PROFIBUS-DP Master Module

User's Manual

MITSUBISHI

Mitsubishi
Programmable Controller

MELSEC-Q

QJ71PB92V

● SAFETY PRECAUTIONS ●

(Read these precautions before using.)

Before using this product, please read this manual and the relevant manuals introduced in this manual carefully and pay full attention to safety to handle the product correctly.
The instructions given in this manual are concerned with this product. For the safety instructions of the programmable controller system, please read the user's manual of the CPU module used.
In this manual, the safety instructions are ranked as "DANGER" and "CAUTION".

DANGER	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
CAUTION	Indicates that incorrect handling may cause hazardous conditions, resulting in medium or slight personal injury or physical damage.

Note that the CAUTION level may lead to a serious consequence according to the circumstances.
Always follow the instructions of both levels because they are important to personal safety.

Please save this manual to make it accessible when required and always forward it to the end user.

[DESIGN PRECAUTIONS]

DANGER

- When a communication error occurs on PROFIBUS-DP, the status of the faulty station is as shown below.
  Create an interlock circuit in the sequence program using the communication status information to ensure the system operates safely (Input X1, buffer memory 5A20H to 5B19H (23072 to 23321)).
  An erroneous output or malfunction may cause accidents.
  (1) The QJ71PB92V holds the input data before the communication failure.
  (2) When the QJ71PB92V has gone down, the output status of each DP-Slave is dependent on the QJ71PB92V parameter setting on GX Configurator-DP.
  (3) When a DP-Slave has gone down, the output status of the other DP-Slaves is dependent on the QJ71PB92V parameter setting on GX Configurator-DP.

- Do not output the "use prohibited" signal as the output signal to an intelligent function module from the programmable controller CPU.
  Wiring data into the "system area" or outputting a signal for "use prohibited" may cause system malfunction in the programmable controller.

[DESIGN PRECAUTIONS]

DANGER

- When a stop error has occurred to the CPU module, the communication status varies depending on the error time output mode setting of GX Developer as shown below.
  Set the communication status for when a stop error has occurred to the CPU module according to the system specifications.
  Note that, if the QJ71PB92V is mounted to a redundant system, it operates as described in (1) below regardless of the setting.
  (1) When "Error time output mode" is set to "Hold".
    (a) Since the communication with the DP-Slave is continued, values at the time of the CPU module stop error occurrence are held as the output data sent to the DP-Slave from the QJ71PB92V.
    (b) Input data received from DP-Slaves are updated into the buffer memory of the QJ71PB92V.
  (2) When "Error time output mode" is set to "Clear"
    (a) Communications with DP-Slaves are interrupted, and output data are not sent.
    (b) Input data received from DP-Slaves are held in the buffer memory of the QJ71PB92V.

- When the QJ71PB92V is mounted in a redundant system, set the watchdog timer for DP-Slaves so that the calculation formula shown in Section 4.8 (5) is satisfied.
  If the formula is not satisfied, a watchdog timer error occurs in DP-Slaves during system switching.

CAUTION

- Do not install PROFIBUS cables together with the main circuit or power lines or bring them close to each other.
  Keep a distance of 100mm (3.9inch) or more between them.
  Failure to do so may cause malfunctions due to noise.

[INSTALLATION PRECAUTIONS]

⚠CAUTION

- Use the programmable controller under the environment specified in the user's manual of the CPU module to be used.
  Otherwise, it may cause electric shocks, fires, malfunctions, product deterioration or damage.

- While pressing the installation lever located at the bottom of the module, insert the module fixing projection into the fixing hole in the base unit to mount the module.
  Incorrect mounting may cause malfunctions, a failure or a drop of the module.
  In an environment of frequent vibrations, secure the module with the screw.

- Tighten the screw within the specified torque range.
  If the screw is too loose, it may cause a drop of the module, a short circuit or malfunctions.
  Overtightening may damage the screw and/or the module, resulting in a drop of the module, a short circuit or malfunctions.

- Be sure to shut off all phases of the external power supply used by the system before mounting or removing the module.
  Failure to do so may damage the module.

[INSTALLATION PRECAUTIONS]

⚠ CAUTION

- Do not directly touch the conductive part or electronic components of the module.
  Doing so may cause malfunctions or a failure of the module.

[WIRING PRECAUTIONS]

DANGER

- Be sure to shut off all phases of the external power supply used by the system before wiring PROFIBUS cables.
  Failure to do so may result in failure or malfunctions of the module.

⚠ CAUTION

- Carefully prevent foreign matter such as dust or wire chips from entering the module.
  Failure to do so may cause a fire, failure or malfunctions.

- Be sure to place the PROFIBUS cables in a duct or clamp them.
  If not, dangling cables may be shifted or inadvertently pulled, resulting in damages to the module or cables or malfunctions due to poor cable contact.

- When disconnecting the PROFIBUS cable, do not pull it by holding the cable part.
  Be sure to hold its connector which is plugged into the module.
  Pulling the cable with it connected to the module may damage the module and/or cable, or cause malfunctions due to poor contact of the cable.

- A protective film is attached onto the module top to prevent foreign matter such as wire chips from entering the module when wiring.
  Do not remove the film during wiring.
  Remove it for heat dissipation before system operation.

[STARTING AND MAINTENANCE PRECAUTIONS]

DANGER

- Before cleaning, be sure to shut off all phases of the external power supply used by the system.
  Failure to do so may cause electrical shocks.

CAUTION

- Do not disassemble or modify the module.
  Doing so may cause failure, malfunctions, personal injuries and/or a fire.
- When using a wireless communication device such as a cellular phone or a PHS, keep it at least 25cm (9.85 inch) away from the entire programmable controller system in all directions.
  Failure to do so may cause a malfunction.
- Be sure to shut off all phases of the external power supply before mounting or removing the module.
  Failure to do so may result in failure or malfunctions of the module.
- Module installation to or removal from the base unit is limited to 50 times after the first use of the product. (IEC 61131-2 compliant)
  Exceeding 50 times may cause malfunctions.
- Before handling modules, touch a grounded metal object to discharge the static electricity from the human body.
  Not doing so may cause failure or malfunctions of the module.

[DISPOSAL PRECAUTIONS]

CAUTION

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

REVISIONS

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

<table>
<tr><th>Print Date</th><th>* Manual Number</th><th>Revision</th></tr>
<tr><td>Aug., 2005</td><td>SH (NA)-080572ENG-A</td><td>First edition</td></tr>
<tr><td>Jun., 2006</td><td>SH (NA)-080572ENG-B</td><td>Modifications
SAFETY PRECAUTIONS, GLOSSARY, Section 1.1, 2.1, 2.2.1, 2.4, 3.1 to 3.5, CHAPTER 4, Section 4.1.1, 4.1.3, 4.2.1 to 4.2.3, 4.5, 4.6, 5.3, 5.4, 6.1 to 6.3, 6.5, 6.6.4, CHAPTER 7 to Section 7.1.3, 9.4, Appendix 2

Additions
2.3 , 3.5.3, 4.7, 4.8, 5.2.2, 6.7, 7.7, 7.9, 8.1, 9.3, 9.4.1 to 9.4.6, Appendix 1

Section number changes
Section 5.2 → 5.2.1, Section 7.7 → 7.8, Section 8.1 to 8.2 → Section 8.2 to Section 8.3, Appendix 1 to Appendix 2 → Appendix 2 to Appendix 3</td></tr>
<tr><td>May, 2007</td><td>SH (NA)-080572ENG-C</td><td>• Rewritten to include the QJ71PB92D-compatible function.
• Modified for descriptions of GX Configurator-DP Version 7.02C.
Change of a term
"PLC" was changed to "programmable controller".

Modifications
SAFETY PRECAUTIONS, ABOUT THE GENERIC TERMS AND ABBREVIATIONS, ABOUT MANUALS, GLOSSARY, CHAPTER 1, Section 1.1, 2.1, 2.4, 3.5.1, 4.5, 4.6, 5.3, 6.1, 6.3 to 6.7, CHAPTER 7, Section 8.1 to 8.3, CHAPTER 9 to Section 9.1, 9.3, 9.5.1 to 9.5.6, Appendix 1 to 2.3

Additions
Section 4.9, 9.2

Section number changes
Section 9.2 to 9.5 → 9.3 to 9.6</td></tr>
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Japanese Manual Version SH-080571-C

INTRODUCTION

Thank you for purchasing the Mitsubishi programmable controller, MELSEC-Q series.
Please read this manual carefully before use to develop familiarity with the functions and performance, and use it correctly.

CONTENTS

CHAPTER6 PARAMETER SETTING 6 - 1 to 6 - 25

CHAPTER7 PROGRAMMING 7 - 1 to 7 - 85

ABOUT MANUALS

The following manuals are related to this product.
Please purchase them if necessary.

Related Manuals

Manual Name	Manual Number (Model Code)
GX Configurator-DP Version 7 Operating Manual Explains the overview, installation method, screen operations, etc. of GX Configurator-DP Version 7. (Sold separately)	SH-080579ENG (13JU54)
GX Configurator-DP Operating Manual (CommDTM) Explains the overview, installation and operating methods, etc, of MELSOFT PROFIBUS CommDTM. (Sold separately)	SH-080582ENG (13JU55)
PROFIBUS-DP Interface Module User's Manual *1 Explains the overview of the QJ71PB92D-compatible function, system configurations, specifcations, functions, procedures before system operation, programming, and dedicated instructions. (Sold separately)	SH-080127 (13JR22)

* 1 Refer to it when using the QJ71PB92D-compatible function.

COMFORMANCE TO THE EMC AND LOW VOLTAGE DIRECTIVES

When incorporating the Mitsubishi programmable controller into other machinery or equipment and keeping compliance with the EMC and low voltage directives, refer to Chapter 3 "EMC Directive and Low Voltage Instruction" of the User’s Manual (hardware) supplied with your CPU module or base unit.
The CE logo is printed on the rating plate of the programmable controller, indicating compliance with the directives.
Note that no additional measures are necessary for this product to make compliance with the directives.

ABOUT THE GENERIC TERMS AND ABBREVIATIONS

Unless otherwise specified, this manual uses the following generic terms and abbreviations to describe the Type QJ71PB92V PROFIBUS-DP Master Module.

General term/Abbreviation	Description
QJ71PB92V	Abbreviation for the QJ71PB92V PROFIBUS-DP Master module.
PROFIBUS-DP	Abbreviation of PROFIBUS-DP network
MELSECNET/H	Abbreviation of MELSECNET/H network system
QCPU CPU module	Generic term for the Q00JCPU, Q00CPU, Q01CPU, Q02CPU, Q02HCPU, Q06HCPU, Q12HCPU, Q25HCPU, Q12PHCPU, Q25PHCPU, Q12PRHCPU, Q25PRHCPU, Q03UDCPU, Q04UDHCPU and Q06UDHCPU
Redundant CPU	Generic term for the Q12PRHCPU and Q25PRHCPU
GX Developer	Generic product name for SWnD5C-GPPW-E, SWnD5C-GPPW-EA, SWnD5C-GPPW-EV, and SWnD5C-GPPW-EVA. ("n" means version 4 or later.) "-A" and "-V" mean "volume license product" and "version-upgrade product" respectively.
GX Configurator-DP	Configuration tool for QJ71PB92V Generic term of the product model SWnD5C-PROFID-E ("n" means version 7 or later.)
BBLKRD	Abbreviation for G. BBLKRD
BBLKWR	Abbreviation for G. BBLKWR

GLOSSARY

This part explains the glossary used in this manual.

Term		Description
PROFIBUS-DPV0		A basic version of PROFIBUS-DP. The following functions are executable: • I/O data exchange • Diagnostic information notification etc.
PROFIBUS-DPV1		A PROFIBUS-DP version for which the following functions have been added to the basic functionality of PROFIBUS-DPV0 • Acyclic communication • Alarm function etc.
PROFIBUS-DPV2		A PROFIBUS-DP version for which the following functions have been added to the PROFIBUS-DPV1 functionality • Time stamping etc.
DP-Master	Class 1	A device exchanging I/O data with a DP-Slaves. (QJ71PB92V, QJ71PB92D, etc)
	Class 2	A device that communicates with DP-Slaves and checks their FDL address settings and/or operation states The DP-Master (Class 2) is used as a DP-Master for supervising the network, which can start, maintain, and diagnose the system.
DP-Slave		A device that exchanges I/O data with a DP-Master (Class 1). (QJ71PB93D, ST1H-PB, etc)
Repeater		A device used to connect different segments of PROFIBUS-DP
Bus terminator		A terminating resistor that is connected to either end of each segment on PROFIBUS-DP
Configuration tool		Software used to set bus parameters, slave parameters, etc. and to write them to a DP-Master (GX Configurator-DP, etc.)
GSD file		An electronic file that contains parameters of a DP-Slave The GSD file is used to set up the slave parameters on GX Configurator-DP.
FDL address		The numbers assigned to a DP-Master and DP-Slaves The FDL address is set within the range from 0 to 125.
Bus parameter		The parameter used for the communication setting of PROFIBUS-DP The bus parameter is set up on the GX Configurator-DP.
Master parameter		The parameter used for the settings (FDL address, transmission speed, etc.) of the QJ71PB92V The master parameter is set up on the GX Configurator-DP.
Slave parameter		The parameter for a DP-Slave, which is set on the DP-Master. The slave parameter is set up on the GX Configurator-DP. The setting items are described on the GSD File.
I/O CONFIGURATION DATA		Information on I/O configuration of a DP-Slave
I/O data exchange		This function allows I/O data exchange between a DP-Master (Class 1) and DP-Slaves.
Global control		This function enables synchronization command transmission for I/O data from a DP-Master (Class 1) to DP-Slaves.
Diagnostic information		Diagnostic information of PROFIBUS-DP, which is detected by a DP-Master or notified by a DP-Slave
Extended diagnostic error information		Diagnostic information specific to each DP-Slave Each of DP-Slaves notifies of it to the DP-Master when an error is detected.

(To the next page)

Term		Description
Bus cycle time		PROFIBUS-DP processing time for the DP-Master to perform cyclic communication with each DP-Slave
FDT (Field Device Tool)		A tool by which the following operations are performed to DP-Slaves on the PROFIBUS-DP via a DP-Master • Writing or reading parameters of DP-Slaves • Monitoring DP-Slave status etc.
DTM (Device Type Manager)		A file in which communication settings and DP-Slave parameters are defined when FDT is used The DTM consists of CommDTM and DeviceDTM.
	CommDTM	An abbreviation of Communication DTM CommDTM is a file used to define the communication settings needed for transmission via a DP-Master.
	DeviceDTM	Device DTM is a file in which parameters to be set for a DP-Slave are defined.
Ident No.		A specific number for each module that is connected to PROFIBUS-DP Ident No. is described in a GSD file of each module.
UTC		The UTC is based on the UTC, which stands for Coordinated Universal Time. In order to adjust the time gap with the GMT (Greenwich Mean Time), the "leap second" has been added.
Time master		A master station that can send a request for time control.(QJ71PB92V, etc.)
System A		The system to which the system-A connector of the tracking cable is connected.
System B		The system to which the system-B connector of the tracking cable is connected.
Control system		The system that is controlling the redundant system and performing network communication
Standby system		The system for backup in the redundant system
New control system		The system changed from the standby system status to the control system status due to system switching
New standby system		The system changed from the control system status to the standby system status due to system switching
QJ71PB92D-compatible function		The function used to replace the QJ71PB92D with the QJ71PB92V The QJ71PB92V type PROFIBUS-DP master module has this function.
	QJ71PB92D	The QJ71PB92D type PROFIBUS-DP interface module

PACKING LIST

The following indicates the packing list of the QJ71PB92V.

Model	Product name	Quantity
QJ71PB92V	QJ71PB92V PROFIBUS-DP master module	1

CHAPTER1 OVERVIEW

This manual explains the specifications, functions, procedures before system operation, and troubleshooting for the QJ71PB92V PROFIBUS-DP master module (hereinafter referred to as "QJ71PB92V").
The QJ71PB92V is used for connecting MELSEC-Q Series programmable controllers to PROFIBUS-DP.
The QJ71PB92V operates as a DP-Master (Class 1) on PROFIBUS-DP networks.

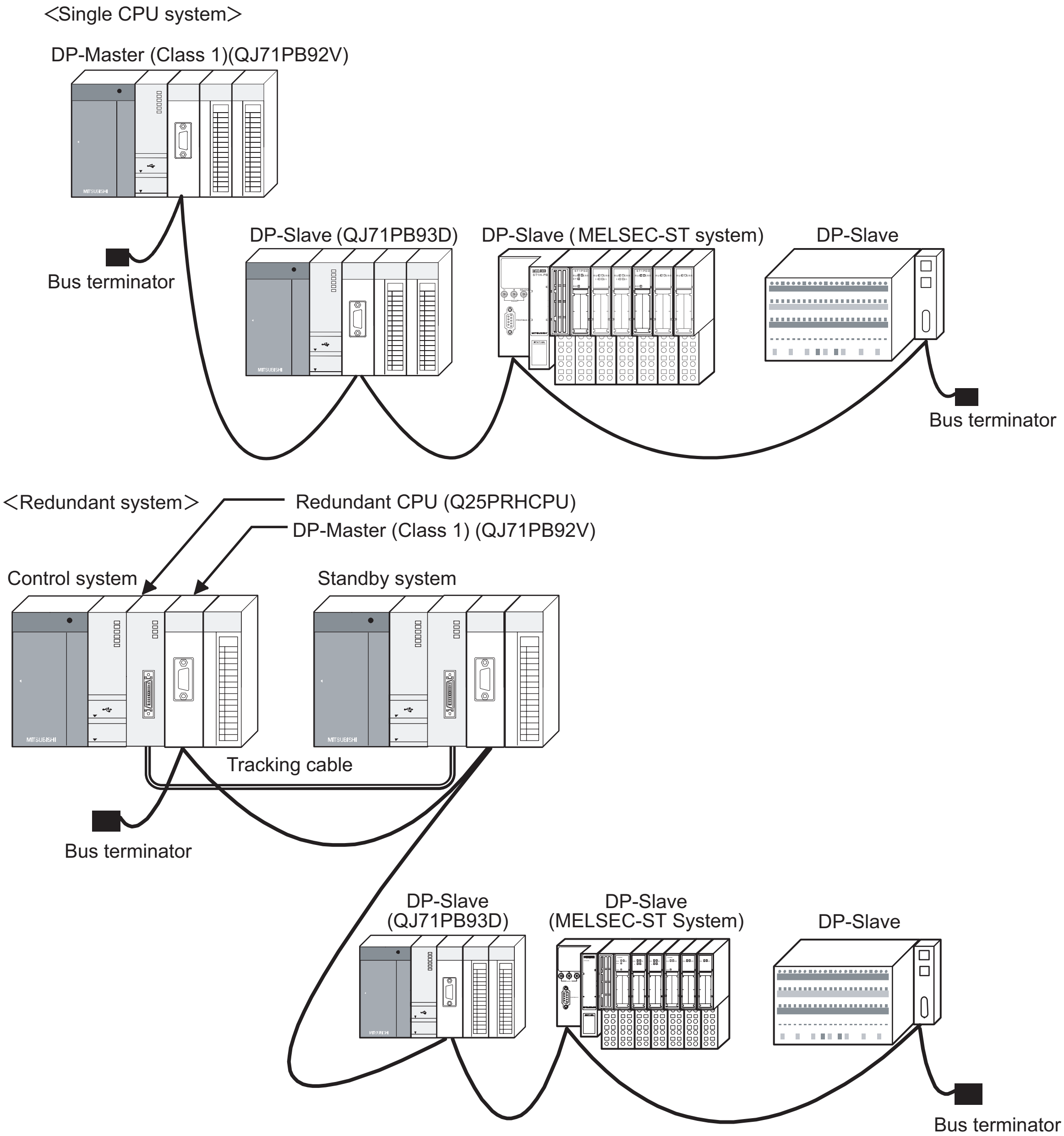


Figure 1.1 PROFIBUS-DP Using QJ71PB92V

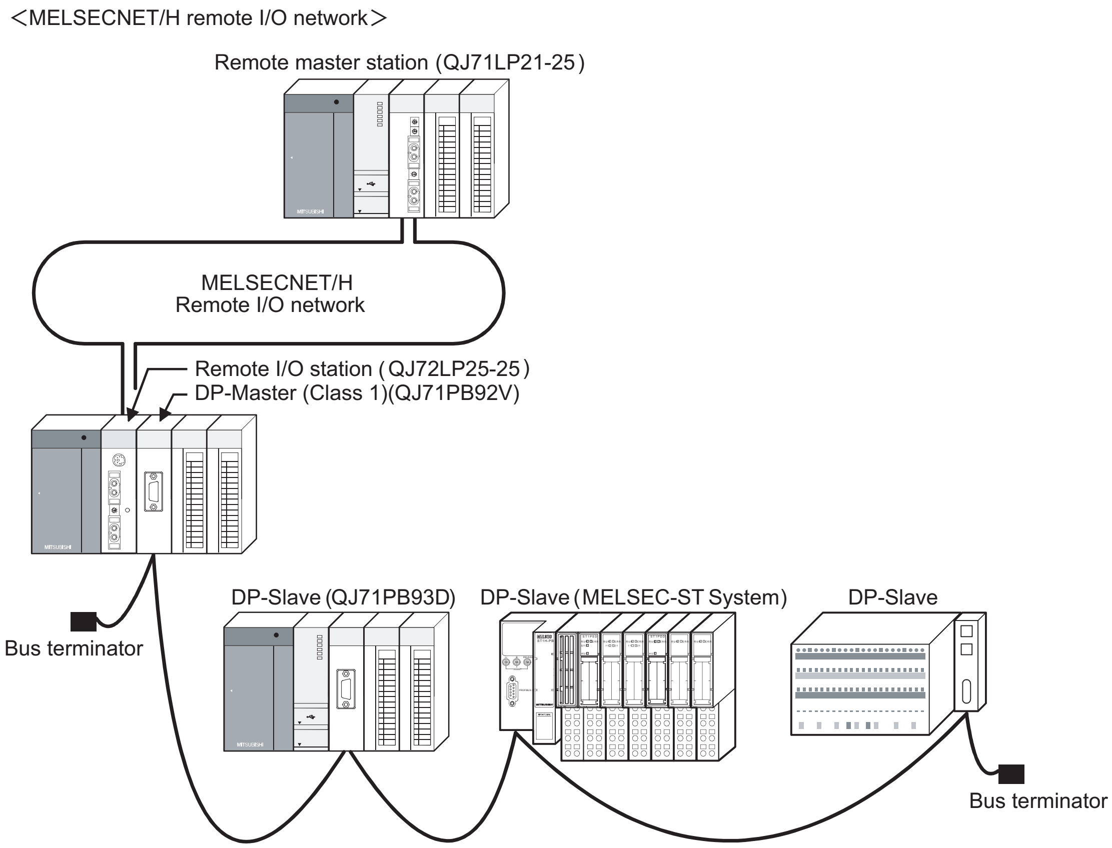


Figure 1.1 PROFIBUS-DP Using QJ71PB92V (Continued)

Remark

The QJ71PB92V has a function for replacing the QJ71PB92D with the QJ71PB92V. (QJ71PB92D-compatible function)
When the QJ71PB92D has failed, replace it with the QJ71PB92V using the QJ71PB92D-compatible function.

Table1.1 Reference Manuals

Purpose	PROFIBUS-DP Master Module User's Manual	PROFIBUS-DP Interface Module User's Manual
Using the functions of the QJ71PB92V	Details	—
Replacing the QJ71PB92D with the QJ71PB92V using the QJ71PB92D-compatible function	Outline	Details

1.1 Features

The following describes the features of the QJ71PB92V.

(1) DP-Master (Class 1) on PROFIBUS-DP

The QJ71PB92V complies with IEC 61158, and operates as a DP-Master (Class 1) on PROFIBUS-DP systems.

(a) Up to 125 DP-Slaves are connectable

Up to 125 DP-Slaves*1 can be connected to a single QJ71PB92V, enabling exchange of I/O data up to 8192 bytes.(Section 4.1.1)

* 1 Up to 124 DP-Slaves when the QJ71PB92V is used in a redundant system.

(b) Diagnostic information can be easily acquired

Diagnostic or extended diagnostic information of an error occurred on a DP-Slave during I/O data exchange can be easily acquired using the buffer memory and I/O signals. (Section 4.1.2)

(c) Supporting the global control function

By sending services (SYNC, UNSYNC, FREEZE, UNFREEZE) to each DP-Slave in a group, synchronous control of DP-Slave I/O data is available.(Section 4.1.3)

Table1.2 Descriptions of Services

Service Name	Description
SYNC	This service is for synchronizing the output status of DP-Slaves. In the SYNC mode, the output status of a DP-Slave is refreshed each time it receives the SYNC service. While no SYNC service is received, the output status is held.
UNSYNC	This service is for ending the SYNC mode.
FREEZE	This service is for synchronizing the input status of DP-Slaves. In the FREEZE mode, the input status of a DP-Slave is refreshed each time it receives the FREEZE service. While no FREEZE service is received, the input status is held.
UNFREEZE	This service is for ending the FREEZE service.

(d) Supporting PROFIBUS-DPV1 and PROFIBUS-DPV2

PROFIBUS-DPV1 and PROFIBUS-DPV2, which are extended versions of PROFIBUS-DP, are supported

The QJ71PB92V supports the following:

1) PROFIBUS-DPV1
- Acyclic communication with DP-Slaves (Section 4.2.1)
- Alarm acquisition (Section 4.2.2)
- FDT/DTM technology (Section 4.2.3)

2) PROFIBUS-DPV2
- Time control function on DP-Slaves (Section 4.3.1)

(2) I/O data consistency
Using the automatic refresh setting in GX Configurator-DP or dedicated instructions (BBLKRD/BBLKWR) ensures data consistency when reading/writing I/O data from the QJ71PB92V buffer memory. (Section 4.5)

(3) Easy parameter setup
Use of GX Configurator-DP enables bus parameters, master parameters, slave parameters, and various other parameters to be easily set up. (CHAPTER 6)

(4) Swapping of I/O data
The upper and lower bytes can be reversed (swapped) in word units when I/O data is sent or received.
This simplifies programming as you no longer need to create a program for swapping the upper and lower bytes on the QJ71PB92V or DP-Slave. (Section 4.4)

(5) Mountable on MELSECNET/H remote I/O station
The QJ71PB92V can be mounted on a MELSECNET/H remote I/O station.
This allows you to install the QJ71PB92V at a remote site away from the QCPU. (Section 7.8)

(6) Output status setting for the case of a CPU stop error (Stop/Continue of I/O data exchange)
For the case of a CPU stop error on a QCPU or remote I/O station where the QJ71PB92V is mounted, whether to stop or continue I/O data exchange with DP-Slaves can be specified. (Section 4.6)

(7) Changing DP-Slave setting to reserved station status temporarily
Without modifying the slave parameter in GX Configurator-DP, the station type of DP-Slaves can be changed to "Reserved station" temporarily. (Section 4.7)
Since there is no need to change slave parameters, changing a DP-Slave setting to a reserved station is easy.

(8) Redundant system can be constructed

(a) Redundancy is available for the QJ71PB92V.
By mounting the QJ71PB92V together with a redundant CPU, a redundant system can be constructed.
Even if the QJ71PB92V detects an error, the control and standby systems are switched each other continuing communications.(☞ Section 4.8)

(b) System switching is available when an error occurs in the QJ71PB92V or in communication with a DP-Slave.
The systems can be switched when an error occurs in the QJ71PB92V or in communication with a DP-Slave.

- When the QJ71PB92V detects a critical error

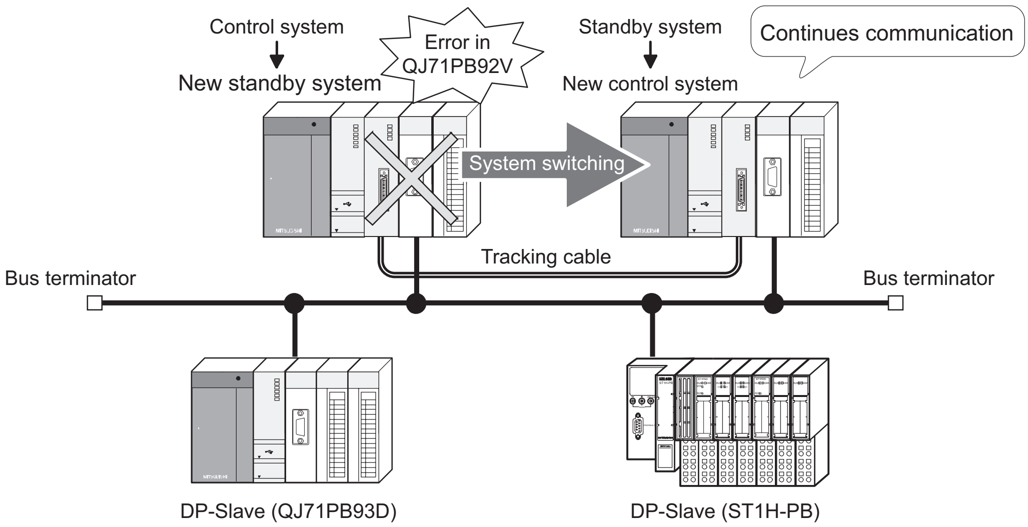


Figure 1.2 When the QJ71PB92V detects a critical error

- When the QJ71PB92V detects a communication error of a DP-Slave

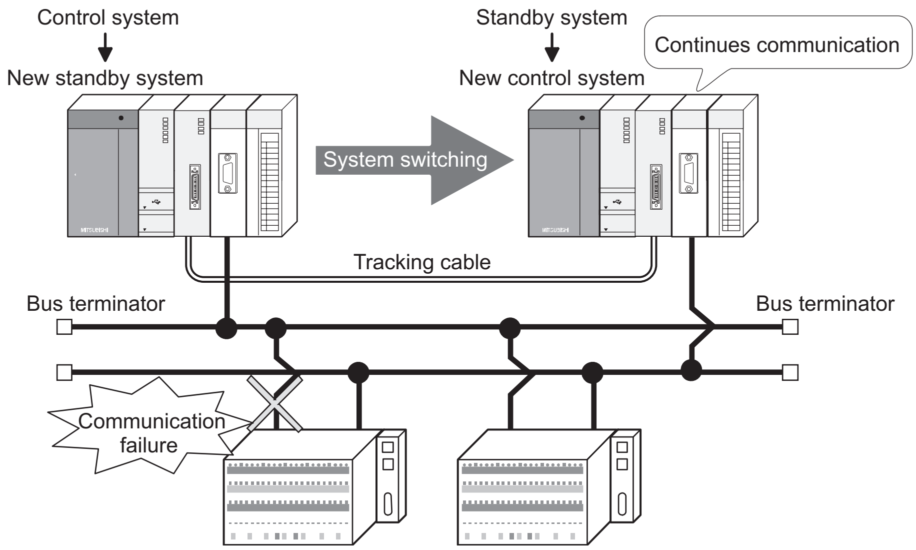


Figure 1.3 When the QJ71PB92V detects a communication error of a DP-Slave

(9) QJ71PB92D can be easily replaced with QJ71PB92V.

The QJ71PB92V has a function for replacing the QJ71PB92D with the QJ71PB92V. (Section 4.9)

Since the existing network configuration and sequence programs for the QJ71PB92D can be utilized, a faulty QJ71PB92D can be smoothly replaced with the QJ71PB92V.

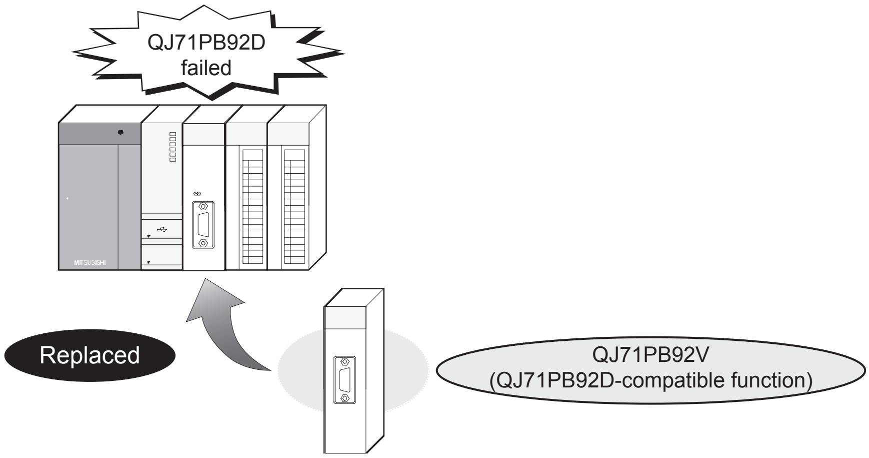


Figure 1.4 QJ71PB92D-Compatible Function

CHAPTER2 SYSTEM CONFIGURATION

This chapter explains the system configuration of the QJ71PB92V.

2.1 Applicable System

This section describes applicable systems.

(1) Mountable modules, No. of mountable modules, and mountable base unit

(a) When mounting to CPU module

The following shows the mountable CPU modules, No. of mountable modules, and mountable base unit of the QJ71PB92V module.
Power shortage may occur depending on the combination with other mounted modules or the number of mounted modules.
When mounting modules, pay attention to the power supply capacity.
When the power shortage occurs, review the combination of modules to be mounted.

Table2.1 When mounting to CPU module

Mountable CPU module			No. of mountable modules *1	Mountable base unit *2	
CPU type		CPU model name		Main base unit	Extension base unit
Programmable controller CPU	Basic model QCPU	Q00JCPU	Up to 8	○	○
		Q00CPU	Up to 24		
		Q01CPU			
	High Performance model QCPU	Q02CPU	Up to 64	○	○
		Q02HCPU			
		Q06HCPU			
		Q12HCPU			
		Q25HCPU			
	Process CPU	Q12PHCPU	Up to 64	○	○
		Q25PHCPU			
	Redundant CPU *3	Q12PRHCPU	Up to 11	○	×
		Q25PRHCPU			
	Universal model QCPU	Q02UCPU	Not mountable	×	×
		Q03UDCPU	Up to 64	○	○
		Q04UDHCPU			
		Q06UDHCPU			

○ : Mountable, × : Not mountable

* 1 Limited to the range of the number of I/O points in the CPU module.
* 2 Mountable on any I/O slot of the mountable base unit.
* 3 Use the QJ71PB92V of function version D or later.

POINT

(1) The number of mountable modules is restricted depending on the automatic refresh setting on the QJ71PB92V. (☞ Section 6.6.4)
For details, refer to Section 6.6.4.

(2) To utilize the data consistency function and dedicated instructions, use a QCPU whose first 5 digits of the serial No. is "02092" or later.

(b) When mounting to remote I/O station of MELSECNET/H

The following shows the mountable network modules, No. of mountable modules, and mountable base unit of the QJ71PB92V module.
Power shortage may occur depending on the combination with other mounted modules or the number of mounted modules.
When mounting modules, pay attention to the power supply capacity.
When the power shortage occurs, review the combination of modules to be mounted.

Table2.2 When mounting to remote I/O station of MELSECNET/H

Mountable network module	No. of mountable modules *1	Mountable base unit *2	
		Main base unit of remote I/O station	Extension base unit of remote I/O station
QJ72LP25-25	Up to 64	○	○
QJ72LP25G			
QJ72LP25GE			
QJ72BR15			

○ : Mountable, × : Not mountable

* 1 Limited to the range of the number of I/O points in the network module.
* 2 Mountable on any I/O slot of the mountable base unit.

Remark

The Basic model QCPU cannot create the MELSECNET/H remote I/O network.

(2) Compatible software packages

The following shows the compatibility between software packages and the system using the QJ71PB92V.

GX Developer: For setting QCPU parameters and creating sequence programs (Required)

GX Configurator-DP: Configuration software for the QJ71PB92V (Required)

Table2.3 Compatible Software Packages

System		Software Package	
		GX Developer	GX Configurator-DP
Q00J/Q00/Q01CPU	Single CPU system	Version 7 or later	Version 7 or later
	Multiple CPU system	Version 8 or later	
Q02/Q02H/Q06H/ Q12H/Q25HCPU	Single CPU system	Version 4 or later	
	Multiple CPU system	Version 6 or later	
Q12PH/Q25PHCPU	Single CPU system	Version 7.10L or later	
	Multiple CPU system		
Q12PRH/Q25PRHCPU	Redundant system	Version 8.17T or later	
Q03UD/Q04UDH/ Q06UDHCPU	Single CPU system	Version 8.48A or later	Version 7.02C or later
	Multiple CPU system		
When mounted on MELSECNET/H remote I/O station		Version 6 or later	Version 7 or later

2.1.1 Precautions for use on MELSECNET/H remote I/O stations

The following are the precautions when using the QJ71PB92V on MELSECNET/H remote I/O stations.

(1) Automatic refresh

Automatic refresh is not available when the QJ71PB92V is mounted on a MELSECNET/H remote I/O station.
To use the automatic refresh, mount the QJ71PB92V on a remote master station (QCPU).

(2) Dedicated instructions (BBLKWR, BBLKRD)

Dedicated instructions (BBLKWR, BBLKRD) cannot be used when the QJ71PB92V is mounted on a MELSECNET/H remote I/O station.
To use dedicated instructions, mount the QJ71PB92V on a remote master station (QCPU).

(3) QJ71PB92V parameter setup

To set QJ71PB92V parameters, connect GX Configurator-DP to a remote I/O station.
QJ71PB92V parameters cannot be set via a remote master station.

(4) FDT/DTM technology

To use the FDT/DTM technology, first connect the FDT (CommDTM) to a remote I/O station.
The FDT/DTM technology cannot be used via a remote master station.

2.2 PROFIBUS-DP Network Configuration

2.2.1 Basic configuration of the PROFIBUS-DP network

This section explains the basic PROFIBUS-DP configuration for using the QJ71PB92V as a DP-Master (Class 1).

(1) System equipment

The following table shows the equipment required for the PROFIBUS-DP system.

Table2.4 System Equipment

System Equipment	Description
DP-Master (Class 1)	QJ71PB92V
Configuration tool	GX Configurator-DP Version 7 or later
DP-Slave	QJ71PB93D, ST1H-PB, etc.
Repeater	Required when 32 or more DP-Slaves are connected
PROFIBUS cable	Section 5.5.1
Bus terminator	

(2) Network configuration

In the PROFIBUS-DP system configuration, the following conditions must be satisfied:

(a) Number of connectable modules in an entire network (When repeaters are used)

DP-Master [*1] + DP-Slaves $\leq$ 126

* 1 Including the QJ71PB92V

(b) Number of connectable modules per segment

DP-Master [*1] + DP-Slaves + repeaters [*2] $\leq$ 32

* 1 Including the QJ71PB92V
* 2 A repeater is counted for both segments.

(c) Max. no. of repeaters

Up to 3 repeaters can be used for communication between the QJ71PB92V and any DP-Slave.

(d) Number of connectable DP-Slaves per QJ71PB92V

Up to 125 DP-Slaves can be connected to a single QJ71PB92V.

(e) Multi-master system

When a communication chip of ASPC2 STEP C mode or equivalent is used, the DP-Master cannot be connected to the PROFIBUS-DP in which the QJ71PB92V is included.
To use a DP-Master with such a communication chip, configure another network.
For the communication chip currently used, consult its manufacturer.

1 OVERVIEW
2 SYSTEM CONFIGURATION
3 SPECIFICATIONS
4 FUNCTIONS
5 PROCEDURES AND SETTINGS BEFORE SYSTEM OPERATION
6 PARAMETER SETTING
7 PROGRAMMING
8 DEDICATED INSTRUCTIONS

2.2.2 PROFIBUS-DP network configuration examples

(1) Maximum configuration with no repeater connected

DP-Master (QJ71PB92V): 1

DP-Slaves: 31

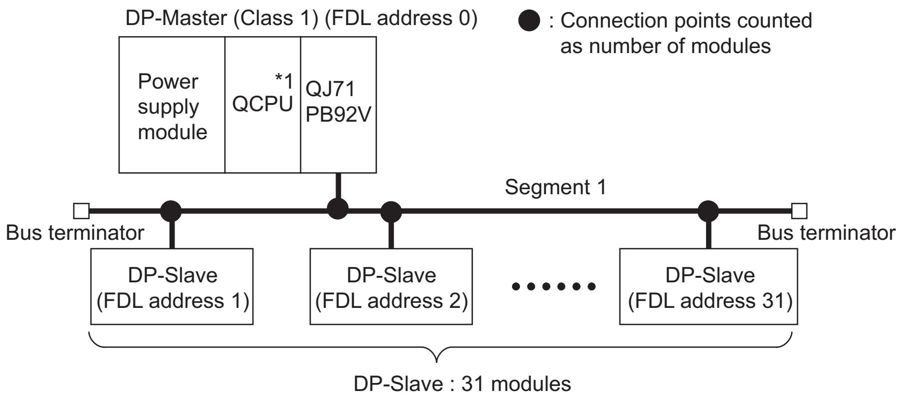


Figure 2.1 Maximum Configuration With No Repeater Connected

* 1 When using redundant CPUs, configure the network as shown in Section 2.3.

(2) Maximum configuration with a repeater connected

DP-Master (QJ71PB92V): 1

DP-Slaves: 61

Repeater: 1

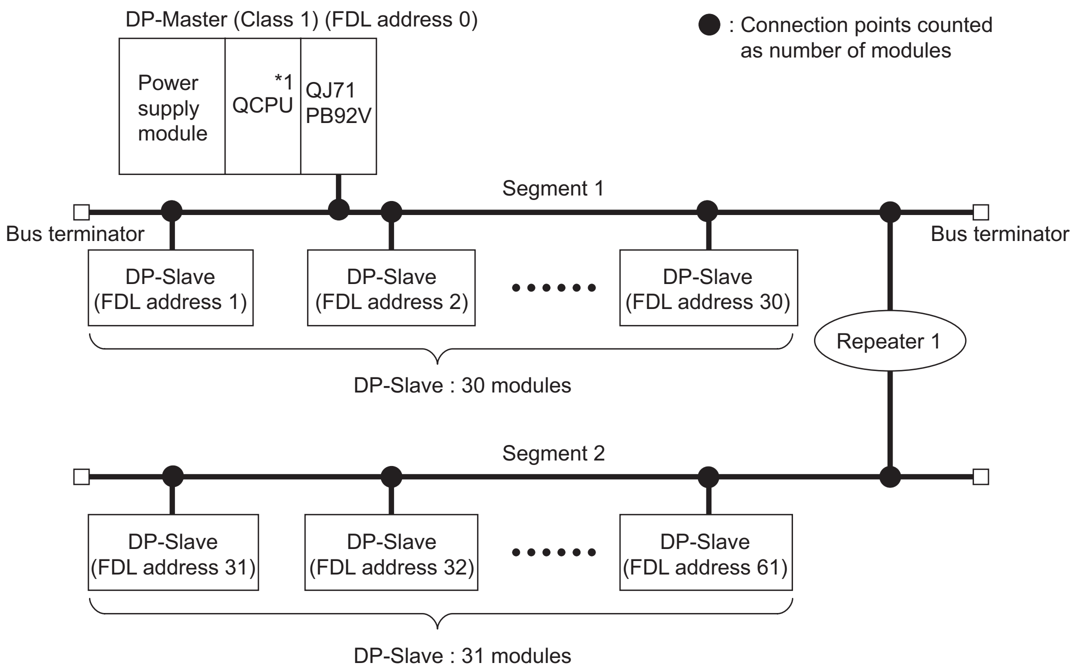


Figure 2.2 Maximum Configuration with a Repeater Connected

* 1 When using redundant CPUs, configure the network as shown in Section 2.3.

(3) **When 125 DP-Slaves are connected**
DP-Master (QJ71PB92V): 1
DP-Slaves: 125
Repeaters: 4

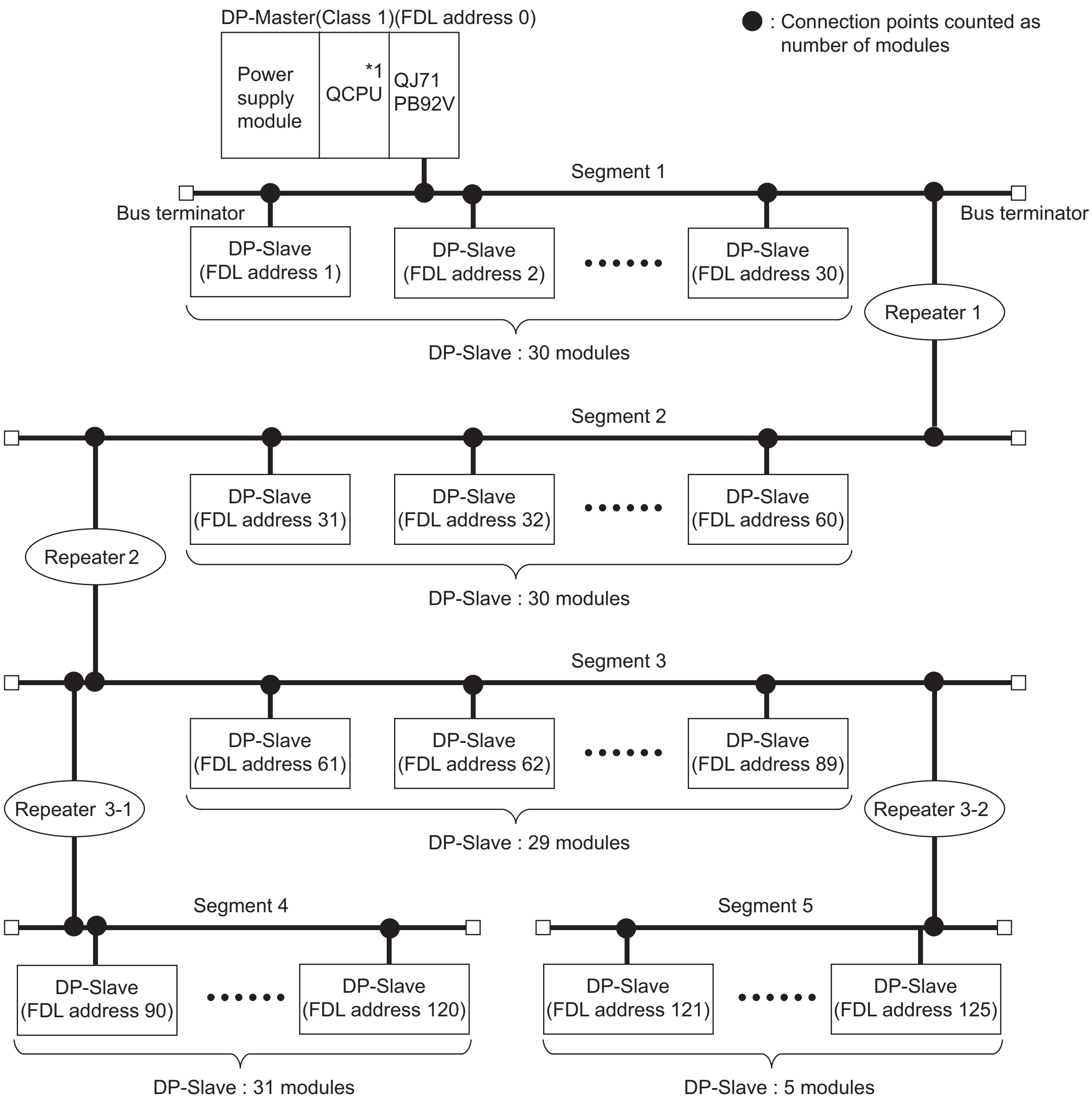


Figure 2.3 When 125 DP-Slaves are connected

* 1 When using redundant CPUs, configure the network as shown in Section 2.3.

(4) **When multiple DP-Masters are connected (Multi-master system)**
More than one DP-Master with different FDL addresses can be connected to the same network.

2.3 Redundant System Configuration (Redundant CPUs Only)

2.3.1 PROFIBUS-DP network configuration

This section explains configuration of a redundant PROFIBUS-DP system in which the QJ71PB92Vs are mounted.
For the redundant system using the QJ71PB92V, refer to Section 4.8.

(1) System equipment

The following table shows the equipment required for the redundant PROFIBUS-DP system.

Table2.5 System Equipment

System Equipment	Description
DP-Master (Class 1)	QJ71PB92V, function version D or later (Section 2.4)
Configuration tool	GX Configurator-DP Version 7 or later
DP-Slave	Redundant or non-redundant DP-Slave (QJ71PB93D, ST1H-PB, etc.)
Repeater	Required when 32 or more DP-Slaves are connected
PROFIBUS cable	Section 5.5.1
Bus terminator	

(2) Network configuration

To use the QJ71PB92V in a redundant PROFIBUS-DP system configuration, the following conditions must be met:

(a) Number of connectable modules in an entire network (When repeaters are used)
Control system QJ71PB92V + Standby system QJ71PB92V + DP-Slaves ≦ 126 * 1 * 2

* 1 Up to 124 DP-Slaves are connectable.
* 2 A redundant DP-Slave may have two FDL addresses (for control and standby systems). If all of the DP-Slaves are this type, the number of connectable DP-Slaves is 62.

(b) Number of connectable modules per segment
Control system QJ71PB92V + Standby system QJ71PB92V + DP-Slaves + Repeaters * 1 ≦ 32

* 1 A repeater are counted for both segments.

(c) Max. no. of repeaters
Up to 3 repeaters can be used for communication between the QJ71PB92V and any DP-Slave.

(d) Number of connectable DP-Slaves per QJ71PB92V
Up to 124 DP-Slaves can be connected to a single QJ71PB92V.

2.3.2 PROFIBUS-DP network configuration examples

(1) When using only non-redundant DP-Slaves

(a) Maximum Configuration With No Repeater Connected
DP-Master (QJ71PB92V): 2
DP-Slave: 30

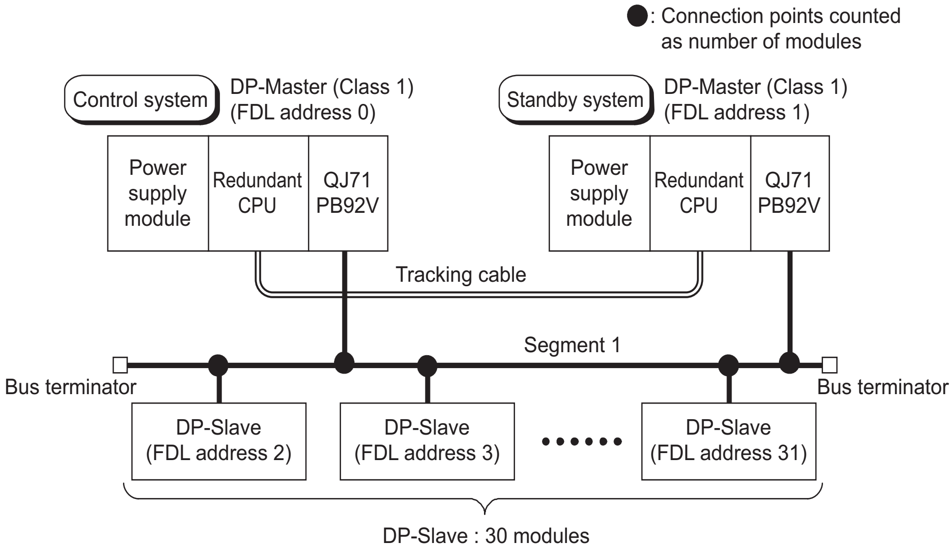


Figure 2.4 Maximum Configuration with No Repeater Connected (Non-Redundant DP-Slaves Only)

(b) Maximum configuration with a repeater connected

DP-Master (QJ71PB92V): 2
DP-Slave: 60
Repeater: 1

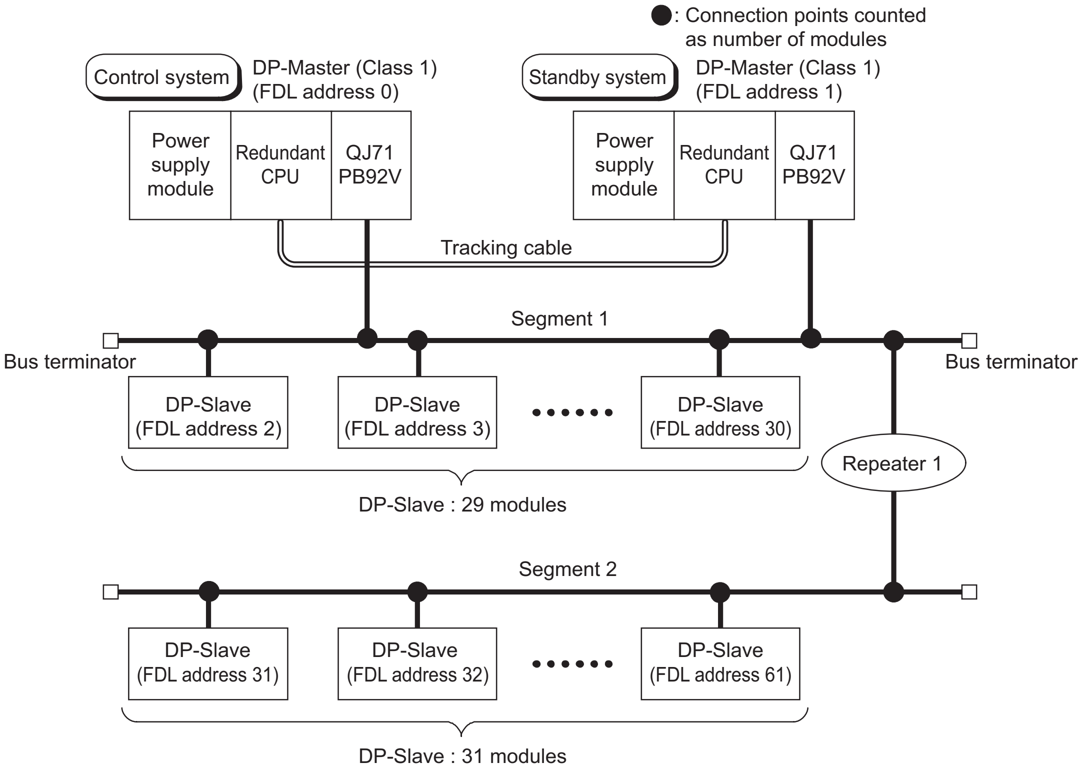


Figure 2.5 Maximum Configuration with a Repeater Connected (Non-Redundant DP-Slaves Only)

(c) When connecting 124 DP-Slaves
DP-Master (QJ71PB92V): 2
DP-Slave: 124
Repeater: 4

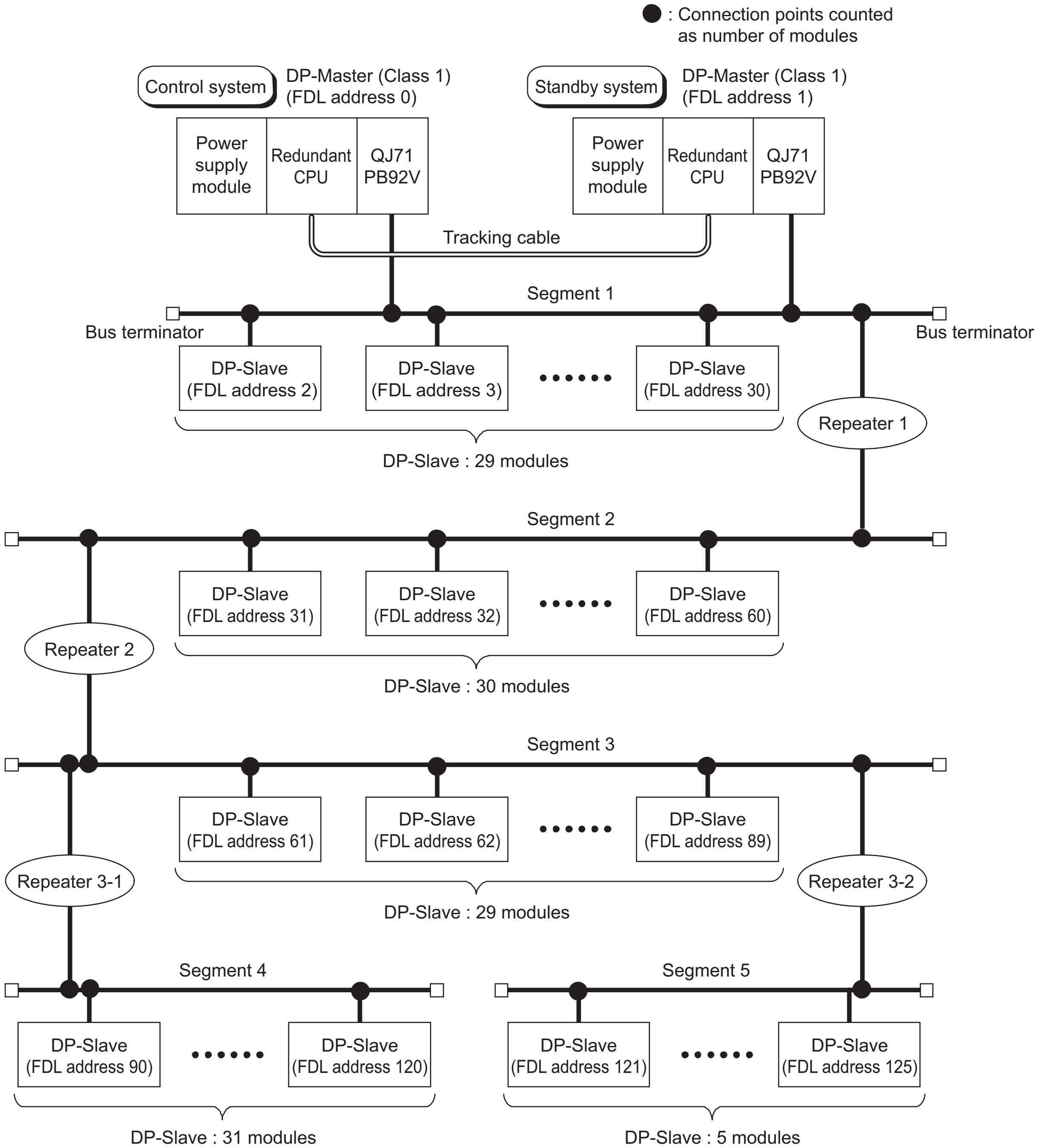


Figure 2.6 When Connecting 124 DP-Slaves (Non-Redundant DP-Slaves Only)

(2) When using only redundant DP-Slaves

DP-Master (QJ71PB92V): 2

DP-Slave: 30

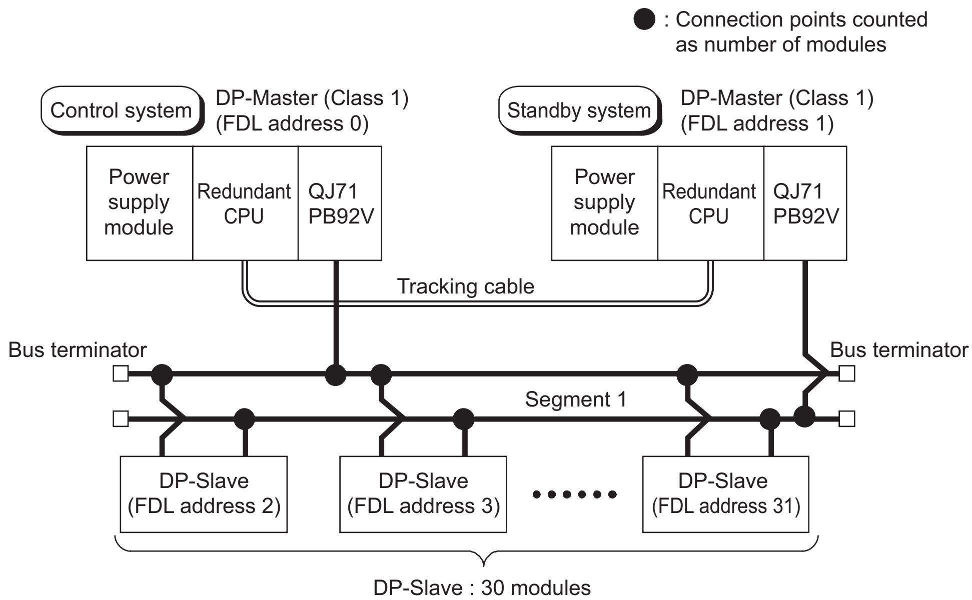


Figure 2.7 Maximum Configuration with No Repeater Connected (Redundant DP-Slaves Only)

(3) When using redundant and non-redundant DP-Slaves

DP-Master (QJ71PB92V): 2
Redundant DP-Slave: 29
Non-redundant DP-Slave: 30
Repeater: 2

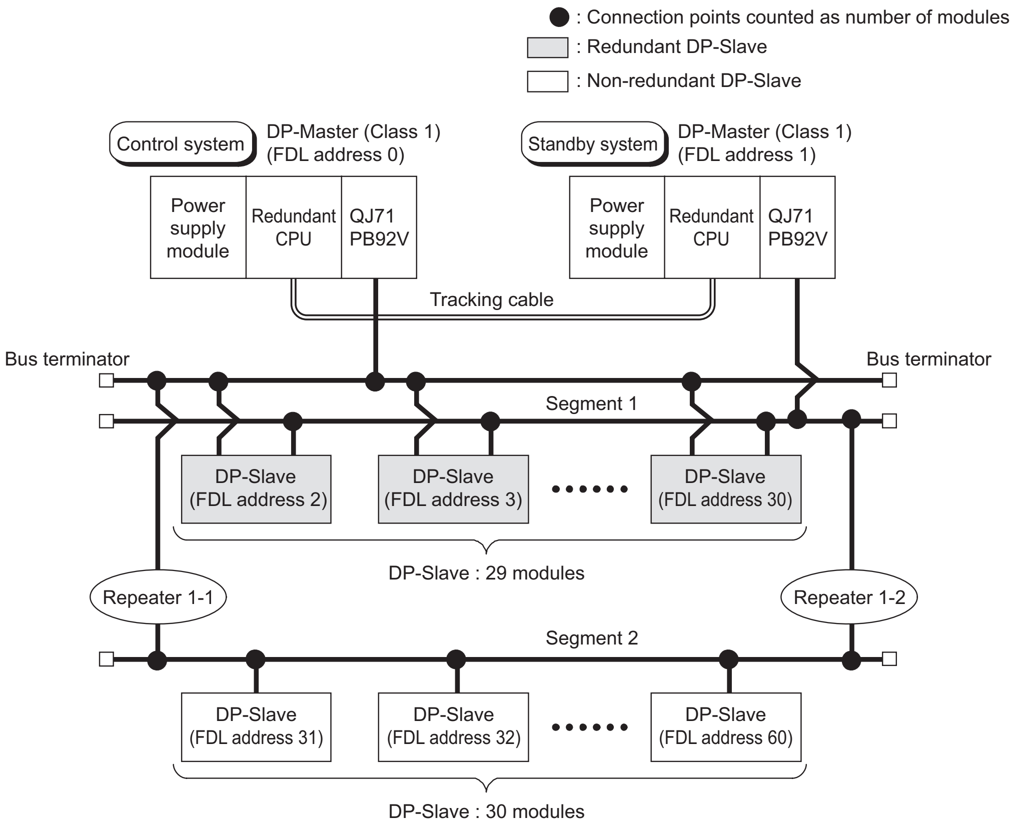


Figure 2.8 When Using Redundant and Non-Redundant DP-Slaves

POINT

Using repeaters, redundant DP-Slaves and non-redundant ones must be separately connected to different segments.

2.4 Checking the Function Version and Serial No.

This section explains how to check the function version and serial No. of the QJ71PB92V.

(1) Checking the "Rating plate" on the side of the module

The serial No. and function version of the module are printed in the SERIAL section of the rating plate.

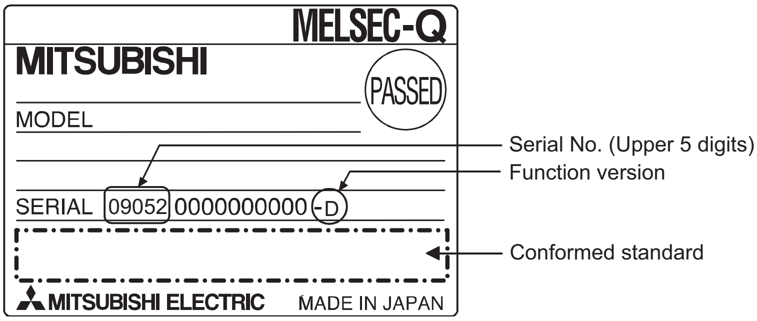
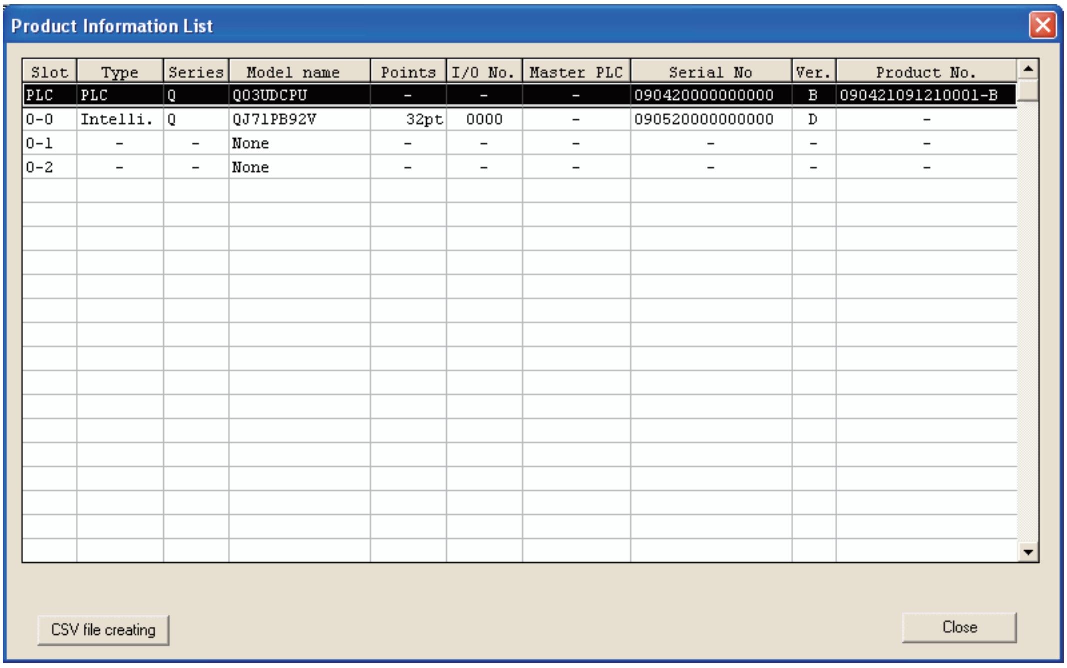


Figure 2.9 Rating Plate

(2) Checking through GX Developer

The following explains how to check the serial No. and function version of the module through GX Developer.
The serial No. and function version are displayed on the "Product information list" or "Module's Detailed Information" screen of GX Developer.
The procedure for checking the serial No. and function version on the "Product information list" screen is shown below.

Start Procedure
[Diagnostics] → [System monitor] → [Product inf. list]



Slot	Type	Series	Model name	Points	I/O No.	Master PLC	Serial No	Ver.	Product No.
PLC	PLC	Q	Q03UDCPU	-	-	-	090420000000000	B	090421091210001-B
0-0	Intelli.	Q	QJ71PB92V	32pt	0000	-	090520000000000	D	-
0-1	-	-	None	-	-	-	-	-	-
0-2	-	-	None	-	-	-	-	-	-

Figure 2.10 Product Information List

[Serial No., Ver., Product No.]

- The serial No. of the module is displayed in the "Serial No." column.
- The function version of the module is displayed in the "Ver." column.
- The serial No. (Product No.) shown on the rating plate is displayed in the "Product No." column. *1
  Note that "-" is displayed in the "Product No." column for the QJ71PB92V since this module is not supporting Product No. display.

* 1 The Product No. is displayed in the column only when the Universal model QCPU is used.

POINT

The serial No. shown on the rating plate may not match with the one displayed on Product information list of GX Developer.

- The serial No. on the rating plate indicates the management information of the product.
- The serial No. displayed on Product inf. list of GX Developer indicates the functional information of the product.
  The functional information of the product is updated when a new function is added.

CHAPTER3 SPECIFICATIONS

This chapter explains the performance and transmission specifications of the QJ71PB92V.
For details of the general specifications, refer to the QCPU User's Manual (Hardware Design, Maintenance and Inspection).

3.1 Performance Specifications

The performance specifications of the QJ71PB92V are given below.

Table3.1 Performance Specifications

Item			Specifications
PROFIBUS-DP station type			DP-Master (Class 1)
Transmission specifications			—
	Electrical standard/ characteristics		EIA-RS485 compliant
	Medium		Shielded twisted pair cable (Section 5.5.1)
	Network topology		Bus topology (Tree topology when repeaters are used)
	Data link method		• Between DP-Master and DP-Master: Token passing method • Between DP-Master and DP-Slave: Polling method
	Encoding method		NRZ
	Transmission speed *1		9.6 kbps to 12 Mbps ((1) in this section)
	Transmission distance		Differs depending on the transmission speed((1) in this section)
	Max. No. of repeaters		3 repeaters
	Number of connectable modules (Per segment)		32 per segment (including repeater(s))
	Number of connectable modules (Per network)		126 per network (total of DP-Masters and DP-Slaves (Section 2.2))
	Max. No. of DP-Slaves *2 (Per QJ71PB92V)		125 per QJ71PB92V (Section 2.2)
	I/O data size	Input data	Max. 8192 bytes (Max. 244 bytes per DP-Slave)
		Output data	Max. 8192 bytes (Max. 244 bytes per DP-Slave)
Number of writes to flash ROM			Max. 100000 times
No. of occupied I/O points			32 (I/O assignment: 32 intelligent points)
Internal current consumption (5VDC)			0.57 A
External dimensions			98(3.86 in.) (H) x 27.4(1.08 in.) (W) x 90(3.54 in.) (D) [mm]
Weight			0.13 kg

* 1 The transmission speed is controlled within ±0.2%. (Compliant with IEC 61158-2)
* 2 Up to 124 when the QJ71PB92V is mounted to a redundant system. (Section 2.3)

(1) Transmission distance

Table3.2 Transmission Distance

Transmission Speed	Transmission Distance	Max. Transmission Distance when Repeater is Used *1
9.6 kbps	1200 m (3937 ft.)/segment	4800 m (15748 ft.)/network
19.2 kbps		
93.75 kbps		
187.5 kbps	1000 m (3281 ft.)/segment	4000 m (13123 ft.)/network
500 kbps	400 m (1312 ft.)/segment	1600 m (5249 ft.)/network
1.5 Mbps	200 m (656 ft.)/segment	800 m (2625 ft.)/network
3 Mbps	100 m (328 ft.)/segment	400 m (1312 ft.)/network
6 Mbps		
12 Mbps		

* 1 The max. transmission distance in the table above is based on the case where 3 repeaters are used.
The calculation formula for the transmission distance extended using a repeater(s) is:
Max. transmission distance [m/network] =
(Number of repeaters + 1) x Transmission distance [m/segment]

3.2 Function List

The following table summarizes a list of QJ71PB92V functions.

Table3.3 Function List

Function		Description	Reference Section
PROFIBUS-DPV0		—	—
	I/O data exchange	Up to 125 DP-Slaves can be connected to a single QJ71PB92V, enabling the I/O data exchange of max. 8192 bytes. Note that it is limited up to 124 DP-Slaves when the QJ71PB92V is used in a redundant system.	Section 4.1.1
	Acquisition of diagnostic and extended diagnostic information	Diagnostic or extended diagnostic information of an error occurred on a DP-Slaves during I/O data exchange can be easily acquired using the buffer memory and I/O signals.	Section 4.1.2
	Global control function	By sending services (SYNC, UNSYNC, FREEZE, UNFREEZE) to each DP-Slave in a group, synchronous control of DP-Slave I/O data is available.	Section 4.1.3
PROFIBUS-DPV1		—	—
	Acyclic communication with DP-Slaves	This function allows data reading/writing to DP-Slaves at any specific timing independently of I/O data exchange.	Section 4.2.1
	Alarm acquisition	This function enables acquisition of up to 8 alarms or status information data that have been generated on any DP-Slave.	Section 4.2.2
	Support of FDT/DTM technology	Using a commercially available FDT, reading/writing the DP-Slave parameters and monitoring the DP-Slave status are executable via the QJ71PB92V.	Section 4.2.3
PROFIBUS-DPV2		—	—
	Time control over DP-Slaves	This function allows the QJ71PB92V to operate as the time master and set the time of each DP-Slave.	Section 4.3.1
Data swap function		This function swaps the upper and lower bytes in word units when I/O data is sent and received.	Section 4.4
Data consistency function		When I/O data from DP-Slaves are read from or written to the buffer memory, this function prevents the I/O data from being separated and incorrectly mixed. • Automatic refresh setting (GX Configurator-DP) • Dedicated instructions (BBLKRD and BBLKWR instructions)	Section 4.5
Output status setting for the case of a CPU stop error		This function sets whether to stop or continue I/O data exchange with DP-Slaves when a CPU stop error occurs on a QCPU or remote I/O station where the QJ71PB92V is mounted. When the QJ71PB92V is mounted to a redundant system, I/O data exchange with DP-Slaves is continued regardless of the setting until systems A and B go down.	Section 4.6
Temporary slave reservation function		Without modifying the slave parameter in GX Configurator-DP, this function allows the DP-Slave station type to be changed to "Reserved station" temporarily.	Section 4.7
Redundant system support function		When the control system CPU or the QJ71PB92V detects an error, the control and standby systems are switched each other to continue communications.	Section 4.8
QJ71PB92D-compatible function		This function is used to replace the QJ71PB92D with the QJ71PB92V. When the QJ71PB92D has failed, replace it with the QJ71PB92V using the QJ71PB92D-compatible function.	Section 4.9

3.3 Input/Output Signals to/from Programmable Controller CPU

This section explains the input/output signals of the QJ71PB92V.

3.3.1 List of I/O signals

The following I/O signal assignment is based on the case where the start I/O No. of the QJ71PB92V is "0000" (installed to slot 0 of the main base unit).
Device X represents input signals from the QJ71PB92V to the QCPU. Device Y represents output signals from the QCPU to the QJ71PB92V.
The following shows the I/O signals to/from the QCPU.

Table3.4 List of I/O Signals

Signal Direction: QJ71PB92V→QCPU		Signal Direction: QCPU→QJ71PB92V	
Device No.	**Signal Name**	**Device No.**	**Signal Name**
X00	Data exchange start completed signal	Y00	Data exchange start request signal
X01	Diagnostic information detection signal	Y01	Diagnostic information detection reset request signal
X02	Diagnostic information area cleared signal	Y02	Diagnostic information area clear request signal
X03	Use prohibited	Y03	Use prohibited
X04	Global control completed signal	Y04	Global control request signal
X05	Global control failed signal	Y05	Use prohibited
X06	Extended diagnostic information read response signal	Y06	Extended diagnostic information read request signal
X07	Use prohibited	Y07	Use prohibited
X08		Y08	
X09		Y09	
X0A		Y0A	
X0B		Y0B	
X0C	Data consistency requesting signal	Y0C	Data consistency start request signal
X0D	Use prohibited	Y0D	Restart request signal
X0E		Y0E	Use prohibited
X0F		Y0F	
X10	Operation mode signal	Y10	
X11	Operation mode change completed signal	Y11	Operation mode change request signal
X12	Use prohibited	Y12	Use prohibited
X13		Y13	
X14		Y14	
X15		Y15	
X16		Y16	
X17		Y17	
X18	Alarm read response signal	Y18	Alarm read request signal
X19	Time control start response signal	Y19	Time control start request signal

(To the next page)

Table3.4 List of I/O Signals (Continued)

Signal Direction: QJ71PB92V→QCPU		Signal Direction: QCPU→QJ71PB92V	
Device No.	Signal Name	Device No.	Signal Name
X1A	Use prohibited	Y1A	Use prohibited
X1B	Communication READY signal	Y1B	
X1C	Use prohibited	Y1C	
X1D	Module READY signal	Y1D	
X1E	Use prohibited	Y1E	
X1F	Watchdog timer error signal	Y1F	

POINT

Among the I/O signals for the QCPU, do not output (turn ON) the signals indicated as "Use prohibited."
If any of the "Use prohibited" signals is output, the programmable controller system may malfunction.

Remark

For how to use the output signals to continue or reexecute respective functions in event of system switching in the redundant system, refer to Section 7.9.

3.3.2 Details of I/O signals

(1) Data exchange start request signal (Y00), data exchange start completed signal (X00)

(a) Turn ON the Data exchange start request signal (Y00) to start I/O data exchange.

(b) When I/O data exchange is started after turning ON the Data exchange start request signal (Y00), the Data exchange start completed signal (X00) turns ON.
The Data exchange start completed signal (X00) turns OFF in any of the following cases:
- When the Data exchange start request signal (Y00) is turned OFF
- When an error causing stop of I/O data exchange occurs
- When parameters are currently being written to the QJ71PB92V from GX Configurator-DP
- When the operation mode of the QJ71PB92V has been changed
- When a communication error has occurred on a DP-Slave.(Only when the master parameter, "Error action flag" is checked)

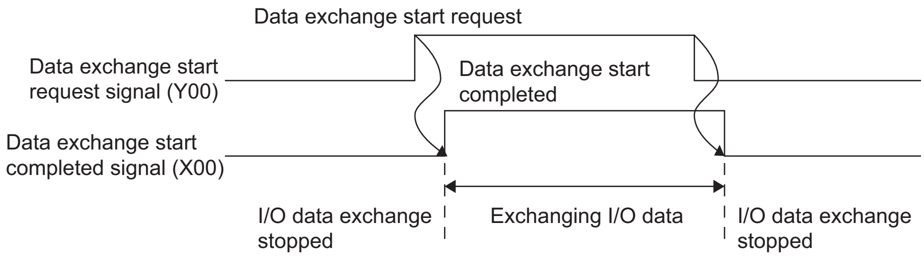


Figure 3.1 Data Exchange Start Request Signal (Y00), Data Exchange Start Completed Signal (X00)

(c) Use these signals as interlock signals when reading/writing I/O data.

(d) Write the initial values of the output data to the buffer memory before turning ON the Data exchange start request signal (Y00).

(e) Turning OFF the Data exchange start request signal (Y00) clears the information in the following areas.
The information in the other buffer memory areas is held.
- Slave status area (Normal communication detection) (Un\G23040 to Un\G23047)
- Slave status area (Diagnostic information detection) (Un\G23056 to Un\G23064)

(2) Diagnostic information detection reset request signal (Y01), Diagnostic information detection signal (X01)

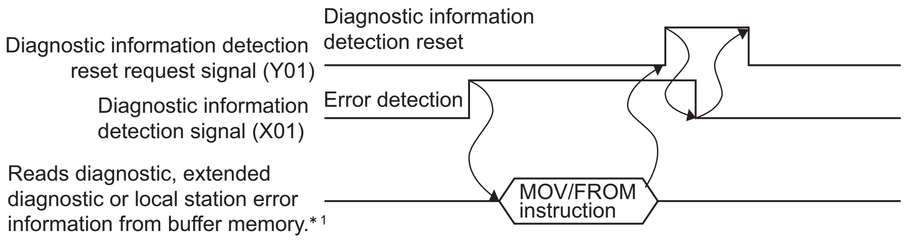
(a) The Diagnostic information detection signal (X01) turns ON when a communication error is detected after the time preset in Diagnostic information non-notification time setting area (Un\G2084) has elapsed.
The following processing is performed at the same time that the Diagnostic information detection signal (X01) turns ON:
- The RSP ERR. LED turns ON.
- The diagnostic information is stored in the Diagnostic information area (for mode 3) (Un\G23072 to Un\G23321).
The extended diagnostic information is stored in the Extended diagnostic information area (for mode 3) (Un\G23328 to Un\G23454).
- The corresponding bit in the Slave status area (Diagnostic information detection) (Un\G23056 to Un\G23064) of the station that sent the diagnostic information turns ON.
- The error information of the QJ71PB92V is stored in the Local station error information area (Un\G23071).

(b) Turning ON the Diagnostic information detection reset request signal (Y01) turns OFF the Diagnostic information detection signal (X01).
The following processing is performed at the same time that the Diagnostic information detection signal (X01) turns OFF:
- The RSP ERR. LED turns OFF.
- The corresponding bit in the slave status area (Diagnostic information detection) (Un\G23056 to Un\G23064) of the station that sent the diagnostic information turns ON.

(c) When new diagnostics information is generated while the Diagnostic information detection reset request signal (Y01) is ON, the behavior is as follows:
- The Diagnostic information detection signal (X01) does not turn ON.
- The RSP ERR. LED does not turn ON.
- The corresponding bit in the Slave status area (Diagnostic information detection) (Un\G23056 to Un\G23064) of the station that sent the diagnostic information does not turn ON.

(d) After the Diagnostic information detection signal (X01) turns OFF, take actions for the error cause and turn OFF the Diagnostic information detection reset request signal (Y01).

(e) After the Diagnostic information detection signal (X01) is turned OFF, the QJ71PB92V checks for diagnostic information again.
If any diagnostic information has been generated, the Diagnostic information detection signal (X01) turns ON, and processing at (a) is performed.



*1 Diagnostic information area (for mode 3) (Un\G23072 to Un\G23321)
Extended diagnostic information area (for mode 3) (Un\G23328 to Un\G23454)
Local station error information area (Un\G23071)

Figure 3.2 Diagnostic Information Detection Reset Request Signal (Y01), Diagnostic Information Detection Signal (X01)

Remark

Turning ON the Diagnostic information detection reset request signal (Y01) does not clear the information shown below.
To clear the following information, turn ON the Diagnostic information area clear request signal (Y02).

- Diagnostic information area (for mode 3) (Un\G23072 to Un\G23321)
- Extended diagnostic information area (for mode 3) (Un\G23328 to Un\G23454)
- Local station error information area (Un\G23071)

(3) Diagnostic information area clear request signal (Y02), Diagnostic information area cleared signal (X02)

(a) Turn ON the Diagnostic information area clear request signal (Y02) when clearing the following information:
- Diagnostic information area (for mode 3) (Un\G23072 to Un\G23321)
- Extended diagnostic information area (for mode 3) (Un\G23328 to Un\G23454)
- Local station error information area (Un\G23071)

(b) When the Diagnostic information area clear request signal (Y02) is turned ON, and the processing at (a) is completed, the Diagnostic information area cleared signal (X02) turns ON.

(c) When new diagnostics information is generated while the Diagnostic information area clear request signal (Y02) is ON, the following information stays cleared. (No diagnostic, extended diagnostic or local station error information is stored.)
- Diagnostic information area (for mode 3) (Un\G23072 to Un\G23321)
- Extended diagnostic information area (for mode 3) (Un\G23328 to Un\G23454)
- Local station error information area (Un\G23071)

(d) After the Diagnostic information area cleared signal (X02) has turned ON, turn OFF the Diagnostic information area clear request signal (Y02).

(e) Taking corrective actions for the error and turning OFF the Diagnostic information area clear request signal (Y02) turns OFF the Diagnostic information area cleared signal (X02).

(f) After the Diagnostic information area clear request signal (Y02) is turned OFF, the QJ71PB92V checks for diagnostic information again.
If any diagnostic information has been generated, the diagnostic information, extended diagnostic information and/or local station error information is stored in the buffer memory.

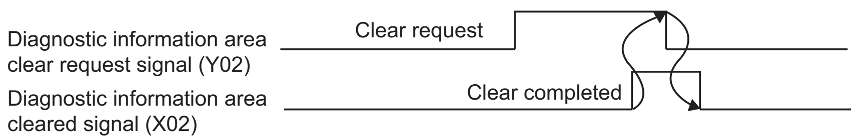


Figure 3.3 Diagnostic Information Area Clear Request Signal (Y02), Diagnostic Information Area Cleared Signal (X02)

(4) Global control request signal (Y04), Global control completed signal (X04)

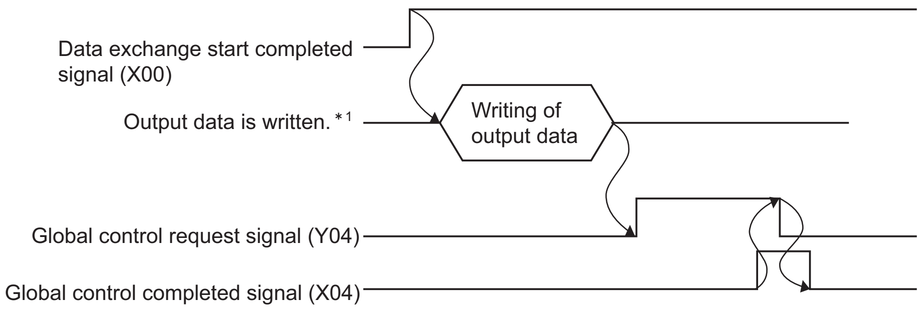
(a) Turn ON the Global control request signal (Y04) when executing the global control.

(b) When the Global control request signal (Y04) is turned ON, and global control processing is completed, the Global control completed signal (X04) turns ON.

(c) After the Global control completed signal (X04) has turned ON, turn OFF the Global control request signal (Y04).

(d) Turning OFF the Global control request signal (Y04) turns OFF the Global control completed signal (X04).

(e) Turn ON the Global control request signal (Y04) while the Data exchange start completed signal (X00) is ON.
If the Global control request signal (Y04) is turned ON with the Data exchange start completed signal (X00) OFF, both of the Global control completed signal (X04) and Global control failed signal (X05) turn ON.



*1 Output data area (for mode 3) (Un\G14336 to Un\G18431)

Figure 3.4 Global Control Request Signal (Y04), Global Control Completed Signal (X04)

(5) Global control failed signal (X05)

(a) If the Global control request signal (Y04) is turned ON while the Data exchange start completed signal (X00) is OFF, both the Global control completed signal (X04) and Global control failed signal (X05) turn ON.

(b) The ON status of the Global control failed signal (X05) means that the global control has failed.
Remedy the cause of the error, and execute the global control again.

(c) Turning OFF the Global control request signal (Y04) turns OFF the Global control failed signal (X05).

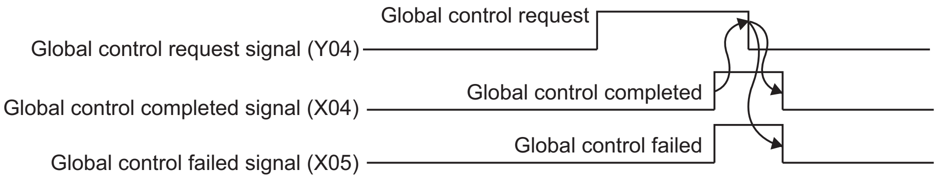


Figure 3.5 Global Control Failed Signal (X05)

Remark

For details on the global control, refer to Section 4.1.3.

(6) Extended diagnostic information read request signal (Y06), Extended diagnostic information read response signal (X06)

(a) Turn ON the Extended diagnostic information read request signal (Y06) when reading the extended diagnostic information of the FDL address specified in the Extended diagnostic information read request area (Un\G23456).

(b) Turning ON the Extended diagnostic information read request signal (Y06) clears the information of the Extended diagnostic information read response area (Un\G23457 to Un\G23583).

(c) When the Extended diagnostic information read request signal (Y06) is turned ON, and reading of the extended diagnostic information of the specified FDL address is completed, the Extended diagnostic information read response signal (X06) turns ON.

(d) After the Extended diagnostic information read response signal (X06) has turned ON, turn OFF the Extended diagnostic information read request signal (Y06).

(e) Turning OFF the Extended diagnostic information read request signal (Y06) turns OFF the Extended diagnostic information read response signal (X06).

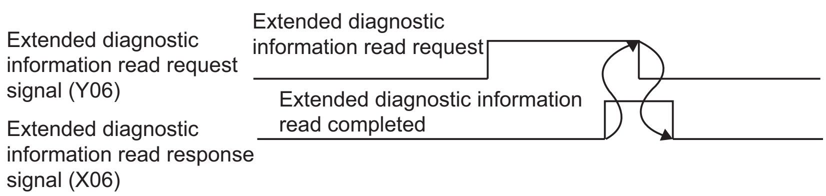


Figure 3.6 Extended Diagnostic Information Read Request Signal (Y06), Extended Diagnostic Information Read Response Signal (X06)

Remark

For details on acquisition of extended diagnostics information, refer to Section 4.1.2.

(7) Data consistency start request signal (Y0C), Data consistency requesting signal (X0C)

(a) The Data consistency start request signal (Y0C) is used to enable the data consistency function for dedicated instructions.

Table3.5 Data Consistency Start Request Signal (Y0C)

ON/OFF Status	Description
ON	Enables read/write executed by dedicated instructions. Turning ON the Data consistency start request signal (Y0C) turns ON the Data consistency requesting signal (X0C).
OFF	Disables read/write executed by dedicated instructions. Turning OFF the Data consistency start request signal (Y0C) turns OFF the Data consistency requesting signal (X0C), and the BBLKRD and BBLKWR instructions are not executed.

(b) Use the Data consistency start request signal (Y0C) and Data consistency requesting signal (X0C) as interlock signals for dedicated instructions.

(c) When using the data consistency function (automatic refresh) by the GX Configurator-DP, turn OFF the Data consistency start request signal (Y0C).

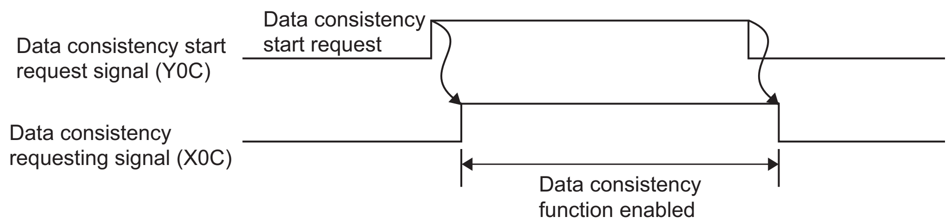


Figure 3.7 Data Consistency Start Request Signal (Y0C), Data Consistency Requesting Signal (X0C)

(8) Restart request signal (Y0D)

(a) If the QJ71PB92V has gone down for some reason (the FAULT LED: ON, the module READY signal (X1D): OFF), turning the Restart request signal (Y0D) OFF, ON and OFF again restarts the QJ71PB92V.

(b) After the QJ71PB92V is restarted, the status is the same as the one after:
- The programmable controller is turned OFF and back ON again.
- The QCPU is reset.

(9) Operation mode signal (X10)

This signal indicates whether or not the current operation mode is Communication mode (mode 3).

Table3.6 Operation Mode Signal (X10)

ON/OFF Status	Description
ON	Other than Communication mode (mode 3)
OFF	Communication mode (mode 3)

(10) Operation mode change request signal (Y11), Operation mode change completed signal (X11)

(a) Turn ON the Operation mode change request signal (Y11) when changing the operation mode to the one set in the Operation mode change request area (Un\G2255).
The operation mode can be changed without resetting the QCPU.

(b) Turning ON the Operation mode change request signal (Y11) clears the information of the Operation mode change result area (Un\G2256).

(c) The Operation mode change completed signal (X11) turns ON when the operation mode is changed, and the result of the change is stored to the Operation mode change result area (Un\G2256).

(d) Make sure that A300H (Normally completed) is stored in the Operation mode change result area (Un\G2256), and turn OFF the Operation mode change request signal (Y11).

(e) Turning OFF the Operation mode change request signal (Y11) turns OFF the Operation mode change completed signal (X11).

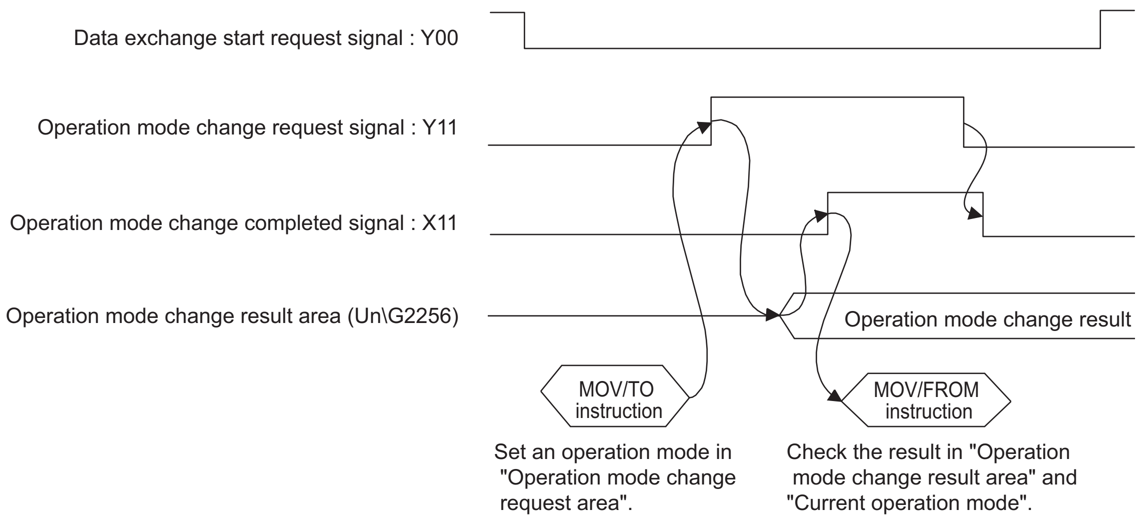


Figure 3.8 Operation mode change request signal (Y11), Operation mode change completed signal (X11)

POINT

(1) Do not turn the power OFF or reset the QCPU during the operation mode registration to the flash ROM by turning ON the Operation mode change request signal (Y11).
Turn the power OFF or reset the QCPU after the Operation mode change completed signal (X11) has turned ON.
If the power is turned OFF or the QCPU is reset by mistake, register the operation mode to the flash ROM again.

(2) If the redundant CPU is in the Backup mode, the operation mode of the QJ71PB92V cannot be changed.
An error code is stored in the Operation mode change result area (Un\G2256).
(Section 9.5.2)
The operation mode of the QJ71PB92V must be changed when the redundant CPU is in Separate or Debug mode. (QnPRHCPU User's Manual (Redundant System))

(11) Alarm read request signal (Y18), Alarm read response signal (X18)

(a) Turn ON the Alarm read request signal (Y18) when reading alarms on the specified DP-Slave according to the information set in the Alarm request area (Un\G26432 to Un\G26434).

(b) Turning ON the Alarm read request signal (Y18) clears the information in the Alarm response area (Un\G26446 to Un\G26768).
Note, however, that the information in the following areas are not cleared when the alarm ACK request (request code: 1501H) is executed:

Table3.7 Areas Not Cleared At Alarm ACK Request Execution

Buffer Memory Address DEC (HEX)	Description
26449 to 26484 (6751H to 6774H)	Area to which alarm data of alarm data No.1 is stored
26489 to 26524 (6779H to 679CH)	Area to which alarm data of alarm data No.2 is stored
26529 to 26564 (67A1H to 67C4H)	Area to which alarm data of alarm data No.3 is stored
26569 to 26604 (67C9H to 67ECH)	Area to which alarm data of alarm data No.4 is stored
26609 to 26644 (67F1H to 6814H)	Area to which alarm data of alarm data No.5 is stored
26649 to 26684 (6819H to 683CH)	Area to which alarm data of alarm data No.6 is stored
26689 to 26724 (6841H to 6864H)	Area to which alarm data of alarm data No.7 is stored
26729 to 26764 (6869H to 688CH)	Area to which alarm data of alarm data No.8 is stored

(c) The Alarm read response signal (X18) turns ON when alarms on the specified DP-Slave are read, and the execution result is stored to the Alarm response area (Un\G26446 to Un\G26768).

(d) Read the alarm information from the Alarm response area (Un\G26446 to Un\G26768), and turn OFF the Alarm read request signal (Y18).

(e) Turning OFF the Alarm read request signal (Y18) turns OFF, the Alarm read response signal (X18).

Remark

For details on acquisition of alarms, refer to Section 4.2.2.

(12) Time control start request signal (Y19), Time control start response signal (X19)

(a) Turn ON the Time control start request signal (Y19) when executing the time control over DP-Slaves according to the information set in the Time control setting request area (Un\G26784 to Un\G26792).

(b) Turning ON the Time control start request signal (Y19) clears the information in the Time control setting response area (Un\G26800 to Un\G26812).

(c) The Time control start response signal (X19) turns ON when the time control over DP-Slaves is executed, and the execution result is stored in the Time control setting response area (Un\G26800 to Un\G26812).

(d) Read the execution result from the Time control setting response area (Un\G26800 to Un\G26812), and turn OFF the Time control start request signal (Y19).

(e) Turning OFF the Time control start request signal (Y19) turns OFF the Time control start response signal (X19).

Remark

For details on time control over DP-Slaves, refer to Section 4.3.1.

(13) Communication READY signal (X1B)

(a) The Communication READY signal (X1B) turns ON when the Module READY signal (X1D) turns ON and I/O data exchange is ready to be started. (The signal turns ON only in the Communication mode (mode 3).)

(b) The signal turns OFF when an error disabling I/O data exchange occurs on the QJ71PB92V.

(c) Use the signal as an interlock signal for when turning ON the Data exchange start request signal (Y00).

(14) Module READY signal (X1D)

(a) This signal turns ON when the QJ71PB92V is started up. (This signal turns ON regardless of the operation mode.)

(b) While the QJ71PB92V is not ready, this signal is OFF.

(15) Watchdog timer error signal (X1F)

(a) This signal turns ON when a watchdog timer error occurs on the QJ71PB92V.

(b) The Watchdog timer error signal (X1F) does not turn OFF until:
- The programmable controller is turned OFF and back ON again, or
- The QCPU is reset.

3.4 Buffer Memory

This section explains the buffer memories of the QJ71PB92V.

3.4.1 Buffer memory list

The following shows a list of the buffer memories that are used for transferring data between the QJ71PB92V and the QCPU.

Table3.8 Buffer Memory List

Address DEC (HEX)	Name	Description	Initial value	Read/ Write*1	Reference Section
0 to 2079 (0$_H$ to 81F$_H$)	System area (Use prohibited)	—	—	—	—
2080 (820$_H$)	Diagnostic information invalid setting area	Values for masking (invalidating) diagnostic information from DP-Slaves are set in this area.	02B9$_H$	R/W	Section 3.4.6
2081 (821$_H$)	Global control area	The global control function to be executed is set in this area.	0	R/W	Section 3.4.9
2082 to 2083 (822$_H$ to 823$_H$)	System area (Use prohibited)	—	—	—	—
2084 (824$_H$)	Diagnostic information non-notification time setting area	This area is used to set the time during which no diagnostic information is notified after communication start.	20	R/W	Section 3.4.6
2085 (825$_H$)	Current diagnostic information non-notification time area	This area stores the time (remaining time) during which no diagnostic information is notified after communication start.	0	R	Section 3.4.6
2086 to 2253 (826$_H$ to 8CD$_H$)	System area (Use prohibited)	—	—	—	—
2254 (8CE$_H$)	Current operation mode area	This area stores data of the currently operating mode.	0001$_H$	R	Section 3.4.2
2255 (8CF$_H$)	Operation mode change request area	When executing the operation mode change request, a desired operation mode is set in this area.	FFFE$_H$	R/W	Section 3.4.3
2256 (8D0$_H$)	Operation mode change result area	This area stores the execution result of the operation mode change request.	0	R	Section 3.4.3
2257 (8D1$_H$)	Local FDL address display area	This area stores the FDL address of the local station.	FFFF$_H$	R	Section 3.4.2
2258 (8D2$_H$)	Offline test status area	This area stores the details or result of the self-diagnostic test.	0	R	Section 3.4.2
2259 (8D3$_H$)	Flash ROM storage mode	This area stores the operation mode currently stored in the flash ROM.	FFFF$_H$	R	Section 3.4.2
2260 to 2262 (8D4$_H$ to 8D6$_H$)	System area (Use prohibited)	—	—	—	—
2263 (8D7$_H$)	Control master FDL address display area	This area stores the FDL address of the control system QJ71PB92V when it is used in a redundant system.	*2	R	Section 3.4.14
2264 (8D8$_H$)	Standby master FDL address display area	This area stores the FDL address of the standby system QJ71PB92V when it is used in a redundant system.	*2	R	Section 3.4.14

* 1 This indicates whether or not read/write is possible from the sequence program.
R: Read only, R/W: Read/write executable
* 2 The initial value varies depending on the QCPU installed with the QJ71PB92V or the parameter.
(Section 3.4.14)

(To the next page)

Table3.8 Buffer Memory List (Continued)

Address DEC (HEX)	Name	Description	Initial value	Read/ Write*1	Reference Section
2265 to 2271 (8D9H to 8DFH)	System area (Use prohibited)	—	—	—	—
2272 (8E0H)	Current bus cycle time	This area stores the current bus cycle time.	0	R	Section 3.4.8
2273 (8E1H)	Min. bus cycle time	This area stores the minimum value of the bus cycle time.	0	R	Section 3.4.8
2274 (8E2H)	Max. bus cycle time	This area stores the maximum value of the bus cycle time.	0	R	Section 3.4.8
2275 to 6143 (8E3H to 17FFH)	System area (Use prohibited)	—	—	—	—
6144 to 10239 (1800H to 27FFH)	Input data area (for mode 3)	In Communication mode (mode 3), this area is used to store the input data received from each DP-Slave.	0	R	Section 3.4.4
10240 to 14335 (2800H to 37FFH)	System area (Use prohibited)	—	—	—	—
14336 to 18431 (3800H to 47FFH)	Output data area (for mode 3)	In Communication mode (mode 3), this area is used to set the output data to be sent to each DP-Slave.	0	R/W	Section 3.4.4
18432 to 22527 (4800H to 57FFH)	System area (Use prohibited)	—	—	—	—
22528 to 22777 (5800H to 58F9H)	Address information area (for mode 3)	In Communication mode (mode 3), this area is used to store the FDL address of each DP-Slave and I/O data length.	FFFFH	R	Section 3.4.4
22778 to 22783 (58FAH to 58FFH)	System area (Use prohibited)	—	—	—	—
22784 to 22908 (5900H to 597CH)	Input data start address area (for mode 3)	In Communication mode (mode 3), this area is used to store the start address (buffer memory address) of the input data of each DP-Slave.	0	R	Section 3.4.4
22909 to 22911 (597DH to 597FH)	System area (Use prohibited)	—	—	—	—
22912 to 23036 (5980H to 59FCH)	Output data start address area (for mode 3)	In Communication mode (mode 3), this area is used to store the start address (buffer memory address) of the output data of each DP-Slave.	0	R	Section 3.4.4
23037 to 23039 (59FDH to 59FFH)	System area (Use prohibited)	—	—	—	—
23040 to 23047 (5A00H to 5A07H)	Slave status area (Normal communication detection)	This area stores the communication status of each DP-Slave.	0	R	Section 3.4.5
23048 to 23055 (5A08H to 5A0FH)	Slave status area (Reserved station setting status)	This area stores the reserved or temporary slave reservation setting of each DP-Slave.	0	R	Section 3.4.5
23056 to 23064 (5A10H to 5A18H)	Slave status area (Diagnostic information detection)	This area stores the diagnostic information generation status of each DP-Slave.	0	R	Section 3.4.5
23065 to 23070 (5A19H to 5A1EH)	System area (Use prohibited)	—	—	—	—
23071 (5A1FH)	Local station error information area	This area stores the error information of the local station (QJ71PB92V).	0	R	Section 3.4.2
23072 to 23321 (5A20H to 5B19H)	Diagnostic information area (for mode 3)	In Communication mode (mode 3), this area is used to store the diagnostic information of the error occurred on each DP-Slave during communication.	0	R	Section 3.4.6

* 1 This indicates whether or not read/write is possible from the sequence program.
R: Read only, R/W: Read/write executable

(To the next page)

Table3.8 Buffer Memory List (Continued)

Address DEC (HEX)	Name	Description	Initial value	Read/ Write*1	Reference Section
23322 to 23327 (5B1AH to 5B1FH)	System area (Use prohibited)	—	—	—	—
23328 to 23454 (5B20H to 5B9EH)	Extended diagnostic information area (for mode 3)	In Communication mode (mode 3), this area is used to store the extended diagnostic information of the error occurred on each DP-Slave during communication.	0	R	Section 3.4.6
23455 (5B9FH)	System area (Use prohibited)	—	—	—	—
23456 (5BA0H)	Extended diagnostic information read request area	This area is used to set the FDL address of the station from which the extended diagnostic information is read.	FFFFH	R/W	Section 3.4.7
23457 to 23583 (5BA1H to 5C1FH)	Extended diagnostic information read response area	This area stores the execution result of the extended diagnostic information read request.	0	R	Section 3.4.7
23584 to 23591 (5C20H to 5C27H)	Parameter setting status area (Active station)	This area stores data of the DP-Slaves that are set to Normal DP-Slave by the slave parameters.	0	R	Section 3.4.5
23592 to 23599 (5C28H to 5C2FH)	Parameter setting status area (Reserved station)	This area stores data of the DP-Slaves that are set to Reserved station by the slave parameters.	0	R	Section 3.4.5
23600 to 23607 (5C30H to 5C37H)	Temporary slave reservation status area	This area stores data of the DP-Slaves that are set to Temporary slave reservation by the temporary slave reservation function.	0	R	Section 3.4.5
23608 to 23615 (5C38H to 5C3FH)	Temporary slave reservation request area	This area is used to set DP-Slaves to Temporary slave reservation using the temporary slave reservation function.	0	R/W	Section 3.4.13
23616 to 23647 (5C40H to 5C5FH)	System area (Use prohibited)	—	—	—	—
23648 to 23656 (5C60H to 5C68H)	System switching condition setting area (Disconnected station detection)	When the QJ71PB92V is mounted on a redundant system, this area is used to set the switching target DP-Slaves.	0	R/W	Section 3.4.14
23657 to 23663 (5C69H to 5C6FH)	System area (Use prohibited)	—	—	—	—
23664 to 23672 (5C70H to 5C78H)	System switching condition setting result area (Disconnected station detection)	When the QJ71PB92V is mounted on a redundant system, this area stores the switching target DP-Slaves.	0	R	Section 3.4.14
23673 to 23807 (5C79H to 5CFFH)	System area (Use prohibited)	—	—	—	—
23808 (5D00H)	Acyclic communication request execution instruction area	This area is used to set which request is to be executed in acyclic communications.	0	R/W	Section 3.4.10
23809 to 24832 (5D01H to 6100H)	Acyclic communication request area	This area is used to set the request data for acyclic communications.	0	R/W	Section 3.4.10
24833 to 25119 (6101H to 621FH)	System area (Use prohibited)	—	—	—	—
25120 (6220H)	Acyclic communication request result area	This area stores the request acceptance status and execution completion status in acyclic communications.	0	R	Section 3.4.10
25121 to 26144 (6221H to 6620H)	Acyclic communication response area	This area stores the execution result of acyclic communication.	0	R	Section 3.4.10

* 1 This indicates whether or not read/write is possible from the sequence program.
R: Read only, R/W: Read/write executable

(To the next page)

Table3.8 Buffer Memory List (Continued)

Address DEC (HEX)	Name	Description	Initial value	Read/ Write*1	Reference Section
26145 to 26415 (6621H to 672FH)	System area (Use prohibited)	—	—	—	—
26416 to 26424 (6730H to 6738H)	Slave status area (Alarm detection)	This area stores the alarm status of each DP-Slave.	0	R	Section 3.4.5
26425 to 26431 (6739H to 673FH)	System area (Use prohibited)	—	—	—	—
26432 to 26434 (6740H to 6742H)	Alarm request area	This area is used to set the request data for alarm acquisition.	0	R/W	Section 3.4.11
26435 to 26445 (6743H to 674DH)	System area (Use prohibited)	—	—	—	—
26446 to 26768 (674EH to 6890H)	Alarm response area	This area stores the execution result of alarm acquisition.	0	R	Section 3.4.11
26769 to 26783 (6891H to 689FH)	System area (Use prohibited)	—	—	—	—
26784 to 26792 (68A0H to 68A8H)	Time control setting request area	This area is used to set the request data for time control.	0	R/W	Section 3.4.12
26793 to 26799 (68A9H to 68AFH)	System area (Use prohibited)	—	—	—	—
26800 to 26812 (68B0H to 68BCH)	Time control setting response area	This area stores the execution result of time control.	0	R	Section 3.4.12
26813 to 32767 (68BDH to 7FFFH)	System area (Use prohibited)	—	—	—	—

* 1 This indicates whether or not read/write is possible from the sequence program.
R : Read only, RW : Read/write executable

☒POINT

Do not write any data to "System area (Use prohibited)".
Doing so may cause the programmable controller system to malfunction.

3.4.2 Local station information area

The information of the local station (QJ71PB92V) is stored in this area.

(1) Local station error information area (Un\G23071)

This area stores the error information of the local station (QJ71PB92V).

Table3.9 Local Station Error Information Area (Un\G23071)

Stored Value	Description
0000H	Normal
Other than 0000H	Error (Error code (Section 9.5.6))

POINT

The information in the Local station error information area (Un\G23071) is not cleared even if the problem occurred on the QJ71PB92V has been solved.
To clear the Local station error information area (Un\G23071), turn ON the Diagnostic information area clear request signal (Y02).

(2) Current operation mode area (Un\G2254)

This area stores the current operation mode value.

Table3.10 Current Operation Mode Area (Un\G2254)

Stored Value	Description
0001H	Parameter setting mode
0002H	Self-diagnostic mode
0003H	Communication mode (mode 3)
0009H	Flash ROM clear mode
0101H	Parameter setting mode *1
0103H	Communication mode (mode 3) *1

* 1 Operation mode currently registered to flash ROM

(3) Flash ROM storage mode (Un\G2259)

This area stores the operation mode currently stored to flash ROM.

Table3.11 Flash ROM Storage Mode (Un\G2259)

Stored Value	Description
0101H	Parameter setting mode
0103H	Communication mode (mode 3)
FFFFH	Not registered (No operation mode has been registered to the flash ROM.)

(4) Local FDL address display area (Un\G2257)

The FDL address of the local station is stored.

Table3.12 Local FDL Address Display Area (Un\G2257)

Stored Value	Description
0000H to 007DH (0 to 125)	The FDL address of the local station *1
FFFFH	Parameter not set

* 1 When the QJ71PB92V is mounted on a redundant system, the following address is stored.
When it is in the control system: Control master FDL address
When it is in the standby system: Standby master FDL address

(5) Offline test status area (Un\G2258)

The self-diagnostics test details or test result is stored in this area.
For details on the self-diagnostics test, refer to Section 5.4.

3.4.3 Operation mode change area

This area is used to change the operation mode of the local station (QJ71PB92V).
For changing the operation mode, refer to Section 6.2.

(1) Operation mode change request area (Un\G2255)

For execution of the operation mode change request, set a desired operation mode. (Initial value: FFFEH)
The initial value (FFFEH) is used for malfunction prevention.
If the Operation mode change request signal (Y11) is turned ON with the initial value stored in the Operation mode change request area (Un\G2255), E300H is stored in the Operation mode change result area (Un\G2256) and the operation mode is not changed.

Table3.13 Operation Mode Change Request Area (Un\G2255)

Set Value	Description
0001H	The mode is changed to Parameter setting mode.
0002H	The mode is changed to Self-diagnostics mode.
0003H	The mode is changed to Communication mode (mode 3).
0009H	The mode is changed to Flash ROM clear mode.
0101H	The mode is changed to Parameter setting mode. The Parameter setting mode is registered to the flash ROM at the same time as the operation mode change.
0103H	The mode is changed to Communication mode (mode 3). The Communication mode (mode 3) is registered to the flash ROM at the same time as the operation mode change.
FFFFH	The mode is changed to Parameter setting mode. The mode registered to the flash ROM is deleted at the same time as the operation mode change.

POINT

If the redundant CPU is in the Backup mode, the operation mode of the QJ71PB92V cannot be changed.
An error code is stored in the Operation mode change result area (Un\G2256).
(Section 9.5.2)
The operation mode of the QJ71PB92V must be changed when the redundant CPU is in Separate or Debug mode. (QnPRHCPU User's Manual (Redundant System))

(2) Operation mode change result area (Un\G2256)

This area stores the execution result of the operation mode change request.

Table3.14 Operation Mode Change Result Area (Un\G2256)

Stored Value	Description
A300H	Normally completed
Other than A300H	Failed (Error code (Section 9.5.2))

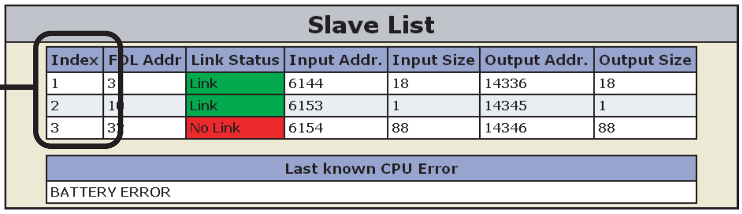
3.4.4 I/O data exchange area

This area is used for the I/O data exchange function.

POINT

(1) Data are assigned to the I/O data exchange area in the order of parameters set in GX Configurator-DP (in the order of FDL addresses).
The actual assignment order can be confirmed in the Address information area (for mode 3) (Un\G22528 to Un\G22777) or in Slave List of GX Configurator-DP.

Order of assignment



Slave List

Index	FDL Addr	Link Status	Input Addr.	Input Size	Output Addr.	Output Size
1	3	Link	6144	18	14336	18
2	1[illegible]	Link	6153	1	14345	1
3	3[illegible]	No Link	6154	88	14346	88

Last known CPU Error
BATTERY ERROR

(2) When parameters have been modified (deletion or addition of DP-Slave(s)) on GX Configurator-DP, the buffer memory is reassigned.
After modifying parameters, review the sequence program.
If some DP-Slaves are expected to be connected to the network in the future, setting them as Reserved stations in the parameter setting eliminates the need to check the sequence program. (Section 6.5)

(3) Input data of a DP-Slave*1, which has failed in I/O data exchange, are not stored in the Input data area of the QJ71PB92V.
Data stored before the fault are held in the relevant Input data area for the DP-Slave.

* 1 DP-Slave corresponding to the bit that is turned OFF in the Slave status area (Normal communication detection) (Un\G23040 to Un\G23047)

(1) Input data area (for mode 3) (Un\G6144 to Un\G10239)

When the operation mode is Communication mode (mode 3), input data from DP-Slaves are stored in this area.

(a) Data length setting

The data length (unit: byte) for each station is variable and assigned based on the slave parameter (Select Modules) set on GX Configurator-DP.
For the DP-Slave that has a fixed data length, the slave parameter (Select Modules) setting is ignored.

(b) Data length range

The maximum data length per module is 244 bytes, and the total data length for all DP-Slaves can be set up to 8192 bytes.
When the data length is an odd number of bytes, 00H is stored to the final high byte.
The input data of the next station is assigned starting from the next buffer memory address.

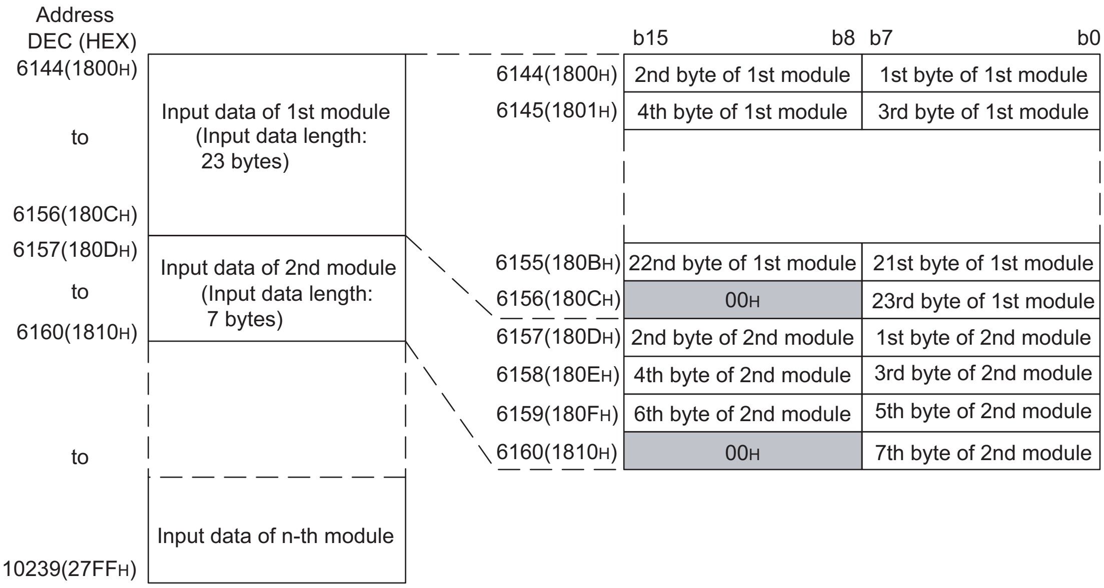
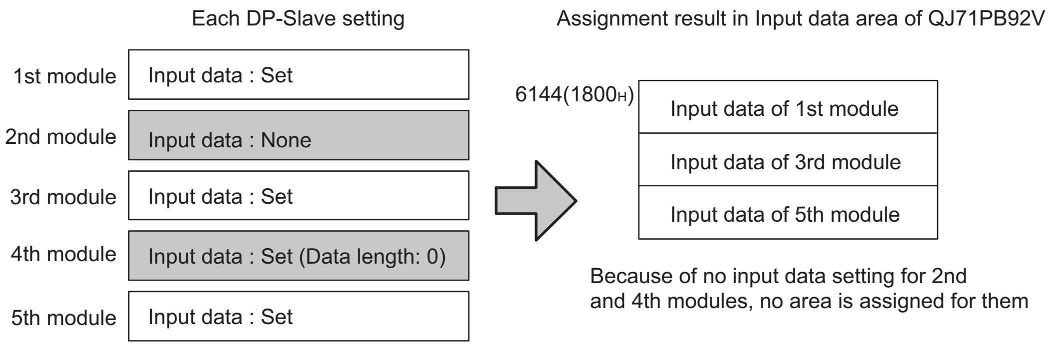


Figure 3.9 Example of Input Data Assignment (1st module: 23 bytes, 2nd module: 7 bytes)

☒POINT

If a DP-Slave with no input data is assigned, its space in the input data area is taken over by the next station with input data, as shown below.



(2) **Output data area (for mode 3) (Un\G14336 to Un\G18431)**

When the operation mode is Communication mode (mode 3), output data to DP-Slaves are set.

(a) Data length setting

The data length (unit: byte) of each station is variable and assigned based on the slave parameter (Select Modules) set on GX Configurator-DP.
For the DP-Slave that has a fixed data length, the slave parameter (Select Modules) setting is ignored.

(b) Data length range

The maximum data length per module is 244 bytes, and the total data length for all DP-Slaves can be set up to 8192 bytes.
When the data length is an odd number of bytes, the final high byte is occupied.
Set 00H to the final high byte.
The output data of the next station is assigned starting from the next buffer address.

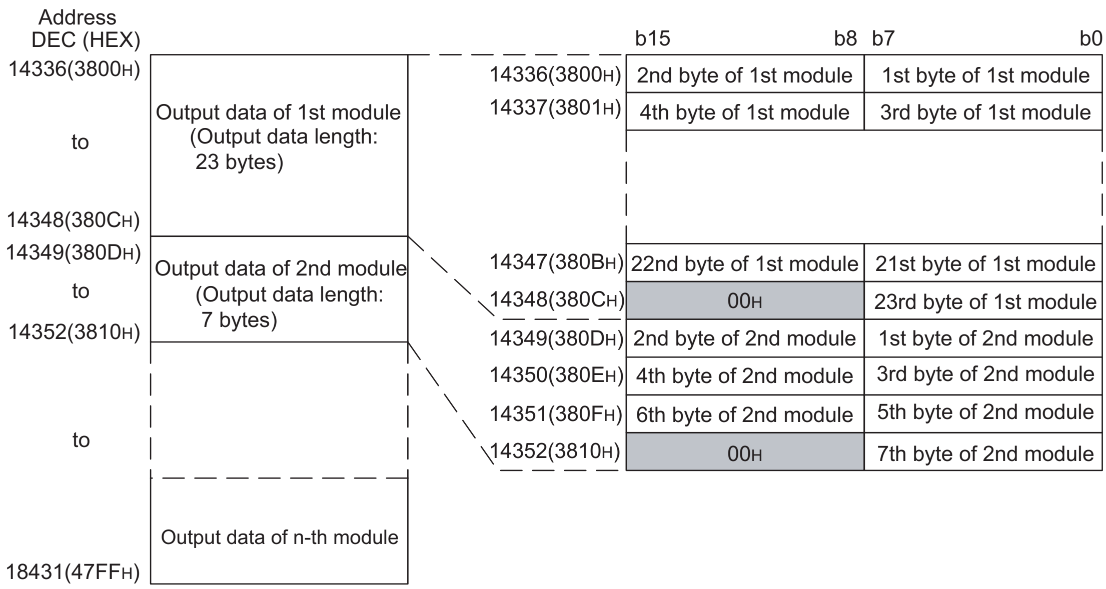
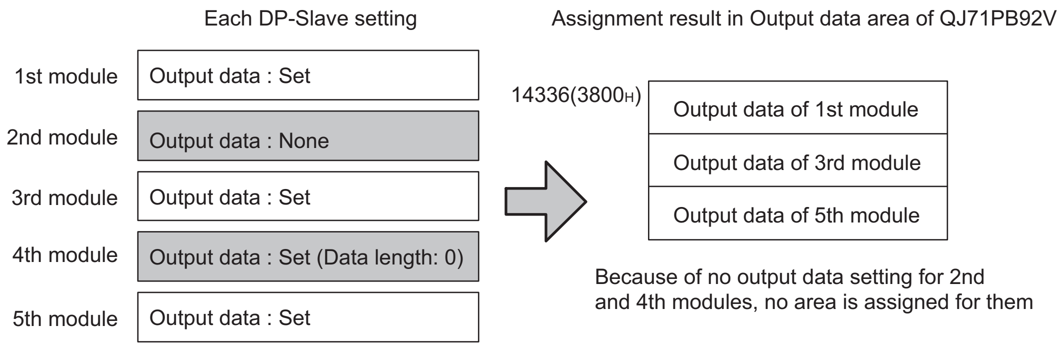


Figure 3.10 Example of Output Data Assignment (1st module: 23 bytes, 2nd module: 7 bytes)

POINT

If a DP-Slave with no output data is assigned, its space in the output data area is taken over by the next station with output data, as shown below.



(3) Address information area (for mode 3) (Un\G22528 to Un\G22777)

When the operation mode is Communication mode (mode 3), the FDL address and I/O data length of each DP-Slave are stored in this area.
Information of 125 modules is stored in the Address information area (for mode 3) in the same order for each module.
Information for reserved or temporary slave reservation is also stored.

Address DEC (HEX)	
22528(5800$_H$)	FDL address of 1st module
22529(5801$_H$)	I/O data length of 1st module
22530(5802$_H$)	FDL address of 2nd module
22531(5803$_H$)	I/O data length of 2nd module
to	
22776(58F8$_H$)	FDL address of 125th module
22777(58F9$_H$)	I/O data length of 125th module

	b15 to b8	b7 to b0
22528(5800$_H$)	The FDL address of the 1st module is stored. (Initial value: FFFF$_H$) 0000$_H$ to 007D$_H$ (0 to 125): FDL address FFFF$_H$: No FDL address assigned	
22529(5801$_H$)	The input data length of the 1st module is stored. (Initial value: FF$_H$) *1 00$_H$ to F4$_H$: Input data length (unit: byte) FF$_H$: Input data not assigned	The output data length of the 1st module is stored. (Initial value: FF$_H$) *1 00$_H$ to F4$_H$: Output data length (unit: byte) FF$_H$: Output data not assigned

Figure 3.11 Address Information Area (for mode 3) (Un\G22528 to Un\G22777)

* 1 The difference between 00$_H$ and FF$_H$ is as follows:
00$_H$ means that input or output data are assigned with the data length set to 0.
FF$_H$ shows that assigned input or output data do not exist.

(4) Input data start address area (for mode 3) (Un\G22784 to Un\G22908)

When the operation mode is Communication mode (mode 3), the start address (buffer memory address) for each DP-Slave's input data is stored in this area.
Creating a sequence program utilizing the Input data start address area (for mode 3) (Un\G22784 to Un\G22908) allows address specification of the Input data area without consideration of the input points for each DP-Slave.
Information of 125 modules is stored in the Input data start address area (for mode 3) in the same order for each module.

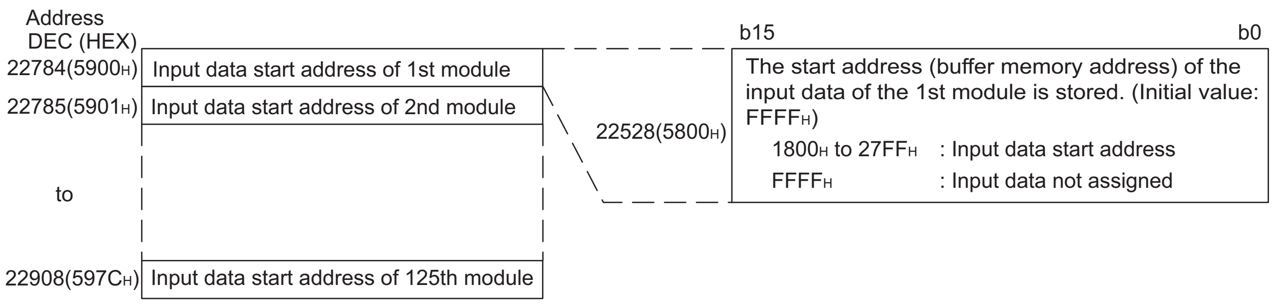


Figure 3.12 Input Data Start Address Area (for mode 3) (Un\G22784 to Un\G22908)

(5) Output data start address area (for mode 3) (Un\G22912 to Un\G23036)

When the operation mode is Communication mode (mode 3), the start address (buffer memory address) for each DP-Slave's output data is stored in this area.
Creating a sequence program utilizing the Output data start address area (for mode 3) (Un\G22912 to Un\G23036) allows address specification of the Output data area without consideration of the output points for each DP-Slave.
Information of 125 modules is stored in the Output data start address area (for mode 3) in the same order for each module.

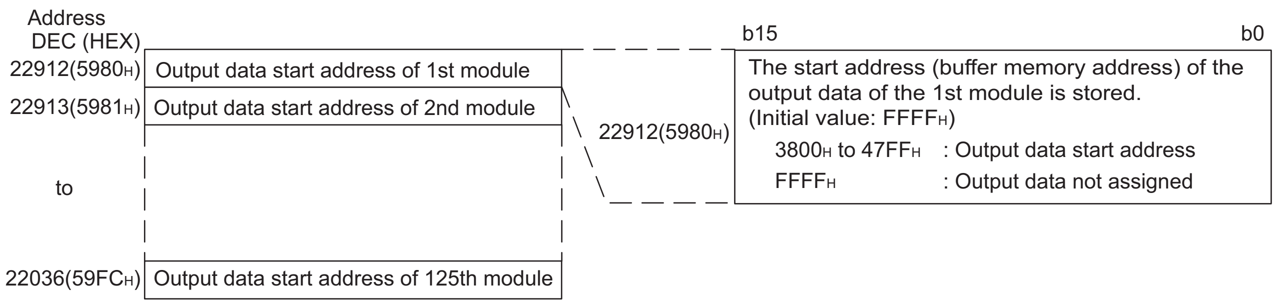


Figure 3.13 Output Data Start Address Area (for mode 3) (Un\G22912 to Un\G23036)

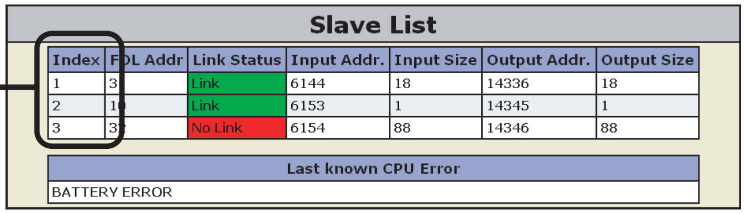
3.4.5 Slave status area

This area stores the operation status of each DP-Slave.

POINT

(1) The corresponding bits of the Slave status area are assigned in order of the parameters set in GX Configurator-DP (in order of the FDL address).
The actual assignment order can be confirmed in the Address information area (for mode 3) (Un\G22528 to Un\G22777) or in Slave List of GX Configurator-DP.

Order of assignment



(2) When parameters have been modified (deletion or addition of DP-Slave(s)) on GX Configurator-DP, the buffer memory is reassigned.
After modifying parameters, review the sequence program.
If some DP-Slaves are expected to be connected to the network in the future, setting them as Reserved stations in the parameter setting eliminates the need to check the sequence program. (☞ Section 6.5)

(1) Slave status area (Normal communication detection) (Un\G23040 to Un\G23047)

The communication status of each DP-Slave is stored in this area. (Initial value: 0000H)
When the Data exchange start request signal (Y00) is turned OFF, all the information of the Slave status area (Normal communication detection) (Un\G23040 to Un\G23047) is cleared.

0: I/O data communication error, or no communication (including reserved, temporary slave reservation and/or not-configured stations)
1: Exchanging I/O data

Address DEC (HEX)	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
23040(5A00H)	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
23041(5A01H)	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
23042(5A02H)	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
23043(5A03H)	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
23044(5A04H)	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
23045(5A05H)	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
23046(5A06H)	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
23047(5A07H)	*1	*1	*1	125	124	123	122	121	120	119	118	117	116	115	114	113

Each bit indicates the n-th DP-Slave.

*1 Bits b15 to b13 of address 23047 (5A07H) are fixed to 0.

Figure 3.14 Slave Status Area (Normal communication detection) (Un\G23040 to Un\G23047)

Turning ON the Data exchange start request signal (Y00) updates the information in the Slave status area (Normal communication detection) (Un\G23040 to Un\G23047), turning ON (1) the bits of the DP-Slave currently exchanging I/O data.

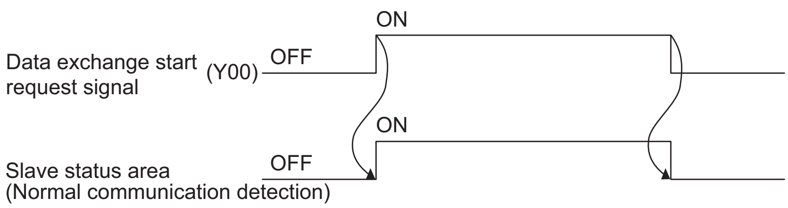


Figure 3.15 Operation in Slave Status Area (Normal communication detection) (When I/O data exchange is normal)

When an I/O data communication error occurs on a DP-Slave, the corresponding bit turns OFF (0), and it turns ON (1) again when normal status is restored.

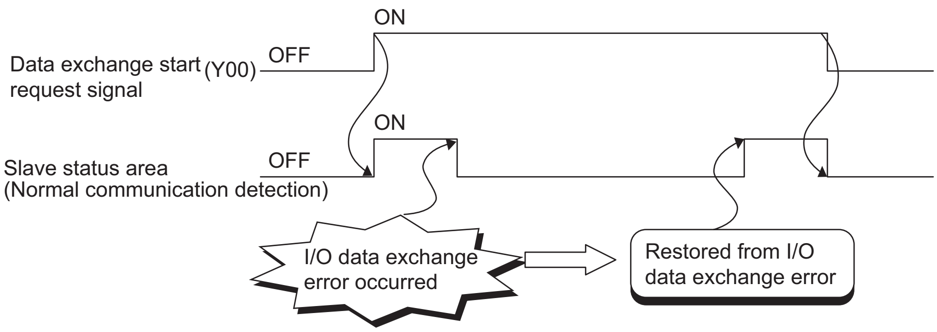


Figure 3.16 Operation in Slave Status Area (Normal communication detection) (When I/O data exchange error occurred)

(2) Slave status area (Reserved station setting status) (Un\G23048 to Un\G23055)

This area stores the reserved or temporary slave reservation setting of each DP-Slave. (Initial value: 0000_H)

0: Normal DP-Slave or not-configured station
1: Reserved or temporary slave reservation

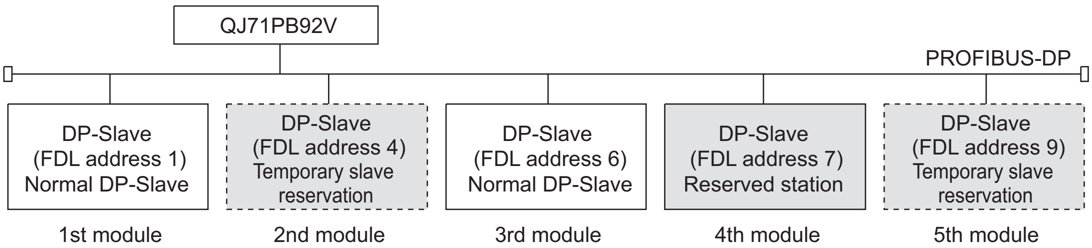
Address DEC (HEX)	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
23048($5A08_H$)	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
23049($5A09_H$)	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
23050($5A0A_H$)	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
23051($5A0B_H$)	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
23052($5A0C_H$)	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
23053($5A0D_H$)	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
23054($5A0E_H$)	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
23055($5A0F_H$)	*1	*1	*1	125	124	123	122	121	120	119	118	117	116	115	114	113

Each bit indicates the n-th DP-Slave.

*1 Bits b15 to b13 of address 23055 ($5A0F_H$) are fixed to 0.

Figure 3.17 Slave Status Area (Reserved station setting status) (Un\G23048 to Un\G23055)

When the Data exchange start completed signal (X00) is turned ON, the data in the Slave status area (Reserved station setting status) (Un\G23048 to Un\G23055) are updated. The following is an example.



Results stored in Slave status area (Reserved station setting status) (Un\G23048 to Un\G23055)

Address DEC(HEX)	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
23048($5A08_H$)	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0

Figure 3.18 An Example in Slave Status Area (Reserved Station Setting Status)

(3) Slave status area (Diagnostic information detection) (Un\G23056 to Un\G23064)

The information on diagnostic status of each DP-Slave is stored in this area.
When the Data exchange start request signal (Y00) is turned OFF, all the information of the Slave status area (Diagnostic information detection) (Un\G23056 to Un\G23064) is cleared.

(a) All stations' diagnostic status (Un\G23056)

This area stores the diagnostic information detection status of all DP-Slaves. (Initial value: 0000_H)
If diagnostic information is detected in any one of the stations in Each station's diagnostic status (Un\G23057 to Un\G23064), 1 is stored in All stations' diagnostic status (Un\G23056).

0: All DP-Slaves normal
1: Diagnostic error information detected

(b) Each station's diagnostic status (Un\G23057 to Un\G23064)

This area stores the diagnostic information detection status of each DP-Slave. (Initial value: 0000_H)

0: Normal (including reserved, temporary slave reservation and/or not-configured stations)
1: Diagnostic information detected

Address DEC(HEX)	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
23057(5A11H)	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
23058(5A12H)	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
23059(5A13H)	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
23060(5A14H)	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
23061(5A15H)	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
23062(5A16H)	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
23063(5A17H)	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
23064(5A18H)	*1	*1	*1	125	124	123	122	121	120	119	118	117	116	115	114	113

Each bit indicates the n-th DP-Slave.

*1 Bits b15 to b13 of address 23064 (5A18H) are fixed to 0.

Figure 3.19 Each Station's Diagnostic Status (Un\G23057 to Un\G23064)

(4) Parameter setting status area (Active station) (Un\G23584 to Un\G23591)

This area stores data of the DP-Slaves that are set to Normal DP-Slave by the slave parameters. (Initial value: 0000_H)

The set data are stored when the Communication READY signal (X1B) turns ON.

0: Reserved or not-configured station

1: Normal DP-Slave

Address DEC(HEX)	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
23584(5C20H)	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
23585(5C21H)	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
23586(5C22H)	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
23587(5C23H)	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
23588(5C24H)	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
23589(5C25H)	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
23590(5C26H)	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
23591(5C27H)	*1	*1	*1	125	124	123	122	121	120	119	118	117	116	115	114	113

Each bit represents the n-th DP-Slave

*1 The bits, b15 to b13 of address 23591 ($5C27_H$) are fixed to 0.

Figure 3.20 Parameter setting status area (Active station) (Un\G23584 to Un\G23591)

(5) Parameter setting status area (Reserved station) (Un\G23592 to Un\G23599)

This area stores data of the DP-Slaves that are set to Reserved station by the slave parameters. (Initial value: 0000_H)

The set data are stored when the Communication READY signal (X1B) turns ON.

0: Normal DP-Slave or not-configured station

1: Reserved station

Address DEC(HEX)	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
23592(5C28H)	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
23593(5C29H)	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
23594(5C2AH)	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
23595(5C2BH)	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
23596(5C2CH)	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
23597(5C2DH)	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
23598(5C2EH)	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
23599(5C2FH)	*1	*1	*1	125	124	123	122	121	120	119	118	117	116	115	114	113

Each bit represents the n-th DP-Slave

*1 The bits, b15 to b13 of address 23599 ($5C2F_H$) are fixed to 0.

Figure 3.21 Parameter setting status area (Reserved station) (Un\G23592 to Un\G23599)

(6) Temporary slave reservation status area (Un\G23600 to Un\G23607)

This area stores data of the DP-Slaves that are set to temporary slave reservation by the temporary slave reservation function. (Initial value: 0000H)
The setting is stored when the Data exchange start completed signal (X00) turns ON. (Section 3.4.13)

0: Normal DP-Slave, reserved or not-configured station
1: Temporary slave reservation

Address DEC(HEX)	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
23600(5C30H)	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
23601(5C31H)	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
23602(5C32H)	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
23603(5C33H)	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
23604(5C34H)	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
23605(5C35H)	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
23606(5C36H)	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
23607(5C37H)	*1	*1	*1	125	124	123	122	121	120	119	118	117	116	115	114	113

Each bit represents the n-th DP-Slave

*1 The bits, b15 to b13 of address 23607 (5C37H) are fixed to 0

Figure 3.22 Temporary slave reservation status area (Un\G23600 to Un\G23607)

(7) Slave status area (Alarm detection) (Un\G26416 to Un\G26424)

The information on alarm status of each DP-Slave is stored in this area.

(a) All stations' alarm status (Un\G26416)

This area stores the alarm detection status of all DP-Slaves. (Initial value: 0000H)
If an alarm is detected in any one of the stations in Each station's alarm status (Un\G26417 to Un\G26424), 1 is stored in All stations' alarm status (Un\G26416).

0: No alarm in all DP-Slaves
1: Alarm detected

(b) Each station's alarm status (Un\G26417 to Un\G26424)

This area stores the alarm detection status of each DP-Slave. (Initial value: 0000H)
If an alarm is detected in any one of the stations and the corresponding bit turns ON (1) in Each station's alarm status (Un\G26417 to Un\G26424), the RSP ERR.LED turns ON.

0: No alarm (including reserved, temporary slave reservation, not-configured and/or non-alarm-ready stations)
1: Alarm generated

Address DEC (HEX)	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
26417(6731H)	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
26418(6732H)	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
26419(6733H)	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
26420(6734H)	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
26421(6735H)	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
26422(6736H)	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
26423(6737H)	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
26424(6738H)	*1	*1	*1	125	124	123	122	121	120	119	118	117	116	115	114	113

Each bit indicates the n-th DP-Slave.

*1 Bits b15 to b13 of address 26424 (6738H) are fixed to 0.

Figure 3.23 Each Station's Alarm Status (Un\G26417 to Un\G26424)

3.4.6 Diagnostic information area

This area stores diagnostic information settings and actual diagnostic information.

(1) Diagnostic information non-notification time setting area (Un\G2084)

The time during which no diagnostic information is notified after communication start (after Data exchange start completed signal (X00) turns ON) is set in this area. (Initial value: 20 seconds)

Table3.15 Diagnostic Information Non-notification Time Setting Area (Un\G2084)

Set Value	Description
0 to 65535	Set the time during which diagnostic information is not notified. (Unit: seconds)

This setting prevents temporary error detection. (e.g. when turning ON a DP-Slave after turning ON the QJ71PB92V)
When diagnostic information is generated within the time duration set by this setting, the conditions are as follows:

- The Diagnostic information detection signal (X01) does not turn ON.
- The RSP ERR. LED does not turn ON.
- No error code and detailed data is stored in the Diagnostic information area (for mode 3) (Un\G2307 to Un\G23321) and/or Extended diagnostic information area (for mode 3) (Un\G23328 to Un\G23454).
- The bit corresponding to the station that sent the diagnostic information does not turn ON in the Slave status area (Diagnostic information detection) (Un\G23056 to Un\G23064).

POINT

Set a value into the Diagnostic information non-notification time setting area (Un\G2084) when the Data exchange start request signal (Y00) is OFF.
Values set with the Data exchange start request signal (Y00) ON are ignored.

Remark

The time (remaining time) during which no diagnostic information is notified after communication start (after Data exchange start completed signal (X00) turns ON) can be checked in the Current diagnostic information non-notification time area (Un\G2085).

(2) Current diagnostic information non-notification time area (Un\G2085)

This area stores the remaining time during which no diagnostic information is notified after communication start (after Data exchange start completed signal (X00) turns ON). (initial value: 0 seconds)
The non-notification time is set in the Diagnostic information non-notification time setting area (Un\G2084).

Table3.16 Current diagnostic Information Non-notification Time Area (Un\G2085)

Stored Value	Description
0 to 65535	A countdown time (remaining time), during which no diagnostic information is notified, is stored. (Unit: seconds) No diagnostic information is notified until the value reaches 0.

When the time set in the Diagnostic information non-notification time setting area (Un\G2084) has elapsed after communication start (after Data exchange start completed signal (X00) turns ON), the value in the Current diagnostic information non-notification time area (Un\G2085) becomes 0.
While communication is stopped (Data exchange start request signal (Y00): OFF), the remaining time is held until the Data exchange start request signal (Y00) is turned ON again.

(3) **Diagnostic information invalid setting area (Un\G2080)**

Setting some values to this area can mask (invalidate) any data of the diagnostic information that is sent from a DP-Slave during communication. (Initial value: $02B9_H$)

0: Validates the diagnostic information.
1: Invalidates the diagnostic information.

Address DEC (HEX)	b15 to b0
2080(820_H)	See below.

bit	Description	Initial value
b0	Parameter transmission request from the DP-Slave	1
b1	Diagnostic information read request	0
b2	Fixed to 0	0
b3	The DP-Slave is monitored by the watchdog timer.	1
b4	DP-Slave entered FREEZE mode.	1
b5	DP-Slave entered SYNC mode.	1
b6	0 (Reserved)	0
b7	Excluded from I/O data exchange according to the parameter settings	1
b8	Unable to exchange I/O data with DP-Slaves.	0
b9	The DP-Slave is not ready to exchange I/O data.	1
b10	The parameter (No. of I/O bytes) received from the DP-Master does not match that of the DP-Slave.	0
b11	Extended diagnostic information exists.	0
b12	The function requested by the DP-Master is not supported.	0
b13	Illegal response from DP-Slave	0
b14	Illegal parameter(s) sent from the DP-Master	0
b15	Controlled by another DP-Master	0

Figure 3.24 Diagnostic Information Invalid Setting Area (Un\G2080)

Even if diagnostic information corresponding to each bit is generated on a DP-Slave, it is not recognized as diagnostic information, and the status of the QJ71PB92V is as follows:

- The Diagnostic information detection signal (X01) does not turn ON.
- The RSP ERR. LED does not turn ON.
- No error code and detailed data is stored in the Diagnostic information area (for mode 3) (Un\G2307 to Un\G23321) and/or Extended diagnostic information area (for mode 3) (Un\G23328 to Un\G23454).
- The bit corresponding to the station that sent the diagnostic information does not turn ON in the Slave status area (Diagnostic information detection) (Un\G23056 to Un\G23064).

POINT

Set values into the Diagnostic information invalid setting area (Un\G2080) when the Data exchange start request signal (Y00) is OFF.
Values set with the Data exchange start request signal (Y00) ON are ignored.

(4) Diagnostic information area (for mode 3) (Un\G23072 to Un\G23321)

(a) This area stores the diagnostic information generated on DP-Slaves during communication.
Information of 125 modules is stored in Diagnostic information area (for mode 3) in the same order for each module.

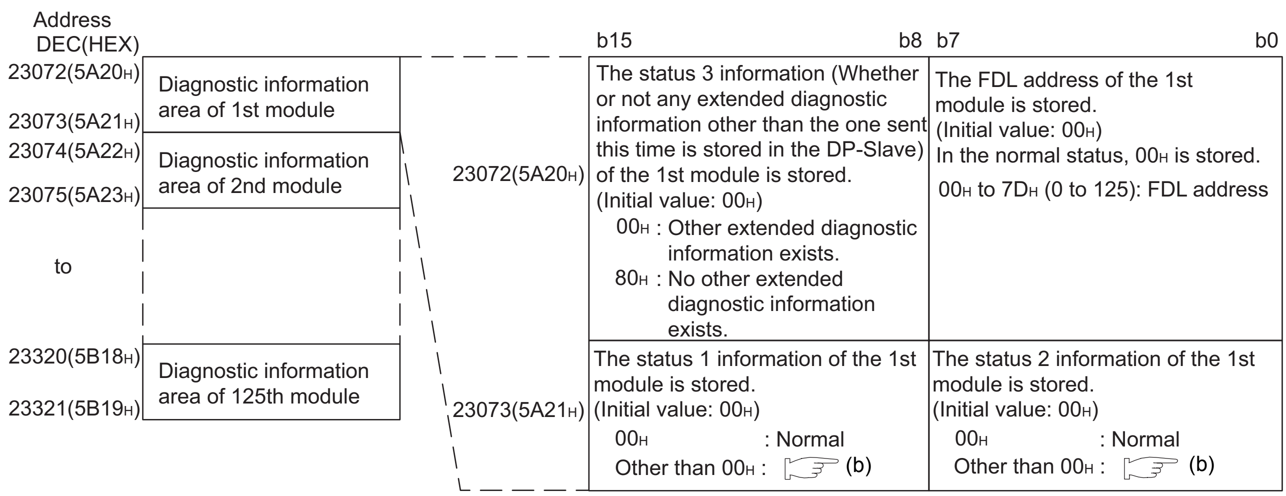
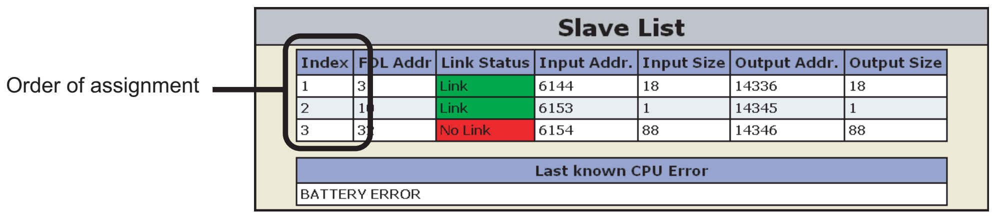


Figure 3.25 Diagnostic Information Area (for mode 3) (Un\G23072 to Un\G23321)

POINT

(1) Data are assigned to the Diagnostic information area (for mode 3) in the order of the parameters set in GX Configurator-DP (in the order of FDL addresses).
The actual assignment order can be confirmed in the Address information area (for mode 3) (Un\G22528 to Un\G22777) or in Slave List of GX Configurator-DP.



(2) When parameters have been modified (deletion or addition of DP-Slave(s)) on GX Configurator-DP, the buffer memory is reassigned.
After modifying parameters, review the sequence program.
If some DP-Slaves are expected to be connected to the network in the future, setting them as Reserved stations in the parameter setting eliminates the need to check the sequence program. (Section 6.5)

(3) The information in Diagnostic information area (for mode 3) (Un\G23072 to Un\G23321) is not cleared even if the problem occurred on the DP-Slave has been solved.
To clear the information in Diagnostic information area (for mode 3) (Un\G23072 to Un\G23321), turn ON the Diagnostic information area clear request signal (Y02).

(b) Information of status 1 and 2

The diagnostic information generated on DP-Slaves is stored to status 1 and 2, and corresponding bits turn ON (1).

I/O data exchange between a DP-Master and DP-Slaves is continued even if any of the following errors occurs.

The following table lists the meaning of each bit, actions to be taken, and the station where the diagnostic information is detected.

Table3.17 Diagnostic Information

Item	Bit	Description	Action	Detected in
Status 2	b0	Requesting transmission of parameters from DP-Slave	(1) When I/O data exchange is started Normally operating (This occurs every time I/O data exchange is started.) (2) While I/O data are exchanged Check the DP-Slave status and communication line.	DP-Slave
	b1	Diagnostic information read request	Check the DP-Slave status.	DP-Slave
	b2	0 (Fixed)	—	—
	b3	The DP-Slave is monitored by the watchdog timer.	Normally operating	DP-Slave
	b4	The DP-Slave entered FREEZE mode.	Normally operating	DP-Slave
	b5	The DP-Slave entered SYNC mode.	Normally operating	DP-Slave
	b6	0 (Reserved)	—	—
	b7	Excluded from I/O data exchange according to the parameter settings	(1) When I/O data exchange is stopped Normally operating(This occurs every time I/O data exchange is stopped.) (2) While I/O data are exchanged Check if any parameter has been changed from the DP-Master (Class 2) on the network.	DP-Master
Status 1	b8	Unable to exchange I/O data with DP-Slaves.	Check the DP-Slave status and communication line. Check the parameters.	DP-Master
	b9	The DP-Slave is not ready to exchange I/O data.	(1) When I/O data exchange is started Normally operating (This occurs every time I/O data exchange is started.) (2) While I/O data are exchanged Check the DP-Slave status and communication line.	DP-Slave
	b10	The parameter (No. of I/O bytes) received from the DP-Master does not match that of the DP-Slave.	Check the DP-Slave parameters.	DP-Slave
	b11	There is some extended diagnostic information.	Check the DP-Slave status.	DP-Master
	b12	The function requested by the DP-Master is not supported.	Check if the DP-Slave supports the global control function or not. Verify the DP-Slave specifications.	DP-Slave
	b13	Illegal response from DP-Slave	Check the DP-Slave or network status.	DP-Master
	b14	Illegal parameter(s) sent from the DP-Master	Check the parameters.	DP-Slave
	b15	Controlled by another DP-Master.	Check if more than one DP-Master are communicating with the same DP-Slave. Check the parameters.	DP-Master

(5) Extended diagnostic information area (for mode 3) (Un\G23328 to Un\G23454)

This area stores the latest extended diagnostic information occurred during communication.

Address DEC(HEX)	b15 to b8	b7 to b0
23328(5B20$_H$)	The FDL address of the DP-Slave that notified of the latest extended diagnostic information in addresses 23329 to 23454 (5B21$_H$ to 5B9E$_H$), is stored. (Initial value: 0000$_H$) 0000$_H$ to 007D$_H$ (0 to 125) : FDL address	
23329(5B21$_H$)	The data size of the latest extended diagnostic information in addresses 23330 to 23454 (5B22$_H$ to 5B9E$_H$) is stored. (Initial value : 0000$_H$) 0006$_H$ to 00F4$_H$: Data size of extended diagnostic information (unit: byte)	
23330(5B22$_H$)	The latest information of status 1 is stored. (Initial value : 00$_H$) 00$_H$: Normal Other than 00$_H$: This section(4)(b)	The latest information of status 2 is stored. (Initial value : 00$_H$) 00$_H$: Normal Other than 00$_H$: This section(4)(b)
23331(5B23$_H$)	The latest status 3 information (Whether or not any extended diagnostic information other than the one sent this time is stored in the DP-Slave) is stored. (Initial value : 00$_H$) 00$_H$: No other extended diagnostic information exists. 80$_H$: Other extended diagnostic information exists.	The latest FDL address of the DP-Master is stored. (Initial value : 00$_H$) For the DP-Slave that has not started I/O data exchange, FF$_H$ is stored. 00$_H$ to 7D$_H$ (0 to 125) : FDL address
23332(5B24$_H$)	The latest ident No. of the DP-Slave is stored. (Initial value : 0000$_H$)	
23333(5B25$_H$) to 23454(5B9E$_H$)	The latest extended diagnostic information (max. 244 bytes) is stored. (Initial value : 0000$_H$)	

Figure 3.26 Extended Diagnostic Information Area (for mode 3) (Un\G23328 to Un\G23454)

POINT

(1) The information in Extended diagnostic information area (for mode 3) (Un\G23328 to Un\G23454) is not cleared even if corrective action is taken for the relevant error that has occurred on a DP-Slave.
To clear the information in Extended diagnostic information area (for mode 3) (Un\G23328 to Un\G23454), turn ON the Diagnostic information area clear request signal (Y02).

(2) When b11 of the Diagnostic information invalid setting area (Un\G2080) is set to ON (1), information is not stored in the Extended diagnostic information area (for mode 3) (Un\G23328 to Un\G23454).

3.4.7 Extended diagnostic information read area

This area is used to read the extended diagnostic information from DP-Slaves.

(1) Extended diagnostic information read request area (Un\G23456)

Set the FDL address of the DP-Slave whose extended diagnostic information is to be read. (Initial value: FFFF$_H$)

Table3.18 Extended Diagnostic Information Read Request Area (Un\G23456)

Set Value	Description
0000$_H$ to 007D$_H$ (0 to 125)	Set the FDL address of the DP-Slave.

By setting the FDL address is set in the Extended diagnostic information read request area (Un\G23456) and turning ON the Extended diagnostic information read request signal (Y06), the extended diagnostic information is stored in the Extended diagnostic information read response area (Un\G23457 to Un\G23583).

(2) Extended diagnostic information read response area (Un\G23457 to Un\G23583)

The execution result of the extended diagnostic information read request is stored in this area.

If the request failed, the values in address 23458 to 23583(5BA2$_H$ to 5C1F$_H$) become 0$_H$.

Address DEC (HEX)	b15 – b8	b7 – b0
23457(5BA1$_H$)	The read result is stored. (Initial value : 0000$_H$) A200$_H$: Normally completed Other than A200$_H$: Failed (Error code Section 9.5.1)	
23458(5BA2$_H$)	The data size of the extended diagnostic information in addresses 23459 to 23583 (5BA3$_H$ to 5C1F$_H$) is stored. (Initial value : 0000$_H$) 0006$_H$ to 00F4$_H$: Data size of extended diagnostic information (unit : byte)	
23459(5BA3$_H$)	The information of status 1 is stored. (Initial value: 00$_H$) 00$_H$: Normal Other than 00$_H$: Section 3.4.6 (4) (b)	The latest information of status 2 is stored. (Initial value : 00$_H$) 00$_H$: Normal Other than 00$_H$: Section 3.4.6 (4) (b)
23460(5BA4$_H$)	The status 3 information (Whether or not any extended diagnostic information other than the one sent this time is stored in the DP-Slave) is stored. (Initial value : 00$_H$) 00$_H$: No other extended diagnostic information exists. 80$_H$: Other extended diagnostic information exists.	The FDL address of the DP-Master is stored. (Initial value: 00$_H$) For the DP-Slave that has not started I/O data exchange, FF$_H$ is stored. 00$_H$ to 7D$_H$ (0 to 125) : FDL address
23461(5BA5$_H$)	The ident No. of the DP-Slave is stored. (Initial value : 0000$_H$)	
23462(5BA6$_H$) to 23583(5C1F$_H$)	The extended diagnostic information (max. 244 bytes) is stored. (Initial value : 0000$_H$)	

Figure 3.27 Extended Diagnostic Information Read Response Area (Un\G23457 to Un\G23583)

3.4.8 Bus cycle time area

This area stores the bus cycle time.

(1) Current bus cycle time (Un\G2272)

The current bus cycle time is stored in this area. (Unit: ×1ms)

(2) Min. bus cycle time (Un\G2273)

The minimum value of the bus cycle time is stored in this area. (Unit: ×1ms)

(3) Max. bus cycle time (Un\G2274)

The maximum value of the bus cycle time is stored in this area. (Unit: ×1ms)

3.4.9 Global control area

This area is used for the global control function.

(1) Global control area (Un\G2081)

(a) Set the global control function to be executed.
Specify the global control service to be sent by bits b5 to b2 in the Global control area, and set the target group No. by bits b15 to b8. (Initial value: 0000H)

0: Not execute
1: Execute

Address DEC(HEX)	b15 to b0
2081(821H)	See below.

bit	Description	Initial value	Reference Section
b0	Unused (Fixed to 0)	0	—
b1	Unused (Fixed to 0)	0	(b)
b2	UNFREEZE (Retention of the actual input data is disabled.)	0	
b3	FREEZE (Actual input data is held and read.)	0	
b4	UNSYNC (Retention of the actual input data is disabled.)	0	
b5	SYNC (Actual output data is written and held.)	0	
b6	Unused (Fixed to 0)	0	—
b7	Unused (Fixed to 0)	0	
b8	Executed on DP-Slaves in group 1	0	(c)
b9	Executed on DP-Slaves in group 2	0	
b10	Executed on DP-Slaves in group 3	0	
b11	Executed on DP-Slaves in group 4	0	
b12	Executed on DP-Slaves in group 5	0	
b13	Executed on DP-Slaves in group 6	0	
b14	Executed on DP-Slaves in group 7	0	
b15	Executed on DP-Slaves in group 8	0	

Figure 3.28 Global Control Area (Un\G2081)

(b) Setting global control services (b5 to b2)
The following service combinations are not executable at the same time.
- SYNC and UNSYNC (If both services are attempted concurrently, UNSYNC only is enabled.)
- FREEZE and UNFREEZE (If both services are attempted concurrently, UNFREEZE only is enabled.)

The following shows the services and their set values for b5 to b2.
1) Setting for execution of the SYNC and UNSYNC services

Table3.19 SYNC/UNSYNC Settings (b5, b4)

Service to be Executed	Set Value	
	b5	b4
SYNC	1	0
UNSYNC	0 *1	1

*1 When 1 is set to this bit, it is handled as an invalid value. (The operation is the same as when the value is set to 0.)

2) Setting for execution of the FREEZE and UNFREEZE services

Table3.20 FREEZE/UNFREEZE Settings (b3, b2)

Service to be Executed	Set Value	
	b3	b2
FREEZE	1	0
UNFREEZE	0 *1	1

*1 When 1 is set to this bit, it is handled as an invalid value. (The operation is the same as when the value is set to 0.)

(c) Setting the target group No. (b15 to b8)
Multiple group Nos. can be set for the target group No.
When 0s are set to all of b8 to b15, the set global control service is sent to all DP-Slaves (including DP-Slaves for which group No. is not set).

Remark

For details on the global control, refer to Section 4.1.3.

3.4.10 Acyclic communication area

The area is used for acyclic communications.

(1) Acyclic communication request area (Un\G23809 to Un\G24832)

Set the request instruction of acyclic communication in this area. (Initial value: 0000H)
Up to eight request instructions can be set.
For the format for request instructions, refer to Section 7.4.

Address DEC (HEX)	
23809(5D01H) to 23936(5D80H)	Request instruction No.1 area (Data size: 128 words)
23937(5D81H) to 24064(5E00H)	Request instruction No.2 area (Data size: 128 words)
24065(5E01H) to 24192(5E80H)	Request instruction No.3 area (Data size: 128 words)
24193(5E81H) to 24320(5F00H)	Request instruction No.4 area (Data size: 128 words)
24321(5F01H) to 24448(5F80H)	Request instruction No.5 area (Data size: 128 words)
24449(5F81H) to 24576(6000H)	Request instruction No.6 area (Data size: 128 words)
24577(6001H) to 24704(6080H)	Request instruction No.7 area (Data size: 128 words)
24705(6081H) to 24832(6100H)	Request instruction No.8 area (Data size: 128 words)

Figure 3.29 Acyclic Communication Request Area (Un\G23809 to Un\G24832)

(2) Acyclic communication request execution instruction area (Un\G23808)

Set the execution instruction for acyclic communication in this area.
When a bit is turned ON (1), the request instruction corresponding to the bit is executed. (Initial value: 0000_H)

0: Not execute
1: Execute

Address DEC (HEX)	b15 to b8	b7 to b0
23808(5D00H)	00H (Fixed)	See below.

Bit	Description	Initial value
b0	Execution instruction of request instruction No.1	0
b1	Execution instruction of request instruction No.2	0
b2	Execution instruction of request instruction No.3	0
b3	Execution instruction of request instruction No.4	0
b4	Execution instruction of request instruction No.5	0
b5	Execution instruction of request instruction No.6	0
b6	Execution instruction of request instruction No.7	0
b7	Execution instruction of request instruction No.8	0

Figure 3.30 Acyclic Communication Request Execution Instruction Area (Un\G23808)

(3) Acyclic communication request result area (Un\G25120)

This area stores the request acceptance status and request execution completion status of acyclic communication.

Address DEC (HEX)	b15 to b8	b7 to b0
25120(6220H)	See ② below.	See ① below.

① The request acceptance status is stored.
0 : Not accepted
1 : Acceptance competed

Bit	Description	Initial value
b0	Acceptance status of request instruction No.1	0
b1	Acceptance status of request instruction No.2	0
b2	Acceptance status of request instruction No.3	0
b3	Acceptance status of request instruction No.4	0
b4	Acceptance status of request instruction No.5	0
b5	Acceptance status of request instruction No.6	0
b6	Acceptance status of request instruction No.7	0
b7	Acceptance status of request instruction No.8	0

② The request completed status is stored.
0 : Not executed or in execution
1 : Execution completed

Bit	Description	Initial value
b8	Completion status of request instruction No.1	0
b9	Completion status of request instruction No.2	0
b10	Completion status of request instruction No.3	0
b11	Completion status of request instruction No.4	0
b12	Completion status of request instruction No.5	0
b13	Completion status of request instruction No.6	0
b14	Completion status of request instruction No.7	0
b15	Completion status of request instruction No.8	0

Figure 3.31 Acyclic Communication Request Result Area (Un\G25120)

(4) Acyclic communication response area (Un\G25121 to Un\G26144)

The execution result of acyclic communication is stored in this area. (Initial value: 0000_H)

For the response format for the execution result, refer to Section 7.4.

Address DEC(HEX)	
25121(6221_H) to 25248($62A0_H$)	Response area for request instruction No.1 (Data size: 128 words)
25249($62A1_H$) to 25376(6320_H)	Response area for request instruction No.2 (Data size: 128 words)
25377(6321_H) to 25504($63A0_H$)	Response area for request instruction No.3 (Data size: 128 words)
25505($63A1_H$) to 25632(6420_H)	Response area for request instruction No.4 (Data size: 128 words)
25633(6421_H) to 25760($64A0_H$)	Response area for request instruction No.5 (Data size: 128 words)
25761($64A1_H$) to 25888(6520_H)	Response area for request instruction No.6 (Data size: 128 words)
25889(6521_H) to 26016($65A0_H$)	Response area for request instruction No.7 (Data size: 128 words)
26017($65A1_H$) to 26144(6620_H)	Response area for request instruction No.8 (Data size: 128 words)

Figure 3.32 Acyclic Communication Response Area (Un\G25121 to Un\G26144)

3.4.11 Alarm area

This area is used for the alarm acquisition.

(1) Alarm request area (Un\G26432 to Un\G26434)
Set request data for alarm acquisition in this area. (Initial value: 0000_H)
For the request format, refer to Section 7.5.

(2) Alarm response area (Un\G26446 to Un\G26768)
The execution result of alarm acquisition is stored in this area. (Initial value: 0000_H)
For the response format for the execution result, refer to Section 7.5.

3.4.12 Time control area

This area is used for the time control.

(1) Time control setting request area (Un\G26784 to Un\G26792)
Set request data for the time control setting in this area. (Initial value: 0000_H)
For the request format, refer to Section 7.6.

(2) Time control setting response area (Un\G26800 to Un\G26812)
The execution result of the time control setting is stored in this area. (Initial value: 0000_H)
For the response format for the execution result, refer to Section 7.6.

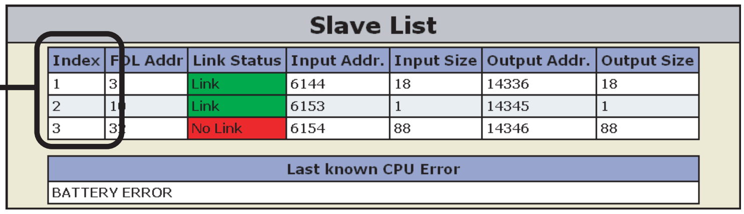
3.4.13 Temporary slave reservation area

This area is used for the temporary slave reservation function.

POINT

(1) The corresponding bits of the Temporary slave reservation area are assigned in order of the parameters set in GX Configurator-DP (in order of the FDL address).
The actual assignment order can be confirmed in the Address information area (for mode 3) (Un\G22528 to Un\G22777) or in Slave List of GX Configurator-DP.

Order of assignment



(2) When parameters have been modified (deletion or addition of DP-Slave(s)) in GX Configurator-DP, the order of the assigned DP-Slaves is changed.
After modifying parameters, check the sequence program.
If some DP-Slaves are expected to be connected to the network in the future, setting them as Reserved stations in the parameter setting eliminates the need to check the sequence program. (☞ Section 6.5)

(1) Temporary slave reservation request area (Un\G23608 to Un\G23615)

This area is used to set DP-Slaves to Temporary slave reservation using the temporary slave reservation function. (Initial value: 0000H)
0: Not specify the DP-Slave to Temporary slave reservation
1: Specify the DP-Slave to Temporary slave reservation

Address DEC(HEX)	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
23608(5C38H)	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
23609(5C39H)	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
23610(5C3AH)	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
23611(5C3BH)	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
23612(5C3CH)	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
23613(5C3DH)	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
23614(5C3EH)	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
23615(5C3FH)	*1	*1	*1	125	124	123	122	121	120	119	118	117	116	115	114	113

Each bit represents the n-th DP-Slave

*1 The bits, b15 to b13 of address 23615 (5C3FH) are fixed to 0.

Figure 3.33 Temporary slave reservation request area (Un\G23608 to Un\G23615)

When the Data exchange start request signal (Y00) is turned ON, the DP-Slaves specified in the Temporary slave reservation request area (Un\G23608 to Un\G23615) become temporary slave reservation.

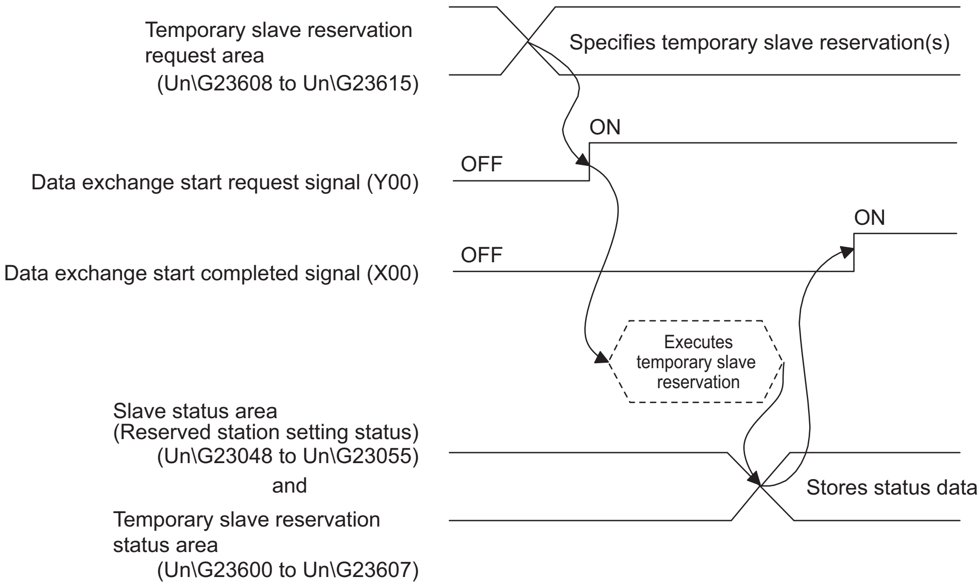


Figure 3.34 Operation in Temporary Slave Reservation Request Area

POINT

(1) Set values in the Temporary slave reservation request area (Un\G23608 to Un\G23615) while the Data exchange start request signal (Y00) is OFF.
Values set with the Data exchange start request signal (Y00) ON are ignored.

(2) Normal DP-Slaves can be changed to Temporary slave reservations.
Changing Reserved stations (DP-Slaves set as reserved stations with slave parameters) to Normal DP-Slave status is not allowed.
For the temporary slave reservation function, refer to Section 4.7.

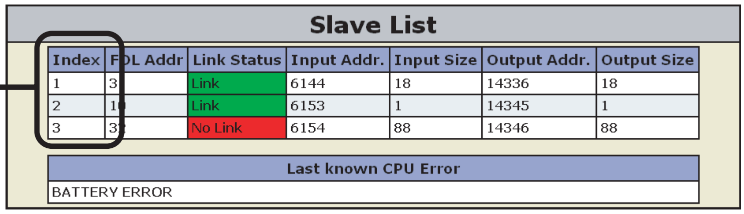
3.4.14 Redundant system area

This area is used for the redundant system support function.
For details on the redundant system support function, refer to Section 4.8.

POINT

(1) The corresponding bits of the Redundant system area are assigned in order of the parameters set in GX Configurator-DP (in order of the FDL address).
The actual assignment order can be confirmed in the Address information area (for mode 3) (Un\G22528 to Un\G22777) or in Slave List of GX Configurator-DP.

Order of assignment



(2) When parameters have been modified (deletion or addition of DP-Slave(s)) in GX Configurator-DP, the order of the assigned DP-Slaves is changed.
After modifying parameters, check the sequence program.
If some DP-Slaves are expected to be connected to the network in the future, setting them as Reserved stations in the parameter setting eliminates the need to check the sequence program. (☞ Section 6.5)

(1) **Control master FDL address display area (Un\G2263)**
This area stores the FDL address of the control system QJ71PB92V when it is used in a redundant system.
The FDL address is stored when the Communication READY signal (X1B) turns ON.
The FDL addresses for the control system are set in GX Configurator-DP.
(Section 6.3)

Table3.21 Control Master FDL Address Display Area (Un\G2263)

Set Value	Description
0000H to 007DH (0 to 125)	The FDL address of the QJ71PB92V in the control system
FFFFH	• Parameter not registered • The QJ71PB92V is not mounted to a redundant system.

(2) **Standby master FDL address display area (Un\G2264)**
This area stores the FDL address of the standby system QJ71PB92V when it is used in a redundant system.
The FDL address is stored when the Communication READY signal (X1B) turns ON.
The FDL addresses for the standby system are set in the Intelligent function module switch setting of GX Developer. (Section 6.7)

Table3.22 Standby Master FDL Address Display Area (Un\G2264)

Set Value	Description
0000H to 007DH (0 to 125)	The FDL address of the QJ71PB92V in the standby system
FFFFH	• Parameter not registered • The QJ71PB92V is not mounted to a redundant system.

(3) System switching condition setting area (Disconnected station detection) (Un\G23648 to Un\G23656)

When the QJ71PB92V is mounted on a redundant system, this area is used to set the switching target DP-Slaves. (Initial value: 0000H)

(a) System switching condition (Un\G23648)
Set AND or OR as a condition for the setting in the System switching DP-Slave specification (Un\G23649 to Un\G23656).
0: OR condition(If a communication error occurs on any of the specified DP-Slaves, the systems are switched.)
1: AND condition (If a communication error occurs on all of the specified DP-Slaves, the systems are switched.)

(b) System switching DP-Slave specification (Un\G23649 to Un\G23656)
Set the target DP-Slaves for the system switching. (Initial value: 0000H)
0: Not system switching target
1: System switching target

Address DEC(HEX)	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
23649(5C61H)	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
23650(5C62H)	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
23651(5C63H)	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
23652(5C64H)	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
23653(5C65H)	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
23654(5C66H)	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
23655(5C67H)	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
23656(5C68H)	*1	*1	*1	*1	124	123	122	121	120	119	118	117	116	115	114	113

Each bit represents the n-th DP-Slave

*1 The bits, b15 to b12 of address 23656 (5C68H) are fixed to 0.

Figure 3.35 System switching DP-Slave specification (Un\G23649 to Un\G23656)

By turning ON the Data exchange start request signal (Y00), the DP-Slaves specified in the System switching condition setting area (Disconnected station detection) (Un\G23648 to Un\G23656) become the target for system switching.

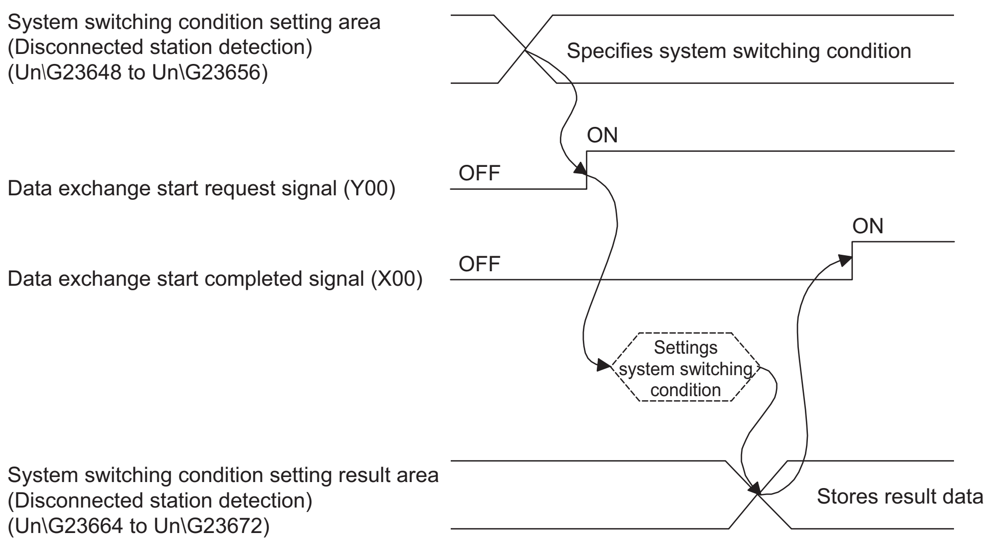


Figure 3.36 Operation in System Switching Condition Setting Area (Disconnected station detection)

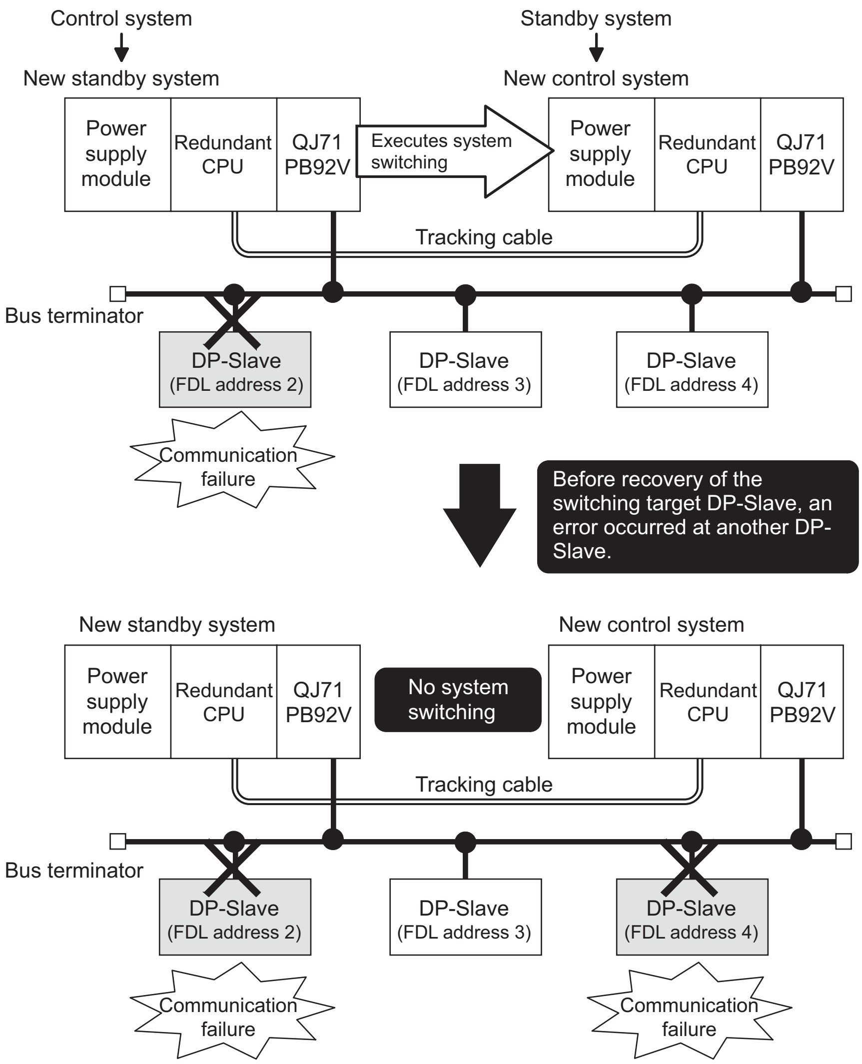
System switching is performed when an error occurs in communication with a DP-Slave, which is specified in the System switching condition setting area (Disconnected station detection) (Un\G23648 to Un\G23656).

POINT

(1) Set values into the System switching condition setting area (Disconnected station detection) (Un\G23648 to Un\G23656) when the Data exchange start request signal (Y00) is OFF.
Values set with the Data exchange start request signal (Y00) ON are ignored.

(2) With a communication error identified in a system switching target DP-Slave*1 after system switching, no system switching is performed even if a communication error occurs in another DP-Slave.
To perform system switching again, restore all of the switching target DP-Slaves*1 to normal condition.
The DP-Slave status can be confirmed in the Slave status area (Normal communication detection) (Un\G23040 to Un\G23047). (Section 3.4.5)

* 1 It is any of all the DP-Slaves that are specified in the System switching DP-Slave specification area (Un\G23649 to Un\G23656).



(4) System switching condition setting result area (Disconnected station detection) (Un\G23664 to Un\G23672)

(a) System switching condition setting result (Un\G23664)
The results of the setting in the System switching condition (Un\G23648) are stored.
0: OR condition
1: AND condition

(b) System switching DP-Slave specification result (Un\G23665 to Un\G23672)
The results of the setting in the System switching DP-Slave specification (Un\G23649 to Un\G23656) are stored.
0: Not system switching target
1: System switching target

Address DEC(HEX)	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
23665(5C71H)	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
23666(5C72H)	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
23667(5C73H)	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
23668(5C74H)	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
23669(5C75H)	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
23670(5C76H)	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
23671(5C77H)	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97
23672(5C78H)	*1	*1	*1	*1	124	123	122	121	120	119	118	117	116	115	114	113

Each bit represents the n-th DP-Slave

*1 The bits, b15 to b12 of address 23672 (5C78H) are fixed to 0.

Figure 3.37 System Switching DP-Slave Specification Result (Un\G23665 to Un\G23672)

POINT

In either of the following cases, check the System switching condition setting (Un\G23648) again.

- A value other than 0 and 1 is stored in the System switching condition setting result area (Un\G23664).
- Although setting is made in the System switching DP-Slave specification area (Un\G23649 to Un\G23656), data in the System switching DP-Slave specification result area (Un\G23665 to Un\G23672) are all 0s.

3.5 Processing Time

This section explains the bus cycle time and transmission delay time.

3.5.1 Bus cycle time

(1) When a single DP-Master is used

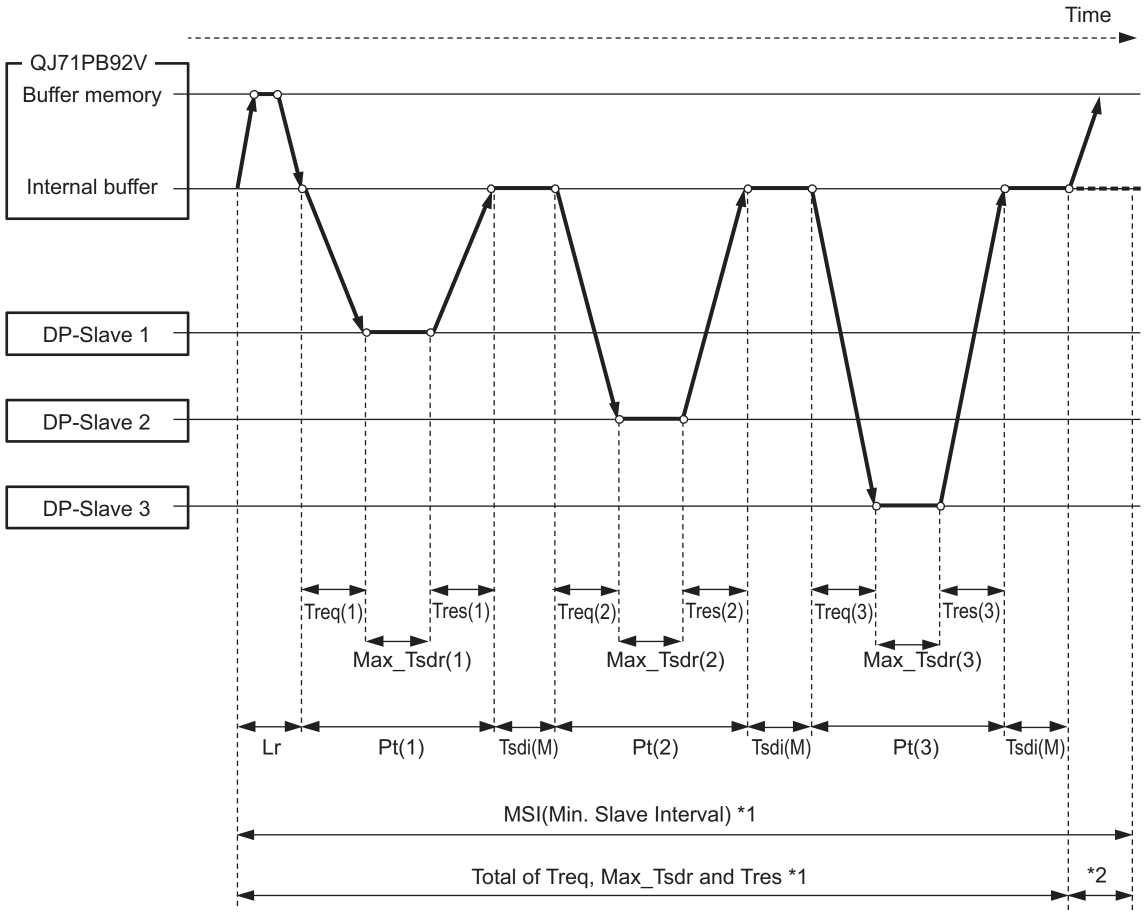


Figure 3.38 Bus Cycle Time (DP-Master: 1, DP-Slave: 3)

* 1 "MSI (Minimum polling cycle)" or "Total of Treq, Max_Tsdr and Tres", whichever is greater is Bc (Bus cycle time). ((1) (a) in this section)
* 2 If "MSI (Minimum polling cycle)" is greater than "Total of Treq, Max_Tsdr and Tres", the QJ71PB92V transfers data from the internal buffer to the buffer memory within the "MSI (Minimum polling cycle)".

(a) Bus cycle time (Bc) calculation formula
The bus cycle time (Bc) of the DP-Master can be obtained from the following calculation formula.
The symbols within the brackets [] indicate units.

$$Bc[ms] = Max\left(MSI, \sum_{i=1}^{n}\left(Pt_{(i)} + Tsdi_{(M)}\right) + Lr\right)$$

n=number of DP-Slaves

Max (A, B) = A or B, whichever is greater

Table3.23 Items in the bus cycle time (Bc) calculation formula

Item	Description
MSI[ms]	Minimum polling cycle (Min. slave interval) *1
$Pt_{(i)}$[ms]	(Polling time to i-th station) = $Treq_{(i)}$ + $Max\_Tsdr_{(i)}$+ $Tres_{(i)}$ • $Treq_{(i)}$[ms] = (Request transmission time of i-th station) = [{(Number of bytes output to i-th station) + 9}× 11[bit]]× 10^3 / (Transmission speed[bps]) • Max_Tsdr(i)[ms] = (Response time [T_{Bit}] of i-th station) *2, *3 × 10^3/ (Transmission speed[bps]) • $Tres_{(i)}$[ms] = (Response transmission time of i-th station) = [{(Number of bytes input from i-th station) + 9}× 11[bit]]× 10^3 / (Transmission speed[bps])
$Tsdi_{(M)}$[ms]	(Request/response processing time [T_{Bit}] of DP-Master(QJ71PB92V)*4× 10^3 / (Transmission speed[bps])
Lr[ms]	(Data refresh time) = 5.50 + (Number of DP-Slaves) × 150 × 10^{-3}

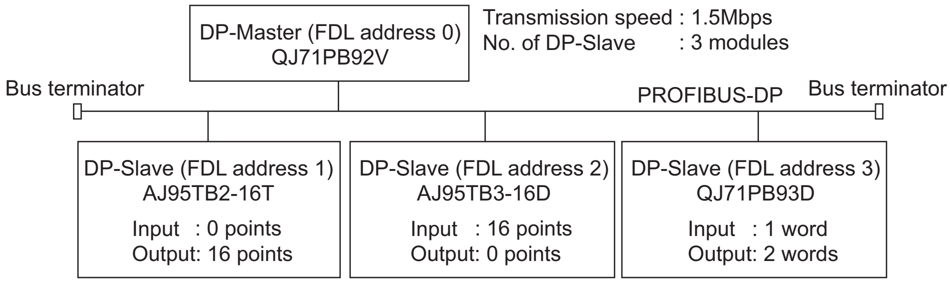
* 1 The value set on the Master Settings screen of GX Configurator-DP
* 2 The MaxTsdr value described in the GSD (DDB) file of the DP-Slave
* 3 [T_{Bit}] (Bit Time) is a unit that expresses the time required for 1-bit data transmission as "1".
The actual processing time differs as shown below depending on the transmission speed.
[Transmission speed is 1.5 Mbps]
1[T_{Bit}]=1 / (1.5× 10^6)=0.667× 10^{-6}[s] = 0.667× 10^{-3}[ms]
[Transmission speed is 12 Mbps]
1[T_{Bit}]=1 / (12× 10^6)=0.083× 10^{-6}[s]= 0.083× 10^{-3}[ms]
* 4 The Tsdi value described in the GSD (DDB) file of the QJ71PB92V
The Tsdi value varies as shown below depending on the transmission speed.
Refer to *3 for the unit [T_{Bit}].

Table3.24 Request/Response Processing Time of DP-Master

Transmission speed	Request/Response Processing Time of DP-Master
9.6kbps, 19.2kbps, 93.75kbps, 187.5kbps	70T_{Bit}
500kbps	150T_{Bit}
1.5Mbps	200T_{Bit}
3Mbps	250T_{Bit}
6Mbps	450T_{Bit}
12Mbps	800T_{Bit}

(b) Bus cycle time calculation example

The following shows a calculation example of the bus cycle time:



	AJ95TB2-16T	AJ95TB3-16D	QJ71PB93D
Output data size [byte]	2	0	4
Input data size [byte]	0	2	2

Figure 3.39 System Configuration Example

1) MSI[ms] value

MSI[ms]=80 × 100 [μs]=8.0 [ms]

2) $Pt_{(i)}$[ms] value

Table3.25 Pt(i) Value

Item	DP-Slave		
	AJ95TB2-16T (FDL address 1)	AJ95TB3-16D (FDL address 2)	QJ71PB93D (FDL address 3)
1 $Treq_{(i)}$[ms]	$\{(2 + 9) \times 11\} \times 10^3 \div (1.5 \times 10^6)$ = 0.081	$\{(0 + 9) \times 11\} \times 10^3 \div (1.5 \times 10^6)$ = 0.066	$\{(4 + 9) \times 11\} \times 10^3 \div (1.5 \times 10^6)$ = 0.095
Response time [T_{Bit}] of i-th station	150	150	150
2 $Max\_Tsdr_{(i)}$[ms]	$150 \times 10^3 \div (1.5 \times 10^6) = 0.1$	$150 \times 10^3 \div (1.5 \times 10^6) = 0.1$	$150 \times 10^3 \div (1.5 \times 10^6) = 0.1$
3 $Tres_{(i)}$[ms]	$\{(0 + 9) \times 11\} \times 10^3 \div (1.5 \times 10^6)$ = 0.066	$\{(2 + 9) \times 11\} \times 10^3 \div (1.5 \times 10^6)$ = 0.081	$\{(2 + 9) \times 11\} \times 10^3 \div (1.5 \times 10^6)$ = 0.081
$Pt_{(i)}$[ms] (1+2+3)	0.081 + 0.1 + 0.066 = 0.247	0.066 + 0.1 + 0.081 = 0.247	0.095 + 0.1 + 0.081 = 0.276

3) $Tsdi_{(M)}$[ms] value

Request/response processing time [T_{Bit}] of DP-Master (QJ71PB92V)=200

$Tsdi_{(M)}[ms]=200 \times 10^3 / (1.5 \times 10^6)=0.13$

4) Lr[ms] value

$Lr[ms]=5.50+3 \times 150 \times 10^{-3}=5.95$

Using the values obtained in above 2) to 4),

$$\begin{aligned}\sum_{i=1}^{3}(Pt_{(i)}+Tsdi_{(M)})+Lr &=\{(Pt_{(1)}+Tsdi_{(M)})+(Pt_{(2)}+Tsdi_{(M)})+(Pt_{(3)}+Tsdi_{(M)})\}+Lr\\ &=\{(0.377)+(0.377)+(0.406)\}+5.95\\ &=1.16+5.95\\ &=7.11\end{aligned}$$

Therefore, the bus cycle time (Bc) value is as follows:

$$\begin{aligned}Bc[ms] &= \mathrm{Max}\left(MSI, \sum_{i=1}^{3}(Pt_{(i)}+Tsdi_{(M)})+Lr\right)\\ &=\mathrm{Max}(8, 7.11)\\ &=8\ [ms]\end{aligned}$$

(2) When multiple DP-Masters are used

The bus cycle time (Bc) can be obtained by the following calculation formula when there are multiple DP-Masters on the same network:

$$TBc[ms] = \sum_{i=1}^{n} Bc_{(i)}$$

n = Number of DP-Masters
Bc = Bus cycle time of each DP-Master ((1) in this section)

The following shows an example where two DP-Masters exist on the same network.

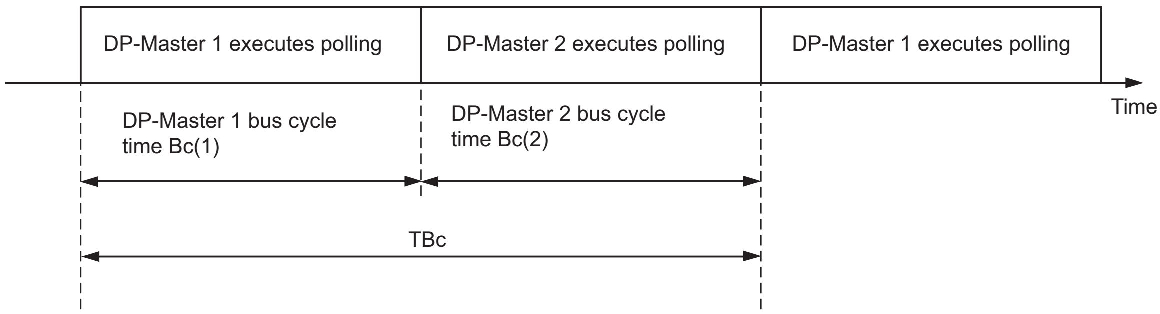


Figure 3.40 Bus Cycle Time When Two DP-Masters Exist on the Same Network

3.5.2 Transmission delay time

The transmission delay times of the input data and output data vary depending on the data consistency setting.
The calculation formulas for the transmission delay time are shown in (1) and (2) below.
Note that the following symbols are used in calculation formulas (1) and (2):

Bc: Bus cycle time *1
Scan: Scan time

* 1 When multiple DP-Masters exist on the same network, replace Bc with TBc.

(1) When the data consistency function is disabled

When reading/writing I/O data by automatic refresh (data consistency function disabled), the MOV instruction or FROM/TO instruction, the transmission delay time is as shown below.

(a) Output data delay time

Table3.26 Output Data Delay Time (Data consistency function disabled)

Item	Transmission Delay Time
Normal value	Bc×1.5
Max. value	Bc×2

(b) Input data delay time

Table3.27 Input Data Delay Time (Data consistency function disabled)

Item	Transmission Delay Time
Normal value	Scan+Bc
Max. value	Scan + Bc×2

(2) When the data consistency function is enabled

The reading/writing I/O data by automatic refresh is set (data consistency function enabled) or dedicated instructions, the transmission delay time is as shown below.

(a) Output data delay time

Table3.28 Output Data Delay Time (Data consistency function enabled)

Item	Condition	Transmission Delay Time
Normal value	—	Scan + Bc
Max. value	Scan×2 ≤ Bc	Bc×3
	Scan×2 > Bc	Scan×2 + Bc×2

(b) Input data delay time

Table3.29 Input Data Delay Time (Data consistency function enabled)

Item	Condition	Transmission Delay Time
Normal value	—	Scan+Bc
Max. value	Scan×2 ≤ Bc	Scan + Bc
	Scan ≦Bc<Scan×2	Scan + Bc×2
	Scan > Bc	Scan×3

3.5.3 System switching time in redundant system

This is the time taken from when the control system QJ71PB92V sends a system switching request to the redundant CPU until control is started with another QJ71PB92V in a new control system.

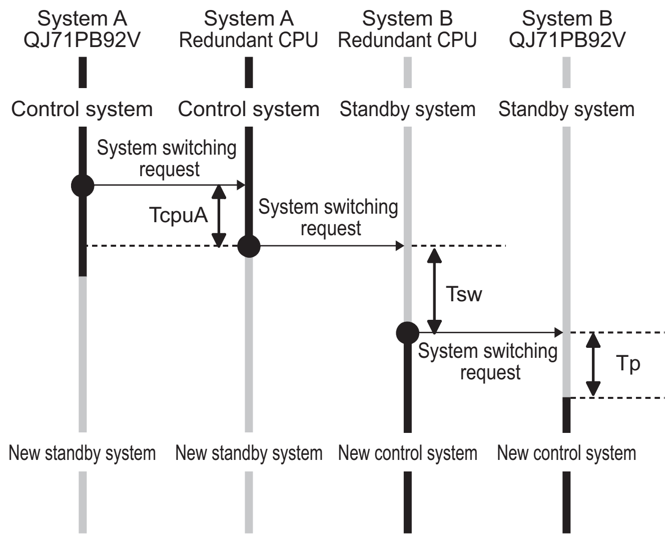


Figure 3.41 System Switching Time in Redundant System (When QJ71PB92V Requests System Switching to Redundant CPU)

(a) Redundant system switching time calculation formula
The system switching time in the redundant system can be obtained from either of the following calculation formulas:

- When the systems are not switched due to a slave error, or when the system switching condition (Un\G23648) is set to OR, the system switching time (Tscu) is:

  Tscu [ms] = TcpuA + Tsw + Tp + Scan × 2

- When the system switching condition (Un\G23648) is set to AND, the system switching time (Tsca) is:

  Tsca [ms] = Tscu + Nand × 20

(To the next page)

Table3.30 Items in Tlcs and Tlsc Calculation Formulas

Item	Description
TcpuA [ms]	The time taken until the redundant CPU in system A receives a system switching request from the QJ71PB92V in system A and then sends a system switching request to the other redundant CPU in system B. TcpuA [ms] = Scan time + 3
Tsw [ms]	System switching time of redundant CPU Tsw [ms] = α + Tαm + Trc • α [ms] = System switching processing time (QnPRHCPU User's Manual (Redundant System)) • Tαm [ms] = Automatic refresh time of QJ71PB92V (QCPU User's Manual (Function Explanation, Program Fundamentals)) • Trc [ms] = Tracking data loading time by standby system CPU (QnPRHCPU User's Manual (Redundant System))
Tp [ms]	Internal processing time of the QJ71PB92V Tp [ms] = (Total number of bytes for I/O data lengths of all DP-Slaves*1 × Time Corresponding to Transmission Speed 1*2) + (No. of connected DP-Slaves × Time Corresponding to Transmission Speed 2*2) + Common processing time*2
Scan [ms]	Scan time of the redundant CPU (QnPRHCPU User's Manual (Redundant System))
Nand	Number of switching target DP-Slaves that are specified in the system switching DP-Slave specification area (Un\G23649 to Un\G23656) when AND is set in the System switching condition area (Un\G23648)

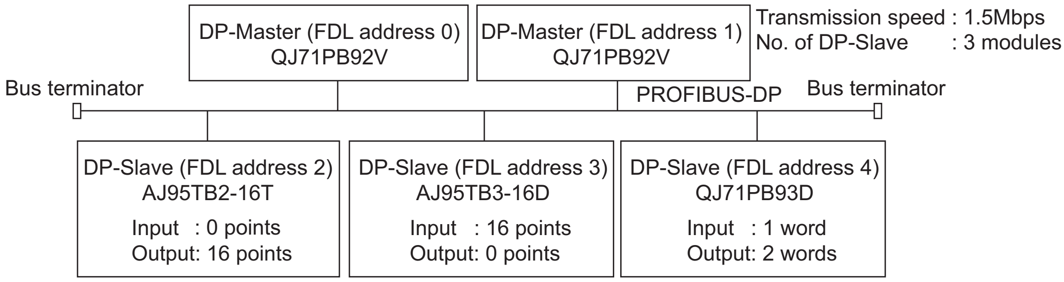
* 1 The I/O data length of each DP-Slave can be confirmed on the Slave Modules screen of GX Configurator-DP. (GX Configurator-DP Operating Manual)
* 2 The time differs as shown below depending on the transmission speed.

Table3.31 Time Corresponding to Transmission Speed

Transmission speed	Time Corresponding to Transmission Speed 1	Time Corresponding to Transmission Speed 2	Common Processing time
9.6kbps	0.9[ms]	1.8[ms]	500[ms]
19.2kbps	0.6[ms]	1.4[ms]	250[ms]
93.75kbps	0.18[ms]	1.0[ms]	60[ms]
187.5kbps	0.09[ms]	1.0[ms]	50[ms]
500kbps	0.035[ms]	1.0[ms]	40[ms]
1.5Mbps	0.01[ms]	1.0[ms]	35[ms]
3Mbps	0.007[ms]	0.9[ms]	35[ms]
6Mbps	0.0025[ms]	0.8[ms]	35[ms]
12Mbps	0.002[ms]	0.8[ms]	30[ms]

(b) Redundant system switching time calculation example
Shown below is a calculation example for the system switching time in the redundant system.
The calculation is based on the following conditions:

- Scan time is 5 [ms].
- AND is set in System switching condition (Un\G23648)
- In System switching DP-Slave specification (Un\G23649 to Un\G23656), 1st to 3rd DP-Slaves are set as switching targets.



	AJ95TB2-16T	AJ95TB3-16D	QJ71PB93D
Output data size [byte]	2	0	4
Input data size [byte]	0	2	2

Figure 3.42 System Configuration Example

1) TcpuA [ms] value
TcpuA [ms] = 5 + 3 = 8 [ms]

2) Tsw [ms] value

Table3.32 Tsw [ms] value

Item	
1 α [ms]	The following is calculated based on the case where signal flow memory is not tracked. α = 20.5 [ms]
2 Tαm[ms]	The following is calculated based on the case where redundant CPUs are used and the number of words to be auto-refreshed is 5. Tαm = 27[μs] + 6[μs] × Number of words to be auto-refreshed =27[μs] + 6[μs] × 5[word] =57[μs] =0.057[ms]
3 Trc)[ms]	The following conditions are applied. • Signal flow memory is not tracked. • No SFC program is executed. • No PID control instructions (PIDINIT, S.PIDINIT) are executed. • Tracking devices are D0 to D31 (32 points). • Number of tracking blocks is 1. • One tracking device range setting Trc = 1 + (32 × 0.09 × 10^{-3}) + (1 × 4 × 10^{-3}) + (1 × 1 × 10^{-3}) = 1.00788 = 1.01[ms]
Tsw[ms] (1+2+3)	Tsw = 20.5 + 0.057 + 1.01 = 21.567 [ms]

3) Tp [ms] value

$Tp = \{(2 + 2 + 4 + 2) \times 0.01\} + (3 \times 1.0) + 35$
$= 38.1$ [ms]

4) Scan [ms] value

Scan = 5 [ms]

5) Nand value

Nand = 3

From the above 1) to 4), Tscu [ms] is:

$Tscu = TcpuA + Tsw + Tp + Scan \times 2$
$= 8 + 21.567 + 38.1 + 5 \times 2$
$= 77.667$ [ms]

Therefore, the redundant system switching time, Tsca [ms], is:

$Tsca = Tscu + Nand \times 20$
$= 77.667 + 3 \times 20$
$= 137.667$ [ms]

CHAPTER4 FUNCTIONS

This chapter explains the functions of the QJ71PB92V.

Table4.1 Function List

Function		Description	Reference Section
PROFIBUS-DPV0		—	—
	I/O data exchange	Up to 125 DP-Slaves can be connected to a single QJ71PB92V, enabling the I/O data exchange of max. 8192 bytes. Note that it is limited up to 124 DP-Slaves when the QJ71PB92V is used in a redundant system.	Section 4.1.1
	Acquisition of diagnostic and extended diagnostic information	Diagnostic or extended diagnostic information of an error occurred on a DP-Slaves during I/O data exchange can be easily acquired using the buffer memory and I/O signals.	Section 4.1.2
	Global control function	By sending services (SYNC, UNSYNC, FREEZE, UNFREEZE) to each DP-Slave in a group, synchronous control of DP-Slave I/O data is available.	Section 4.1.3
PROFIBUS-DPV1		—	—
	Acyclic communication with DP-Slaves	This function allows data reading/writing to DP-Slaves at any specific timing independently of I/O data exchange.	Section 4.2.1
	Alarm acquisition	This function enables acquisition of up to 8 alarms or status information data that have been generated on any DP-Slave.	Section 4.2.2
	Support of FDT/DTM technology	Using a commercially available FDT, reading/writing the DP-Slave parameters and monitoring the DP-Slave status are executable via the QJ71PB92V.	Section 4.2.3
PROFIBUS-DPV2		—	—
	Time control over DP-Slaves	This function allows the QJ71PB92V to operate as the time master and set the time of each DP-Slave.	Section 4.3.1
Data swap function		This function swaps the upper and lower bytes in word units when I/O data is sent and received.	Section 4.4
Data consistency function		When I/O data from DP-Slaves are read from or written to the buffer memory, this function prevents the I/O data from being separated and incorrectly mixed. • Automatic refresh setting (GX Configurator-DP) • Dedicated instructions (BBLKRD, BBLKWR)	Section 4.5
Output status setting for the case of a CPU stop error		This function sets whether to stop or continue I/O data exchange with DP-Slaves when a CPU stop error occurs on a QCPU or remote I/O station where the QJ71PB92V is mounted. When the QJ71PB92V is mounted to a redundant system, I/O data exchange with DP-Slaves is continued regardless of the setting until systems A and B go down.	Section 4.6
Temporary slave reservation function		Without modifying the slave parameter in GX Configurator-DP, this function allows the DP-Slave station type to be changed to "Reserved station" temporarily.	Section 4.7
Redundant system support function		When the control system CPU or the QJ71PB92V detects an error, the control and standby systems are switched each other to continue communications.	Section 4.8
QJ71PB92D-compatible function		This function is used to replace the QJ71PB92D with the QJ71PB92V. When the QJ71PB92D has failed, replace it with the QJ71PB92V using the QJ71PB92D-compatible function.	Section 4.9

4.1 PROFIBUS-DPV0 Functions

4.1.1 I/O data exchange

The QJ71PB92V can operate as a DP-Master (Class 1) on the PROFIBUS-DP system and perform I/O data exchange with DP-Slaves.
Up to 125 DP-Slaves can be connected to a single QJ71PB92V, enabling the exchange of I/O data up to 8192 bytes.*1

* 1 Up to 124 DP-Slaves when the QJ71PB92V is used in a redundant system.

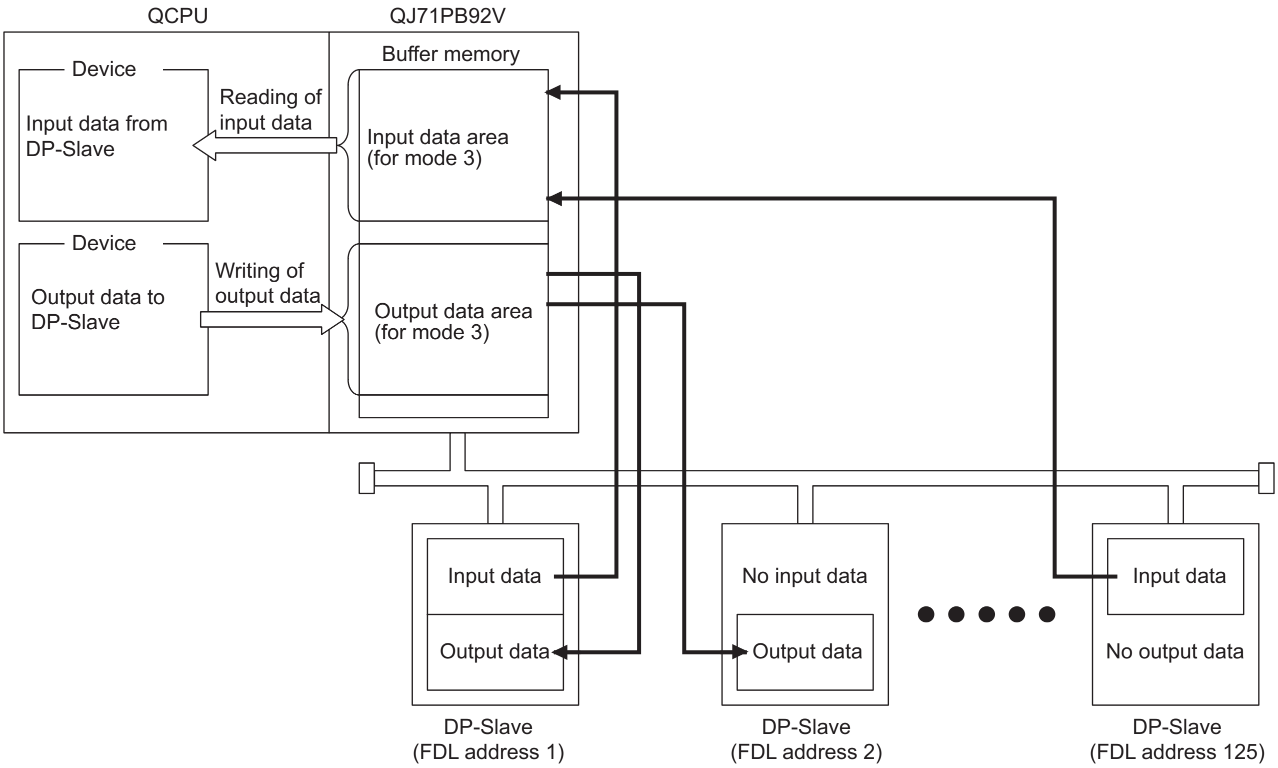


Figure 4.1 I/O Data Exchange

(1) Reading/writing I/O data

(a) Buffer memory

Read or write I/O data from the following buffer memory in the QJ71PB92V:

- Input data: Input data area (for mode 3) (Un\G6144 to Un\G10239)
- Output data: Output data area (for mode 3) (Un\G14336 to Un\G18431)

(b) Read/write methods

Read or write I/O data (from the buffer memory) to devices in QCPU by the following methods.

Table4.2 Read/Write Methods

Read/Write Methods	Setting Location	Data Consistency Function
Automatic refresh	GX Configurator-DP	Available
Dedicated instructions (BBLKRD, BBLKWR)	Sequence program	
MOV or FROM/TO instructions	Sequence program	Not available

(2) **Starting and stopping I/O data exchange**

(a) Write the initial value of the output data to the Output data area (for mode 3) (Un\G14336 to Un\G18431).

(b) Turn ON the Data exchange start request signal (Y00).

(c) When I/O data exchange is started after turning ON the Data exchange start request signal (Y00), the Data exchange start completed signal (X00) turns ON.

(d) Input data from DP-Slaves are stored in the Input data area (for mode 3) (Un\G6144 to Un\G10239).

(e) Turning OFF the Data exchange start request signal (Y00) turns OFF the Data exchange start request signal (X00), and I/O data exchange is stopped.

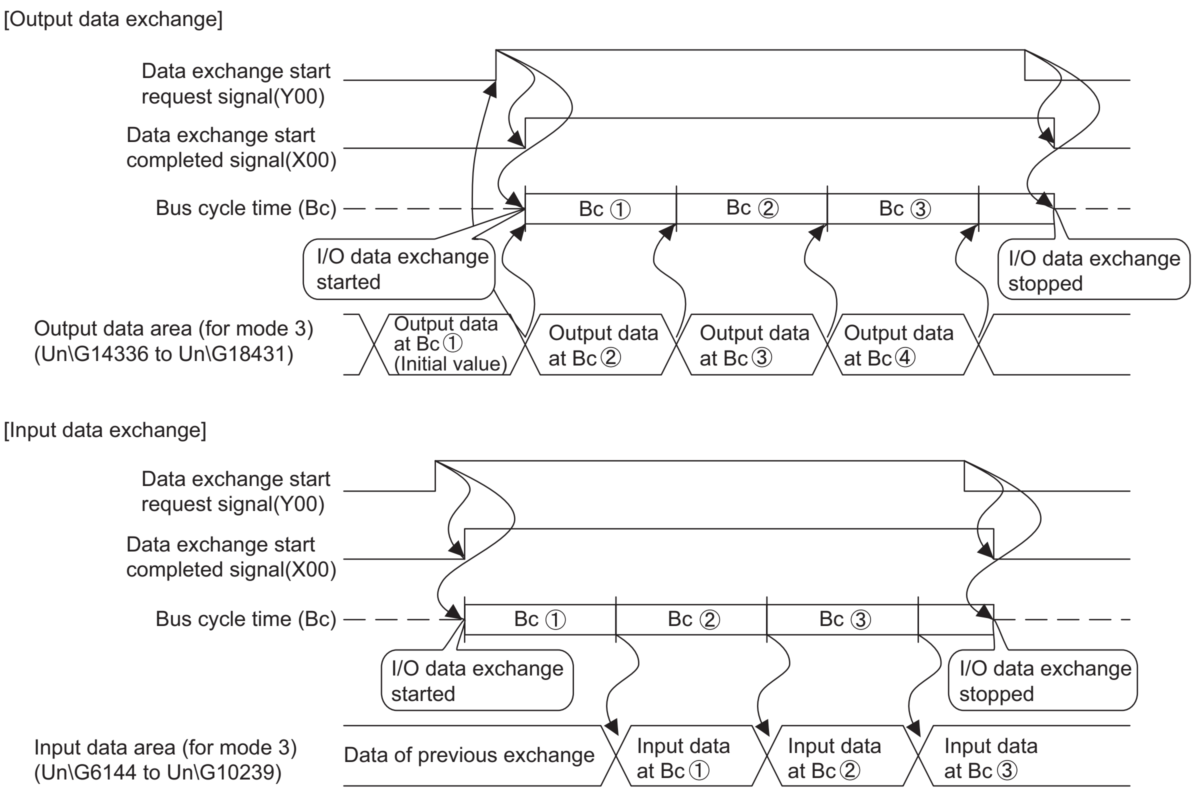


Figure 4.2 I/O Data Exchange Processing

Remark

For program examples of the I/O data exchange, refer to the following:

- Single CPU system: Section 7.1, 7.8
- Redundant system: Section 7.9.1

4.1.2 Acquisition of diagnostic and/or extended diagnostic information

Diagnostic and/or extended diagnostic information of an error occurred on DP-Slaves during I/O data exchange can be easily acquired using buffer memory and I/O signals. The cause of errors occurring on DP-Slaves can be checked on the QJ71PB92V from the diagnostic and/or extended diagnostic information.

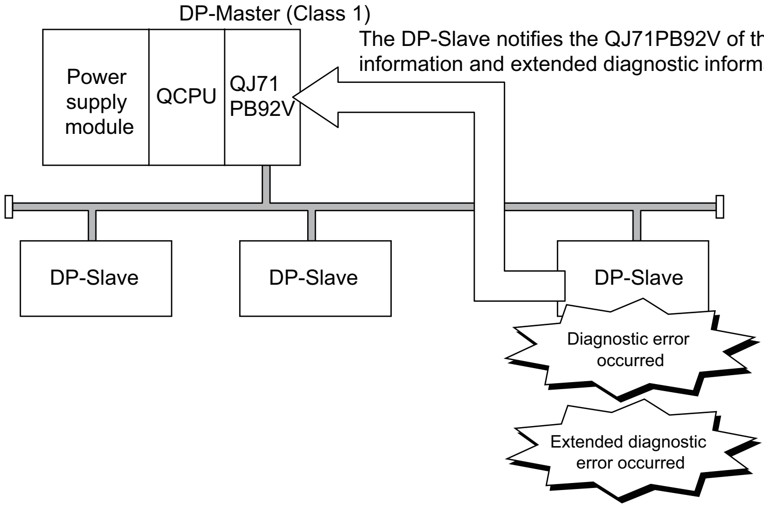


Figure 4.3 Acquisition of Diagnostic and/or Extended Diagnostic Information

(1) Procedure for acquiring diagnostic and/or extended diagnostic information

The following shows the procedure for acquiring diagnostic and/or extended diagnostic information.

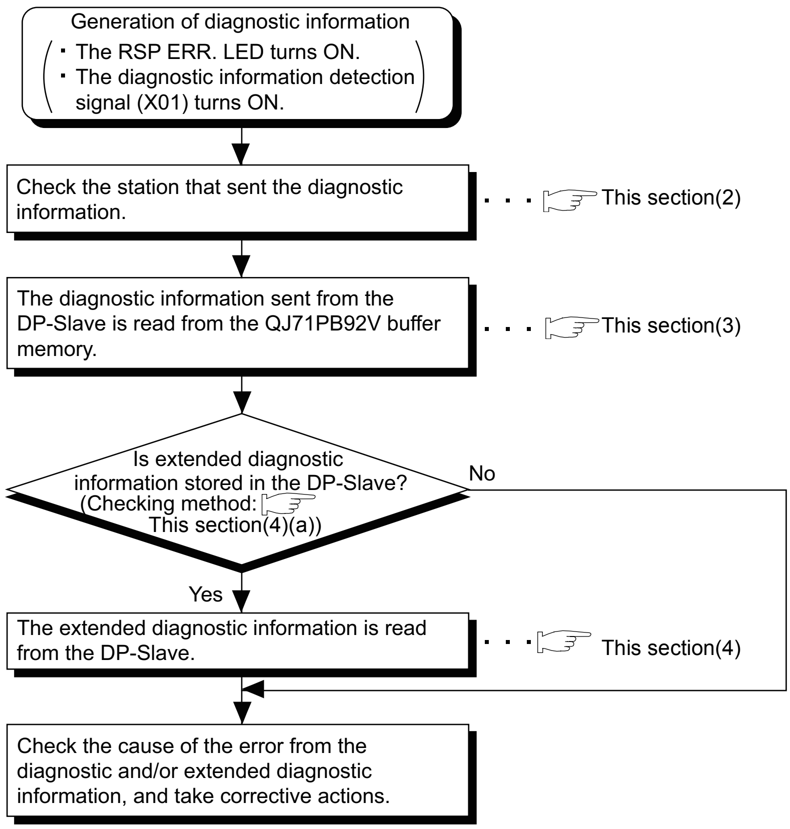


Figure 4.4 Acquisition of Diagnostic and/or Extended Diagnostic Information

(2) **Checking the station generating diagnostic information**

The data showing where diagnostic information of each DP-Slave is occurring are stored in the Slave status area (Diagnostic information detection) (Un\G23056 to Un\G23064).

The bit corresponding to the station that sent the diagnostic information turns ON in the Each station's diagnostic status area (Un\G23057 to Un\G23064).

(3) **Acquiring diagnostic information**

The diagnostic information of DP-Slaves is stored in the buffer memory of the QJ71PB92V.

Read the diagnostic information from the following buffer memory.

- Diagnostic information area (for mode 3) (Un\G23072 to Un\G23321)

(4) Acquiring extended diagnostic information

(a) Checking the station generating extended diagnostic information
For whether extended diagnostic information is stored in any of DP-Slaves or not, check each DP-Slave's Status 1 information that is stored in the Diagnostic information area (for mode 3) (Un\G23072 to Un\G23321).
In the case of the 1st DP-Slave, check b11 of buffer memory address 23073 (5A21H).

(b) Acquiring extended diagnostic information from DP-Slaves
Perform the following procedure to acquire extended diagnostic information:

1) Write the FDL address of the DP-Slave, from which extended diagnostic information is read, to the Extended diagnostic information read request area (Un\G23456).
2) Turn ON the Extended diagnostic information read request signal (Y06).
3) When reading of the extended diagnostic information is completed, the Extended diagnostic information read response signal (X06) turns ON, and the extended diagnostic information is stored in the Extended diagnostic information read response area (Un\G23457 to Un\G23583).
4) Check the read extended diagnostic information, and turn OFF the Extended diagnostic information read request signal (Y06).

POINT

The latest extended diagnostic information that occurred during I/O data exchange is stored in the buffer memory of the QJ71PB92V.
To check the latest extended diagnostic information, read it from the following buffer memory area:

- Extended diagnostic information area (for mode 3) (Un\G23328 to Un\G23454)

Remark

For program examples on acquisition of extended diagnostic information, refer to the following:

- Single CPU system: Section 7.2
- Redundant system: Section 7.9.2

4.1.3 Global control function

By multicasting (broadcasting) data, the QJ71PB92V can simultaneously control I/O data of each DP-Slave in a specified group.

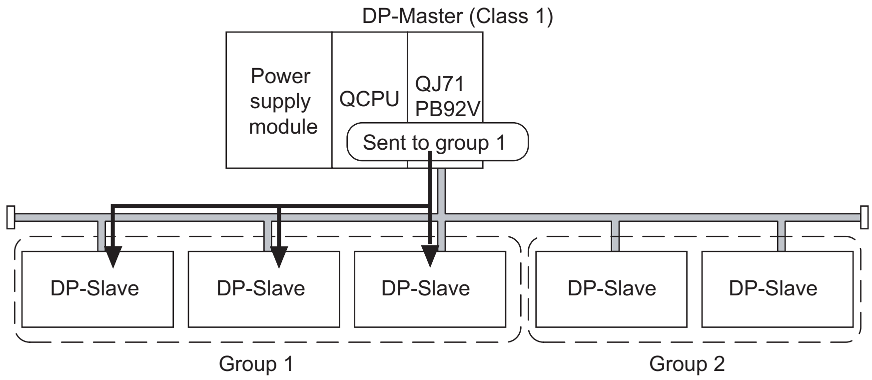


Figure 4.5 Global Control Function

(1) Global control services

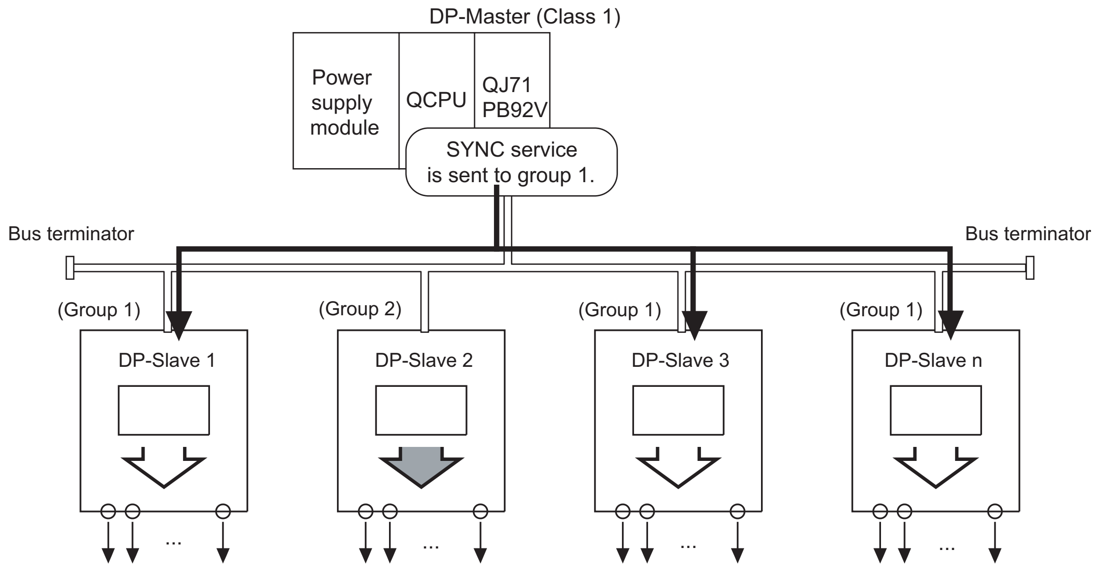
(a) SYNC, UNSYNC

1) SYNC

This service starts the SYNC (output synchronization) mode.
In the SYNC mode, the output status is refreshed every time a DP-Slave receives the SYNC service.
If no SYNC service is received, the output status is held.

2) UNSYNC

This service ends the SYNC (output synchronization) mode.



… Output image memory: Data are refreshed at all times by polling.

… <During UNSYNC execution/Default>The output image memory values are output without being changed. (Normal status)

… <During SYNC execution>The output image memory values are output only once at the timing of the SYNC service.

… SYNC service (Issued within the same group)

… Output to external device.

Figure 4.6 SYNC, UNSYNC

(b) FREEZE, UNFREEZE

1) FREEZE
This service starts the FREEZE (input synchronization) mode.
In the FREEZE mode, the input status is refreshed every time a DP-Slave receives the FREEZE service.
If no FREEZE service is received, the input status is held.

2) UNFREEZE
This service ends the FREEZE (input synchronization) mode.

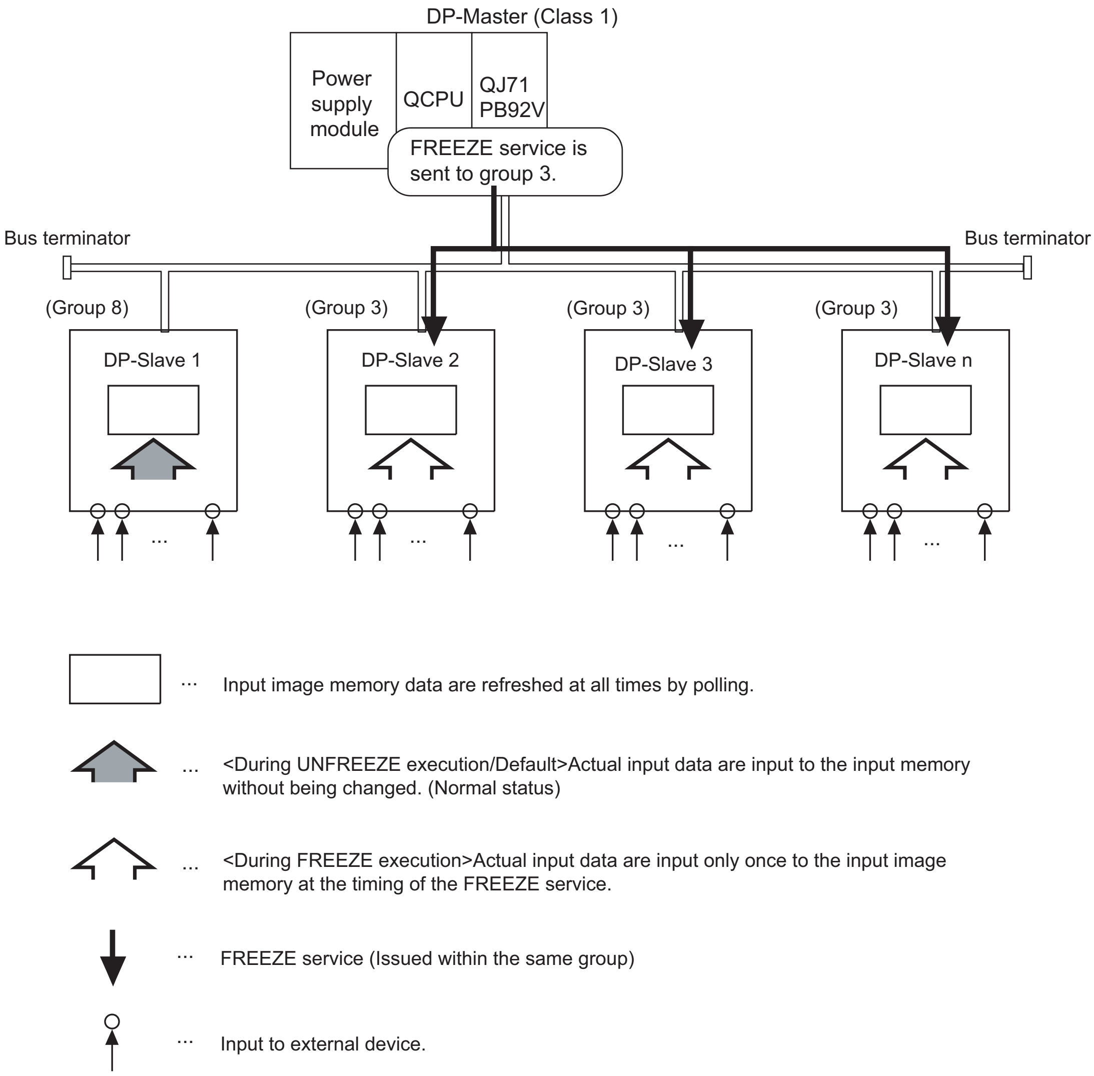


Figure 4.7 FREEZE, UNFREEZE

(2) Group setting

The group setting can be made with the slave parameters ("Slave Parameter Settings" in GX Configurator-DP).
Up to eight groups, groups 1 to 8, can be set.
Multiple groups can also be assigned to a single DP-Slave.

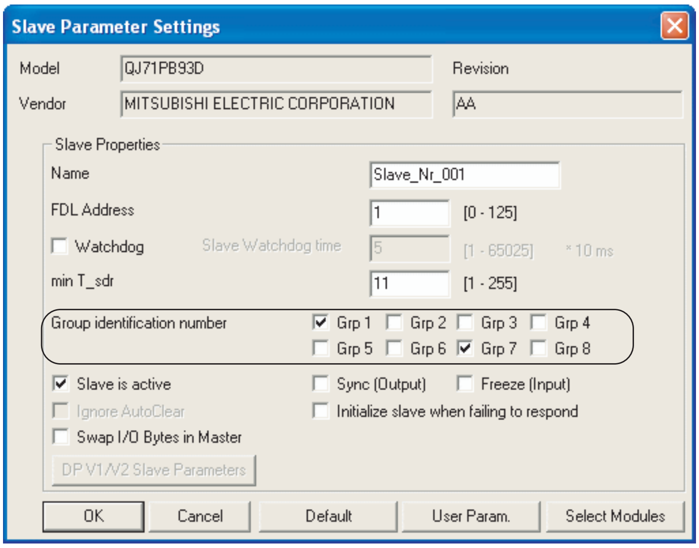


Figure 4.8 Group Setting (GX Configurator-DP)

(3) Executing the global control function

Execute the global control function by the following procedure:

(a) Write the service to be sent and the target group to the Global control area (Un\G2081).

(b) Turn ON the Global control request signal (Y04).

(c) When global control processing is completed, the Global control completed signal (X04) turns ON.
If the processing failed, the Global control failed signal (X05) turns ON.

(d) After confirming completion of the global control, turn OFF the Global control request signal (Y04).

POINT

To execute the global control function to all DP-Slaves (including DP-Slaves for which group No. is not set), set 0s to all of b15 to b8 in the Global control area (Un\G2081).

Remark

For program examples on the global control function, refer to the following:

- Single CPU system: Section 7.3
- Redundant system: Section 7.9.3

4.2 PROFIBUS-DPV1 Functions

POINT

(1) To utilize PROFIBUS-DPV1 functions, use a DP-Slave that supports the PROFIBUS-DPV1.
For details, refer to the manual for the DP-Slave.

(2) When using the PROFIBUS DPV1 function, set a "Min. slave interval" value greater than the bus cycle time calculated from Pt, Tsdi and Lr.(Section 3.5.1)
If the "Min. slave interval" is less than the value calculated from Pt, Tsdi and Lr, the processing of the PROFIBUS-DPV1 function may take time.

4.2.1 Acyclic communication with DP-Slaves

This function allows data reading/writing to DP-Slaves at any specific timing independently of I/O data exchange.
Up to eight requests are executable.

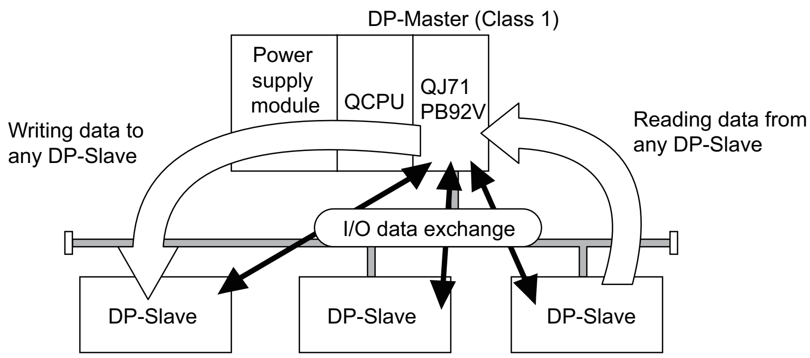


Figure 4.9 Acyclic Communication

(1) Services available on the QJ71PB92V

In acyclic communications, there are two types of services: Class1 and Class2 services.
The services available on the QJ71PB92V differ depending on whether or not the target DP-Slave is performing I/O data exchange.

Table4.3 Available Services

Target DP-Slave	Available Service	
	Class1 service	Class2 service
DP-Slave performing I/O data exchange	○	○
DP-Slave not performing I/O data exchange	×	○

○ : Available, × : Not available

Whether the DP-Slave supports each service or not can be checked in the GSD file.
For details, refer to the manual for the DP-Slave.

1 OVERVIEW
2 SYSTEM CONFIGURATION
3 SPECIFICATIONS
4 FUNCTIONS
5 PROCEDURES AND SETTINGS BEFORE SYSTEM OPERATION
6 PARAMETER SETTING
7 PROGRAMMING
8 DEDICATED INSTRUCTIONS

(a) Class1 services

When executing a Class1 service, verify in advance that the bit corresponding to the target DP-Slave is ON in the Slave status area (Normal communication detection) (Un\G23040 to Un\G23047).

Table4.4 Available Services (Class1 services)

Service Name	Description
READ(Class1_SERVICE)	Reads data from any specified DP-Slave. * 1
WRITE(Class1_SERVICE)	Writes data to any specified DP-Slave.* 1

* 1 The data that can be read or written by READ or WRITE services vary depending on the DP-Slave to be used.
For details, refer to the manual for the DP-Slave.

(b) Class2 services

Connect the line to the DP-Slave by the INITIATE service, and execute the READ and/or WRITE services.
To end the acyclic communication, disconnect the line from the DP-Slave by the ABORT service.
When executing a Class2 service to a DP-Slave that is exchanging I/O data, verify in advance that the bit corresponding to the DP-Slave is ON in the Slave status area (Normal communication detection) (Un\G23040 to Un\G23047).
When executing a Class2 service to a DP-Slave that is not exchanging I/O data, verify in advance that the DP-Slave has been completely activated.
For details, refer to the manual for the DP-Slave.

Table4.5 Available Services (Class2 services)

Service Name	Description
INITIATE(Class2_SERVICE)	Establishes a line connection with any specified DP-Slave.
ABORT(Class2_SERVICE)	Disconnects a line connection from any specified DP-Slave.
READ(Class2_SERVICE)	Reads data from a DP-Slave connected to the line by the INITIATE service. * 2
WRITE(Class2_SERVICE)	Writes data to a DP-Slave connected to the line by the INITIATE service.* 2

* 2 The data that can be read or written by READ or WRITE services vary depending on the DP-Slave to be used.
For details, refer to the manual for the DP-Slave.

(2) Executing acyclic communication

Execute the acyclic communication by the following procedure:

(a) Write the request instruction to be executed to the Acyclic communication request area (Un\G23809 to Un\G24832).

(b) Turn ON (1) the bit corresponding to the request instruction No. in the Acyclic communication request execution instruction area (Un\G23808).

(c) When the QJ71PB92V accepts the acyclic communication request instruction, the acceptance status bit in the Acyclic communication request result area (Un\G25120) turns ON (1).

(d) When execution of the acyclic communication is completed, the completion status bit in the Acyclic communication request result area (Un\G25120) turns ON (1), and the execution result is stored in the Acyclic communication response area (Un\G25121 to Un\G26144).

POINT

When acommunication fails in Class 1 services due to the following, being exchanged with DP-Slaves may be initialized. (Inputs and outputs are turned OFF.)

- Cable fault, influence of noise (☞ Sections 5.5.1 and 5.5.2)
- System switching occurred in redundant system

Especially, when this occurs in redundant system switching, outputs of the relevant DP-Slaves momentarily turn OFF. Therefore, fully examine if the system has no problem. (☞ Section 7.9.4)

Remark

For program examples on the acyclic communication, refer to the following:

- Single CPU system: ☞ Section 7.4
- Redundant system: ☞ Section 7.9.4

4.2.2 Alarm acquisition

This function enables acquisition of up to 8 alarms or status information data that have been generated on any DP-Slave.

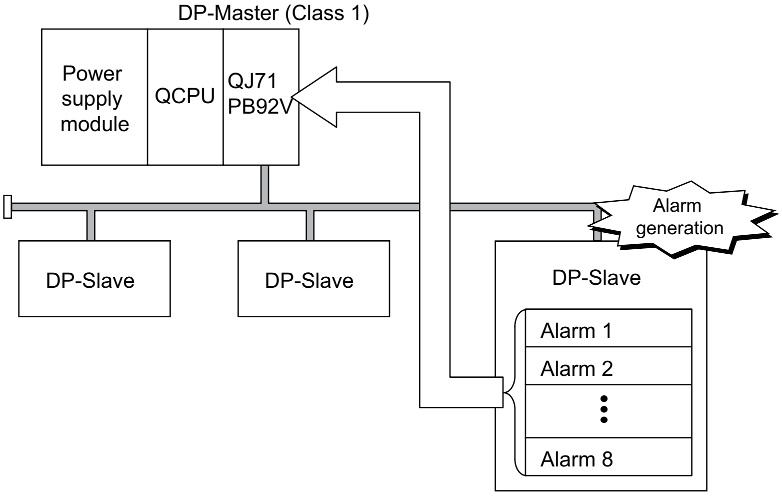


Figure 4.10 Alarm Acquisition

(1) Requests available on the QJ71PB92V

There are the following two ways for acquiring alarms: using the Alarm read request (without ACK) and Alarm ACK request, and using the Alarm read request (with ACK).
Whether the DP-Slave supports this function or not can be checked in the GSD file.
For details, refer to the manual for the DP-Slave.

(a) Alarm read request (without ACK), Alarm ACK request
Use these requests when a certain time may be required to return ACK after reading an alarm from a DP-Slave (e.g. when taking corrective actions for the DP-Slave error).
The Alarm ACK request enables ACK to be returned for each read-out alarm.

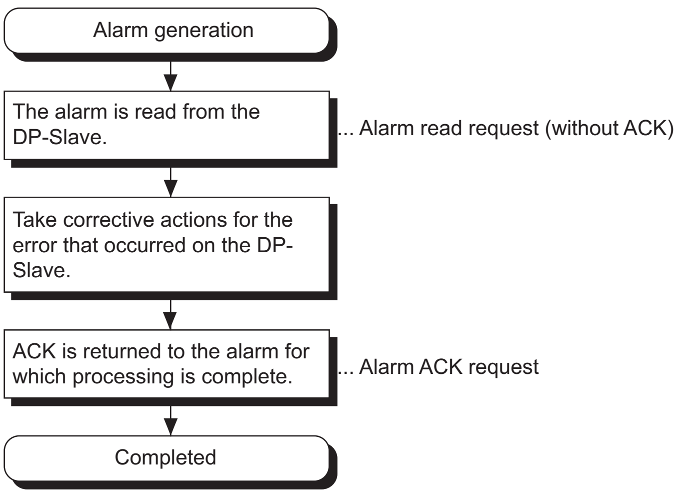


Figure 4.11 Procedure Using Alarm Read Request (without ACK) and Alarm ACK Request

(b) Alarm read request (with ACK)
This request automatically sends ACK after reading an alarm.
ACK is returned in response to all read-out alarms.

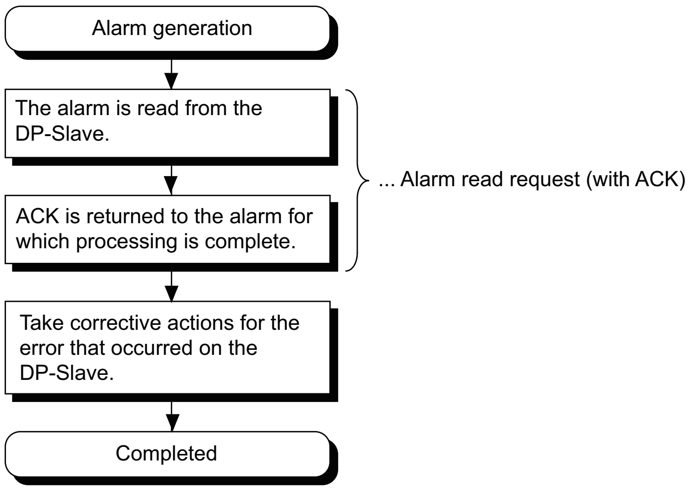


Figure 4.12 Procedure Using Alarm Read Request (with ACK)

(2) Executing alarm acquisition

Execute alarm acquisition by the following procedure:

(a) In the Slave status area (Alarm detection) (Un\G26416 to Un\G26424), identify the DP-Slave where an alarm is occurring.

(b) Write the request data to the DP-Slave into the Alarm request area (Un\G26432 to Un\G26434).

(c) Turn ON the Alarm read request signal (Y18).

(d) When alarm reading is completed, the read result is stored in the Alarm response area (Un\G26446 to Un\G26768) and the Alarm read response signal (X18) turns ON.

(e) Check the alarm stored in the Alarm response area (Un\G26446 to Un\G26768), and turn OFF the Alarm read request signal (Y18).

POINT

In redundant systems, do not use the Alarm acquisition (☞ Section 7.9.5)

Remark

For program examples on the alarm acquisition, refer to the following:

- Single CPU system: ☞ Section 7.5
- Redundant system: ☞ Section 7.9.5

4.2.3 FDT/DTM technology

Using a commercially available FDT, reading/writing the DP-Slave parameters and monitoring the DP-Slave status are executable via the QJ71PB92V.
For details of the FDT/DTM technology, refer to the GX Configurator-DP Operating Manual (CommDTM).

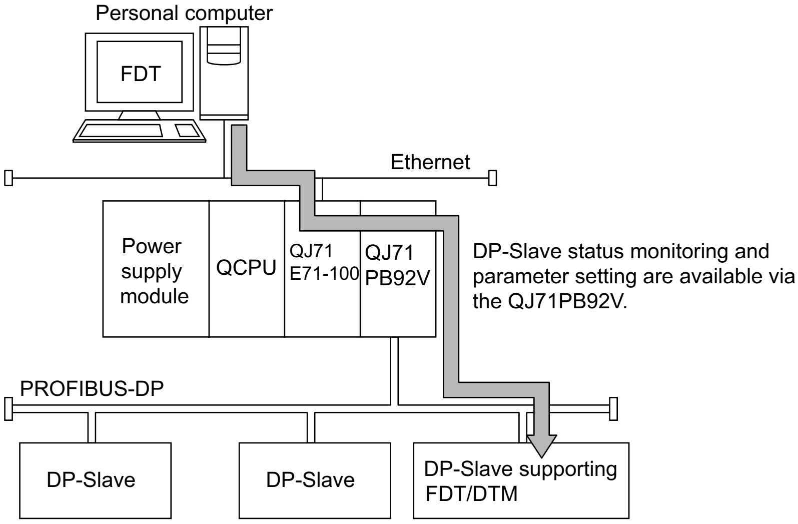


Figure 4.13 FDT/DTM Technology

POINT

Once system switching has occurred, the function of the FDT/DTM technology is disabled and cannot be continued.
When using the function of the FDT/DTM technology in the redundant system, pay attention to the following and fully examine possible operations in advance.

(1) A commercially available FDT must be connected to the control system. The FDT/DTM technology cannot be used in the standby system.

(2) The FDT/DTM technology must be utilized for temporary applications*1.
If it is used for a constant application*2, when system switching occurs, execution of the FDT/DTM technology may be disabled even after reconnection to the new control system.
If this occurs, wait for several minutes*3 and then retry the execution.

* 1 Parameter settings of DP-Slaves, temporary status monitoring, etc.
* 2 Constant status monitoring, etc.
* 3 The time during which the FDT/DTM technology is re-executable varies depending on the DP-Slave.
If not re-executable, retry until it becomes executable.

4.3 PROFIBUS-DPV2 Functions

POINT

(1) To utilize PROFIBUS-DPV2 functions, use a DP-Slave that supports the PROFIBUS-DPV2.
For details, refer to the manual for the DP-Slave.

(2) When using the PROFIBUS-DP2 function, set a "Min. slave interval" value greater than the bus cycle time calculated from Pt, Tsdi and Lr.(☞ Section 3.5.1)
If the "Min. slave interval" is less than the value calculated from Pt, Tsdi and Lr, the processing of the PROFIBUS-DPV2 function may take time.

4.3.1 Time control over DP-Slaves

This function allows the QJ71PB92V to operate as the time master and set the time of each DP-Slave.

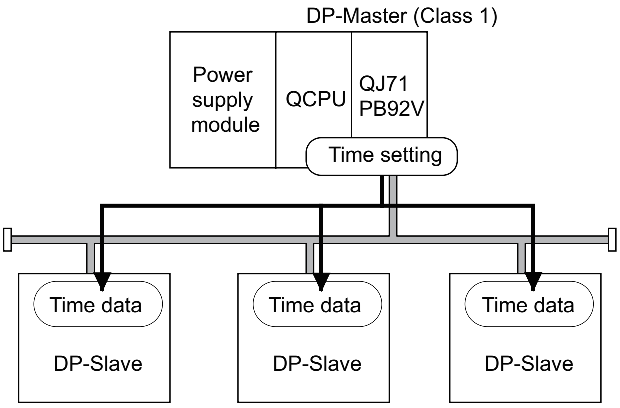


Figure 4.14 Time Control Function

(1) Requests available on the QJ71PB92V

For whether the DP-Slave supports this function or not, refer to the manual for the DP-Slave.

(a) Requests for writing time data

Table4.6 Request for Writing Time Data

Request Name	Description
Time data write request	Sets the year, month, day, hour, minute and second, and writes the time data.
Time data write request (UTC format)	Writes time data in UTC seconds (year + month + day + hour + minute + second). The set value, 9DFF4400H represents "January 1st in 1984, 00:00:00".

(b) Request for reading time data
The time data read request is used to read the time data written to a DP-Slave by another time master out to the QJ71PB92V.
This request can be used when two or more time masters exist on the same network.

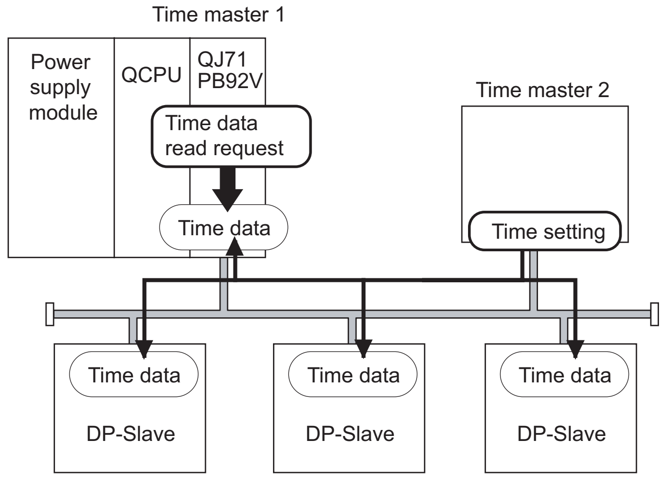


Figure 4.15 Time Data Read Request

(2) Executing time control function

Execute the time control function by the following procedure:

(a) Write request data to the Time control setting request area (Un\G26784 to Un\G26792).

(b) Turn ON the Time control start request signal (Y19).

(c) When the time control is completed, the execution result is stored in the Time control setting response area (Un\G26800 to Un\G26812), and the Time control start response signal (X19) turns ON.

(d) Check the execution result stored in the Time control setting response area (Un\G26800 to Un\G26812), and turn OFF the Time control start response signal (X19).

Remark

For program examples on the time control function, refer to the following:

- Single CPU system: Section 7.6
- Redundant system: Section 7.9.6

4.4 Data Swap Function

This function swaps the upper and lower bytes in word units when I/O data is sent and received.
Use this function for DP-Slaves whose word structure is different (upper and lower bytes are reversed) from that of the QJ71PB92V.
This function enables you to swap upper and lower bytes to exchange I/O data without the need to create a special sequence program for the swapping.

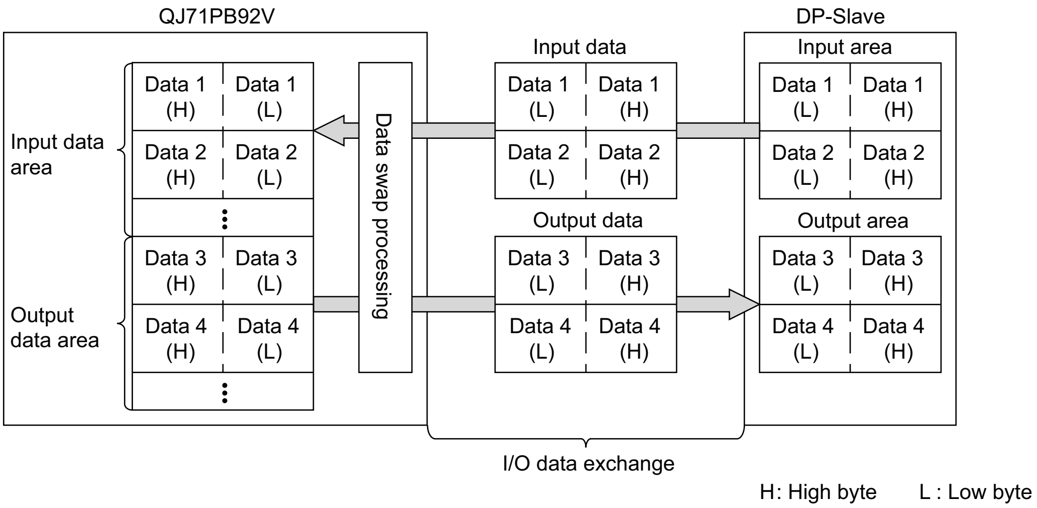


Figure 4.16 Data Swap Function

(1) Data swap setting

The data swap setting can be made with the slave parameters ("Slave Parameter Settings" in GX Configurator-DP).
Data swap setting must be made for each DP-Slave.
Mark the Swap I/O Bytes in Master checkbox to enable the swap setting for the DP-Slave.

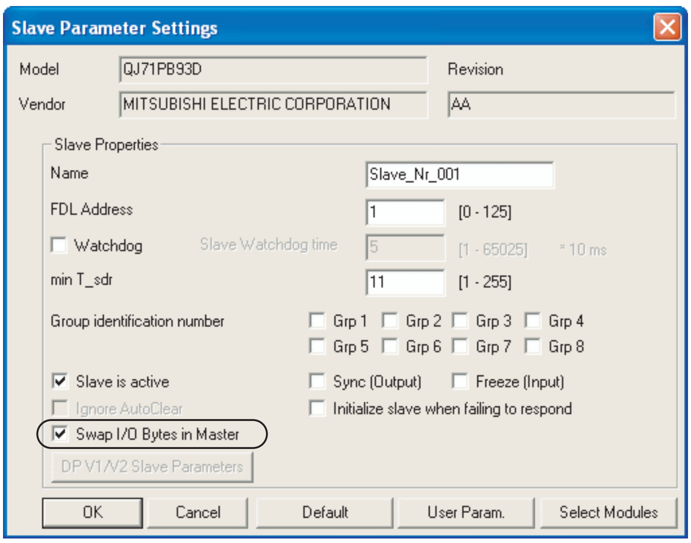


Figure 4.17 Data swap Setting (GX Configurator-DP)

(2) **Invalidating or validating data swap setting**

For DP-Slaves that handle data whose word structure is the same as that of the QJ71PB92V, invalidate the data swap setting.

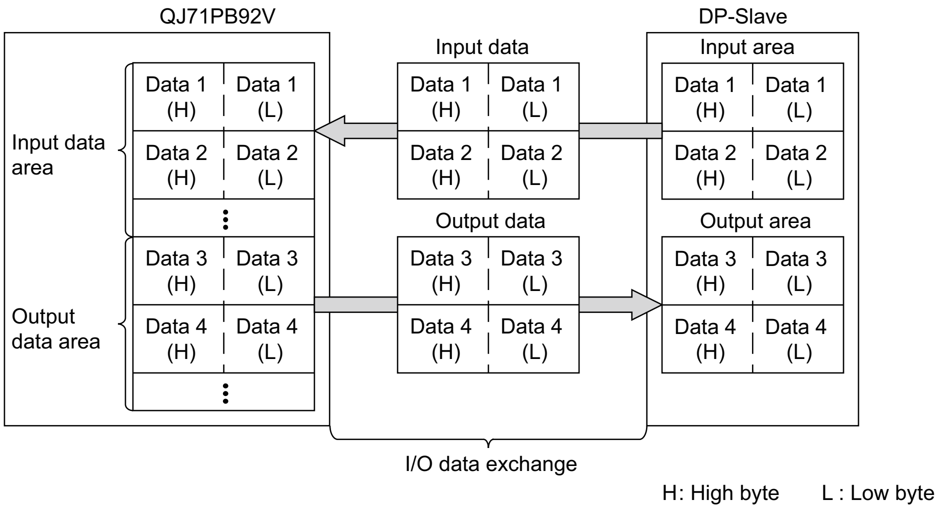


Figure 4.18 When Invalidating the Data Swap Setting

For DP-Slaves that handle data whose word structure is the reverse of the QJ71PB92V, validate the data swap setting.

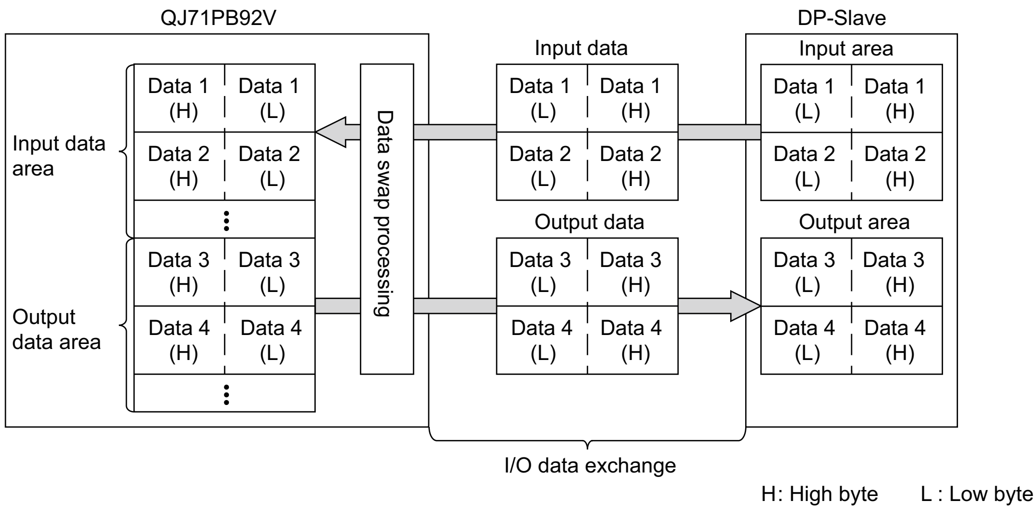


Figure 4.19 When Validating the Data Swap Setting

4.5 Data Consistency Function

When I/O data from DP-Slaves are read from or written to buffer memory, this function prevents the I/O data from being separated and incorrectly mixed.

(1) I/O data consistency function

(a) The PROFIBUS-DP bus cycle and QCPU sequence scan are performed asynchronously.
Because of this, when the QCPU reads input data in the buffer memory during input data transfer from a DP-Slave to the buffer memory, the original data may be divided generating inconsistency in the input data. (The same applies to output data.)
The following shows an example of data inconsistency when data are read from the QCPU during the input data transfer from a DP-Slave to the buffer memory.

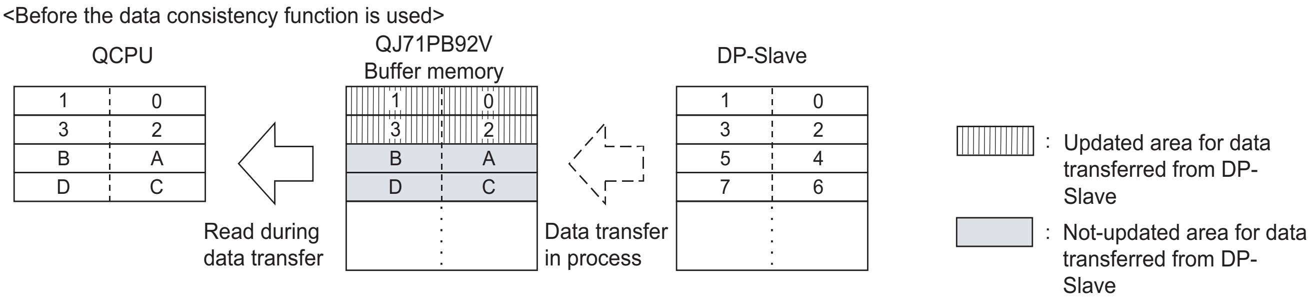


Figure 4.20 Example of Input Data Inconsistency

(b) When the data consistency function is enabled, it makes reading from the QCPU wait until data transfer from a DP-Slave to the QJ71PB92V buffer memory (Input data area) is completed, and the reading is executed upon completion of the data transfer.
Alternatively, the QJ71PB92V stands by for data transfer to DP-Slaves until writing from the QCPU to the QJ71PB92V buffer memory (Output data area) is completed, and executes the data transfer upon completion of the writing.

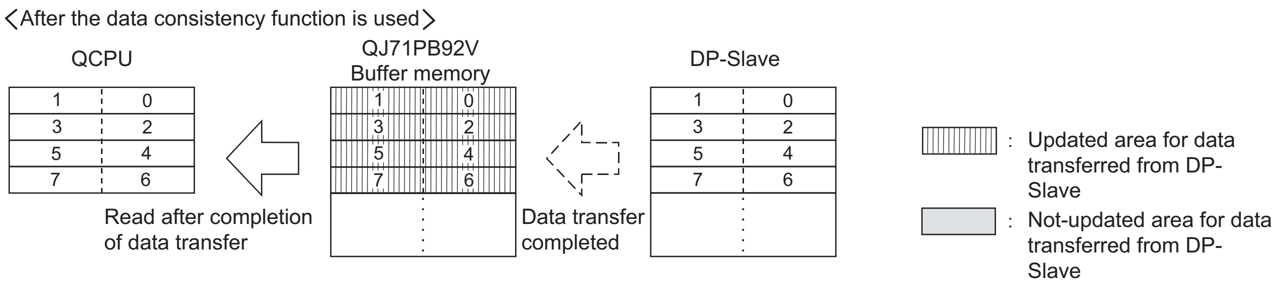


Figure 4.21 Example of Input Data Consistency

(2) How to prevent data inconsistency

The data consistency function can be used by either of the following methods.

(a) Data consistency function by automatic refresh

In GX Configurator-DP, select [Setup] → [PLC and GX IEC Developer (GID) Settings] and enable the automatic refresh setting.

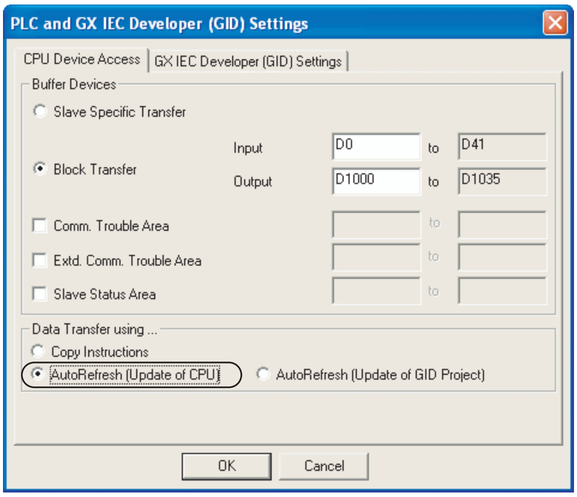


Figure 4.22 Automatic Refresh Setting (GX Configurator-DP)

To use the data consistency function by automatic refresh, check the checkbox of the master parameter, Consistency.

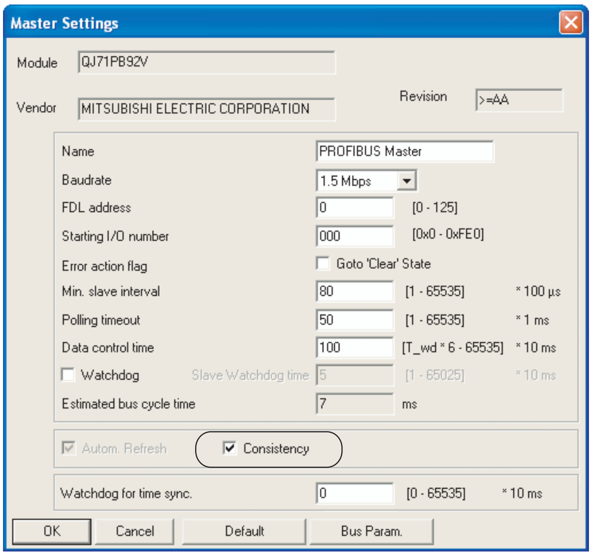


Figure 4.23 Automatic Refresh Setting (GX Configurator-DP)

Remark

For the automatic refresh setting method, refer to Section 6.6.2.

(b) Data consistency function by dedicated instructions
Use the BBLKRD (read) and BBLKWR (write) instructions as dedicated instructions for reading/writing QJ71PB92V buffer memory to execute the data consistency function.
For details on dedicated instructions, refer to Chapter 8.

Remark

For program examples on the I/O data exchange using dedicated instructions, refer to the following:

- Single CPU system: ☞ Section 7.1.2
- Redundant system: ☞ Section 7.9.1

(3) Precautions

(a) Applicable QCPUs
For QCPUs supporting the data consistency function, refer to Section 2.1.

(b) Transmission delay time when the data consistency function is used
When the data consistency function is used, the transmission delay time between the QCPU and DP-Slaves increases because the time waiting for read/write from the QCPU or data transfer from/to DP-Slaves arises. (☞ Section 3.5.2)
The data consistency function can be disabled in the automatic refresh setting.
If this function is unnecessary, disable it.

(c) When the data consistency function is enabled in the automatic refresh setting
Dedicated instructions are not executable. (They are not processed.)
Dedicated instructions are executable if the data consistency function is disabled in the automatic refresh setting.

(d) MOV or FROM/TO instruction.
The data consistency function is not usable when data refresh are performed between the QCPU and the QJ71PB92V buffer memory by the MOV or FROM/TO instruction.

4.6 Output Status Setting for the Case of a CPU Stop Error

This function sets whether to stop or continue I/O data exchange with DP-Slaves when a CPU stop error occurs on a QCPU or remote I/O station where the QJ71PB92V is mounted.

POINT

(1) When the QJ71PB92V is installed in a redundant system, the setting described in this section is not required.
The QJ71PB92V continues I/O data exchange with DP-Slaves until systems A and B go down, regardless of the setting shown in this section.

(2) When the QJ71PB92D-compatible function is enabled, the setting described in this section is invalid.
When the QJ71PB92D-compatible function is used, set the output status setting for the case of a CPU stop error by the intelligent function module switch setting. (☞ Section 6.7)

(1) Output status setting for the case of a CPU stop error

On GX Developer, set the output status for the case where a CPU stop error occurs. Set desired output status in the intelligent function module detailed settings after setting the I/O assignments of the QJ71PB92V.

(a) I/O assignment setting

1) Startup procedure

[Parameters] → [PLC parameter] → <<I/O assignment>>

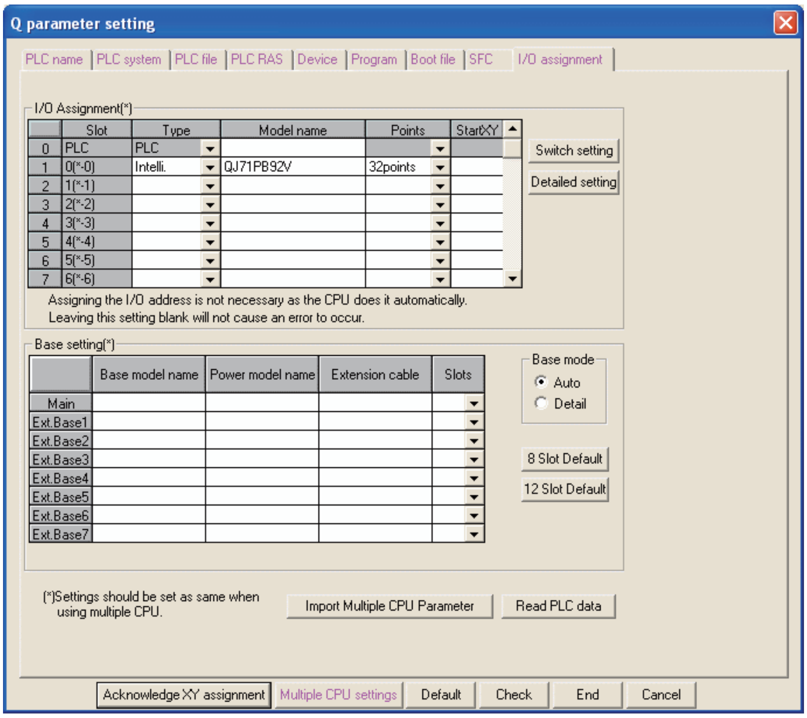


Figure 4.24 I/O Assignment Setting (GX Developer)

(b) Intelligent function module detailed settings

1) Startup procedure

[Parameters] → [PLC parameter] → <<I/O assignment>> →

Detailed setting button

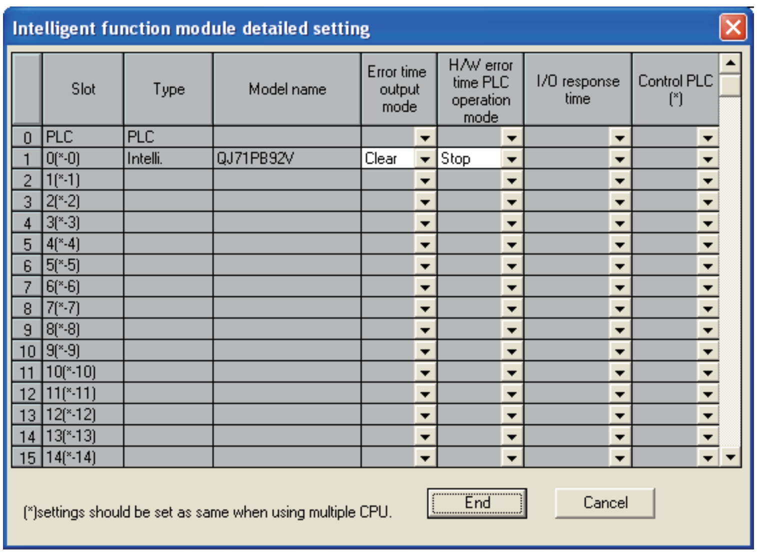


Figure 4.25 Output Status Setting for the Case of a CPU Stop Error (GX Developer)

(2) Output status for the case of a CPU stop error

(a) When "Error time output mode " is set to "Clear "
The QJ71PB92V stops I/O data exchange when a CPU stop error occurs.
Due to stop of I/O data exchange, no output data is sent to DP-Slaves.
Input data received from a DP-Slave before stop of I/O data exchange are held in the buffer memory of the QJ71PB92V.

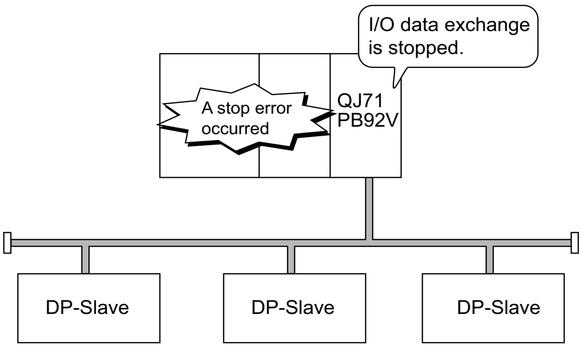


Figure 4.26 When "Error time output mode" is Set to "Clear"

POINT

Whether or not output data are output from each DP-Slave to external devices after stop of I/O data exchange differs depending on the setting of the DP-Slave.
For details, refer to the manual for the DP-Slave.

(b) When "Error time output mode" is set to "Hold"
The QJ71PB92V continues I/O data exchange when a CPU stop error occurs.
The data before occurrence of the CPU stop error are held and they are sent to the DP-Slaves.
Input data received from DP-Slaves updates the buffer memory of the QJ71PB92V.

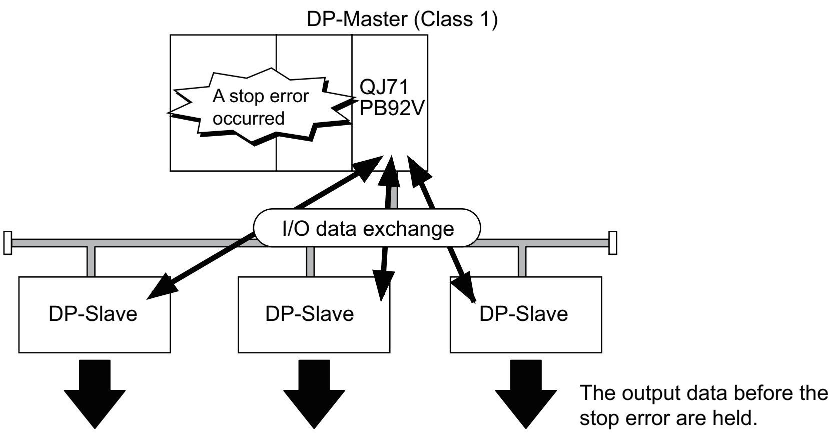


Figure 4.27 When "Error time output mode" is Set to "Hold"

4.7 Temporary slave reservation function

Without modifying the slave parameter in GX Configurator-DP, this function allows the DP-Slave station type to be changed to "Reserved station" temporarily.
Since there is no need to change slave parameters, changing a DP-Slave setting to a reserved station is easy.

(1) DP-Slaves that can be changed to Temporarily reserved stations

Normal DP-Slaves can be changed to Temporarily reserved stations.
Changing Reserved stations (DP-Slaves set as reserved stations with slave parameters) to Normal DP-Slave status is not allowed.

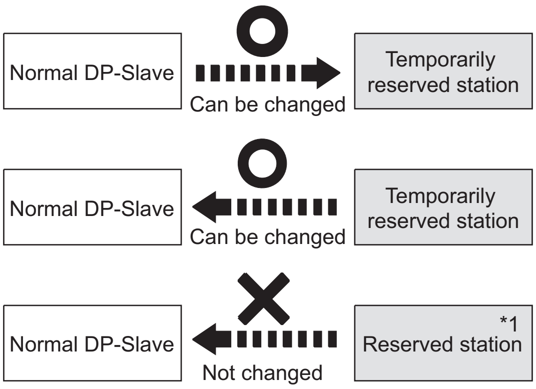


Figure 4.28 DP-Slaves That Can Be Changed to Temporarily Reserved Stations

* 1 In the slave parameter setting of GX Configurator-DP, "Slave is active" is unchecked for this DP-Slave. (☞ Section 6.5)

(2) Temporary slave reservation specification and cancellation

Use the temporary slave reservation function by the following procedures:

(a) Specification method

1) Set Normal DP-Slaves, which are to be changed to Temporary slave reservations, in the temporary slave reservation request area (Un\G23608 to Un\G23615). (☞ Section 3.4.13)
2) Turn ON the Data exchange start request signal (Y00).
3) Upon completion of the temporary slave reservation specification, the results are stored in the temporary slave reservation status area (Un\G23600 to Un\G23607), and the Data exchange start completed signal (X00) turns ON. (☞ Section 3.4.5)

(b) Cancel method

1) Turn OFF the Data exchange start request signal (Y00).
2) In the temporary slave reservation request area (Un\G23608 to Un\G23615), cancel the DP-Slaves specified as temporary slave reservation.
3) Turn ON the Data exchange start request signal (Y00).
4) Upon completion of the temporary slave reservation cancellation, the results are stored in the temporary slave reservation status area (Un\G23600 to Un\G23607), and the Data exchange start completed signal (X00) turns ON.

Remark

For program examples on the temporary slave reservation function, refer to the following:

- Single CPU system: ☞ Section 7.7
- Redundant system: ☞ Section 7.9.7

4.8 Redundant system support function

When the control system CPU or the QJ71PB92V detects an error, the control and standby systems are switched each other to continue communications.

(1) Redundant system operation overview

When the CPU or QJ71PB92V in the control system detects an error, system switching is performed to continue communications.

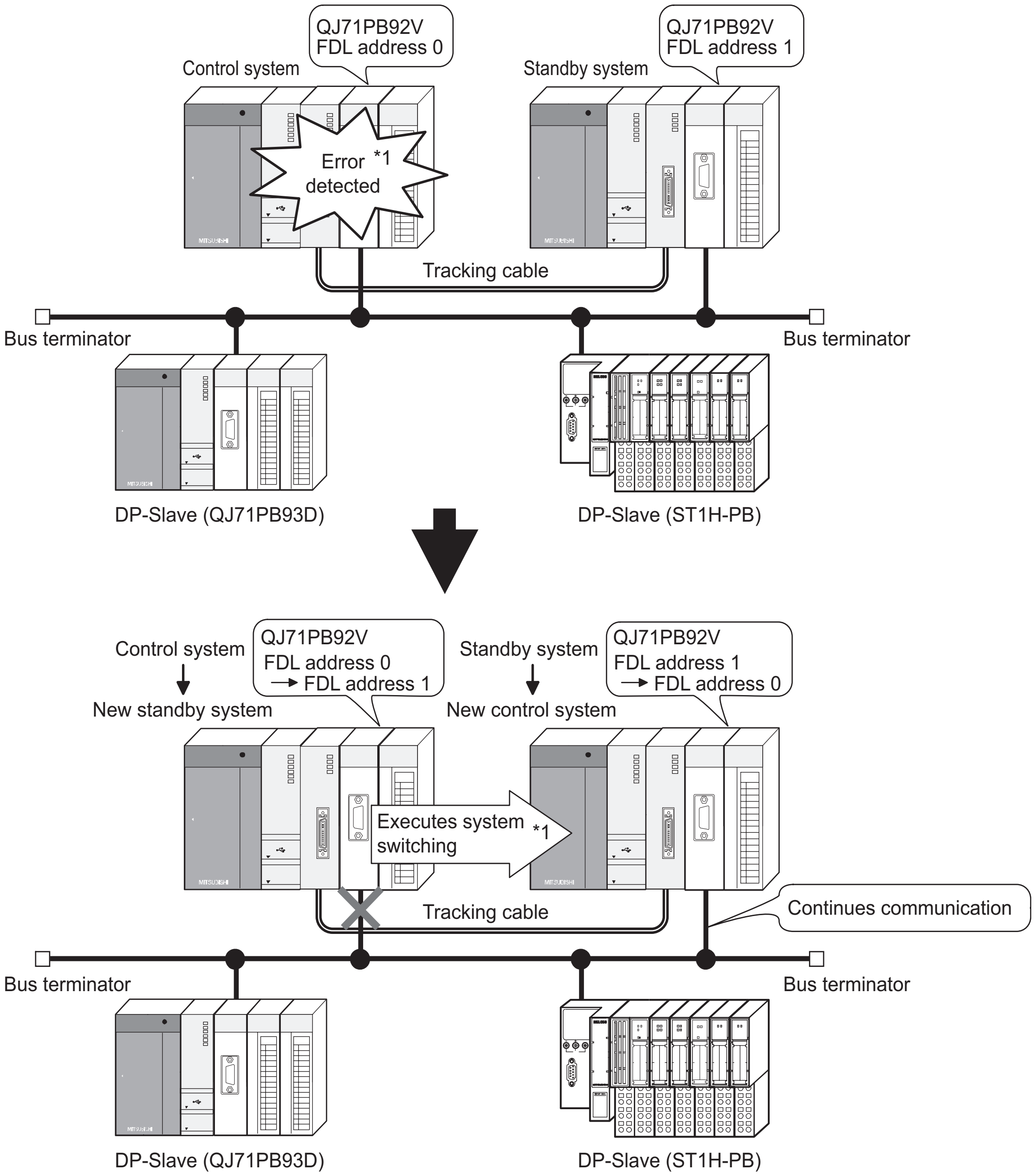


Figure 4.29 Redundant System Operation Overview

* 1 For conditions for making a system switching request (system switching methods), refer to (2) in this section.

(a) Operation of the QJ71PB92V in system switching

1) The control system CPU or QJ71PB92V performs system switching when it detects a system switching error.
For errors that cause system switching (system switching methods), refer to (2) in this section.

2) When system switching occurs, the FDL address of the QJ71PB92V is changed as shown below.

Table4.7 FDL Address of the QJ71PB92V in System Switching

Item	FDL address
QJ71PB92V switched from control system to new standby system	Control master FDL address → Standby master FDL address
QJ71PB92V switched from standby system to new control system	Standby master FDL address → Control master FDL address

These changes can be confirmed in the Local FDL address display area (Un\G2257).

3) System switching is performed, and the QJ71PB92V in the new control system continues communication.

(b) Redundant system parameters
In a redundant system including redundant CPUs, write the same parameters to system A (control system) and B (standby system).

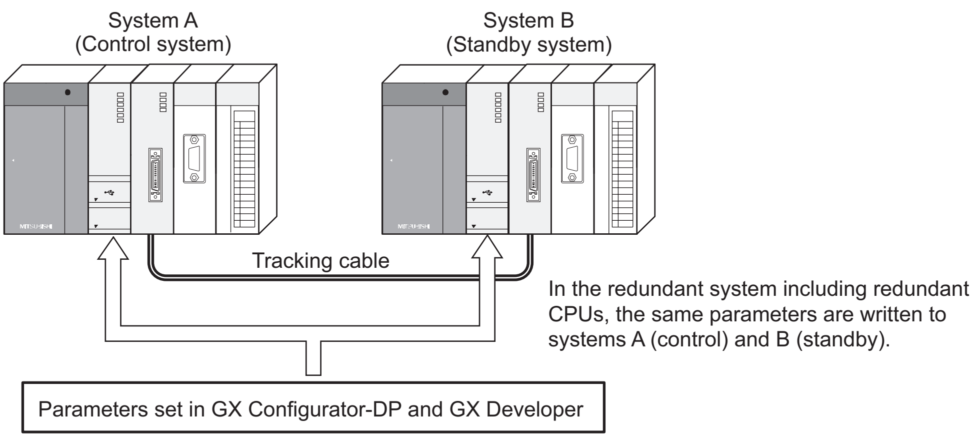


Figure 4.30 Redundant System Parameters

(2) **System switching error (System switching methods)**

There are the following cases where system switching occurs by an error.

Table4.8 System Switching Methods

Method	Reference
Switching by system switching request from QJ71PB92V	(2)(a) and (2)(b) in this section
Switching by system switching request from other network module than QJ71PB92V	QnPRHCPU User's Manual (Redundant System)
System switching when a fault occurs in the control system	
System switching using GX Developer	
System switching by system switching instruction	

(a) System switching due to a QJ71PB92V error

The QJ71PB92V performs system switching when it detects a error that disables the system operation.

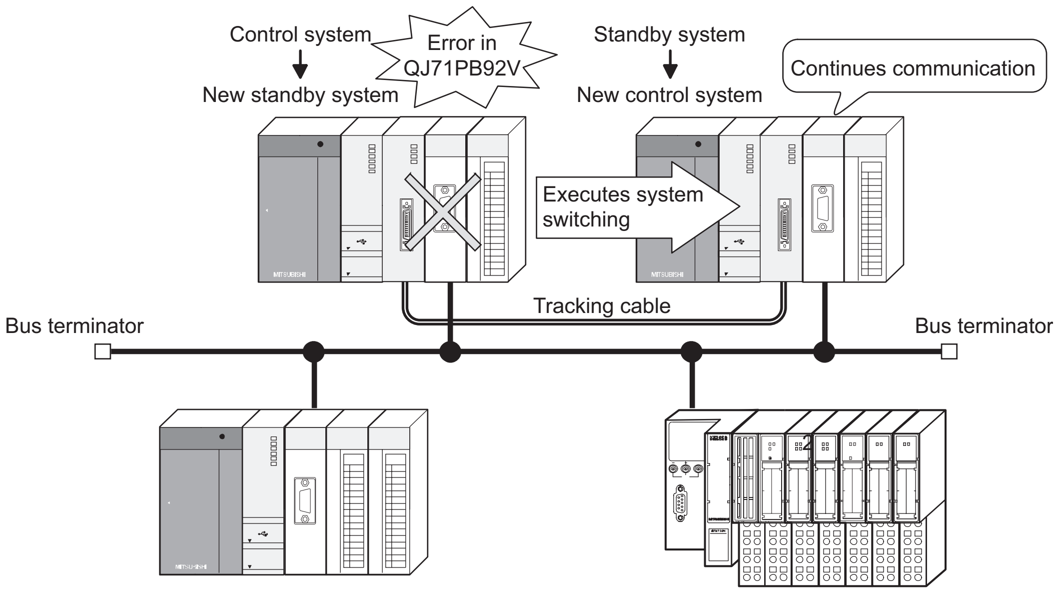


Figure 4.31 System Switching due to QJ71PB92V Error

The following lists the QJ71PB92V errors that may cause system switching.

Table4.9 Errors by Which System Switching Request is Automatically Generated

Error Code	Error Description
E4E2H	Hardware failure
E5A1H	
F101H	No DP-Slaves are set to perform I/O data exchange in the parameter settings.
F10EH	Hardware failure
F10FH*1	
F1FFH	
FB04H	An error has occurred during processing of system switching (Standby system → Control system)

* 1 Systems are not switched when the power turns OFF and then ON or in Separate mode.

Remark

For details on the error codes, refer to Section 9.5.

(b) System switching due to a DP-Slave error
The QJ71PB92V performs system switching when it detects a error in communication with a DP-Slave.

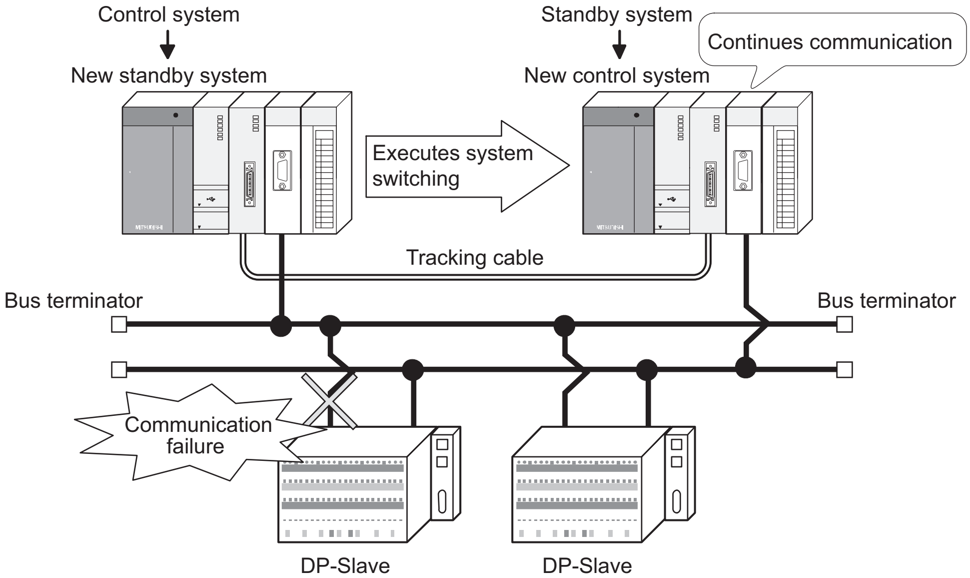


Figure 4.32 System Switching due to DP-Slave Error

To switch the systems due to an error in communication with a DP-Slave, specify the system switching target DP-Slaves in the following buffer memory.

- System switching condition setting area (Disconnected station detection) (Un\G23648 to Un\G23656) (Section 3.4.14)

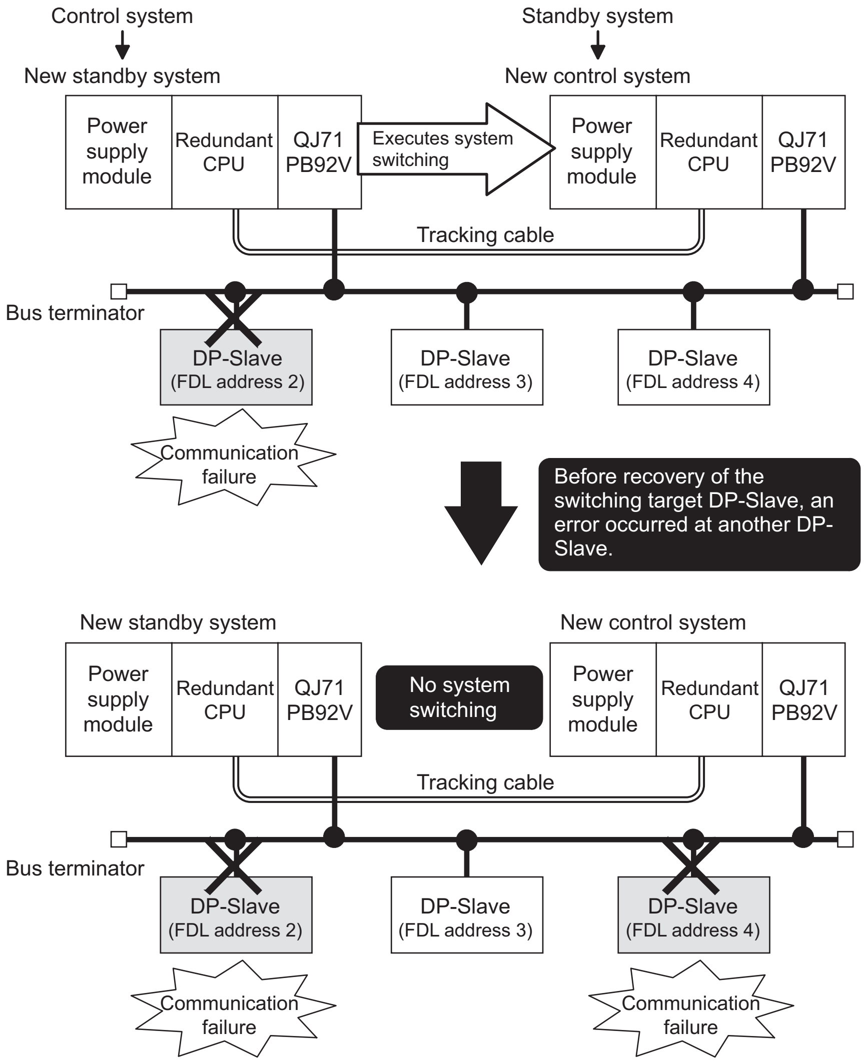
Remark

For the program example for setting the System switching condition setting area (Disconnected station detection) (Un\G23648 to Un\G23656), refer to Section 7.9.1.

POINT

(1) With a communication error identified in a system switching target DP-Slave*1 after system switching, no system switching is performed even if a communication error occurs in another DP-Slave.
To perform system switching again, restore all of the switching target DP-Slaves*1 to normal condition.
The DP-Slave status can be confirmed in the Slave status area (Normal communication detection) (Un\G23040 to Un\G23047). (☞ Section 3.4.5)

* 1 It is any of all the DP-Slaves that are specified in the System switching DP-Slave specification area (Un\G23649 to Un\G23656).



(2) Do not change the initial value of b8 in the Diagnostic information invalid setting area (Un\G2080). (☞ Section 3.4.6)
Changing the initial value disables the system switching by a DP-Slave.

(3) System switching by DP-Slave is enabled when the value in the Current diagnostic information non-notification time area (Un\G2085) becomes 0 after the Data exchange start request signal (Y00) turns ON.

(3) Functions available for redundant systems

The following shows the functions available for the case where the QJ71PB92V is mounted on a redundant system.

Table4.10 Functions available for redundant systems

Function		Availability	Reference
PROFIBUS-DPV0		—	—
	I/O data exchange	△ *1	Section 4.1.1
	Acquisition of diagnostic and extended diagnostic information	△ *1	Section 4.1.2
	Global control function	△ *1	Section 4.1.3
PROFIBUS-DPV1		—	—
	Acyclic communication with DP-Slaves	×	Section 4.2.1
	Alarm acquisition	×	Section 4.2.2
	Support of FDT/DTM technology	×	Section 4.2.3
PROFIBUS-DPV2		—	—
	Time control over DP-Slaves	△ *1	Section 4.3.1
Data swap function		○	Section 4.4
Data consistency function	Data consistency function by automatic refresh	○	Section 4.5
	Data consistency function by dedicated instructions	△ *1	Chapter 8
Output status setting for the case of a CPU stop error		○ *2	Section 4.6
Temporary slave reservation function		△ *1	Section 4.7
QJ71PB92D-compatible function		×	Section 4.9

○ : Available △ : Available with restriction × : Not available

* 1 For precautions for using respective functions in the redundant system, refer to section 7.9 to 7.9.7.

* 2 Independently of the setting, I/O data exchange with DP-Slaves is continued until both A and B systems go down.

(4) Setting for using the QJ71PB92V in the redundant system

To use the QJ71PB92V in a redundant system, make the following settings.

Table4.11 Setting for using the QJ71PB92V in the redundant system

Item		Description	Reference
Required setting	Parameter setting in GX Configurator-DP	In GX Configurator-DP, set the parameters of the QJ71PB92V. The FDL address set as a master parameter is assigned to the QJ71PB92V in the control system.	Section 6.1 to 6.6
	Standby master FDL address setting	In the intelligent function module switch setting in GX Developer, set an FDL address for the QJ71PB92V in the standby system.	Section 6.7
Set if needed	Setting of the target DP-Slaves for system switching.	Specify the target DP-Slaves for system switching in the System switching condition setting area (Disconnected station detection) (Un\G23648 to Un\G23656). This setting is not required when no system switching is to be performed n the event of a communication error with a DP-Slave.	Section 3.4.14
	Tracking settings	Set the tracking devices to continuously use the QJ71PB92V functions after system switching.	Section 7.9 to 7.9.7

(5) Precautions for using the QJ71PB92V in the redundant system

This section explains precautions for the case where the QJ71PB92Vs are mounted to a redundant PROFIBUS-DP system.

(a) Precautions on the QJ71PB92V side

1) Function version of the QJ71PB92V

Use the QJ71PB92V of function version D or later. (☞ Section 2.4)

2) Version of GX Developer

Use GX Developer of Version 8.17T or later. (☞ Section 2.1)

3) When starting up the redundant system

Check the Local station error information area (Un\G23071) to see if the QJ71PB92V has an error or not. (☞ Section 3.4.2)
If an error exists, remove the error cause.
When an error exists, system switching is not executed.

4) Continuation of each function of the QJ71PB92V

For precautions for continuing each function of the QJ71PB92V, refer to Section 7.9.7.

5) When system switching occurred

Do not perform the following before the system switching is completed.

- Turning off the power of the new control system
- Resetting the redundant CPU on the new control system

If either of these is performed before completion of the system switching, DP-Slave outputs may turn off momentarily.
Confirm that the system switching is completed before doing the above operations.
Completion of the system switching can be confirmed by either of the following methods.

Table4.12 Confirmation of system switching completion

Item	QJ71PB92V in new control system
Input signals	Communication READY signal (X1B) and Module READY signal (X1D) are ON.
LEDs	• RUN and READY LEDs are ON. • RSP ERR. and FAULT LEDs are OFF.

6) Operations available for the QJ71PB92V in the standby system

The following operations are available for the QJ71PB92V in the standby system when the redundant CPU is in Separate or Debug mode.

- Writing parameters by GX Configurator-DP*1
- Changing the operation mode (☞ Section 6.2)
- Restarting the QJ71PB92V using the Restart request signal (Y0D) (☞ Section 3.3.2(8))

* 1 When the redundant CPU is in Backup mode, GX Configurator-DP automatically changes it to the Separate mode to write the parameters.

(b) Precautions on the DP-Slave side

1) Watchdog timer setting value
Set a watchdog timer value so that it satisfies the following formula.
If the formula is not satisfied, a watchdog timer error occurs in DP-Slaves during system switching.

Table4.13 Watchdog timer setting value

System Configuration	Description	Reference
When using only non-redundant DP-Slaves	Watchdog timer ≧ (Bus cycle time × 2) + Redundant system switching time (Section 3.5.1, 3.5.3)	Section 2.3.2 (1)
When using redundant and non-redundant DP-Slaves		Section 2.3.2 (3)
When using only redundant DP-Slaves	Line switching time of DP-Slave For the line switching time for a DP-Slave, refer to the manual of the DP-Slave, or contact the manufacturer.	Section 2.3.2 (2)
Multi-master system configuration	HSA × MSI (Section 3.5.1, 6.4)	-

* 1 In addition to the QJ71PB92V used in the redundant system, another DP-Master is connected on the same PROFIBUS network.

2) When using only redundant DP-Slaves
It may take several seconds until system switching is completed on the DP-Slave side.
Before setting the watchdog timer of a DP-Slave, confirm the specifications of the DP-Slave.

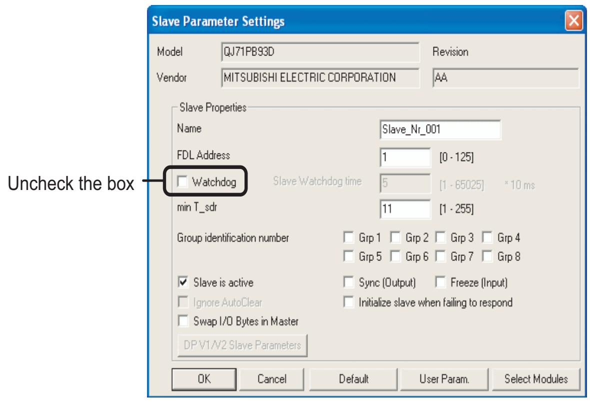
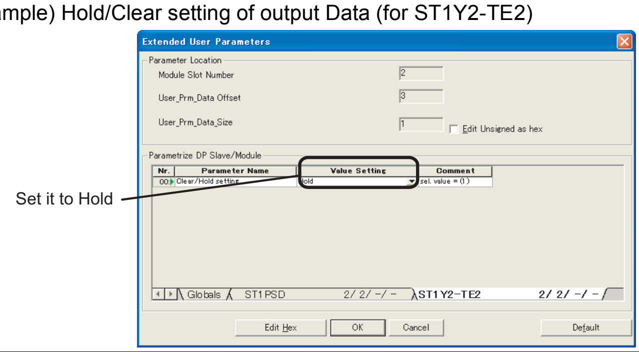
3) DP-Slave output status when the CPUs in the control and standby systems are stopped

Communication of the QJ71PB92V is stopped.

Since the communication is stopped, a watchdog timer error may occur in the DP-Slaves for which a watchdog timer is set, and their outputs may be turned OFF.

Examples for holding the DP-Slave's output are shown below.

Table4.14 Setting Examples for Holding DP-Slave's Output

Item	Description
When DP-Slave has no Hold/Clear function for output data	Disable the watchdog timer for the DP-Slave. Even if the Hold/Clear selection for output data is not allowed for the DP-Slave, its output can be held. Example) Watchdog timer setting example (for QJ71PB93D) 
When DP-Slave has Hold/Clear function for output data	Set the Clear/Hold setting for output data to "Hold" for the DP-Slave. Output data can be held with the DP-Slave's watchdog timer enabled. Example) Hold/Clear setting of output Data (for ST1Y2-TE2) 

⊠POINT

Whether or not output data are output from each DP-Slave to external devices after stop of I/O data exchange differs depending on the DP-Slave setting.
For details, refer to the manual for the DP-Slave.

(c) Precautions on the GX Configurator-DP side

1) When using Slave list
The monitoring target is the QJ71PB92V, which is mounted on the same base as the redundant CPU where GX Configurator-DP is connected (by RS-232 cable, USB cable, etc.)

2) When using Current Configuration
The monitoring target is the QJ71PB92V, which is mounted on the same base as the redundant CPU where GX Configurator-DP is connected (by RS-232 cable, USB cable, etc.)
To display the parameters written to the QJ71PB92V in the standby system, perform the following:
- Change the operation mode of the redundant CPU to Separate or Debug mode.
- Stop the tracking transfer between the redundant CPUs.

4.9 QJ71PB92D-Compatible Function

This function is used to replace the QJ71PB92D with the QJ71PB92V.
When the QJ71PB92D has failed, replace it with the QJ71PB92V using the QJ71PB92D-compatible function.
Since the existing network configuration or sequence programs for the QJ71PB92D can be utilized, a faulty QJ71PB92D can be smoothly replaced with the QJ71PB92V.

POINT

This manual describes only the overview of the QJ71PB92D-compatible function.
For details, refer to the following manual.
PROFIBUS-DP Interface Module User's Manual

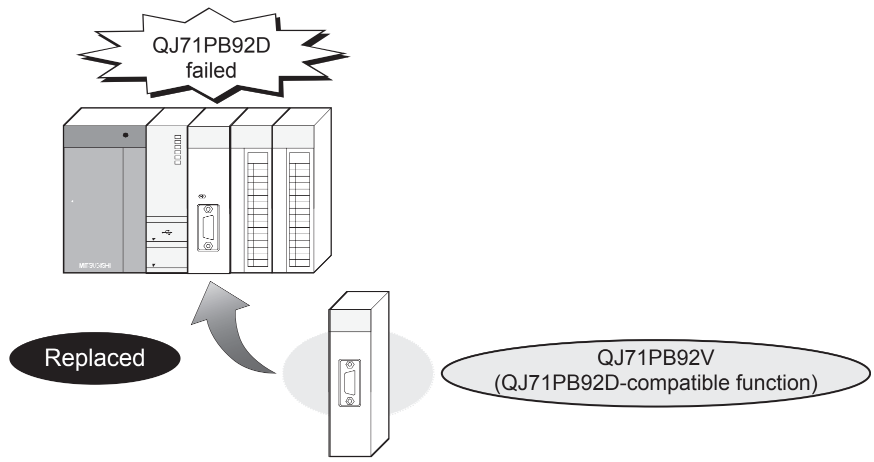


Figure 4.33 QJ71PB92D-Compatible Function

(1) System configuration for using the QJ71PB92D-compatible function

Same as that of the QJ71PB92D, except for the supported software packages.

Table4.15 Supported Software Packages for Use of the QJ71PB92D-Compatible Function

System		Software Version	
		GX Developer	GX Configurator-DP
Q00J/Q00/Q01CPU	Single CPU system	Version 7 or later	Version 5 to 6 Version 7.01B or later*1
	Multiple CPU system	Version 8 or later	
Q02/Q02H/Q06H/Q12H/Q25HCPU	Single CPU system	Version 4 or later	Version 4 to 6 Version 7.01B or later*1
	Multiple CPU system	Version 6 or later	
Q12PH/Q25PHCPU	Single CPU system	Version 7.10L or later	
	Multiple CPU system		
Q03UD/Q04UDH/Q06UDHCPU	Single CPU system	Version 8.48A or later	Version 7.02C or later
	Multiple CPU system		

* 1 In Version 7.01B, only the Web-based online access function cannot be used.

POINT

GX Configurator-DP Version 7.00A cannot be used.
For GX Configurator-DP Version 7.00A, upgrade it to Version 7.01B or later.
For version upgrades, please consult your local Mitsubishi representative.

(2) Wiring for using the QJ71PB92D-compatible function

Except for the PROFIBUS interface connector position and no terminating resistor, the wiring is the same as the QJ71PB92D.

(a) PROFIBUS interface connector position

The PROFIBUS interface connector position on the QJ71PB92V is moved up by 17mm (0.67 inch), compared with the QJ71PB92D.
If the PROFIBUS cable is not long enough, extend the cable length by using an extension connector.

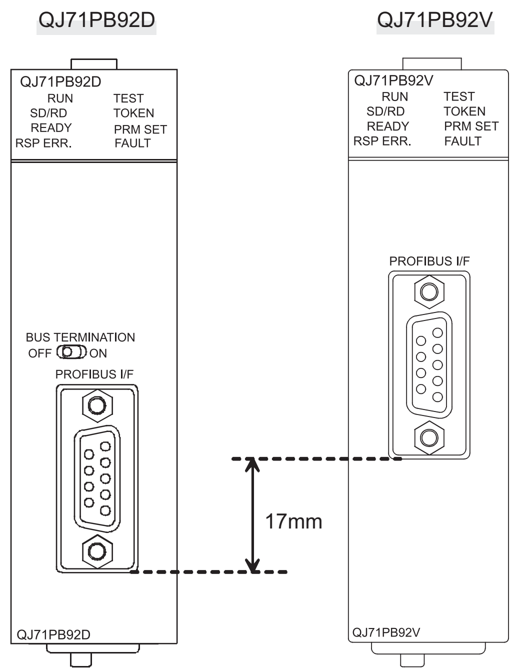


Figure 4.34 PROFIBUS Interface Connector Position

(b) Bus terminator

The QJ71PB92V does not have a built-in bus terminator.
When the bus terminator setting switch on the QJ71PB92D has been set to ON, use a connector with a built-in bus terminator for the QJ71PB92V.
For wiring specifications for the bus terminator of the QJ71PB92V, refer to Section 5.5.1.

Remark

For details on PROFIBUS cables and connectors, access the following website.

- PROFIBUS International: http://www.profibus.com/

(3) Procedures before system operation

In the Intelligent function module switch setting, enable the QJ71PB92D-compatible function.

The following shows how to enable the QJ71PB92D-compatible function.

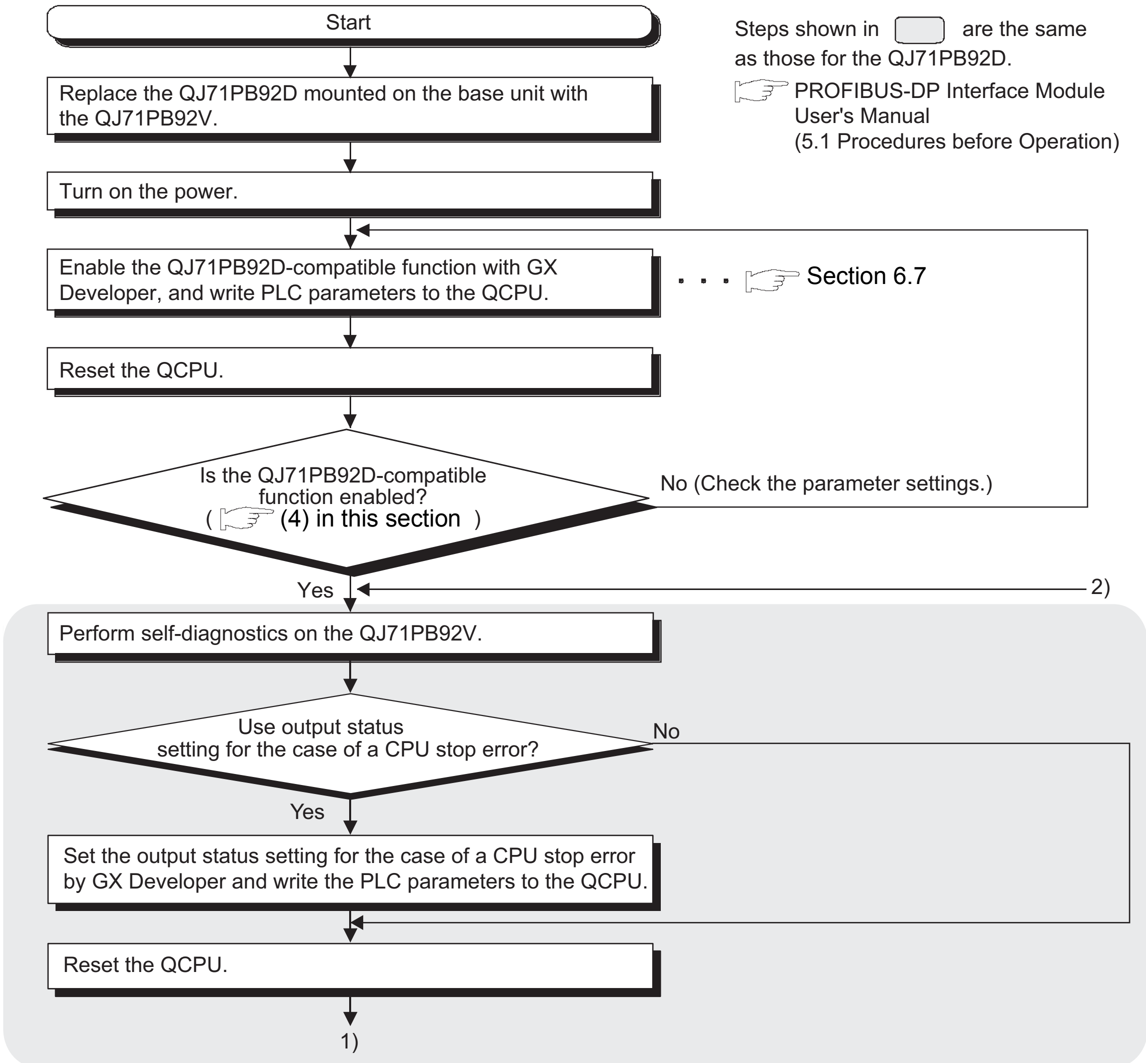
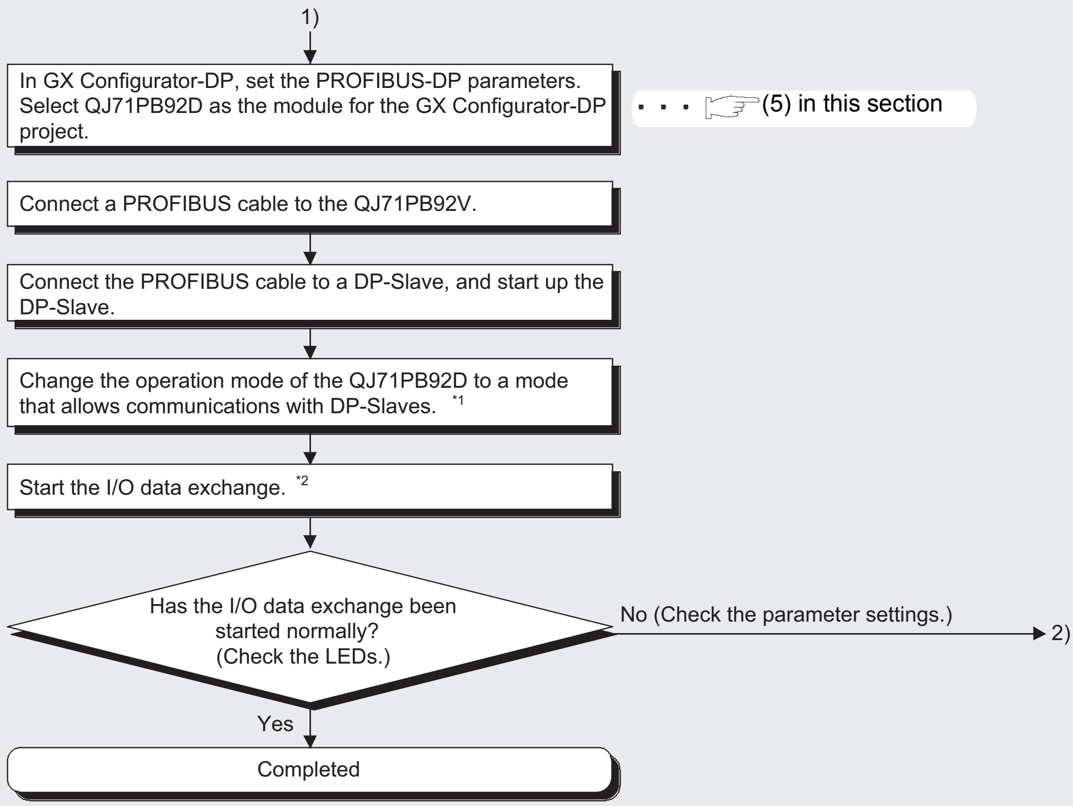


Figure 4.35 Procedures before System Operation



*1 The operation mode is changed by either of the following.
* Change it from GX Configurator-DP. (Except for GX Configurator-DP Version 7.01B)
* Use the Operation mode change request area (Un\G2255) and Operation mode change request signal (Y11).

*2 I/O data exchange is started by either of the following.
* Turn ON the Data exchange start request signal (Y00).
* Start it from GX Configurator-DP

Figure 4.36 Procedures before System Operation (Continued)

(4) Checking if the QJ71PB92D-compatible function is enabled

The model name displayed in Module's Detailed Information of GX Developer is changed to "QJ71PB92D (92V)".

QJ71PB92D (92V)

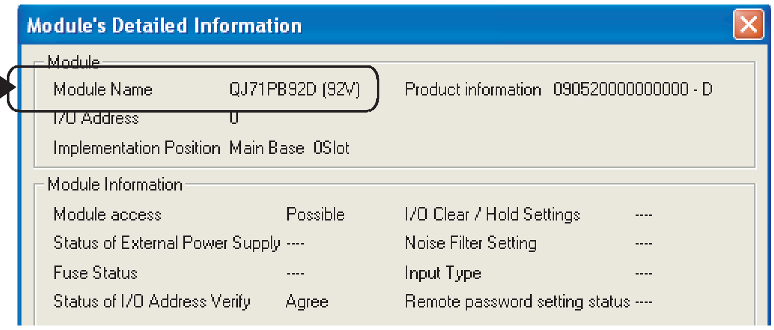


Figure 4.37 Checking if QJ71PB92D-Compatible Function is Enabled

(5) Precautions

(a) Serial No. of the QJ71PB92V

Select the QJ71PB92V whose serial No. (first 5 digits) is 09052 or later.
(☞ Section 2.4)

(b) Module to be selected in GX Configurator-DP projects

1) When utilizing the project created for the QJ71PB92D

Utilize the project without change.

Use the parameter set for the QJ71PB92D.

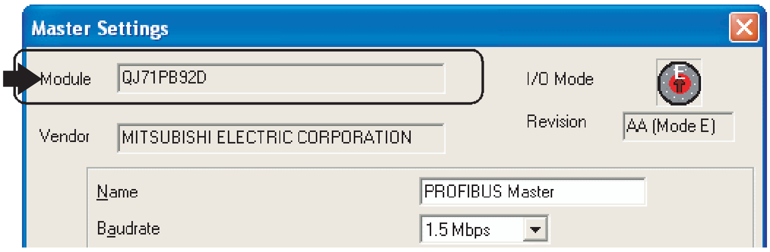


Figure 4.38 Module to be Selected in a GX Configurator-DP Project

2) When creating a new project

Select QJ71PB92D for the module.

Select QJ71PB92D.

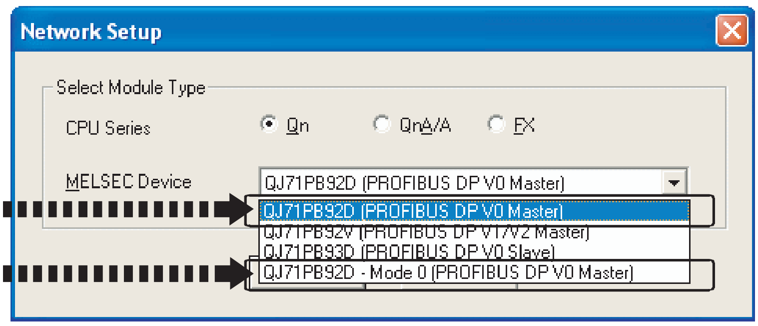


Figure 4.39 Module to be Selected in a GX Configurator-DP Project

(c) When no matching module is identified in GX Configurator-DP
The following dialog box is displayed in GX Configurator-DP.

Figure 4.40 When No Matching Module is Identified in GX Configurator-DP

If the above dialog box appears, check if:

- The module selected in the GX Configurator-DP project is QJ71PB92D.
- The version of the GX Configurator-DP is any other than Version 7.00A.
- The "Module Slot" setting in "Transfer Setup" of GX Configurator-DP is correct.

(d) After operation with the QJ71PB92D-compatible function enabled
For details after the operation, refer to the following manual.
☞ PROFIBUS-DP Interface Module User's Manual

CHAPTER5 PROCEDURES AND SETTINGS BEFORE SYSTEM OPERATION

This chapter explains the procedures for connecting the QJ71PB92V to PROFIBUS-DP, wiring and other information.

5.1 Implementation and Installation

This section provides the handling precautions, from unpacking to installation of the QJ71PB92V.
For details on implementation and installation of the QJ71PB92V, refer to the "QCPU User's Manual (Hardware Design, Maintenance and Inspection)."

5.1.1 Handling precautions

The following are precautions for handling the QJ71PB92V as a unit.

(1) Do not drop the module case or subject it to heavy impact since it is made of resin.

(2) Do not remove the printed-circuit board of each module from its case. This may cause a failure in the module.

(3) Be careful not to let foreign objects such as wire chips enter the module during wiring. In the event any foreign object enters, remove it immediately.

(4) A protective film is attached onto the module top to prevent foreign matter such as wire chips entering the module when wiring.
Do not remove the film during wiring.
Remove it for heat dissipation before system operation.

(5) Tighten the module fixing screws and connector screws using torque within the following ranges.

Table5.1 Screw Tightening Torque

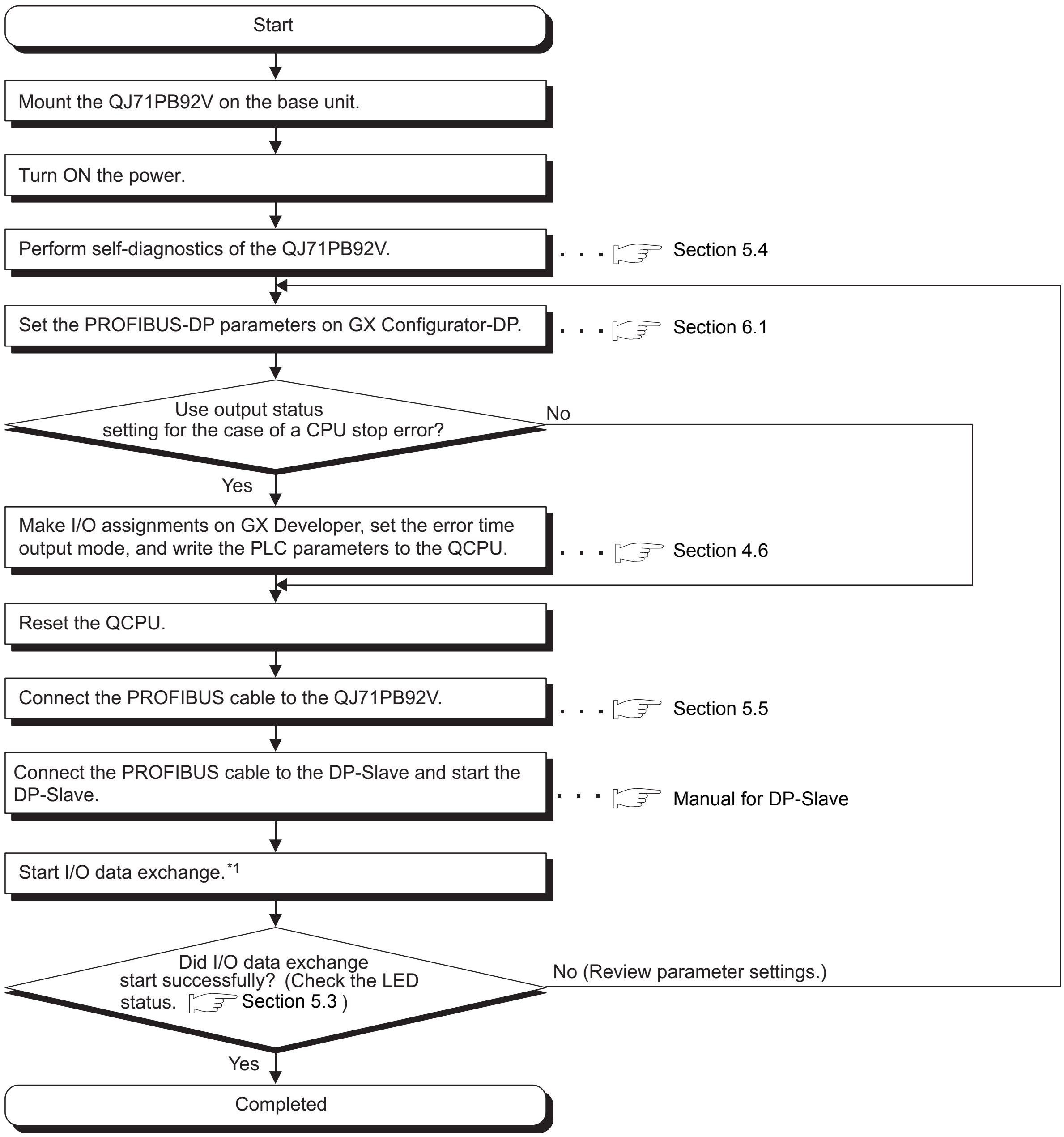
Screw Location	Tightening Torque Range
Module fixing screw (M3 screw)*1	0.36 to 0.48 N·m
PROFIBUS cable connector screw (#4 - 40UNC screws)	0.20 to 0.28 N·m

* 1 The module can be easily fixed onto the base unit using the hook at the top of the module. However, it is recommended to secure the module with the module mounting screw if the module is subject to significant vibration or shock.

5.2 Procedures and Settings before System Operation

The following diagram illustrates the procedure before system operation.

5.2.1 In the case of the single CPU system



*1 Start I/O data exchange by either of the following methods:
- Turn ON the Data exchange start request signal (Y00).
- Start it from GX Configurator-DP

Figure 5.1 Procedures before System Operation (Single CPU System)

5.2.2 In the case of the redundant system

Start

↓

Mount the QJ71PB92V on the base unit.

↓

Set the RUN/STOP switches of the redundant CPUs in system A and B to STOP, and turn ON the power supply to systems A and B.

↓

Set the operation mode of the redundant CPU to Debug mode.
1) In Debug mode setting of Redundant parameter in GX Developer, select "Start with Debug mode".
2) Write the configured redundant parameters to the redundant CPUs in systems A and B.
3) Reset the redundant CPUs in systems A and B at the same time, or turn the power OFF and then ON.

. . . ☞ QnPRHCPU User's Manual (Redundant System)

↓

Perform self-diagnostics on the QJ71PB92Vs in systems A and B. . . . ☞ Section 5.4

↓

Set the operation mode of the redundant CPU to Backup mode.
1) In Debug mode setting of Redundant parameter in GX Developer select "Do not start with Debug mode".
2) Write the configured redundant parameters to the redundant CPUs in systems A and B.
3) Reset the redundant CPUs in systems A and B at the same time, or turn the power OFF and then ON.

. . . ☞ QnPRHCPU User's Manual (Redundant System)

↓ ← 2)

Set PROFIBUS-DP parameters in GX Configurator-DP. . . . ☞ Section 6.1

↓

Set the standby master FDL address in GX Developer. . . . ☞ Section 6.7

↓

Connect PROFIBUS cables to the QJ71PB92Vs in systems A and B. . . . ☞ Section 5.5

↓

Connect PROFIBUS cables to DP-Slaves and boot them. . . . ☞ Manual for DP-Slave

↓

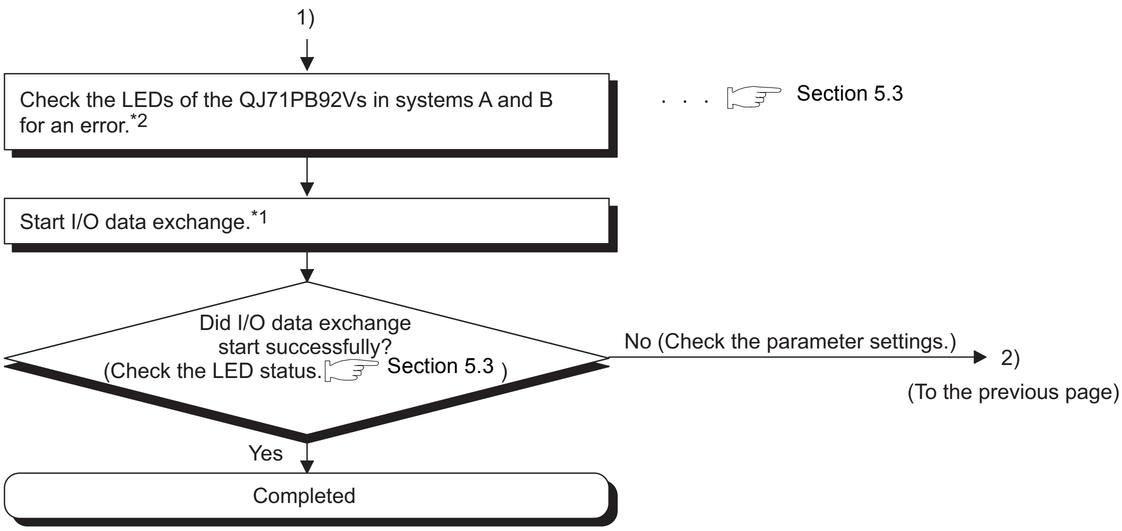
Set the RUN/STOP switches of the redundant CPUs in systems A and B to RUN.
Reset the redundant CPUs in systems A and B at the same time, or turn the power OFF and then ON.

↓

1)

(To the next page)

Figure 5.2 Procedures before System Operation (Redundant System)



*1 Start I/O data exchange by either of the following methods:
- Turn ON the Data exchange start request signal (Y00).
- Start it from GX Configurator-DP.

*2 Check the Local station error information area (Un\G23071) to see if the QJ71PB92V has an error or not. (Section 3.4.2)
If an error exists, remove the error cause.
When an error exists, system switching is not executed.

Figure 5.2 Procedures before System Operation (Redundant System) (Continued)

5.3 Part Names and Settings

This section explains the names and settings of each part of the QJ71PB92V.

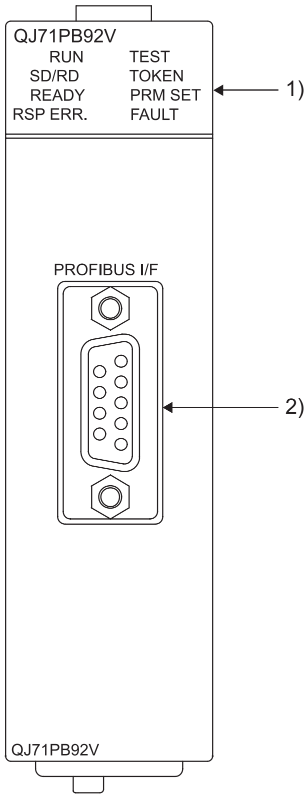


Figure 5.3 QJ71PB92V Appearance

Table5.2 Names of Parts

No.	Name	Description
1)	Indicator LEDs	These LEDs indicate the operation status of the QJ71PB92V. For details, refer to (1) in this section.
2)	PROFIBUS interface connector	This connector connects the PROFIBUS cable to the QJ71PB92V.

(1) Indicator LEDs

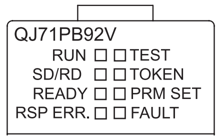


Figure 5.4 Indicator LEDs

Table5.3 Indicator LEDs

LED	Status	Description	Reference
RUN	ON	Normally operating	—
	OFF	Hardware error (watchdog timer error) or power failure	Section 9.1
SD/RD	ON	Exchanging I/O data *1 or during acyclic communication *2	Section 4.1.1 Section 4.2.1
	Flashing		
	OFF	Not communicating with DP-Slave, or being in the standby system	—
READY	ON	Ready to communicate or communication being performed	—
	OFF	Not ready to communicate or no communication	—
RSP ERR.	ON	A communication error has occurred.	Section 3.4.6
	OFF	No communication error	—
TEST	ON	Executing self-diagnostics or flash ROM initialization	Section 5.4 Section 9.6
	Flashing	Executing self-diagnostics	Section 5.4
	OFF	Not executing self-diagnostics or flash ROM initialization	—
TOKEN	ON	Token being passed *3	—
	Flashing		
	OFF	No token passing, or being in the standby system *3	—
PRM SET	ON	Operating in Parameter setting mode (mode 1)	Section 6.2
	Flashing	The written parameters are invalid	Section 9.1
	OFF	Operating in operation mode other than Parameter setting mode (mode 1)	Section 6.2
FAULT	ON	An error has occurred.	Section 9.1
	OFF	Normally operating	—

* 1 The LED flashes at intervals based on the value set in "Data control time" in Master Parameters.
* 2 The LED flashes at the time of request or response in acyclic communication.
* 3 The LED status during token passing varies depending on the number of DP-Masters within the same network and the transmission speed setting, as shown the Table 5.4.

Table5.4 TOKEN LED Status

No. of DP-Masters within the Same Network	Transmission Speed	
	19.2kbps or less	93.75kbps or more
1	ON	
More than 1	Flashing	ON or OFF

5.4 Self-diagnostics

The self-diagnostics of the QJ71PB92V performs a unit test on the QJ71PB92V.
It takes about 15 seconds to complete the self-diagnostics.

(1) Self-diagnostics execution procedure

The following shows how to execute the self-diagnostics.

(a) When the QJ71PB92V is mounted on a redundant system, set the operation mode of the redundant CPU to the Separate or Debug mode.
(QnPRHCPU User's Manual (Redundant System))

(b) Set the operation mode of the QJ71PB92V to Self-diagnostics mode (mode 2) by either of the following methods:
- Set by "Module Configuration" in GX Configurator-DP.
- Set 02_H in the Operation mode change request area (Un\G2255) and turn ON the Operation mode change request signal (Y11).

(c) When the operation mode is set to Self-diagnostics mode (mode 2), the self-diagnostics is automatically started.
During execution of self-diagnostics, the TEST LED is ON or flashing.
Upon completion of the self-diagnostics, the LEDs on the QJ71PB92V change as shown below, storing the test result to the Offline test status area (Un\G2258).
- When normally completed: The TEST LED turns OFF.
- When failed: The TEST and FAULT LEDs are ON.

POINT

When using the QJ71PB92V in a redundant system and performing the self-diagnostic test during system operation, set it to Self-diagnostic mode (mode 2) according to the procedure shown in Section 9.4.3.

(2) Execution result of self-diagnostics

(a) TEST LED OFF (When normally completed)
When the TEST LED turns OFF after execution of self-diagnostics, this indicates a normal completion.

(b) TEST and FAULT LEDs ON (When failed)
If the TEST and FAULT LEDs are ON after execution of self-diagnostics, this indicates that the diagnostics failed.
Check the value stored in the Offline test status area (Un\G2258), and retry the self-diagnostics.
If the diagnostics fails again, a QJ71PB92V hardware error is probable.
Please check the value currently stored in the Offline test status area (Un\G2258), and consult your local Mitsubishi representative, explaining a detailed description of the problem.

(c) Values that may be stored in the Offline test status area (Un\G2258)
Any of the following values is stored in the Offline test status area (Un\G2258) after execution of self-diagnostics.

Table5.5 Self-diagnostics Result

Stored Value	Description
07FFH	Normal completion
F700H	ROM check test error
F701H	Timer test error
F702H	MPU test error
F703H	RAM test error
F704H	2-port RAM test error
F705H	Swap port test error

5.5 Wiring

This section explains PROFIBUS cable wiring and relevant precautions.

5.5.1 PROFIBUS cable wiring

The following describes the pin assignments of the PROFIBUS interface connector on the QJ71PB92V, the PROFIBUS cable wiring specifications, bus terminator and other information.

(1) Pin assignments of the PROFIBUS interface connector

The following shows the pin assignments of the PROFIBUS interface connector (D-sub 9-pin female connector) on the QJ71PB92V.

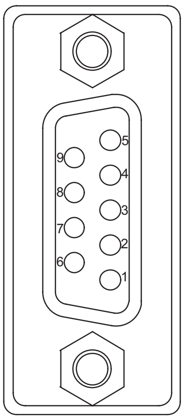


Figure 5.5 PROFIBUS Interface Connector

Table5.6 Pin Assignments of the PROFIBUS Interface Connector

Pin No.	Signal Code	Name	Description	Cable color
1	—	SHIELD *1	Shield, protective ground	—
2	—	—	Open	—
3	B/B'	RxD/TxD-P	Receive/send data-P	Red
4	—	—	Open	—
5	C/C'	DGND *2	Data Ground	—
6	—	VP *2	Voltage +	—
7	—	—	Open	—
8	A/A'	RxD/TxD-N	Receive/send data-N	Green
9	—	—	Open	—

* 1 Optional signal.
* 2 Signal used to connect the bus terminator.

(2) PROFIBUS cable

The following shows the PROFIBUS cable and wiring specifications.

(a) PROFIBUS cable
Use a PROFIBUS cable that meets the following specifications (Type A (IEC 61158-2) compliant).

Table5.7 PROFIBUS Cable

Item	Transmission line
Applicable cable	Shielded twisted pair cable
Impedance	135 to 165 Ω (f=3 to 20 MHz)
Capacity	Less than 30 pF/m
Conductor resistance	Less than 110 Ω/km
Cross-sectional area	0.34mm^2 or more (22AWG)

(b) Wiring specifications

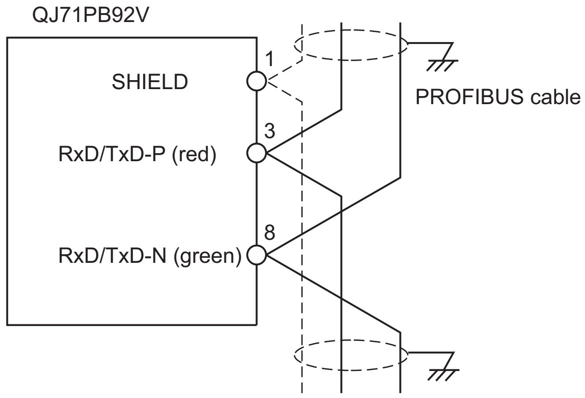


Figure 5.6 PROFIBUS Cable Wiring Specifications

(3) Connector

Use a D-sub 9-pin male connector for the PROFIBUS cable.
The applicable screw size is #4-40 UNC.

(4) Wiring specifications for bus terminator

When the QJ71PB92V is a terminal station, use a connector with built-in bus terminator that meets the following wiring specifications.

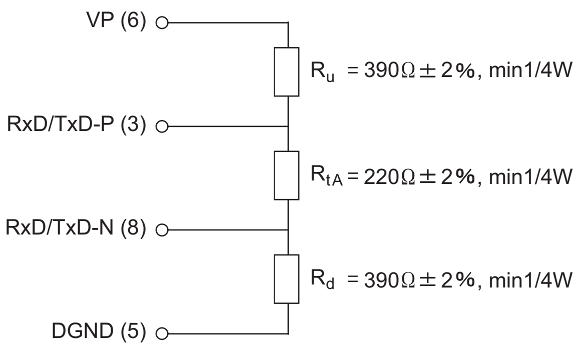


Figure 5.7 Wiring Specifications for Bus Terminator

(5) PROFIBUS equipment

The PROFIBUS cables, connectors and other PROFIBUS equipment must be purchased or obtained at user's discretion.
For details on PROFIBUS equipment, access the following website.

- PROFIBUS International: http://www.profibus.com/

5.5.2 Wiring precautions

As one of the requirements to give full play to QJ71PB92V's functions and make up the system with high reliability, it is necessary to have an external wiring unsusceptible to an influence of noise.
The following gives the precautions for external wiring of the QJ71PB92V.

(1) Communication cable wiring

Do not install the QJ71PB92V communication cable together with the main circuit, power lines and/or load carrying wires for other than the programmable controller, or bring them close.
Doing so may cause the QJ71PB92V to be affected by noise and surge induction.

(2) Wirings from programmable controller and I/O modules

Keep the PROFIBUS cable away from I/O module cables as much as possible.

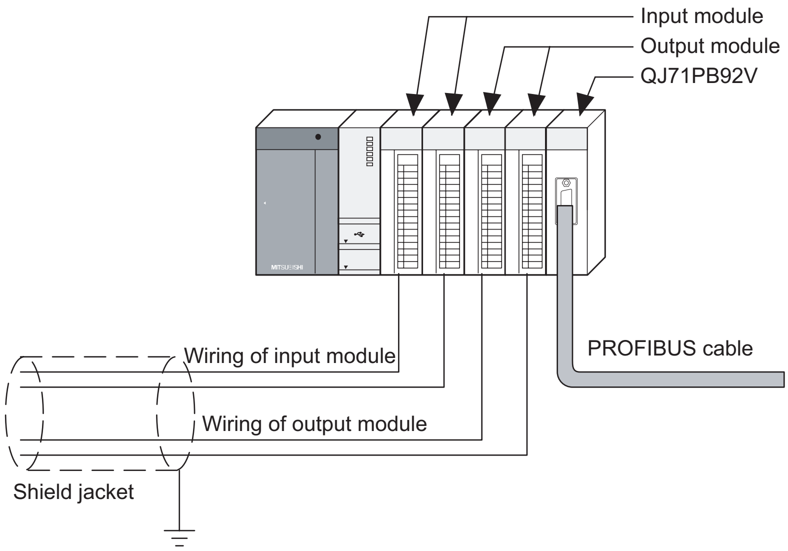


Figure 5.8 Programmable Controller Wiring

(3) Grounding

For use of the QJ71PB92V, ground the FG and LG terminals of the programmable controllers power supply module.

CHAPTER6 PARAMETER SETTING

This section explains the procedure for setting QJ71PB92V parameters and details of the parameters.

6.1 Parameter Setting Procedure

The following describes the QJ71PB92V parameter setting procedure.

(1) Setting procedure

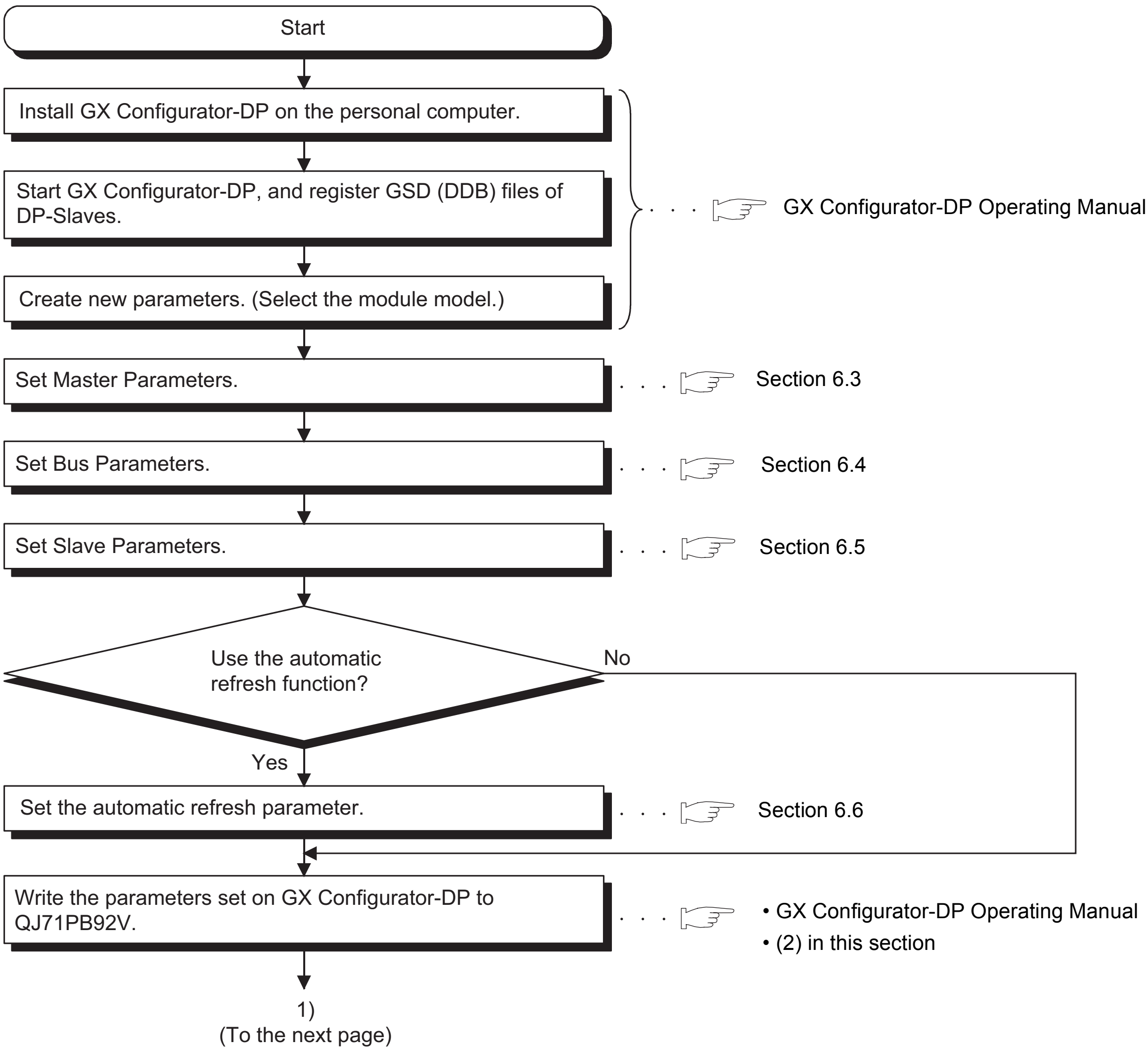


Figure 6.1 Parameter Setting Procedure

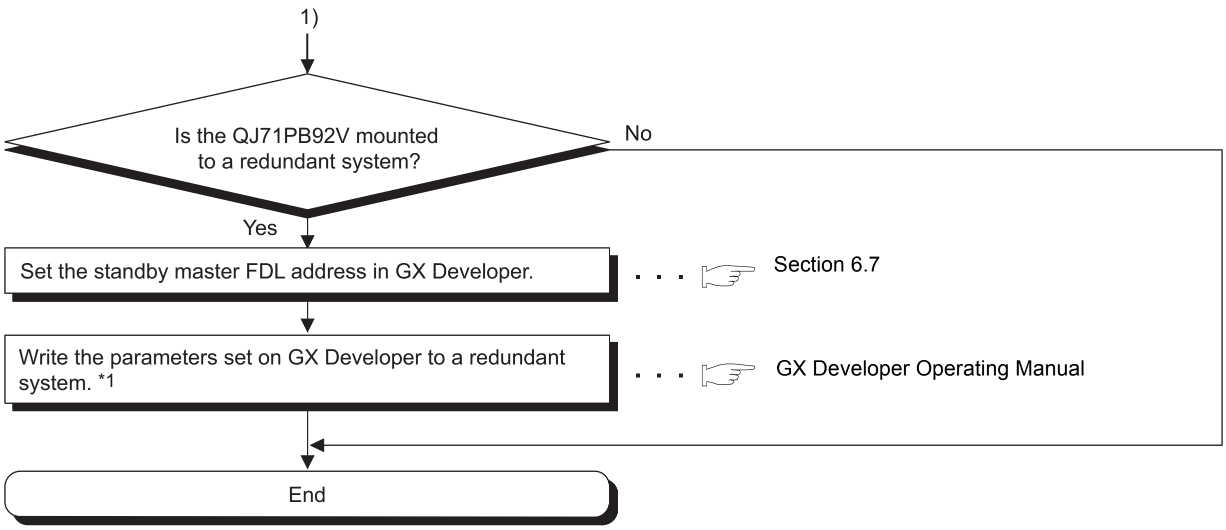
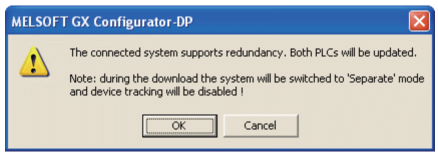
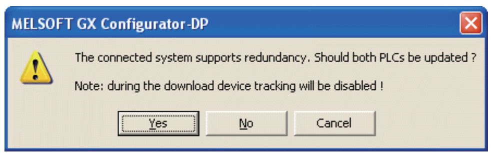


Figure 6.1 Parameter Setting Procedure (Continued)

(2) Precautions for using the QJ71PB92V in a redundant system and writing parameters through GX Configurator-DP

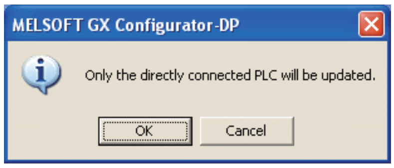
(a) Parameter writing from GX Configurator-DP
When writing parameters from GX Configurator-DP, the write target varies depending on the operation mode of the redundant CPU.

Table6.1 Parameter Writing from GX Configurator-DP

Item	Target for parameter writing		Description
	Both systems A and B	One system	
Backup mode	○	×	 When clicking the OK button, parameters are written to both systems A and B. When parameters are written, the operation mode of the redundant CPU is changed to Separate mode and tracking transfer is stopped.
Separate mode	○	○*1	 When clicking the Yes button, parameters are written to both systems A and B. When clicking the No button, parameters are written to the one system. The tracking transfer of the redundant CPU is stopped when parameters are written.

(To the next page)

Table6.1 Parameter Writing from GX Configurator-DP (Continued)

Item	Target for parameter writing		Description
	Both systems A and B	One system	
Debug mode	×	○	 When clicking the OK button, parameters are written to the system of the redundant CPU where cables (including RS-232 cable or USB cable) are connected.

○: Writable ×: Not writable

* 1 Parameters are written to the system of the redundant CPU that is set in [Target System] of the [Transfer Setup] dialog box.
However, when [Not specified] is set in [Target System], parameters are written to the system of the redundant CPU where cables (including RS-232 cable or USB cable) are connected.

POINT

When a tracking cable is not connected to the redundant CPU, regardless of operation mode of the redundant CPU, parameters are written to the system of the redundant CPU where cables (including RS-232 cable or USB cable) are connected.

(b) Target for parameter writing
When using the QJ71PB92V in a redundant system, write the same parameters to systems A and B.

(c) When some parameters have been modified (deletion or addition of DP-Slave(s))
The buffer memory is reassigned.
After modifying parameters, review the sequence program.
If some DP-Slaves are expected to be connected to the network in the future, setting them as Reserved stations in the parameter setting eliminates the need to check the sequence program. (☞ Section 6.5)

6.2 Operation Mode Setting

This section describes QJ71PB92V operation modes and the procedure for setting the operation mode.
The operation mode of the QJ71PB92V can be changed by using the Operation mode change request area (Un\G2255) or on the GX Configurator-DP.

(1) Types of operation modes

The following lists the operation modes of the QJ71PB92V.

Table6.2 List of Operation Modes

Operation mode	Description	Operation mode change	
		Operation Mode Change Request Area (Un\G2255)	GX Configurator-DP
Parameter setting mode (mode 1)	The parameters set on GX Configurator-DP are written to QJ71PB92V in this mode. When no operation mode has been written to the flash ROM, the QJ71PB92V starts up in this mode.	○	○
Self-diagnostic mode (mode 2)	The unit test on the QJ71PB92V is performed in this mode. (Section 5.4)	○	○
Communication mode (mode 3)	I/O data exchange with DP-Slaves is performed in this mode.	○	○
Flash ROM clear mode	This mode is used to return the QJ71PB92V to the factory default status. (Section 9.6)	○	○

○ : Can be changed, × : Cannot be changed

(2) Operation mode change using the Operation mode change request area (Un\G2255)

Perform the following procedure when changing the operation mode from the Operation mode change request area (Un\G2255).

(a) Write a value for a desired operation mode into the Operation mode change request area (Un\G2255). (Section 3.4.3)

(b) Turn ON the Operation mode change request signal (Y11).

(c) The Operation mode change completed signal (X11) turns ON when the operation mode is changed, and the result of the change is stored in the Operation mode change result area (Un\G2256).

(d) Make sure that A300H (Normally completed) is stored in the Operation mode change result area (Un\G2256), and turn OFF the Operation mode change request signal (Y11).

(e) Turning OFF the Operation mode change request signal (Y11) turns OFF the Operation mode change completed signal (X11).

Remark

For a program example for changing the operation mode, refer to Section 7.1.1.

(3) Changing the operation mode by GX Configurator-DP

(a) Change method
Change the operation mode at "Module Configuration" in GX Configurator-DP.
For details, refer to the GX Configurator-DP Operating Manual.

(b) When the QJ71PB92V is mounted on a redundant system
The monitoring target is the QJ71PB92V, which is mounted on the same base as the redundant CPU where GX Configurator-DP is connected (by RS-232 cable, USB cable, etc.)

(4) Error codes for the operation mode change failure

If the operation mode change is unsuccessfully completed, an error code is stored in the Operation mode change result area (Un\G2256) on the QJ71PB92V.
For error codes, refer to Section 9.5.2.

(5) Precautions when changing the operation mode

(a) When the operation mode change is attempted during I/O data exchange
When the operation mode change is attempted during I/O data exchange, the QJ71PB92V stops I/O data exchange before changing the operation mode.
The Data exchange start completed signal (X00) turns OFF.

(b) Status in which the operation mode change is not executable
The operation mode change is not allowed while the QJ71PB92V is executing the following processing.
Change the operation mode after the processing is completed.
If the operation mode change is attempted during execution of the following processing, E302H is stored in the Operation mode change result area (Un\G2256):

- Acquisition of extended diagnostic information
- Global control function
- Acyclic communication
- Alarm acquisition
- FDT/DTM technology
- Time control function

(c) When the QJ71PB92V is mounted on a redundant system

1) Operation mode of redundant CPU
If the redundant CPU is in the Backup mode, the operation mode of the QJ71PB92V cannot be changed.
An error code is stored in the Operation mode change result area (Un\G2256).
(☞ Section 9.5.2)
The operation mode of the QJ71PB92V must be changed when the redundant CPU is in Separate or Debug mode. (☞ QnPRHCPU User's Manual (Redundant System))

2) Tracking transfer between redundant CPUs
Stop the tracking transfer between the redundant CPUs.
Use the special relays (SM1520 to SM1583) of the redundant CPU to stop the tracking transfer. (☞ QnPRHCPU User's Manual (Redundant System))
If the operation mode of the QJ71PB92V is changed without stopping the tracking transfer, an error code may be stored in the Operation mode change result area (Un\G2256).

3) Confirmation after operation mode change
To use the redundant CPU in Backup mode, check that the same operation mode is active in the QJ71PB92V in system A and the one in system B.
If the mode is different between them, a malfunction may occur in system switching.

6.3 Master Parameters

Set the QJ71PB92V's transmission speed, FDL address and other parameters.

(1) Start procedure

(a) Right-click on the DP-Master graphic → [Modify Settings].

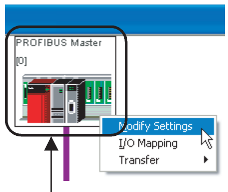


Figure 6.2 Master Settings Screen Start Procedure

(2) Setting items

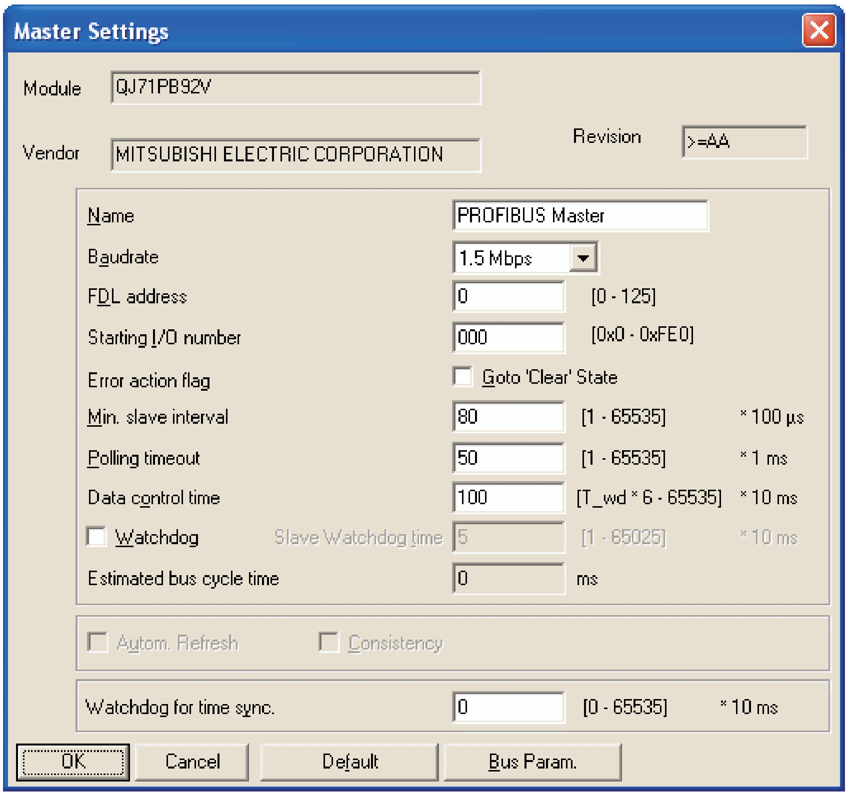


Figure 6.3 Master Settings Screen

Table6.3 Master Parameter Setting Items

Item	Description
Name	Set the name of the DP-Master. Setting range: Up to 17 alphanumeric characters
Baudrate	Set the transmission speed of the PROFIBUS-DP. Setting range: 9.6 kbps to 12 Mbps (Default: 1.5 Mbps)
FDL address	Set the FDL address. Setting range: 0 to 125 (Default: 0)

(To the next page)

Table6.3 Master Parameter Setting Items (Continued)

Item	Description
Starting I/O number	Set the first 3 digits of starting I/O number of the QJ71PB92V expressed in 4 digits. Set this item for using the "POU for GX IEC Developer" command of GX Configurator-DP. Setting range: 000H to the value shown in *1 (Default: 000H)
Error action flag	Check this checkbox when sending a clear request to all DP-Slaves from the DP-Master. When a communication error occurs even in one DP-Slave, the clear request is sent to all DP-Slaves. Not checked: The clear request is not sent to all DP-Slaves. Checked: The clear request is sent to all DP-Slaves.
Min. slave interval	Set the minimum required time from the slave polling cycle to the next one. This set value is enabled on all connected DP-Slaves. Set a value for the DP-Slave that needs the longest time. Setting range: 1 to 65535 (Unit: × 100 μs, Default: 80 × 100 μs)
Polling timeout	Set the maximum time required for a requester to receive the response in communication between DP-Masters. Setting range: 1 to 65535 (Unit: × 1 ms, Default: 50 × 1 ms)
Data control time	Set the time during which the QJ71PB92V notifies of the DP-Slave operation status. Set a value of 6 times or more the watchdog timer set value of the DP-Slave. Setting range: 1 to 65535 (Unit: × 10 ms, Default: 100 × 10 ms)
Watchdog	Check this checkbox to enable the watchdog timer on all DP-Slaves. When the "Watchdog" checkbox is checked in the master parameter setting, "Watchdog" in the slave parameters cannot be set. Not checked: The watchdog timer setting of all DP-Slaves is disabled. Checked: The watchdog timer setting of all DP-Slaves is enabled.
Slave Watchdog time	Set a watchdog timer value for all DP-Slaves. This setting is available when "Watchdog" is checked. The set value must satisfy the following condition: • Bus cycle time ≦ Set value of "Slave Watchdog time" ≦ (Set value of "Data control time") / 6 • When the QJ71PB92V is mounted on a redundant system, set an appropriate value so that the formula shown in Section 4.8 (5) is satisfied. Setting range: 1 to 65025 (Unit: × 10 ms, Default: 5 × 10 ms)
Estimated bus cycle time	A reference value for bus cycle time, which is calculated from GX Configurator-DP parameters, is displayed. Set a value greater than the displayed value for "Min. slave interval" or "Watchdog". Note that, since the displayed value is a value calculated from GX Configurator-DP parameters, the actual bus cycle time may be longer than the displayed time due to communication with another master station. (☞ Section 3.5.1) Set sufficient time for "Min. slave interval" or "Watchdog", considering the time that will be spent for communications with another master station.
Autom. Refresh	Automatic refresh enabled/disabled is displayed. Automatic refresh enabled/disabled is set in "PLC and GX IEC Developer (GID) Settings". (☞ Section 6.6.2) Not checked: Automatic refresh disabled Checked: Automatic refresh enabled
Consistency	Check this checkbox to use the data consistency function when automatic refresh is executed. When "Autom. Refresh" is enabled, the checkbox is available. Not checked: Data consistency function disabled Checked: Data consistency function enabled
Watchdog for time sync.	Set the time during which the transmission interval of the clock data sent from the time master is monitored. Setting range: 0 to 65535 (Unit: × 10 ms, Default: 0 × 10 ms)
Bus Param. button	Displays the Bus Parameter screen. (☞ Section 6.4)

* 1 "The upper limit of the "Starting I/O number" setting range varies depending on the QCPU with which the QJ71PB92V is installed.
For details, refer to the manual for the QCPU.

POINT

(1) When "Error action flag" is checked, outputs of all DP-Slaves are cleared when a communication error occurs even in one DP-Slave.
To restart output, perform either of the following operations.
- Turn OFF the Data exchange start request signal (Y00) and then turn it ON.
- Reset the QCPU.

(2) When using the PROFIBUS-DPV1 or PROFIBUS-DPV2 function, set a "Min. slave interval" value greater than the bus cycle time calculated from Pt, Tsdi and Lr. (Section 3.5.1)
If the "Min. slave interval" is less than the value calculated from Pt, Tsdi and Lr, the processing of the PROFIBUS-DPV1 or PROFIBUS-DPV2 function may take time.

6.4 Bus Parameters

Set the PROFIBUS-DP parameters.
Normally, the bus parameters are used as default values.
When changing some of the bus parameters, make sure of the PROFIBUS-DP standard in advance.

(1) Start procedure

(a) Right-click on the DP-Master graphic → [Modify Settings].

(b) Click the Bus Param. button in the Master Settings screen.

(2) Setting items

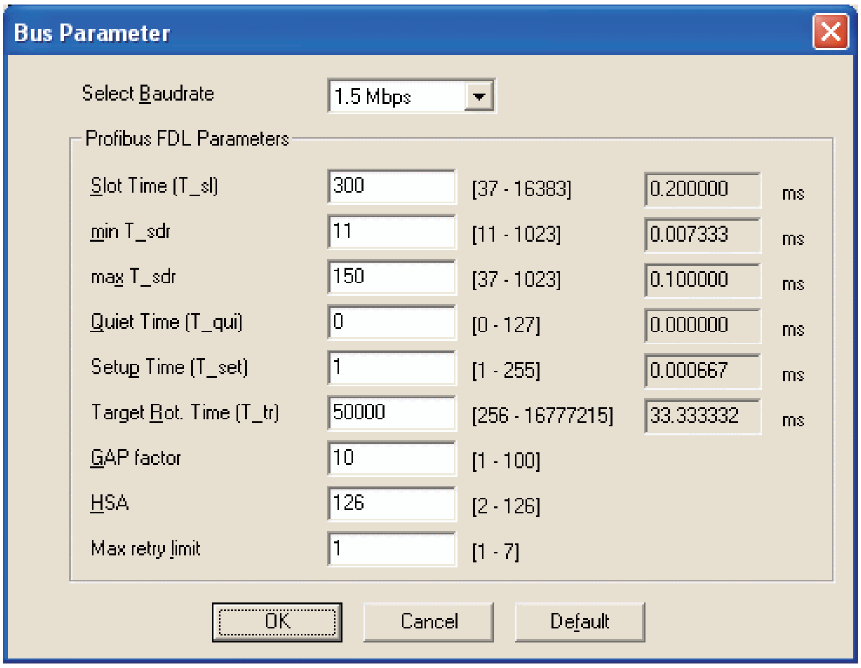


Figure 6.4 Bus Parameter Screen

Table6.4 Bus Parameter Setting Items

Item	Description
Select Baudrate	Sets the transmission speed of the PROFIBUS-DP. When the set value is changed on this screen, the "Baudrate" value in the master parameter settings is also changed automatically. Setting range: 9.6 kbps to 12 Mbps (Default: 1.5 Mbps)
Slot Time (T_sl)	Set the slot time (maximum time for waiting for a response). If this set time is exceeded, an error will be detected. Setting range: 37 to 16383 (Unit: × TBit, Default: Depends on the transmission speed)
min T_sdr	Set the minimum response time of responders. Setting range: 11 to 1023 (Unit: × TBit, Default: 11 × TBit)
max T_sdr	Set the maximum response time of responders. Setting range: 37 to 1023 (Unit: × TBit, Default: Depends on the transmission speed)
Quiet Time (T_qui)	Set the repeater switching time (the time required for switching the transmission direction of the repeater). Set 0 when the network does not contain a repeater. Setting range: 0 to 127 (Unit: × TBit, Default: Depends on the transmission speed)

(To the next page)

Table6.4 Bus Parameter Setting Items (Continued)

Item	Description
Setup Time (T_set)	Set the setup time. Setting range: 1 to 255 (Unit: × T_{Bit}, Default: Depends on the transmission speed)
Target Rot. Time (T_tr)	Set the target token rotation time. Setting range: 256 to 16777215 (Unit: × T_{Bit}, Default: 50000 × T_{Bit})
GAP factor	Set a constant for controlling the GAP update time (T_gud). Setting range: 1 to 100 (Default: 10)
HSA	Set the highest FDL address of DP-Slaves that exist on the network. Setting range: 2 to 126 (Default: 126)
Max retry limit	Set the maximum number of retries for individual data transmission. Setting range: 1 to 7 (Default: Depends on the transmission speed)

Remark

[T_{Bit}] (Bit Time) is a unit that expresses the time required for 1-bit data transmission as "1".
The actual processing time differs as shown below depending on the transmission speed.

- In the case of 1.5 Mbps, 1[T_{Bit}]=1 / (1.5 × 10^6)=0.667 × 10^{-6}[s]
- In the case of 12 Mbps, 1[T_{Bit}]=1 / (12 × 10^6)=0.083 × 10^{-6}[s]

T_{Bit} is converted into ms automatically on GX Configurator-DP.
The results of the conversion (ms) are displayed on the right side of the screen.

(3) Precautions for bus parameter setting

For each set value of the max T_sdr, Quiet Time (T_qui) and Setup Time (T_set), set the maximum value among those of the stations connected to PROFIBUS-DP (including the DP-Master).
The default value of the QJ71PB92V varies depending on the transmission speed.

Table6.5 Default Values of max T_sdr, Quiet Time (T_qui) and Setup Time (T_set)

Item	Default Values of QJ71PB92V					
	187.5kbps or less	500kbps	1.5Mbps	3Mbps	6Mbps	12Mbps
max T_sdr	60	100	150	250	450	800
Quiet Time (T_qui)	0	0	0	3	6	9
Setup Time (T_set)	1	1	1	4	8	16

6.5 Slave Parameters

Set parameters for each DP-Slave.

(1) Start procedure

(a) Right-click on the graphic of the cable → [Insert DP-Slave].

(b) Select a DP-Slave in the Device Database screen.

(2) Setting items

(a) Slave Parameter Settings screen

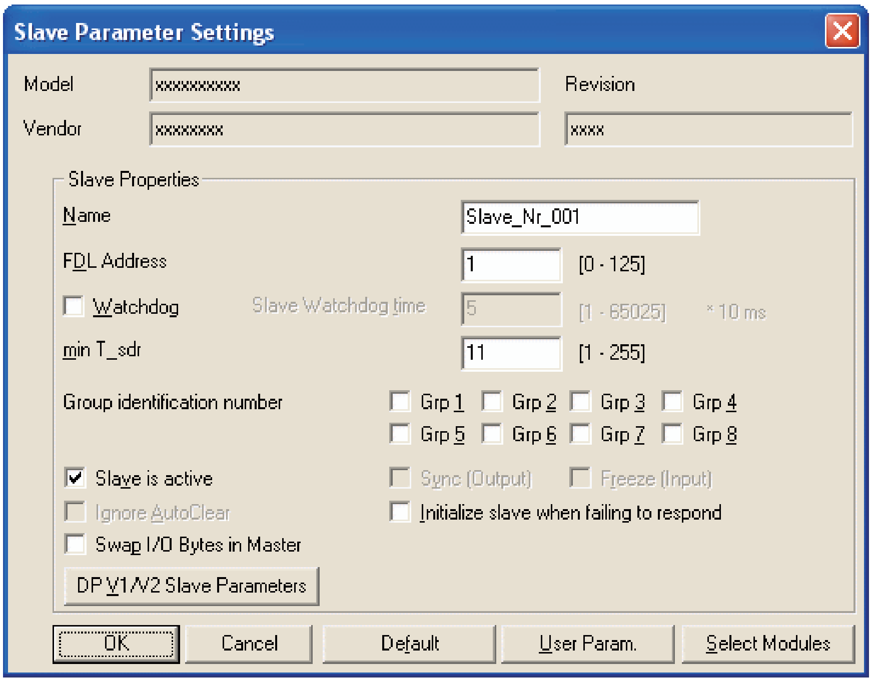


Figure 6.5 Slave Parameter Settings Screen

Table6.6 Slave Parameter Setting Items

Item	Description
Name	Set the name of the DP-Slave. Setting range: max. 17 alphanumeric characters
FDL Address	Set the FDL address. Setting range: 0 to 125
Watchdog	Check this checkbox to use a watchdog timer. When this setting is enabled, a communication error is detected if no data are received from the QJ71PB92V within the time specified in "Slave Watchdog time". (When disabled, a communication error is not detected even if data are no longer received from the QJ71PB92V.) Once the "Watchdog" checkbox has been checked in the master parameter setting, "Watchdog" in the slave parameters cannot be set. Not checked: Watchdog timer disabled (Default) Checked: Watchdog timer enabled Whether or not output data at the time of error communication are output from each DP-Slave to external devices differs depending on the DP-Slave setting. For details, refer to the manual for the DP-Slave.

(To the next page)

Table6.6 Slave Parameter Setting Items (Continued)

Item	Description
Slave Watchdog time	Set the time of the watchdog timer. This setting is available when "Watchdog" is checked. The set value must satisfy the following condition: • Bus cycle time ≤ Set value of "Slave Watchdog time" ≤ (Set value of "Data control time") / 6 • When the QJ71PB92V is mounted on a redundant system, set an appropriate value so that the formula shown in Section 4.8 (5) is satisfied. Setting range: 1 to 65025 (Unit: × 10 ms or × 1 ms, Default: 5 × 10 ms)
min T_sdr	Set the minimum response time required for a DP-Slave to send a response frame to the QJ71PB92V. Normally, use the default value. Setting range: 1 to 255 (Unit: × T_{Bit}, Default: 11 × T_{Bit})
Group identification number	Set the group No. (Grp 1 to Grp 8) of the DP-Slave. Multiple groups Nos. can also be set. Not checked: Not belonging to the group No. Checked: Belonging to the group No.
Slave is active	Uncheck the box when the DP-Slave is to be set as a reserved station. Not checked: Set as a reserved station. Checked: Set as a station performing I/O data exchange.
Sync (Output)	Check the box to check if the DP-Slave supports the Sync function or not in communication for initialization. When the DP-Slave does not support the Sync function, diagnostic information is stored in the Diagnostic information area (for mode 3) (Un\G23072 to Un\G23321) of the QJ71PB92V. Not checked: No function check Checked: Function check performed
Freeze (Input)	Check the box to check if the DP-Slave supports the Freeze function or not in communication for initialization. When the DP-Slave does not support the Freeze function, the diagnostic information is stored in the Diagnostic information area (for mode 3) (Un\G23072 to Un\G23321) of the QJ71PB92V. Not checked: No function check Checked: Function check performed
Ignore AutoClear	Check this box to disable the clear request transmission when a diagnostic error is detected on this DP-Slave, even though the master parameter, "Error action flag" is enabled. Check this checkbox to disable the "Error action flag" setting in the master parameters. This setting is available when the "Error action flag" setting in the master parameters is enabled. Not checked: Enables "Error action flag" setting. Checked: Disables "Error action flag" setting.
Initialize slave when failing to respond	Check this checkbox so that the DP-Master resends parameters to DP-Slaves when the DP-Master is restored from the status of a communication error. Not checked: Not resend parameters to DP-Slaves. Checked: Resends parameters to DP-Slaves.
Swap I/O Bytes in Master	Check this box to swap the I/O data of the DP-Slave on the QJ71PB92V buffer memory. Not checked: No swapping Checked: Enables data swapping
DP V1/V2 Slave Parameters button	Displays the DP V1/V2 Slave Parameters screen. (☞ (2)(b) in this section) This can be selected when "DP V1 Support enable" is checked.
User Param button	Used when setting parameters specific to the DP-Slave. For details, refer to the manual for the DP-Slave.
Select Modules button	Used when setting equipment mounted on the DP-Slave. For details, refer to the manual for the DP-Slave.

(b) DP V1/V2 Slave Parameters Screen

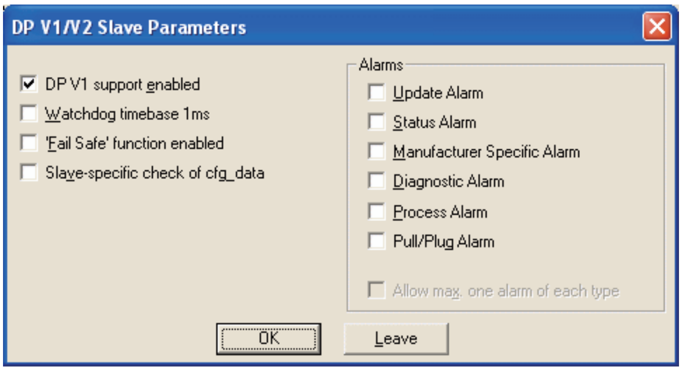


Figure 6.6 DP V1/V2 Slave Parameters Screen

Table6.7 DP V1/V2 Slave Parameters Setting Items

Item	Description
DP V1 Support enable	Check this checkbox to use the PROFIBUS-DPV1 functions. This setting is available when the DP-Slave supports the PROFIBUS-DPV1 functions. Not checked: Not use the PROFIBUS-DPV1 functions Checked: Use the PROFIBUS-DPV1 functions
Watchdog timebase 1ms	Check this checkbox to set the "Slave Watchdog time" unit to 1 ms. This setting is available when the DP-Slave supports this function. This setting is available when the master parameter, "Watchdog" is unchecked. Not checked: 10 ms units Checked: 1 ms units
'Fail Safe' function enable	Check this checkbox to place the DP-Slave into the 'Fail Safe' status when the DP-Master sends a clear request. This setting is available when the DP-Slave supports this function. For the 'Fail Safe' setting, refer to the manual for the DP-Slave. Not checked: Not placed into 'Fail Safe' status Checked: Placed into 'Fail Safe' status
Slave-specific check of cfg_data	Check this checkbox when the parameter check method for the DP-Slave is different from that of the PROFIBUS standard. This setting is available when the DP-Slave supports this function. For the parameter check method, refer to the manual for the DP-Slave. Not checked: Checks parameters based on the PROFIBUS standard Checked: Checks parameters by the DP-Slave-specific method.

(To the next page)

Table6.7 DP V1/V2 Slave Parameters Setting Items (Continued)

Item	Description
Update Alarm	Check this checkbox to enable transmission of the Update Alarm. This setting is available when the DP-Slave supports this function. Not checked: Disables transmission of the Update Alarm Checked: Enables transmission of the Update Alarm
Status Alarm	Check this checkbox to enable transmission of the Status Alarm. This setting is available when the DP-Slave supports this function. Not checked: Disables transmission of the Status Alarm Checked: Enables transmission of the Status Alarm
Manufacturer Specific Alarm	Check this checkbox to enable transmission of the Manufacturer Specific Alarm. This setting is available when the DP-Slave supports this function. Not checked: Disables transmission of the Manufacturer Specific Alarm Checked: Enables transmission of the Manufacturer Specific Alarm
Diagnostic Alarm	Check this checkbox to enable transmission of the Diagnostic Alarm. This setting is available when the DP-Slave supports this function. Not checked: Disables transmission of the Diagnostic Alarm Checked: Enables transmission of the Diagnostic Alarm
Process Alarm	Check this checkbox to enable transmission of the Process Alarm. This setting is available when the DP-Slave supports this function. Not checked: Disables transmission of the Process Alarm Checked: Enables transmission of the Process Alarm
Pull/Plug Alarm	Check this checkbox to enable transmission of the Pull/Plug Alarm. This setting is available when the DP-Slave supports this function. Not checked: Disables transmission of the Pull/Plug Alarm Checked: Enables transmission of the Pull/Plug Alarm
Allow max. one alarm of each type	Check this checkbox to acquire alarms one by one for each type when the DP-Slave detects multiple types of alarms. Not checked: Acquires alarms in order of occurrence. (Max. 8 alarms) Checked: Acquires generated alarms one by one for each type (Max. 6 alarms)

6.6 Automatic Refresh Parameters

Set the automatic refresh parameters by which data in the QJ71PB92V buffer memory are automatically transferred to QCPU devices.

6.6.1 Automatic refresh parameter setup procedure

The following describes the automatic refresh parameter setup procedure.

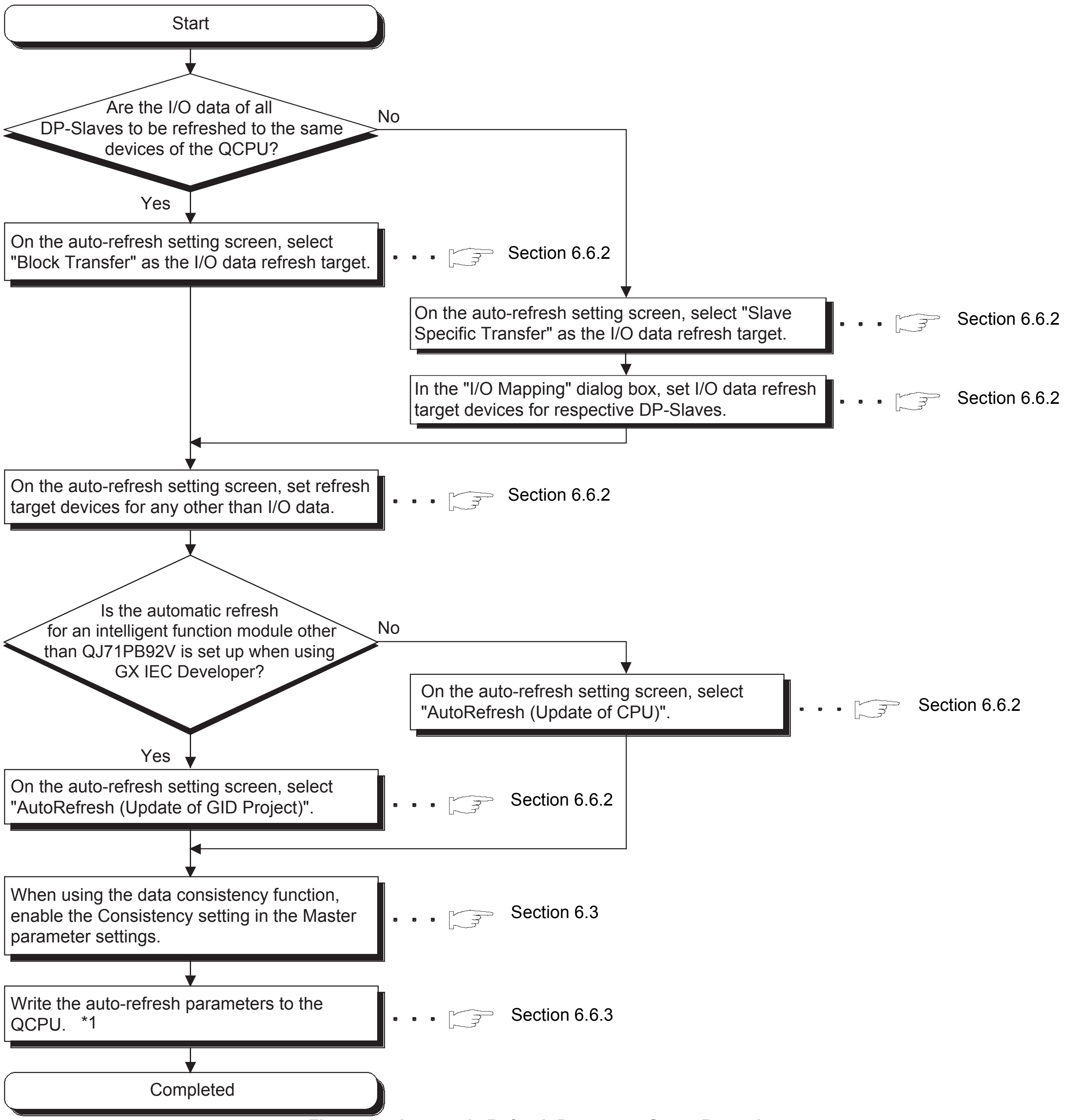


Figure 6.7 Automatic Refresh Parameter Setup Procedure

* 1 When using the QJ71PB92V in a redundant system, write the same parameters to the redundant CPUs in systems A and B.

6.6.2 Automatic Refresh Settings

(1) PLC and GX IEC Developer (GID) Settings screen

Set the automatic refresh setting.

(a) Start procedure

[Setup] → [PLC and GX IEC Developer (GID) Settings]

(b) Setting items

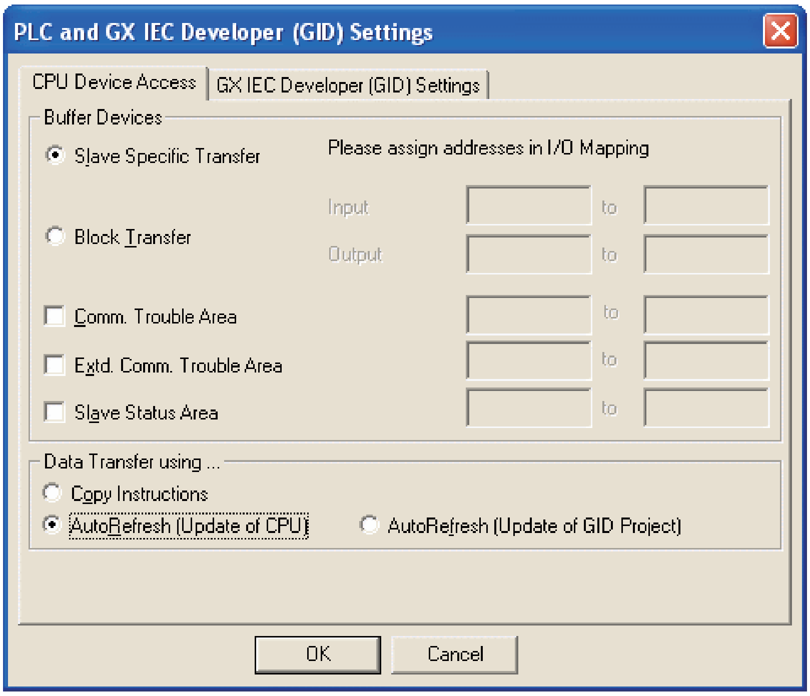


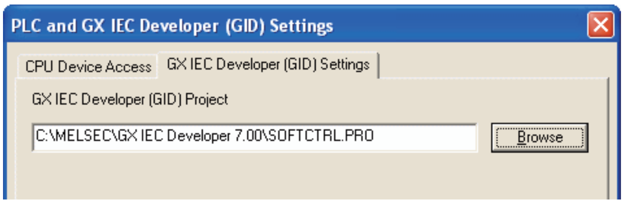
Figure 6.8 Auto Refresh Setting

Table6.8 Setting Items for Automatic Refresh Settings (PLC and GX IEC Developer (GID) Settings)

Item		Description
Buffer Devices		Set the CPU module devices used in the communication between the QJ71PB92V and the CPU module.
	Slave Specific Transfer	Select this item when setting devices used in the communication in units of DP-Slaves. Devices can be set by the "Buffer MIT-Address" of each DP-Slave in the "I/O Mapping" dialog box after selecting this item. (☞ (2) in this section)
	Block Transfer	Select this item when setting devices used in the communication to the same kinds of devices of all DP-Slaves. Devices are set in the following "Input" or "Output". Input: Device used for the communication of input data is set. (Default: D1000) For a bit device, setting must be made in units of 16 points. Output: Device used for the communication of output data is set. (Default: D2000) For a bit device, setting must be made in units of 16 points.
	Comm. Trouble Area	Set the automatic refresh target device of the Diagnostic information area (for mode 3) (Un\G23072 to Un\G23321).
	Extd. Comm. Trouble Area	Set the automatic refresh target device of the Extended diagnostic information area (for mode 3) (Un\G23328 to Un\G23454).
	Slave Status Area	Set the automatic refresh target devices of the following areas. • Slave status area (Normal communication detection) (Un\G23040 to Un\G23047) • Slave status area (Reserved station setting status) (Un\G23048 to Un\G23055) • Slave status area (Diagnostic information detection) (Un\G23056 to Un\G23064)

(To the next page)

Table6.8 Setting Items for Automatic Refresh Settings (PLC and GX IEC Developer (GID) Settings) (Continued)

Item		Description
Data Transfer using		Set communication method between the master module and the CPU module.
	Copy Instructions	Select this item in case of communication using the FROM/TO/MOV instruction and dedicated instruction.
	AutoRefresh (Update of CPU)	Select this item in case of communication using the automatic refresh. If selecting this item, automatic refresh parameters are written to the CPU module when the project is downloaded.
	AutoRefresh (Update of GID Project)	Select this item in case of communication using the automatic refresh. If selecting this item, automatic refresh parameters are written to the project file of GX IEC Developer. The project file of GX IEC Developer is set with "GX IEC Developer (GID) Settings" tab.  Writing to the CPU module can be performed from GX IEC Developer.

POINT

Set "Block Transfer" for the following applications.

- To refresh I/O data of all DP-Slaves into the same kind of device
- To reduce the number of automatic refresh parameters of the QJ71PB92V, and increase the automatic refresh parameters of other intelligent function modules

(2) I/O Mapping dialog box

Set the devices used for the communication in units of DP-Slaves.

(a) Operation procedure

Right-click on the graphic of DP-Master → [I/O Mapping]

(b) Setting items

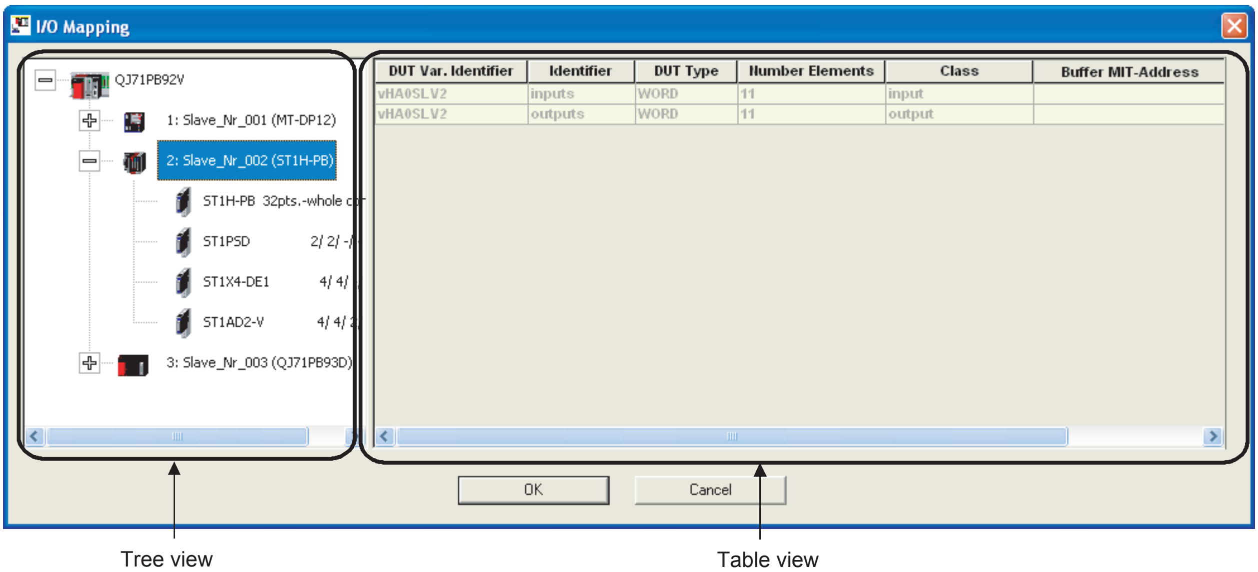


Figure 6.9 I/O Mapping Dialog Box

1) Tree view

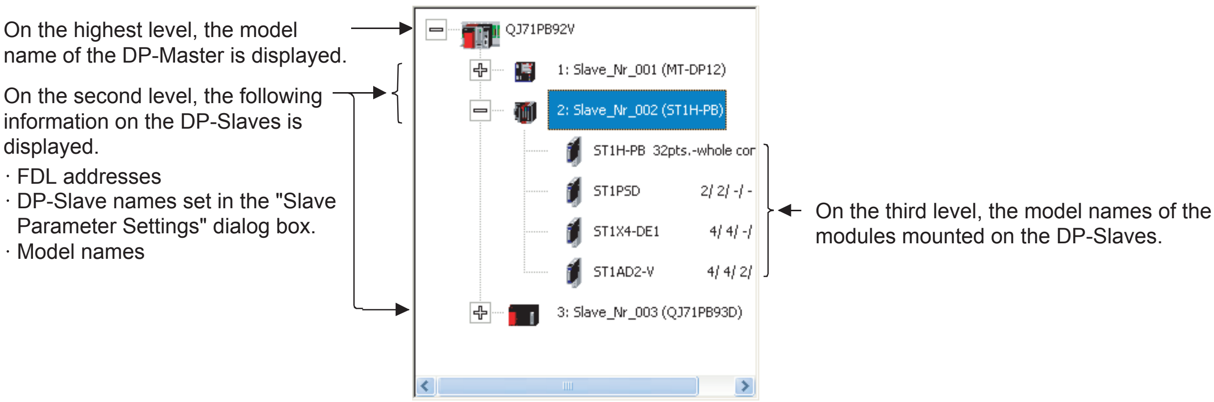


Figure 6.10 I/O Mapping Dialog Box (Tree View)

2) Table view

When selecting a module of DP-Slaves in the tree view, the following DUT element is displayed in the table view.

Table6.9 Setting item of table view

Item	Description
DUT Var. Identifier	Automatically creates and displays the name of the global variable instance of the DUT.
Identifier	Displays name of the DUT element.
DUT Type	Displays the data type of the DUT element or global variable.
Number Elements	Displays the number of elements. When this item is 2 or larger, the element is an array.
Class	Displays whether data to be treated is input or output data. input: Input data output: Output data
Global Var. Identifier	Sets any global variable name. If set, any global variable name can be used at the time of programming. This item can be set when selecting the module of DP-Slave from tree view.
User MIT-Address	Sets devices to be relayed when accessing to I/O data in a program of GX IEC Developer. Devices to be set cannot be duplicated with other modules. Set devices so as not to be duplicated. For details of "User MIT-Address", refer to (2) (c) in this section. This item can be set when selecting the module of DP-Slave from the tree view.
Buffer MIT-Address	Displays or sets the CPU module devices used in the communication between the QJ71PB92V and the CPU module. This item can be set when selecting "Slave Specific Transfer" from the "PLC and GX IEC Developer (GID) Settings" dialog box and selecting DP-Slave from the tree view.

(c) User MIT-Address

When accessing to the device set at "User MIT-Address" in a program of GX IEC Developer, accessing to the I/O data is enabled.
When the address of I/O data is changed due to increase and decrease of modules, the address is recalculated by the I/O Mapping.
Therefore, when exporting and incorporating the user library again, accessing to the I/O data is enabled as well as before increase or decrease of modules.
A program needs no modification.

6.6.3 Writing Automatic Refresh Parameters

Write the automatic refresh parameters to the QCPU.
Reset the QCPU after writing the automatic refresh parameters.
Before writing them, check the "PLC and GX IEC Developer (GID) Settings" screen to see that "AutoRefresh (Update of CPU)" or "AutoRefresh (Update of GID Project)" is selected.

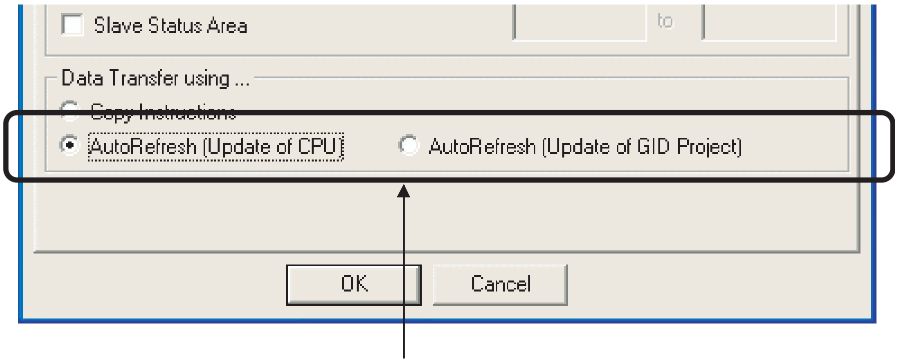


Figure 6.11 Writing Automatic Refresh Parameters

(1) Start procedure

1) [Online] → [Transfer] → [Download to Module]
2) When "AutoRefresh (Update of GID Project)" is selected from the "PLC and GX IEC Developer (GID) Settings" screen, parameters are written from GX IEC Developer.

POINT

When automatic refresh parameters were written from GX Configurator-DP while GX Developer was running, they are not displayed in file lists such as Read from PLC, Delete PLC data on GX Developer.

Update the file lists by the Refresh view button of the Read from PLC or Delete PLC data on GX Developer.

6.6.4 Number of set automatic refresh parameters

There are restrictions on the number of automatic refresh parameters that can be set for QCPUs.
This section describes the number of automatic refresh parameters that can be set for QCPUs and the QJ71PB92V.

(1) Number of automatic refresh parameter settings for QCPUs

When multiple intelligent function modules are mounted, the number of automatic refresh parameter settings must not exceed the following limit.

Table6.10 Max. No. of Auto-refresh Parameter Settings

CPU Type	Max. No. of Auto-refresh Parameter Settings
Q00J/Q00/Q01CPU	256
Q02/Q02H/Q06H/Q12H/Q25HCPU	256
Q12PH/Q25PHCPU	256
Q12PRH/Q25PRHCPU	256
Q03UD/Q04UDH/Q06UDHCPU	2048

(2) Number of automatic refresh parameter settings for the QJ71PB92V

The number of automatic refresh parameter settings for the QJ71PB92V varies depending on the automatic refreshing setting method for I/O data.

(a) When "Block Transfer" is used
When the automatic refresh of I/O data is set by "Block Transfer" (i.e. I/O data of all DP-Slaves are refreshed into the same kind of device), up to five automatic refresh parameters can be set per QJ71PB92V.

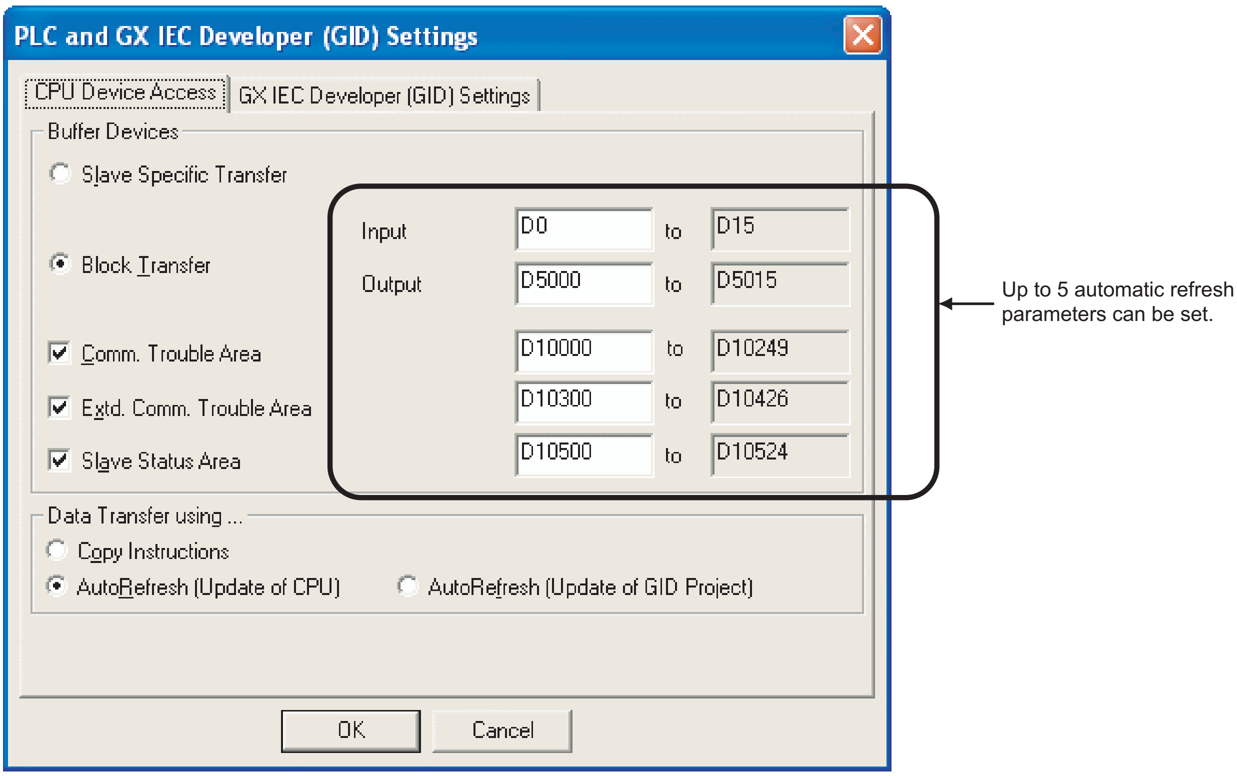


Figure 6.12 Number of Automatic Refresh Parameter Settings (When Set by "Block Transfer")

(b) When "Slave Specific Transfer" is used

When the automatic refresh of I/O data is set by "Slave Specific Transfer" (i.e. when changing the refresh target device on a per-DP-Slave basis), the following number of automatic refresh parameters can be set per QJ71PB92V.

Max. number of settings = {(Number of connected DP-Slaves) × 2} + 3

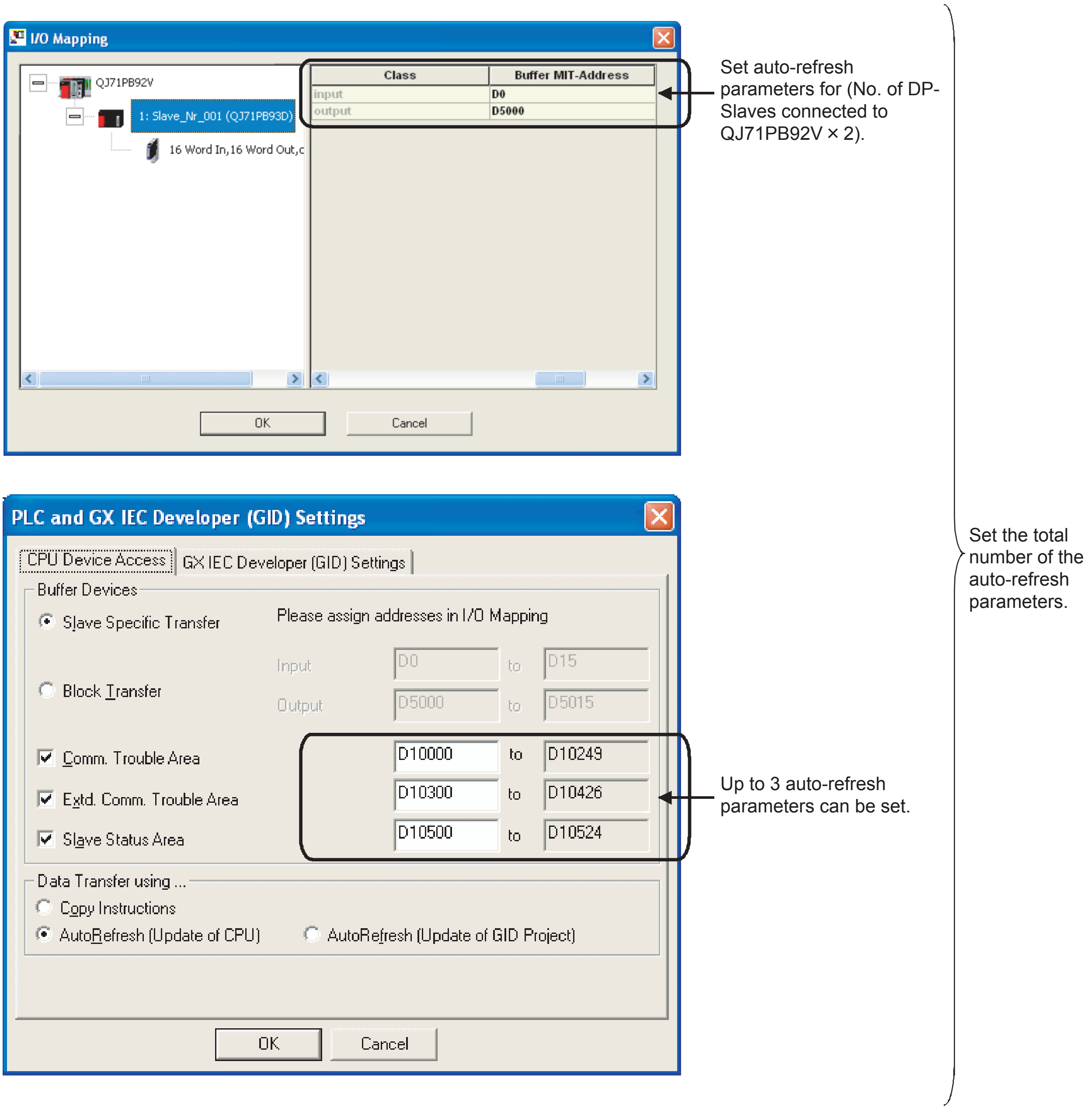


Figure 6.13 Number of Automatic Refresh Parameter Settings (When Set by "Slave Specific Transfer")

6.7 Parameter Setting by GX Developer

Set output status at the time of CPU stop error, redundant system support function, and QJ71PB92D-compatible function.

(1) Output status setting for the case of a CPU stop error

(a) For the QJ71PB92V
For the setting method, refer to Section 4.6.

(b) For the QJ71PB92D-compatible function
For how to set, refer to (2) in this section.

(2) Redundant system support function and QJ71PB92D-compatible function

The following setting should be made only when using the redundant system support function or QJ71PB92D-compatible function.

POINT

When setting intelligent function module switch setting, set either redundant system support function or QJ71PB92D-compatible function.
The redundant system support function cannot be used together with the QJ71PB92D-compatible function.

(a) Start procedure

1) Double-click "PLC parameter" in the project window of GX Developer.

2) Enter I/O data on the I/O assignment screen, and click the Switch setting button.

(b) Setting items

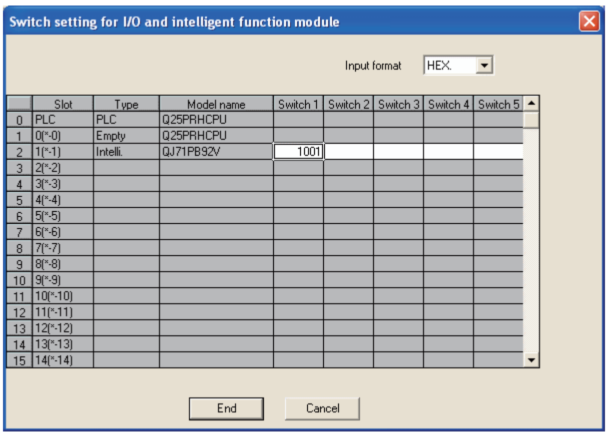


Figure 6.14 Intelligent Function Module Switch Setting Screen

1) For the redundant system support function

Table6.11 Intelligent Function Module Switch Setting Items (For the redundant system support function)

<table>
<tr><th>Item</th><th>Description</th></tr>
<tr><td>Switch 1</td><td>Set the standby master FDL address when the QJ71PB92V is mounted in a redundant system.
If the standby master FDL address setting is failed, an error code is stored in the Local station error information area (Un\G23071). (Section 9.5.6)
Disabled: No setting (blank)
Enabled: Refer to the following (Set only when using the redundant system support function)
1 | 0 | | H
Standby master FDL address
Setting range: 0H to 7DH (0 to 125)</td></tr>
<tr><td>Switch 2</td><td rowspan="4">No setting (blank).
If any setting exists, delete it.</td></tr>
<tr><td>Switch 3</td></tr>
<tr><td>Switch 4</td></tr>
<tr><td>Switch 5</td></tr>
</table>

2) For the QJ71PB92D-compatible function

Table6.12 Intelligent Function Module Switch Setting Items (For the QJ71PB92D-compatible function)

<table>
<tr><th>Item</th><th>Description</th></tr>
<tr><td>Switch 1</td><td>Set whether to continue or stop the I/O data communication with the DP-Slave when the CPU stop error occurs.
Continue : No setting (blank)
Stop : 0001H</td></tr>
<tr><td>Switch 2</td><td>9244H</td></tr>
<tr><td>Switch 3</td><td rowspan="3">No setting (blank).
If any setting exists, delete it.</td></tr>
<tr><td>Switch 4</td></tr>
<tr><td>Switch 5</td></tr>
</table>

CHAPTER7 PROGRAMMING

When applying the following program examples to the actual system, make sure to examine the applicability of the program and confirm that it will not cause system control problems.
The following lists the installation positions of the QJ71PB92V and corresponding program examples shown in this chapter.

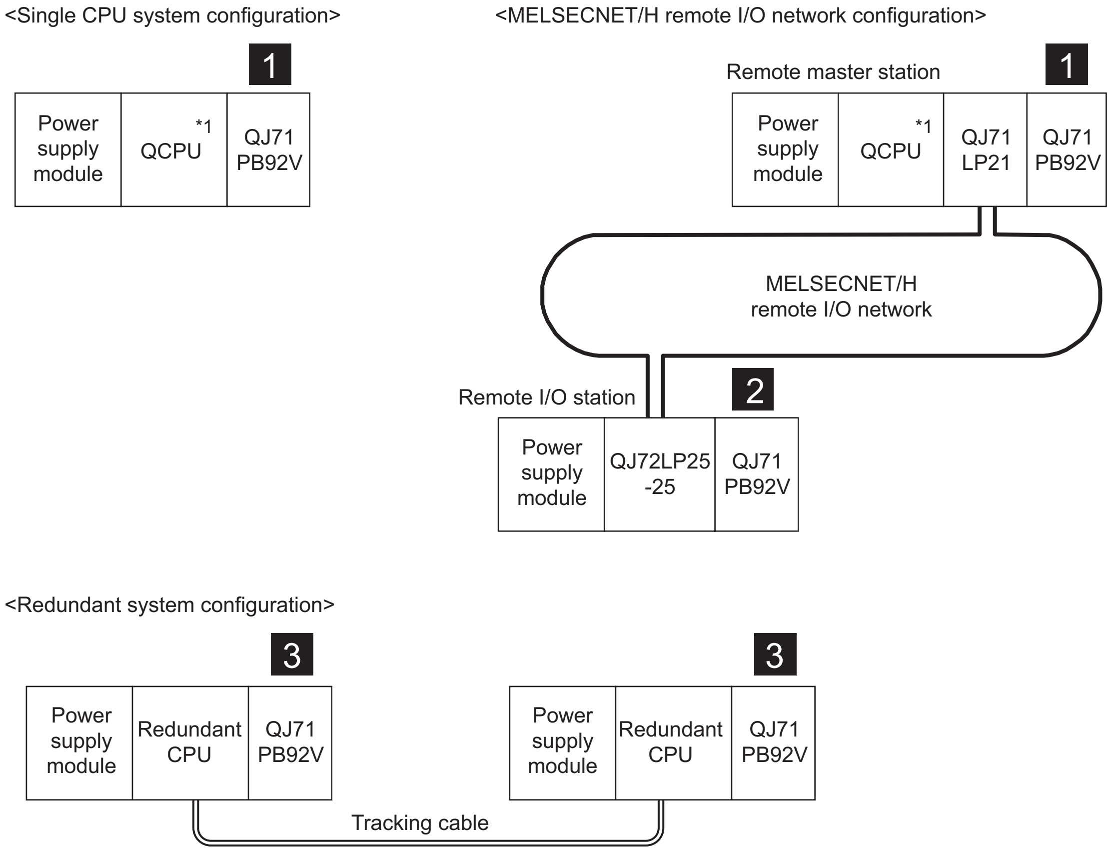


Figure 7.1 Installation Positions of the QJ71PB92V and Corresponding Program Examples in This Chapter

Table7.1 Installation Positions of the QJ71PB92V and Corresponding Program Examples in This Chapter

Installation position	Reference
1	Section 7.1 to 7.7
2	Section 7.8
3	Section 7.9

7.1 I/O Data Exchange Program Examples

This section explains the examples of I/O data exchange programs.
The following system configuration is used as an example for explanations in Sections 7.1.1 to 7.1.3.

(1) System configuration example

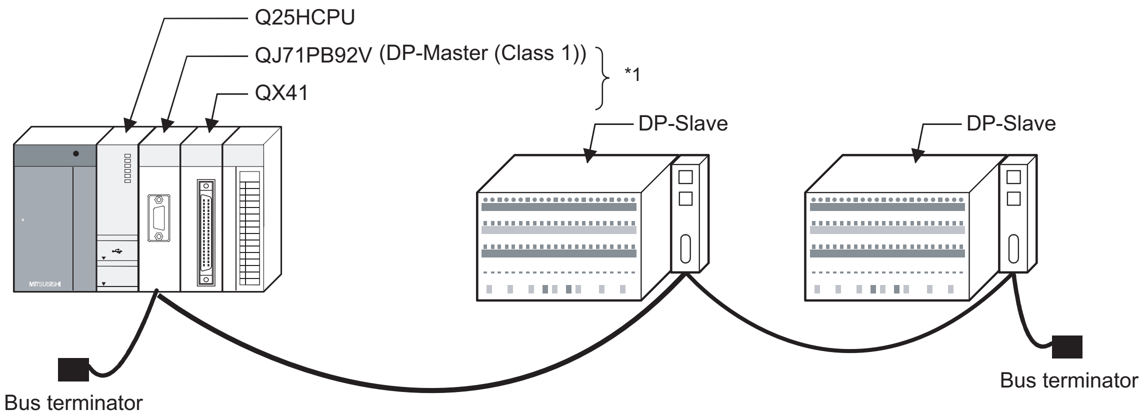


Figure 7.2 System Configuration Example for I/O Data Exchange

* 1 Modules are installed in order from slot 0 as shown in the figure, and the following start I/O Nos. are to be set.

I/O Assignment(*)

	Slot	Type	Model name	Points	StartXY
0	PLC	PLC	Q25HCPU		
1	0(*-0)	Intelli.	QJ71PB92V	32points	0000
2	1(*-1)	Input	QX41	32points	0020
3	2(*-2)				

Figure 7.3 I/O Assignment in Program Example

Table7.2 Assignment of Input and Output Signals

module	Input signal	Output signal
QJ71PB92V	X00 to X1F	Y00 to Y1F
QX41	X20 to X3F	—

(2) Settings

(a) QJ71PB92V settings

Table7.3 QJ71PB92V Settings

Item		Description
FDL address		FDL address 0
Transmission speed		1.5 Mbps
Operation mode		Communication mode (mode 3)
I/O data area for FDL address 1 (Buffer memory)	Input data area (for mode 3)	6144 (1800H) to 6239 (185FH)
	Output data area (for mode 3)	14336 (3800H) to 14431 (385FH)
I/O data area for FDL address 2 (Buffer memory)	Input data area (for mode 3)	6240 (1860H)
	Output data area (for mode 3)	14332 (3860H)

(b) DP-Slave Settings

Table7.4 DP-Slave Settings (1st module)

Item		Description
FDL address		FDL address 1
I/O data size	Input data size	96 words (192 bytes)
	Output data size	96 words (192 bytes)

Table7.5 DP-Slave Settings (2nd module)

Item		Description
FDL address		FDL address 2
I/O data size	Input data size	1 words (2 bytes)
	Output data size	1 words (2 bytes)

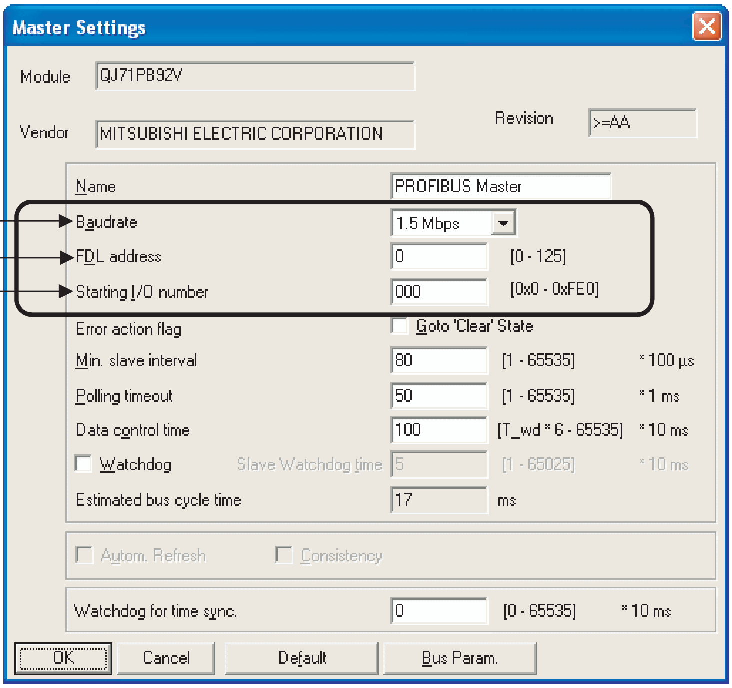
(c) Parameter settings on GX Configurator-DP

<Master parameters>

The transmission speed is set.

Set the FDL address of the QJ71PB92V.

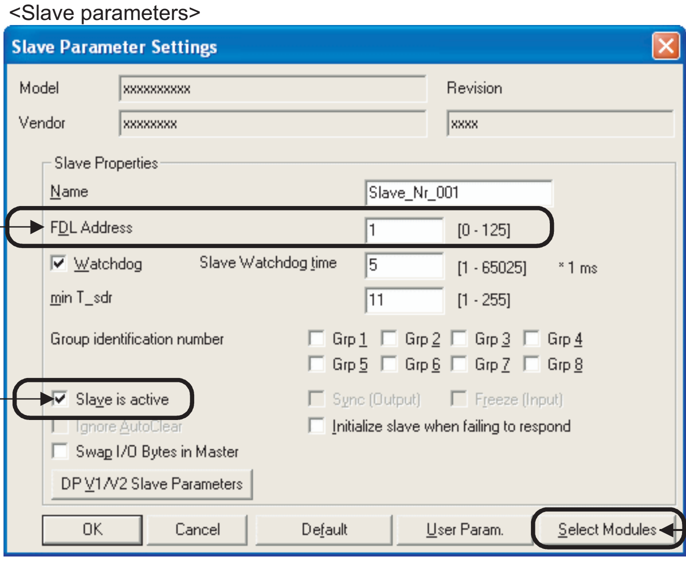
Set the I/O No. of the QJ71PB92V. (In 3 digits)



<Slave parameters>

Set the FDL address of the DP-Slave.

Set this for normal DP-Slave.



I/O data size is set.

Figure 7.4 Example of I/O Data Exchange Parameter Settings

(3) Assignment of devices in program examples

The program examples given in Sections 7.1.1 to 7.1.3 use the following device assignments.

(a) Devices used by the QJ71PB92V

Table7.6 List of Devices for the QJ71PB92V

Device	Description	Device	Description
X00	Data exchange start completed signal	Y00	Data exchange start request signal
X01	Diagnostic information detection signal	Y01	Diagnostic information detection reset request signal
X02	Diagnostic information area cleared signal	Y02	Diagnostic information area clear request signal
X0C	Data consistency requesting signal	Y0C	Data consistency start request signal
X11	Operation mode change completed signal	Y11	Operation mode change request signal
X1B	Communication READY signal	—	
X1D	Module READY signal		
X1F	Watchdog timer error signal		

(b) Devices used by the user

Table7.7 List of Devices for the User

Device	Description	Device	Description
X20	I/O data exchange start command	SM402	ON for 1 scan only after RUN
X21	Communication error detection reset command	M0	Refresh start request
X22	Communication error area clear command	M2	For operation mode change interlock
X23	Operation mode change command	M400	Initial setting execution command
X30	Conditions for write to output data (1st word)	—	
X31	Conditions for write to output data (2nd word)		

(c) Devices used as automatic refresh or buffer memory read target

Table7.8 List of Devices Used as Automatic Refresh or Buffer Memory Read Target

Device	Description	Device	Description
D0 to D95	Input data	D1000	Diagnostic information read target
D100 to D195	Output data	D1100	Read target of operation mode change result
D200 to D207	Slave status area (Normal communication detection)	—	
D208 to D215	Slave status area (Reserved station setting status)		
D216 to D224	Slave status area (Diagnostic information detection)		

7.1.1 Program examples using automatic refresh

This section explains a program for the case where the QJ71PB92V communicates with DP-Slaves using automatic refresh.
Program examples in this section are based on the system configuration example shown in Section 7.1.

(1) Setting automatic refresh parameters

Enable the automatic refresh parameters and the data consistency function.
The figure below shows the case that automatic refresh parameters are set by "Block Transfer".

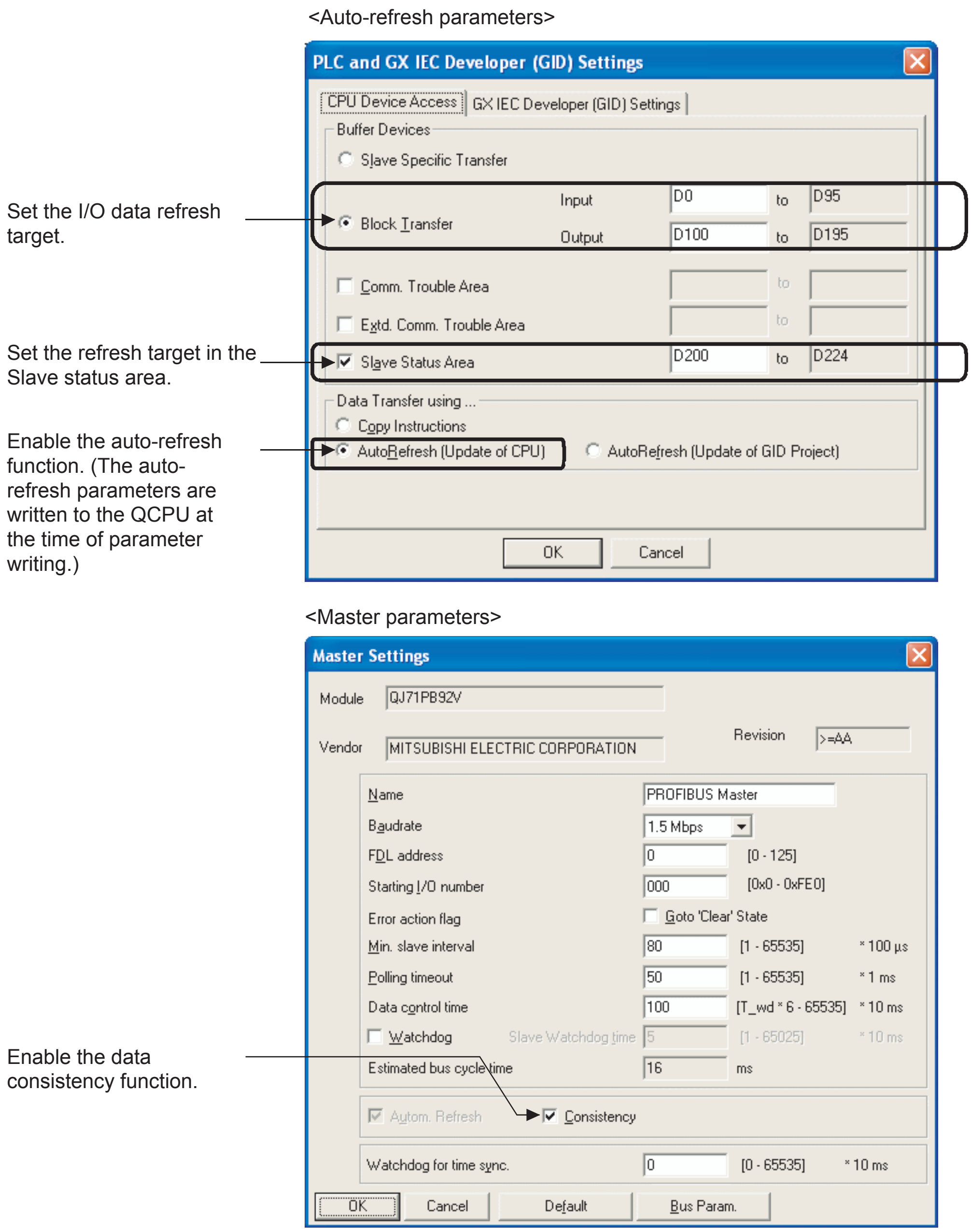


Figure 7.5 Automatic Refresh Parameter Setting Example

(2) Program example

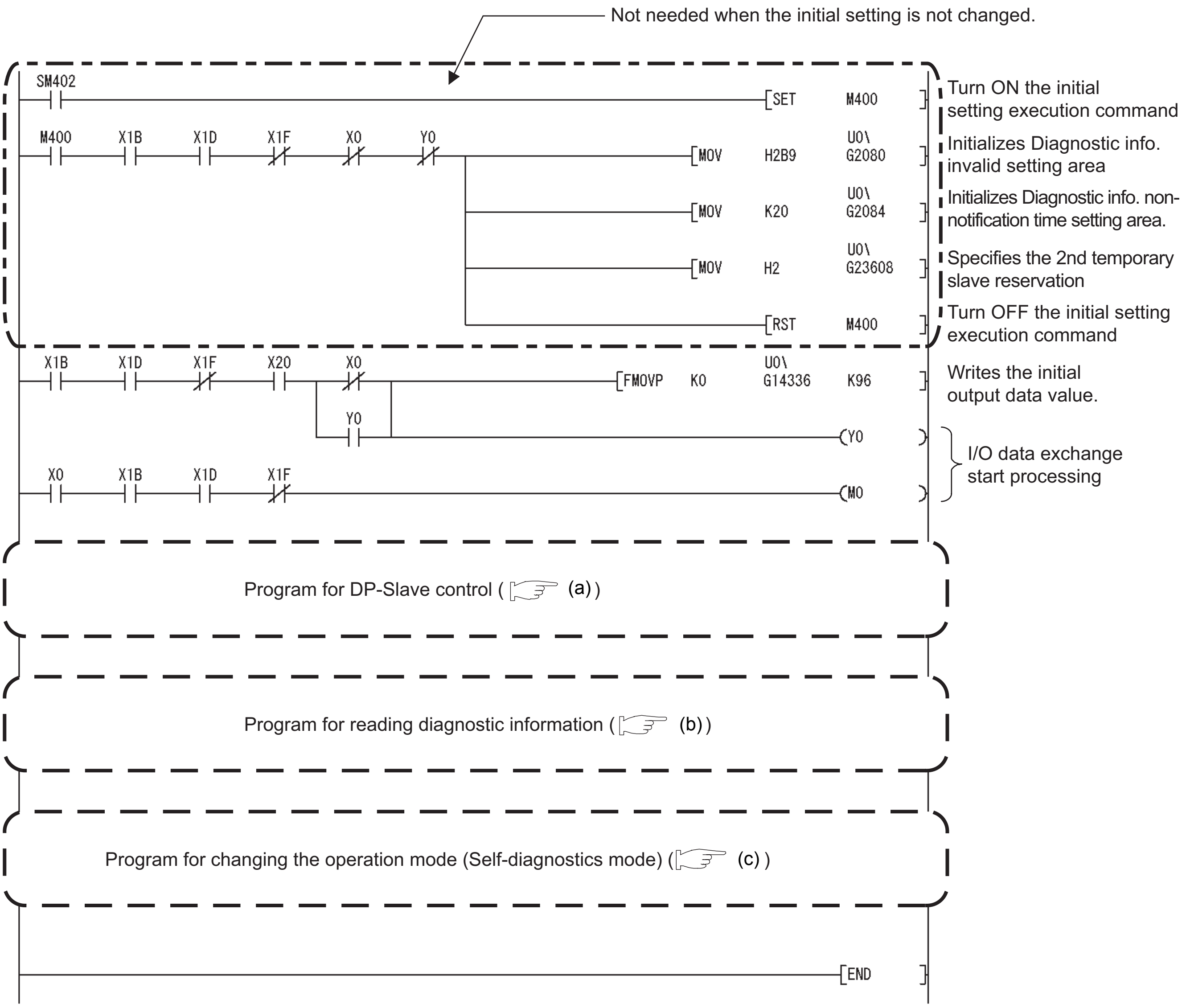


Figure 7.6 I/O Data Exchange Program Examples (Automatic Refresh)

(a) Program example for control of DP-Slaves

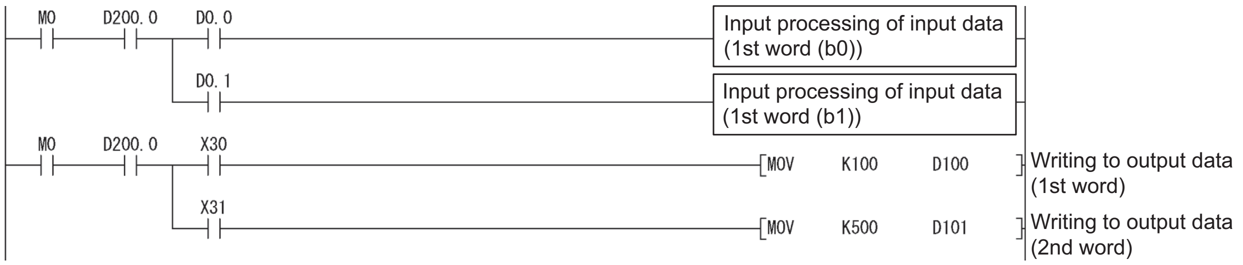


Figure 7.7 Program Example for Control of DP-Slaves

(b) Program example for diagnostic information read

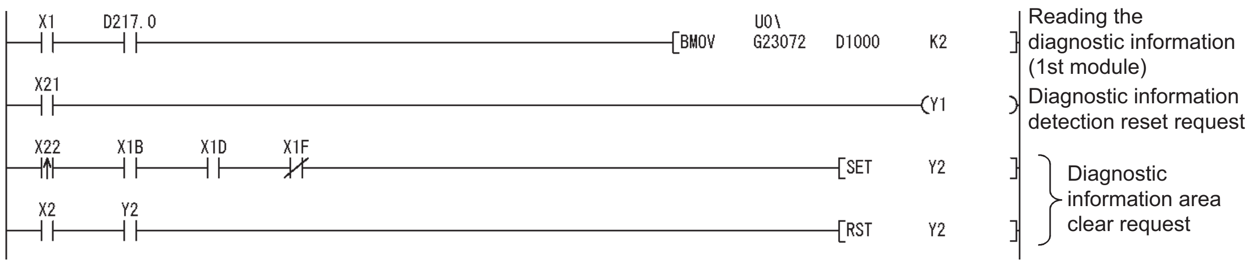


Figure 7.8 Program Example for Diagnostic Information Read

(c) Program example for operation mode change (Self-diagnostics mode)
When changing the operation mode using this program example, do not change the operation mode from GX Configurator-DP.

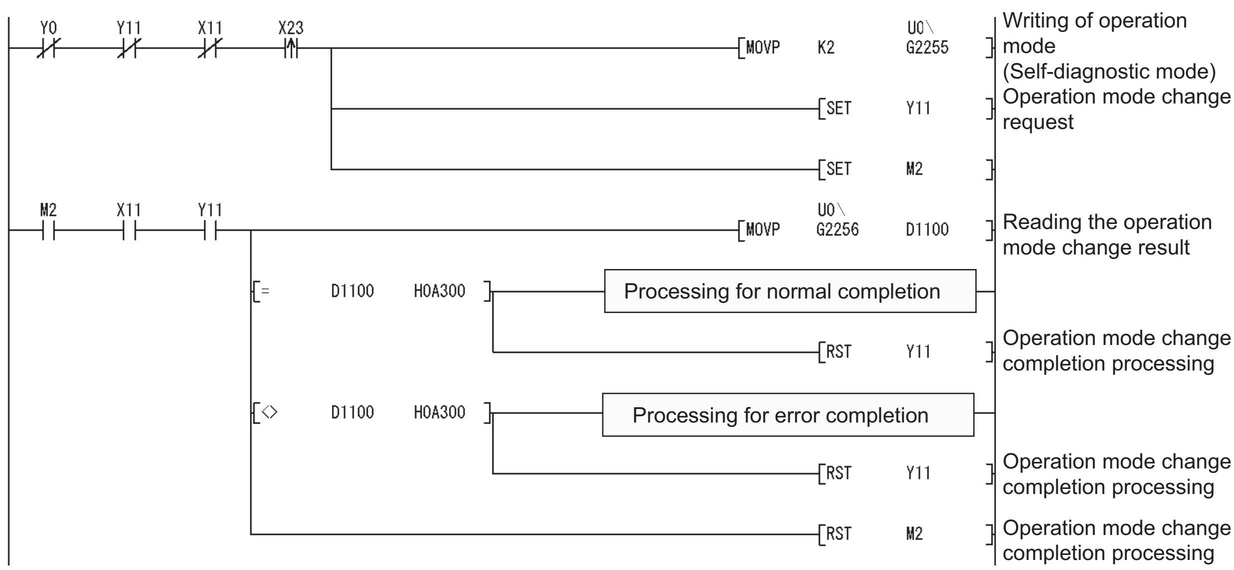


Figure 7.9 Program Example for Operation Mode Change (Self-diagnostics Mode)

7.1.2 Program example using dedicated instructions

This section explains a program in which the QJ71PB92V communicates with DP-Slaves using dedicated instructions.
This program example is based on the system configuration example shown in Section 7.1.

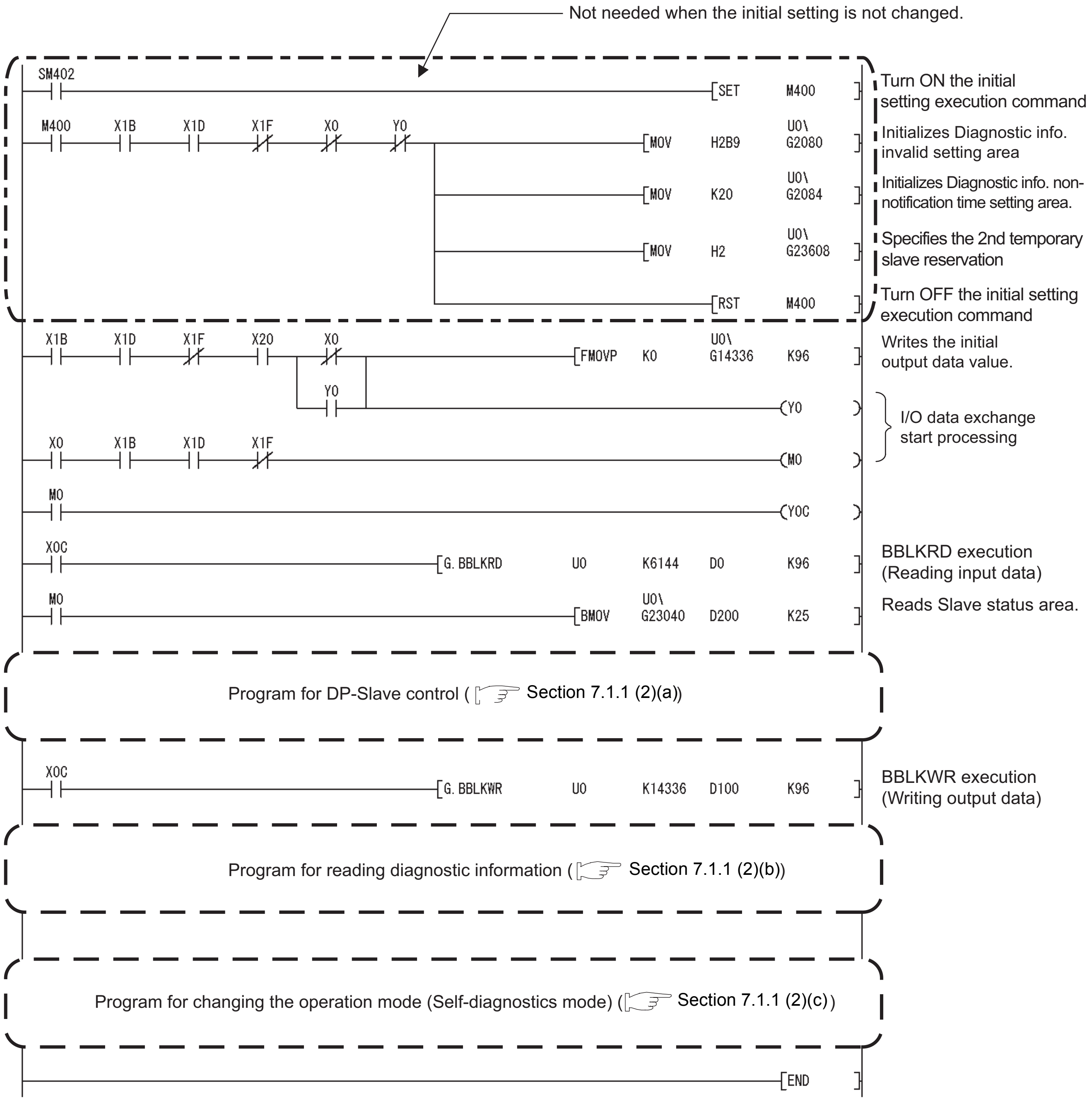
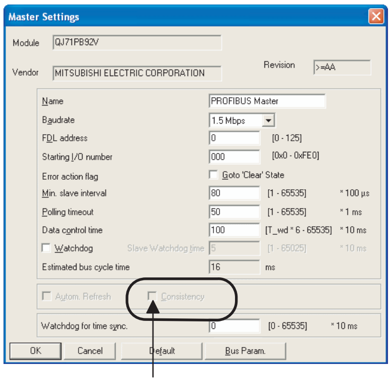


Figure 7.10 I/O Data Exchange Program Example (Dedicated instructions)

POINT

Confirm that Consistency is disabled with Autom. Refresh enabled.
(☞ Section 6.3)
When the automatic refresh and data consistency functions are enabled, dedicated instructions are not processed.



Make sure the box is unchecked.

7.1.3 Program example using the MOV instruction

This section explains a program in which the QJ71PB92V communicates with a DP-Slave using the MOV instruction.
This program example is based on the system configuration example shown in Section 7.1.

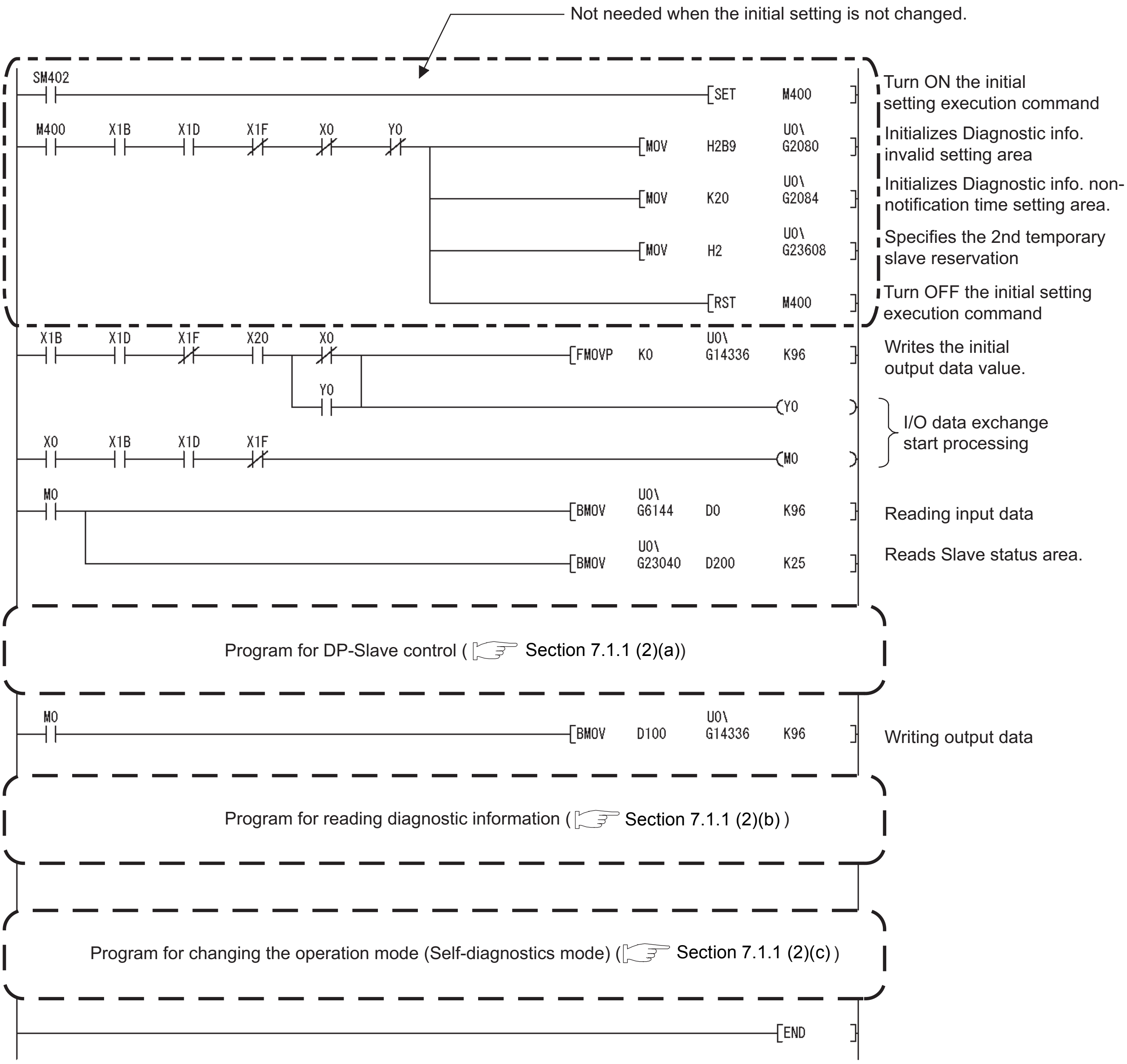


Figure 7.11 I/O Data Exchange Program Example (MOV instruction)

7.2 Program Example for Acquisition of Extended Diagnostic Error Information

(1) Assignment of devices in program examples

The program example in this section uses the following device assignments.

(a) Devices used by the QJ71PB92V

Table7.9 List of Devices for the QJ71PB92V

Device	Description	Device	Description
X06	Extended diagnostic information read response signal	Y06	Extended diagnostic information read request signal

(b) Devices used by the user

Table7.10 List of Devices for the User

Device	Description	Device	Description
X24	Extended diagnostic information read command	—	

(c) Devices used as automatic refresh or buffer memory read target

Table7.11 List of Devices Used as Automatic Refresh or Buffer Memory Read Target

Device	Description	Device	Description
D2000 to D2126 *1	Extended diagnostic error information read result	—	
D2500 to D2502	For word conversion of extended diagnostic error information data size		

* 1 Varies depending on the data size of the extended diagnostic error information.

(2) Program example

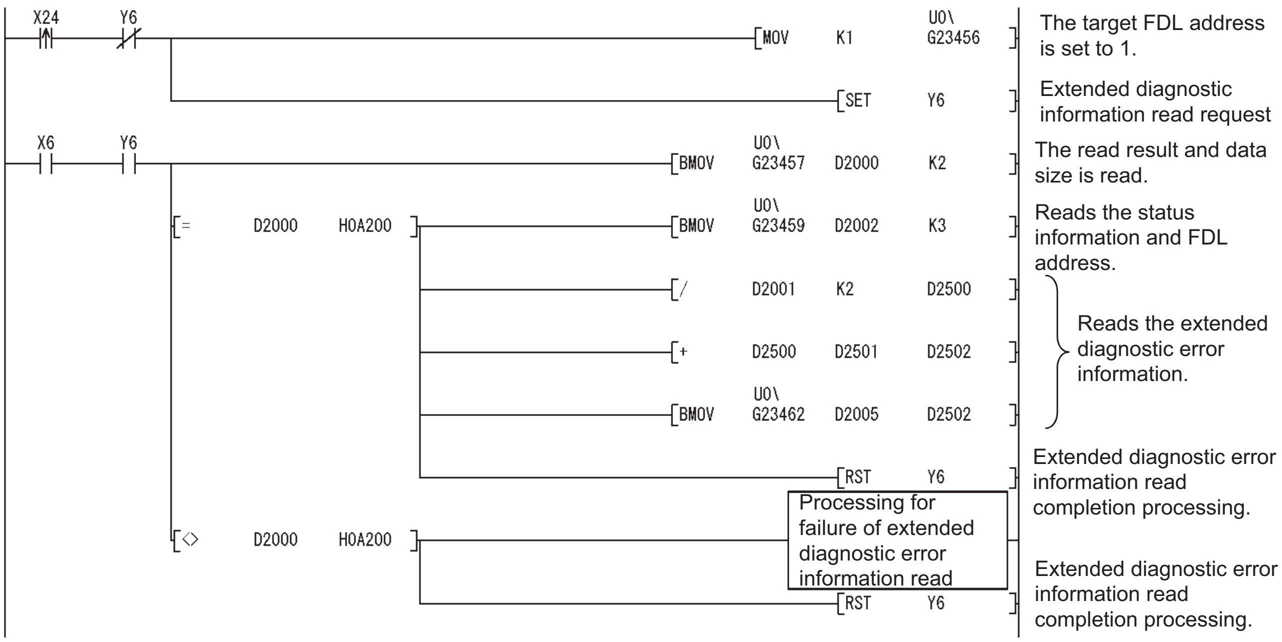


Figure 7.12 Program Example for Acquisition of Extended Diagnostic Error Information

7.3 Program Example for Global Control Function

(1) Assignment of devices in program examples

The program example in this section uses the following device assignments.

(a) Devices used by the QJ71PB92V

Table7.12 List of Devices for the QJ71PB92V

Device	Description	Device	Description
X04	Global control completed signal	Y04	Global control request signal
X05	Global control failed signal	—	

(b) Devices used by the user

Table7.13 List of Devices for the User

Device	Description	Device	Description
X25	Global control execution command	M0	Refresh start request (Section 7.1.1)

(2) Program example

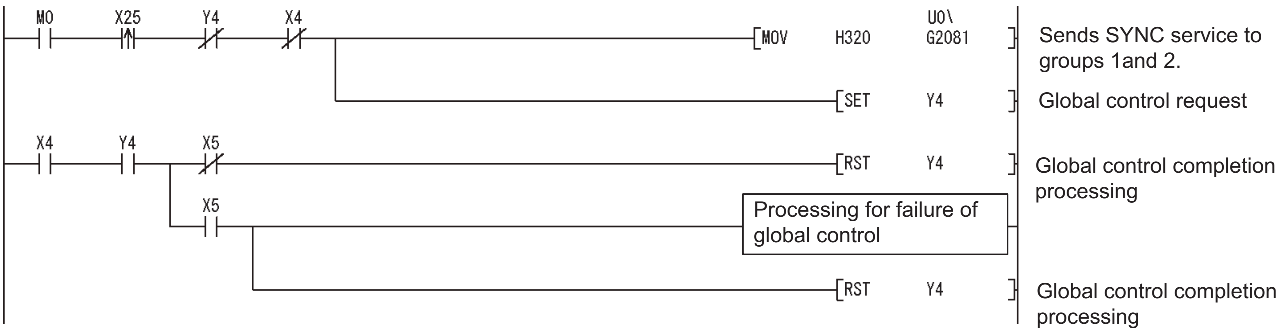


Figure 7.13 Program Example for Global Control Function

7.4 Program Example for Acyclic Communication with DP-Slaves

The following explains the request and response formats in acyclic communications, providing a program example.
The request and response formats in this section employ offset addresses (in word units).
The "offset address" refers to the n-th data in word units starting from the start address of the request instruction No. area to be used.

Table7.14 List of Start Addresses in Request Instruction No. Areas

Request Instruction No.	Start Address of Acyclic Communication Request Area	Start Address of Acyclic Communication Response Area
Request instruction No.1	23809 (5D01H)	25121 (6221H)
Request instruction No.2	23937 (5D81H)	25249 (62A1H)
Request instruction No.3	24065 (5E01H)	25377 (6321H)
Request instruction No.4	24193 (5E81H)	25505 (63A1H)
Request instruction No.5	24321 (5F01H)	25633 (6421H)
Request instruction No.6	24449 (5F81H)	25761 (64A1H)
Request instruction No.7	24578 (6001H)	25889 (6521H)
Request instruction No.8	24705 (6081H)	26017 (65A1H)

(1) Making a sequence program

The following example program is created for executing request instruction No.1.
For details on the program example, refer to Section 7.4.5.

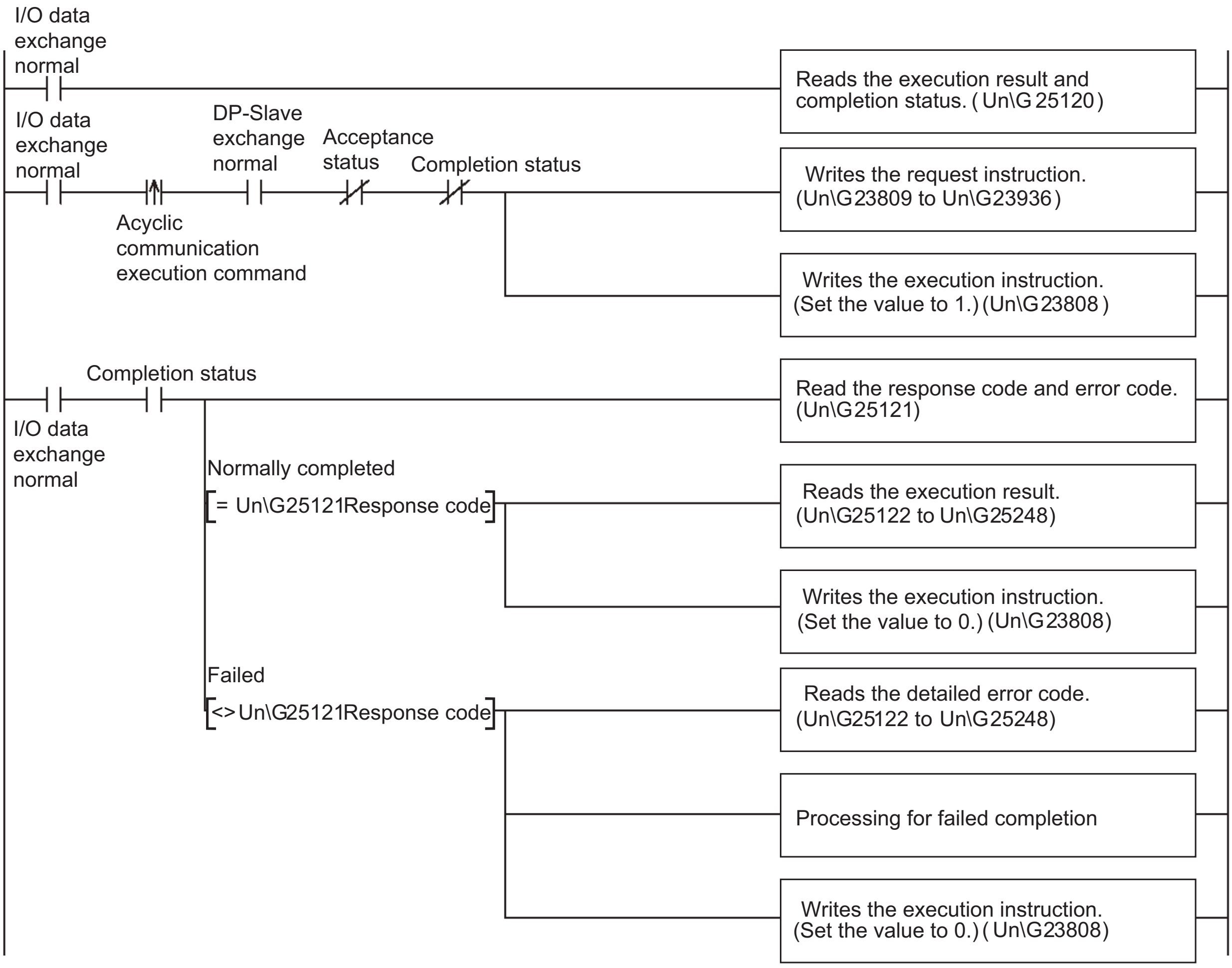


Figure 7.14 Sequence Program (Acyclic Communication)

7.4.1 READ services (Class1_SERVICE, Class2_SERVICE)

This section explains the request and response formats of the READ services (Class1_SERVICE, Class2_SERVICE).

(1) Request format

Table7.15 Request Format

Offset Address	Description/Set Value
+ 0 (+ 0H)	Set a request code. (1) In READ service (Class1_SERVICE) Set value: 1400H (2) In READ service (Class2_SERVICE) Set value: 1410H
+ 1 (+ 1H)	(1) In READ service (Class1_SERVICE) b15 b8 b7 b0 0 1) 1) Set the FDL address of the target DP-Slave. Set value: 00H to 7DH (0 to 125) (2) In READ service (Class2_SERVICE) b15 b8 b7 b0 2) 1) 1) Set the FDL address of the target DP-Slave. Set value: 00H to 7DH (0 to 125) 2) Set CommRef No. contained in the response format of the INITIATE service. Set value: 00H to 7EH (0 to 126) (0 to 126)
+ 2 (+ 2H)	Set the length of the data to read. (Unit: byte) Set value: 1 to 240
+ 3 (+ 3H)	Set the slot No. to read. Set value: 0 to 254
+ 4 (+ 4H)	Set the index to read. Set value: 0 to 255
+ 5 (+ 5H) to +127 (+7FH)	Empty area (Write 0000H.) Set value: Fixed to 0000H

(2) Response format

(a) When normally completed

Table7.16 Response Format (When Normally Completed)

Offset Address	Result
+ 0 (+ 0H)	A response code is stored. (1) In READ service (Class1_SERVICE) Stored value: A400H (2) In READ service (Class2_SERVICE) Stored value: A410H
+ 1 (+ 1H)	(1) In READ service (Class1_SERVICE) b15 – b8: 0 / b7 – b0: 1) 1) The FDL address of the DP-Slave is stored. Stored value : 00H to 7DH (0 to 125) (2) In READ service (Class2_SERVICE) b15 – b8: 2) / b7 – b0: 1) 1) The FDL address of the DP-Slave is stored. Stored value : 00H to 7DH (0 to 125) 2) The CommRef No. is stored. Stored value : 00H to 7EH (0 to 126)
+ 2 (+ 2H)	The length of the read data is stored. (Unit: byte) Stored value: 1 to 240
+ 3 (+ 3H)	The read slot No. is stored. Stored value: 0 to 254
+ 4 (+ 4H)	The read index is stored. Stored value: 0 to 255
+ 5 (+ 5H) to +124 (+7CH)	The read data are stored. When the read data length is shorter than the length specified in the request format, 0s are stored in the empty area. When the read data length is longer than the length specified in the request format, only data of the specified data length are stored. b15 – b8 / b7 – b0 +5 (+5H): Data 2 / Data 1 +6 (+6H): Data 4 / Data 3 to +124 (+7CH): Data 240 / Data 239
+125 (+7DH) to +127 (+7FH)	Empty area Stored value: 0000H

(b) When failed

Table7.17 Response Format (When Failed)

Offset Address	Result
+ 0 (+ 0H)	An error code is stored. (Section 9.5.3)
+ 1 (+ 1H)	(1) In READ service (Class1_SERVICE) b15 b8 b7 b0 [0 | 1)] 1) The FDL address of the DP-Slave is stored. Stored value : 00H to 7DH (0 to 125) (2)In READ service (Class2_SERVICE) b15 b8 b7 b0 [2) | 1)] 1) The FDL address of the DP-Slave is stored. Stored value : 00H to 7DH (0 to 125) 2) The CommRef No. is stored. Stored value : 00H to 7EH (0 to 126)
+ 2 (+ 2H)	(1) When E403H is currently stored in offset address +0 (+0H) Detailed error code 1 is stored. (Section 9.5.3) (2) When a value other than E403H is currently stored in offset address +0 (+0H) Stored value: FFFFH (No detailed error code 1)
+ 3 (+ 3H)	(1) When E403H is currently stored in offset address +0 (+0H) Detailed error code 2 is stored. (Section 9.5.3) (2) When a value other than E403H is currently stored in offset address +0 (+0H) Stored value: FFFFH (No detailed error code 2)
+ 4 (+ 4H)	(1) When E403H is currently stored in offset address +0 (+0H) Detailed error code 3 is stored. (Section 9.5.3) (2) When a value other than E403H is currently stored in offset address +0 (+0H) Stored value: FFFFH (No detailed error code 3)
+ 5 (+ 5H) to +127 (+7FH)	Empty area Stored value: 0000H

7.4.2 WRITE services (Class1_SERVICE, Class2_SERVICE)

This section explains the request and response formats of the WRITE services (Class1_SERVICE, Class2_SERVICE).

(1) Request format

Table7.18 Request Format

Offset Address	Description/Set Value
+ 0 (+ 0H)	Set a request code. (1) In WRITE service (Class1_SERVICE) Set value: 1401H (2) In WRITE service (Class2_SERVICE) Set value: 1411H
+ 1 (+ 1H)	(1) In WRITE service (Class1_SERVICE) b15 – b8: 0 / b7 – b0: 1) 1) Set the FDL address of the target DP-Slave. Set value : 00H to 7DH (0 to 125) (2)In WRITE service (Class2_SERVICE) b15 – b8: 2) / b7 – b0: 1) 1) Set the FDL address of the target DP-Slave. Set value : 00H to 7DH (0 to 125) 2) Set CommRef No. contained in the response format of the INITIATE service. Set value : 00H to 7EH (0 to 126)
+ 2 (+ 2H)	Set the length of the data to write. (Unit: byte) Set value: 1 to 240
+ 3 (+ 3H)	Set the slot No. to write. Set value: 0 to 254
+ 4 (+ 4H)	Set the index to write. Set value: 0 to 255
+ 5 (+ 5H) to +124 (+7CH)	Set the data to write. (b15 – b8 / b7 – b0) +5 (+5H): Data 2 / Data 1 +6 (+6H): Data 4 / Data 3 to 124 (+7CH): Data 240 / Data 239
+125 (+7DH) to +127 (+7FH)	Empty area (Write 0000H.) Set value: Fixed to 0000H

(2) Response format

(a) When normally completed

Table7.19 Response Format (When Normally Completed)

Offset Address	Result
+ 0 (+ 0H)	A response code is stored. (1) In WRITE service (Class1_SERVICE) Stored value: A401H (2) In WRITE service (Class2_SERVICE) Stored value: A411H
+ 1 (+ 1H)	(1) In WRITE service (Class1_SERVICE) b15–b8: 0 / b7–b0: 1) 1) The FDL address of the DP-Slave is stored. Stored value : 00H to 7DH (0 to 125) (2) In WRITE service (Class2_SERVICE) b15–b8: 2) / b7–b0: 1) 1) The FDL address of the DP-Slave is stored. Stored value : 00H to 7DH (0 to 125) 2) The CommRef No. is stored. Stored value : 00H to 7EH (0 to 126)
+ 2 (+ 2H)	The length of the written data is stored. (Unit: byte) Set value: 1 to 240
+ 3 (+ 3H)	Set the written slot No. Set value: 0 to 254
+ 4 (+ 4H)	Set the written index. Set value: 0 to 255
+ 5 (+ 5H) to +127 (+7FH)	Empty area Stored value: 0000H

(b) When failed

Table7.20 Response Format (When Failed)

Offset Address	Result
+ 0 (+ 0H)	An error code is stored.(Section 9.5.3)
+ 1 (+ 1H)	(1) In WRITE service (Class1_SERVICE) b15 … b8 | b7 … b0 0 | 1) 1) The FDL address of the DP-Slave is stored. Stored value : 00H to 7DH (0 to 125) (2) In WRITE service (Class2_SERVICE) b15 … b8 | b7 … b0 2) | 1) 1) The FDL address of the DP-Slave is stored. Stored value : 00H to 7DH (0 to 125) 2) The CommRef No. is stored. Stored value : 00H to 7EH (0 to 126)
+ 2 (+ 2H)	(1) When E443H is currently stored in offset address +0 (+0H) Detailed error code 1 is stored. (Section 9.5.3) (2) When a value other than E443H is currently stored in offset address +0 (+0H) Stored value: FFFFH (No detailed error code 1)
+ 3 (+ 3H)	(1) When E443H is currently stored in offset address +0 (+0H) Detailed error code 2 is stored. (Section 9.5.3) (2) When a value other than E443H is currently stored in offset address +0 (+0H) Stored value: FFFFH (No detailed error code 2)
+ 4 (+ 4H)	(1) When E443H is currently stored in offset address +0 (+0H) Detailed error code 3 is stored. (Section 9.5.3) (2) When a value other than E443H is currently stored in offset address +0 (+0H) Stored value: FFFFH (No detailed error code 3)
+ 5 (+ 5H) to +127 (+7FH)	Empty area Stored value: 0000H

7.4.3 INITIATE service (Class2_SERVICE)

This section explains the request and response formats of the INITIATE service (Class2_SERVICE).

(1) Request format

Table7.21 Request format

Offset Address	Description/Set Value
+ 0 (+ 0H)	Set a request code. Set value: 1412H
+ 1 (+ 1H)	Set the FDL address of the DP-Slave to which the network line is connected. Set value: 0000H to 007DH(0 to 125)
+ 2 (+ 2H)	Set a transmission timeout value. (Unit: 10ms) The setting range differs depending on the DP-Slave specifications. Check the DP-Slave specifications. Set value: 0 to 65535
+ 3 (+ 3H)	Set Alignment. The setting range differs depending on the DP-Slave specifications. Check the DP-Slave specifications. Set value: Fixed to 0000H
+ 4 (+ 4H)	Set Features Supported. The setting range differs depending on the DP-Slave specifications. Check the DP-Slave specifications. Set value: Fixed to 0001H
+ 5 (+ 5H)	Set Profile Features Supported. The setting range differs depending on the DP-Slave specifications. Check the DP-Slave specifications. Set value: Fixed to 0000H
+ 6 (+ 6H)	Set Profile Ident Number. The setting range differs depending on the DP-Slave specifications. Check the DP-Slave specifications. Set value: Fixed to 0000H
+ 7 (+ 7H)	b15 … b8 : 2) / b7 … b0 : 1) 1) Set S_Type. The setting range differs depending on the DP-Slave specifications. Check the DP-Slave specifications. Set value : Fixed to 00H 2) Set S_Len. The setting range differs depending on the DP-Slave specifications. Check the DP-Slave specifications. Set value : Fixed to 00H

(To the next page)

Table7.21 Request format (Continued)

Offset Address	Description/Set Value
+ 8 (+ 8H)	b15 b8 b7 b0 [2) | 1)] 1) Sets D_Type. The setting range differs depending on the DP-Slave specifications. Check the DP-Slave specifications. Set value : Fixed to 00H 2) Set D_Len. The setting range differs depending on the DP-Slave specifications. Check the DP-Slave specifications. Set value : Fixed to 00H
+ 9 (+ 9H) to +127 (+7FH)	Empty area (Write 0000H.) Set value: Fixed to 0000H

(2) Response format

(a) When normally completed

Table7.22 Response Format (When Normally Completed)

Offset Address	Result
+ 0 (+ 0H)	A response code is stored. Stored value: A412H
+ 1 (+ 1H)	b15 b8 b7 b0: [2) | 1)] 1) The FDL address of the DP-Slave connected to the network is stored. Stored value : 00H to 7DH (0 to 125) 2) The CommRef No. is stored. Stored value : 00H to 7EH (0 to 126)
+ 2 (+ 2H)	Max LenDataUnit is stored. The stored value differs depending on the DP-Slave specifications. Check the DP-Slave specifications.
+ 3 (+ 3H)	Features Supported is stored. The stored value differs depending on the DP-Slave specifications. Check the DP-Slave specifications.
+ 4 (+ 4H)	Profile Features Supported is stored. The stored value differs depending on the DP-Slave specifications. Check the DP-Slave specifications.
+ 5 (+ 5H)	Profile Ident Number is stored. The stored value differs depending on the DP-Slave specifications. Check the DP-Slave specifications.
+ 6 (+ 6H)	b15 b8 b7 b0: [2) | 1)] 1) S_Type is stored. The stored value differs depending on the DP-Slave specifications. Check the DP-Slave specifications. 2) S_Len is stored. The stored value differs depending on the DP-Slave specifications. Check the DP-Slave specifications.
+ 7 (+ 7H)	b15 b8 b7 b0: [2) | 1)] 1) D_Type is stored. The stored value differs depending on the DP-Slave specifications. Check the DP-Slave specifications. 2) D_Len is stored. The stored value differs depending on the DP-Slave specifications. Check the DP-Slave specifications.
+ 8 (+ 8H) to +127 (+7FH)	Empty area Stored value: 0000H

(b) When failed

Table7.23 Response Format (When Failed)

Offset Address	Result
+ 0 (+ 0H)	An error code is stored. (Section 9.5.3)
+ 1 (+ 1H)	b15 b8 b7 b0 | 2) | 1) | 1) The FDL address of the DP-Slave connected to the network is stored. Stored value : 00H to 7DH (0 to 125) 2) The CommRef No. is stored. Stored value : 00H to 7EH (0 to 126)
+ 2 (+ 2H)	(1) When E482H is currently stored in offset address +0 (+0H) Detailed error code 1 is stored. (Section 9.5.3) (2) When a value other than E482H is currently stored in offset address +0 (+0H) Stored value: FFFFH (No detailed error code 1)
+ 3 (+ 3H)	(1) When E482H is currently stored in offset address +0 (+0H) Detailed error code 2 is stored. (Section 9.5.3) (2) When a value other than E482H is currently stored in offset address +0 (+0H) Stored value: FFFFH (No detailed error code 2)
+ 4 (+ 4H)	(1) When E482H is currently stored in offset address +0 (+0H) Detailed error code 2 is stored. (Section 9.5.3) (2) When a value other than E482H is currently stored in offset address +0 (+0H) Stored value: FFFFH (No detailed error code 3)
+ 5 (+ 5H) to +127 (+7FH)	Empty area Stored value: 0000H

7.4.4 ABORT service (Class2_SERVICE)

This section explains the request and response formats of the ABORT service (Class2_SERVICE).

(1) Request format

Table7.24 Request Format

Offset Address	Description/Set Value
+ 0 (+ 0H)	Set a request code. Set value: 1413H
+ 1 (+ 1H)	b15 b8 | b7 b0 2) | 1) 1) The FDL address of the DP-Slave to be connected to network is stored. Set value : 00H to 7DH (0 to 125) 2) Set the CommRef No. contained in the response format of the INITIATE service. Set value : 00H to 7EH (0 to 126)
+ 2 (+ 2H)	b15 b8 | b7 b0 2) | 1) 1) Set Instance Reason. The setting range differs depending on the DP-Slave specifications. Check the DP-Slave specifications. Set value : Fixed to 00H 2) Set Subnet. The setting range differs depending on the DP-Slave specifications. Check the DP-Slave specifications. Set value : Fixed to 30H
+ 3 (+ 3H) to +127 (+7FH)	Empty area (Write 0000H.) Set value: Fixed to 0000H

(2) Response format

(a) When normally completed

Table7.25 Response Format (When Normally Completed)

Offset Address	Result
+ 0 (+ 0H)	A response code is stored. Stored value: A413H
+ 1 (+ 1H)	b15 b8 b7 b0 2) | 1) 1) The FDL address of the DP-Slave connected to the network is stored. Stored value : 00H to 7DH (0 to 125) 2) The CommRef No. is stored. Stored value : 00H to 7EH (0 to 126)
+ 2 (+ 2H) to +127 (+7FH)	Empty area Stored value: 0000H

(b) When failed

Table7.26 Response Format (When Failed)

Offset Address	Result
+ 0 (+ 0H)	An error code is stored. (Section 9.5.3)
+ 1 (+ 1H)	b15 b8 b7 b0 2) | 1) 1) The FDL address of the DP-Slave connected to the network is stored. Stored value : 00H to 7DH (0 to 125) 2) The CommRef No. is stored. Stored value : 00H to 7EH (0 to 126)
+ 2 (+ 2H) to +127 (+7FH)	Empty area Stored value: 0000H

7.4.5 Program example

(1) Settings

The example program in this section uses the following example requests.

Table7.27 Details of Program Example

Item	Description
Request instruction No.	Request instruction No.1
Service name	READ service (Class1_SERVICE)
DP-Slave FDL address	FDL address 2
Data length	16 bytes
Slot No.	0
Index	1

(2) Assignment of devices in program example

The program example in this section uses the following device assignments.

(a) Devices used by the user

Table7.28 List of Devices for the User

Device	Description	Device	Description
X26	Acyclic communication execution command	M0	Refresh start request (Section 7.1.1)

(b) Devices used as automatic refresh or buffer memory read target

Table7.29 List of Devices Used as Automatic Refresh or Buffer Memory Read Target

Device	Description	Device	Description
D200 to D207	Slave status area (Normal communication detection)	M100 to M115	Acyclic communication request result area
D3000 to D3012	Acyclic communication response area	—	

(3) Program example

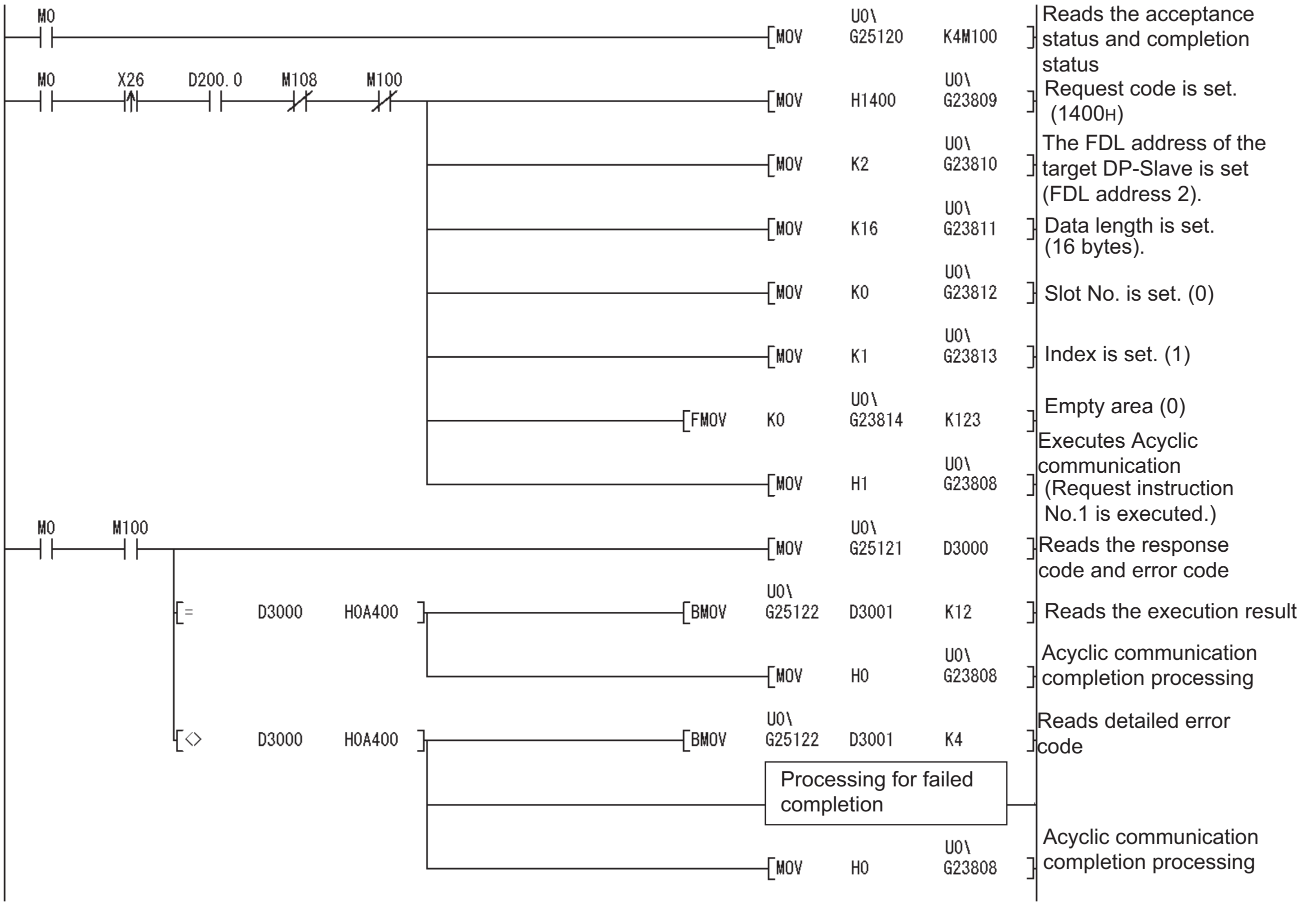


Figure 7.15 Program Example for Acyclic Communication (READ service (Class1_SERVICE))

7.5 Program Example for Alarm Acquisition

The following explains the request and response formats in alarm acquisition, providing a program example.

(1) Making a sequence program

For details on the program example, refer to Section 7.5.4.

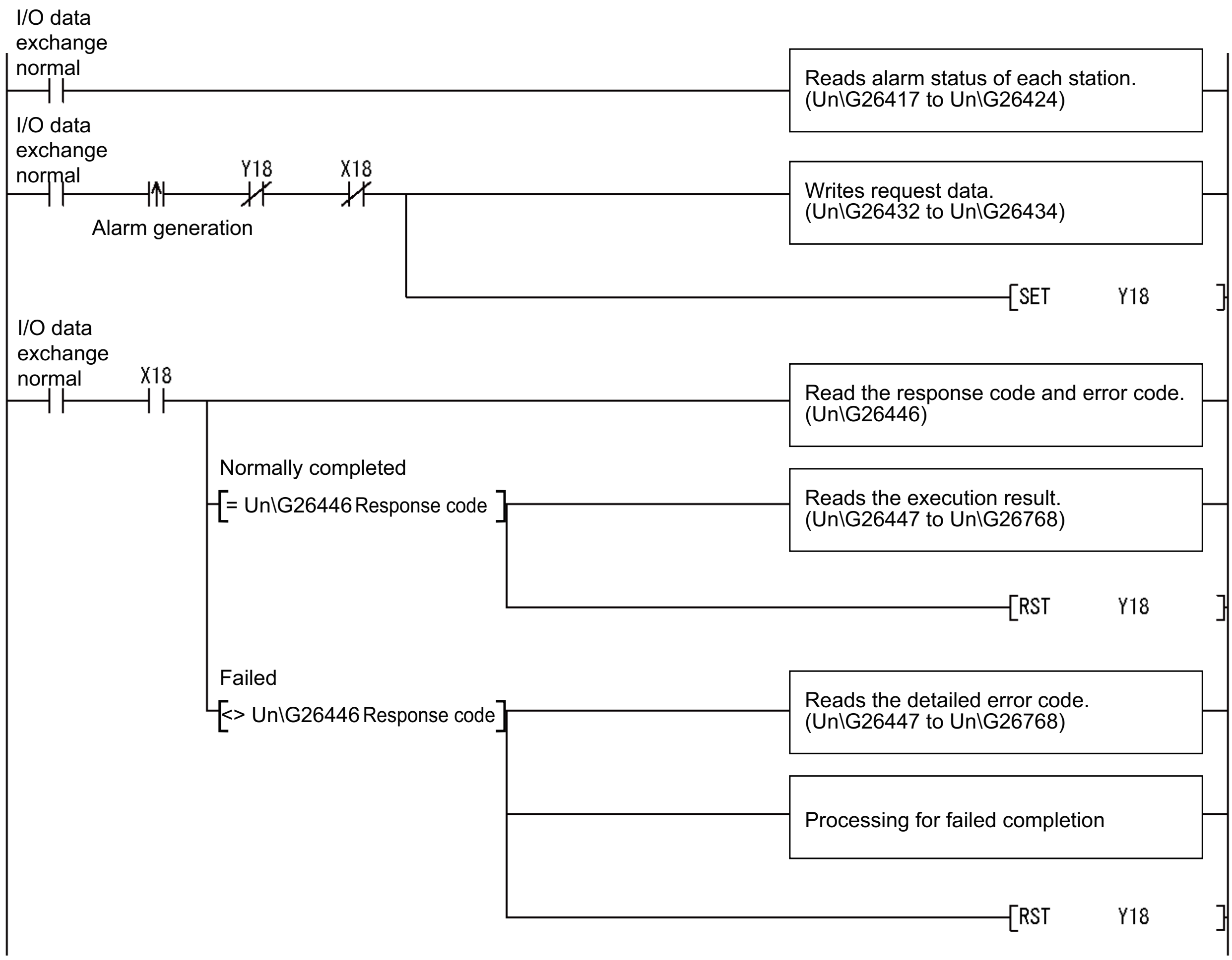


Figure 7.16 Sequence Program (Alarm Acquisition)

7.5.1 Alarm read request (without ACK)

This section explains the request and response formats of the alarm read request (without ACK).

(1) Request format

Table7.30 Request Format

Buffer memory address	Description/Set value
26432(6740H)	Set a request code. Set value: 1500H
26433(6741H)	Set the FDL address of the DP-Slave whose alarm is to be read. Set value: 0000H to 007DH (0 to 125)
26434(6742H)	Empty area (Write 0000H.) Set value: Fixed to 0000H

(2) Response format

(a) When normally completed

Table7.31 Response Format (When Normally Completed)

<table>
<tr><th>Buffer memory address</th><th colspan="2">Result</th></tr>
<tr><td>26446(674E$_{H}$)</td><td colspan="2">A response code is stored.
Stored value: A500$_{H}$</td></tr>
<tr><td>26447(674F$_{H}$)</td><td colspan="2">The FDL address of the DP-Slave from which alarm was read is stored.
Stored value: 0000$_{H}$ to 007D$_{H}$(0 to 125)</td></tr>
<tr><td>26448(6750$_{H}$)</td><td colspan="2">The read completion status of the alarm data is stored.

<table>
<tr><td>b15 to b8</td><td>b7 to b0</td></tr>
<tr><td>0</td><td>See below.</td></tr>
</table>
<table>
<tr><th>Bit</th><th>Description</th><th>Bit</th><th>Description</th></tr>
<tr><td>b0</td><td>Read completion status of alarm data No.1
0: Failed or not executed
1: Normally completed</td><td>b4</td><td>Read completion status of alarm data No.5
0: Failed or not executed
1: Normally completed</td></tr>
<tr><td>b1</td><td>Read completion status of alarm data No.2
0: Failed or not executed
1: Normally completed</td><td>b5</td><td>Read completion status of alarm data No.6
0: Failed or not executed
1: Normally completed</td></tr>
<tr><td>b2</td><td>Read completion status of alarm data No.3
0: Failed or not executed
1: Normally completed</td><td>b6</td><td>Read completion status of alarm data No.7
0: Failed or not executed
1: Normally completed</td></tr>
<tr><td>b3</td><td>Read completion status of alarm data No.4
0: Failed or not executed
1: Normally completed</td><td>b7</td><td>Read completion status of alarm data No.8
0: Failed or not executed
1: Normally completed</td></tr>
</table></td></tr>
<tr><td>26449(6751$_{H}$)</td><td rowspan="3">Alarm data No.1</td><td>The length of the alarm data is stored. (Unit: byte)
Stored value: 1 to 64</td></tr>
<tr><td>26450(6752$_{H}$)</td><td>The alarm type is stored.
<table>
<tr><th>Stored value</th><th>Alarm type</th></tr>
<tr><td>A510$_{H}$</td><td>Diagnosis alarm</td></tr>
<tr><td>A511$_{H}$</td><td>Process alarm</td></tr>
<tr><td>A512$_{H}$</td><td>Pull alarm</td></tr>
<tr><td>A513$_{H}$</td><td>Plug alarm</td></tr>
<tr><td>A514$_{H}$</td><td>Status alarm</td></tr>
<tr><td>A515$_{H}$</td><td>Update alarm</td></tr>
<tr><td>A516$_{H}$</td><td>Manufacturer specific alarm</td></tr>
</table></td></tr>
<tr><td>26451(6753$_{H}$)</td><td>The slot No. is stored.
Stored value: 0 to 254</td></tr>
</table>

(To the next page)

Table7.31 Response Format (When Normally Completed) (Continued)

<table>
<tr><th>Buffer memory address</th><th colspan="2">Result</th></tr>
<tr><td>26452(6754H)</td><td rowspan="3">Alarm data No.1</td><td>The alarm status and sequence No. are stored.
<table><tr><td>b15 … b8</td><td>b7 to b3</td><td>b2</td><td>b1 b0</td></tr><tr><td>0</td><td>3)</td><td>2)</td><td>1)</td></tr></table>
1) Alarm details category is stored.
00 : No additional information
01 : Error detected, and alarm notified from the corresponding slot
10 : No error occurred after alarm notification from the corresponding slot
11 : Error occurred after alarm notification from the corresponding slot

2) Whether individual ACK is required or not is stored.
0 : No ACK return from the user is required.
1 : ACK return from the user is required.

3) Sequence No. is stored.
Stored value : 0 to 31</td></tr>
<tr><td>26453(6755H) to
26484(6774H)</td><td>The alarm data are stored.
<table><tr><td></td><td>b15 … b8</td><td>b7 … b0</td></tr><tr><td>26453(6755H)</td><td>Alarm data (2nd byte)</td><td>Alarm data (1st byte)</td></tr><tr><td>26454(6756H)</td><td>Alarm data (4th byte)</td><td>Alarm data (3rd byte)</td></tr><tr><td>to</td><td></td><td></td></tr><tr><td>26484(6774H)</td><td>Alarm data (64th byte)</td><td>Alarm data (63rd byte)</td></tr></table></td></tr>
<tr><td>26485(6775H) to
26488(6778H)</td><td>Empty area
Stored value: 0000H</td></tr>
<tr><td>26489(6779H) to
26528(67A0H)</td><td>Alarm data No.2</td><td>(Same as alarm data No.1)</td></tr>
<tr><td>26529(67A1H) to
26568(67C8H)</td><td>Alarm data No.3</td><td>(Same as alarm data No.1)</td></tr>
<tr><td>26569(67C9H) to
26608(67F0H)</td><td>Alarm data No.4</td><td>(Same as alarm data No.1)</td></tr>
<tr><td>26609(67F1H) to
26648(6818H)</td><td>Alarm data No.5</td><td>(Same as alarm data No.1)</td></tr>
<tr><td>26649(6819H) to
26688(6840H)</td><td>Alarm data No.6</td><td>(Same as alarm data No.1)</td></tr>
<tr><td>26689(6841H) to
26728(6868H)</td><td>Alarm data No.7</td><td>(Same as alarm data No.1)</td></tr>
<tr><td>26729(6869H) to
26768(6890H)</td><td>Alarm data No.8</td><td>(Same as alarm data No.1)</td></tr>
</table>

(b) When failed

Table7.32 Response Format (When Failed)

<table>
<tr><th>Buffer memory address</th><th colspan="2">Result</th></tr>
<tr><td>26446(674EH)</td><td colspan="2">An error code is stored.(Section 9.5.4)</td></tr>
<tr><td>26447(674FH)</td><td colspan="2">The FDL address of the DP-Slave from which the alarm was read is stored.
Stored value: 0000H to 007DH(0 to 125)</td></tr>
<tr><td>26448(6750H)</td><td colspan="2">The read completion status of the alarm data is stored.

b15 to b8: 0
b7 to b0: See below.

<table>
<tr><th>Bit</th><th>Description</th><th>Bit</th><th>Description</th></tr>
<tr><td>b0</td><td>Read completion status of alarm data No.1
0: Failed or not executed
1: Normally completed</td><td>b4</td><td>Read completion status of alarm data No.5
0: Failed or not executed
1: Normally completed</td></tr>
<tr><td>b1</td><td>Read completion status of alarm data No.2
0: Failed or not executed
1: Normally completed</td><td>b5</td><td>Read completion status of alarm data No.6
0: Failed or not executed
1: Normally completed</td></tr>
<tr><td>b2</td><td>Read completion status of alarm data No.3
0: Failed or not executed
1: Normally completed</td><td>b6</td><td>Read completion status of alarm data No.7
0: Failed or not executed
1: Normally completed</td></tr>
<tr><td>b3</td><td>Read completion status of alarm data No.4
0: Failed or not executed
1: Normally completed</td><td>b7</td><td>Read completion status of alarm data No.8
0: Failed or not executed
1: Normally completed</td></tr>
</table></td></tr>
<tr><td>26449(6751H)</td><td rowspan="5">Response result</td><td>(1) When E506H is currently stored in buffer memory address 26446 (674EH)
Detailed error code 1 is stored. (Section 9.5.4)
(2) When a value other than E506H is currently stored in buffer memory address 26446 (674EH)
Stored value: FFFFH (No detailed error code 1)</td></tr>
<tr><td>26450(6752H)</td><td>(1) When E506H is currently stored in buffer memory address 26446 (674EH)
Detailed error code 2 is stored. (Section 9.5.4)
(2) When a value other than E506H is currently stored in buffer memory address 26446 (674EH)
Stored value: FFFFH (No detailed error code 2)</td></tr>
<tr><td>26451(6753H)</td><td>(1) When E506H is currently stored in buffer memory address 26446 (674EH)
Detailed error code 3 is stored. (Section 9.5.4)
(2) When a value other than E506H is currently stored in buffer memory address 26446 (674EH)
Stored value: FFFFH (No detailed error code 3)</td></tr>
<tr><td>26452(6754H) to
26484(6774H)</td><td>Empty area
Stored value: 0000H</td></tr>
<tr><td>26485(6775H) to
26488(6778H)</td><td>Empty area
Stored value: 0000H</td></tr>
<tr><td>26489(6779H) to
26768(6890H)</td><td colspan="2">Empty area
Stored value: 0000H</td></tr>
</table>

7.5.2 Alarm ACK request

This section explains the request and response formats of the alarm ACK request.
The alarm ACK request is used for returning ACK to the DP-Slave after execution of the alarm read request (without ACK) and deleting alarms in the DP-Slave.
ACK can be returned for each alarm that was read.

(1) Request format

Table7.33 Request Format

<table>
<tr><th>Buffer memory address</th><th>Description/Set value</th></tr>
<tr><td>26432(6740H)</td><td>Set a request code.
Set value: 1501H</td></tr>
<tr><td>26433(6741H)</td><td>Set the FDL address of the DP-Slave to which ACK is to be returned.
Set value: 0000H to 007DH(0 to 125)</td></tr>
<tr><td>26434(6742H)</td><td>Set the alarm data No. for which ACK is to be returned.
<table>
<tr><td>b15 to b8</td><td>b7 to b0</td></tr>
<tr><td>00H (Fixed)</td><td>See below.</td></tr>
</table>
<table>
<tr><th>Bit</th><th>Description</th></tr>
<tr><td>b0</td><td>Execution instruction to alarm data No.1</td></tr>
<tr><td>b1</td><td>Execution instruction to alarm data No.2</td></tr>
<tr><td>b2</td><td>Execution instruction to alarm data No.3</td></tr>
<tr><td>b3</td><td>Execution instruction to alarm data No.4</td></tr>
<tr><td>b4</td><td>Execution instruction to alarm data No.5</td></tr>
<tr><td>b5</td><td>Execution instruction to alarm data No.6</td></tr>
<tr><td>b6</td><td>Execution instruction to alarm data No.7</td></tr>
<tr><td>b7</td><td>Execution instruction to alarm data No.8</td></tr>
</table></td></tr>
</table>

(2) Response format

(a) When normally completed

Table7.34 Response Format (When Normally Completed)

<table>
<tr><th>Buffer memory address</th><th>Result</th></tr>
<tr><td>26446(674EH)</td><td>A response code is stored.
Stored value: A501H</td></tr>
<tr><td>26447(674FH)</td><td>The FDL address of the DP-Slave that returned ACK is stored.
Stored value: 0000H to 007DH(0 to 125)</td></tr>
<tr><td>26448(6750H)</td><td>The alarm data read completion status and the ACK response completion status are stored.
<table>
<tr><th>b15 to b8</th><th>b7 to b0</th></tr>
<tr><td>2)</td><td>1)</td></tr>
</table>
(1) The read completion status of the alarm data is stored.
<table>
<tr><th>Bit</th><th>Description</th><th>Bit</th><th>Description</th></tr>
<tr><td>b0</td><td>Read completion status of alarm data No.1
0: Failed or not executed
1: Normally completed</td><td>b4</td><td>Read completion status of alarm data No.5
0: Failed or not executed
1: Normally completed</td></tr>
<tr><td>b1</td><td>Read completion status of alarm data No.2
0: Failed or not executed
1: Normally completed</td><td>b5</td><td>Read completion status of alarm data No.6
0: Failed or not executed
1: Normally completed</td></tr>
<tr><td>b2</td><td>Read completion status of alarm data No.3
0: Failed or not executed
1: Normally completed</td><td>b6</td><td>Read completion status of alarm data No.7
0: Failed or not executed
1: Normally completed</td></tr>
<tr><td>b3</td><td>Read completion status of alarm data No.4
0: Failed or not executed
1: Normally completed</td><td>b7</td><td>Read completion status of alarm data No.8
0: Failed or not executed
1: Normally completed</td></tr>
</table>
(2) The ACK response completion status is stored.
<table>
<tr><th>Bit</th><th>Description</th><th>Bit</th><th>Description</th></tr>
<tr><td>b8</td><td>Completion status of response to alarm data No.1
0: Failed or not executed
1: Normally completed</td><td>b12</td><td>Completion status of response to alarm data No.5
0: Failed or not executed
1: Normally completed</td></tr>
<tr><td>b9</td><td>Completion status of response to alarm data No.2
0: Failed or not executed
1: Normally completed</td><td>b13</td><td>Completion status of response to alarm data No.6
0: Failed or not executed
1: Normally completed</td></tr>
<tr><td>b10</td><td>Completion status of response to alarm data No.3
0: Failed or not executed
1: Normally completed</td><td>b14</td><td>Completion status of response to alarm data No.7
0: Failed or not executed
1: Normally completed</td></tr>
<tr><td>b11</td><td>Completion status of response to alarm data No.4
0: Failed or not executed
1: Normally completed</td><td>b15</td><td>Completion status of response to alarm data No.8
0: Failed or not executed
1: Normally completed</td></tr>
</table>
</td></tr>
</table>

(To the next page)

Table7.34 Response Format (When Normally Completed) (Continued)

<table>
<tr><th>Buffer memory address</th><th colspan="2">Result</th></tr>
<tr><td>26449(6751H) to
26484(6774H)</td><td rowspan="5">Alarm data No.1</td><td>The alarm data that was read by the alarm read request (without ACK) is stored.
(Section 7.5.1 (2)(a))</td></tr>
<tr><td>26485(6775H)</td><td>A response code is stored. *1
Stored value: A501H</td></tr>
<tr><td>26486(6776H)</td><td>The alarm type is stored. *1
<table><tr><th>Stored value</th><th>Alarm type</th></tr><tr><td>A510H</td><td>Diagnosis alarm type</td></tr><tr><td>A511H</td><td>Process alarm</td></tr><tr><td>A512H</td><td>Pull alarm</td></tr><tr><td>A513H</td><td>Plug alarm</td></tr><tr><td>A514H</td><td>Status alarm</td></tr><tr><td>A515H</td><td>Update alarm</td></tr><tr><td>A516H</td><td>Manufacturer specific alarm</td></tr></table></td></tr>
<tr><td>26487(6777H)</td><td>The alarm status and sequence No. are stored. *1
<table><tr><th>b15 to b8</th><th>b7 to b3</th><th>b2</th><th>b1 b0</th></tr><tr><td>0</td><td>3)</td><td>2)</td><td>1)</td></tr></table>1) Alarm details category is stored.
00 : No additional information
01 : Error detected, and alarm notified from the corresponding slot
10 : No error occurred after alarm notification from the corresponding slot
11 : Error occurred after alarm notification from the corresponding slot

2) Whether individual ACK is required or not is stored.
0 : No ACK return from the user is required.
1 : ACK return from the user is required.

3) Sequence No. is stored.
Stored value : 0 to 31</td></tr>
<tr><td>26488(6778H)</td><td>The slot No. is stored. *1
Stored value: 0 to 254</td></tr>
<tr><td>26489(6779H) to
26528(67A0H)</td><td>Alarm data No.2</td><td>(Same as alarm data No.1)</td></tr>
<tr><td>26529(67A1H) to
26568(67C8H)</td><td>Alarm data No.3</td><td>(Same as alarm data No.1)</td></tr>
<tr><td>26569(67C9H) to
26608(67F0H)</td><td>Alarm data No.4</td><td>(Same as alarm data No.1)</td></tr>
<tr><td>26609(67F1H) to
26648(6818H)</td><td>Alarm data No.5</td><td>(Same as alarm data No.1)</td></tr>
<tr><td>26649(6819H) to
26688(6840H)</td><td>Alarm data No.6</td><td>(Same as alarm data No.1)</td></tr>
<tr><td>26689(6841H) to
26728(6868H)</td><td>Alarm data No.7</td><td>(Same as alarm data No.1)</td></tr>
<tr><td>26729(6869H) to
26768(6890H)</td><td>Alarm data No.8</td><td>(Same as alarm data No.1)</td></tr>
</table>

* 1 Data are stored only when the ACK response completion status is "Normally completed" (the corresponding bit in buffer memory address 26448 (6750H) is ON).

(b) When failed

Table7.35 Response Format (When Failed)

<table>
<tr><th>Buffer memory address</th><th>Result</th></tr>
<tr><td>26446(674EH)</td><td>An error code is stored. (Section 9.5.4)</td></tr>
<tr><td>26447(674FH)</td><td>The FDL address of the DP-Slave that returned ACK is stored.
Stored value: 0000H to 007DH(0 to 125)</td></tr>
<tr><td>26448(6750H)</td><td>The alarm data read completion status and the ACK response completion status are stored.
<table>
<tr><th>b15 to b8</th><th>b7 to b0</th></tr>
<tr><td>2)</td><td>1)</td></tr>
</table>
(1) The read completion status of the alarm data is stored.
<table>
<tr><th>Bit</th><th>Description</th><th>Bit</th><th>Description</th></tr>
<tr><td>b0</td><td>Read completion status of alarm data No.1
0: Failed or not executed
1: Normally completed</td><td>b4</td><td>Read completion status of alarm data No.5
0: Failed or not executed
1: Normally completed</td></tr>
<tr><td>b1</td><td>Read completion status of alarm data No.2
0: Failed or not executed
1: Normally completed</td><td>b5</td><td>Read completion status of alarm data No.6
0: Failed or not executed
1: Normally completed</td></tr>
<tr><td>b2</td><td>Read completion status of alarm data No.3
0: Failed or not executed
1: Normally completed</td><td>b6</td><td>Read completion status of alarm data No.7
0: Failed or not executed
1: Normally completed</td></tr>
<tr><td>b3</td><td>Read completion status of alarm data No.4
0: Failed or not executed
1: Normally completed</td><td>b7</td><td>Read completion status of alarm data No.8
0: Failed or not executed
1: Normally completed</td></tr>
</table>
(2) The ACK response completion status is stored.
<table>
<tr><th>Bit</th><th>Description</th><th>Bit</th><th>Description</th></tr>
<tr><td>b8</td><td>Completion status of response to alarm data No.1
0: Failed or not executed
1: Normally completed</td><td>b12</td><td>Completion status of response to alarm data No.5
0: Failed or not executed
1: Normally completed</td></tr>
<tr><td>b9</td><td>Completion status of response to alarm data No.2
0: Failed or not executed
1: Normally completed</td><td>b13</td><td>Completion status of response to alarm data No.6
0: Failed or not executed
1: Normally completed</td></tr>
<tr><td>b10</td><td>Completion status of response to alarm data No.3
0: Failed or not executed
1: Normally completed</td><td>b14</td><td>Completion status of response to alarm data No.7
0: Failed or not executed
1: Normally completed</td></tr>
<tr><td>b11</td><td>Completion status of response to alarm data No.4
0: Failed or not executed
1: Normally completed</td><td>b15</td><td>Completion status of response to alarm data No.8
0: Failed or not executed
1: Normally completed</td></tr>
</table>
</td></tr>
</table>

(To the next page)

Table7.35 Response Format (When Failed) (Continued)

Buffer memory address	Result	
26449(6751H) to 26484(6774H)	Alarm data No.1	The alarm data that was read by the alarm read request (without ACK) is stored. (Section 7.5.1 (2)(a))
26485(6775H)		An error code is stored. *1 (Section 9.5.4)
26486(6776H)		(1) When E508H is currently stored in buffer memory address 26485 (6775H) Detailed error code 1 is stored. *1 (Section 9.5.4) (2) When a value other than E508H is currently stored in buffer memory address 26485 (6775H) Stored value: FFFFH (No detailed error code 1) *1
26487(6777H)		(1) When E508H is currently stored in buffer memory address 26485 (6775H) Detailed error code 2 is stored. *1 (Section 9.5.4) (2) When a value other than E508H is currently stored in buffer memory address 26485 (6775H) Stored value: FFFFH (No detailed error code 2) *1
26488(6778H)		(1) When E508H is currently stored in buffer memory address 26485 (6775H) Detailed error code 3 is stored. *1 (Section 9.5.4) (2) When a value other than E508H is currently stored in buffer memory address 26485 (6775H) Stored value: FFFFH (No detailed error code 3) *1
26489(6779H) to 26528(67A0H)	Alarm data No.2	(Same as alarm data No.1)
26529(67A1H) to 26568(67C8H)	Alarm data No.3	(Same as alarm data No.1)
26569(67C9H) to 26608(67F0H)	Alarm data No.4	(Same as alarm data No.1)
26609(67F1H) to 26648(6818H)	Alarm data No.5	(Same as alarm data No.1)
26649(6819H) to 26688(6840H)	Alarm data No.6	(Same as alarm data No.1)
26689(6841H) to 26728(6868H)	Alarm data No.7	(Same as alarm data No.1)
26729(6869H) to 26768(6890H)	Alarm data No.8	(Same as alarm data No.1)

* 1 Data are stored only when the ACK response completion status is "Failed" (the corresponding bit in buffer memory address 26448 (6750H) is OFF).

7.5.3 Alarm read request (with ACK)

This section explains the request and response formats of the alarm read request (with ACK).

(1) Request format

Table7.36 Request Format

Buffer memory address	Description/Set value
26432(6740H)	Set a request code. Set value: 1502H
26433(6741H)	Set the FDL address of the DP-Slave whose alarm is to be read. Set value: 0000H to 007DH(0 to 125)
26434(6742H)	Empty area (Write 0000H.) Set value: Fixed to 0000H

(2) Response format

(a) When normally completed

Table7.37 Response Format (When Normally Completed)

<table>
<tr><th>Buffer memory address</th><th>Result</th></tr>
<tr><td>26446(674EH)</td><td>A response code is stored.
Stored value: A502H</td></tr>
<tr><td>26447(674FH)</td><td>The FDL address of the DP-Slave whose alarm was read is stored.
Stored value: 0000H to 007DH(0 to 125)</td></tr>
<tr><td>26448(6750H)</td><td>The alarm data read completion status and the ACK response completion status are stored.
<table>
<tr><th>b15 to b8</th><th>b7 to b0</th></tr>
<tr><td>2)</td><td>1)</td></tr>
</table>
(1) The read completion status of the alarm data is stored.
<table>
<tr><th>Bit</th><th>Description</th><th>Bit</th><th>Description</th></tr>
<tr><td>b0</td><td>Read completion status of alarm data No.1
0: Failed or not executed
1: Normally completed</td><td>b4</td><td>Read completion status of alarm data No.5
0: Failed or not executed
1: Normally completed</td></tr>
<tr><td>b1</td><td>Read completion status of alarm data No.2
0: Failed or not executed
1: Normally completed</td><td>b5</td><td>Read completion status of alarm data No.6
0: Failed or not executed
1: Normally completed</td></tr>
<tr><td>b2</td><td>Read completion status of alarm data No.3
0: Failed or not executed
1: Normally completed</td><td>b6</td><td>Read completion status of alarm data No.7
0: Failed or not executed
1: Normally completed</td></tr>
<tr><td>b3</td><td>Read completion status of alarm data No.4
0: Failed or not executed
1: Normally completed</td><td>b7</td><td>Read completion status of alarm data No.8
0: Failed or not executed
1: Normally completed</td></tr>
</table>
(2) The ACK response completion status is stored.
<table>
<tr><th>Bit</th><th>Description</th><th>Bit</th><th>Description</th></tr>
<tr><td>b8</td><td>Completion status of response to alarm data No.1
0: Failed or not executed
1: Normally completed</td><td>b12</td><td>Completion status of response to alarm data No.5
0: Failed or not executed
1: Normally completed</td></tr>
<tr><td>b9</td><td>Completion status of response to alarm data No.2
0: Failed or not executed
1: Normally completed</td><td>b13</td><td>Completion status of response to alarm data No.6
0: Failed or not executed
1: Normally completed</td></tr>
<tr><td>b10</td><td>Completion status of response to alarm data No.3
0: Failed or not executed
1: Normally completed</td><td>b14</td><td>Completion status of response to alarm data No.7
0: Failed or not executed
1: Normally completed</td></tr>
<tr><td>b11</td><td>Completion status of response to alarm data No.4
0: Failed or not executed
1: Normally completed</td><td>b15</td><td>Completion status of response to alarm data No.8
0: Failed or not executed
1: Normally completed</td></tr>
</table>
</td></tr>
</table>

(To the next page)

Table7.37 Response Format (When Normally Completed) (Continued)

<table>
<tr><th>Buffer memory address</th><th colspan="2">Result</th></tr>
<tr><td>26449(6751H)</td><td rowspan="5">Alarm data No.1</td><td>The length of the alarm data is stored. (Unit: byte)
Stored value: 1 to 64</td></tr>
<tr><td>26450(6752H)</td><td>The alarm type is stored.
<table>
<tr><th>Stored value</th><th>Alarm type</th></tr>
<tr><td>A510H</td><td>Diagnosis alarm</td></tr>
<tr><td>A511H</td><td>Process alarm</td></tr>
<tr><td>A512H</td><td>Pull alarm</td></tr>
<tr><td>A513H</td><td>Plug alarm</td></tr>
<tr><td>A514H</td><td>Status alarm</td></tr>
<tr><td>A515H</td><td>Update alarm</td></tr>
<tr><td>A516H</td><td>Manufacturer specific alarm</td></tr>
</table></td></tr>
<tr><td>26451(6753H)</td><td>The slot No. is stored.
Stored value: 0 to 254</td></tr>
<tr><td>26452(6754H)</td><td>The alarm status and sequence No. are stored.
<table>
<tr><th>b15 to b8</th><th>b7 to b3</th><th>b2</th><th>b1 b0</th></tr>
<tr><td>0</td><td>3)</td><td>2)</td><td>1)</td></tr>
</table>
1) Alarm details category is stored.
00 : No additional information
01 : Error detected, and alarm notified from the corresponding slot
10 : No error occurred after alarm notification from the corresponding slot
11 : Error occurred after alarm notification from the corresponding slot

2) Whether individual ACK is required or not is stored.
0 : No ACK return from the user is required.
1 : ACK return from the user is required.

3) Sequence No. is stored.
Stored value : 0 to 31</td></tr>
<tr><td>26453(6755H) to
26484(6774H)</td><td>The alarm data are stored.
<table>
<tr><th></th><th>b15 to b8</th><th>b7 to b0</th></tr>
<tr><td>26453(6755H)</td><td>Alarm data (2nd byte)</td><td>Alarm data (1st byte)</td></tr>
<tr><td>26454(6756H)</td><td>Alarm data (4th byte)</td><td>Alarm data (3rd byte)</td></tr>
<tr><td>to</td><td></td><td></td></tr>
<tr><td>26484(6774H)</td><td>Alarm data (64th byte)</td><td>Alarm data (63rd byte)</td></tr>
</table></td></tr>
</table>

(To the next page)

Table7.37 Response Format (When Normally Completed) (Continued)

<table>
<tr><th>Buffer memory address</th><th colspan="2">Result</th></tr>
<tr><td>26485(6775H)</td><td rowspan="4">Alarm data No.1</td><td>A response code is stored. *1
Stored value: A501H</td></tr>
<tr><td>26486(6776H)</td><td>The alarm type is stored. *1
<table><tr><th>Stored value</th><th>Alarm type</th></tr><tr><td>A510H</td><td>Diagnosis alarm</td></tr><tr><td>A511H</td><td>Process alarm</td></tr><tr><td>A512H</td><td>Pull alarm</td></tr><tr><td>A513H</td><td>Plug alarm</td></tr><tr><td>A514H</td><td>Status alarm</td></tr><tr><td>A515H</td><td>Update alarm</td></tr><tr><td>A516H</td><td>Manufacturer specific alarm</td></tr></table></td></tr>
<tr><td>26487(6777H)</td><td>The alarm status and sequence No. are stored. *1
<table><tr><th>b15 to b8</th><th>b7 to b3</th><th>b2</th><th>b1 b0</th></tr><tr><td>0</td><td>3)</td><td>2)</td><td>1)</td></tr></table>1) Alarm details category is stored.
00 : No additional information
01 : Error detected, and alarm notified from the corresponding slot
10 : No error occurred after alarm notification from the corresponding slot
11 : Error occurred after alarm notification from the corresponding slot

2) Whether individual ACK is required or not is stored.
0 : No ACK return from the user is required.
1 : ACK return from the user is required.

3) Sequence No. is stored.
Stored value : 0 to 31</td></tr>
<tr><td>26488(6778H)</td><td>The slot No. is stored. *1
Stored value: 0 to 254</td></tr>
<tr><td>26489(6779H) to 26528(67A0H)</td><td>Alarm data No.2</td><td>(Same as alarm data No.1)</td></tr>
<tr><td>26529(67A1H) to 26568(67C8H)</td><td>Alarm data No.3</td><td>(Same as alarm data No.1)</td></tr>
<tr><td>26569(67C9H) to 26608(67F0H)</td><td>Alarm data No.4</td><td>(Same as alarm data No.1)</td></tr>
<tr><td>26609(67F1H) to 26648(6818H)</td><td>Alarm data No.5</td><td>(Same as alarm data No.1)</td></tr>
<tr><td>26649(6819H) to 26688(6840H)</td><td>Alarm data No.6</td><td>(Same as alarm data No.1)</td></tr>
<tr><td>26689(6841H) to 26728(6868H)</td><td>Alarm data No.7</td><td>(Same as alarm data No.1)</td></tr>
<tr><td>26729(6869H) to 26768(6890H)</td><td>Alarm data No.8</td><td>(Same as alarm data No.1)</td></tr>
</table>

* 1 Data are stored only when the ACK response completion status is Normal completion (the corresponding bit in buffer memory address 26448 (6750H) is ON).

(b) When failed

Table7.38 Response Format (When Failed)

<table>
<tr><th>Buffer memory address</th><th>Result</th></tr>
<tr><td>26446 (674EH)</td><td>An error code is stored. (Section 9.5.4)</td></tr>
<tr><td>26447 (674FH)</td><td>The FDL address of the DP-Slave whose alarm was read is stored.
Stored value: 0000H to 007DH(0 to 125)</td></tr>
<tr><td>26448(6750H)</td><td>The alarm data read completion status and the ACK response completion status are stored.
<table>
<tr><td>b15 to b8</td><td>b7 to b0</td></tr>
<tr><td>2)</td><td>1)</td></tr>
</table>
(1) The read completion status of the alarm data is stored.
<table>
<tr><th>Bit</th><th>Description</th><th>Bit</th><th>Description</th></tr>
<tr><td>b0</td><td>Read completion status of alarm data No.1
0: Failed or not executed
1: Normally completed</td><td>b4</td><td>Read completion status of alarm data No.5
0: Failed or not executed
1: Normally completed</td></tr>
<tr><td>b1</td><td>Read completion status of alarm data No.2
0: Failed or not executed
1: Normally completed</td><td>b5</td><td>Read completion status of alarm data No.6
0: Failed or not executed
1: Normally completed</td></tr>
<tr><td>b2</td><td>Read completion status of alarm data No.3
0: Failed or not executed
1: Normally completed</td><td>b6</td><td>Read completion status of alarm data No.7
0: Failed or not executed
1: Normally completed</td></tr>
<tr><td>b3</td><td>Read completion status of alarm data No.4
0: Failed or not executed
1: Normally completed</td><td>b7</td><td>Read completion status of alarm data No.8
0: Failed or not executed
1: Normally completed</td></tr>
</table>
(2) The ACK response completion status is stored.
<table>
<tr><th>Bit</th><th>Description</th><th>Bit</th><th>Description</th></tr>
<tr><td>b8</td><td>Completion status of response to alarm data No.1
0: Failed or not executed
1: Normally completed</td><td>b12</td><td>Completion status of response to alarm data No.5
0: Failed or not executed
1: Normally completed</td></tr>
<tr><td>b9</td><td>Completion status of response to alarm data No.2
0: Failed or not executed
1: Normally completed</td><td>b13</td><td>Completion status of response to alarm data No.6
0: Failed or not executed
1: Normally completed</td></tr>
<tr><td>b10</td><td>Completion status of response to alarm data No.3
0: Failed or not executed
1: Normally completed</td><td>b14</td><td>Completion status of response to alarm data No.7
0: Failed or not executed
1: Normally completed</td></tr>
<tr><td>b11</td><td>Completion status of response to alarm data No.4
0: Failed or not executed
1: Normally completed</td><td>b15</td><td>Completion status of response to alarm data No.8
0: Failed or not executed
1: Normally completed</td></tr>
</table>
</td></tr>
</table>

(To the next page)

Table7.38 Response Format (When Failed) (Continued)

Buffer memory address	Result	
26449(6751H)	Alarm data No.1	(1) When E506H is currently stored in buffer memory address 26446 (674EH) Detailed error code 1 is stored. (Section 9.5.4) (2) When a value other than E506H is currently stored in buffer memory address 26446 (674EH) Stored value: FFFFH (No detailed error code 1)
26450(6752H)		(1) When E506H is currently stored in buffer memory address 26446 (674EH) Detailed error code 2 is stored. (Section 9.5.4) (2) When a value other than E506H is currently stored in buffer memory address 26446 (674EH) Stored value: FFFFH (No detailed error code 2)
26451(6753H)		(1) When E506H is currently stored in buffer memory address 26446 (674EH) Detailed error code 3 is stored. (Section 9.5.4) (2) When a value other than E506H is currently stored in buffer memory address 26446 (674EH) Stored value: FFFFH (No detailed error code 3)
26452(6754H) to 26484(6774H)		Empty area Stored value: 0000H
26485(6775H)		An error code is stored. *1 (Section 9.5.4)
26486(6776H)		(1) When E508H is currently stored in buffer memory address 26485 (6775H) Detailed error code 1 is stored. *1 (Section 9.5.4) (2) When a value other than E508H is currently stored in buffer memory address 26485 (6775H) Stored value: FFFFH (No detailed error code 1) *1
26487(6777H)		(1) When E508H is currently stored in buffer memory address 26485 (6775H) Detailed error code 2 is stored. *1 (Section 9.5.4) (2) When a value other than E508H is currently stored in buffer memory address 26485 (6775H) Stored value: FFFFH (No detailed error code 2) *1
26488(6778H)		(1) When E508H is currently stored in buffer memory address 26485 (6775H) Detailed error code 3 is stored. *1 (Section 9.5.4) (2) When a value other than E508H is currently stored in buffer memory address 26485 (6775H) Stored value: FFFFH (No detailed error code 3) *1
26489(6779H) to 26528(67A0H)	Alarm data No.2	(Same as alarm data No.1)
26529(67A1H) to 26568(67C8H)	Alarm data No.3	(Same as alarm data No.1)
26569(67C9H) to 26608(67F0H)	Alarm data No.4	(Same as alarm data No.1)
26609(67F1H) to 26648(6818H)	Alarm data No.5	(Same as alarm data No.1)
26649(6819H) to 26688(6840H)	Alarm data No.6	(Same as alarm data No.1)
26689(6841H) to 26728(6868H)	Alarm data No.7	(Same as alarm data No.1)
26729(6869H) to 26768(6890H)	Alarm data No.8	(Same as alarm data No.1)

* 1 Data are stored only when the ACK response completion status is "Failed" (the corresponding bit in buffer memory address 26448 (6750H) is OFF).

7.5.4 Program example

(1) Settings

The example program in this section uses the following example requests.

Table7.39 Details of Program Example

Item	Description
Service name	Alarm read request (with ACK)
DP-Slave FDL address	FDL address 1

(2) Assignment of devices in program example

The program examples in this section use the following device assignments.

(a) Devices used by the QJ71PB92V

Table7.40 List of Devices for the QJ71PB92V

Device	Description	Device	Description
X18	Alarm read response signal	Y18	Alarm read request signal

(b) Devices used by the user

Table7.41 List of User Devices

Device	Description	Device	Description
M0	Refresh start request (Section 7.1.1)	—	

(c) Devices used as automatic refresh or buffer memory read target

Table7.42 List of Devices Used as Automatic Refresh or Buffer Memory Read Target

Device	Description	Device	Description
D4000 to D4321	Alarm read request (with ACK) response area	M200 to M215	Slave status area (Alarm detection)

(3) Program example

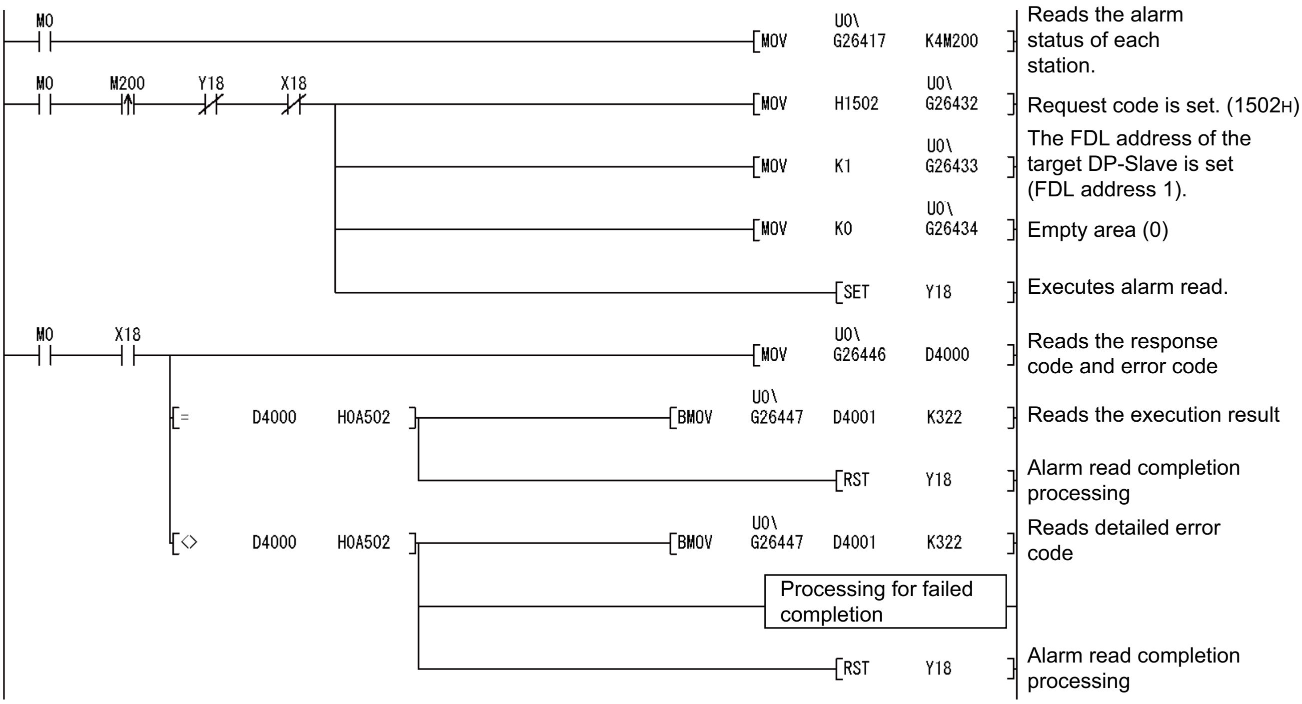


Figure 7.17 Program Example for Alarm Acquisition (Alarm Read (with ACK))

7.6 Program Example for Time Control over DP-Slaves

This section explains the request and response formats in the time control function, providing a program example.

(1) Making a sequence program

For details on the program example, refer to Section 7.6.4.

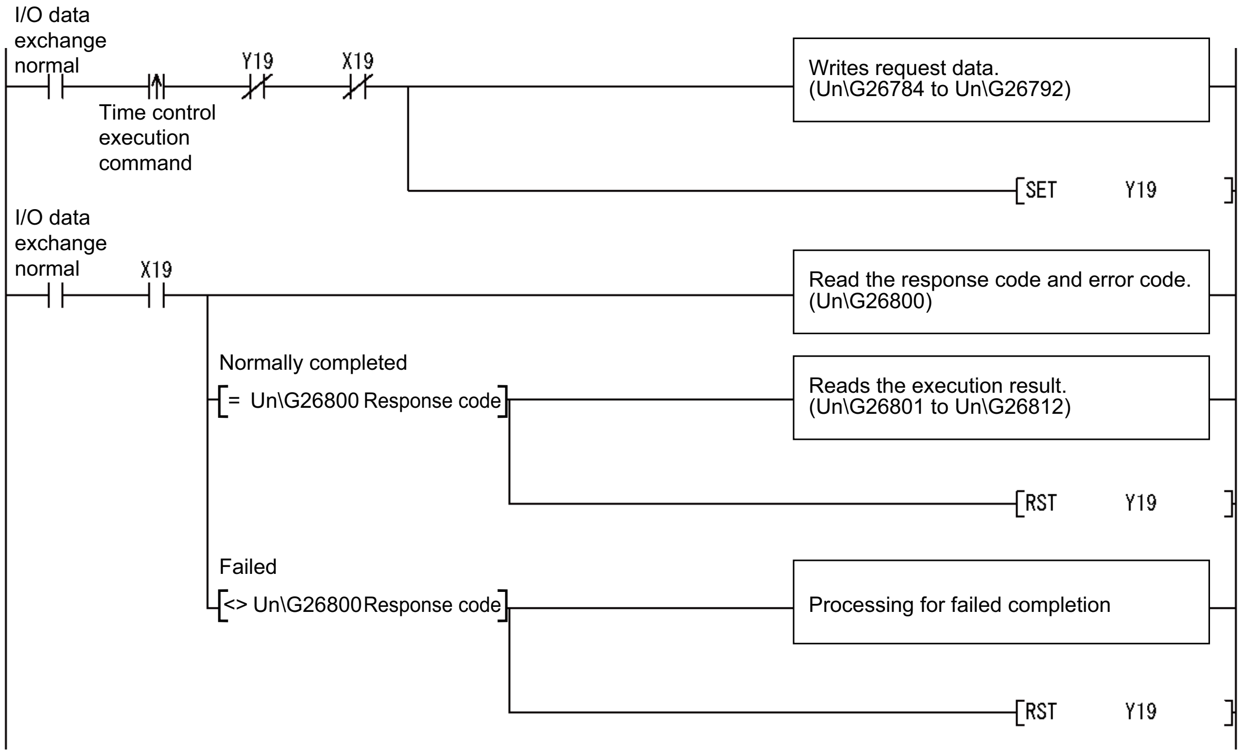


Figure 7.18 Sequence Program (Time Control Function)

7.6.1 Time data read request

This section explains the request and response formats of the time data read request.

(1) Request format

Table7.43 Request Format

Buffer memory address	Description/Set value
26784(68A0H)	Set a request code. Set value: 1600H
26785(68A1H) to 26792(68A8H)	Empty area (Write 0000H.) Set value: Fixed to 0000H

(2) Response format

(a) When normally completed

Table7.44 Response Format (When Normally Completed)

<table>
<tr><th>Buffer memory address</th><th>Result</th></tr>
<tr><td>26800(68B0H)</td><td>A response code is stored.
Stored value: A600H</td></tr>
<tr><td>26801(68B1H)</td><td>The year is stored.
Stored value: 1984 to 2036</td></tr>
<tr><td>26802(68B2H)</td><td>The month is stored.
Stored value: 1 to 12</td></tr>
<tr><td>26803(68B3H)</td><td>The day is stored.
Stored value: 1 to 31</td></tr>
<tr><td>26804(68B4H)</td><td>The hour is stored.
Stored value: 0 to 23</td></tr>
<tr><td>26805(68B5H)</td><td>The minute is stored.
Stored value: 0 to 59</td></tr>
<tr><td>26806(68B6H)</td><td>The second is stored.
Stored value: 0 to 59</td></tr>
<tr><td>26807(68B7H)</td><td>1/1000 second is stored.
Stored value: 0 to 999</td></tr>
<tr><td>26808(68B8H) to
26809(68B9H)</td><td>The UTC second (year + month + day + hour + minute + second) is stored.
The stored value, 9DFF4400H represents "January 1st in 1984, 00:00:00".
Stored value: 9DFF4400H to FFFFFFFFH</td></tr>
<tr><td>26810(68BAH) to
26811(68BBH)</td><td>UTC nanosecond (ms to ns setting) is stored.
Stored value: 00000000H to FFFFFFFFH</td></tr>
<tr><td>26812(68BCH)</td><td>The clock status is stored.
<table>
<tr><td>b15</td><td>b14 to b10</td><td>b9 b8</td><td>b7</td><td>b6</td><td>b5</td><td>b4 b3</td><td>b2 b1</td><td>b0</td></tr>
<tr><td>6)</td><td>5)</td><td>0</td><td>4)</td><td>3)</td><td>0</td><td>2)</td><td>0</td><td>1)</td></tr>
</table>
1) Synchronous setting with the time master is stored.
0 : Not synchronize the time setting with that of the time master.
1 : Synchronize the time setting with that of the time master.
2) Time resolution (minimum unit) setting is stored.
00 : 1ms
01 : 10ms
10 : 100ms
11 : 1s
3) Summer/Winter time setting is stored.
0 : Winter time setting
1 : Summer time setting
4) Advance notice of summer/winter time switching is stored.
0 : Not switch between summer and winter times in an hour
1 : Switches between summer and winter times in an hour
5) Time difference (the time to be added or subtracted) is stored.
The value, 0 means "No addition or subtraction".
Stored value: 0 to 31 (Unit: x 0.5 hours)
6) Time calculation method is stored.
0 : Adds the time difference
1 : Subtracts the time difference</td></tr>
</table>

(b) When failed

Table7.45 Response Format (When Failed)

Buffer memory address	Result
26800(68B0H)	An error code is stored. (Section 9.5.5)
26801(68B1H) to 26812(68BCH)	Empty area Stored value: 0000H

7.6.2 Time data write request (UTC format)

This section explains the request and response formats of the time data write request (UTC format).

(1) Request format

Table7.46 Request Format

<table>
<tr><th>Buffer memory address</th><th>Description/Set value</th></tr>
<tr><td>26784(68A0H)</td><td>Set a request code.
 Set value: 1601H</td></tr>
<tr><td>26785(68A1H) to
26786(68A2H)</td><td>Set the UTC second (year + month + day + hour + minute + second).
The set value, 9DFF4400H represents "January 1st in 1984, 00:00:00".
 Set value: 9DFF4400H to FFFFFFFFH</td></tr>
<tr><td>26787(68A3H) to
26788(68A4H)</td><td>Set UTC nanosecond (ms to ns setting).
 Set value: 00000000H to FFFFFFFFH</td></tr>
<tr><td>26789(68A5H)</td><td>Set the clock status.
<table>
<tr><td>b15</td><td>b14 to b10</td><td>b9 b8</td><td>b7</td><td>b6</td><td>b5</td><td>b4 b3</td><td>b2 b1</td><td>b0</td></tr>
<tr><td>6)</td><td>5)</td><td>0</td><td>4)</td><td>3)</td><td>0</td><td>2)</td><td>0</td><td>1)</td></tr>
</table>
1) Set the synchronous setting with the time master.
0 : Not synchronize the time setting with that of the time master.
1 : Synchronize the time setting with that of the time master.
2) Set the time resolution (minimum unit).
00 : 1ms
01 : 10ms
10 : 100ms
11 : 1s
3) Set summer or winter time.
0 : Set winter time.
1 : Set summer time.
4) Set advance notice of summer/winter time switching.
0 : Not switch between summer and winter times in an hour
1 : Switches between summer and winter times in an hour
5) Set the time difference (the time to be added or subtracted).
The value, 0 means "No addition or subtraction".
Set value: 0 to 31 (Unit: x 0.5 hours)
6) Set the time calculation method.
0 : Adds the time difference
1 : Subtracts the time difference</td></tr>
<tr><td>26790(68A6H) to
26792(68A8H)</td><td>Empty area (Write 0000H.)
 Set value: Fixed to 0000H</td></tr>
</table>

(2) Response format

(a) When normally completed

Table7.47 Response Format (When Normally Completed)

Buffer memory address	Result
26800(68B0H)	A response code is stored. Stored value: A601H
26801(68B1H) to 26812(68BCH)	Empty area Stored value: 0000H

(b) When failed

Table7.48 Response Format (When Failed)

Buffer memory address	Result
26800(68B0H)	An error code is stored. (Section 9.5.5)
26801(68B1H) to 26812(68BCH)	Empty area Stored value: 0000H

7.6.3 Time data write request

This section explains the request and response formats of the time data write request.

(1) Request format

Table7.49 Request Format

<table>
<tr><th>Buffer memory address</th><th>Description/Set value</th></tr>
<tr><td>26784(68A0H)</td><td>Set a request code.
Set value: 1602H</td></tr>
<tr><td>26785(68A1H)</td><td>Set the year.
Set value: 1984 to 2036</td></tr>
<tr><td>26786(68A2H)</td><td>Set the month.
Set value: 1 to 12</td></tr>
<tr><td>26787(68A3H)</td><td>Set the day.
Set value: 1 to 31</td></tr>
<tr><td>26788(68A4H)</td><td>Set the hour.
Set value: 0 to 23</td></tr>
<tr><td>26789(68A5H)</td><td>Set the minute.
Set value: 0 to 59</td></tr>
<tr><td>26790(68A6H)</td><td>Set the second.
Set value: 0 to 59</td></tr>
<tr><td>26791(68A7H)</td><td>Set 1/1000 second.
Set value: 0 to 999</td></tr>
<tr><td>26792(68A8H)</td><td>Set the clock status.
<table>
<tr><td>b15</td><td>b14 to b10</td><td>b9 b8</td><td>b7</td><td>b6</td><td>b5</td><td>b4 b3</td><td>b2 b1</td><td>b0</td></tr>
<tr><td>6)</td><td>5)</td><td>0</td><td>4)</td><td>3)</td><td>0</td><td>2)</td><td>0</td><td>1)</td></tr>
</table>
1) Set the synchronous setting with the time master.
0 : Not synchronize the time setting with that of the time master.
1 : Synchronize the time setting with that of the time master.
2) Set the time resolution (minimum unit).
00 : 1ms
01 : 10ms
10 : 100ms
11 : 1s
3) Set summer or winter time.
0 : Set winter time.
1 : Set summer time.
4) Set advance notice of summer/winter time switching.
0 : Not switch between summer and winter times in an hour
1 : Switches between summer and winter times in an hour
5) Set the time difference (the time to be added or subtracted).
The value, 0 means "No addition or subtraction".
Set value: 0 to 31 (Unit: x 0.5 hours)
6) Set the time calculation method.
0 : Adds the time difference
1 : Subtracts the time difference</td></tr>
</table>

(2) Response format

(a) When normally completed

Table7.50 Response Format (When Normally Completed)

Buffer memory address	Result
26800(68B0H)	A response code is stored. Stored value: A602H
26801(68B1H) to 26812(68BCH)	Empty area Stored value: 0000H

(b) When failed

Table7.51 Response Format (When Failed)

Buffer memory address	Result
26800(68B0H)	An error code is stored. (Section 9.5.5)
26801(68B1H) to 26812(68BCH)	Empty area Stored value: 0000H

7.6.4 Program example

(1) Settings

The example program in this section uses the following example requests.

Table7.52 Details of Program Example

Item	Description
Service name	Time data write request

(2) Assignment of devices in program example

The program example in this section uses the following device assignments.

(a) Devices used by the QJ71PB92V

Table7.53 List of Devices for the QJ71PB92V

Device	Description	Device	Description
X19	Time control start response signal	Y19	Time control start request signal

(b) Devices used by the user

Table7.54 List of Devices for the User

Device	Description	Device	Description
X27	Time control execution command	M0	Refresh start request (☞ Section 7.1.1)

(c) Devices used as automatic refresh or buffer memory read target

Table7.55 List of Devices Used as Automatic Refresh or Buffer Memory Read Target

Device	Description	Device	Description
D5000	Time data write request response area	—	

(3) Program example

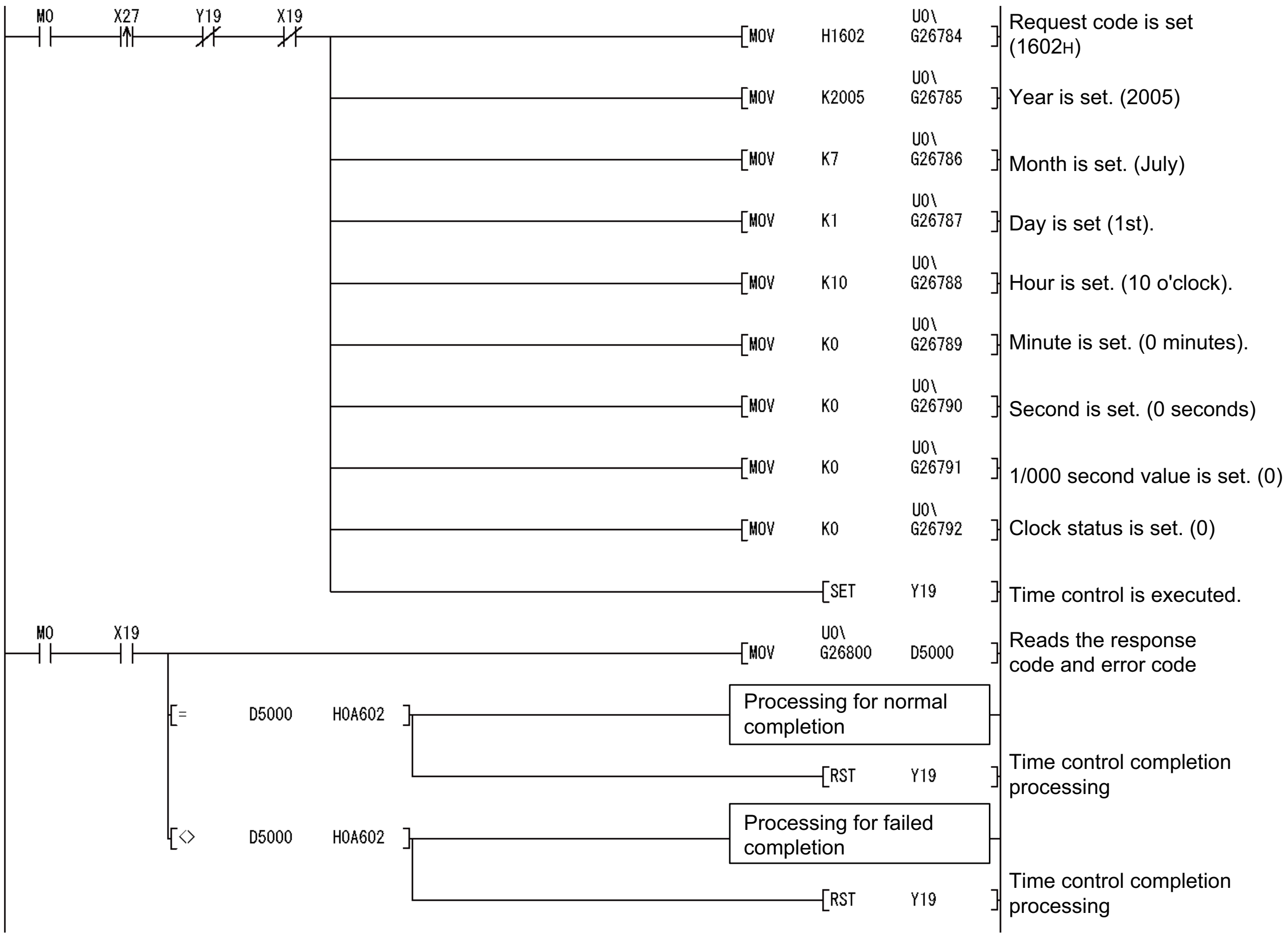


Figure 7.19 Program Example for Time Control Function (Time Data Write Request)

7.7 Program Example for Temporary Slave Reservation

Program example for temporary slave reservation, refer to section 7.1.1 to 7.1.3.

POINT

The program for the temporary slave reservation must be executed before turning ON the Data exchange start request signal (Y00). (Section 7.1.1 to 7.1.3)

7.8 Program Example When Mounting the QJ71PB92V on a MELSECNET/H Remote I/O Network

This section presents a program example for the case where the QJ71PB92V is mounted and used on a MELSECNET/H remote I/O station.

7.8.1 Program example for the I/O data exchange function (When mounted on a remote I/O station)

This section explains a program example for the I/O data exchange function when the QJ71PB92V is mounted and used on a MELSECNET/H remote I/O station.

(1) System configuration example

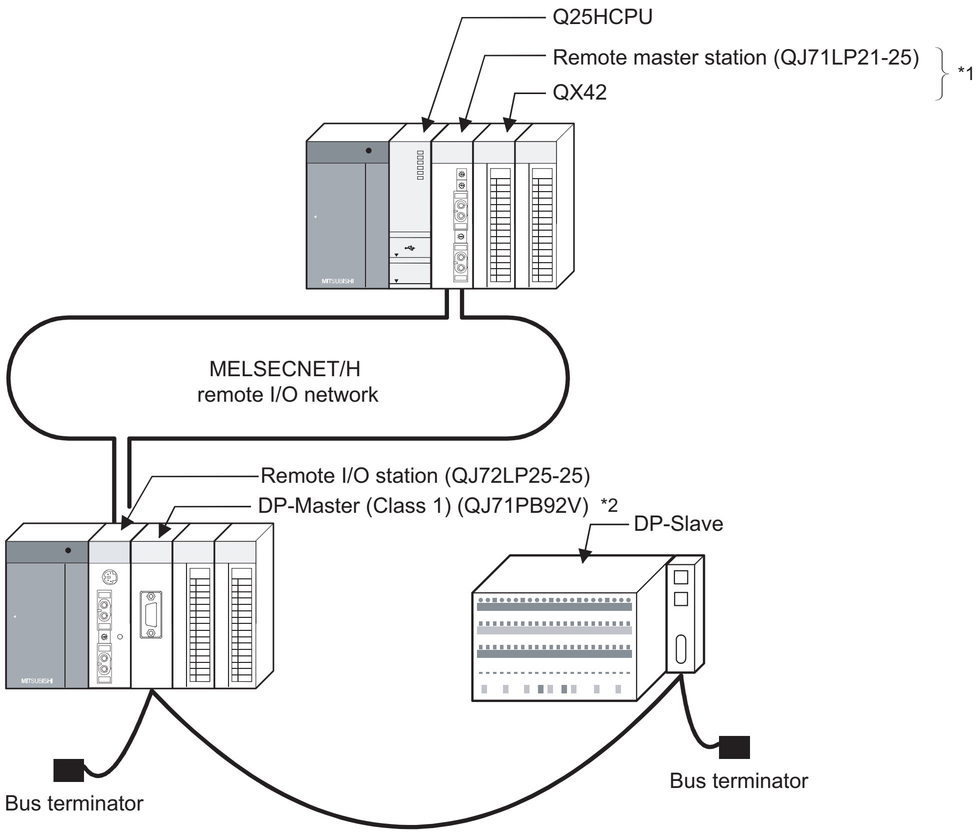
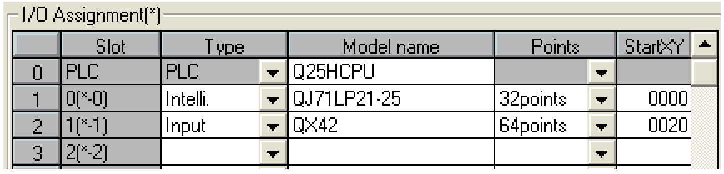


Figure 7.20 System Configuration Example for I/O Data Exchange (When Mounted on a Remote I/O Station)

* 1 Modules are installed in order from slot 0 as shown in the figure, and the following start I/O Nos. are to be set.



I/O Assignment(*)

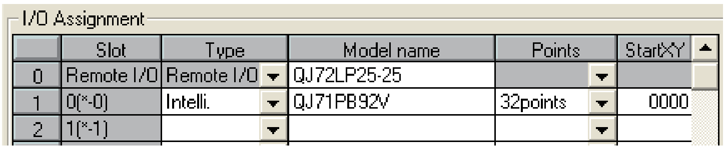
	Slot	Type	Model name	Points	StartXY
0	PLC	PLC	Q25HCPU		
1	0(*-0)	Intelli.	QJ71LP21-25	32points	0000
2	1(*-1)	Input	QX42	64points	0020
3	2(*-2)				

Figure 7.21 I/O Assignment in Program Example (Remote Master Station)

Table7.56 Assignment of Input and Output Signals (Remote Master Station)

Module	Input signal	Output signal
QJ71LP21-25	X00 to X1F	Y00 to Y1F
QX42	X20 to X5F	—

* 2 The QJ71PB92V is to be installed in slot 0 of the base unit as shown in the figure, with the start I/O No. set to 00H.



I/O Assignment

	Slot	Type	Model name	Points	StartXY
0	Remote I/O	Remote I/O	QJ72LP25-25		
1	0(*-0)	Intelli.	QJ71PB92V	32points	0000
2	1(*-1)				

Figure 7.22 I/O Assignment in Program Example (Remote I/O Station)

Table7.57 Assignment of Input and Output Signals (Remote I/O Station)

Module	Input signal	Output signal
QJ71PB92V	X00 to X1F	Y00 to Y1F

(2) MELSECNET/H (remote I/O network) settings

(a) Remote master station (QJ71LP21-25) settings

Table7.58 Remote Master Station Settings

Item	Description
Station No.	Station No. : 0
Transmission speed	25 Mbps (MODE 4)
Operation mode	Online

(b) Remote I/O station (QJ72LP25-25) settings

Table7.59 Remote I/O Station Settings

Item	Description
Station No.	Station No. 1
Transmission speed	25 Mbps (MODE 4)
Operation mode	Online

(c) Parameter settings on GX Developer (remote master station)

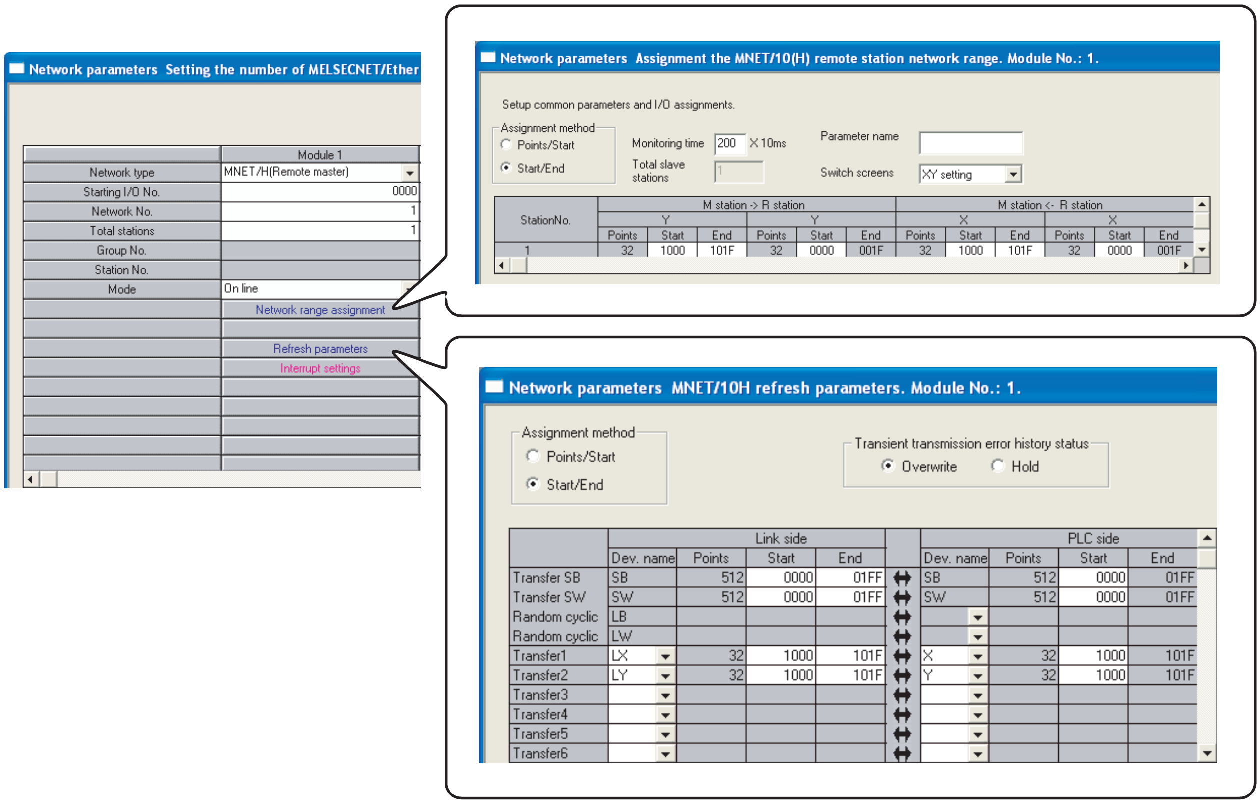


Figure 7.23 Network Parameter Setting

(3) PROFIBUS-DP settings

The parameter settings on QJ71PB92V, DP-Slaves and GX Configurator-DP are the same as those explained in Section 7.1.

(4) Assignment of devices in program example

The program examples in this section use the following device assignments.

(a) Devices used by the QJ71PB92V

Table7.60 List of Devices for the QJ71PB92V

Device	Description	Device	Description
X1000	Data exchange start completed signal	Y1000	Data exchange start request signal
X101B	Communication READY signal	—	
X101D	Module READY signal		
X101F	Watchdog timer error signal		

(b) Devices used by the user

Table7.61 List of Devices for the User

Device	Description	Device	Description
X20	I/O data exchange start command	SB20	Module status
X30	Conditions for write to output data (1st word)	SB47	Baton pass status (own station)
X31	Conditions for write to output data (2nd word)	SB49	Data link status (own station)
M0	Refresh start request	SW70.0	Baton pass status of each station
M1	For MC instruction	SW74.0	Cyclic transmission status of each station
M300	ON for 1 scan only after start of communication	SW78.0	Parameter communication status of each station
M301	For REMTO/REMFR instruction interlock	T0 to T4	For MELSECNET/H interlock
M302	For holding I/O data exchange run	—	
M303	For REMTO/REMFR instruction interlock		
M304	For REMTO/REMFR instruction interlock		
M1000	REMTO instruction (Completion)		
M1001	REMTO instruction (Result)		
M1002	REMTO instruction (Completion)		
M1003	REMTO instruction (Result)		
M1004	REMTO instruction (Completion)		
M1005	REMTO instruction (Result)		
M1006	REMFR instruction (Completion)		
M1007	REMFR instruction (Result)		
M1008	REMFR instruction (Completion)		
M1009	REMFR instruction (Result)		
M1010	REMTO instruction (Completion)		
M1011	REMTO instruction (Result)		

(c) Devices used as buffer memory read target

Table7.62 List of Devices Used as Buffer Memory Read Target

Device	Description	Device	Description
D0 to D95	Input data	D6000	Diagnostic information invalid setting area
D100 to D195	Output data	D6001	Diagnostic information non-notification time setting area
D200 to D207	Slave status area (Normal communication detection)	—	
D208 to D215	Slave status area (Reserved station setting status)		
D216 to D224	Slave status area (Diagnostic information detection)		

(5) Program example

(a) Interlock program example for remote master station and remote I/O station

Provide interlocks depending on the link status of the remote master station (host station) and remote I/O station (other station).

The following example shows a communication program interlock using the link status (SB47, SB49) of the remote master station and the link status (SW70 b0, SW74 b0, SW78 b0) of the remote I/O station (station No. 1).

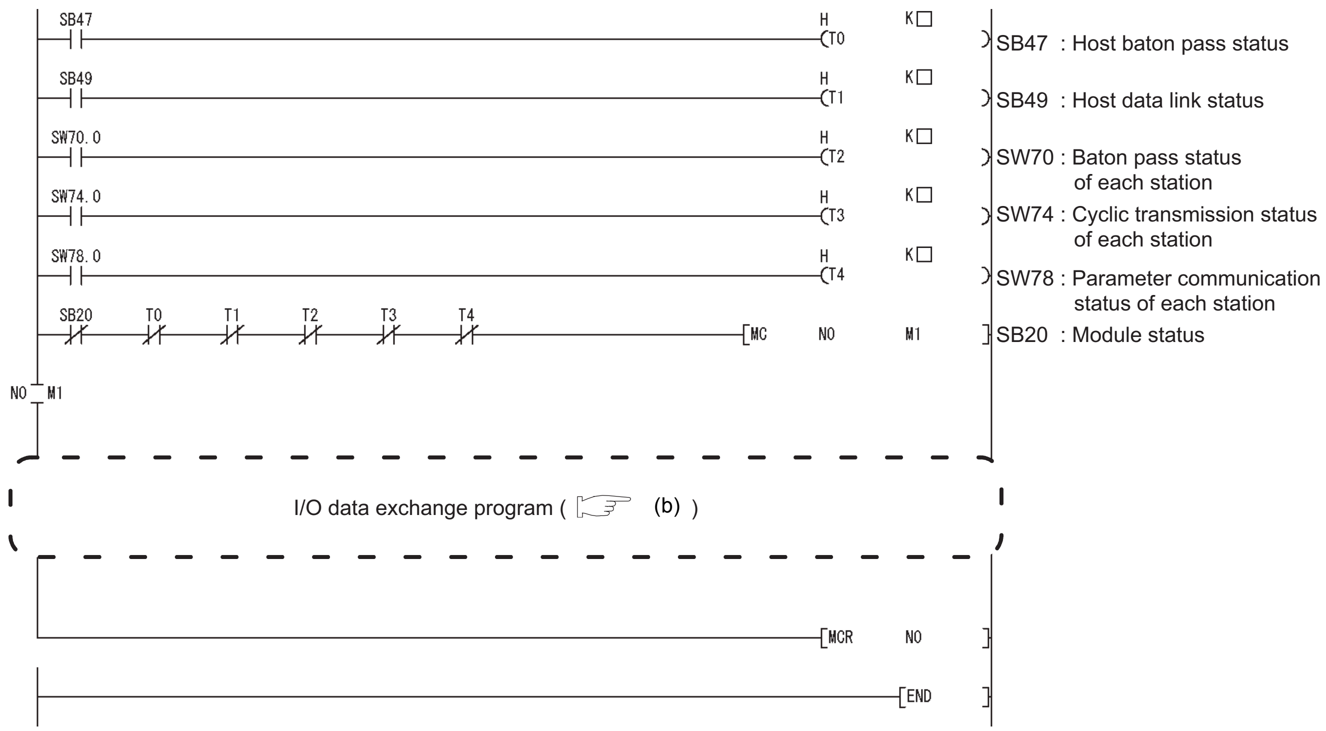


Figure 7.24 MELSECNET/H Remote I/O Network Interlock Program Example

Set an appropriate value for the timer constant K□ according to the following.

Table7.63 Set Value for Timer Constant

Item	Set Value
Baton pass status (T0, T2)	(Sequence scan time × 4) or more
Cyclic transmission status Parameter communication status (T1, T3, T4)	(Sequence scan time × 3) or more

* 1 To prevent control from stopping even if the network detects an instantaneous error due to a cable problem, noise, etc.
Note that "4" and "3" represent standard values.

POINT

For details of the interlock program for the MELSECNET/H remote master station and remote I/O station, refer to the Q Corresponding MELSECNET/H Network System Reference Manual (Remote I/O Network).

(b) I/O data exchange program example

POINT

After execution of the REMFR/REMTO instruction, it requires several scans until read/write of actual data is completed.

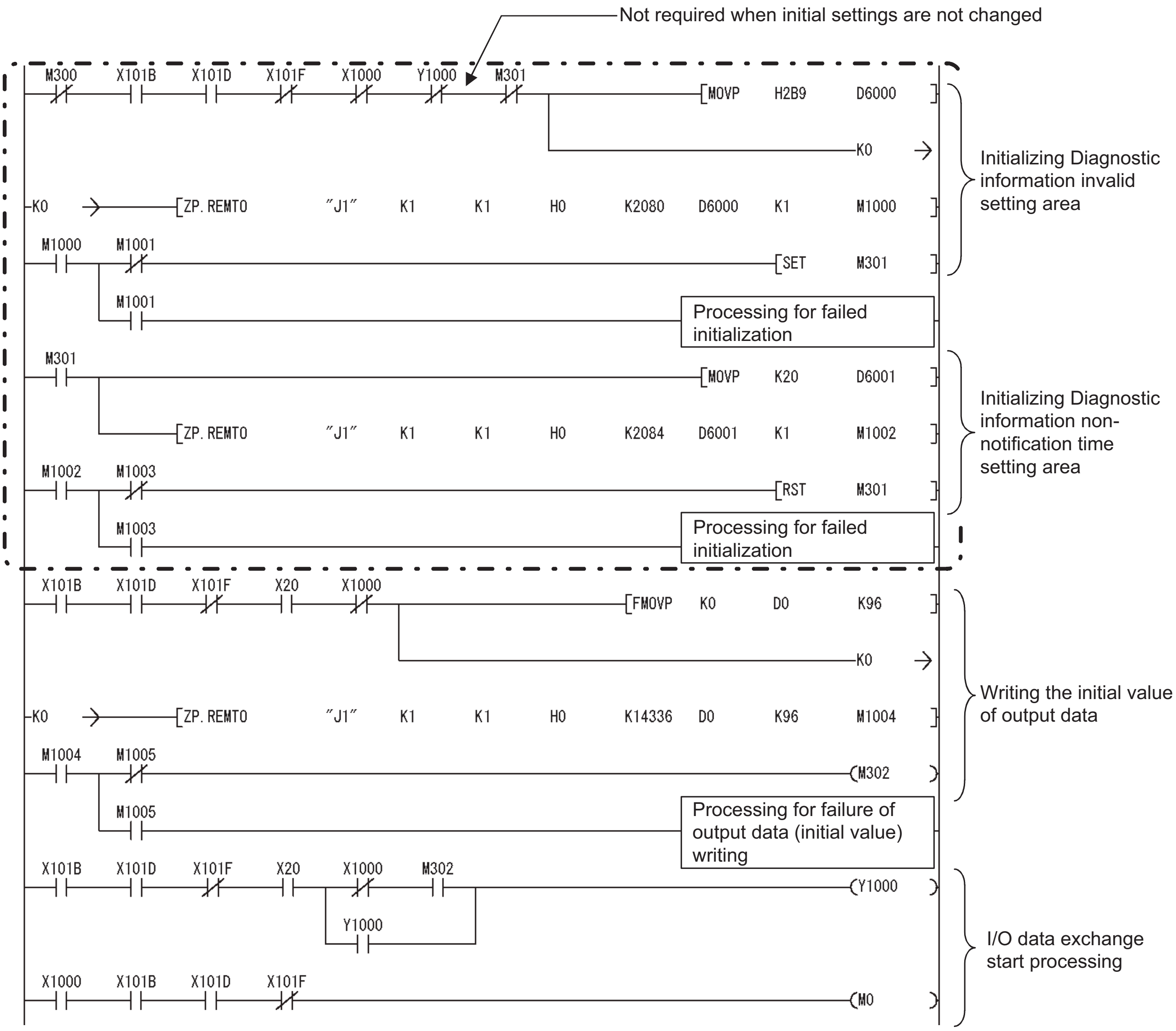


Figure 7.25 Program Example for the I/O Data Exchange Function (When Mounted on a Remote I/O Station)

(To the next page)

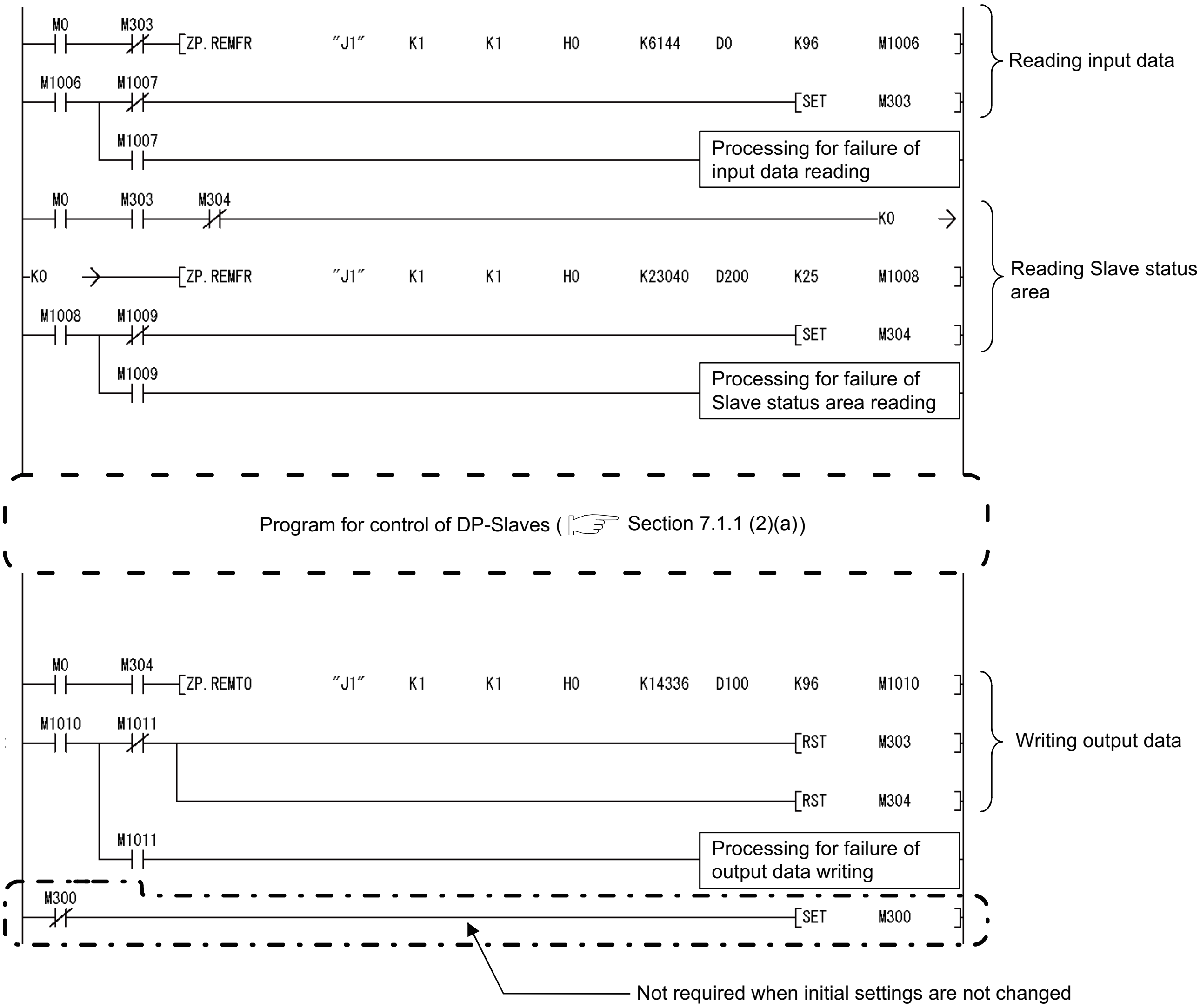


Figure 7.25 Program Example for the I/O Data Exchange Function (When Mounted on a Remote I/O Station) (Continued)

7.8.2 Other precautions

When programming for the QJ71PB92V on a MELSECNET/H remote I/O station, pay attention to the following.

(1) QJ71PB92V I/O signals

I/O signals of the QJ71PB92V are refreshed into link devices (LX/LY) on the remote I/O station and then transferred to the remote master station.
Make the link devices (LX/LY) of the remote master station refreshed into the devices (X/Y) of the QCPU and use them in sequence programs.

(2) QJ71PB92V buffer memory

Use MELSECNET/H dedicated instructions (REMFR/REMTO instructions) for reading from or writing to the buffer memory of the QJ71PB92V.
After execution of the REMFR/REMTO instruction, several scans are required until read/write of actual data is completed.
For details on the REMFR/REMTO instructions, refer to the Q Corresponding MELSECNET/H Network System Reference Manual (Remote I/O network).

7.9 Program Examples for Use in the Redundant System

This section explains program examples for the case where the QJ71PB92V is mounted in a redundant system.

(1) Making a sequence program

The following explains the sequence program creation for the case where the QJ71PB92V is mounted in a redundant system.

(a) Handling output signals of the QJ71PB92V

1) How to turn ON an output signal of the QJ71PB92V

An output signal of the QJ71PB92V is turned ON with the OUT instruction using the start command device.

To keep each function enabled or re-executable [*1] in the case of system switching, tracking-transfer the start command device data.

Tracking transfer is not needed for output signals of the QJ71PB92V.

* 1 For whether or not each QJ71PB92V function can be continued or reexecuted in system switching, refer to Sections 7.9.1 to 7.9.7.

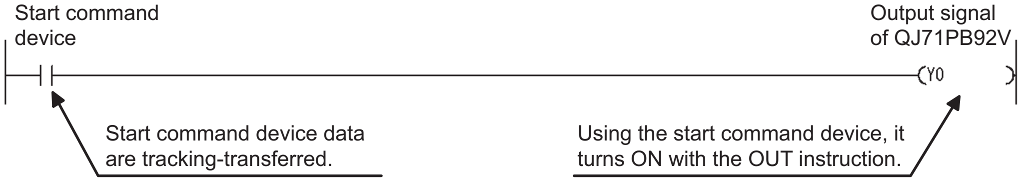


Figure 7.26 How to Turn ON an Output Signal of the QJ71PB92V

2) Processing after system switching

Output signals of the QJ71PB92V are turned OFF in the timing of "ON for 1 scan only after switching system from standby to control" (SM1518). (This prevents the QJ71PB92V's output signals from remaining ON in the new control system after system switching.)

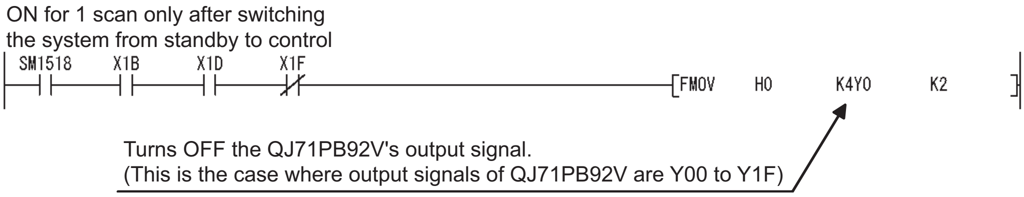


Figure 7.27 Processing After System Switching

1 OVERVIEW
2 SYSTEM CONFIGURATION
3 SPECIFICATIONS
4 FUNCTIONS
5 PROCEDURES AND SETTINGS BEFORE SYSTEM OPERATION
6 PARAMETER SETTING
7 PROGRAMMING
8 DEDICATED INSTRUCTIONS

(b) When keeping the I/O data exchange function enabled after system switching

1) Initial setting

The initial setting is performed in the timing of "ON for 1 scan only after switching system from standby to control" (SM1518).

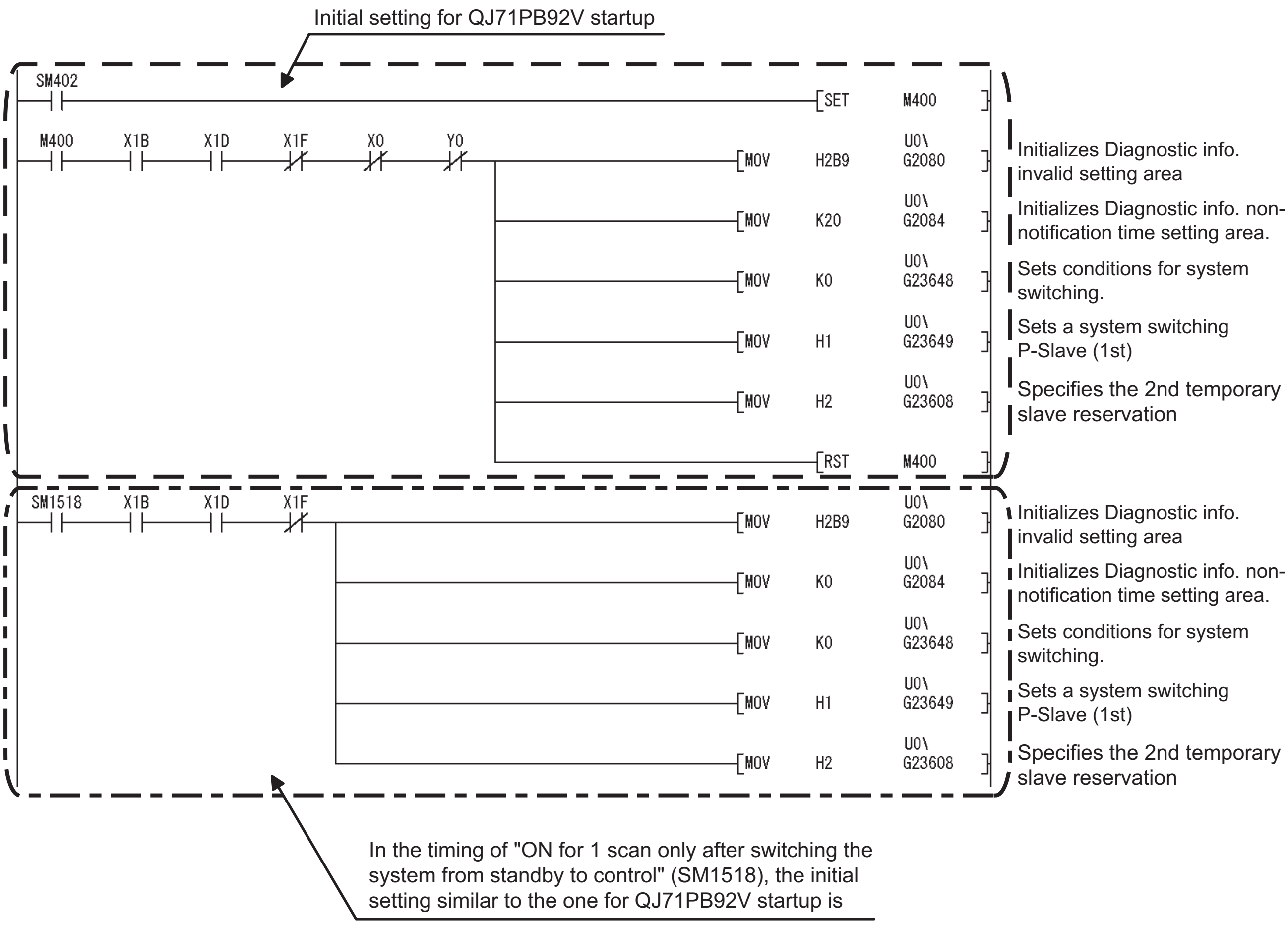


Figure 7.28 Initial Setting

POINT

To enable the system switching due to a DP-Slave error immediately after system switching, store 0 in the Diagnostic information non-notification time setting area (Un\G2084) in the timing of "ON for 1 scan only after switching system from standby to control" (SM1518). (Figure 7.28)

2) Keeping output data

To keep output data after system switching, perform the following.

- Processing of the QJ71PB92V in the control system (Before system switching)
  Write the output data to the Output data area (Un\G14336 to Un\G18431) using devices.
  Tracking-transfer the output data stored in the devices.

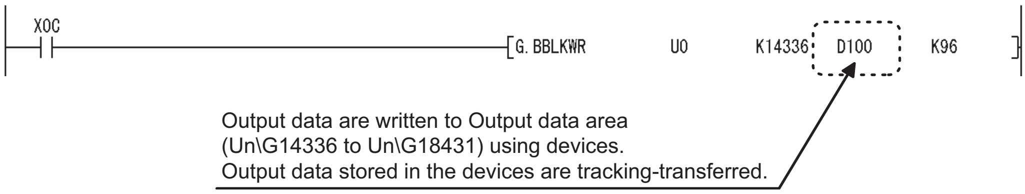


Figure 7.29 Processing of the QJ71PB92V in the Control System (Before System Switching)

Remark

(1) Figure 7.29 is an example for using a dedicated instruction.
(2) When using the automatic refresh, output data in the specified auto-refresh target devices are tracking-transferred.

- Processing of the QJ71PB92V in the new control system (After system switching)
  The tracking-transferred output data are written to the Output data area (Un\G14336 to Un\G18431) in the timing of "ON for 1 scan only after switching system from standby to control" (SM1518). (This processing is not needed when the automatic refresh is used.)

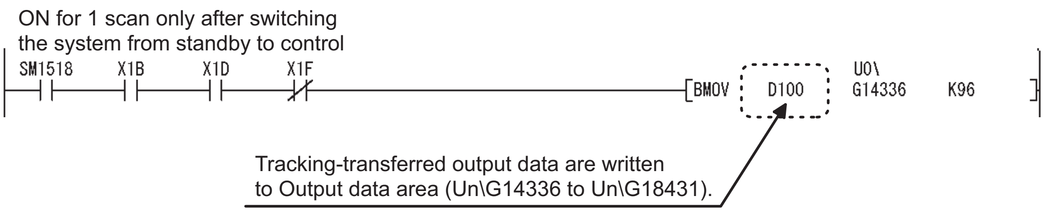


Figure 7.30 Processing of the QJ71PB92V in the New Control System (After System Switching)

(2) Precautions

(a) Operation mode change
To change the operation mode of the QJ71PB92V, set the redundant CPU in Separate or Debug mode and refer to the program example in Section 7.1.1 (2) (c).
For precautions for changing the operation mode of the QJ71PB92V, refer to Section 6.2.

(b) Timing for turning ON an output signal of the QJ71PB92V
Do not turn ON any output signal of the QJ71PB92V in the timing of "ON for 1 scan only after switching system from standby to control" (SM1518). (No processing is performed.)

(c) When using "ON for 1 scan only after switching system from standby to control" (SM1518)
Use of a rise execution instruction is not allowed. (Example: MOVP, PLS, etc.)

7.9.1 I/O Data Exchange Program Examples

I/O data exchange can be continued after system switching.
This section explains program examples for continuing I/O data exchange in the case of system switching.

The following system configuration is used as an example for explanations in Sections 7.9.1 to 7.9.7.

(1) System configuration example

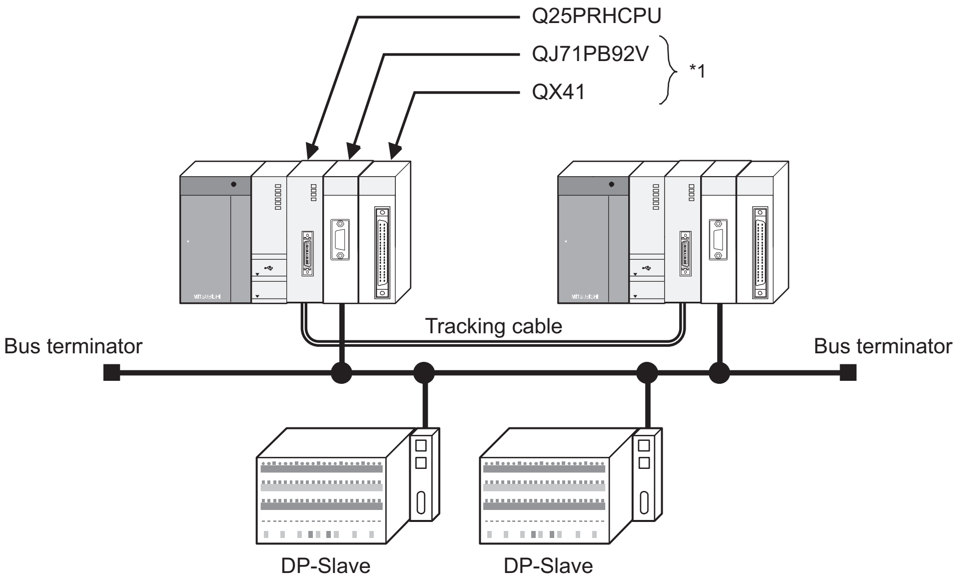
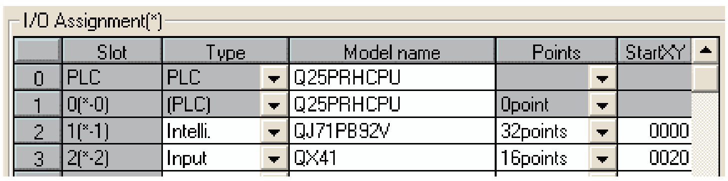


Figure 7.31 System Configuration Example for I/O Data Exchange (When Mounted on a Redundant System)

* 1 Modules are installed in order from slot 1 as shown in the figure, and the following start I/O Nos. are to be set.


I/O Assignment(*)

	Slot	Type	Model name	Points	StartXY
0	PLC	PLC	Q25PRHCPU		
1	0(*-0)	(PLC)	Q25PRHCPU	0point	
2	1(*-1)	Intelli.	QJ71PB92V	32points	0000
3	2(*-2)	Input	QX41	16points	0020

Figure 7.32 I/O Assignment in Program Example

Table7.64 Assignment of Input and Output Signals

Module	Input signal	Output signal
QJ71PB92V	X00 to X1F	Y00 to Y1F
QX41	X20 to X3F	—

(2) Settings

(a) QJ71PB92V settings

Table7.65 QJ71PB92V Settings

Item		Description
FDL address	Control master FDL address *1	FDL address 0
	Standby master FDL address *1	FDL address 1
Transmission speed		1.5Mbps
Operation mode		Communication mode (mode 3)
I/O data area for FDL address 2 (Buffer memory)	Input data area (for mode 3)	6144 (1800H) to 6239 (185FH)
	Output data area (for mode 3)	14336 (3800H) to 14431 (385FH)
I/O data area for FDL address 3 (Buffer memory)	Input data area (for mode 3)	6240 (1860H)
	Output data area (for mode 3)	14332 (3860H)

* 1 Set the control master FDL address in the master parameter setting of GX Configurator-DP. (☞ (2) (c) in this section)
Set the standby master FDL address in the Intelligent function module switch setting of GX Developer. (☞ (2) (d) in this section)

(b) DP-Slave settings

Table7.66 DP-Slave Settings (1st module)

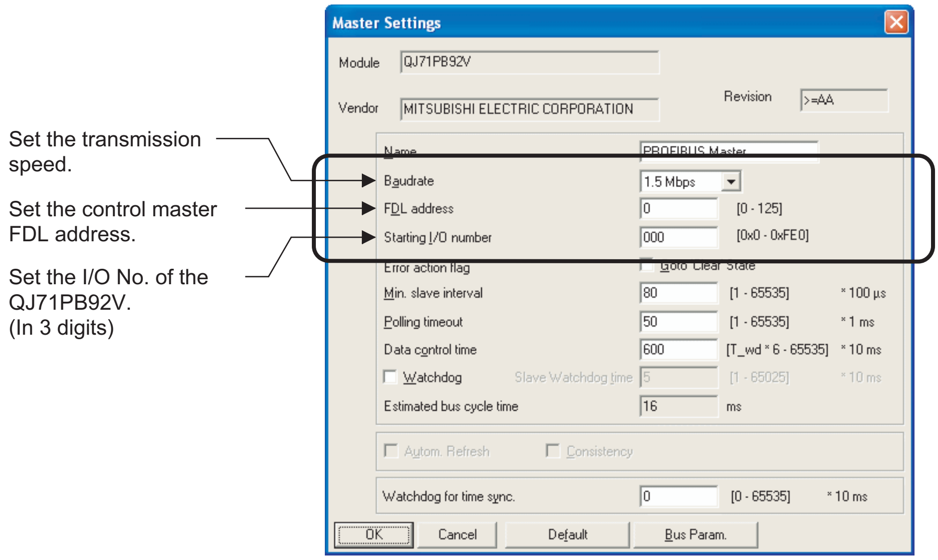
Item		Description
FDL address		FDL address 2
I/O data size	Input data size	96 words (192 bytes)
	Output data size	96 words (192 bytes)

Table7.67 DP-Slave Settings (2nd module)

Item		Description
FDL address		FDL address 3
I/O data size	Input data size	1 words (2 bytes)
	Output data size	1 words (2 bytes)

(c) Parameter settings in GX Configurator-DP

<Master parameters>



<Slave parameters>

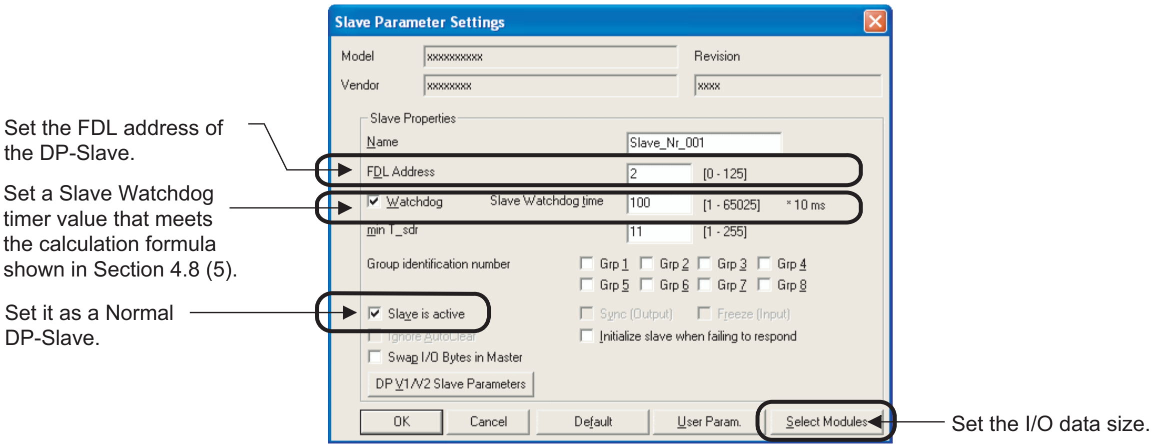
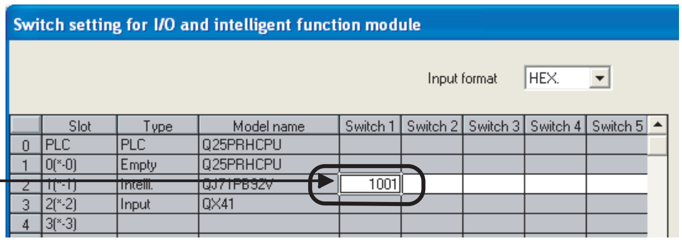


Figure 7.33 I/O Data Exchange Parameter Setting Example (GX Configurator-DP)

(d) Parameter settings in GX Developer

<Intelligent function module switch setting>

Set a standby master FDL address.



<Tracking settings>

Select "Device detail settings".

Set tracking devices. *1

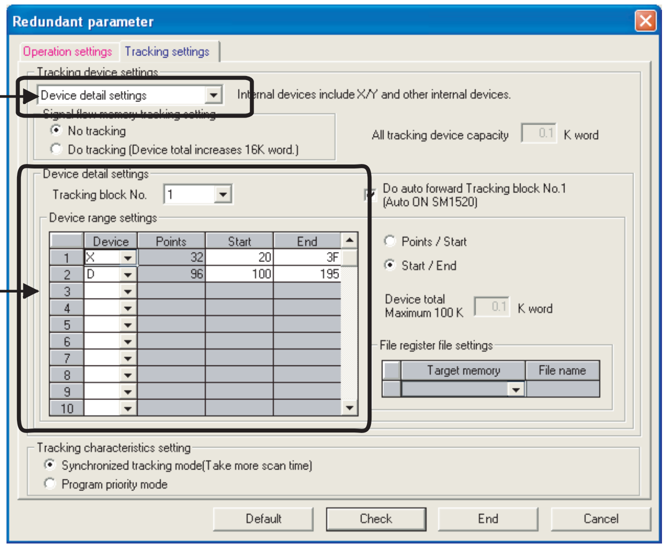


Figure 7.34 I/O Data Exchange Parameter Setting Example (GX Developer)

* 1 For tracking devices used for continuing respective functions of the QJ71PB92V, refer to (4) in this section and sections 7.9.2 to 7.9.7.

Remark

For details on the tracking settings, refer to the QnPRHCPU User's Manual (Redundant System).

(3) Device assignments in program example

The program examples in this section use the following device assignments.

(a) Devices used by the QJ71PB92V

Table7.68 List of Devices for the QJ71PB92V

Device	Description	Device	Description
X00	Data exchange start completed signal	Y00	Data exchange start request signal
X01	Diagnostic information detection signal	Y01	Diagnostic information detection reset request signal
X02	Diagnostic information area cleared signal	Y02	Diagnostic information area clear request signal
X0C	Data consistency requesting signal	Y0C	Data consistency start request signal
X1B	Communication READY signal	—	
X1D	Module READY signal		
X1F	Watchdog timer error signal		

(b) Devices used by the user

Table7.69 List of User Devices

Device	Description	Device	Description
X20	I/O data exchange start command	SM402	ON for 1 scan only after RUN
X21	Communication error detection reset command	SM1518	ON for 1 scan only after switching system from standby to control
X22	Communication error area clear command	M0	Refresh start request
X30	Conditions for write to output data (1st word)	M400	Initial setting execution command
X31	Conditions for write to output data (2nd word)	—	

(c) Devices used as automatic refresh or buffer memory read target

Table7.70 List of Devices Used as Automatic Refresh or Buffer Memory Read Target

Device	Description	Device	Description
D0 to D95	Input data	D208 to D215	Slave status area (Reserved station setting status)
D100 to D195	Output data	D216 to D224	Slave status area (Diagnostic information detection)
D200 to D207	Slave status area (Normal communication detection)	D1000	Diagnostic information read target

(4) Tracking devices for continuously using the functions in the case of system switching

In the I/O data exchange program example, data in the following devices are tracking-transferred.

(a) Devices whose data are tracking-transferred by I/O data exchange programs
Data in the following devices are tracking-transferred:

- Start command device by which the Data exchange start request signal (Y00) is turned ON
- Start command device by which the Data consistency start request signal (Y0C) is turned ON
- Devices that store output data *1

* 1 The devices that store output data are:
- Devices that are set as the automatic refresh target of output data in the automatic refresh setting
- Devices that are used to store data in the Output data area (Un\G14336 to Un\G18431)
- Devices whose data are specified as write data of the BBLKWR instruction
Tracking transfer is performed only for the devices that store output data. (Tracking transfer of all areas is not needed.)

Table7.71 Tracking Transfer Devices in the I/O Data Exchange Program Example

Device	Description	Device	Description
X20	I/O data exchange start command	D100 to D195	Output data

(b) Devices whose data are tracking-transferred by DP-Slave control programs
Devices, which are specified as conditions for writing output data, are tracked.

Table7.72 Tracking-Transfer Devices in the DP-Slave Control Program Example

Device	Description	Device	Description
X30	Conditions for write to output data (1st word)	X31	Conditions for write to output data (2nd word)

(c) Devices whose data are tracking-transferred by programs for reading diagnostic information
Data in the following devices are tracking-transferred:

- Start command device by which the Diagnostic information detection reset request signal (Y01) is turned ON
- Start command device by which the Diagnostic information area clear request signal (Y02) is turned ON

Table7.73 Devices Tracked in the Program Example for Reading Diagnostic Information

Device	Description	Device	Description
X21	Communication error detection reset command	X22	Communication error area clear command

(5) Program examples

(a) When using automatic refresh

This section explains a program for the case where the QJ71PB92V communicates with DP-Slaves using automatic refresh.

1) Setting automatic refresh parameters

The setting is the same as in Section 7.1.1 (1).

2) I/O data exchange program example (Automatic refresh)

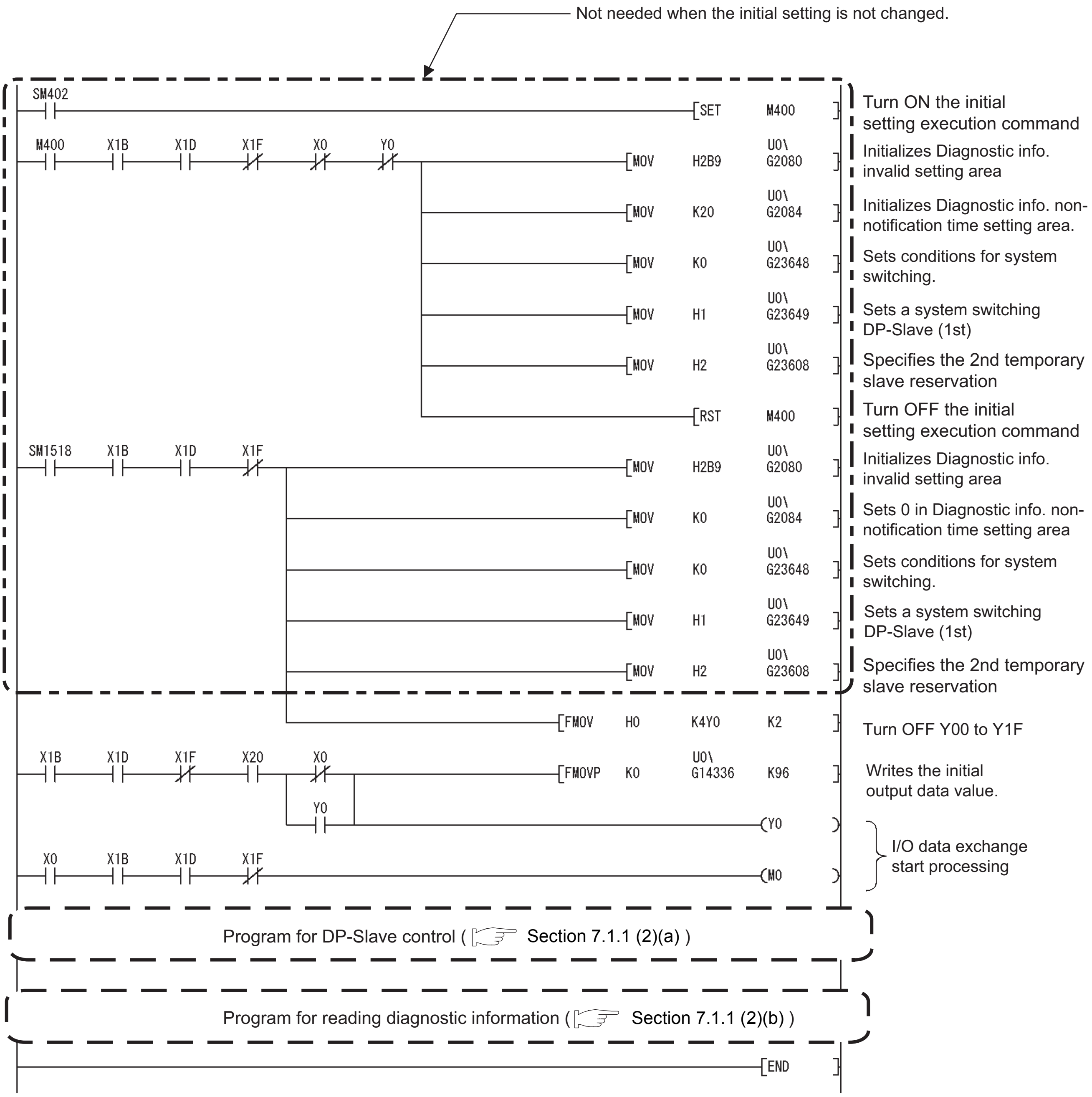


Figure 7.35 I/O Data Exchange Program Example (Automatic Refresh)

(b) When using dedicated instructions
This section explains a program in which the QJ71PB92V communicates with DP-Slaves using dedicated instructions.

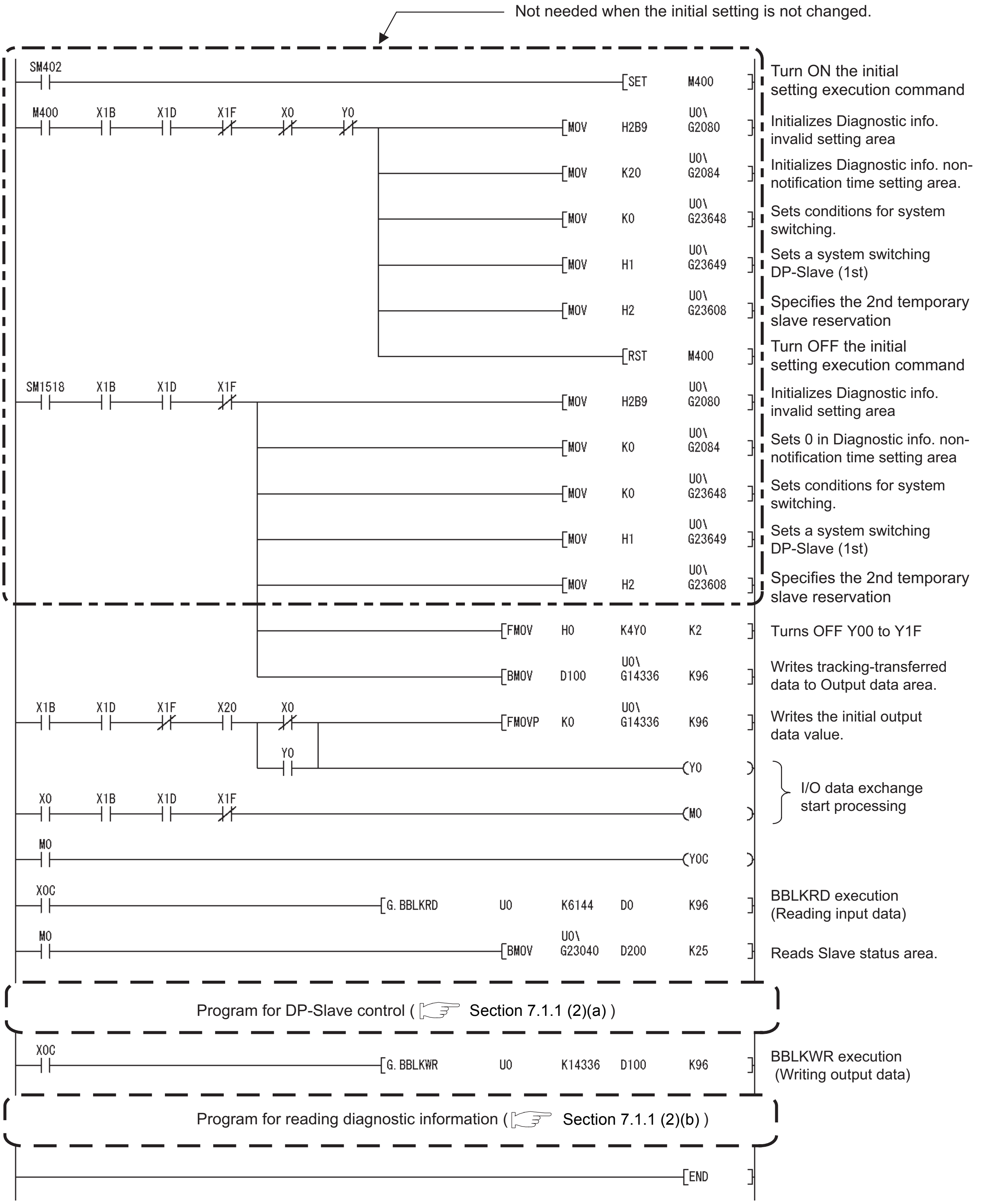
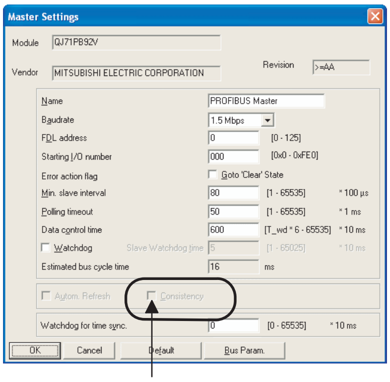


Figure 7.36 I/O Data Exchange Program Example (Dedicated Instructions)

POINT

Confirm that Consistency is disabled with Autom. Refresh enabled.
(☞ Section 6.3)
When the automatic refresh and data consistency functions are enabled, dedicated instructions are not processed.



Make sure the box is unchecked.

(c) When using the MOV instruction
This section explains a program in which the QJ71PB92V communicates with a DP-Slave using the MOV instruction.

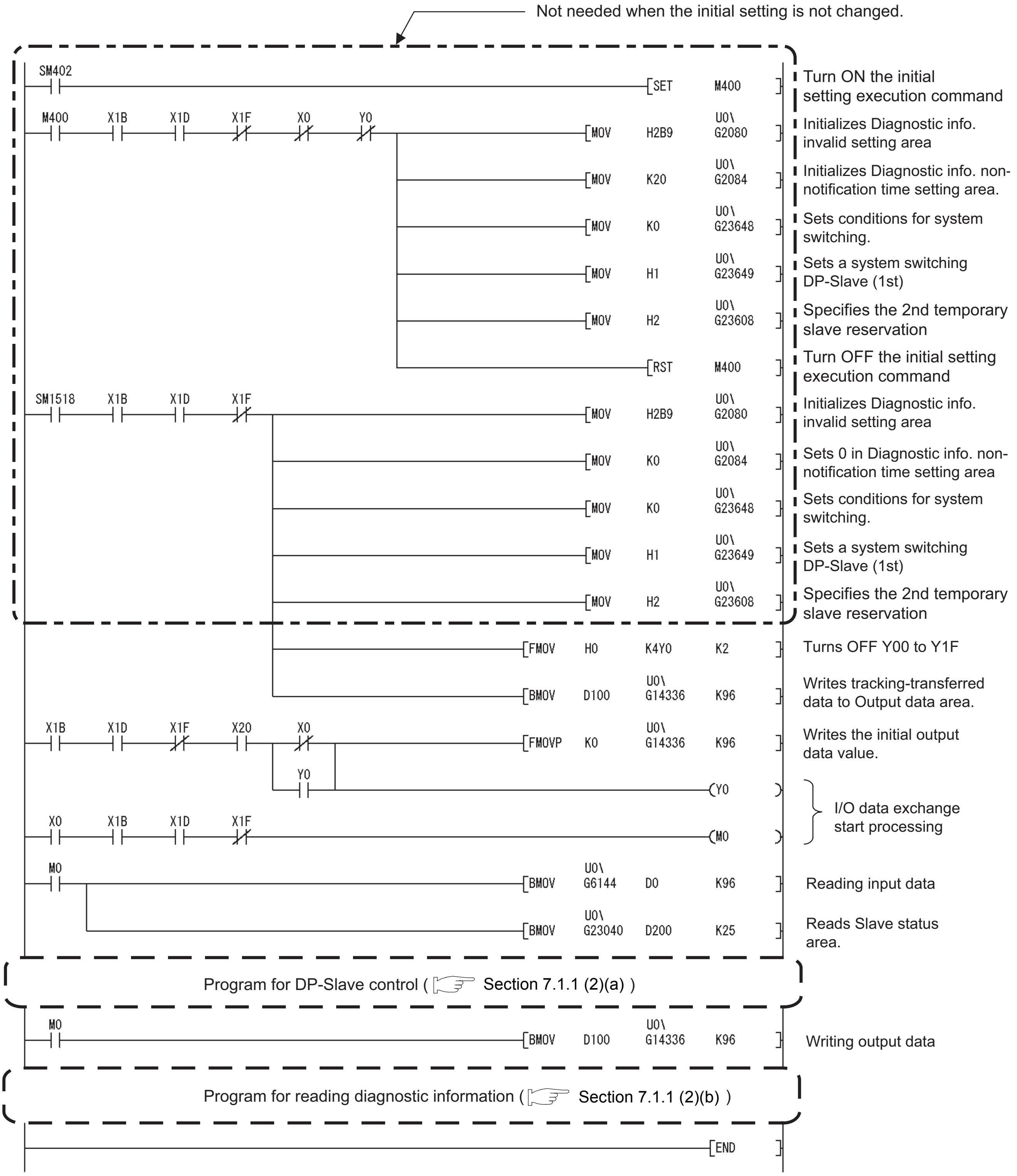


Figure 7.37 I/O Data Exchange Program Example (MOV Instruction)

7.9.2 Program example for acquisition of extended diagnostic error information

If a system switching occurs, acquisition of the extended diagnostic error information is disabled.
After the system switching, only the extended diagnostic error information that is newly generated after the switching can be obtained.
For a program example for acquisition of extended diagnostic information, refer to section 7.2.

7.9.3 Program example for global control function

If a system switching occurs during execution of the global control function, the processing cannot be continued.
This section explains a program example for reexecuting the global control function in the case of system switching.

(1) Device assignments in program example

(a) Devices used by the QJ71PB92V
The devices are the same as those in Section 7.3 (1) (a).

(b) Devices used by the user

Table7.74 List of User Devices

Device	Description	Device	Description
X25	Global control execution command	SM1518	ON for 1 scan only after switching system from standby to control
M0	Refresh start request (Section 7.9.1)	—	

(2) Tracking devices for reexecuting the function after system switching

Data in the following devices are tracking-transferred:

- Start command device by which the Global control request signal (Y04) is turned ON
- Start command device to which global control request data are set

Table7.75 Tracking Transfer Devices in the Program Example for the Global Control Function

Device	Description	Device	Description
X25	Global control execution command	—	

(3) Program example

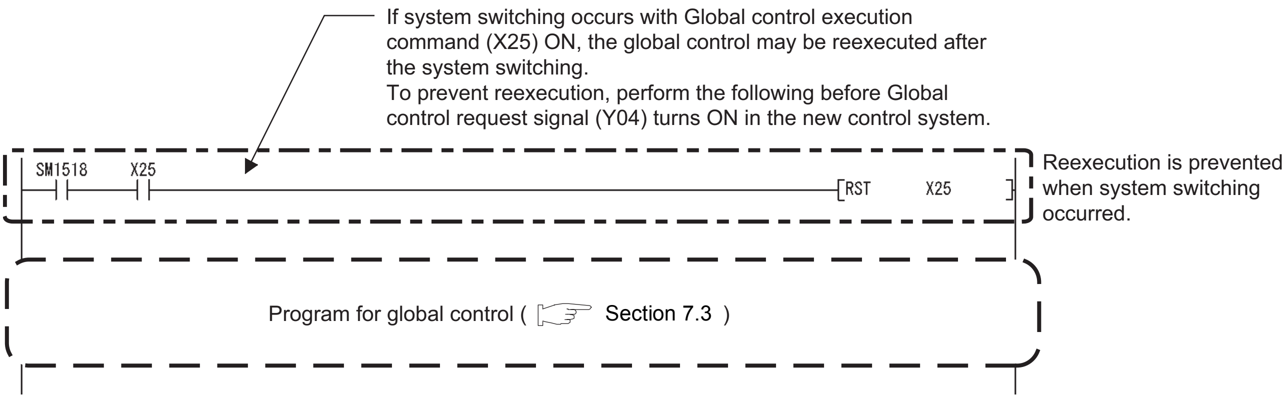


Figure 7.38 Program Example for Global Control Function

7.9.4 Program example for acyclic communication with DP-Slaves

If a system switching occurs, the function of the acyclic communication with DP-Slaves cannot be continued.
In redundant systems, do not use the acyclic communication with DP-Slaves.
To use the function, pay attention to the descriptions given below and fully examine the possible operations in advance.

(1) Application types and precautions

The Acyclic communication with DP-Slaves must be utilized for temporary applications*1.

If it is used for a constant application*2, system switching causes the new control system to operate in the manner shown in (a) and (b). Therefore, fully examine the system for any problem.

* 1 Parameter settings of DP-Slaves, temporary status monitoring, etc.
* 2 Constant status monitoring, etc.

(a) When using Class 1 service
When system switching occurs during acyclic communication with DP-Slaves, and if an error occurs, states of communication with DP-Slaves are initialized. (Inputs and outputs are turned OFF.)

(b) When using Class 2 service
If system switching occurs before execution of the ABORT service, the INITIATE service is not completed normally in the new control system.
In this case, after the time for the INITIATE service transmission timeout has elapsed, execute the INITIATE service again.

7.9.5 Program example for alarm acquisition

If a system switching occurs, the function of the alarm acquisition cannot be continued.
In redundant systems, do not use the alarm acquisition.
To use the function, pay attention to the this section and fully examine the possible operations in advance.

(1) After the system switching

After the system switching, only the alarms that is newly generated after the switching can be obtained.
When system switching occurs in the redundant system, the alarms that have been obtained before the system switching cannot be read out in the new control system.

7.9.6 Program example for time control over DP-Slaves

If a system switching occurs during execution of the time control function, the processing cannot be continued.
The following explains a program example for reexecuting the time control function after system switching.

(1) Request and response formats

For the request and response formats used for the time control over DP-Slaves, refer to Sections 7.6.1 to 7.6.3.

(2) Program example

(a) Settings
The setting is the same as in Section 7.6.4 (1).

(b) Device assignments in program example

1) Devices used by the QJ71PB92V
The devices are the same as in Section 7.6.4 (2).

2) Devices used by the user

Table7.76 List of User Devices

Device	Description	Device	Description
X27	Time control execution command	SM1518	ON for 1 scan only after switching system from standby to control

3) Devices used as automatic refresh or buffer memory read target
The device assignment is the same as that in Section 7.6.4 (2).

(c) Tracking devices for reexecuting the function in the case of system switching
In the program for the time control over DP-Slaves, data in the following devices are tracking-transferred.
- Start command device by which the Time control start request signal (Y19) is turned ON
- Start command device to which time control request data are set

Table7.77 Tracking-Transfer Devices in the Program Example for Time Control over DP-Slaves

Device	Description	Device	Description
X27	Time control execution command	—	

(d) Program example

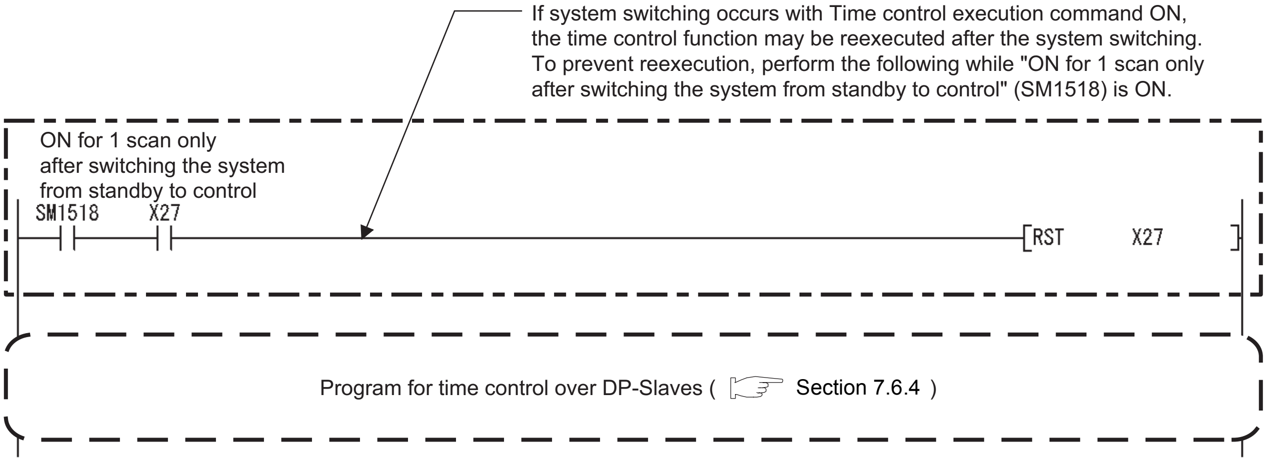


Figure 7.39 Program Example for Time Control Function (Time Data Write Request)

7.9.7 Program example for temporary slave reservation

If a system switching occurs during execution of the temporary slave reservation function, the processing cannot be continued.
The following explains a program example for reexecuting temporary slave reservation function after system switching.

(1) Device assignments in program example

The devices assignment are the same as those in Section 7.9.1.

(2) Tracking devices for reexecuting the function in the case of system switching

In the program for the temporary slave reservation function, data in the following devices are tracking-transferred.

- Start command device for execution of the temporary slave reservation function

(3) Program example

Program example for temporary slave reservation, refer to section 7.9.1.

POINT

The program for the temporary slave reservation must be executed before turning ON the Data exchange start request signal (Y00). (Section 7.9.1)

CHAPTER8 DEDICATED INSTRUCTIONS

A "dedicated instruction" is defined as an instruction designed to make programming easy for use of the intelligent function module functionality.
This chapter describes the dedicated functions available for the QJ71PB92V.

(1) List of dedicated functions

The following list shows the dedicated instructions available for the QJ71PB92V.

Table8.1 List of Dedicated Instructions

Dedicated instruction	Description	Reference section
BBLKRD	Reads data from the buffer memory of a specified module, ensuring data consistency.	Section 8.2
BBLKWR	Writes data to the buffer memory of a specified module, ensuring data consistency.	Section 8.3

(2) Usable devices

The following devices are available for dedicated instructions.

Table8.2 Usable Devices

Internal device		File register	Constant *1
Bit	Word		
—	T, ST, C, D, W	R, ZR	K, H

* 1 Available devices are given in the Constant field in each section.

8.1 Precautions for Dedicated Instructions

(1) Before executing a dedicated instruction

Before executing a dedicated instruction, be sure to confirm the following.

(a) Turn ON the Data consistency start request signal (Y0C)
Before executing a dedicated instruction, turn ON the Data consistency start request signal (Y0C).
Attempting to execute a dedicated instruction with the Data consistency start request signal (Y0C) OFF will result in non-processing (non-execution).
Use the Data consistency requesting signal (X0C) as an interlock for execution of dedicated instructions.

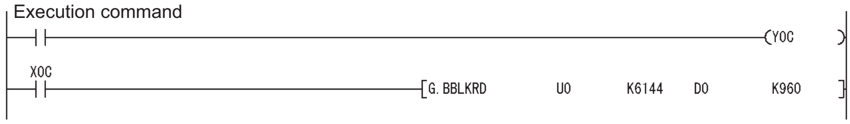


Figure 8.1 Interlock Example for Dedicated Instruction

(b) Check that Consistency is disabled with Autom. Refresh enabled.
If the automatic refresh and data consistency functions are enabled, use of dedicated instructions is not allowed. (They are not processed.)
Dedicated instructions are executable if the data consistency function is disabled in the automatic refresh setting. (Section 6.3)

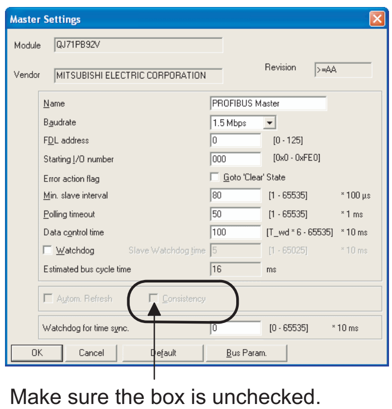


Figure 8.2 Data Consistency in Automatic Refresh

(2) The BBLKRD and BBLKWR instructions must be used in pair

Use the BBLKRD and BBLKWR instructions as a pair, and always execute them once for every sequence scan.
If only one of these instructions is used, an error code is stored in the Local station error information area (Un\G23071). (Section 9.5.6)

(3) Execution timing

Execute the BBLKRD and BBLKWR instructions all the time.
While the QJ71PB92V is implementing the data consistency function, the dedicated instruction is not processed (not executed). (☞ Section 4.5)
Therefore, I/O data may not be read or written in a program where either of the instructions is executed only once at the rising or falling edge of the pulse.

(4) When mounted on MELSECNET/H remote I/O station

Dedicated instructions are not executable when the QJ71PB92V is mounted on a MELSECNET/H remote I/O station.

(5) Transmission delay time when using a dedicated instruction

Use of the data consistency function increases the transmission delay time.
(☞ Section 3.5.2)

(6) QCPUs available when using dedicated instructions

For QCPUs supporting the dedicated instruction, refer to Section 2.1.

8.2 G. BBLKRD

Table8.3 Device Usable in the BBLKRD Instruction

<table>
<tr><th rowspan="3">Set data</th><th colspan="9">Usable device</th></tr>
<tr><th colspan="2">Internal device (System, user)</th><th rowspan="2">File register</th><th colspan="2">Link direct device J□\□</th><th rowspan="2">Intelligent function module device U□\G□</th><th rowspan="2">Index register Z□</th><th rowspan="2">Constant K, H</th><th rowspan="2">Other</th></tr>
<tr><th>Bit</th><th>Word</th><th>Bit</th><th>Word</th></tr>
<tr><td>n1</td><td>—</td><td colspan="2">○</td><td colspan="3">—</td><td>—</td><td>○</td><td>—</td></tr>
<tr><td>Ⓓ</td><td>—</td><td colspan="2">○</td><td colspan="3">—</td><td>—</td><td>—</td><td>—</td></tr>
<tr><td>n2</td><td>—</td><td colspan="2">○</td><td colspan="3">—</td><td>—</td><td>○</td><td>—</td></tr>
</table>

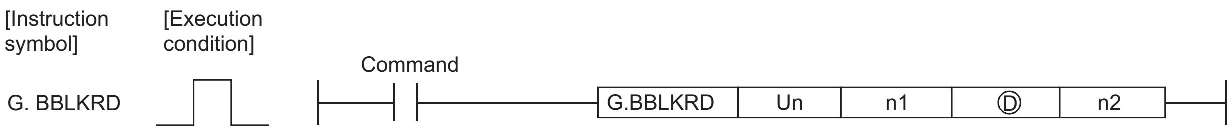


Figure 8.3 BBLKRD Instruction

Set data

Table8.4 Set Data in the BBLKRD Instruction

<table>
<tr><th>Set data</th><th>Description</th><th>Setting range</th><th>Data type</th></tr>
<tr><td>Un</td><td>QJ71PB92V module start I/O number
Upper 2 digits of the I/O number in 3-digit notation</td><td>0 to FEH</td><td rowspan="2">BIN 16 bits</td></tr>
<tr><td>n1</td><td>Start address of reading data</td><td>Specified device range</td></tr>
<tr><td>Ⓓ</td><td>Start No. of the device to which read data are stored</td><td>Specified device range</td><td>Device name</td></tr>
<tr><td>n2</td><td>Number of read data</td><td>1 to 4096 (word)</td><td>BIN 16 bits</td></tr>
</table>

Function

This instruction allows data reading from the buffer memory of a specified module with data consistency ensured.

Error

An operation error occurs in the following instances. (Error code: 4101)

- When a value outside the setting range is set to the set data field
- When the size, which is obtained by adding the number of read data to the start address of reading data, exceeds the buffer memory size
- When the points available for the start address of reading data or after is less than the number of read data

Program example

At the timing of M10 = ON, data of 960 points are read to D0 to D959 from address 6144 (1800H) of the Input data area (for mode 3) of the QJ71PB92V (module start I/O No.0) with data consistency ensured.

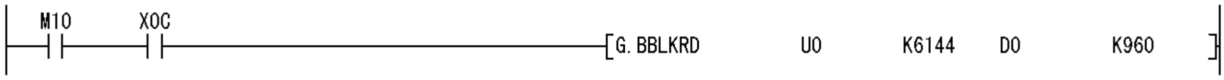


Figure 8.4 BBLKRD Instruction Program Example

8.3 G. BBLKWR

Table8.5 Device Usable in the BBLKWR Instruction

Set data	Usable device								
	Internal device (System, user)		File register	Link direct device J□\□		Intelligent function module device U□\G□	Index register Z□	Constant K, H	Other
	Bit	Word		Bit	Word				
n1	—	○		—			—	○	—
Ⓢ	—	○		—			—	—	—
n2	—	○		—			—	○	—

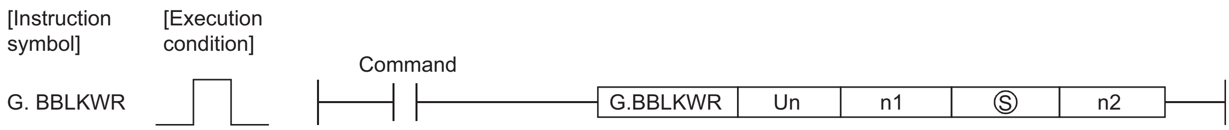


Figure 8.5 BBLKWR Instruction

Set data

Table8.6 Set Data in the BBLKWR Instruction

Set data	Description	Setting range	Data type
Un	QJ71PB92V module start I/O number Upper 2 digits of the I/O number in 3-digit notation	0 to FEH	BIN 16 bits
n1	Start address for writing data	Specified device range	
Ⓢ	Start No. of the device storing write data	Specified device range	Device name
n2	Number of write data	1 to 4096 (word)	BIN 16 bits

Function

This instruction allows data writing to the buffer memory of a specified module with data consistency ensured.

Error

An operation error occurs in the following instances. (Error code: 4101)

- When a value outside the setting range is set to the set data field
- When the size, which is obtained by adding the number of write data to the start address for writing data, exceeds the buffer memory size
- When the points available for the start address for writing data or after is less than the number of write data

Program example

At the timing of M 10 = 10, data of 960 points in D0 to D959 are written to the Output data area (for mode 3) of the QJ71PB92V (module start I/O No.0) with data consistency ensured, starting from address 14336 (3800H).

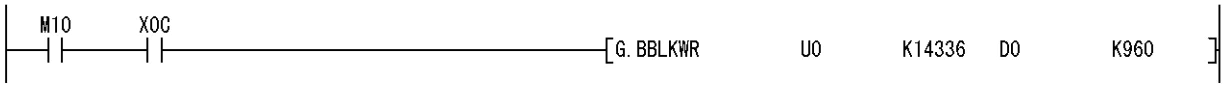


Figure 8.6 BBLKWR Instruction Program Example

CHAPTER9 TROUBLESHOOTING

This chapter explains the troubleshooting and error codes of the QJ71PB92V.
Before troubleshooting the QJ71PB92V, check that no errors have occurred on the QCPU or MELSECNET/H remote I/O network.
If any error is identified, check the error details and take corrective actions.
For the troubleshooting in Section 9.1 to 9.4, refer to the following flowchart.

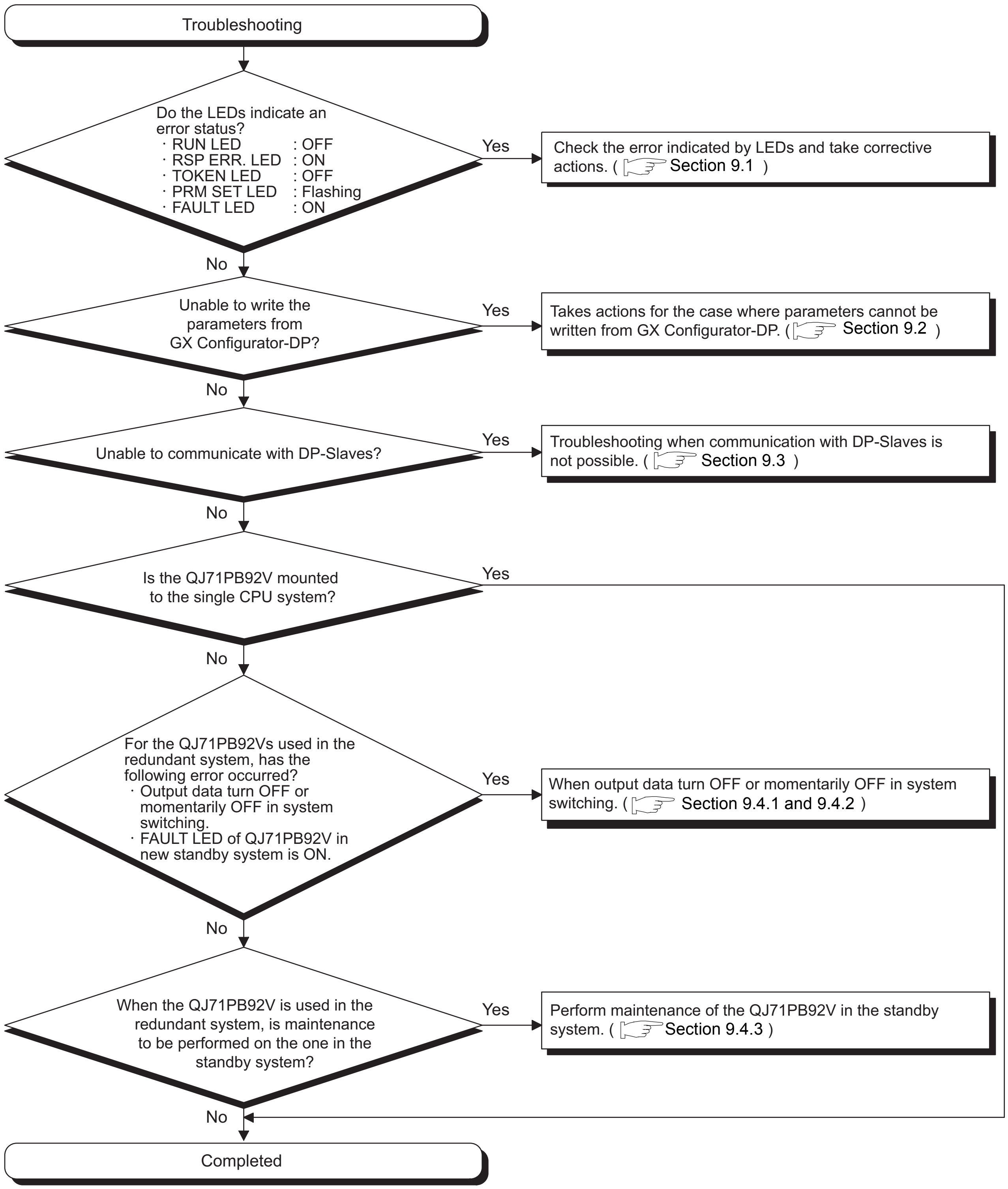


Figure 9.1 Troubleshooting Flowchart

9.1 Error Check Using the LEDs and Corrective Actions

This section explains how to check errors by the LEDs or by checking the LED status on GX Developer.

(1) Causes and actions

The following table summarizes causes that can be thought from the LED status of the QJ71PB92V and corrective actions to be taken.

Table9.1 Causes and Actions

LED	Status	Cause	Action
RUN	OFF	The watchdog monitoring time has been exceeded.	Please consult your local Mitsubishi representative, explaining a detailed description of the problem.
RSP ERR.	ON	A communication error has occurred.	Read the diagnostic information from the Diagnostic information area (for mode 3) (Un\G23072 to Un\G23321).
TOKEN	OFF	The token is not being rotated. *1	• Check the PROFIBUS cable connections. (Section 5.5.1) • Check if the bus terminator is connected. (Section 5.5.1) • Check if the FDL address of each station is unique. (Section 6.3 and 6.5) • Check if the FDL address does not exceed the HSA. (Section 6.4)
PRM SET	Flashing	Parameters in the flash ROM are corrupted.	Initialize the QJ71PB92V (initialization of the flash ROM) and write parameters again. (Section 9.6)
		Parameters of the QJ71PB92D were written with the QJ71PB92D-compatible function disabled.	• Change the module selected in the GX Configurator-DP project to QJ71PB92V, and write the parameters. • Check Switch 2 of the intelligent function module switches. (Section 6.7)
		Parameters of the QJ71PB92V were written with the QJ71PB92D-compatible function enabled.	• Change the module selected in the GX Configurator-DP project to QJ71PB92D, and write the parameters. • Check Switch 2 of the intelligent function module switches. (Section 6.7)
FAULT	ON	The FDL address of a DP-Slave is duplicated with that of the DP-Master in parameter settings.	Check the parameters. (Section 6.3 and 6.5)
		Parameters in the flash ROM are corrupted.	Initialize the QJ71PB92V (initialization of the flash ROM) and write parameters again. (Section 9.6)
		An unexpected error other than the above has occurred.	Please consult your local Mitsubishi representative, explaining a detailed description of the problem.

* 1 Depending on the number of DP-Masters within the same network and the transmission speed setting, the TOKEN LED seems to be unlit even in execution of token passing. (Section 5.3)

(2) Checking the LED status on GX Developer

The status of the QJ71PB92V's LEDs can be also checked on the H/W LED Information screen (H/W LED information) of GX Developer.

For checking the LED status, use GX Developer Version 8.27D or later.

Start Procedure

[Diagnostics] → [System monitor] → Module's Detailed Information button → H/W Information button

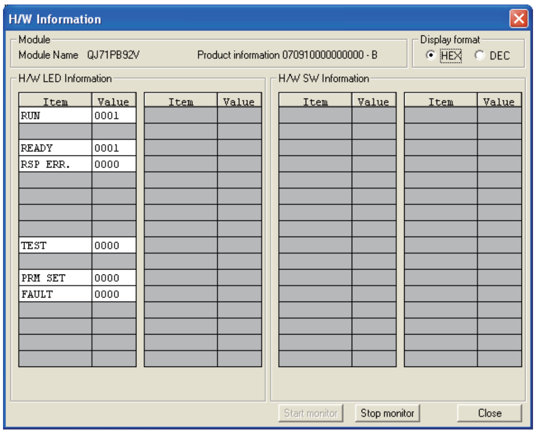


Figure 9.2 H/W Information Screen

Table9.2 Values Displayed at H/W LED Information

Value	Description
0000	The LED on the QJ71PB92V is OFF.
0001	The LED on the QJ71PB92V is ON.
Displaying "0000" and "0001" alternately.	The LED on the QJ71PB92V is flashing.

9.2 When Parameters cannot be Written from GX Configurator-DP

The following shows the troubleshooting procedures to be taken when parameters cannot be written to the QJ71PB92V from GX Configurator-DP.

(1) When the QJ71PB92D-compatible function is disabled

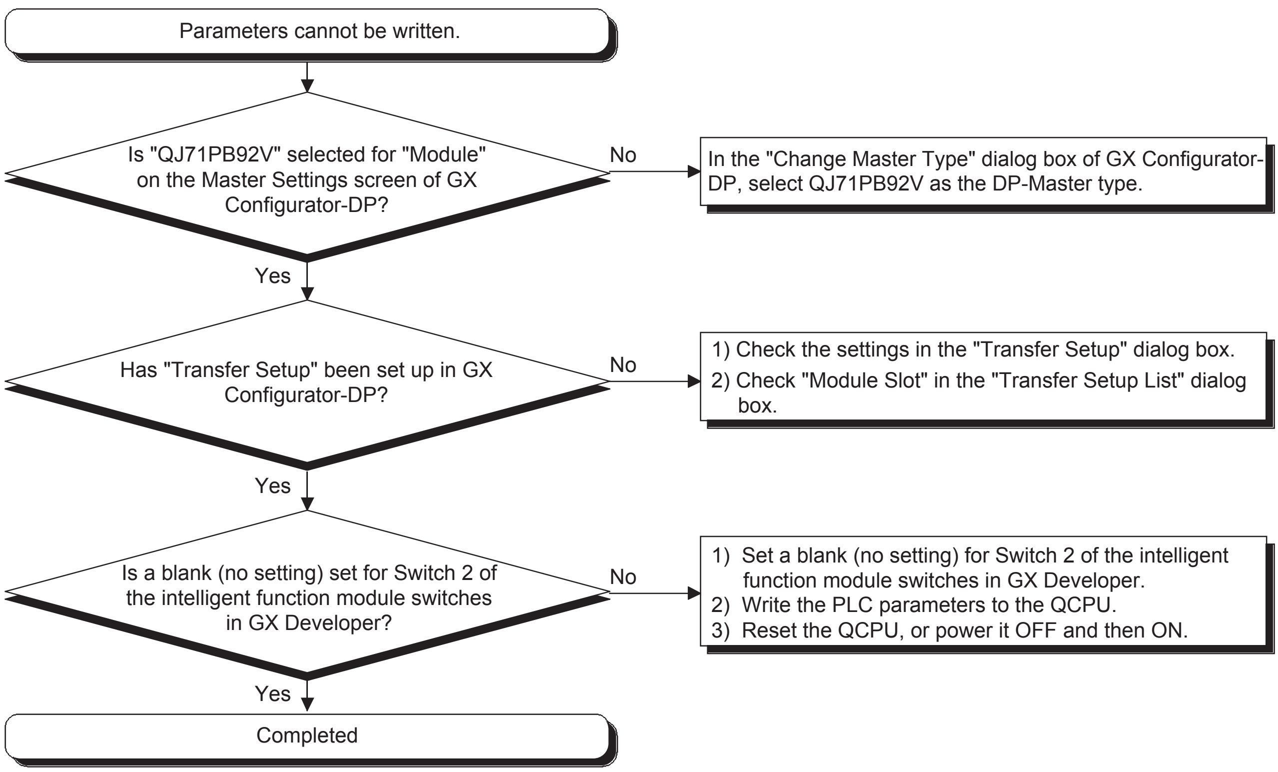


Figure 9.3 When the QJ71PB92D-Compatible Function is Disabled

(2) When the QJ71PB92D-compatible function is enabled

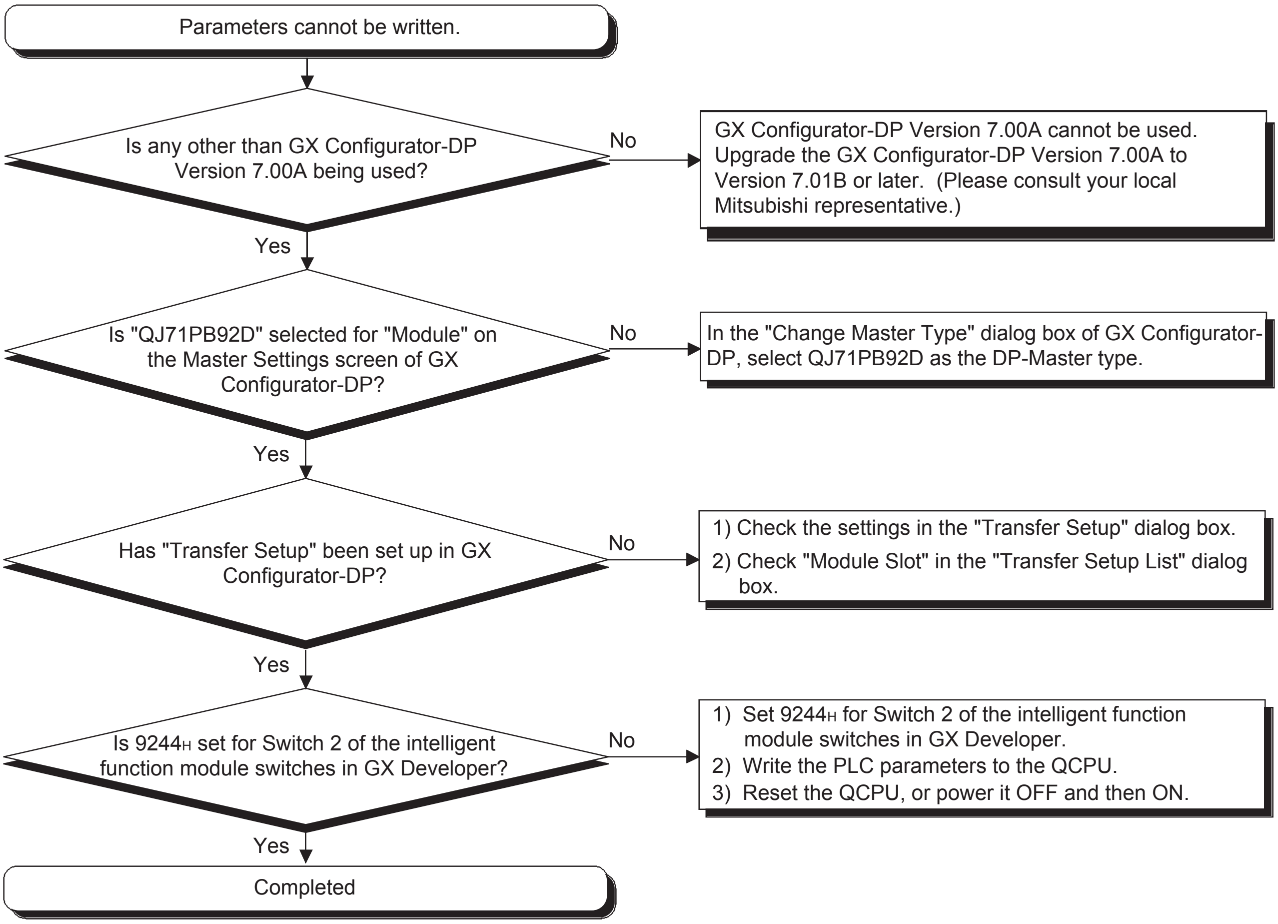


Figure 9.4 When the QJ71PB92D-Compatible Function id Enabled

9.3 When Communication with DP-Slaves Is Not Possible

The following shows the troubleshooting procedures when communications between the QJ71PB92V and DP-Slaves are not possible.

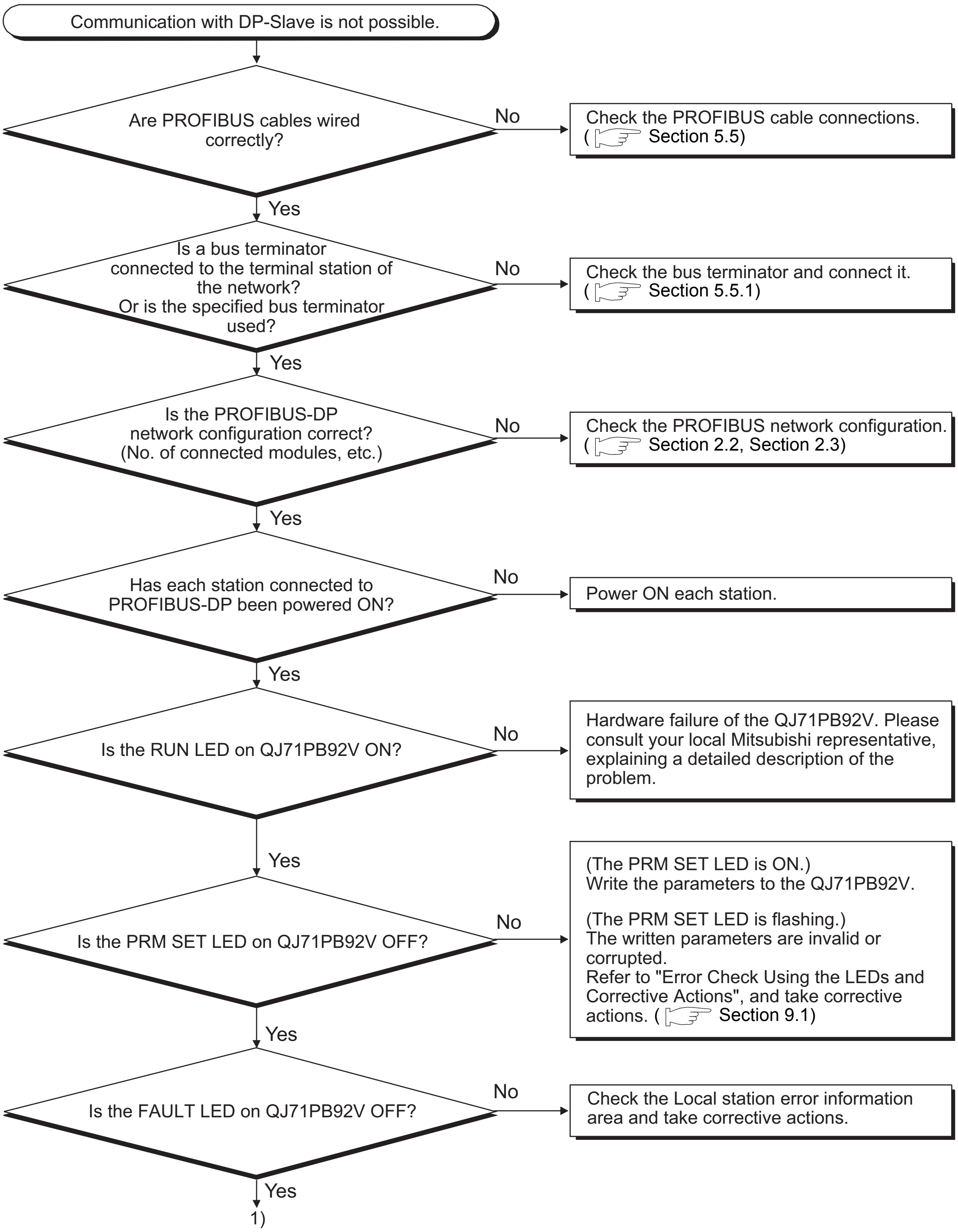


Figure 9.5 Troubleshooting When Communications with DP-Slaves Are Not Possible

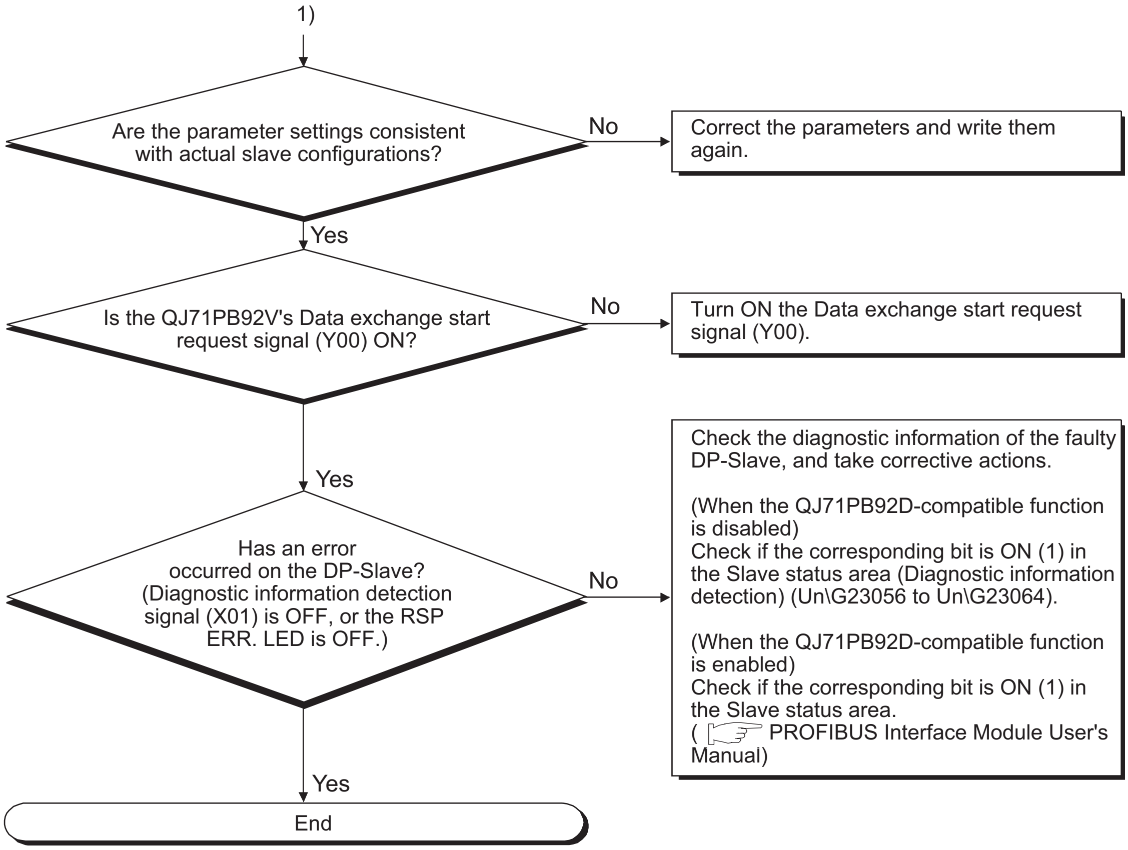


Figure 9.5 Troubleshooting When Communications with DP-Slaves Are Not Possible (Continued)

9.4 Troubleshooting in the Redundant System

This section explains the troubleshooting procedures for the case where the QJ71PB92V is mounted in a redundant system.

9.4.1 When output data turn OFF or momentarily OFF in system switching

The following shows the troubleshooting steps for the case where output data turn OFF or momentarily OFF in system switching.

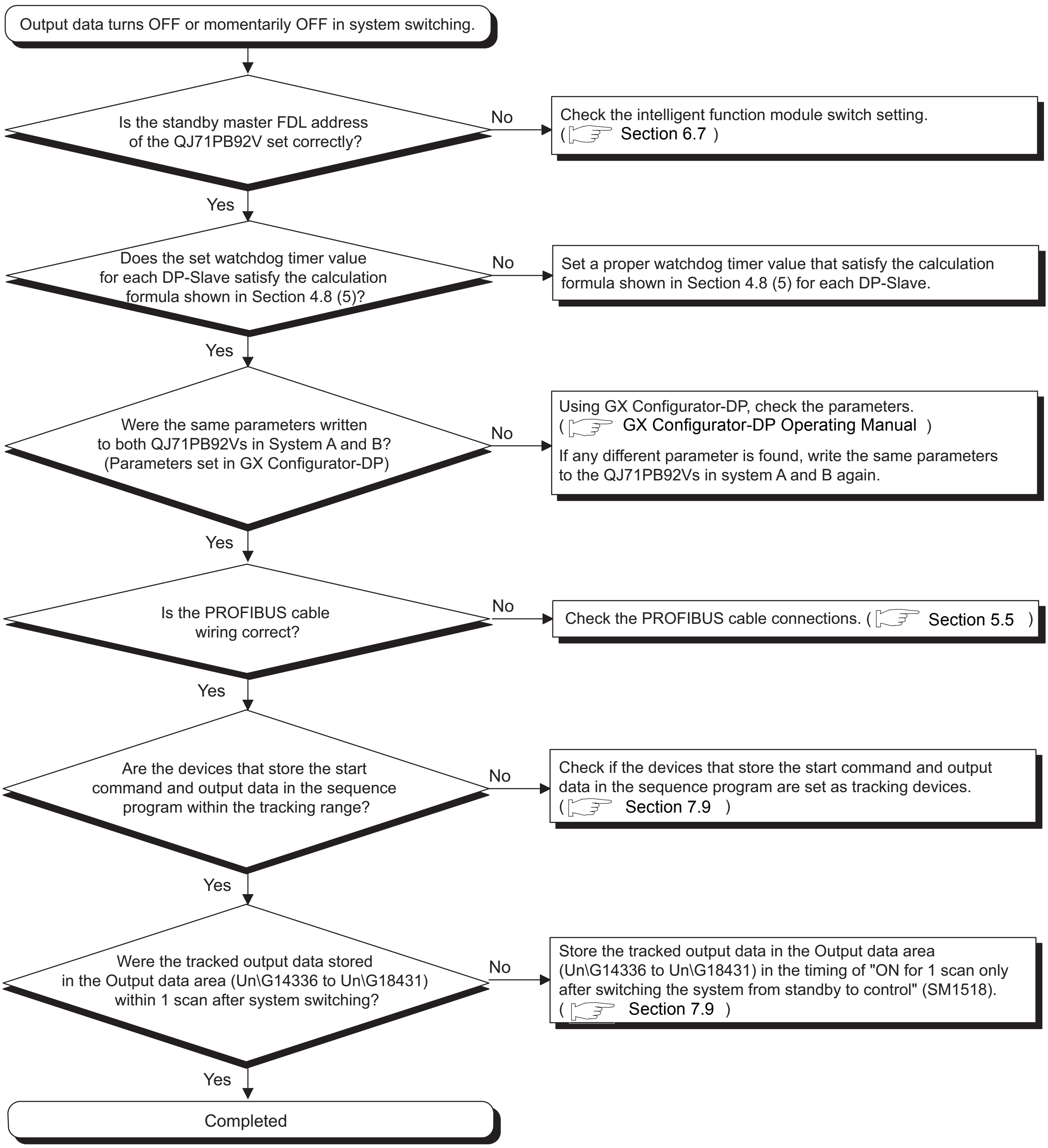


Figure 9.6 When Output Data Turn OFF or Momentarily OFF in System Switching

9.4.2 When the FAULT LED of the QJ71PB92V in the new control system is ON

The following shows how to recover the QJ71PB92V in the new control system when its FAULT LED is ON.

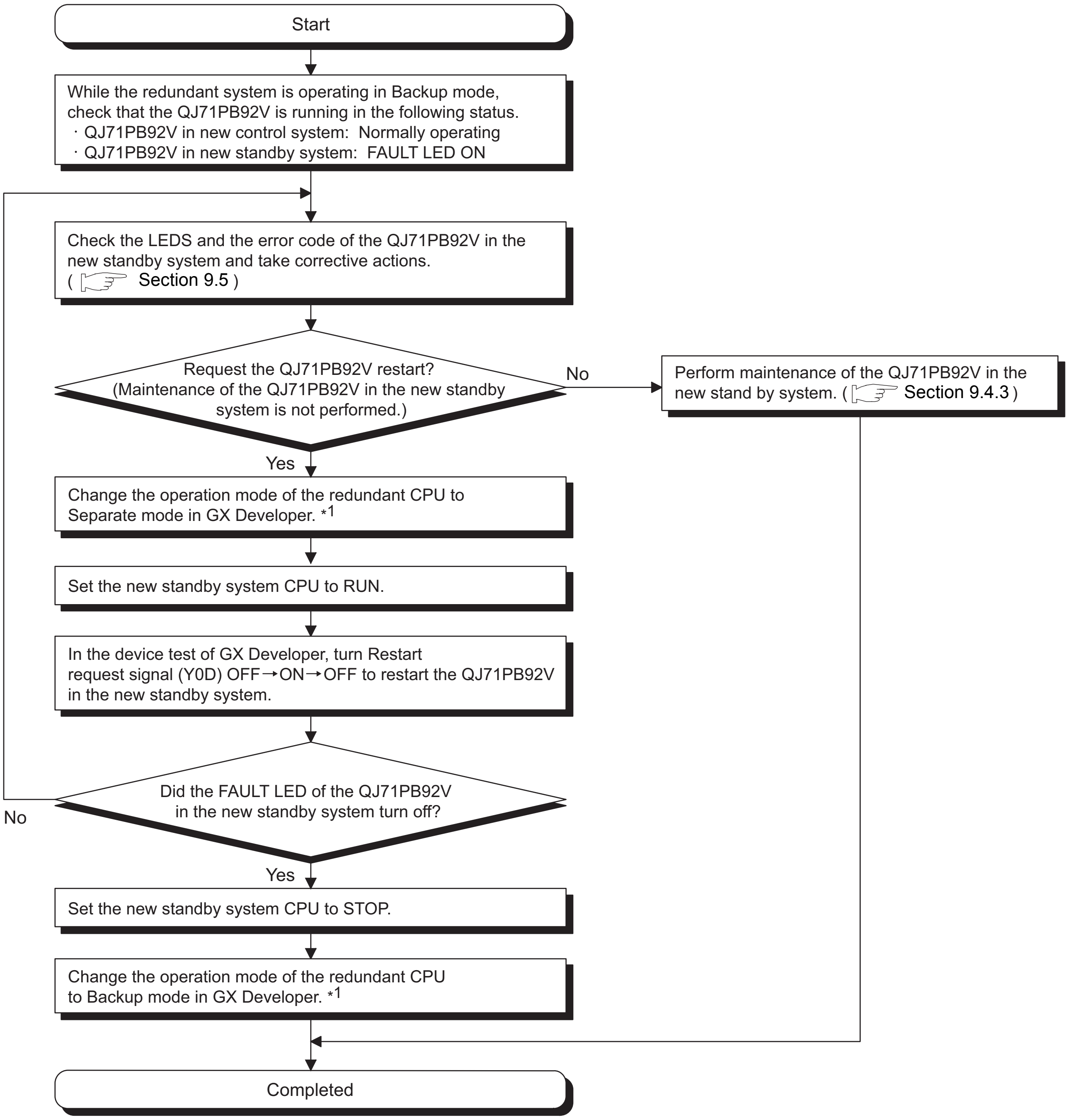


Figure 9.7 When the FAULT LED of the QJ71PB92V in the New Control System is ON

* 1 For how to change the operation mode of the redundant CPU, refer to the QnPRHCPU User's Manual (Redundant System).

9.4.3 Maintenance of the QJ71PB92V in the standby system

The following shows how to perform maintenance in the standby system during Backup mode operation and to restart the redundant system operation.

Maintenance

- Sequence program modification
- Parameter change in GX Configurator-DP or GX Developer
- Change of QJ71PB92V operation mode
- Recovery from error
- Powering OFF and then ON
- Reseting redundant CPU
- Replacement of QJ71PB92V

Figure 9.8 Detail of Maintenance

Start

↓

Connect GX Developer to the control system CPU.

↓

On the Redundant operation screen of GX Developer, select Separate mode for Operation mode of the redundant CPU. *1

↓ ← 2)

Stop the system for which maintenance is to be performed (standby system CPU).

↓

Disconnect the PROFIBUS cable connected to the QJ71PB92V in the standby system.

↓

Connect GX Developer to the standby system CPU.

↓

Set the operation mode of the standby system CPU to Debug mode. *1
1. In Debug mode setting in Redundant parameter of GX Developer, select "Start with Debug mode".
2. Write the set redundant parameters to the standby system CPU.
3. Reset the standby system CPU, or power OFF→ON the standby system.

↓

Perform maintenance of the standby system.

Maintenance

- Sequence program modification
- Parameter change in GX Configurator-DP or GX Developer
- Change of QJ71PB92V operation mode
- Recovery from error
- Powering OFF and then ON
- Reseting redundant CPU
- Replacement of QJ71PB92V

↓

Return the operation mode of the standby system CPU to Separate mode. *1
1. In Debug mode setting in Redundant parameter of GX Developer, select "Do not start with Debug mode".
2. Write the set redundant parameters to the standby system CPU.
3. Reset the standby system CPU, or power OFF→ON the standby system.

↓

1)
(To the next page)

Figure 9.9 Maintenance of the QJ71PB92V in the Standby System

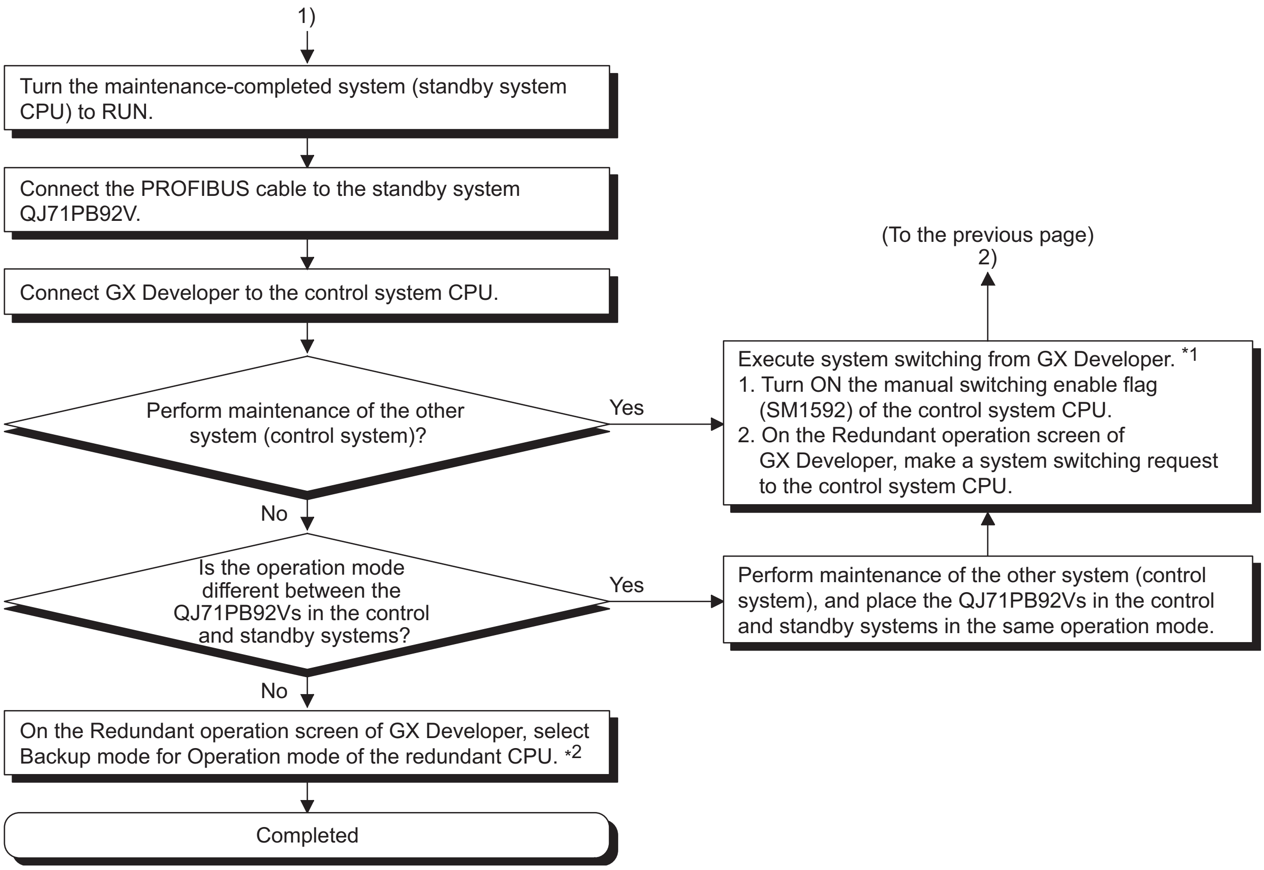


Figure 9.7 Maintenance of the QJ71PB92V in the Standby System (Continued)

* 1 For how to change the operation mode of the redundant CPU and how to switch the systems, refer to the QnPRHCPU User's Manual (Redundant System).
* 2 When changing the mode from Separate to Backup, use the same communication pathway as the one used when Backup mode was changed to Separate mode. (☞ QnPRHCPU User's Manual (Redundant System))

POINT

The following maintenance must be performed on both QJ71PB92Vs in the control and standby systems.

- Sequence program modification
- Parameter modification in GX Configurator-DP or GX Developer
- Operation mode change of the QJ71PB92V

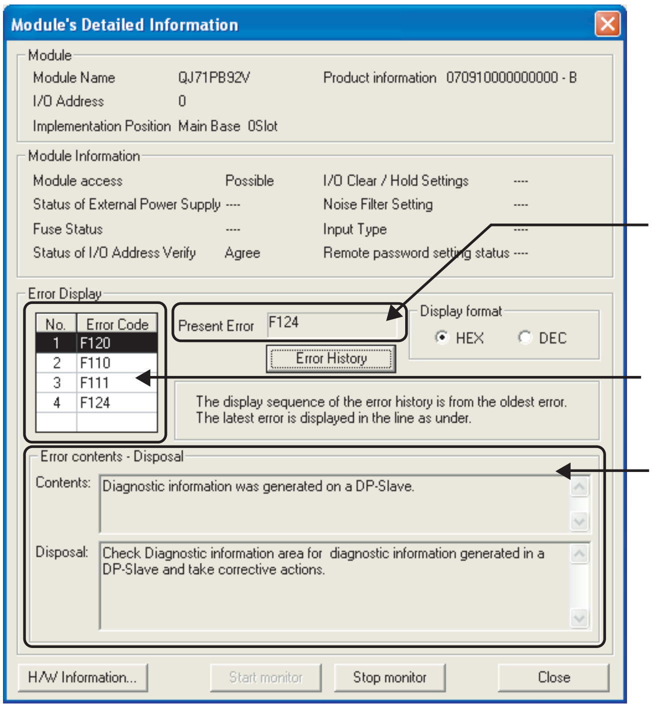
9.5 Error Codes

This section explains the error codes that are output on the QJ71PB92V.
The QJ71PB92V error codes are classified by groups with error No.
The following table lists the groups of the error codes and the areas where they are stored.

Table9.3 Error Code Classifications

Error Codes	Classification	Storage Location (Buffer memory address)	Reference Section
E200H to E2FFH	Error codes generated when reading extended diagnostic error information	Extended diagnostic information read response area (Address: 23457 (5BA1H))	Section 9.5.1
E300H to E3FFH	Error codes generated during operation mode switching	Operation mode change result area (Address: 2256 (8D0H))	Section 9.5.2
E400H to E4FFH	Error codes generated during acyclic communication	Acyclic communication response area (Address: 25121 to 26144 (6221H to 6620H))	Section 9.5.3
E500H to E5FFH	Error codes generated when reading alarms	Alarm response area (Address: 26446 to 26768 (674EH to 6890H))	Section 9.5.4
E600H to E6FFH	Error codes generated during execution of time control	Time control setting response area (Address: 26800 (68B0H))	Section 9.5.5
F100H to F1FFH	Diagnostic information of local station*1 (QJ71PB92V)	Local station error information area (Address: 23071 (5A1FH))	Section 9.5.6

* 1 The diagnostic information of the local station can be confirmed on the Module's Detailed Information screen of GX Developer.
For the confirmation on the Module's Detailed Information screen, use GX Developer Version 8.27D or later.



Displays the latest error code.

Displays the error history.

Displays the description of the error code selected in the error history and the action against it.

Figure 9.8 Module's Detailed Information Screen (GX Developer)

9.5.1 Error codes E200H to E2FFH (Error codes generated when reading extended diagnostic information)

Table9.4 Error codes E200H to E2FFH

Error Code	Error Description	Action
E200H	The specified FDL address is out of the range.	Check if the specified FDL address is correct, and retry.
E201H	No FDL address has been specified.	
E202H	The specified FDL address belongs to the local station (QJ71PB92V).	
E203H	The specified FDL address belongs to a reserved or temporarily reserved station.	
E204H	No extended diagnostic information is found in the specified FDL address.	
E205H	Invalid mode	Change the QJ71PB92V operation mode to mode 3, and retry. When a value is set for Switch 2 of the intelligent function module switches, delete it and leave it as blank (no setting).

9.5.2 Error codes E300H to E3FFH (Error codes generated when switching operation mode)

Table9.5 Error codes E300H to E3FFH

Error Code	Error Description	Action
E300H	The specified operation mode is invalid.	Check if the operation mode set in Operation mode change request area is correct, and retry.
E301H	Parameters have not been written to the module.	After writing parameters, change the mode to Communication mode (mode 3).
E302H	Unable to change the operation mode in the current operation status.	After completing the following processing, change the operation mode. Acquisition of extended diagnostic information • Global control function • Acyclic communication • Alarm acquisition • FDT/DTM technology • Time control function
E303H	Failed to write to the flash ROM. Or failed to initialize the flash ROM.	Initialize the flash ROM. If the same error occurs again, replace the QJ71PB92V.
E304H	The flash ROM clear mode processing is incorrect.	Initialize the flash ROM. If the same error occurs again, please consult your local Mitsubishi representative, explaining a detailed description of the problem.
E305H	The operation mode of the QJ71PB92D was set with the QJ71PB92D-compatible function disabled.	Set the operation mode of the QJ71PB92V when the QJ71PB92D-compatible function is disabled.
E306H	The operation mode was changed during Class2 service execution of Acyclic communication.	After execution of ABORT, change the operation mode.
E307H	Unable to change the operation mode of the QJ71PB92V in the current operation mode of the redundant CPU.	Change the operation mode of the redundant CPU to Separate or Debug mode, and then change the operation mode of the QJ71PB92V.
E3A0H E3A1H E3A2H E3A3H	Hardware failure	Please consult your local Mitsubishi representative, explaining a detailed description of the problem.

9.5.3 Error codes E400H to E4FFH (Error codes generated during acyclic communication)

Table9.6 Error codes E400H to E4FFH

Error Code	Error Description	Action
E400H	The FDL address of the target DP-Slave is out of the range.	Check if the specified FDL address is correct, and retry.
E401H	The FDL address specified for the target DP-Slave belongs to the local station (QJ71PB92V).	
E402H	The read data length is incorrect.	Check if the specified read data length is correct, and retry.
E403H	Read error response.	Check the detailed error codes 1 to 3 and take corrective actions.
E404H	The slot number is incorrect.	Check if the specified slot number is correct, and retry.
E405H	The index is incorrect.	Check if the specified index is correct, and retry.
E406H	The CommRef number is incorrect.	Check if the specified CommRef number is correct, and retry.
E407H	Class1 service of Acyclic communication was executed while I/O data exchange is stopped.	Turn ON the Data exchange start request signal (Y00) to start I/O data exchange. Verify that the bit corresponding to the DP-Slave is ON in the Slave status area (Normal communication detection) (Un\G23040 to Un\G23047) and then retry.
E410H	A physical execution error detected, or system switching occurred during service execution in the redundant system.	Check the detailed error codes 2 and 3, and take corrective actions. Verify that the bit corresponding to the DP-Slave is ON in the Slave status area (Normal communication detection) (Un\G23040 to Un\G23047) and then retry. Check the detailed error codes 2 and 3, and take corrective actions.
E411H	Execution error on the protocol was detected.	Check the detailed error codes 2 and 3, and take corrective actions.
E412H	Execution error on the application was detected.	
E420H	Read error was detected on the DP-Slave side.	Check if the request data supported by the DP-Slave is correctly set or not, and retry. For details, refer to the manual for the DP-Slave.
E421H	Write error was detected on the DP-Slave side.	
E422H	Module error was detected on the DP-Slave side.	
E423H	Processing on the DP-Slave side is not available.	
E424H	Application error was detected on the DP-Slave side.	
E425H	Request-not-supported error was detected on the DP-Slave side.	
E426H	Incorrect index was detected on the DP-Slave side.	
E427H	Incorrect data length was detected on the DP-Slave side.	
E428H	Incorrect slot number was detected on the DP-Slave side.	
E429H	Incorrect data type was detected on the DP-Slave side.	
E42AH	Access to an access-disabled area was attempted from the DP-Slave side.	
E42BH	Access is not available on the DP-Slave side.	
E42CH	The access was rejected on the DP-Slave side.	
E42DH	Incorrect access range was detected on the DP-Slave side.	
E42EH	Incorrect request was detected on the DP-Slave side.	
E42FH	Incorrect data type was detected on the DP-Slave side.	
E430H	Incorrect parameter in the request was detected on the DP-Slave side.	

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Error codes E431H to E468H

Table9.6 Error codes E400H to E4FFH (Continued)

Error Code	Error Description	Action
E431H	Resource error was detected during read processing on the DP-Slave side.	Check if the request data supported by the DP-Slave is correctly set or not, and retry. For details, refer to the manual for the DP-Slave.
E432H	Resource error was detected during write processing on the DP-Slave side.	
E433H	The resource is already in use on the DP-Slave side.	
E434H	There is no resource that can be used on the DP-Slave side.	
E435H	The service not available for the specified DP-Slave was requested.	
E436H	Memories used for request processing are insufficient on the DP-Slave side.	
E437H	The DP-Slave side made this service invalid.	
E438H	The DP-Slave side did not respond to the request	
E440H	The FDL address of the target DP-Slave is out of the range.	Check if the specified FDL address is correct, and retry.
E441H	The FDL address specified for the target DP-Slave belongs to the local station (QJ71PB92V).	
E442H	The write data length is incorrect.	Check if the specified write data length is correct, and retry.
E443H	Write error response	Check the detailed error codes 1 to 3 and take corrective actions.
E444H	The slot number is incorrect.	Check if the specified slot number is correct, and retry.
E445H	The index is incorrect.	Check if the specified index is correct, and retry.
E446H	The CommRef number is incorrect.	Check if the specified CommRef number is correct, and retry.
E447H	Class1 service of Acyclic communication was executed while I/O data exchange is stopped.	Turn ON the Data exchange start request signal (Y00) to start I/O data exchange. Verify that the bit corresponding to the DP-Slave is ON in the Slave status area (Normal communication detection) (Un\G23040 to Un\G23047) and then retry.
E450H	A physical execution error detected, or system switching occurred during service execution in the redundant system.	Check the detailed error codes 2 and 3, and take corrective actions. Verify that the bit corresponding to the DP-Slave is ON in the Slave status area (Normal communication detection) (Un\G23040 to Un\G23047) and then retry. Check the detailed error codes 2 and 3, and take corrective actions.
E451H	Execution error on the protocol was detected.	Check the detailed error codes 2 and 3, and take corrective actions.
E452H	Execution error on the application was detected.	
E460H	Read error was detected on the DP-Slave side.	Check if the request data supported by the DP-Slave is correctly set or not, and retry. For details, refer to the manual for the DP-Slave.
E461H	Write error was detected on the DP-Slave side	
E462H	Module error was detected on the DP-Slave side.	
E463H	Processing on the DP-Slave side is not available	
E464H	Application error was detected on the DP-Slave side.	
E465H	Request-not-supported error was detected on the DP-Slave side.	
E466H	Incorrect index was detected on the DP-Slave side.	
E467H	Incorrect data length was detected on the DP-Slave side.	
E468H	Incorrect slot number was detected on the DP-Slave side.	

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Table9.6 Error codes E400H to E4FFH (Continued)

Error Code	Error Description	Action
E469H	Incorrect data type was detected on the DP-Slave side.	Check if the request data supported by the DP-Slave is correctly set or not, and retry. For details, refer to the manual for the DP-Slave.
E46AH	Access to an access-disabled area was attempted from the DP-Slave side.	
E46BH	Access is not available on the DP-Slave side.	
E46CH	The access was rejected on the DP-Slave side.	
E46DH	Incorrect access range was detected on the DP-Slave side.	
E46EH	Incorrect request was detected on the DP-Slave side.	
E46FH	Incorrect data type was detected on the DP-Slave side.	
E470H	Incorrect parameter in the request was detected on the DP-Slave side.	
E471H	Resource error was detected during read processing on the DP-Slave side.	
E472H	Resource error was detected during write processing on the DP-Slave side.	
E473H	The resource is already in use on the DP-Slave side.	
E474H	There is no resource that can be used on the DP-Slave side.	
E475H	The service not available for the specified DP-Slave was requested.	
E476H	Memories used for request processing are insufficient on the DP-Slave side.	
E477H	The DP-Slave side made this service invalid.	
E478H	The DP-Slave side did not respond to the request.	
E480H	The FDL address of the target DP-Slave is out of the range.	Check if the specified FDL address is correct, and retry.
E481H	The FDL address specified for the target DP-Slave belongs to the local station (QJ71PB92V).	
E482H	INITIATE error response	Check the detailed error codes 1 to 3 and take corrective actions.
E483H	Invalid Alignment setting	Check if the specified Alignment is correct, and retry.
E484H	The CommRef number is incorrect.	Check if the specified CommRef number is correct, and retry.
E485H	Total size of S Len and D Len is out of range.	Adjust the total size of S Len and D Len to 230 bytes or less, and retry.
E490H	Physical execution error detected.	Check the detailed error codes 2 and 3, and take corrective actions.
E491H	Execution error on the protocol was detected.	
E492H	Execution error on the application was detected.	
E4A0H	Read error was detected on the DP-Slave side.	Check if the request data supported by the DP-Slave is correctly set or not, and retry. For details, refer to the manual for the DP-Slave.
E4A1H	Write error was detected on the DP-Slave side.	
E4A2H	Module error was detected on the DP-Slave side.	
E4A3H	Processing on the DP-Slave side is not available.	
E4A4H	Application error was detected on the DP-Slave side.	
E4A5H	Request-not-supported error was detected on the DP-Slave side.	
E4A6H	Incorrect index was detected on the DP-Slave side.	
E4A7H	Incorrect data length was detected on the DP-Slave side.	
E4A8H	Incorrect slot number was detected on the DP-Slave side.	
E4A9H	Incorrect data type was detected on the DP-Slave side.	

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Error codes E4AAH to E4DEH

Table9.6 Error codes E400H to E4FFH (Continued)

Error Code	Error Description	Action
E4AAH	Access to an access-disabled area was attempted from the DP-Slave side.	Check if the request data supported by the DP-Slave is correctly set or not, and retry. For details, refer to the manual for the DP-Slave.
E4ABH	Access is not available on the DP-Slave side.	
E4ACH	The access was rejected on the DP-Slave side.	
E4ADH	Incorrect access range was detected on the DP-Slave side.	
E4AEH	Incorrect request was detected on the DP-Slave side.	
E4AFH	Incorrect data type was detected on the DP-Slave side.	
E4B0H	Incorrect parameter in the request was detected on the DP-Slave side.	
E4B1H	Resource error was detected during read processing on the DP-Slave side.	
E4B2H	Resource error was detected during write processing on the DP-Slave side.	
E4B3H	The resource is already in use on the DP-Slave side.	
E4B4H	There is no resource that can be used on the DP-Slave side.	
E4B5H	The service not available for the specified DP-Slave was requested.	
E4B6H	Memories used for request processing are insufficient on the DP-Slave side.	
E4B7H	The DP-Slave side made this service invalid.	
E4B8H	The DP-Slave side did not respond to the request.	
E4C0H	The CommRef number is incorrect.	Check if the specified CommRef number is correct, and retry.
E4D0H	Hardware failure	Please consult your local Mitsubishi representative, explaining a detailed description of the problem.
E4D1H		
E4D2H		
E4D3H		
E4D4H		
E4D5H		
E4D6H		
E4D7H		
E4D8H		
E4D9H		
E4DAH		
E4DBH		
E4DCH	Another Acyclic communication or alarm request is being executed to the same DP-Slave.	Verify that another Acyclic communication or alarm request has been completed, and then retry.
E4DDH	There is no executable resource.	
E4DEH	There is an invalid parameter setting.	Check the parameter settings and then retry.

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Error codes E4DFH to E4E3H

Table9.6 Error codes E400H to E4FFH (Continued)

Error Code	Error Description	Action
E4DFH	(1) The DP-Slave is not able to respond. (2) Because of current processing of a Class2 service, the DP-Slave cannot handle the next service. (3) The INITIATE service has not been executed. (4) A transmission timeout has occurred after execution of the INITIATE service. (5) A system switching occurred during service execution in the redundant system.	(1) Check the PROFIBUS cable wiring status and start completion status of the DP-Slave, and then retry. For the start completion status of the DP-Slave, refer to the manual for the DP-Slave. (2) When Acyclic communications have been continuously executed to the same DP-Slave, check the execution intervals and retry. For the execution intervals of the Acyclic communication, refer to the manual for the DP-Slave. (3) Retry after execution of the INITIATE service. (4) Increase the set transmission timeout value of the INITIATE service. (5) After leaving it for a while, retry the execution from the INITIATE service in the new control system. Depending on the DP-Slave the time allowed for re-execution varies. Continue retrying until it is normally executed.
E4E0H	No response was received from the DP-Slave.	Check the DP-Slave status and retry.
E4E1H	Any of the following functions are being executed from the same DP-Master to the same DP-Slave. • Acyclic communication • Alarm acquisition • FDT/DTM technology	Verify that the processing of the following functions is completed, and retry. • Acyclic communication • Alarm acquisition • FDT/DTM technology
E4E2H E4E3H	Hardware failure	Please consult your local Mitsubishi representative, explaining a detailed description of the problem.

9.5.4 Error codes E500H to E5FFH (Error codes generated when reading alarms)

Table9.7 Error codes E500H to E5FFH

Error Code	Error Description	Action
E500H	The FDL address of the target DP-Slave is out of the range.	Check if the specified FDL address is correct, and retry.
E501H	The FDL address specified for the target DP-Slave belongs to a non-configured station.	
E502H	The FDL address specified for the target DP-Slave belongs to the local station (QJ71PB92V).	
E503H	The FDL address specified for the target DP-Slave belongs to a reserved or temporarily reserved station.	
E504H	The alarm read request code is incorrect.	Check if the specified request code is correct, and retry.
E505H	The ACK request bit is incorrect.	Check if the bit specified in the buffer memory address 26434 (6742H) is correct, and retry.
E506H	Alarm read error response	Check the detailed error codes 1 to 3 and take corrective actions.
E507H	Currently not exchanging I/O data	Turn ON the Data exchange start request signal (Y00), and retry.
E508H	There is an error response to the ACK request.	Check the detailed error codes 1 to 3 and take corrective actions.
E510H	Physical execution error was detected	Check the detailed error codes 2 and 3, and take corrective actions.
E520H	Incorrect parameter in the request was detected on the DP-Slave side.	Check if the request data supported by the DP-Slave is correctly set or not, and retry. For details, refer to the manual for the DP-Slave.
E521H	There is no alarm that can be used on the DP-Slave side.	
E530H	Use of the alarm function is not allowed.	Check if the DP-Slave supports the alarm function or not, and retry.
E531H	Invalid DP-Slave status	Check if the DP-Slave is properly exchanging I/O data or not, and retry.
E540H	The FDL address of the target DP-Slave is out of the range.	Check if the specified FDL address is correct, and retry.
E541H	The FDL address specified for the target DP-Slave belongs to a non-configured station.	
E542H	The FDL address specified for the target DP-Slave belongs to the local station (QJ71PB92V).	
E543H	The FDL address specified for the target DP-Slave belongs to a reserved or temporarily reserved station.	
E544H	The alarm type is incorrect.	Check if the alarm data returning ACK is stored in the Alarm response area (Un\G26446 to Un\26768), and retry.
E545H	Alarm ACK request error response	Check the detailed error codes 1 to 3 and take corrective actions.
E546H	The slot number is incorrect.	Check if the alarm data returning ACK is stored in the Alarm response area (Un\G26446 to Un\26768), and retry.
E547H	The sequence number is incorrect.	
E550H	Physical execution error was detected	Check the detailed error codes 2 and 3, and take corrective actions.
E551H	Execution error on the protocol was detected.	
E552H	Execution error on the application was detected.	
E560H	Read error was detected on the DP-Slave side.	Check if the request data supported by the DP-Slave is correctly set or not, and retry. For details, refer to the manual for the DP-Slave.
E561H	Write error was detected on the DP-Slave side.	
E562H	Module error was detected on the DP-Slave side.	
E563H	Processing on the DP-Slave side is not available.	

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Error codes E564H to E59DH

Table9.7 Error codes E500H to E5FFH (Continued)

Error Code	Error Description	Action
E564H	Application error was detected on the DP-Slave side.	Check if the request data supported by the DP-Slave is correctly set or not, and retry. For details, refer to the manual for the DP-Slave.
E565H	Request-not-supported error was detected on the DP-Slave side.	
E566H	Incorrect index was detected on the DP-Slave side	
E567H	Incorrect data length was detected on the DP-Slave side.	
E568H	Incorrect slot number was detected on the DP-Slave side.	
E569H	Incorrect data type was detected on the DP-Slave side.	
E56AH	Access to an access-disabled area was attempted from the DP-Slave side.	
E56BH	Access is not available on the DP-Slave side.	
E56CH	The access was rejected on the DP-Slave side.	
E56DH	Incorrect access range was detected on the DP-Slave side.	
E56EH	Incorrect request was detected on the DP-Slave side.	
E56FH	Incorrect data type was detected on the DP-Slave side.	
E570H	Incorrect parameter in the request was detected on the DP-Slave side.	
E571H	Resource error was detected during read processing on the DP-Slave side.	
E572H	Resource error was detected during write processing on the DP-Slave side.	
E573H	The resource is already in use on the DP-Slave side.	
E574H	There is no resource that can be used on the DP-Slave side.	
E575H	Incorrect parameter exists in the ACK request.	
E576H	There is no alarm for which ACK can be requested.	Check the alarm status on the specified DP-Slave and retry.
E580H		
E581H	The alarm specified for ACK request is not found.	
E582H	Use of the alarm function is not allowed.	Check if the DP-Slave supports the alarm function or not, and retry.
E590H	Hardware failure	Please consult your local Mitsubishi representative, explaining a detailed description of the problem.
E591H		
E592H		
E593H		
E594H		
E595H		
E596H		
E597H		
E598H		
E599H		
E59AH		
E59BH	Acyclic communication is executed to the same DP-Slave.	Verify that the Acyclic communication is completed, and retry.
E59CH	There is no executable resource.	
E59DH	There is an invalid parameter setting.	Check the parameter settings and then retry.

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Error codes E59EH to E5A2H

Table9.7 Error codes E500H to E5FFH (Continued)

Error Code	Error Description	Action
E59EH	The DP-Slave is not able to respond. Or, because of current processing of a Class2 service, the DP-Slave cannot handle the next service.	Check the PROFIBUS cable wiring status and start completion status of the DP-Slave, and then retry. When Acyclic communications have been continuously executed to the same DP-Slave, check the execution intervals and retry. For the start completion status of the DP-Slave and the Acyclic communication execution intervals, refer to the manual for the DP-Slave.
E59FH	No response was received from the DP-Slave.	Check the DP-Slave status and retry.
E5A0H	Any of the following functions are being executed from the same DP-Master to the same DP-Slave. • Acyclic communication • Alarm acquisition • FDT/DTM technology	Verify that the processing of the following functions is completed, and retry. • Acyclic communication • Alarm acquisition • FDT/DTM technology
E5A1H	Hardware failure	Please consult your local Mitsubishi representative, explaining a detailed description of the problem.
E5A2H		

9.5.5 Error codes E600H to E6FFH (Error codes generated when executing time control)

Table9.8 Error codes E600H to E6FFH

Error Code	Error Description	Action
E600H	The request code is incorrect.	Check if the request code is correct, and retry.
E601H	No clock data have been written from another time master.	After writing clock data from another time master, execute the time data read request again.
E602H E603H E604H E605H	Hardware failure	Please consult your local Mitsubishi representative, explaining a detailed description of the problem.
E606H	A set value of the time master is invalid.	Modify it so that the time master can read it out, and then retry.
E611H	The UTC second value set in the Time control setting request area (Un\G26784 to Un\G26792) is out of the range.	Check if the UTC second value is correct, and retry. (Section 7.6.2)
E612H E613H E614H E615H E622H E623H E624H E625H	Hardware failure	Please consult your local Mitsubishi representative, explaining a detailed description of the problem.
E626H	Incorrect Year (At the time of write request)	Check if the request data is correct, and retry.
E627H	Incorrect Month (At the time of write request)	
E628H	Incorrect Day (At the time of write request)	
E629H	Inconsistent Date (At the time of write request)	
E62AH	Incorrect Hour (At the time of write request)	
E62BH	Incorrect Minute (At the time of write request)	
E62CH	Incorrect Second (At the time of write request)	
E62DH	Clock data is out of the range. (At the time of write request)	

9.5.6 Error codes F100H to F1FFH (Local diagnostic information of the QJ71PB92V)

Table9.9 Error codes F100H to F1FFH

Error Code	LED Status	Error Description	Action
F100H	FAULT LED ON	FDL address No. of a DP-Slave is duplicated with that of the DP-Master in the parameter settings.	Check the FDL addresses of the DP-Master and DP-Slaves, and set correct parameters without duplication.
F101H	FAULT LED ON	No DP-Slaves are set up for I/O data exchange.	Check the following and correct the setting so that one or more DP-Slaves can exchange I/O data. • Is the slave parameter, "Slave is active" checked? • In the temporary slave reservation, haven't all of DP-Slaves been specified as reserved stations?
F102H F103H F104H F105H	FAULT LED ON	Hardware failure	Replace the QJ71PB92V. If the same error occurs again, please consult your local Mitsubishi representative, explaining a detailed description of the problem.
F106H	PRM SET LED flashing	Parameters have not been written to the flash ROM.	Write the parameters.
F107H	FAULT LED ON	The parameters or operation mode read from the flash ROM are corrupted.	Initialize the flash ROM, and then write the parameters and operation mode. If the same error occurs again, replace the QJ71PB92V.
F108H	FAULT LED ON	Unable to access the flash ROM. Or failed to initialize the flash ROM.	Initialize the flash ROM. If the same error occurs again, replace the QJ71PB92V.
F109H	PRM SET LED flashing	Parameters of the QJ71PB92D were written with the QJ71PB92D-compatible function disabled.	• Change the module selected in the GX Configurator-DP project to QJ71PB92V, and write the parameters. • Check Switch 2 of the intelligent function module switches. (Section 6.7)
F10AH	PRM SET LED flashing	Parameters of the QJ71PB92V were written with the QJ71PB92D-compatible function enabled.	• Change the module selected in the GX Configurator-DP project to QJ71PB92D, and write the parameters. • Check Switch 2 of the intelligent function module switches. (Section 6.7)
F10BH	FAULT LED ON	Unable to read the operation mode registered to the flash ROM.	Initialize the flash ROM. If the same error occurs again, replace the QJ71PB92V.
F10CH	PRM SET LED flashing	In the parameter settings, there is a DP-Slave whose I/O data size is set to 0 byte.	Check the slave parameters, and make the setting again to ensure that the I/O data size of each DP-Slave is 1byte or more.
F10DH	PRM SET LED flashing	Parameter error	Initialize the flash ROM. If the same error occurs again, please consult your local Mitsubishi representative, explaining a detailed description of the problem.
F10EH F10FH	FAULT LED ON	Hardware failure	Please consult your local Mitsubishi representative, explaining a detailed description of the problem.

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Error codes F110H to FB01H

Table9.9 Error codes F100H to F1FFH (Continued)

Error Code	LED Status	Error Description	Action
F110H	—	Although Data consistency start request signal (Y0C) is ON, the BBLKRD instruction is not executed.	Modify the sequence program so that the BBLKRD instruction is executed when Data consistency start request signal (Y0C) is ON.
F111H	—	Although Data consistency start request signal (Y0C) is ON, the BBLKWR instruction is not executed.	Modify the sequence program so that the BBLKWR instruction is executed when Data consistency start request signal (Y0C) is ON.
F112H	—	Although Data consistency start request signal (Y0C) is ON, the BBLKRD and BBLKWR instructions are not executed.	Modify the sequence program so that the BBLKRD and BBLKWR instructions are executed when Data consistency start request signal (Y0C) is ON.
F113H	—	Data consistency start request signal (Y0C) was turned ON during execution of the data consistency function in automatic refresh.	The data consistency function in automatic refresh and dedicated instructions are not concurrently executable. In the master parameter setting of GX Configurator-DP, disable the data consistency function. (Section 6.3)
F120H	RSP ERR. LED ON	Diagnostic information was generated on a DP-Slave.	Check Diagnostic information area for diagnostic information generated in a DP-Slave and take corrective actions.
F121H	RSP ERR. LED ON	There is a DP-Master or DP-Slave that has a duplicated FDL address on the same line.	Check the FDL addresses of the DP-Master and DP-Slaves, and set correct parameters without duplication. When the QJ71PB92V is mounted on a redundant system, reset Switch 1 in the intelligent function module switch setting. (Section 6.7)
F122H	RSP ERR. LED ON	An error has been detected on the line. Or, some master parameter is not appropriate.	Check the wiring status of the bus terminator(s) and PROFIBUS cable(s). If the terminating resistor and PROFIBUS cable wiring status is correct, increase the set value of the master parameter, "Min. slave interval".
F123H			
F124H			
F125H	RSP ERR. LED ON	The DP-Master is in the clear request transmission status.	Since "Error action flag" is check-marked in the master parameter settings, the clear request has been sent to all DP-Slaves. To disable transmission of the clear request, uncheck "Error action flag".
F1FEH	FAULT LED ON	Hardware failure	Please consult your local Mitsubishi representative, explaining a detailed description of the problem.
F1FFH			
FB00H	FAULT LED ON	The standby master FDL address is out of the range.	Reset Switch 1 in the intelligent function module switch setting. (Section 6.7)
FB01H	FAULT LED ON	The FDL address of the control master is duplicated with that of the standby master.	Reset the following items: • "FDL address" in the master parameter setting of GX Configurator-DP (Section 6.3) • Switch 1 in the intelligent function module switch setting of GX Developer (Section 6.7)

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Error codes FB02H to FB04H

Table9.9 Error codes F100H to F1FFH (Continued)

Error Code	LED Status	Error Description	Action
FB02H	FAULT LED ON	The FDL address of the standby master is duplicated with that of a DP-Slave.	Reset the following items: • Switch 1 in the intelligent function module switch setting of GX Developer (Section 6.7) • "FDL Address" in the slave parameter setting of GX Configurator-DP (Section 6.5)
FB03H	FAULT LED ON	An error has occurred during processing of system switching (Control system → Standby system)	Please consult your local Mitsubishi representative, explaining a detailed description of the problem.
FB04H	FAULT LED ON	An error has occurred during processing of system switching (Standby system → Control system)	• Check the wiring status of the bus terminator(s) and PROFIBUS cable(s). (Section 5.5.1) If the bus terminators and PROFIBUS cables are correctly connected, increase the set value of the master parameter, "Min. slave interval". • In the multi-master system configuration, check if the FDL address of the control master is duplicated with that of another DP-Master. • If the same error occurs again after performing the above, please consult your local Mitsubishi representative, explaining a detailed description of the problem.

9.6 How to Return the QJ71PB92V to Its Factory-set Conditions

This section explains how to return the QJ71PB92V to its factory-set condition.
This procedure initializes the flash ROM of the QJ71PB92V.
Perform the following procedure, for example, when parameters in the flash ROM are corrupted (The PRM SET LED is flashing).

(1) Stop the QCPU

(2) Connect the GX Developer to the QCPU, and perform the following steps (a) to (k) by using the Device test on the GX Developer

(a) Write 9_H to the Operation mode change request area (Un\G2255) of the QJ71PB92V.

(b) Turn ON the Operation mode change request signal (Y11).

(c) When the Operation mode change completed signal (X11) has turned ON, turn OFF the Operation mode change request signal (Y11).

(d) Write F_H to the Operation mode change request area (Un\G2255) of the QJ71PB92V.

(e) Turn ON the Operation mode change request signal (Y11).

(f) When the Operation mode change completed signal (X11) has turned ON, turn OFF the Operation mode change request signal (Y11).

(g) Write A_H to the Operation mode change request area (Un\G2255) of the QJ71PB92V.

(h) Turn ON the Operation mode change request signal (Y11).

(i) When the Operation mode change completed signal (X11) has turned ON, turn OFF the Operation mode change request signal (Y11).

(j) The TEST LED turns ON, and the processing for returning the QJ71PB92V to its factory-set conditions is started.

(k) When the processing is completed, the following status will be identified.
- When normally completed: The TEST LED turns OFF.
- When failed: The TEST and FAULT LEDs are ON.

When the processing has failed, please consult your local Mitsubishi representative, explaining a detailed description of the problem.

POINT

If the redundant CPU is in the Backup mode, the operation mode of the QJ71PB92V cannot be changed.
An error code is stored in the Operation mode change result area (Un\G2256).
(☞ Section 9.5.2)
The operation mode of the QJ71PB92V must be changed when the redundant CPU is in Separate or Debug mode. (☞ QnPRHCPU User's Manual (Redundant System))

(3) **Reapply power to or reset the QCPU**

The PRM SET LED on the QJ71PB92V turns ON, and the QJ71PB92V starts in the Parameter setting mode (mode 1).
Write the QJ71PB92V parameters on GX Configurator-DP.

APPENDICES

Appendix 1 Functional Upgrade of the QJ71PB92V

The following table shows the functions added to the QJ71PB92V, and the applicable function version and serial No. for each function.
Refer to this section and check if your QJ71PB92V supports respective functions.

TableApp.1 Function Upgrade of the QJ71PB92V

Additional function	Function version	Serial No.
Temporary slave reservation function	D	—
Redundant system support function	D	—
QJ71PB92D-compatible function	—	09052 or later

—: No restrictions

Remark

For how to check the function version and serial No, refer to Section 2.4.

Appendix 2 Differences between the QJ71PB92V and Former Models

This section compares the specifications of the QJ71PB92V and those of the former models, and explains the precautions to be taken when replacing the system and programs.
The former models are shown in the following table.

TableApp.2 List of Former Models

Model	Remarks
QJ71PB92D	The model, QJ71PB92D is compared here. For replacement with the QJ71PB92V (QJ71PB92D-compatible function), refer to the following manual. PROFIBUS-DP Interface Module User's Manual: SH-080127
A1SJ71PB92D	Products of hardware version B and software version F or later are compared here. For versions earlier than the above, refer to the following manual to check differences. PROFIBUS-DP Interface Module Type AJ71PB92D/A1SJ71PB92D User's Manual: IB-66773
AJ71PB92D	Products of software version B or later are compared in this manual. For versions earlier than the above, refer to the following manual to check differences. PROFIBUS-DP Interface Module Type AJ71PB92D/A1SJ71PB92D User's Manual: IB-66773

Appendix 2.1 Specification comparisons

The following compares the performance specifications and functions between the QJ71PB92V and former models.

(1) Comparisons of performance specifications

TableApp.3 Comparisons of Performance Specifications

<table>
<tr><th colspan="3">Item</th><th>QJ71PB92V</th><th>QJ71PB92D</th><th>A1SJ71PB92D/AJ71PB92D</th></tr>
<tr><td colspan="3">PROFIBUS-DP station type</td><td>DP-Master (Class 1) (IEC 61158 compliant)</td><td colspan="2">DP-Master (Class 1) (EN50170 compliant)</td></tr>
<tr><td colspan="3">Transmission specifications</td><td colspan="3">—</td></tr>
<tr><td rowspan="13"></td><td colspan="2">Electrical standard/ characteristics</td><td colspan="3">EIA-RS485 compliant</td></tr>
<tr><td colspan="2">Medium</td><td colspan="3">Shielded twisted pair cable</td></tr>
<tr><td colspan="2">Network topology</td><td colspan="3">Bus topology (Tree topology when repeaters are used)</td></tr>
<tr><td colspan="2">Data link method</td><td colspan="3">• Between DP-Masters: Token passing method
• Between DP-Master and DP-Slave: Polling method</td></tr>
<tr><td colspan="2">Encoding method</td><td colspan="3">NRZ</td></tr>
<tr><td colspan="2">Transmission speed</td><td colspan="3">9.6kbps, 19.2kbps, 93.75kbps, 187.5kbps, 500kbps, 1.5Mbps, 3Mbps, 6Mbps, 12Mbps</td></tr>
<tr><td colspan="2">Transmission distance</td><td colspan="3">100 m to 1200 m (Differs depending on the transmission speed)</td></tr>
<tr><td colspan="2">Max. no. of repeaters</td><td colspan="3">3 repeaters</td></tr>
<tr><td colspan="2">Number of connectable modules (Per segment)</td><td colspan="3">32 per segment (including repeater(s))</td></tr>
<tr><td colspan="2">Number of connectable modules (Per network)</td><td colspan="3">126 per network (total of DP-Masters and DP-Slaves)</td></tr>
<tr><td colspan="2">Max. no. of DP-Slaves</td><td>125 per QJ71PB92V *1</td><td colspan="2">60 per QJ71PB92D/A1SJ71PB92D/AJ71PB92D</td></tr>
<tr><td rowspan="2">I/O data size</td><td>Input data</td><td>Max. 8192 bytes (Max. 244 bytes per DP-Slave)</td><td colspan="2">(1) In normal service mode
Max. 32 bytes per DP-Slave
(2) In extended service mode
Max. 1920 bytes (Max. 244 bytes per DP-Slave)</td></tr>
<tr><td>Output data</td><td>Max. 8192 bytes (Max. 244 bytes per DP-Slave)</td><td colspan="2">(1) In normal service mode
Max. 32 bytes per DP-Slave
(2) In extended service mode
Max. 1920 bytes (Max. 244 bytes per DP-Slave)</td></tr>
<tr><td colspan="3">No. of occupied I/O points</td><td colspan="2">32 (I/O assignment: 32 intelligent points)</td><td>32 (I/O assignment: 32 special points)</td></tr>
</table>

* 1 The number of DP-Slaves is 124 when the QJ71PB92V is used in a redundant system.

(2) Functional comparisons

TableApp.4 Functional Comparisons

Function		QJ71PB92V	QJ71PB92D	A1SJ71PB92D/AJ71PB92D
PROFIBUS-DPV0		—		
	I/O data exchange	○ *1	○ *1	○ *1
	Acquisition of diagnostic and extended diagnostic information	○	○ *2	○ *2
	Global control function	○	○	○
PROFIBUS-DPV1		—		
	Acyclic communication with DP-Slaves	○	×	×
	Alarm acquisition	○	×	×
	Support of FDT/DTM technology	○	×	×
PROFIBUS-DPV2		—		
	Time control over DP-Slaves	○	×	×
Data swap function		○	○	×
Data consistency function		○	○	○ *3
Output status setting for the case of a CPU stop error		○	○ *4	×
Temporary slave reservation		○	×	×
Redundant system support function		○	×	×
QJ71PB92D-compatible function		○	×	×

○ : Available, × : Not available

* 1 They are different in the number of connectable DP-Slaves and I/O data size. ((1) in this appendix)
* 2 Extended diagnostic information cannot be read from any station.
* 3 Data consistency function by the FROM/TO instruction only is executable. (Data consistency function by automatic refresh or dedicated instructions is not executable.)
* 4 Set by the intelligent function module switch setting of GX Developer. (Section 6.7)

Appendix 2.2 Precautions for replacing the system

POINT

The Communication mode (mode 3) of the QJ71PB92V supports the PROFIBUS-DPV1 and -DPV2 functions.
Because of this, the bus cycle time is increased compared with the former models.
If fast response is required, reexamine and replace the existing system since some control timing may be delayed in the system.
For details on the bus cycle time of the QJ71PB92V, refer to Section 3.5.

(1) PROFIBUS cable

The PROFIBUS cables used for former models can be used for this model.

(2) Wiring

(a) PROFIBUS interface connector position
The PROFIBUS interface connector position is different from that of the former models.
If the PROFIBUS cable length is not long enough, extend the cable length by using an extension connector.

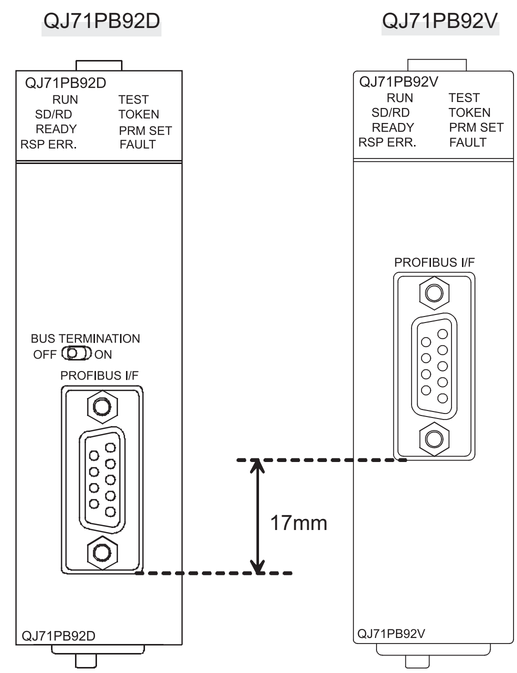


Figure App.1 QJ71PB92V and QJ71PB92D

(b) Bus terminator
The QJ71PB92V does not have any built-in bus terminator.
When the former model has been used with the bus terminator setting switch set to ON, use a PROFIBUS connector with a built-in bus terminator for the QJ71PB92V.
For wiring specifications for the bus terminator of the QJ71PB92V, refer to Section 5.5.1.

Remark

For details on PROFIBUS cables and connectors, access the following website.
- PROFIBUS International: http://www.profibus.com/

(3) Operation mode setting

Set the QJ71PB92V's operation mode on GX Configurator-DP or in the sequence program.

(4) Configuration software

Use GX Configurator-DP Version 7 or later for setting QJ71PB92V parameters.
Use of PROFIMAP or GX Configurator-DP Version 6 or earlier is not allowed.

(5) Parameters

(a) Parameter conversion
Convert parameters of former models using GX Configurator-DP Version 7 or later.
Parameter conversion can be executed by "Change Master Type" on GX Configurator-DP.
After modifying parameters, be sure to check the parameters.

(b) Auto-refresh parameter check (for the QJ71PB92D only)
If refresh target devices for other than I/O data are set up in the QJ71PB92D, check the refresh ranges.
The refresh ranges are different between the QJ71PB92D and QJ71PB92V.

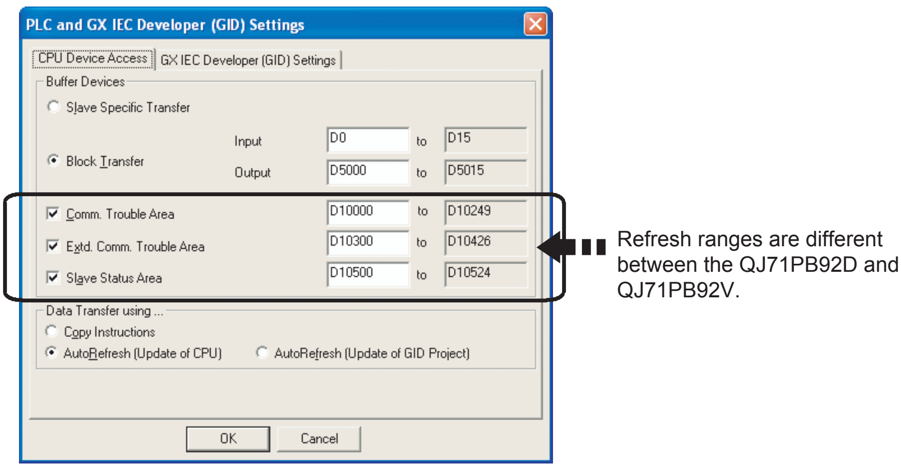


Figure App.2 Checking Auto-refresh Parameters

Appendix 2.3 Precautions for replacing programs

(1) I/O signals

(a) Input signals

Some input signals have been changed.

Change programs referring to the following table.

TableApp.5 Input Signal Comparisons

Input signal	Signal name			Compatibility	Replacement precautions
	QJ71PB92V	QJ71PB92D	A1SJ71PB92D/ AJ71PB92D		
X00	Data exchange start completed signal ON: I/O data exchange start completed OFF: I/O data exchange start not completed			○	—
X01	Diagnostic information detection signal ON: Diagnostic information detected OFF: No diagnostic information detected			△	(2)(a) in this section
X02	Diagnostic information area cleared signal ON: Area cleared OFF: Area not cleared	Communication trouble area clear end signal ON: Area cleared OFF: Area not cleared		△	(2)(b) in this section
X03	Use prohibited			○	—
X04	Global control completed signal ON: Global control completed OFF: Global control not completed			○	—
X05	Global control failed signal ON: Global control failed OFF: Global control normally completed			○	—
X06	Extended diagnostic information read response signal ON: Completed OFF: Not completed	Use prohibited		○	—
X07	Use prohibited			○	—
X08	Use prohibited			○	—
X09	Use prohibited			○	—
X0A	Use prohibited			○	—
X0B	Use prohibited			○	—
X0C	Data consistency requesting signal ON: Data consistency enabled OFF: Data consistency disabled	Use prohibited		○	—

○ : Compatible, △ : Partially compatible, × : Not compatible

(To the next page)

TableApp.5 Input Signal Comparisons (Continued)

Input signal	Signal name: QJ71PB92V	Signal name: QJ71PB92D	Signal name: A1SJ71PB92D/ AJ71PB92D	Compatibility	Replacement precautions
X0D	Use prohibited		Watchdog timer error signal ON: Watchdog timer error occurred OFF: Watchdog timer error not occurred	△	When replacing the A1SJ71PB92D/ AJ71PB92D, refer to *1 shown below.
X0E	Use prohibited			○	—
X0F	Use prohibited			○	—
X10	Operation mode signal ON: Other than Communication mode (mode 3) OFF: Communication mode (mode 3)	Operation mode signal ON: Parameter setting mode (mode 1) OFF: Other than Parameter setting mode (mode 1)		△	The operation mode in which this signal is ON is different.
X11	Operation mode change completed signal ON: Completed OFF: Not completed			○	—
X12	Use prohibited			○	—
X13	Use prohibited			○	—
X14	Use prohibited			○	—
X15	Use prohibited			○	—
X16	Use prohibited			○	—
X17	Use prohibited			○	—
X18	Alarm read response signal ON: Completed OFF: Not completed	Use prohibited		○	—
X19	Time control start response signal ON: Completed OFF: Not completed	Use prohibited		○	—
X1A	Use prohibited			○	—
X1B	Communication READY signal ON: I/O data exchange ready OFF: I/O data exchange not ready			○	—
X1C	Use prohibited			○	—

○ : Compatible, △ : Partially compatible, × : Not compatible

* 1 The watchdog timer error signal code has been changed to X1F. Change the corresponding section in the sequence program.

(To the next page)

TableApp.5 Input Signal Comparisons (Continued)

Input signal	Signal name			Compatibility	Replacement precautions
	QJ71PB92V	QJ71PB92D	A1SJ71PB92D/ AJ71PB92D		
X1D	Module READY signal ON: Module start completed OFF: Module start not completed			○	—
X1E	Use prohibited			○	—
X1F	Watchdog timer error signal ON: Watchdog timer error occurred OFF: Watchdog timer error not occurred		Use prohibited	△	When replacing the A1SJ71PB92D/ AJ71PB92D, refer to *1 shown below.

○ : Compatible, △ : Partially compatible, × : Not compatible

* 1 The watchdog timer error signal code has been changed to X1F. Change the corresponding section in the sequence program.

(b) Output signals
Some output signals have been changed.
Change programs referring to the following table.

TableApp.6 Output Signal Comparisons

Output signal	Signal name			Compatibility	Replacement precautions
	AJ71PB92D/ A1SJ71PB92D	QJ71PB92D	QJ71PB92V		
Y00	Data exchange start request signal ON: I/O data exchange start OFF: I/O data exchange stop			○	—
Y01	Diagnostic information detection reset request signal ON: Diagnostic information detection signal reset OFF: —	Communication trouble detection signal reset ON: Communication trouble detection signal reset OFF: —		△	☞(2)(a) in this section
Y02	Diagnostic information area clear request signal ON: Diagnostic and extended diagnostic information area clear request OFF: —	Communication trouble area clear request signal ON: Communication and extended communication trouble area clear request OFF: —		△	☞(2)(b) in this section
Y03	Use prohibited	Communication trouble area type selection signal ON: Fixed type OFF: Ring type		△	Not used in QJ71PB92V. Delete the corresponding section in the sequence program.
Y04	Global control request signal ON: Global control execution request OFF: —			○	—
Y05	Use prohibited			○	—
Y06	Extended diagnostic information read request signal ON: Extended diagnostic information read request OFF: —	Use prohibited		○	—
Y07	Use prohibited			○	—
Y08	Use prohibited			○	—
Y09	Use prohibited			○	—

○ : Compatible, △ : Partially compatible, × : Not compatible

(To the next page)

TableApp.6 Output Signal Comparisons (Continued)

Output signal	Signal name: AJ71PB92D/ A1SJ71PB92D	Signal name: QJ71PB92D	Signal name: QJ71PB92V	Compatibility	Replacement precautions
Y0A	Use prohibited			○	—
Y0B	Use prohibited			○	—
Y0C	Data consistency start request signal ON: Data consistency by dedicated instruction enabled OFF: Data consistency by dedicated instruction disabled	Dedicated instruction valid signal ON: Data consistency by dedicated instruction enabled OFF: Data consistency by dedicated instruction disabled	Use prohibited	○	—
Y0D	Restart request signal ON: Restart request OFF: —			○	—
Y0E	Use prohibited			○	—
Y0F	Use prohibited			○	—
Y10	Use prohibited			○	—
Y11	Operation mode change request signal ON: Operation mode change OFF: —			△	(2)(c) in this section
Y12	Use prohibited			○	—
Y13	Use prohibited			○	—
Y14	Use prohibited			○	—
Y15	Use prohibited			○	—
Y16	Use prohibited			○	—
Y17	Use prohibited			○	—
Y18	Alarm read request signal ON: Alarm read request OFF: —	Use prohibited		○	—
Y19	Time control start request signal ON: Time control start request OFF: —	Use prohibited		○	—
Y1A	Use prohibited			○	—
Y1B	Use prohibited			○	—
Y1C	Use prohibited			○	—
Y1D	Use prohibited			○	—
Y1E	Use prohibited			○	—
Y1F	Use prohibited			○	—

○ : Compatible, △ : Partially compatible, × : Not compatible

(2) Differences in I/O signal operations

(a) Communication trouble detection signal reset (Y01) and Communication trouble detection signal (X01)

While the Communication trouble detection signal reset (Y01) is ON, another communication failure may occur. In such cases, the QJ71PB92D detects the failure again.

The QJ71PB92V does not detect the failure.

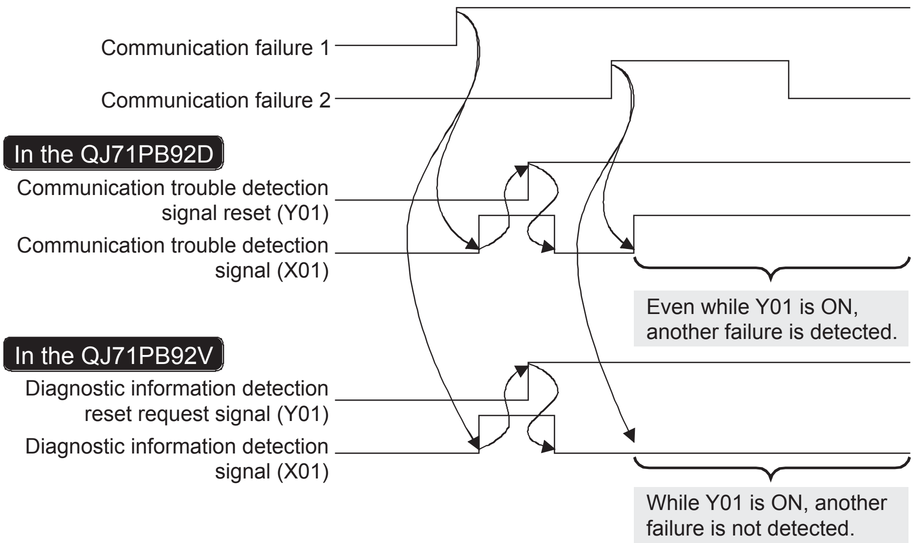


Figure App.3 When Another Communication Failure Occurs While Y01 is ON

When the Communication trouble detection signal (X01) turns OFF by the Communication trouble detection signal reset (Y01) during a communication failure, even if the reset signal (Y01) is turned OFF, the QJ71PB92D does not detect this failure again.

The QJ71PB92V detects the failure.

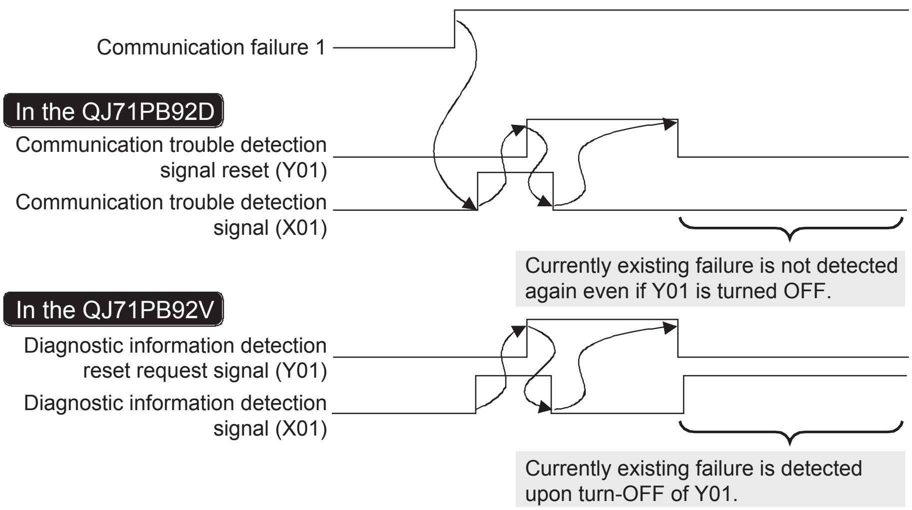
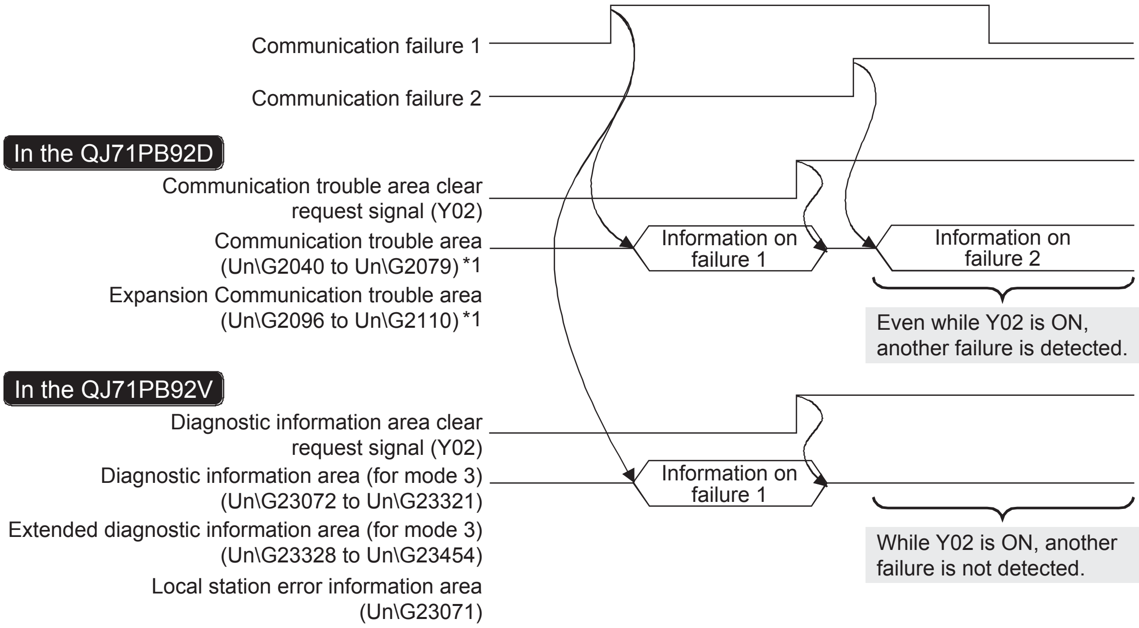


Figure App.4 When Y01 is Turned OFF

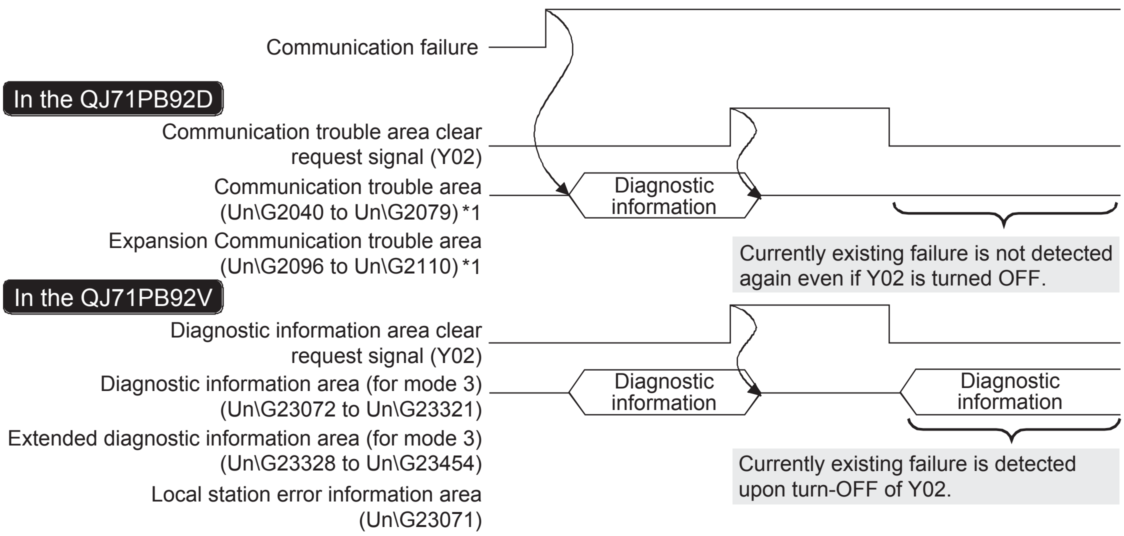
(b) Communication trouble area clear request signal (Y02) and Communication trouble area clear end signal (X02)
If another communication failure occurs while the Communication trouble area clear request signal (Y02) is ON, the QJ71PB92D detects it again.
The QJ71PB92V does not detect the failure.



*1 For details,refer to the following manual.
PROFIBUS-DP Interface Module User's Manual

Figure App.5 When Another Communication Failure Occurs While Y01 is ON

When the diagnostic information of the currently existing failure is cleared by the Communication trouble area clear request signal (Y02), even if the clear request signal (Y02) is turned OFF, the QJ71PB92D does not store the diagnostic information again.
The QJ71PB92V stores the diagnostic information.



*1 For details,refer to the following manual.
PROFIBUS-DP Interface Module User's Manual

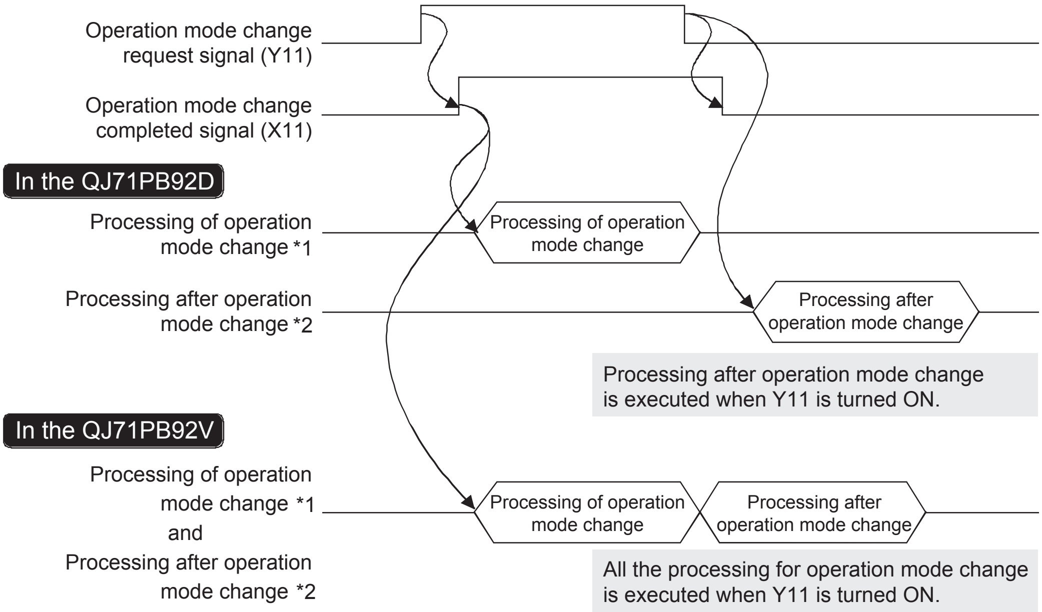
Figure App.6 When Y02 is Turned OFF

(c) Operation mode change request signal (Y11)

The following processing is executed at a different timing. For the processing other than the following, the operation is the same as that of the QJ71PB92D/ A1SJ71PB92D/AJ71PB92D.

- Self-diagnostics start timing (Self-diagnostic mode (mode 2))
- Return-to-factory-set-condition timing (By writing AH to the Operation mode change request area (Un\G2255), the status is returned to the factory-set condition with the Operation mode change request signal (Y11).)

In the QJ71PB92D, the processing is executed when the Operation mode change request signal (Y11) is turned OFF.
In the QJ71PB92V, the processing is executed when the Operation mode change request signal (Y11) is turned ON.



*1 Storing a value into the Current operation mode area (Un\G2254)
Storing a value into the Operation mode change result area (Un\G2256)

*2 Execution of self-diagnostics
Returning to the factory-set condition (Flash ROM initialization)

Figure App.7 Operation Mode Change Request Signal (Y11) Behavior

(3) Buffer memory

Changes have been made to buffer memory addresses.
Change programs referring to the following table.

TableApp.7 Buffer Memory Comparisons

QJ71PB92V: Buffer memory address DEC (HEX)	QJ71PB92V: Area name	QJ71PB92D/A1SJ71PB92D/AJ71PB92D: Buffer memory address DEC (HEX)	QJ71PB92D/A1SJ71PB92D/AJ71PB92D: Area name	Replacement precautions
2256 (8D0$_H$)	Operation mode change result area	2256 (8D0$_H$)	Operation mode change result area	In the QJ71PB92V, values stored in the buffer memory and operation specifications are different. (Section 3.4.1) Modify the relevant parts of the sequence program.
2258 (8D2$_H$)	Offline test status area	2258 (8D2$_H$)	Self-diagnostic test status code area	
6144 to 10239 (1800$_H$ to 27FF$_H$)	Input data area (for mode 3)	0 to 959 (0$_H$ to 3BF$_H$)	Input area	Buffer memory addresses have been changed. Modify the relevant parts of the sequence program.
14336 to 18431 (3800$_H$ to 47FF$_H$)	Output data area (for mode 3)	960 to 1919 (3C0$_H$ to 77F$_H$)	Output area	
22528 to 22777 (5800$_H$ to 58F9$_H$)	Address information area (for mode 3)	1920 to 2039 (780$_H$ to 7F7$_H$)	Address information area	
23072 to 23321 (5A20$_H$ to 5B19$_H$)	Diagnostic information area (for mode 3)	2040 to 2079 (7F8$_H$ to 81F$_H$)	Communication trouble area	Buffer memory addresses have been changed. In the QJ71PB92V, values stored in the buffer memory and operation specifications are different. (Section 3.4.1) Modify the relevant parts of the sequence program.
23328 to 23454 (5B20$_H$ to 5B9E$_H$)	Extended diagnostic information area (for mode 3)	2096 to 2110 (830$_H$ to 83E$_H$)	Expansion communication trouble area	
23056 to 23064 (5A10$_H$ to 5A18$_H$)	Slave status area (Diagnostic information detection)	2112 to 2116 (840$_H$ to 844$_H$)	Slave status area	
22784 to 22908 (5900$_H$ to 597C$_H$)	Input data start address area (for mode 3)	2128 to 2247 (850$_H$ to 8C7$_H$)	I/O start address (Extended service mode (MODE E) only)	Buffer memory addresses have been changed. Modify the relevant parts of the sequence program.
22912 to 23036 (5980$_H$ to 59FC$_H$)	Output data start address area (for mode 3)			

(4) **Program replacement examples**

The following example shows how sample programs provided in the QJ71PB92D manual are changed for the QJ71PB92V.

For the A1SJ71PB92D and AJ71PB92D, replace the programs referring to the following replacement examples.

(a) Deleting the diagnostic information area type selection signal (Y03)

Relevant sample programs: Sections 7.1, 7.2, 7.3, and 7.4

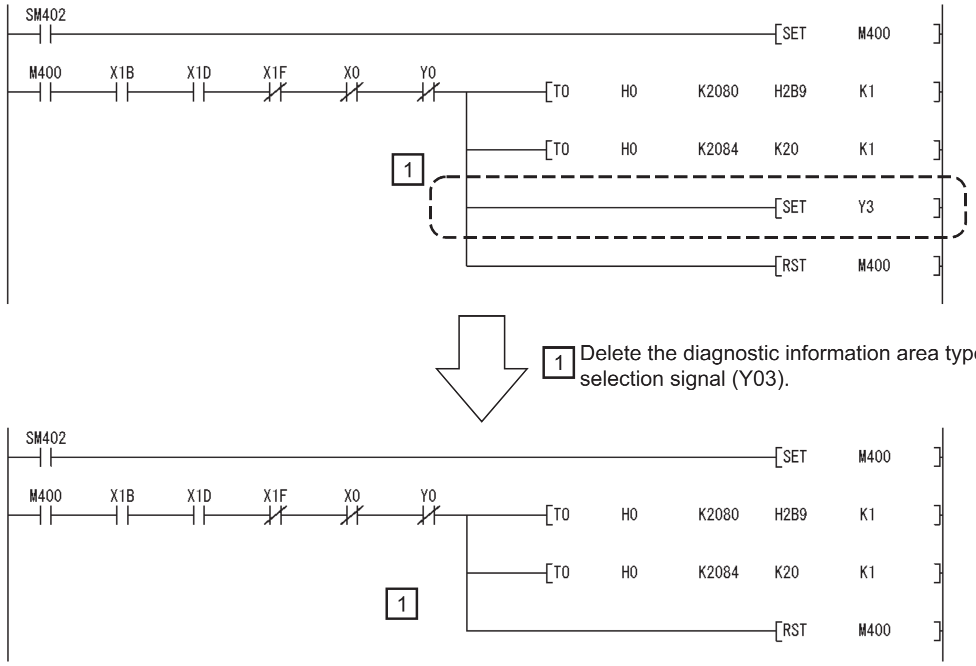


Figure App.8 Deleting the Diagnostic Information Area Type Selection Signal (Y03)

(b) Changing an input start address and an output start address
Relevant sample program: Section 7.3

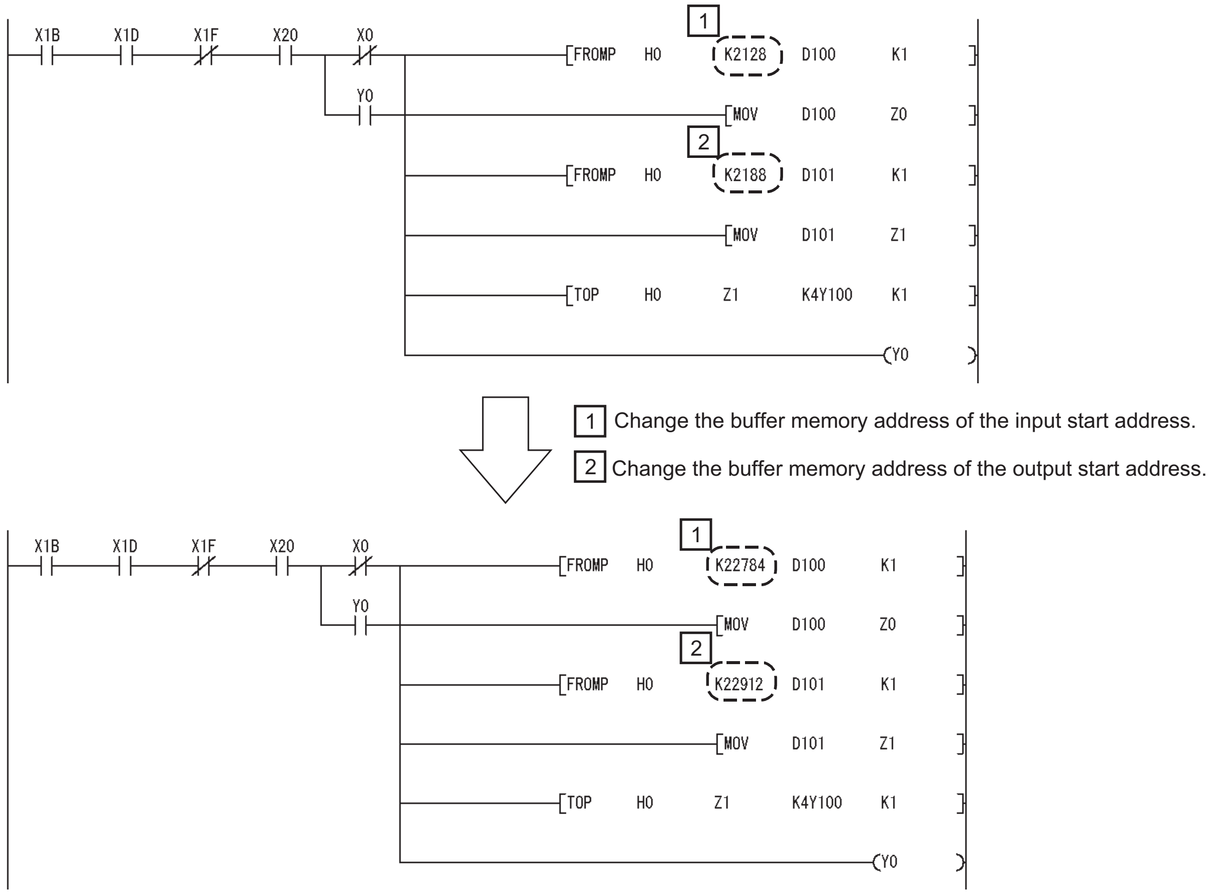


Figure App.9 Changing Input and Output Start Addresses

(c) Changing the input area and output area
Relevant sample programs: Section 7.1, 7.2, and 7.4
In the following example, the sample program in section 7.2 is replaced.

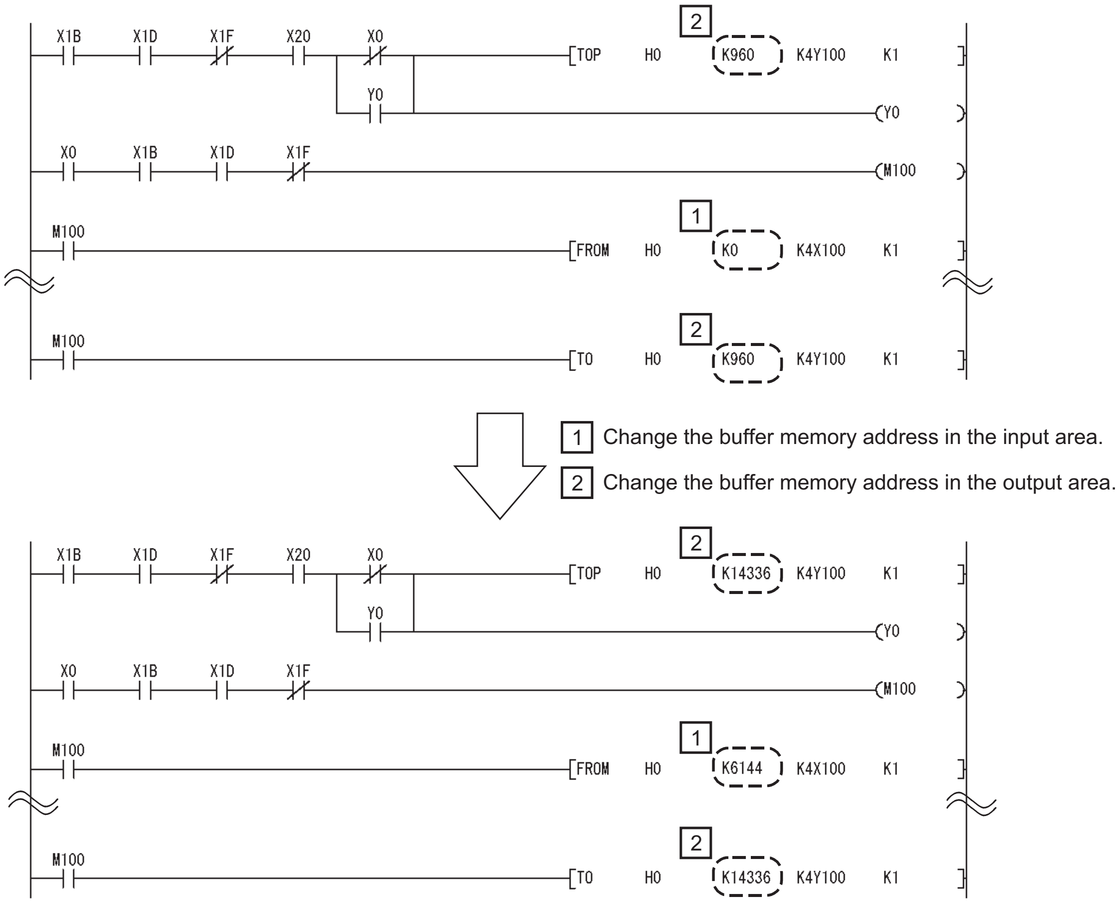


Figure App.10 Changing Input and Output Areas

(d) Changing a program for input and output data
Relevant sample programs: Section 7.1, 7.2, 7.3, and 7.4
In the following example, the sample program in section 7.2 is replaced.

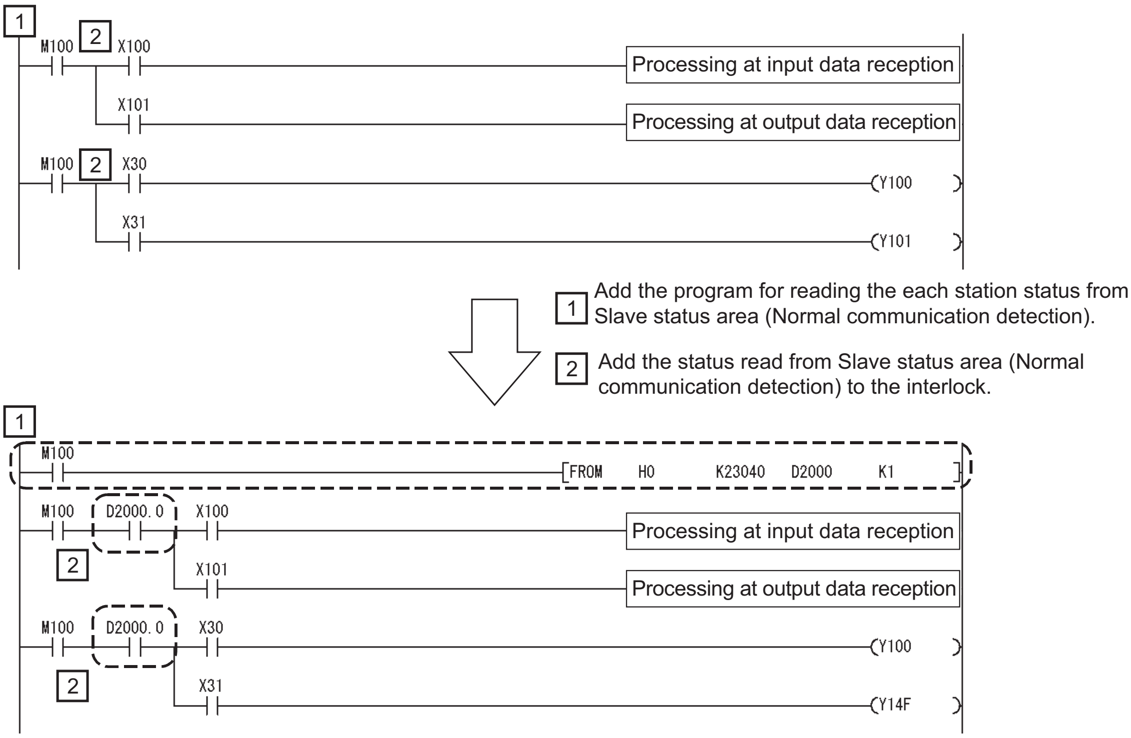


Figure App.11 Changing Program for Input and Output Data

(e) Changing the program for reading diagnostic information
Relevant sample programs: Section 7.1, 7.2, 7.3, and 7.4

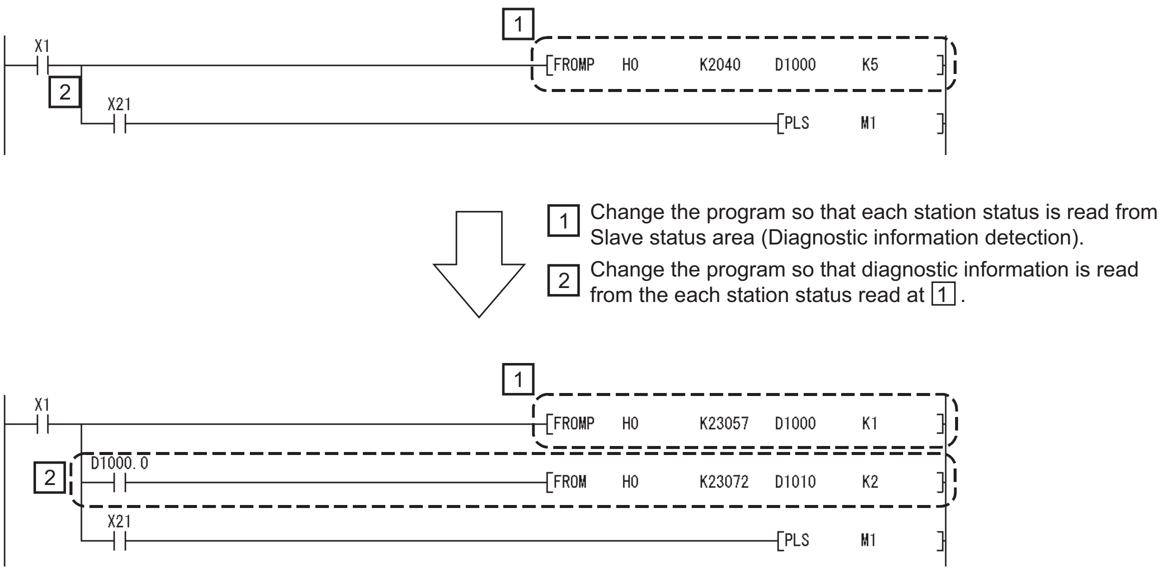
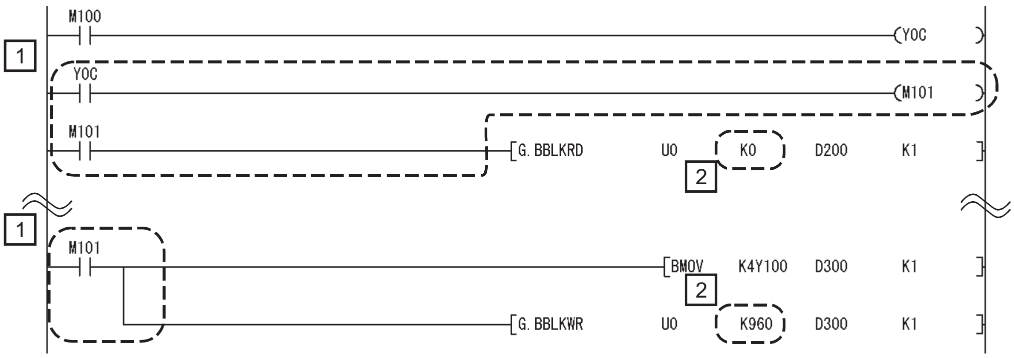


Figure App.12 Changing Program for Reading Diagnostic Information

(f) Replacing a dedicated instruction (QJ71PB92D only)
Relevant sample program: Section 7.4



1 Add X0C to the dedicated instruction interlock.

2 Change the buffer memory addresses of the input area and output area.

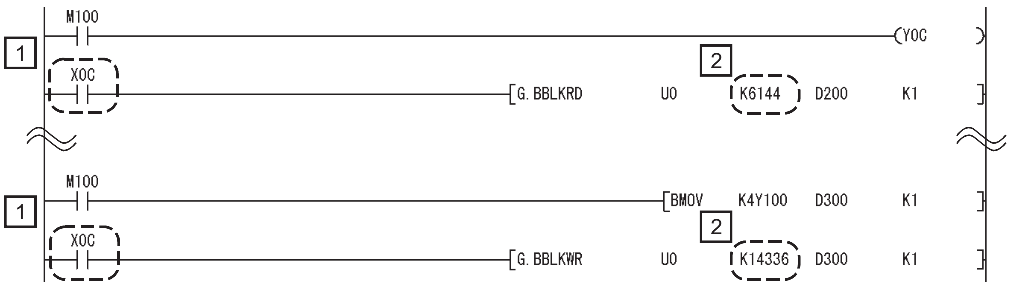


Figure App.13 Replacing Dedicated Instruction (QJ71PB92D only)

Appendix 3 External Dimensions

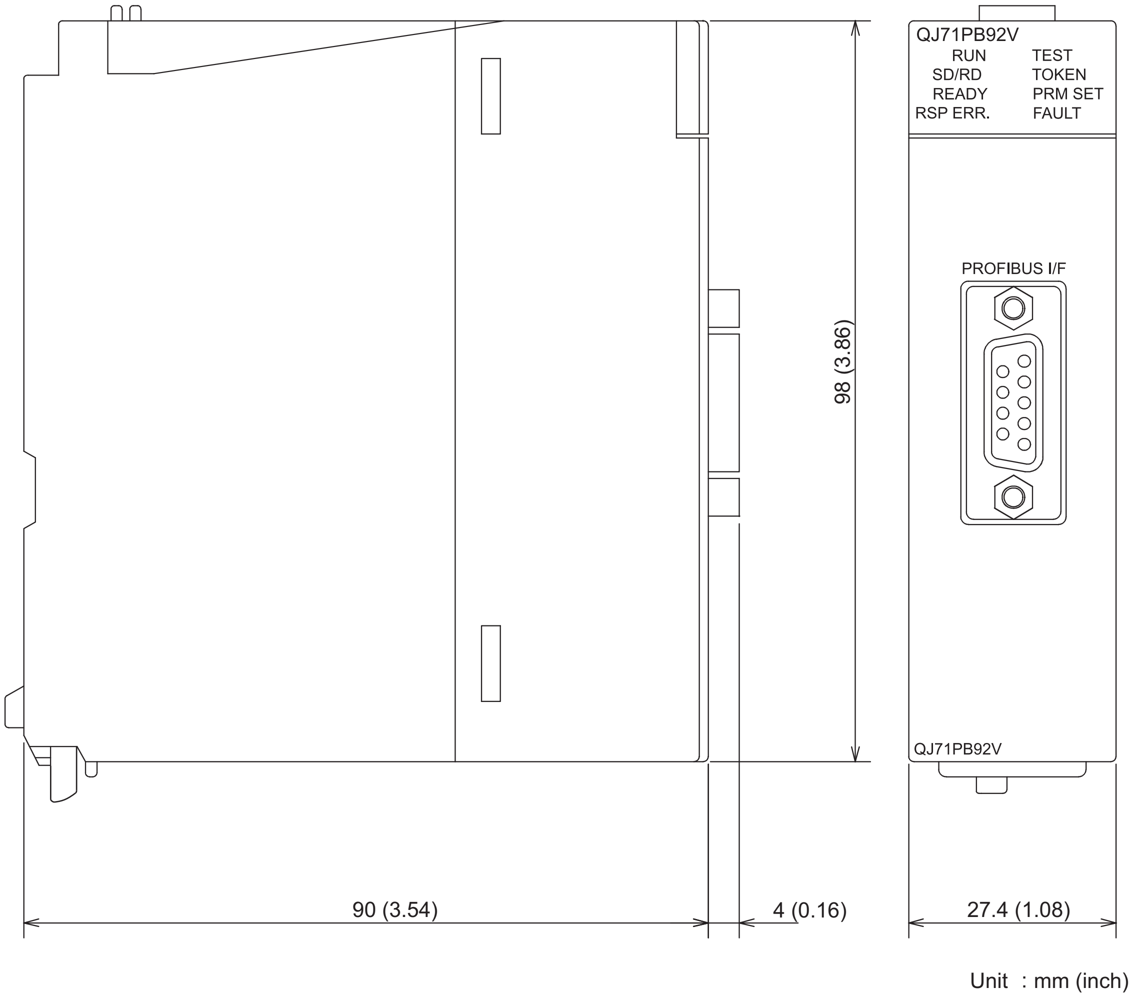


Figure App.14 External Dimensions

Memo

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Warranty

Please confirm the following product warranty details before using this product.

1. Gratis Warranty Term and Gratis Warranty Range

If any faults or defects (hereinafter "Failure") found to be the responsibility of Mitsubishi occurs during use of the product within the gratis warranty term, the product shall be repaired at no cost via the sales representative or Mitsubishi Service Company.

However, if repairs are required onsite at domestic or overseas location, expenses to send an engineer will be solely at the customer's discretion. Mitsubishi shall not be held responsible for any re-commissioning, maintenance, or testing on-site that involves replacement of the failed module.

[Gratis Warranty Term]

The gratis warranty term of the product shall be for one year after the date of purchase or delivery to a designated place.

Note that after manufacture and shipment from Mitsubishi, the maximum distribution period shall be six (6) months, and the longest gratis warranty term after manufacturing shall be eighteen (18) months. The gratis warranty term of repair parts shall not exceed the gratis warranty term before repairs.

[Gratis Warranty Range]

(1) The range shall be limited to normal use within the usage state, usage methods and usage environment, etc., which follow the conditions and precautions, etc., given in the instruction manual, user's manual and caution labels on the product.

(2) Even within the gratis warranty term, repairs shall be charged for in the following cases.

1. Failure occurring from inappropriate storage or handling, carelessness or negligence by the user. Failure caused by the user's hardware or software design.
2. Failure caused by unapproved modifications, etc., to the product by the user.
3. When the Mitsubishi product is assembled into a user's device, Failure that could have been avoided if functions or structures, judged as necessary in the legal safety measures the user's device is subject to or as necessary by industry standards, had been provided.
4. Failure that could have been avoided if consumable parts (battery, backlight, fuse, etc.) designated in the instruction manual had been correctly serviced or replaced.
5. Failure caused by external irresistible forces such as fires or abnormal voltages, and Failure caused by force majeure such as earthquakes, lightning, wind and water damage.
6. Failure caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.
7. Any other failure found not to be the responsibility of Mitsubishi or that admitted not to be so by the user.

2. Onerous repair term after discontinuation of production

(1) Mitsubishi shall accept onerous product repairs for seven (7) years after production of the product is discontinued.
Discontinuation of production shall be notified with Mitsubishi Technical Bulletins, etc.

(2) Product supply (including repair parts) is not available after production is discontinued.

3. Overseas service

Overseas, repairs shall be accepted by Mitsubishi's local overseas FA Center. Note that the repair conditions at each FA Center may differ.

4. Exclusion of loss in opportunity and secondary loss from warranty liability

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation of damages caused by any cause found not to be the responsibility of Mitsubishi, loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products, special damages and secondary damages whether foreseeable or not , compensation for accidents, and compensation for damages to products other than Mitsubishi products, replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

5. Changes in product specifications

The specifications given in the catalogs, manuals or technical documents are subject to change without prior notice.

6. Product application

(1) In using the Mitsubishi MELSEC programmable controller, the usage conditions shall be that the application will not lead to a major accident even if any problem or fault should occur in the programmable controller device, and that backup and fail-safe functions are systematically provided outside of the device for any problem or fault.

(2) The Mitsubishi programmable controller has been designed and manufactured for applications in general industries, etc. Thus, applications in which the public could be affected such as in nuclear power plants and other power plants operated by respective power companies, and applications in which a special quality assurance system is required, such as for Railway companies or Public service purposes shall be excluded from the programmable controller applications.
In addition, applications in which human life or property that could be greatly affected, such as in aircraft, medical applications, incineration and fuel devices, manned transportation, equipment for recreation and amusement, and safety devices, shall also be excluded from the programmable controller range of applications.
However, in certain cases, some applications may be possible, providing the user consults their local Mitsubishi representative outlining the special requirements of the project, and providing that all parties concerned agree to the special circumstances, solely at the users discretion.

PROFIBUS-DP Master Module

User's Manual

MODEL	QJ71PB92V-U-SY-E
MODEL CODE	13JR84
SH(NA)-080572ENG-C(0705)MEE	

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