O control.



8.9 Setting the Remote I/O Station Output Status when the System is Down Due to the Master Station Error (Remote I/O Network)

When the system setting switch 3 of the master station (Q4ARCPU) which controls the remote I/O network is set to "hold mode," the output status of the remote I/O station will be retained when the system goes down due to the master station error (including when an error that stops the CPU's operation occurs).

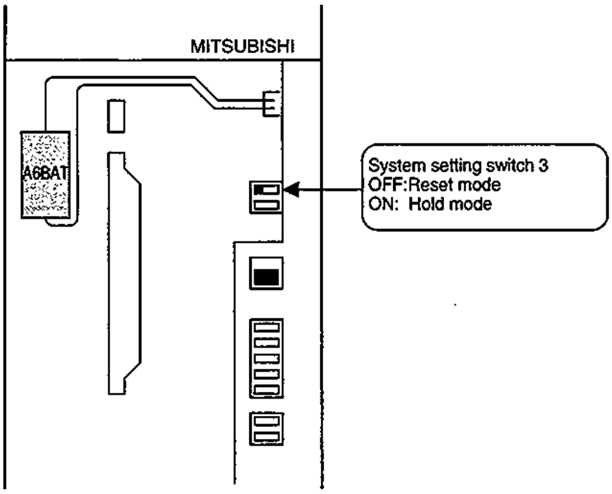
Conditions under which the remote I/O station can hold the output

All of the following three conditions have to be met:

1) Must be Q4ARCPU.
2) The software version of the network module (AJ71QLP21(S), AJ71QBR11) in the master station (submaster station) which controls the remote I/O station must be "H" or later.
3) The software version of the remote I/O module (AJ72QLP25, AJ72QBR15) must be "G" or later.

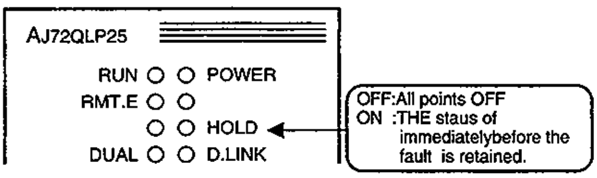
The setting of the system setting switch is shown below:

- OFF (Reset mode): All points OFF
- ON (Hold mode): The status of immediately before is retained.



Point

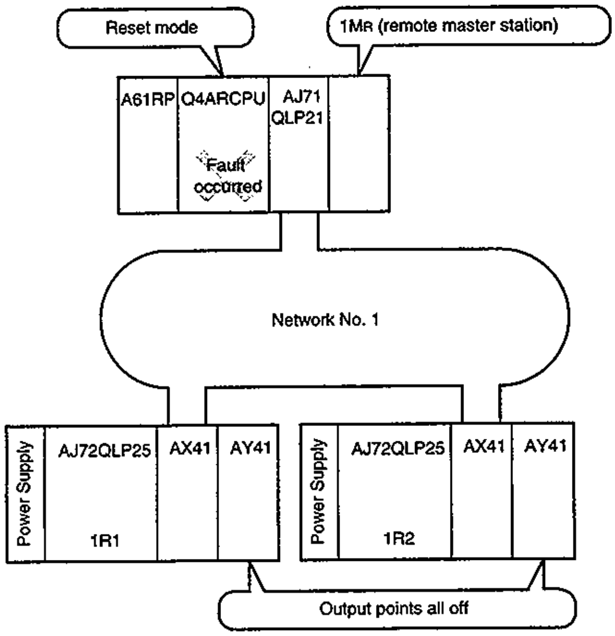
The hold status of each I/O station can be checked by the "HOLD" LED of the module.



(1) Double layer system

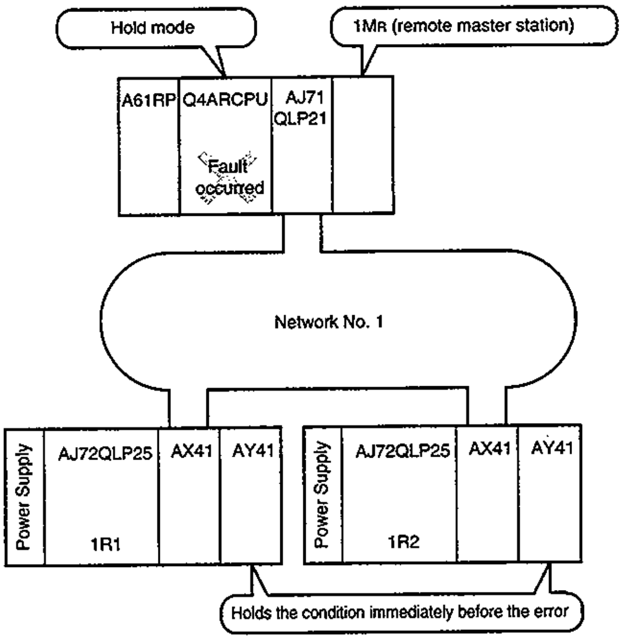
(a) When in reset mode

All the output becomes off.



(b) When in hold mode

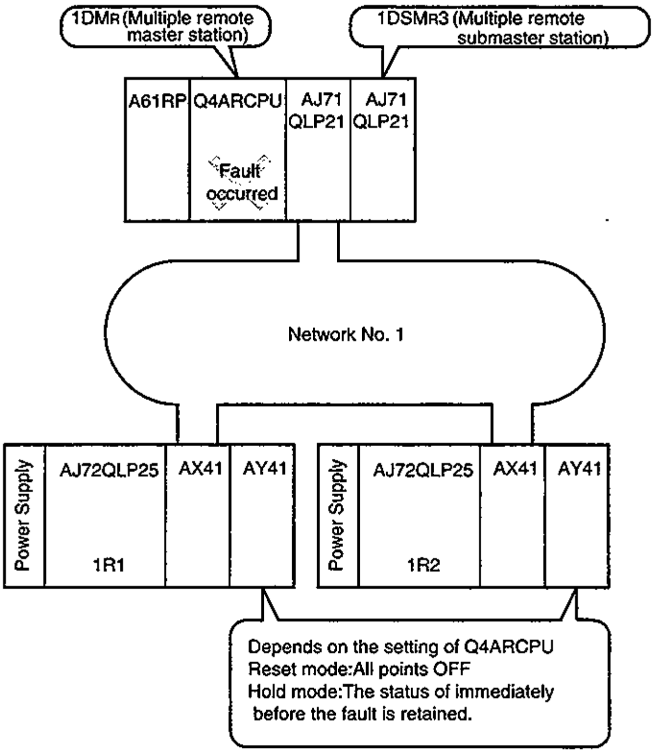
Holds the condition immediately before the error.



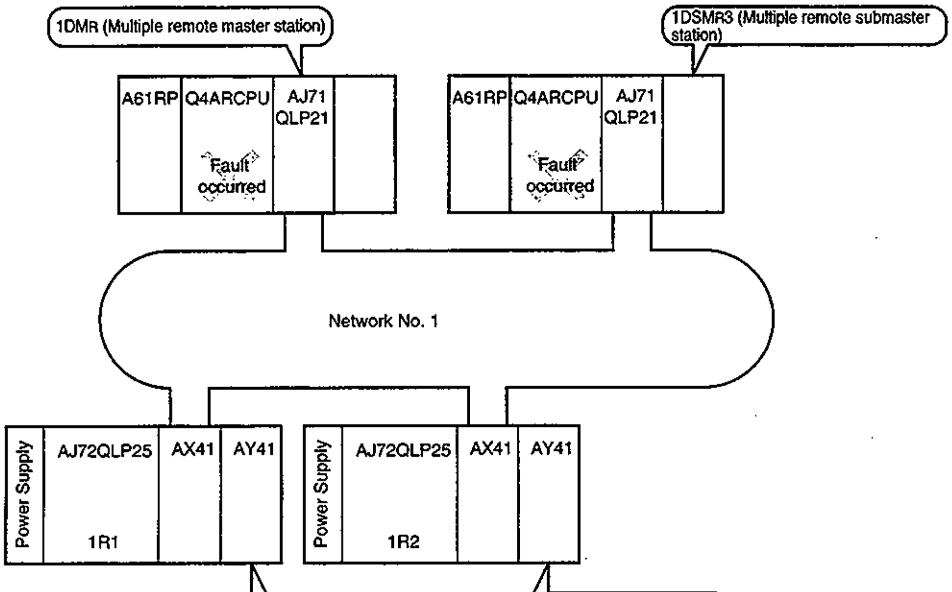
(2) Multiple master system

(a) When the multiple remote master station and the multiple remote submaster station exist in one Q4ARCPU.

It is identical to the double layer system.



(b) When the multiple remote master station and the multiple remote submaster station exist in different Q4ARCPUs.
The operation depends on the setting of the PC CPU in the station which had an error at the end.

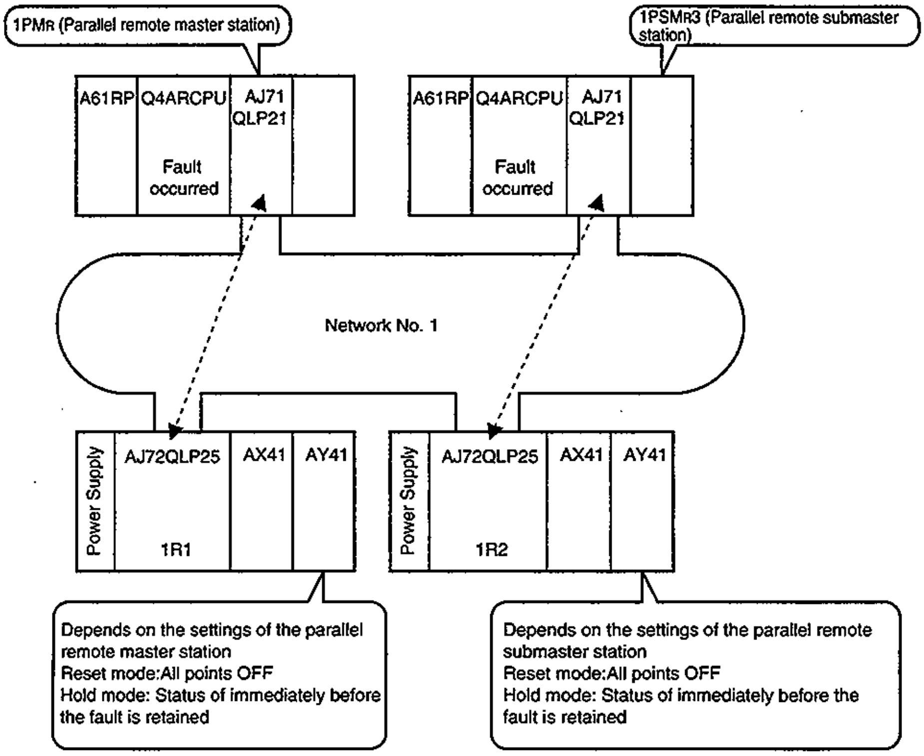


Output status of the remote I/O station

	Output status of the remote I/O station	
	1DMR → 1DSMR3	1DSMR3 → 1DMR
1DMR : Reset mode 1DSMR3 : Reset mode	All points OFF	All points OFF
1DMR : Hold mode 1DSMR3 : Reset mode	All points OFF	Status of immediately before the fault is retained
1DMR : Hold mode 1DSMR3 : Reset mode	Status of immediately before the fault is retained	All points OFF
1DMR : Hold mode 1DSMR3: Reset mode	Status of immediately before the fault is retained	Status of immediately before the fault is retained

(3) Parallel master system

The operation depends on the settings of the controlling PC CPU.



Points

(1) The output status of the remote I/O station (AJ72LP25, AJ72BR15) which corresponds to AnU will be all OFF even if the system setting switch 3 of the PC CPU is set to "ON (hold mode)".

(2) The retained output can be cleared (OFF) by the following operations:

① Reset by the reset switch of the remote I/O module (AJ72QLP25, AJ72QBR15).

② Turn off the power.

8.10 SB/SW Can be used as you like (user Flags)

By using the user flags (SW01F0 to 01F3), arbitrary control information can be sent from the host station to all the stations without using the link register (B/W).

(1) In order to turn ON/OFF the user flags, three kinds of instructions can be used:

1) User flag set instruction (UFSET)
2) User flag reset instruction (UFRST)
3) User flag out instruction (UFOUT)

Refer to Section 10.3 for details.

(2) The user flags consist of the following. The numbers from 1 to 64 indicate the station numbers.

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
SW01F0	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
SW01F1	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
SW01F2	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
SW01F3	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49

(3) The status of the user flags can be checked by SB01F0.
OFF: All of the bits from SW01F0 to 01F3 are OFF.
ON: One of the bits from SW01F0 to 01F3 is ON.

(4) The combinations of PC CPU and the network module are as follows:

	AJ71QLP21 AJ71QLP21S AJ71QBR11		AJ71LP21 AJ71BR11	A1SJ71LP21 A1SJ71BR11
	Software version "H" or later	Software version "G" or later		
Q4ARCPU	○	×	—	—
QnACPU	△	×	—	—
AnUCPU AnACPU AnNCPU	—	—	×	—
AnSCPU A2USCPU	—	—	—	×

○: Executing the user flag instruction and checking the contents of the user flag (SB01F0, SW01F0 to 01F3) are allowed.

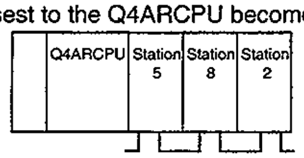
△: Only checking the contents of the user flags (SB01F0, SW01F0 to 01F3) is allowed. (Executing the user flag instruction is now allowed.)

×: Executing the user flag instruction and checking the contents of the user flags (SB01F0, SW01F0 to 01F3) are not allowed.

—: Module installation is not allowed.

Point

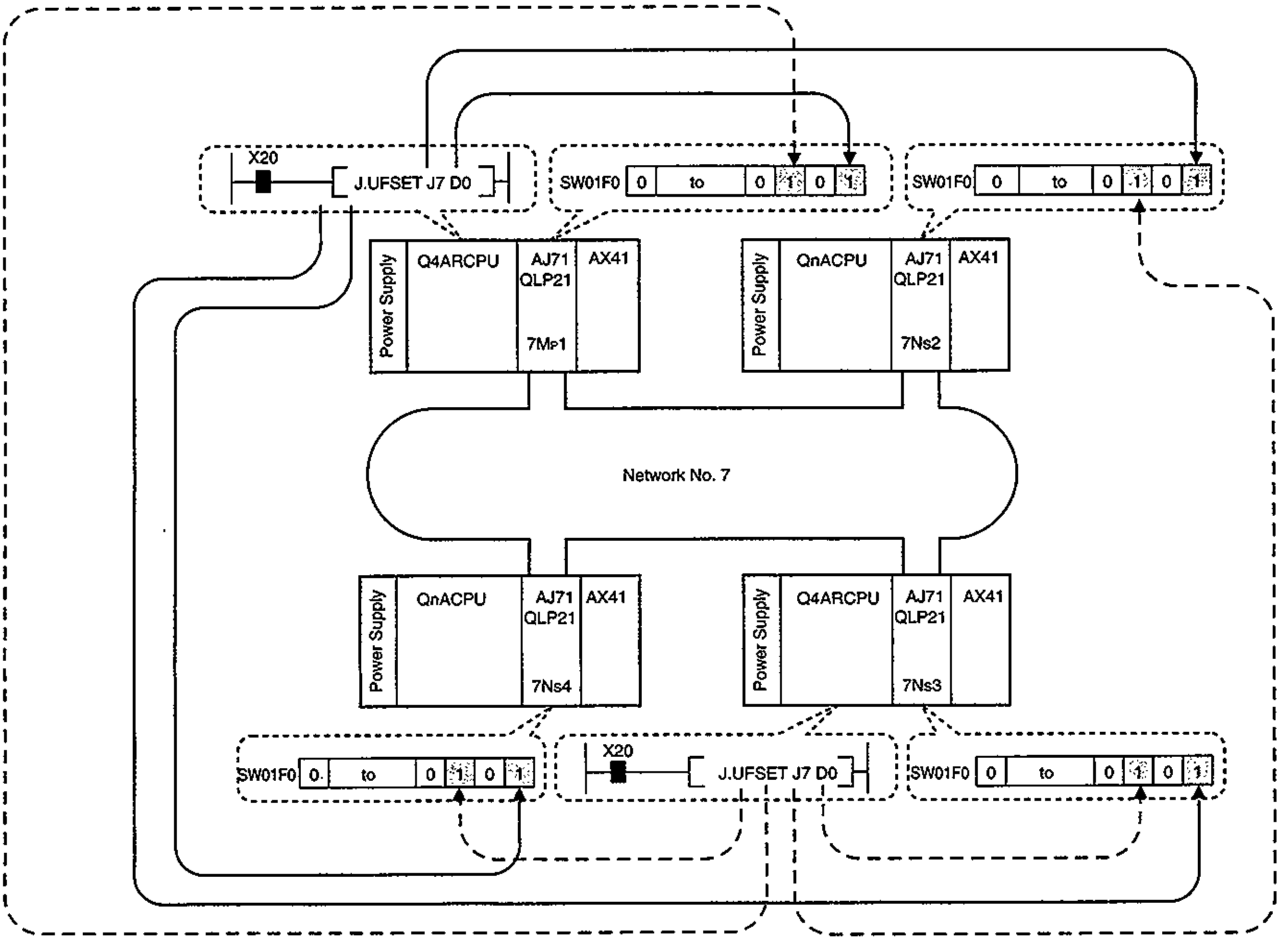
When two or more modules of the same network number are installed as shown here, the module closest to the Q4ARCPU becomes the target of the instruction.



In the system shown on the left, the bit which correspoinds to the station 5 is the one to be turned ON/OFF.

(5) User flag instruction

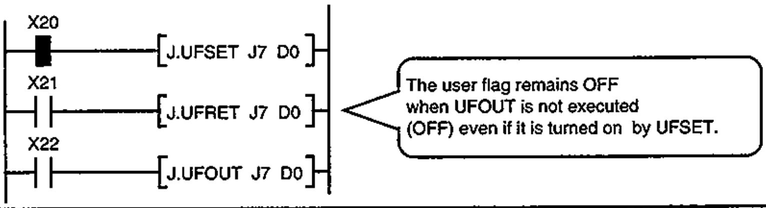
(a) User flag set instruction (UFSET)
Turns on the bit which corresponds to the host station from off.



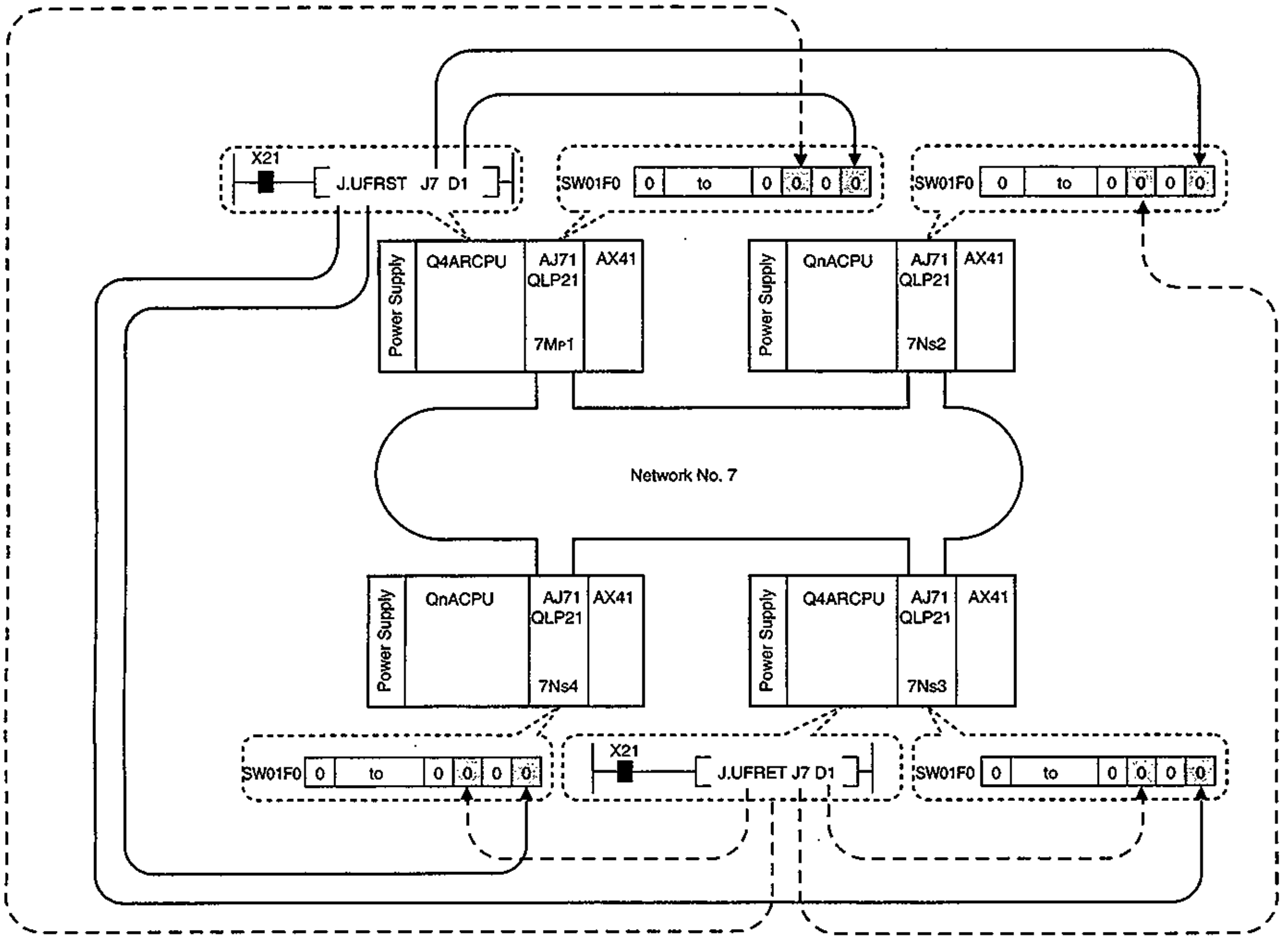
It is assumed that "1" is stored in D0 which is used by the program.

Point

Do not use the UFOUT instruction when controlling the user flag by UFSET or UFRST. It does not turn ON/OFF properly.



(b) User flag set instruction (UFRST)
Turns on the bit which corresponds to the host station from off.

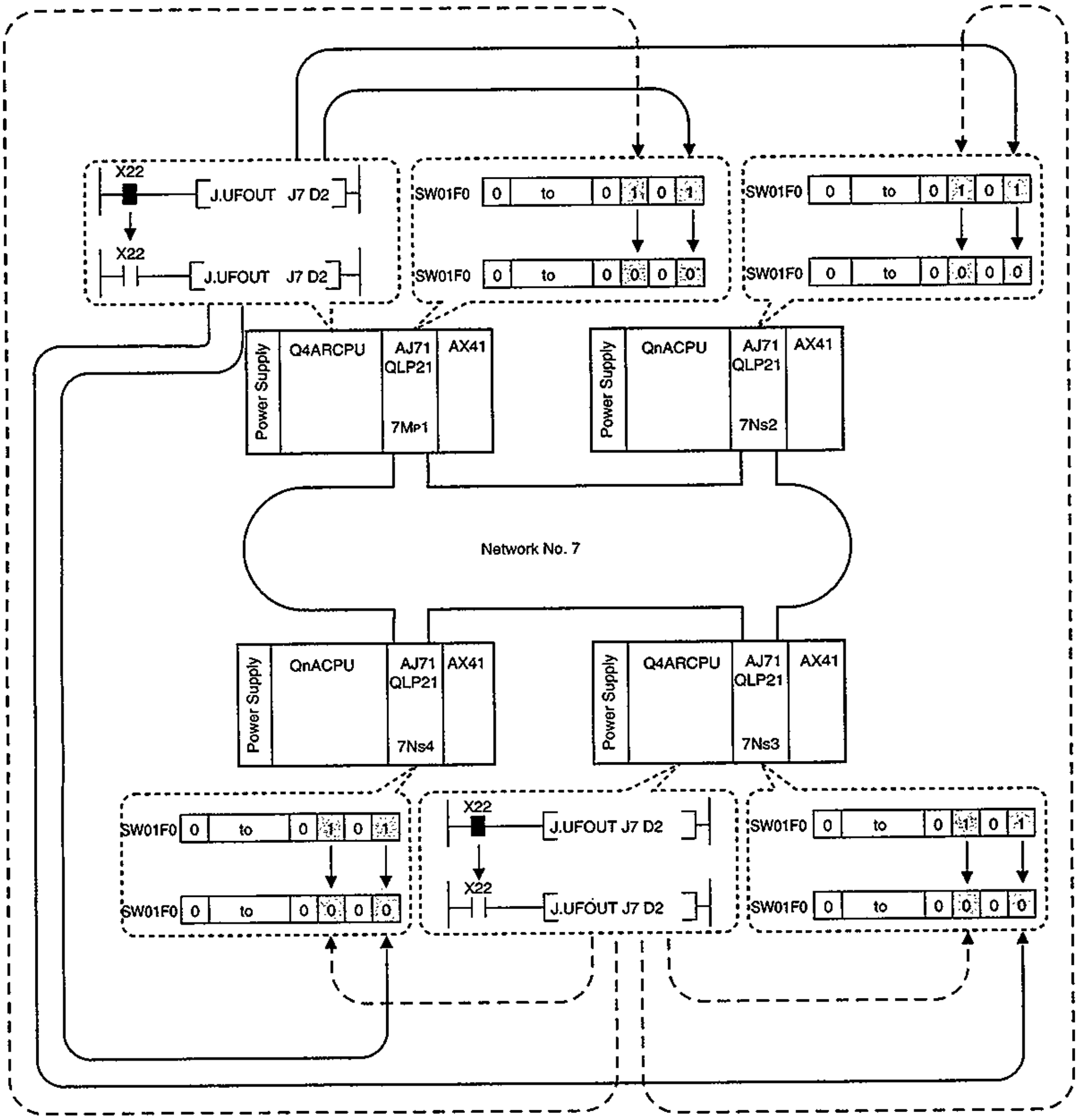


It is assumed that "1" is stored in D1 which is used by the program.

(c) User flag out instruction (UFOUT)

Turn ON/OFF the bit which corresponds to the host station.

Turn it on when the instruction is being executed, and off when the instruction is not being executed.

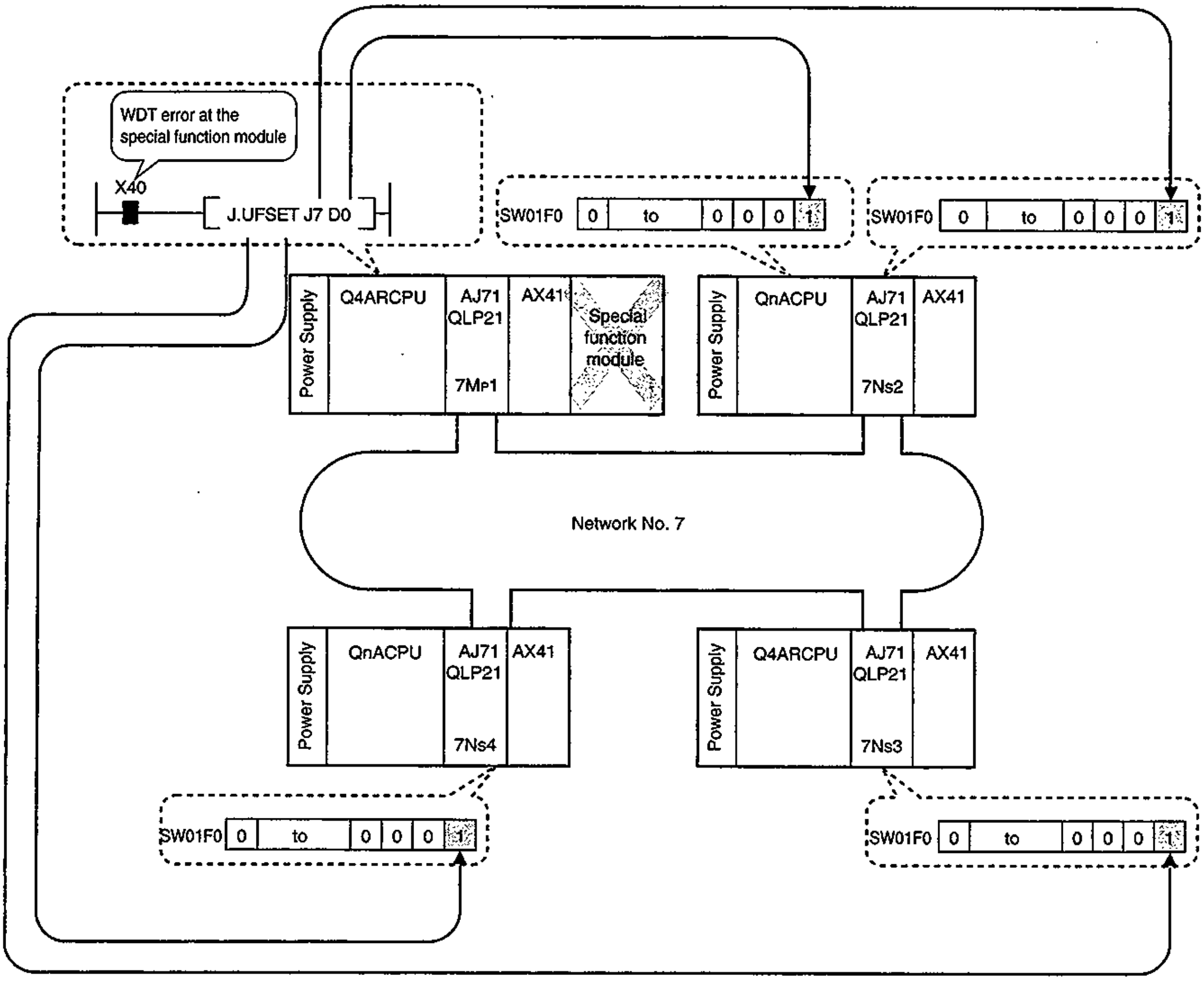


It is assumed that "1" is stored in D2 which is used by the program.

Point
The UFOUT instruction is executed independent of the link status before the execution just like the OUT instruction (–< >–).

(6) Usage example

For example, the watchdog timer error (WDT error) status of the 7MP1 station's special function module can be sent to all the stations.



It is assumed that "1" is stored in D0 which is used by the program.

8.11 RAS Function

RAS function is the acronym of Reliability, Availability, and Serviceability, and it represents the overall ease of use of automated facilities.

8.11.1 Automatic recovery function

When a station is once disconnected from the data link due to a data link fault, this function automatically resumes the data link when the station returns to the normal operation.
The data link communication status and the recovery process of the faulty station will be as follows:

(1) When the control station went down:

Even though the control station was disconected from the data link, the normal station can communicate as follows depending on the control station transfer function available/not available setting:

(a) When the control station transfer function is available:
The control is handed over to the subcontrol station and the cyclic transfer and the transient transmission is allowed.

(b) When the control station transfer functional is not available:
Since the control is not transferred to the subcontrol station, the cyclic transmission is suspended but the transient transmission is allowed.

Control station transfer function available	Control station transfer function not available
The data link is continued by the subcontrol station.	The cyclic transmission is suspended until the control station becomes ready for resuming communication. The transient transmission is allowed.

(2) When the control station returns to the normal operation:

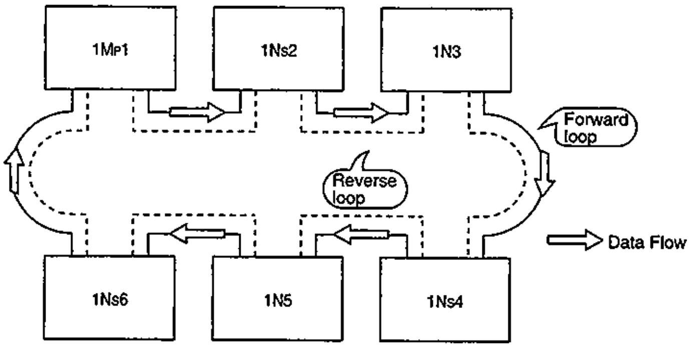
When the control station is capable of communication, the data link is resumed based on the parameters of the control station.

8.11.2 Loop back function (optical loop system)

The optical loop system has duplex transmission path. When an error occurs in the transmission path, the normal communication is maintained among the available stations after isolating the faulty part by switching the transmission path from forward loop to reverse loop/and vice versa, or by performing loopback.

(1) Normal operation

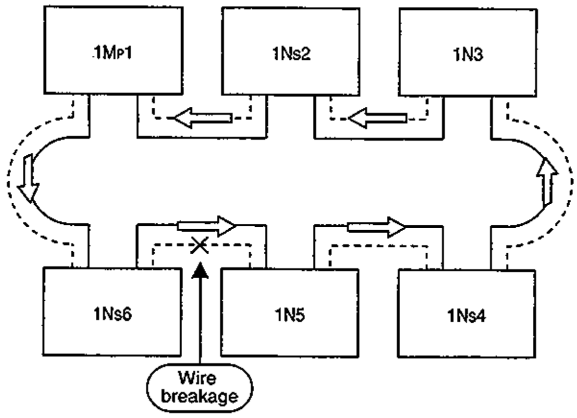
The data is linked by the forward loop (or the reverse loop).



(2) When fault occurred

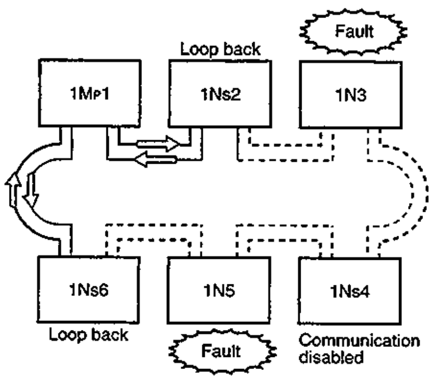
(a) Faulty forward loop (reverse loop)

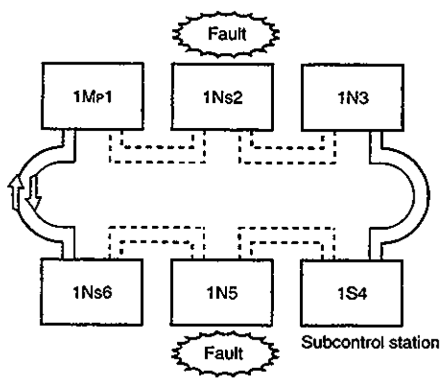
The data link is maintained by the reverse loop (forward loop).



(b) Faulty station

The data link is maintained by excluding the faulty station.
When two or more stations become faulty, the data link is not available between those faulty stations. However, if QnA(R)CPU exists, that station becomes the subcontrol station and the data link continues.





(3) Precautions when the optical loop system is used

(a) When the cable is plugged/unplugged, the lines used (forward loop/reverse loop) might be switched but the data link will be continued normally.

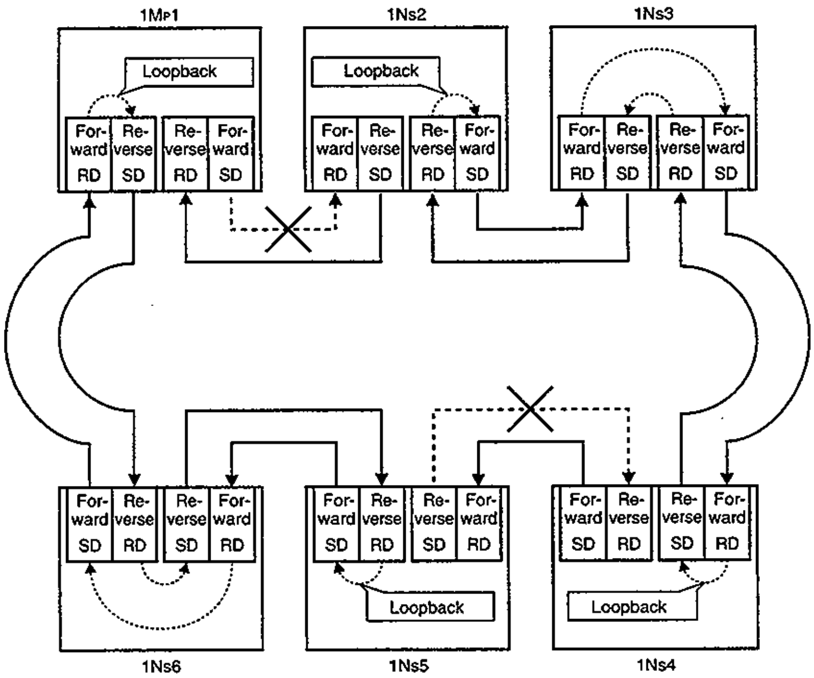
(b) When the loop back is performed because of a cable breakage, both of the forward loop and the reverse loop might become normal. The normal/fault status of the forward/reverse loop is determined by the "RD" status of the loopback station.

[Example]

In the following example, the data link is divided into two, "1MP1-1NS5-1NS6" and "1NS2-1NS3-1NS4".

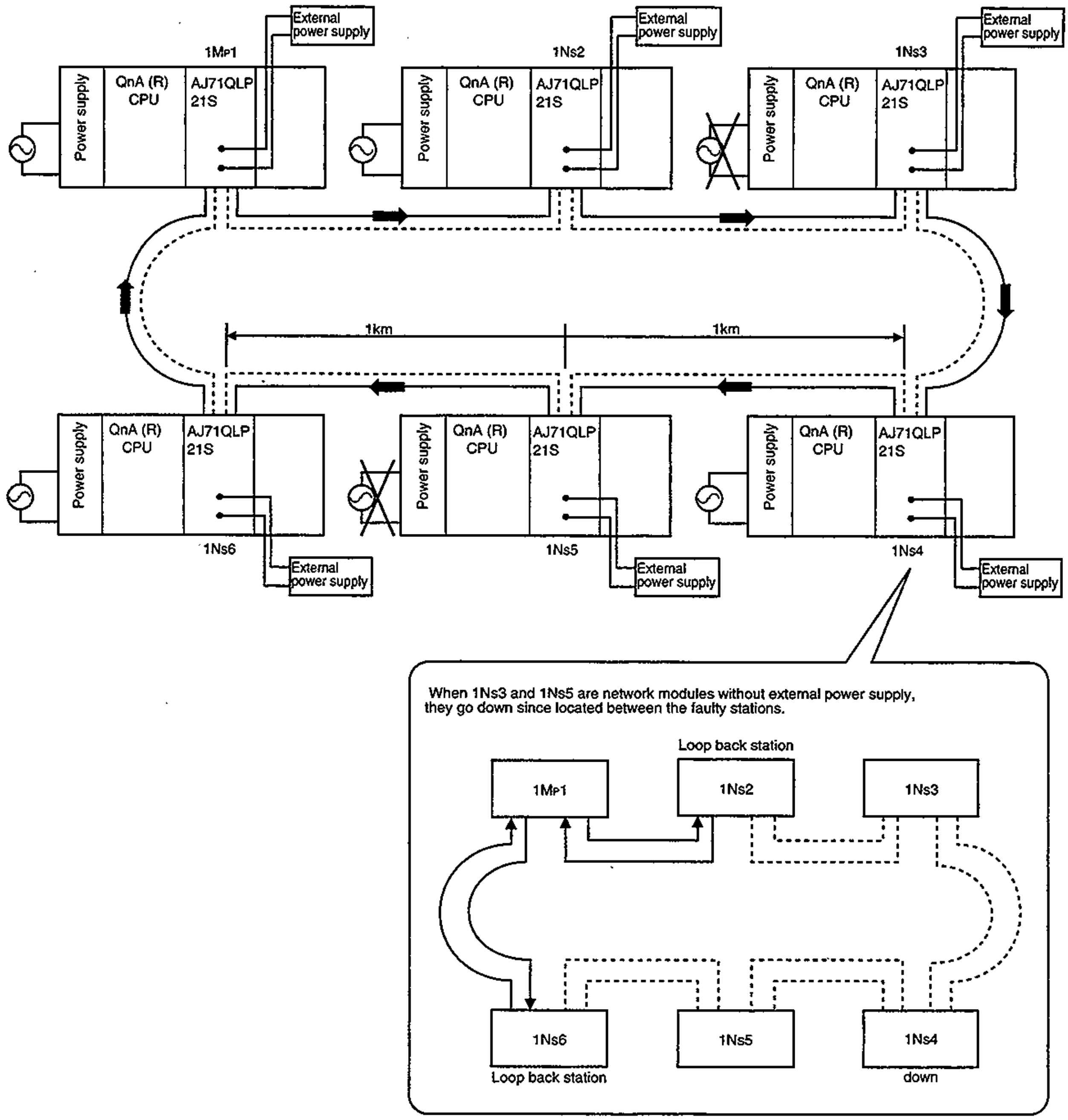
1) 1MP1-1NS5-1NS6 loop
   1MP1:Normal forward loop/reverse loop — Normal forward loop
   1NS5: Normal forward loop/reverse loop — Normal reverse loop

2) 1NS2-1NS3-1NS4 loop
   1NS2:Faulty forward loop, normal reverse loop — Faulty forward loop
   1NS4:Normal forward loop, faulty reverse loop — Faulty reverse loop



8.11.3 Preventing stations from going down by using the external power supply (inter-PC network: optical loop system)

When the power (24VDC) is directly supplied to the network module externally, the loop back is prevented and the station between the faulty stations do not go down even if more than one stations goes down. (The external power can be supplied to the AJ71QLP21S network module.)
Normal data link is maintained even if the distance between a normal station and another normal station (1Ns2 and 1Ns4, 1Ns4 and 1Ns6) exceeds 1km or more.



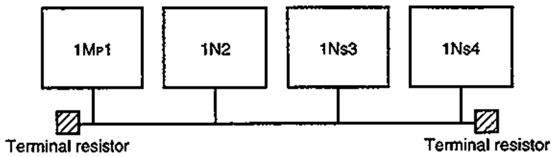
Remark

Even when the power of QnA(R)CPU (the control station) turns off, the control station is not transfered because the network module of the control station is operating normally.

8.11.4 Station detachment function (coaxial bus system)

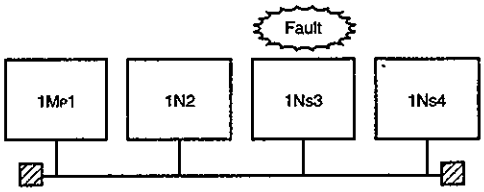
When a connected station's power is turned off in the coaxial bus system, the normal communication continues among other operational stations.
However, the normal transmission can not be continued when the cable is cut off, because the terminal resistor is lost.

(1) Normal operation



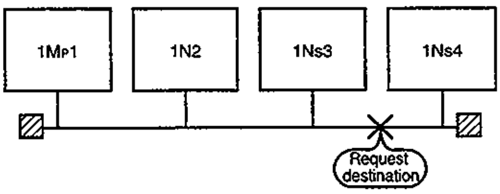
(2) When fault occured

The data link continues by excluding the faulty station.



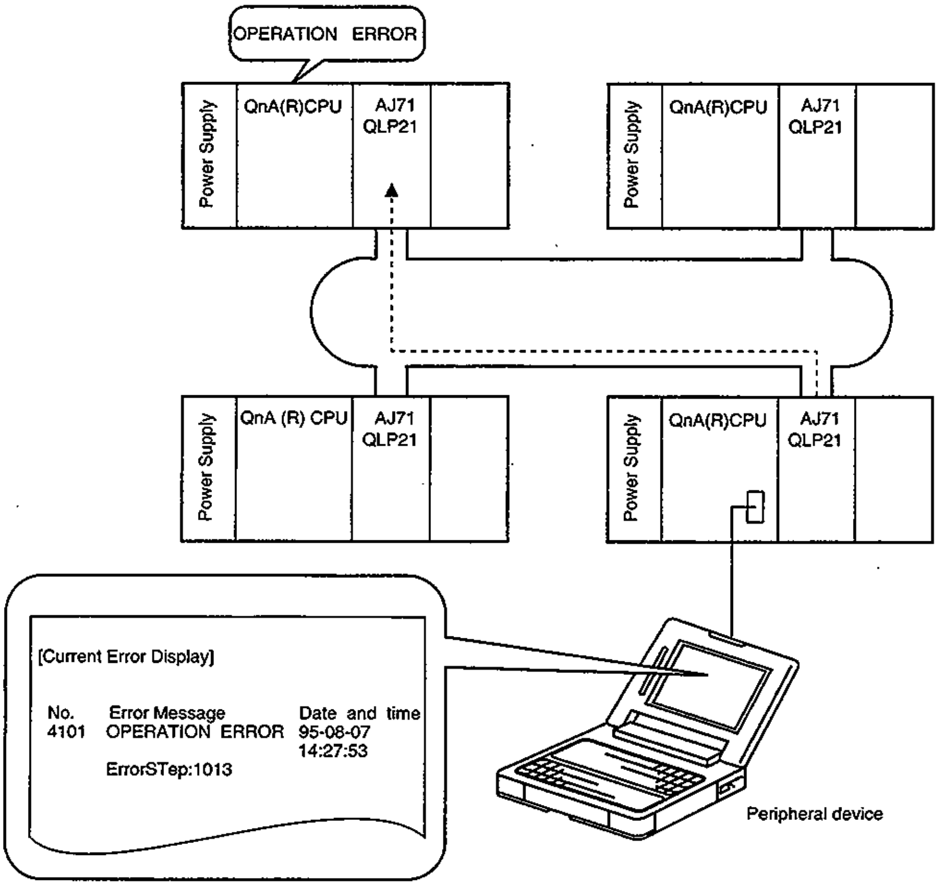
Point

When the cable is disconected, the data link can not be continued because the terminal resistor is lost.



8.11.5 Transient transmission is possible when the PC CPU is in fault

Even if an error that stops the PC CPU occurs during system operation, the network module operates normally and the transient transmission continues.
The details of the error at the applicable station can be checked from other stations using peripheral device, etc.

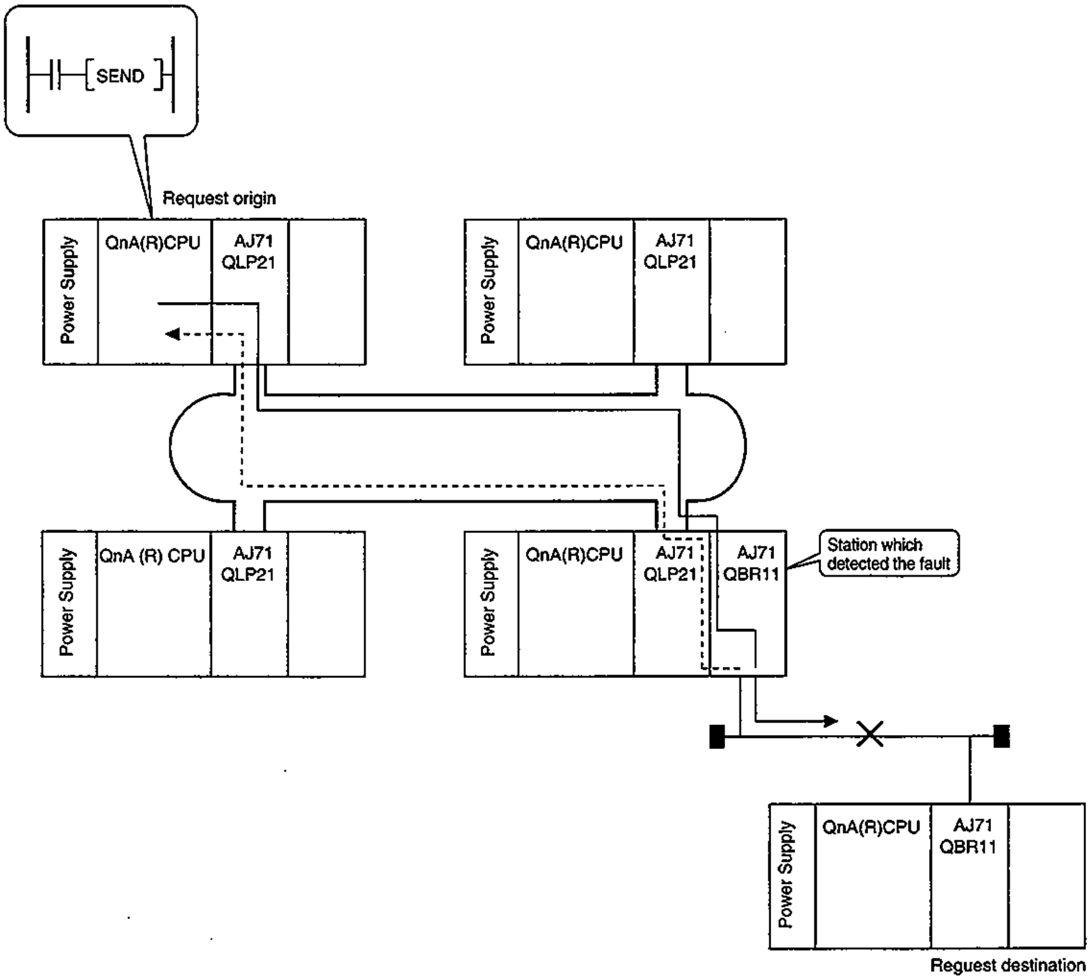


Cyclic/transient transmission status for different status of the PC CPU are as follows:

Level	Status of PC CPU	Cyclic transmission	Transient transmission
Insignificant	Continue (low battery, etc.)	Continue	Possible
Medium	Stop (WDT error, etc.)	Stop	
Serious	Uncontrollable (RAM fault, etc.)		Error is returned

8.11.6 Confirming the transient transmission error detection time

When the transient transmission (SEND, READ, WRITE, REQ instruction) finishes abnormally, "the time", "the network No. can be checked", and "the station number can be checked".
Refer to Section 10.2 for the details of the instructions.



Point
When AnUCPU (AJ71LP21, AJ71BR11) station detects a fault, "the time", "the network No. can be checked" and "the station number can be checked" are not stored.

8.11.7 Diagnostic function

The diagnostic function is used to verify the network status, the module setting status, etc.
The diagnostic function is generally divided into the following two categories:
(1) "Offline test" performed by the network module alone
(2) "Online test" performed by the peripheral device

Point
Perform the offline and online test when the network module is actually used for communication (T.PASS LED is on). An error occurs when pereformed from a station disconnected from the data link.

(1) Offline test
The network module hardware status and the wiring of the data link cable can be checked at the system start up by setting the network module to the test mode.
There is no need of special parameter settings to perform the test.

Item	Contents	Optical loop system	Coaxial bus system	Reference section
Hardware test	Checks the internal hardware of the network module	○	○	Section 4.4.1
Internal self loop back test	Checks the hardware including the sending/receiving circuit of the transmission system in the network module alone	○	○	Section 4.4.2
Self loop back test	Checks the hardware including the sending/receiving circuit and the cable of the transmission system in the network module alone	○	○	Section 4.4.3
Station-to-station test	Checks the line between two stations	○	○	Section 4.4.4
Forward loop, reverse loop test	Checks the line status of the forward and reverse loops when all the stations are connected	○	×	Section 4.4.5

(2) Online test

The line status can be easily checked by the peripheral device.
When a trouble occurs while the system is in operation, the diagnosis can be obtained while the system is online.

Item	Contents	Optical loop system	Coaxial bus system	Data link status (Cyclic transfer and transient transmission)	Reference section
Loop test	Checks the wiring	○	×	Temporarily suspended	Section 4.5.1
Setting confirmation test	Checks the module switch status such as the control station, overlapping station number, etc.	○	○	Temporarily suspended	Section 4.5.2
Station order confirmation test	Checks the order of the stations which are connected to the forward loop direction and the reverse loop direction.	○	×	Temporarily suspended	Section 4.5.3
Communication confirmation test	Checks if the transient transmission can be done normally. Can be a check for the correct/incorrect setting of the routing parameter at the same time.	○	○	Continue	Section 4.5.4

9 Parameter Setting

To operate MELSECNET/10, it is necessary to set parameters by peripheral devices. However, depending on the system, parameter setting by the peripheral devices may not be required.

(1) Parameter set-up items by module model names are shown in Table 9.1. Set up method for each parameter will be described following Section 9.2.

Table 9.1 Parameter setting items by module model names

Parameter setting items \ Module Model Name		Inter-PC Network				Remote I/O network					Reference
		①	②	③	④	⑤	⑥	⑦	⑧	⑨	
		Control station		Normal station	Standby station	Remote master station	Multiple master system		Parallel master system		
		Default parameter *1	Common parameter				Multiple remote master stations	Multiple remote submaster stations	Parallel remote master station	Parallel remote submaster station	
Number of module setting		△	●	△	●	●	●	●	●	●	Section 9.2
Network setting	First I/O number	△	●	△	●	●	●	●	●	●	Section 9.3
	Network Number	△	●	△	●	●	●	●	●	●	Section 9.3
	Total number of linked (slave) stations	×	●	×	×	●	●	×	●	×	Section 9.3
Network refresh parameter		△	△	△	×	●*3	●*3	●*3*4	●*3	●*3	Section 9.4
Common parameter		×	●	×	×	●	●	×	●	×	Section 9.5
Station-specific parameter		△	△	△	×	×	×	×	×	×	Section 9.6
I/O allocation		×	×	×	×	△	△	×	△	×	Section 9.7
Inter data link transfer parameter		△*2	△*2	△*2	×	×	×	×	×	×	Section 9.8
Routing parameter		△	△	△	×	△	△	△	△	△	Section 9.9

●: Setting required
△: Setting when required
×: Setting not required
*1: Set transmission range for each station by the switch at the network module (refer to Section 9.1).
*2: Only when two or more units of ①, ②, and ③ are installed.
*3: For X/Y refresh range setting
*4: Set to "x" when multiple remote master stations exist on the same CPU.

Point

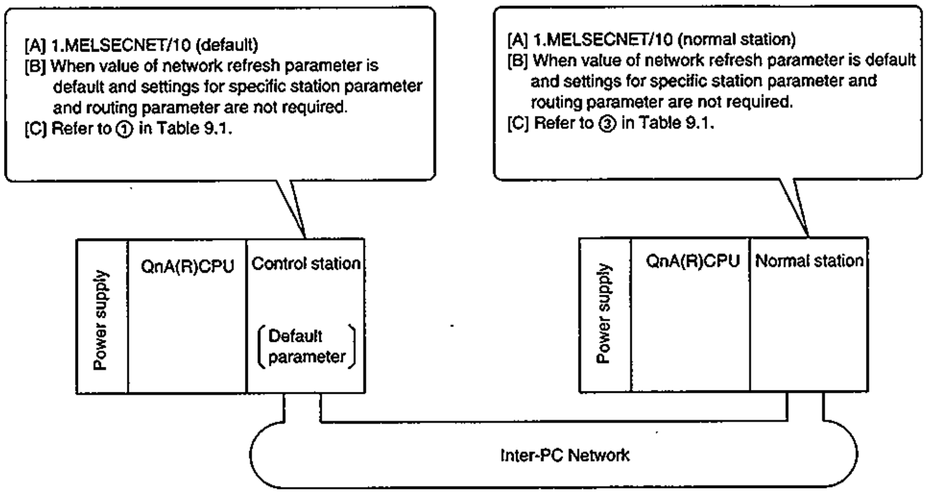
When multiple pieces of network modules are installed on single QnACPU, it is necessary to set up parameters with peripheral devices if there is a dot (●) mark on one of the module model names.

(2) The parameter setup concept is explained below.

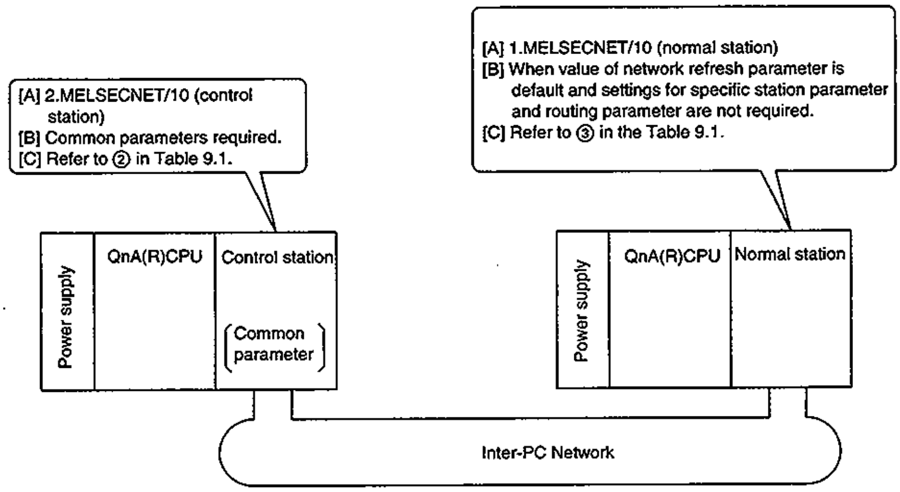
Contents of [A] through [C] described in the explanation
[A] .... Module model name for number of module setting (including module model name selection procedure).
[B] .... Conditions whereby setting parameter by peripheral devices become unnecessary.
[C] .... Parameter setting items

(a) Inter-PC Network

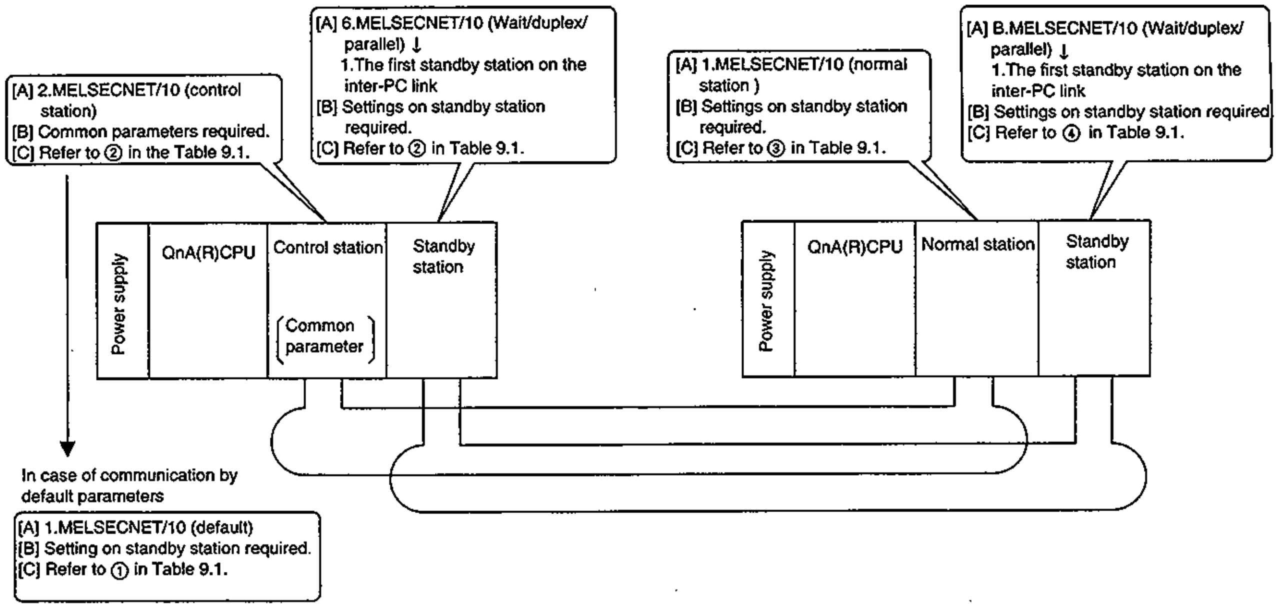
1) Double-layer system (communication by default parameters)



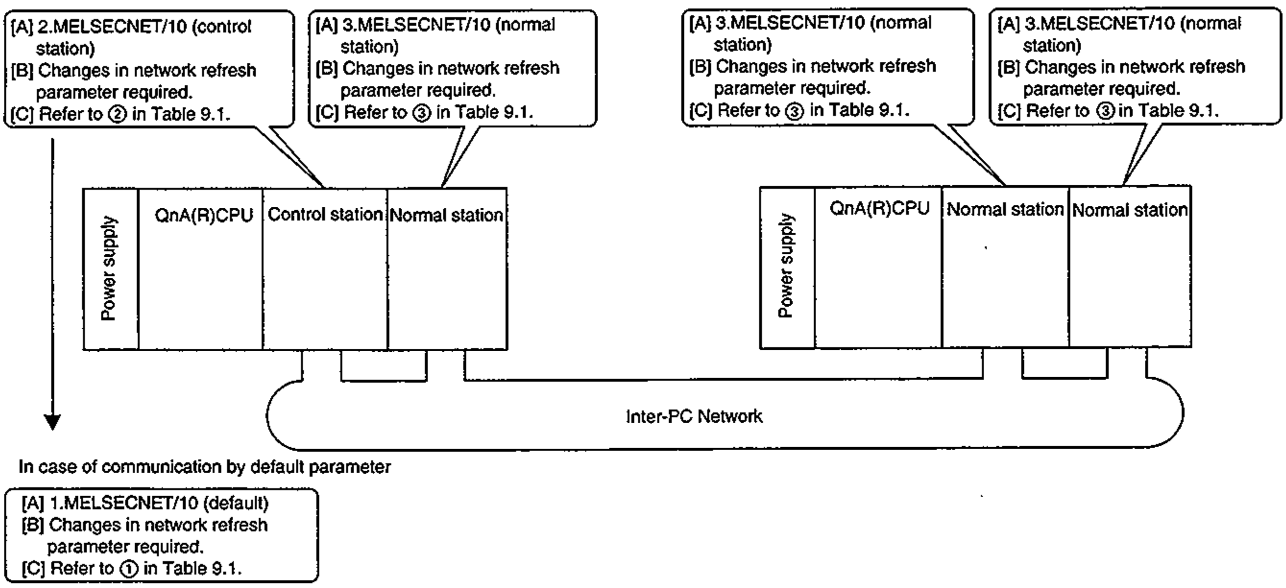
2) Double-layer system (communication by common parameters)



3) Simplified duplex system

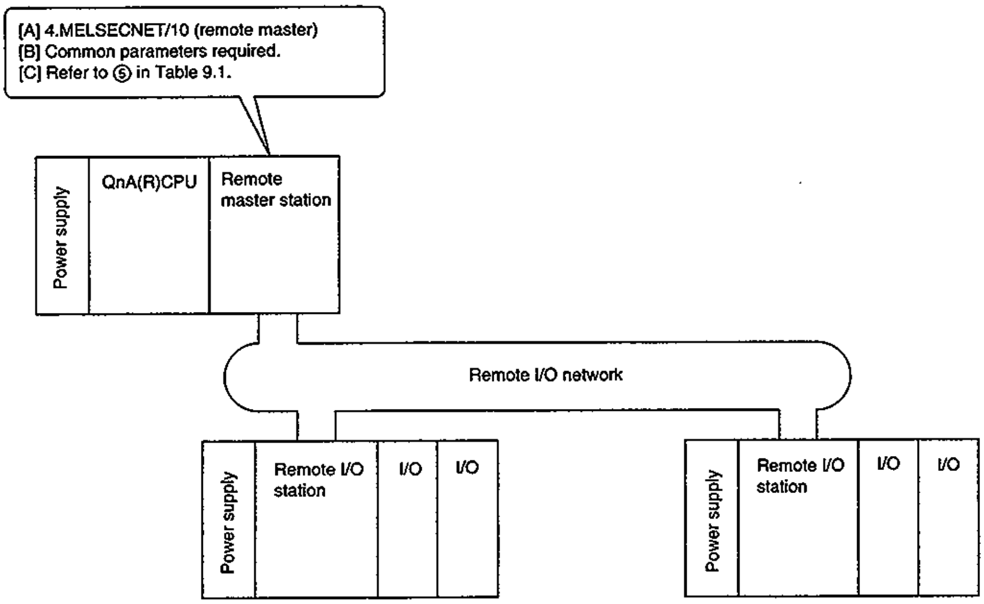


4) The system to increase link points (install multiple module of the same network number)

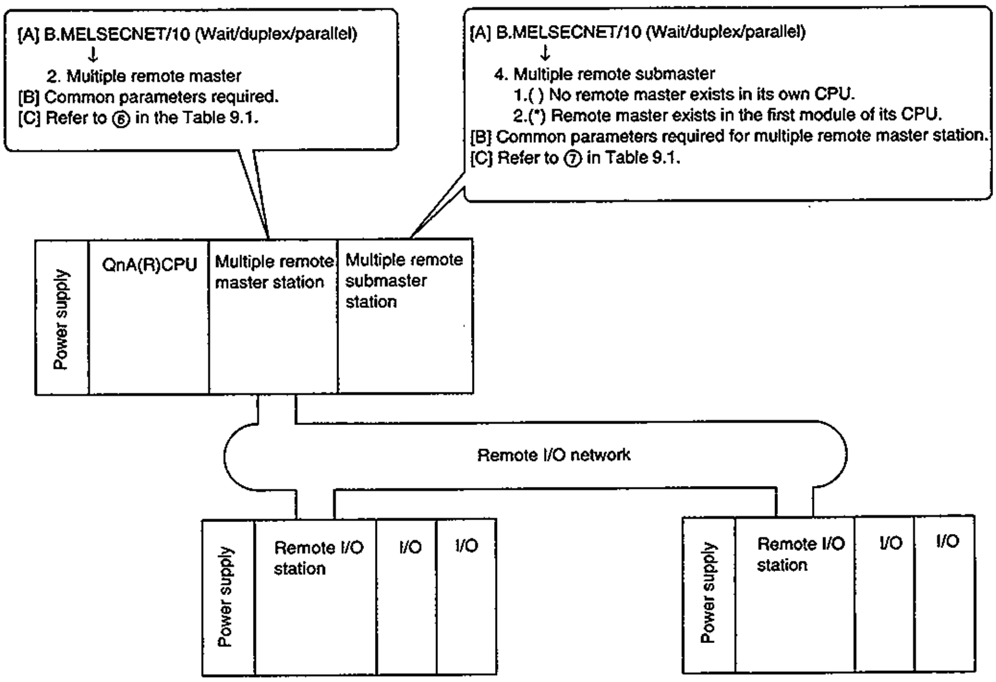


(b) Remote I/O network

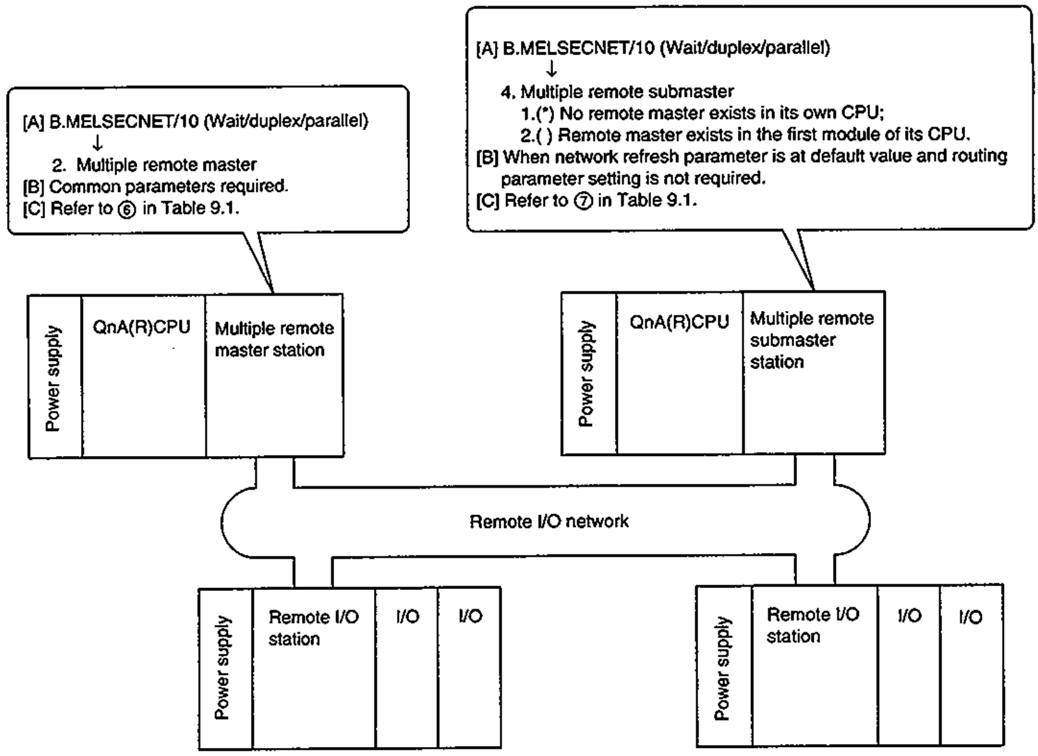
1) Double-layer system



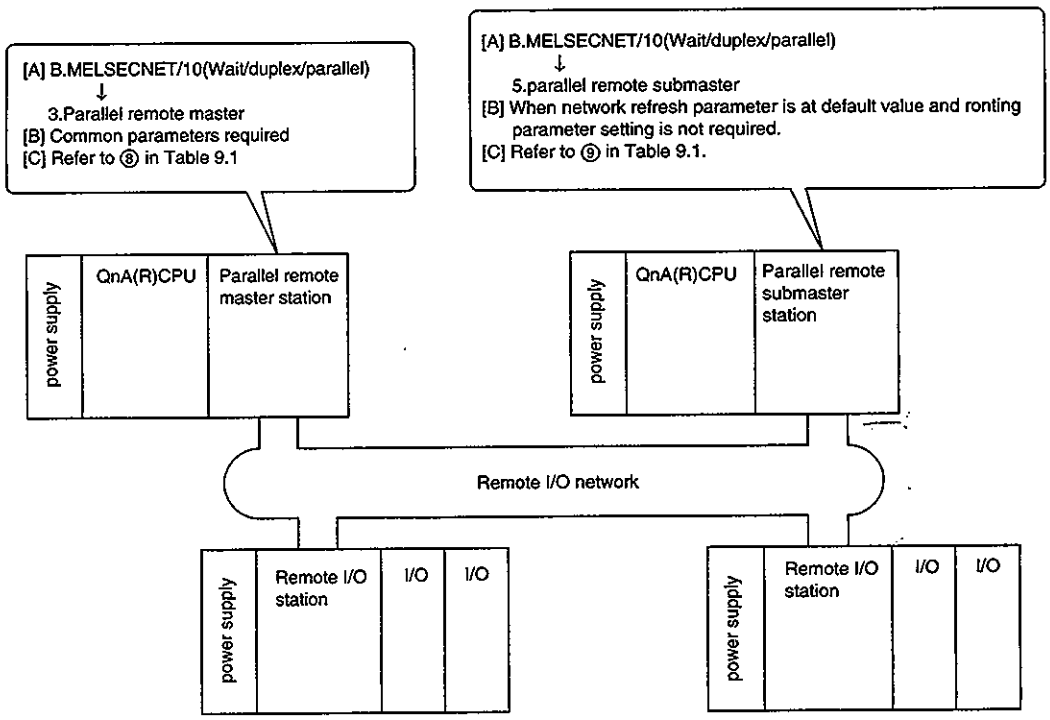
2) Multiple master system (Multiple remote master station and multiple remote submaster station exist on the same QnA(R)CPU)



3) Multiple master system (multiple remote master station and multiple remote submaster station exist on separate QnA(R)CPU's)



4) Parallel master system



9.1 Default Parameters (Transmission Range Setting for Each Station by DIP Switches on Network Module)

Transmission range for cyclic transmission for each station can be set, not by peripheral devices, but by "the condition setting switches" located on the front console of the network module of control station (settings by peripheral devices are not required).

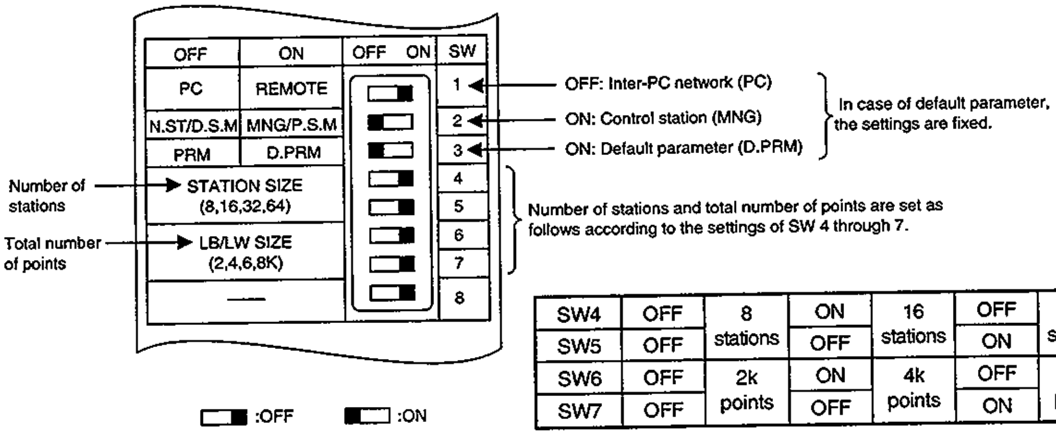
(1) Default parameters set total number of points and total number of stations. Number of points of B and W for each station are shown in the table below.

Number of points of B and W for each station

Total number of stations \ Total number of points	2k points (2048 points)	4k points (4096 points)	6k points (6144 points)	8k points (8192 points)
8 stations	256 points	512 points	768 points	Setting error
16 stations	128 points	256 points	384 points	512 points
32 stations	64 points	128 points	192 points	256 points
64 stations	32 points	64 points	96 points	128 points

Because the number of link points exceeds 2000 bytes.

(2) Network module setting for control station (AJ71QLP21(S), AJ71QBR11)
Set the condition setting switches as shown below:



SW4	OFF	8 stations	ON	16 stations	OFF	32 stations	ON	64 stations
SW5	OFF		OFF		ON		ON	
SW6	OFF	2k points	ON	4k points	OFF	6k points	ON	8k points
SW7	OFF		OFF		ON		ON	

(3) Pay attention to the following items when communicating at default parameters in contrast to setting common parameters by peripheral devices:

(a) B/W addresses are allocated from "0" in the order of station number.
(b) X/Y communication is not possible.
(c) Stations which do not actually exist become communication stations.
(Ex.: If number of total station is 8 while only 6 stations actually exist, station with numbers 7 to 8 become communication faulty stations.)
(d) Auxiliary settings are made with default values:

Auxiliary setting items	Setting value
Watchdog time	2000 ms
Constant link scan	No
Multiplex transmission	No
Maximum number of network-return stations for single scan	2 stations
Maximum number of transient times for single scan	2 times
Maximum number of transient times for single station	2 times
Data link by subcontrol station when control station is down	Yes

(e) Settings for network refresh parameters are shown in Section 9.4 (4). Change the settings as required.

9.2 Number of Module Setting

Sets numbers of network module and data link module, and module type installed on QnA(R)CPU.

(1) Setting items

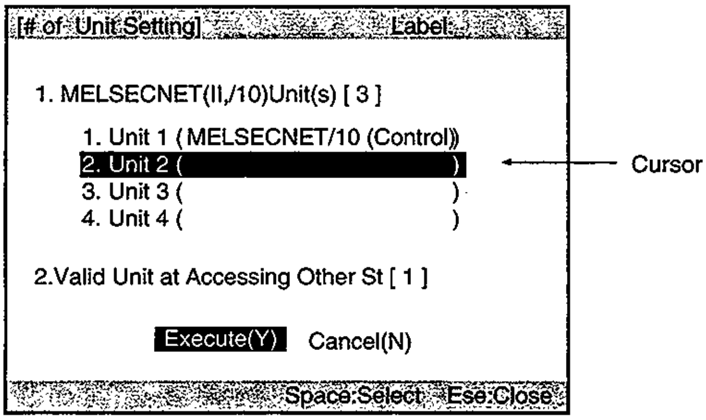
(a) Number of MELSECNET(II, /10) modules

Sets numbers of network modules and data-link modules installed on QnA(R)CPU.
Model names of network modules and data-link modules are shown below:
MELSECNET/10 Network modules AJ71QLP21, AJ71QLP21S, AJ71QBR11
MELSECNET(II) Data-link modules.....AJ71P22, AJ71R22, AJ71AP22, AJ71AR22, AJ71AP21, AJ71AR21
MELSECNET/B Data-link modules......AJ71AT21B

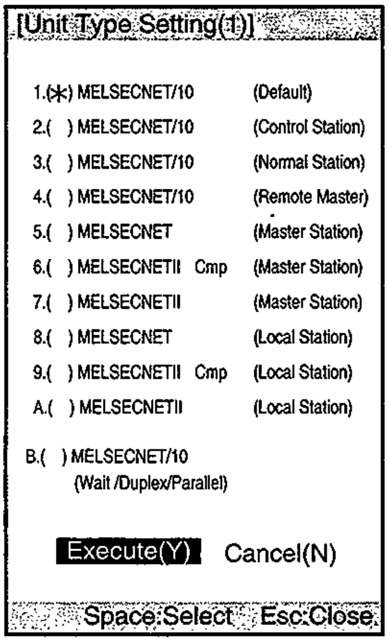
(b) Module type

Sets which mode to operate each module installed.
For module model names set at each station in each system, refer to Section (2) in Chapter 7.
Procedure to select a module type is shown below:

1) After module number is set, move the cursor to the number to set and press the [↵] key. The module type setting menu is displayed.

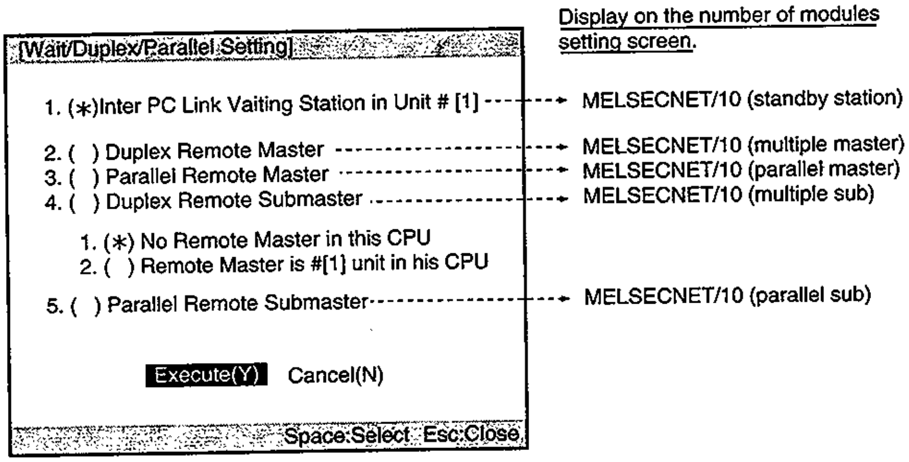


2) Put asterisk (*) in ( ) for the module type to be selected, then press the [↵] key to go back to the module number setting menu. The setting is completed when the module type is displayed.



There are two ways to affix an asterisk"*".
1) Press the corresponding key among [1] to [B].
2) Move the cursor and press the [Space] key.

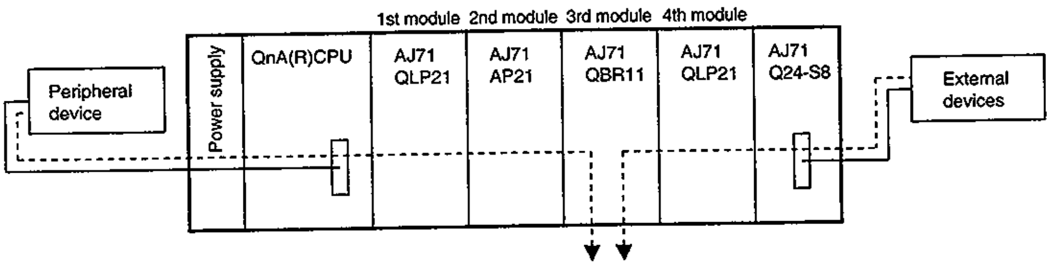
3) However, when "B" is selected, the screen changes to the following.
Place an asterisk (*) in ( ) for the similar manner, then press the [↵] key to go back to the module number setting menu. The setting procedure is completed when the module type is displayed.



(c) Effective module when accessing other stations
Sets which module's network as target when accessing other stations from peripheral device (such as SW4GP-GPPA, SW0SRXV-GPPA, etc.) or special function modules (such as AJ71C24-S8, AJ71UC24, AD51H-S3, etc.) which are not compatible with QnA(R)CPU.
However, in case of using peripheral devices (SW1SRXV-GPPA, SW2SRXV-GPPA, SW0NX-GPPQ) or special function modules (AJ71QC24, AJ71QC24-R2, AJ71QC24-R4) which can specify network numbers, leave the value with default "1" for usage.

[Example]

In case of setting number of effective modules when accessing other stations to "3":

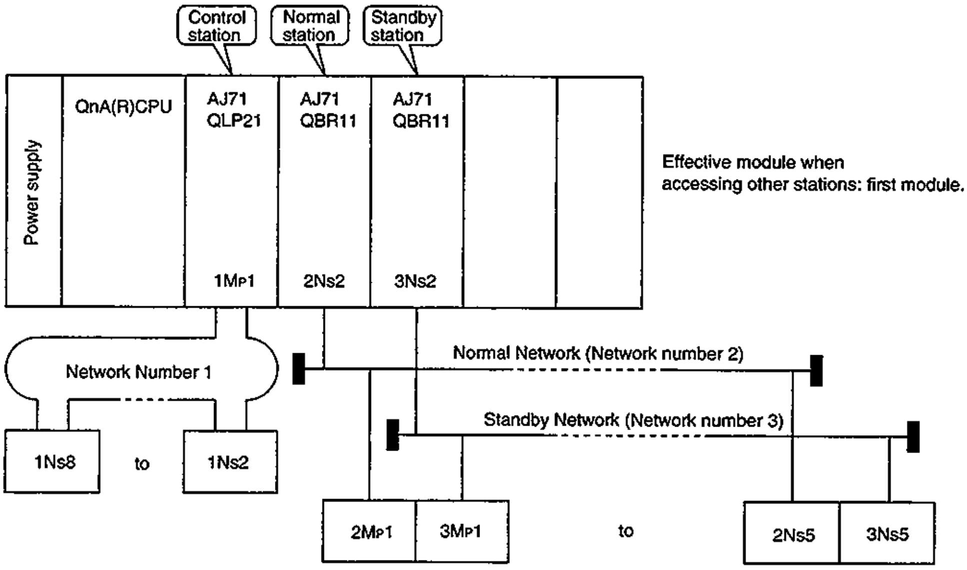


Access request origin		Access to other stations possible	Access method to other stations
Peripheral devices	SW4GP-GPPA	○	The network specified by the effective module when accessing other stations is accessible.
	SW0GP-GPPAU	○	Regardless to the setting of the effective module when accessing other stations, station set by PC number becomes accessible.
	SW1GP-GPPAU	○	
	SW0□-GPPA	○	The network specified by the effective module when accessing other stations is accessible.
	SW1□-GPPA	○	Regardless to the setting of the effective module when accessing other stations, station set by PC number becomes accessible.
	SW2□-GPPA	○	
Special function module	AJ71C24 (S3/S6/S8)	○	The network specified by the effective module when accessing other stations is accessible.
	AJ71UC24	○	
	AD51 (S3)	○	
	AD51H	○	
	AD51H-S3 (AnUCPU not compatible)	○	
	AD51H-S3 (AnUCPU compatible)	×	Only the host is accessible.
	AD57G (S3)	○	The network specified by the effective module when accessing other stations is accessible.
GOT	A64GOT	○	
	A77GOT (S3)	○	
	A77GOT-S5 (when connected to RS422)	○	
	A77GOT-S5 (when connected to bus)	○	

(2) Setting example

An example of module number setting is illustrated.

(a) System configuration example



(b) Setting screen

Setting display for the system with above configuration is shown below.

```
[# of Units Setting]                     Label:

  1. MELSECNET(II,/10)  Unit(s) [3]

     1. Unit  1(MELSECNET/10    (Control))
     2. Unit  2(MELSECNET/10    (Normal))
     3. Unit  3(MELSECNET/10      (Wait))
     4. Unit  4(                         )

  2. Valid Unit at Accessing Other St [1]

           Execute(Y)   Cancel(N)

                     Space:Select  Esc:Close
```

Detailed settings for standby station

```
[Wait/Duplex/Parallel Setting]

  1. (*)Inter PC Link   Waiting Station in Unit  #[2]

  2. (  )Duplex Remote Mastar
  3. (  )Parallel Remote Master
  4. (  )Duplex Remote Submaster
       1. (*)No Remote Master in this CPU
       2. (  )Remote Master is #[1] unit in this CPU

  5. (  )Parallel Remote Submaster

           Execute(Y)   Cancel(N)

                     Space:Select  Esc:Close
```

Indicates that it is the standby station for a normal station.

9.3 Network Setting

Sets head I/O number, network number, and total link number by module type set in the number of module setting.

(1) Setting items

(a) First I/O number

Sets head I/O number by module type set in the number of units setting (in case of X/Y 130 to 14F, set to 130).

Point
Be careful since setting is done in the three digit format, for it differs from the setting procedure for AnUCPU, which takes upper two digits of 3-digit expression.

(b) Network number

Set the network number of a network module according to the network number setting switch. However, be careful in case of setting for following module type:

1) Standby station
   Network number different from the normal station.
2) Duplex remote submaster station
   Network number same as the duplex remote master station.
3) Parallel remote submaster station
   Network number same as the parallel remote master station.

(c) Total number of linked (slave) stations

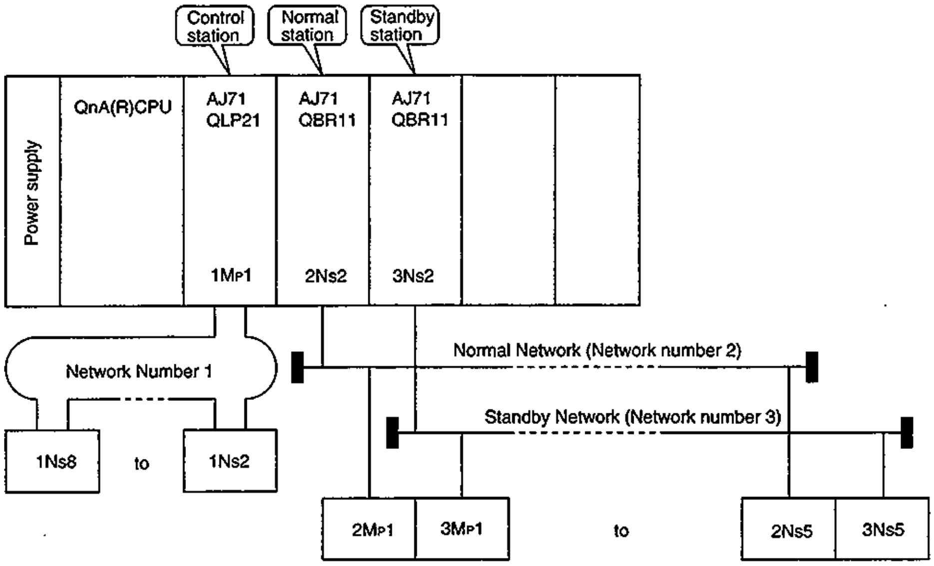
Sets number of stations that perform data link.

1) Control station
   Total number of control station and normal station
2) Remote master station
   Total number of remote I/O stations
3) Duplex remote master station
   Total number of duplex remote submaster station and remote I/O station
4) Parallel remote master station
   Total number of parallel remote submaster station and remote I/O station

(2) Setting example

Setting example for network setting is shown below.

(a) System configuration example



(b) Setting screen

Setting screen for the above system configuration example is shown below.

1.Parameter setting condition can be confirmed.
2.Move the cursor to the item to be set up and prass the [Enter] key, then the display changes to setting menu.
The setting details for each item will be explained in Section 9.4 and later.

[Network setting] Label:

	Unit #1 NET/10 Control Station	Unit #2 NET/10 Normal Station	Unit #3 NET/10 Stand by Station	Unit #4
1st I/O#	[0]	[20]	[40]	---------
Network#	[1]	[2]	[3]	---------
# of Station(slave)	[8]	---------	---------	---------
Network Refresh Parm	⊡ None	⊡ None	*	---------
Common Parameter	■ None	*	*	---------
Specific Parameter	⊡ None	⊡ None	*	---------
I/O Allocation	---------	---------	---------	---------
TX Parm For DataLink	⊡ None			
Routing Parameter	⊡ None			

• :Must Be Set ⊡:If Necessary ■,■:Setting Done *:For Only Reference

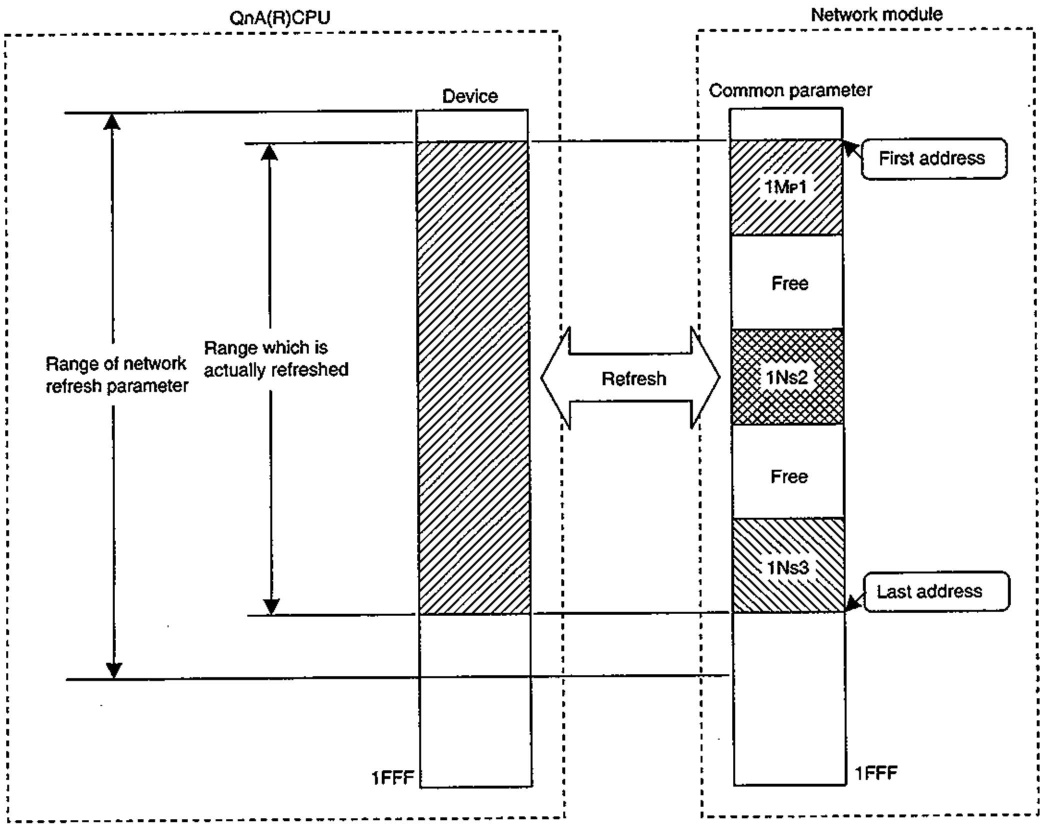
Space:Select Esc:Close

9.4 Network Refresh Parameter

Network refresh parameter is a parameter that refreshes link device to QnA(R)CPU so that the link device (B, W, X, Y) stored in the network module can be utilized in the sequence program.

(1) The refresh range concept

From the first address to the last address for all stations (1MP1 to 1Ns3) range set by the common parameter within the range specified by the Network refresh parameter, are refreshed. Unused range shall be refreshed also.



(2) **Setting items**

Up to three refresh ranges for B/W and two refresh ranges for X/Y can be set up per network module. The extension transfer can transfer to a different device (other than B, W, X, Y). However, extension transfer cannot be set for MELSECNET (II, /B).

B, X, Y can be set with 16 point units and W with 1 point units.

Combination of link devices for the network module and link devices for QnA(R)CPU are shown below.

	Setting items	Link device on the network module side	Link device on the QnA(R)CPU side											
			B	W	X	Y	M	L	T*1	ST*1	C*1	D	R	ZR
	B transfer	B	O	×	×	×	×	×	×	×	×	×	×	×
	W transfer	W	×	O	×	×	×	×	×	×	×	×	×	×
	X transfer	X	×	×	O	×	×	×	×	×	×	×	×	×
	Y transfer	Y	×	×	×	O	×	×	×	×	×	×	×	×
*2	B extension transfer 1	B	O	O	O	O	O	O	O	O	O	O	O	O
*2	W extension transfer 1	W	O	O	×	O	O	O	O	O	O	O	O	O
*2	X extension transfer 1	X	O	O	O	O	O	O	O	O	O	O	O	O
*2	Y extension transfer 1	Y	O	O	O	O	O	O	O	O	O	O	O	O
*2	B extension transfer 2	B	O	O	O	O	O	O	O	O	O	O	O	O
*2	W extension transfer 2	W	O	O	×	O	O	O	O	O	O	O	O	O

O: Transfer possible

×: Transfer not possible

*1: Applied to the current value (word)

*2: Extension transfer is not possible with the following module type:

- Remote master station
- Duplex remote master station
- Duplex remote submaster station
- Parallel remote master station
- Parallel remote submaster station
- MELSECNET(II, /B)

Point

When communicating via X/Y, it is necessary to set network refresh parameter on duplex remote submaster station and parallel remote submaster station. (They are not set by default.)

If they are not specified, data link does not behave normally.

Remark

Since special link relay (SB) and special link register (SW) exist in QnA(R)CPU, the refresh range settings for these two are not necessary.

Settings are made here.

[Device Setting] Label:

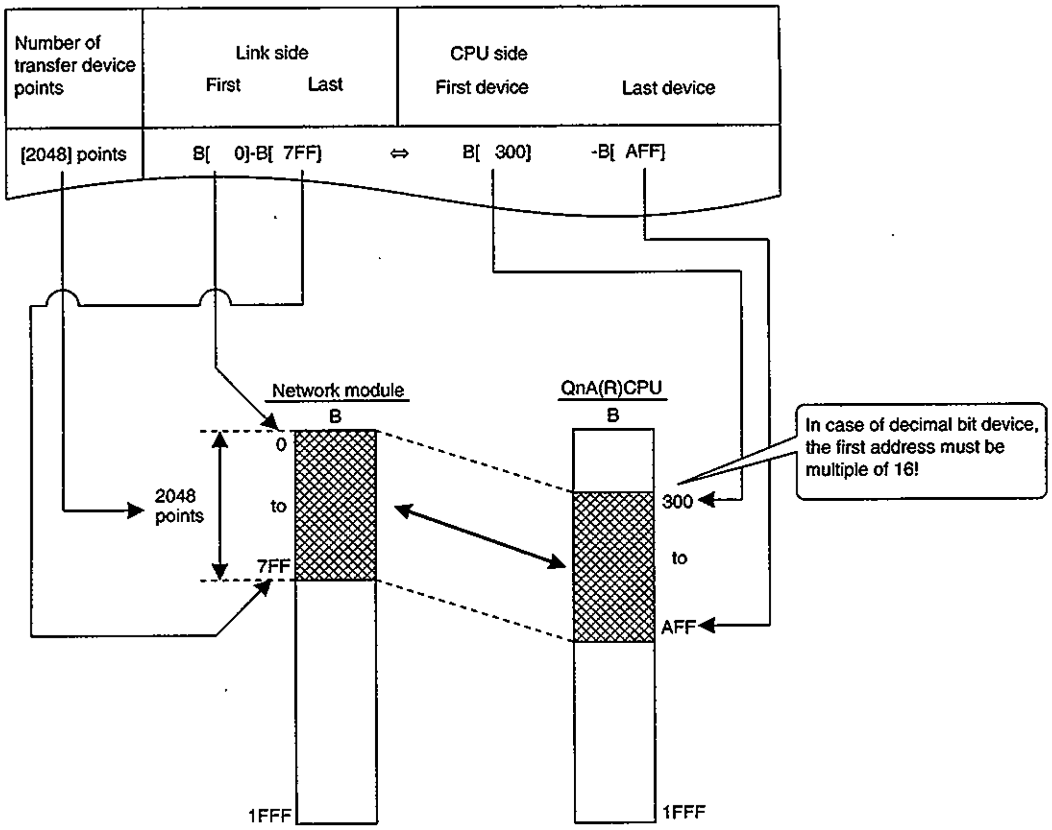
Device	Sym	Rad	Devices	Enable C/L Key	Disable C/L Key
Input Relay	X	16	8K		
Output Relay	Y	16	8K		
Internal Relay	M	10	[8K]		
Latch Relay	L	10	[8K]		
Link Relay	B	16	[8K]		[ ]-[ ]
Annunciator	F	10	[2K]	[ ]-[ ]	[ ]-[ ]
Link Sp Relay	SB	16	2K	[ ]-[ ]	[ ]-[ ]
Edge Relay	U	10	[2K]		
Step Relay	S	10	8K	[ ]-[ ]	[ ]-[ ]
Timer	T	10	[2K]		
Acumlt Timer	ST	10	[0K]	[ ]-[ ]	[ ]-[ ]
Counter	C	10	[1K]	[ ]-[ ]	[ ]-[ ]
Date Register	D	10	[12K]	[ ]-[ ]	[ ]-[ ]
Link Register	W	16	[8K]	[ ]-[ ]	[ ]-[ ]
Link Sp Reg	SW	16	2K	[ ]-[ ]	[ ]-[ ]

Devices Total (28.8)K Word

Esc:Close

(3) Setting procedure

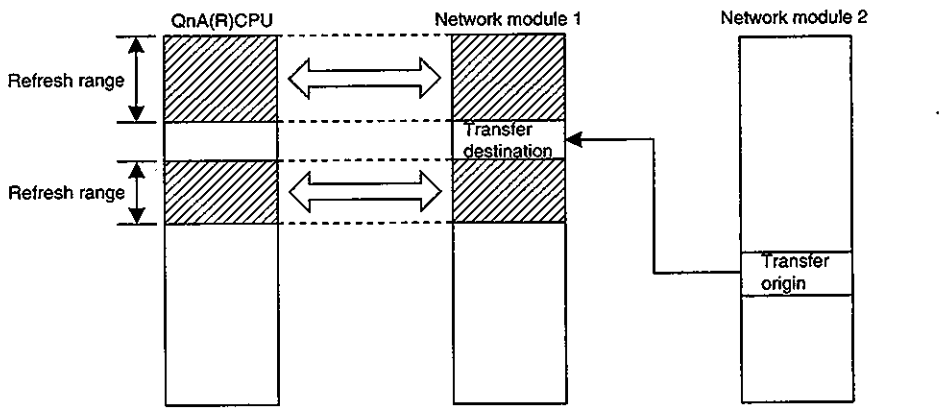
Sets the first and last of the network module and QnA(R)CPU.



Points

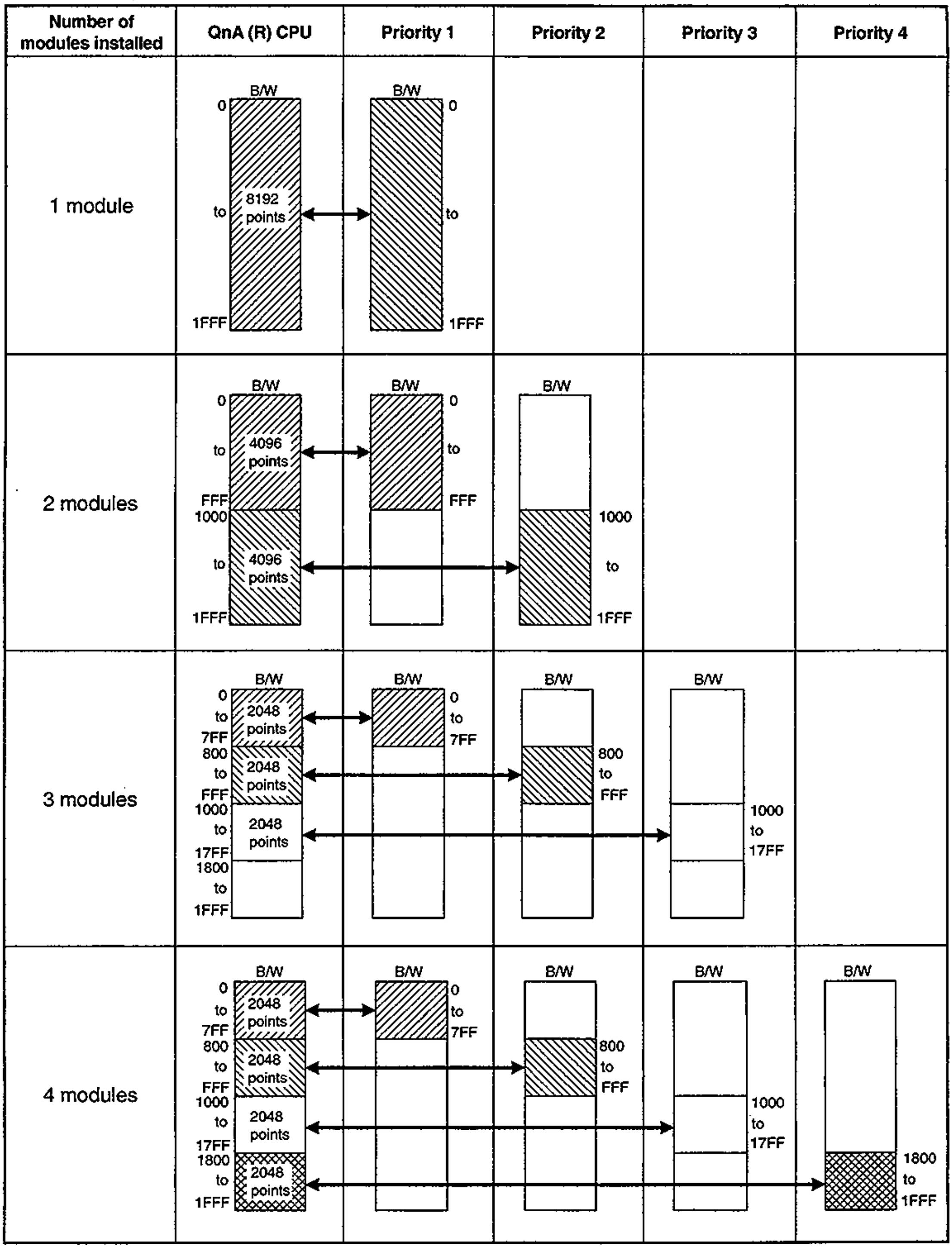
(1) In setting device range for QnA(R)CPU side, be careful not to duplicate the refresh range with ranges for other use .
Other use range includes the following:
- Real I/O (Range in which modules are actually installed)
- MELSECNET/MINI-S3 auto refresh.

(2) When inter-data link transfer parameter is set, do not include the destination device range in the refresh range.
Data cannot be transmitted to other stations correctly.



(4) Default settings for network refresh parameter

Even if the parameter values are not specified (display for network settings is △), they are set to the contents shown below as default values. Unless it is necessary to change the value, setting is not required.



Priority order 1st : MELSECNET (II)
2nd : the first MELSECNET/10 module
3rd : the second MELSECNET/10 module
4th : the third MELSECNET/10 module
5th : the fourth MELSECNET/10 module

The order of first I/O number of network module corresponds to the first to 4th module.

Point

Values for X/Y are not set at all. It is necessary to set up when communicating with X/Y.

Points

When MELSECNET (II,/B) data link module is installed, default values are assigned as follows:

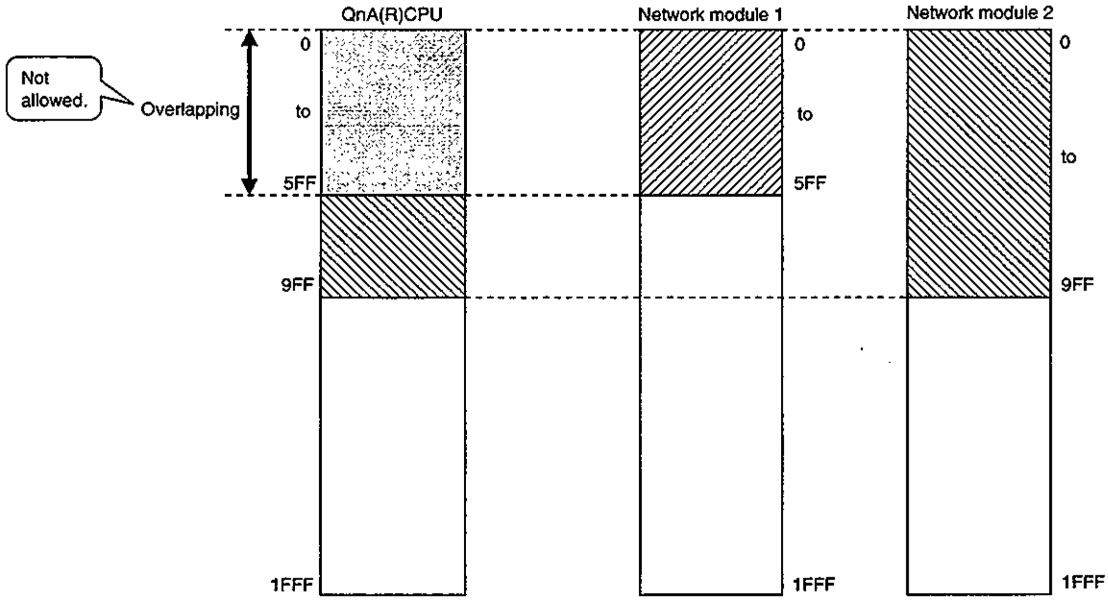
(1) Regardless of installation position of the module, it is set to "Priority 1."

(2) I/O is set as well.X/Y0 to 7FF of the data link module are set to be refreshed in X/Y0 to 7FF of QnA(R)CPU.

(3) Even when two data-link modules (master station and local station are installed), they are treated as one module.

(5) Settings for when multiple network modules are installed

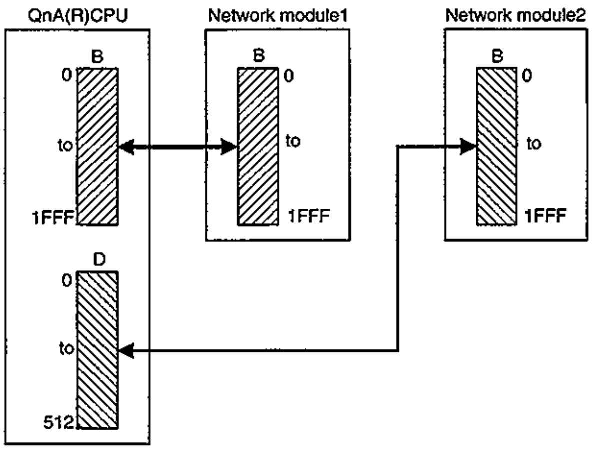
(a) Overlapping device range on the QnA(R)CPU side cannot be set.



(b) In case of using the same device (B, W, X, Y) at multiple modules for the total of more than 8192 points, they can be allocated to devices other than link devices.

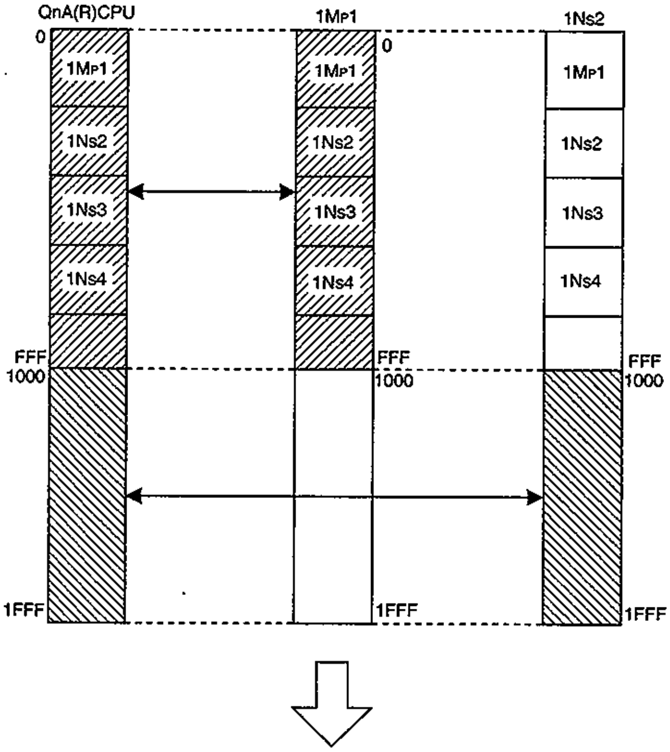
[Example]

In this example, B0 to 1FFF of network module 1 is refreshed to B0 to 1FFF of QnA(R)CPU, and B0 to 1FFF of network module 2 is refreshed to D0 to 512 of QnA(R)CPU.

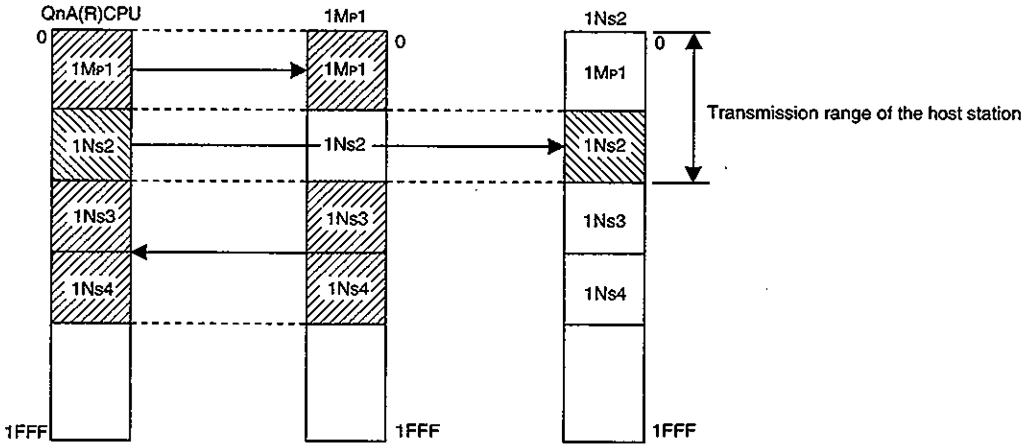


(c) In case of increasing the number of link points for a station by installing multiple network modules having the same network No., it becomes necessary to change refresh parameter setting.

1) In default, refresh range is divided into equal areas by module. (In this case, only the 1Mp1 range can be sent).



2) Therefore, as shown below, it is necessary to modify the setting so that transmission range of the host station (1Mp1, 1Ns2) can be refreshed.



(6) Auxiliary setting

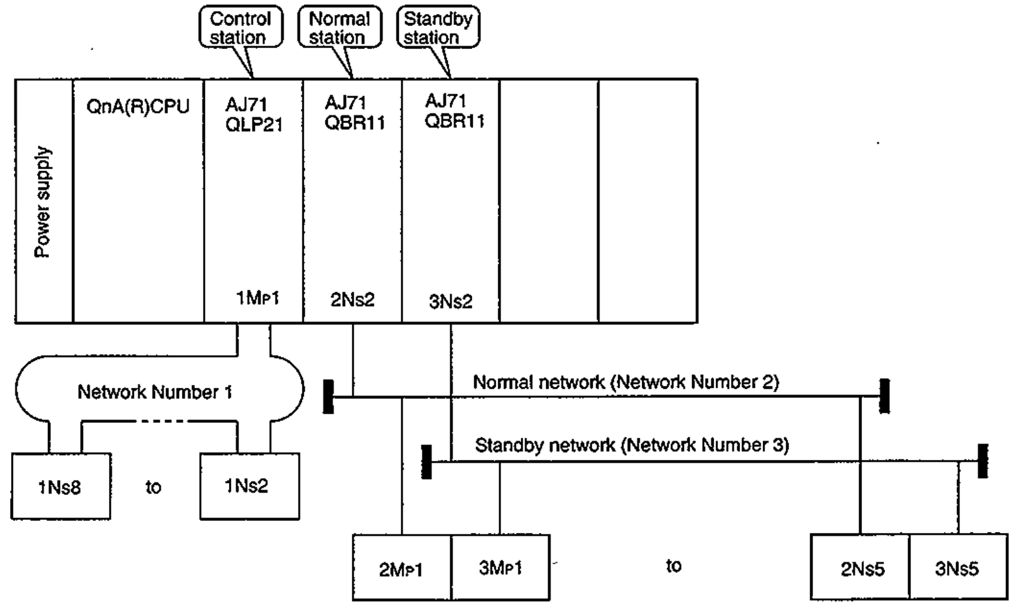
Sets the condition of transient transmission error history (SW00F0 to FF).

- Overwriting
  The newest information is stored. (When 17 or more errors occur, data is erased starting from the oldest error content.)
- Hold
  The oldest information is stored (when 16 errors are stored, the 17th and later error information it will not be stored).

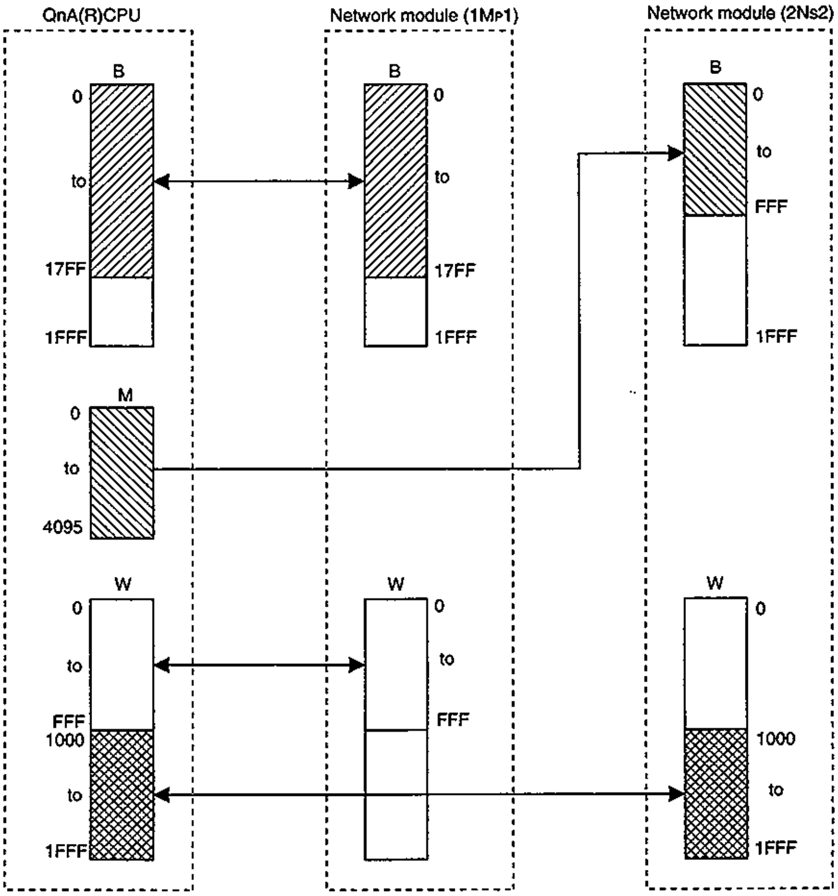
(7) Setting example

A setting example for network refresh parameter is shown below.

(a) System configuration example



(b) Parmeter allocation



(c) Setting screen

This shows the setting screen for the parameter allocation.

[Network Refresh Parameter] Label:

1

NET/10 Control 1st I/O # 0 Network # 1	# of TX Devices	Link Side First Last	CPU Side First Device Last Device
B TX W TX X TX Y TX	[6144] [4096] [0] [0]	B[0]-B[17FF] W[0]-W[FFF] X[ ]-X[ ] Y[ ]-Y[ ]	< > B[0]-B[17FF] < > W[0]-W[FFF] < > X[ ]-X[ ] < > Y[ ]-Y[ ]
B Extension TX1 W Extension TX1 X Extension TX1 Y Extension TX1	[0] [0] [0] [0]	B[ ]-B[ ] W[ ]-W[ ] X[ ]-X[ ] Y[ ]-Y[ ]	< > [ ]- < > [ ]- < > [ ]- < > [ ]-
B Extension TX2 W Extension TX2	[0] [0]	B[ ]-B[ ] W[ ]-W[ ]	< > [ ]- < > [ ]-

Esc:Close

[Network Refresh Parameter] Label:

2

NET/10 Norrmal 1st I/O # 20 Network # 2	# of TX Devices	Link Side First Last	CPU Side First Device Last Device
B TX W TX X TX Y TX	[0] [4096] [0] [0]	B[ ]-B[ ] W[1000]-W[1FFF] X[ ]-X[ ] Y[ ]-Y[ ]	< > B[ ]-B[ ] < > W[1000]-W[1FFF] < > X[ ]-X[ ] < > Y[ ]-Y[ ]
B Extension TX1 W Extension TX1 X Extension TX1 Y Extension TX1	[4096] [0] [0] [0]	B[0]-B[FFF] W[ ]-W[ ] X[ ]-X[ ] Y[ ]-Y[ ]	< >[MO]-M4095 < >[ ]- < >[ ]- < >[ ]-
B Extension TX2 W Extension TX2	[0] [0]	B[ ]-B[ ] W[ ]-W[ ]	< >[ ]- < >[ ]-

Esc:Close

9.5 Common Parameter

Sets cyclic transmission (B/W/X/Y) ranges which each station can send for inter-PC network and remote I/O network, etc. In addition, settings related to transient transmission and abnormal communication conditions are made.

9.5.1 Inter-PC Network

For inter-PC network, there are "double layer system", "simplified duplex system", and "system with which the number of link points are increased by installation of multiple network modules having the same network number", but setting procedure for them is all the same.

(1) Setting items

(a) Transmission range of each station (B/W)

1) B allocates the range which each station can send in 16 point units (□□□0 to □□□F).
2) W allocates the range which each station can transmit in one point units.
3) It is not necessary to set the transmission range in the order of station number.

[Setting screen]

Setting screen example where each station is sending by 512 points is shown.

[Cmm Parm (MELSECNET/10 Control)(BW Set)] Label:

Auxiliary Setting
Link WDT 2000 ms

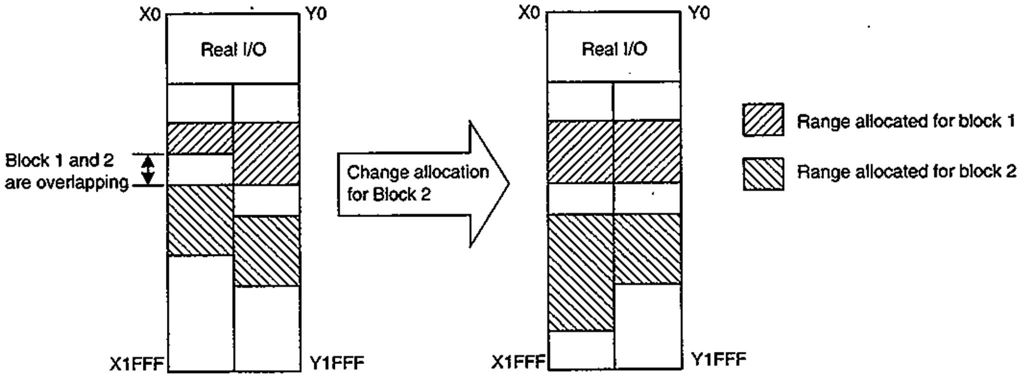
Network(# 1)
NET/10 Control 1st I/O # 30
Network # 1 # of Sta 4

Station	TX Range of Sta B First Last	TX Range of Sta W First Last
1	[0] - [FF]	[0] - [FF]
2	[200] - [3FF]	[200] - [3FF]
3	[400] - [5FF]	[400] - [5FF]
4	[600] - [7FF]	[600] - [7FF]
	[ ] - [ ]	[ ] - [ ]
	[ ] - [ ]	[ ] - [ ]
	[ ] - [ ]	[ ] - [ ]
	[ ] - [ ]	[ ] - [ ]

PgUp:Prev PgDn:Next F3:BW→XY1→XY2→ Esc:Close

(b) Transmission range of each station (X/Y)

1) It is necessary to set I/O master station.
2) Allocate the following with 1 to 1: I/O master station (Y) → Other station (X), I/O master station (X) ← Other station (Y).
3) X/Y communication can be set to block 1 or block 2.
4) For device ranges allocated to each station, avoid block 1 and block 2 overlapping each other. In addition, avoid overlapping with the range for real I/O (the range in which module are actually installed).



[Setting screen]

Setting desplay shown below. With station No.2 block 1 I/O masterstation, in case of communication with station No.1 or 4.

[Cmm Parm (MELSECNET/10 Control)(XY Set 1)] Label:

Auxiliary Setting
Link WDT 2000 ms

Network(# 1)
NET/10 Control 1st I/O # 30
Network # 1 # of Sta 4

Station	TX Range of Each Station(M →L) Y First Last	X First Last	RX Range of Each Station(M ←L) X First Last	Y First Last
1	[200]-[2FF]	[200]- 2FF	[200]-[2FF]	[200]- 2FF
Master 1	-------------	-------------	-------------	-------------
3	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-
4	[400]-[4FF]	[500]- 5FF	[400]-[4FF]	[500]- 5FF
	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-
	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-
	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-
	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-

PgUp:Prev PgDn:Next F3:BW→XY1→XY2→ Esc:Close

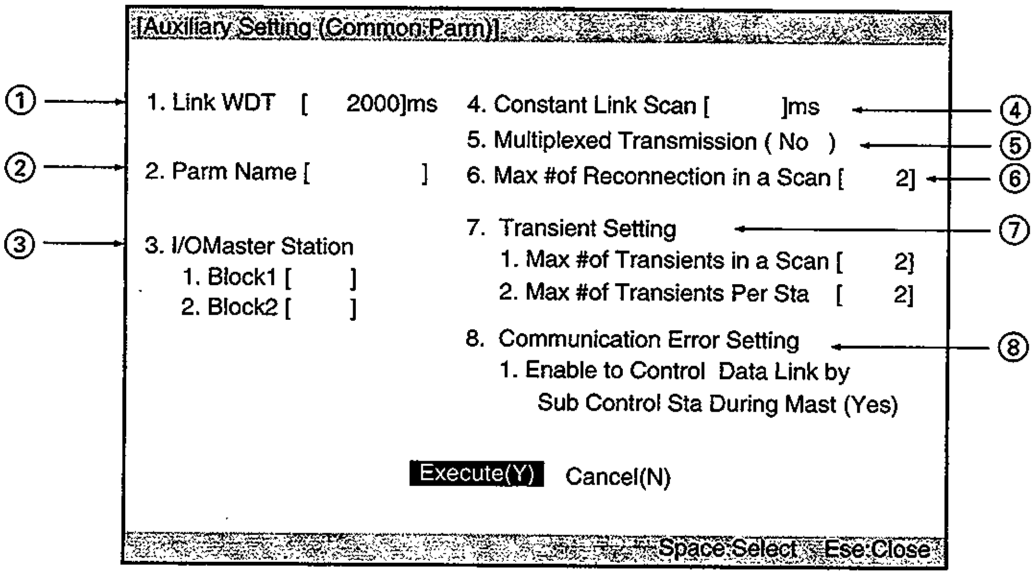
Devices on I/O master station side.

Devices on the side to be controlled by the I/O master station.

(c) Auxiliary settings

These items are set as required. It is not necessary to set them.

1) Auxiliary setting



① Link WDT

Sets the period of time to check whether normal cyclic transmission is performed between a control station (subcontrol station) and normal stations.
Default value (2000ms) should be used for ordinary condition.
Set to a period of time longer than the link scan time by 10ms units within a range of 10 to 2000ms. If set to a period of time shorter than the link scan time, the watchdog time will be exceeded and data link becomes impossible.

② Parm Name

Set to make it easier to understand what it was allocated for when confirming parameters later.

③ I/O Master Station

Set the station number which becomes the mother station (control station) while X/Y communication. Any QnACPU and AnUCPU station can be assigned to I/O master station regardless of control or normal station.

④ Constant Link Scan

Set when desired to maintain link scan time constant.
It is not set by default.

Setting value	Constant link scan
0 ms or vacant	Not executed
1 to 500 ms	Executed at 1 to 500ms

⑤ Multiplex Transmission

Set whether to execute multiplex transmission function.
It is set to "No execution at" default.

⑥ Maximum # of Reconnection in a Scan

Set the number of faulty stations that can be back online in one link scan.
It is set in a range of 1 to 16 stations.
The default is "two stations".

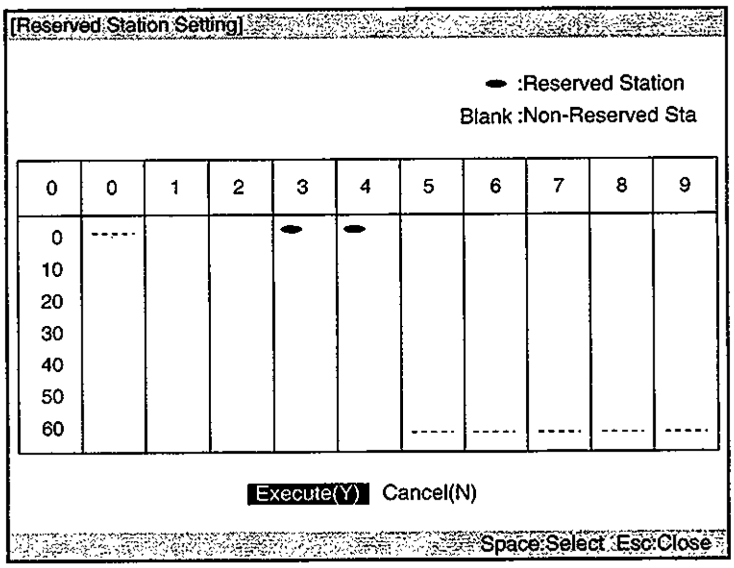
⑦ Transient Setting

- Maximum # of Transient in a Scan
  Sets the number of times transient transmissions can be executed within one link scan (total of the whole network).
  It is set in a range of 1 to 16 times.
  The default is "twice".
- Maximum # of Transient Per Station
  Sets the number of times a station can execute transient transmissions within one link scan.
  It is set in a range of 1 to 16 times.
  The default is "twice".

⑧ Communication Error Setting

- Data link by subcontrol station while the control station is down
  Sets whether to execute control transfer function or not.
  The default is "Yes (Execute)".

2) Reserve station setting
Sets reserved stations.
It can be set so that stations that will be connected in the future (stations which are included in the number of stations but not actually connected) are not treated as communication faulty stations.



Remarks

There are functions to set common parameters for peripheral devices easily.

1) Easy allocation
   B and W can be allocated to all stations for the same number of points.
   Number of points allocated to a station against total number of link stations is shown below.

Total number of link stations	Number of points allocated per station
2 to 16 stations	512 points
17 to 32 stations	256 points
33 to 64 stations	128 points

2) Allocation method
   Allocation method for transmission range for each station can be switched between "setting by the number of points" and " setting based on address".

3) Uniform allocation
   By entering the number of stations and number of points to be allocated, the number of points is automatically allocated among all stations equally.

(2) Setting example

(a) System configuration

Common parameter setting for the system configuration shown in Figure 9.1 will be explained.
It is assumed that each of the input module and the output module occupies 16 points.

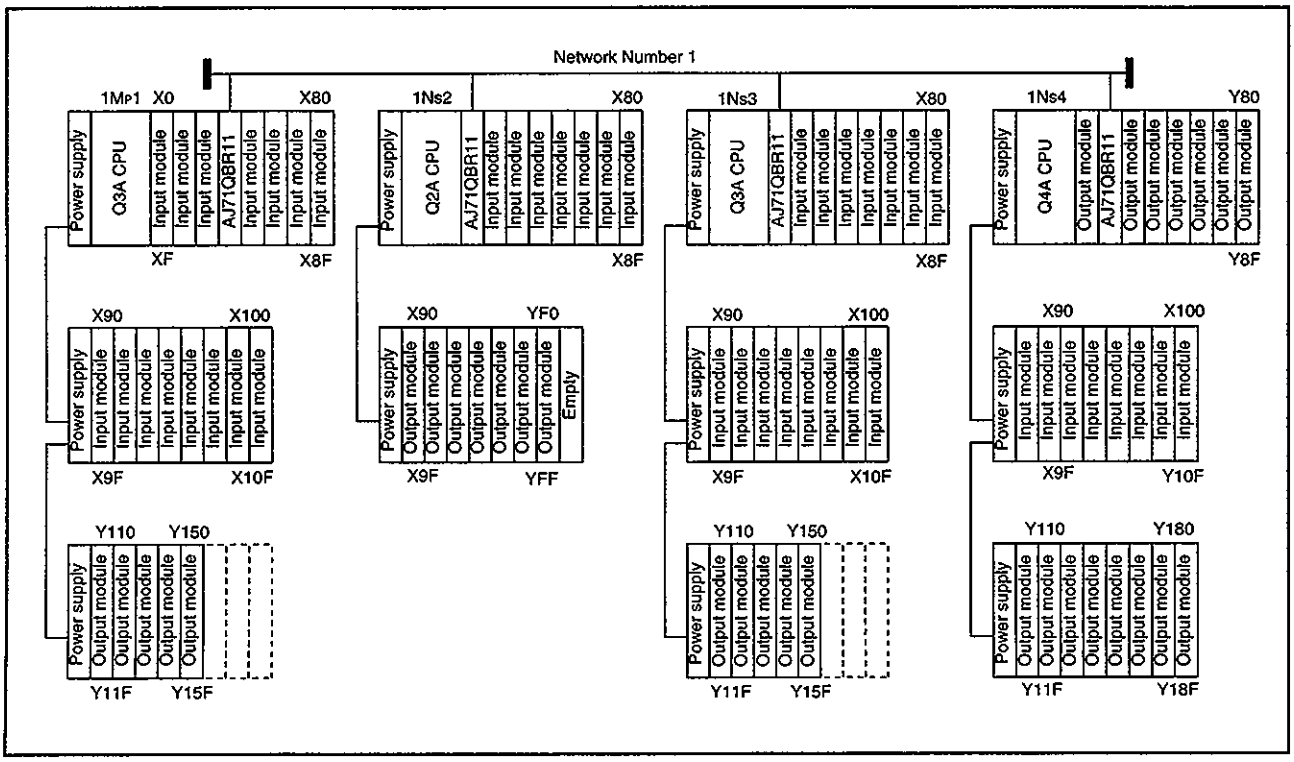


Figure 9.1 System configuration example

(b) B/W Allocation

In the example, "512 sending points" are allocated at a time, for each station.

Transmission range for each station is shown in Figure 9.2. Setting screen for the common parameters is shown in Figure 9.3.

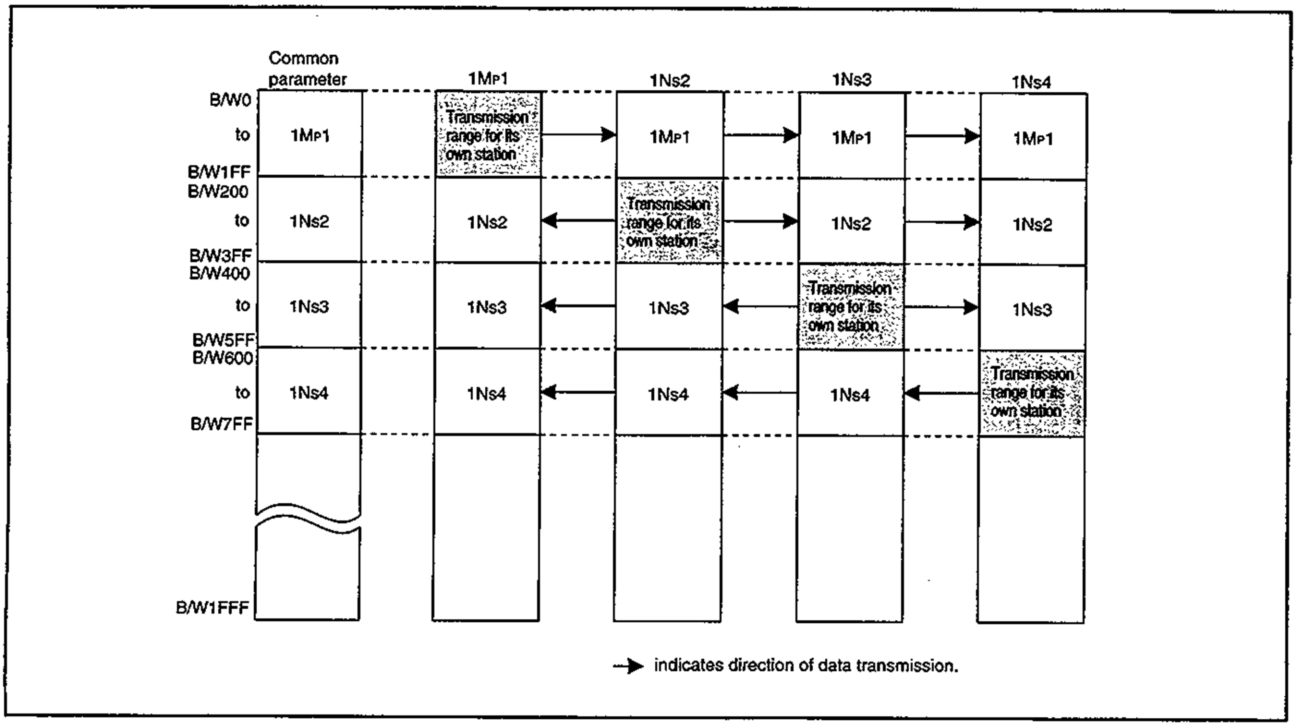


Figure 9.2 B/W allocation example

[Cmm Parm (MELSECNET/10 Control)(BW Set)] Label:

Auxiliary Setting
Link WDT 2000 ms

Network(# 1)
NET/10 Control 1st I/O # 30
Network # 1 # of Sta 4

Station No.	TX Range of Sta —B— First Last	TX Range of Sta —W— First Last
1	[0]-[FF]	[0]-[FF]
2	[200]-[3FF]	[200]-[3FF]
3	[400]-[5FF]	[400]-[5FF]
4	[600]-[7FF]	[600]-[7FF]
	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]

PgUp:Prev PgDn:Next F3:BW→XY1→XY2→ Esc:Close

Figure 9.3 Screen for setting B/W common parameters

(c) X/Y Allocation

"256 points" are to be allocated to each station between 1MP1 and 1Ns4, while 1Ns2 is the I/O master station.

Figure 9.4 shows an example of X/Y allocation. The actual I/O range in this figure indicates the device range used by the input/output module and the special function module installed in each station.

Allocate X/Y after the actual I/O range.

The screen for setting common parameters is shown in Figure 9.5.

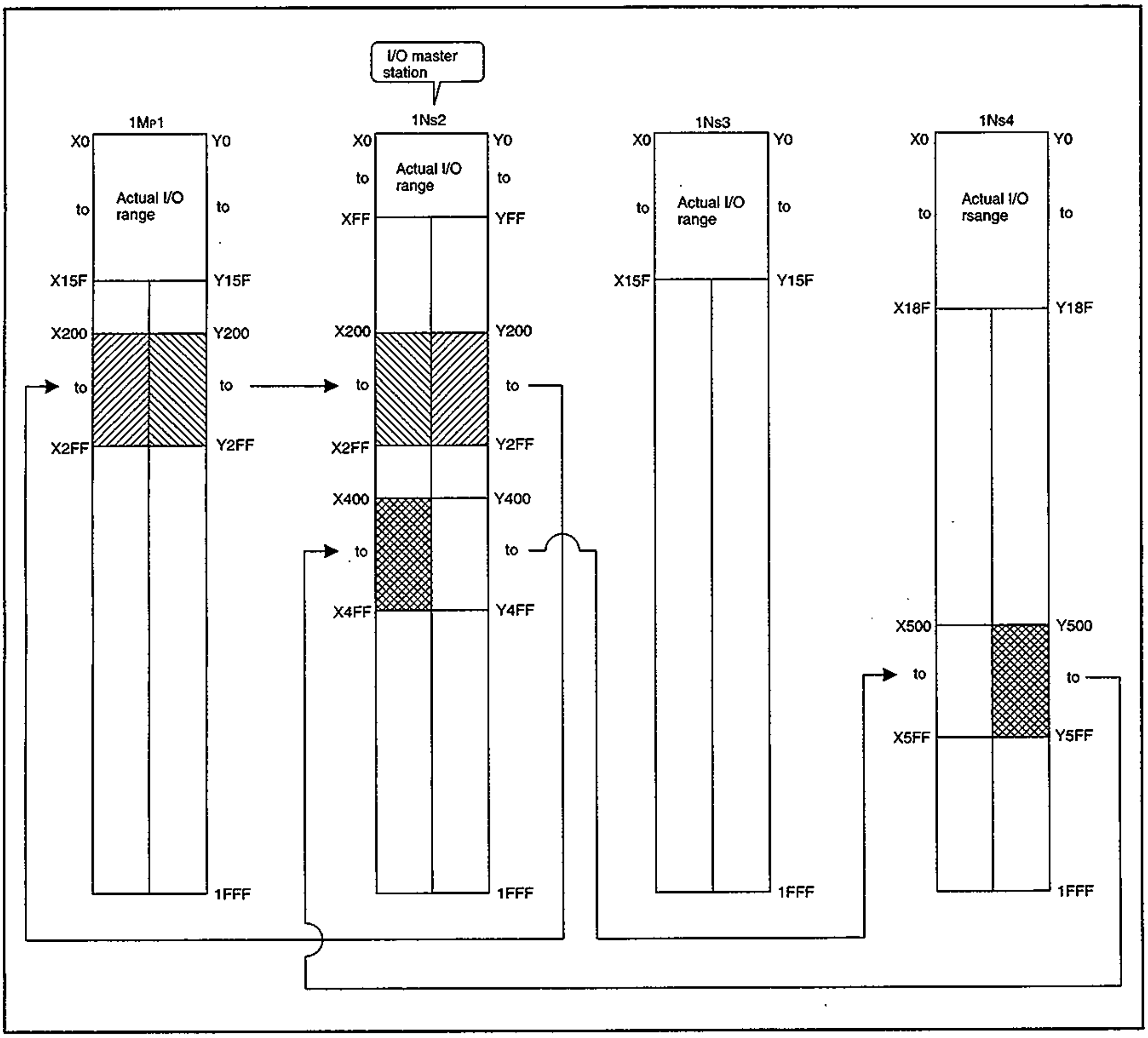


Figure 9.4 X/Y allocation range

[Cmm Parm (MELSECNET/10 Control)(XY Set 1)] Label:

Auxiliary Setting
Link WDT 2000 ms

Network(# 1)
NET/10 Control 1st I/O # 30
Network # 1 # of Sta 4

Station	TXRange of Each Station (M→L) Y First Last	X First Last	RXRange of Each Station (M←L) X First Last	Y First Last
① 1	[200] - [2FF]	[200] - 2FF	[200] - [2FF]	[200] - 2FF ③
Master 2	------------	------------	------------	------------
3	[ ] - [ ]	[ ] -	[ ] - [ ]	[ ] -
② 4	[400] - [4FF]	[500] - 5FF	[400] - [4FF]	[500] - 5FF ④
	[ ] - [ ]	[ ] -	[ ] - [ ]	[ ] -
	[ ] - [ ]	[ ] -	[ ] - [ ]	[ ] -
	[ ] - [ ]	[ ] -	[ ] - [ ]	[ ] -
	[ ] - [ ]	[ ] -	[ ] - [ ]	[ ] -

PgUp:Prev PgDn:Next F3:BW→XY1→XY2→ Esc:Close

① The data of Y200 to 2FF of 1Ns2 (I/O master station) is received by X200 to 2FF of 1MP1.
② The data of Y400 to 4FF of 1Ns2 (I/O Smaster station) is received by X500 to 5FF of 1Ns4.
③ The data of Y200 to 2FF of 1MP1 is received by X200 to 2FF of 1Ns2 (I/O master station).
④ The data of Y500 to 5FF of 1Ns4 is received by X400 to 4FF of 1Ns2(I/O master station).

Figure 9.5 Screen for setting X/Y common parameters

Points

(1) There is no default settings for X/Y ranges in the network refresh parameters. The X/Y refresh range must be set.

[Network Refresh Parameter] Label:

1

NET/10 Control 1st I/O # 30 Network # 1	# of TX Devices	Link Side First Last	CPU Side First Device Last Device
B TX	[8192]	B [0]-B [1FFF]< >	B [0] -B [1FFF]
W TX	[8192]	W[0]-W[1FFF]< >	W[0] -W[1FFF]
X TX	[8192]	X [0]-X [1FFF]< >	X [0] -X [1FFF]
Y TX	[8192]	Y [0]-Y [1FFF]< >	Y [0] -Y [1FFF]
B Extension TX1	[0]	B [ ]-B [ ]< >	[ ]-
W Extension TX1	[0]	W[ ]-W[ ]< >	[ ]-
X Extension TX1	[0]	X [ ]-X [ ]< >	[ ]-
Y Extension TX1	[0]	Y [ ]-Y [ ]< >	[ ]-
B Extension TX2	[0]	B [ ]-B [ ]< >	[ ]-
W Extension TX2	[0]	W[ ]-W[ ]< >	[ ]-

Esc:Close

(2) If the same addresses as in the actual I/O range are allocated, set the network refresh parameters so that refresh is conducted after the actual I/O range.

9.5.2 Remote I/O Network

With remote I/O network, a system can be configured to "Double-layer system", "Multiple master system", or "parallel master system".

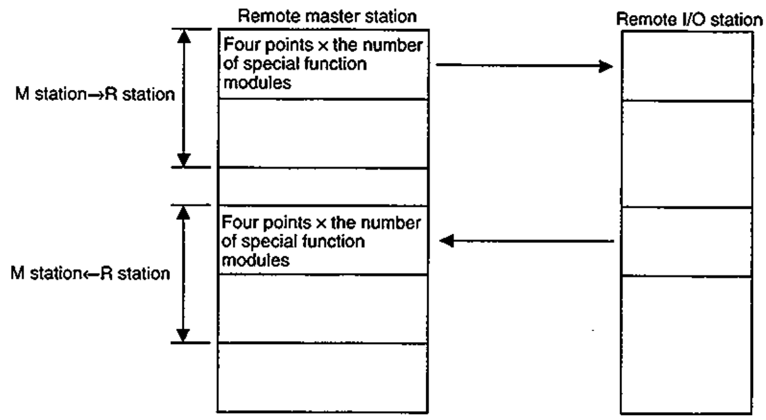
1) Set up procedures of common parameters for each system are fundamentally the same. An explanation for the set up procedure is provided below using procedure for a remote master station as the basis.

2) Set up station for common parameters differs depending on the system.

System	Parameter set-up location
• Double layer system	Remote master station
• Multiple master system	Multiple remote master station
• Parallel master system	Parallel remote master station

(1) Setting items for remote master station

In case of using ZNFR/ZNTO instructions, "four points X the number of special function modules" of M station → R station (B), M station ← R station (B), M station → R station (W), and M station ← R station (W) become necessary for the purpose of handshaking.



[Cmm Parm (MELSECNET/10 Remote)(BW Set)] Label

Auxiliary Setting
Link WDT 2000 ms

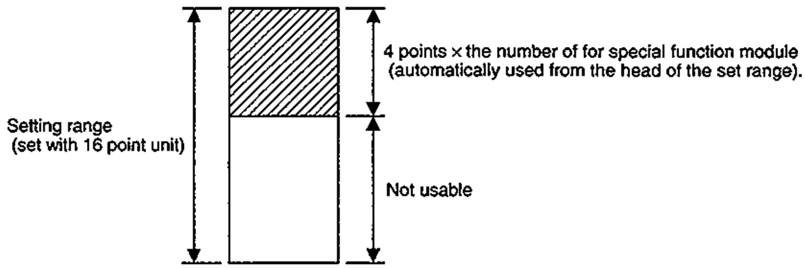
Network(# 1)
NET/10 Remote 1st I/O # 30
Network # 1 Slave PC Sta 4

Station	M Sta → R Sta B First	M Sta → R Sta B Last	M Sta ← R Sta B First	M Sta ← R Sta B Last	M Sta → R Sta W First	M Sta → R Sta W Last	M Sta ← R Sta W First	M Sta ← R Sta W Last
1	0	F	100	10F	0	1F	100	11F
2								
3	10	1F	110	11F	20	3F	120	13F
4	20	2F	120	12F	40	5F	140	15F
	(a)		(b)		(c)		(d)	

PgUp:Prev PgDn:Next F3:BW↔XY Esc:Close

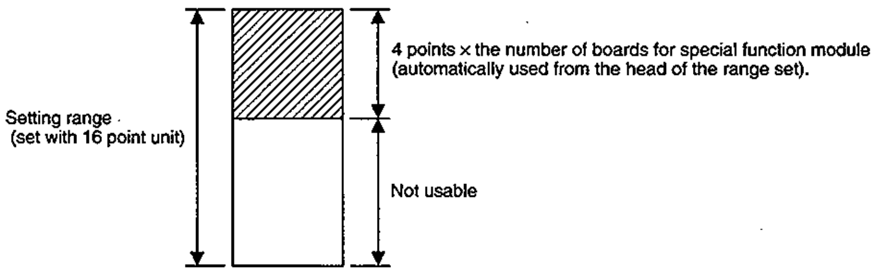
(a) M station → R station (B)

It is set for handshaking for ZNFR/ZNTO instructions.



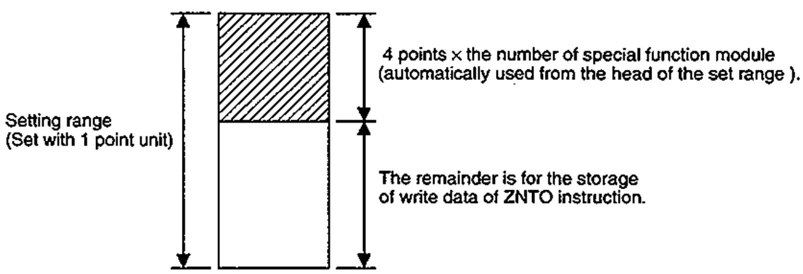
(b) M station ← R station (B)

It is set for handshaking for ZNFR/ZNTO instructions.



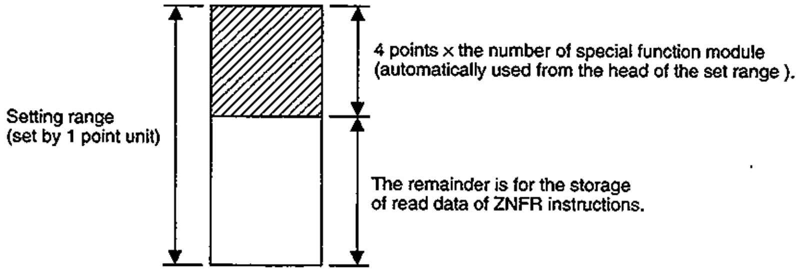
(c) M station → R station (W)

It is set for handshaking for ZNFR/ZNTO instruction and for the storage of write data of ZNTO instructions.



(d) M station ← R station (W)

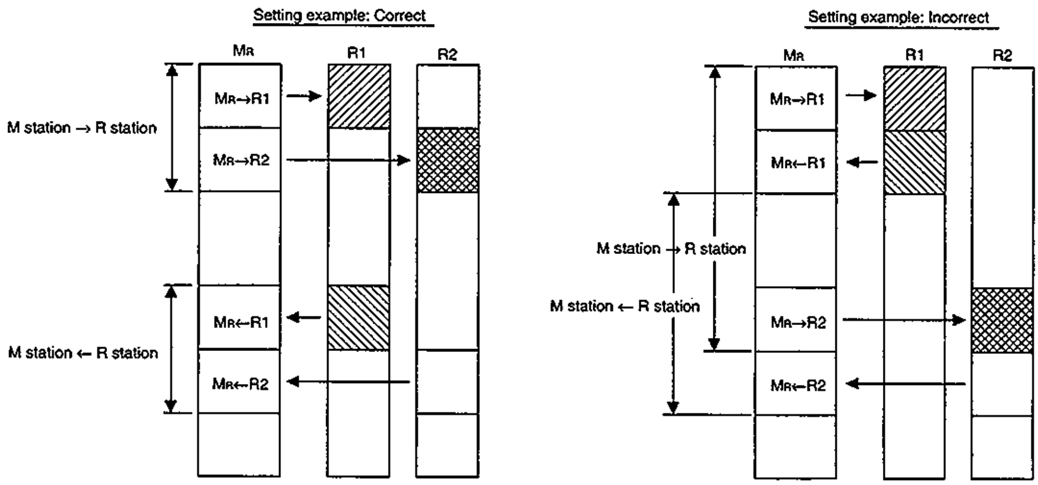
It is set for handshaking for ZNFR/ZNTO instructions and for the storage of read data of ZNFR instructions.

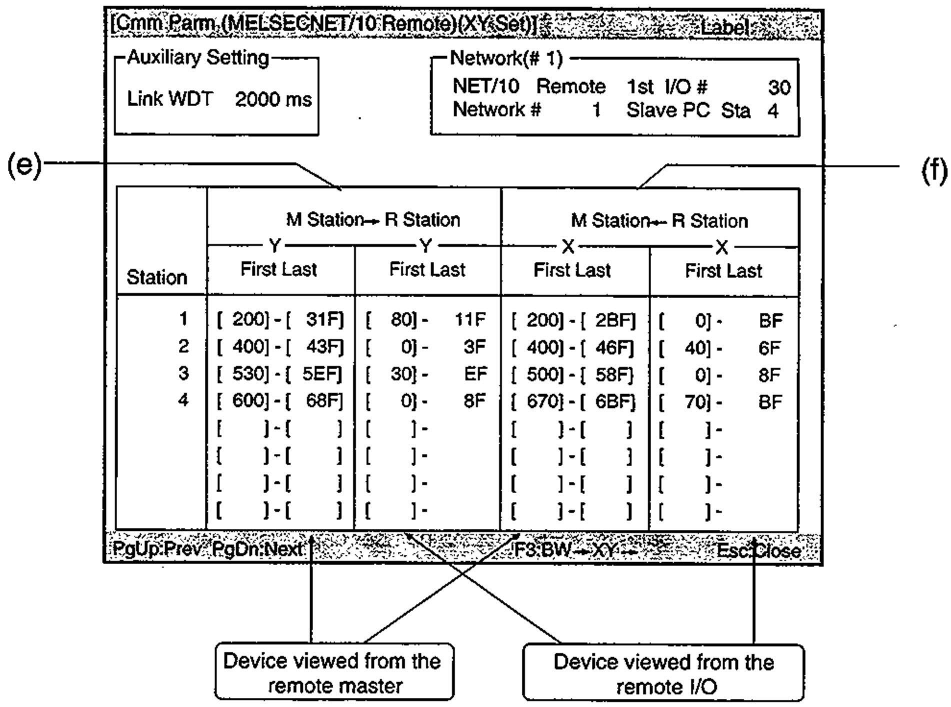


Points

(1) Regardless to use/non-use by ZNFR/ZNTO instructions, in case of setting B/W for even a point, it must be set for the points of special function module installed on the remote I/O station or more. It causes "PRM.E" if the number of points is insufficient.

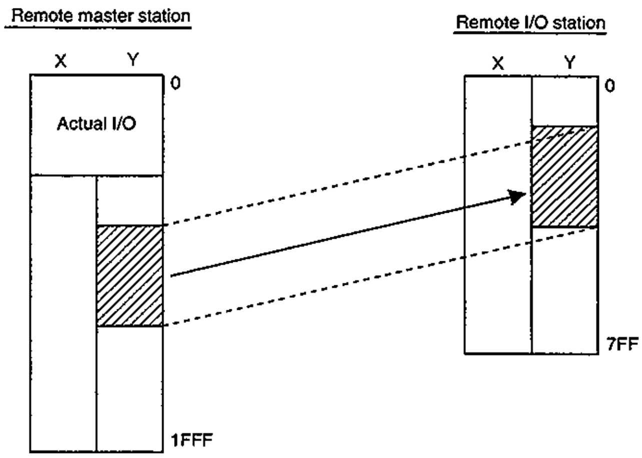
(2) It must be set in such a way so that the range for M station → R station and the M station ← R station do not overlap each other.





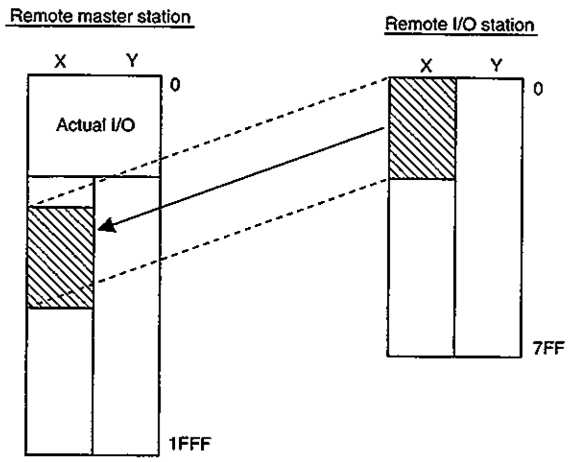
(e) M station → R station (Y)

Sets which address to use in the remote master station for controlling the output signal (Y) of output module of remote I/O station and special function module. In addition, the same number of points must be set for both remote master station and remote I/O station.



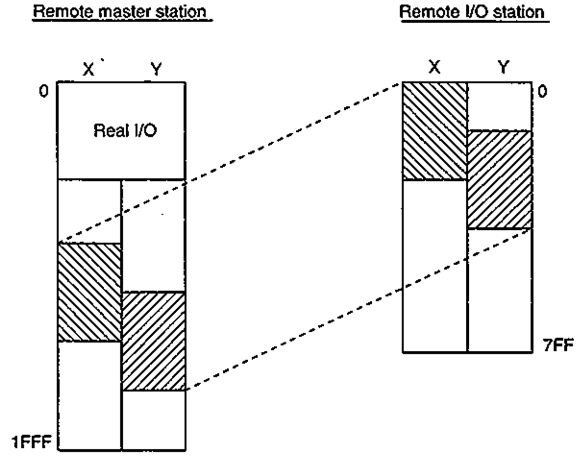
(f) M station ← R station (X)

Sets which address to use in the remote master station for controlling the output signal (X) of output module of remote I/O station and special function module. In addition, the same number of points must be set for both remote master station and remote I/O station.

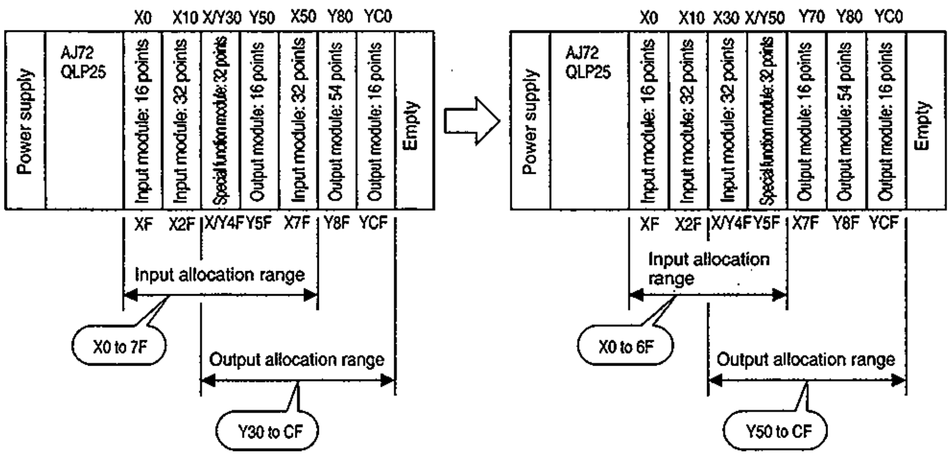


Points

(1) Setting for the remote master station side must be performed with the module installed to the remote I/O station.

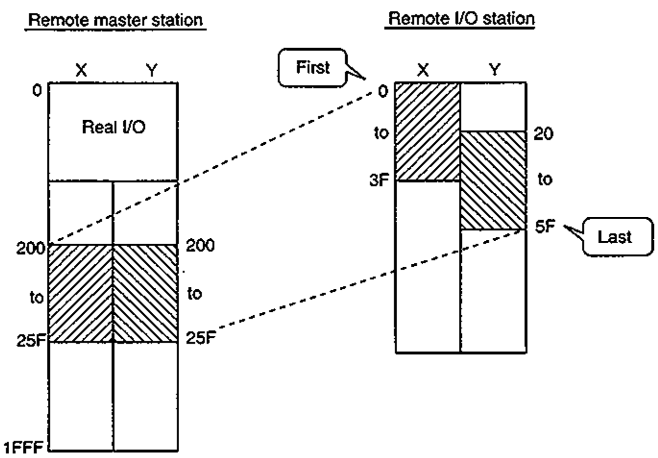


(2) The number of link points can be reduced if module are installed to remote I/O stations in groups, such as input module, special function module and output module as shown below.



Remark

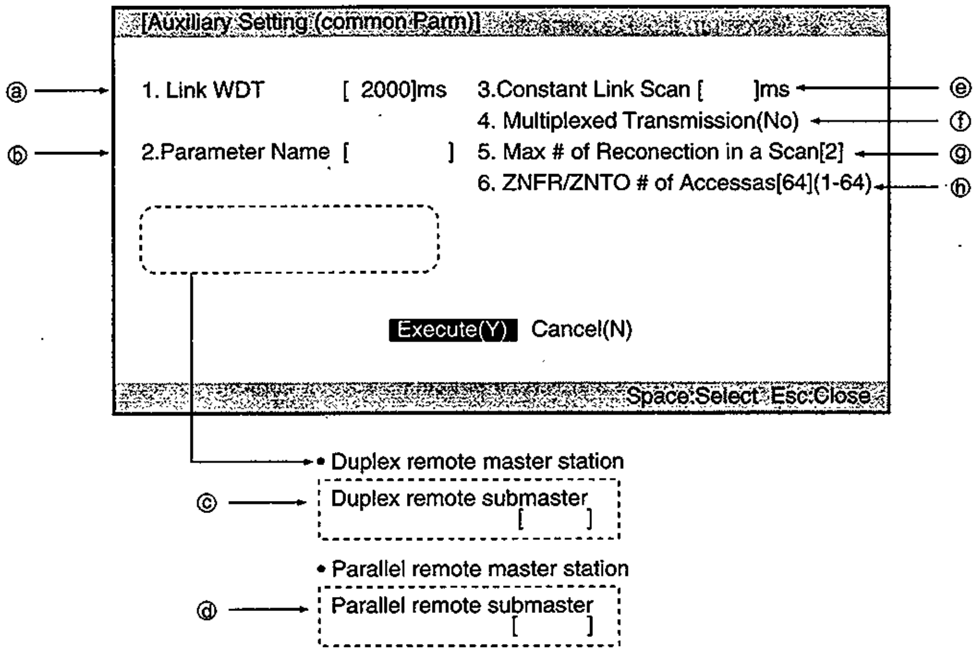
Both X and Y can be allocated easily by setting the same range for them.



(g) Auxiliary setting

These items are set and changed as required. They are not the items which must be set up.

① Auxiliary setting



ⓐ Link WDT

Sets the period of time to check whether normal transmission is performed between a remote master station and remote I/O station, multiple remote (sub)master station and remote I/O station, and parallel remote (sub)master station and remote I/O station.
Default value (2000ms) should be used for ordinary condition.
Set this item to a period of time longer than the link scan time by 10 ms units within a range of 10 to 4000ms.

ⓑ Parameter Name

Set to make it easier to understand what it was allocated for when confirming the parameters later.

ⓒ Duplex remote submaster

Sets the station numbers of duplex remote submasters.

ⓓ Parallel remote submaster

Sets the station numbers of parallel remote submasters.

ⓔ Constant Link Scan

Set this item when it is desired to maintain link scan time constant.
It is not set by default.

Setting value	Constant link scan
0 ms or vacancy	Not executed
1 to 500 ms	Executed at 1 to 500ms

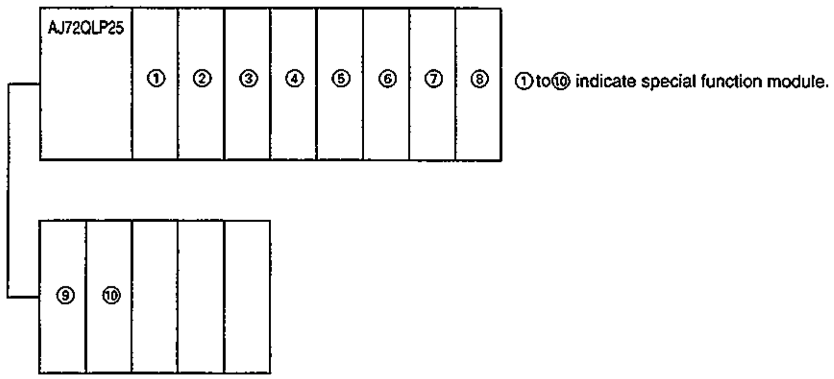
ⓕ Multiplex Transmission
Set whether to execute multiplex transmission function.
The default is "No execution".

ⓖ Maximum # of Reconnection in a Scan
Sets the number of stations having communication error that can return online in one link scan.
It is set in a range of 1 to 16 stations.
The default is "2 stations"

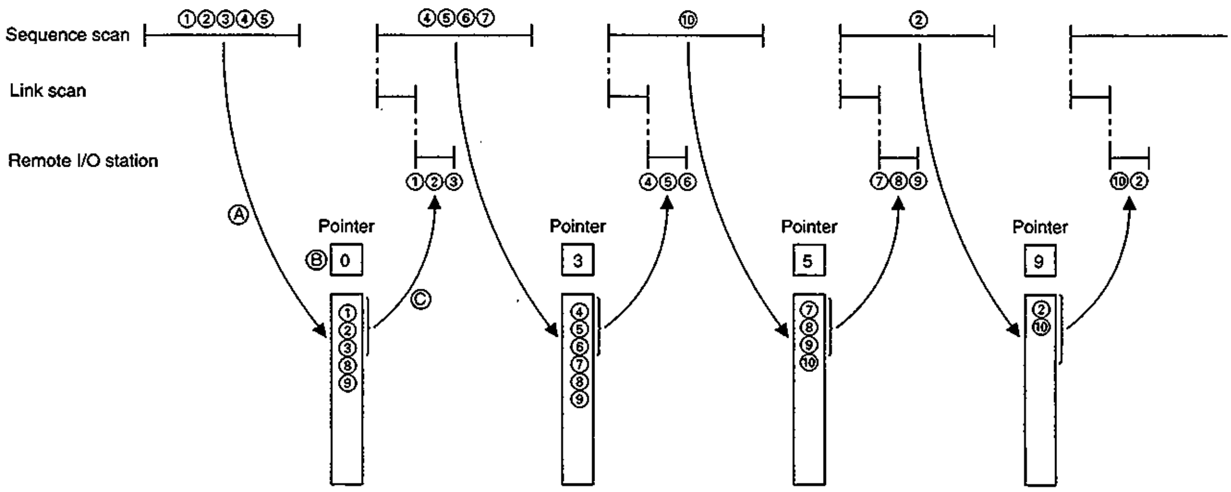
ⓗ ZNFR/ZNTO # of Accessible
Sets the number of modules a remote I/O station can execute instruction in one scan.
The scan time increase can be prevented by setting this item.
This item is set to 64 by default. The setting range is "1 to 64".

[Example] When ZNFR/ZNTO instructions access number is set to "3":
Ⓐ Data which execute the ZNFR/ZNTO instructions are arranged in the order of modules.
Ⓑ The number of special function modules which executed the ZNFR/ZNTO instructions is stored in the pointer.
Ⓒ The ZNFR/ZNTO instructions is executed for "3" module from the special function module following the pointer.

<System configuration>



<ZNFR/ZNTO instructions execution flow>



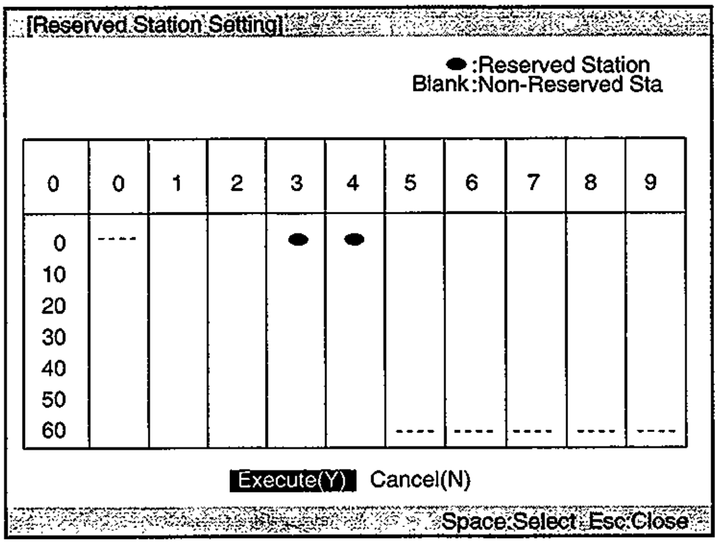
Point

When two ZNFR/ZNTO instructions are executed to the same special function module, the secondly issued one is ignored until the first one is completed (the completion signal turns on).

② Reserve station setting

Sets reserved stations.

It can be set so that stations that will be connected in the future (stations which are included in the number of stations but not actually connected) are not treated as communication faulty stations.



Remarks

There are functions to set common parameters for peripheral devices easily.

1) Allocation method
   Allocation method of transmission range for each station can be switched between "setting by the number of points" and "setting by address".

2) Uniform allocation
   By entering the number of stations and number of points to be allocated, the number of points is automatically allocated equally among all stations.

(2) Setting items for cases with multiple remote master station

Sections that are different from those explained in section (1) will be explained here.

1) Set the station number of multiple remote submaster station with the auxiliary setting. 2) Settings for communicating between multiple remote master station and multiple remote submaster station can be made.

(a) M station → Sub M station/R station (B/W)

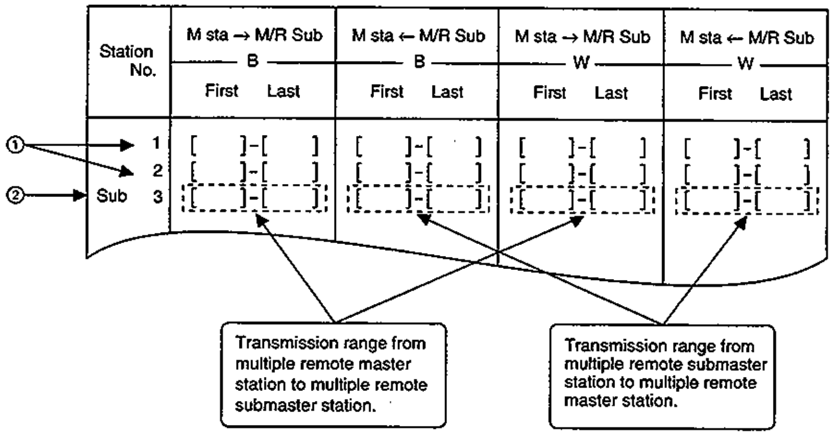
① Entries for station number without "sub" are the setting for communication with remote I/O station (M station → R station). Refer to (a) and (c) of (1) for details.

② Entries for station number with "sub" set the range where the multiple remote master station can send data to multiple remote submaster station (M station → Sub M station).

(b) M station ← Sub M station/R station (B/W)

① Entries for station number without "sub" are the setting for communication with remote I/O station (M station ← R station). Refer to (b) and (d) of (1) for details.

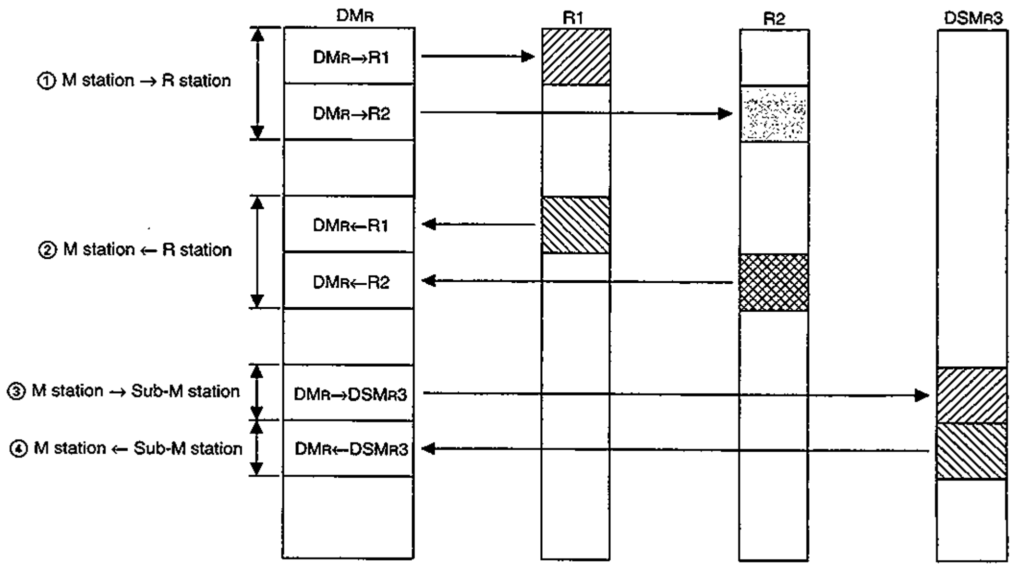
② Entries for station number with "sub" set the range where the multiple remote submaster station can send data to multiple remote master station (M station ← Sub M station).



Point

Set each of the ranges ① to ④ not to overlap.

Set the ranges so that the ranges ① to ② and ranges ③ , ④ do not overlap.



(c) M station (Y) → Sub M station/R station (X/Y)

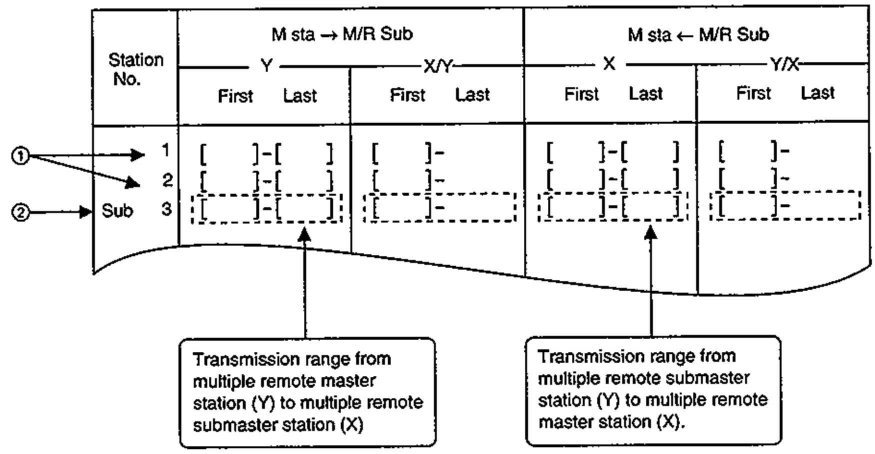
① Entries for station number without "sub" are the setting for communication with remote I/O station (M station → R station). Refer to (e) of (1) for details.

② Entries for station number with "sub" set the range where the multiple remote master station can send data to multiple remote submaster station (X).

(d) M station(X) ← Sub M station/R station (X/Y)

① Entries for station number without "sub" are the setting for communication with remote I/O station (M station ← R station). Refer to (f) of (1) for details.

② Entries for station number with "sub" set the range where the multiple remote submaster station (Y) can send data to multiple remote master station (X).



(3) Setting items for cases with parallel remote master station

Sections that are different from those explained in section (1) will be explained here.

1) Set the station number of parallel remote submaster station with the auxiliary setting.
2) Settings for communicating between parallel remote master station and parallel remote submaster station can be made.
3) Be sure not to set the same station number for both the parallel remote master station setting and parallel remote submaster station setting.

(a) M station → Sub M station/R station (B/W)

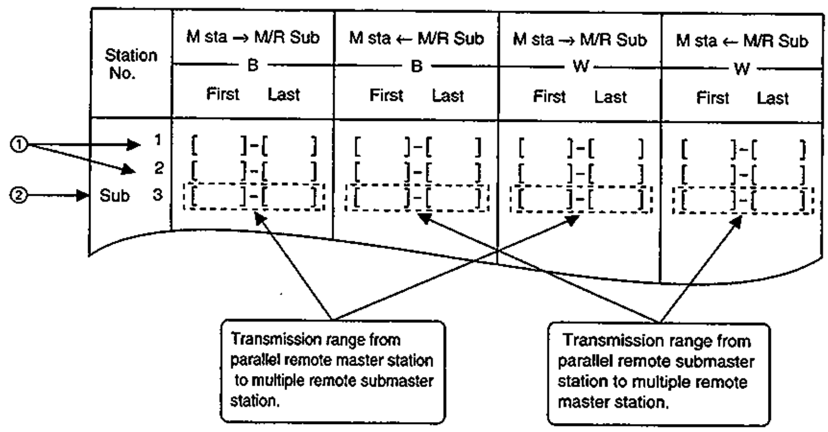
① Entries for station number without "sub" are the setting for communication with remote I/O station controlled by the parallel remote master station. (M station → R station) Refer to (a) and (c) of (1) for details.

② Entries for station number with "sub" set the range where the parallel remote master station can send data to parallel remote submaster station (M station → Sub M station).

(b) M station ← Sub M station/R station (B/W)

① Entries for station number without "sub" are the setting for communication with remote I/O station controlled by the parallel remote master station (M station ← R station). Refer to (b) and (d) of (1) for details.

② Entries for station number with "sub" set the range where the parallel remote submaster station can send data to multiple remote master station (M station ← Sub M station).



(c) M station → Sub M station/R station (X/Y)

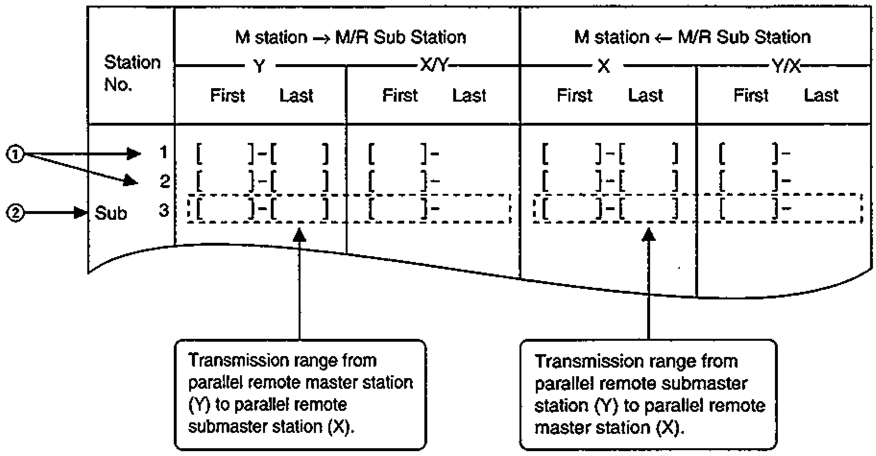
① Entries for station number without "sub" are the setting for communication with remote I/O station controlled by the parallel remote master station (M station → R station). Refer to (e) of (1) for details.

② Entries for station number with "sub" set the range where the parallel remote master station (Y) can send data to parallel remote submaster station (X) (M station → Sub M station).

(d) M station ← Sub M station/R station (X/Y)

① Entries for station number without "sub" set the range from the remote I/O station to controlling parallel remote master station (M station ← R station). Refer to (f) of (1) for details.

② Entries for station number with "sub" set the range where parallel remote submaster station (Y) can send data to parallel remote master station (X) (M station ← Sub M station).



(e) Sub M station → R station (B/W)

Sets the range from the remote I/O station to controlling parallel remote submaster station. Refer to (a) and (c) of (1) for details.

(f) Sub M station ← R station (B/W)

Sets the range from the remote I/O station to controlling parallel remote submaster station. Refer to (b) and (d) of (1) for details.

Station No.	Sub M Sta → R Sta B		Sub M Sta ← R Sta B		Sub M Sta → R Sta W		Sub M Sta ← R Sta W	
	First	Last	First	Last	First	Last	First	Last
1	[ ]-[ ]		[ ]-[ ]		[ ]-[ ]		[ ]-[ ]	
2	[ ]-[ ]		[ ]-[ ]		[ ]-[ ]		[ ]-[ ]	
Sub 3	------------		------------		------------		------------	
4	[ ]-[ ]		[ ]-[ ]		[ ]-[ ]		[ ]-[ ]	
5	[ ]-[ ]		[ ]-[ ]		[ ]-[ ]		[ ]-[ ]	

(g) Sub M station → R station (Y)

Sets the range from the remote I/O station to controlling parallel remote submaster station. Refer to (e) of (1) for details.

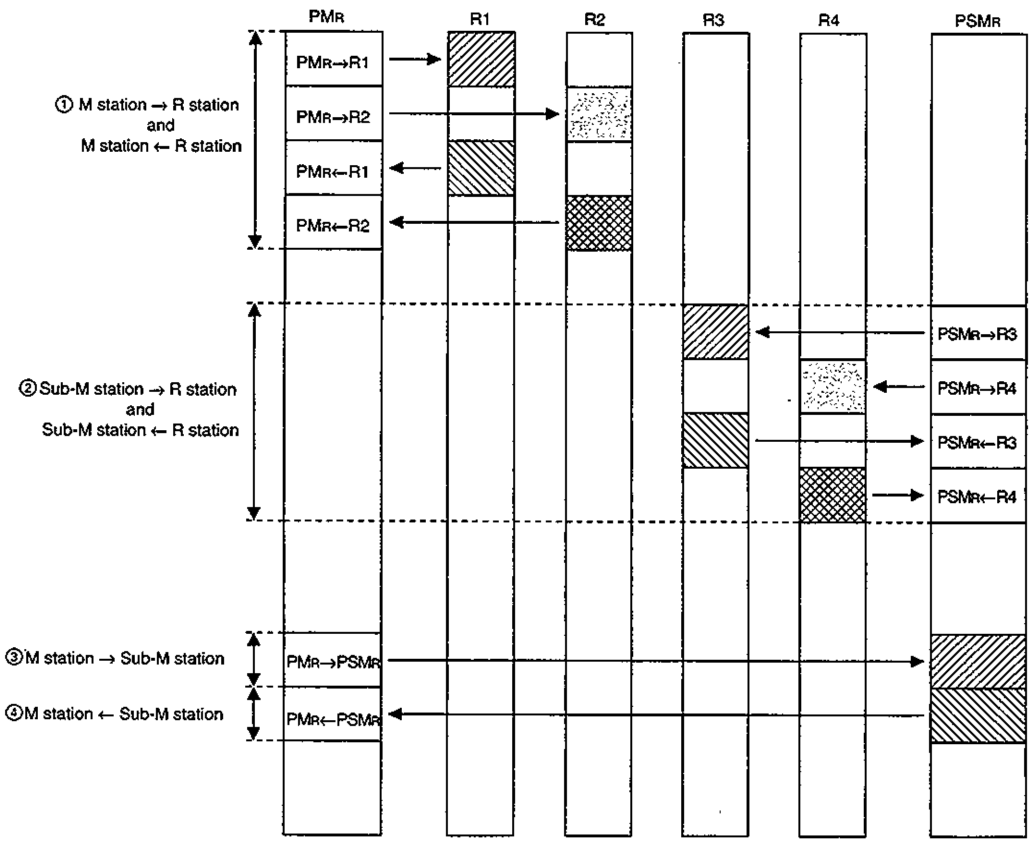
(h) Sub M station ← R station (X)

Sets the range from the remote I/O station to controlling by the parallel remote submaster station. Refer to (f) of (1) for details.

Station No.		Sub M Sta → R Sta Y First Last	Sub M Sta → R Sta Y First Last	Sub M Sta ← R Sta X First Last	Sub M Sta ← R Sta X First Last
Sub	1	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-
	2	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-
	3	------------	------------	------------	------------
	4	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-
	5	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-

Point

Set each of the ranges ① to ④ not to overlap.
Set the ranges so that ranges ① to ② and ranges ③, ④ do not overlap.



(4) Setting example of double layer system

(a) System configuration

Common parameter setting for the system configuration shown in Figure 7.6 will be explained. It is assumed that each of the input module and the output module occupies 16 points, and the special function module occupies 32 points.

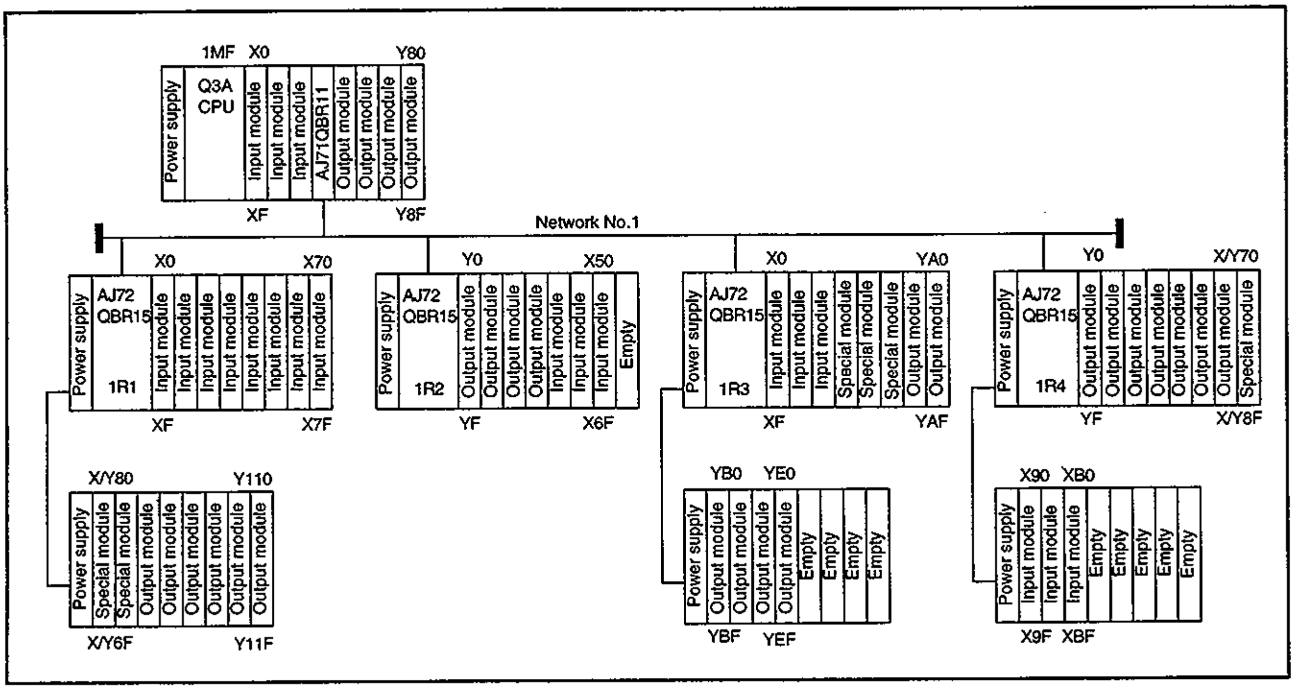


Figure 9.6 System configuration example

(b) B/W Allocation

An example of B/W allocation is shown in Figure 9.7. It is set so that ZNFR/ZNTO instructions can read/write data from/to the buffer memory in the special function module installed in each remote I/O station.

The screen for setting B/W common parameters is shown in Figure 9.8.

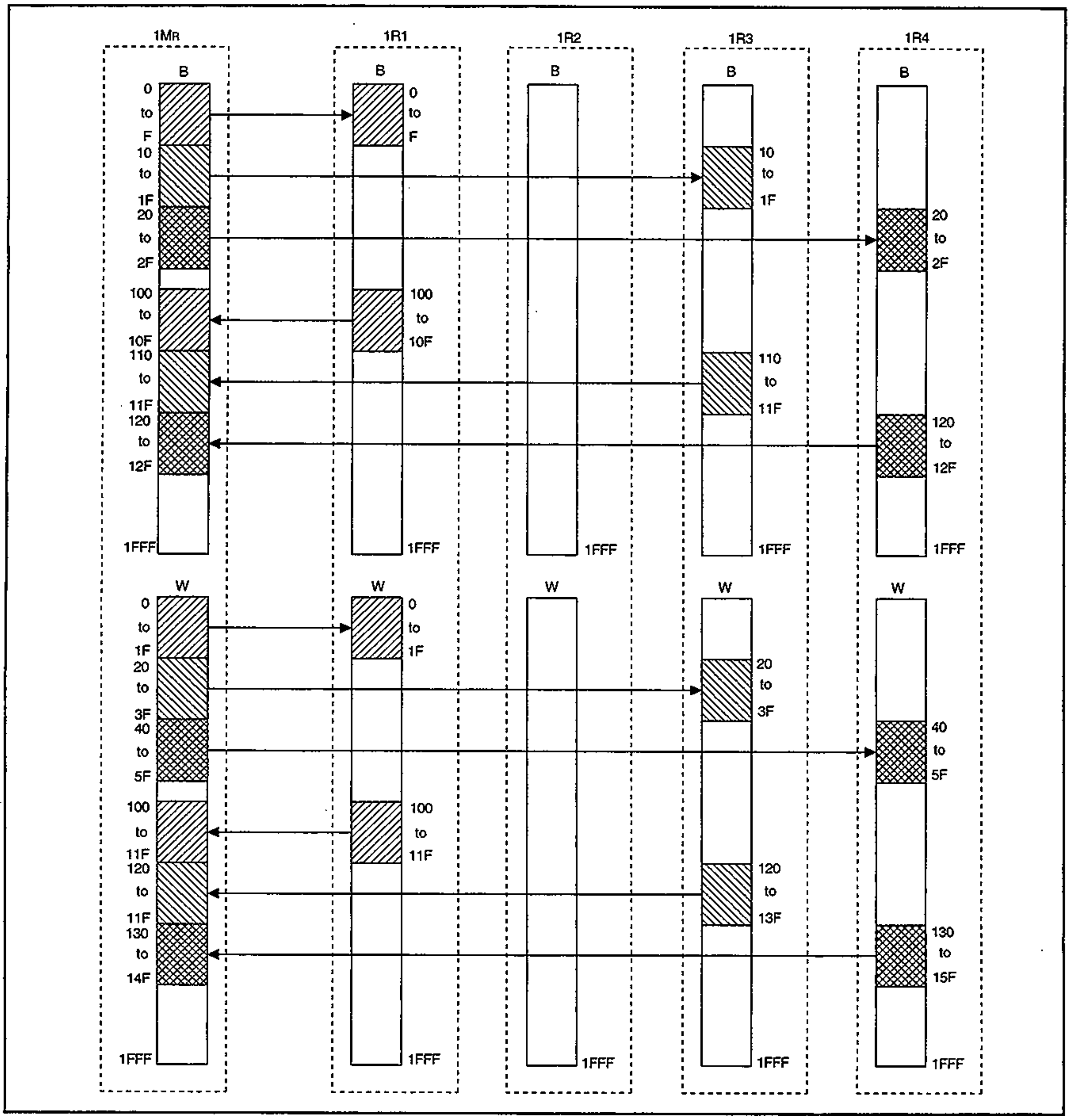


Figure 9.7 Screen for setting B/W common parameters

[Cmm Parm (MELSECNET/10 Remote)(BW Set)] Label:

Auxiliary Setting
Link WDT 2000 ms

Network(# 1)
NET/10 Remote 1st I/O # 30
Network # 1 Slave PC Sta 4

Station	M Sta → R Sta B First Last	M Sta ← R Sta B First Last	M Sta → R Sta W First Last	M Sta ← R Sta W First Last
1	[0]-[F]	[100]-[10F]	[0]-[1F]	[100]-[11F]
2	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
3	[10]-[1F]	[110]-[11F]	[20]-[3F]	[120]-[13F]
4	[20]-[2F]	[120]-[12F]	[40]-[5F]	[140]-[15F]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]

PgUp:Prev PgDn:Next F3:BW→XY← Esc:Close

Figure 9.8 Screen for setting B/W common parameters

(c) X/Y Allocation

Figure 9.9 shows an example of X/Y allocation. The actual I/O range in this figure indicates the device range used by the input/output modules and the special function modules installed in remote master station (1MR).

Allocate X/Y after the actual I/O range.

The screen for setting common parameters is shown in Figure 9.10.

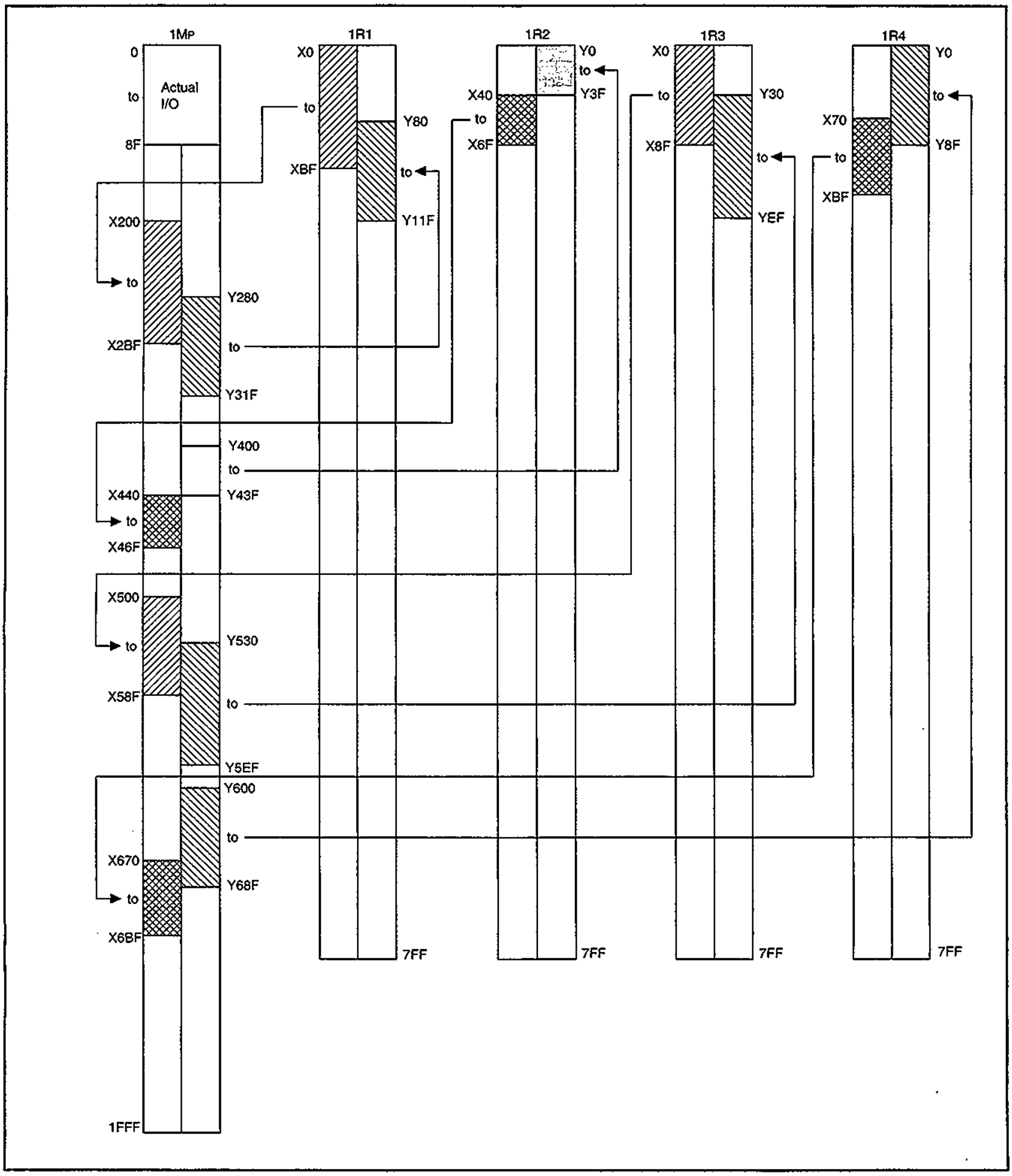


Figure 9.9 Screen for setting X/Y common parameters

[Cmm Parm (MELSECNET/10 Remote)(XY Set)] Label:

Auxiliary Setting

Link WDT 2000 ms

Network(# 1)

NET/10 Remote 1st I/O # 30

Network # 1 Slave PC Sta 4

	M Station→R Station		M Station→R Station	
	Y	Y	X	X
Station	First Last	First Last	First Last	First Last
1	[200] - [31F]	[80] - 11F	[200] - [2BF]	[0] - BF
2	[400] - [43F]	[0] - 3F	[440] - [46F]	[40] - 6F
3	[530] - [5EF]	[30] - EF	[500] - [58F]	[0] - 8F
4	[600] - [68F]	[0] - 8F	[670] - [6BF]	[70] - BF
	[ ] - [ ]	[ ] -	[ ] - [ ]	[ ] -
	[ ] - [ ]	[ ] -	[ ] - [ ]	[ ] -
	[ ] - [ ]	[ ] -	[ ] - [ ]	[ ] -
	[ ] - [ ]	[ ] -	[ ] - [ ]	[ ] -

Pgup:Prev PgDn:Next F3:BW→XY→ Esc:Close

Figure 9.10 Screen for setting X/Y common parameters

Points

(1) There is no default settings for X/Y ranges in the network refresh parameters. The X/Y refresh range must be set.

[Network Refresh Parameter] Rabel:

1

NET/10 Remoto 1st I/O # 30 Netwoek # 1	# of TX Device	Link Side First Last	CPU Side Fiest Device Last Device
B TX	[8192]	B [0]-B [1FFF]	< > B [0] -B [1FFF]
W TX	[8192]	W[0]-W[1FFF]	< > W[0] -W[1FFF]
X TX	[8192]	X [0]-X [1FFF]	< > X [0] -X [1FFF]
Y TX	[8192]	Y [0]-Y [1FFF]	< > Y [0] -Y [1FFF]

Esc:Close

(2) If the same addresses as in the actual I/O range are allocated, set the network refresh parameters so that refresh is performed after the actual I/O range.

(5) Setting example of multiple master system

(a) System configuration

Common parameter setting for the system configuration shown in Figure 9.11 is explained. It is assumed that each of the input module and the output module occupies 16 points, and the special function module occupies 32 points.

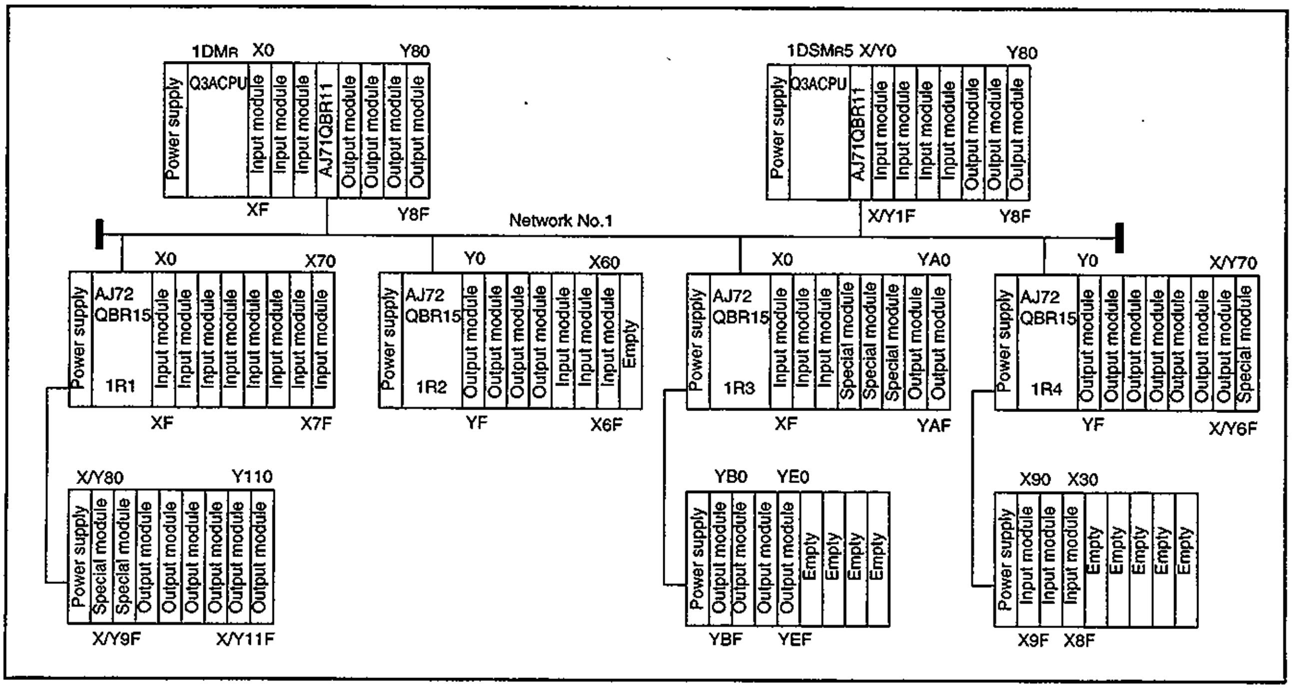


Figure 9.11 System configuration example

(b) B/W allocation

An example of B/W allocation is shown in Figure 9.12. It is set so that ZNFR/ZNTO instructions can read/write data from/to the buffer memory in the special function module installed in each remote I/O station. It is also set for communication between multiple remote master station and multiple remote submaster station.

The screen for setting B/W common parameters is shown in Figure 9.13.

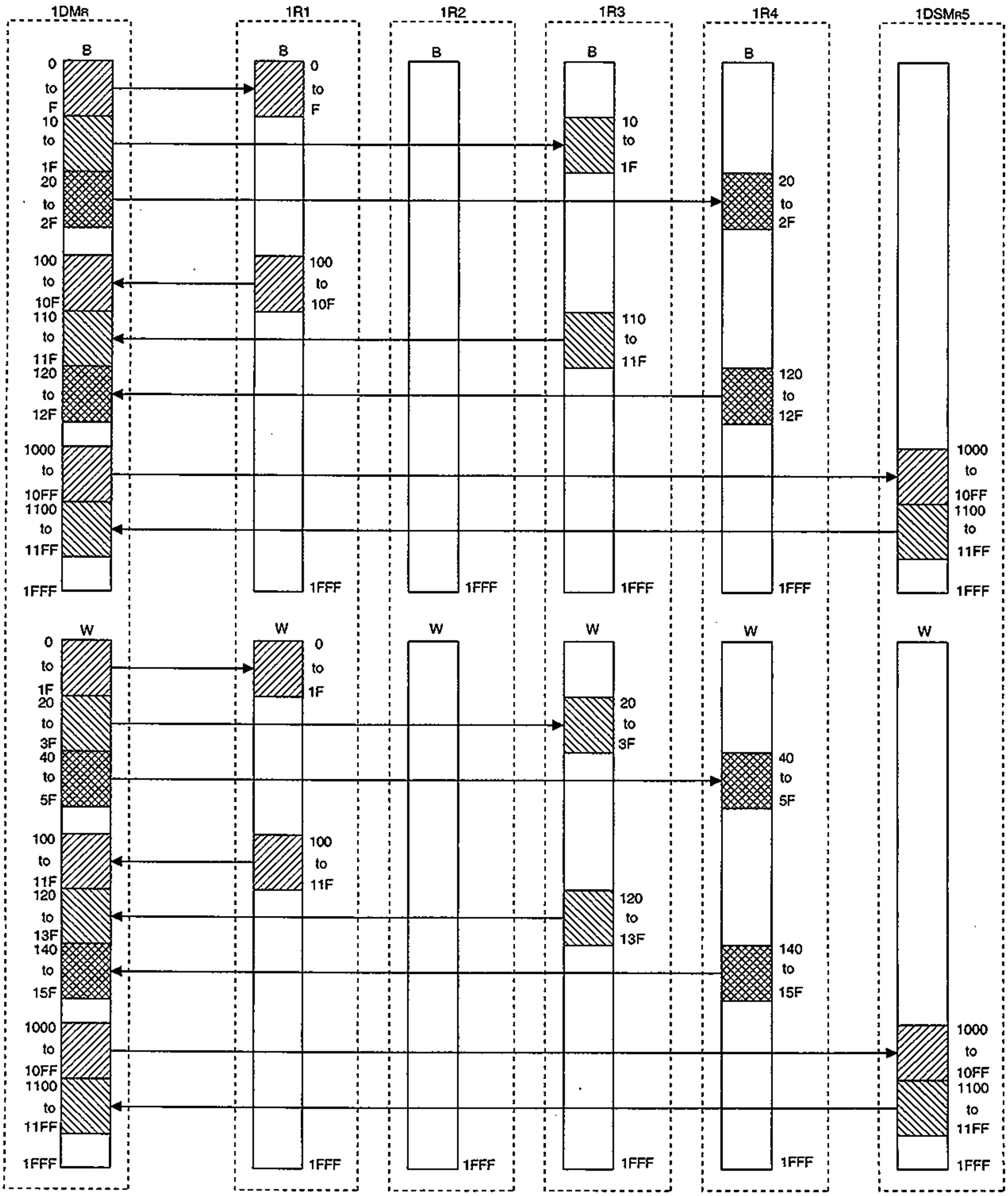


Figure 9.12 B/W allocation example

[Cmm Parm (MELSECNET/10 Duplex H/M)(XW Set)] Label:

Auxiliary Setting
Link WDT 2000 ms

Network(# 1)
NET/10 Duplex R/M 1st I/O # 30
Network # 1 Slave PC Sta 5

Station	M Sta→M/R Sub B First Last	M Sta→M/R Sub B First Last	M Sta→M/R Sub W First Last	M Sta→M/R Sub W First Last
1	[0] - [F]	[100] - [10F]	[0] - [1F]	[100] - [11F]
2	[ ] - [ ]	[ ] - [ ]	[ ] - [ ]	[ ] - [ ]
3	[10] - [1F]	[110] - [11F]	[20] - [3F]	[120] - [13F]
4	[20] - [2F]	[120] - [12F]	[40] - [5F]	[140] - [15F]
Sub 5	[1000] - [10FF]	[1100] - [11FF]	[1000] - [10FF]	[1100] - [11FF]
	[ ] - [ ]	[ ] - [ ]	[ ] - [ ]	[ ] - [ ]
	[ ] - [ ]	[ ] - [ ]	[ ] - [ ]	[ ] - [ ]
	[ ] - [ ]	[ ] - [ ]	[ ] - [ ]	[ ] - [ ]

Pgup:Prev PgDn:Next F3:BW→XY → Esc:Close

Figure 9.13 Screen for setting B/W common parameters

(c) X/Y allocation

Figure 9.14 shows an example of X/Y allocation. The actual I/O range in this figure indicates the device range used by the input/output module and the special function module installed in multiple remote master station (1DMR) and multiple remote submaster station (1DSMR5).

Allocate X/Y after the actual I/O range.

The screen for setting common parameters is shown in Figure 9.15.

Figure 9.15 X/Y Allocation Example.

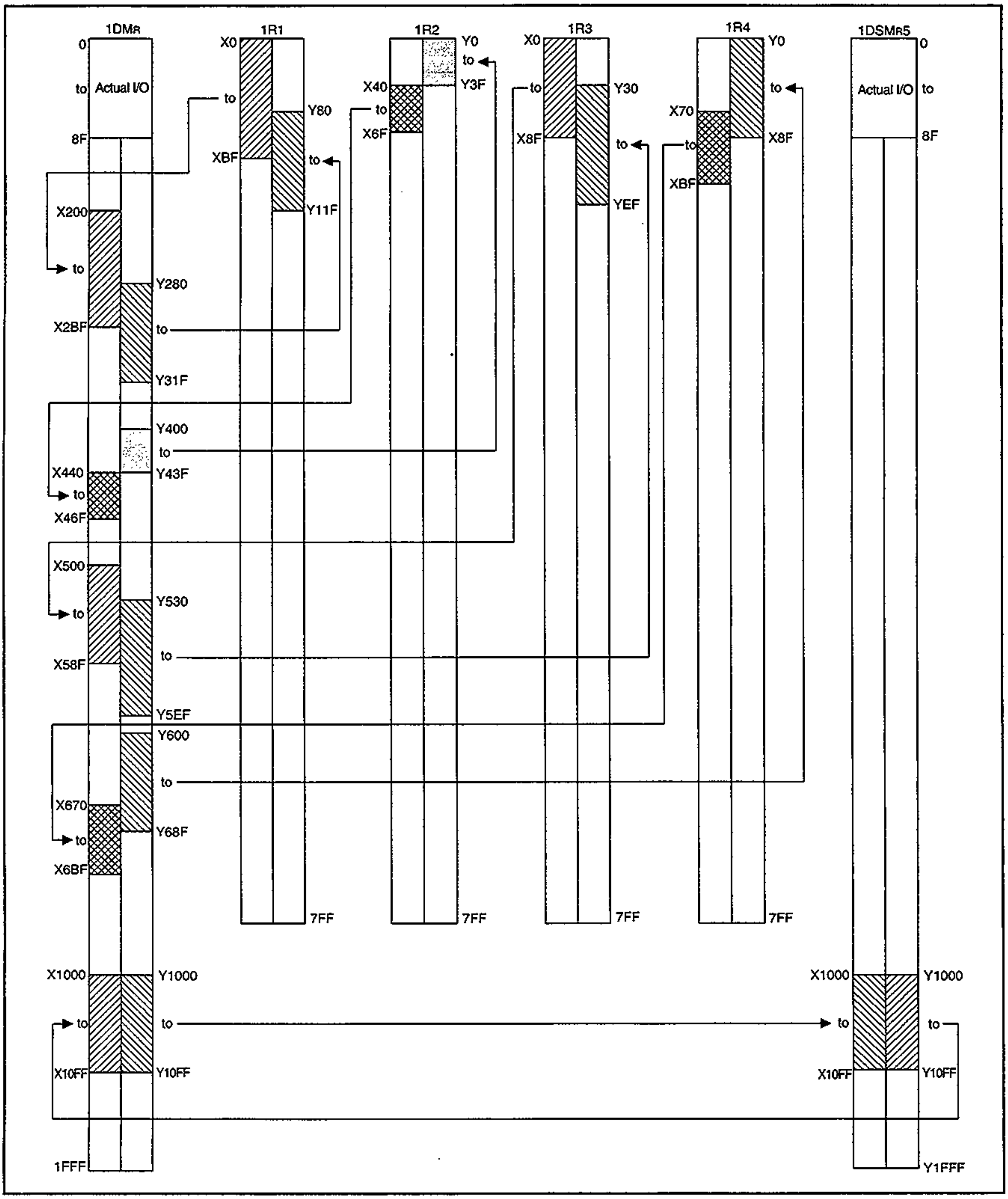


Figure 9.15 Screen for setting X/Y common parameters

[Cmm Parm (MELSECNET/10 Duplex H/M)(XY Set)] Label:

Auxiliary Setting
Link WDT 2000 ms

Network(# 1)
NET/10 Duplex R/M 1st I/O # 30
Network # 1 Slave PC Sta 5

Station	M Sta→M/R Sub Y First Last	X/Y First Last	M Sta→M/R Sub X First Last	X/Y First Last
1	[200] - [31F]	[80] - 11F	[200] - [2BF]	[0] - BF
2	[400] - [43F]	[0] - 3F	[400] - [46F]	[40] - 6F
3	[530] - [5EF]	[30] - EF	[500] - [58F]	[0] - 8F
4	[600] - [68F]	[0] - 8F	[670] - [6BF]	[70] - BF
Sub 5	[1000] - [10FF]	[1000] - 10FF	[1000] - [10FF]	[1000] - 10FF
	[ ] - [ ]	[ ] -	[ ] - [ ]	[ ] -
	[ ] - [ ]	[ ] -	[ ] - [ ]	[ ] -
	[ ] - [ ]	[ ] -	[ ] - [ ]	[ ] -

Pgup:Prev PgDn:Next F3:BW→XY→ Esc:Close

Figure 9.15 Screen for setting X/Y common parameters

Points

(1) There is no default settings for X/Y ranges in the network refresh parameters. The X/Y refresh range must be set in multiple remote master station and multiple remote submaster station.

[Network Refresh Parameter] Label:

# 1 NEt/10 Dup/M 1st I/O # 0 Netwoek # 1	# of TX Device	Link Side First Last	CPU Side Fiest Device Last Device
B TX	[8192]	B [0]-B [1FFF]< >	B [0] -B [1FFF]
W TX	[8192]	W[0]-W[1FFF]< >	W[0] -W[1FFF]
X TX	[8192]	X [0]-X [1FFF]< >	X [0] -X [1FFF]
Y TX	[8192]	Y [0]-Y [1FFF]< >	Y [0] -Y [1FFF]

Esc:Close

(2) If the same addresses as in the actual I/O range are allocated, set the network refresh parameters so that refresh is performed after the actual I/O range.

(6) Parallel master system

(a) System configuration

Common parameter setting for the system configuration shown in Figure 9.16 is explained. It is assumed that each of the input module and the output module occupies 16 points, and the special function module occupied 32 points.

Parallel remove master station(1PMR) communicates with 1R1 and 1R3 and parallel remote submaster station (1PSMR5) communicates 1R4.

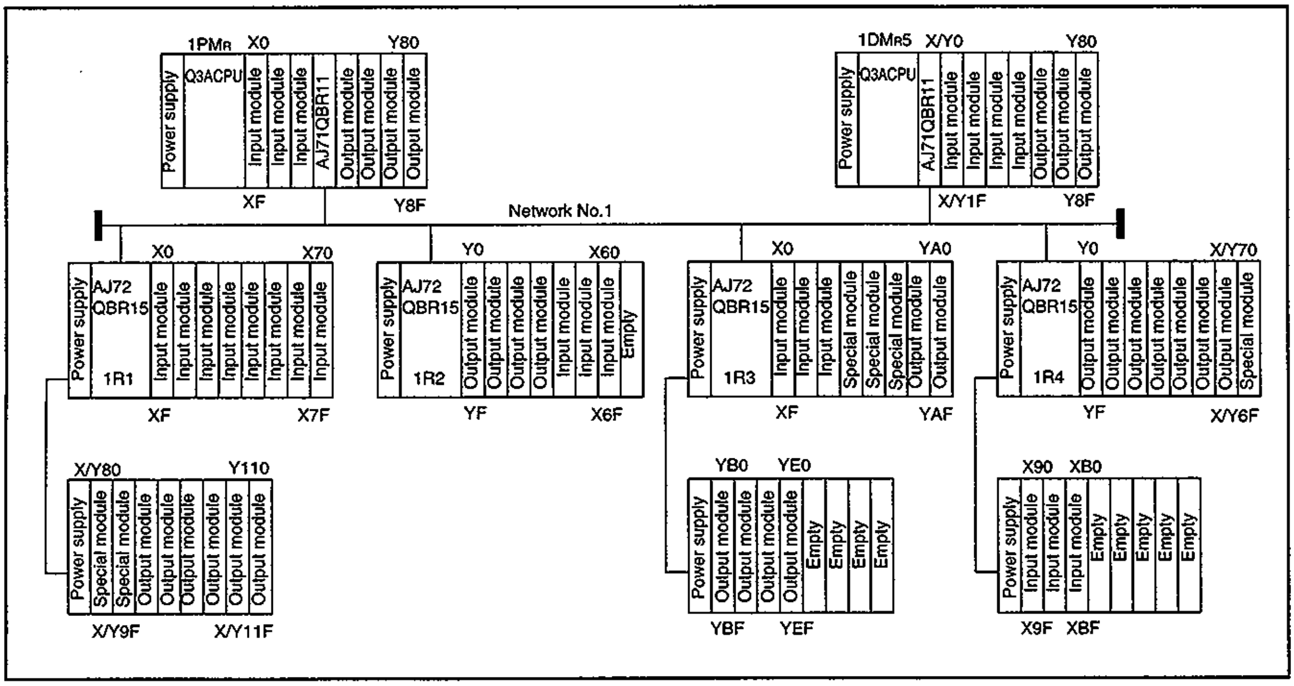


Figure 9.16 System configuration example

(b) B/W allocation

An example of B/W allocation is shown in Figure 9.17. It is set so that ZNFR/ZNTO instructions can read/write data from/to the buffer memory in the special function module installed in each remote I/O station. It is also set for communication beween parallel remote master station and parallel remote submaster station.

The screen for setting B/W common parameters is shown in Figure 9.18.

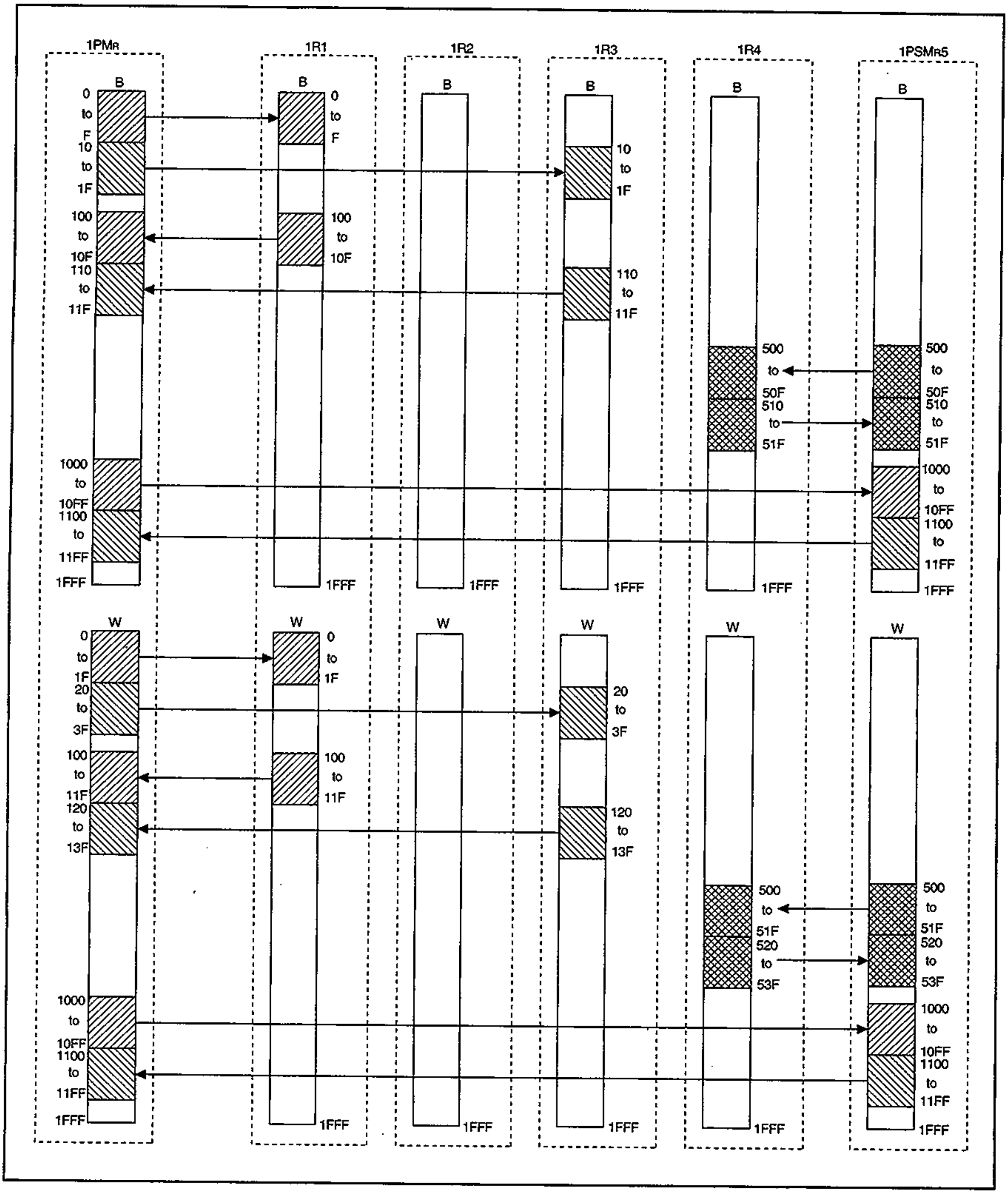


Figure 9.17 B/W allocation example

[Cmm Parm (MELSECNET/10 Parallel R/M)(BW Set)] Label:

Auxiliary Setting
Link WDT 2000 ms

Network(# 1)
NET/10 Parallel R/M1st I/O # 30
Network # 1 Slave PC Sta 5

Station	M Sta→M/R Sub B First Last	M Sta←M/R Sub B First Last	M Sta→M/R Sub W First Last	M Sta←M/R Sub W First Last
1	[0]-[F]	[100]-[10F]	[0]-[1F]	[100]-[11F]
2	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
3	[10]-[1F]	[110]-[11F]	[20]-[3F]	[120]-[13F]
4	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
Sub 5	[1000]-[10FF]	[1100]-[11FF]	[1000]-[10FF]	[1100]-[11FF]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]

Pgup:Prev PgDn:Next F3:BW↔XY Sub BW↔SubXY Esc:Close

[Cmm Parm (MELSECNET/10 Parallel R/M)(Sub BW Set)] Label:

Auxiliary Setting
Link WDT 2000 ms

Network(# 1)
NET/10 Parallel R/M1st I/O # 30
Network # 1 Slave PC Sta 5

Station	M Sta→M/R Sub B First Last	M Sta←M/R Sub B First Last	M Sta→M/R Sub W First Last	M Sta←M/R Sub W First Last
1	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
2	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
3	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
4	[500]-[50F]	[510]-[51F]	[500]-[51F]	[520]-[53F]
Sub 5	------------	------------	------------	------------
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]

Pgup:Prev PgDn:Next F3:BW↔XY Sub BW↔SubXY Esc:Close

Figure 9.18 Screen for setting B/W common parameters

(c) X/Y allocation

Figure 9.19 shows an example of X/Y allocation. The actual I/O range in this figure indicates the device range used by the input/output module and the special function module installed in parallel remote master station (1PMR) and parallel remote submaster (1PSMR5).
Allocate X/Y after the actual I/O range.
The screen for setting common parameters is shown in Figure 9.20.

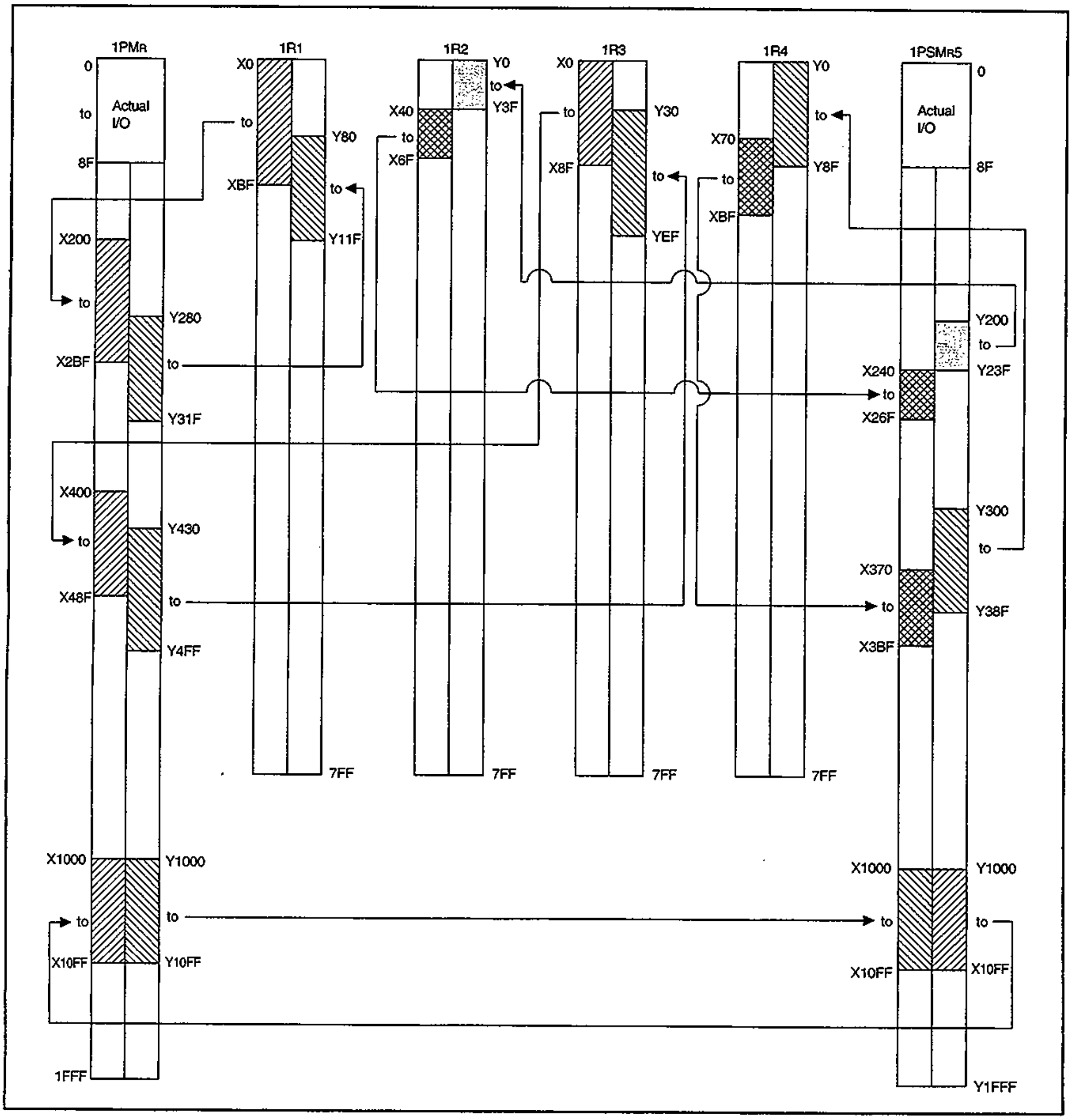


Figure 9.19 X/Y allocation example

[Cmm Parm (MELSECNET/10 Parallel R/M)(XY Set)] Label:

Auxiliary Setting
Link WDT 2000 ms

Network(# 1)
NET/10 Parallel R/M1st I/O # 30
Network # 1 Slave PC Sta 5

Station	M Station→ M/R Sub Station Y First Last	X/Y First Last	M Station← M/R Sub Station X First Last	Y/X First Last
1	[200] - [31F]	[80] - 11F	[200] - [2BF]	[0] - BF
2	[ ] - [ ]	[ ] -	[ ] - [ ]	[ ] -
3	[430] - [4EF]	[30] - EF	[400] - [48F]	[0] - 8F
4	[ ] - [ ]	[ ] -	[ ] - [ ]	[ ] -
Sub 5	[1000] - [10FF]	[1000] - 10FF	[1000] - [10FF]	[1000] - 10FF
	[ ] - [ ]	[ ] -	[ ] - [ ]	[ ] -
	[ ] - [ ]	[ ] -	[ ] - [ ]	[ ] -
	[ ] - [ ]	[ ] -	[ ] - [ ]	[ ] -

Pgup:Prev PgDn:Next F3:BW→XY→Sub BW→SubXY Esc:Close

[Cmm Parm (MELSECNET/10 Parallel R/M)(Sub XY Set)] Label:

Auxiliary Setting
Link WDT 2000 ms

Network(# 1)
NET/10 Parallel R/M1st I/O # 30
Network # 1 Slave PC Sta 5

Station	M sub Sta →R Sta Y First Last	Y First Last	M sub Sta →R Sta X First Last	X First Last
1	[ ] - [ ]	[ ] -	[ ] - [ ]	[ ] -
2	[200] - [23F]	[0] - 3F	[240] - [26F]	[40] - 6F
3	[ ] - [ ]	[ ] -	[ ] - [ ]	[ ] -
4	[300] - [38F]	[0] - 8F	[370] - [3BF]	[70] - BF
Sub 5	-------------	-------------	-------------	-------------
	[ ] - [ ]	[ ] -	[ ] - [ ]	[ ] -
	[ ] - [ ]	[ ] -	[ ] - [ ]	[ ] -
	[ ] - [ ]	[ ] -	[ ] - [ ]	[ ] -

Pgup:Prev PgDn:Next F3:BW→XY→Sub BW→SubXY Esc:Close

Figure 9.20 Screen for setting X/Y common parameters

Points

(1) The default settings for network refresh parameters have no values for X/Y. It is necessary to set the refresh range for X/Y on parallel remote master station and parallel remote submaster station.

[Network Refresh Parameter] Rabel:

1

NEt/10 Para /M 1st I/O # 30 Netwoek # 1	# of TX Device	Link Side First Last	CPU Side Fiest Device Last Device
B TX	[8192]	B [0]-B [1FFF]< >	B [0] -B [1FFF]
W TX	[8192]	W[0]-W[1FFF]< >	W[0] -W[1FFF]
X TX	[8192]	X [0]-X [1FFF]< >	X [0] -X [1FFF]
Y TX	[8192]	Y [0]-Y [1FFF]< >	Y [0] -Y [1FFF]

Esc:Close

(2) In case of allocating the same address as the range used by actual I/O, set it using network refresh parameter so that it refreshes after the range used by the actual I/O.

9.6 Station Specific Parameter

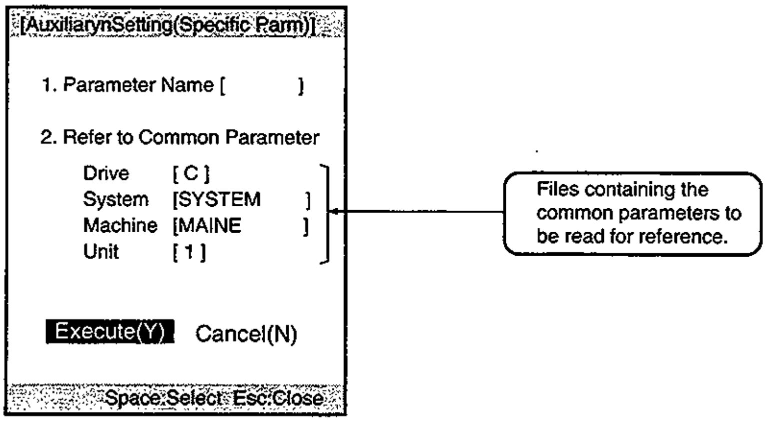
This is the parameter to set for rearranging transmission range (B,W) for each station allocated by common parameters or using only the necessary part of them. The setting is effective only to that station. By using it, it becomes not necessary to change the sequence program when the common parameter setting is changed.

(1) Setting items

(a) Common parameter

The display contents differ depending on the module type.

- Control station .... Displays actually allocated by the common parameter.
- Normal station .... Displays common parameter contents read by auxiliary setting. However, if an item is not displayed here it does not mean that it cannot be set.
  It is provided here for reference for setting 1/setting 2 settings.



(b) Setting 1/setting 2

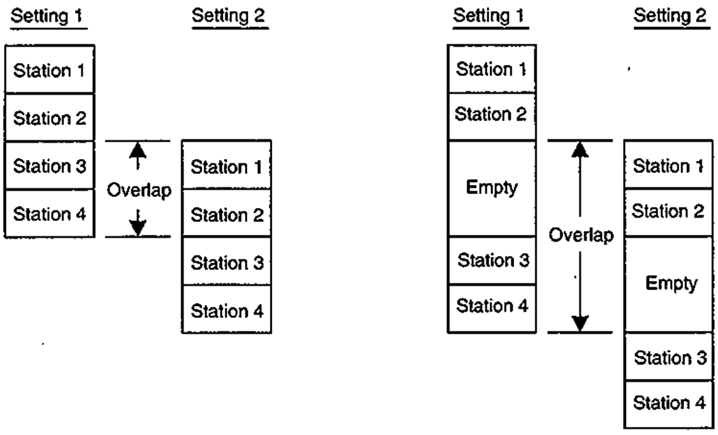
① The setting 1 and setting 2 indicate that transmission range for each station number can be divided into two parts.

② It can be set freely within the range allocated to all stations by the common parameter.

③ Station numbers for which no settings are made for setting 1 or 2 are treated as having no range settings even if ranges are set by the common parameters.

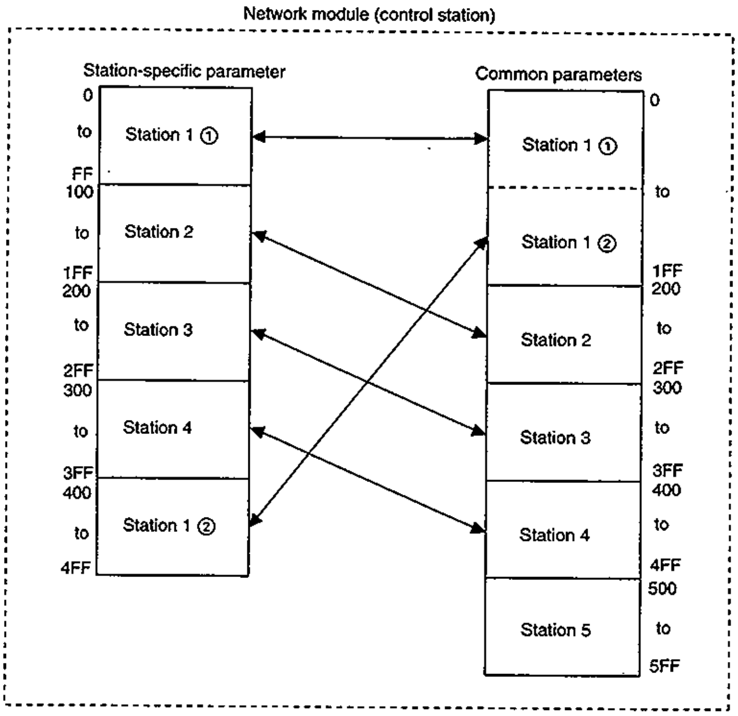
Point

Set the setting 1 and setting 2 within the device ranges set by the common parameters. Setting them outside the ranges cause a mismatch error (PRM.E LED is illuminated). In addition, ranges overlapping each other cannot be set for the setting 1 and setting 2.



(2) Setting Example

The screen with settings to achieve the range changes at each station as illustrated below is shown in Figure 9.21.



[Cmm Parm (MELSECNET/10 Control)(BW Set)] Label:

Network(# 1)
NET/10 Control 1st I/O # 0
Network # 1 # of Sta 6

	Setting 1	Setting 2	Common Parm
	B	B	B
Station	First Last	First Last	First Last
1	[0]-[FF]	[500]-[5FF]	0 - 1FF
2	[100]-[1FF]	[ ]-[ ]	200 - 2FF
3	[200]-[2FF]	[ ]-[ ]	300 - 3FF
4	[300]-[3FF]	[ ]-[ ]	400 - 4FF
5	[400]-[4FF]	[ ]-[ ]	500 - 5FF
6	[ ]-[ ]	[ ]-[ ]	600 - 6FF
	[ ]-[ ]	[ ]-[ ]	-
	[ ]-[ ]	[ ]-[ ]	-

Pgup:Prev PgDn:Next F8:B→W→ Esc:Close

Figure 9.21 Screen for setting station proper parameters

9.7 I/O Allocation

Module information is set beforehand so that installing or removing a module will not cause any shifts in I/O signals and save I/O numbers for empty slots.
Perform the setting only for the remote I/O stations which require I/O allocation. It is not necessary to set for all remote I/O stations.

(1) Setting items

(a) Number of slots

Sets number of slots for I/O allocation in remote I/O station.
Consider 8 slots are occupied even if a base module less than 8 slots is used.

(b) Slot

Displays slot that is set up.

```
8 (1-0)
| |  |
| |  └──────── Slot number (0 to 7) by the base module.
| └─────────── Base module number (0 to 7)
└───────────── Serial slot number (0 to 64)
```

(c) Type

Sets the module type.

- Blank........................In cases no I/O allocations are made.
- Empty
- Input ....Input module
- Output ....Output module
- Special ....Special function module

(d) Number of points

Sets number of points for a module.

- 0 point
- 16 points
- 32 points
- 48 points
- 64 points

(e) Model

Sets model name of the module. Since it is used just as a "comment", the setting is not mandatory.

Points

(1) Installation condition and I/O allocation

The system behavior differs depending on the combination of "installation condition" and "I/O allocation".

The combinations are shown in the table below.

Installation condition / I/O allocation	Input	Output	Special	Empty
Blank	O	O	O	*3
Empty	—	—	—	*4
Input	O *1	—	x	*4
Output	O *1	O *1	x	*4
Special	x	x	O *2	—

O: Normal operation

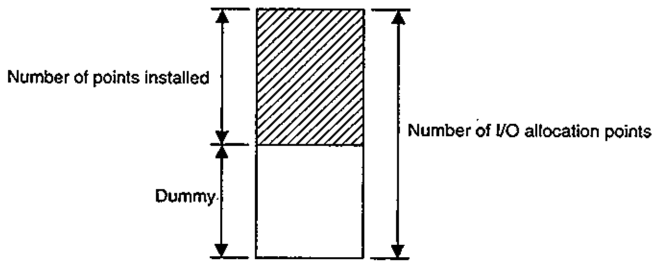
—: No operation

X: No operation (becomes RMT.E.)

*1: Number of installation points is different from the number of I/O allocation points.

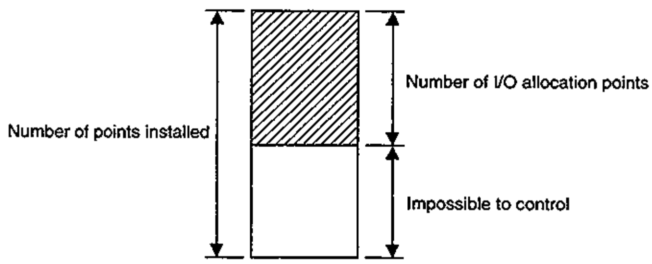
[Number of installation points < Number of I/O allocation points]

Points after installation points do not count (become dummy).



[Number of installation points > Number of I/O allocation points]

Points after I/O allocation points cannot be controlled.



*2: Applicable only when number of installation points is the same to the number of I/O allocation points. When the numbers are different, it does not operate normally.

*3: Treated as 16 points.

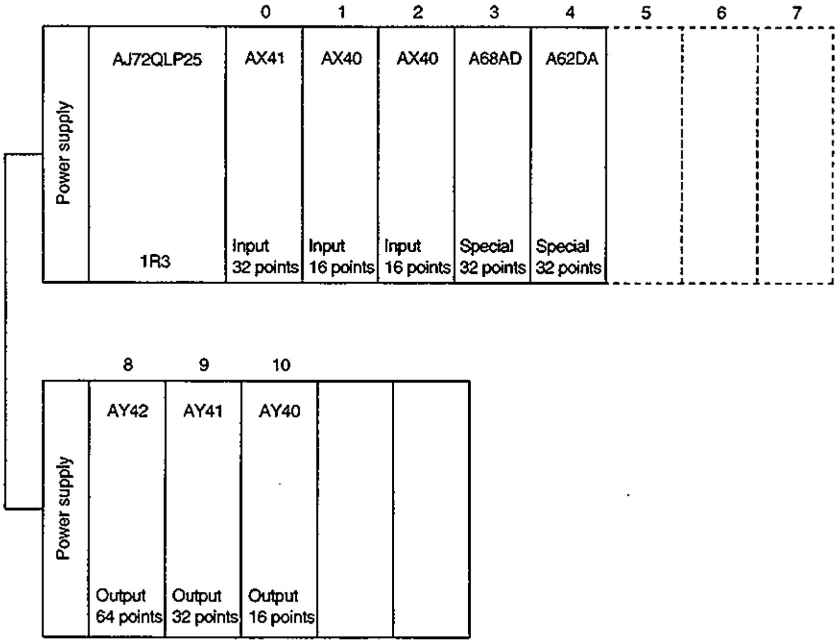
*4: Usage is different depending on I/O allocation.

- Empty............ To set it vacant 0 point.
- Input/Output..... Input/output module will be installed in the future.

(2) Set common parameters according to the contents set in I/O allocation.

(2) Setting example

For the remote I/O station (1R3) shown below, unused slot is set to "0 point".
The I/O allocation screens are shown in Figure 9.22 and 9.23.



[I/O (NET/10 Remote)(Setting:Slots)] Label:

Network(# 1)
NET/10 Remote 1st I/O # 40
Network # 1 Slave PC Sta 6

Sta #	Slot	Sta #	Slot	Sta #	Slot	Sta #	Slot	Sta #	Slot	Sta #	Slot	Sta #	Slot	Sta #	Slot
1	[ ]	9	----	17	----	25	----	33	----	41	----	49	----	57	----
2	[ ]	10	----	18	----	26	----	34	----	42	----	50	----	58	----
3	[11]	11	----	19	----	27	----	35	----	43	----	51	----	59	----
4	[ ]	12	----	20	----	28	----	36	----	44	----	52	----	60	----
5	[ ]	13	----	21	----	29	----	37	----	45	----	53	----	61	----
6	[ ]	14	----	22	----	30	----	38	----	46	----	54	----	62	----
7	----	15	----	23	----	31	----	39	----	47	----	55	----	63	----
8	----	16	----	24	----	32	----	40	----	48	----	56	----	64	----

Esc:Close

Figure 9.22 Screen for I/O alloccation (slot number setting)

[I/O (NET/10 Remote)]

Station	Slot	Type	Items	Type Name
3	0 (0-0)	(Inp)	(32Pt)	[AX41]
3	1 (0-1)	(Inp)	(16Pt)	[AX40]
3	2 (0-2)	(Inp)	(16Pt)	[AX40]
3	3 (0-3)	(Sp)	(32Pt)	[A68AD]
3	4 (0-4)	(Sp)	(32Pt)	[A62DA]
3	5 (0-5)	(Free)	(0Pt)	[ ]
3	6 (0-6)	(Free)	(0Pt)	[ ]
3	7 (0-7)	(Free)	(0Pt)	[ ]
3	8 (1-0)	(Out)	(64Pt)	[AY42]
3	9 (1-1)	(Out)	(32Pt)	[AY41]
3	10 (1-2)	(Out)	(16Pt)	[AY40]
-----	-------	( )	( )	[ ]
-----	-------	( )	( )	[ ]
-----	-------	( )	( )	[ ]

Esc:Close

Figure 9.23 Screen for I/O allocation

9.8 Transfer Parameters for Data Link

These parameters are for data transferring to other networks.
Refer to Section 8.1.6 for details of the function.
It can set up to 24 B settings and 24 W settings.

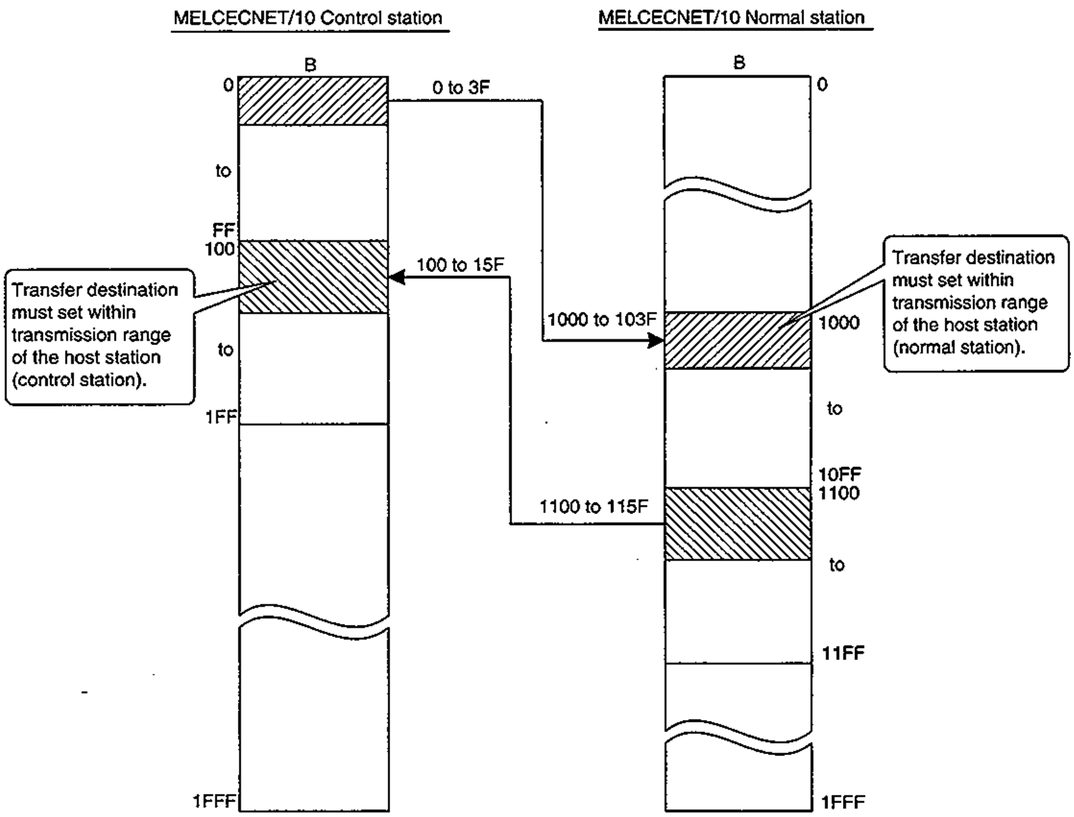
[TX Parameter for Data Link (V)] Label:

	Unit #1	Unit #2	Unit #3	Unit #4
	MELSECNET/10 Control	MELSECNET/10 Normal		
	W First Last	W First Last	W First Last	W First Last
1	[0] - [3F]→	→[1000] - [103F]	[ ] - [ ]	[ ] - [ ]
2	[100] - [15F]←	←[1100] - [115F]	[ ] - [ ]	[ ] - [ ]
3	[ ] - [ ]	[ ] - [ ]	[ ] - [ ]	[ ] - [ ]
4	[ ] - [ ]	[ ] - [ ]	[ ] - [ ]	[ ] - [ ]
5	[ ] - [ ]	[ ] - [ ]	[ ] - [ ]	[ ] - [ ]
6	[ ] - [ ]	[ ] - [ ]	[ ] - [ ]	[ ] - [ ]
7	[ ] - [ ]	[ ] - [ ]	[ ] - [ ]	[ ] - [ ]
8	[ ] - [ ]	[ ] - [ ]	[ ] - [ ]	[ ] - [ ]
9	[ ] - [ ]	[ ] - [ ]	[ ] - [ ]	[ ] - [ ]
10	[ ] - [ ]	[ ] - [ ]	[ ] - [ ]	[ ] - [ ]

Pgup:Prev PgDn:Next F3:B→W→ Esc:Close

Screen for setting transfer parameters for data link

The setting contents in the display above are as follows:



9.9 Routing Parameters

Set in order to perform the routing function. Refer to Section 8.2.2 for details of the function.

[Routing Paramrter] Label:

#	TX Dest Network #	Relay Network #	Relay Station #	Via Station #
1	[6]	[2]	[13]Sta	[ ]Sta
2	[7]	[2]	[9]Sta	[ ]Sta
3	[ ]	[ ]	[ ]Sta	[ ]Sta
4	[ ]	[ ]	[ ]Sta	[ ]Sta
5	[ ]	[ ]	[ ]Sta	[ ]Sta
6	[ ]	[ ]	[ ]Sta	[ ]Sta
7	[ ]	[ ]	[ ]Sta	[ ]Sta
8	[ ]	[ ]	[ ]Sta	[ ]Sta
9	[ ]	[ ]	[ ]Sta	[ ]Sta
10	[ ]	[ ]	[ ]Sta	[ ]Sta

Setting (# 1)
NET/10 Remote 1st I/O # 0
Network # 1 Slate PC Sta 7

Setting (# 2)
1st I/O #
Network # Slave PC Sta

Setting (# 3)
1st I/O #
Network # Slave PC Sta

Setting (# 4)
1st I/O #
Network # Slave PC Sta

Pgup:Prev PgDn:Next Esc:Close

Screen for setting routing parameters

Point
Routing parameters can read/write (change) contents by RTREAD/RTWRITE instructions. This is useful to change the intermediate station numbers.

10 Programming

10.1 Precautions when Programming

This section describes the items to note when creating a program.

10.1.1 Program overall

Create a program so that interlocking is performed by the status of the communicating station (cyclic transmission/transient transmission).
Use the summary of interlock signals shown below as a reference.

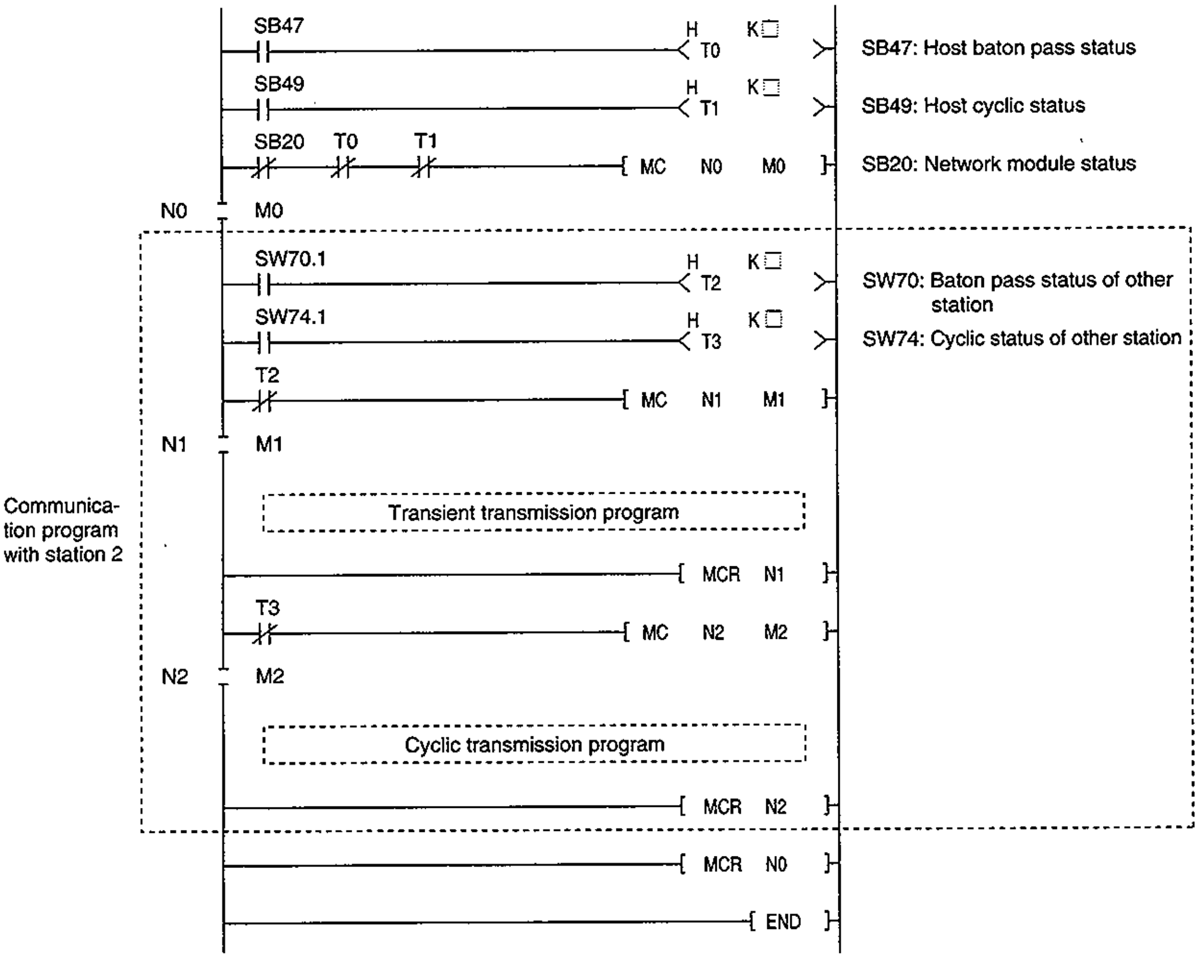
Interlock signals summary

Device	Details	OFF	ON
SB20	Indicates the status of the host network module.	Normal	Hardware error
SB47	Indicates the baton pass status of the host.	Baton pass in progress	Baton pass stopped
SB49	Indicates the cyclic transmission status of the host.	Cyclic transmission in progress	Cyclic transmission not performed
SB70	Indicates the baton pass status of the host.	Baton pass for all stations in progress	Station with stopped baton pass exists
SB74	Indicates the cyclic transmission status of the host.	Cyclic transmission for all stations in progress	Station with cyclic transmission not performed exists
SW70 to 73	Indicates the baton pass status of each station.	Baton pass in progress	Baton pass stopped
SW74 to 77	Indicates the cyclic transmission status of each station.	Cyclic transmission in progress	Cyclic transmission not performed

Baton pass indicates whether the communication is possible or not.

(1) For the inter-PC network

Perform the interlock by the link status of host and other stations as shown in the following program example.



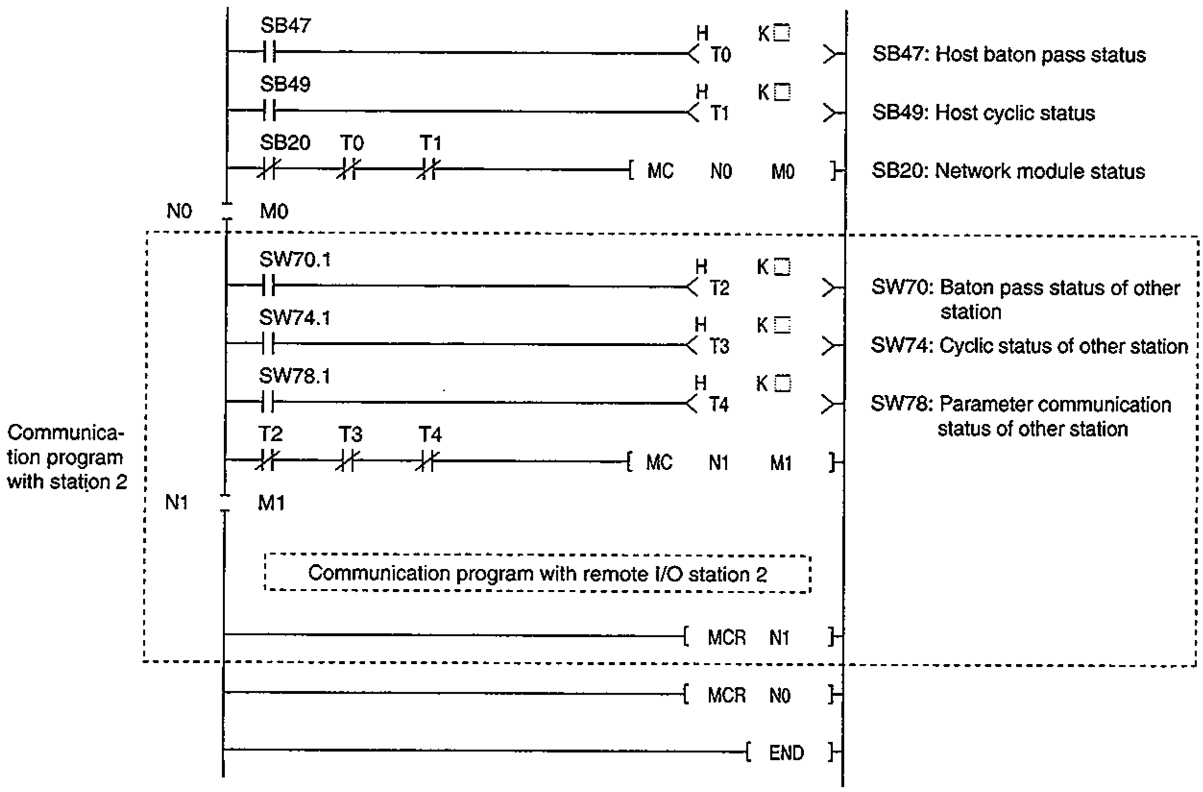
Set the value shown below for the timer constant K□:

Baton pass status (T0, T2)	(Link scan time x 6)+(Target station CPU sequence scan time x 2) or more
Cyclic transmission status (T1, T3)	(Link scan time x 3) or more

Reason: This is in order not to stop the control even if a momentary error is detected in the network module due to cable or noise conditions.
The multiple values, 6, 2, and 3, are mere estimates.

(2) For the remote I/O network

Perform the interlock from the link status of host and other stations as shown in the following program example.



Set the value shown below for the timer constant K□:

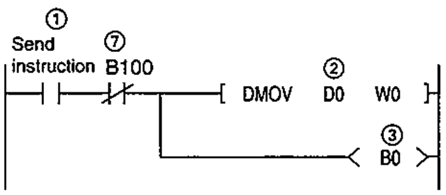
Baton pass status (T0, T2)	(Sequence scan time x 4) or more
Cyclic transmission status (T1, T3, T4)	(Sequence scan time x 3) or more

Reason: This is in order not to stop the control even if a momentary error is detected in the network module due to cable or noise conditions.
The multiple values, 4 and 3, are mere estimates.

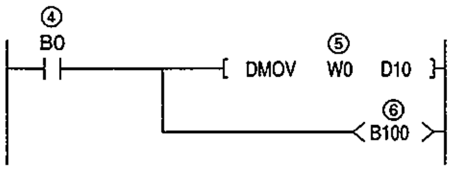
10.1.2 Cyclic transmission

When handling more than two words of data at once, new data and old data may reside at the same time. Set the program to perform handshaking by link relay (B).

Sending station



Receiving station



① Send instruction turns on.

② The contents of D0 and D1 are stored in W0 and W1.

③ When storage to W0 and W1 is complete, B0 for handshaking turns on.

④ B0 turns on.

⑤ The contents of W0 and W1 are stored in D10 and D11.

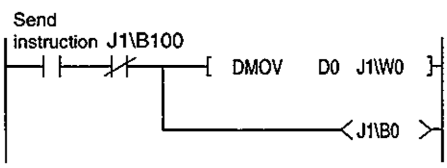
⑥ When storage to D10 and D11 are complete, B100 for handshaking turns on.

⑦ Turns off when the data is sent to the receiving station.

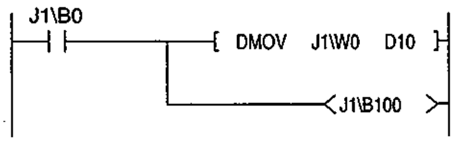
Point

Create a program as shown below for direct accessing.

Sending station



Receiving station



As discussed in Section 8.1.7, separate the refresh area and direct access area.
When usage is overlapped, the data may not be sent/received correctly.

10.1.3 Transient transmission

Interlocking is necessary for the transient transmission instructions as well.

(1) For SEND, RECV, READ, WRITE, REQ, ZNRD, and ZNWR instructions

The network module has eight channels to execute instructions. Eight channels can be used at once, but the same channel cannot be used by multiple instructions.

Create a program performing interlocking with link special relay (SB) so that multiple instructions cannot be executed.

The interlock signals for each instruction is shown below:

Instruction	ZNRD *1	ZNWR *2	—	—	—	—	—	—
	SEND, RECV, READ, WRITE, and REQ instructions							
	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	Channel 6	Channel 7	Channel 8
1st	SB030	SB032	SB034	SB036	SB038	SB03A	SB03C	SB03E
2nd	SB230	SB232	SB234	SB236	SB238	SB23A	SB23C	SB23E
3rd	SB430	SB432	SB434	SB436	SB438	SB43A	SB43C	SB43E
4th	SB630	SB632	SB634	SB636	SB638	SB63A	SB63C	SB63E

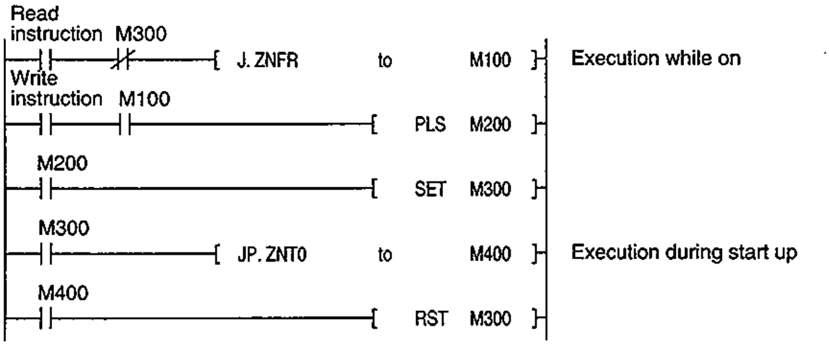
*1......ZNRD always uses channel 1.
*2 .....ZNWR always uses channel 2.

(2) ZNFR and ZNTO instructions

ZNFR and ZNTO instructions cannot be executed at the same time for the special function module installed to the same I/O number of the remote I/O station.

Create a program to perform interlocking so that an instruction cannot be executed until the previous instruction execution is complete.

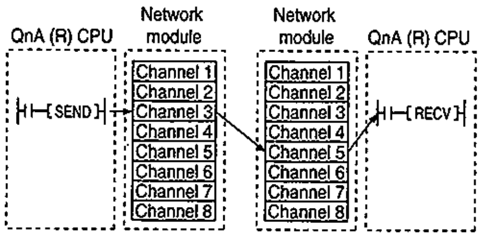
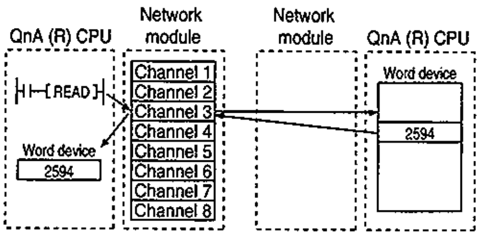
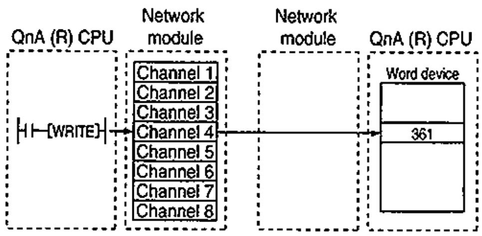
[Example] A program example for execution while on (read) and execution during startup (write) is shown below.



Point
ZNFR and ZNTO instructions are different from SEND, RECV, READ, WRITE, REQ, ZNRD and ZNWR instructions described in (1), in that link special relay (SB) to show the instruction execution status does not exist.

10.2 Link-dedicated Instructions

This section describes the instructions that can be used with MELSECNET/10. The overview of each instruction is shown below.

Instruction	Details	Instruction execution station (host)	Target station		
		Station type	Station type	PC CPU type: QnA(R) CPU	PC CPU type: Other than QnA(R)CPU
SEND RECV	Data is sent (SEND) and received (RECV) between the QnA(R)CPU stations. 	Control station Normal station Remote master station Multiple remote master station Parallel remote master station Multiple remote submaster station Parallel remote submaster station	Control station Normal station Remote master station Multiple remote master station Parallel remote master station Multiple remote submaster station Parallel remote submaster station	○	x
READ SREAD	Reads data from another station's word device. (With SREAD, device on target station can be turned on.) 	Control station Normal station Remote master station Multiple remote master station Parallel remote master station Multiple remote submaster station Parallel remote submaster station	Control station Normal station Remote master station Multiple remote master station Parallel remote master station Multiple remote submaster station Parallel remote submaster station	○	x
WRITE SWRITE	Writes data to another station's word device. (With SWRITE, device on target station can be turned on.) 	Control station Normal station Remote master station Multiple remote master station Parallel remote master station Multiple remote submaster station Parallel remote submaster station	Control station Normal station Remote master station Multiple remote master station Parallel remote master station Multiple remote submaster station Parallel remote submaster station	○	x

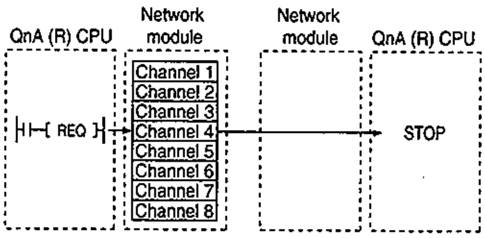
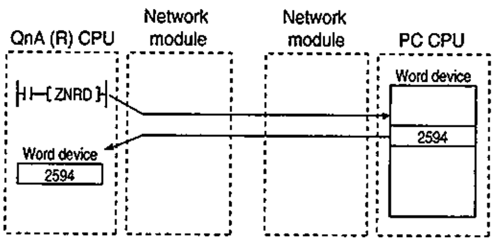
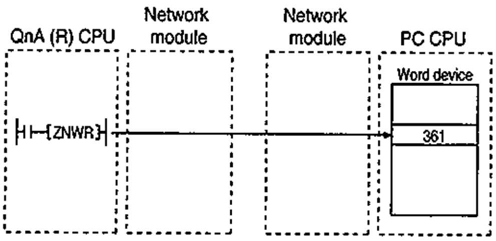
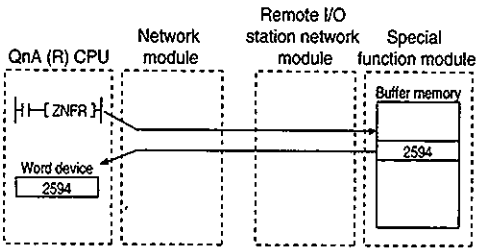
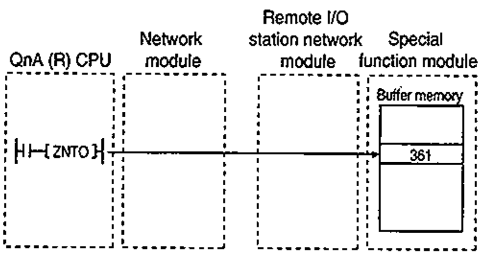
* Channels 1 to 8 are common areas for SEND/RECV/READ/WRITE/REQ instructions.

There are no operation differences in the instruction format JP.□ and GP.□, and J.□ and G.□.

DANGER **[Precautions for link dedicated instructions]**

(1) In a system where QnA(R)CPU and AnUCPU coexist, never execute the following instructions from the QnA(R)CPU to another station's AnUCPU.
The AnUCPU that has been executed such instructions results in "MAIN CPU DOWN" or "WDT ERROR," and may stop the operation.
① SEND ② READ ③ SREAD ④ WRITE ⑤ SWRITE ⑥ REQ

(2) When executing an instruction for all stations on the network, perform the execution only to the QnA(R)CPU using the group specification.

Instruction	Details	Instruction execution station (host): Station type	Target station: Station type	Target station: PC CPU type: QnA(R) CPU	Target station: PC CPU type: Other than QnA(R)CPU
REQ	Perform "remote RUN/STOP" "clock data read and write" for other stations. 	Control station Normal station Remote master station Multiple remote master station Parallel remote master station Multiple remote submaster station Parallel remote submaster station	Control station Normal station Remote master station Multiple remote master station Parallel remote master station Multiple remote submaster station Parallel remote submaster station	○	×
ZNRD	Read data from another station's word device. 	Control station Normal station Remote master station Multiple remote master station Parallel remote master station Multiple remote submaster station Parallel remote submaster station	Control station Normal station Remote master station Multiple remote master station Parallel remote master station Multiple remote submaster station Parallel remote submaster station	○	○
ZNWR	Write data to another station's word device. 	Control station Normal station Remote master station Multiple remote master station Parallel remote master station Multiple remote submaster station Parallel remote submaster station	Control station Normal station Remote master station Multiple remote master station Parallel remote master station Multiple remote submaster station Parallel remote submaster station	○	○
ZNFR	Read the buffer memory data of the special function module installed on a remote I/O station. 	Remote master station Multiple remote master station Parallel remote master station Multiple remote submaster station Parallel remote submaster station	Remote I/O station [AJ72QLP25 AJ72QBR15 AJ72LP25 AJ72BR15]	—	—
ZNTO	Write data to the buffer memory of the special function module installed on a remote I/O station. 	Remote master station Multiple remote master station Parallel remote master station Multiple remote submaster station Parallel remote submaster station	Remote I/O station [AJ72QLP25 AJ72QBR15 AJ72LP25 AJ72BR15]	—	—

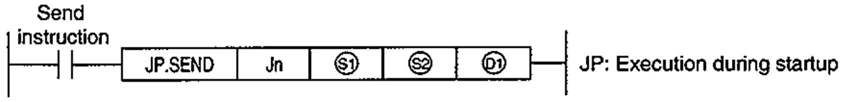
10.2.1 Send/receive data (SEND/RECV)

The instruction format and program example of the SEND/RECV instructions are described.

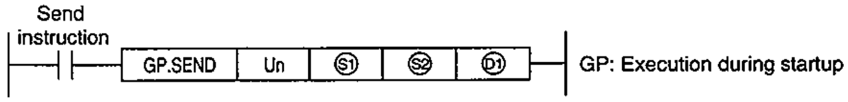
(1) Instruction format

(a) SEND instruction

[Network number specification]



[Network module first I/O number specification]



	Setting details	Setting range
Jn	Host network number	1 to 239 254: Network specified in the valid module for other station access
Un	Host network module's first I/O number Specify with two upper digits of the three digit I/O number.	0 to FEH
S1	Control data first storage device Specify the first device of the host where the control data is stored.	Word device *2
S2	Send data first storage device Specify the first device of the host where the send data is stored.	Word device *2
D1	Send completion device Specify the device to turn on one scan when the transmissionis complete. D1.........OFF: Incomplete ON: Complete D1 + 1 ...OFF: Normal ON: Error	Bit device *1 Word device bit specification *3

*1 : Bit device...................................X, Y, M, L, F, V, B

*2 : Word device ....T, C, D, W, ST, R, ZR

*3 : Word device bit specification.....Word device . Bit number

[Control data structure S1]

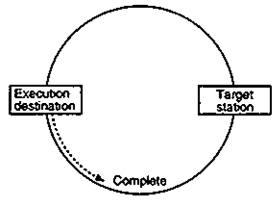
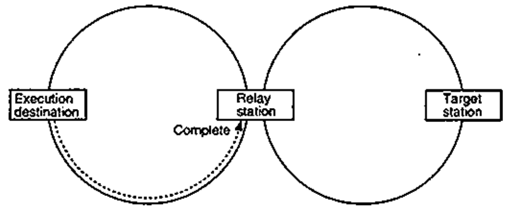
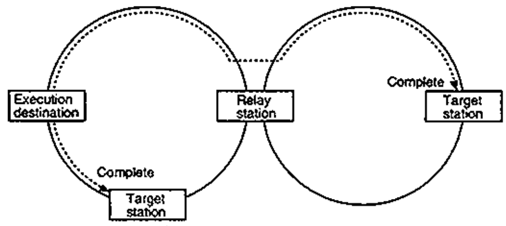
For details of each item, refer to the next page.

Device	Item	Data set	
		User (when executing)*1	System (when complete)*2
S1	Execution abnormal completion type	O	
S1 + 1	Completion status		O
S1 + 2	Host usage channel	O	
S1 + 3	Target station storage channel	O	
S1 + 4	Target station network number	O	
S1 + 5	Target station number	O	
S1 + 6	(Special function module station number)		
S1 + 7	Number of resend	O	O
S1 + 8	Delivery monitoring time	O	
S1 + 9	Send data length	O	
S1 + 10	(Unused)	—	—
S1 + 11	Clock set flag		O
S1 + 12	Year/month of abnormal completion		O
S1 + 13	Day/hour of abnormal completion		O
S1 + 14	Minute/second of abnormal completion		O
S1 + 15	Day of the week of abnormal completion		O
S1 + 16	Error detected network number		O
S1 + 17	Error detected station number		O

Used when the abnormal completion type is set to "clock data is set." (S1 + 11 to S1 + 17)

*1: Item set by sequence program *2: Item stored when instruction execution is complete

Control data details

Device	Item	Details
Ⓢ1	Execution abnormal completion type	b15 to b7 to b0 0 ② 0 ① ① Execution type (0th bit) 0 : No delivery confirmation When the target station is on the host network.....Complete when data is sent from host.  When the target station is on another network.....Complete when the data reaches the host network relay station.  1 : Delivery confirmation Complete when the data is stored in the specified channel of the target station  ② Abnormal completion (7th bit) Set the clock data set status for abnormal completion 0: Do not set clock data.....Do not set clock data when error occurs in Ⓢ1 +11 to Ⓢ1+17. 1: Set clock data................Set clock data when error occurs in Ⓢ1 +11 to Ⓢ1 +17.
Ⓢ1 + 1	Completion status	The instruction completion status is stored. 0 : Normal Other than 0 : Error (Refer to section 15.1 for error codes.)
Ⓢ1 + 2	Host usage channel	Specify the channel used by the host. 1 to 8 (channel)
Ⓢ1 + 3	Target station storage channel	Specify the channel of the target station to store data. 1 to 8 (channel)
Ⓢ1 + 4	Target station network number	Specify the target station network number 1 to 239: Network number 254 : When 254 is specified for Jn

Control data details

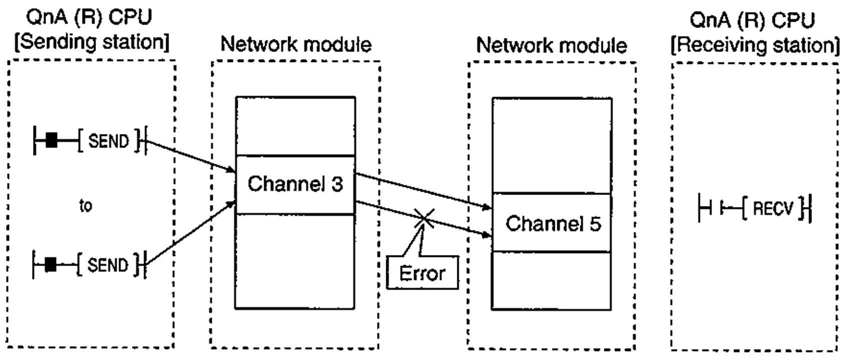
Device	Item	Details
(S1) + 5	Target station number	Specify the target station's station number. (Refer to Section 10.2 "Precautions for link dedicated instructions"). 1 to 64 : Station number 81_H to 89_H : Group specification (Can be set when the execution type specified in (S1) is "0: No delivery confirmation") FF_H : All stations on the target network number. (Can be set when the execution type specified in (S1) is "0: No delivery confirmation").
(S1) + 6	(Special function module station number)	Setting not necessary (Specification is valid when the instruction is executed from the special function module.)
(S1) + 7	Number of retries	① During instruction execution Valid when the execution type specified in (S1) is "1: Delivery confirmation". Set the number of retries for when transmission is not complete in the monitoring time specified in (S1)+8. 0 to 15 (times) ② When instruction is complete The number of retries (result) is stored. 0 to 15 (times)
(S1) + 8	Delivery monitoring time	Valid when the execution type specified in (S1) is "1: Delivery confirmation". Sets the monitoring time until the instruction completion. When instruction is not complete within the time, the instruction execution is retried for the number of retries specified in (S1)+7. 0 : 10 seconds 0 to 32767 : 1 to 32767 seconds
(S1) + 9	Send data length	Specify the number of send data for (S2) to (S2)+n. 1 to 480 (words)
(S1) + 10	(Unused)	—
(S1) + 11	Clock set flag	Valid/invalid status of the data in (S1)+12 to (S1)+17 is stored. 0: Invalid 1: Valid
(S1) + 12	Year/month of abnormal completion	The year (lower two digits) and month are stored in BCD code. b15 to b8: Year (00_H to 99_H) / b7 to b0: Month (01_H to 12_H)
(S1) + 13	Day/hour of abnormal completion	The day and hour are stored in BCD code. b15 to b8: Day (01_H to 31_H) / b7 to b0: Hour (00_H to 23_H)
(S1) + 14	Minute/second of abnormal completion	The minute and seconds are stored in BCD code. b15 to b8: Minute (00_H to 59_H) / b7 to b0: Second (00_H to 59_H)
(S1) + 15	Day of the week of abnormal completion	The day of the week is stored in BCD code. b15 to b8: 00_H / b7 to b0: Day of week (00_H to 06_H) 00_H (Sunday) to 06_H (Saturday)
(S1) + 16	Error detected network number	The network number of the station where the error was detected is stored. However, if the completion status of (S1)+1 is "channel in use ($F7C1_H$)", the network number is not stored. 1 to 239 (Network number)
(S1) + 17	Error detected number	The station number where the error was detected is stored. However, if the completion status of (S1)+1 is "channel in use ($F7C1_H$)", the network number is not stored. 1 to 64 (Station number)

Points

(1) To increase the data reliability, instructions with "delivery confirmation" is recommended for the execution type.

(2) When the execution type is set to "no delivery confirmation", even if the contents of the sent data is erroneous, the sending station completes the process normally if the communication ends normally.
Even if the contents of the transmission is normal, if the instruction is executed from multiple stations to the same station, "reception buffer full ($F222_H$)" error occurs in the target station, but the sending station completes the process normally.

(3) When sending data to the same channel of the receiving station, execute the instruction after the receiving station reads data with the RECV instruction.
It becomes an error when the second data is sent from the sending station to the same channel of receiving station where the first data was sent before the first data is read by RECV.



(b) RECV instruction

[Network number specification]

Receive command

JP.RECV	Jn	S1	D1	D2

JP: Execution during start up

[Network module first I/O number specification]

Receive command

GP.RECV	Un	S1	D1	D2

GP: Execution during start up

	Setting details	Setting range
Jn	Host network number	1 to 239 254: Network specified in the valid module for other station access
Un	Host network module's first I/O number Specify with two upper digits of the three digit I/O number.	0 to FE_H
S1	Control data first storage device Specify the first device of the host where the control data is stored.	Word device *2
D1	Receive data first storage device Specify the first device of the host where the received data is stored.	Word device *2
D2	Receive completion device Specify the device to turn on one scan when the receive is complete. D2..........OFF: Incomplete ON: Complete D2 + 1 ...OFF: Normal ON: Error	Bit device *1 Word device bit specification *3

*1 : Bit device..................................X, Y, M, L, F, V, B

*2 : Word device ....T, C, D, W, ST, R, ZR

*3 : Word device bit specification.....Word device . Bit number

[Control data structure S1]

For details of each item, refer to the next page.

Device	Item	Data set	
		User (when executing)*1	System (when complete)*2
S1	Execution abnormal completion type	○	
S1 + 1	Completion status		○
S1 + 2	Host storage channel	○	
S1 + 3	Sending station storage channel		○
S1 + 4	Sending station network number		○
S1 + 5	Sending station number		○
S1 + 6	(Unused)	—	—
S1 + 7	(Unused)	—	—
S1 + 8	Delivery monitoring time	○	
S1 + 9	Send data length		○
S1 + 10	(Unused)	—	—
S1 + 11	Clock set flag		○
S1 + 12	Year/month of abnormal completion		○
S1 + 13	Day/hour of abnormal completion		○
S1 + 14	Minute/second of abnormal completion		○
S1 + 15	Day of the week of abnormal completion		○

Used when the abnormal completion type is set to "clock data is set".

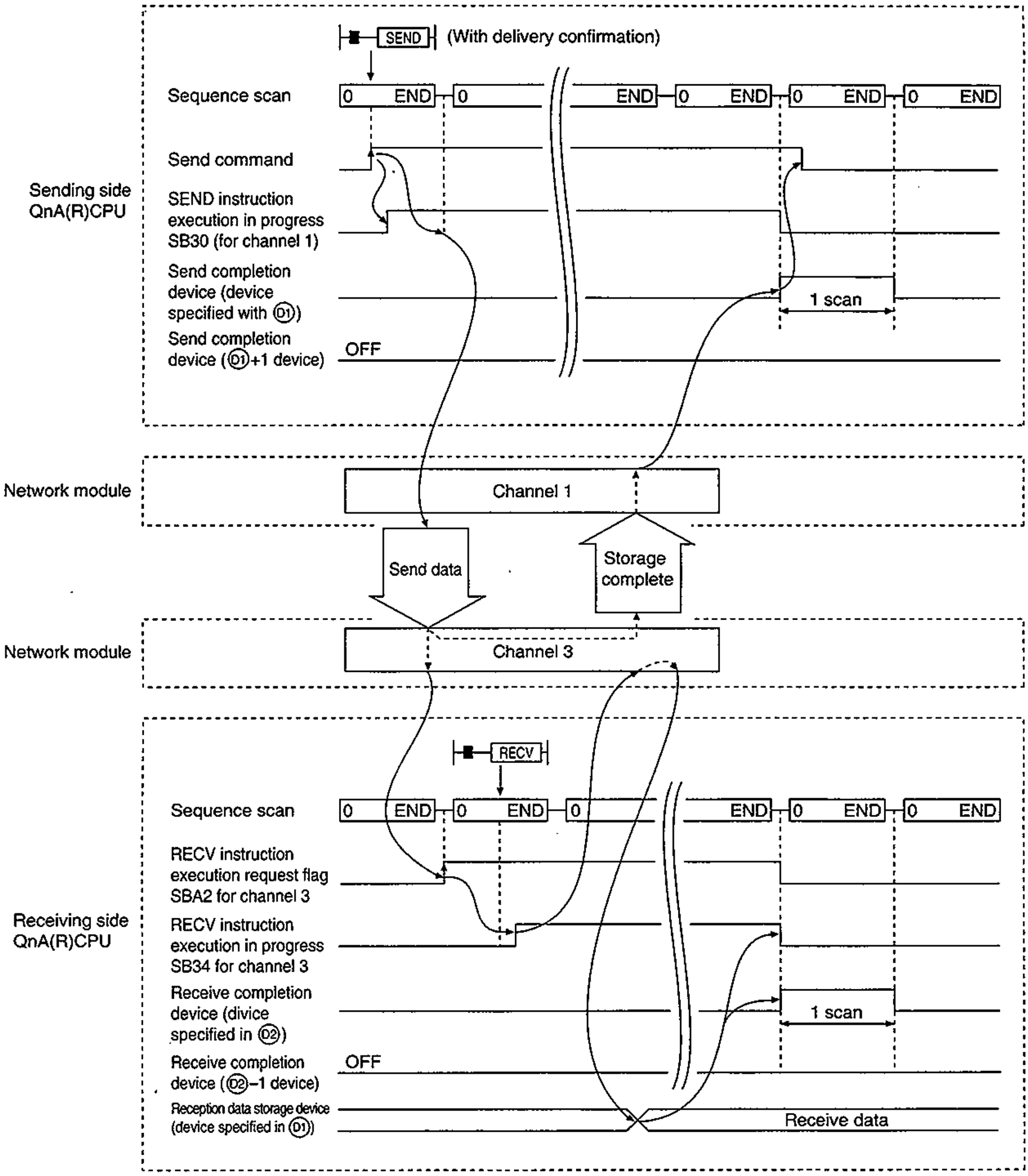
*1: Item set by sequence program *2: Item stored automatically when instruction execution is complete

Control data details

Device	Item	Details
(S1)	Abnormal completion type	b15 to b8 b7 b6 to b0 | 0 | to | 0 | ① | 0 | to | 0 | ① Abnormal completion type (7th bit) Set clock data set status for abnormal completion. 0 : Do not set the clock data.....Do not set the clock data for abnormal completion at (S1) + 11 to (S1) + 15. 1 : Set the clock data................Set the clock data for abnormal completion at (S1) + 11 to (S1) + 15.
(S1) + 1	Completion status	The status at instruction completion is stored. 0 : Normal Other than 0 : Error (Refer to Section 15.1 for error codes.)
(S1) + 2	Host station storage channel	Specify the channel where the data to read is stored. 1 to 8 (Channels)
(S1) + 3	Channel for sending station	Specify the channel the sending station used. 1 to 8 (Channels)
(S1) + 4	Sending station network number	Specify the network number of the sending station. 1 to 239: Network number
(S1) + 5	Sending station number	Specify the station number of the sending station. 1 to 64: Station numbers FF_H : All stations
(S1) + 6	(Unused)	——
(S1) + 7	(Unused)	——
(S1) + 8	Delivery monitoring time	Specify the monitoring time module instruction completion. When the instruction does not end within the time it will be an abnormal completion. 0 : 10 seconds 0 to 32767 : 1 to 32767 seconds
(S1) + 9	Receiving data length	The number of received data stored in (D1) to (D1)+n is stored. 1 to 480 (words)
(S1) + 10	(Unused)	——
(S1) + 11	Clock set flag	Valid/invalid status of the data in (S1)+12 to (S1)+15 is stored. 0: Invalid 1: Valid
(S1) + 12	Year/month of abnormal completion	The year (lower two digits) and month are stored in BCD code. b15 to b8 b7 to b0 | Year (00_H to 99_H) | Month (01_H to 12_H) |
(S1) + 13	Day/hour of abnormal completion	The day and hour are stored in BCD code. b15 to b8 b7 to b0 | Day (01_H to 31_H) | Hour (00_H to 23_H) |
(S1) + 14	Minute/second of abnormal completion	The minute and seconds are stored in BCD code. b15 to b8 b7 to b0 | Minute (00_H to 59_H) | Second (00_H to 59_H) |
(S1) + 15	Day of week of abnormal completion	The day of the week is stored in BCD code. b15 to b8 b7 to b0 | 00_H | Day of week (00_H to 06_H) | 00_H (Sunday) to 06_H (Saturday)

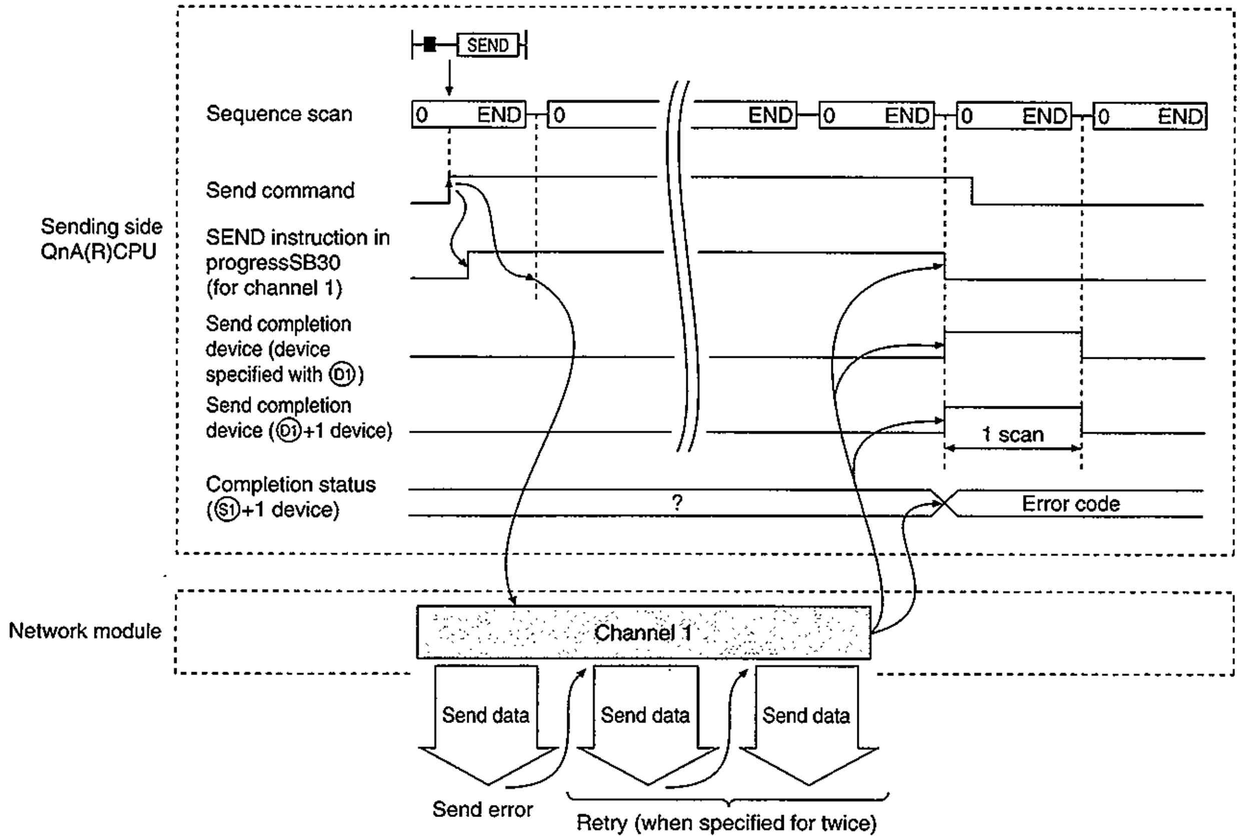
(2) Instruction execution timing

(a) When normal completion

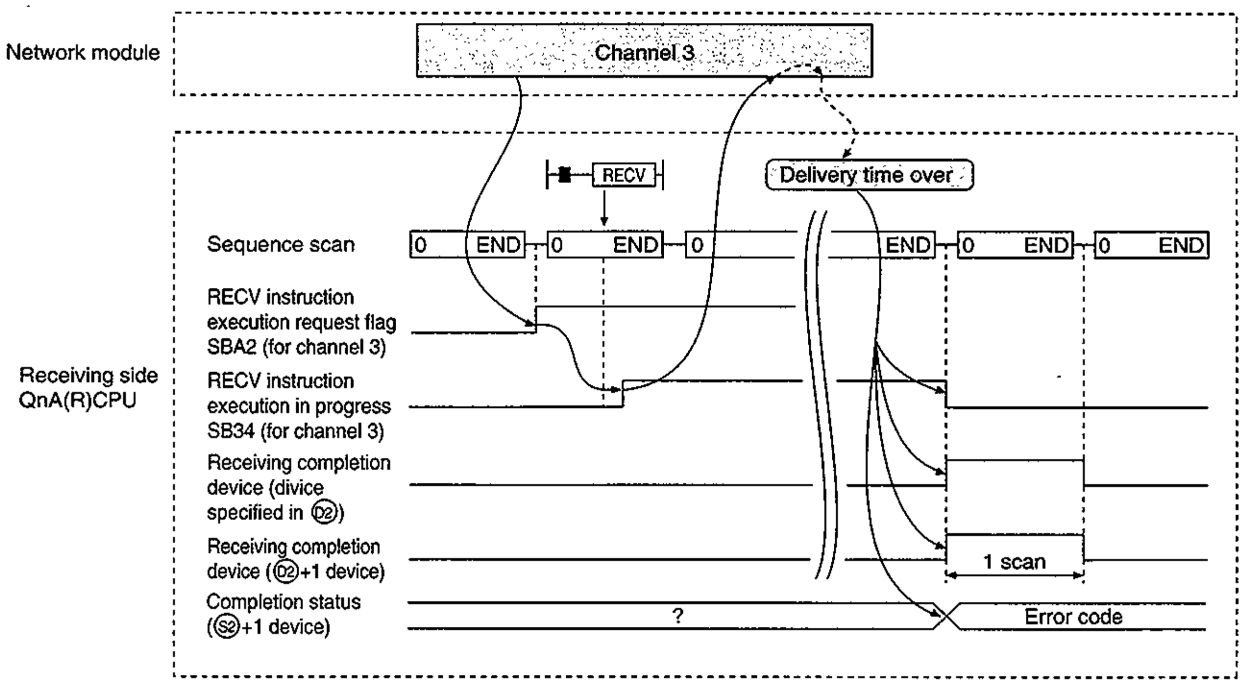


(b) When abnormal completion

1) SEND instruction

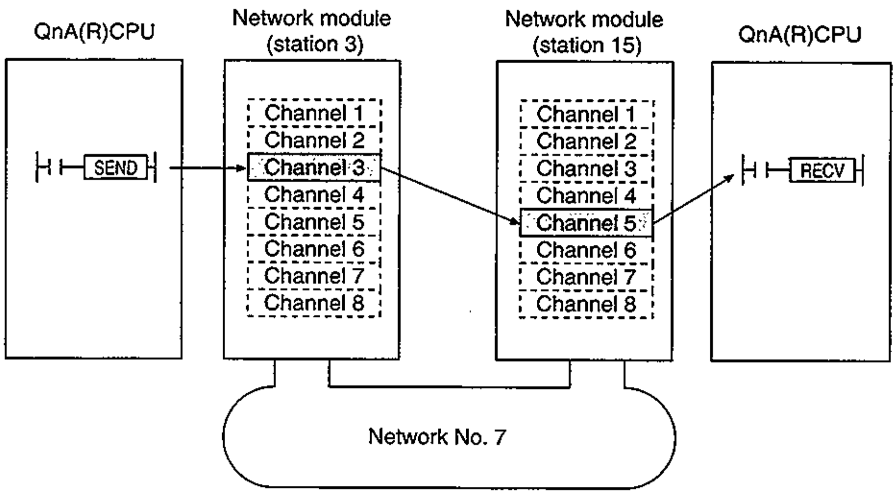


2) RECV instruction



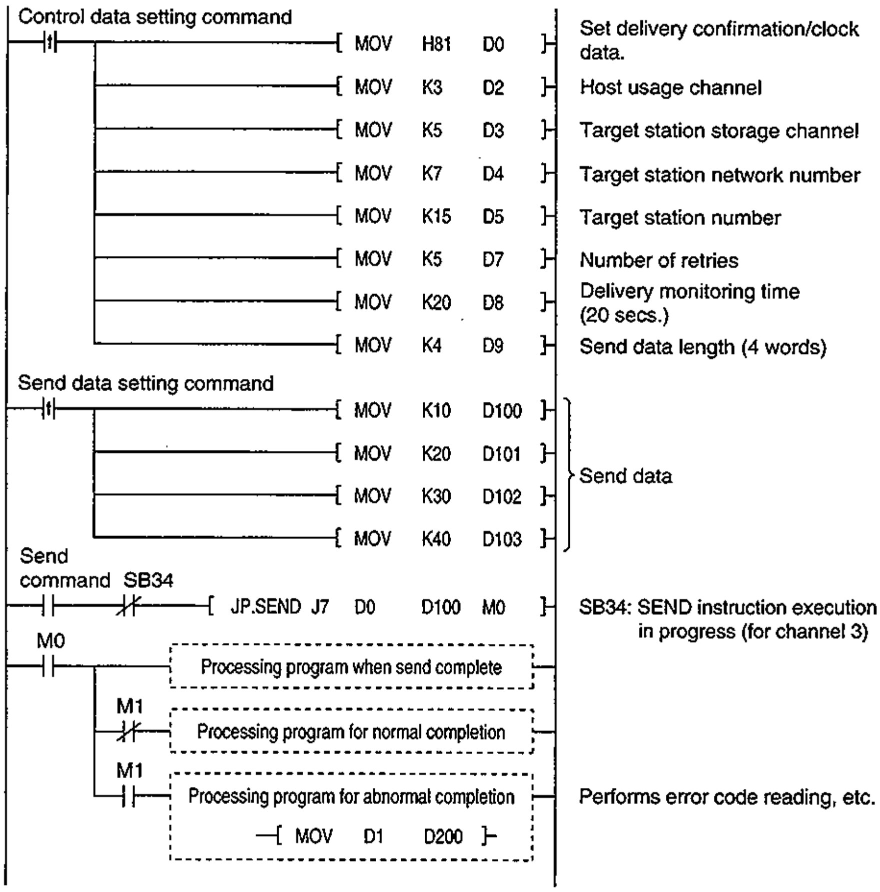
(3) Program example

Station 3 uses channel 3 with a SEND instruction, and sends data to station 15 using channel 5. When data is received at station 15, data is read from channel 5.

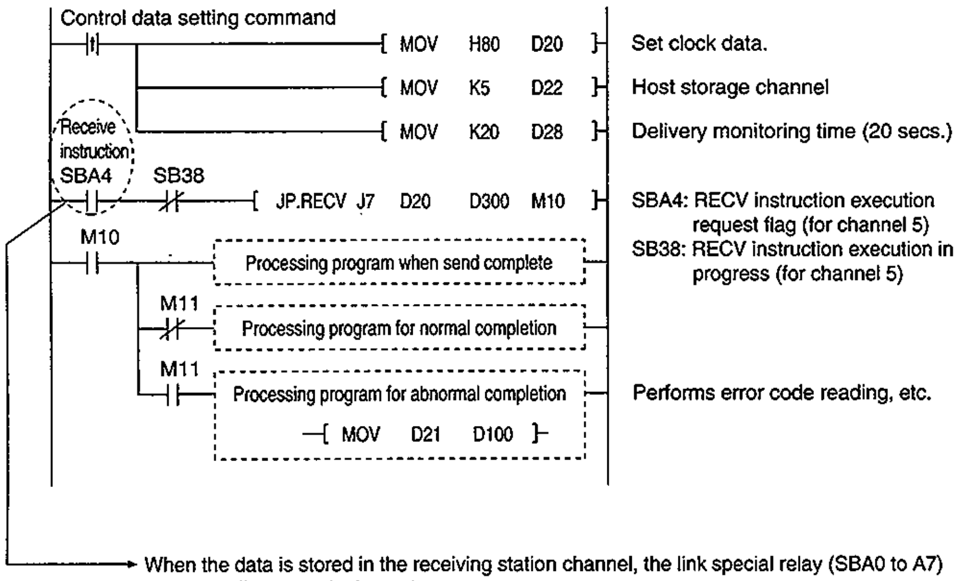


(a) Station 3 program (SEND instruction)

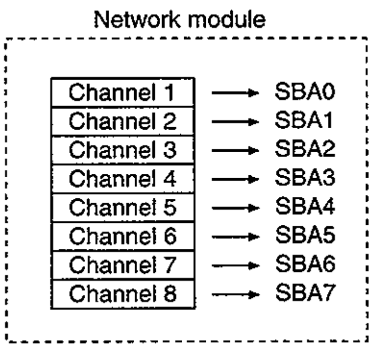
When actually using the program below, perform interlocking referring to Section 10.1.1 (1).



(b) Station 15 program (RECV instruction)
When actually using the program below, perform interlocking referring to Section 10.1.1 (1).



When the data is stored in the receiving station channel, the link special relay (SBA0 to A7) corresponding to each channel turns on.
Using this signal for receive command, data can be read automatically.
The signal turns off when RECV is complete.



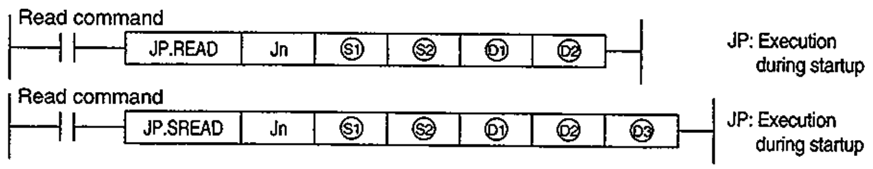
10.2.2 Read/write word device of other stations (READ/WRITE)

The instruction format and program example of the READ/WRITE instructions are described.

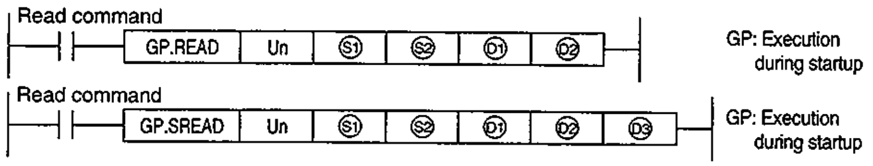
(1) Instruction format

(a) READ, SREAD instructions

[Network number specification]



[Network module first I/O number specification]



	Setting details	Setting range
Jn	Host network number	1 to 239 254: Network specified in the valid module for other station access
Un	Host network module's first I/O number Specify with two upper digits of the three digit I/O number.	0 to FE_H
S1	Control data first storage device Specify the first device of the host where the control data is stored.	Word device *2
S2	Read data first storage device (target station) Specify the first device of the target station where the data to read is stored.	Word device *2
D1	Read data first storage device (host) Specify the first device of the host where the data to read is stored.	Word device *2
D2	Read completion device (host) Specify the device of the host to turn on one scan when the read is complete. D2..........OFF: Incomplete ON: Complete D2 + 1 ...OFF: Normal ON: Error	Bit device *1 Word device bit specification *3
D3	Read notify device (target station) Specify the device of the target station to turn on one scan when the read is complete. (Can recognize data of target station has been read from another station.) D3..........OFF: Incomplete ON: Complete	Bit device *1 Word device bit specification *3

*1 : Bit device..................................X, Y, M, L, F, V, B

*2 : Word device ....T, C, D, W, ST, R, ZR

*3 : Word device bit specification.....Word device . Bit number

[Control data structure S1]

Device	Item	Data set	
		User (when executing)*1	System (when complete)*2
S1	Abnormal completion type	O	
S1 + 1	Completion status		O
S1 + 2	Host usage channel	O	
S1 + 3	(Unused)	—	—
S1 + 4	Target station network number	O	
S1 + 5	Target station number	O	
S1 + 6	(Special function module station number)		
S1 + 7	Number of resend	O	O
S1 + 8	Delivery monitoring time	O	
S1 + 9	Send data length	O	
S1 + 10	(Unused)	—	—
S1 + 11	Clock set flag		O
S1 + 12	Year/month of abnormal completion		O
S1 + 13	Day/hour of abnormal completion		O
S1 + 14	Minute/second of abnormal completion		O
S1 + 15	Day of the week of abnormal completion		O
S1 + 16	Error detected network number		O
S1 + 17	Error detected station number		O

Used when the abnormal completion type is set to "clock data is set".

*1 : Item set by sequence program
*2 : Item stored when instruction execution is complete

Control data details

Device	Item	Details
S1	Abnormal completion type	b15 to b7 to b0: [0 | ① | 0 | 1] ① Abnormal completion type (7th bit) Set clock data set status for abnormal completion. 0 : Do not set the clock data.....Do not set the clock data for abnormal completion at S1 + 11 to S1 + 17. 1 : Set the clock data...............Set the clock data for abnormal completion at S1 + 11 to S1 + 17.
S1 + 1	Completion status	The status at instruction completion is stored. 0 : Normal Other than 0 : Error (Refer to Section 15.1 for error codes.)
S1 + 2	Host station storage channel	Specify the channel used by the host. 1 to 8 (Channels)
S1 + 3	(Unused)	—
S1 + 4	Sending station network	Specify the network number of the sending station. 1 to 239 : Network number 254 : When 254 is specified by Jn.
S1 + 5	Target station number	Specify the station number of the sending station(Refer to section 10.2(precautions for link dedicated instruction)). 1 to 64 : Station numbers
S1 + 6	(Special function module station number)	Setting not necessary (Specification is valid when the instruction is executed from the special function module.)
S1 + 7	Number of resend	① During instruction execution Valid when the execution type specified in S1 is "1: Delivery confirmation". Set the number of retries for when transmission is not complete in the monitoring time specified in S1+8. 0 to 15 (times) ② When instruction is complete The number of retries (result) is stored. 0 to 15 (times)
S1 + 8	Delivery monitoring time	When the instruction is not complete within the time, the instruction execution is retried for the number of retries specified in S1+7. 0 : 10 seconds 1 to 32767 : 1 to 32767 seconds

Control data details

Device	Item	Details
(S1) + 9	Read data length	Specify the number of send data for S2 to S2+n. 1 to 480 (words)
(S1) + 10	(Unused)	—
(S1) + 11	Clock set flag	Valid/invalid status of the data in (S1)+12 to (S1)+17 is stored. 0: Invalid 1: Valid
(S1) + 12	Year/month of abnormal completion	The year (lower two digits) and month are stored in BCD code. b15 to b8: Year (00H to 99H) b7 to b0: Month (01H to 12H)
(S1) + 13	Day/hour of abnormal completion	The day and hour are stored in BCD code. b15 to b8: Day (01H to 31H) b7 to b0: Hour (00H to 23H)
(S1) + 14	Minute/second of abnormal completion	The minute and seconds are stored in BCD code. b15 to b8: Minute (00H to 59H) b7 to b0: Second (00H to 59H)
(S1) + 15	Day of week of abnormal completion	The day of the week is stored in BCD code. b15 to b8: 00H b7 to b0: Day of week (00H to 06H) 00H (Sunday) to 06H (Saturday)
(S1) + 16	Error detected network number	The network number of the station where the error was detected is stored. However, if the completion status of (S1)+1 is "channel in use (F7C1H)", the network number is not stored. 1 to 239 (Network number)
(S1) + 17	Error detected number	The station number where the error was detected is stored. However, if the completion status of (S1)+1 is "channel in use (F7C1H)", "the network number is not stored. 1 to 64 (Station number)

(b) WRITE, SWRITE instructions

[Network number specification]

Write command

| JP.WRITE | Jn | S1 | S2 | D1 | D2 |

JP: Execution during startup

Write command

| JP.SWRITE | Jn | S1 | S2 | D1 | D2 | D3 |

JP: Execution during startup

[Network module first I/O number specification]

Write command

| GP.WRITE | Un | S1 | S2 | D1 | D2 |

GP: Execution during startup

Write command

| GP.SWRITE | Un | S1 | S2 | D1 | D2 | D3 |

GP: Execution during startup

	Setting details	Setting range
Jn	Host network number	1 to 239 254: Network specified in the valid module for other station access
Un	Host network module's first I/O number Specify with two upper digits of the three digit I/O number.	0 to FE_H
S1	Control data first storage device Specify the first device of the host where the control data is stored.	Word device *2
S2	Write data first storage device (host) Specify the first device of the target station where the data to write is stored.	Word device *2
D1	Write data first storage device (target station) Specify the first device of the host where the data to write is stored.	Word device *2
D2	Write completion device (host) Specify the device of the host to turn on one scan when the write is complete. D2.........OFF: Incomplete ON: Complete D2 + 1 ...OFF: Normal ON: Error	Bit device *1 Word device bit specification *3
D3	Write notify device (target station) Specify the device of the target station to turn on one scan when the write is complete. (Can recognize data of target station has been write from another station.) D3.........OFF: Incomplete ON: Complete	Bit device *1 Word device bit specification *3

*1 : Bit device..................................X, Y, M, L, F, V, B

*2 : Word device ....T, C, D, W, ST, R, ZR

*3 : Word device bit specification.....Word device . Bit number

[Control data structure S1]

Refer to the next page for details of each item.

Device	Item	Data set: User (when executing)*1	Data set: System (when complete)*2
S1	Execution abnormal completion type	○	
S1 + 1	Completion status		○
S1 + 2	Host usage channel	○	
S1 + 3	(Unused)	—	—
S1 + 4	Target station network number	○	
S1 + 5	Target station number	○	
S1 + 6	(Special function module station number)		
S1 + 7	Number of resend	○	○
S1 + 8	Delivery monitoring time	○	
S1 + 9	Write data length	○	
S1 + 10	(Unused)	—	—
S1 + 11	Clock set flag		○
S1 + 12	Year/month of abnormal completion		○
S1 + 13	Day/hour of abnormal completion		○
S1 + 14	Minute/second of abnormal completion		○
S1 + 15	Day of the week of abnormal completion		○
S1 + 16	Error detected network number		○
S1 + 17	Error detected station number		○

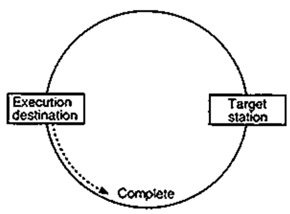
(S1 + 11 to S1 + 17) Used when the abnormal completion type is set to "clock data is set".

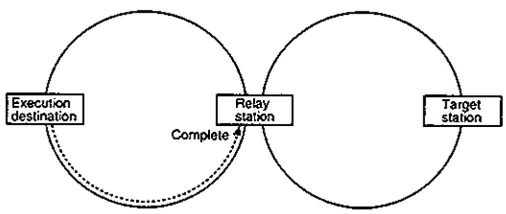
*1 : Item set by sequence program

*2 : Item stored when instruction execution is complete

Control data details

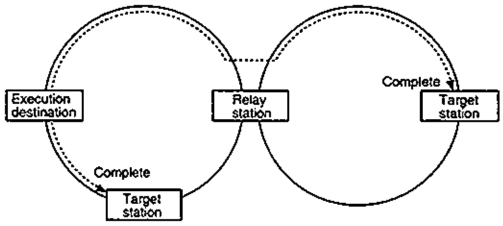
<table>
<tr><th>Device</th><th>Item</th><th>Details</th></tr>
<tr><td>S1</td><td>Execution abnormal completion type</td><td>
b15 to b7 to b0
[0 | 2 | 0 | 1]

1 Excution type (0 th bit)
0 : No delivery confirmation
When the target station is on the host network.....Complete when data is sent from host.


When the target station is on another network.....Complete when the data reaches the host network relay station.


</td></tr>
</table>

Control data details

Device	Item	Details
S1	Execution abnormal completion type	1 : Delivery confirmation Complete when the data is written to the target station.  ② Abnormal completion (7th bit) Set the clock data-set status for abnormal completion 0: Do not set clock data .....Do not set clock data when error occurs in S1+11 to S1+17. 1: Set clock data..................Set clock data when error occurs in S1+11 to S1+17.
S1 + 1	Completion status	The status at instruction completion is stored. 0 : Normal Other than 0 : Error (Refer to Section 15.1 for error codes.)
S1 + 2	Host station storage channel	Specify the channel used by the host. 1 to 8 (Channels)
S1 + 3	(Unused)	——
S1 + 4	Sending station network number	Specify the network number of the sending station. 1 to 239 : Network number 254 : When 254 is specified by Jn.
S1 + 5	Target station number	Specify the station number of the sending station.(Refer to section 10.2 "Precautions for link dedicated instructions") 1 to 64 : Station numbers 81_H to 89_H : Group specification (Can be set when the execution type specified in S1 is "0: No delivery confirmation".) FF_H : All stations on the target network number. (Can be set when the execution type specified in S1 is "0: No delivery confirmation".)
S1 + 6	(Special function module station number)	Setting not necessary (Specification is valid when the instruction is executed from the special function module.)
S1 + 7	Number of resend	① During instruction execution Valid when the execution type specified in S1 is "1: Delivery confirmation". Set the number of retries for when transmission is not complete in the monitoring time specified in S1+8. 0 to 15 (times) ② When instruction is complete The number of retries (result) is stored. 0 to 15 (times)
S1 + 8	Delivery monitoring time	Valid when the execution type specified in S1 is "1: Delivery confirmation". Sets the monitoring time until the instruction is complete. When the instruction is not complete within the time, the instruction execution is retried for the number of retries specified in S1+7. 0 : 10 seconds 1 to 32767 : 1 to 32767 seconds
S1 + 9	Send data length	Specify the number of write data for S2 to S2+n. 1 to 480 (words)
S1 + 10	(Unused)	——
S1 + 11	Clock set flag	Valid/invalid status of the data in S1+12 to S1+17 is stored. 0: Invalid 1: Valid
S1 + 12	Year/month of abnormal completion	The year (lower two digits) and month are stored in BCD code. b15 to b8 | b7 to b0 Year (00_H to 99_H) | Month (01_H to 12_H)
S1 + 13	Day/hour of abnormal completion	The day and hour are stored in BCD code. b15 to b8 | b7 to b0 Day (01_H to 31_H) | Hour (00_H to 23_H)

Control data details

Device	Item	Details
S1 + 14	Minute/second of abnormal completion	The minute and seconds are stored in BCD code. b15 to b8 b7 to b0 Minute (00H to 59H) | Second (00H to 59H)
S1 + 15	Day of week of abnormal completion	The day of the week is stored in BCD code. b15 to b8 b7 to b0 00H | Day of week (00H to 06H) 00H (Sunday) to 06H (Saturday)
S1 + 16	Error detected network number	The network number of the station where the error was detected is stored. However, if the completion status of S1+1 is "channel in use (F7C1H)", the network number is not stored. 1 to 239 (Network number)
S1 + 17	Error detected station number	The station number where the error was detected is stored. However, if the completion status of S1+1 is "channel in use (F7C1H)", the network number is not stored. 1 to 64 (Station number)

Points

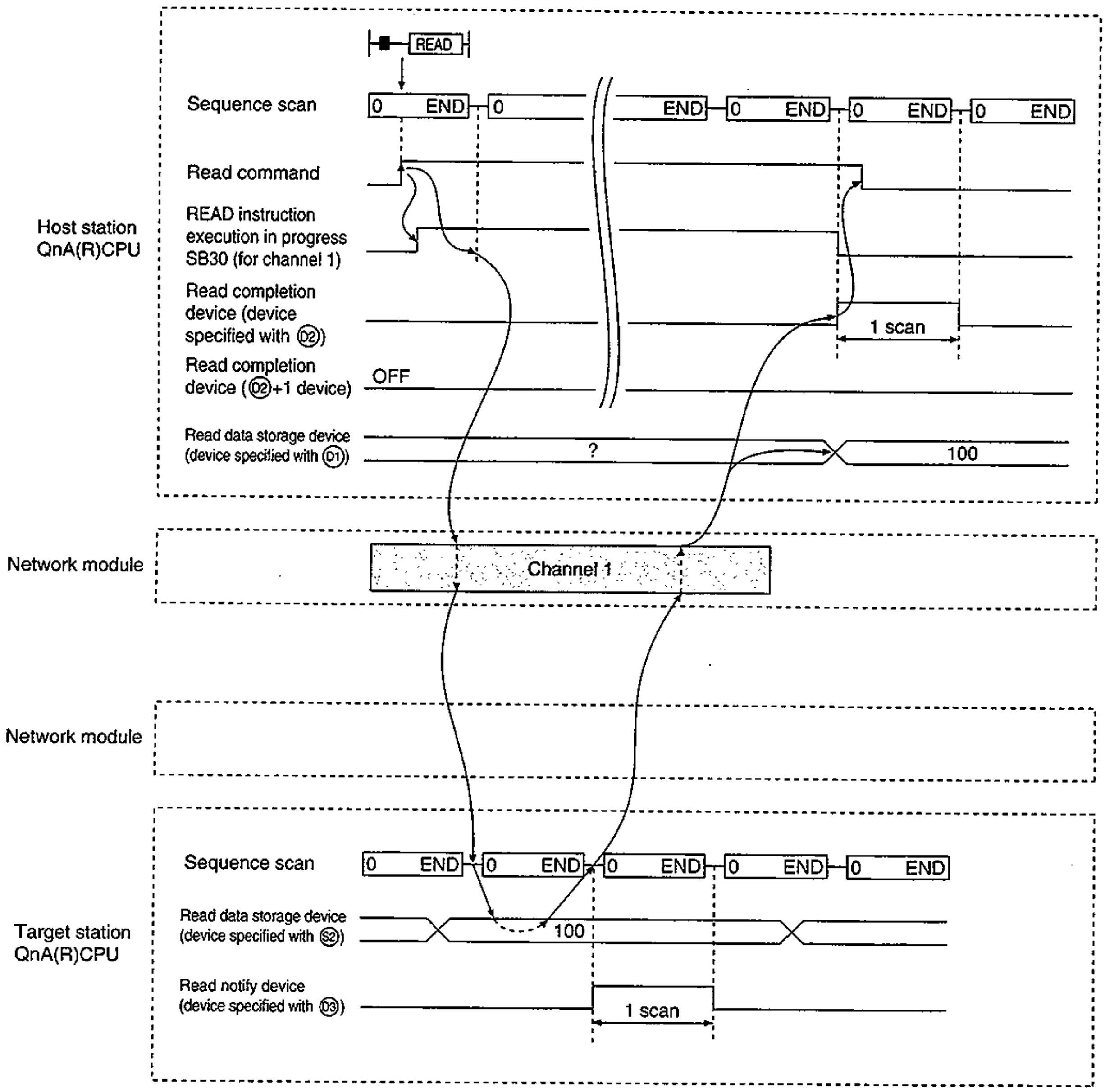
(1) To increase the data reliability, instructions with "delivery confirmation" is recommended for the execution type.

(2) When the execution type is set to "no delivery confirmation", even if the contents of the sent data is erroneous, the sending station completes the process normally if the communication completes normally.
Even if the contents of the transmission is normal, if the instruction is executed from multiple stations to the same station, "reception buffer full (F222H)" error occurs in the target station, but the sending station completes normally.

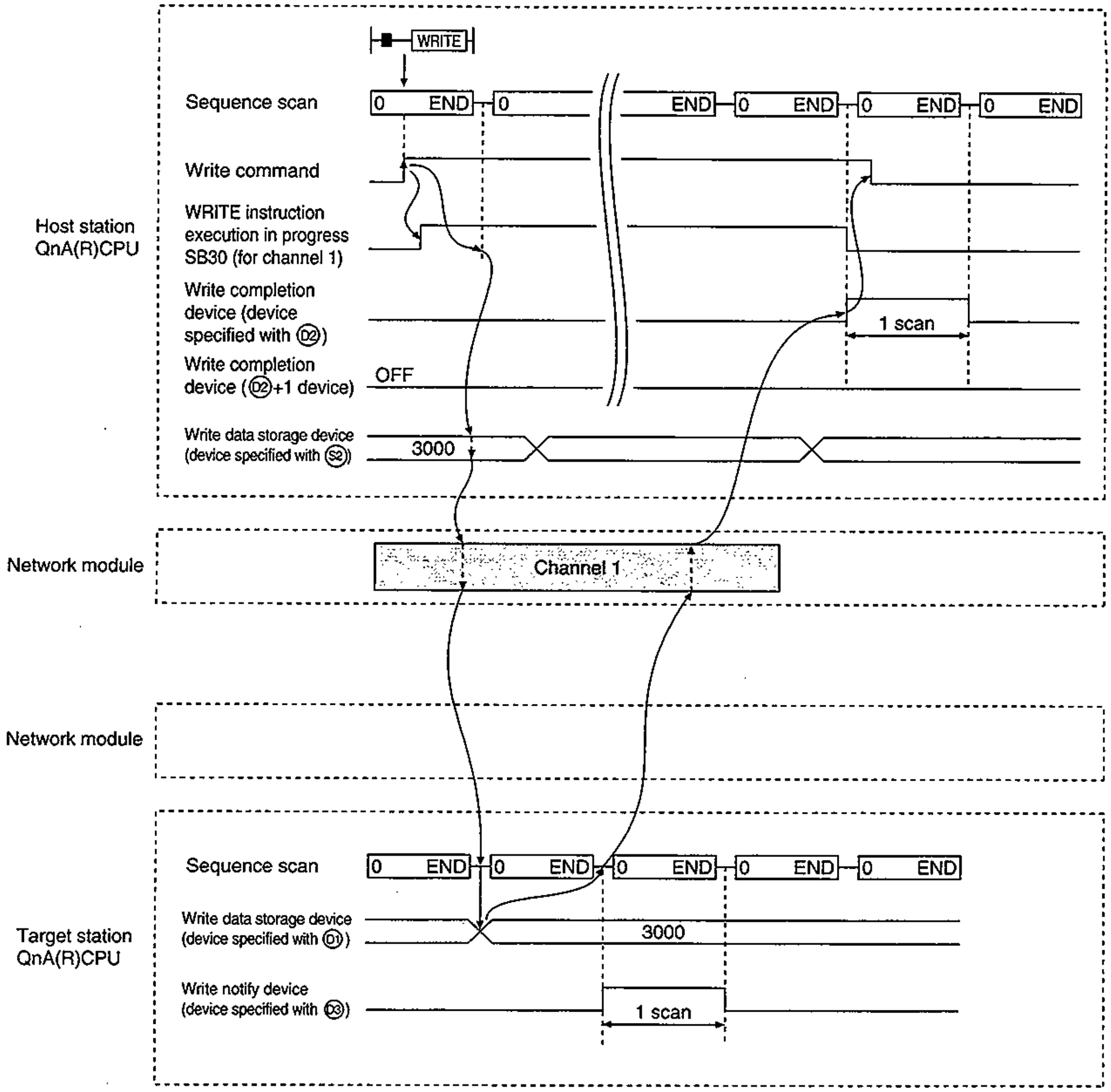
(2) Instruction execution timing

(a) When normal completion

1) READ instruction

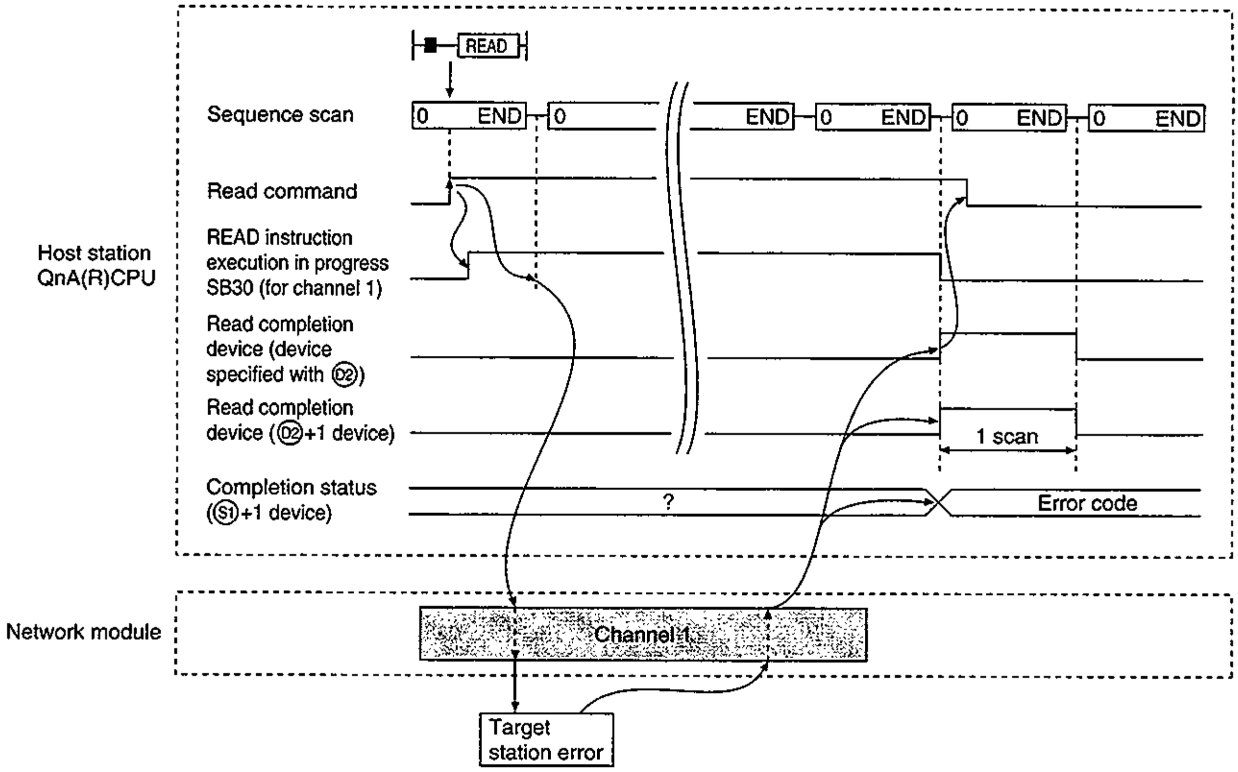


2) WRITE instruction

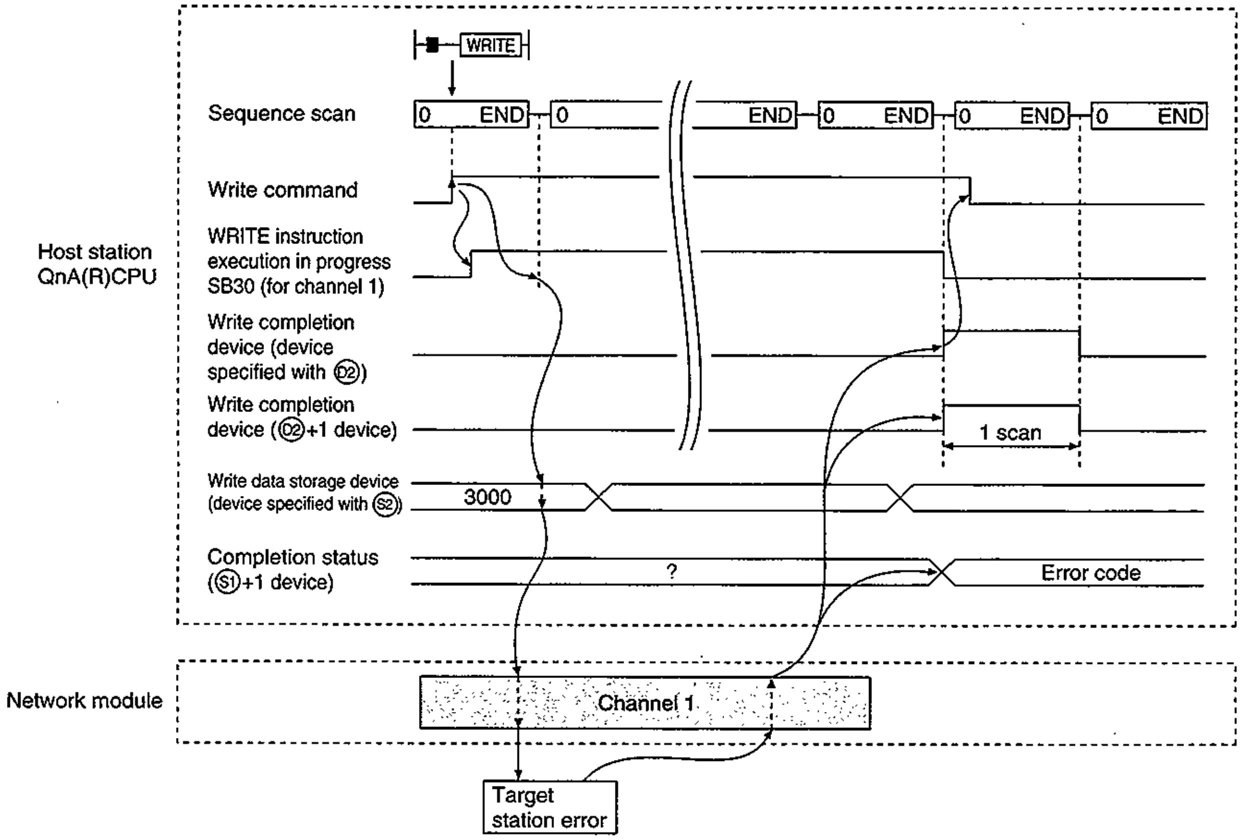


(b) When abnormal completion

1) READ instruction

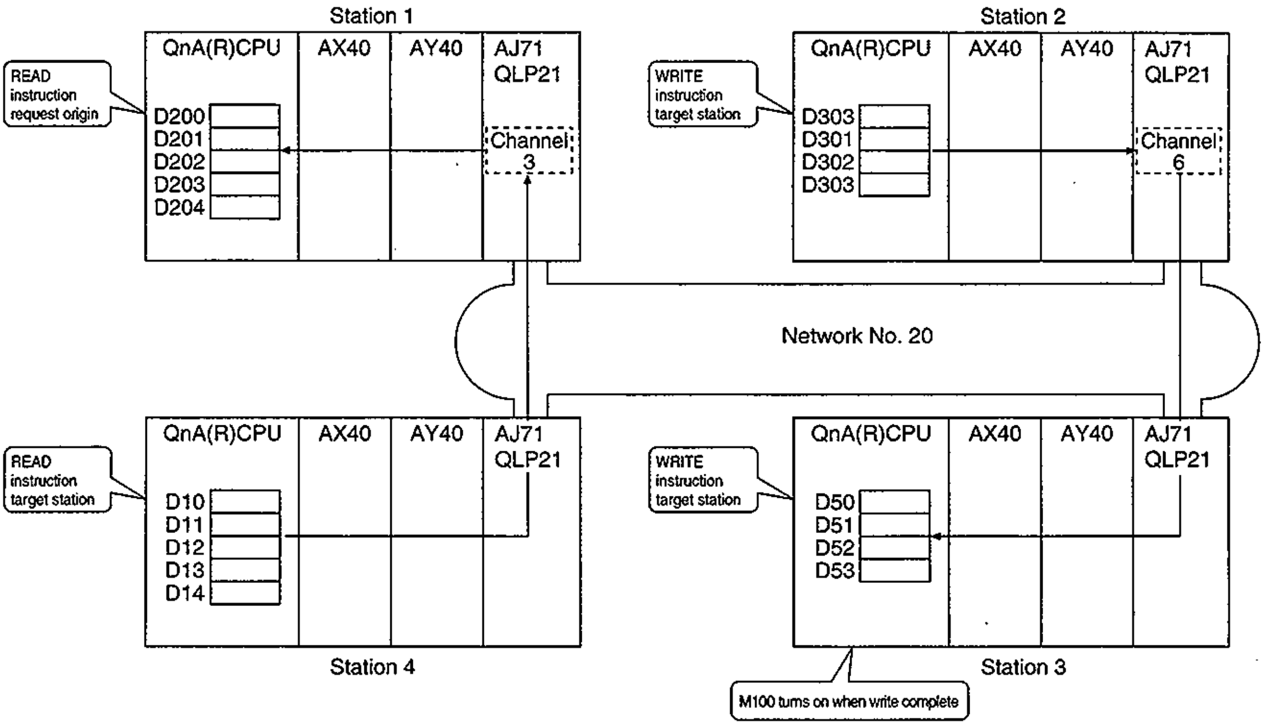


2) WRITE instruction

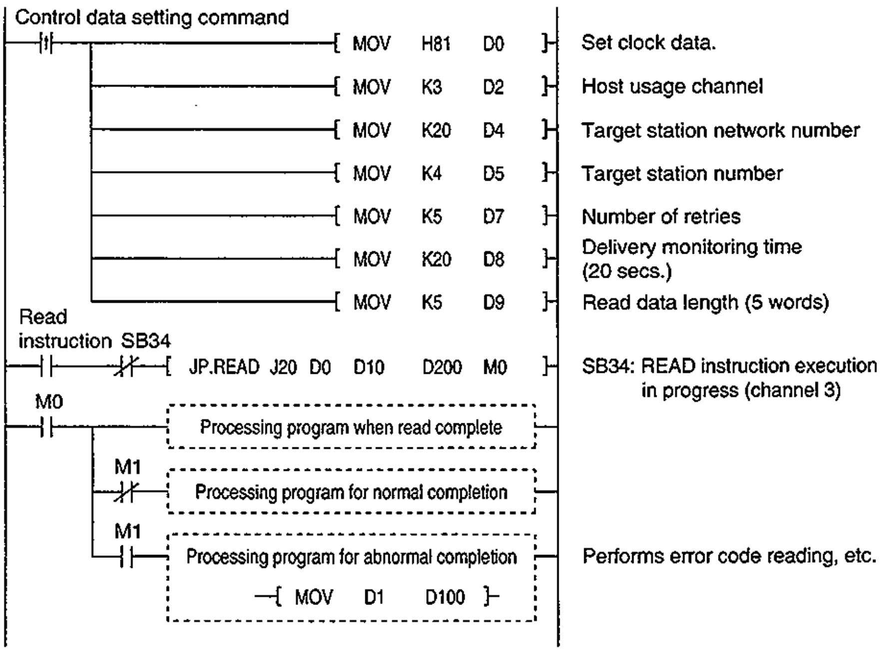


(3) **Program example**

Read data from D10 to 14 of station 4 to D200 to 204 of station 1.
Write the data stored in D300 to 303 of station 2 to D50 to 53 of station 3.

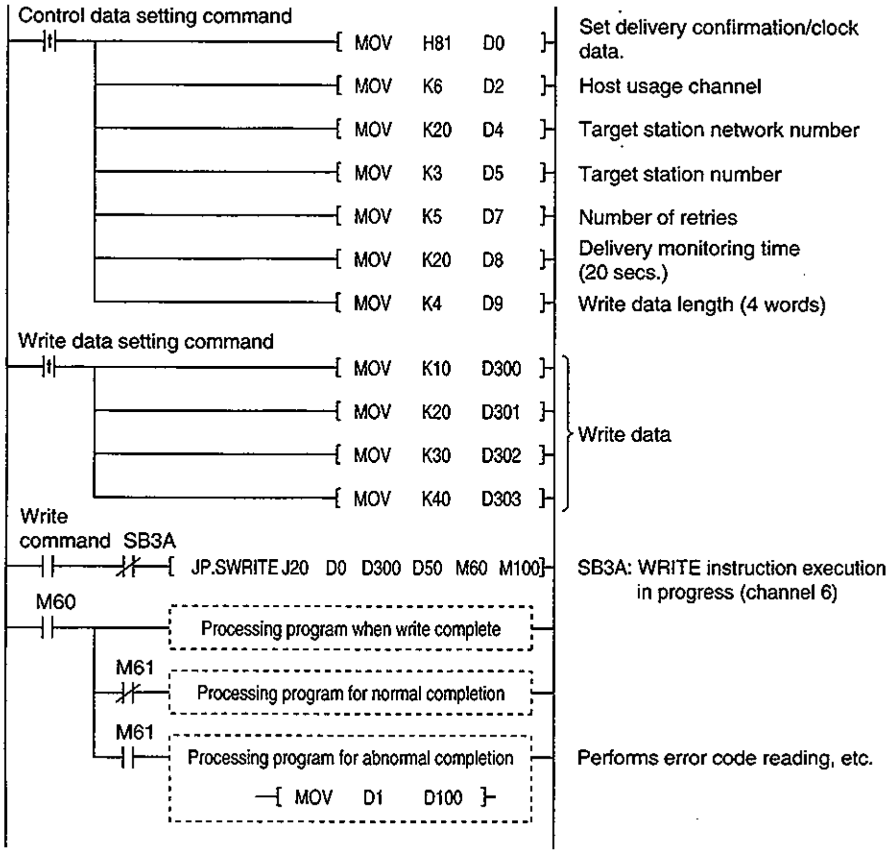


(a) Station 1 program (READ instruction)
When actually using the program below, perform interlocking by referring to Section 10.1.1 (1).



(b) Station 2 program (WRITE instruction)

When actually using the program below, perform interlocking by referring to Section 10.1.1 (1).



10.2.3 Transient request to other stations (REQ)

The instruction format and program example of the REQ instructions is described.

(1) Instruction format

[Network number specification]

Execution command

J.REQ	Jn	S1	S2	D1	D2

J: Execution while on

Execution command

JP.REQ	Jn	S1	S2	D1	D2

JP: Execution during startup

[Network module first I/O number specification]

Execution command

G.REQ	Un	S1	S2	D1	D2

G: Execution while on

Execution command

GP.REQ	Un	S1	S2	D1	D2

GP: Execution during startup

	Setting details	Setting range
Jn	Host network number	1 to 239 254: Network specified in the valid module for other station access
Un	Host network module's first I/O number Specify with two upper digits of the three digit I/O number.	0 to FE$_H$
S1	Control data first storage device Specify the first device of the host where the control data is stored.	Word device *2
S2	Request data first storage device (host) Specify the first device of the target station where the request data is stored.	Word device *2
D1	Response data first storage device (host) Specify the first device of the host where the response data is stored.	Word device *2
D2	Execution completion device (host) Specify the device of the host to turn on one scan when the execution is complete. D2..........OFF: Incomplete ON: Complete D2 + 1 ...OFF: Normal ON: Error	Bit device *1 Word device bit specification *3

*1 : Bit device..................................X, Y, M, L, F, V, B

*2 : Word device ....T, C, D, W, ST, R, ZR

*3 : Word device bit specification.....Word device . Bit number

[Control data structure Ⓢ1]

Device	Item	Data set: User (when executing)*1	Data set: System (when complete)*2	
Ⓢ1	Abnormal completion type	O		
Ⓢ1 + 1	Completion status		O	
Ⓢ1 + 2	Host usage channel	O		
Ⓢ1 + 3	(Target station I/O number)			
Ⓢ1 + 4	Target station network number	O		
Ⓢ1 + 5	Target station number	O		
Ⓢ1 + 6	(Special function module station number)			
Ⓢ1 + 7	Number of resend	O	O	
Ⓢ1 + 8	Delivery monitoring time	O		
Ⓢ1 + 9	Request data length	O		
Ⓢ1 + 10	Response data length	O		
Ⓢ1 + 11	Clock set flag		O	Used when the abnormal completion type is set to "clock data is set".
Ⓢ1 + 12	Year/month of abnormal completion		O	
Ⓢ1 + 13	Day/hour of abnormal completion		O	
Ⓢ1 + 14	Minute/second of abnormal completion		O	
Ⓢ1 + 15	Day of the week of abnormal completion		O	
Ⓢ1 + 16	Error detected network number		O	
Ⓢ1 + 17	Error detected station number		O	

*1 : Item set by sequence program
*2 : Item stored when instruction execution is complete

Control data details

Device	Item	Details
Ⓢ1	Abnormal completion type	b15 to b7 to b4 to b0: [0 | ① | 0 | 1 | 0 | 1] ① Abnormal completion type (7th bit) Set clock data set status for abnormal completion. 0 : Do not set the clock data.....Do not set the clock data for abnormal completion at Ⓢ1 + 11 to Ⓢ1 + 17. 1 : Set the clock data................Set the clock data for abnormal completion at Ⓢ1 + 11 to Ⓢ1 + 17.
Ⓢ1 + 1	Completion status	The status at instruction completion is stored. 0 : Normal Other than 0 : Error (Refer to Section 15.1 for error codes.)
Ⓢ1 + 2	Host station storage channel	Specify the channel used by the host. 1 to 8 (Channels)
Ⓢ1 + 3	(Target station I/O number)	Setting not necessary (Specification is valid when the instruction is executed from the special function module.)
Ⓢ1 + 4	Sending station network number	Specify the network number of the sending station. 1 to 239 : Network number 254 : When 254 is specified by Jn.
Ⓢ1 + 5	Target station number	Specify the station number of the sending station.(Refer to Section 10.2 "Precautions for link dedicated instructions") 1 to 64 : Station numbers 81_H to 89_H: Group specification (Only clock data write and remote RUN/STOP can be executed.) FF_H : All stations on the target network number. (Only clock data write and remote RUN/STOP can be executed.)
Ⓢ1 + 6	(Special function module station number)	Setting not necessary (Specification is valid when the instruction is executed from the special function module.)
Ⓢ1 + 7	Number of resend	① During instruction execution Valid when the execution type specified in Ⓢ1 is "1: Delivery confirmation". Set the number of retries for when transmission is not complete in the monitoring time specified in Ⓢ1+8. 0 to 15 (times) ② When instruction is complete The number of retries (result) is stored. 0 to 15 (times)

Control data details

Device	Item	Details
S1 + 8	Delivery monitoring time	When the instruction is not complete within the time, the instruction execution is retried for the number of retries specified in S1+7. 0 : 10 seconds 1 to 32767 : 1 to 32767 seconds
S1 + 9	Request data length	Specify the number of request data (words). 2 : Read clock data 7 : Write clock data 4 : Remote RUN/STOP
S1 + 10	Response data length	Number of response data (words) is stored. 4 : Read clock data
S1 + 11	Clock set flag	Valid/invalid status of the data in S1+12 to S1+17 is stored. 0: Invalid 1: Valid
S1 + 12	Year/month of abnormal completion	The year (lower two digits) and month are stored in BCD code. b15 to b8 | b7 to b0 Year (00H to 99H) | Month (01H to 12H)
S1 + 13	Day/hour of abnormal completion	The day and hour are stored in BCD code. b15 to b8 | b7 to b0 Day (01H to 31H) | Hour (00H to 23H)
S1 + 14	Minute/second of abnormal completion	The minute and seconds are stored in BCD code. b15 to b8 | b7 to b0 Minute (00H to 59H) | Second (00H to 59H)
S1 + 15	Day of week of abnormal completion	The day of the week is stored in BCD code. b15 to b8 | b7 to b0 00H | Day of week (00H to 06H) 00H (Sunday) to 06H (Saturday)
S1 + 16	Error detected network number	The network number of the station where the error was detected is stored. However, if the completion status of S1+1 is "channel in use (F7C1H)", the network number is not stored. 1 to 239 (Network number)
S1 + 17	Error detected number	The station number where the error was detected is stored. However, if the completion status of S1+1 is "channel in use (F7C1H)", the network number is not stored. 1 to 64 (Station number)

[Clock data reading/request data for writing/response data S2, D1]

1) Request data

Device	Item	Details	Read clock data	Write clock data
S2	Request type	0001H: Read clock data 0011H: Write clock data	○	○
S2 + 1	Subrequest type	0002H: Read clock data 0001H: Write clock data	○	○
S2 + 2	Change pattern	Specifies which item in the clock data S2+3 to S2+6 to write b15 to b7 b6 b5 b4 b3 b2 b1 b0 | 0 | to | 0 | | | | | | | | 0: Do not change 1: Change b0 → Year b1 → Month b2 → Day b3 → Hour b4 → Minute b5 → Second b6 → Day of week		○
S2 + 3	Month/year of change	The year (lower two digits) and month are stored in BCD code. b15 to b8 b7 to b0 | Month (01H to 12H) | Year (00H to 99H) |		○
S2 + 4	Hour/day of change	The day and hour are stored in BCD code. b15 to b8 b7 to b0 | Hour (00H to 23H) | Day (01H to 31H) |		○
S2 + 5	Second/minute of change	The minute and second are stored in BCD code. b15 to b8 b7 to b0 | Second (00H to 59H) | Minute (00H to 59H) |		○
S2 + 6	Day of the week of change	The day of the week is stored in BCD code. b15 to b8 b7 to b0 | 00H | Day of week (00H to 06H) | → 00H (Sunday) to 06H (Saturday)		○

2) Response data

Device	Item	Details	Read clock data	Write clock data
D1	Month/year of change	The year (lower two digits) and month are stored in BCD code. b15 to b8 b7 to b0 | Month (01H to 12H) | Year (00H to 99H) |	○	
D1 + 1	Hour/day of change	The day and hour are stored in BCD code. b15 to b8 b7 to b0 | Hour (00H to 23H) | Day (01H to 31H) |	○	
D1 + 2	Second/minute of change	The minute and second are stored in BCD code. b15 to b8 b7 to b0 | Second (00H to 59H) | Minute (00H to 59H) |	○	
D1 + 3	Day of the week of change	The day of the week is stored in BCD code. b15 to b8 b7 to b0 | 00H | Day of week (00H to 06H) | → 00H (Sunday) to 06H (Saturday)	○	

> **Point**
>
> When the system protect is in effect for the target station QnA(R)CPU (system protect switch SW5 is on), clock data read/write cannot be performed.

[Request/response data at remote RUN/STOP (S2)]

1) Request data

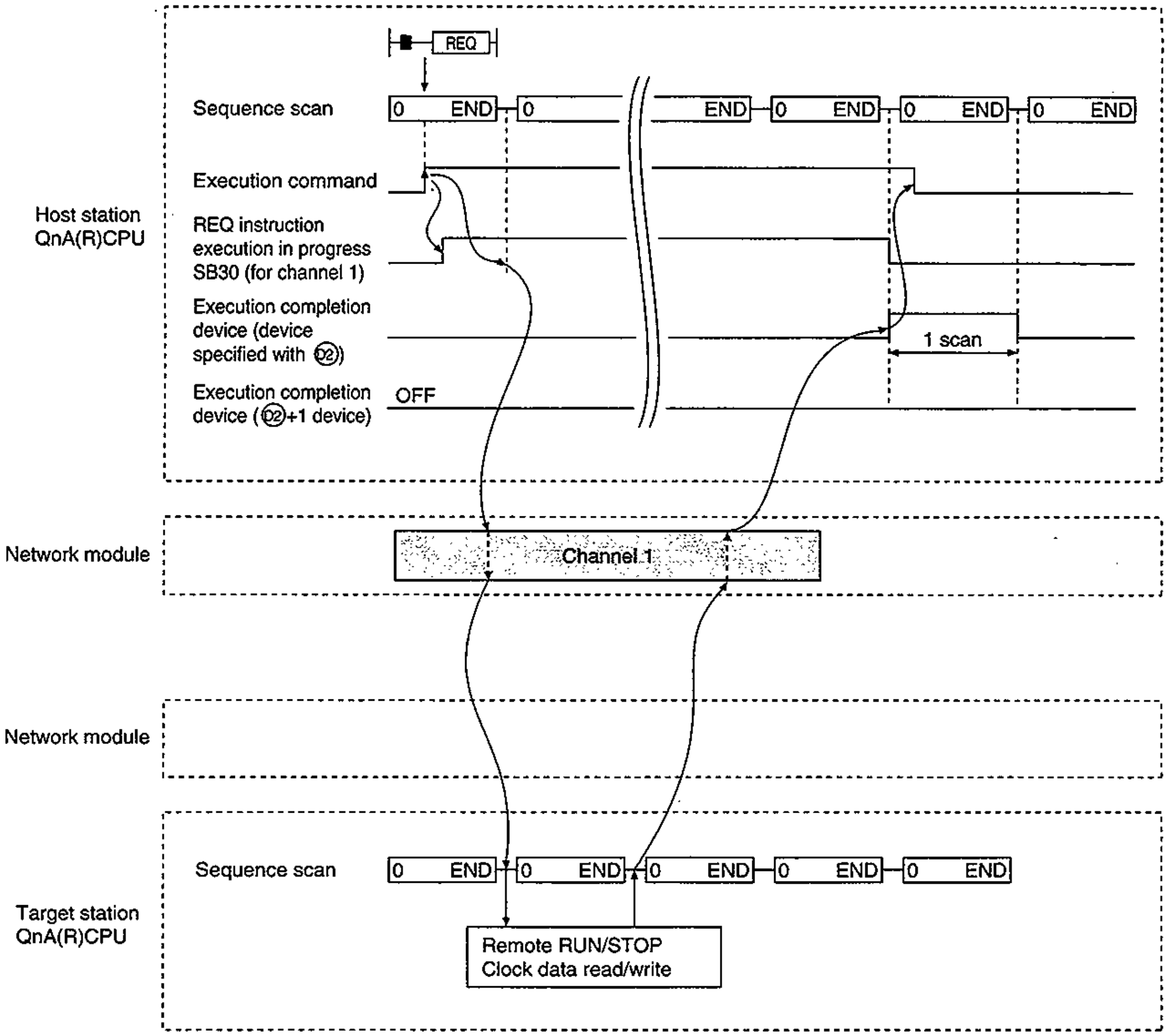
Device	Item	Details	Remote RUN	Remote STOP
(S2)	Request type	0010H	O	O
(S2) + 1	Subrequest type	0001H: Remote RUN 0002H: Remote STOP	O	O
(S2) + 2	Mode	Specifies whether the remote RUN is executed forcefully. 0001H : No force execution 0003H : Force execution (setting for remote STOP) (The forceful execution allows a forceful remote RUN from another station when the station that performed the remote STOP cannot perform remote RUN.)	O	O
(S2) + 3	Clear mode	Specifies the QnACPU device memory status when remote RUN is performed. 0000H : Do not clear (setting for remote STOP) 0001H : Clear (excludes latch range) 0002H : Clear (includes latch range)	O	O

2) Response data does not exist.

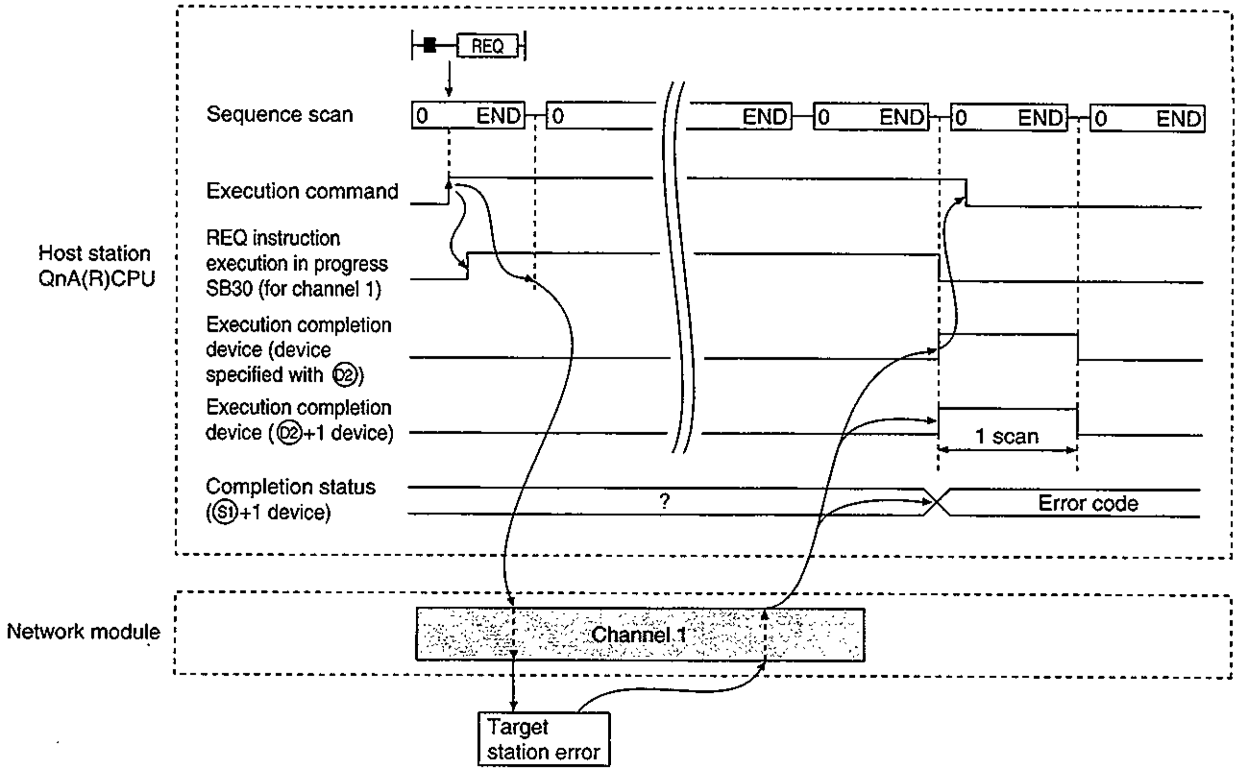
> **Points**
>
> (1) The remote RUN/STOP is valid when the target station QnA(R)CPU's RUN/STOP key switch is at "RUN".
>
> (2) Remote RUN/STOP cannot be performed when the target station QnA(R)CPU has system protect on (system protect switch SW5 is on).
>
> (3) When remote STOP/PAUSE has been set by another station for the target station, it cannot be set to RUN if the (S2)+1 mode is set to "no force execution (0001H)".
>
> (4) When the QnA(R)CPU of the remote RUN/STOP target station is reset, the remote RUN/STOP data is erased.

(2) Instruction execution timing

(a) When normal completion

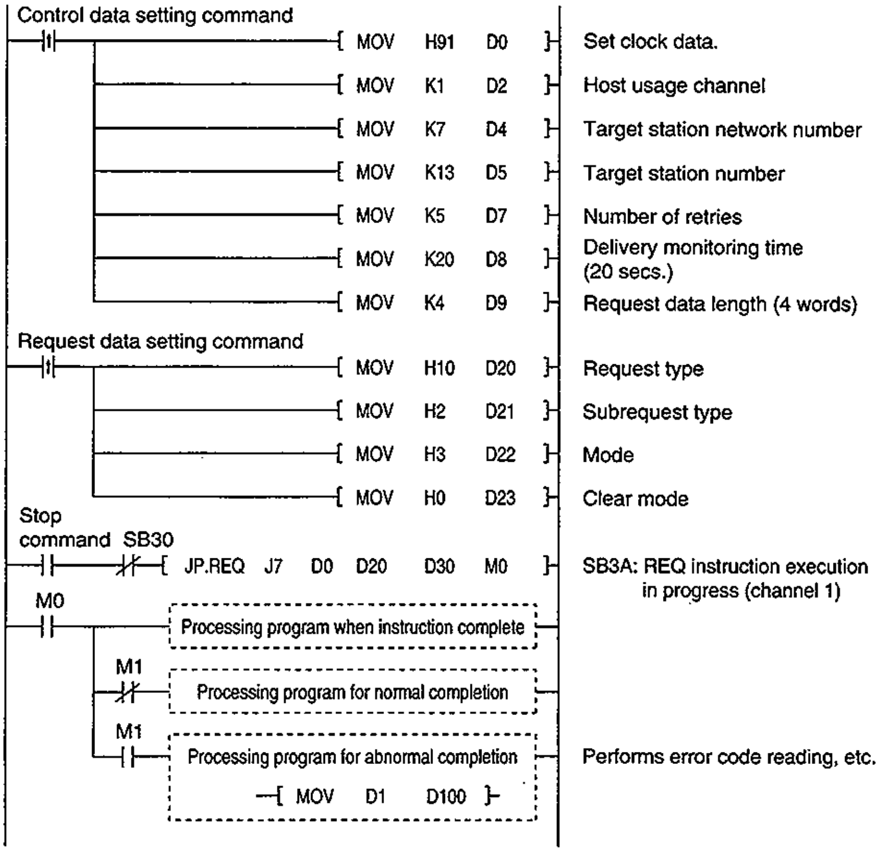


(b) When abnormal completion



(3) Program example

This is a program to "STOP" station 13 on network No. 7.
When actually using the program below, perform interlocking by referring to Section 10.1.1 (1).



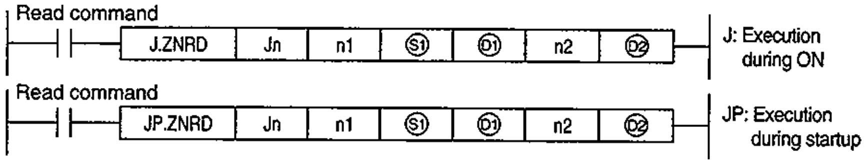
10.2.4 Read/write word device of other stations (ZNRD/ZNWR)

The instruction format and program example of the ZNRD/ZNWR instructions are described.

(1) Instruction format

(a) ZNRD

[Network number specification]



	Setting details	Setting range
Jn	Target station network number	1 to 239
n1	Target station number	1 to 64 (constant) Digit specification of bit device *2 Word device *3
S1	Read data first storage device of the target station	T, C, D, W
D1	Read data first storage device of the host	Word device *3
n2	Read points (words)	1 to 230 (constant) Digit specification of bit device *2 Word device *3
D2	Completion device Specify the device of the host to turn on one scan when the read is complete. u..........OFF: Incomplete ON: Complete D2 + 1 ...OFF: Normal ON: Error	Bit device *1 Word device bit specification *4

*1 : Bit device...................................X, Y, M, L, F, V, B

*2: Bit device digit specification.......K digit number Bit device first number

*3 : Word device ....T, C, D, W, ST, R, ZR

*4 : Word device bit specification.....Word device. Bit number

(b) ZNWR instruction

[Network No. specification]

Write command

J.ZNWR	Jn	n1	D1	S1	n2	D2

J: Execution while on

Write command

JP.ZNWR	Jn	n1	D1	S1	n2	D2

JP: Execution during startup

	Setting details	Setting range
Jn	Target station network number	1 to 239
n1	Target station number	1 to 64 (constant) 81_H to 89_H : Group specification FF_H : All stations on the target network number Digit specification of bit device *2 Word device *3
D1	Write data first storage device of the target station	T, C, D, W
S1	Write data first storage device of the host	Word device *3
n2	Write points (words)	1 to 230 (constant) Digit specification of bit device *2 Word device *3
D2	Completion device Specify the device of the host to turn on one scan when the write is complete. u.........OFF: Incomplete ON: Complete D2 + 1 ...OFF: Normal ON: Error	Bit device *1 Word device bit specification *4

*1 : Bit device..................................X, Y, M, L, F, V, B

*2 : Bit device digit specification......K digit number Bit device first number

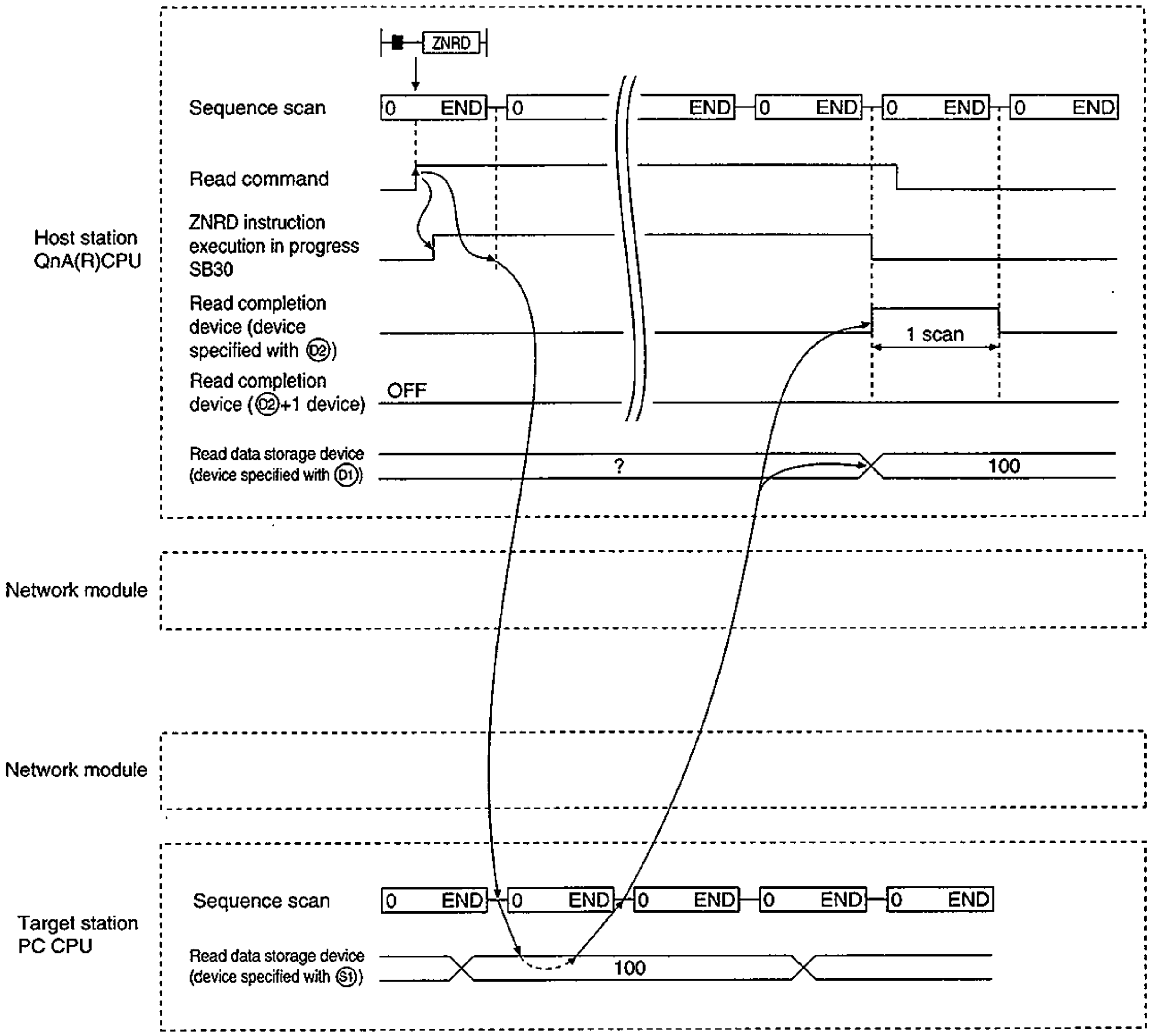
*3 : Word device ....T, C, D, W, ST, R, ZR

*4 : Word device bit specification.....Word device . Bit number

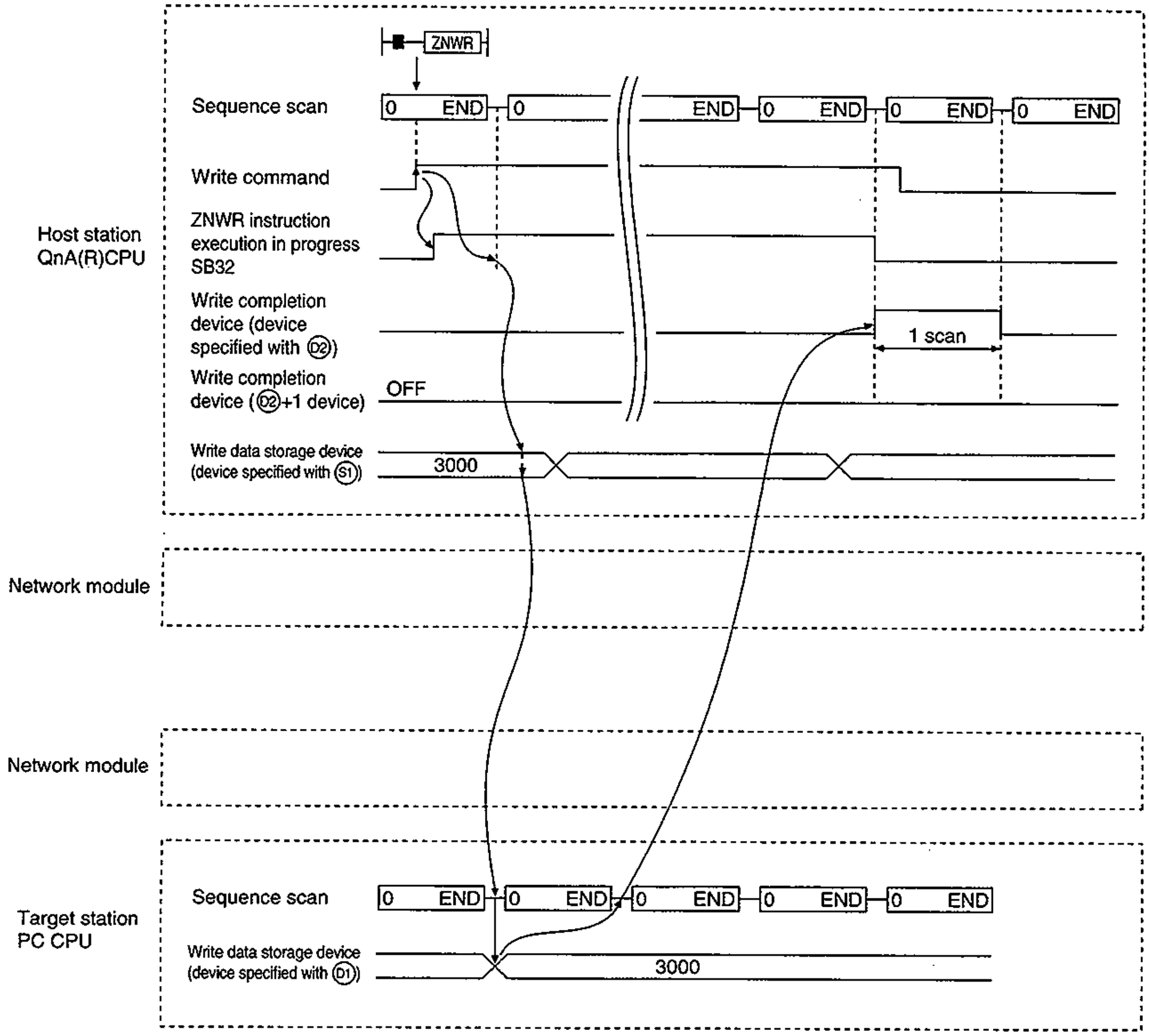
(2) Instruction execution timing

(a) When normal completion

1) ZNRD instruction

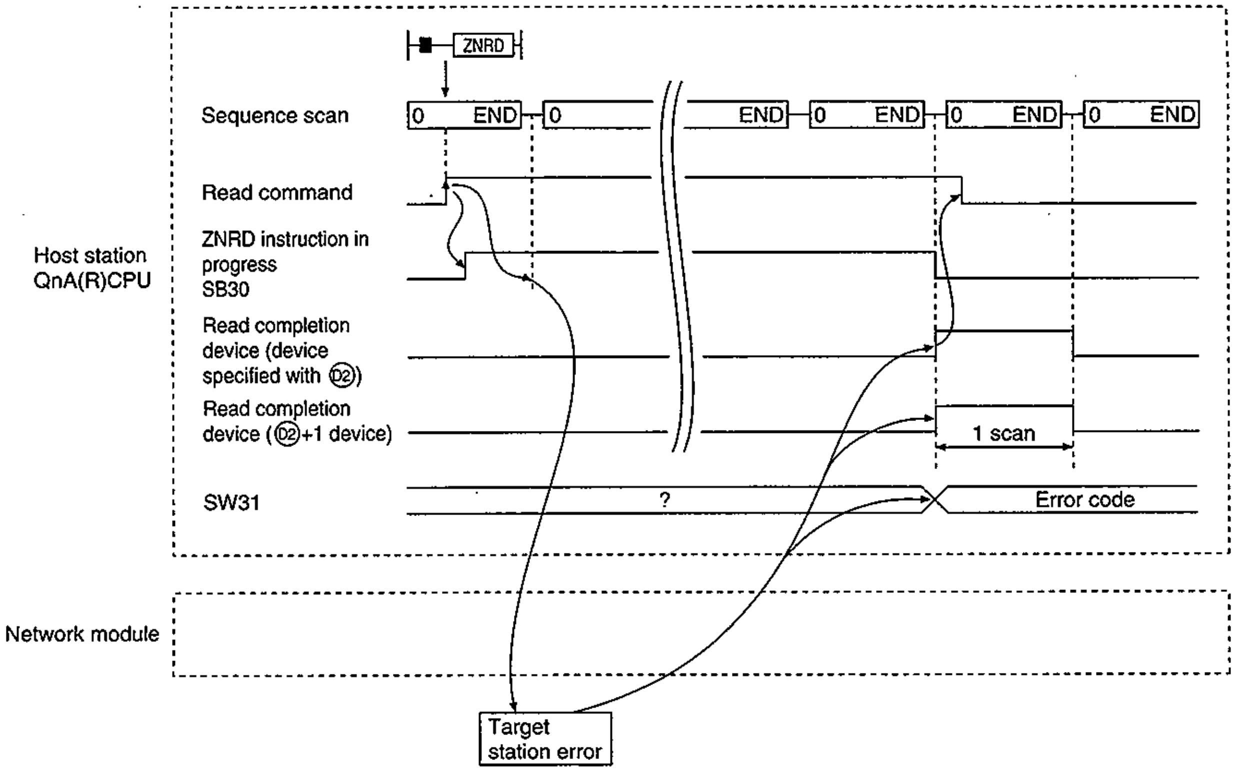


2) ZNWR instruction

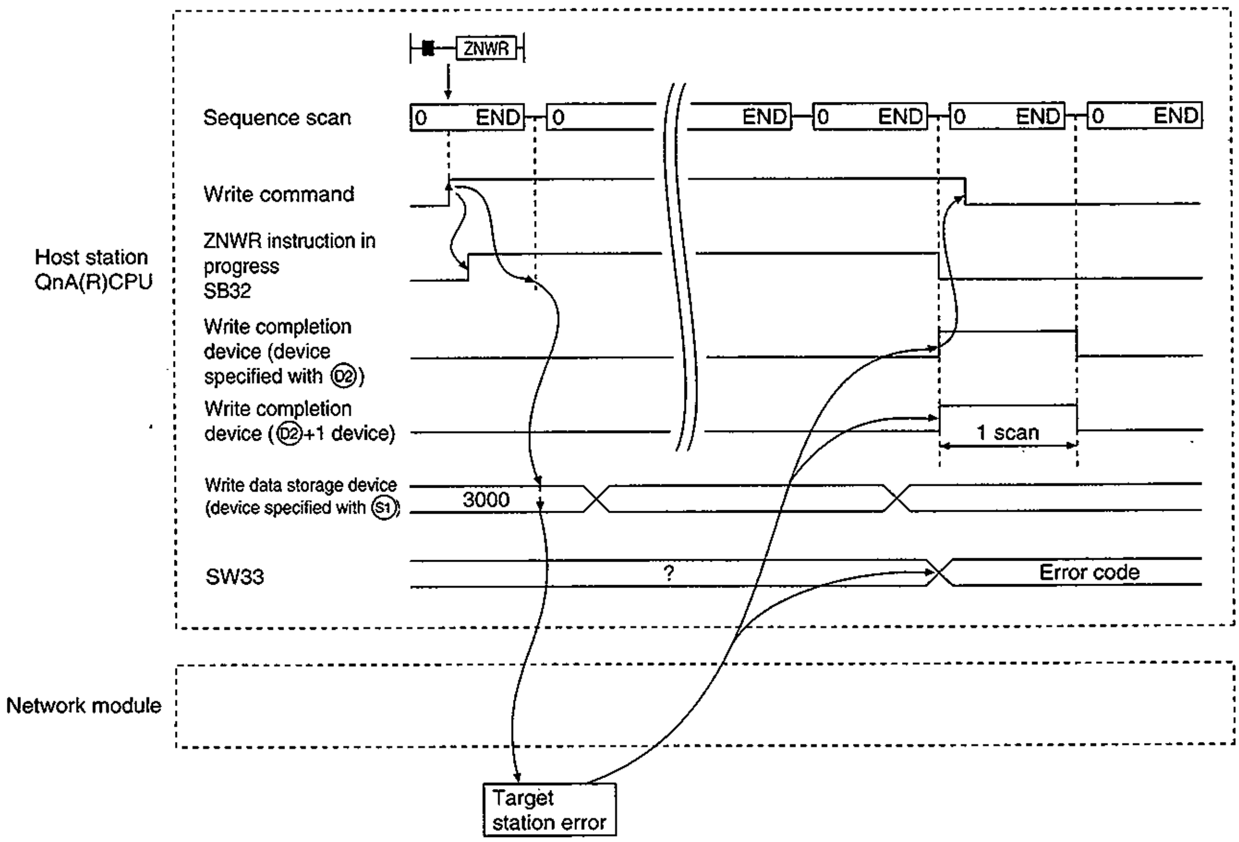


(b) When abnormal completion

1) ZNRD instruction

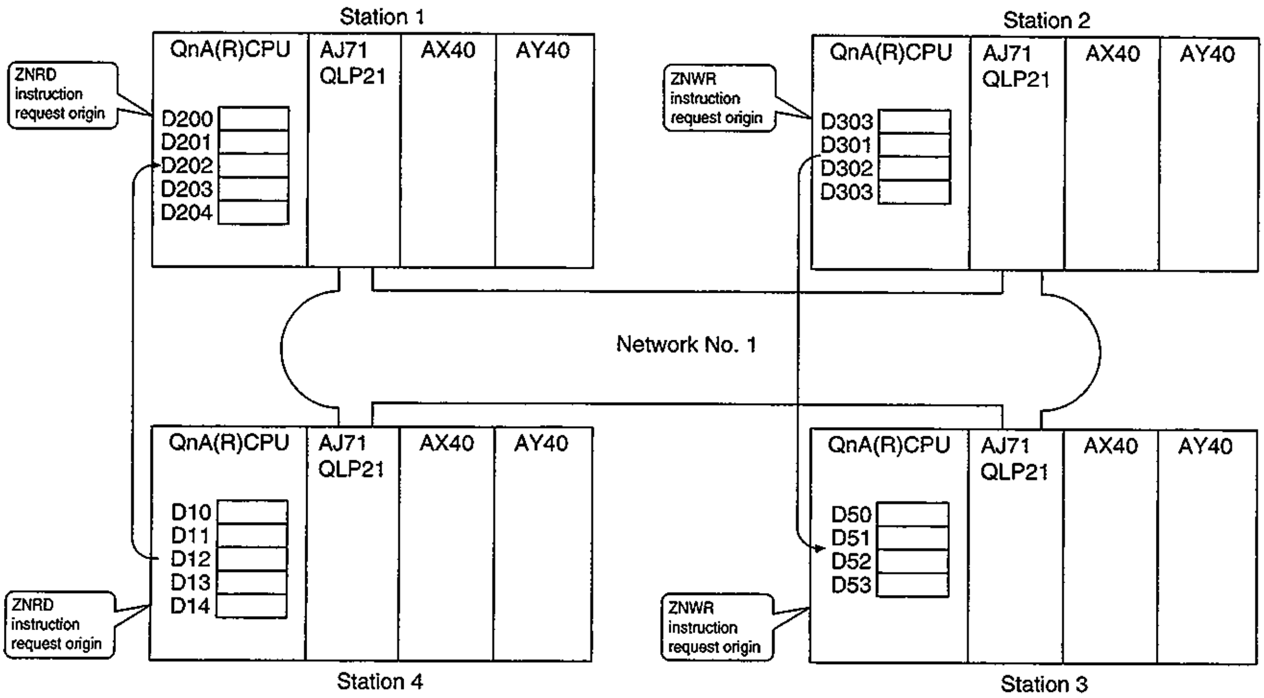


2) ZNWR instruction



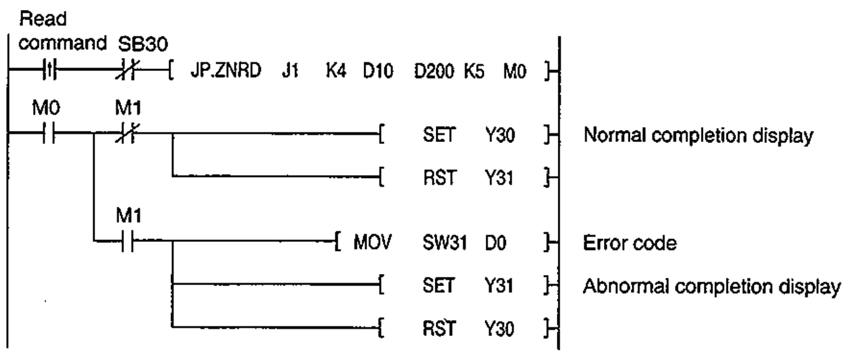
(3) Program example

The following system configuration is assumed for the program example. When actually using the program below, perform interlocking by referring to Section 10.1.1 (1).



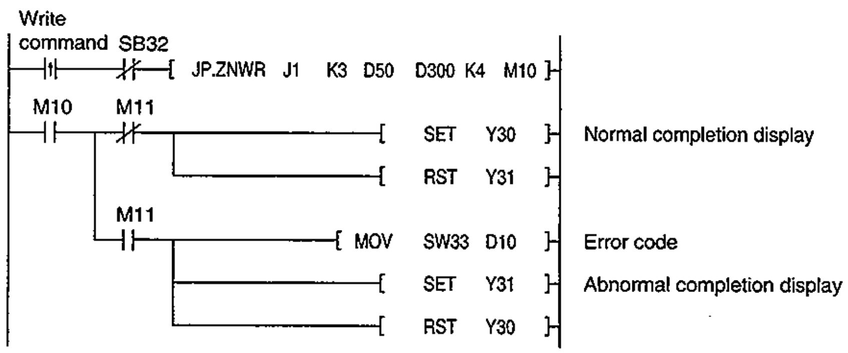
(a) ZNRD

The program to read data in D10 to 14 of station 4 to D200 to 204 of station 1 is shown below:



(b) ZNWR

The program to write data in D300 to 303 of station 2 to D50 to 53 of station 3 is shown below:



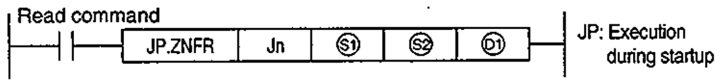
10.2.5 Read/write the buffer memory of the special function module at remote I/O station (ZNFR/ZNTO)

The instruction format and program example of the ZNFR/ZNTO instructions are described.

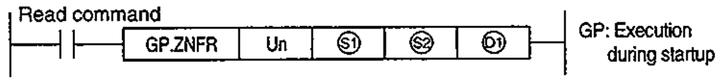
(1) Instruction format

(a) ZNFR instruction

[Network number specification]



[Network module first I/O number specification]



	Setting details	Setting range
Jn	Host network number	1 to 239 254: Network specified in the valid module for other station access
Un	Host network module's first I/O number Specify with two upper digits of the three digit I/O number.	0 to FE_H
S1	Control data first storage device Specify the first device of the host where the control data is stored.	Word device *2
S2	Read data first storage device Specify the first device of the target station where the data to read is stored.	W(The M ← R device specified by the common parameter (except for handshaking))
D1	Read completion device (host) Specify the device of the host to turn on one scan when the read is complete. D1..........OFF: Incomplete ON: Complete D1 + 1 ...OFF: Normal ON: Error	Bit device *1 Word device bit specification *3

*1 : Bit device...................................X, Y, M, L, F, V, B

*2 : Word device ....T, C, D, W, ST, R, ZR

*3 : Word device bit specification.....Word device . Bit number

[Control data structure S1]

For details of each item, refer to the next page.

Device	Item	Data set	
		User (when executing)*1	System (when complete)*2
S1	Abnormal completion type	O	
S1 + 1	Completion status		O
S1 + 2	(Unused)	—	—
S1 + 3	Buffer memory address	O	
S1 + 4	(Unused)	—	—
S1 + 5	Target station number	O	
S1 + 6	n th module	O	
S1 + 7	(Unused)	—	—
S1 + 8	(Unused)	—	—
S1 + 9	Send data length	O	
S1 + 10	(Unused)	—	—
S1 + 11	Clock set flag		O
S1 + 12	Year/month of abnormal completion		O
S1 + 13	Day/hour of abnormal completion		O
S1 + 14	Minute/second of abnormal completion		O
S1 + 15	Day of the week of abnormal completion		O

Used when the abnormal completion type is set to "clock data is set". (S1 + 11 to S1 + 15)

*1: Item set by sequence program *2: Item stored automatically when instruction execution is complete

Control data details

Device	Item	Details
S1	Abnormal completion type	b15 to b7 to b0: [0 | ① | 0 | 1] ① Abnormal completion type (7th bit) Set clock data set status for abnormal completion. 0 : Do not set the clock data.....Do not set the clock data for abnormal completion at S1 + 11 to S1 + 15. 1 : Set the clock data................Set the clock data for abnormal completion at S1 + 11 to S1 + 15.
S1 + 1	Completion status	The status at instruction completion is stored. 0 : Normal Other than 0 : Error (Refer to Section 15.1 for error codes.)
S1 + 2	(Unused)	—
S1 + 3	Buffer memory address	Specify the first address of the buffer memory.
S1 + 4	(Unused)	—
S1 + 5	Sending station number	Specify the station number of the sending station. 1 to 64: Station numbers
S1 + 6	n th unit	Specify the sequence number (n th) of the special function module installed on the target station.
S1 + 7	(Unused)	—
S1 + 8	(Unused)	—
S1 + 9	Read data length	Specify number of data to read. 1 to 256 (Word)
S1 + 10	(Unused)	—
S1 + 11	Clock set flag	Valid/invalid status of the data in S1+12 to S1+15 is stored. 0: Invalid 1: Valid
S1 + 12	Year/month of abnormal completion	The year (lower two digits) and month are stored in BCD code. b15 to b8 b7 to b0: [Year (00H to 99H) | Month (01H to 12H)]
S1 + 13	Day/hour of abnormal completion	The day and hour are stored in BCD code. b15 to b8 b7 to b0: [Day (01H to 31H) | Hour (00H to 23H)]
S1 + 14	Minute/second of abnormal completion	The minute and seconds are stored in BCD code. b15 to b8 b7 to b0: [Minute (00H to 59H) | Second (00H to 59H)]
S1 + 15	Day of week of abnormal completion	The day of the week is stored in BCD code. b15 to b8 b7 to b0: [00H | Day of week (00H to 06H)] 00H (Sunday) to 06H (Saturday)

(b) ZNTO instruction

[Network number specification]

Write command

JP.ZNTO	Jn	S1	S2	D1

JP: Execution during startup

[Network module first I/O number specification]

Write command

GP.ZNTO	Un	S1	S2	D1

GP: Execution during startup

	Setting details	Setting range
Jn	Host network number	1 to 239 254: Network specified in the valid module for other station access
Un	Host network module's first I/O number Specify with two upper digits of the three digit I/O number.	0 to FE_H
S1	Control data first storage device Specify the first device of the host where the control data is stored.	Word device *2
S2	Write data first storage device Specify the first device of the target station where the data to write is stored.	M(The M → R device specified by the common parameter (except for handshaking))
D1	Write completion device Specify the device of the host to turn on one scan when the write is complete. D1..........OFF: Incomplete ON: Complete D1 + 1 ...OFF: Normal ON: Error	Bit device *1 Word device bit specification *3

*1 : Bit device..................................X, Y, M, L, F, V, B

*2 : Word device ....T, C, D, W, ST, R, ZR

*3 : Word device bit specification.....Word device . Bit number

[Control data structure S1]

For details of each item, refer to the next page.

Device	Item	Data set	
		User (when executing)*1	System (when complete)*2
S1	Abnormal completion type	O	
S1 + 1	Completion status		O
S1 + 2	(Unused)	—	—
S1 + 3	Buffer memory address	O	
S1 + 4	(Unused)	—	—
S1 + 5	Target station number	O	
S1 + 6	n th unit	O	
S1 + 7	(Unused)	—	—
S1 + 8	(Unused)	—	—
S1 + 9	Read data length	O	
S1 + 10	(Unused)	—	—
S1 + 11	Clock set flag		O
S1 + 12	Year/month of abnormal completion		O
S1 + 13	Day/hour of abnormal completion		O
S1 + 14	Minute/second of abnormal completion		O
S1 + 15	Day of the week of abnormal completion		O

Used when the abnormal completion type is set to "clock data is set". (S1 + 11 to S1 + 15)

*1 : Item set by sequence program

*2 : Item stored automatically when instruction execution is complete

Control data details

Device	Item	Details
S1	Abnormal completion type	b15 to b7 to b0 [0 | ① | 0 | 1] ① Abnormal completion type (7th bit) Set clock data set status for abnormal completion. 0 : Do not set the clock data.....Do not set the clock data for abnormal completion at S1 + 11 to S1 + 15. 1 : Set the clock data...............Set the clock data for abnormal completion at S1 + 11 to S1 + 15.
S1 + 1	Completion status	The status at instruction completion is stored. 0 : Normal Other than 0 : Error (Refer to Section 15.1 for error codes.)
S1 + 2	(Unused)	—
S1 + 3	Buffer memory address	Specify the first address of the buffer memory.
S1 + 4	(Unused)	—
S1 + 5	Sending station number	Specify the station number of the sending station. 1 to 64: Station numbers
S1 + 6	n th unit	Specify the sequence number (n th) of the special function module installed on the target station.
S1 + 7	(Unused)	—
S1 + 8	(Unused)	—
S1 + 9	Write data length	Specify number of data to write. 1 to 256 (Word)
S1 + 10	(Unused)	—
S1 + 11	Clock set flag	Valid/invalid status of the data in S1+12 to S1+15 is stored. 0: Invalid 1: Valid
S1 + 12	Year/month of abnormal completion	The year (lower two digits) and month are stored in BCD code. b15 to b8 b7 to b0 [Year (00H to 99H) | Month (01H to 12H)]
S1 + 13	Day/hour of abnormal completion	The day and hour are stored in BCD code. b15 to b8 b7 to b0 [Day (01H to 31H) | Hour (00H to 23H)]
S1 + 14	Minute/second of abnormal completion	The minute and seconds are stored in BCD code. b15 to b8 b7 to b0 [Minute (00H to 59H) | Second (00H to 59H)]
S1 + 15	Day of week of abnormal completion	The day of the week is stored in BCD code. b15 to b8 b7 to b0 [00H | Day of week (00H to 06H)] 00H (Sunday) to 06H (Saturday)

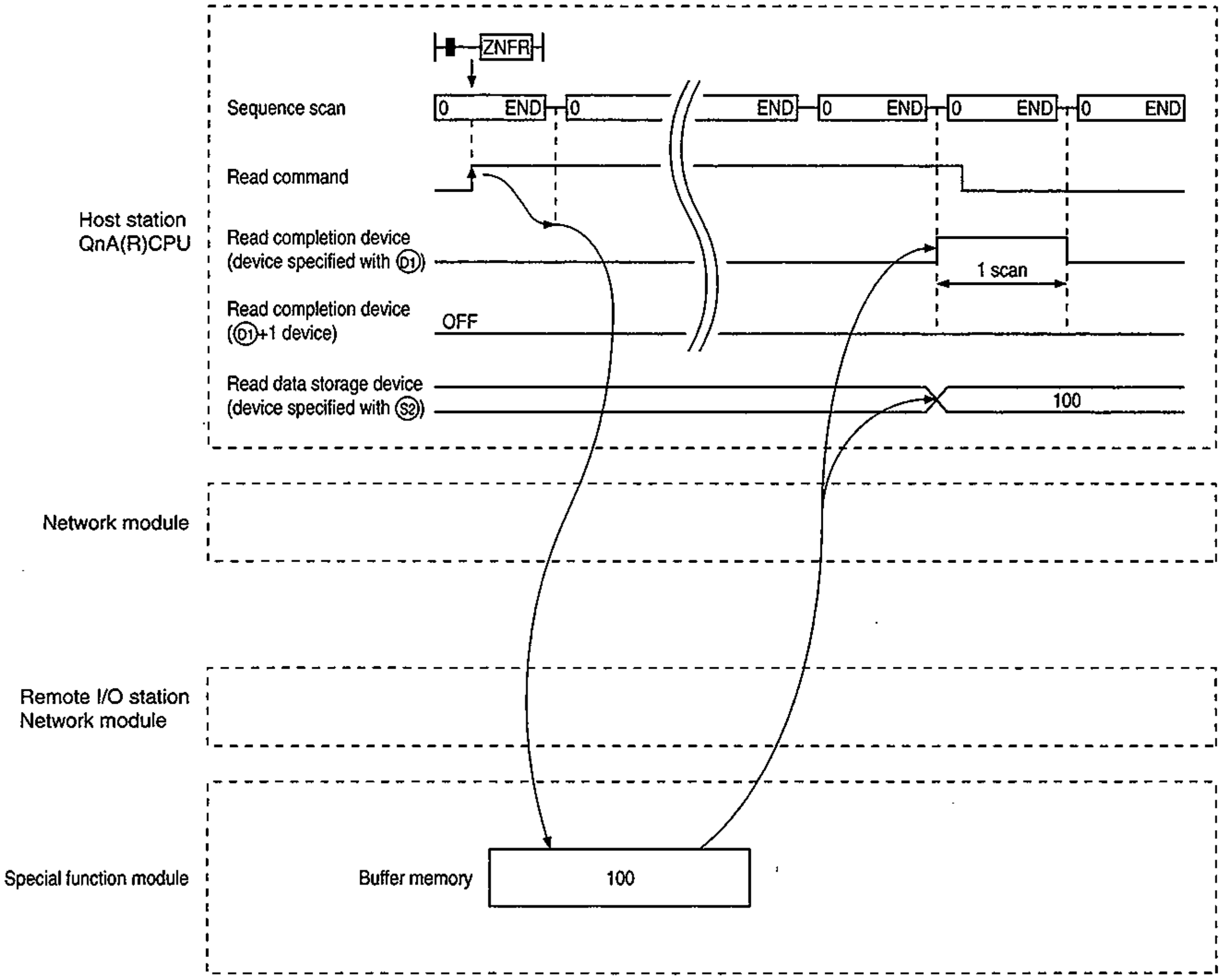
Point

The ZNFR/ZNTO insrunctions can only be executed from the remote master station specified by Jn or Un to the remote I/O stations connected to the same network number.
They cannot be executed from stations on the inter-PC network or by routing.

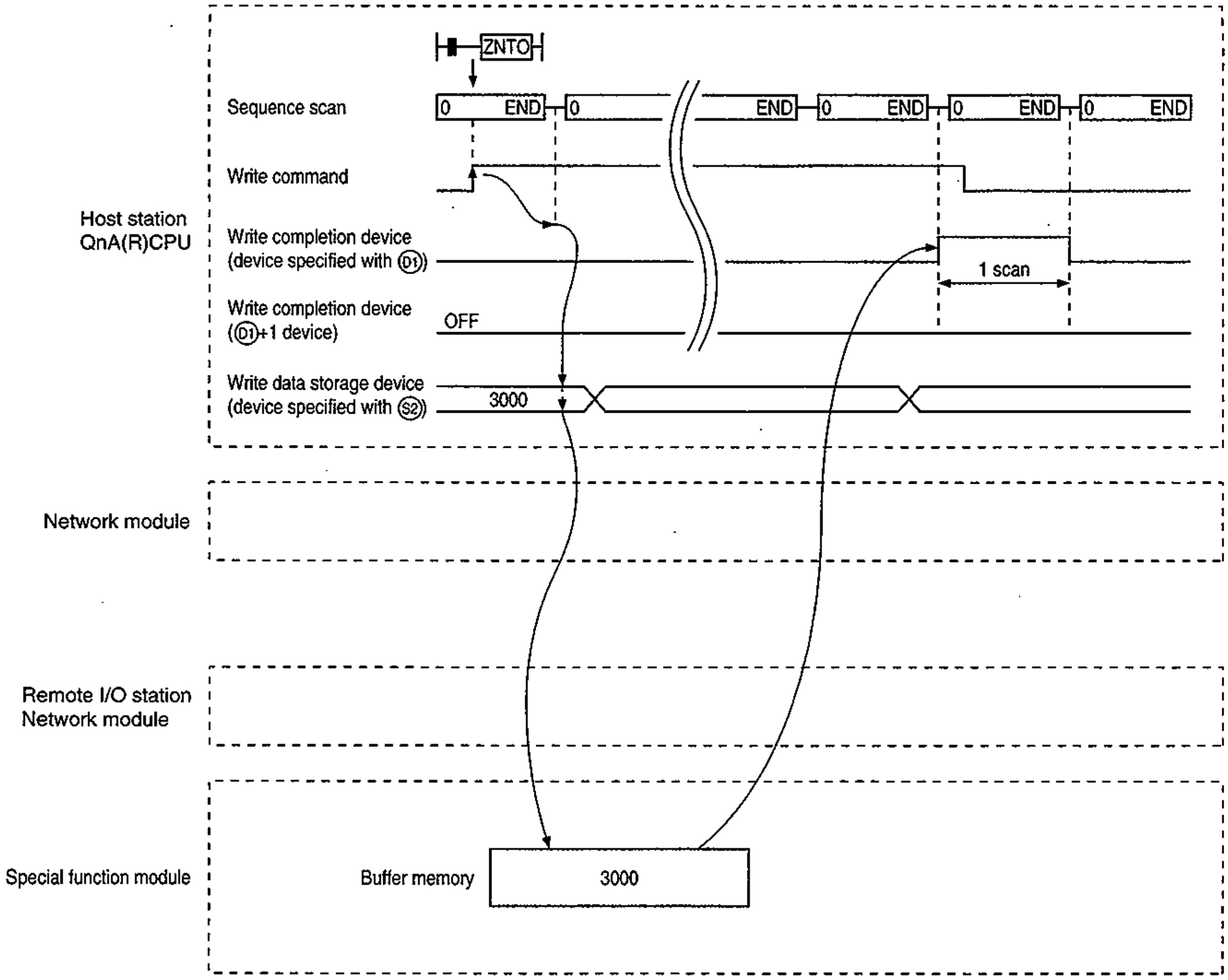
(2) Instruction execution timing

(a) When normal completion

1) ZNFR instruction

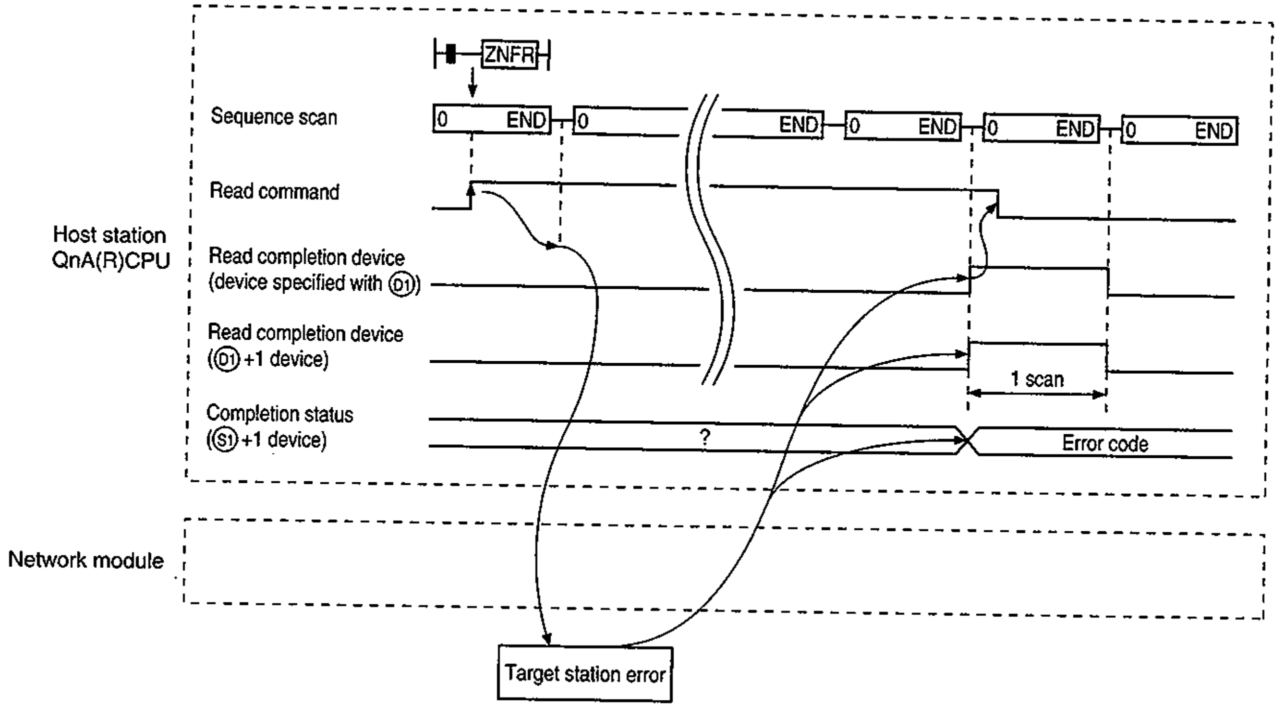


2) ZNTO instruction

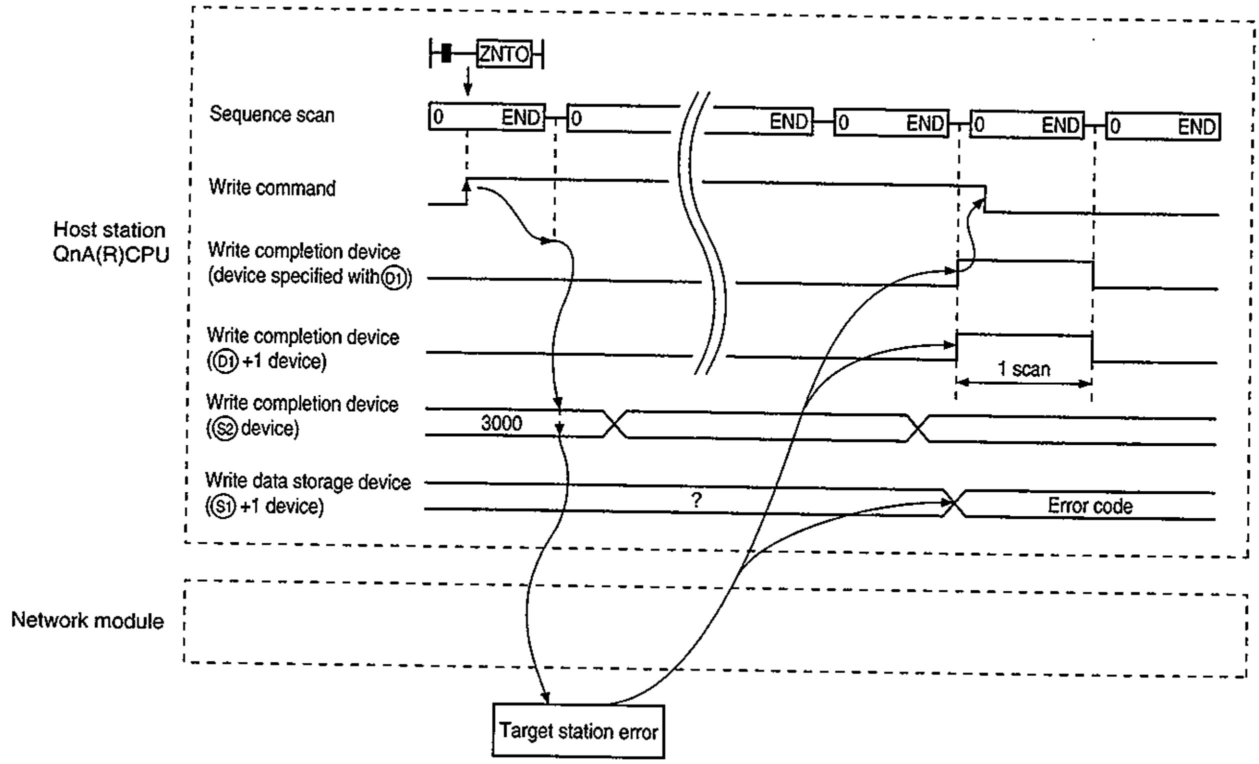


(b) When abnormal completion

1) ZNFR instruction



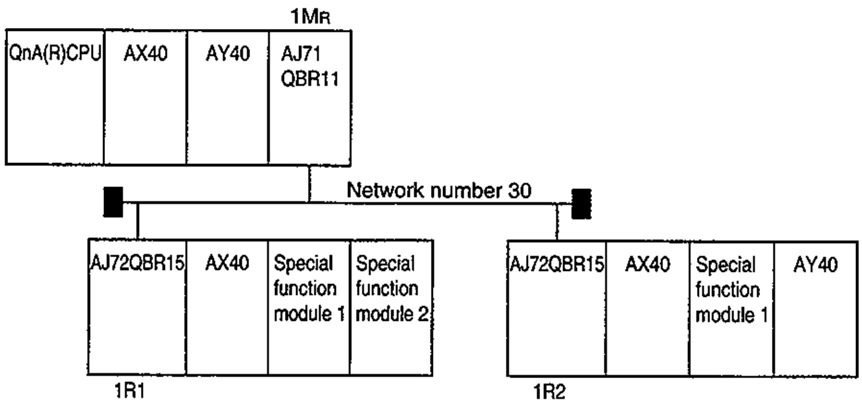
2) ZNTO instruction



(3) Program example

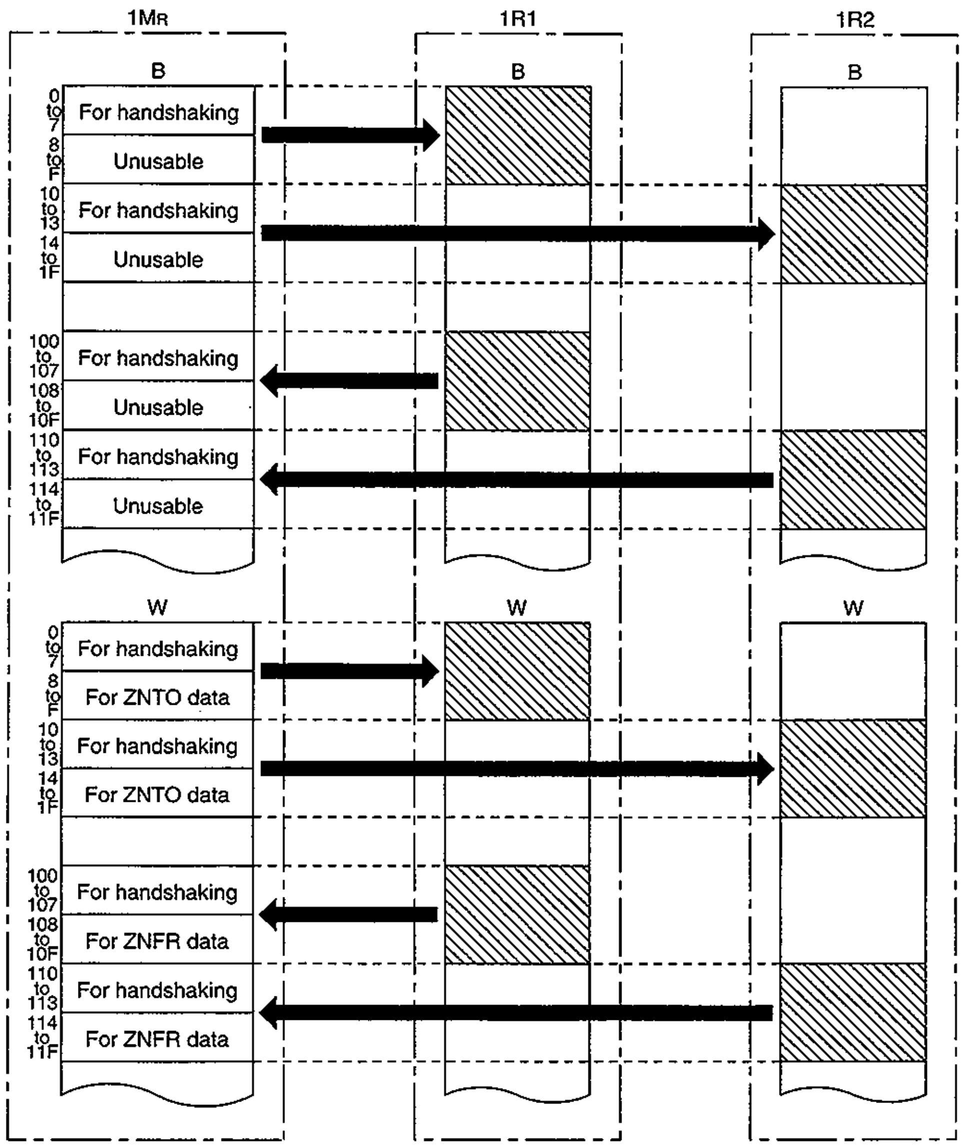
The following system configuration and common parameters are assumed for the program example:

[System configuration]



[Common parameter settings]

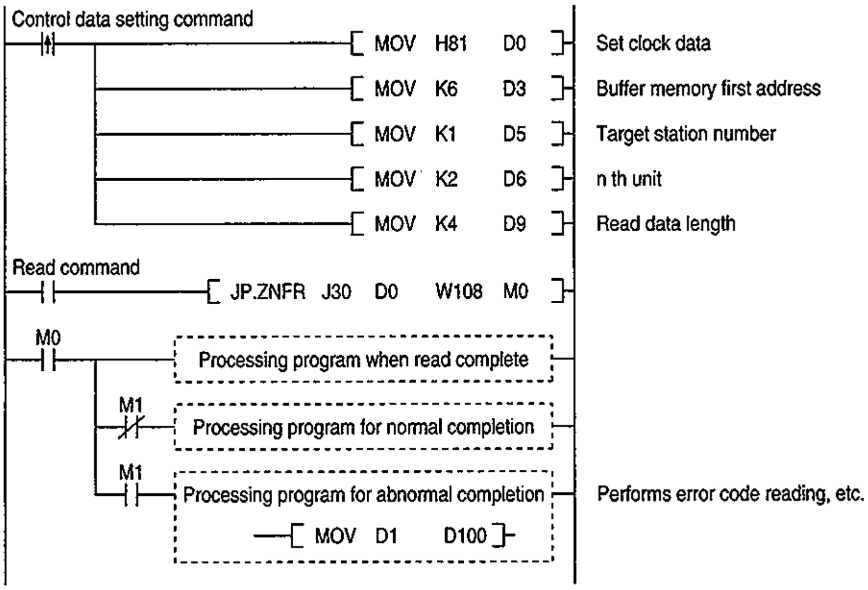
Station number	Station M → R	Station M ← R	Station M → R	Station M ← R
	B	B	W	W
1	0 - F	100 - 10F	0 - F	100 - 10F
2	10 - 1F	110 - 11F	10 - 1F	110 - 11F



(a) ZNFR

This is a program example to read the buffer memory address 6 to 9 in the second special function module of station 1R1 to W108 to 10B.

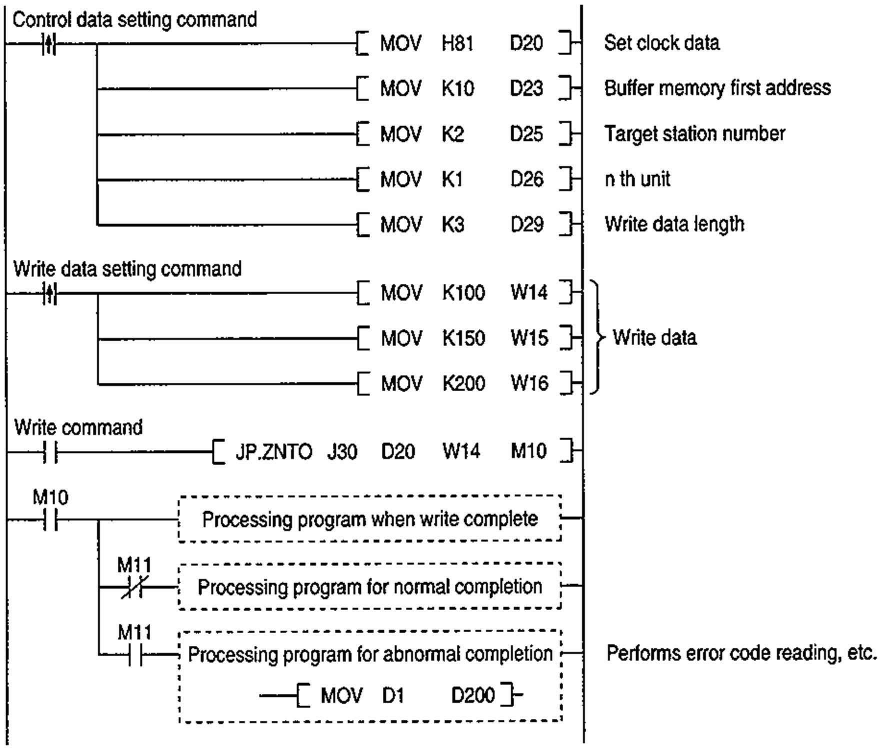
When actually using the program shown below, perform interlocking by referring to Section 10.1.1 (2).



(b) ZNTO

This is a program example to write data in buffer memory address 10 to 12 in the 1st special function module of station 1R2 to W14 to 16.

When actually using the program shown below, perform interlocking by referring to Section 10.1.1.(2).



10.3 User Flag Control Instruction

This section describes about the instructions to control the user flags (SW01F0 to 01F3).

10.3.1 User flag set instruction (UFSET)

(1) Function

(a) The bit corresponding to the user flag at the host (SW01F0 to 01F3) can be turned on. (For example, if the UFSET instruction is executed at station 13, the 12th bit in SW01F0 can be tumed on.)

(b) Bits for other stations (bits other than host) cannot be turned on.

(c) The user flags (SW01F0 to 01F3) for all stations on the network number specified by the instruction (S1) are tumed on.

(d) The bits turned on by the UFSET instruction maintain the on status. To turn off the bits, execute the UFRST instruction. (Refer to Section 11.3.2.)

(e) When one of the bits in SW01F0 to 01F3 is on, SB01F0 tums on. If all bits in SW01F0 to 01F3 are tumed off, SB01F0 tums off.

(f) The user flag structure is shown below.
The values in the chart show the station numbers.

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
SW01F0	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
SW01F1	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
SW01F2	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
SW01F3	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49

(2) Execution instruction

Execution instruction

J. UFSET	Jn	S1

	Setting details	Setting range
Jn	Target network number	1 to 239 (J1 to J239)
S1	User flag level Sets the device where the user flag level is stored. 1 is the only valid numeric value.	T, ST, C, D, W, Z, ZR

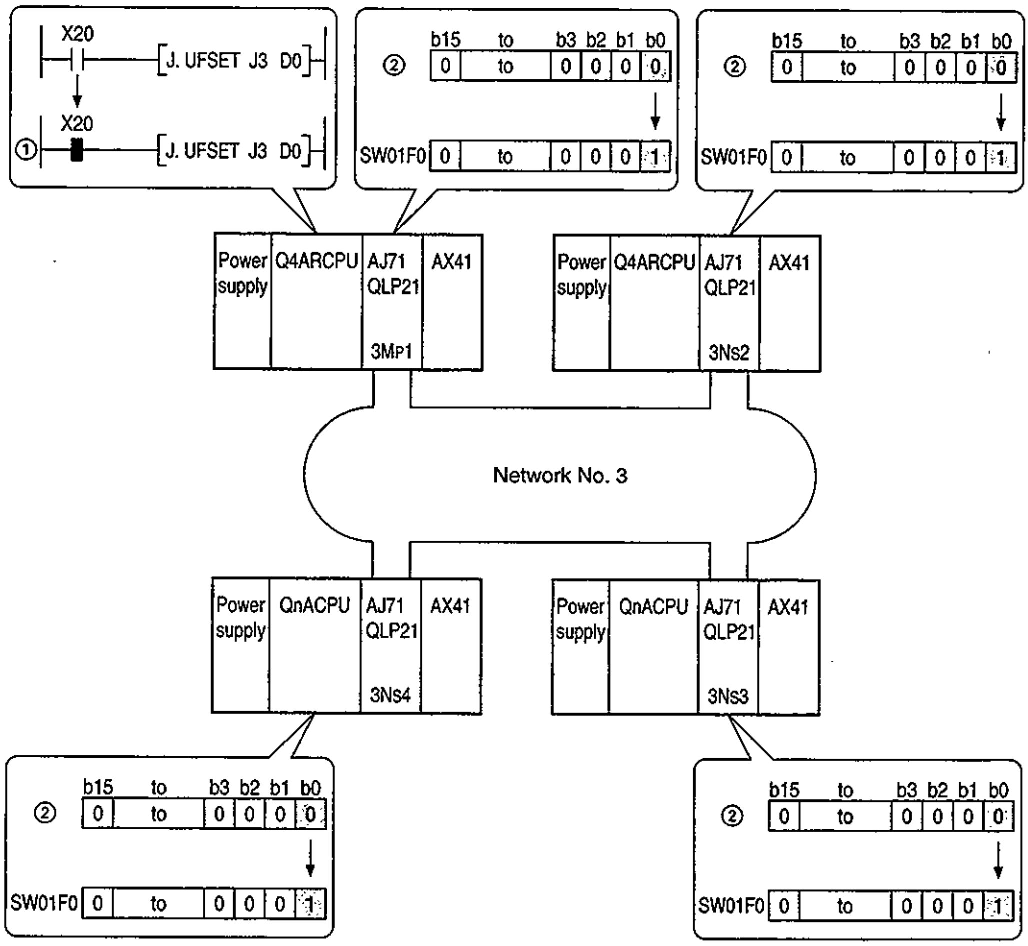
When the module does not exist on the network number specified in Jn, the system results in SP. UNIT ERROR (error code 2111).
When the user flag level specified in S1 is "0", it results in OPERATION ERROR (error code 4100).

(3) **Program example**

The program example and user flag (SW01F0 to 01F3) status when executing the UFSET instruction from 3MP1 (control station) with the following system configuration are shown.
However, D0 used in the program stores 1 in this example.

[Operation]

① The execution command (X20) for the UFSET instruction turns on.
② The 0th bit in SW01F0 turns on.



10.3.2 User flag reset instruction (UFRST)

(1) Function

(a) The bit corresponding to the user flag (SW01F0 to 01F3) at the host can be turned off by UFSET instryction.

(b) Bits for other stations (bits other than host) cannot be turned off.

(c) The user flags (SW01F0 to 01F3) for all stations on the network number specified by the instruction (S1) are turned off.

(d) If all bits in SW01F0 to 01F3 are turned off, SB01F0 turns off. When one of the bits in SW01F0 to 01F3 is on, the SB01F0 turns on.

(e) The user flag structure is shown below.
The values in the table indicate the station numbers.

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
SW01F0	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
SW01F1	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
SW01F2	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
SW01F3	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49

(2) Instruction format

Execution command

J. UFRST	Jn	S1

	Setting details	Setting range
Jn	Target network number	1 to 239 (J1 to J239)
S1	User flag level Sets the device where the user flag level is stored. 1 is the only valid numeric value.	T, ST, C, D, W, Z, ZR

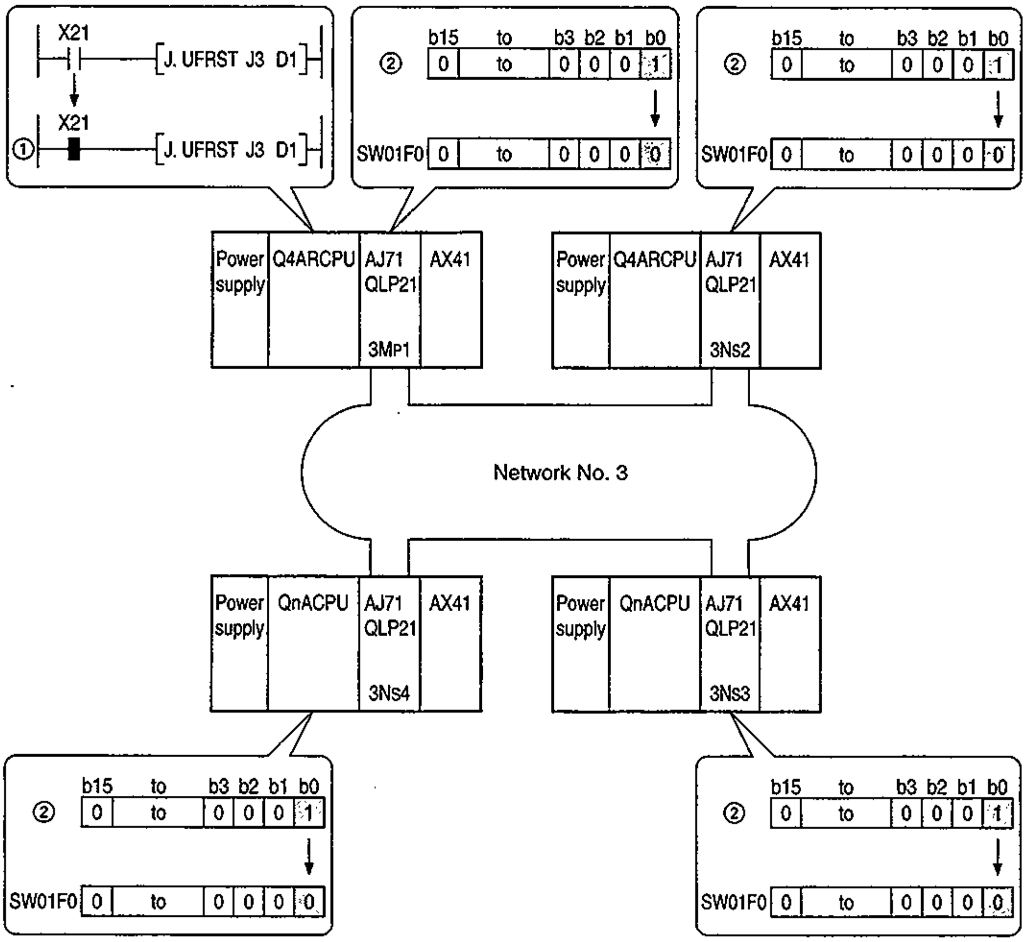
When the module does not exist on the network number module specified in Jn, the system results in SP. UNIT ERROR (error code 2111).
When the user flag level specified in S1 is "0", it results in OPERATION ERROR (error code 4100).

(3) Program example

The program example and user flag (SW01F0 to 01F3) status when executing the UFRST instruction using 3MP1 (control station) with the following system configuration are shown.
However, D1 used in the program stores 1 in this example.

[Operation]

① The execution command (X21) for the UFRST instruction turns on.
② The 0th bit for SW01F0 turns off.



10.3.3 User flag out instruction (UFOUT)

(1) Function

(a) The bit corresponding to the user flag (SW01F0 to 01F3) at the host can be turned on/off.

(b) Bits for other stations (bits other than host) cannot be turned on/off.

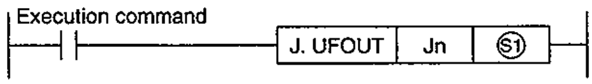
(c) The user flags (SW01F0 to01F3) for all stations on the network number specified by the instruction (S1) are turned on/off.

(d) When one of the bits in SW01F0 to 01F3 is on, the SB01F0 turns on. If all bits in SW01F0 to 01F3 are turned off, SB01F0 turns off.

(e) The user flag structure is shown below.
The values in the table show the station numbers.

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
SW01F0	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
SW01F1	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
SW01F2	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
SW01F3	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49

(2) Instruction format



	Setting details	Setting range
Jn	Target network number	1 to 239 (J1 to J239)
S1	User flag level Sets the device where the user flag level is stored. 1 is the only valid numeric value.	T, ST, C, D, W, Z, ZR

When the module does not exist on the network number specified in Jn, the system results in SP. UNIT ERROR (error code 2111).
When the user flag level specified in S1 is "0", it results in OPERATION ERROR (error code 4100).

Points

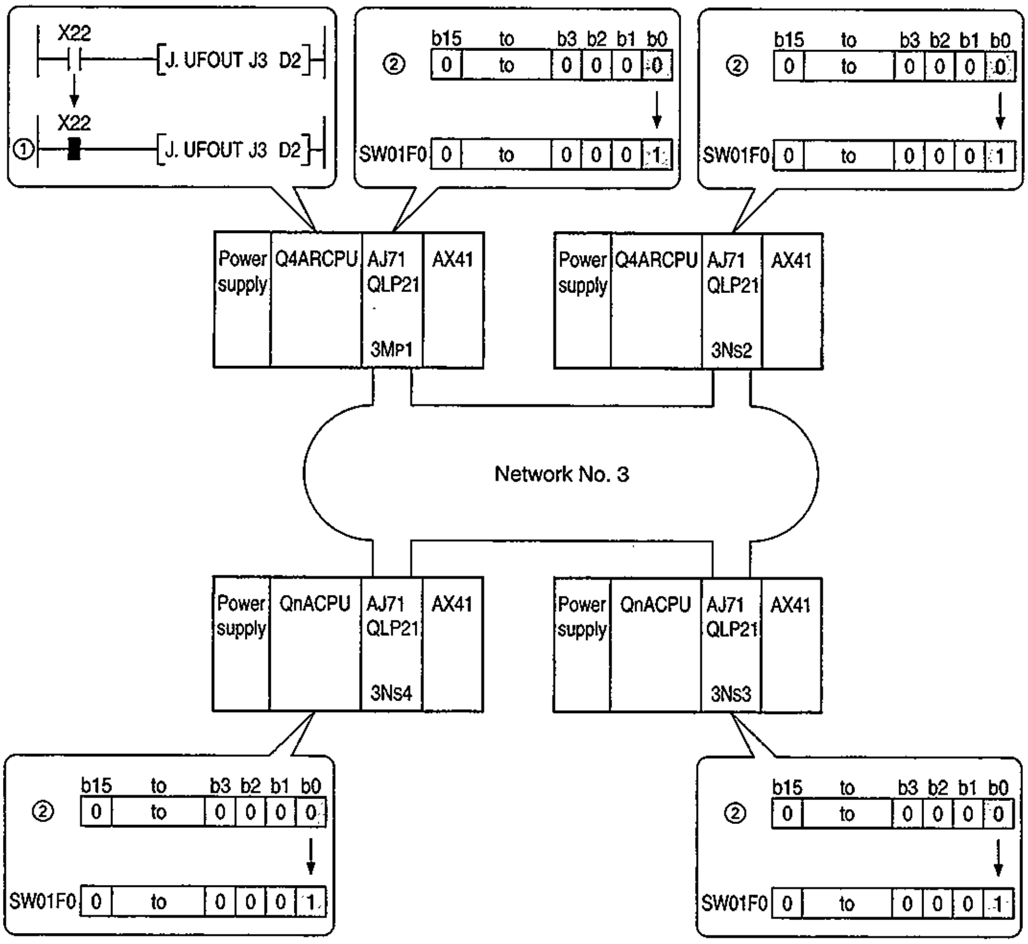
(1) The UFOUT instruction, like the OUT instruction (-( )-), is always executed regardless of the connection status before the instruction.
(2) The S1 user flag level must be written in the CPU beforehand.

(3) Program example

The program example and user flag (SW01F0 to 01F3) status when executing the UFOUT instruction from 3MP1 (control station) with the following system configuration are shown.
However, D2 used in the program stores 1 in this example.

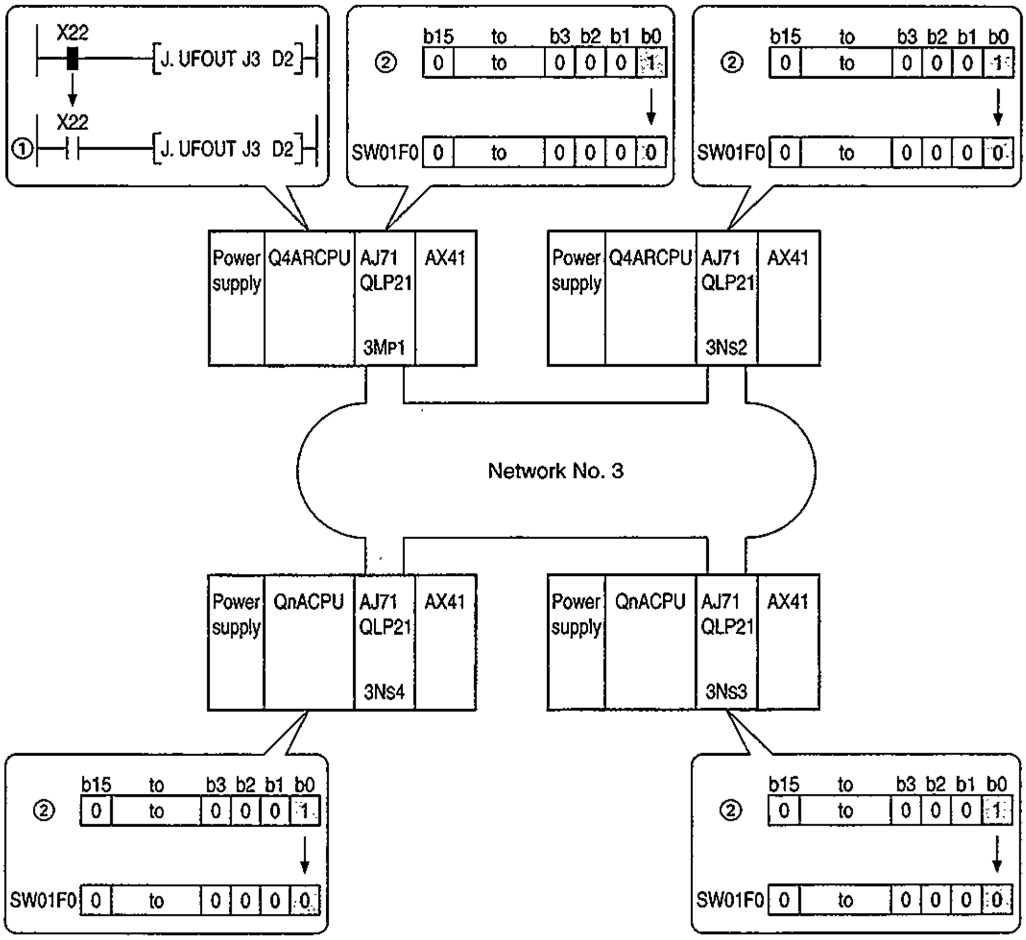
[Operation for changing the execution command from off to on]

① The execution command (X22) for the UFOUT instruction turns on.
② The 0th bit in SW01F0 turns on.



[Operation for changing the execution command from on to off]

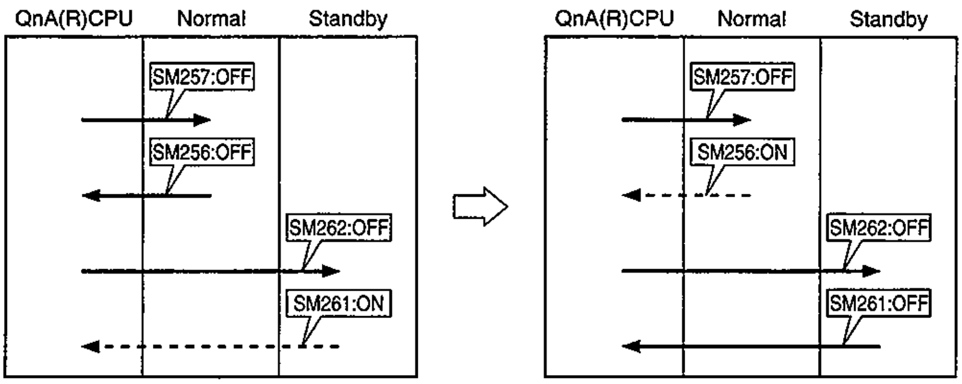
① The execution command (X22) for the UFOUT Instruction turns off.
② The 0th bit in SW01F0 turns off.



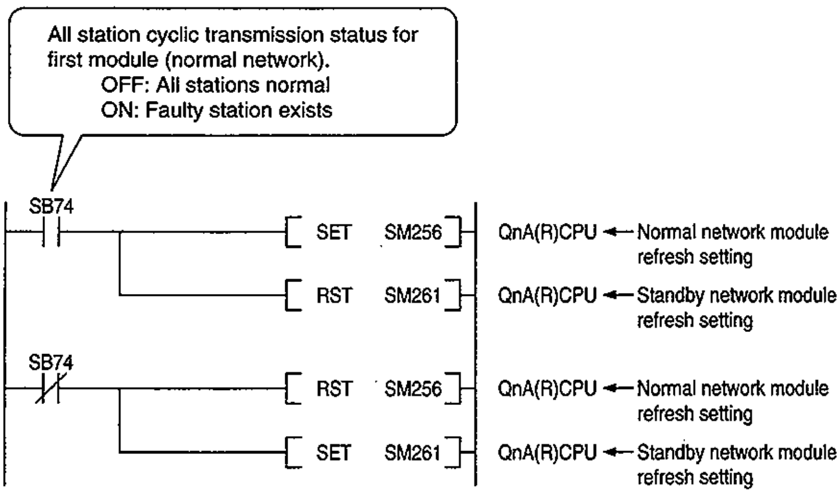
10.4 Programs for Simplified Duplex System

1) The normal ↔ standby refresh switching program is described below:

[When the noraml is operating normally] [When there is an error with the normal]



(1) A program to switch the refresh to the standby side when a faulty station exists in a regular network is shown below. The same program must be loaded at all stations.



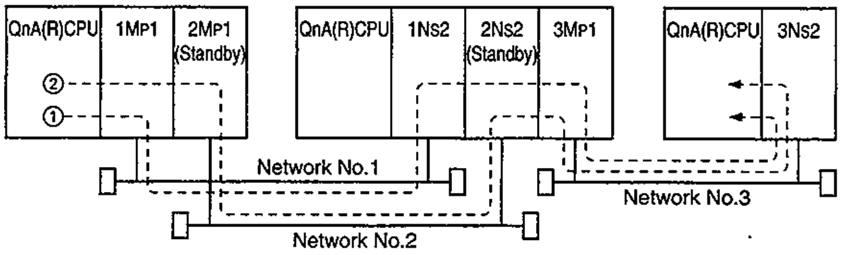
(2) The refresh setting device (SM) for each network module is shown below.

	1st module	2nd module	3rd module	4th module
Normal/standby network setting status (OFF: normal ON: standby)	SM255	SM260	SM265	SM270
QnA(R)CPU network module refresh (OFF: refresh ON: no refresh)	SM256	SM261	SM266	SM271
QnA(R)CPU network module refresh (OFF: refresh ON: no refresh)	SM257	SM262	SM267	SM272

Points

(1)The same network number cannot be set two or more times for destination of routing parameter.
Therefore, it must be rewritten using the RTWRITE instruction.
① When normal network is operating normally

② When there is an error in the normal network



	Routing destination network number.	Relay destination network number.	Relay destination station number.	Intermediate station number.
①	3	1	2	
②	3	2	2	

(2) The network number (Jn) must be changed for the link-dedicated instruction as shown below.
① When normal network is operating normally

JP. SEND J1 D0 D100 M0

② When there is an error in the normal network

JP. SEND J2 D0 D100 M0

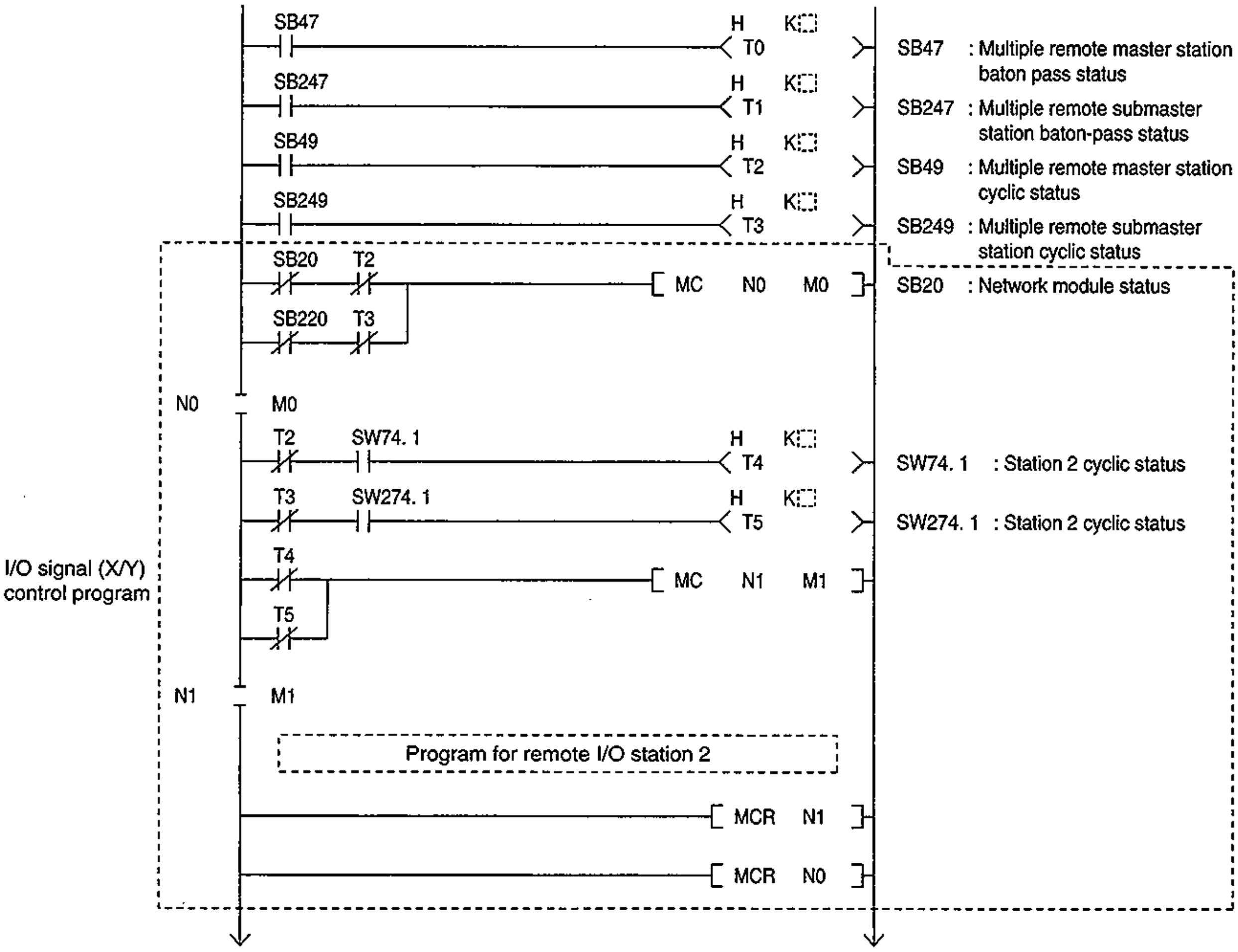
10.5 Programs for Multiple Master System

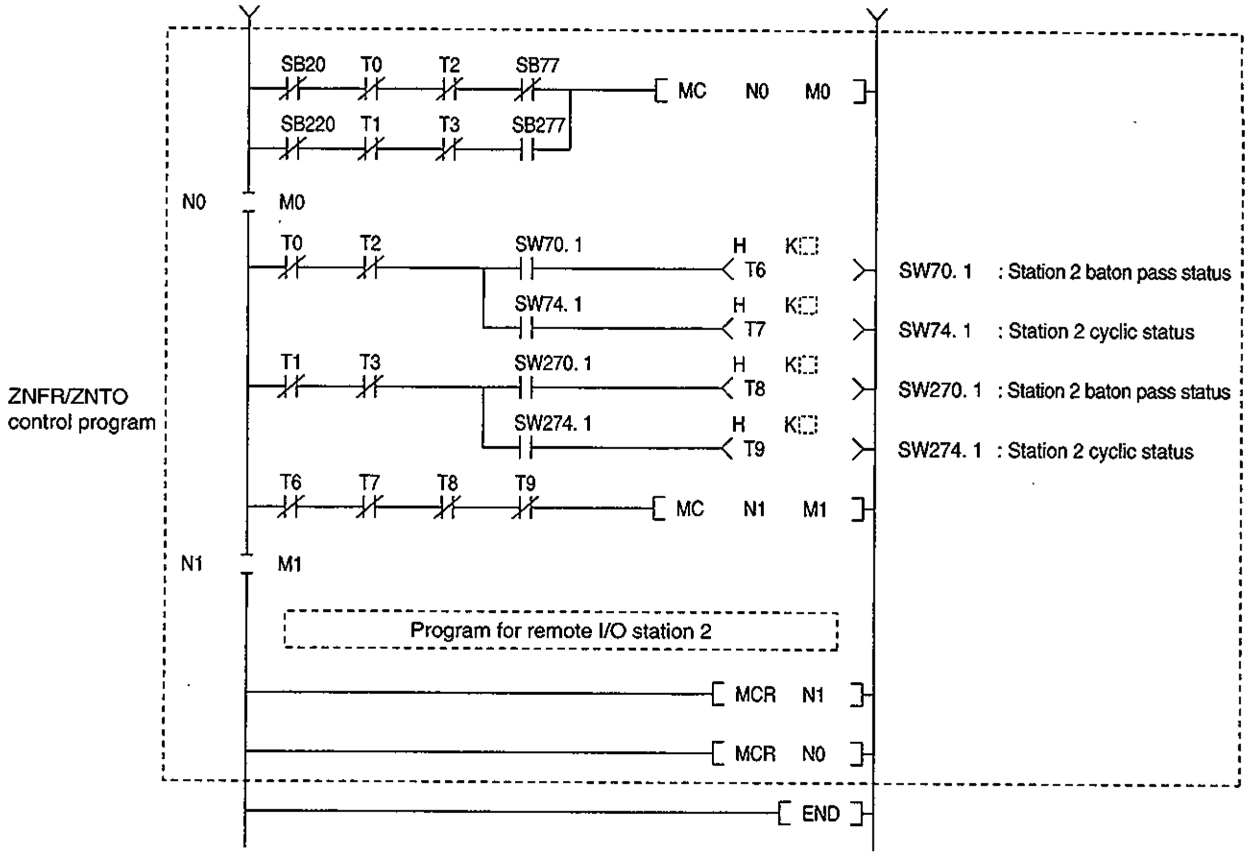
10.5.1 When multiple remote master station and multiple remote submaster station are installed on one QnA(R)CPU

A program used when both multiple remote and submaster stations are installed on one QnA(R)CPU is described in this section.

(1) Program example

Each remote I/O station is controlled by the multiple remote master station while the multiple remote master station is normal, and by the multiple remote submaster station when there is an error with the multiple remote master station.





Set the following value to the timer constant K.

Baton pass status (T0, T1, T6, T8)	(Sequence scan time x 4) or more
Cyclic transmission status (T2, T3, T4, T5, T7, T9)	(sequence scan time x 3) or more

Reason:

This is in order not to stop the control even if a momentary error is detected in the network module due to the cable or noise condition.

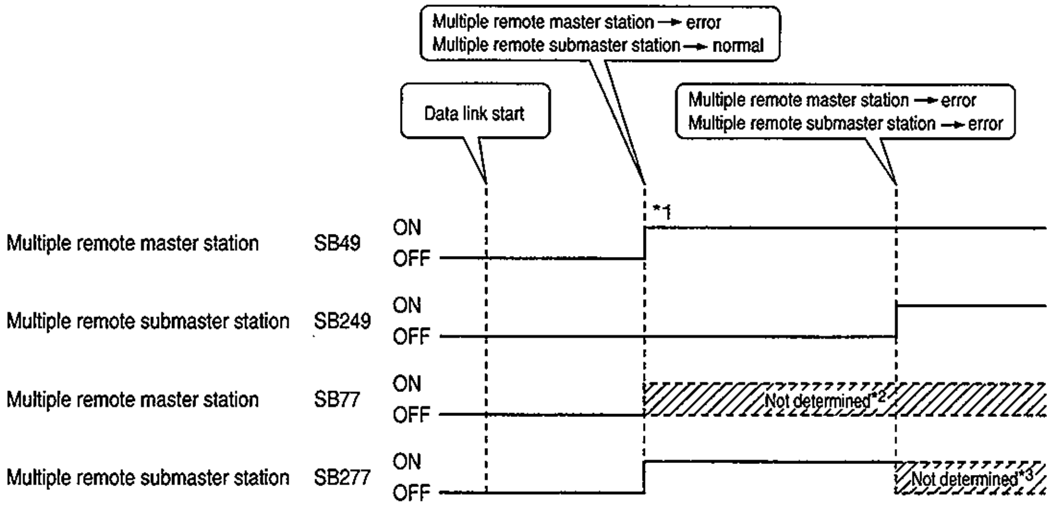
4x or 3x is a mere estimate.

Point

Create the ZNFR/ZNTO instruction with "-[GP. ZNFR U5ZO....]-" so the first I/O number is changed depending on the multiple remote master station status.

(2) Timing

The on/off timing for the SB49/SB249 (cyclic transmission status) and SB77/SB277 (data link control status) depending on the multiple remote master and submaster stations are described below:



*1...Since the multiple remote submaster station is normal, the system will not stop even if the multiple remote master station results in an error.

*2...Do not refer when SB49 is on (error).

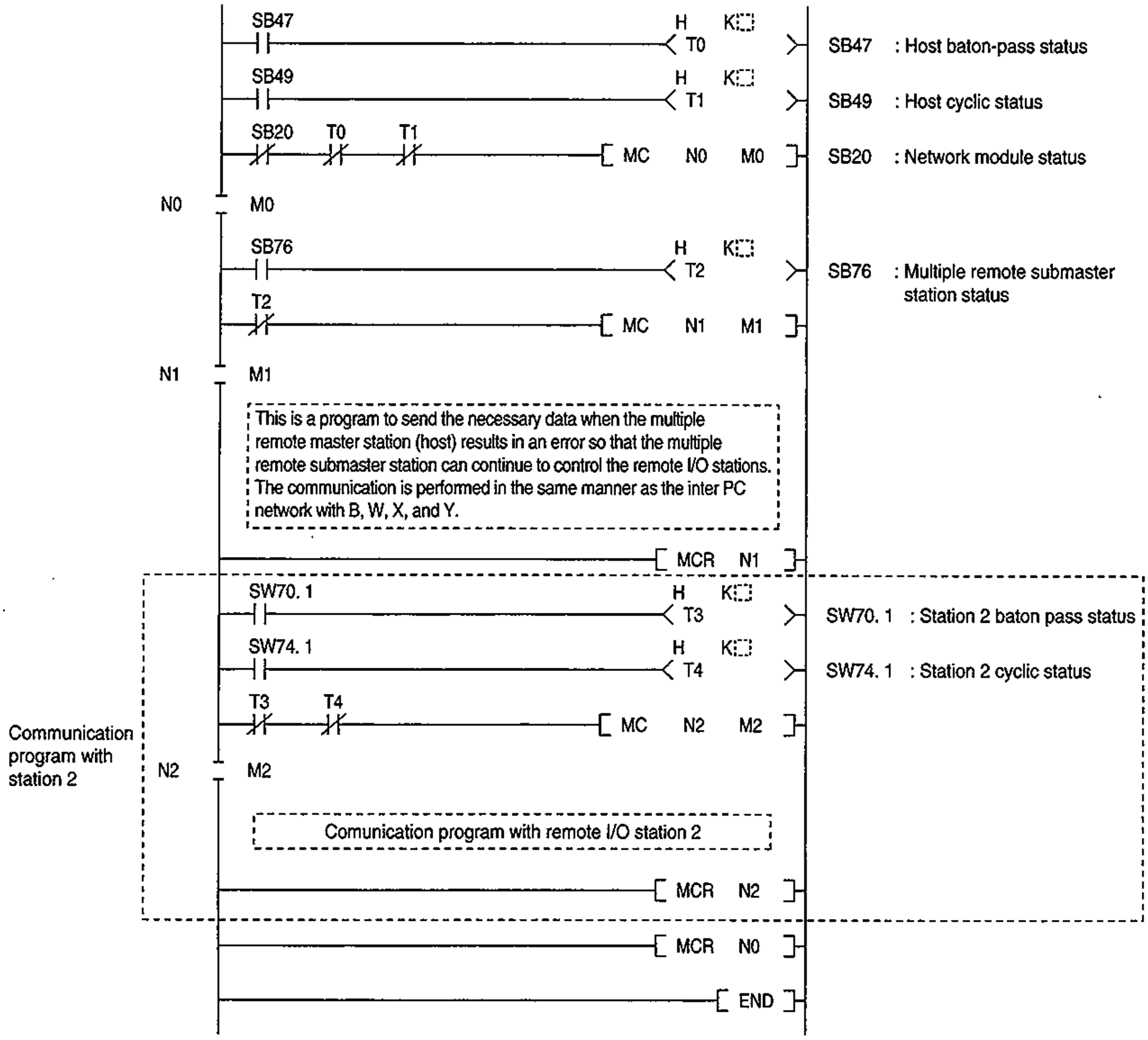
*3...Do not refer when SB249 is on (error).

10.5.2 When the multiple remote master station and multiple remote submaster station are installed on different QnA(R)CPUs

A program used when the multiple remote master and submaster stations are installed on different QnA(R)CPUs are described in this section.

(1) Multiple remote master station program example

If the host (multiple remote master station) is normal, each remote I/O station is controlled. Even if the host goes down, the multiple remote submaster station performs the communication so that the control is continued.



Set the following value to the timer constant K□.

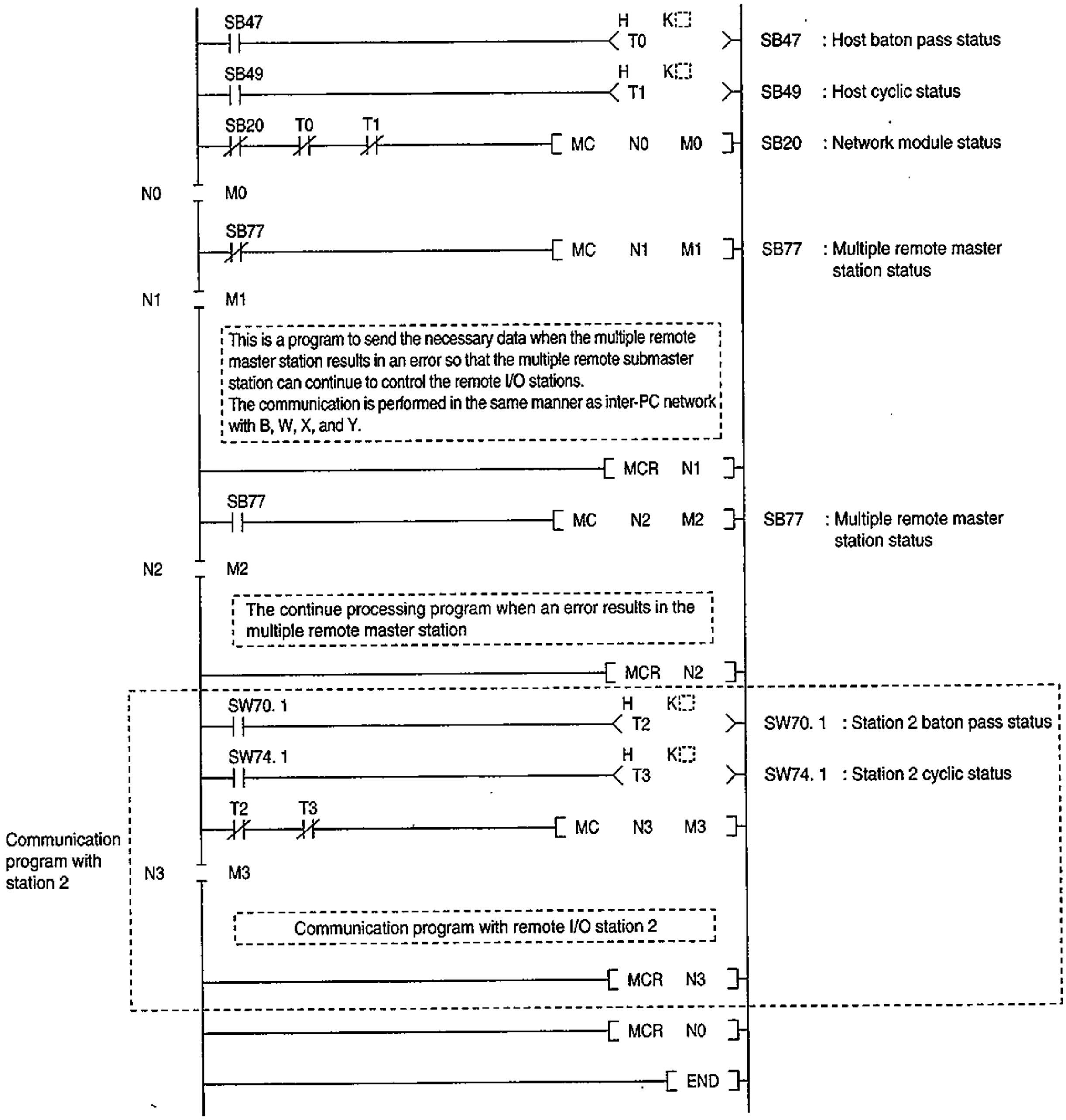
Baton pass status (T0, T3)	(Sequence scan time x 4) or more
Cyclic transmission status (T1, T2, T4)	(sequence scan time x 3) or more

Reason:

This is in order not to stop the control even if a momentary error is detected in the network module due to the cable or noise condition.
4x or 3x is a mere estimate.

(2) Multiple remote submaster station program example

If the multiple remote master station results in an error, each remote I/O station is controlled.
Even if the multiple remote master station goes down, the communication is performed with the master station so that the host (submaster station) can continue the control.



Set the following value to the timer constant K☐.

Baton pass status (T0, T2)	(Sequence scan time x 4) or more
Cyclic transmission status (T1, T3)	(sequence scan time x 3) or more

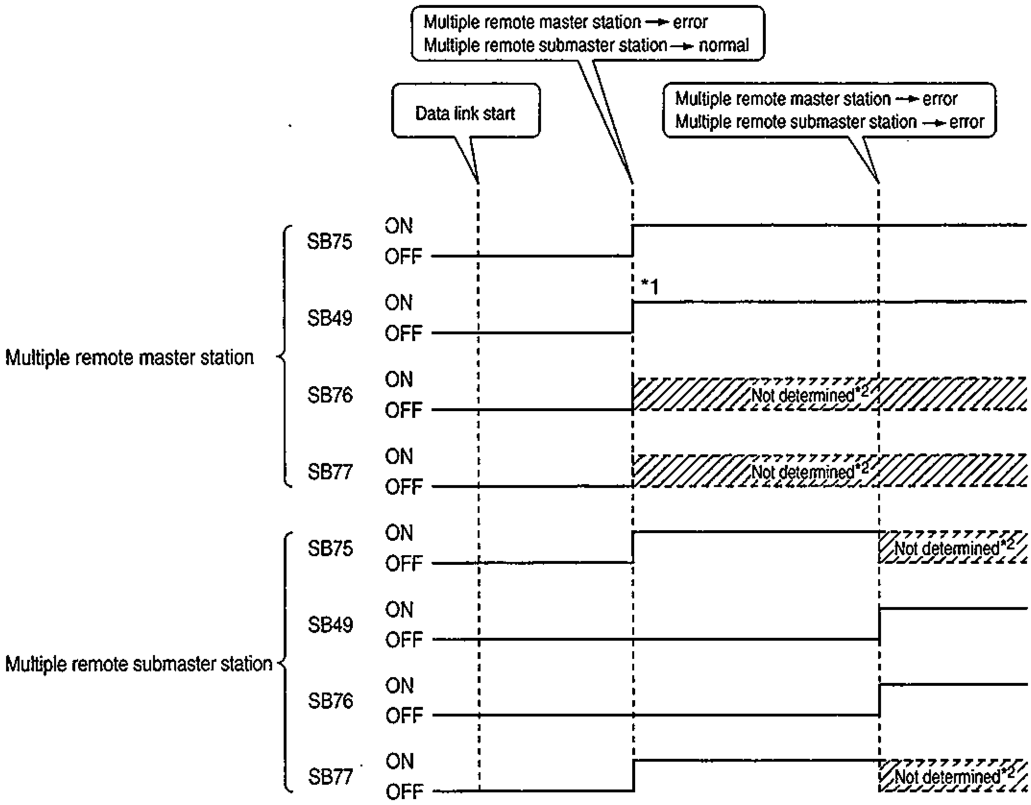
Reason:

This is in order not to stop the control even if a momentary error is detected in the network module due to the cable or noise condition.

4x or 3x is a mere estimate.

(3) Timing

The on/off timing for SB75 (multiple master station status), SB49 (cyclic transmission status), SB76 (multiple remote submaster station status), and SB77 (data link control status) depending on the multiple remote master and submaster station status are shown below:



*1...Since the multiple remote submaster station is normal, it will not stop even if the multiple remote master station results in an error.

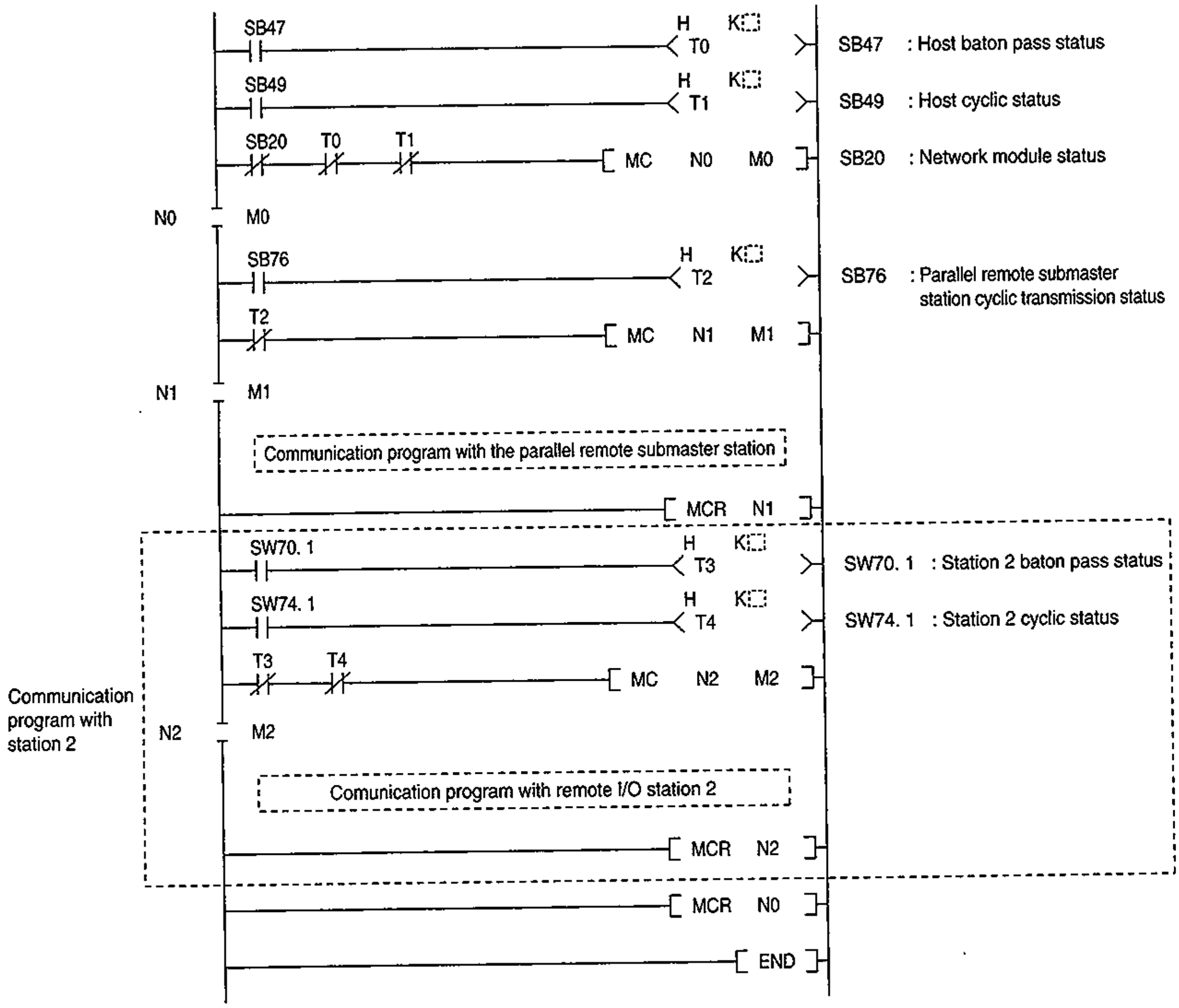
*2...Do not refer if SB49 is on (error).

10.6 Programs for Parallel Master System

The program for the parallel master system is described in this section.

(1) Parallel remote master station program example

If the host (multiple remote master station) is normal, each remote I/O station is controlled. Also, it communicates with the parallel remote submaster station as necessary.



Set the following value to the timer constant K.

Baton pass status (T0, T3)	(Sequence scan time x 4) or more
Cyclic transmission status Parallel remote submaster status (T1, T2, T4)	(sequence scan time x 3) or more

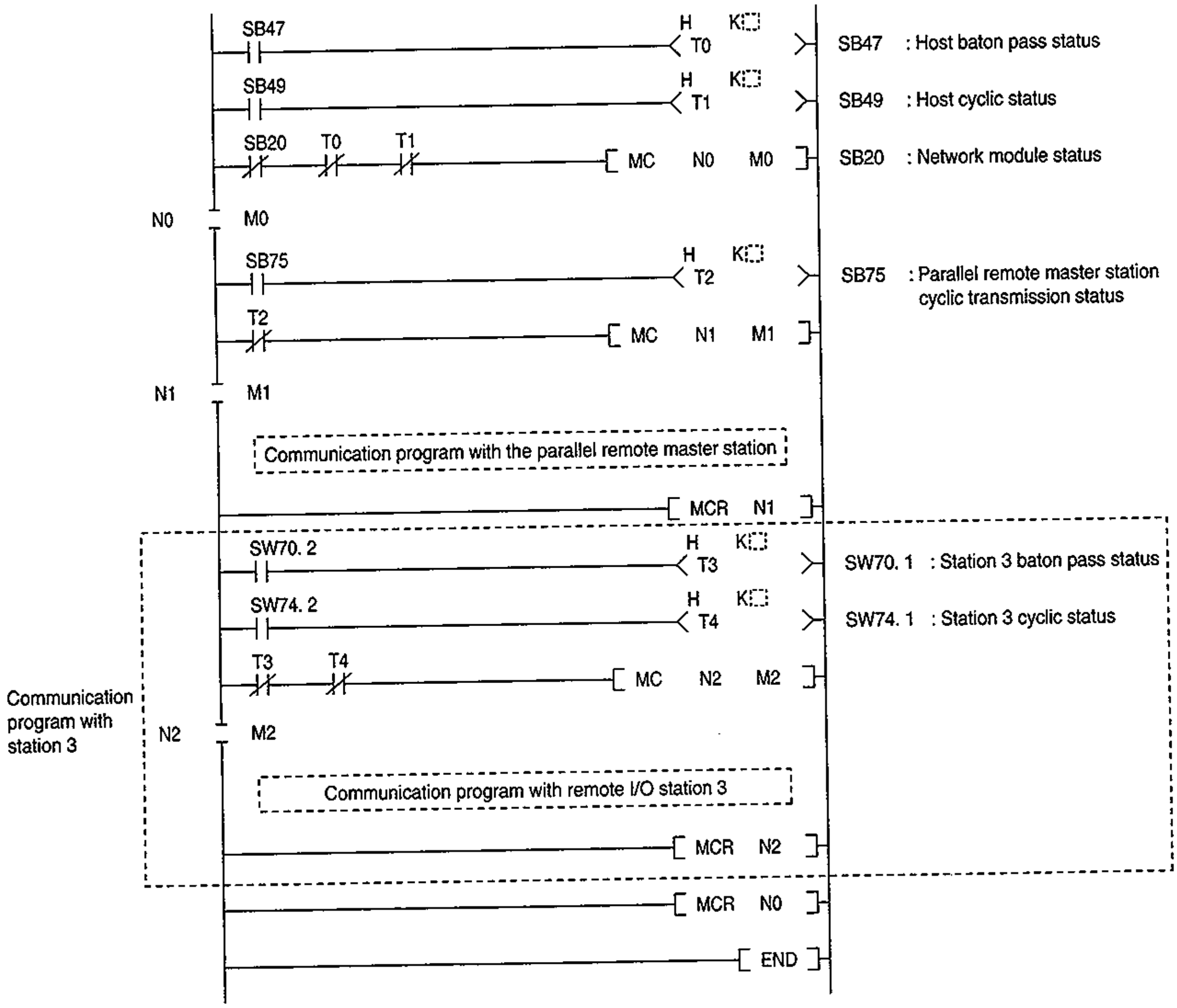
Reason:

This is in order not to stop the control even if a momentary error is detected in the network module due to the cable or noise condition.

4x or 3x is a mere estimate.

(2) **Parallel remote submaster station program example**

If the parallel remote submaster station is normal, each remote I/O station is controlled.
Also, it communicates with the parallel remote master station as necessary.



Set the following value to the timer constant K.

Baton pass status (T0, T3)	(Sequence scan time x 4) or more
Cyclic transmission status Parallel remote master station status (T1, T2, T4)	(sequence scan time x 3) or more

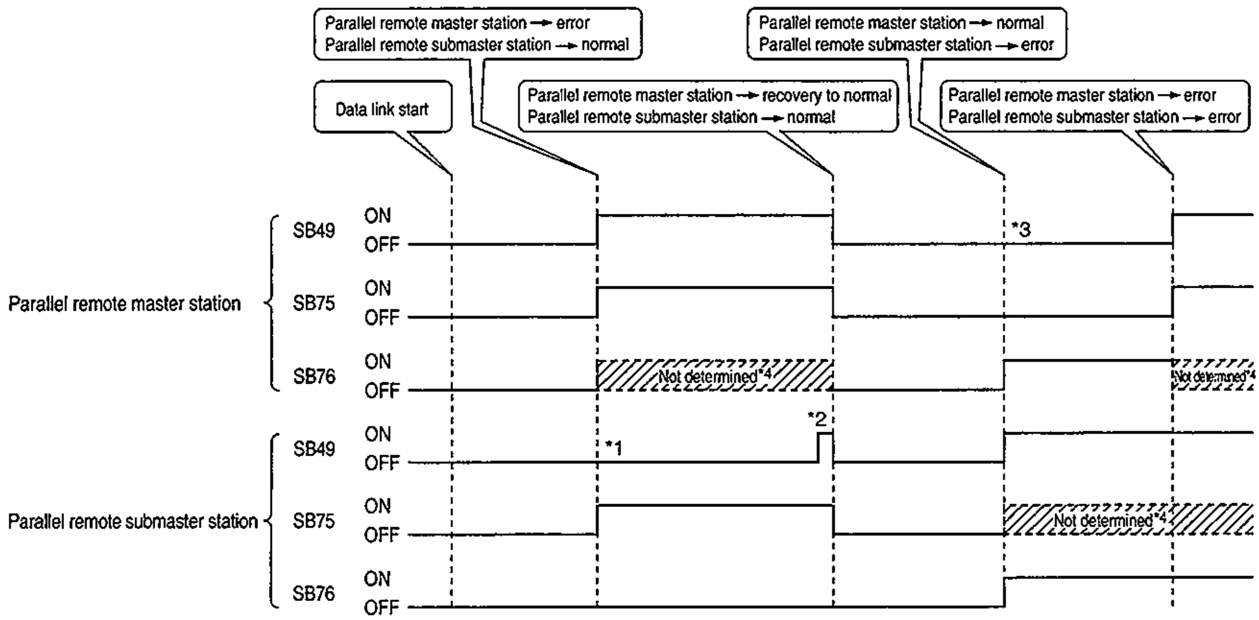
Reason:

This is in order not to stop the control even if a momentary error is detected in the network module due to the cable or noise condition.

4x or 3x is a mere estimate.

(3) **Timing**

The on/off timing for SB49 (cyclic transmission status), SB75 (parallel remote master station's data link status), and SB76 (parallel remote submaster station's data link status) are shown below.



*1...The parallel remote submaster station continues control.
The output from the remote I/O station controlled by the parallel remote master station are all turned off.

*2...Stops temporarily so that the parallel remote master station can resend the parameters.
All output (Y) points for the remote I/O station are turned off during stop.

*3...The parallel remote master station continues the control.
All output points of the remote I/O station controlled by the parallel remote submaster station are turned off.

*4...Do not refer if SB49 is on (error).

10.7 Link Special Relay (SB)/Register (SW)

SB/SW where the data link data is stored are categorized by usage. Refer to the followiing tables when reading Section 10.7.1 on.

(1) Inter-PC network

(a) For the host information inquiry

Item	SB	SW
Host CPU status	SB004A SB004B	SW0043
Clear command status of each log area	SB0005 to 000B	—
Execution status for link dedicated command	SB0030 to 0038	SW0031 to 003F
Network module operation status	SB0020	SW0020
Network module setting status	SB0040 to 0044 SB0058 to 0069	SW0040 to 0046 SW0054 to 0068
Network module status	SB0047 to 0049	SW0047 to 004A

(b) For the total network information inquiry

Item	SB	SW
CPU status of each station (normal/error)	SB0080 SB0088	SW0080 to 0083 SW0088 to 008B
CPU operation status (RUN/STOP) of each station	SB0084	SW0084 to 0087
Cyclic transmission status of each station	SB0074	SW0074 to 0077
Link scan, communication mode	SB0068 SB0069	SW0068 to 008D
Network setting information	SB0064 to 0069	SW0054 to 0068
Network status	SB0070	SW0070 to 0073
Line status	SB0090 to 009A	SW0090 to 009A

(2) Remote I/O network

(a) For the host (remote master station) information inquiry

Item	SB	SW
Host CPU status	SB004A SB004B	SW004B
Clear command status of each log area	SB0005 to 000B	—
Network module operation status	SB0020	SW0020
Network module setting status	SB0040 to 0044 SB0058 to 0069	SW0040 to 0046 SW0054 to 0068
Network module status	SB0047 to 0049	SW0047 to 004A

(b) For the total network information inquiry

Item	SB	SW
Operation status of each station (normal/error)	SB0080	SW0080 to 0083
CPU operation status of remote master station (RUN/STOP)	SB0085	—
CPU operation status of remote submaster station (RUN/STOP)	SB0086	—
Cyclic transmission status of each station	SB0074 to 0076	SW0074 to 0077
Link scan, communication mode	SB0068 SB0069	SW0068 to006D
Network setting information	SB0054 to 006C	SW0054 to 0068
Network status	SB0070	SW0070 to 0073
Line status	SB0090 to 009A	SW0090 to 009A

10.7.1 Link special relay (SB)

The link special relay controls the on/off from different causes during data link. The data link error status can be obtained by using it in the sequence program or by monitoring.
The link special relay (SB) which stores the link status is used in the peripheral device network monitoring. The device number is listed for each item on the monitor screen in Chapter 5.
The SB on each network module is automatically refreshed to the following devices on QnA(R)CPU depending on the number of modules:

1st module	2nd module	3rd module	4th module
SB0 to 1FF	SB200 to 3FF	SB400 to 5FF	SB600 to 7FF

Table 10.1 Link special relay list

Number	Name	Details	Device usage availability							
			Inter-PC network				Remote I/O network			
			MP		NS		MR		R	
			Optical fiber	Coax	Optical fiber	Coax	Optical fiber	Coax	Optical fiber	Coax
SB0000 (0)	Link startup (host) *1	Restarts the host cyclic transmission OFF: No startup command ON: Startup command exists (valid during startup)*2	○	○	○	○	○	○	○	○
SB0001 (1)	Link stop (host)*1	Stops host cyclic transmission OFF: No stop command ON: Stop command exists (valid during startup)*2	○	○	○	○	○	○	○	○
SB0002 (2)	System link startup *1	Cyclic transmission is restarted from the contents of SW0000 to SW0004. OFF: No startup command ON: Startup command exists (valid during startup)*2	○	○	○	○	○	○	○	○
SB0003 (3)	System link stop *1	Stops the cyclic transmission from the contents of SW0000 to SW0004 OFF: No stop command ON: Stop command exists (valid during startup)*2	○	○	○	○	○	○	○	○
SB0005 (5)	Number of retries clear	Number of retries (SW0008, SW0009) are cleared with "0". OFF: No clear command ON: Clear command exists (valid when ON)	○	○	○	○	○	○	○	○
SB0006 (6)	Number of communication errors clear *1	The communication error (SW00B8 to SW0007) are cleared with "0". OFF: No clear command ON: Clear command exists (valid when ON)	○	○	○	○	○	○	○	○
SB0007 (7)	Forward loop transmission error clear	Forward line error detection (SW0000) is cleared with "0". OFF: No clear command ON: Clear command exists	○	×	○	×	○	×	○	×

*1: Used in the peripheral device network testing.
*2: SB000 to 3 are valid when only one point is on.

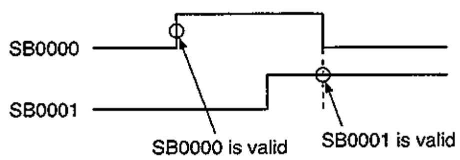


Table 10.1 Link special relay list (continued)

Number	Name	Details	Device usage availability: Inter-PC network MP Optical fiber	Inter-PC network MP Coax	Inter-PC network NS Optical fiber	Inter-PC network NS Coax	Remote I/O network MR Optical fiber	Remote I/O network MR Coax	Remote I/O network R Optical fiber	Remote I/O network R Coax
SB0008 (8)	Reverse loop transmission error clear	The reverse line error detection (SW00CD) is cleared with "0". OFF: No clear command ON: Clear specification exists (valid when on)	○	×	○	×	○	×	○	×
*2 SB0009 (9)	Number of loop switching clear	Number of loop switching (SW00E to E7) is cleared with "0". OFF: No clear command ON: Clear command exists (valid when on)	○	×	○	×	○	×	○	×
SB000A (10)	Transient transmission error clear	Transient transmission error (SW00EE, SW00EF) is cleared with "0". OFF: No clear command ON: Clear command exists (valid when on)	○	○	○	○	○	○	○	○
SB000B (11)	Transient transmission error area setting	Specifies the overwrite/maintain of the transient transmission error (SW00F0 to FF) OFF: Overwrite ON: Maintain	○	○	○	○	○	○	○	○
SB0020 (32)	Module status	Indicates the network module status OFF: Normal ON: Error	○	○	○	○	○	○	×	×
SB0030 (48)	ZNRD instruction acceptance	Indicates the ZNRD instruction receive status OFF: Not received ON: Received	○	○	○	○	○	○	×	×
	Send/receive (1) command	Indicates the acceptance status of SEND/RECV/READ/WRITE/REQ instructions (when using channel 1) OFF: Not accepted ON: accepted/in progress								
SB0032 (50)	ZNWR instruction acceptance	Indicates the ZNRD instruction receive status OFF: Not received ON: Received	○	○	○	○	○	○	×	×
	Send/receive (2) command	Indicates the acceptance status of SEND/RECV/READ/WRITE/REQ instructions (when using channel 2) OFF: Not accepted ON: accepted/in progress								
SB0034 (52)	Send/receive (3) command	Indicates the acceptance status of SEND/RECV/READ/WRITE/REQ instructions (when using channel 3) OFF: Not accepted ON: accepted/in progress	○	○	○	○	○	○	×	×
SB0036 (54)	Send/receive (4) command	Indicates the acceptance status of SEND/RECV/READ/WRITE/REQ instructions (when using channel 4) OFF: Not accepted ON: accepted/in progress	○	○	○	○	○	○	×	×
SB0038 (56)	Send/receive (5) command	Indicates the acceptance status of SEND/RECV/READ/WRITE/REQ instructions (when using channel 5) OFF: Not accepted ON: accepted/in progress	○	○	○	○	○	○	×	×
SB003A (58)	Send/receive (6) command	Indicates the acceptance status of SEND/RECV/READ/WRITE/REQ instructions (when using channel 6) OFF: Not accepted ON: accepted/in progress	○	○	○	○	○	○	×	×

*2: It is necessary to keep the SB0009 ON until the SW000E becomes 0.

Table 10.1 Link special relay list (continued)

Number	Name	Details	Device usage availability							
			Inter-PC network				Remote I/O network			
			M_P		N_S		M_R		R	
			Optical fiber	Coax	Optical fiber	Coax	Optical fiber	Coax	Optical fiber	Coax
SB0003C (60)	Send/receive (7) command	Accept status of SEND/RECV/READ/WRITE/REQ instructions (when using channel 7) is indicated. OFF: Not accepted ON: Accepted/in progress	○	○	○	○	○	○	×	×
SB003E (62)	Send/receive (8) command	Accept status of SEND/RECV/READ/WRITE/REQ instructions (when using channel 8) is indicated. OFF: Not accepted ON: Accepted/in progress	○	○	○	○	○	○	×	×
SB0040 (64)	Network type (host)	The network type set by the host network module switch is indicated. OFF: Inter-PC network ON: Remote I/O network	○	○	○	○	○	○	○	○
SB0042 (66)	Host power supply status	Host's external power supply status is indicated. OFF: No external power supply ON: External power supply exists	○	○	○	○	○	○	×	×
SB0043 (67)	Online switch (host)	The mode set by the host's network module switch is indicated. OFF: Online (Mode setting is "0".) ON: Not online (Mode setting is not "0.")	○	○	○	○	○	○	○	○
SB0044 (68)	Station setting (host)	The station type set by the host's network module switch is indicated. OFF: Normal station } Inter-PC ON: Control station } network OFF: Remote I/O station } Remote I/O ON: Remote master station } network	○	○	○	○	○	○	○	○
SB0047 (71)	Baton pass status	The baton-pass status of the host (transient transmission is possible) is indicated. OFF: Normal ON: Error	○	○	○	○	○	○	○	○
*3 SB0048 (72)	Control station status (inter-PC network)	The host status is indicated. (Valid when SB0047 is off.) OFF: Normal station ON: Control station (SB0044 is on.) Submanagement station (SB0042 is off.)	○	○	○	○	—	—	—	—
	Control station status (Remote I/O network)	Station controlling the baton pass (transient transmission is possible) is indicated. (valid when SB0047 is OFF.) OFF: Remote I/O station ON: Remote master station (SB0044 is on.) Remote I/O station (SB0044 is off.)	—	—	—	—	○	○	○	○
*3 SB0049 (73)	Host data link status	Host data-link status is indicated. OFF: Normal ON: Error (Set after the refresh is complete.)	○	○	○	○	○	○	○	○
*3*4 SB004A (74)	Host CPU status (1)	Host CPU status is indicated. OFF: Normal ON: Minor error occurred	○	○	○	○	○	○	○	○

*3: Valid only when SB0047 is off (normal). When it is on (error), the previous data is maintained.
*4: Aminor error is an error where the CPU operation status results in "continue" (such as battery error).

Table 10.1 Link special relay list (continued)

Number	Name	Details	Device usage availability							
			Inter-PC network				Remote I/O network			
			M_P		N_S		M_R		R	
			Optical fiber	Coax	Optical fiber	Coax	Optical fiber	Coax	Optical fiber	Coax
*3*5 SB004B (75)	Host CPU status	Indicates the host CPU status. OFF: Normal ON: Mid to serious error occurred	○	○	○	○	○	○	○	○
*3 SB004C (76)	Cyclic transmission startup acceptance status	The startup acceptance status of the cyclic transmission is indicated. OFF: Not accept received (SB0000 is off.) ON: Stop accept receive (SB0000 is on.)	○	○	○	○	○	○	○	○
*3 SB004D (77)	Cyclic transmission startup complete status	Cyclic transmission completion status is indicated. OFF: Not complete (SB0000 is off.) ON: Startup complete (SB0000 is on.)	○	○	○	○	○	○	○	○
*3 SB004E (78)	Cyclic transmission stop acceptance status	Cyclic transmission stop acceptance status is indicated. OFF: Not accepted (SB0001 is off.) ON: Stop accept (SB0001 is on.)	○	○	○	○	○	○	○	○
*3 SB004F (79)	Cyclic transmission stop completion status	Cyclic stop completion status is indicated. OFF: Not complete (SB0001 is off.) ON: Stop complete (SB0001 is on.)	○	○	○	○	○	○	○	○
*3 SB0050 (80)	Cyclic transmission startup acceptance status	Cyclic transmission startup acceptance status is indicated. OFF: Not accepted (SB0002 is off.) ON: Startup accepted (SB0002 is on.)	○	○	○	○	○	○	○	○
*3 SB0051 (81)	Cyclic transmission startup completion status	Cyclic transmission completion status OFF: Not complete (SB0002 is off.) ON: Startup complete (SB0002 is on.)	○	○	○	○	○	○	○	○
*3 SB0052 (82)	Cyclic transmission stop acceptance status	Cyclic transmission stop acceptance status is indicated. OFF: Not accepted (SB0003 is off.) ON: Startup accepted (SB0003 is on.)	○	○	○	○	○	○	○	○
*3 SB0053 (83)	Cyclic transmission stop completion status	Cyclic transmission stop completion status is indicated. OFF: Not complete (SB0003 is off.) ON: Stop complete (SB0003 is on.)	○	○	○	○	○	○	○	○
*3 SB0054 (84)	Parameter acceptance status	Parameter receive status is indicated. OFF: Receive complete ON: Not received	○	○	○	○	○	○	○	○
*3 SB0055 (85)	Received parameter error	The received parameter status is indicated. OFF: Parameter normal ON: Parameter error	○	○	○	○	○	○	○	○
*3 SB0056 (86)	Communi-cation status	Transient transmission status is indicated. (Valid when SB0047 is off.) OFF: Transient transmission by the control station (remote master station) ON: Transient transmission by the subcontrol station (other than remote master station)	○	○	○	○	○	○	○	○
*3 SB0058 (88)	Subcontrol station link	Cyclic transmission status when the control station is down is indicated. OFF: Cyclic transmission at the subcontrol station exists ON: No cyclic transmission at the submanagement station	○	○	○	○	○	○	○	○
*3 SB005C (92)	I/O master station (block 1)	Block 1's I/O master station setting (common parameter setting) is indicated. (Valid when SB0049 is off.) OFF: No setting ON: Setting exists. (Station number is stored in SW0050.)	○	○	○	○	×	×	×	×

*3: Valid only when SB0047 is off (normal). When it turns on (error), the previous data is stored.
*5: A middle-class error is when the CPU operation status turns to "stop" (such as WDT error).
A serious error is when the CPU operation status turns to "stop" (Such as RAM error). (Error code 11□□)

Table 10.1 Link special relay list (continued)

Number	Name	Details	Device usage availability							
			Inter-PC network				Remote I/O network			
			Mp		Ns		MR		R	
			Optical fiber	Coax	Optical fiber	Coax	Optical fiber	Coax	Optical fiber	Coax
*3 SB005D (93)	I/O master station (block 2)	The I/O master station setting (common parameter setting) for block 2 is indicated. (Valid when SB0049 is off.) OFF: No setting ON: Setting exists (Station number is stored in SW005D.)	○	○	○	○	×	×	×	×
*3 SB0064 (100)	Reserved station specification	The reserved station specification is indicated. (Valid when SB0049 is off.) OFF: None ON: Exists Turns off when all SW0064 to 67 are "0".	○	○	○	○	○	○	○	○
*3 SB0068 (104)	Communi-cation mode	Link scan mode (common parameter extended setting status) is indicated. (Valid when SB0049 is off.) OFF: Normal mode ON: Constant scan mode	○	○	○	○	○	○	○	○
*3 SB0069 (105)	Multiplex transmission specification	Transmission specification status (common parameter extended setting status) is indicated. (Valid when SB0049 is off.) OFF: Normal transmission specification ON: Multiplex transmission specification	○	×	○	×	○	×	○	×
*3 SB006A (106)	Multiplex transmission status	The transmission status is indicated. OFF: Normal transmission in progress ON: Multiplex transmission in progress	○	×	○	×	○	×	○	×
*3 SB006B (107)	Multiplex/ parallel function specification	Multiple master/parallel master function specification status is indicated. OFF: No setting ON: Setting exists	×	×	×	×	○	○	○	○
*3 SB006C (108)	Multiplex/ parallel function status	Multiple master/parallel master function status is indicated. OFF: Multiple master ON: Parallel master	×	×	×	×	○	○	○	○
*3 SB006D (109)	Communi-cation status with the master station	The cyclic transmission status with the parallel remote master station is indicated. OFF: No cyclic transmission ON: Cyclic transmission exists	×	×	×	×	×	×	○	○
*3 SB006E (110)	Communi-cation status with the submaster station	The cyclic transmission status with the parallel remote submaster station is indicated. OFF: No cyclic transmission ON: Cyclic transmission exists	×	×	×	×	×	×	○	○
*3 SB0070 (112)	Baton pass status at each station	The baton-pass status of each station is indicated. (Reserved stations, stations beyond maximum station number not included.) OFF: All stations normal ON: Faulty station exists. Off when SW0070 to 73 are all "0".	○	○	○	○	○	○	○	○
*3 SB0071 (113)	Master station transient transmission status	The transient transmission status of the remote master station is indicated. OFF: Normal ON: Error	×	×	×	×	○	○	○	○
*3 SB0072 (114)	Submaster station transient transmission status	The transient transmission status of the remote submaster station is indicated. OFF: Normal ON: Error	×	×	×	×	○	○	○	○
*3 SB0074 (116)	Cyclic transmission status at each station	The cyclic transmission status of each station is indicated. (Reserved stations, stations beyond maximum station number not included.) OFF: Data link at all stations ON: Stations not executing data link exists. Off when SW0074 to 77 are all "0".	○	○	○	○	○	○	○	○

*3: Valid only when SB0047 is off (normal). When it turns on (error), the previous data is maintained.

Table 10.1 Link special relay list (continued)

Number	Name	Details	Device usage availability							
			Inter-PC network				Remote I/O network			
			MP		NS		MR		R	
			Optical fiber	Coax	Optical fiber	Coax	Optical fiber	Coax	Optical fiber	Coax
*3 SB0075 (117)	Master station cyclic transmission status	Remote master station's cyclic transmission status is indicated. OFF: Normal ON: Error	×	×	×	×	○	○	○	○
*3 SB0076 (118)	Submaster station cyclic transmission status	Remote submaster station's cyclic transmission status is indicated. (Valid when SB006B is on.) OFF: Normal ON: Error	×	×	×	×	○	○	○	○
*3 SB0077 (119)	Master station cyclic transmission control status	The station controlling the cyclic transmission is indicated. (Valid when SB006B is on.) OFF: Controlled by the remote master station ON: Controlled by the remote submaster station	×	×	×	×	○	○	○	○
*3 SB0078 (120)	Parameter status for each station	The parameter communication status for each station is indicated. (Reserved stations, stations beyond maximum station number not included.) OFF: Not in parameter communication ON: In parameter communication Off when all SW0078 to 7B are all "0".	○	○	×	×	○	○	×	×
*3 SB007C (124)	Parameter status for each station	The parameter status of each station is indicated. (Reserved stations, stations beyond maximum station number not included.) OFF: No station detected parameter error. ON: Station which detected parameter error exists. Off when all SW0070 to 7F are all "0".	○	○	×	×	○	○	×	×
*3 SB0080 (128)	CPU operation status for each station*5	CPU operation status of each station is indicated (including host). OFF: No station with mid to serious error ON: Station with mid to serious major error exists Off when all SW0080 to 83 are all "0".	○	○	○	○	×	×	×	×
	Remote I/O station status	Remote I/O station status is indicated (including host). OFF: All stations normal ON: Faulty station exists. Off when all SW0080 to 83 are all "0".	×	×	×	×	○	○	○	○
*3 SB0084 (132)	CPU RUN status for each station	CPU RUN status of each station is indicated. OFF: All stations at RUN or STEP RUN state. ON: Stations at STOP or PAUSE status exists (including host). Off when all SW0084 to 87 are all "0".	○	○	○	○	×	×	×	×
*3 SB0085 (133)	Master station CPU status	Remote master station CPU status is indicated. OFF: RUN, STEP RUN ON: STOP, PAUSE	×	×	×	×	○	○	○	○
*3 SB0086 (134)	Submaster station CPU status	Remote submaster station CPU status is indicated. OFF: RUN, STEP RUN ON: STOP, PAUSE	×	×	×	×	○	○	○	○
*3 SB0088 (136)	CPU operation status for each station*7	CPU operation status of each station is indicated (including host). OFF: No station with minor error ON: Station with minor error exists Off when all SW0088 to 8B are all "0".	○	○	○	○	○	○	○	○

*3: Valid only when SB0047 is off (normal). When it turns on (error), the previous data is maintained.
*5: A middle-class error is when the CPU operation status turns to "stop" (such as WDT error).
A major error is when the CPU operation status turns to "stop." (Such as RAM error.) (Error code 11□□)
*7: A minor error is when the CPU operation status results in "continue" (such as a battery error).

Table 10.1 Link special relay list (continued)

Number	Name	Details	Device usage availability							
			Inter-PC network				Remote I/O network			
			MP		NS		MR		R	
			Optical fiber	Coax	Optical fiber	Coax	Optical fiber	Coax	Optical fiber	Coax
*3 SB008C (140)	External power existence information	External power supply information is indicated (including host). OFF: No external power supply for all stations ON: Station with external power supply exists Off when all SW0088 to 8B are all "0".	○	○	○	○	○	○	○	○
*3 SB0090 (144)	Host loop status	The host loop status is indicated. OFF: Normal ON: Error Turns off when SW0090 is "0".	○	×	○	×	○	×	○	×
*3 SB0091 (145)	Forward loop status	The status of the stations connected to the forward loop is indicated. OFF: All stations normal ON: Faulty station exists. Turns off when SW0091 to 94 are all "0".	○	×	○	×	○	×	○	×
*3 SB0092 (146)	Master station forward loop status	Remote master station's forward loop status is indicated. OFF: Normal ON: Error	×	×	×	×	×	×	○	×
*3 SB0095 (149)	Reverse loop status	The status of the stations connected to the reverse loop is indicated. OFF: All stations normal ON: Faulty station exists. Turns off when SW0095 to 98 are all "0".	○	×	○	×	○	×	○	×
*3 SB0096 (150)	Master station reverse loop status	Remote master station's reverse loop status is indicated. OFF: Normal ON: Error	×	×	×	×	×	×	○	×
*3 SB0099 (153)	Forward loop loop-back	The loop-back status of the forward loop in the system is indicated. OFF: No loop backs ON: Station in loop back exists. (The station in the loop back is stored in SW0099.)	○	×	○	×	○	×	○	×
*3 SB009A (154)	Reverse loop loop-back	The loop back status of the reverse loop in the system is indicated. OFF: No loop backs ON: Station in loop back exists (Station in the loop back is stored in SW009A.)	○	×	○	×	○	×	○	×
*3 SB00A0 (160)	RECV instruction execution request flag (1)	RECV instruction execution request status indicated. (Channel 1) OFF: No execution request ON: Execution request exists	○	○	○	○	○	○	×	×
*3 SB00A1 (161)	RECV instruction execution request flag (2)	RECV instruction execution request status indicated. (Channel 2) OFF: No execution request ON: Execution request exists	○	○	○	○	○	○	×	×
*3 SB00A2 (162)	RECV instruction execution request flag (3)	RECV instruction execution request status indicated. (Channel 3) OFF: No execution request ON: Execution request exists	○	○	○	○	○	○	×	×
*3 SB00A3 (163)	RECV instruction execution request flag (4)	RECV instruction execution request status indicated. (Channel 4) OFF: No execution request ON: Execution request exists	○	○	○	○	○	○	×	×
*3 SB00A4 (164)	RECV instruction execution request flag (5)	RECV instruction execution request status indicated. (Channel 5) OFF: No execution request ON: Execution request exists	○	○	○	○	○	○	×	×
*3 SB00A5 (165)	RECV instruction execution request flag (6)	RECV instruction execution request status indicated. (Channel 6) OFF: No execution request ON: Execution request exists	○	○	○	○	○	○	×	×

*3: Valid only when SB0047 is off (normal). When it turns on (error), the previous data is maintained

Table 10.1 Link special relay list (continued)

Number	Name	Details	Device usage availability							
			Inter-PC network				Remote I/O network			
			Mp		Ns		MR		R	
			Optical fiber	Coax	Optical fiber	Coax	Optical fiber	Coax	Optical fiber	Coax
*3 SB00A6 (166)	RECV instruction execution request flag (7)	RECV instruction execution request status indicated. (Channel 7) OFF: No execution request ON: Execution request exists	○	○	○	○	○	○	×	×
*3 SB00A7 (167)	RECV instruction execution request flag (8)	RECV instruction execution request status indicated. (Channel 8) OFF: No execution request ON: Execution request exists	○	○	○	○	○	○	×	×
*3 SB00A8 (168)	Online test specification	The online test specification status is indicated. OFF: Not specified ON: Specified	○	○	○	○	○	○	○	○
*3 SB00A9 (169)	Online test complete	Online test completion status is indicated. OFF: Not complete ON: Complete	○	○	○	○	○	○	○	○
*3 SB00AA (170)	Online test response specification	Online test response status is indicated. OFF: No response ON: Response complete	○	○	○	○	○	○	○	○
*3 SB00AB (171)	Online test response complete	Online test response completion status is indicated. OFF: No response complete ON: Response complete	○	○	○	○	○	○	○	○
*3 SB00AC (172)	Offline test specification	Offline test specification status is indicated. OFF: Not specified ON: Specified	○	○	○	○	○	○	○	○
*3 SB00AD (173)	Offline test complete	Offline test completion status is indicated. OFF: Not complete ON: Complete	○	○	○	○	○	○	○	○
*3 SB00AE (174)	Offline test response specification	Offline test response status is indicated. OFF: No response ON: Response	○	○	○	○	○	○	○	○
*3 SB00AF (175)	Offline test response complete	Offline test response completion status is indicated. OFF: No response complete ON: Response complete	○	○	○	○	○	○	○	○
*3 SB00EE (238)	Transient error	Error status of the transient transmission is indicated. OFF: No error ON: Error exists	○	○	○	○	○	○	○	○
*3 SB01F0 (496)	User-free flag status	User-flag status is indicated. (Reserved stations and stations beyond the max. station number are not included.) OFF: All user flags are off ON: Turned on user-flag exists Off when SW01F0 to 1F3 are all "0".	○	○	○	○	×	×	×	×

*3: Valid only when SB0047 is off (normal). When it turns on (error), the previous data is maintained.

10.7.2 Link Special Register (SW)

The link special registers store the information during data link in numeric values.
By monitoring these registers, the erroneous areas and causes can be investigated.
The link special registers (SW) that store the link status are used by the peripheral device network monitor. Refer to Chapter 5 for the device numbers by item in the monitor screen.
The SW for each network module is reafreshed automatically to the QnA(R)CPU device shown below, depending on the number of modules:

1st module	2nd module	3rd module	4th module
SW0 to 1FF	SW200 to 3FF	SW400 to 5FF	SW600 to 7FF

Table 10.2 Link special register list

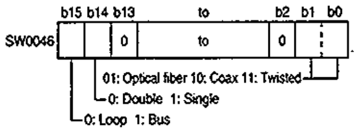
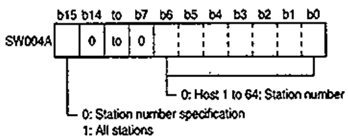
<table>
<tr><th rowspan="4">Number</th><th rowspan="4">Name</th><th rowspan="4">Details</th><th colspan="8">Device usage availability</th></tr>
<tr><th colspan="4">Inter-PC network</th><th colspan="4">Remote I/O network</th></tr>
<tr><th colspan="2">MP</th><th colspan="2">NS</th><th colspan="2">MR</th><th colspan="2">R</th></tr>
<tr><th>Optical fiber</th><th>Coax</th><th>Optical fiber</th><th>Coax</th><th>Optical fiber</th><th>Coax</th><th>Optical fiber</th><th>Coax</th></tr>
<tr><td>SW0000
(0)</td><td>Link stop/startup specification details*1</td><td>Station to stop/restart the data link is set.
00H: Host
01H: All stations
02H: Specified station
80H: Host (forced stop/restart)
81H: All stations (forced stop/restart)
82H: Specified station (forced stop/restart)</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td></tr>
<tr><td>SW0001
(1)
•
SW0002
(2)
•
SW0003
(3)
•
SW0004
(4)</td><td>Link stop/startup specification details*1</td><td>Set for specified station. (When SW000 is 02H or B2H.)
Set the bit for the station in which data link will be stopped/restarted to "1."
0: Data link stop/restart specification invalid
1: Data link stop/restart specification valid
<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>SW0001</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>SW0002</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>SW0003</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>SW0004</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>1 to 64 in the table indicates station numbers.</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td></tr>
<tr><td>SW0020
(32)</td><td>Module status</td><td>The network module status is stored.
0: Normal
1 to :Error (Refer to Section 15.1 for error codes.) FF: Module error</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td rowspan="2">SW0031
(49)</td><td>ZNRD instruction processing result</td><td>ZNRD instruction processing result is indicated.
0: Normal completion
1 to :Error completion(Refer to Section 15.1 for error codes.)</td><td rowspan="2">○</td><td rowspan="2">○</td><td rowspan="2">○</td><td rowspan="2">○</td><td rowspan="2">○</td><td rowspan="2">○</td><td rowspan="2">×</td><td rowspan="2">×</td></tr>
<tr><td>Send/receive instruction (1) processing result</td><td>SEND/RECV/READ/WRITE/REQ instruction (when channel 1 is used) processing result is indicated.
0: Normal completion
1 to :Error completion(Refer to Section 15.1 for error codes.)</td></tr>
</table>

*1: Used in peripheral device network testing.

Table 10.2 Link special register list (continued)

Number	Name	Details	Device usage availability							
			Inter-PC network				Remote I/O network			
			M_P		N_S		M_R		R	
			Optical fiber	Coax	Optical fiber	Coax	Optical fiber	Coax	Optical fiber	Coax
SW0033 (51)	ZNWR instruction processing result	ZNWR instruction processing result is indicated. 0: Normal completion 1 to: Error completion (Refer to Section 15.1 for error codes.)	○	○	○	○	○	○	×	×
	Send/receive instruction (2) processing result	SEND/RECV/READ/WRITE/REQ instruction (when using channel 2) processing result is indicated. 0: Normal completion 1 to: Error completion (Refer to Section 15.1 for error codes.)	○	○	○	○	○	○	×	×
SW0035 (53)	Send/receive instruction (3) processing result	SEND/RECV/READ/WRITE/REQ instruction (when using channel 3) processing result is indicated. 0: Normal completion 1 to: Error completion (Refer to Section 15.1 for error codes.)	○	○	○	○	○	○	×	×
SW0037 (55)	Send/receive instruction (4) processing result	SEND/RECV/READ/WRITE/REQ instruction (when using channel 4) processing result is indicated. 0: Normal completion 1 to: Error completion (Refer to Section 15.1 for error codes.)	○	○	○	○	○	○	×	×
SW0039 (57)	Send/receive instruction (5) processing result	SEND/RECV/READ/WRITE/REQ instruction (when using channel 5) processing result is indicated. 0: Normal completion 1 to: Error completion (Refer to Section 15.1 for error codes.)	○	○	○	○	○	○	×	×
SW003B (59)	Send/receive instruction (6) processing result	SEND/RECV/READ/WRITE/REQ instruction (when using channel 6) processing result is indicated. 0: Normal completion 1 to: Error completion (Refer to Section 15.1 for error codes.)	○	○	○	○	○	○	×	×
SW003D (61)	Send/receive instruction (7) processing result	SEND/RECV/READ/WRITE/REQ instruction (when using channel 7) processing result is indicated. 0: Normal completion 1 to: Error completion (Refer to Section 15.1 for error codes.)	○	○	○	○	○	○	×	×
SW003F (63)	Send/receive instruction (8) processing result	SEND/RECV/READ/WRITE/REQ instruction (when using channel 8) processing result is indicated. 0: Normal completion 1 to: Error completion (Refer to Section 15.1 for error codes.)	○	○	○	○	○	○	×	×
SW0040 (64)	Network number	Host network number is stored. Range: 1 to 239	○	○	○	○	○	○	○	○
SW0041 (65)	Group number	Host group number is stored. 0: No group specification 1 to 9: Group number	○	○	○	○	×	×	×	×
SW0042 (66)	Station number	Host station number is stored. Range: 1 to 64 70H: Remote master station	○	○	○	○	○	○	○	○
SW0043 (67)	Online switch	Host mode switch status is stored. Range: 0_H-F_H	○	○	○	○	○	○	○	○
SW0044 (68)	Station setting	Host condition setting switch status is stored. 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] 1 to 8 in the table indicates the SW number.	○	○	○	○	○	○	○	○

Table 10.2 Link special register list (continued)

Number	Name	Details	Device usage availability							
			Inter-PC network				Remote I/O network			
			M_P		N_S		M_R		R	
			Optical fiber	Coax	Optical fiber	Coax	Optical fiber	Coax	Optical fiber	Coax
SW0046 (70)	Module ID	Stores the type of the host network module.  	○	○	○	○	○	○	○	○
SW0047 (71)	Baton pass status	Stores the baton-pass status of the host 0: Data link in progress 1: Data link stopped (by another station) 2: Data link stopped (by host) 3: Batonpass in progress (parameter received) 4: Batonpass in progress (parameter received) 5: Batonpass in progress (parameter not received) 6: Disconnected from network (no batonpass) 7: Disconnected from network (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	○	○	○	○	○	○	○	○
SW0048 (72)	Baton pass interrupt cause	Stores the baton-pass interruption cause for host 0: Normal communication 1: Offline 2: Offline test 3 to: Interrupt cause (Refer to Section 15.1.)	○	○	○	○	○	○	○	○
*2 SW0049 (73)	Data link transmission stop cause	Stores the cause for the host data link stop. 0: Normal 1: Stop specified 2: No common parameter 3: Common parameter error 4: Host CPU error 5: Communication interrupt	○	○	○	○	○	○	○	○
*2 SW004A (74)	Data link stop request station	Stores the station which stopped the host data link (Valid when SW0049 is "1".)  	○	○	○	○	○	○	○	○

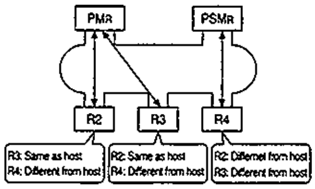
*2: Valid only when SB0047 is off (normal). When it turns on (error), the previous data is maintained.

Table 10.2 Link special register list (continued)

Number	Name	Details	Device usage availability							
			Inter-PC network				Remote I/O network			
			M_P		N_S		M_R		R	
			Optical fiber	Coax	Optical fiber	Coax	Optical fiber	Coax	Optical fiber	Coax
*2 SW004B (75)	Host PCU status	Host CPU status is indicated. 0: Normal 1 to: Error (Refer to Section 15.1 for error codes.)	○	○	○	○	○	○	○	○
*2 SW004C (76)	Host CPU error slot number	The slot number of the host where error occurred is stored. (Valid when SW004B is not "0".)	×	×	×	×	×	×	○	○
*2 SW004D (77)	Data link startup status (host)	Data link startup result is stored. 0: Normal 1 to: Error (Refer to Section 15.1 for error codes.)	○	○	○	○	○	○	○	○
*2 SW004F (79)	Data link stop status (host)	Data link stop result is stored. 0: Normal 1 to: Error (Refer to Section 15.1 for error codes.)	○	○	○	○	○	○	○	○
*2 SW0051 (81)	Data link startup status (whole system)	Data link startup result is stored. 0: Normal 1 to: Error (Refer to Section 15.1 for error codes.)	○	○	○	○	○	○	○	○
*2 SW0053 (83)	Data link stop status (whole system)	Data link stop result is stored. 0: Normal 1 to: Error (Refer to Section 15.1 for error codes.)	○	○	○	○	○	○	○	○
*2 SW0054 (84)	Parameter (1)	The parameter information is stored. (Valid when SB0054 and SB0055 are off.) 0: Used only for common parameters 1: Common parameter + station-specific parameters 2: Used only for default parameters 3: Default parameters + station-specific parameters	○	○	○	○	×	×	×	×
*2 SW0055 (85)	Parameter (2)	The parameter status is stored. 0: Parameter normal 1 to: Parameter error (Refer to Section 10.1.)	○	○	○	○	○	○	○	○
*2 SW0056 (86)	Current control station	The station number of the station actually taking the control station role is stored (including subcontrol station). Range: 1 to 64	○	○	○	○	—	—	—	—
	Current master station	The station number of the station controlling the baton-pass is stored. 7DH: Remote master station Other than 7DH: Station number of controlling station	—	—	—	—	○	○	○	○
*2 SW0057 (87)	Specified control station	The station number set as the control station is stored. Range: 1 to 64 0: Specified control station error	○	○	○	○	—	—	—	—
	Specified master station	7DH: Remote master station 0: Remote master station	—	—	—	—	○	○	○	○
*2 SW0059 (89)	Total number of linked stations	The total number of linked stations set in the parameter is stored. Range: 1 to 64 (64 when parameter does not exist.)	○	○	○	○	○	○	○	○
*2 SW005A (90)	Max. station number in normal baton-pass stations	The maximum. station number performing normal baton-pass is stored. Range: 1 to 64	○	○	○	○	○	○	○	○
*2 SW005B (91)	Max. station number in cyclic transmission stations	The maximum station number performing cyclic transmission is stored. Range: 1 to 64	○	○	○	○	○	○	○	○

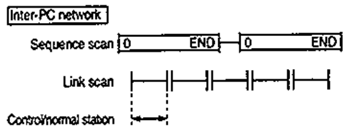
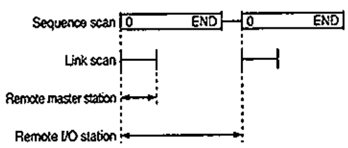
*2: Valid only when SB0047 is off (normal). When it turns on (error), the previous data is maintained.

Table 10.2 Link special register list (continued)

Number	Name	Details	Device usage availability							
			Inter-PC network				Remote I/O network			
			MP		NS		MR		R	
			Optical fiber	Coax	Optical fiber	Coax	Optical fiber	Coax	Optical fiber	Coax
*2 SW005C (92)	I/O master station (block 1)	The station number of block I/O master station is stored. 0: None 1 to 64: Station number Valid when SB0049 is off.	○	○	○	○	×	×	×	×
*2 SW005D (93)	I/O master station (block 2)	Station number of block 2's I/O master station is stored. 0: None 1 to 64: Station number Valid when SB0049 is off.	○	○	○	○	×	×	×	×
*2 SW0060 (96) • SW0061 (97) • SW0062 (98) • SW0063 (99)	Cyclic transmission control status	The status of whether the controlling station (parallel remote master station/parallel remote submaster station) is the same station as the host. 0: Same as host 1: Different from host b15 b14 b13 b12 to b4 b3 b2 b1 b0 SW0060: 16 15 14 13 to 5 4 3 2 1 SW0061: 32 31 30 29 to 21 20 19 18 17 SW0062: 48 47 46 45 to 37 36 35 34 33 SW0063: 64 63 62 61 to 53 52 51 50 49 1 to 64 in the table indicates the station number. 	×	×	×	×	○	○	○	○
*2 SW0064 (100) • SW0065 (101) • SW0066 (102) • SW0067 (103)	Reserved station specification	The estation set as the reserved station is stored. 0: Not reserved station 1: Reserved station Valid 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 1 to 64 in the table indicates the station number.	○	○	○	○	○	○	○	○
*2 SW0068 (104)	Comunication mode	The constant link scan setting status is stored. 0: No storage 1 to 500: Setting time [ms] Valid when SB0049 is off.	○	○	○	○	○	○	○	○

*2: Valid only when SB0047 is off (normal). When it turns on (error), the previous data is maintained.

Table 10.2 Link special register list (continued)

Number	Name	Details	Device usage availability							
			Inter-PC network				Remote I/O network			
			MP		NS		MR		R	
			Optical fiber	Coax	Optical fiber	Coax	Optical fiber	Coax	Optical fiber	Coax
*2 SW006B (107)	Max. link scan time	The max./min./current values for the link scan time are stored. (Unit [ms]) The time for the control station (remote master station) and normal station (remote I/O station) differ. Inter-PC network  The constant scan setting is as follows: Control station (Setting value)<(Link scan measured value + KB of the link scan time calculation expression) →Link scan measured value + KB of the link scan time calculation expression (Setting value)<(Link scan measured value + link scan time calculation method KB) →Link scan measured value Normal station→ Set constant link scan Remote I/O network 	○	○	○	○	○	○	○	○
*2 SW006C (108)	Min. link scan time		○	○	○	○	○	○	○	○
*2 SW006D (109)	Current link scan time		○	○	○	○	○	○	○	○
*2 SW0070 (112) • SW0071 (113) • SW0072 (114) • SW0073 (115)	Baton pass status at each station	The baton pass status of each station is stored (including the host). (Online) 0: Normal (inluding stations beyond the max. station number and reserved stations) 1: Error (Offline test) 0: Normal 1: Error (inluding stations beyond the max. station number and reserved stations)	○	○	○	○	○	○	○	○

	b15	b14	b13	b12	to	b4	b3	b2	b1	b0
SW0070	16	15	14	13	to	5	4	3	2	1
SW0071	32	31	30	29	to	21	20	19	18	17
SW0072	48	47	46	45	to	37	36	35	34	33
SW0073	64	63	62	61	to	53	52	51	50	49

1 to 64 in the table indicates the station number.

*2: Valid only when SB0047 is off (normal). When it turns on (error), the previous data is maintained.

Table 10.2 Link special register list (continued)

Number	Name	Details	Device usage availability							
			Inter-PC network				Remote I/O network			
			MP		NS		MR		R	
			Optical fiber	Coax	Optical fiber	Coax	Optical fiber	Coax	Optical fiber	Coax
*2 SW0074 (116) • SW0075 (117) • SW0076 (118) • SW0077 (119)	Cyclic transmission status of each station	The cyclic transmission status of each station is stored (including host). 0: Cyclic transmission in progress (including the stations beyond max. station number and reserved stations) 1: Cyclic transmission not executed b15 b14 b13 b12 to b4 b3 b2 b1 b0 SW0074 16 15 14 13 to 5 4 3 2 1 SW0075 32 31 30 29 to 21 20 19 18 17 SW0076 48 47 46 45 to 37 36 35 34 33 SW0077 64 63 62 61 to 53 52 51 50 49 1 to 64 in the table indicates the station number.	○	○	○	○	○	○	○	○
*2 SW0078 (120) • SW0079 (121) • SW007A (122) • SW007B (123)	Parameter communication status at each station	The parameter communication status of each station is stored. 0: Parameter communication not in progress (including the stations beyond max. station number and reserved stations) 1: Parameter communication in progress b15 b14 b13 b12 to b4 b3 b2 b1 b0 SW0078 16 15 14 13 to 5 4 3 2 1 SW0079 32 31 30 29 to 21 20 19 18 17 SW007A 48 47 46 45 to 37 36 35 34 33 SW007B 64 63 62 61 to 53 52 51 50 49 1 to 64 in the table indicates the station number.	○	○	×	×	○	○	×	×
*2 SW007C (124) • SW007D (125) • SW007E (126) • SW007F (127)	Parameter error status at each station	The parameter status of each station is stored. 0: Parameter normal (including the stations beyond max. station number and reserved stations) 1: Parameter error b15 b14 b13 b12 to b4 b3 b2 b1 b0 SW007C 16 15 14 13 to 5 4 3 2 1 SW007D 32 31 30 29 to 21 20 19 18 17 SW007E 48 47 46 45 to 37 36 35 34 33 SW007F 64 63 62 61 to 53 52 51 50 49 1 to 64 in the table indicates the station number.	○	○	×	×	○	○	×	×
*2 SW0080 (128) • SW0081 (129) • SW0082 (130) • SW0083 (131)	CPU oepration status (1) at each station	The CPU status of each station is stored (including host). Valid only when SW70 to 73 are normal. 0: Normal (including the stations beyond max. station number and reserved stations) 1: Mid/serious error b15 b14 b13 b12 to b4 b3 b2 b1 b0 SW0080 16 15 14 13 to 5 4 3 2 1 SW0081 32 31 30 29 to 21 20 19 18 17 SW0082 48 47 46 45 to 37 36 35 34 33 SW0083 64 63 62 61 to 53 52 51 50 49 1 to 64 in the table indicates the station number.	○	○	○	○	○	○	○	○

*2: Valid only when SB0047 is off (normal). When it turns on (error), the previous data is maintained.

Table 10.2 Link special register list (continued)

<table>
<tr><th rowspan="4">Number</th><th rowspan="4">Name</th><th rowspan="4">Details</th><th colspan="8">Device usage availability</th></tr>
<tr><th colspan="4">Inter-PC network</th><th colspan="4">Remote I/O network</th></tr>
<tr><th colspan="2">MP</th><th colspan="2">NS</th><th colspan="2">MR</th><th colspan="2">R</th></tr>
<tr><th>Optical fiber</th><th>Coax</th><th>Optical fiber</th><th>Coax</th><th>Optical fiber</th><th>Coax</th><th>Optical fiber</th><th>Coax</th></tr>
<tr><td>*2
SW0084
(132)
•
SW0085
(133)
•
SW0086
(134)
•
SW0087
(135)</td><td>CPU RUN status at reach station</td><td>The CPU RUN status for each station is stored (including host).
The standby-system Q4ARCPU stores the key switch status at normal state.
Valid only for stations with SW70 to 73 being normal.
0: RUN or STEP RUN (including stations beyond max. station number and reserved stations)
1: STOP, PAUSE, 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>SW0084</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>SW0085</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>SW0086</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>SW0087</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>
1 to 64 in the table indicates the station number.</td><td>○</td><td>○</td><td>○</td><td>○</td><td>×</td><td>×</td><td>×</td><td>×</td></tr>
<tr><td>*2
SW0088
(136)
•
SW0089
(137)
•
SW008A
(138)
•
SW008B
(139)</td><td>CPU operation status at each station (2)</td><td>The CPU status of each station is stored (including host).
Valid for stations with SW70 to 73 being normal.
0: Normal (including stations beyond max. station number and reserved stations)
1: Minor 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>SW0088</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>SW0089</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>SW008A</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>SW008B</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>
1 to 64 in the table indicates the station number.</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td></tr>
<tr><td>*2
SW008C
(140)
•
SW008D
(141)
•
SW008E
(142)
•
SW008F
(143)</td><td>External power supply existence information for other stations</td><td>The external power supply status of each station is stored (including host)
Valid only for stations with SW70 to 73 being normal.
0: No power supply (including stations beyond max. station number and reserved stations)
1: Power supply exists
<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>SW008C</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>SW008D</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>SW008E</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>SW008F</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>
1 to 64 in the table indicates the station number.</td><td>○</td><td>×</td><td>○</td><td>×</td><td>○</td><td>×</td><td>○</td><td>×</td></tr>
<tr><td>*2
SW0090
(144)</td><td>Loop-back information</td><td>The loop status of the host is stored.
0: Loop normal
1: Forward loop error
2: Reverser loop error
3: Loop back
4: Data link not possible</td><td>○</td><td>×</td><td>○</td><td>×</td><td>○</td><td>×</td><td>○</td><td>×</td></tr>
</table>

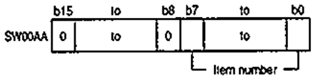
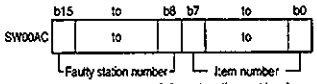
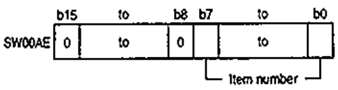
*2: Valid only when SB0047 is off (normal). When it turns on (error), the previous data is maintained.

Table 10.2 Link special register list (continued)

Number	Name	Details	Device usage availability							
			Inter-PC network				Remote I/O network			
			MP		NS		MR		R	
			Optical fiber	Coax	Optical fiber	Coax	Optical fiber	Coax	Optical fiber	Coax
*2 SW0091 (145) • SW0092 (146) • SW0093 (147) • SW0094 (148)	Forward loop status at each station	The forwrd loop status at each station is stored (including host). 0: Normal (including stations beyond max. station number and reserved stations) 1: Error The disconnected station is maintained at the status before disconnection . b15 b14 b13 b12 to b4 b3 b2 b1 b0 SW0091: 16 15 14 13 to 5 4 3 2 1 SW0092: 32 31 30 29 to 21 20 19 18 17 SW0093: 48 47 46 45 to 37 36 35 34 33 SW0094: 64 63 62 61 to 53 52 51 50 49 1 to 64 in the table indicates the station number.	○	×	○	×	○	×	○	×
*2 SW0095 (149) • SW0096 (150) • SW0097 (151) • SW0098 (152)	Reverse loop status at each station	The reverse loop status at each station is stored (including host). 0: Normal (including stations beyond max. station number and reserved stations) 1: Error b15 b14 b13 b12 to b4 b3 b2 b1 b0 SW0095: 16 15 14 13 to 5 4 3 2 1 SW0096: 32 31 30 29 to 21 20 19 18 17 SW0097: 48 47 46 45 to 37 36 35 34 33 SW0098: 64 63 62 61 to 53 52 51 50 49 1 to 64 in the table indicates the station number.	○	×	○	×	○	×	○	×
*2 SW0099 (153)	Loop-back station (forward loop)	The station number executing a loopback on the forward loop side is stored. Range: 1 to 64	○	×	○	×	○	×	○	×
*2 SW009A (154)	Loop-back station (reverse loop)	The station number executing a loopback on the reverse loop side is stored. Range: 1 to 64	○	×	○	×	○	×	○	×
*2 SW00A8 (168)	Online test item/faulty station (request side)	The online test items and error stations on the requesting side is stored. Valid when SB00A9 is on. b15 to b8 b7 to b0 SW00A8: [Faulty station number (b15 to b8)] [Item number (b7 to b0)] 10_H: Loop test 20_H: Setting confirmation test 30_H: Station order confirmation test 40_H: Communication test	○	○	○	○	○	○	○	○
*2 SW00A9 (169)	Online test result (request side)	The online result on the requesting side is stored. (Valid when SB00A9 is on.) 0: Test normal 1 to: Test error details (Refer to Section 15.1)	○	○	○	○	○	○	○	○

*2: Valid only when SB0047 is off (normal). When it turns on (error), the previous data is maintained.

Table 10.2 Link special register list (continued)

Number	Name	Details	Device usage availability							
			Inter-PC network				Remote I/O network			
			M_P		N_S		M_R		R	
			Optical fiber	Coax	Optical fiber	Coax	Optical fiber	Coax	Optical fiber	Coax
*2 SW00AA (170)	Online test item (response side)	The online test item on the response side is stored. (Valid when SB00AB is on.)  10H: Loop test 20H: Setting confirmation test 30H: Station order confirmation test 40H: Communication test	○	○	○	○	○	○	○	○
*2 SW00AB (171)	Online test result (response side)	The online test result on the response side is stored. (Valid when SB00AB is on.) 0: Test normal 1 to: Test error details (Refer to Section 15.1.)	○	○	○	○	○	○	○	○
*2 SW00AC (172)	Offline test item/faulty station (request side)	The offline test item and faulty station on the request side are stored. (Valid when SB00AD is on.)  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	○	○	○	○	○	○	○	○
*2 SW00AD (173)	Offline test result (request side)	The offline test result on the request side is stored. (Valid when SB00AD is on.) 0: Test normal 1 to: Test error details (Refer to Section 10.1.)	○	○	○	○	○	○	○	○
*2 SW00AE (174)	Offline test item (response side)	The offline test item on the response side is stored. (Valid when SB00AF is on.)  3: Loop test (forward loop) 4: Loop test (reverse loop)	○	○	○	○	○	○	○	○
*2 SW00AF (175)	Online test result (response side)	The offline test result on the response side is stored. (Valid when SB00AF is on.) 0: Test normal 1 to: Test error details (Refer to Section 10.1.)	○	○	○	○	○	○	○	○

*2: Valid only when SB0047 is off (normal). When it turns on (error), the previous data is maintained.

Table 10.2 Link special register list (continued)

Number	Name	Details	Device usage availability							
			Inter-PC network				Remote I/O network			
			MP		NS		MR		R	
			Optical fiber	Coax	Optical fiber	Coax	Optical fiber	Coax	Optical fiber	Coax
*2 SW00B0 (176) • SW00B1 (177) • SW00B2 (178) • SW00B3 (179)	Multiplex transmission status (1)	The forward loop usage status at each station during multiplex transmission is stored. 0: Other than forward loop 1: Forward loop in use b15 b14 b13 b12 to b4 b3 b2 b1 b0 SW00B0: 16 15 14 13 to 5 4 3 2 1 SW00B1: 32 31 30 29 to 21 20 19 18 17 SW00B2: 48 47 46 45 to 37 36 35 34 33 SW00B3: 64 63 62 61 to 53 52 51 50 49 1 to 64 in the table indicates the station number.	○	×	○	×	○	×	○	×
*2 SW00B4 (180) • SW00B5 (181) • SW00B6 (182) • SW00B7 (183)	Multiplex transmission status (2)	The reverse loop usage status at each station during multiplex transmission is stored. 0: Other than reverse loop 1: Reverse loop in use b15 b14 b13 b12 to b4 b3 b2 b1 b0 SW00B4: 16 15 14 13 to 5 4 3 2 1 SW00B5: 32 31 30 29 to 21 20 19 18 17 SW00B6: 48 47 46 45 to 37 36 35 34 33 SW00B7: 64 63 62 61 to 53 52 51 50 49 1 to 64 in the table indicates the station number.	○	×	○	×	○	×	○	×
*2*3 SW00B8 (184)	Forward loop side UNDER	The number of "UNDER" errors on the forward loop is counted and stored. 0 to: Number of errors	○	○	○	○	○	○	○	○
*2*3 SW00B9 (185)	Forward loop side CRC	The number of "CRC" errors on the forward loop is counted and stored. 0 to: Number of errors	○	○	○	○	○	○	○	○
*2*3 SW00BA (186)	Forward loop side OVER	The number of "OVER" errors on the forward loop is counted and stored. 0 to: Number of errors	○	○	○	○	○	○	○	○
*2*3 SW00BB (187)	Forward loop side short frame	The number of "short frame" errors on the forward loop is counted and stored. 0 to: Number of errors	○	○	○	○	○	○	○	○
*2*3 SW00BC (188)	Forward loop side abort (AB.IF)	The number of "AB.IF" errors on the forward loop is counted and stored. 0 to: Number of errors	○	○	○	○	○	○	○	○
*2*3 SW00BD (189)	Forward loop side timeout (TIME)	The number of "TIME" errors on the forward loop is counted and stored. 0 to: Number of errors	○	○	○	○	○	○	○	○
*2*3 SW00BE (190)	Forward loop side more than 2k bytes received (DATA)	The number of "DATA" errors on the forward loop is counted and stored. 0 to: Number of errors	○	○	○	○	○	○	○	○

*2: Valid only when SB0047 is off (normal). When it turns on (error), the previous data is maintained.
*3: Turn SB0006 on to reset SW00B8 to C7.
For the number of SW00B8 to C7, it will not have problems when count is incremented little by little over a long period of time.
When the count is incremented in a short amount of time (when monitoring by peripheral device, etc.) there may be problems with the cable.

Table 10.2 Link special register list (continued)

Number	Name	Details	Device usage availability							
			Inter-PC network				Remote I/O network			
			MP		NS		MR		R	
			Optical fiber	Coax	Optical fiber	Coax	Optical fiber	Coax	Optical fiber	Coax
*2*3 SW00BF (191)	Forward loop side DPLL error	The number of "DPLL" errors on the forward loop is counted and stored. 0 to: Number of errors	O	O	O	O	O	O	O	O
*2*3 SW00C0 (192)	Reverse loop side UNDER	The number of "UNDER" errors on the reverse loop is counted and stored. 0 to: Number of errors	O	O	O	O	O	O	O	O
*2*3 SW00C1 (193)	Reverse loop side CRC	The number of "CRC" errors on the reverse loop is counted and stored. 0 to: Number of errors	O	O	O	O	O	O	O	O
*2*3 SW00C2 (194)	Reverse loop side OVER	The number of "OVER" errors on the reverse loop is counted and stored. 0 to: Number of errors	O	O	O	O	O	O	O	O
*2*3 SW00C3 (195)	Reverse loop side short frame	The number of "short frame" errors on the reverse loop is counted and stored. 0 to: Number of errors	O	O	O	O	O	O	O	O
*2*3 SW00C4 (196)	Reverse loop side abort (AB.IF)	The number of "AB.IF" errors on the reverse loop is counted and stored. 0: Number of errors	O	O	O	O	O	O	O	O
*2*3 SW00C5 (197)	Reverse loop side timeout (TIME)	The number of "TIME" errors on the reverse loop is counted and stored. 0 to: Number of errors	O	O	O	O	O	O	O	O
*2*3 SW00C6 (198)	Reverse loop side more than 2k bytes received (DATA)	The number of "DATA" errors on the reverse loop is counted and stored. 0 to: Number of errors	O	O	O	O	O	O	O	O
*2*3 SW00C7 (199)	Reverse loop side DPLL error	The number of "DPLL" errors on the reverse loop is counted and stored. 0 to: Number of errors	O	O	O	O	O	O	O	O
*2*4 SW00C8 (200)	Forward loop side number of retries	The number of retries on the forward loop is counted and stored. 0 to: Number of errors	O	O	O	O	O	O	O	O
*2*4 SW00C9 (201)	Reverse loop side number of retries	The number of retries on the reverse loop is counted and stored. 0 to: Number of errors	O	O	O	O	O	O	O	O
*2*5 SW00CC (204)	Forward loop side line error	The number of line error detections on the forward loop is counted and stored. 0 to: Number of line errors detected	O	×	O	×	O	×	O	×
*2*6 SW00CD (205)	Reverse loop side line error	The number of line error detections on the reverse loop is counted and stored. 0 to: Number of line errors detected	O	×	O	×	O	×	O	×
*2 SW00CE (206)	Number of loop switches	The number of loop checks performed is counted and stored. 0 to: Number of loop switches	O	×	O	×	O	×	O	×

*2: Valid only when SB0047 is off (normal). When it turns on (error), the previous data is maintained.
*3: Turn on SB0006 to reset SW00B8 to C7.
For the number of SW00B8 to C7, it will not have problems when count is incremented little by little over a long period of time.
When the count is incremented in a short amount of time (when monitoring by peripheral device, etc.) there may be problems with the cable.
*4: the count may be incremented when the power is turned on/reset, however, they are not errors.
When the number of retries is not necessary before data link is started, clear with SB0005.
*5: Turn on SB0007 to reset SW00CC.
*6: Turn on SB0008 to reset SW00CD

Table 10.2 Link special register list (continued)

Number	Name	Details	Device usage availability							
			Inter-PC network				Remote I/O network			
			MP		NS		MR		R	
			Optical fiber	Coax	Optical fiber	Coax	Optical fiber	Coax	Optical fiber	Coax
*2*7 SW00CF (207)	Loop switch data pointer	The pointer that sets the next loop switch data is stored.	○	×	○	×	○	×	○	×
*2*7 SW00D0 (208) to SW00DF (223)	Loop switch data	The reason and status of loop switch is stored. The data overwrite/maintain is set by the common parameters. SW00D0 to SW00DF: b15 to b8 b7 b6 b5 b4 b3 b2 b1 b0 b15 to b8: Status after switching; b7 to b0: Reason (Reason) The bit corresponding to each error is set to 1. All 0: Recovery specification b0: Forward loop H/W error b1: Reverse loop H/W 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 (Status after switching) 0: Multiplex transmission (forward loop/reverse loop normal) 1: Data link with forward loop 2: Data link with reverse loop 3: Data link with loop back	○	×	○	×	○	×	○	×
*2*7*8 SW00E0 (224) to SW00E7 (231)	Switch request station	The station number requesting the loop switch is stored. SW00E0 to SW00E7: b15 to b8 b7 to b0 b15 to b8: Switch request stations at odd number of times; b7 to b0: Switch request stations at even number of times	○	×	○	×	○	×	○	×
*9 SW00EE (238)	Transient transmission error	The number of transient-transmission error is counted and stored. 0 to: Number of errors	○	○	○	○	○	○	○	○
*9 SW00EF (239)	Transient transmission error pointer	The pointer to set the next transient-transmission error data is stored.	○	○	○	○	○	○	○	○
*2 SW00F0 (240) to SW00FF (255)	Transient transmission error data	The transient-transmission error data is stored.	○	○	○	○	○	○	○	○

*2: Valid only when SB0047 is off (normal). When it turns on (error), the previous data is maintained.
*7: Turn on SB0009 to reset SW00CD to E7.
*8: The loop switch request is performed by the station detecting the loop error first, so the station besides the two adjacent stations at the loop error may be stored.
*9: turn on SB0C0A to reset SW00EE to EF.

Table 10.2 Link special register list (continued)

<table>
<tr><th rowspan="4">Number</th><th rowspan="4">Name</th><th rowspan="4">Details</th><th colspan="8">Device usage availability</th></tr>
<tr><th colspan="4">Inter-PC network</th><th colspan="4">Remote I/O network</th></tr>
<tr><th colspan="2">MP</th><th colspan="2">NS</th><th colspan="2">MR</th><th colspan="2">R</th></tr>
<tr><th>Optical fiber</th><th>Coax</th><th>Optical fiber</th><th>Coax</th><th>Optical fiber</th><th>Coax</th><th>Optical fiber</th><th>Coax</th></tr>
<tr><td>*2
SW01F0
(496)
•
SW01F1
(497)
•
SW01F2
(498)
•
SW01F3
(499)</td><td>User-flag status</td><td>The user-flag status is stored.
0: Flag off
1: Flag on
<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>SW01F0</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>SW01F1</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>SW01F2</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>SW01F3</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>1 to 64 in the table indicates the station number.</td><td>○</td><td>○</td><td>○</td><td>○</td><td>×</td><td>×</td><td>×</td><td>×</td></tr>
</table>

*2: Valid only when SB0047 is off (normal). When it turns on (error), the previous data is maintained.

10.7.3 SB/SW valid during offline test

Most SB/SW are inavlid during the offline test except for the SB/SW shown below. However, these are valid for only control station and master station.

Valid SB/SW		Mode setting switch				
		3	4	5 to 8	A	B
SB	00AC	○	○	○	○	○
	00AD	○	○	○	○	○
SW	0047	×	×	○	○	○
	0048	×	×	○	○	○
	0049	×	×	○	○	○
	0070 to 73	○	○	×	×	×
	00AC	○	○	○	○	○
	00AD	○	○	○	○	○

○: Valid ×: Invalid

10.8 Remote I/O Station Special Relay (M, SM)/ Special Register (D, SD)

The special relays (M9000 to, SM0 to) and special registers (D9000 to, SD0 to) of the remote I/O station are described.

The special relays/registers can be set its monitoring, on/off, and data from the peripheral device.

10.8.1 Special relay (M, SM)

Table 10.3 Special relay (M)

Number	Name	Details
*1 M9000	Fuse shut off	OFF: Normal ON: There is an output module with a fuse shut off. (Remains on as long as it is not reset even if the output module is back to normal.)
*1 M9002	I/O module verification error	OFF: Normal ON: I/O verification error (Different from the status when the I/O module power is turned on. → Module has been removed.) (Remains on as long as it is not reset even if the module is back to normal.)
*1 M9008	Self diagnosis error	OFF: Normal ON: Error detection (Error code is stored in D9008.) (Remains on as long as it is not reset even if the module is back to normal.)
M9084	Error check	OFF: Perform error check (Fuse shut off, I/O module verification error) ON: No error checking
M9094	I/O replacement flag	OFF: No replacement ON: Replace (The replacement can be replaced by turning on M9094 after setting the first I/O number the I/O module to replace to D9094.)

*1: The RMT.E LED turns on.

Table 10.4 Special relay (SM)

Number	Name	Details
*1 SM1	Self diagnosis error	OFF: Normal ON: Error detection (Remains on as long as it is not reset even if the output module is back to normal.)
*1 SM60	Fuse shut off	OFF: Normal ON: There is an output module with fuse shut off. (Remains on as long as it is not reset even if the output module is back to normal.)
*1 SM61	I/O module verification error	OFF: Normal ON: I/O verification error (Different from the status when the I/O module power is turned on. → Module has been removed.) (Remains on as long as it is not reset even if the output module is back to normal.)
SM251	I/O replacement flag	OFF: Not replaced ON: Replaced (The replacement can be performed by turning on SM251 after setting the first I/O number of the I/O module to be replaced with SD251)
SM252	I/O replacement OK	OFF: Replacement not possible ON: Replacement possible
SM253	Peripheral device connection flag	OFF: Not connected ON: Connected
SM1000 to SM1255	Special relay corresonding to ACPU	The special relays corresponding to M9000 to 9255 are stored.

*1: The RMT.E LED turns on.

10.8.2 Special Register (D, SD)

Table 10.5 Special register (D)

Number	Name	Details
D9000	Fuse shut off module number (valid when M9000 is on)	The first I/O number of the module with fuse shut off is stored. When the errors occur in multiple output module, the smallest first I/O number is stored. (EX.: Y50 to 6F output module → Hex "50_H" is stored.)
D9002	I/O module verification error module number (valid when M9002 is on)	The first I/O number of the module with I/O module verification error is stored. When the errors occur in multiple output modules, the smallest first I/O number is stored. (EX.: Y50 to 6F output module → Hex "50_H" is stored.)
D9008	Self-diagnosis error number (valid when M9008 is on)	Self-diagnosis error detail is stored. (Refer to table 9.7.)
D9010	Error slot number	The slot number where the module causing the self-diagnosis error is stored.
D9014	I/O control method	I/O control method is stored. 3: Input and output refreshed.
D9015	Operation status	Remote I/O station CPU operation status is stored. 1: STOP
D9072	PC communication check	Area to perform communication check with remote I/O station CPU in the independent self-loopback test of calculator link module.
D9091	Self-diagnosis error detail number	Self-diagnosis error details are stored. (Refer to table 9.7.)
D9094	Replacement I/O first I/O number	The first I/O number of the module removed or installed during online is stored. (EX.: Y50 to 6F output module → Hex "50_H" is stored.)
D9100 to D9107	Fuse shut off error module	"1" is stored in the I/O number (16-point module) for the output module with fuse shut off status. 0 to 7F0 in the table indicate the I/O numbers.

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
D9100	F0	E0	D0	C0	B0	A0	90	80	70	60	50	40	30	20	10	0
D9101	1F0	1E0	1D0	1C0	1B0	1A0	190	180	170	160	150	140	130	120	110	100
D9102	2F0	2E0	2D0	2C0	2B0	2A0	290	280	270	260	250	240	230	220	210	200
D9103	3F0	3E0	3D0	3C0	3B0	3A0	390	380	370	360	350	340	330	320	310	300
D9104	4F0	4E0	4D0	4C0	4B0	4A0	490	480	470	460	450	440	430	420	410	400
D9105	5F0	5E0	5D0	5C0	5B0	5A0	590	580	570	560	550	540	530	520	510	500
D9106	6F0	6E0	6D0	6C0	6B0	6A0	690	680	670	660	650	640	630	620	610	600
D9107	7F0	7E0	7D0	7C0	7B0	7A0	790	780	770	760	750	740	730	720	710	700

Number	Name	Details
D9116 to D9123	I/O module verification error module	"1" is stored in the I/O number (16-point module) for the output module with I/O module verification error. 0 to 7F0 in the table indicate the I/O numbers.

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
D9116	F0	E0	D0	C0	B0	A0	90	80	70	60	50	40	30	20	10	0
D9117	1F0	1E0	1D0	1C0	1B0	1A0	190	180	170	160	150	140	130	120	110	100
D9118	2F0	2E0	2D0	2C0	2B0	2A0	290	280	270	260	250	240	230	220	210	200
D9119	3F0	3E0	3D0	3C0	3B0	3A0	390	380	370	360	350	340	330	320	310	300
D9120	4F0	4E0	4D0	4C0	4B0	4A0	490	480	470	460	450	440	430	420	410	400
D9121	5F0	5E0	5D0	5C0	5B0	5A0	590	580	570	560	550	540	530	520	510	500
D9122	6F0	6E0	6D0	6C0	6B0	6A0	690	680	670	660	650	640	630	620	610	600
D9123	7F0	7E0	7D0	7C0	7B0	7A0	790	780	770	760	750	740	730	720	710	700

Table 10.6 Special registers (SD)

Number	Name	Details
SD0	Diagnosis error number	The details of the diagnosis error (SM0 is on) is stored. (Refer to table 10.7.)
SD60	Fuse shutoff Module number	The first I/O number of the output module with fuse shutoff. However, if the errors occur in multiple output modules, the smallest first I/O number is stored. (e.g.: Y50 to 6F output module → Hex "50_H" is stored.)
SD61	I/O module verification Error module number	The first I/O number of the module with the I/O module verification error is stored. However, if the errors occur in multiple output modules, the smallest first I/O number is stored. (e.g.: Y50 to 6F output module → Hex "50_H" is stored.)
SD203	CPU operation status	Remote I/O station CPU operation status is stored. 0: RUN
SD251	Repalcement I/O first I/O number	The first I/O number of the I/O module removed or installed during online is stored. (e.g.: Y50 to 6F output module → Hex "50_H" is stored.)
SD1000 to SD1255	Special register corresponding to ACPU	The special registers corresponding to D9000 to 9255 are stored.
SD1300 to SD1307	Fuse shutoff Error module	The I/O number (16-point unit) of the output module with fuse shutoff is set to "1". 0 to 7F0 in the table indicate the I/O numbers.

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
SD1300	F0	E0	D0	C0	B0	A0	90	80	70	60	50	40	30	20	10	0
SD1301	1F0	1E0	1D0	1C0	1B0	1A0	190	180	170	160	150	140	130	120	110	100
SD1302	2F0	2E0	2D0	2C0	2B0	2A0	290	280	270	260	250	240	230	220	210	200
SD1303	3F0	3E0	3D0	3C0	3B0	3A0	390	380	370	360	350	340	330	320	310	300
SD1304	4F0	4E0	4D0	4C0	4B0	4A0	490	480	470	460	450	440	430	420	410	400
SD1305	5F0	5E0	5D0	5C0	5B0	5A0	590	580	570	560	550	540	530	520	510	500
SD1306	6F0	6E0	6D0	6C0	6B0	6A0	690	680	670	660	650	640	630	620	610	600
SD1307	7F0	7E0	7D0	7C0	7B0	7A0	790	780	770	760	750	740	730	720	710	700

Number	Name	Details
SD1400 to SD1407	I/O module verification Error module	The I/O number (16-point unit) of the output module with I/O module verification error is set to "1". 0 to 7F0 in the table indicate the I/O numbers.

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
SD1400	F0	E0	D0	C0	B0	A0	90	80	70	60	50	40	30	20	10	0
SD1401	1F0	1E0	1D0	1C0	1B0	1A0	190	180	170	160	150	140	130	120	110	100
SD1402	2F0	2E0	2D0	2C0	2B0	2A0	290	280	270	260	250	240	230	220	210	200
SD1403	3F0	3E0	3D0	3C0	3B0	3A0	390	380	370	360	350	340	330	320	310	300
SD1404	4F0	4E0	4D0	4C0	4B0	4A0	490	480	470	460	450	440	430	420	410	400
SD1405	5F0	5E0	5D0	5C0	5B0	5A0	590	580	570	560	550	540	530	520	510	500
SD1406	6F0	6E0	6D0	6C0	6B0	6A0	690	680	670	660	650	640	630	620	610	600
SD1407	7F0	7E0	7D0	7C0	7B0	7A0	790	780	770	760	750	740	730	720	710	700

Table 10.7 Error code

D9008 SD0 (Hex)	D9091 (Hex)	Name	Details	Operation status*1	
				Cyclic	I/O
11*2	111	I/O allocation error	There is an error in the I/O allocation.	Stops	Continues
	112 113	B/W points insufficient	The B/W points set in the common parameter are insufficient for the number of special function modules.		
31*3	311	I/O module verification error	I/O module verification error occurred.	By master station	
32*3	321	Fuse shutoff error	Fuse shutoff error occurred.		
43*3	431	Incorrect interruption occurred	Interruption occurred from a module besides the intelligent special function module.	Continues	Stops
44*3	441	Number of installed intelligent special function module error	More than two intelligent special function modules are installed.		
	442	Special function module sumcheck error	Sumcheck value verification error for the AnUCPU special function module occurred.		

*1: Operation
Stops: Cannot accessed with I/O module or special function module
Continues: Forced output is possible from peripheral device with "test mode".
By master station: Stop/continue by QnA(R)CPU parameter

[Operation method] menu→Parameter→PC RAS setting→Operation mode when error occurs
*2: The PRM.E LED turns on.
*3: The RMT.E LED turns on.

Duplex Network Section

The functions, parameter settings and programming only for the duplex network is described in the duplex network.
Refer to the "Simplex Network" when necessary.

11 Let's Grasp the Duplex Network Image!

By using examples with the PC network and remote I/O network, the switches and parameter setting images are described for data link.

11.1 PC network

The following are necessary for duplex network:

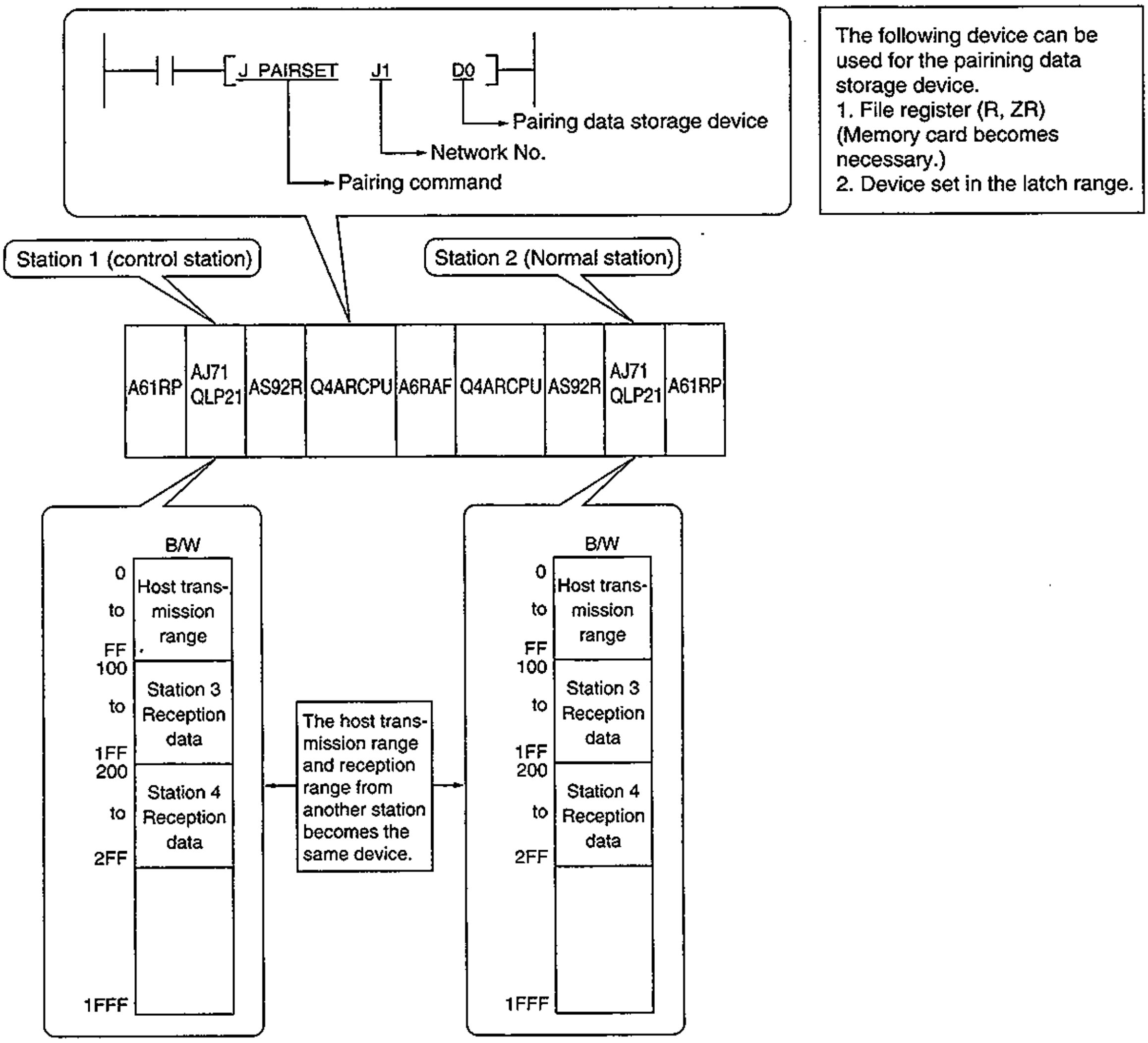
- Pairing setting (PAIRSET command)
- Tracking setting (TRUCK command)

(1) Pairing setting

(a) This is to set which to pair stations in the duplex system. Always set with a management station. Setting with a normal station is invalid.

(b) Always set with adjacent station numbers (such as 1 and 2, and 6 and 7).

(c) When the pairing setting is performed, the transmission range is the same device for control and alternate.
The transmission range for the shared parameters, the most recent side is set.



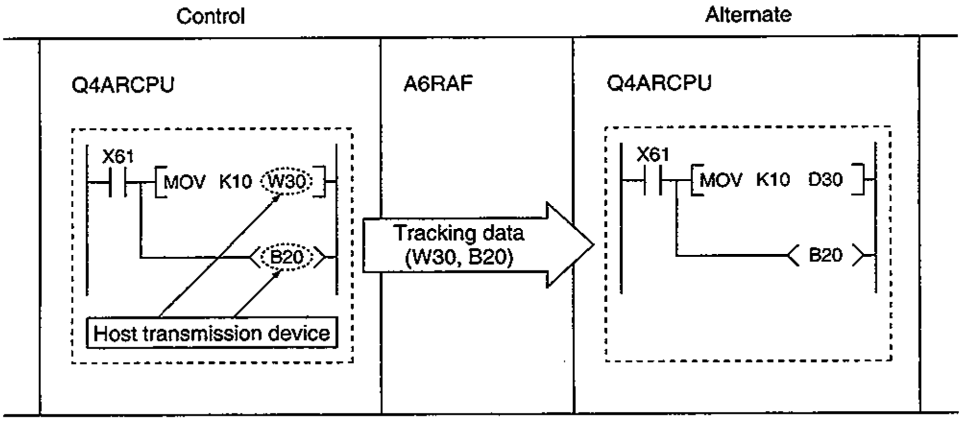
Point

When the pairing is not set, the Q4ARCPU is not switched form control → alternate when the data link is not performed with cable disconnected cable.

(2) Tracking setting

(a) This is set to send the device data for the control to the alternate.
The control is continued when siwtched to the alternate by sending the device data.

(b) To prevent the transmission data to be turned off temporarily when switching from control to alternate, the transmission range link device (B/W) of the host must be tracked.
However, do not track the link special relay (SB20 to 1FF) and registers (SW20 to 1FF).

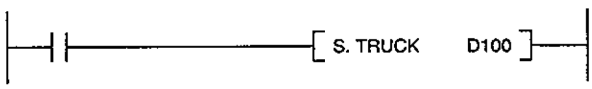


(c) Refer to the Q4ARCPU User's Manual (Detailed edition) for details of the tracking setting.
The difference of the tracking setting exists/not exist is shown below.

	Tracking setting	
	None	Exists
Sequence scan time	—	Extends
Link output data (Y, B, W) when switching from control - alternate	Cleared temporarily	Maintained

Points

The tracking command data (D100 in the program example) is written to the Q4ARCPU first.



The following device can be used for the tracking command data

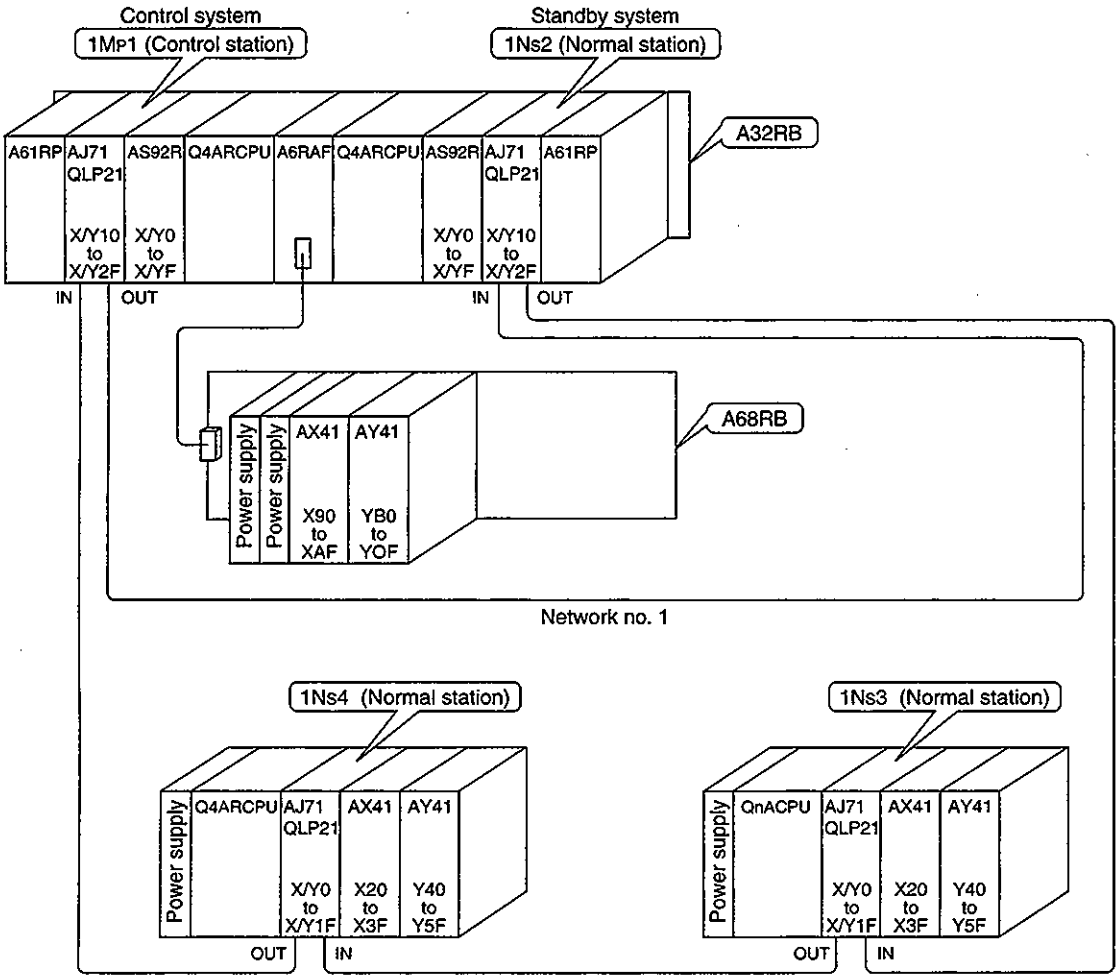
1) File register (R, ZR) . . . . memory card is necessary
2) Device set to the latch range

11.1.1 System configuration

Inter-PC network duplexing is described using the following system configuration.

(1) System configuration example

Stations 1 and 2 are on the duplex system network.



(2) Sending range for each station

The B/W send points for each station is "256 points" as shown in the table below. The sending range for the duplex system is set to the lower number side (1MP1).

1Ns2 is paired with 1MP1, and the setting is not necessary because the same sending range is used.

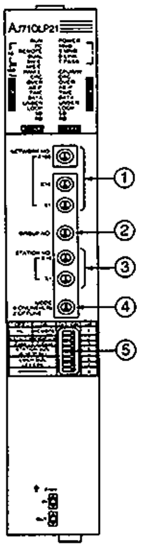
Sending range for each station

Station	B	W
1MP1	0 to FF	0 to FF
1Ns2	—	—
1Ns3	100 to 1FF	100 to 1FF
1Ns4	200 to 2FF	200 to 2FF

Do not set.
LINK PARA.ERROR results if set.

(3) Network module setting

The following is set for the network module:

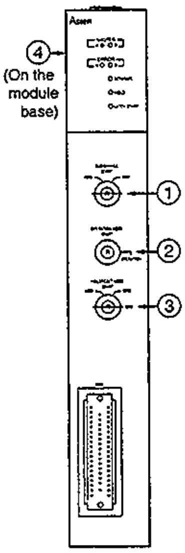


No.	Item			Description	1MP1	1NS2	1NS3	1NS4
①	NETWORK No.	x100		Network number	0	0	0	0
		x10			0	0	0	0
		x1			1	1	1	1
②	GROUP No.			Group number	0	0	0	0
③	STATION No.	x10		Station number	0	0	0	0
		x1			1	2	3	4
④	MODE			Mode	0	0	0	0
⑤	SW	OFF	ON	—				
	1	PC	REMOTE	Inter-PC network/remote I/O network	OFF	OFF	OFF	OFF
	2	N.ST/D.S.M	MNG/P.S.M	Normal station/control station	ON	OFF	OFF	OFF
	3	PRM	D.PRM	Common parameter default parameter	OFF	OFF	OFF	OFF
	4	STATION SIZE (8, 16, 32, 64)		Total number of stations (Valid when SW3 is on.)	OFF	OFF	OFF	OFF
	5				OFF	OFF	OFF	OFF
	6	LB/LW SIZE (2, 4, 6, 8k)		LB/LW total number of points (Valid when SW3 is on.)	OFF	OFF	OFF	OFF
	7				OFF	OFF	OFF	OFF
	8	—		—	OFF	OFF	OFF	OFF

(4) Bus switching module (A6RAF) setting

The bus switching module (A6RAF) is a required module in configuring a duplex system, and performs the control/standby systems switching.

The following items are set for the bus switching module.



No.	Item	Description	Setting
①	BUS CHANGE	The control/standby systems switching setting REQUEST: Auto-switching A: Forceful switch to the control by A system B: Forceful switch to the control by B system	REQUEST
②	OPERATION MODE	Backup mode/separate mode switching BACKUP: Backup mode SEPARATE: Separate mode	BACKUP
③	HOLD/RESET MODE	Output status setting when CPU option is stopped. RESET: All points off HOLD: Maintains the status right before the error	RESET
④	Control system setting	Control system setting when powers is on LACTH: Operates with previous operation status A.LOCK: Fixed to A system	A.LOCK

11.1.2 Setting the parameters

The parameters to set and the operation method using a peripheral device are described.

(1) Parameter setting items

The items to set in the parameters and sequence program are shown in table 11.1.

Table 11.1 Parameter setting items

	Parameter setting items		Control station (1M$_P$1)	Normal station (1N$_S$2 to 1N$_S$4)
Parameters	Number of modules set		○	△
	Network setting	First I/O number		
		Network number		
		Total number of (slave) link stations		×
	Network refresh parameters		△	△
	Common parameters		○	×
	Station-specific parameters		△	△
	I/O allocation		×	×
	Inter data link transfer parameter		×	×
	Routing parameter		×	×
Sequence program	Pairing setting *1		○	×
	Tracking setting *2		○	×

*1: Refer to Section 11.1.3 for details.
*2: Refer to "Q4ARCPU User's Manual (Detailed Section)".
●: Setting mandatory △: Set as necessary ×: Setting not necessary

(2) Operation with a peripheral device

The operation method using a DOS/V PC (SW□IVD-GPPQ) is described.

(1) Startup the GPPQ type GPP function software package.

(2) Select 1, "Create new" in the initial setting.

(3) Select 4, "Q4A" by placing the "*" in "create new".

(4) The file setting is not performed here. (But it can be set.)

Do you want to execute File Setting?

Yes(Y) No(N)

N

(5) Select "3/ Parameters" in the menu.

(6) Select "7/ Set MELSECNET (II,/10)".

To the next page

Continued from the previous page

(7) Select "No (N)"

Clears parameters and reads Installation status. All right?

Yes(Y) No(N)

N

(8) Number of modules setting

[# of Units Setting] Label:

1. MELSECNET(II,/10)Unit(s) [ ]

1. Unit 1 ( )
2. Unit 2 ( )
3. Unit 3 ( )
4. Unit 4 ( )

2. Valid Unit at Accessing Other St [1]

Execute(Y) Cancel(N)

Space:Select Esc:Close

Set the number of network modules installed here.

Set the types of network modules here.

[Setting the number of modules]

Space → 1 → Enter

Move the cursor to the setting field. / Number of modules / Move the cursor to the type setting field

[Setting the model name for the first modules]

Enter 2 → Enter

Open the model name setting screen / Control station / Selection completed

[Unit Type Setting(1)]

1.(*) MELSECNET/10 (Default)
2.( ) MELSECNET/10 (Control Station)
3.( ) MELSECNET/10 (Normal Station)
4.( ) MELSECNET/10 (Remote Master)
5.( ) MELSECNET (Master Station)
6.( ) MELSECNETII Cmp (Master Station)
7.( ) MELSECNETII (Master Station)
8.( ) MELSECNET (Local Station)
9.( ) MELSECNETII Cmp (Local Station)
A.( ) MELSECNETII (Local Station)

B.( ) MELSECNET/10 (Wait /Duplex/Parallel)

Execute(Y) Cancel(N)

Space:Select Esc:Close

[Valid modules for other station access]

[↓] [↓] [↓] [↓]

2. Locate the cursor at the valid modules for other station access.

[# of Units Setting] Label:

1. MELSECNET(II,/10) Unit(S) [1]

   1. Unit 1(MELSECNET/10 (Control))
   2. Unit 2( )
   3. Unit 3( )
   4. Unit 4( )

2. Valid Unit at Accessing Other St [1]

Execute(Y) Cancel(N)

Space:Select Esc:Close

[Y] (Execute)

(9) Network settings

Set the current 1st I/O # of the network module as it is.

Set the network # specifiied by switch.

Set the number of stations (control station+normal stations) here.

[Network Setting] Label:

	Unit #1 NET/10 Control	Unit #2	Unit #3	Unit #4
1st I/O#	[ ]	---------	---------	---------
Network#	[ ]	---------	---------	---------
# of Station(Slave)	[ ]	---------	---------	---------
Network Refresh Parm	None	---------	---------	---------
Common Parameter	• None	---------	---------	---------
Specific Parameter	None	---------	---------	---------
I/O Allocation	---------	---------	---------	---------
TX Parm For DataLink	---------			
Routing Parameter	None			

• :Must Be Set :If Necessary :Setting Done ∗For Only Reference

Space:Select Esc:Close

1 0 → Enter → 1 → Enter → 4

First I/O No. Network No. Total number of link stations

[Network Setting] Label:

	Unit #1 NET/10 Control	Unit #2	Unit #3	Unit #4
1st I/O#	[10]	---------	---------	---------
Network#	[1]	---------	---------	---------
# of Station(Slave)	[4]	---------	---------	---------
Network Refresh Parm	None	---------	---------	---------
Common Parameter	• None	---------	---------	---------
Specific Parameter	None	---------	---------	---------
I/O Allocation	---------	---------	---------	---------
TX Parm For DataLink	---------			
Routing Parameter	None			

• :Must Be Set :If Necessary :Setting Done ∗For Only Reference

Space:Select Esc:Close

↓ ↓ → Enter

Locate the cursor at common parameters.

(10) Common parameter

[Cmm Parm (MELSECNET/10 Control)(BW Set)] Label:

Auxiliary Setting
Link WDT 2000 ms

Network(# 1)
NET/10 Control 1st I/O # 0
Network # 1 # of Sta 4

Station	TX Range of Sta B First Last	TX Range of Sta W First Last
1	[ ]-[ ]	[ ]-[ ]
2	[ ]-[ ]	[ ]-[ ]
3	[ ]-[ ]	[ ]-[ ]
4	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]

PgUp:Prev PgDn:Next F3:BW→XY1→XY2→ Esc:Close

[0] [→] [F] [F] [→] [0] [→] [F] [F] [Enter]

B first B final W First W final

Make settings for stations 2 through 4 in the same way so that the screen appears as shown below:

[Cmm Parm (MELSECNET/10 Control)(BW Set)] Label:

Auxiliary Setting
Link WDT 2000 ms

Network(# 1)
NET/10 Control 1st I/O # 10
Network # 1 # of Sta 4

Station	TX Range of Sta B First Last	TX Range of Sta W First Last
1	[0]-[FF]	[0]-[FF]
2	[ ]-[ ]	[ ]-[ ]
3	[100]-[1FF]	[100]-[1FF]
4	[200]-[2FF]	[200]-[2FF]
	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]

PgUp:Prev PgDn:Next F3:BW→XY1→XY2→ Esc:Close

Setting is prohibited. If setting is performed, LINK PARA. ERROR will occur.

[Esc]

(11) Select "Yes (Y)"

Do you want to register the parameter?
Yes(Y) No(N)

.........Registering the common parametes.

(12) Network settings

Confirm that "● Set" is set for common parameters. No settings are made at the items marked △.

[Network Setting] Label

	Unit #1 NET/10 Control	Unit #2	Unit #3	Unit #4
1st I/O#	[10]	----------	----------	----------
Network#	[1]	----------	----------	----------
# of Station(Slave)	[4]	----------	----------	----------
Network Refresh Parm	None	----------	----------	----------
Common Parameter	Set	----------	----------	----------
Specific Parameter	None	----------	----------	----------
I/O Allocation	----------	----------	----------	----------
TX Parm For DataLink	----------			
Routing Parameter	None			

• :Must Be Set :If Necessary :Setting Done *For Only Reference

Space:Select Esc:Close

↓

Esc

(13) Select "Yes (Y)"

Do you want to register the parameter?
Yes(Y) No(N)

.........Registering the network settings.

↓

Esc

(14) Confirm that "Set" for MELSECNET(II,/10) settings.

parameter

	Current Statuss
1.( ) PC Name definition	None
2.( ) PC System Setting	Default
3.( ) PC File Setting	Default
4.( ) Device Setting	Default
5.( ) PC RAS Setting	Default
6.( ) I/O All ocation	None
7.(*) MELSECNETII,/10 Setting	Set
8.( ) MELSECNETII,/MINI Setting	Nonet
9.( ) Auxiliary Setting	
A.( ) SFC	Default
B.( ) X/Y Allocation Confirm	

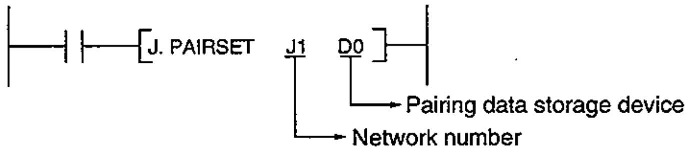
Execute(Y) Cancel(N)

11.1.3 Creating data for pairing setting

The pairing data must be created and written to Q4ARCPU for pairing.
The pairing data can set the following:

- Device set in the latch range
- File register (R, ZR): Memory card is necessary.

The pairing data creation method is described below.
The following example shows how to set D0 to D3 as a latch range and create a pairing data.
Ex.: A program when D0 to D3 stores the pairing setting data.



(a) Use four words of device, and set for all 64 stations. The station number corresponding to each bit are shown below:

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
D0	Station number 16	Station number 15	Station number 14	Station number 13	Station number 12	Station number 11	Station number 10	Station number 9	Station number 8	Station number 7	Station number 6	Station number 5	Station number 4	Station number 3	Station number 2	Station number 1
D1	Station number 32	Station number 31	Station number 30	Station number 29	Station number 28	Station number 27	Station number 26	Station number 25	Station number 24	Station number 23	Station number 22	Station number 21	Station number 20	Station number 19	Station number 18	Station number 17
D2	Station number 48	Station number 47	Station number 46	Station number 45	Station number 44	Station number 43	Station number 42	Station number 41	Station number 40	Station number 39	Station number 38	Station number 37	Station number 36	Station number 35	Station number 34	Station number 33
D3	Station number 64	Station number 63	Station number 62	Station number 61	Station number 60	Station number 59	Station number 58	Station number 57	Station number 56	Station number 55	Station number 54	Station number 53	Station number 52	Station number 51	Station number 50	Station number 49

(b) Set "1" to the greater station number in the system to duplex. When pairing station 1 and 2, set the first bit in D0 on (1) as shown below. (This is to set D0=2, D1=0, D2=0 and D3=0.)

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
D0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
D1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Point

Four words (Ex.: D0 to D3) are always used for the pairing data storage device. Make sure not to write incorrect data.

(c) The followings explain operation method of peripheral device.
However it's an operation after "parameter setting", Section 11.1.2.

1) Select 4., "Device Setting".
2) Set D0 to D3 for the range of invalid latch clear key
   Make setting the screen appears as shown below:

3/Find 5/Wdit 6/Auxiliary

Parameter CPU:Q4A C:KIKAI_MAIN (Ins)

Device	Sym	Red	Devices	Enable C/L Key	Disable C/L Key
Input Relay	X	16	8K		
Output Relay	Y	16	8K		
Internal Relay	M	10	[8K]		
Latch Relay	L	10	[8K]		[ ]-[ ]
Link Relay	B	16	[8K]	[ ]-[ ]	[ ]-[ ]
Annunciator	F	10	[2K]	[ ]-[ ]	[ ]-[ ]
Link Sp Relay	SB	16	2K		
Edge Relay	U	10	[2K]	[ ]-[ ]	[ ]-[ ]
Step Relay	S	10	8K		
Timer	T	10	[2K]	[ ]-[ ]	[ ]-[ ]
Acumlt Timer	ST	10	[0K]	[ ]-[ ]	[ ]-[ ]
Counter	C	10	[1K]	[ ]-[ ]	[ ]-[ ]
Data Register	D	10	[12K]	[ ]-[ ]	[0]-[3]
Link Register	W	16	[8K]	[ ]-[ ]	[ ]-[ ]
Link Sp Reg	SW	16	[2K]		

Devices Total (28.8)K Word

1 2 3 4 5 6 7 8 9 0

↓

Esc

↓

Do you want to register the parameter?

Yes(Y) No(N)

↓

Y

3) Confirm that "Set" is set for device setting.

[Parameter] Rabel:1

1. (	)PC Name Definition	None
2. (	)PC System Setting	Default
3. (	)PC File Setting	Default
4. (∗	)Device Setting	Set
5. (	)PC RAS Setting	Default
6. (	)I/O Allocation	None
7. (	)MELSECNETII,/10 Setting	Set
8. (	)MELSECNET/MINI Setting	None
9. (	)Auxiliary Setting	
A. (	)SFC	Default
B. (	)X/Y Allocation Confirm	

Execute(Y) Cancel(N)

Space:Select Esc:Close

4) Open the menu with F11 and select "4/Device."
5) Set 2 for data register D0.

1/File

Device CPU:Q4A C:KIKAI_G1 MAIN (Ins)
Device D0
Display:16-Bit Type :Decimal Character String

Device	+0	+1	+2	+3	+4	+5	+6	+7	0123456789ABCDEF
D 0	0	0	0	0	0	0	0	0	----------------
D 8	0	0	0	0	0	0	0	0	----------------
D 16	0	0	0	0	0	0	0	0	----------------
D 24	0	0	0	0	0	0	0	0	----------------
D 32	0	0	0	0	0	0	0	0	----------------
D 40	0	0	0	0	0	0	0	0	----------------
D 48	0	0	0	0	0	0	0	0	----------------
D 56	0	0	0	0	0	0	0	0	----------------
D 64	0	0	0	0	0	0	0	0	----------------
D 72	0	0	0	0	0	0	0	0	----------------
D 80	0	0	0	0	0	0	0	0	----------------
D 88	0	0	0	0	0	0	0	0	----------------
D 96	0	0	0	0	0	0	0	0	----------------
D 104	0	0	0	0	0	0	0	0	----------------
D 112	0	0	0	0	0	0	0	0	----------------
D 120	0	0	0	0	0	0	0	0	----------------

1 2 3 4 5 6 7 8 9 0

↓

[2] [Enter]

↓

1/File

Device CPU:Q4A C:KIKAI_G1 MAIN (Ins)
Device D0
Display:16-Bit Type :Decimal Character String

Device	+0	+1	+2	+3	+4	+5	+6	+7	0123456789ABCDEF
D 0	2	0	0	0	0	0	0	0	----------------
D 8	0	0	0	0	0	0	0	0	----------------
D 16	0	0	0	0	0	0	0	0	----------------
D 24	0	0	0	0	0	0	0	0	----------------
D 32	0	0	0	0	0	0	0	0	----------------
D 40	0	0	0	0	0	0	0	0	----------------
D 48	0	0	0	0	0	0	0	0	----------------
D 56	0	0	0	0	0	0	0	0	----------------
D 64	0	0	0	0	0	0	0	0	----------------
D 72	0	0	0	0	0	0	0	0	----------------
D 80	0	0	0	0	0	0	0	0	----------------
D 88	0	0	0	0	0	0	0	0	----------------
D 96	0	0	0	0	0	0	0	0	----------------
D 104	0	0	0	0	0	0	0	0	----------------
D 112	0	0	0	0	0	0	0	0	----------------
D 120	0	0	0	0	0	0	0	0	----------------

1 2 3 4 5 6 7 8 9 0

6) Write the parameters and device data to the control system Q4ARCPU (set the Q4ARCPU to STOP).

Alt → 2
Menu Select PC

↓

```
1/File 2/PC                              7/Windou
        1/Read...
        2/Write...
        3/Compare...
        4/New...
        5/File List...
        6/Connection...
        7/Remote Option...
        8/Write Option...
```

↓

2 (Write)

↓

```
[Write to PC]
  Interface     RS232C        <----->    QnACPU
  Target PC     Network:0      Station: FF PC  Type:Q4A
  Target Mem    Internal RAM   Title  [                        ]
1.File 1.File   Name[NET10]    Title  [                        ]
       2.Tgt    1.[*] Parameter
                2.[*] Seq/SFC Prog
                                  1 (*) Who le Range   [    ]K Step
                3.[ ] Device Comment  2.( ) Step Range  [    ]-[    ]
                4.[ ] Dev Init Value  3.( ) Step Range  P[   ]-[    ]
                5.[ ] Simulation Data 4.( ) Block Range [    ]-[    ]
                6.[ ] File Register
                                  1.(*) Who le Range
                                  2.( ) Specify   ZR[   ]-[    ]
2.Device Mem    1.[ ] Internal    1.(*) Who le Range
                                  2.( ) Specify Detail Range
                  Execute(Y)  Cancel(N)
                Ctrl+L:List Ctrl+D=Dir  Space:Select  Esc:Close
```

↓

As shown in the following screen, make targeting items as parameter and device memory.
Sequence program is not a targeting item here.

```
[Write to PC]
  Interface     RS232C        <----->    QnACPU
  Target PC     Network:0      Station: FF PC  Type:Q4A
  Target Mem    Internal RAM   Title  [                        ]
1.File 1.File   Name[NET10]    Title  [                        ]
       2.Tgt    1.[*] Parameter
                2.[ ] Seq/SFC Prog
                                  1 (*) Who le Range   [    ]K Step
                3.[ ] Device Comment  2.( ) Step Range  [    ]-[    ]
                4.[ ] Dev Init Value  3.( ) Step Range  P[   ]-[    ]
                5.[ ] Simulation Data 4.( ) Block Range [    ]-[    ]
                6.[ ] File Register
                                  1.(*) Who le Range
                                  2.( ) Specify   ZR[   ]-[    ]
2.Device Mem    1.[ ] Internal    1.(*) Who le Range
                                  2.( ) Specify Detail Range
                  Execute(Y)  Cancel(N)
                Ctrl+L:List Ctrl+D=Dir  Space:Select  Esc:Close
```

↓

Y (Execute)

↓

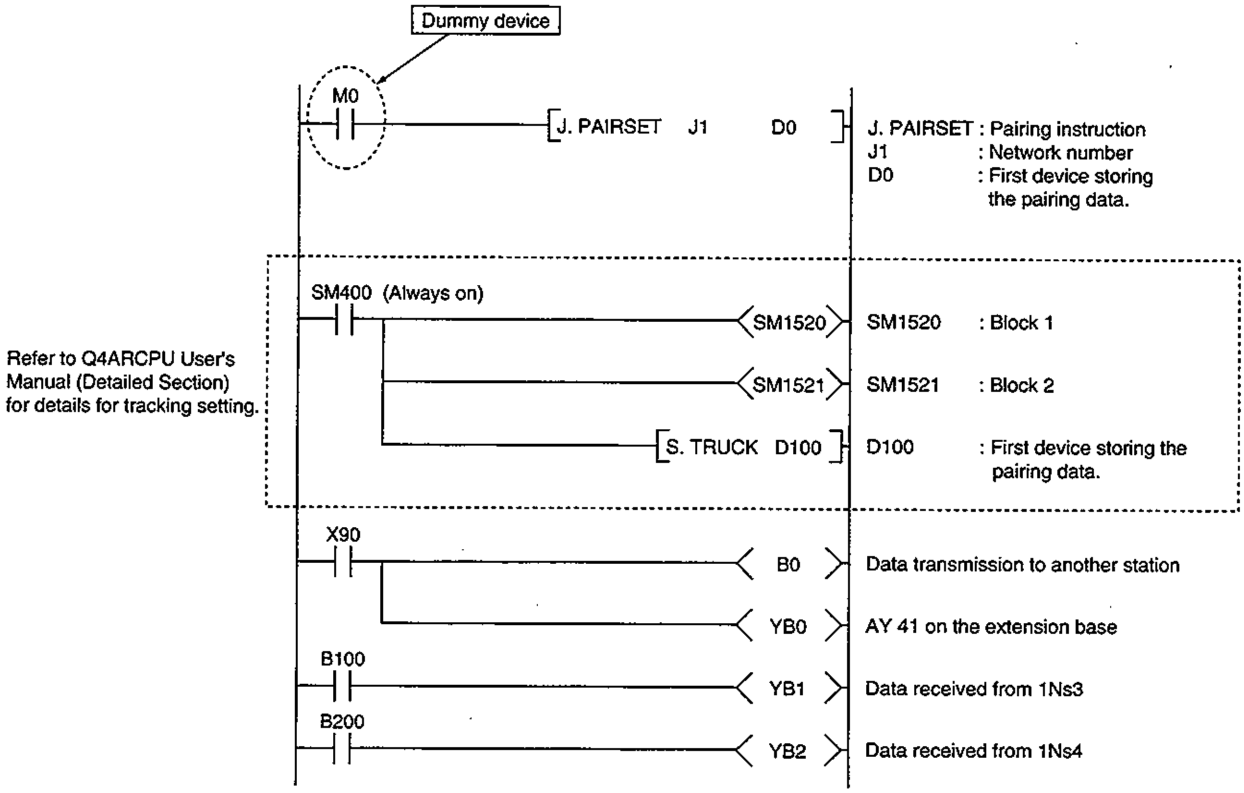
Writing is complete when the message "Completion" is displayed.

11.1.4 Creating a program

The sequence program to load to the duplex system and other normal stations is created. Load to each CPU after creation.

(1) Duplex system (1Mp1 and 1Ns2)

1) When X90 is turned on, B0 turns on, and B0 contacts for other stations turn on.
2) When the on status for B100 is received from 1Ns3, the output module's YB1 turns on.
3) When the on status for B200 is received from 1Ns4, the output module's YB2 turns on.



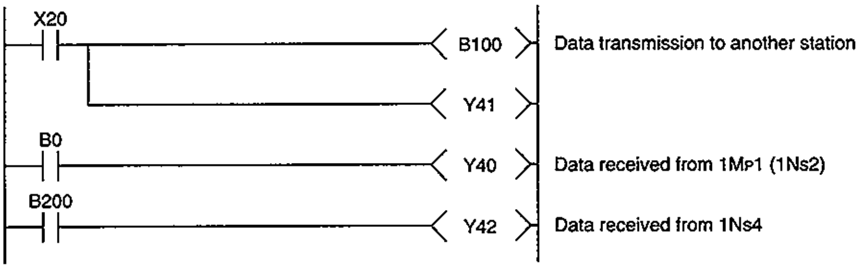
[Tracking data structure]

The structure of the tracking data (D100 to D110) is shown below.
YB0 to B2, and B0 are tracked.
Refer to the Q4ARCPU User's Manual (Detailed Section) for details.

D100	2	Total number of ranges: Set the device types (Y, B)		
D101	1	Block 1 setting: Device Y		
D102	1	Block 2 setting: Device B		
D103	1	Device code: Y	YB0 to YBF	Block 1 setting
D104	16	Device points (hex points unit)		
D105	00B0H (L)	First device number		
D106	0000H (H)			
D107	5	Device code: B	B0 to BF	Block 2 setting
D108	16	Device points (hex points unit)		
D109	00B0H (L)	First device number		
D110	0000H (H)			

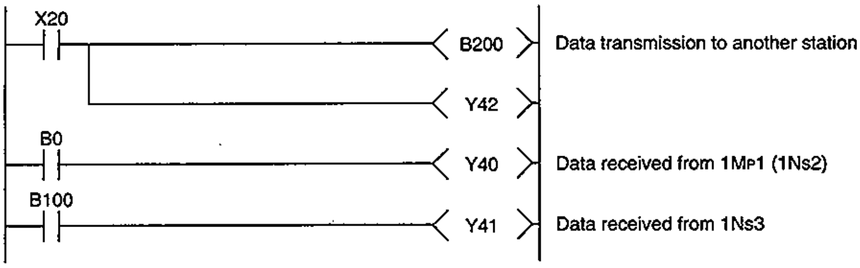
(2) Normal station (1Ns3)

1) When X20 is turned on, the host's B100 turns on, and B100 contacts for other stations turn on.
2) When the on status for B0 is received from 1MP1 (1Ns2), the output module's Y40 turns on.
3) When the B200 on status is received from 1Ns4, the output module's Y42 turns on.



(3) Normal station (1Ns4)

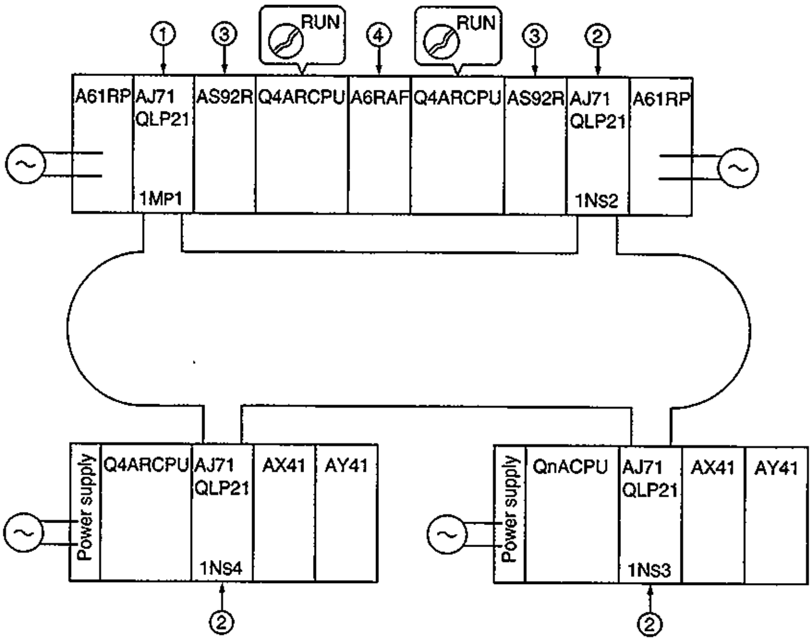
1) When X20 is turned on, the host's B200 turns on, and B200 contacts for other stations turn on.
2) When the on status for B0 from 1MP1 (1Ns2) is received, the output module's Y40 turns on.
3) When the B100 on status is received from 1Ns3, the output modue's Y41 turns on.



11.1.5 Confirming the operation when control system and standby system are normal

The duplex network operation is checked when the control system and standby system are at normal status. The checking is performed using the LED indication for each module and sequence program operation status.

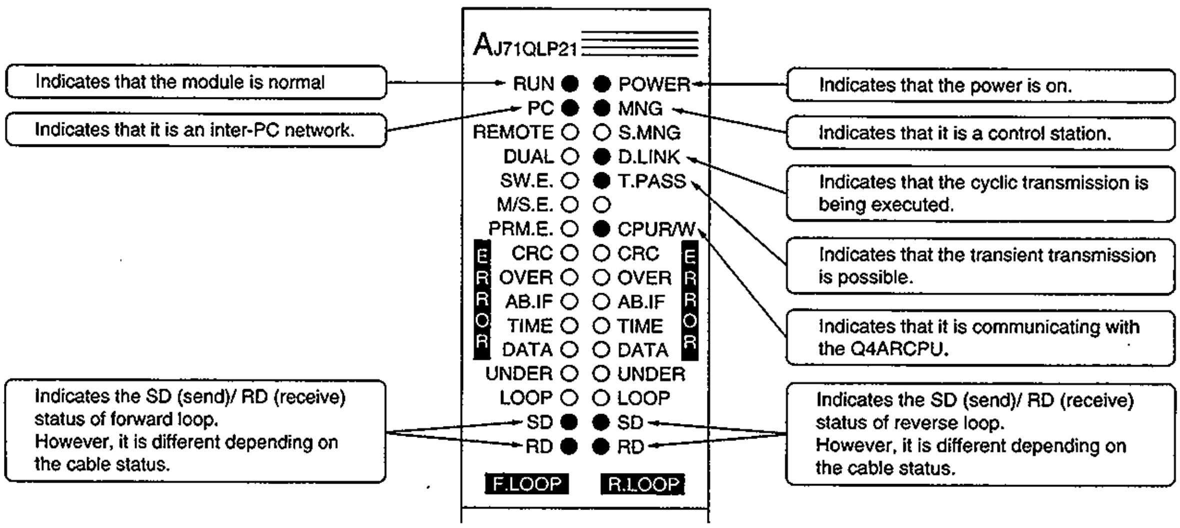
Startup the system so that 1MP1 (control station) and 1NS2 (normal station) will be the control system and standby system, respectively.



(1) **Checking by LED indication**

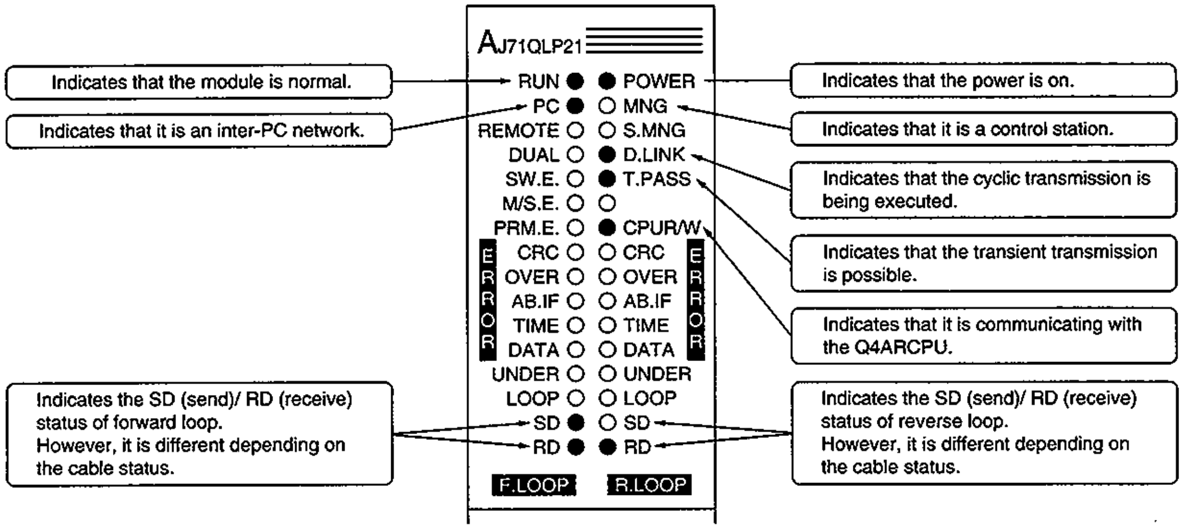
The LED indication status during normal operation (● is on and ○ is off) is shown below:

1) Network module (1MP1: Control station)

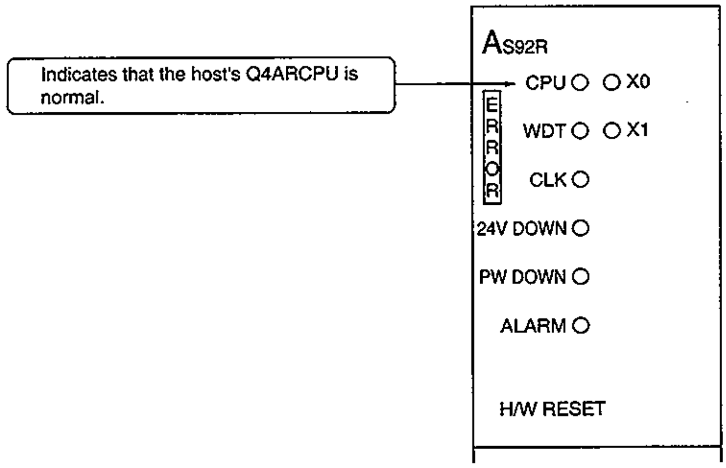


When the standby system's Q4ARCPU key switch is at STOP when the control system's Q4ARCPU is at RUN, "MODE. VERIFY ERR" results.

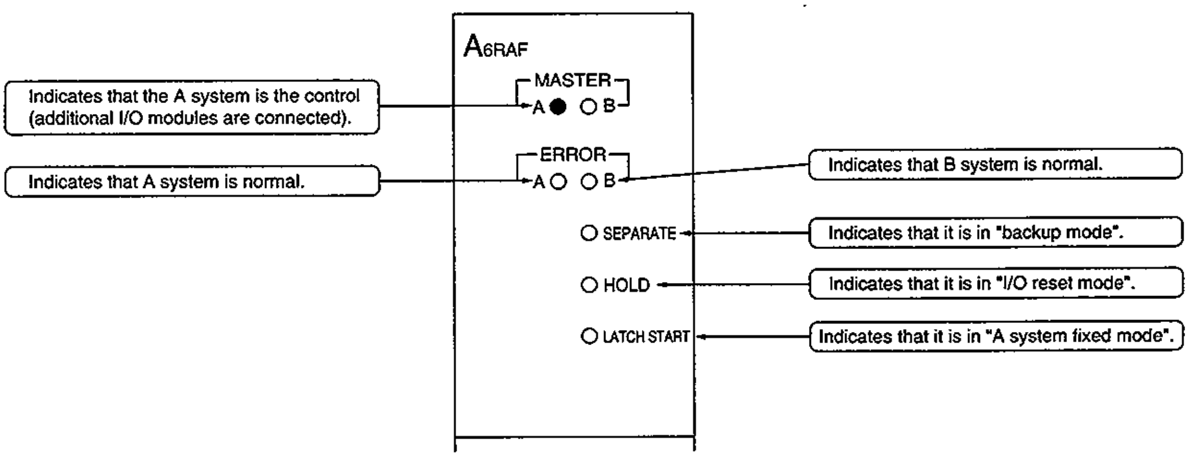
2) Network module (1Ns2 to 1Ns4: Normal Station)



3) System control module (AS92R)
The AS92R LED turns on "when an error occurs".
The control and standby systems have the same LED indication status.
Refer to Q4ARCPU User's Manual (Detailed Section) for details.



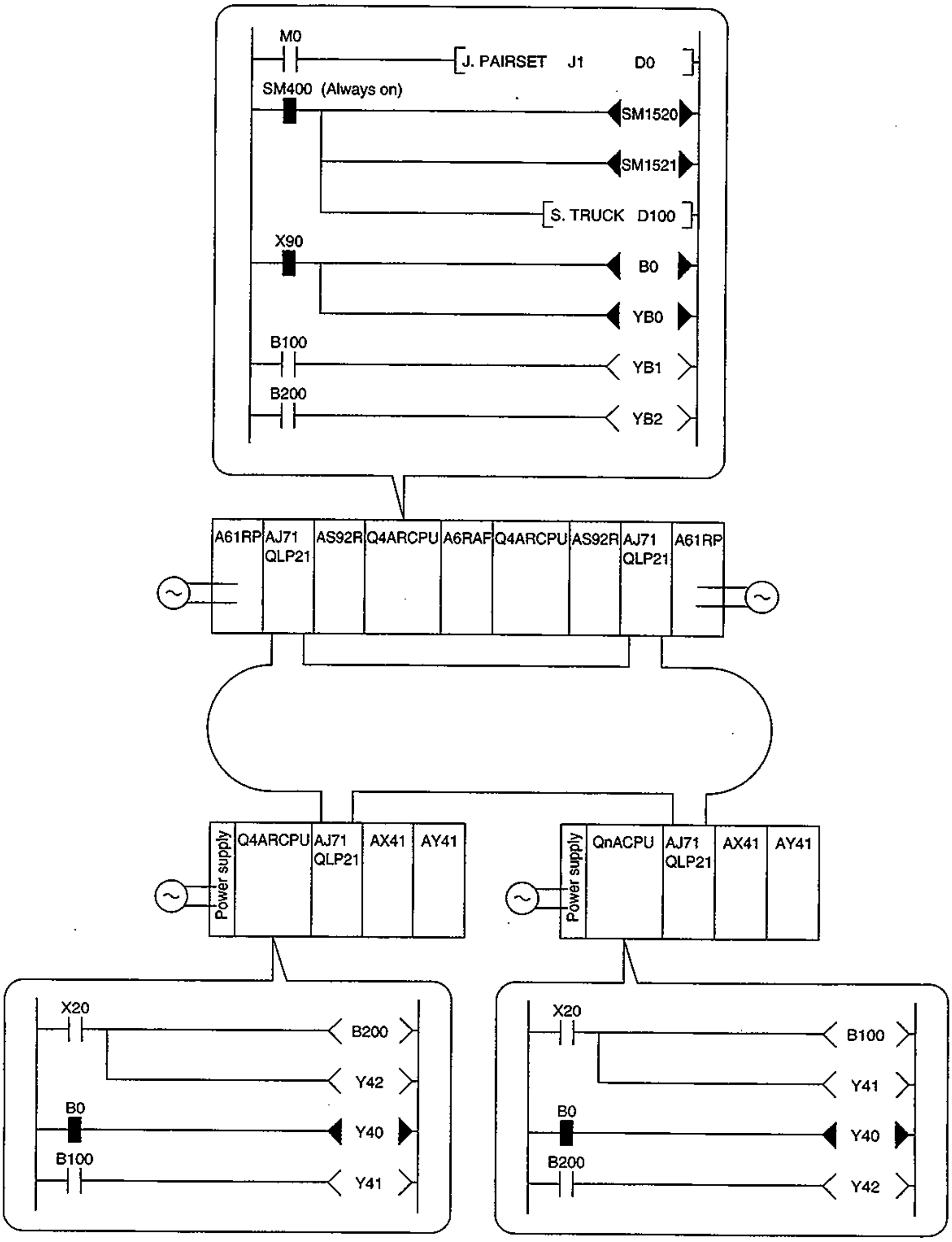
4) Bus switching module (A6RAF)
Refer to Q4ARCPU User's Manual (Detailed Section) for details.



(2) Checking from sequence program

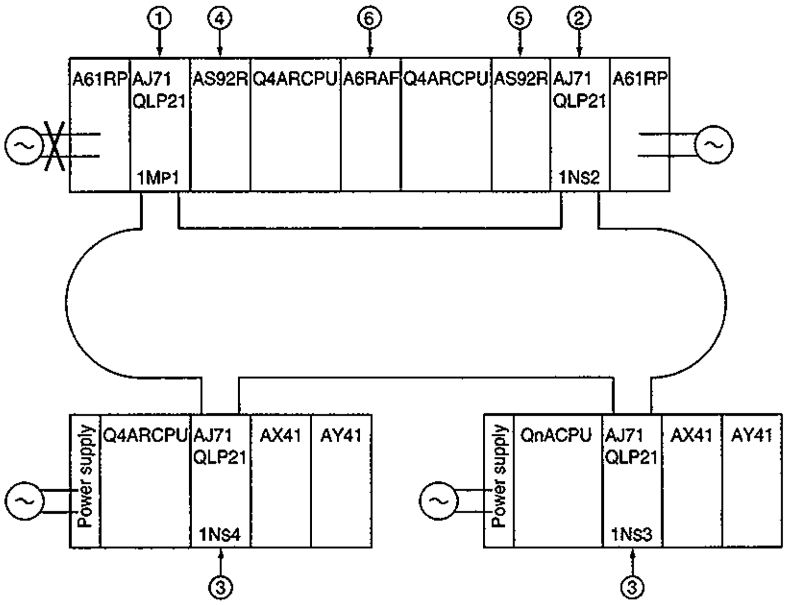
For example, when the X90 for the duplex system (Q4ARCPU) is turned on, the 1Ns3 and 1Ns4 B0 contacts are turned on, and the output signal Y40 turns on.

Similarly, when the link relay (B) for each station is turned on, check that the link relay (B) contacts for other stations are turned on.



11.1.6 Confirming the status when the control system's power is off

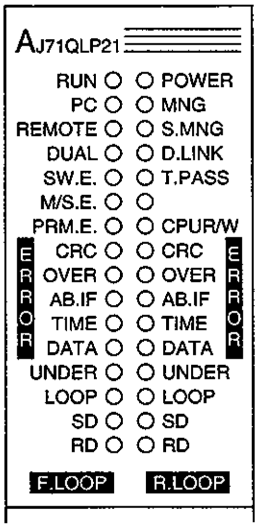
The LED indication status and sequence program operation status are checked when the control system (A system)'s power is turned off.



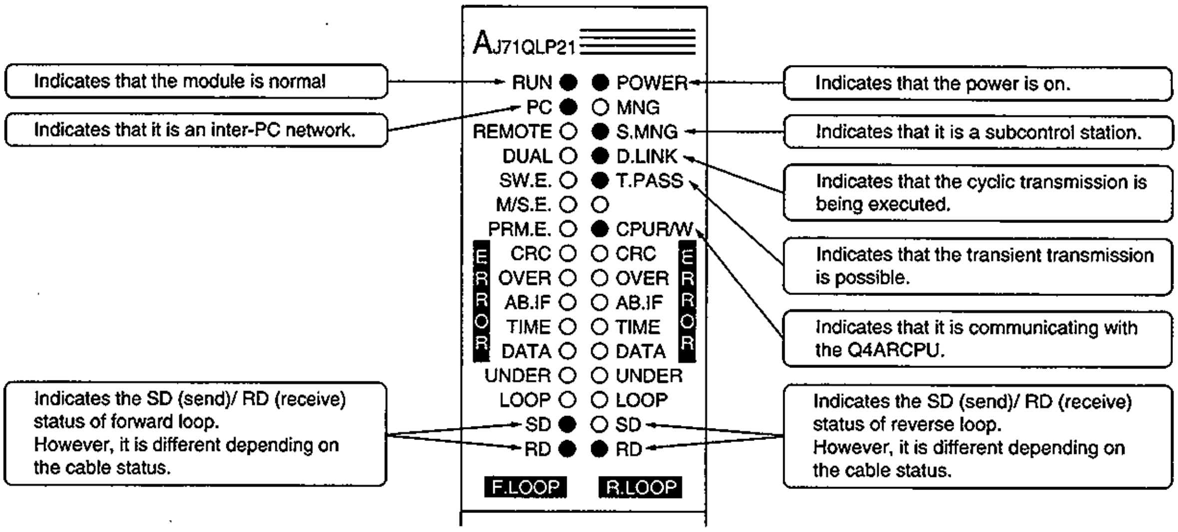
(1) Checking with the LED display

The LED display status (● is on, ○ is off) is shown below.

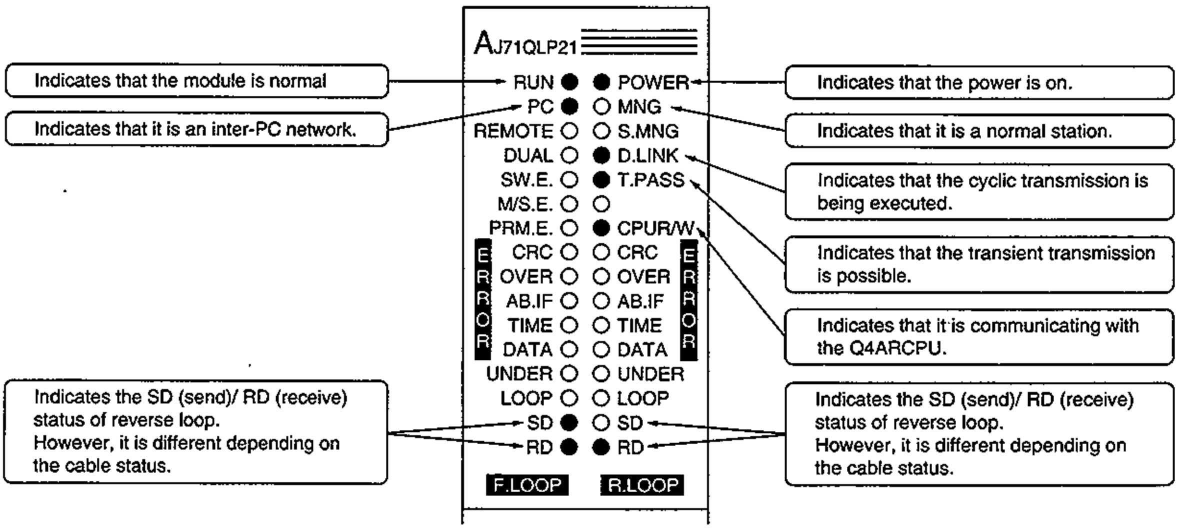
1) Network module (1MP1: Control station)
   All LEDs are off because the power is not supplied.



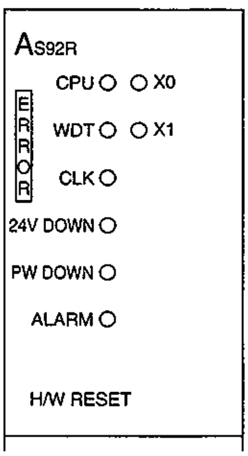
2) Network module (1Ns2: Subcontrol station)



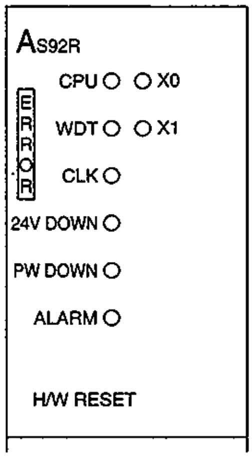
3) Network module (1Ns3, 1Ns4: Normal stations)



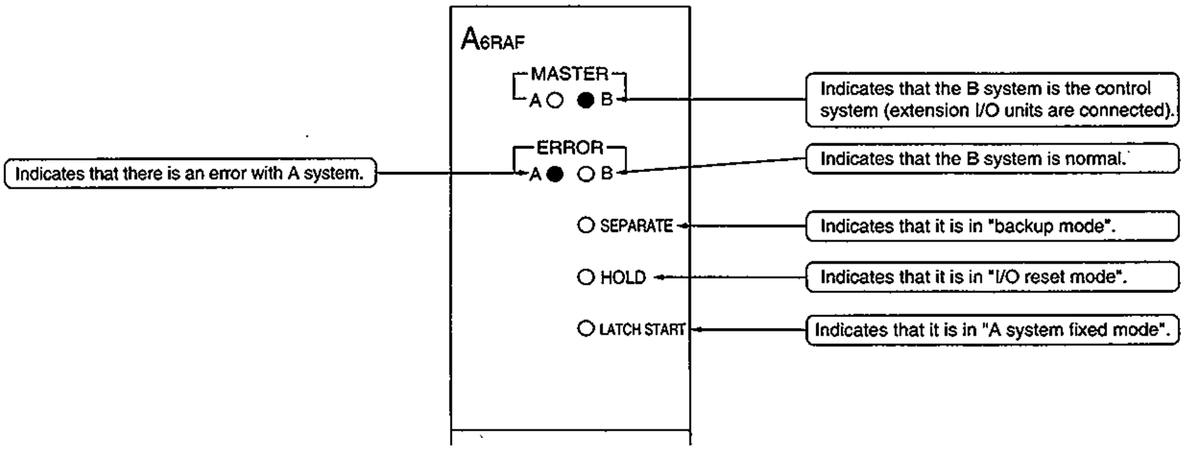
4) System control module (AS92R) . . . A system
The AS92R LED turns on when an error occurs.
All LEDs are off because the power is not supplied to A.
Refer to the Q4ARCPU User's Manual (Detailed Section) for details.



5) System control module (AS92R) . . . B system
The AS92R LED turns on "when an error occurs".
All LED are off because B is normal.



6) Bus switching module (A6RAF)
Refer to the Q4ARCPU User's Manual (Detailed Section) for details.



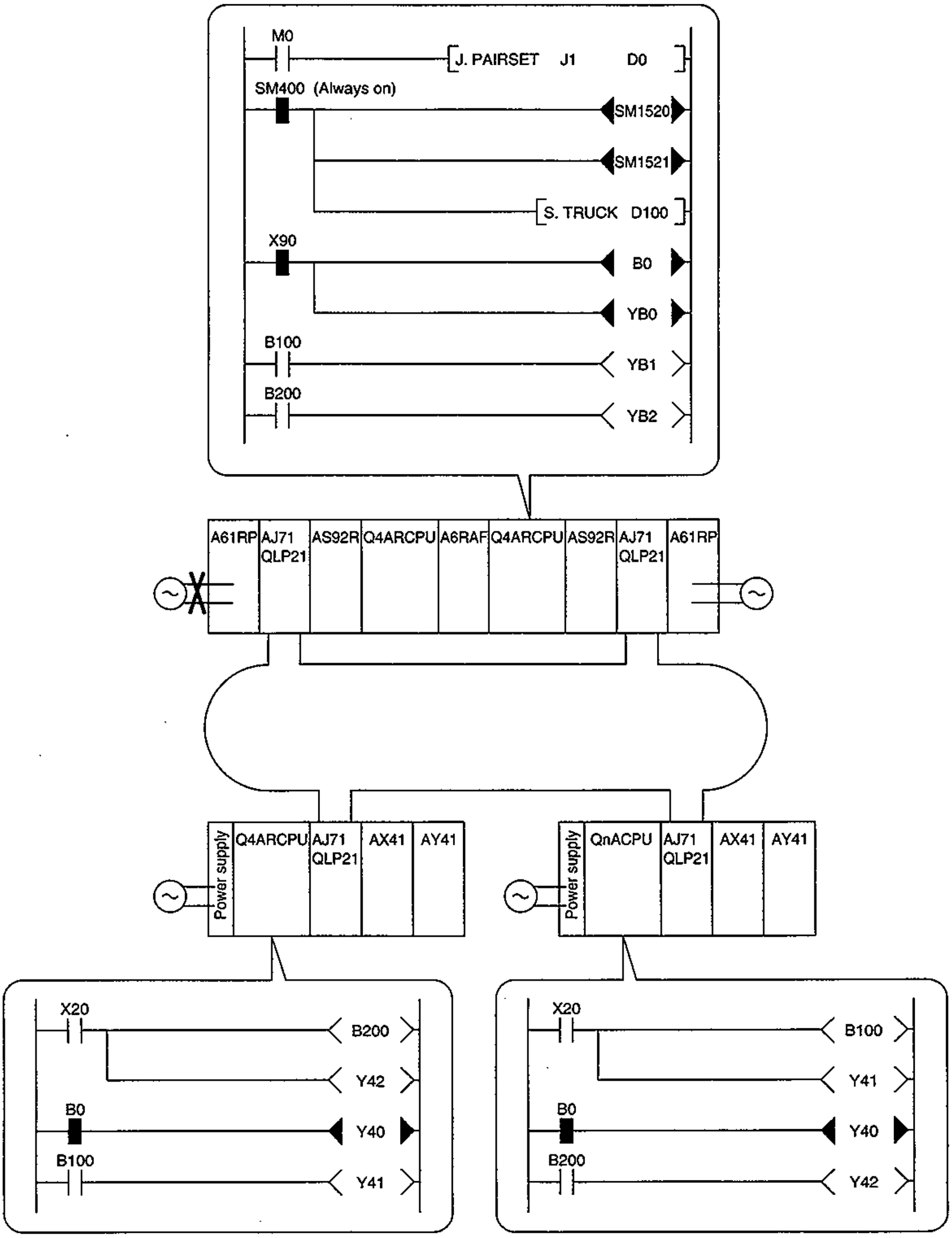
Point

Messages are displayed in the Q4ARCPU LED display area when the control system is switched.
CONTROL EXE: Switched from standby system → control system
CONTROL WAIT: Switched from control system → standby system

(2) Checking from sequence program

Confirm that the data link can be continued by the standby system when the control system is stopped.

Make sure that the link relay (B) or the output (Y) is not turned OFF.



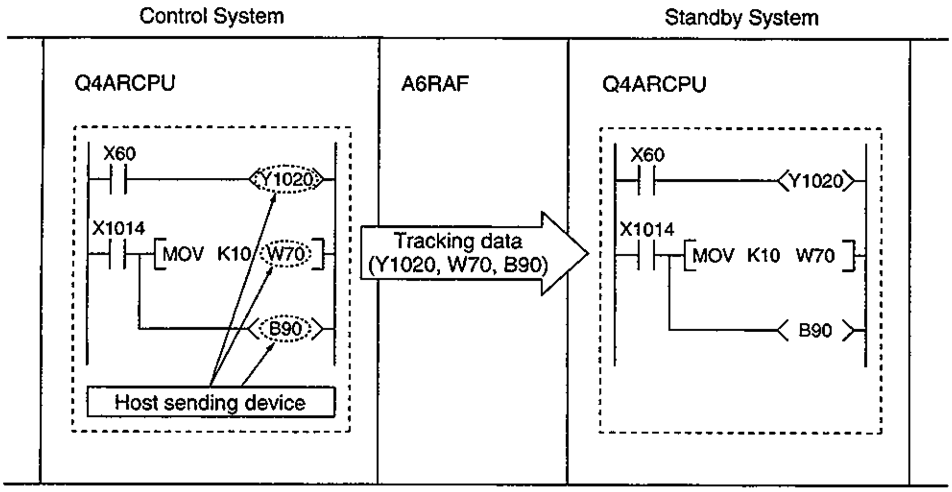
11.2 Remote I/O Network (Multiple Master System)

The tracking setting (TRUCK instruction) is necessary.
Unlike the inter-PC network, pairing setting (PAIRSET instruction) is not required.

[Tracking setting]

(1) This is to set to send control system device information to standby system.
By sending the device information, control can be continued when switched to the standby system.

(2) To prevent the transmission data from being stopped momentarily when switching from control system to standby system, the link devices (Y, B, W) in the host's sending range must be tracked.
However, do not track the link special relays (SB20 to IFF) and registers (SW20 to IFF).



(3) Refer to the Q4ARCPU User's Manual for details about the tracking setting.
The differences in having/not having tracking setting are shown below:

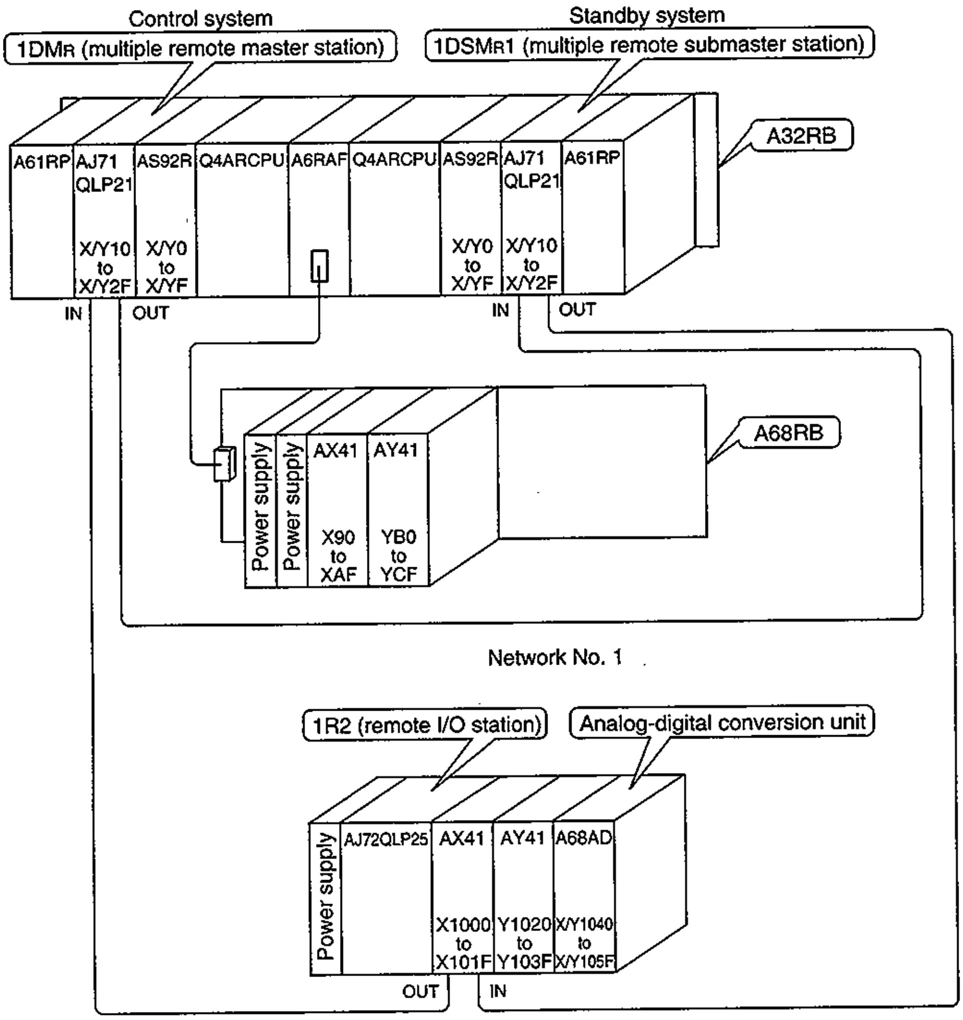
	Tracking setting	
	None	Exists
Sequence scan time	—	Extended
Link output data (Y, B, W) when switching from control system → standby system	Cleared momentarily	Maintained

11.2.1 System configuration

The remote I/O network duplex system (multiple master system) is described using the following system configuration example.

(1) System configuration example

The following is the system which connects one remote I/O station.

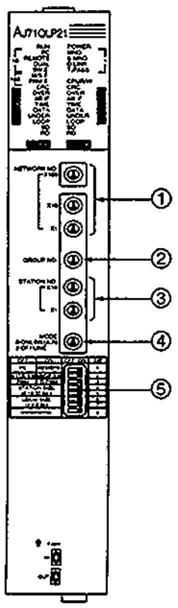


Point
Startup the system so that the multiple remote master station and multiple remote submaster station are the control system and the standby system, respectively.

(2) **Network module setting**

(a) Multiple remote master station (1DM$_R$) and multiple remote submaster station (1DSM$_R$1)

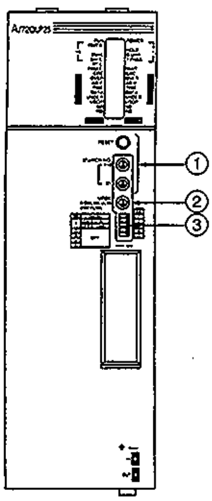
The following is set for the multiple remote master station (1DM$_R$) and multiple remote submaster station (1DSM$_R$1):



No.	Item			Description	1DM$_R$	1DSM$_R$1
①	NETWORK No.		x100	Network number	0	0
			x10		0	0
			x1		1	1
②	GROUP No.			Group number (Invalid when using remote I/O network)	0	0
③	STATION No.		x10	Station number	0	0
			x1		0	1
④	MODE			Mode	0	0
⑤	SW	OFF	ON	—		
	1	PC	REMOTE	Inter-PC network/remote I/O network	ON	ON
	2	N.ST/D.S.M	MNG/P.S.M	Multiple remote submaster station Parallel remote submaster station	OFF	OFF
	3	PRM	D.PRM	Not applicable for remote I/O network	OFF	OFF
	4	STATION SIZE (8, 16, 32, 64)			OFF	OFF
	5				OFF	OFF
	6	LB/LW SIZE (2, 4, 6, 8k)			OFF	OFF
	7				OFF	OFF
	8	—		—	OFF	OFF

(b) Remote I/O network

The following is set for the remote I/O station (1R2):

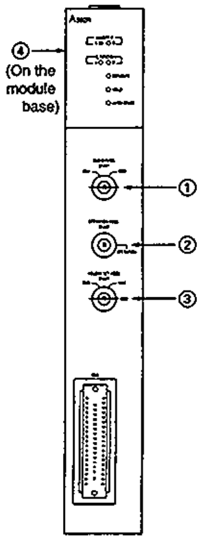


No.	Item			Description	1R2
①	STATION No.		x10	Station number	0
			x1		2
②	MODE			Mode	0
③	SW	OFF	ON	—	
	1	QnA	A	QnACPU peripheral device connected ACPU peripheral device connected	OFF
	2	—		Always off	OFF
	3				OFF
	4				OFF
	5				OFF

(3) Bus switching module (A6RAF)

The bus switching module (A6RAF) is a required module in configuring a duplex system, and performs the control system/standby system switching.

The following items are set in the bus switching module:



No.	Item	Description	Setting
①	BUS CHANGE	The control/standby systems switching setting REQUEST: Auto-switching A: Forceful switch to the control by A system B: Forceful switch to the control by B system	REQUEST
②	OPERATION MODE	Backup mode/separate mode switching BACKUP: Backup mode SEPARATE: Separate mode	BACKUP
③	HOLD/RESET MODE	Output status setting when CPU option is stopped. RESET: All points off HOLD: Maintains the status right before the error	RESET
④	Control system setting	Control system setting when powers are on at the same time LATCH: Operates with previous operation status A.LOCK: Fixed to A system	A.LOCK

11.2.2 Setting the parameters

The parameters to set and the operation method using a peripheral device is described below:

(1) Parameter settings

The items to set in the parameters and sequence program are shown in Table 11.2.

Table 11.2 Parameter setting items

	Parameter setting items		Multiple remote master station (1DM$_R$)	Multiple remote submaster station (1DSM$_R$1)
Parameters	Number of modules set		○	○
	Network setting	First I/O number	○	○
		Network number	○	○
		Total number of (slave) link stations	○	×
	Network refresh parameters		○	○
	Common parameters		○	×
	Station specific parameters		×	×
	I/O allocation		△	×
	Inter data link transfer parameter		×	×
	Routing parameter		×	×
Sequence program	Pairing setting *1		×	×
	Tracking setting *2		○	○

*: Refer to "Q4ARCPU User's Manual (Detailed Section)."

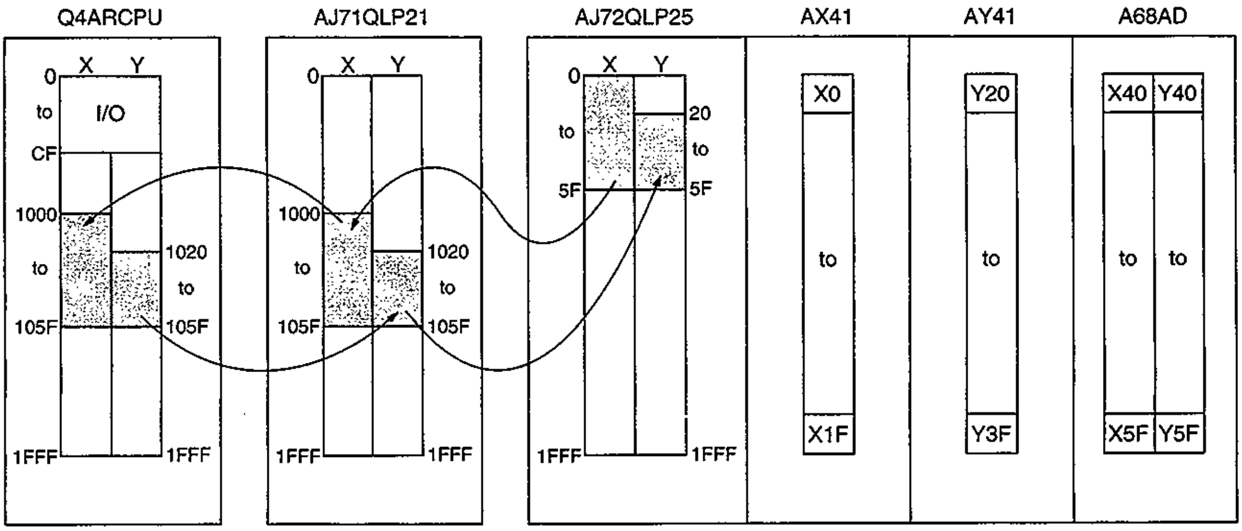
○: Always set △: Set as necessary ×: Setting not necessary

(2) Setting for common parameters

(a) X/Y communication

Remote I/O station's X0 to 5F, Y20 to 5F are controlled by devices with X1000 to 105F and 1020 to 105F.

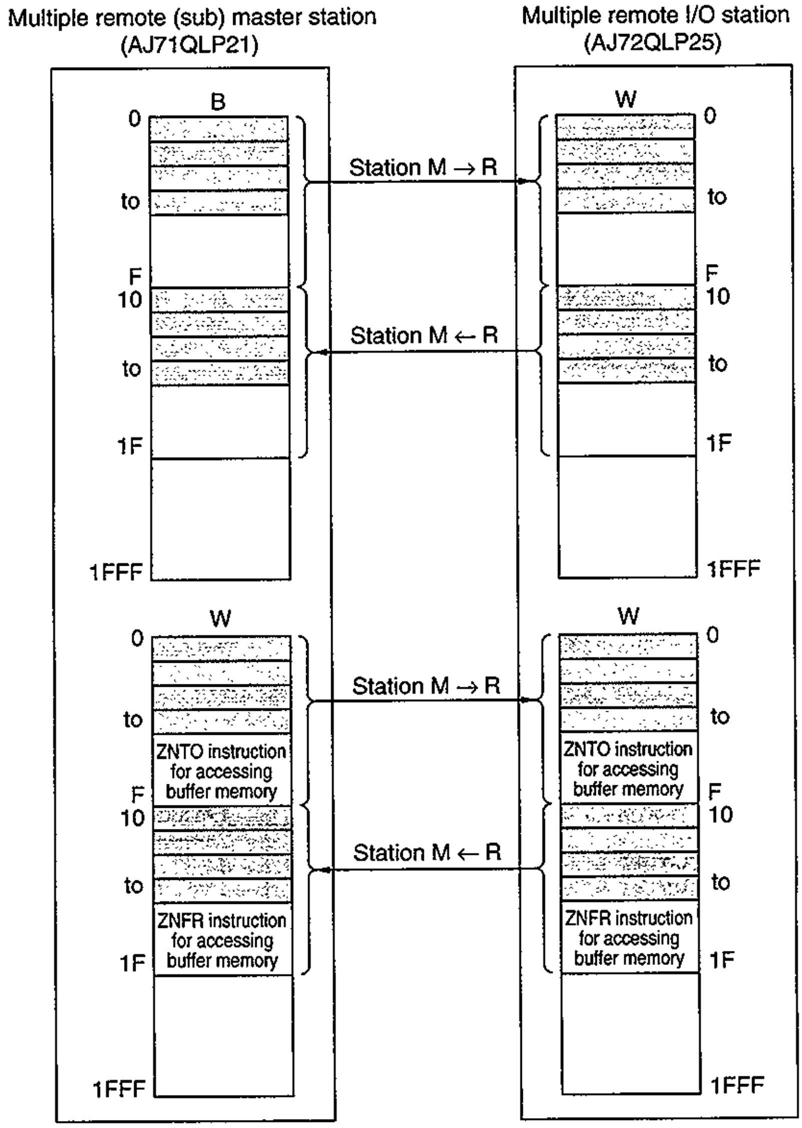
(The details are the same for controlling with the multiple remote submaster station.)



(b) B/W communication

Setting is required for reading data from the special function module (A68AD) buffer memory and writing data to the buffer memory.

Refer to Section 7.2.2 (2) or 9.5.2 for details about setting.



Area (4 points) used as Handshake

(3) Parameter setting operation for duplex remote master station (1DM$_R$)

Operation of DOS/V personal computer (SW□IVD-GPPQ) is explained here.

1) Start up software package with the function of GPPQ type GPP.
2) On Initial Setting, select "1. Writing a new program".
3) On writing a new program, select "4.04A", by marking with an asterisk(*).
4) File Setting is not executed here.

Do you want to execute File Setting?

Yes(Y)   No(N)

↓

N

5) On the menu, select "3/parameter".
6) Select "7/MELSECNET(II./10)Setting".
7) Select "No".

Clears parameters and reads Installation status. All right?

Yes(Y)   No(N)

↓

N

8) # of ,modules setting

[# of Unit Setting]   Label:

1. MELSECNET(II,/10)Unit(s) [ ] ← Set the number of network modules installed here.

1. Unit 1 ( )
2. Unit 2 ( )
3. Unit 3 ( )
4. Unit 4 ( )

← Set the types of network modules here.

2. Valid Unit at Accessing Other St [1]

Execute(Y)   Cancel(N)

Space:Select   Esc:Close

↓

Space → 1 → Enter → Enter

Locate cursor at (# of module) setting field. / # of module. / Locate cursor at type name setting field. / Open the type name setting screen.

↓

Go to next page

Continued from the previous page

[Type name setting for module 1]

[Unit Type Setting(1)]

1.(*) MELSECNET/10 (Default)
2.( ) MELSECNET/10 (Control Station)
3.( ) MELSECNET/10 (Normal Station)
4.( ) MELSECNET/10 (Remote Master)
5.( ) MELSECNET (Master Station)
6.( ) MELSECNETII Cmp (Master Station)
7.( ) MELSECNETII (Master Station)
8.( ) MELSECNET (Local Station)
9.( ) MELSECNETII Cmp (Local Station)
A.( ) MELSECNETII (Local Station)

B.( ) MELSECNET/10
(Wait /Duplex/Parallel)

Execute(Y) Cancel(N)

Space:Select Ese:Close

6 Enter

[Wait/Duplex/Parallel Setting] Label:

1. (*)Inter PC Link Waiting Station in Unit#[1]

2. ( ) Duplex Remote Master
3. ( ) Parallel Remote Master
4. ( ) Duplex Remote Submaster
   1. (*) No Remote Master in this CPU
   2. ( ) Duplex Remote Master
5. ( ) Parallel Remote Submaster

Execute(Y) Cancel(N)

Space:Select Ese:Close

2 Enter

[# of Unit Setting] Label:

1. MELSECNET(II,/10)Unit(s) [1]
   1. Unit 1 (MELSECNET/10 (Dup/M))
   2. Unit 2 ( )
   3. Unit 3 ( )
   4. Unit 4 ( )

2. Valid Unit at Accessing Other St [1]

Execute(Y) Cancel(N)

Space:Select Ese:Close

↓ ↓ ↓ ↓ → Y

Locate the cursor at the valid modules for other station access. — Execute

9) Network setting

Set the current 1st I/O # of the network module as it is.

Set the network # specified by switch.

Set the # of stations of remote I/O station and duplex remote submaster station.

[Network Setting] Label:

	Unit #1 NET/10 Dup /M	Unit #2	Unit #3	Unit #4
1st I/O#	[ ]	---------	---------	---------
Network#	[ ]	---------	---------	---------
# of Station(Slave)	[ ]	---------	---------	---------
Network Refresh Parm	None	---------	---------	---------
Common Parameter	• None	---------	---------	---------
Specific Parameter	---------	---------	---------	---------
I/O Allocation	None	---------	---------	---------
TX Parm For DtaLink	---------			
Routing Parameter	None			

• :Must Be Set :If Necessary :Setting Done * For Only Reference

Space:Select Esc:Close

1 0 → Enter → 1 → Enter → 2

First I/O No. Network No. Total number of link stations

[Network Setting] Label:

	Unit #1 NET/10 Dup /M	Unit #2	Unit #3	Unit #4
1st I/O#	[10]	---------	---------	---------
Network#	[1]	---------	---------	---------
# of Station(Slave)	[2]	---------	---------	---------
Network Refresh Parm	None	---------	---------	---------
Common Parameter	• None	---------	---------	---------
Specific Parameter	---------	---------	---------	---------
I/O Allocation	None	---------	---------	---------
TX Parm For DataLink	---------			
Routing Parameter	None			

• :Must Be Set :If Necessary :Setting Done * For Only Reference

Space:Select Esc:Close

↓ ↓ → Enter

Move the cursor to the common parameters.

10) Setting the station number for duplex remote submaster.

[Cmm Parm (MELSECNET/10 Control)(BW Set)] Label:

Auxiliary Setting
Link WDT 2000 ms

Network(# 1)
NET/10 Duplex R/M 1st I/O # 10
Network # 1 Slave PC Sta 2

Station No.	M Sta→M/R Sub — B — First Last	M Sta←M/R Sub — B — First Last	M Sta→M/R Sub — W — First Last	M Sta←M/R Sub — W — First Last
1	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
2	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]

PgUp:Prev PgDn:Next F3:BW→XY1→ Esc:Close

Alt → 6
Menu Auxiliary setting

1/File 2/PC 6/Auxiliary 7/Windou

1/Auxiliary Setting...
2/Simplified allocation
3/Compare...
4/New...
5/File List...
6/Connaction...
7/Remote Option...

1

[Auxiliary Setting(Cmm Parm)]

1. Link WDT [2000]ms
2. Parameter Name [ ]
3. Duplex Remote Submaster Station[ ]
4. Constant Link Scan [ ]ms
5. Multiplexed Transmission (No.)
6. Max # of Reocnnection in a Scan[2]
7. ZNFR/ZNTO # of Accesses [64](1-64)

Execute(Y) Cancel(N)
Space:Select Esc:Close

↓↓ → Space → 1 → Enter
Locate cursor at duplex remote submaster field. Locate cursor at setting field. # of modules Locate cursor at type name setting field.

[Auxiliary Setting(Cmm Parm)]

1. Link WDT [2000]ms
2. Parameter Name [ ]
3. Duplex Remote Submaster Station[1]
4. Constant Link Scan [ ]ms
5. Multiplexed Transmission (No.)
6. Max # of Reocnnection in a Scan[2]
7. ZNFR/ZNTO # of Accesses [64](1-64)

Execute(Y) Cancel(N)
Space:Select Esc:Close

Y

11) B/W setting

Set to access the A68AD buffer memory of remote I/O station.

And, communication between duplex remote master station and duplex remote submaster station should not be executed.

[Cmm Parm (MELSECNET/10 Control)(BW Set)] Label:

Auxiliary Setting: Link WDT 2000 ms

Network(# 1): NET/10 Duplex R/M 1st I/O # 10; Network # 1 Slave PC Sta 2

Station No.	M Sta→M/R Sub B First Last	M Sta←M/R Sub B First Last	M Sta→M/R Sub W First Last	M Sta←M/R Sub W First Last
Sub 1	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
2	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]

PgUp:Prev PgDn:Next F3:BW→XY1→Esc:Close

↓

Set according to the following screen.

[Cmm Parm (MELSECNET/10 Control)(BW Set)] Label:

Auxiliary Setting: Link WDT 2000 ms

Network(# 1): NET/10 Duplex R/M 1st I/O # 10; Network # 1 Slave PC Sta 2

Station No.	M Sta→M/R Sub B First Last	M Sta←M/R Sub B First Last	M Sta→M/R Sub W First Last	M Sta←M/R Sub W First Last
Sub 1	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
2	[0]-[F]	[10]-[1F]	[0]-[F]	[10]-[1F]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]
	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]	[ ]-[ ]

PgUp:Prev PgDn:Next F3:BW→XY1→Esc:Close

↓

[f·3] (Switches the setting screen)

12) X/Y setting

Set to communicate with AX41 and A68AD I/O signals of remote I/O station.

And, Communication between duplex remote master station and duplex remote submaster station should not be executed.

[Cmm Parm (MELSECNET/10 Control)(XY Set)] Label:

Auxiliary Setting
Link WDT 2000 ms

Network(# 1)
NET/10 Duplex R/M 1st I/O # 10
Network # 1 Slave PC Sta 2

Station No.	M Sta M/R Sub Station Y First Last	X/Y First Last	M Sta M/R Sub Station X First Last	Y/X First Last
Sub 1	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-
2	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-
	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-
	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-
	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-
	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-
	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-
	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-

PgUp:Prev PgDn:Next F3:BW→XY1→Esc:Close

↓

Set according to the following screen.

[Cmm Parm (MELSECNET/10 Control)(XY Set)] Label:

Auxiliary Setting
Link WDT 2000 ms

Network(# 1)
NET/10 Duplex R/M 1st I/O # 10
Network # 1 Slave PC Sta 2

Station No.	M Sta→M/R Sub Station Y First Last	X/Y First Last	M Sta←M/R Sub Station X First Last	Y/X First Last
Sub 1	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-
2	[1020]-[105 F]	[20]- 5F	[1000]-[105 F]	[0]- 5F
	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-
	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-
	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-
	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-
	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-
	[ ]-[ ]	[ ]-	[ ]-[ ]	[ ]-

PgUp:Prev PgDn:Next F3:BW→XY1→Esc:Close

↓

[Esc]

↓

Do you want to register the parameter?

Yes(Y) No(N)

↓

[Y]

13) Confirm that common parameter is set to "■".

[Network Setting] Label:

	Unit #1 NET/10 Dup /M	Unit #2	Unit #3	Unit #4
1st I/O#	[10]	....	....	....
Network#	[1]	....	....	....
# of Station(Slave)	[2]	....	....	....
Network Refresh Parm	☐ None	....	....	....
Common Parameter	■ Set	....	....	....
Specific Parameter	....	....	....	....
I/O Allocation	☐ None	....	....	....
TX Parm For DataLink	....			
Routing Parameter	☐ None			

• :Must Be Set ☐:If Necessary ■,■:Setting Done ∗ For Only Reference

Space:Select Esc:Close

14) Change of network refresh parameter

Device X/Y is (OR Device E and Y are) not set within the refresh range at default setting.

Set according to the following screen.

↑ ——→ Enter

Locate cursor at network refresh parameter.

[Network Refresh Parameter]

# 1 NET/10 Dup /M 1st I/O # 10 Network # 1	# of TX Device	Link Side First	Link Side Last	CPU Side First Device	CPU Side Last Device
B TX	[8192]	B [0]	-B [1FFF]	<> B [0]	-B [1FFF]
W TX	[8192]	W[0]	-W[1FFF]	<> W[0]	-W[1FFF]
X TX	[0]	X [ ]	-X [ ]	<> X [0]	-X [ ]
Y TX	[0]	Y [ ]	-Y [ ]	<> Y [0]	-Y [ ]

Set according to the following screen.

[Network Refresh Parameter]

# 1 NET/10 Dup /M 1st I/O # 10 Network # 1	# of TX Device	Link Side First	Link Side Last	CPU Side First Device	CPU Side Last Device
B TX	[8192]	B [0]	-B [1FFF]	<> B [0]	-B [1FFF]
W TX	[8192]	W[0]	-W[1FFF]	<> W[0]	-W[1FFF]
X TX	[8192]	X [0]	-X [1FFF]	<> X [0]	-X [1FFF]
Y TX	[8192]	Y [0]	-Y [1FFF]	<> Y [0]	-Y [1FFF]

Continued to the next page

Continued from the previous page

↓

[Esc]

↓

Do you want to register the parameter?

Yes(Y) No(N)

↓

[Y]

15) Confirm that network refresh parameter is set to "■ set".

[Network Setting] Label:

	Unit #1 NET/10 Dup /M	Unit #2	Unit #3	Unit #4
1st I/O#	[10]	---------	---------	---------
Network#	[1]	---------	---------	---------
# of Station(Slave)	[2]	---------	---------	---------
Network Refresh Parm	■ Set	---------	---------	---------
Common Parameter	■ Set	---------	---------	---------
Specific Parameter	---------	---------	---------	---------
I/O Allocation	☐ None	---------	---------	---------
TX Parm For DataLink	---------			
Routing Parameter	☐ None			

• :Must Be Set ☐:If Necessary ■,■:Setting Done ∗ For Only Reference

Space:Select Esc:Close

↓

[Esc]

↓

Do you want to register the parameter?

Yes(Y) No(N)

↓

[Y]

↓

[# of Unit Setting] Label:

1. MELSECNET(II,/10)Unit(s) [1]
   1. Unit 1 (MELSCNET/10 (Dup /M))
   2. Unit 2 ( )
   3. Unit 3 ( )
   4. Unit 4 ( )
2. Valid Unit at Accessing Other St [1]

Execute(Y) Cancel(N)

Space:Select Ese:Close

16) Write the parameter to the duplex remote master station (Control system Q4ARCPU).
(set the Q4ARCPU to STOP)

[Alt] → [2]
Menu Select PC

↓

```
1/File 2/PC                              7/Windou
       1/Read...
       2/Write...
       3/Compare...
       4/New...
       5/File List...
       6/Connaction...
       7/Remote Option...
       8/Write Option...
```

↓

[2] (Write)

↓

```
[Write to PC]
 Interface     RS232C          <----->      QnACPU
 Target PC     Network:0       Station: FF PC  Type:Q4A
 Target Mem    Internal RAM    Title   [                          ]
               Name[NET10]     Title   [                          ]
1.File 1.File  1.[*] Parameter
       2.Tgt   2.[*] Seq/SFC Prog
                                  1 (*) Who le Range   [     ]K Step
               3.[ ] Device Comment   2.( ) Step Range  [   ]-[   ]
               4.[ ] Dev Init Value   3.( ) Step Range  P[   ]-[   ]
               5.[ ] Simulation Data  4.( ) Block Range [   ]-[   ]
               6.[ ] File Register
                                  1.(*) Who le Range
                                  2.( ) Specify    ZR[   ]-[   ]
2.Device Mem   1.[ ] Internal     1.(*) Who le Range
                                  2.( ) Specify Detail Range
                     Execute(Y)   Cancel(N)
           Ctrl+L:List Ctrl+D=Dir Space:Select Esc:Close
```

↓

As shown on the screen below, set the target only parameter.
Sequence program is not included here.

```
[Write to PC]
 Interface     RS232C          <----->      QnACPU
 Target PC     Network:0       Station: FF PC  Type:Q4A
 Target Mem    Internal RAM    Title   [                          ]
               Name[NET10]     Title   [                          ]
1.File 1.File  1.[*] Parameter
       2.Tgt   2.[ ] Seq/SFC Prog
                                  1 (*) Who le Range   [     ]K Step
               3.[ ] Device Comment   2.( ) Step Range  [   ]-[   ]
               4.[ ] Dev Init Value   3.( ) Step Range  P[   ]-[   ]
               5.[ ] Simulation Data  4.( ) Block Range [   ]-[   ]
               6.[ ] File Register
                                  1.(*) Who le Range
                                  2.( ) Specify    ZR[   ]-[   ]
2.Device Mem   1.[ ] Internal     1.(*) Who le Range
                                  2.( ) Specify Detail Range
                     Execute(Y)   Cancel(N)
           Ctrl+L:List Ctrl+D=Dir Space:Select Esc:Close
```

↓

[Y] (Execute)

↓

Writing is complete when the message "Completion" is displayed.

(4) Parameter setting operation for duplex remote submaster station (1DSM$_R$1)

Operation of DOS/V personal computer (SW□IVD-GPPQ) is explained here.

1) Start up software package with the function of GPPQ type GPP.
2) On Initial Setting, select "1. Writing a new program".
3) On Writing a new program, select "4.04A", by marking with an asterisk(*).
4) File setting is not executed here, (but it is allowed if it's done).

Do you want to execute File Setting?

Yes(Y) No(N)

↓

N

5) On the menu, select "3/Parameter".
6) Select "7/MELSECNET(II./10)Setting".
7) Select "No".

Clears parameters and reads Installation status. All right?

Yes(Y) No(N)

↓

N

8) # of modules setting

[# of Unit Setting] Label:

1. MELSECNET(II,/10)Unit(s) [ ] ← Set the number of network modules installed here.

1. Unit 1 ( )
2. Unit 2 ( )
3. Unit 3 ( )
4. Unit 4 ( )

← Set the types of network modules here.

2. Valid Unit at Accessing Other St [1]

Execute(Y) Cancel(N)

# of modules.

Space → 1 → Enter → Enter

Space: Locate cursor at (# of module) setting field.
1: # of module.
Enter: Locate cursor at type name setting field.
Enter: Open the type name setting screen.

↓

Go to next page

Continued from the previous page

[Type name setting for Module 1]

[Unit Type Setting(1)]

1.( ) MELSECNET/10 (Default)
2.( ) MELSECNET/10 (Control Station)
3.( ) MELSECNET/10 (Normal Station)
4.( ) MELSECNET/10 (Remote Master)
5.( ) MELSECNET (Master Station)
6.( ) MELSECNETII Cmp (Master Station)
7.( ) MELSECNETII (Master Station)
8.( ) MELSECNET (Local Station)
9.( ) MELSECNETII Cmp (Local Station)
A.( ) MELSECNETII (Local Station)

B.( ) MELSECNET/10
(Wait /Duplex/Parallel)

Execute(Y) Cancel(N)

Space:Select Esc:Close

↓

[B] [Enter]

↓

[Wait/Duplex/Parallel Setting] Label:

1. (*)Inter PC Link Waiting Station in Unit#[1]

2. ( ) Duplex Remote Master
3. ( ) Parallel Remote Master
4. ( ) Duplex Remote Submaster
    1. (*) No Remote Master in this CPU
    2. ( ) Duplex Remote Master
5. ( ) Parallel Remote Submaster

Execute(Y) Cancel(N)

Space:Select Esc:Close

↓

[4] [Enter]

↓

[# of Unit Setting] Label:

1. MELSECNET(II,/10)Unit(s) [1]
    1. Unit 1 (MELSECNET/10 (Dup/S))
    2. Unit 2 ( )
    3. Unit 3 ( )
    4. Unit 4 ( )

2. Valid Unit at Accessing Other St [1]

Execute(Y) Cancel(N)

Space:Select Esc:Close

↓

[↓] [↓] [↓] [↓] → [Y]

Locate the cursor at the valid modules for other station access. (Execute)

9) Network setting

Set the current 1st I/O # of the network module as it is.

Set the network # specified by switch.

[Network Setting] Label:

	Unit #1 NET/10 Dup /S	Unit #2	Unit #3	Unit #4
1st I/O#	[ ]	-------	-------	-------
Network#	[ ]	-------	-------	-------
# of Station(Slave)	-------	-------	-------	-------
Network Refresh Parm	None	---------	---------	---------
Common Parameter	*	---------	---------	---------
Specific Parameter	---------	---------	---------	---------
I/O Allocation	---------	---------	---------	---------
TX Parm For DataLink	---------			
Routing Parameter	None			

• :Must Be Set :If Necessary ■,■:Setting Done * For Only Reference

Space:Select Esc:Close

[1] [0] → [Enter] → [1]

First I/O No. Network No.

[Network Setting] Label:

	Unit #1 NET/10 Dup /S	Unit #2	Unit #3	Unit #4
1st I/O#	[10]	-------	-------	-------
Network#	[1]	-------	-------	-------
# of Station(Slave)	-------	-------	-------	-------
Network Refresh Parm	None	---------	---------	---------
Common Parameter	*	---------	---------	---------
Specific Parameter	---------	---------	---------	---------
I/O Allocation	---------	---------	---------	---------
TX Parm For DataLink	---------			
Routing Parameter	None			

• :Must Be Set :If Necessary ■,■:Setting Done * For Only Reference

Space:Select Esc:Close

10) Change of network refresh parameter

Device X/Y is not set within the refresh range at default setting.

[↓] → [Enter]

Locate cursor at network refresh parameter.

↓

[Network Refresh Parameter]

# 1 NET/10 Dup /S 1st I/O # 10 Network # 1	# of TX Device	Link Side First	Link Side Last	CPU Side First Device	CPU Side Last Device
B TX	[8192]	B [0]-B [1FFF]	<>	B [0]	-B [1FFF]
W TX	[8192]	W[0]-W[1FFF]	<>	W[0]	-W[1FFF]
X TX	[0]	X [ ]-X [ ]	<>	X[ ]	-X [ ]
Y TX	[0]	Y [ ]-Y [ ]	<>	Y[ ]	-Y [ ]

↓

Set according to the following screen.

[Network Refresh Parameter]

# 1 NET/10 Dup /S 1st I/O # 10 Network # 1	# of TX Device	Link Side First	Link Side Last	CPU Side First Device	CPU Side Last Device
B TX	[8192]	B [0]-B [1FFF]	<>	B [0]	-B [1FFF]
W TX	[8192]	W[0]-W[1FFF]	<>	W[0]	-W[1FFF]
X TX	[8192]	X [0]-X [1FFF]	<>	X[0]	-X [1FFF]
Y TX	[8192]	Y [0]-Y [1FFF]	<>	Y[0]	-Y [1FFF]

↓

[Esc]

↓

Do you want to register the parameter?

Yes(Y) No(N)

↓

[Y]

11) Confirm that network refresh parameter is set to "■ set".

[Network Setting] Label:

	Unit #1 NET/10 Dup /S	Unit #2	Unit #3	Unit #4
1st I/O#	[10]	--------	--------	--------
Network#	[1]	--------	--------	--------
# of Station(Slave)	--------	--------	--------	--------
Network Refresh Parm	■ Set	----------	----------	----------
Common Parameter	*	----------	----------	----------
Specific Parameter	----------	----------	----------	----------
I/O Allocation	----------	----------	----------	----------
TX Parm For DataLink	----------			
Routing Parameter	☐ None			

• :Must Be Set ☐:If Necessary ■,■:Setting Done *For Only Reference

Space:Select Esc:Close

↓ Esc ↓

Do you want to register the parameter?

Yes(Y) No(N)

↓ Y ↓

[# of Unit Setting] Label:

1. MELSECNET(II,/10)Unit(s) [1]
   1. Unit 1 (MELSCNET/10 Dup / S))
   2. Unit 2 ( )
   3. Unit 3 ( )
   4. Unit 4 ( )

2. Valid Unit at Accessing Other St [1]

Execute(Y) Cancel(N)

Space:Select Esc:Close

12) Write the parameter to the duplex remote master station (Control system Q4ARCPU).
(set the Q4ARCPU to stop)

[Alt] → [2]
Menu Select PC

↓

```
1/File 2/PC                                7/Windou
       1/Read...
       2/Write...
       3/Compare...
       4/New...
       5/File List...
       6/Connaction...
       7/Remote Option...
       8/Write Option...
```

↓

[2] (Write)

↓

```
[Write to PC]
  Interface      RS232C         <----->     QnACPU
  Target PC      Network:0      Station: FF PC  Type:Q4A
  Target Mem     Internal RAM   Title  [                              ]
                 Name[NET10]    Title  [                              ]
 1.File 1.File   1.[*] Parameter
        2.Tgt    2.[*] Seq/SFC Prog
                                   1 (*) Who le Range    [    ]K Step
                 3.[ ] Device Comment  2.( ) Step Range  [   ]-[   ]
                 4.[ ] Dev Init Value  3.( ) Step Range  P[  ]-[   ]
                 5.[ ] Simulation Data 4.( ) Block Range [   ]-[   ]
                 6.[ ] File Register
                                   1.(*) Who le Range
                                   2.( ) Specify   ZR[   ]-[   ]
 2.Device Mem    1.[ ] Internal    1.(*) Who le Range
                                   2.( ) Specify Detail Range
                       Execute(Y)  Cancel(N)
                    Ctrl+L:List Ctrl+D=Dir  Space:Select  Esc:Close
```

↓

As shown on the screen below, set the target only parameter.
Sequence program is not included here.

```
[Write to PC]
  Interface      RS232C         <----->     QnACPU
  Target PC      Network:0      Station: FF PC  Type:Q4A
  Target Mem     Internal RAM   Title  :[                             ]
                 Name[NET10]    Title  :[                             ]
 1.File 1.File   1.[*] Parameter
        2.Tgt    2.[ ] Seq/SFC Prog
                                   1 (*) Who le Range    [    ]K Step
                 3.[ ] Device Comment  2.( ) Step Range  [   ]-[   ]
                 4.[ ] Dev Init Value  3.( ) Step Range  P[  ]-[   ]
                 5.[ ] Simulation Data 4.( ) Block Range [   ]-[   ]
                 6.[ ] File Register
                                   1.(*) Who le Range
                                   2.( ) Specify   ZR[   ]-[   ]
 2.Device Mem    1.[ ] Internal    1.(*) Who le Range
                                   2.( ) Specify Detail Range
                       Execute(Y)  Cancel(N)
                    Ctrl+L:List Ctrl+D=Dir  Space:Select  Esc:Close
```

↓

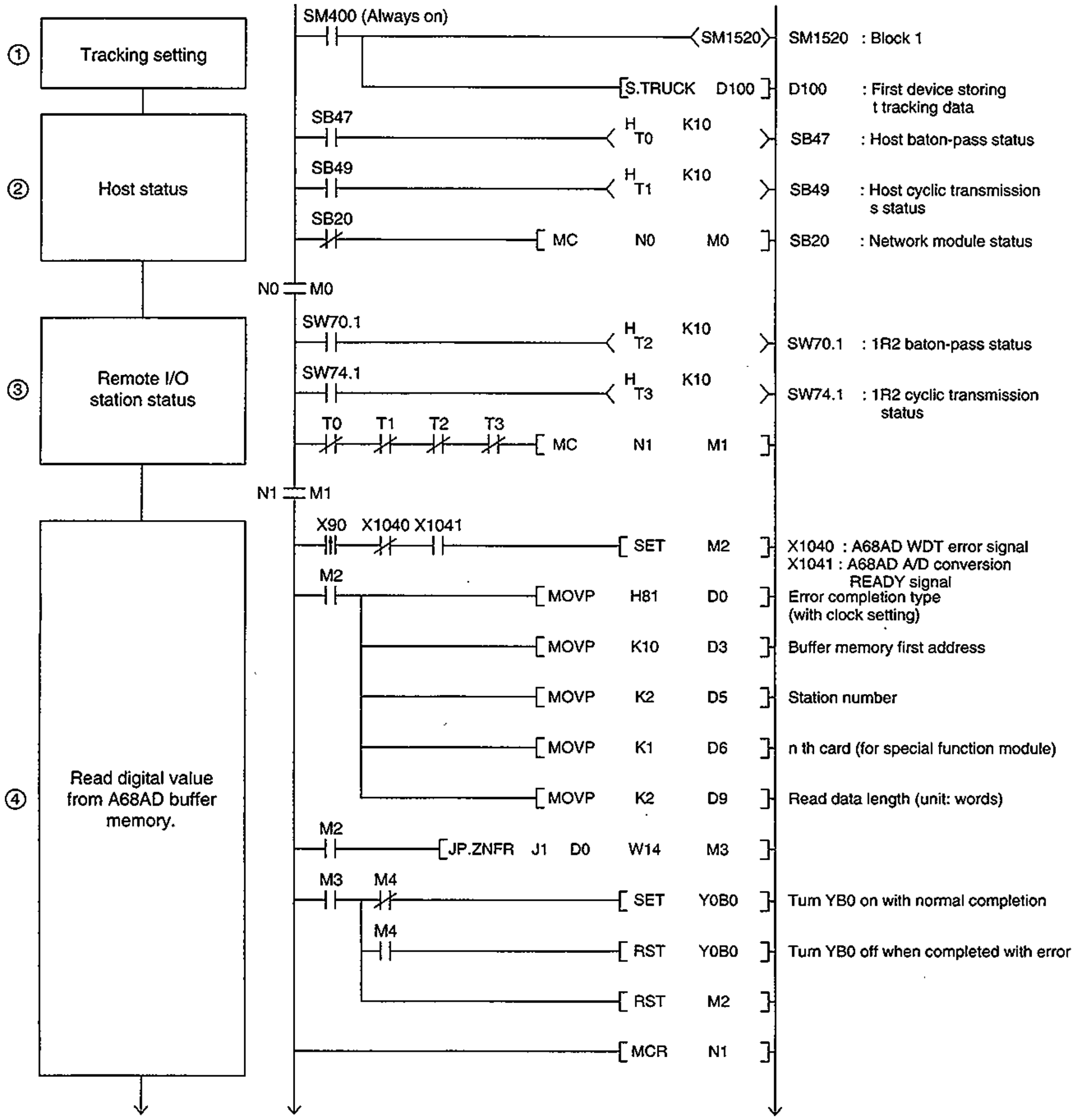
[Y] (Execute)

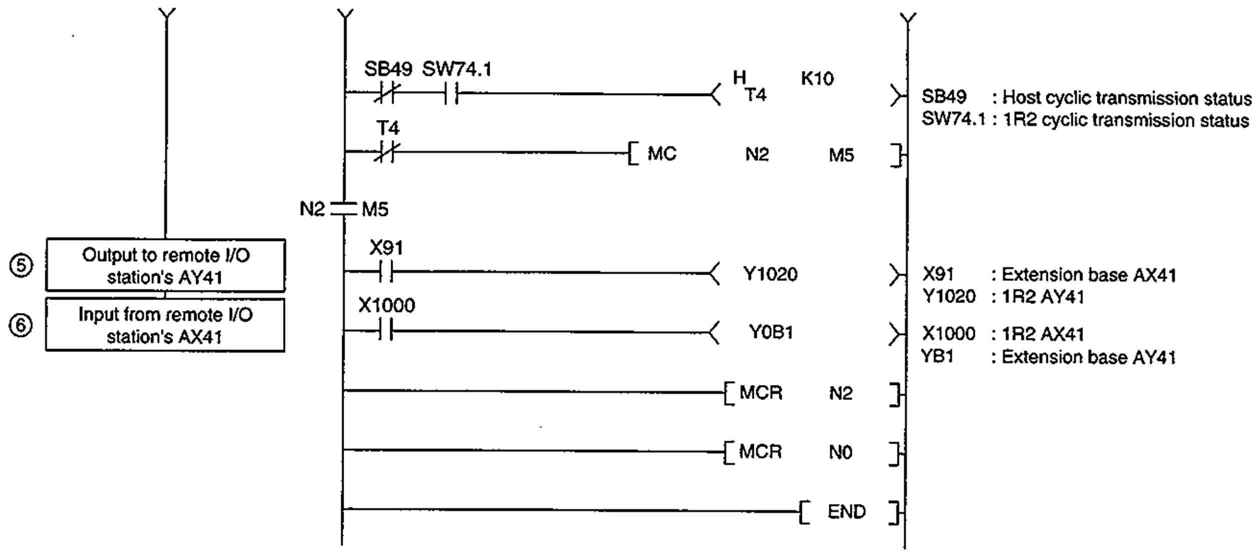
↓

Writing is complete when the message
"Completion" is displayed.

11.2.3 Creating a program

The sequence program to load in the duplex network (multiple remote master station and multiple remote submaster station) is created.
Load the same sequence program to both CPUs.





[Tracking data structure]

The tracking data (D100 to D109) structure is shown below:
YB0 to YB1 and Y1020 are tracked.
Refer to the Q4ARCPU User's manual (etailed section) for details.

Device	Value		Description	Range	
D100	1		Total range number: Set the device type (Y)		
D101	2		Block 1 setting: Device Y		
D102	1		Device code: Y	YB0 to YBF	Block 1 setting
D103	16		Device point (16 point unit)		
D104	00B0H	(L)	First device number		
D105	0000H	(H)			
D106	1		Device code: Y	Y1020 to Y102F	
D107	16		Device point (16 point unit)		
D108	1020H	(L)	First device number		
D109	0000H	(H)			

[Program operation description]

The operation details of the program on the previous page is described below:

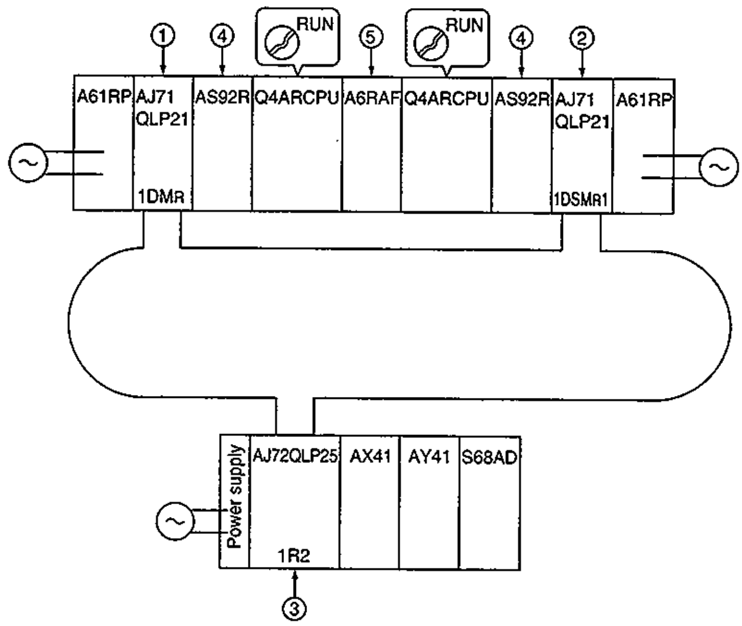
1) TRUCK instruction is executed when the CPU is RUN, and tracking starts.
2) The network module status, baton pass status, and cyclic status of the multiple remote master station (multiple remote submaster station) are read.
3) The baton pass status and cyclic transmission status of the remote I/O station are read.
4) By turning the X90 on for the AX41 installed on the extension base, the digital value is read from the buffer memory of A68AD in the remote I/O station.
   When completed normally, YB0 of the AY41 is turned on, and if completed with error, YB0 of the AY41 is turned off.
5) By turning on the X91 on for the AX41 installed on the extension base, the remote I/O station's Y1020 of the AY41 (the address is Y20 when seen from the remote I/O station) is turned on.
6) By turning on the X1000 (the address is X0 seen from the remote I/O station) for the AX41 on the remote I/O station, the YB1 is turned on for the AY41 installed on the extension base.

11.2.4 Confirming the operation when control system and standby system are normal

The duplex network operation is checked when the control system and standby system are at normal status. The checking is performed using the LED indication for each module and sequence program operation status.

The LED indication status and sequence program operation status are checked when all station's power is on (normal).

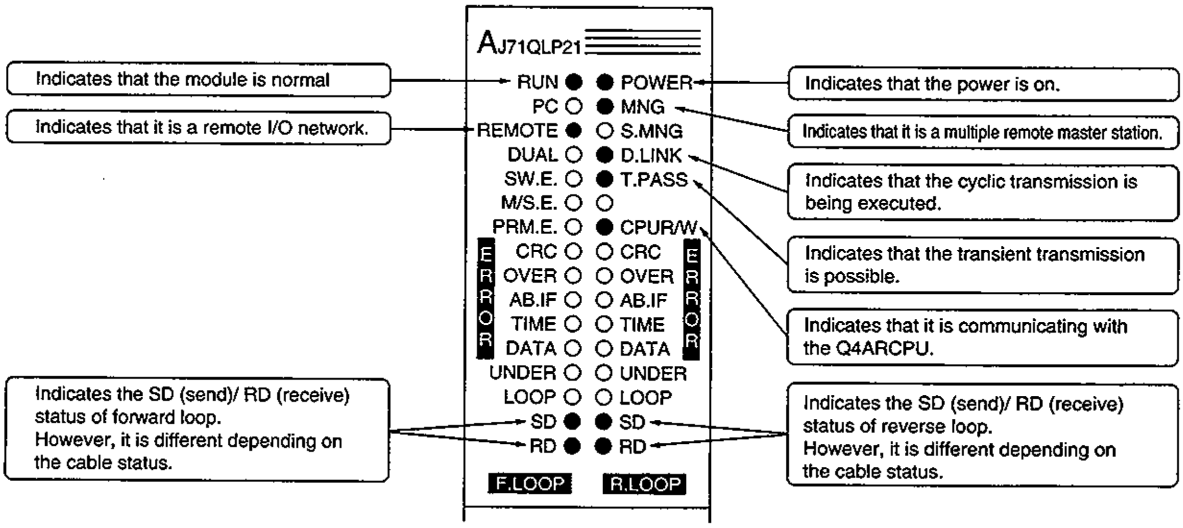
Startup the system with 1DMR (multiple remote master station) as the control system and 1DSMR1 (multiple remote submaster station) as the standby system.



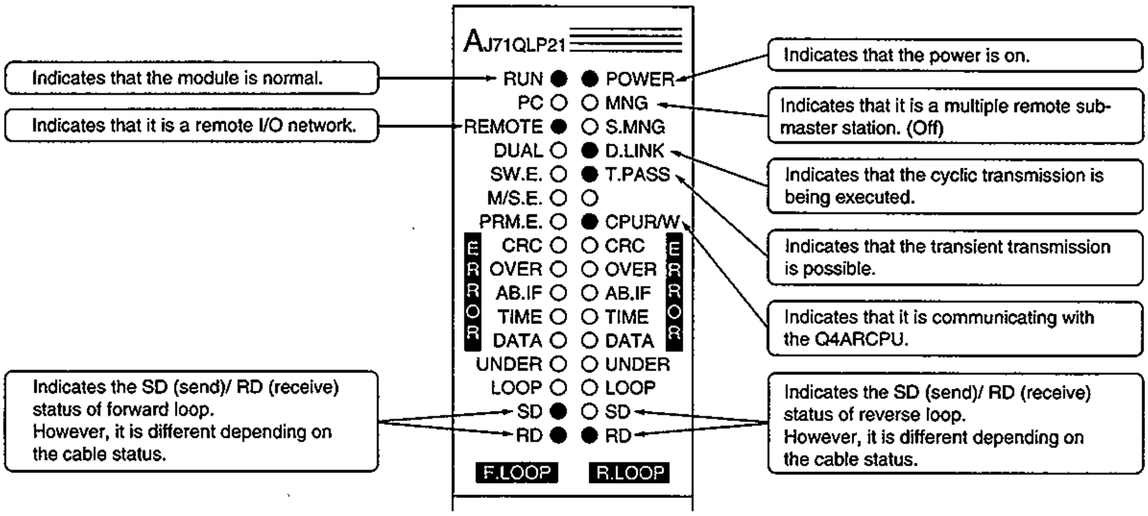
(1) Checking by LED indication

The LED indication status during normal operation (● is on and ○ is off) is shown below:

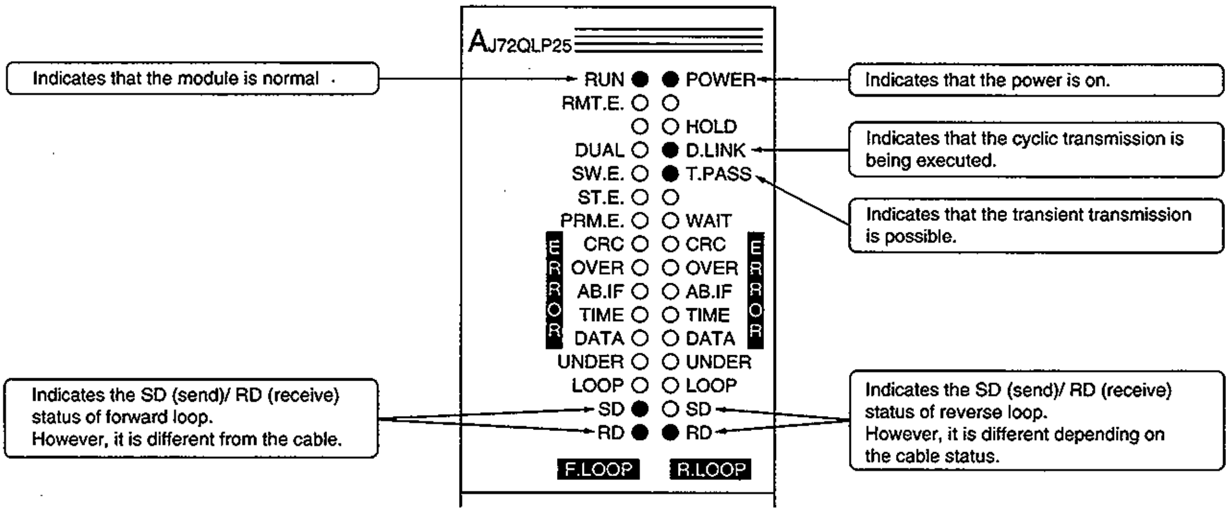
① Network module (1DMR: multiple remote master station)



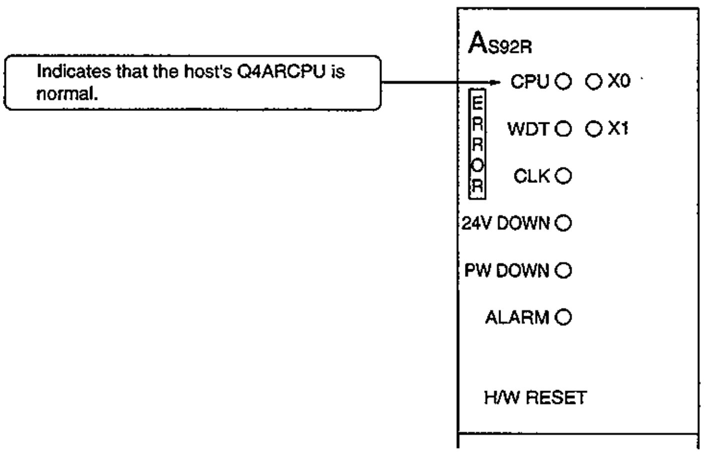
② Network module (1DSMR1: multiple remote submaster station)



③ Network module (1R2: remote I/O station)

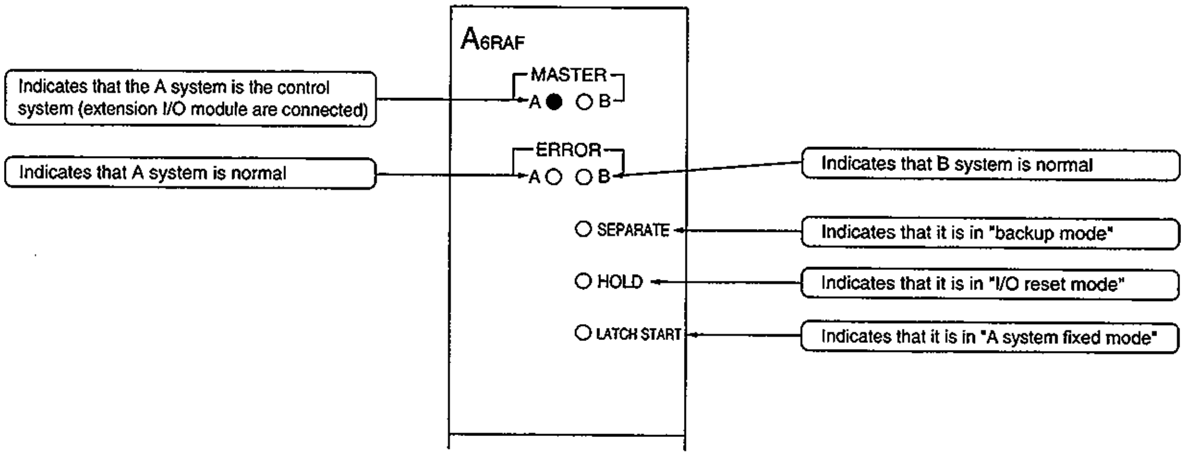


④ System control module (AS92R) . . . A system
The AS92R LED turns on "when an error occurs".
A system and B system have the same LED indication status.
Refer to Q4ARCPU User's Manual (Detailed Section) for details.



⑤ Bus switching module (A6RAF)

Refer to Q4ARCPU user's manual (detailed section) for details.

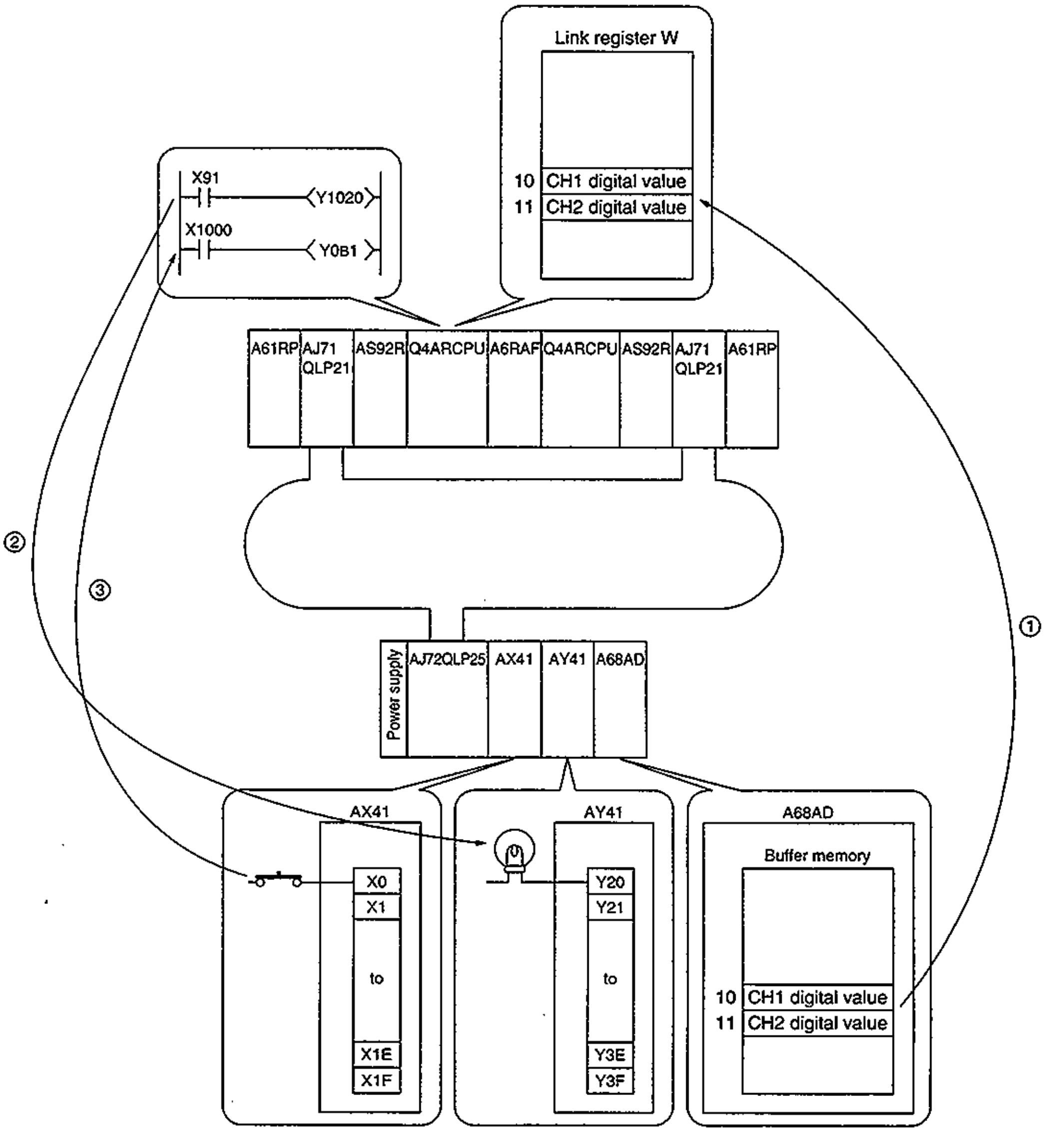


(2) Checking from the sequence program

① When X90 of the AX41 installed on the extension base is turned on, the remote I/O station's A68AD digital values can be read into W14 and W15.
When read is completed successfully, the YB0 is turned on for the AY41 installed on the extension base.

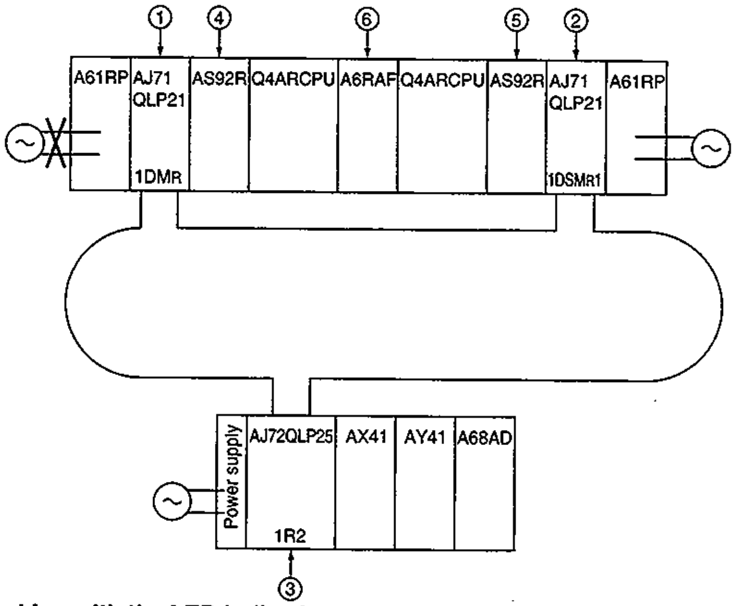
② When X91 is turned on for the AX41 installed on the extension base, check that the Y1020 (the address is Y20 when seen from the remote I/O station) for the AY41 on the remote I/O station, is turned on.

③ By turning on the X1000 (the address is X0 seen from the remote I/O station) for the AX41 on the remote I/O station, the YB1 is turned on for the AY41 installed on the extension base.



11.2.5 Checking the status when the control system's power is turned off

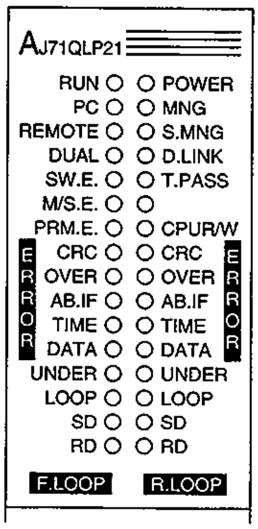
The LED indication status and sequence program operation status are checked when the control system side (multiple remote master station) power is turned off.



(1) Checking with the LED indication

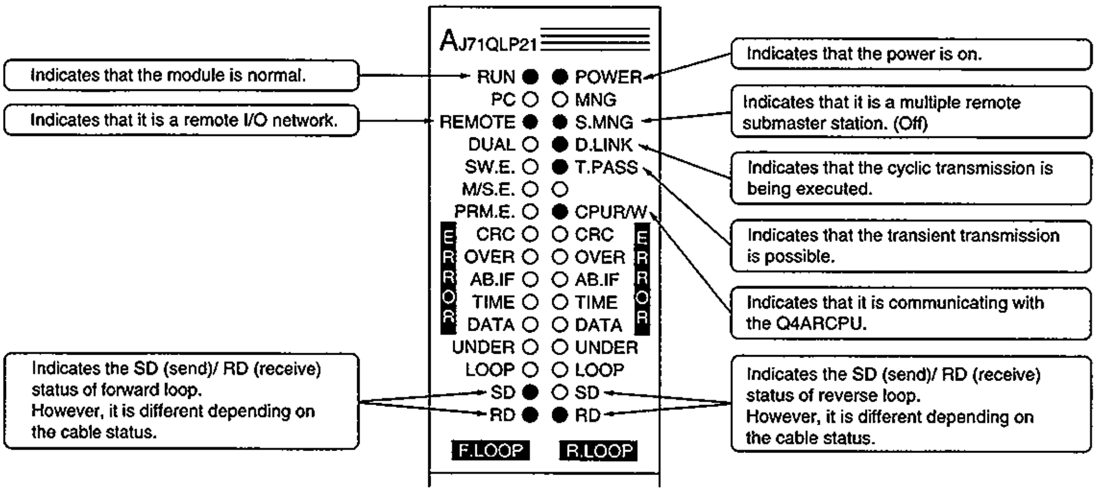
The LED indication status (● is on, ○ is off) is shown below:

① Network module (1DMR: multiple remote master station)
All LEDs are off because the power is not supplied.

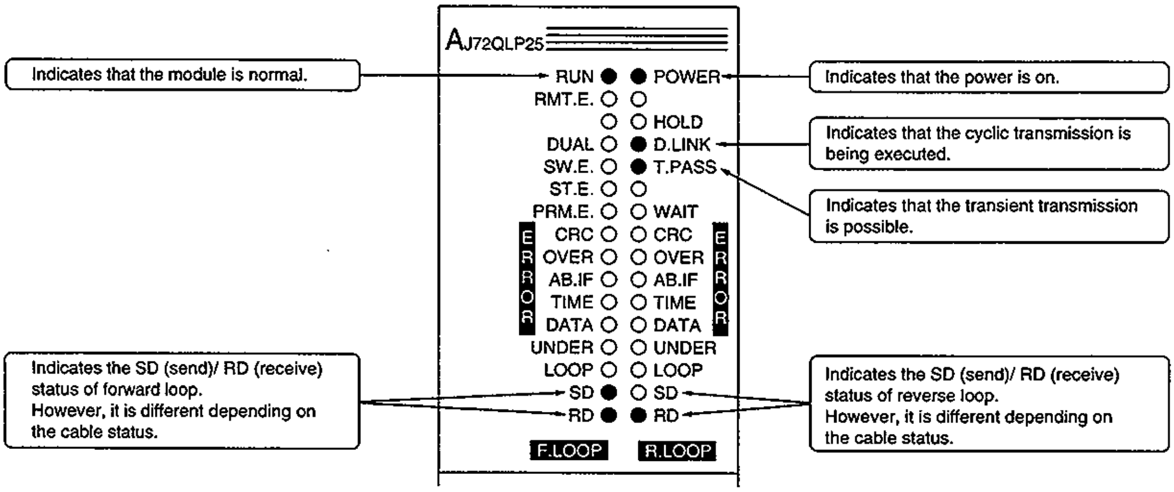


② Network module (1DSMR1: multiple remote submaster station)

"S.MNG" turns on because the multiple remote submaster station is controlling the remote I/O stations.



③ Network module (1R2: remote I/O station)

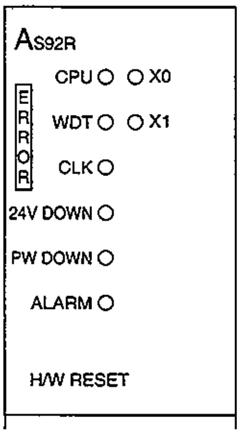


④ System control module (AS92R)

The AS92R LED turns on when an "error" occurs.

All LEDs are off because the power is not supplied for the A system.

Refer to Q4ARCPU User's Manual (Detailed Section) for details.

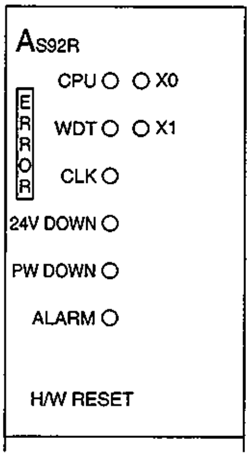


⑤ System control module (AS92R) . . . B system

The AS92R LED turns on when an "error" occurs.

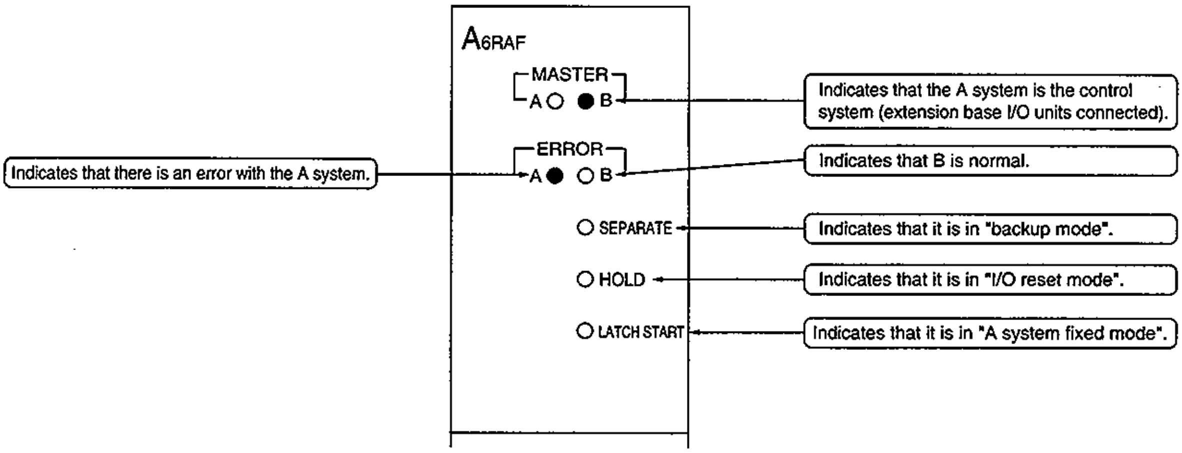
B system have the same LED indication status.

Refer to Q4ARCPU User's manual (detailed section) for details.



⑥ Bus switching module (A6RAF)

Refer to Q4ARCPU user's manual (detailed section) for details.



Point

A message is displayed in the Q4ARCPU LED indication area when the control system is switched.

CONTROL EXE. : Switched from standby system → control system

CONTROL WAIT : Switched from control system → standby system

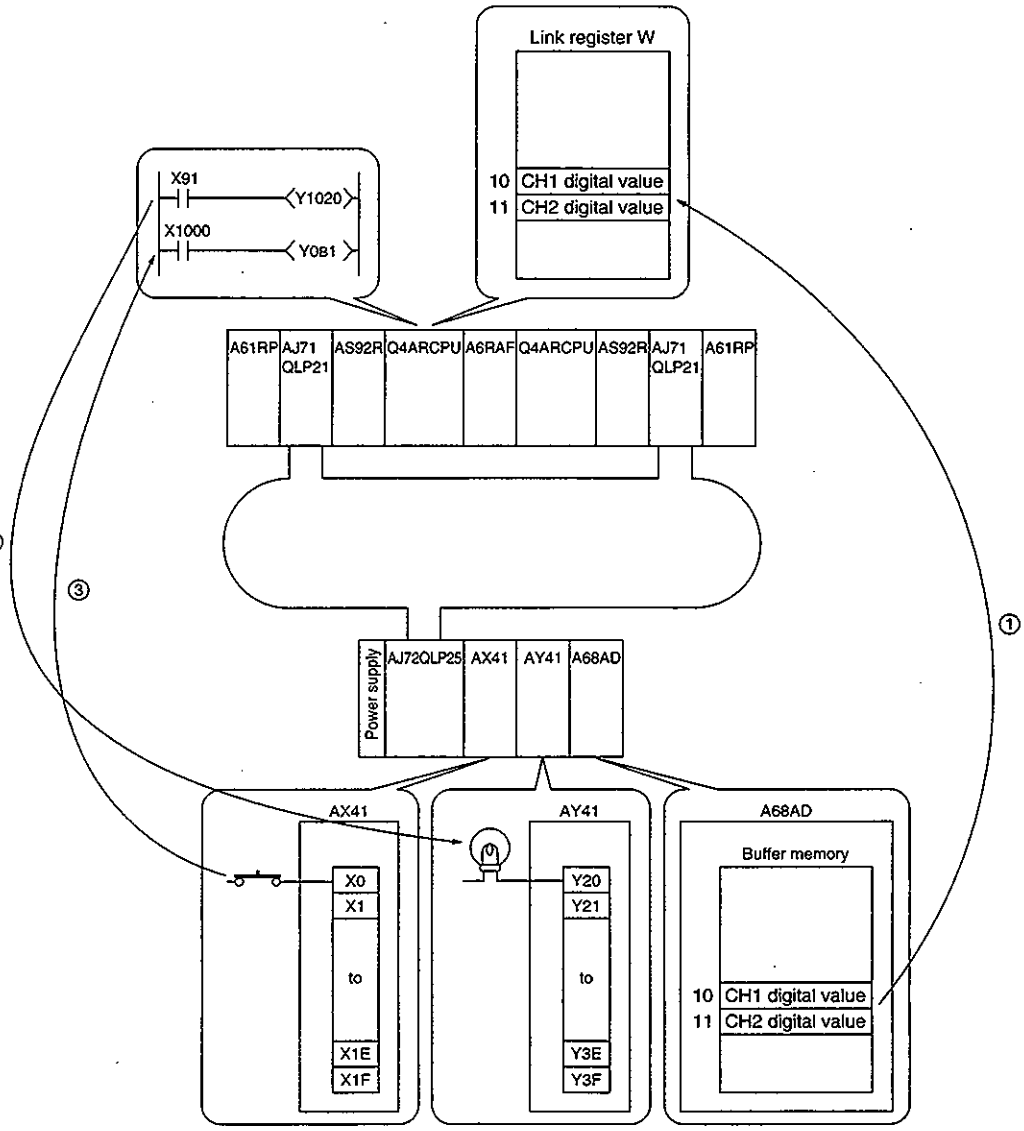
(2) Checking from the sequence program

① When X90 of the AX41 installed on the extension base is turned on, the remote I/O station's A68AD digital values can be read into W14 and W15.
When read is completed successfully, the YB0 is turned on for the AY41 installed on the extension base.

② When X91 is turned on for the AX41 installed on the extension base, check that the Y1020 (the address is Y20 when seen from the remote I/O station) for the AY41 on the remote I/O station is turned on.

③ By turning on the X1000 (the address is X0 seen from the remote I/O station) for the AX41 on the remote I/O station, the YB1 is turned on for the AY41 installed on the extension base.

Make sure that the remote I/O station output does not turn off when switching control from the multiple remote master station ($1DM_R$) to multiple remote submaster station ($1DSM_R1$).



12 Function

Functions related only to the duplex network is described.

12.1 Difference from the simplex network

Reference section of each function is listed in the following table.
Refer to Chapter 8 for the contents which are the same as the one for the simplex network.

Function		Reference section
Cyclic transmission function		Section 8.1
	Communication by B/W (Inter-PC network)	Section 12.2.2
	Communication by X/Y (Inter-PC network)	Section 8.1.2
	Communication with I/O modules (Remote I/O network)	Sections 8.1.3 and 12.3.2
	Communication with special function module (Remote I/O network)	Sections 8.1.4 and 12.3.2
	Stopping/restarting cyclic transmission as well as stopping the link refresh	Section 8.1.5
	Inter data link transfer function	Section 8.1.6
	Direct access to the link device	Section 8.1.7
	Increasing the send points by installing multiple modules of the same network number	Section 8.1.8
	Default values of network refresh parameters	Section 8.1.9
Transient transmission function routing function		Section 8.2
	Communication range	Section 8.2.1
	Routing function	Sections 12.2.6 and 12.3.5
	Group function (Inter-PC network)	Section 8.2.3
	Link dedicated instructions	Section 8.2.4
	Specifying default network	Section 8.2.5
	Clock setting at stations in the network from peripheral devices	Section 8.2.6
Control station transfer function (Inter-PC network)		Section 12.2.3
Multiplex transmission function (Optical loop system)		Section 8.4
Reserved station function		Section 8.5
Simplified network duplexing (Inter-PC network)		Section 8.6
Multiple master system (Remote I/O network)		Section 12.3
Parallel master system (Remote I/O network)		System configuration impossible
Output setting of remote I/O station for system down due to CPU error (Remote I/O network)		Section 8.9
SB/SW can be used as you like (User flags)		Section 8.10
RAS Function		Section 8.11
	Automatic recovery function	Section 8.11.1
	Loop back function (Optical loop system)	Section 8.11.2
	Preventing stations from going down by using the external power supply (Inter-PC network: optical loop system)	Section 8.11.3
	Station detachment function	Section 8.11.4
	Transient transmission is possible when the PC CPU is in fault	Section 8.11.5
	Confirming the transient transmission error detection time	Section 8.11.6
	Diagnostic function	Section 8.11.7

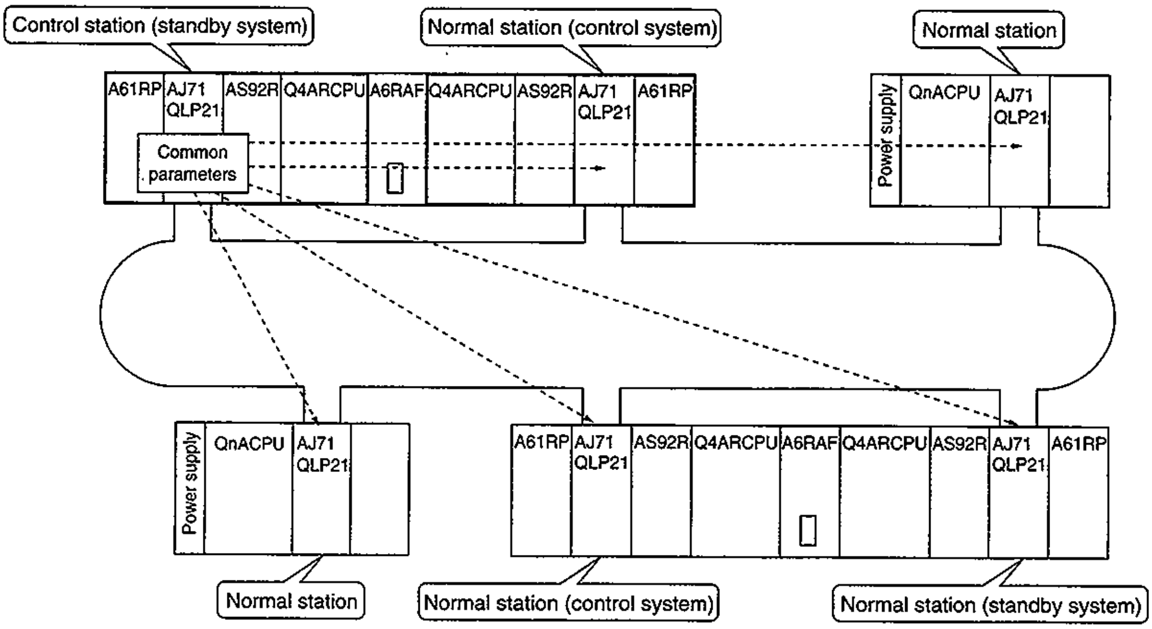
12.2 Inter-PC network

Duplex network specific functions of the inter-PC network are described.

12.2.1 Relationship between the control system/standby system and the control station/normal station

The control station can establish the data link after the startup either from the control system or from the standby system.

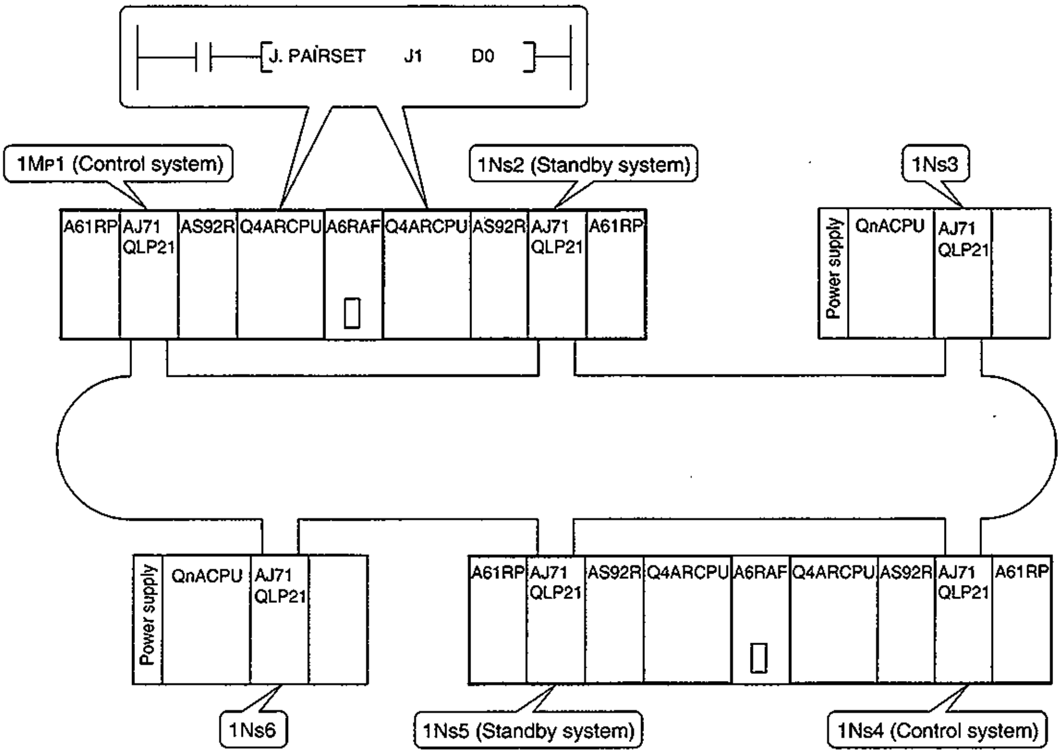
Even if the control station is started up from the standby system, the data link is possible since the parameters are transmitted from the control station to all of the stations.



12.2.2 Data communication status of the control system and the standby system (cyclic transmission)

Data communication status of the control system and the standby system in cyclic transmission for the following system configuration example and common parameter settings are explained.

[System Configuration]



[Common Parameter Settings]

Set B/W to the stations of the lower number (Station 1, Station 4).
The contents of the higher station number (Station 2, Station 5) are ignored.
The settings of X/Y cannot be the object for the pairing.

[Cmm Parm (MELSECNET/10Remote)(BW Set)] Label:

Auxiliary Setting
Link WDT 2000 ms

Network(# 1)
NET/10 Control 1st I/O # 10
Network # 1 # of Sta 6

Station	TX Range of Sta B First	Last	TX Range of Sta W First	Last
1	[0]	[FF]	[0]	[FF]
2	[ ]	[ ]	[ ]	[ ]
3	[100]	[1FF]	[100]	[1FF]
4	[200]	[2FF]	[200]	[2FF]
5	[ ]	[ ]	[ ]	[ ]
6	[300]	[3FF]	[300]	[3FF]
	[ ]	[ ]	[ ]	[ ]
	[ ]	[ ]	[ ]	[ ]

PgUp:Prev PgDn:Next F3:BW→ XY1→ XY2→ Esc:Close

Always set to the lower number. LINK PARA. ERR will occur when they are set to the higher number.

[Pairing Setting]

In order to set the pairing setting data, turn on the bit of the higher station number.
(Example to store the pairing setting data in D0 to D3:)

Station 5 (b4) Station 2 (b1)

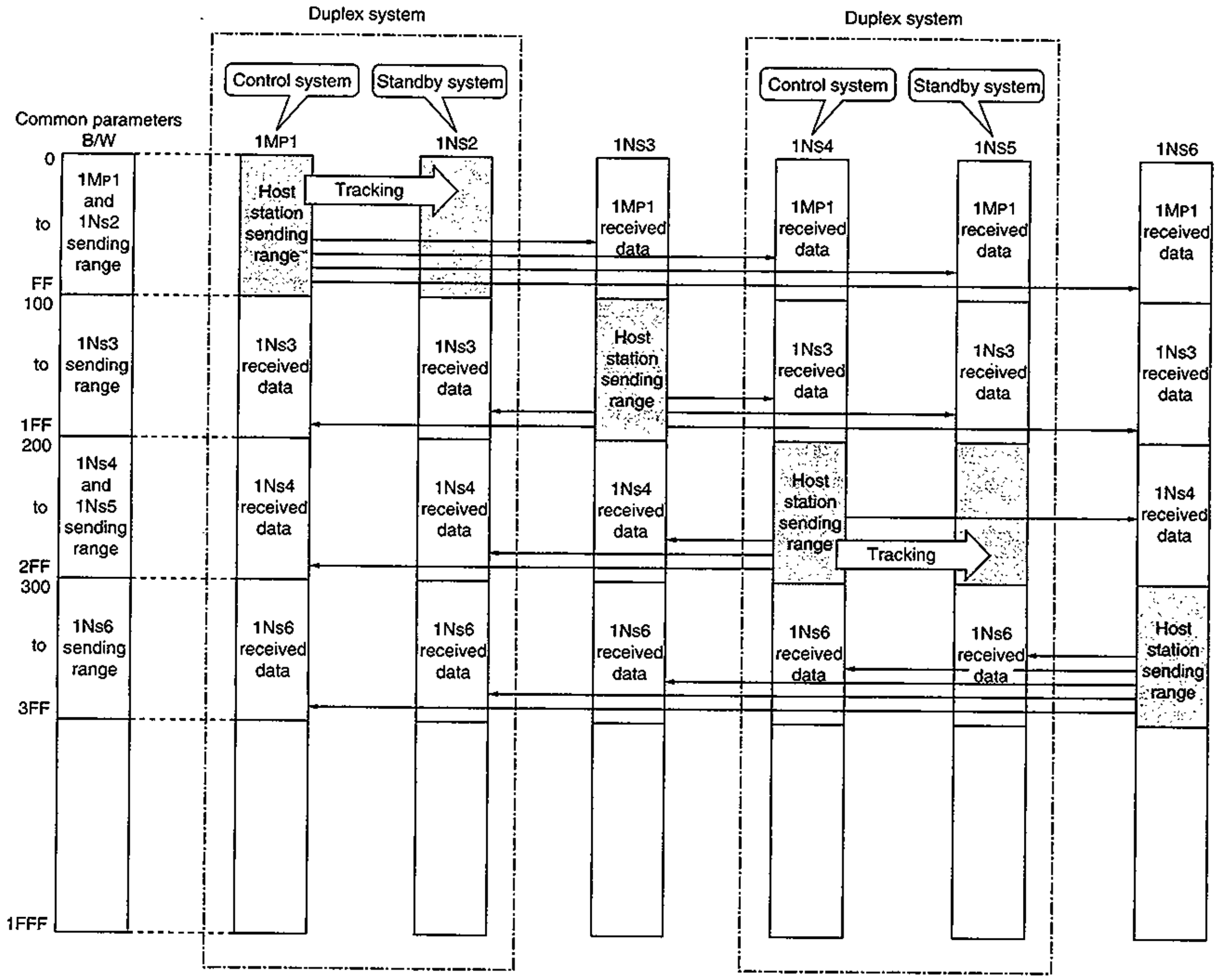
	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
D0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0
D1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(1) Data communication status when the control system is operating normally

(a) The control system of the duplex system (1MP1, 1Ns4) as well as 1Ns3 and 1Ns6 of the independent system can send data to and receive data from other stations.

(b) The standby system of the duplex system (1Ns2, 1Ns5) can only receive data from other stations.

(c) In order to prevent the B/W send data to be cleared (off) when the control system is switched to the standby system, it is necessary to track the data into the sending range of the standby system.



(2) Data communication status when the control system (1Ns4) is faulty

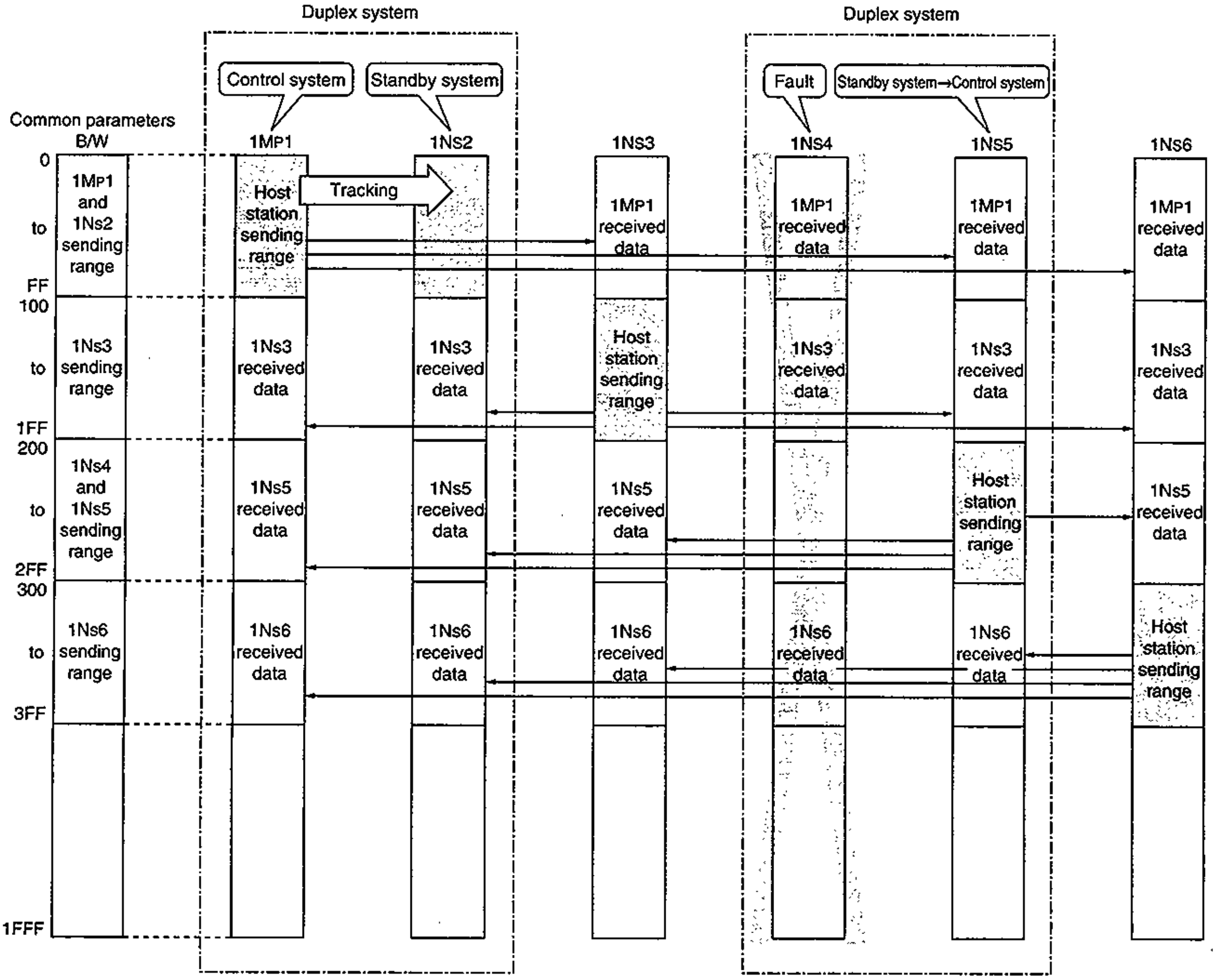
(a) 1Ns5 will be switched from the standby system to the control system and the data link is executed.

(b) The control system of the duplex system (1MP1, 1Ns5) as well as 1Ns3 and 1Ns6 of the independent system can send data to and receive data from other stations.

(c) The standby system of the duplex system (1Ns2) can only receive data from other stations.

(d) In order to prevent the B/W send data to be cleared (off) when the control system is switched to the standby system, it is necessary to track the data into the sending range of the standby system.

(e) B/W send data is retained upon switching from 1Ns4 to 1Ns5 (when the tracking is set).



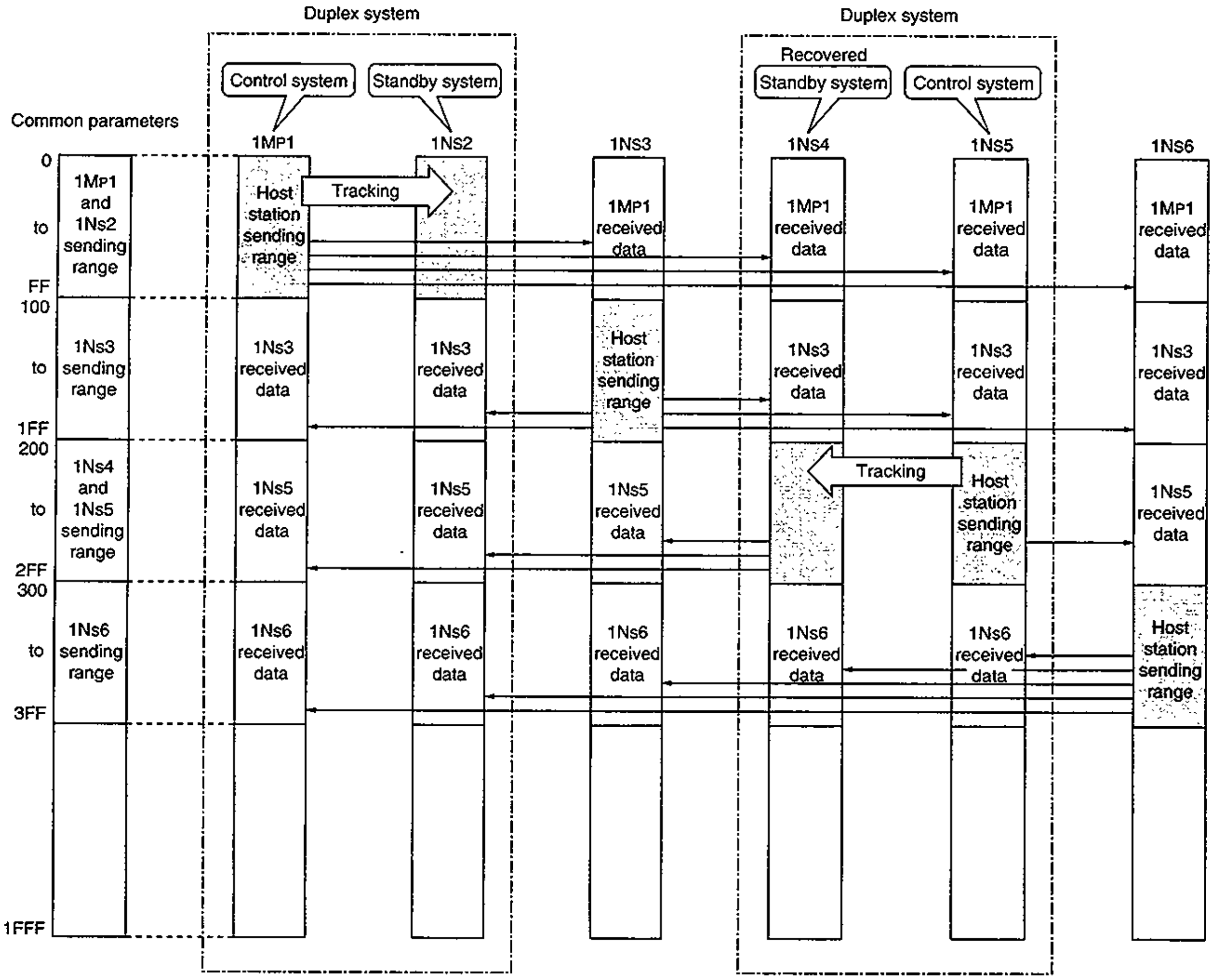
(3) Data communication status when 1Ns4 is recovered

(a) The data link continues while 1Ns5 stays as the control system, and 1Ns4 becomes the standby system.

(b) The control system of the duplex system (1MP1, 1Ns5) as well as 1Ns3 and 1Ns6 of the independent system can send data to and receive data from other stations.

(c) The standby system of the duplex system (1Ns2, 1Ns4) can only receive data from other stations.

(d) In order to prevent the B/W send data to be cleared (off) when the control system is switched to the standby system, it is necessary to track the data into the sending range of the standby system.



(4) Data communication status when the control system (1Ns5) is faulty

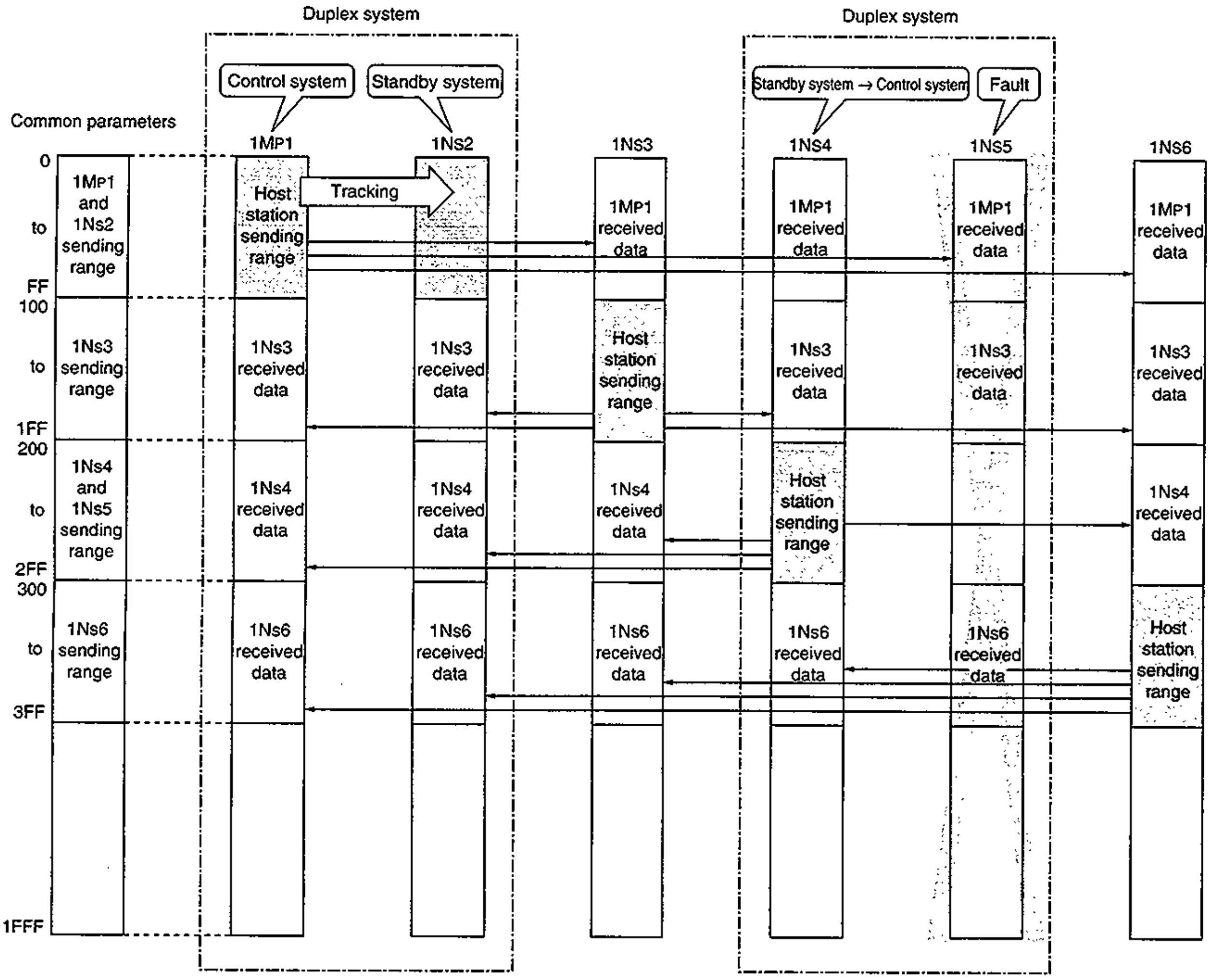
(a) 1Ns4 will be switched from the standby system to the control system and the data link is executed.

(b) The control system of the duplex system (1MP1, 1Ns4) as well as 1Ns3 and 1Ns6 of the independent system can send data to and receive data from other stations.

(c) The standby system of the duplex system (1Ns2) can only receive data from other stations.

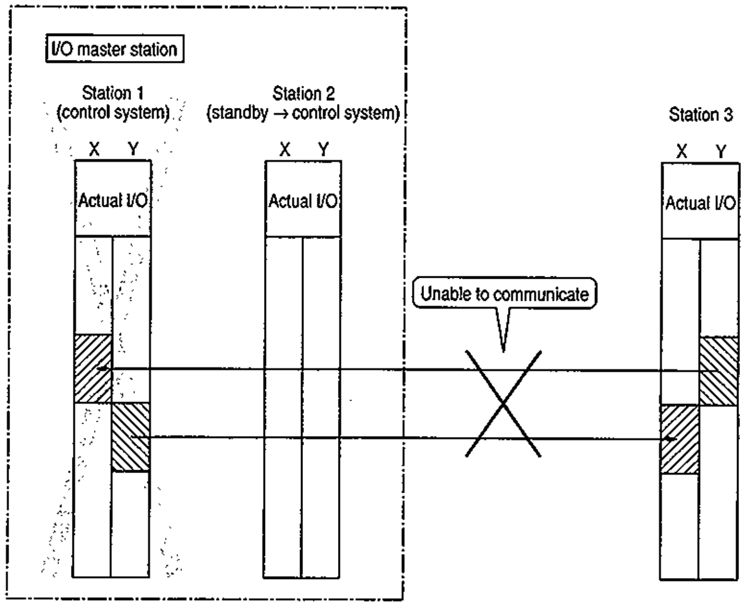
(d) In order to prevent the B/W send data to be cleared (OFF) when the control system is switched to the standby system, it is necessary to track the data into the sending range of the standby system.

(e) B/W send data is retained upon switching from 1Ns4 to 1Ns5 (when the tracking is set).



Point

The X/Y communication cannot be the object of the pairing.
When I/O master station is set as the control system, the data link cannot be continued when errors occur to the control system, since the standby system does not become I/O station.



12.2.3 Control station transfer function

Even if the control station (the station where the common parameters are registered) goes down, another normal station becomes a subcontrol station, which enables to maintain the data link.

(1) Only the QnARCPU, QnACPU and AnUCPU can become a subcontrol station.

(2) Among the stations whose data links are operating normally, a station with the lowest station number becomes the subcontrol station.

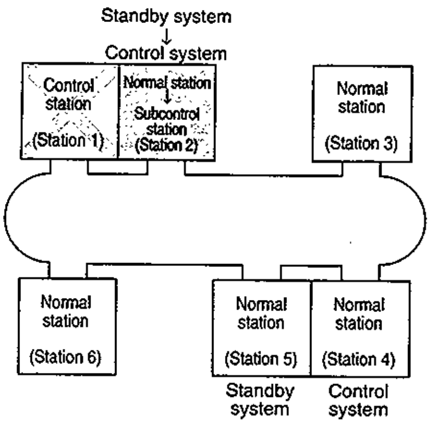
(3) The data link halts temporarily while the control station is transferred.
The status immediately before the halt will be retained during the data link halt.

(4) All stations will be treated as communication faulty stations during the halt.

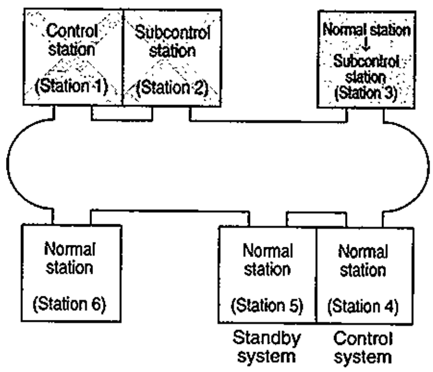
(5) The transfer status of the control station depends on the location of the control station.

(a) When the control station is a duplex system:
When the subcontrol station goes down while the control station is in the control system, the control station takes over the data link.
The control does not return when the control station is in the standby system.

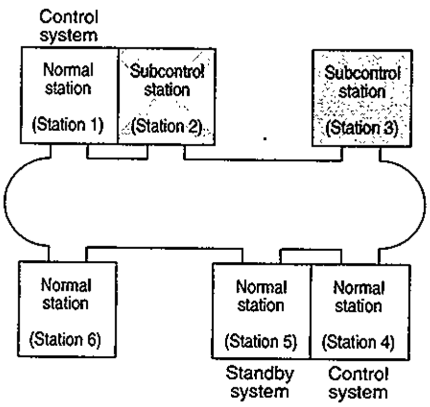
① Station 2 becomes the subcontrol station when the control station goes down.



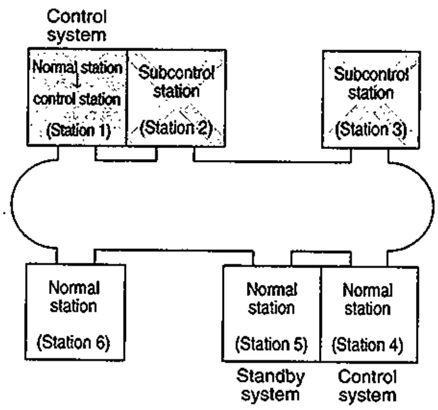
② When the subcontrol station (Station 2) goes down, Station 3 becomes the subcontrol station.



③ Even if Station 1 recovers, Station 3 stays as the subcontrol station. (Station 1 is treated as a normal station.)

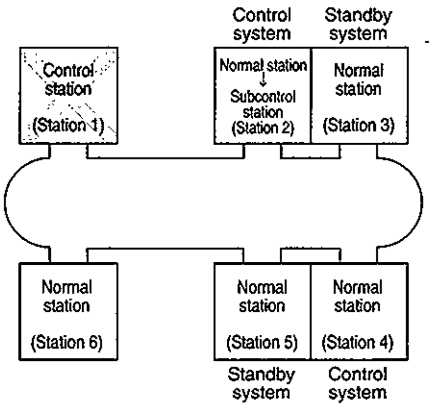


④ Station 1 returns as the control station when the subcontrol station (Station 3) goes down.

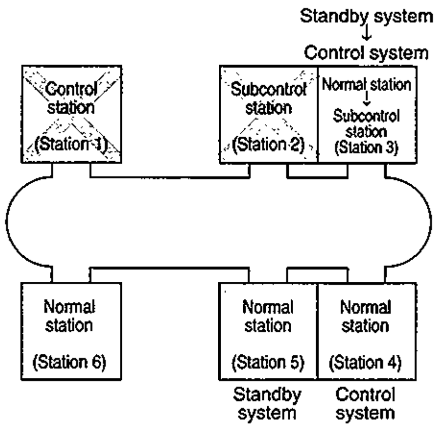


(b) When the control station is an independent station:
When the control station recovers, the control station takes over the data link.

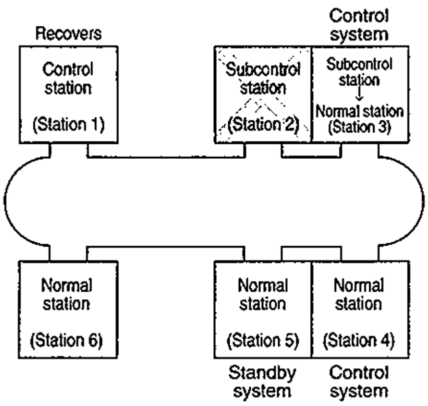
① Station 2 becomes the subcontrol station when the control station goes down.



② When the subcontrol station (Station 2) goes down, Station 3 becomes the subcontrol station.



③ When Station 1 recovers, Station 3 returns as a normal station and Station 1 becomes the control station.



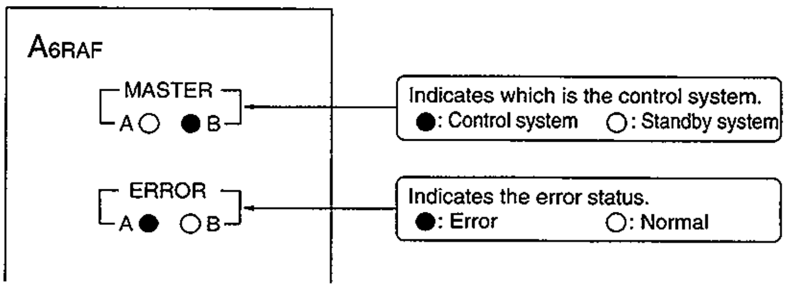
12.2.4 Switching the control system and the standby system depending on the CPU status

The following table shows the process of switching the control system and the standby when Q4ARCPU of the control system becomes faulty:

Switching the control system and the standby system depending on the PC CPU status.

PC CPU status	A system: Network module LED status	A system: Q4ARCPU program operation status	LED display of the Bus switching module (A6RAF)	B system: Q4ARCPU program operation status	B system: Network module LED status	Remarks
Startup the A system as the control system and B system as the standby system ⇩	● D. LINK ● T. PASS	RUN	MASTER: A● ○B ERROR: A○ ○B	STOP	● D. LINK ● T. PASS (Only receiving is allowed by the cyclic transmission)	——
An error which allows continued operation occurred in the Q4ARCPU of A system (battery error, etc.) ⇩	● D. LINK ● T. PASS	RUN	MASTER: A● ○B ERROR: A○ ○B	STOP	● D. LINK ● T. PASS (Only receiving is allowed by the cyclic transmission)	The control is not transferred to B system, since the Q4ARCPU of A system is continuing the operation.
An error which stopped the operation occurred in the Q4ARCPU of A system ⇩	○ D. LINK ● T. PASS	ERROR	MASTER: A○ ●B ERROR: A● ○B	RUN	● D. LINK ● T. PASS	The control is switched to B system, since the Q4ARCPU of A system stopped the operation.
Q4ARCPU of A system recovers ⇩	● D. LINK ● T. PASS (Only receiving is allowed by the cyclic transmission)	STOP	MASTER: A○ ●B ERROR: A○ ○B	RUN	● D. LINK ● T. PASS	Even after the Q4ARCPU of A system resumes its normal operation, the control is continued by B system.
An error which stopped the operation occurred in Q4ARCPU of B system	● D. LINIK ● T. PASS	RUN	MASTER: A● ○B ERROR: A○ ●B	ERROR	○ D. LINK ● T. PASS	The control is switched to A system, since the Q4ARCPU of B system stopped the operation.

[How to read the bus switching unit (A6RAF) LED displays]



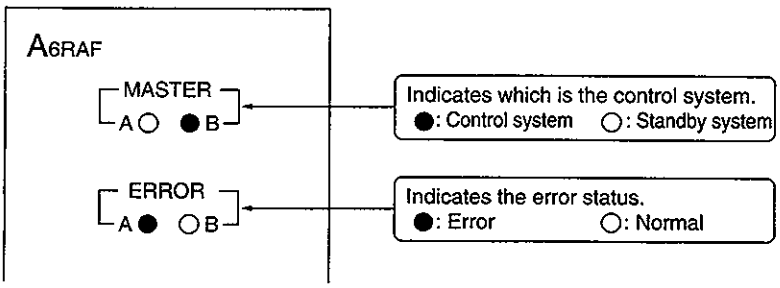
12.2.5 Switching the control system and the standby system depending on the network module status

The following table shows the process of switching the control system and the standby system when the network unit of the control system becomes faulty (unable to communicate):

Switching the control system and the standby system depending on the network module status.

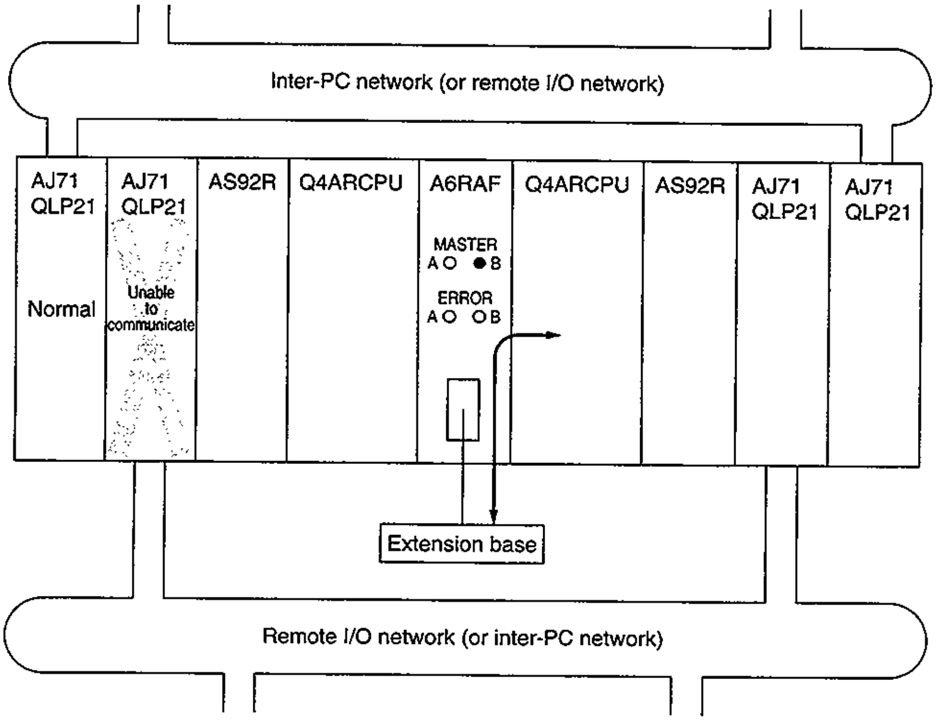
PC CPU Status	A system		LED display of the bus switching module (A6RAF)	B system		Remarks
	Network module LED status	Q4ARCPU program operation status		Q4ARCPU program operation status	Network module LED status	
Startup the A system as the control system and B system as the standby system ⇩	● D. LINK ● T. PASS	RUN	MASTER A● ○B ERROR A○ ○B	STOP	● D. LINK ● T. PASS (Only receiving is allowed by the cyclic transmission)	—
Unable to communicate by the network module of A system ⇩	Unable to communicat (○ D. LINK ○ T. PASS)	STOP	MASTER A○ ●B ERROR A○ ○B	RUN	● D. LINK ● T. PASS	The control is switched to B system since the network module of A system became unable to communicate.
The network module of A system recovers ⇩	● D. LINK ● T. PASS (Only receiving is allowed by the cyclic transmission)	STOP	MASTER A○ ●B ERROR A○ ○B	RUN	● D. LINK ● T. PASS	Even after the network module of A system resumes its normal operation, the control is continued by B system.
Unable to communicate by the network module of B system	● D. LINK ● T. PASS	RUN	MASTER A● ○B ERROR A○ ○B	STOP	Unable to communicat (○ D. LINK ○ T. PASS)	The control is switched to A system, since the network module of B system became unable to communicate.

[How to read the bus switching module (A6RAF) LED displays]

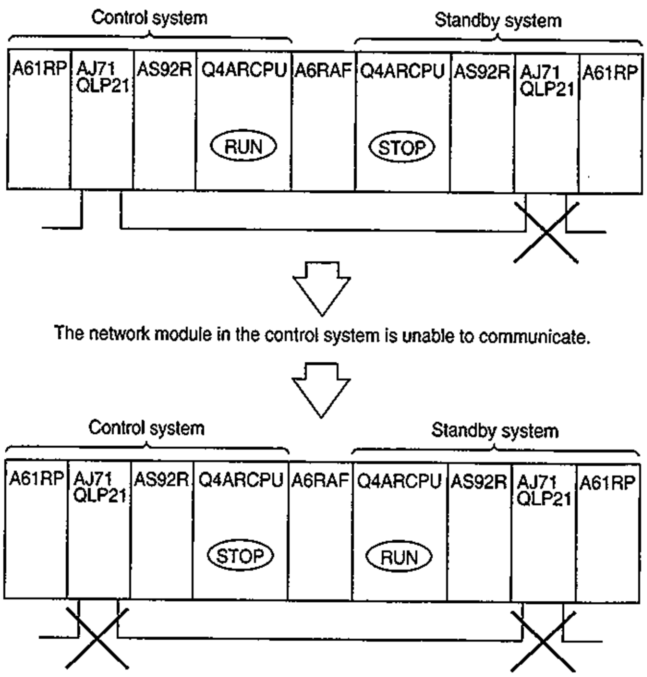


Points

(1) In the following system configuration in which two network modules are installed for the control system and the standby system, and when one network module of the control system is unable to communicate, the control is transferred to the standby system, even if the other network module is operating normally.



(2) When the network module of the control system becomes unable to communicate while the network module of the standby system is unable to communicate, the Q4ARCPU is switched from the control system to the standby system.

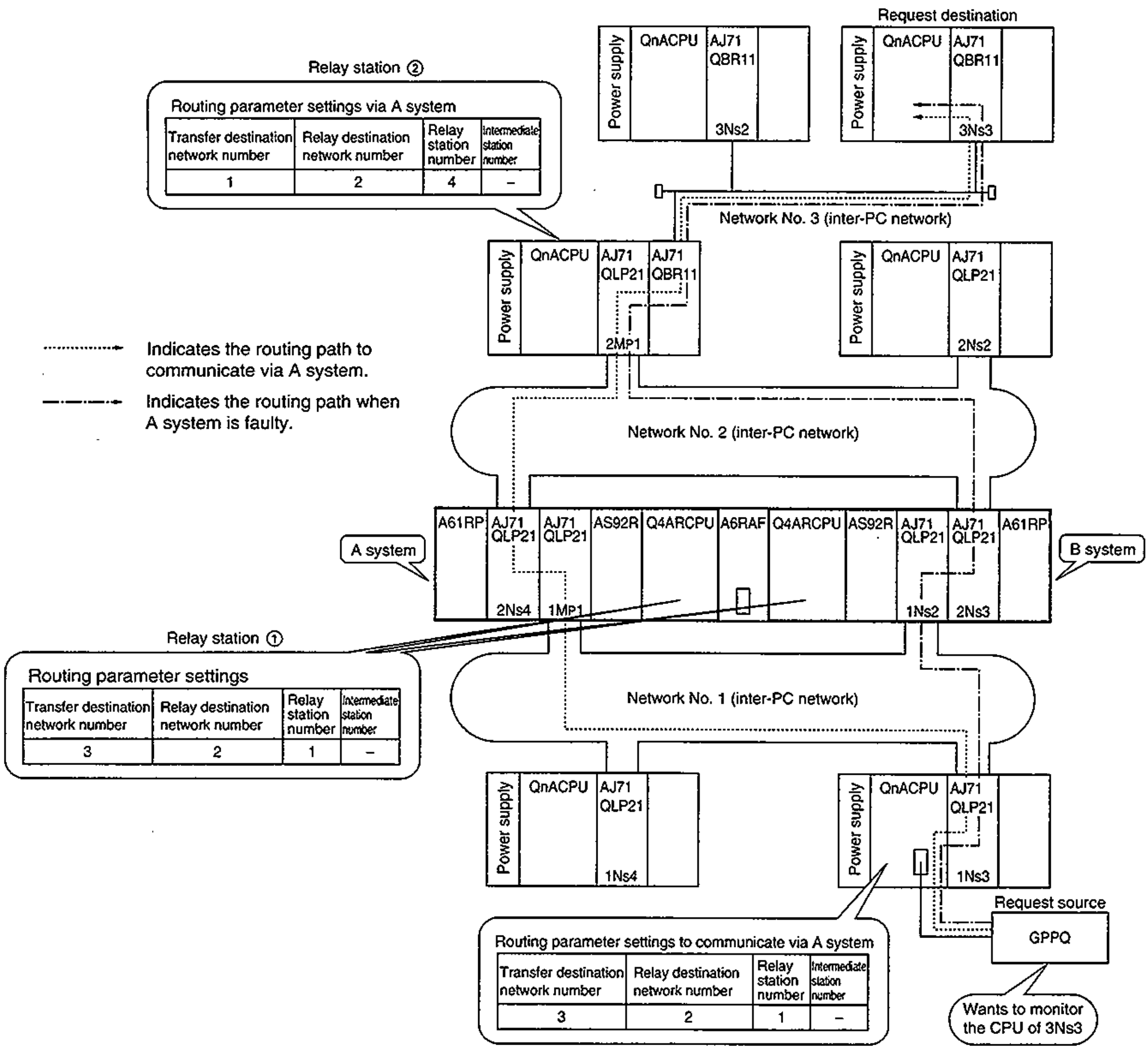


12.2.6 Routing function

The routing is available via either the control system or the standby system.
However, set the routing parameters so that the same path is used for both "request source → request destination" and "request destination → request source", as required in the simplex network.

[When setting the routing parameter via the A system]

When the routing via the A system is not possible due to an error in the A system, a program to modify the routing parameters is required to continue the routing via B system.



[Program to modify the routing parameters]

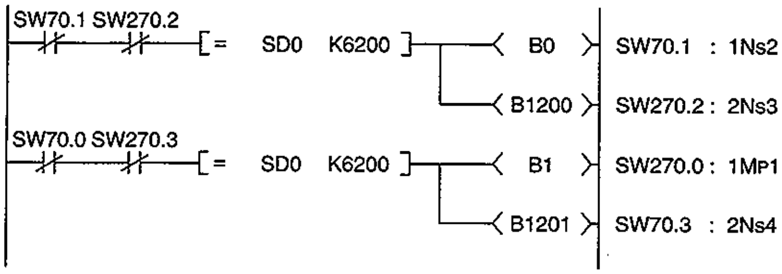
After detecting the normal/error status of A system and B in a duplex system, the system is switched by sending the contents to the request origin and the relay station 2).

Example of the common parameter allocations:

Network No. 1		Network No. 2	
1MP1	B0 to FF	2MP1	B1000 to 10FF
1NS2	——	2NS2	B1100 to 11FF
1NS3	B100 to 1FF	2NS3	B1200 to 12FF
1NS4	B200 to 2FF	2NS4	——

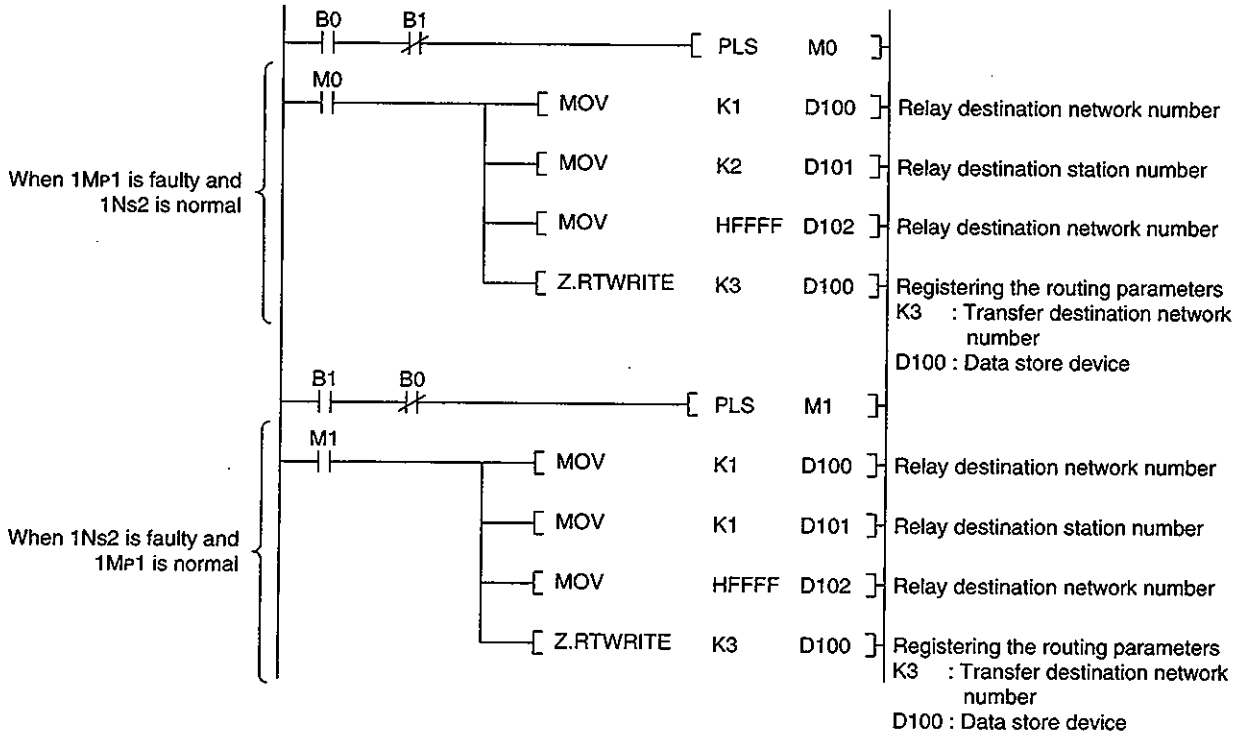
(1) Program for relay station ①

Detects which system, A or B, is in control.



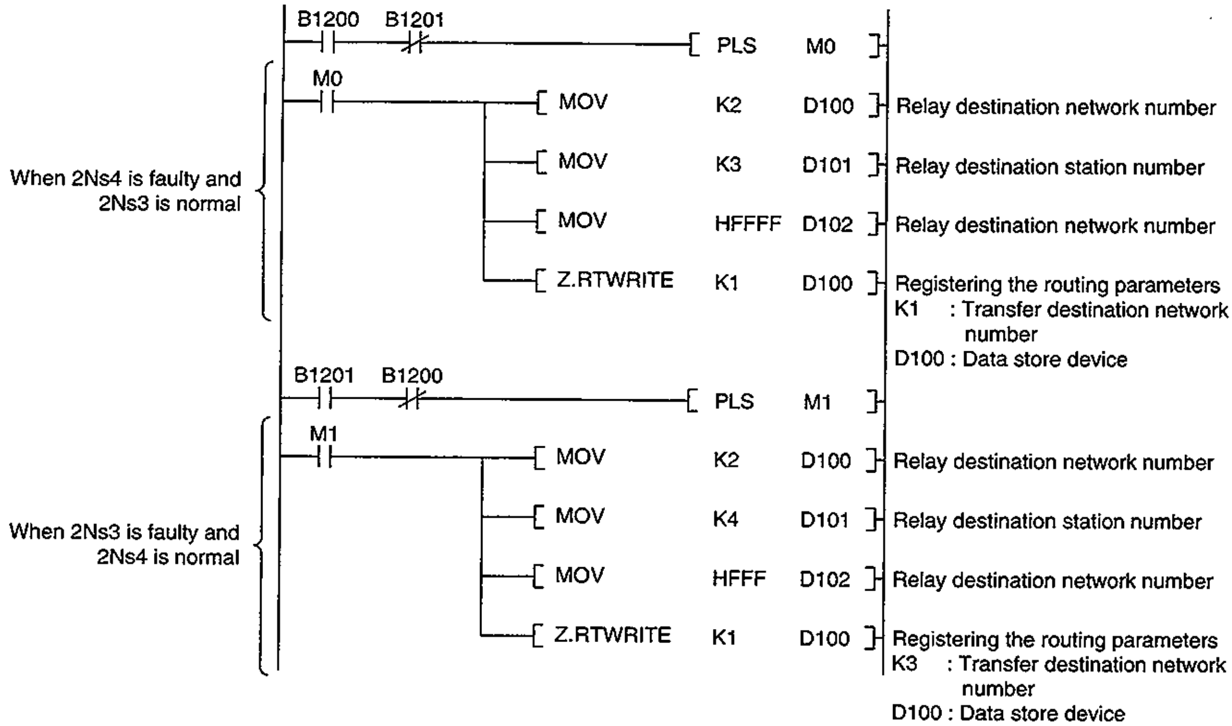
(2) Program for the request source

The routing parameters are modified depending on the status of 1MP1 and 1Ns2.



(3) Program for relay station ②

The routing parameters are modified depending on the status of 2Ns3 and 2Ns4.

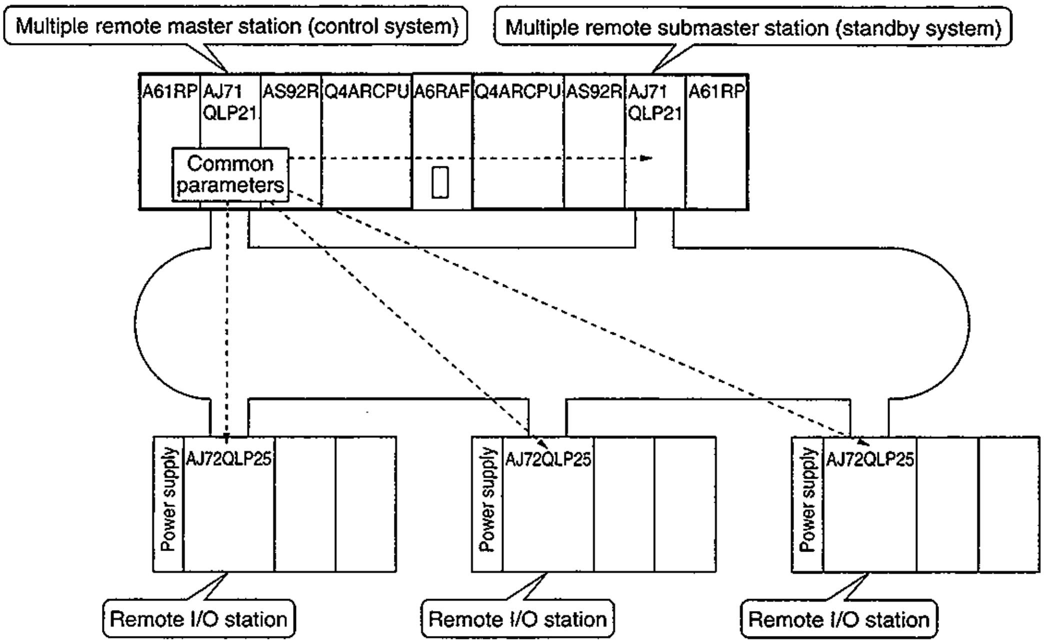


12.3 Remote I/O Network

Functions specific to the duplex system of the remote I/O network are described.

12.3.1 Relationship between the control system/standby system and the multiple remote master station/multiple remote submaster station

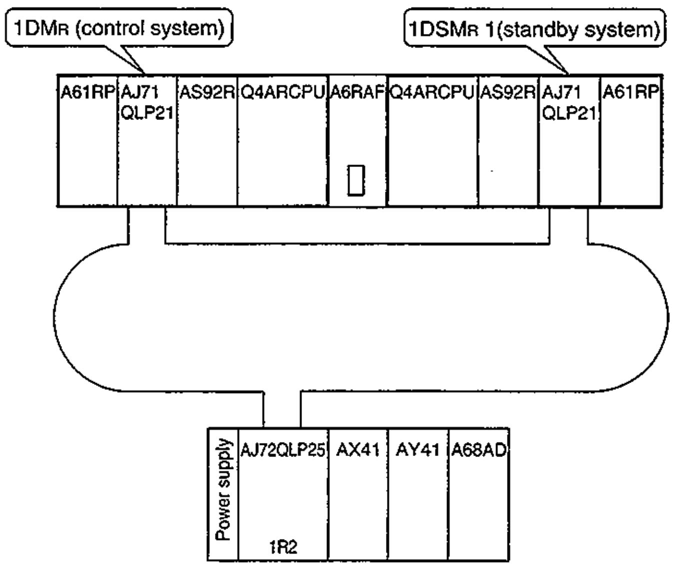
Always startup with the multiple remote master station as the control system and the multiple remote submaster station as the standby system.
If the system is started up with the multiple remote master station as the standby system and the multiple remote submaster station as the control system, the normal data link cannot be established.



12.3.2 Data communication status of the control system/standby system (cyclic transmission)

The data communication status of the control system and the standby system during the cyclic transmission is described using the following system configuration example and the common parameter settings.

[System configuration]



[Common Parameter Settings]

1) X/Y allocation

[Cmm Parm (MELSECNET/10Remote)(XY Set)] Label:

Auxiliary Setting
Link WDT 2000 ms

Network(# 1)
NET/10 Duplex R/M 1st I/O # 10
Network # 1 Slave PC Sta 2

For communication between the multiple remote master station and the multiple remote submaster station

For communication between the multiple remote master station (multiple remote sub master station) and the remote I/O station

Station	M Station→ M/R Sub Station Y First Last	X/Y First Last	M Station← M/R Sub Station Y First Last	X/Y First Last
Sub 1	[520] - [53F]	[520] - 53F	[500] - [51F]	[500] - 51F
2	[1020] - [103F]	[20] - 3F	[1000] - [101F]	[0] - 1F
	[ ] - [ ]	[ ] -	[ ] - [ ]	[ ] -
	[ ] - [ ]	[ ] -	[ ] - [ ]	[ ] -
	[ ] - [ ]	[ ] -	[ ] - [ ]	[ ] -
	[ ] - [ ]	[ ] -	[ ] - [ ]	[ ] -
	[ ] - [ ]	[ ] -	[ ] - [ ]	[ ] -
	[ ] - [ ]	[ ] -	[ ] - [ ]	[ ] -

PgUp:Prev PgDn:Next F3:BW→XY→ Esc:Close

2) B/W allocation

[Cmm Parm (MELSECNET/10Remote)(XY Set)] Label:

Auxiliary Setting
Link WDT 2000 ms

Network(# 1)
NET/10 Duplex R/M 1st I/O # 10
Network # 1 Slave PC Sta 2

For communication between the multiple remote master station and the multiple remote submaster station

For communication between the multiple remote master station (multiple remote sub master station) and the remote I/O station

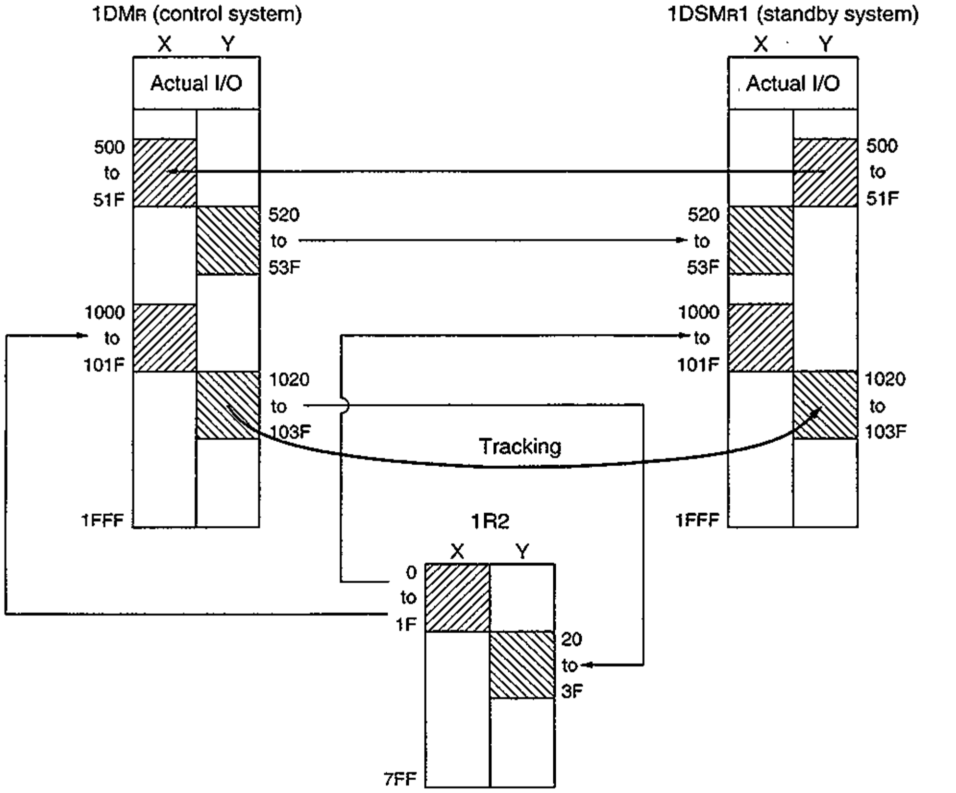
Station	M Sta→M/R Sub B First Last	M Sta←M/R Sub B First Last	M Sta→M/R Sub W First Last	M Sta←M/R Sub W First Last
Sub 1	[0] - [7F]	[80] - [FF]	[0] - [7F]	[80] - [FF]
2	[600] - [60F]	[610] - [61F]	[600] - [60F]	[610] - [61F]
	[ ] - [ ]	[ ] - [ ]	[ ] - [ ]	[ ] - [ ]
	[ ] - [ ]	[ ] - [ ]	[ ] - [ ]	[ ] - [ ]
	[ ] - [ ]	[ ] - [ ]	[ ] - [ ]	[ ] - [ ]
	[ ] - [ ]	[ ] - [ ]	[ ] - [ ]	[ ] - [ ]
	[ ] - [ ]	[ ] - [ ]	[ ] - [ ]	[ ] - [ ]
	[ ] - [ ]	[ ] - [ ]	[ ] - [ ]	[ ] - [ ]

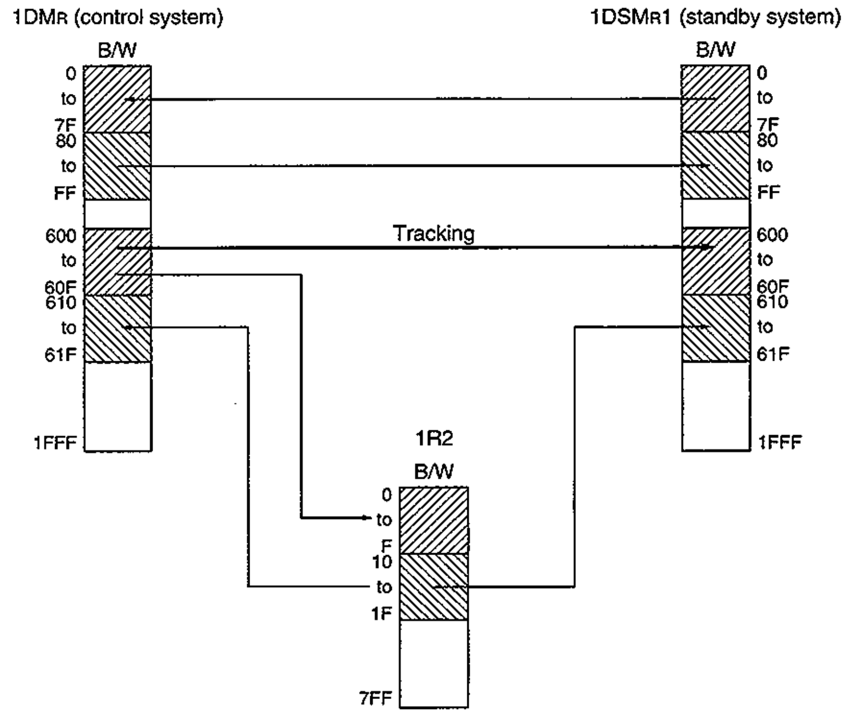
PgUp:Prev PgDn:Next F3:BW→XY→ Esc:Close

(1) Data communication status when the multiple remote master station is operating normally

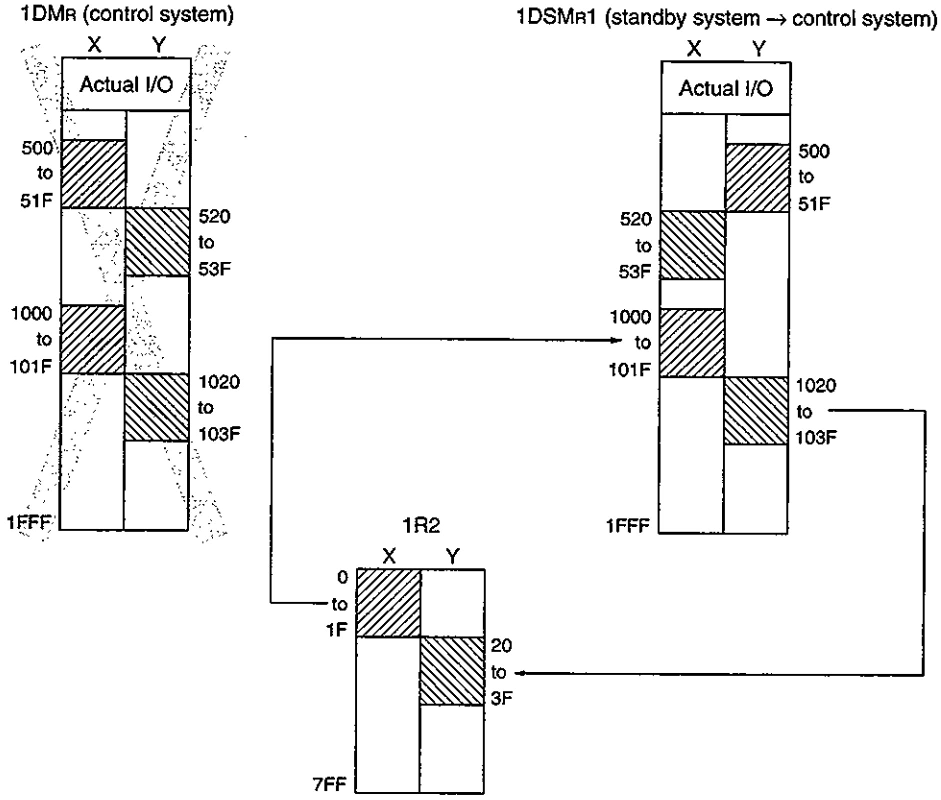
(a) The multiple remote master station can send data (Y, B, W) to the remote I/O station and receive data (X, B, W) from the remote I/O station. The multiple remote submaster station can only receive data (X, B, W) from the remote I/O station.

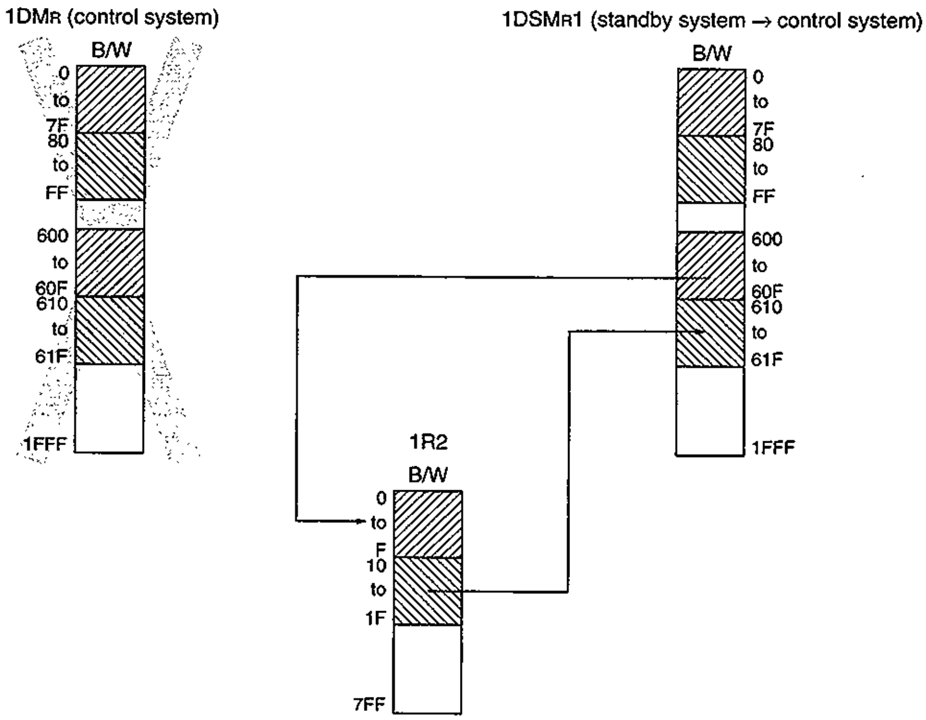
(b) In order to prevent the remote I/O station's output from being turned OFF when the control system is switched to the standby system, it is necessary to track the data into the sending range of the standby system.





(2) Data communication status when the multiple remote master station is faulty
The multiple remote submaster station can send data (Y, B, W) to the remote I/O station and receive data (X, B, W) from the remote I/O station.

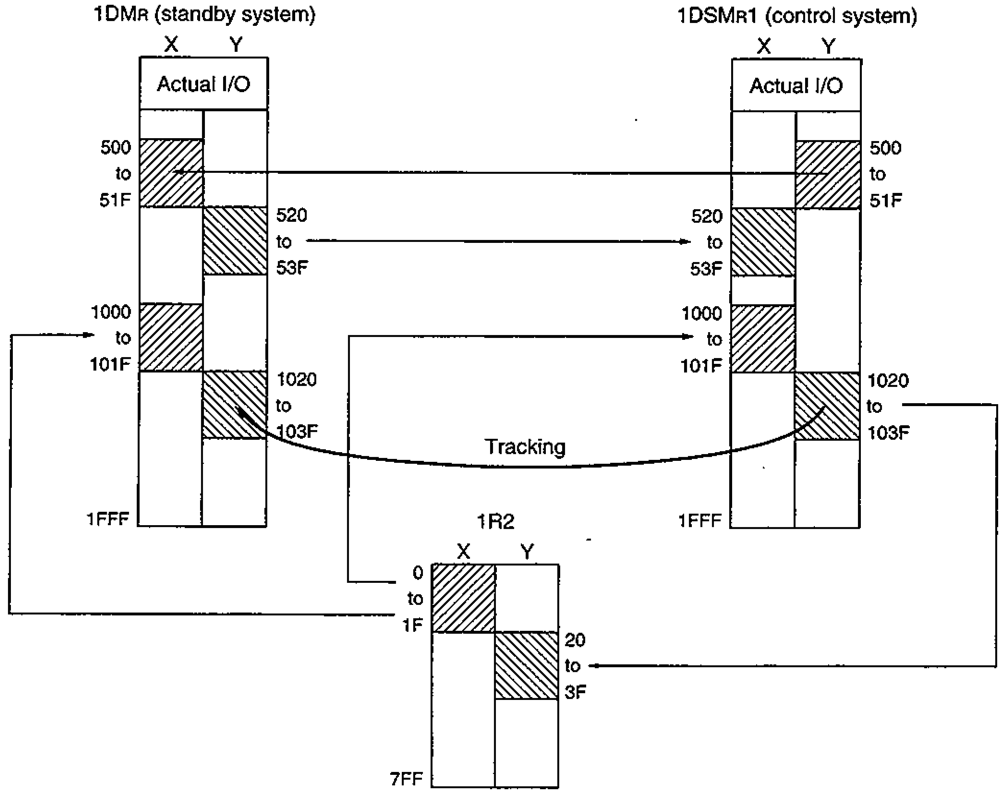


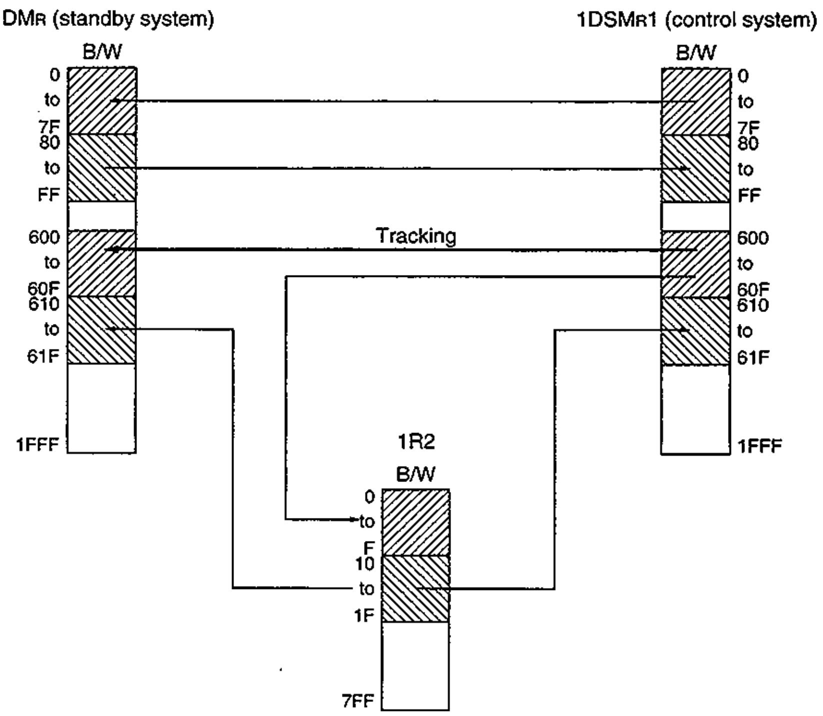


(3) Data communication status when the multiple remote master station recovers

(a) The multiple remote submaster station can send data (Y, B, W) to the remote I/O station and receive data (X, B, W) from the remote I/O station. The multiple remote master station can only receive data (X, B, W) from the remote I/O station.

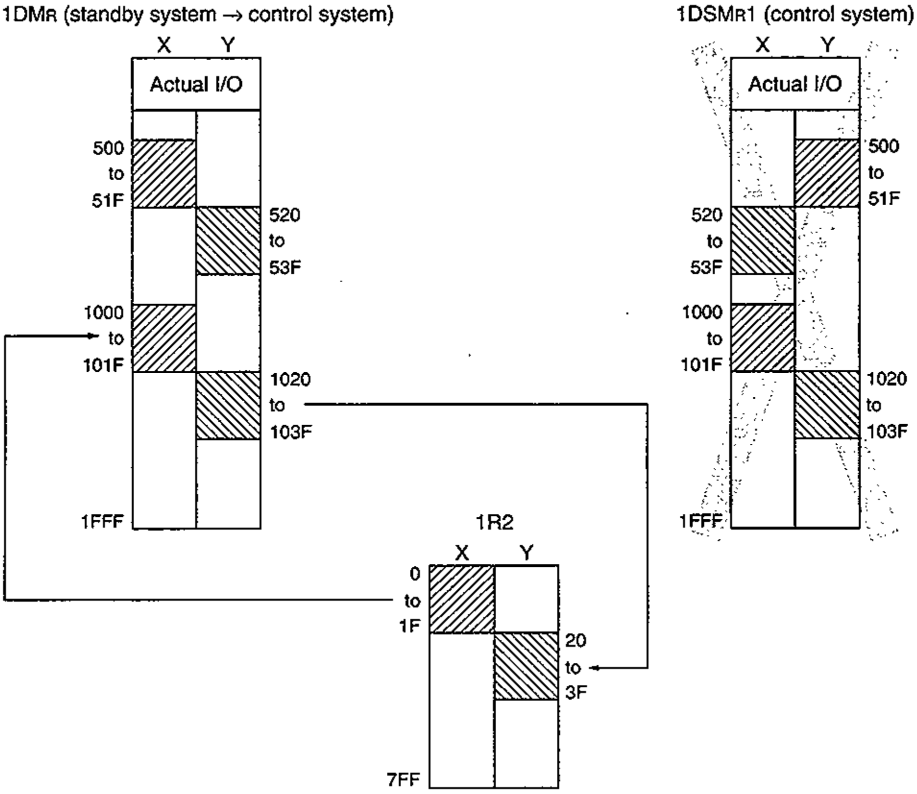
(b) In order to prevent the remote I/O station's output from being turned off when the control system is switched to the standby system, it is necessary to track the data into the sending range of the standby system.

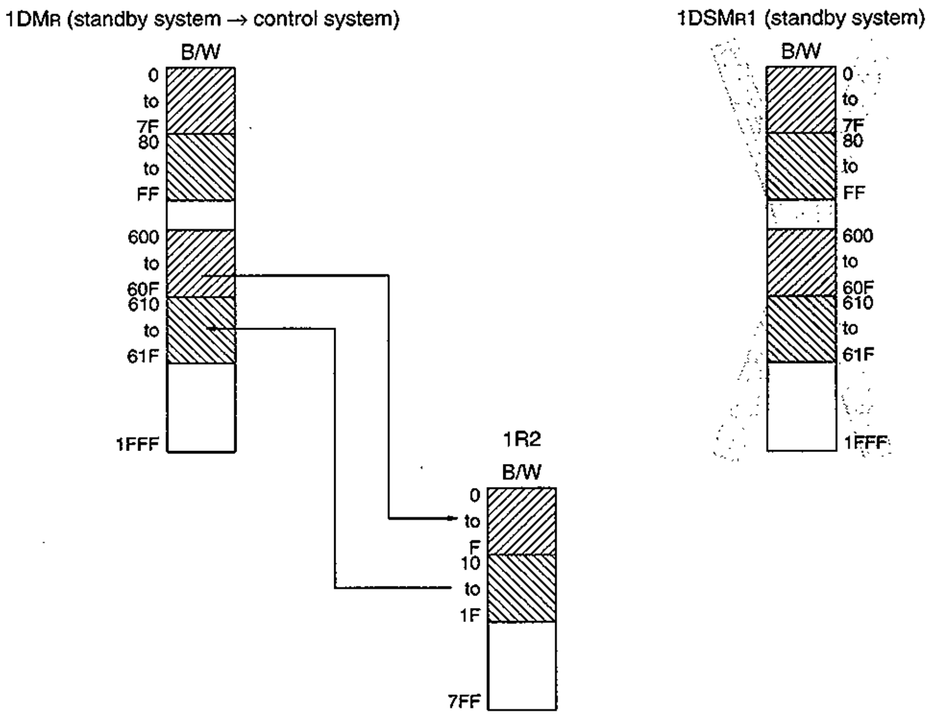




(4) Data communication status when the multiple remote submaster station is faulty

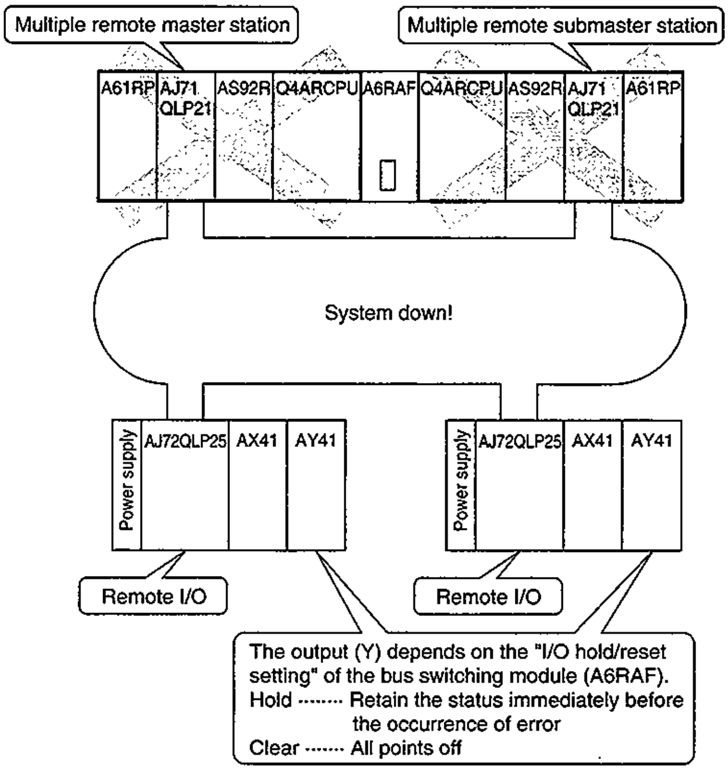
The multiple remote master station can send data (Y, B, W) to the remote I/O station and receive data (X, B, W) from the remote I/O station.



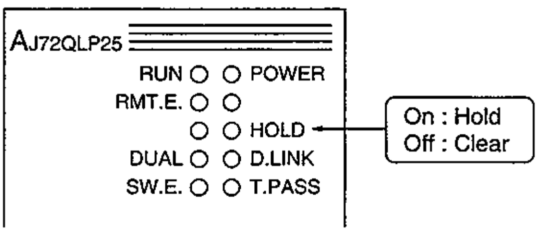


Point

When both of the multiple remote master and submaster stations go down, the data link cannot be performed. The output from the remote I/O station (Y) at that time depends on "I/O hold/reset setting" of the bus switching module (A6RAF).
The I/O hold/reset setting of the Q4ARCPU is ignored.



The setting status can be checked by "HOLD" LED of each remote I/O module.



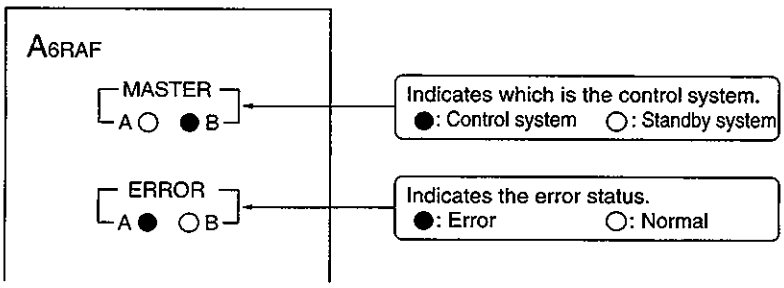
12.3.3 Switching the control system and the standby system depending on the CPU status

The following table shows the process of switching the control system and the standby system when Q4ARCPU of the control system becomes faulty:

Switching the control system and the standby system depending on the PC CPU status

PC CPU status	A system: Network module LED status	A system: Q4ARCPU program operation status	LED display of the bus switching module (A6RAF)	B system: Q4ARCPU program operation status	B system: Network module LED status	Remarks
Startup with the multiple remote master station as the control system and the multiple remote submaster station as the standby system ⇩	● D. LINK ● T. PASS	RUN	MASTER A● ○B ERROR A○ ○B	STOP	○ S. MNG ● D. LINK ● T. PASS (Only receiving is allowed by the cyclic transmission)	—
An error which allows continued operation occurred in the Q4ARCPU the multiple remote master station A (battery error, etc.) ⇩	● D. LINK ● T. PASS	RUN	MASTER A● ○B ERROR A○ ○B	STOP	○ S. MNG ● D. LINK ● T. PASS (Only receiving is allowed by the cyclic transmission)	The control is not transferred to the multiple remote submaster station, since the multiple remote master station Q4ARCPU is continuing the operation.
An error which stopped the operation occurred in the Q4ARCPU of the multiple remote master station ⇩	○ D. LINK ● T. PASS	ERROR	MASTER A○ ●B ERROR A● ○B	RUN	● S. MNG ● D. LINK ● T. PASS	The control is switched to the multiple remote submaster station, since the multiple remote master station Q4ARCPU stopped the operation.
Q4ARCPU of the multiple remote master station recovers. ⇩	● D. LINK ● T. PASS (Only receiving is allowed by the cyclic transmission)	STOP	MASTER A○ ●B ERROR A○ ○B	RUN	● S. MNG ● D. LINK ● T. PASS	Even after the multiple remote master station Q4ARCPU resumes its normal operation, the control is continued by the multiple remote submaster station.
An error which stopped the operation occurred in the Q4ARCPU of the multiple remote submaster station	● D. LINIK ● T. PASS	RUN	MASTER A● ○B ERROR A○ ●B	ERROR	○ S. MNG ○ D. LINK ● T. PASS	The control is switched to the multiple remote master station, since the multiple remote submaster station Q4ARCPU stopped the operation.

[How to read the bus switching module (A6RAF) LED displays]



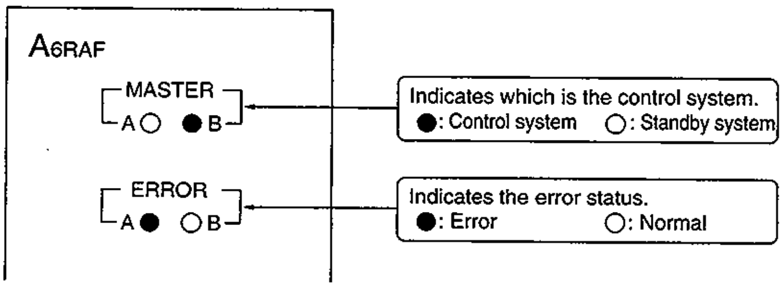
12.3.4 Switching the control system and the standby system depending on the network module status

The following table shows the process of switching the control system and the standby system when the network unit of the control system becomes faulty (unable to communicate):

Switching the control system and the standby system depending on the network module status

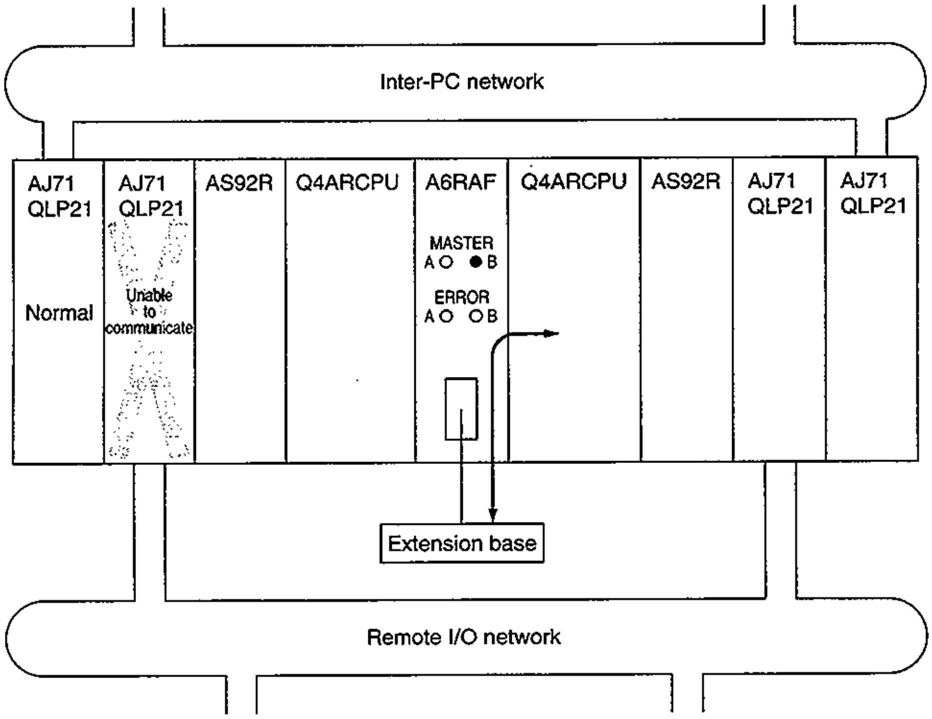
PC CPU status	A system		LED display of the bus switching module (A6RAF)	B system		Remarks
	Network module LED status	Q4ARCPU program operation status		Q4ARCPU program operation status	Network module LED status	
Startup the multiple remote master station as the control system and the multiple remote submaster station as the standby system	● D. LINK ● T. PASS	RUN	MASTER A● ○B ERROR A○ ○B	STOP	○ S. MNG ● D. LINK ● T. PASS (Only receiving is allowed by the cyclic transmission)	—
Unable to communicate by the network unit of the multiple remote master station	Unable to communicate (○ D. LINK ○ T. PASS)	STOP	MASTER A○ ●B ERROR A○ ○B	RUN	● S. MNG ● D. LINK ● T. PASS	The control is switched to the multiple remote submaster station, since the multiple remote master station became unable to communicate.
The network unit of the multiple remote master station recovers	● D. LINK ● T. PASS (Only receiving is allowed by the cyclic transmission)	STOP	MASTER A○ ●B ERROR A○ ○B	RUN	● S. MNG ● D. LINK ● T. PASS	Even after the network module of the multiple remote master station resumes normal operation, the control is continued by the multiple remote submaster station.
Multiple remote master station	● D. LINK ● T. PASS	RUN	MASTER A● ○B ERROR A○ ○B	STOP	Unable to communicat (○ S. MNG ○ D. LINK ○ T. PASS)	The control is switched to the multiple remote master station, since the multiple remote submaster station became unable to communicate.

[How to read the bus switching module (A6RAF) LED displays]

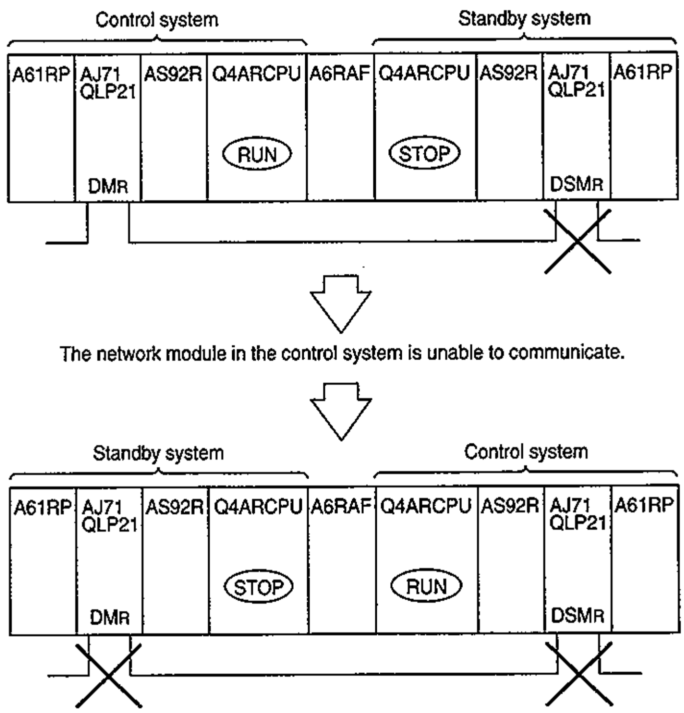


Point

(1) In the following system configuration in which two network modules are installed for the control system and the standby system, and when one network module of the control system is unable to communicate, the control is transferred to the standby system, even if the other network module is operating normally.



(2) When the network module of the control system becomes unable to communicate while the network module of the standby system is unable to communicate, the Q4ARCPU is switched from the control system to the standby system.

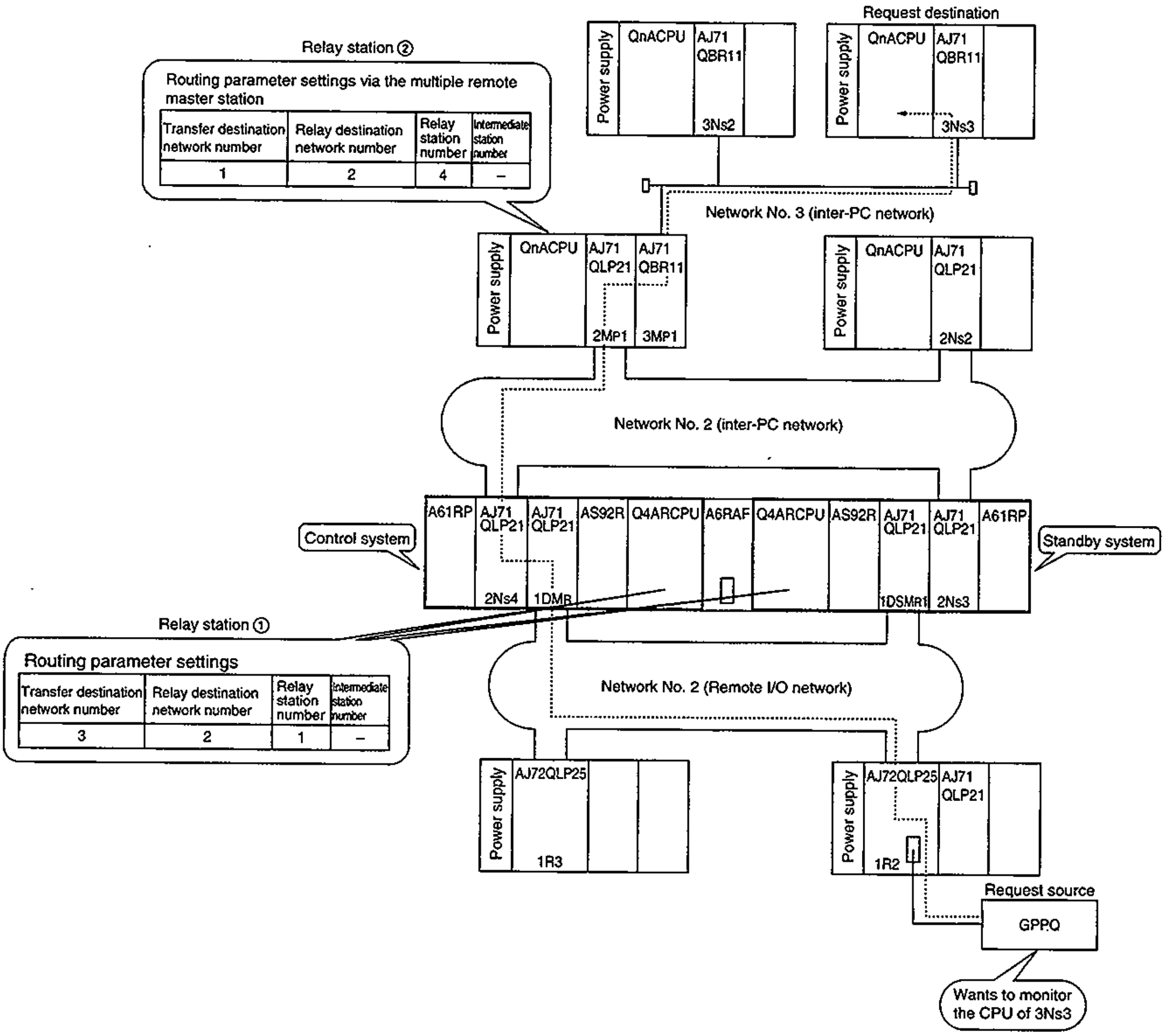


12.3.5 Routing Function

When accessing from a remote I/O station to a station of another network, different routing paths are used depending on the control status of the control system/standby system.
Therefore, a program to modify the routing parameters is necessary for systems configured with two or more relay stations (three or more networks are connected).

(1) Routing path when the multiple remote master station is operating normally

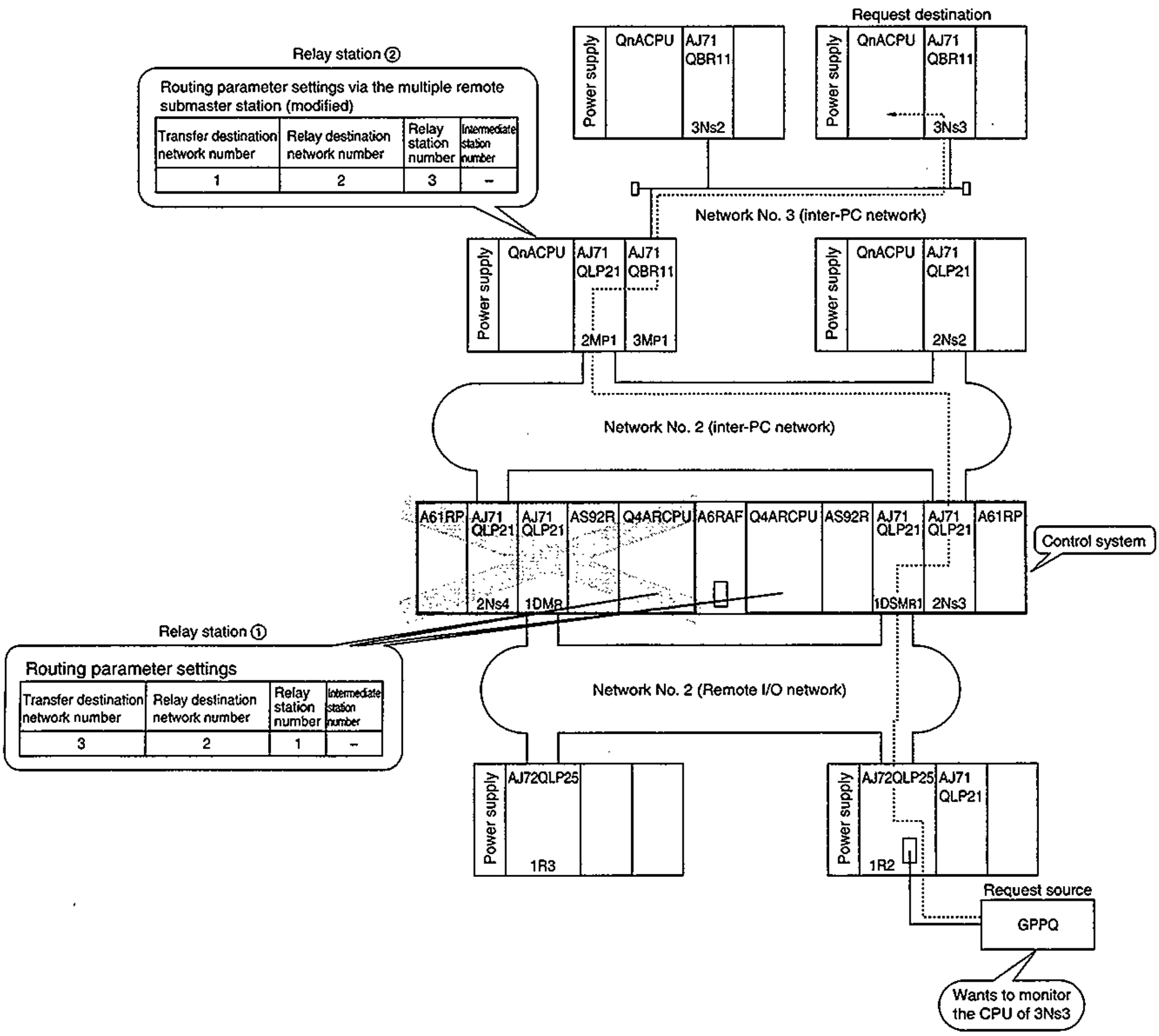
The routing is performed via the multiple remote master station.
Routing through the multiple remote submaster station cannot be done.



(2) Routing path when the multiple remote master station is faulty

The routing is performed via the multiple remote submaster station.

The routing parameter settings of the relay stations (2Ns2, 3MP1) need to be modified by the routing information register instruction (RTWRITE).



Point
If the relay station ② is AnUCPU, the routing cannot be done since it cannot use the routing information register instruction (RTWRITE) to modify the routing parameters. However, the routing becomes possible by modifying the routing parameters from the peripheral device.

[Program to modify the routing parameters]

After detecting the normal/error status of A and B systems in a duplex system, the system is switched by sending the contents to the relay station ②.

Example of the common parameter allocations (Inter-PC network):

2MP1	B1000 to 10FF
2NS2	B1100 to 11FF
2NS3	B1200 to 12FF
2NS4	

(2NS3 and 2NS4: Pair)

(1) Program for relay station ①

Detects which system, A or B, is in control.

```
                     SB72  SW270.2
Controlled by B system |--|/|----|/|----[= SD0 K6200 ]----( B1200 )
                     SB71  SW270.3
Controlled by A system |--|/|----|/|----[= SD0 K6200 ]----( B1201 )
```

SB72 : 1DSMR1
SW270.2 : 2NS3
SB71 : 1DMR
SW270.3 : 2NS4

(2) Program for relay station ②

```
  B1200  B1201
|--| |----|/|------------------[ PLS       M0     ]
  M0                                                  (When switched to B system)
|--| |-----------+----[ MOV       K2     D100 ]   Relay destination network number
                 +----[ MOV       K3     D101 ]   Relay destination station number
                 +----[ MOV       HFFFF  D102 ]   Relay destination network number
                 +----[ Z.RTWRITE K1     D100 ]   Registering the routing parameters
                                                  K1   : Transfer destination network number
                                                  D100 : Data store device
  B1201  B1200
|--| |----|/|------------------[ PLS       M1     ]
  M1                                                  (When switched to A system)
|--| |-----------+----[ MOV       K2     D100 ]   Relay destination network number
                 +----[ MOV       K4     D101 ]   Relay destination station number
                 +----[ MOV       HFFFF  D102 ]   Relay destination network number
                 +----[ Z.RTWRITE K1     D100 ]   Registering the routing parameters
                                                  K1   : Transfer destination network number
                                                  D100 : Data store device
```

When switched to B system

When switched to A system

12.4 RUN/STOP status of Q4ARCPU in the control system and Q4ARCPU in the standby system

RUN/STOP status of Q4ARCPU in the standby system is different from the key switch status.

	Control system	Standby system	Remark
Key switch status of Q4ARCPU	RUN	RUN	Both of the control system and the standby system are running.
RUN LED status of Q4ARCPU	ON	OFF	Off: Program is stopped On: Program is running
Operation status by GPPQ monitor (including SB/SW status)	RUN	RUN	Status of the key switch is displayed (stored).

13 Parameter Setting

Parameter settings for duplex systems are explained.

13.1 Differences from simplex network

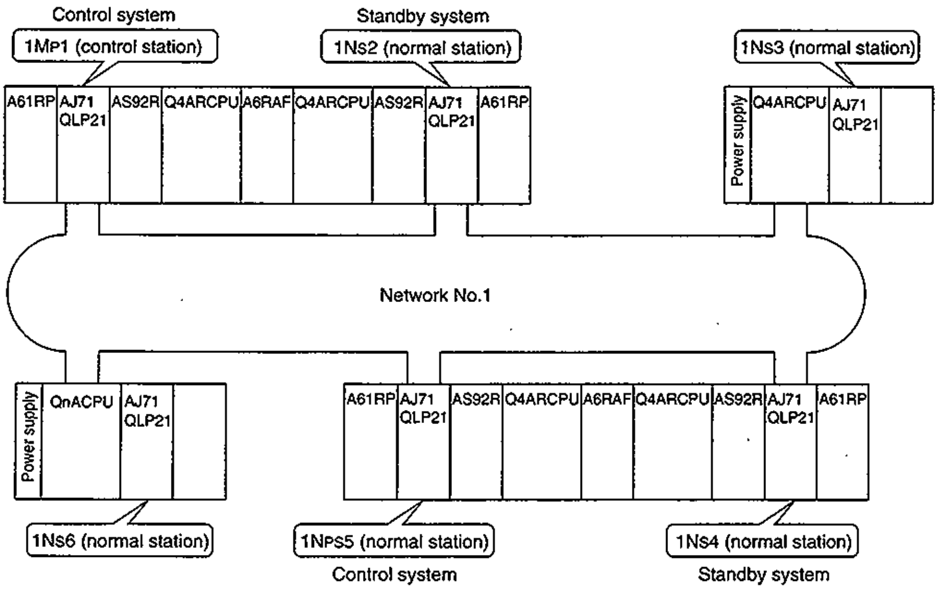
Procedures for setting various parameters for duplex system are same as those for simplex network except common parameters of inter-PC network.
Further, "pairing setting" from a sequence program is necessary for inter-PC network. (Pairing setting by remote I/O network is not necessary).
Refer to Section 14.4 for pairing settings.

[Parameter setting items for inter-PC networks]

Parameter setting items on control station and normal stations for a system configuration example shown below are shown in Table 13.1.

<System configuration>

This is a system in which the control station exist in a duplex system.



<Parameter setting items>

Control stations require pairing setting (from a sequence program) regardless to control system/standby system.

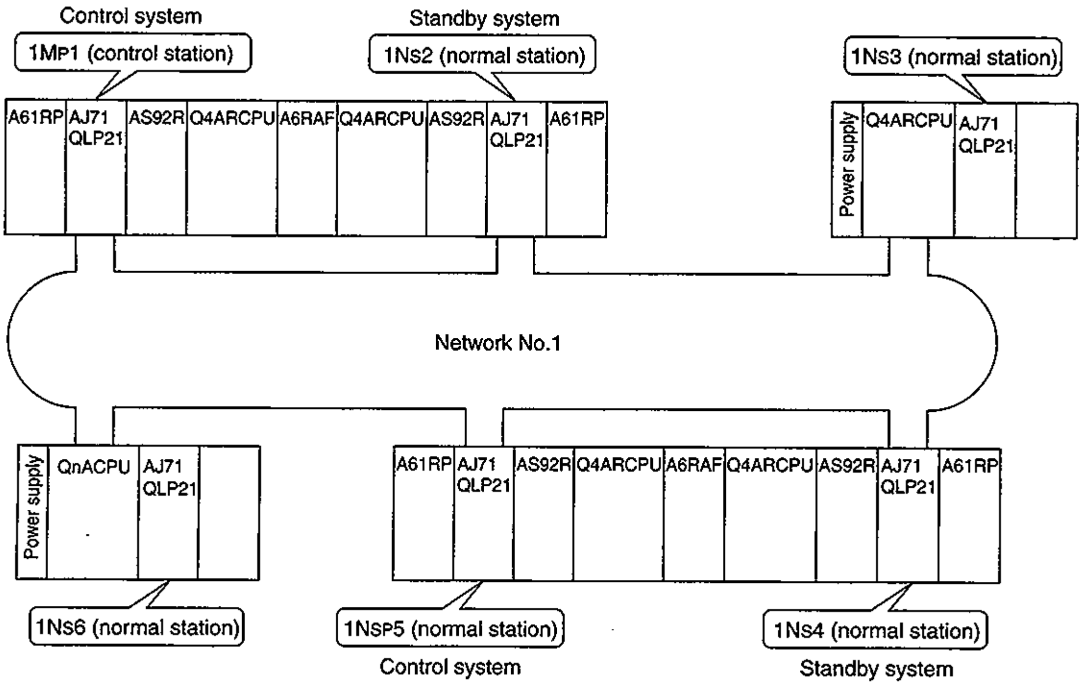
Table 13.1 Parameter setting items

Setting items		Control station (MP) Default parameter	Control station (MP) Common parameter	Normal station (NS)	References
Number of modules		Duplex system cannot be operated by default parameter settings.	●	△	Section 9.2
Network setting	First I/O number				Section 9.3
	Network number				
	Total number of (slave) link stations			×	
Network refresh parameter			△	△	Section 9.4
Common parameter			●	×	Section 13.2. 1
Station-specific parameter			△	△	Section 9.6
I/O allocation			×	×	—
Inter data-link transfer parameter			×	×	—
Routing parameter			△	△	Section 9.9
Pairing setting (sequence program)			●	×	Section 14.4

●: Setting mandatory △: Set as necessary ×: Setting not necessary.

13.2 Common parameters for inter-PC network

With the system configuration shown below, only those parts which differ from simplex network are explained.

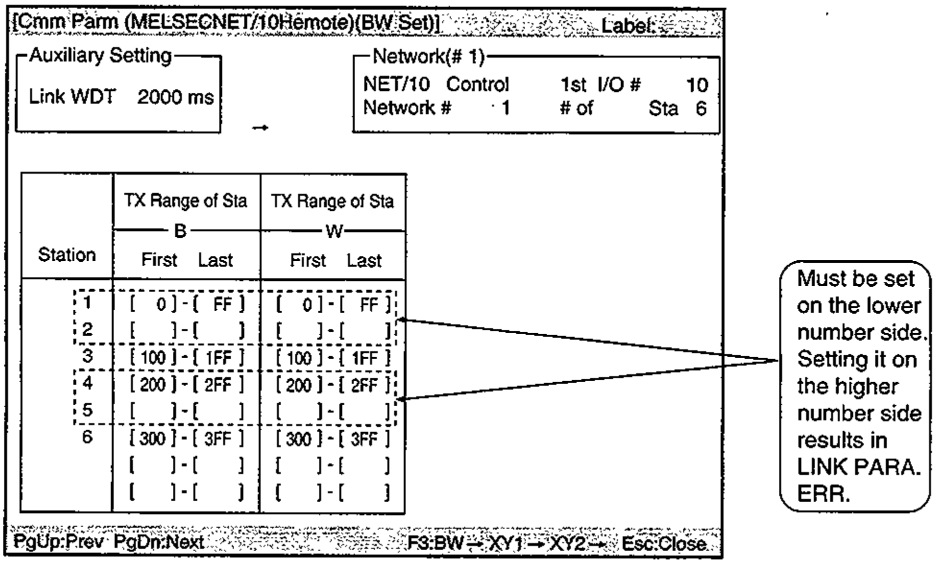


(1) B/W setting

In duplex network, transmission range is set on the "lower number" side. (In this example, it is set on Station 1 and Station 4).

Setting made on the higher number side (in this example, on Station 2 and Station 5) is voided.

[Parameter setting example] The monitor screen showing allocation by 256 points each.



[Cmm Parm (MELSECNET/10Remote)(BW Set)] Label:

Auxiliary Setting
Link WDT 2000 ms

Network(# 1)
NET/10 Control 1st I/O # 10
Network # 1 # of Sta 6

Station	TX Range of Sta B First	Last	TX Range of Sta W First	Last
1	0	FF	0	FF
2				
3	100	1FF	100	1FF
4	200	2FF	200	2FF
5				
6	300	3FF	300	3FF

PgUp:Prev PgDn:Next F3:BW→XY1→XY2→ Esc:Close

(2) X/Y setting

Setting procedure is the same as in the case of simplex network.

However, stations in standby can only receive data.

It is not related to pairing setting as B/W.

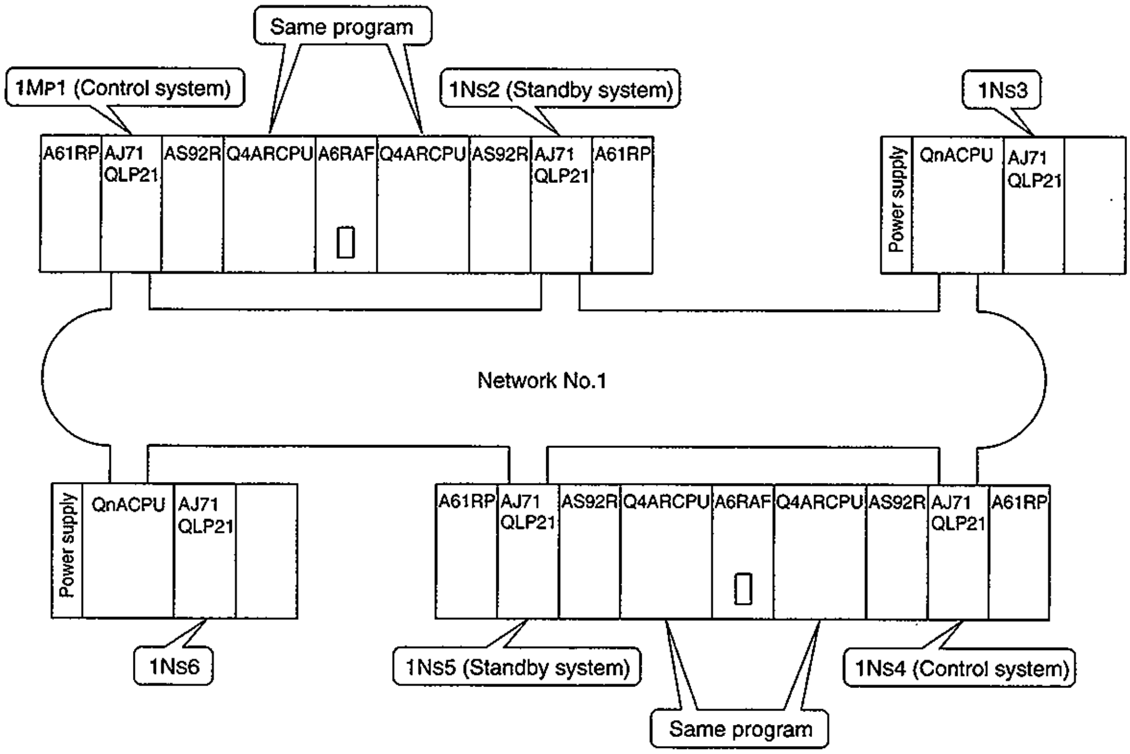
14 Programming

14.1 Precautions for programming

This section describes matters to be noted in creating programs for duplex network.

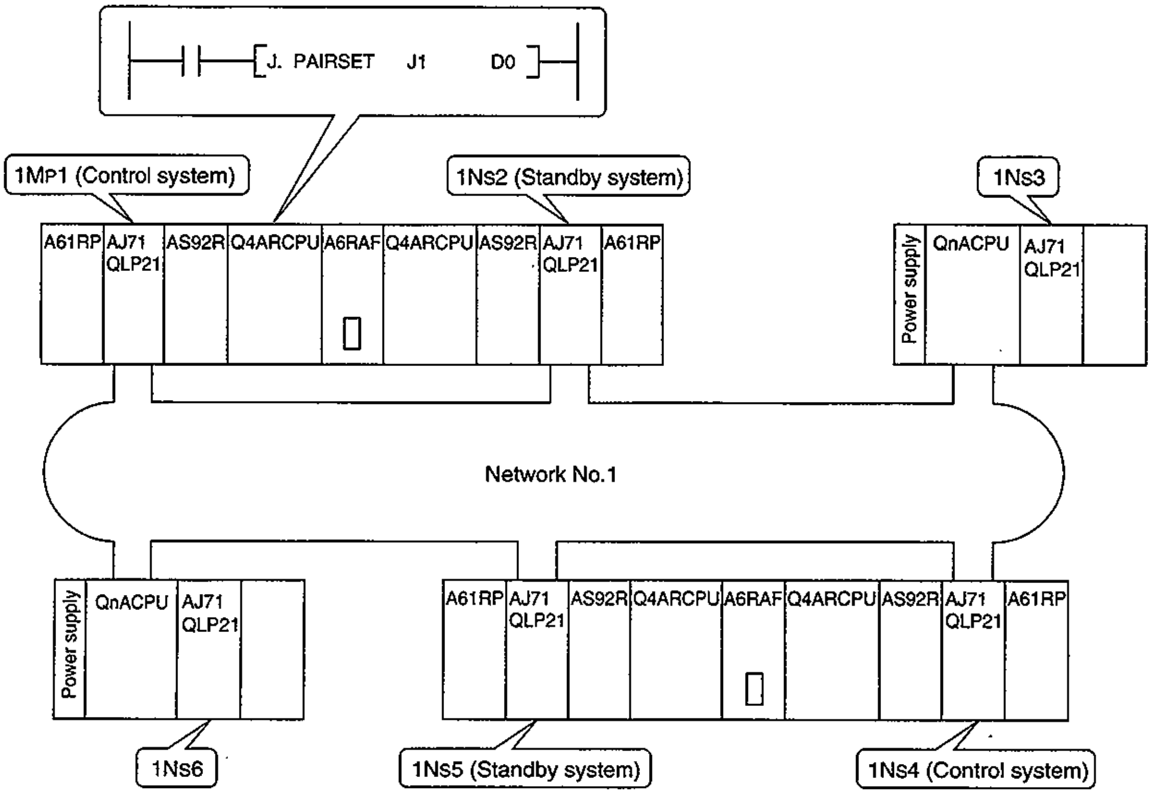
(1) Control system and standby system

Install the "same program" on both control and standby systems.
If different programs are loaded between control and standby systems, the systems will not operate.
It causes PRG. VERIFY ERR.



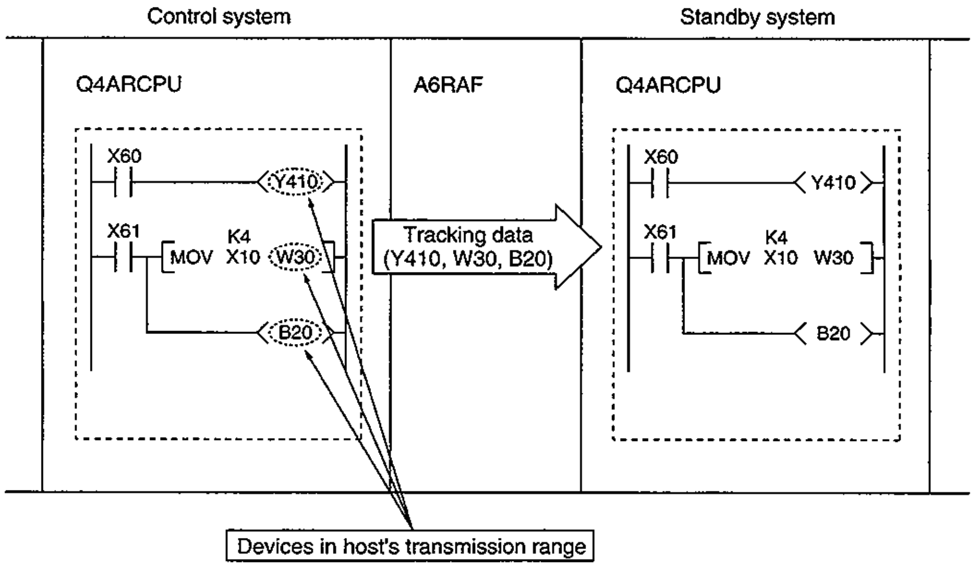
(2) Pairing setting

"Pairing setting (PAIRSET)" is required on the control station for inter-PC network.



(3) Tracking setting

To enable continued control while switching from control system to standby system, the tracking sends device information of the control system (devices of hosts transmission range: B, W, Y) to the standby system and set it up to the same condition as the control system. Refer to the Q4ARCPU users manual (Detailed Section) for details on tracking settings.



(4) Link-dedicated instructions

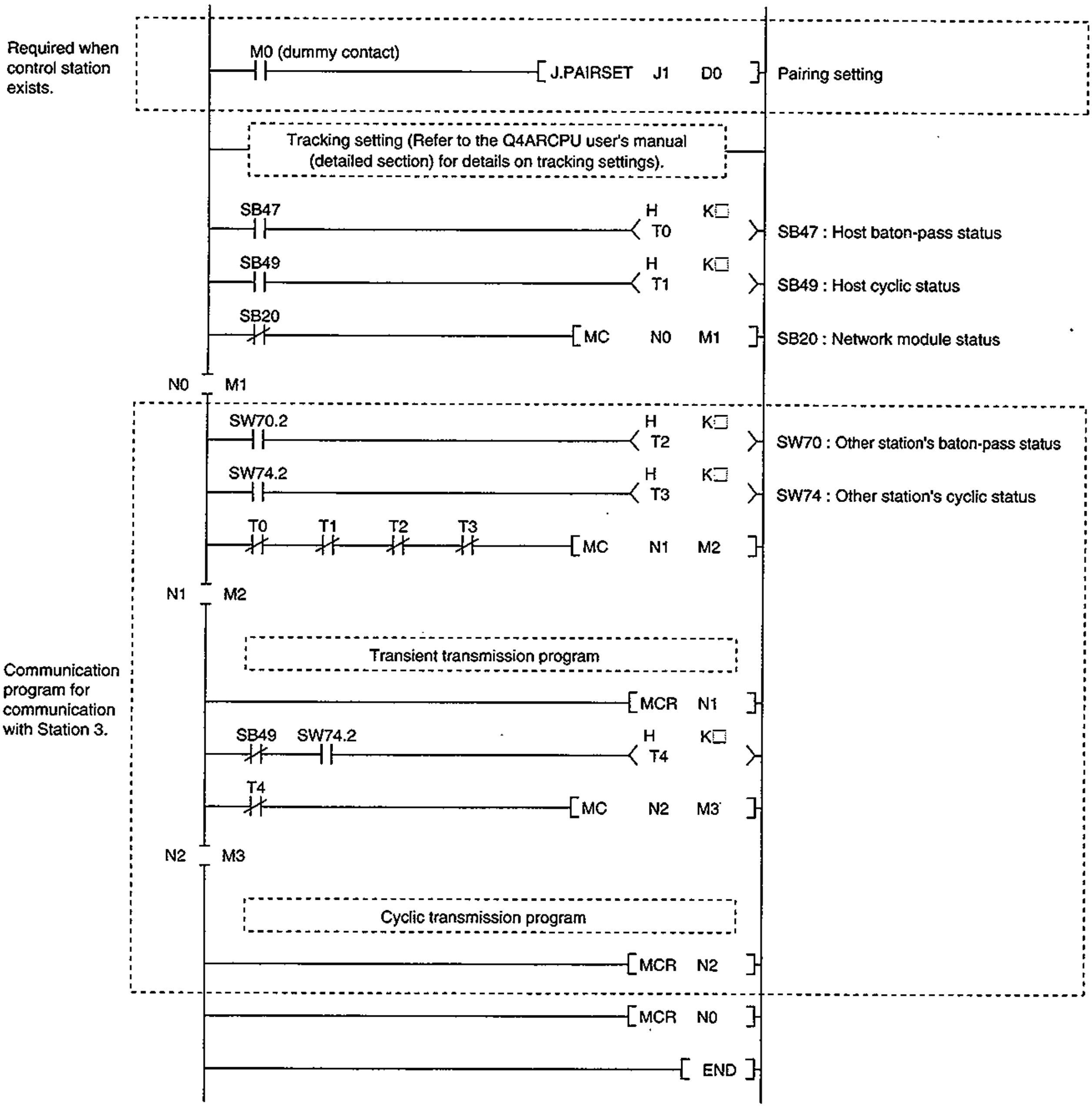
If a network is switched from "control system to standby system" while executing link-dedicated instructions (SEND, READ, WRITE, REQ, ZNRD, ZNWR, ZNFR,ZNTO), the execution of the instructions will not be completed.

It is necessary to execute the link-dedicated instructions once again.

14.2 Inter-PC Network

A Program example on duplex system for inter-PC network on duplex network is shown below.

As shown in the program example below, perform interlocking depending on the link condition of host and other stations.



Use the values provided below for the timer constant K☐.

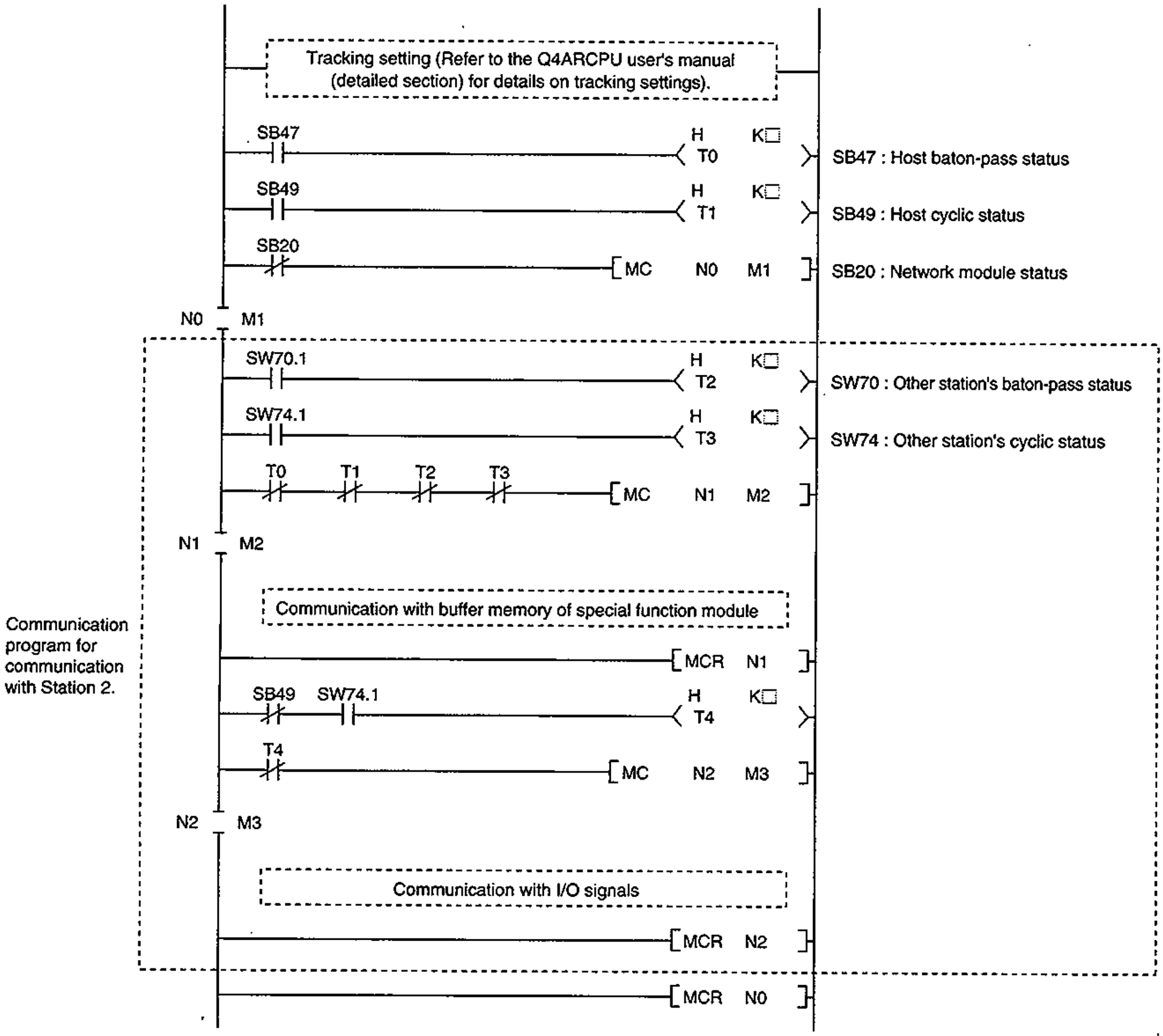
Baton pass status (T0, T2)	(Link scan time x 6) + (Object station CPU sequence scan time x 2) or more
Cyclic transmission status (T1, T3, T4)	(Link scan time x 3) or more

Reason:
This is in order not to stop the control even if a momentary error is detected in the network module due to cable or noise conditions.
The multiple values 6, 2 and 3 are mere estimates.

14.3 Remote I/O Network

Program example of remote I/O network on duplex network system (multiple master system) is shown below.

As shown in the program example below, perform interlocking depending on the link condition of host and other stations.



Use the values provided below for the timer constant K☐.

Baton pass status (T0, T2)	(Link scan time x 4) or more
Cyclic transmission status (T1, T3, T4)	(Link scan time x 3) or more

Reason:
This is in order not to stop the control even if a momentary error is detected in the network module due to cable or noise conditions.
The multiple values 4 and 3 are mere estimates.

14.4 Pairing Setting Instruction (PAIRSET)

Pairing setting instruction sets which station numbers are paired (duplexed). It is required to set up on the control station.

(1) Instruction format

```
| Dummy contact
|--| |-----------[ J.PAIRSET | Jn | S1 ]---|
```

	Setting content	Setting range
Jn	Target network number	n: 1 to 239
S1	First device for paring data storage Specifies first device in which pairing data is stored.	File register (R, ZR)* Devices (T, ST, C, D, W) set in latch range

*: Memory card is required when file register (R, ZR) is used.

[Pairing data structure]

1) They are not set up by sequence program.
   It is necessary to load them in PC CPU by peripheral devices in advance.
2) Four words are used regardless of the number of stations connected.
3) Set the bit on the "higher number side" of the station to be paired (duplexed) to 1.

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
S1	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
S1+1	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
S1+2	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
S1+3	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49

1 to 64 indicate station numbers.

Points

(1) Pairing setting instruction is valid only on "control station". Any settings on normal stations are voided.

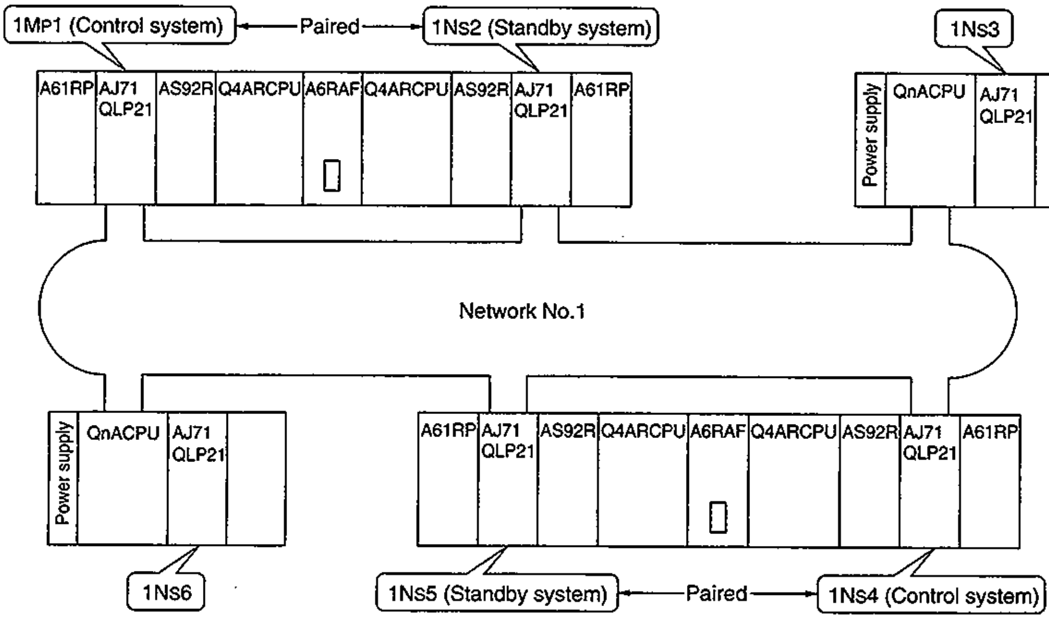
(2) If pairing settings are not performed, Q4ARCPU will not switch from control system to standby system even when the control system's network module fails to data-link due to cable connection breakage.

(2) Program example

A pairing setting program with the following system configuration is shown below.

(a) System configuration example

Duplex network where in the Stations 1 and 2, Stations 4 and 5 are duplexed:



(b) Program and pairing data

Pairing data is assumed to be stored in D0 to D3.

1) Program

2) Pairing data

Set the first bit corresponding to 1Ns2 and the fourth bit corresponding to 1Ns5. (D0=18; D1=0; D2=0; D3=0)

												Pair			Pair	
	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
D0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0
D1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

14.5 Special Link Relay (SB)/Register (SW)

Special link relays (SB) and registers (SW), use of which become valid only on duplex network, are described below.
Refer to simplex network's Section 10.7 SB0000 to 01F0 and SW0000 to 01F3.

14.5.1 Special link relay (SB)

A summary of special link relays (SB) is shown in Table 14.1.

Table 14.1 Special link relay (SB)

Number	Name	Contents	Device usage availability							
			Inter-PC network				Remote I/O network			
			M_P		N_S		M_R		R	
			Optical fiber	Coax	Optical fiber	Coax	Optical fiber	Coax	Optical fiber	Coax
SB01F4 (500)	Each station in CPU operation mode	Status of each station's CPU operation mode (SW01F4 to SW01F7) is shown. OFF: All stations in CPU backup mode ON: Separate mode station exists.	○	○	○	○	—	—	—	—
SB01F8 (504)	Each station in pairing status	Pairing setting status (SW01F8 to SW01FB) are shown. OFF: No pairing settings. ON: Pairing setting exists.	○	○	○	○	—	—	—	—
SB01FC (508)	Each station in CPU operation status (control system/stand by system)	Status of CPU operation mode (SW01FC to SW01FF) for each station is shown. OFF: All stations in control system. ON: Station in standby system exists.	○	○	○	○	—	—	—	—

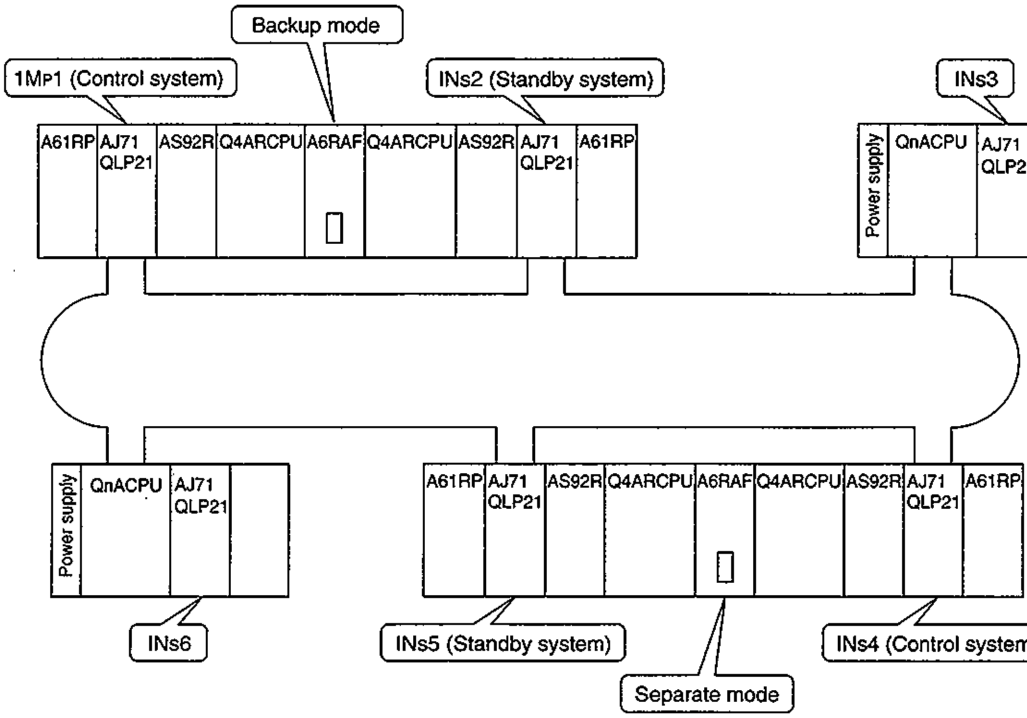
14.5.2 Special link register (SW)

Special link register (SW) is shown in Table 14.2.

Table 14.2 Special link relay (SW)

<table>
<tr><th rowspan="4">Number</th><th rowspan="4">Name</th><th rowspan="4">Contents</th><th colspan="8">Device usage availability</th></tr>
<tr><th colspan="4">Inter-PC network</th><th colspan="4">Remote I/O network</th></tr>
<tr><th colspan="2">MP</th><th colspan="2">NS</th><th colspan="2">MR</th><th colspan="2">R</th></tr>
<tr><th>Optical fiber</th><th>Coax</th><th>Optical fiber</th><th>Coax</th><th>Optical fiber</th><th>Coax</th><th>Optical fiber</th><th>Coax</th></tr>
<tr><td>SW01F4 (500)
SW01F5 (501)
SW01F6 (502)
SW01F7 (503)</td><td>CPU operation mode of each station</td><td>Status of each station's CPU operation mode is shown.
0: Backup mode (including stand-alone system).
1: Separate mode
<table><tr><td></td><td>b15</td><td>b14</td><td>b13</td><td>b12</td><td>to</td><td>b4</td><td>b3</td><td>b2</td><td>b1</td><td>b0</td></tr><tr><td>SW01F4</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>SW01F5</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>SW01F6</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>SW01F7</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>1 to 64 in the table indicate station numbers.</td><td>○</td><td>○</td><td>○</td><td>○</td><td>—</td><td>—</td><td>—</td><td>—</td></tr>
<tr><td>SW01F8 (504)
SW01F9 (505)
SW01FA (506)
SW01FB (507)</td><td>Pairing condition of each station</td><td>Pairing setting status is shown.
0: Station without pairing setting (including stand-alone system)
1: Station with pairing setting
<table><tr><td></td><td>b15</td><td>b14</td><td>b13</td><td>b12</td><td>to</td><td>b4</td><td>b3</td><td>b2</td><td>b1</td><td>b0</td></tr><tr><td>SW01F8</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>SW01F9</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>SW01FA</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>SW01FB</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>1 to 64 in the table indicate station numbers.</td><td>○</td><td>○</td><td>○</td><td>○</td><td>—</td><td>—</td><td>—</td><td>—</td></tr>
<tr><td>SW01FC (508)
SW01FD (509)
SW01FE (510)
SW01FF (511)</td><td>CPU operation condition of each station (control system/stand by system)</td><td>CPU operation condition of each station is shown.
0: Control system (including stand-alone system)
1: Standby system
<table><tr><td></td><td>b15</td><td>b14</td><td>b13</td><td>b12</td><td>to</td><td>b4</td><td>b3</td><td>b2</td><td>b1</td><td>b0</td></tr><tr><td>SW01FC</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>SW01FD</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>SW01FE</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>SW01FF</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>1 to 64 in the table indicate station numbers.</td><td>○</td><td>○</td><td>○</td><td>○</td><td>—</td><td>—</td><td>—</td><td>—</td></tr>
</table>

(Example) The SB/SW status with a system configuration provided below are shown.



1) SB01F4 (CPU operation mode of each station)
   ON: Since INs4 and INs5 are in separate mode.
2) SB01F8 (Pairing status of each station)
   ON: Since the pairing setting is done on 1Ns2 and 1Ns5.
3) SB01FC (CPU operation status of each station)
   ON: Since 1Ns2 and 1Ns5 are operating in standby system.
4) SW01F4 to SW01F7 (CPU operation status of each station)
   Bits of 1Ns4 and 1Ns5 are turned on.

	b15	b14	b13	b12	to	b4	b3	b2	b1	b0
SW01F4	0	0	0	0	to	1	1	0	0	0
SW01F5	0	0	0	0	to	0	0	0	0	0
SW01F6	0	0	0	0	to	0	0	0	0	0
SW01F7	0	0	0	0	to	0	0	0	0	0

5) SW 01F8 to SW 01FB (Pairing status of each station)
   Higher-number side bits (1Ns2, 1Ns5) where "1MP1 and 1Ns2" and "1Ns4 and 1Ns5" are paired (duplexed) are turned on.

	b15	b14	b13	b12	to	b4	b3	b2	b1	b0
SW01F8	0	0	0	0	to	1	0	0	1	0
SW01F9	0	0	0	0	to	0	0	0	0	0
SW01FA	0	0	0	0	to	0	0	0	0	0
SW01FB	0	0	0	0	to	0	0	0	0	0

6) SW01FC to SW01FF (CPU operation status of each station)
   Bits on the standby system (1Ns2, 1Ns5) are turned on.

	b15	b14	b13	b12	to	b4	b3	b2	b1	b0
SW01FC	0	0	0	0	to	1	0	0	1	0
SW01FD	0	0	0	0	to	0	0	0	0	0
SW01FE	0	0	0	0	to	0	0	0	0	0
SW01FF	0	0	0	0	to	0	0	0	0	0

Troubleshooting Section

This troubleshooting section explains about the corrective actions to take at the time of error code and trouble occurrences.

15 Troubleshooting

In order to increase system reliability, it is certainly important to start up correctly as well as to recover quickly and surely at the time of error occurrences.

There are following three clues to check error contents:
1) Error code
2) Monitor and test peripheral devices
3) LED on the front side of the network module

(1) Error code (Refer to Section 15.1.)

An error code is stored when transient transmission (communication to other station) is performed by link-dedicated instruction or peripheral device but not able to communicate properly.
The contents of error can be checked with the error code.

(2) Monitor and test peripheral devices

(a) Monitor (Refer to Chapter 5.)
The following four network status can be checked:
1) Network overall status: Line monitor (host)
2) Each station's cyclic transmission, transient transmission, loop status, etc.: Line monitor (other station)
3) Host's switch and parameter setting status: Status monitor
4) Line, communication, transient transmission error status: Error log monitor

(b) Test (Refer to Section 4.5.)
The following four items can be checked:
1) Data link cable wiring condition (IN/OUT reverse connection, etc.): Loop test
2) Station number and control station/remote master station overlap, network number and group number setting status: Setting confirmation test
3) Routing parameter setting status: Communication test
4) Connection station sequence in forward and reverse loop directions: Station sequence confirmation test

(c) Network module front side LED (Refer to Section 4.2, 15.3.)
Host's data link, switch and parameter settings, communication error, loop status are indicated on the LEDs.

Remark

For quick and sure recovery from the error which occurred during the data link, it is important to check the network-module hardware setting and data-link cable at the time of startup.
Make sure to perform network-module hardware setting, data link cable connection and off-line test (hardware test, self-loopback test, station-to-station test, forward/reverse loop test) properly.

15.1 Error Codes

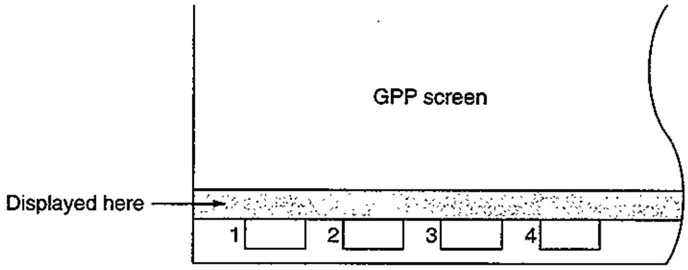
When transient transmission is performed from the instruction or peripheral device and cannot have proper communication, an error code (hexadecimal) is stored or displayed.

(1) The following shows the location where error code is stored.
For 4□□□ error codes, refer to QnACPU User's Manual (Detailed Section).

(a) Instructions

1) SEND, RECV, READ, WRITE, REQ, ZNFR, ZNTO: Control data completion status (Ⓢ+1)
2) ZNRO: SW31
3) ZNWR: SW33

(b) Peripheral Device
The error code is displayed above the function key display.



(2) The error code descriptions are shown in Table 15.1.

Table 15.1 Error code list

Error No.	Error description	Corrective action
F101	Initial status	Make SB0047 (baton-pass status)/SB0049 (data link status) to be off (normal).
F102	Initial status	
F103	Initial status (during on-line test)	
F104	Control station/subcontrol station transfer status	
F105	Initial status	
F106	Control station/subcontrol station transfer status	
F107	Baton-pass error (baton lost)	
F108	Baton-pass error (baton overlap)	
F109	Initial status (during on-line test)	
F10A	Initial status (during on-line test/off-line loop test)	
F10B	Station number overlap error	Correct station number.
F10C	Control station overlap error	Correct control station setting.
F10D	Off-line status	Make it on-line.
F10E	Receive error retry over	Check for cable damage, hardware error, noise, miswiring, missing terminal resistor connection (during bus), station number overlap or control station overlap.
F10F	Send error retry over	
F110	Time out error	
F111	Corresponding station error	Re-examine corresponding station's status, parameter, switch settings (confirm if there is no parameter errors and if the corresponding station is properly set at the control station).
F112	Loop condition failure	Check for cable damage, hardware error, noise, miswiring, station number overlap or control station overlap.
F113	Send error	Retry after waiting for a while. If the error repeats, check for cable damage, hardware error, noise, miswiring, missing terminal resistor connection (during bus), station number overlap or control station overlap. Re-examine parameter and switch settings. (Confirm if there is no parameter errors and if the corresponding station is properly set at the control station.)
F114	Send error	Retry after waiting for a while. If the error repeats, check for cable damage, hardware error, noise, miswiring, missing terminal resistor connection (during bus), station number overlap or control station overlap.
F117	Send error	Check for cable damage, hardware error, noise, miswiring, station number overlap or control station overlap.
F118	Initial status (baton replay)	Wait until SB0047 (baton-pass status)/SB0049 (data link status) turn off (normal).
F11A	Send error (multiple loop transmission stopped)	Retry after waiting for a while.
F11B	Disconnecting	Re-examine parameter and switch settings. (Confirm if there is no parameter errors and if the corresponding station is properly set at the control station.) Check for cable damage, hardware error, noise, miswiring, station number overlap and control station overlap.
F11F	Initial status (no host-addressed baton)	Re-examine parameter and switch settings. (Confirm it there is no parameter errors and if the corresponding station is properly set at the control station.)
F112	Send error (during bus)	Check if coaxial cable is connected, the connection is loose, terminal resistor is not connected or cable is damaged.
F222	No receiving buffer space (buffer full error)	Retry after waiting for a while. If the error repeats, re-examine the number of transient communication in the entire system and communication intervals, and check if the send destination CPU is in an error (such as no receiving process (END process)).

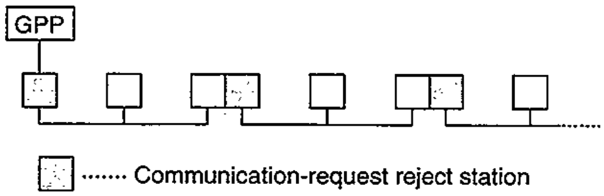
Table 15.1 Error code list (continued)

Error No.	Error description	Corrective action
F701	Specified station number error 1) At data sending: Tried to send to station 0. At data receiving: Received data that is not addressed to the host. 2) Tried to send to a specified control station but it was down.	Correct send destination station number.
F702	Send destination station number error (Send destination station number is out of range (greater than 65 stations).)	Correct send destination station number.
F703	Send destination group number error (Send destination station number is out of range (greater than 10 (8AH).)	Correct send destination group number.
F705	Send destination CPU error (Send destination hardware error)	Check send destination CPU.
F707	Relay station number error (send destination is specified out of range (8 stations) that can relay.)	Set transmission possible station. Check the entire system.
F709	Network number error at the time of receiving (Received network number is erroneous.)	Check the network number.
F70B	Response waiting time-out	Retry after waiting for a while.
F7C1	Used a channel that is in use (host).	The same channel cannot be used at the same time. Change channel number or avoid using the same channel at the same time.
F7C2	Target station's channel is in use.	• Execute the SEND instruction again after a while. • Confirm there is no multiple requests to the same channel of target station from the host or other stations.
F7C3	Delivery watchdog time expired. (When number of resend is 0)	• In the case of error occurrence with the RECV instruction and if other station is executing SEND, set a lager value for delivery watchdog time. • If the host is the instruction execution station, set a larger valve for delivery watchdog time. If it still becomes an error, check the network and target stations. • RECV instruction is executed even though RECV instruction execution request flag is not on.
F7C4	It performed resending for specified times with the number of resend, but could not communicate.	Set a larger value for delivery watchdog time. If it still becomes an error, check the network and target stations.
F7C5	Executed SEND instruction to remote I/O station.	Avoid executing SEND instruction to the remote I/O station.
F7C6	Channel number is out of setting range.	Specify channel number of host and target stations within the range of 1 to 8.
F7C7	Host is specified as target station number.	Specify target station numbers other than the host.
F7C8	Execution type of all-station or group specification is set to "perform delivery checking".	For all-station or group specification, make the execution type to be "no delivery confirmation."
F7C9	Number of resend is out of setting range.	Set within the range of 0 to 15 (times).
F7CA	Delivery watchdog time is out of setting range.	Set within the range of 0 to 32767 (seconds).
F7CB	SEND instruction's transmission data length is out of setting range.	Set within the range of 1 to 480 (words).
F800	Mode switch error	Correct the H/W switch setting.
F801	Network number error	
F803	Station number error	
F804	DIP switch error	
F820	Link parameter error (Parameter content is damaged)	Correct common parameter or station-specific parameter.
F823	Parameter conformity error (Each station's sending range is not "common parameter station-specific parameter.")	
F826	Time comparison error (Host parameter is older than received parameter from subcontrol station.)	Check the control station parameter and reset the host.

Table 15.1 Error code list (continued)

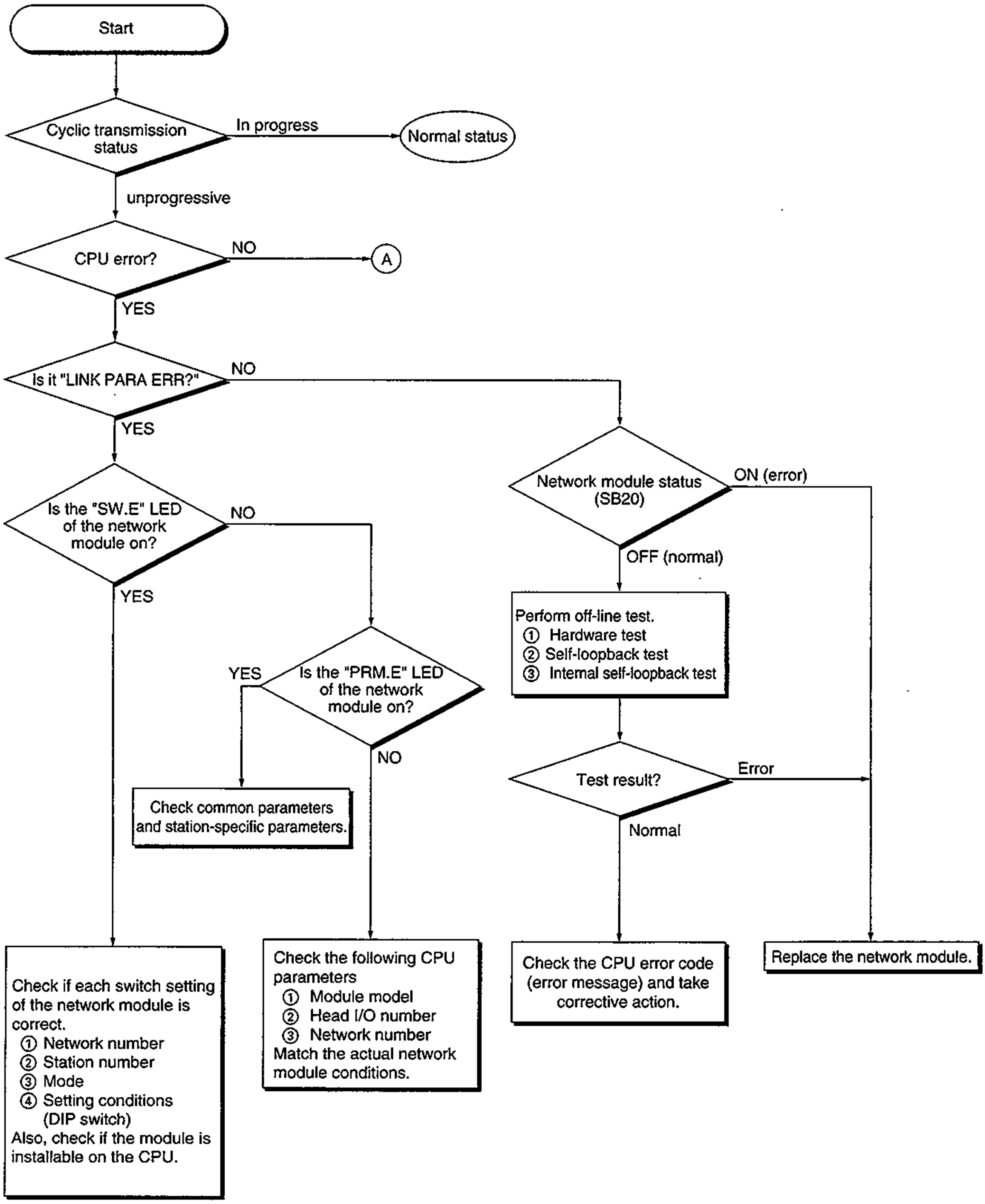
Error No.	Error description	Corrective action
F827	No automatic reconnections	Perform the process according to the setting of no automatic reconnection transfer.
F828	No control station transfer settings	Perform the process according to no control station transfer.
F832	Startup rejected (Started in a condition which disables startup.)	Startup all stations during the data-link stop with the all-station specification. Do not startup the host during the data-link stop with the other station specification.
F833	Key word error (Started from the station different from the station requested the stop.)	Startup from the station that stopped the station. Perform forceful startup.
F837	Retry count over	Check control station's status (whether it is reset or an error had occurred).
F838	Corresponding timer time-out	Check control station's status (whether it is reset or an error had occurred).
F839	Communication disabled (SW0056 is 0)	Repair the cause of disconnection.
F83A	SW0000's request is outside the range	Correct SW0000 contents.
F906	Relay destination CPU error	Check the relay destination CPU.
FA20	Master station routing parameter error	Correct master station's routing parameter.
FA21	Network number, station number, unit number, setting error	Correct network number, station number, module number.
FA22	Master station error	Set the routing parameter.
FA23	The header section of request error (SWOSX/NX-GPPQ peripheral device was connected to AnU supported remote I/O module (AJ72LP25, AJ72BR15).)	Connect the SW2SRXV/NX-GPPA peripheral device.
FA24	The data section of request error (SWOSX/NX-GPPQ peripheral device was connected to AnU supported remote I/O module (AJ72LP25, AJ72BR15).)	
FA25	ZNFR/ZNTO execution error (buffer memory address specification error, number of points specification error)	Correct the ZNFR/ZNTO instruction.
FA26	Special function module handshake error	Execute ZNFR/ZNTO toward special function module.
FA30	I/O allocation error	Correct I/O allocation.
FA31	LB/LW allocation error	Correct common parameter (LB/LW).
FA32	Incorrect allocation error	Check the installed modules.
FA33	Number of installed intelligent special function modules error	Install two units or less.
FA34	Special function module sum check error	Check the special function module. - Replacement
FA35	I/O module verification error	Check if any module is disconnected or not.
FA36	Fuse blown error	Check the output module.
FD01	CRC error (off line test)	Retry. (If the error occurs repeatedly, check cable damage, hardware error, noise, missing terminal resistor connection (during bus), miswiring.)
FD02	Overrun error (off line test)	
FD03	AB.IF error (off line test)	
FD04	TIME error (off line test)	
FD05	DATA error (off line test)	
FD06	UNDER error (off line test)	
FD07	Send error	Retry. (If the error occurs repeatedly, check cable damage, hardware error, noise, missing terminal resistor connection (during bus), miswiring.)
FD08	Send error (during bus)	Check if the coaxial cable is not connected or loose, terminal resistor is not connected or cable is damaged.
FD09	Loop status change occurred during the test (off line loop test)	Retry (do not switch the loop during the retry). If the error occurs repeatedly, check the line and connection conditions.
FD0A	Communication unstable (off line loop test)	Retry. If the error occurs repeatedly, check cable damage, hardware error, noise, missing terminal resistor connection (during bus) or loose wiring.
FD0B	Wiring error (off line loop test)	Check the wiring.
FD11	Test in-progress error	Perform after completing a test from the other station.
FD12	Disconnection error	Repair the cause of disconnection.

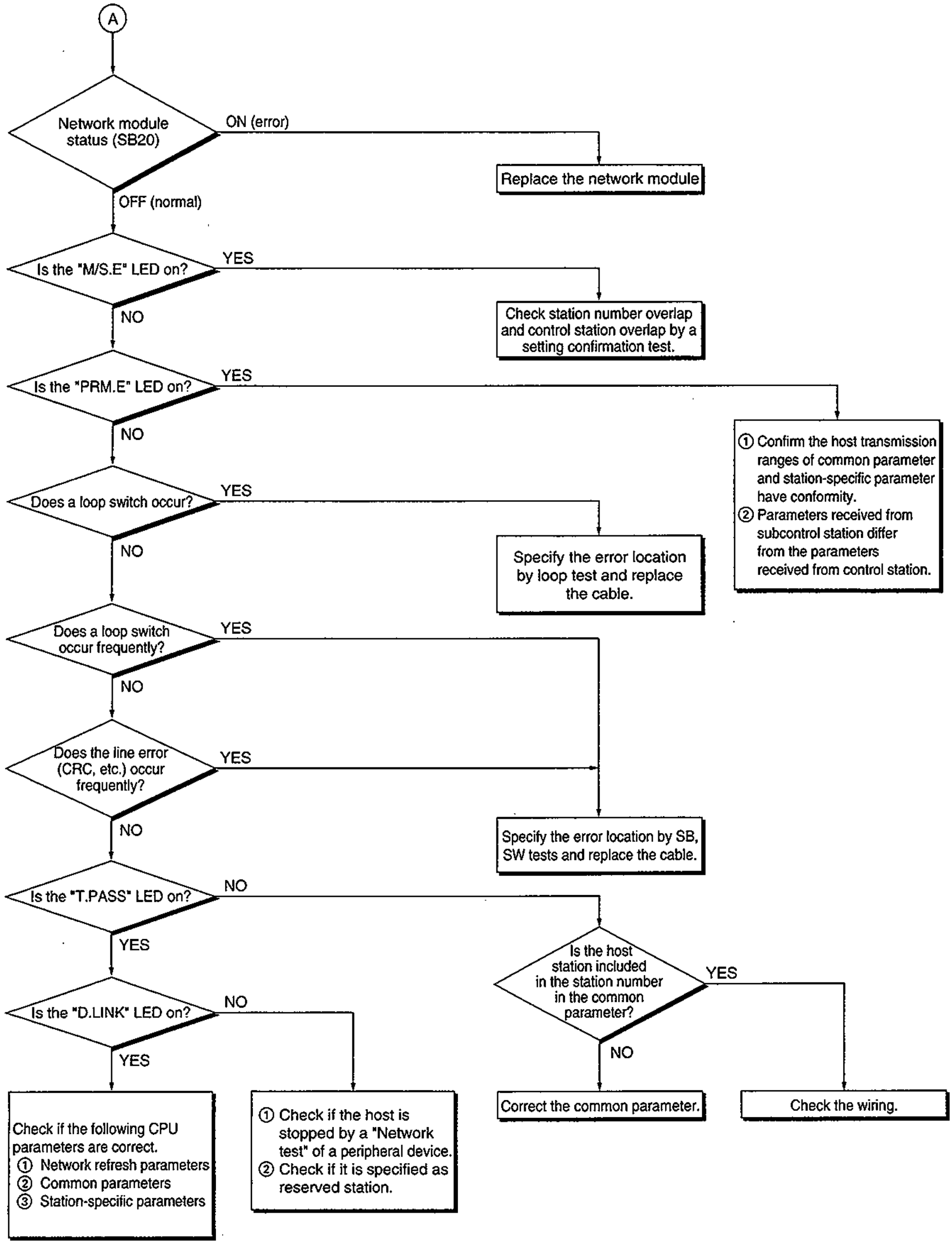
Table 15.1 Error code list (continued)

Error No.	Error description	Corrective action
FD13	Station number error 1) On line diagnosis specified by the parameter was performed when the parameter was not received. 2) On line diagnosis was performed with smaller number of stations specified than the host station number.	1) Set total link station number with common parameter. 2) Set the same station number as the host or greater.
FD1A	There is overlapped station numbers (during station sequence confirmation test).	Check station overlap and correct it.
FD1B	Test interruption error	Test performing station is interrupted with reset, etc. during the test. There is a faulty station on the line.
FD1C	Interruption error caused by the loop switch during the test	Retry (do not switch loop during the test). If the error occurs repeatedly, check line and connection conditions.
FD1E	Test disable error for the bus type	Perform the test that can be executed on the bus type.
FD31	On-line diagnosis double-request error (On-line diagnosis requests were issued at the same time.)	Perform again after the first on-line diagnosis is completed.
FD35	Response waiting time-out occurred	Retry after a while. Check corresponding station and line conditions. Change test request destination.
FD36	Corresponding waiting time-out occurred	
FD38	Message overlap error	
FD39	Test requested to the host (communication test)	Change the test request destination.
FD3A	Test request destination is request reject station (communication test)	A station that cannot accept test request is requested. Communication-request reject station 
FE20	Data error (Not able to process the received data, other than AnUCPU is specified as a relay station.)	Correct routing parameter, or change the relay station to AnUCPU.
FE21	LWDP/LWTP device range error	Check the counter-side CPU device range.
FE22	QnACPU request contents error	Data length error of general data, etc.

15.2 Troubleshooting

The following flowchart shows the simplified troubleshooting flow.




A
Network module status (SB20)
ON (error)
Replace the network module
OFF (normal)
Is the "M/S.E" LED on?
YES
Check station number overlap and control station overlap by a setting confirmation test.
NO
Is the "PRM.E" LED on?
YES
① Confirm the host transmission ranges of common parameter and station-specific parameter have conformity.
② Parameters received from subcontrol station differ from the parameters received from control station.
NO
Does a loop switch occur?
YES
Specify the error location by loop test and replace the cable.
NO
Does a loop switch occur frequently?
YES
NO
Does the line error (CRC, etc.) occur frequently?
YES
Specify the error location by SB, SW tests and replace the cable.
NO
Is the "T.PASS" LED on?
NO
Is the host station included in the station number in the common parameter?
YES
Check the wiring.
NO
Correct the common parameter.
YES
Is the "D.LINK" LED on?
NO
① Check if the host is stopped by a "Network test" of a peripheral device.
② Check if it is specified as reserved station.
YES
Check if the following CPU parameters are correct.
① Network refresh parameters
② Common parameters
③ Station-specific parameters

15.2.1 Things to check first

Check item	Checking method
Monitor each station's communication status with peripheral device's network monitor.	Check communication faulty station's CPU module status, network module status, each station's loop status and locate the error.
Is the communication faulty station's "POWER" LED on the power supply module on?	If the "POWER" LED is off, check the power supply voltage to the power supply module, insufficient power capacity, excessive voltage, power supply module damage, etc.
Is the "RUN" LED on the CPU module on?	If the "RUN" LED is off or flashing, read the error code from peripheral device and take a corrective action appropriate for the error description. (Refer to the CPU module User's Manual for error descriptions and corrective actions.)
Is the LED illumination status on the network module normal?	Check if "RUN", "SW.E", "M/S.E", and "PRM.E LED" are illuminated and take corrective action appropriate for the error description. (Refer to Section 15.3.)

15.2.2 When data link is disabled in the entire system

Check item	Checking method
Monitor each station's communication status with peripheral device's network monitor.	Check line status by peripheral device network-diagnosis loop test. (Optical-fiber loop system only) Check the communication faulty station's CPU module and network module. Check the network module and data link cable by performing off-line test such as self-loopback test and station-to-station test, and locate the error. Check if it became data link all-station stop.
Are the network parameters set at the control station and remote master station?	Check if the network parameters were set by reading the parameters from the CPU module of control station and remote master station.
Are the network module switch settings of the control station and remote network module correct?	Check the network number, setup switch, station number setting switch, mode setting switch, condition setting switch, etc.
Is the link watchdog time setting okay?	Check if data link is possible with the maximum link watchdog time setting.
Is the control station or remote master station down?	Check the network module LED illumination status of the control station and remote master station.
Has the control been transferred to subcontrol station?	Confirm if the common parameter for data link by subcontrol station when the control station is down is set to "yes" in the communication error setting of the control station.

15.2.3 When data link is disabled by the reset of each station and power-supply off

Check item	Checking method
Is it wired correctly?	Check wiring condition by peripheral device network diagnosis loop test. (Refer to Section 4.5.1.)
Isn't the cable disconnected?	Find out if the error occurred in the entire system or at specific station by checking each station's status, and locate the error.
Is the link watchdog time setting proper?	Confirm if data link is possible with a maximum link watchdog time setting. Confirm whether the TIME LED is on at normal station and remote I/O station.

15.2.4 When data link is disabled at specific station

Check item	Checking method
Monitor each station's communication status.	Check the status of communication faulty station and the loop status by performing line monitor of network monitor with peripheral device. In addition, check if data link is stopped or not. In the case of optical-fiber loop system, check line status and each station's communication status by the loop test of the peripheral-device network diagnosis.
Is the communication faulty station's network module normal?	Check if there is an error or damage with network module or communication faulty station's CPU module.
Is the network module causing loop error? Or, data-link cable?	Check if the network module is normal or not by off-line self-loopback test. Confirm if data-link cable is normal by off-line station-to-station test.
Are the parameters of control station and remote master station correct?	Confirm with the common parameters that total link station number is set to the largest link station number or greater and that the station which cannot communicate is not set as a reserved station.
Are the faulty station's parameters normal?	Read the network parameter from communication faulty station's CPU module and confirm if the number of modules and network refresh parameter are correctly set.
Is the switch setting of the network module correct?	Check network number setting switch, station number setting switch, mode setting switch, condition setting switch, etc.

15.2.5 When transmission data is erroneous

(1) Cyclic transmission data error

Check item	Checking method
Is the sequence program correct?	Stop sending station and receiving station's CPU modules, turn on and off the link device of sending station with test operation of peripheral device to check if data is sent to receiving station. If it is normal, revise the sequence program. If it is not, revise control station's common parameter and host's network refresh parameter.
Are the parameter settings of control station and remote master station correct?	Re-examine the link device range allocated to the sending station.
Are the parameter settings of sending station correct?	Check the network refresh parameter and station-specific parameter settings and confirm to which of the network module's B/W/X/Y ranges the device range in the sequence program is stored.
Are the parameter settings of receiving station correct?	Check the network refresh parameter and station-specific parameter settings and confirm what part of the device range in the sequence program is used for storing the B/W/X/Y range of the network station received from the sending station.

(2) Transient transmission error

Check item	Checking method
Is there an error occurrence during the transient transmission execution?	Check error code during transient transmission and take corrective action according to Section 10.1 Error code list.
Is the routing parameter setting correct?	Confirm with the communication test of the peripheral-device on-line diagnosis.

15.2.6 When duplex system is not operating correctly

(1) Link data (BW) is momentarily stopped at the time of switching from control system to standby system.

Check item	Checking method
Is the tracking performed?	Check if a tracking instruction (TRUCK) is created. Confirm if the tracking setting data is correct.

(2) The operation is not switched to the standby system even control system network module is at the state of data link disabled. (Inter-PC network)

Check item	Checking method
Is there repairing setting?	Check of the pairing instruction (PAIRSET) is created. Confirm whether the pairing setting data is correct.

(3) Data (B,W) transmission is disabled when the operation is switched from control system to standby system (inter-PC network)

Check item	Checking method
Is there repairing setting?	Check of the pairing instruction (PAIRSET) is created. Confirm whether the pairing setting data is correct.

15.3 Network Module LEDs

This section describes the LEDs indicating error occurrence during the data-link execution.

Display	Error detection status	Description
RUN	Off	Network module hardware error has occurred.
SW.E.	On	Network number setting switch is set to other than 1 to 239. Station number setting switch is set to other than 1 to 64. (Control station, normal station, remote I/O station) Station number setting switch is set to other than 0. (Remote master station) Mode setting switch is set to unusable. In the default parameter setting the number of station is set to 8 stations and total number of points is set to 8k points. Installed on other than QnA(R)CPU.
M/S.E.	On	Station number or control station setting is overlapping on the same network.
PRM.E.	On	Station-specific parameter setting range exceeds the LB/LW range allocated to the host station with common parameter, resulting in conformity error. (Inter-PC network) The parameter received from subcontrol station and the parameter of the host station (received from the control station) are different. (Inter-PC network) I/O allocation to the remote I/O station is abnormal. (Remote I/O network) The number of B/W points for handshaking to a special function module is insufficient. (Remote I/O network) The contents of parameters received from the remote master station is abnormal. (Remote I/O network)
D.LINK	Off	Cyclic transmission is stopped due to the data-link stop from peripheral device or on-line test execution. (This is not an error.) When T.PASS is turned off.
T.PASS	Off	It is not able to perform cyclic or transient transmission because it cannot participate in the baton pass. The communication has been suspended due to control station transfer or line error.
CRC	On	An error caused by cable damage or noise.
OVER	On	Data was received before the previous receiving data was received internally, and the previous data was erased. There is a hardware error in the receiving section of network module.
AB.IF	On	Receiving data length is shorter than specified length, or the number of continuous "1" bits in the frame of receiving data exceeds the regulated value. Watchdog time is too short; there is a cable damage or noise, etc.
TIME	On	The baton was not passed to the host within watchdog time. Watchdog time is too short; there is a cable damage or noise, etc. Control station is not started.
DATA	On	An error-code data was received. There is a cable damage, noise, etc.
UNDER	On	Internal processes for sending data were not performed with constant intervals. There is a hardware error in the sending section of network module.
LOOP	On	If the F.Loop side is illuminated, there is an error in the forward loop line, such as turned-off power supply of adjacent station which is sending to the host, hardware error in the forward-loop sending section of the adjacent station, forward-loop data-link cable is disconnected, or hardware error in the forward-loop receiving section of the host. If the R.Loop side is illuminated, there is an error in the reverse loop line, such as turned-off power supply of adjacent station which is sending to the host, hardware error in the reverse-loop sending section of the adjacent station, reverse-loop data-link cable is disconnected, or hardware error in the reverse-loop receiving section of the host.

Appendix

Appendix 1. Remote I/O station devices

Remote I/O station has devices similar to PC CPU.
The following shows device types and number of points:

Device	Number of points
X	0 to 7FF (2048 points)
Y	0 to 7FF (2048 points)
B	0 to 1FFF (8192 points)
W	0 to 1FFF (8192 points)
M	0 to 511 (replacing SB0000 to 01FF)
D	0 to 511 (replacing SW000 to 01FF)
Special M	9000 to 9255 (256 points)
Special D	9000 to 9255 (256 points)
SM	0 to 1999 (2000 points)
SD	0 to 2047 (2048 points)

Appendix 2. Precautions for using intelligent special function module at the remote I/O station

(1) There is a limitation in installable module number to the remote I/O station.
Refer to Section 2.1.2(6).

(2) Device range that can access to the host station (remote I/O station) differs depending on the module (each module has its own limitation).

Module / Device	QnA supported	AnU supported	A3A supported	AnU supported
B	0 to 1FFF	0 to 1FFF	0 to FFF	0 to 3FF
W	0 to 1FFF	0 to 1FFF	0 to FFF	0 to 3FF
SM	○	×	×	×
SD	○	×	×	×

Devices not listed above are the same as Appendix 1.

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