

# MELSEC L-Series

Programmable Logic Controllers

User's Manual

## PROFIBUS DP Slave Module ME2PB1-L





**User's Manual**  
**ME2PB1-L PROFIBUS DP Slave Module**  
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# About this manual

The texts, illustrations, diagrams and examples in this manual are provided for information purposes only. They are intended as aids to help explain the installation, operation, programming and use of the programmable controllers of the Mitsubishi MELSEC-L series.

If you have any questions about the installation and operation of any of the products described in this manual please contact your local sales office or distributor (see back cover).

You can find the latest information and answers to frequently asked questions on our website at <https://eu3a.mitsubishielectric.com>.

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# Safety guidelines

## For use by qualified staff only

This manual is only intended for use by properly trained and qualified electrical technicians who are fully acquainted with the relevant automation technology safety standards. All work with the hardware described, including system design, installation, configuration, maintenance, service and testing of the equipment, may only be performed by trained electrical technicians with approved qualifications who are fully acquainted with all the applicable automation technology safety standards and regulations. Any operations or modifications to the hardware and/or software of our products not specifically described in this manual may only be performed by authorized Mitsubishi Electric staff.

## Proper use of the products

The ME2PB1-L PROFIBUS DP Slave Module is only intended for the specific applications explicitly described in this manual. All parameters and settings specified in this manual must be observed. The products described have all been designed, manufactured, tested and documented in strict compliance with the relevant safety standards.

Unqualified modification of the hardware or software or failure to observe the warnings on the products and in this manual may result in serious personal injury and/or damage to property. Only peripherals and expansion equipment specifically recommended and approved by Mitsubishi Electric may be used with the programmable controllers of the MELSEC-L series.

All and any other uses or application of the products shall be deemed to be improper.

## Relevant safety regulations

All safety and accident prevention regulations relevant to your specific application must be observed in the system design, installation, configuration, maintenance, servicing and testing of these products. The regulations listed below are particularly important in this regard.

This list does not claim to be complete; however, you are responsible for being familiar with and conforming to the regulations applicable to you in your location.

- VDE Standards
  - VDE 0100  
Regulations for the erection of power installations with rated voltages below 1000 V
  - VDE 0105  
Operation of power installations
  - VDE 0113  
Electrical installations with electronic equipment
  - VDE 0160  
Electronic equipment for use in power installations
  - VDE 0550/0551  
Regulations for transformers
  - VDE 0700  
Safety of electrical appliances for household use and similar applications
  - VDE 0860  
Safety regulations for mains-powered electronic appliances and their accessories for household use and similar applications.
- Fire safety regulations
- Accident prevention regulation
  - VBG No. 4  
Electrical systems and equipment

**Safety warnings in this manual**

In this manual special warnings that are important for the proper and safe use of the products are clearly identified as follows:



**DANGER:**

*Personnel health and injury warnings.*

*Failure to observe the safety warnings identified with this symbol can result in health and injury hazards for the user.*



**CAUTION:**

*Equipment and property damage warnings.*

*Failure to observe the safety warnings identified with this symbol can result in damage to the equipment or other property.*



## General safety information and precautions

The following safety precautions are intended as a general guideline for using PLC systems together with other equipment. These precautions must always be observed in the design, installation and operation of all control systems.



### **DANGER:**

- **Observe all safety and accident prevention regulations applicable to your specific application. Always disconnect all power supplies before performing installation and wiring work or opening any of the assemblies, components and devices.**
- **Assemblies, components and devices must always be installed in a shockproof housing fitted with a proper cover and fuses or circuit breakers.**
- **Devices with a permanent connection to the mains power supply must be integrated in the building installations with an all-pole disconnection switch and a suitable fuse.**
- **Check power cables and lines connected to the equipment regularly for breaks and insulation damage. If cable damage is found immediately disconnect the equipment and the cables from the power supply and replace the defective cabling.**
- **Before using the equipment for the first time check that the power supply rating matches that of the local mains power.**
- **Take appropriate steps to ensure that cable damage or core breaks in the signal lines cannot cause undefined states in the equipment.**
- **You are responsible for taking the necessary precautions to ensure that programs interrupted by brownouts and power failures can be restarted properly and safely. In particular, you must ensure that dangerous conditions cannot occur under any circumstances, even for brief periods. EMERGENCY OFF must be switched forcibly, if necessary.**
- **Residual current protective devices pursuant to DIN VDE Standard 0641 Parts 1-3 are not adequate on their own as protection against indirect contact for installations with PLC systems. Additional and/or other protection facilities are essential for such installations.**
- **EMERGENCY OFF facilities conforming to EN 60204/IEC 204 and VDE 0113 must remain fully operative at all times and in all control system operating modes. The EMERGENCY OFF facility reset function must be designed so that it cannot ever cause an uncontrolled or undefined restart.**
- **You must implement both hardware and software safety precautions to prevent the possibility of undefined control system states caused by signal line cable or core breaks.**
- **When using modules always ensure that all electrical and mechanical specifications and requirements are observed exactly.**
- **Do not install/remove the module more than 50 times after the first use of the product (conforming to IEC 61131-2). Failure to do so may cause the module to malfunction due to poor contact of connector.**

### Precautions to prevent damages by electrostatic discharge

Electronic devices and modules can be damaged by electrostatic charge, which is conducted from the human body to components of the controller. Always take the following precautions, when handling the controller.



#### CAUTION:

- *Before touching a module of the controller, always touch grounded metal, etc. to discharge static electricity from human body. Failure to do so may cause the module to fail or malfunction.*
- *Wear isolating gloves when touching the powered controller, e. g. at maintenance during visual check.*
- *You shouldn't wear clothing made of synthetic fiber at low humidity. This clothing gets a very high rate of electrostatic charge.*

### 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 Xn1).*  
*An erroneous output or malfunction may cause accidents.*
  - *The input data from the master station remains unchanged from the data prior to the communication error.*
  - *When the master station becomes faulty, the output status of the ME2PB1-L will be as in the parameter settings of the master station.*
  - *When any ME2PB1-L is down, the output state of other slave stations will be in accordance with the parameter settings of the master station.*
- *Do not output the "use prohibited" signal as the output signal to an intelligent function module from the programmable controller CPU.*  
*Doing so may cause malfunction of the programmable controller system.*
- *Wiring data into the "system area" or outputting a signal for "use prohibited" may cause system malfunction in the programmable controller.*

## Installation Precautions



### 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 100 mm or more between them.*  
*Failure to do so may result in malfunction due to noise.*
- **Use the programmable controller in an environment that meets the general specifications in the user's manual for the CPU module used.**  
*Failure to do so may result in electric shock, fire, malfunction, or damage to or deterioration of the product.*
- **Shut off the external power supply (all phases) used in the system before mounting or removing the module.**  
*Failure to do so may result in damage to the product.*
- **Do not directly touch any conductive parts and electronic components of the module.**  
*Doing so can cause malfunction or failure of the module.*
- **To interconnect modules, engage the respective connectors and securely lock the module joint levers.**  
*Incorrect interconnection may cause malfunction, failure, or drop of the module.*

## Wiring precautions



### CAUTION:

- **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 cause the module to fail or malfunction.*
- **Prevent foreign matter such as dust or wire chips from entering the module.**  
*Such foreign matter can cause a fire, failure, or malfunction.*
- **Be sure to place the PROFIBUS cables in a duct or clamp them.**  
*If not, dangling cable may swing or inadvertently be pulled, resulting in damage to the module or cables or malfunction due to poor contact.*
- **When disconnecting the 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.*

### Startup and maintenance precautions



**DANGER:**

***Shut off the external power supply (all phases) used in the system before cleaning the module. Failure to do so may result in electric shock or cause the module to fail or malfunction.***



**CAUTION:**

- ***Do not disassemble or modify the modules. Doing so may cause failure, malfunction, injury, or a fire.***
- ***Use any radio communication device such as a cellular phone or PHS (Personal Handy-phone System) more than 25 cm away in all directions from the programmable controller. Failure to do so may cause malfunction.***
- ***Shut off the external power supply (all phases) used in the system before mounting or removing the module. Failure to do so may cause the module to fail or malfunction.***
- ***Module installation to or removal from the base unit is limited to 50 times after the first use of the product (IEC61131-2 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.***
- ***Set the ON/OFF select switch of the terminal resistor before the operation. If the setting is switched during the operation, network error may occur, or error detection may not be performed by error.***

### Operating precautions



**DANGER:**

***Do not write data into the "not usable" of the buffer memory of special function modules. Also, do not output the "not usable" signal as the output signal to a special function module from the PLC CPU.***

***Writing data into the "not usable area" or outputting an "not usable" signal may cause system malfunctions in the PLC.***



**CAUTION:**

***The online operations conducted for the CPU module being operated (especially when changing data or operation status), shall be conducted after the manual has been carefully read and a sufficient check of safety has been conducted.***

***Operation mistakes could cause breakdowns to or malfunction of the module.***

**Disposal precautions**



**CAUTION:**

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



# Symbols used in the manual

## Use of notes

Notes concerning important information are marked separately and are displayed as follows:

**NOTE**

| Note text

## Use of numbering in the figures

Numbering within the figures is displayed by white numbers within black circles and is explained in a table following it using the same number, e.g.:

❶ ❷ ❸ ❹

## Use of handling instructions

Handling instructions are steps that must be carried out in their exact sequence during startup, operation, maintenance and similar operations.

They are numbered consecutively (black numbers in white circles):

- ❶ Text.
- ❷ Text.
- ❸ Text.

## Use of footnotes in tables

Instructions in tables are explained in footnotes underneath the tables (in superscript). There is a footnote character at the appropriate position in the table (in superscript).

If there are several footnotes for one table then these are numbered consecutively underneath the table (black numbers in white circle, in superscript):

- ❶ Text
- ❷ Text
- ❸ Text

## Writing conventions and guidance notes

Keys or key-combinations are indicated in square brackets, such as [Enter], [Shift] or [Ctrl]. Menu names of the menu bar, of the drop-down menus, options of a dialogue screen and buttons are indicated in italic bold letters, such as the drop down menu ***New*** in the ***Project*** menu or the option ***Serial USB*** in the "Transfer Setup Connection" screen.





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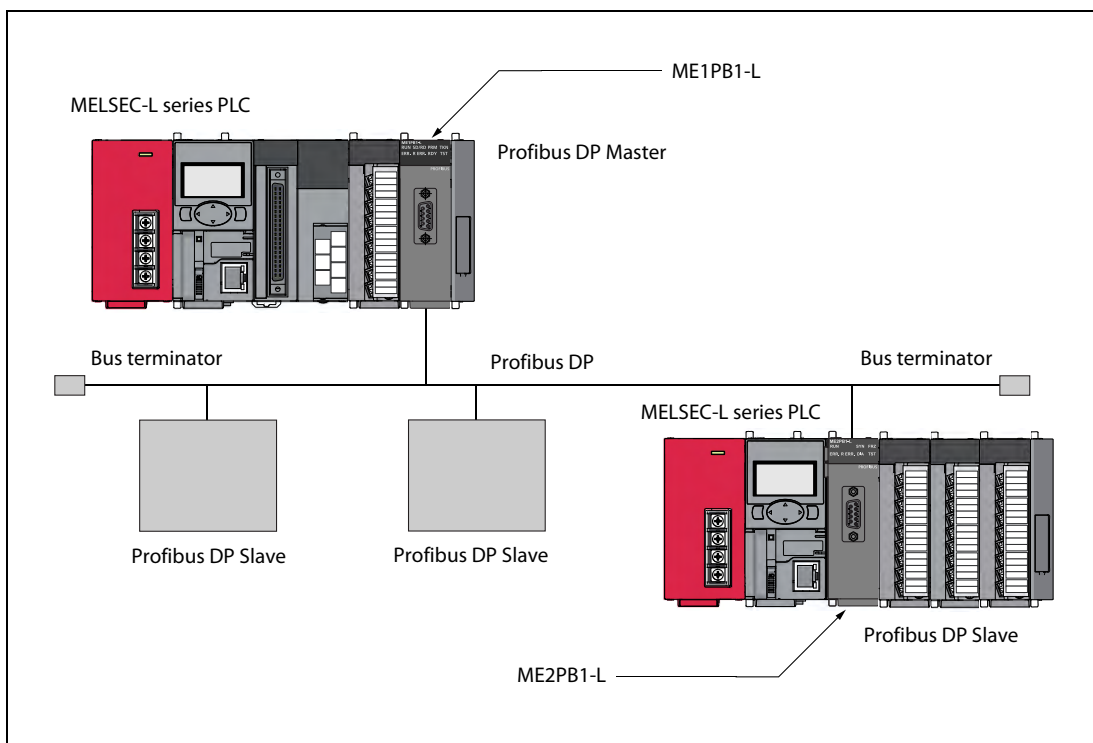
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# 1 Overview

This manual explains the specifications, functions, procedures before system operation, and troubleshooting for the ME2PB1-L Profibus DP slave module (hereinafter referred to as "ME2PB1-L").

The ME2PB1-L operates as a slave station in a Profibus DP network.



**Fig. 1-1:** Profibus DP using ME2PB1-L

# 1.1 Features

The following describes the features of the ME2PB1-L.

## Conformance with EN50170 Volume 2 (Part 1, 2, 3, 4, 8)

The ME2PB1-L conforms with EN50170 Volume 2 (Part 1, 2, 3, 4, 8) and can communicate with the master station as a Profibus DP slave station.

## I/O data communication with class 1 master station

The ME2PB1-L can communicate I/O data with the class 1 master station (master station that makes data communication cyclically with a slave station) of Profibus DP.

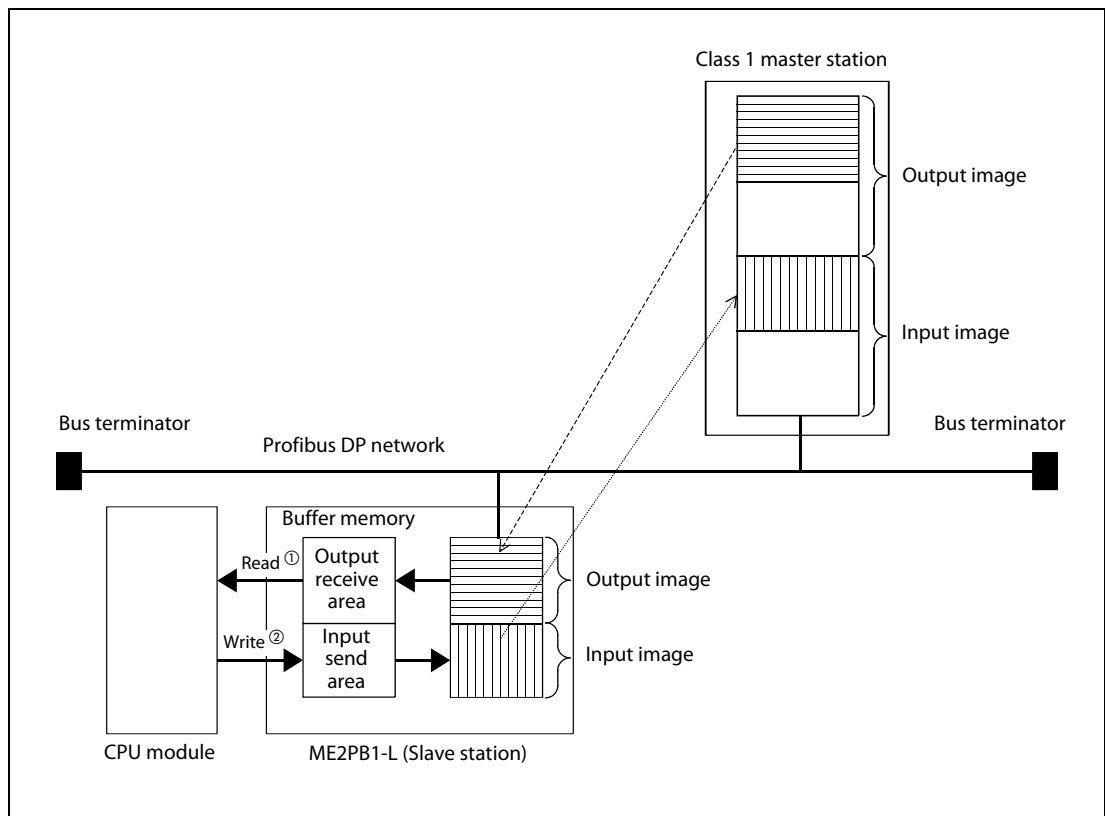
The ME2PB1-L supports the Profibus-DPV0 function.

Profibus-DPV1 and Profibus-DPV2, which are extended versions of Profibus DP, are not supported.

- Available data size

The ME2PB1-L can handle the following size of data. (Refer to section 4.1)

Input data: Max. 122 words	}	Max. 192 words in total
Output data: Max. 122 words		



**Fig. 1-2:** I/O data exchange between the Profibus DP master and a ME2PB1-L

- ① Reads with BBLKRD/MOV/FROM instruction or automatic refresh.
- ② Writes with BBLKWR/MOV/TO instruction or automatic refresh.

**Communication can be made by merely setting the master station parameters**

After you have set the parameters at the master station, the ME2PB1-L can make communication by merely setting the station number. (Refer to section 5.2)

**Swapping of I/O data**

When I/O data is sent/received from/to the master station, their upper and lower bytes can be swapped.

Though Profibus DP handles the upper and lower bytes of I/O data differently depending on the master station type, the I/O data need not be swapped in a sequence program. (Refer to section 4.4.1)

**Start/stop of refreshing the input send area**

Refreshing of send data from the ME2PB1-L to the master station is controllable by an output signal (Yn0).

Providing an interlock disables the buffer memory data from being sent to the master station at error occurrence. (Refer to section 4.1.1)

**Extended trouble notification function**

Data stored in the extended trouble information area of the buffer memory can be sent to the master station as extended trouble information\* when the host is faulty, for example.

When the host is not faulty anymore, notify the master station that there is no fault. (Refer to section 3.4.10)

\* Diagnostics Information (device-related trouble information set by the user as desired)

**Compatibility with global control function**

Compatibility with the global control function allows the updating of I/O data at the ME2PB1-L to be controlled from the class 1 master station using the command (SYNC, UNSYNC, FREEZE, UNFREEZE) sent by the class 1 master. (Refer to section 4.3.1)

**Communication with class 2 master station**

The following communications can be made with the class 2 master station (master station designed for network management to perform booting, maintenance and diagnostics) of Profibus DP.

- Read from input send area/output receive area
- Read of I/O configuration information
- Station number change

For the way to use each function, refer to the manual of the class 2 master station used.

**I/O data separation prevention**

For data transmission between the CPU module and buffer memory of the ME2PB1-L, automatic refresh or dedicated instruction are used to prevent I/O data from being separated\*. (Refer to section 4.2.1)

\* The data of specified sizes are not matched with each other.

## 1.2 Abbreviations and Generic Terms

Unless otherwise specified, this manual uses the following generic terms and abbreviations to describe the ME2PB1-L Profibus DP Slave Module.

General term / Abbreviation		Description
ME2PB1-L		Abbreviation for the ME2PB1-L Profibus DP Slave Module.
Profibus DP		Abbreviation of Profibus DP network
CC-Link IE		Abbreviation of CC-Link IE network system
MELSEC-L CPU L2CPU		Generic term for L series CPU modules, e.g. L02CPU, L02CPU-P, L26CPU-BT and L26CPU-PBT, etc.
PLC CPU CPU module		Generic term for programmable controller.
GX Works2		Generic product name for the programming and configuration software GX Works2.
BBLKRD		Abbreviation for the G. BBLKRD instruction
BBLKWR		Abbreviation for the G. BBLKWR instruction
Profibus DPV0		A basic version of Profibus DP. The following functions are executable: <ul style="list-style-type: none"> <li>• I/O data exchange</li> <li>• Diagnostic information notification, etc.</li> </ul>
Profibus DPV1		A Profibus DP version for which the following functions have been added to the basic functionality of Profibus DPV0. <ul style="list-style-type: none"> <li>• Acyclic communication</li> <li>• Alarm function, etc.</li> </ul>
Profibus DPV2		A Profibus DP version for which the following functions have been added to the Profibus DPV1 functionality. <ul style="list-style-type: none"> <li>• Time stamping, etc.</li> </ul>
DP-Master	Class 1	A device exchanging I/O data with a DP-Slave.
	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). (ME2PB1-L, 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.
GSD file		An electronic file that contains parameters of a DP-Slave. The GSD file is used to set up the slave parameters on the intelligent function utility.
FDL address		The numbers assigned to a DP-Master and DP-Slaves. The FDL address is set within the range from 0 to 125.
Configuration tool		Software used to set slave parameters, etc. and to write them to a master station.
Bus parameter		The parameter used for the communication setting of Profibus DP. The bus parameter is set up on the intelligent function utility.
Master parameter		The parameter used for the settings (FDL address, transmission speed, etc.) of the DP-Master. The master parameter is set up on the intelligent function utility.
Slave parameter		The parameter for a DP-Slave, which is set on the DP-Master. The slave parameter is set up on the intelligent function utility. The setting items are described on the GSD File.
I/O configuration data (Data module)		Information on input/output configuration of a DP-Slave
Input data		Data sent by the ME2PB1-L and received by the master station. (Data input by the master station.)
Output data		Data sent by the master station and received by the ME2PB1-L. (Data output by the master station.)
Global control		This function enables synchronization command transmission for I/O data from a DP-Master (Class 1) to DP-Slaves.
Communication watchdog timer		Watchdog timer set in the slave parameter of the master station.

**Tab. 1-1:** Abbreviations and general terms



General term / Abbreviation	Description
Module watchdog timer	Watchdog timer in the ME2PB1-L.
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.
Bus cycle time	Profibus DP processing time for the DP-Master to perform cyclic communication with each DP-Slave
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.

**Tab. 1-1:** *Abbreviations and general terms*



# 2 System Configuration

This chapter describes the overall configuration, number of connectable modules, and compatible software version of the ME2PB1-L.

## 2.1 Total Configuration

The ME2PB1-L can be connected to a CPU module, an extension module or a CC-Link IE Field network head module.

### 2.1.1 Applicable System

For the number of connectable modules and the compatible software version, refer to the following.

- MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection)
- MELSEC-L CC-Link IE Field Network Head Module User's Manual

### 2.1.2 Restrictions when the ME2PB1-L is connected to a head module

When the ME2PB1-L is connected to a CC-Link IE Field network head module LJ72GF15-T2, dedicated instructions (BBLKWR, BBLKRD) cannot be used. Data consistency between the head module and the ME2PB1-L is also not supported.

### 2.1.3 How to check the function version and serial No. of the modules

The serial No. and function version can be checked on the label attached to the right side of the module.

Using the programming software GX Works2, the serial No. and the function version can be checked while the PLC is operating.

From the **Diagnostics** menu select **System Monitor** and then select **Product Information List**.

Block	Slot	Type	Series	Model Name	Point	I/O Address	Serial No.	Ver	
0	CPU	Display Module	L	L6DSPU	-	-	111110000000000	A	
0	CPU	CPU	L	L26CPU-BT	-	-	111120000000000	A	11
0	CPU	Built-in I/O	L	L26CPU-BT	16Point	0000	111120000000000	A	11
0	CPU	Built-in CC-Link	L	L26CPU-BT	32Point	0010	111120000000000	A	11
0	0	Input	L	LX40C6	16Point	0030	-	-	
0	1	Intelli.	L	026ME2PB1-L	32Point	0040	150230000000000	A	
0	-	END Cover	-	LbEC	-	-	-	-	

**Fig. 2-1:** Product Information List for a PLC with a ME2PB1-L

## 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 ME2PB1-L as a slave station.

#### System equipment

The following table shows the equipment required for the Profibus DP system.

System equipment	Description
Slave station	ME2PB1-L
Class 1 master station	ME2PB1-L, QJ71PB92V, QJ71PB92D, etc.
Configuration tool	Configurator applicable to the master station
Repeater	Required when 32 or more stations are connected
Profibus cable	Refer to section 5.5.2
Bus terminator	

**Tab. 2-1:** System equipment

#### Network configuration

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

- Number of connectable modules in an entire network (When repeaters are used)  
 DP-Master + DP-Slaves <sup>①</sup> ≤ 126  
<sup>①</sup> Including the ME2PB1-L
- Number of connectable modules per segment  
 DP-Master + DP-Slaves <sup>①</sup> + repeaters <sup>②</sup> ≤ 32  
<sup>①</sup> Including the ME2PB1-L  
<sup>②</sup> A repeater is counted for both segments.
- Max. no. of repeaters  
 Up to 3 repeaters can be used for communication between the master station and the ME2PB1-L.
- Number of slave stations that are connectable to master station  
 The maximum number of slave stations that may be connected to one master station depends on the specifications of the master station.

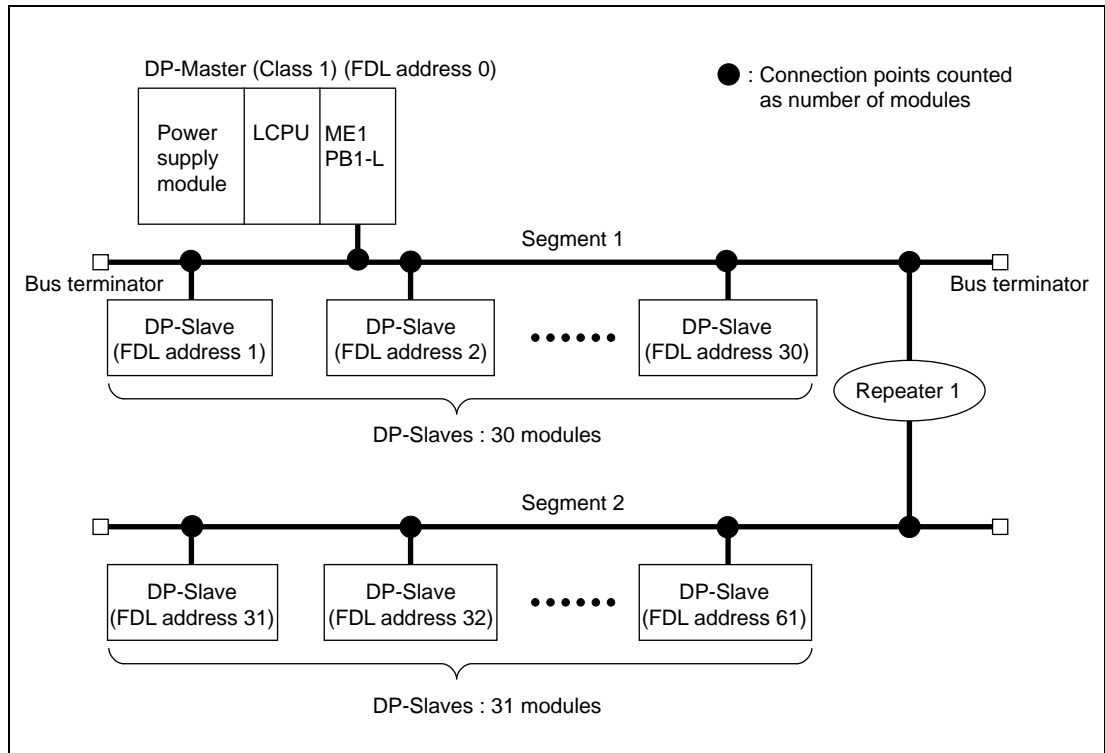
### 2.2.2 Profibus DP Network Configuration Example

#### Maximum configuration with one repeater connected

DP-Master (ME1PB1-L): 1

DP-Slaves: 61

Repeater: 1



**Fig. 2-2:** With one repeater, up to 61 slaves can be connected

## 2.3 Precautions for Configuring a System

### Precaution for station number setting

- If a station number different from the one of the currently operating station is set during I/O data communication, the communication is suspended to execute the setting.

It is restarted after completion of the station number setting.

- Do not change the operation mode during execution of the station number setting.

Doing so may disable proper station number setting or mode change.

### Precaution for parameter writing

- If a parameter based on a station number setting different from the one of the currently operating station is written to the ME2PB1-L that is exchanging I/O data, the I/O data communication is suspended. It is restarted after completion of parameter writing.

- Do not change the operation mode from the sequence program during parameter writing.

Doing so may disable proper station number setting or mode change.

- Do not write parameters from multiple configuration tools to a single ME2PB1-L at the same time.

Doing so makes the parameter values of the ME2PB1-L incorrect.

### When switching the operation mode using Y(n+1)1/X(n+1)1 on the sequence program

Be sure to switch the mode while the module READY signal (X(1+n)D) of the ME2PB1-L is ON.

If data are read from or written to the buffer memory with the X(1+n)D status ignored, the CPU module may detect an error to stop the sequence calculation.

## **3 Specifications**

### **3.1 General Specifications**

For the general specifications of the ME2PB1-L, refer to the manual "Safety Guidelines", the manual supplied with the CPU module or head module.

## 3.2 Performance Specifications

Item		Specifications
Profibus DP station type		Slave station (Complies with EN50170 Volume2 (Part 1, 2, 3, 4, 8))
Station numbers that may be set		0 to 125 <sup>②</sup>
Transmission data size	Input data	Max. 122 words <sup>③</sup>
	Output data	Max. 122 words <sup>③</sup>
Transmission specifications	Electrical standard/ characteristics	EIA-RS485 compliant
	Medium	Shielded twisted pair cable (Type A) (refer to section 5.5.2)
	Network topology	Bus topology
	Data link method	Polling method
	Encoding method	NRZ
	Transmission speed <sup>①</sup>	9.6 kbps to 12 Mbps (refer to tab. 3-2)
	Transmission distance	Differs depending on the transmission speed (refer to tab. 3-2)
	Max. No. of repeaters	3
Number of connectable modules (Per segment)	32 (including repeater(s))	
Number of writes to flash ROM		Max. 10,000 times
No. of occupied I/O points		32 (I/O assignment: 32 intelligent points)
Internal current consumption (5 V DC)		0.39 A
Weight		0.14 kg

**Tab. 3-1:** Performance specifications

- ① Transmission speed control within +/- 0.3% (EN50170 Volume 2 compliant)
- ② Factory-set to "126" (EN50170 Volume 2 compliant)  
Set a station number within 0 to 125 for I/O data communication.
- ③ Number of I/O data is 192 words in total.

### Transmission distance

Transmission speed	Transmission distance per segment	Max. transmission distance per network when three repeaters are used <sup>①</sup>
9.6 kbps	1200 m	4800 m
19.2 kbps		
45.45 kbps		
93.75 kbps		
187.5 kbps	1000 m	4000 m
500 kbps	400 m	1600 m
1.5 Mbps	200 m	800 m
3 Mbps	100 m	400 m
6 Mbps		
12 Mbps		

**Tab. 3-2:** Transmission distance

- 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) × Transmission distance [m/segment]



## 3.3 I/O-Signals for the PLC-CPU

### 3.3.1 List of I/O Signals

Note that the I/O numbers (X/Y) shown in this section and thereafter depend on the mounting position resp. on the start I/O number or head address of the ME2PB1-L. This head address has to be added to the shown I/O numbers.

For example, if the ME2PB1-L occupies the range from X/Y040 to X/Y05F the head address is X/Y040. However the least significant digit is omitted and the head address "n" in this case reads as "4". The "Watchdog timer error" input (Xn0) will be X40 and the "Operation mode change completion signal" will be X51.

Signal Direction: ME2PB1-L → CPU module		Signal Direction: CPU module → ME2PB1-L		
Device no. (Input)	Signal name	Device no. (Output)	Signal name	
Xn0	Watchdog timer error	Yn0	Input send area refresh directive signal	
Xn1	I/O communication signal	Yn1	Use prohibited	
Xn2	Extension trouble notification completion signal	Yn2	Extension trouble notification request signal	
Xn3	Module error signal	Yn3	Module error reset request signal	
Xn4	Use prohibited	Yn4	Use prohibited	
Xn5	SYNC mode signal	Yn5		
Xn6	SYNC receive signal	Yn6		
Xn7	FREEZE mode signal	Yn7		
Xn8	Use prohibited	Yn8		
Xn9		Yn9		
XnA	BBLKRD start request acceptance completion signal	YnA	BBLKRD start request signal	
XnB	BBLKWR start request acceptance completion signal	YnB	BBLKWR start request signal	
XnC	Use prohibited	YnC	Use prohibited	
XnD		YnD		
XnE		YnE		
XnF		YnF		
X(n+1)0		Y(n+1)0		
X(n+1)1	Operation mode change completion signal	Y(n+1)1	Operation mode change request signal	
X(n+1)2	Use prohibited	Y(n+1)2	Use prohibited	
X(n+1)3	Station number change completion signal	Y(n+1)3	Station number change request signal	
X(n+1)4	Use prohibited	Y(n+1)4	Use prohibited	
X(n+1)5		Y(n+1)5		
X(n+1)6		Y(n+1)6		
X(n+1)7		Y(n+1)7		
X(n+1)8		Y(n+1)8		
X(n+1)9		Y(n+1)9		
X(n+1)A		Y(n+1)A		
X(n+1)B		Y(n+1)B		
X(n+1)C		Y(n+1)C		
X(n+1)D		Module READY signal		Y(n+1)D
X(n+1)E		Use prohibited		Y(n+1)E
X(n+1)F	Y(n+1)F			

**Tab. 3-3:** I/O signals of the ME2PB1-L

**NOTE**

Among the I/O signals for the MELSEC-L series CPU, 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.

### 3.3.2 Details of I/O Signals

#### Watchdog timer error signal (Xn0)

- This signal turns ON when a watchdog timer error occurs on the ME2PB1-L.
- The Watchdog timer error signal (Xn0) does not turn OFF until:
  - The programmable controller is turned OFF and back ON again, or
  - The MELSEC-L series CPU is reset.

If the signal turns ON again, a hardware error may be the cause.

#### I/O communication signal (Xn1)

- This signal turns ON when the module is ready to communicate with the master station properly.
- While the I/O communication signal (Xn1) is ON, the output receive area is updated to the output data sent from the master station. (It is independent of the status of the input send area refresh directive signal (Yn0).)
- The I/O communication signal (Xn1) turns OFF when a communication timeout error occurs due to a stop of communication with the master station.

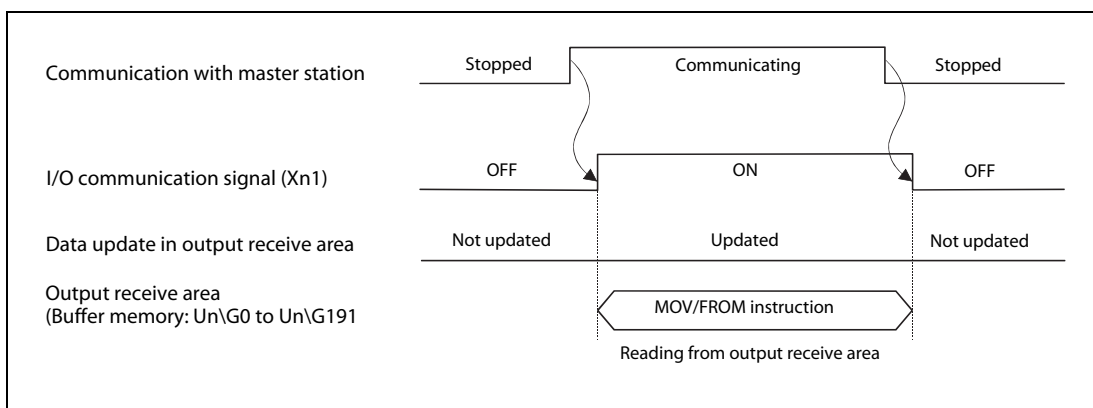
However, if the communication watchdog timer setting in the master station side parameters is "invalid", the I/O communication signal does not turn OFF since a communication time-out error does not occur. (The output data in the output receive area is held.)

Communication watchdog timer setting in master station side parameters	Operation at master station fault
Invalid	No error (I/O communication signal (Xn1) remains ON)
Valid (2 to 65025)	Communication time-out error occurrence (I/O communication signal (Xn1) turns OFF)

**Tab. 3-4:** Dependence of the I/O communication signal (Xn1) on the master station parameters

The communication watchdog timer setting can be confirmed in the "Current communication watchdog timer value" (buffer memory address Un\G2257) of the ME2PB1-L.

- Use this signal as a signal for interlocking output receive area read performed with the MOV/FROM instruction.



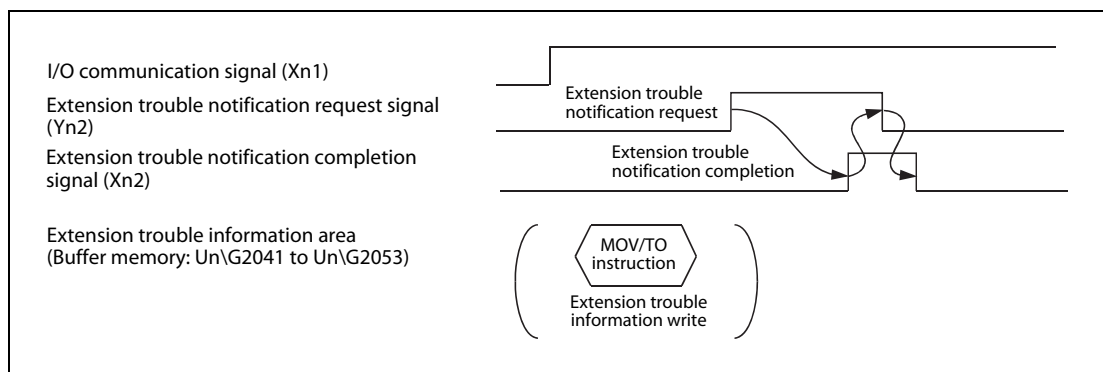
**Fig. 3-1:** Utilization of the I/O communication signal (Xn1)

### Extension trouble notification request signal (Yn2), Extension trouble notification completion signal (Xn2)

- Turning ON the extension trouble notification request signal (Yn2) sends the data set in the extension trouble information area (Un\G2041 to Un\G2053) to the master station as extension trouble information. (The extension trouble notification request is ignored while the I/O communication signal (Xn1) is OFF.)
- The extension trouble notification completion signal (Xn2) turns ON when the extension trouble information is sent to the master station by turning ON the extension trouble notification request signal (Yn2).

(While the I/O communication signal (Xn1) is OFF, the extension trouble notification completion signal (Xn2) does not turn ON since an extension trouble notification request is ignored.)

- When you have checked that the extension trouble notification completion signal (Xn2) is ON, turn OFF the extension trouble notification request signal (Yn2).
- Turning OFF the extension trouble notification request signal (Yn2) turns OFF the extension trouble notification completion signal (Xn2).



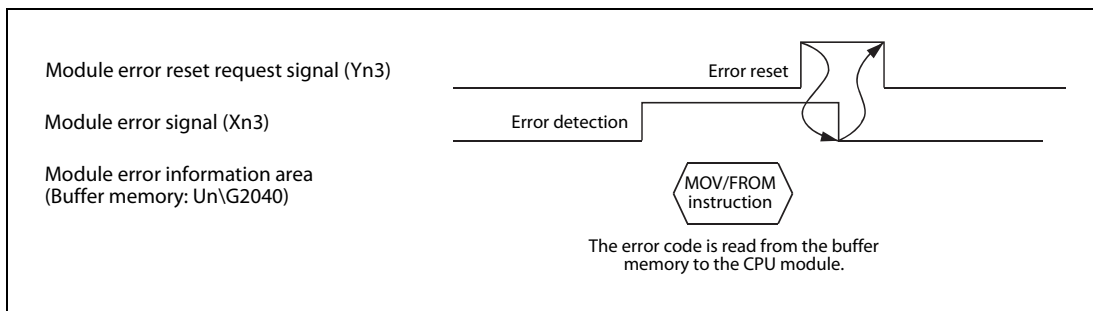
**Fig. 3-2:** Extension trouble notification request signal (Yn2), Extension trouble notification completion signal (Xn2)

#### NOTE

When performing the extension trouble notification requests consecutively, provide an interlock using the extension trouble notification completion signal (Xn2) in the procedure shown above.

**Module error signal (Xn3), Module error reset request signal (Yn3)**

- The module error signal (Xn3) turns ON when an error occurs.  
At this time, an error code is stored into the module error information area (Un\G2040).
- Turning ON the module error reset request signal (Yn3) resets the error of the ME2PB1-L.
- Xn3 turns OFF when the error is reset by turning ON the module error reset request signal (Yn3) or resetting the CPU, for example. At this time, the ERR. LED goes OFF and the error code in Un\G2040 is cleared.
- When you have checked that the module error signal (Xn3) is OFF, turn OFF the module error reset request signal (Yn3).



**Fig. 3-3:** Module error signal (Xn3), Module error reset request signal (Yn3)

**SYNC mode signal (Xn5)**

- This signal turns ON when the ME2PB1-L is placed in the SYNC mode by a SYNC request from the master station.
- The SYNC mode signal (Xn5) turns OFF when the SYNC mode is terminated by an UNSYNC request from the master station, a communication stop or a CPU reset.
- The SYNC LED turns ON/OFF in synchronization with the ON/OFF of the SYNC mode signal (Xn5).
- The SYNC mode signal (Xn5) turns OFF if a communication time-out error occurs due to a stop of communication with the master station while the SYNC mode signal (Xn5) is ON.

However, if the communication watchdog timer setting in the master station side parameters is "invalid", the SYNC mode signal (Xn5) does not turn OFF since a communication time-out error does not occur. (The output data in the output receive area is held.)

Communication watchdog timer setting in master station side parameters	Operation at master station fault
Invalid	No error (SYNC mode signal (Xn5) remains ON)
Valid (2 to 65025)	Communication time-out error occurrence (SYNC mode signal (Xn5) turns OFF)

**Tab. 3-5:** Dependence of the SYNC mode signal (Xn5) on the master station parameters

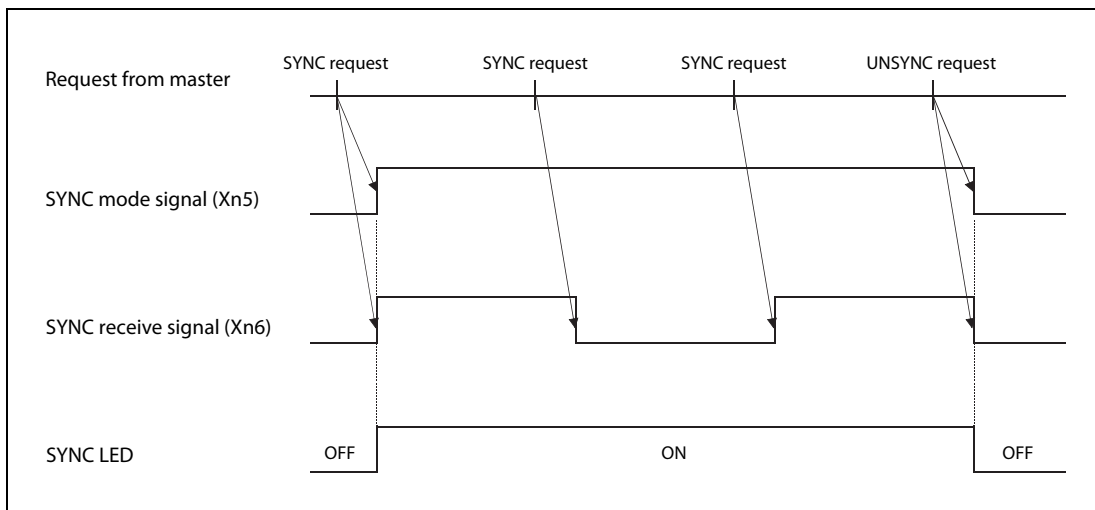
The communication watchdog timer setting can be confirmed in the "Current communication watchdog timer value" (buffer memory address Un\G2257) of the ME2PB1-L.

**SYNC receive signal (Xn6)**

- The SYNC receive signal (Xn6) turns ON at receipt of a SYNC request from the master station.
- While the SYNC mode signal (Xn5) is ON, the receipt of a SYNC request from the master station changes the ON/OFF state of the SYNC receive signal (Xn6).

At this time, the SYNC mode signal (X05) remains ON.

- The SYNC receive signal (Xn6) turns OFF when the SYNC mode is terminated by an UNSYNC request from the master station, a communication stop or a CPU reset.



**Fig. 3-4:** SYNC mode signal (Xn5), SYNC receive signal (Xn6)

- The SYNC receive signal (Xn6) turns OFF if a communication time-out error occurs due to a stop of communication with the master station while the SYNC receive signal (Xn6) is ON.

However, if the communication watchdog timer setting in the master station side parameters is "invalid", the SYNC receive signal (Xn6) does not turn OFF since a communication time-out error does not occur. (The output data in the output receive area is held.)

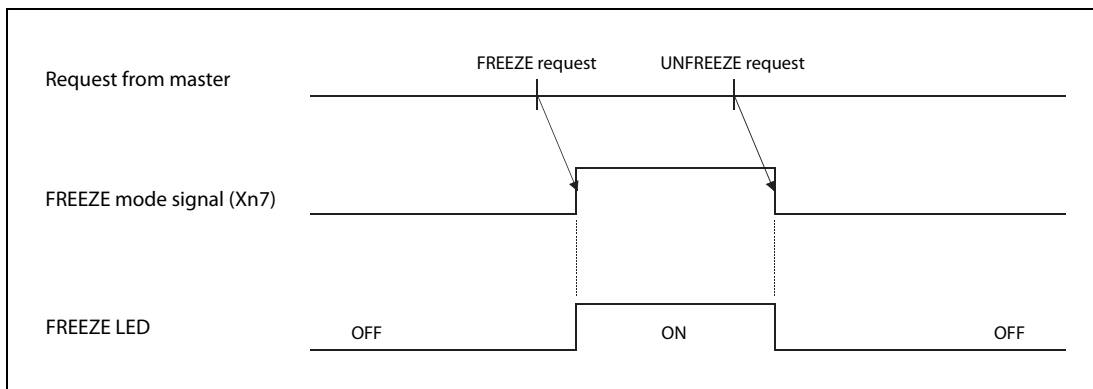
Communication watchdog timer setting in master station side parameters	Operation at master station fault
Invalid	No error (SYNC receive signal (Xn6) remains ON)
Valid (2 to 65025)	Communication time-out error occurrence (SYNC receive signal (Xn6) turns OFF)

**Tab. 3-6:** Dependence of the SYNC receive signal (Xn6) on the master station parameters

The communication watchdog timer setting can be confirmed in the "Current communication watchdog timer value" (buffer memory address Un\G2257) of the ME2PB1-L.

**FREEZE mode signal (Xn7)**

- The FREEZE mode signal (Xn7) turns ON when the ME2PB1-L is placed in the FREEZE mode by a FREEZE request from the master station.
- The FREEZE mode signal (Xn7) turns OFF when the FREEZE mode is terminated by an UNFREEZE request from the master station, a communication stop or a CPU reset.
- The FREEZE LED turns ON/OFF in synchronization with the ON/OFF of the FREEZE mode signal (Xn7).



**Fig. 3-5:** FREEZE mode signal (Xn7)

- The FREEZE mode signal (Xn7) turns OFF if a communication time-out error occurs due to a stop of communication with the master station while the FREEZE mode signal (Xn7) is ON.

However, if the communication watchdog timer setting in the master station side parameters is "invalid", the FREEZE mode signal (Xn7) does not turn OFF since a communication time-out error does not occur. (The output data in the output receive area is held.)

Communication watchdog timer setting in master station side parameters	Operation at master station fault
Invalid	No error (FREEZE mode signal (Xn7) remains ON)
Valid (2 to 65025)	Communication time-out error occurrence (FREEZE mode signal (Xn7) turns OFF)

**Tab. 3-7:** Dependence of the FREEZE mode signal (Xn7) on the master station parameters

The communication watchdog timer setting can be confirmed in the "Current communication watchdog timer value" (buffer memory address Un\G2257) of the ME2PB1-L.

**BBLKRD start request signal (YnA), BBLKRD start request acceptance completion signal (XnA)**

- The BBLKRD start request signal (YnA) is used to start the processing of the dedicated instruction BBLKRD.

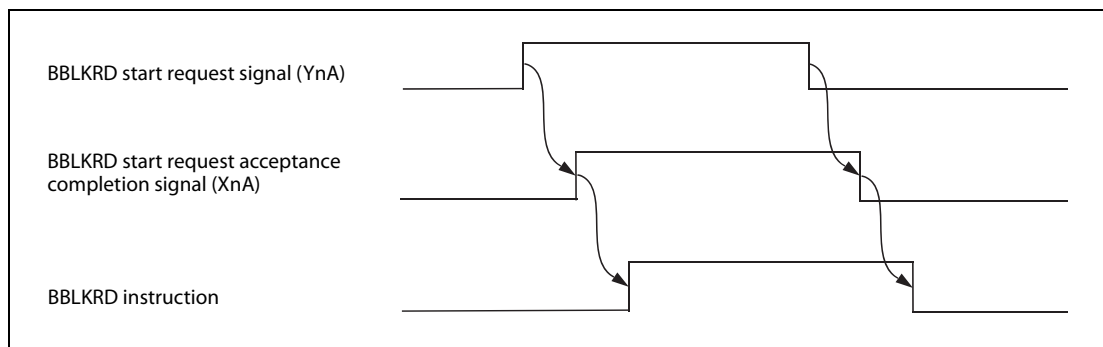
When executing the dedicated instruction BBLKRD, always turn ON the BBLKRD start request signal (YnA) to turn ON the BBLKRD start request acceptance completion signal (XnA) so that it is used as an interlock condition.

- When the BBLKRD start request signal (YnA) is turned ON in the sequence program, the BBLKRD start request acceptance completion signal (XnA) turns ON and the ME2PB1-L starts the processing of the dedicated instruction BBLKRD.
- When the BBLKRD start request signal (YnA) is turned OFF by the sequence program, the processing of the dedicated instruction BBLKRD is ignored.
- Only when using the dedicated instruction BBLKRD, turn ON the BBLKRD start request signal (YnA).

**NOTE**

If the dedicated instruction BBLKRD is not executed after the BBLKRD start request signal (YnA) has been turned ON, the transmission delay time between the master and a slave stations is prolonged.

- When the BBLKRD start request signal (YnA) is turned OFF in the sequence program, the BBLKRD start request acceptance completion signal (XnA) also turns OFF.



**Fig. 3-6:** BBLKRD start request signal (YnA), BBLKRD start request acceptance completion signal (XnA)

**BBLKWR start request signal (YnB), BBLKWR start request acceptance completion signal (XnB)**

- The BBLKWR start request signal (YnB) is used to start the processing of the dedicated instruction BBLKWR.

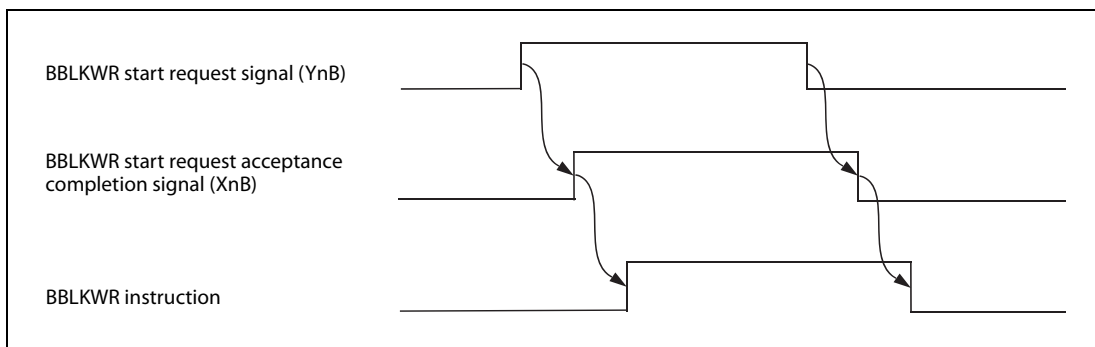
When executing the dedicated instruction BBLKWR, always turn ON the BBLKWR start request signal (YnB) to turn ON the BBLKWR start request acceptance completion signal (XnB) so that it is used as an interlock condition.

- When the BBLKWR start request signal (YnB) is turned ON in the sequence program, the BBLKWR start request acceptance completion signal (XnB) turns ON and the ME2PB1-L starts the processing of the dedicated instruction BBLKWR.
- When the BBLKWR start request signal (YnB) is turned OFF by the sequence program, the processing of the dedicated instruction BBLKWR is ignored.
- Only when using the dedicated instruction BBLKWR, turn ON the BBLKWR start request signal (YnB).

**NOTE**

If the dedicated instruction BBLKWR is not executed after the BBLKWR start request signal (YnB) has been turned ON, the transmission delay time between the master and a slave stations is prolonged.

- When the BBLKWR start request signal (YnB) is turned OFF in the sequence program, the BBLKWR start request acceptance completion signal (XnB) also turns OFF.



**Fig. 3-7:** BBLKWR start request signal (YnB), BBLKWR start request acceptance completion signal (XnB)

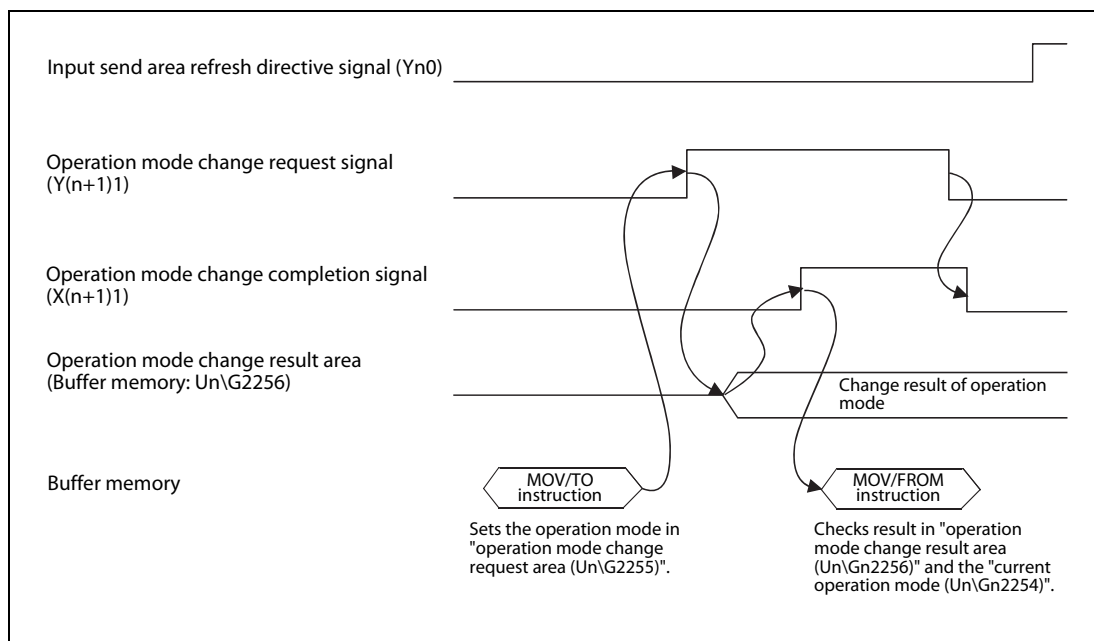


### Operation mode change request signal (Y(n+1)1), Operation mode change completed signal (X(n+1)1)

- Turn ON the Operation mode change request signal (Y(n+1)1) 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 PLC CPU.
- Turning ON the Operation mode change request signal (Y(n+1)1) clears the information of the Operation mode change result area (Un\G2256).
- The Operation mode change completed signal (X(n+1)1) 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).
- Make sure that 0 (Normally completed) is stored in the Operation mode change result area (Un\G2256), and turn OFF the Operation mode change request signal (Y(n+1)1).
- The Operation mode change completed signal (X(n+1)1) turns ON at either normal or abnormal completion of an operation mode change.

At abnormal completion, the operation mode change request is made invalid and operation continues in the operation mode that had been used before the change request was given.

- Turning OFF the Operation mode change request signal (Y(n+1)1) turns OFF the Operation mode change completed signal (X(n+1)1).



**Fig. 3-8:** Operation mode change request signal (Y(n+1)1), Operation mode change completed signal (X(n+1)1)

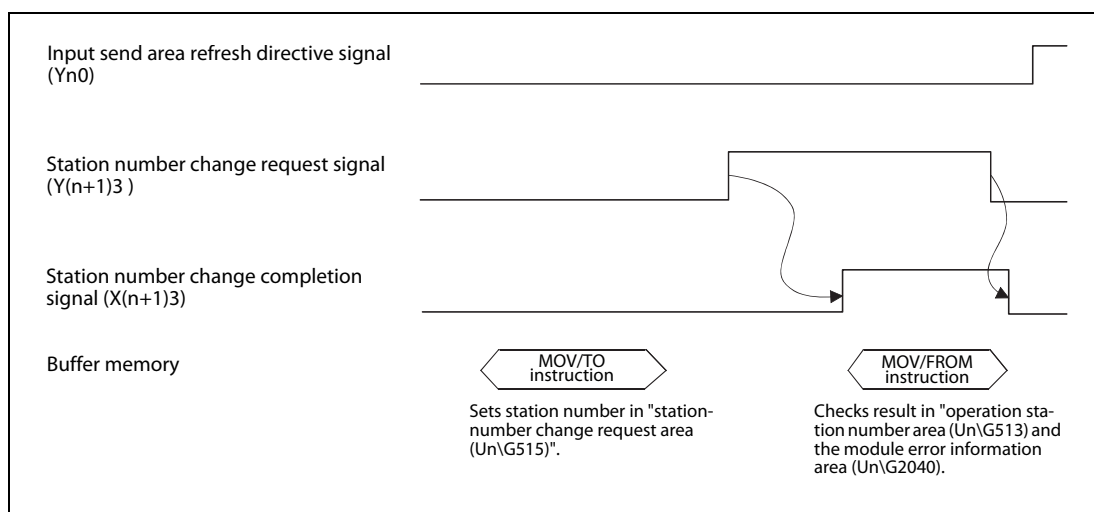
#### NOTE

Do not turn the power OFF or reset the MELSEC-L series CPU during the operation mode registration to the flash ROM by turning ON the Operation mode change request signal (Y(n+1)1).

Turn the power OFF or reset the MELSEC-L series CPU after the Operation mode change completed signal (X(n+1)1) has turned ON. If the power is turned OFF or the MELSEC-L series CPU is reset by mistake, register the operation mode to the flash ROM again.

### Station number change request signal (Y(n+1)3), Station number change completion signal (X(n+1)3)

- Turn ON the station number change request signal (Y(n+1)3) when changing the station number to the one set in the station number change request area (Un\G515).
- When you have checked that the station number change completion signal (X(n+1)3) is ON, turn OFF the station number change request signal (Y(n+1)3).
- The station number change completion signal (X(n+1)3) turns ON when the station number setting is completed by setting the station number to the station number change request area (Un\G515) and turning ON the station number change request signal (Y(n+1)3).
- Check the setting result in the operation station number area (Un\G513) and module error information area (Un\G2040).
- Turning OFF the station number change request signal (Y(n+1)3) after confirmation of the result turns OFF the station number change completion signal (X(n+1)3).
- If a station number error (error code: 1002H) has occurred, the station number change request is made invalid and operation continues with the station number that had been used before the change request was given.
- Turning on the station number change request signal (Y(n+1)3) suspends I/O communication. Turning on the station number change completion signal (X(n+1)3) resumes I/O communication.



**Fig. 3-9:** Station number change request signal (Y(n+1)3), Station number change completion signal (X(n+1)3)

#### NOTE

Station numbers can be set from the class 2 master station.

In this case, specifying "TRUE" for "No\_Add\_Chg" disables the station number change on the ME2PB1-L.

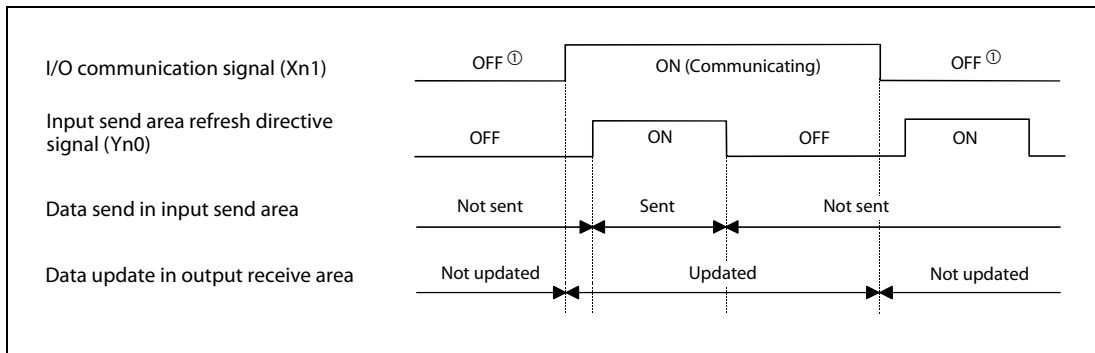
The station number of the ME2PB1-L cannot be changed while the station number change is disabled. To change the station number again, clear the station number in the station number change request area of the ME2PB1-L (Un\G515) to cancel the disabled status. (Refer to section 3.4.7).

### Module READY signal (X(n+1)D)

- This signal turns on when the ME2PB1-L is enabled for access from the CPU module. (It turns on regardless of the operation mode.)
- This signal turns off when the ME2PB1-L is disabled for access from the CPU module due to a module watchdog timer error or hardware fault.

**Input send area refresh directive signal (Yn0)**

- Turning ON this signal during communication with the master station (I/O communication signal (Xn1) = ON) starts data communication of the input send area (buffer memory addresses Un\G256 to Un\G447).
- Turning this signal OFF stops sending of the data in the input send area to the master station. (0 data are sent.)
- While the I/O communication signal (Xn1) is OFF, ON of the input send area refresh directive signal (Yn0) is invalid.



**Fig. 3-10:** Input send area refresh directive signal (Yn0)

① Communication is stopped.

**NOTE**

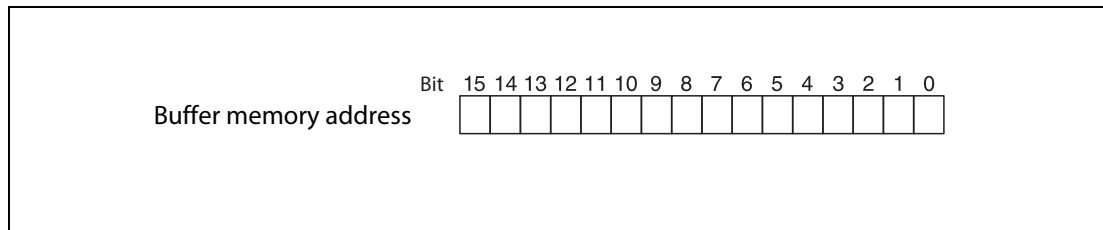
The relationships between data send and receive of the ME2PB1-L, which vary with the states of the I/O communication signal (Xn1) and the input send area refresh directive signal (Yn0), are shown below.

State of Xn1	State of Yn0	Data in Output Receive Area/Input Send Area
OFF	ON/OFF	<p>Master station: Input area, Output area. ME2PB1-L: Input send area, Output receive area. Dashed arrows indicate 'Not sent' from ME2PB1-L to Master station and 'Not updated' from Master station to ME2PB1-L.</p>
ON	ON	<p>Master station: Input area, Output area. ME2PB1-L: Input send area, Output receive area. Solid arrows indicate 'Sent' from ME2PB1-L to Master station and 'Updated' from Master station to ME2PB1-L.</p>
	OFF	<p>Master station: Input area, Output area. ME2PB1-L: Input send area, Output receive area. Solid arrows indicate '0 data sent' from ME2PB1-L to Master station and 'Updated' from Master station to ME2PB1-L.</p>

## 3.4 Buffer Memory

The ME2PB1-L has a memory range assigned as a buffer for temporary storage of data, such as communication related data or error information. The PLC CPU can access this buffer and both read the stored values from it and write new values to it which the module can then process.

Each buffer memory address consists of 16 bits.



**Fig. 3-11:** Assignments of bits to a buffer memory address

### NOTE

Do not write data in the "system areas" of the buffer memory. If data is written to any of the system areas, the PLC system may not be operated properly. Some of the user areas contain partially system areas. Care must be taken when reading/writing to the buffer memory. Also, do not write data (e.g. in a sequence program) to the buffer memory area where writing is disabled. Doing so may cause malfunction.

### Instructions for data exchange with the buffer memory

Communication between the PLC CPU and the buffer memory of special function modules is performed with FROM and TO instructions. The buffer memory of a special function module can also be accessed directly, e.g. with a MOV instruction.

Format of the device address: Un\Gn

- Un: Head address of the special function module
- Gn: Buffer memory address (decimal)

For example the device address U3\G11 designates the buffer memory address 11 in the special function module with the head address 3 (X/Y30 to X/Y3F).

In this User's Manual the latter form of addressing is used widely.

For full documentation of all the instructions used with examples please refer to the Programming Manual for the MELSEC System Q and the MELSEC-L series.

### 3.4.1 Buffer memory list

Address DEC (HEX)	Name	Description	Read/ Write <sup>①</sup>	Reference (section)
0 to 191 (0H to BF <sub>H</sub> )	Output receive area	Stores the output data received from the master station. (Max. usable range 122 words)	R	3.4.2
192 to 255 (C0 <sub>H</sub> to FF <sub>H</sub> )	System area (Use prohibited)	—	—	—
256 to 447 (100 <sub>H</sub> to 1BF <sub>H</sub> )	Input send area	Used to set the input data to be sent to the master station. (Max. usable range 122 words).	R/W	3.4.3
448 to 511 (1C0 <sub>H</sub> to 1FF <sub>H</sub> )	System area (Use prohibited)	—	—	—
512 (200 <sub>H</sub> )	Operation baud rate	Stores the baud rate in current operation.	R	3.4.4
513 (201 <sub>H</sub> )	Operation station number	Stores the station number in current operation.	R	3.4.5
514 (202 <sub>H</sub> )	Station number set on flash ROM	Stores the station number saved on the flash ROM.	R	3.4.6
515 (203 <sub>H</sub> )	Station number change request area	Used to set a new station number to be set in response to the station number change request signal (Y(n+1)3).	R/W	3.4.7
516 (204 <sub>H</sub> )	Station number rewritable count to flash ROM	Stores the remaining number of times when the station number can be saved onto the flash ROM during continuous operation.	R	3.4.8
517 to 2039 (205 <sub>H</sub> to 7F7 <sub>H</sub> )	System area (Use prohibited)	—	—	—
2040 (7F8 <sub>H</sub> )	Module error information	Stores the error code detected by the ME2PB1-L.	R	3.4.9
2041 to 2053 (7F9 <sub>H</sub> to 805 <sub>H</sub> )	Extension trouble information area	Used to set the extension trouble notification data to the master station.	R/W	3.4.10
2054 to 2253 (806 <sub>H</sub> to 8CD <sub>H</sub> )	System area (Use prohibited)	—	—	—
2254 (8CE <sub>H</sub> )	Current operation mode	Stores the operation mode in current operation.	R	3.4.11
2255 (8CF <sub>H</sub> )	Operation mode change request area	Used to set a new operation mode to be set in response to the operation mode change request signal (Y(n+1)1).	R/W	3.4.12
2256 (8D0 <sub>H</sub> )	Operation mode change result	Stores the result of changing the operation mode in response to the operation mode change request signal (Y(n+1)1).	R	
2257 (8D1 <sub>H</sub> )	Current communication watchdog timer value	Stores the communication watchdog timer value in current operation.	R	3.4.13
2258 (8D2 <sub>H</sub> )	Offline test status area	This area stores the details or result of the self-diagnostic test.	R	5.6
2259 (8D3 <sub>H</sub> )	Swapping function setting status	Stores the setting status of the swapping function in current operation.	R	3.4.15
2260 to 2271 (8D4 <sub>H</sub> to 8DF <sub>H</sub> )	System area (Use prohibited)	—	—	—
2272 to 2283 (8E0 <sub>H</sub> to 8EB <sub>H</sub> )	Output receive area used status	Stores the current used status of the output receive area.	R	3.4.16
2284 to 2287 (8EC <sub>H</sub> to 8EF <sub>H</sub> )	System area (Use prohibited)	—	—	—
2288 to 2299 (8F0 <sub>H</sub> to 8FB <sub>H</sub> )	Input send area used status	Stores the current used status of the input send area.	R	3.4.17
2300 to 2815 (8FC <sub>H</sub> to AFF <sub>H</sub> )	System area (Use prohibited)	—	—	—

**Tab. 3-8:** Buffer memory list

① This indicates whether or not read/write is possible from the sequence program.

R: Read only

R/W: Read/write executable

### 3.4.2 Output receive area (Un\G0 to Un\G191)

The output receive area stores the output data received from the master station.

The structure varies with the data module setting and data assignment mode setting in the slave parameters. (Refer to sections 5.3.1 to 5.3.3)

### 3.4.3 Input send area (Un\G256 to Un\G447)

The input send area stores the input data to be sent to the master station.

The structure varies with the data module setting and data assignment mode setting in the slave parameters. (Refer to sections 5.3.1 to 5.3.3)

### 3.4.4 Operation baud rate (Un\G512)

The buffer memory address Un\G512 stores the baud rate which is currently active.

Baud Rate	Stored Value
Baud rate not yet recognized	0000H
9.6 kbps	96E2H
19.2 kbps	19E3H
45.45 kbps	45E3H
93.75 kbps	93E3H
187.5 kbps	18E4H
500 kbps	05E5H
1.5 Mbps	15E5H
3 Mbps	03E6H
6 Mbps	06E6H
12 Mbps	12E6H

**Tab. 3-9:**

*Values in the Operation baud rate area (Un\G512)*

The stored value while the I/O communication signal (Xn1) is ON is valid.

Use the master station parameter to set the baud rate of Profibus DP.

### 3.4.5 Operation station number (Un\G513)

The buffer memory address Un\G513 stores the station number of the ME2PB1-L which is currently active.

- The storage range is 0 to 126.
- The stored value while the I/O communication signal (Xn1) is ON is valid.
- If the station number is not set (the station number is as set in the factory or has been cleared), "126" is stored.

I/O data cannot be communicated if the station number is not set.

### 3.4.6 Station number set on flash ROM (Un\G514)

In the buffer memory address Un\G514 the station number of the ME2PB1-L set to the flash ROM is stored.

- The setting range is 0 to 125.
- If the station number is not set to the flash ROM (the station number is as set in the factory or has been cleared), "FFFFH" is stored.

### 3.4.7 Station number change request area (Un\G515)

The buffer memory address Un\G515 is used to set any of the following values when setting a new station number of the ME2PB1-L in response to the station number change request signal (Y(n+1)3).

Set Value	Description
0000H to 007DH or 0100H to 017DH	<p>Set a station number. By turning on b8, the station number is saved onto the flash ROM.</p> <p>0: Not save onto the flash ROM 1: Save onto the flash ROM.</p> <p>Set a station number within the range from 0H to 7DH (0 to 125).</p> <p>Example 1: When the station number is set to 12, but not saved onto the flash ROM: 000CH Example 2: When the station number is set to 12 and saved onto the flash ROM: 010CH</p>
FFFFH	<p>Clears the station number. After clearing, the operation station number is "126". The station number set to the flash ROM is "FFFFH".</p>

**Tab. 3-10:** Station number change request area

At power-on or at CPU reset, "FFFEH" is stored.

Turn on the station number change request signal (Y(n+1)3) after storing a setting value given in the above table.

Executing the station number change request with any invalid value results in a station number error (error code: 1002H).

### 3.4.8 Station number rewritable count to flash ROM (Un\G516)

The buffer memory address Un\G516 stores the remaining number of times when the station number setting can be saved onto the flash ROM during operation.

- The initial value is 60.

#### Counting down the number of times

- Every time the station number is changed on the flash ROM, the count is decremented by 1.
- The count is not decremented when station number setting is requested with the same station number as the one saved on the flash ROM (in buffer memory address Un\514).

#### Resetting the count

The count is reset to 60 by resetting the CPU, by powering on the ME2PB1-L or by clearing the station number on the flash ROM using the station number change request signal (Y(n+1)3).

#### When the remaining count is 0

If an attempt is made to rewrite the station number on the flash ROM at the remaining count of 0, a station number rewrite count excess error (error code: 2001H) occurs and the station number on the flash ROM is not changed.

If the station number rewrite count excess error has occurred, switch power on again, reset the CPU, or clear the station number on the flash ROM using the station number change request signal (Y(n+1)3). (This returns the remaining count to 60 times.)

### 3.4.9 Module error information (Un\G2040)

In the buffer memory address Un\G2040 the error code of the error that occurred in the ME2PB1-L is stored.

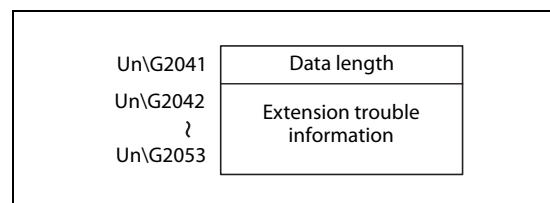
Refer to section 9.4 for the error codes.

### 3.4.10 Extension trouble information area (Un\G2041 to Un\G2053)

- The buffer memory addresses Un\G2041 to Un\G2053 are used to set the extension trouble information to be sent to the master station.
- The extension trouble information sent by the ME2PB1-L is the Device Related Diagnostic specified in Profibus.
- The extension trouble information can be set in a sequence program.

Data length: Data length of the data to be sent as extension trouble information (bytes units)

Extension trouble information: Any data to be set to the master station (max. 24 bytes)



**Fig. 3-12:**  
Extension trouble information area

- The extended trouble information area is used as described below when an extended trouble occurs and when the extended trouble is removed.

#### When extended trouble occurs

When the host becomes faulty, for example, the data stored in the extended trouble information area of the buffer memory is sent to the master station as extended trouble information.

In the following procedure, the ME2PB1-L can notify the master station of the extended trouble of the host.

- ① In the buffer memory Un\G2042 to Un\G2053, set the data to be sent to the master station.
- ② In the buffer memory Un\G2041, set the length of the data to be sent to the master station.
- ③ Turn ON the extension trouble notification request signal (Yn2).
- ④ After the extension trouble notification completion signal (Xn2) has turned ON, turn OFF the extension trouble notification request signal (Yn2).

#### When extended trouble is removed

When the host is not faulty anymore, notify the master station that there is no fault.

In the following procedure, the ME2PB1-L can notify the master station that the extended trouble of the host has been removed.

- ① In the buffer memory Un\G2041, set the data length 0.
- ② Turn ON the extension trouble notification request signal (Yn2).
- ③ After the extension trouble notification completion signal (Xn2) has turned ON, turn OFF the extension trouble notification request signal (Yn2).



The DIA LED on the front panel of the ME2PB1-L is turned on as follows:

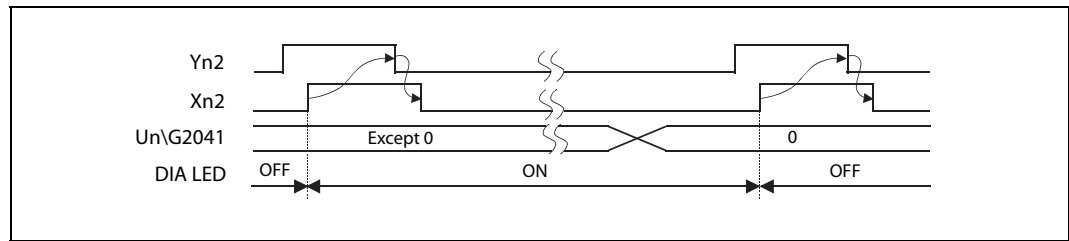


Fig. 3-13: Behaviour of the DIA LED of the ME2PB1-L

### 3.4.11 Current operation mode (Un\G2254)

The buffer memory address UN\G2254 stores the current operation mode (Refer to section 3.5).

Stored value	Description
0000H	Normal operation mode
0002H	Self-diagnostic mode

Tab. 3-11: Current operation mode area (Un\G2254)

At power-on or CPU reset, the module starts in the normal operation mode.

### 3.4.12 Operation mode change area (Un\G2255 and Un\G2256)

This area is used to change the operation mode of the slave station (ME2PB1-L).

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

Set any of the following values when changing the operation mode of the ME2PB1-L with the operation mode change request signal (Y(n+1)1).

Set value	Description
0000H	The mode is changed to normal operation mode.
0002H	The mode is changed to Self-diagnostics mode.

Tab. 3-12: Operation mode change request area (Un\G2255)

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

This area stores the result of changing the operation mode in response to the operation mode change request signal (Y(n+1)1).

Stored value	Description
0	Normally completed
1	Abnormal completion (A change request was made with an illegal value set in the operation mode change request area (Un\G2255).)

Tab. 3-13: Operation mode change result area (Un\G2256)

### 3.4.13 Current communication watchdog timer value (Un\G2257)

The buffer memory address Un\G2257 stores the communication watchdog timer value set in the master station side parameters.

The stored value is invalid if the I/O communication signal (Xn1) is OFF.

Stored value	Description
0	Communication watchdog timer setting invalid
Other than 0	Communication watchdog timer setting (in increments of 10ms)

**Tab. 3-14:** Current communication watchdog timer value (Un\G2257)

When the master station becomes faulty, the send/receive data and I/O communication signal (Xn1) statuses change depending on the communication watchdog timer setting.

Statuses at master station fault	Current communication watchdog timer value (Un\G2257)	
	0	Other than 0
Send data to master station ①	HOLD ②	CLEAR
Data update in output receive area	HOLD ②	CLEAR
I/O communication signal (Xn1)	ON ②	OFF

**Tab. 3-15:** Behaviour at master station fault

- ① The send data to the master station indicates the data that flows on the Profibus DP actually. It differs from the data in the input send area of the ME2PB1-L.
- ② If the communication watchdog timer setting is invalid (Un\G2257 contains the value 0), the data is held since the communication watchdog timer does not count up if the master station becomes faulty during communication.

### 3.4.14 Self-diagnostic status type code display area (Un\G2258)

The diagnostic status type code at the time of self-diagnostics is stored.

Type Code	Description	
0000H	Normal termination of self-diagnostics	
0001H to 0009H	During self-diagnostics the state of the test is shown.	
8001H to 8006H	At abnormal termination of self-diagnostics	Hardware fault
8007H		Swap test error

**Tab. 3-16:** Self-diagnostic status type code display area (Un\G2258)

### 3.4.15 Swapping function setting status (Un\G2259)

The buffer memory address Un\G2259 stores the setting status of the swapping function set in the master station side parameter.

The stored value while the I/O communication signal (Xn1) is on is valid.

Stored value	Description
0	Without swap setting
1	With swap setting

**Tab. 3-17:**  
Stored values for the communication status

### 3.4.16 Output receive area used status (Un\G2272 to Un\G2283)

In this area the used status of the output receive area is stored.

The bits corresponding to the buffer memory addresses in output receive area set by the master station parameters (Data module setting) turn ON.

The stored value while the I/O communication signal (Xn1) is ON is valid.

Buffer memory address Decimal (HEX)	Corresponding Buffer Memory Addresses (Hexadecimal) in output receive area															
	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
2272 (8E0H)	FH	EH	DH	CH	BH	AH	9H	8H	7H	6H	5H	4H	3H	2H	1H	0H
2273 (8E1H)	1FH	1EH	1DH	1CH	1BH	1AH	19H	18H	17H	16H	15H	14H	13H	12H	11H	10H
2274 (8E2H)	2FH	2EH	2DH	2CH	2BH	2AH	29H	28H	27H	26H	25H	24H	23H	22H	21H	20H
2275 (8E3H)	3FH	3EH	3DH	3CH	3BH	3AH	39H	38H	37H	36H	35H	34H	33H	32H	31H	30H
2276 (8E4H)	4FH	4EH	4DH	4CH	4BH	4AH	49H	48H	47H	46H	45H	44H	43H	42H	41H	40H
2277 (8E5H)	5FH	5EH	5DH	5CH	5BH	5AH	59H	58H	57H	56H	55H	54H	53H	52H	51H	50H
2278 (8E6H)	6FH	6EH	6DH	6CH	6BH	6AH	69H	68H	67H	66H	65H	64H	63H	62H	61H	60H
2279 (8E7H)	7FH	7EH	7DH	7CH	7BH	7AH	79H	78H	77H	76H	75H	74H	73H	72H	71H	70H
2280 (8E8H)	8FH	8EH	8DH	8CH	8BH	8AH	89H	88H	87H	86H	85H	84H	83H	82H	81H	80H
2281 (8E9H)	9FH	9EH	9DH	9CH	9BH	9AH	99H	98H	97H	96H	95H	94H	93H	92H	91H	90H
2282 (8EAH)	A FH	A EH	A DH	A CH	A BH	A AH	A 9H	A 8H	A 7H	A 6H	A 5H	A 4H	A 3H	A 2H	A 1H	A 0H
2283 (8EBH)	B FH	B EH	B DH	B CH	B BH	B AH	B 9H	B 8H	B 7H	B 6H	B 5H	B 4H	B 3H	B 2H	B 1H	B 0H

Each bit indicates the buffer memory address in the output receive area

Tab. 3-18: Output receive area used status (Un\G2272 to Un\G2283)

#### Example of output receive area used status

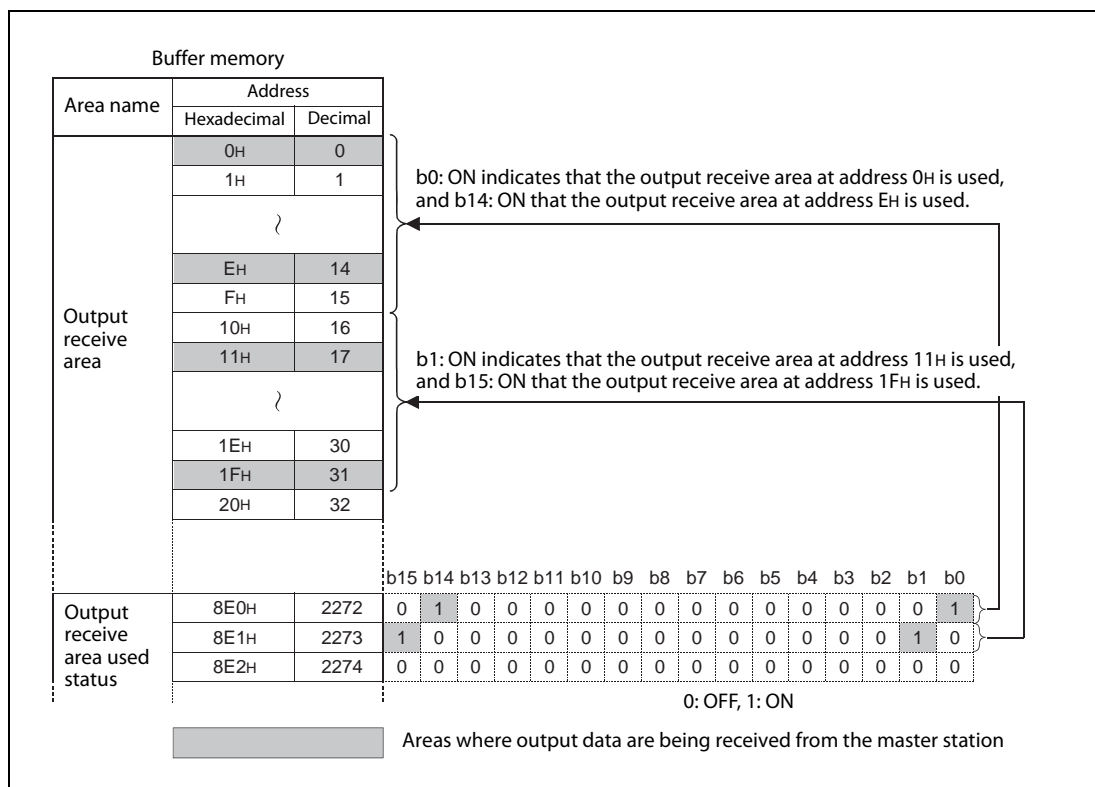


Fig. 3-14: Example for indication of the output receive area used status

### 3.4.17 Input send area used status (Un\G2288 to Un\G2299)

In this area the used status of the input send area is stored.

The bits corresponding to the buffer memory addresses of the input send area set in the master station parameters (Data module setting) turn ON.

The stored value while the I/O communication signal (Xn1) is ON is valid.

Buffer memory address Decimal (HEX)	Corresponding Buffer Memory Addresses (Hexadecimal) in output receive area															
	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
2288 (8F0H)	10FH	10EH	10DH	10CH	10BH	10AH	109H	108H	107H	106H	105H	104H	103H	102H	101H	100H
2289 (8F1H)	11FH	11EH	11DH	11CH	11BH	11AH	119H	118H	117H	116H	115H	114H	113H	112H	111H	110H
2290 (8F2H)	12FH	12EH	12DH	12CH	12BH	12AH	129H	128H	127H	126H	125H	124H	123H	122H	121H	120H
2291 (8F3H)	13FH	13EH	13DH	13CH	13BH	13AH	139H	138H	137H	136H	135H	134H	133H	132H	131H	130H
2292 (8F4H)	14FH	14EH	14DH	14CH	14BH	14AH	149H	148H	147H	146H	145H	144H	143H	142H	141H	140H
2293 (8F5H)	15FH	15EH	15DH	15CH	15BH	15AH	159H	158H	157H	156H	155H	154H	153H	152H	151H	150H
2294 (8F6H)	16FH	16EH	16DH	16CH	16BH	16AH	169H	168H	167H	166H	165H	164H	163H	162H	161H	160H
2295 (8F7H)	17FH	17EH	17DH	17CH	17BH	17AH	179H	178H	177H	176H	175H	174H	173H	172H	171H	170H
2296 (8F8H)	18FH	18EH	18DH	18CH	18BH	18AH	189H	188H	187H	186H	185H	184H	183H	182H	181H	180H
2297 (8F9H)	19FH	19EH	19DH	19CH	19BH	19AH	199H	198H	197H	196H	195H	194H	193H	192H	191H	190H
2298 (8FAH)	1AFH	1AEH	1ADH	1ACH	1ABH	1AAH	1A9H	1A8H	1A7H	1A6H	1A5H	1A4H	1A3H	1A2H	1A1H	1A0H
2299 (8FBH)	1BFH	1BEH	1BDH	1BCH	1BBH	1BAH	1B9H	1B8H	1B7H	1B6H	1B5H	1B4H	1B3H	1B2H	1B1H	1B0H

Each bit indicates the buffer memory address in the input send area

Tab. 3-19: Input send area used status (Un\G2288 to Un\G2299)

#### Example of input sent area used status

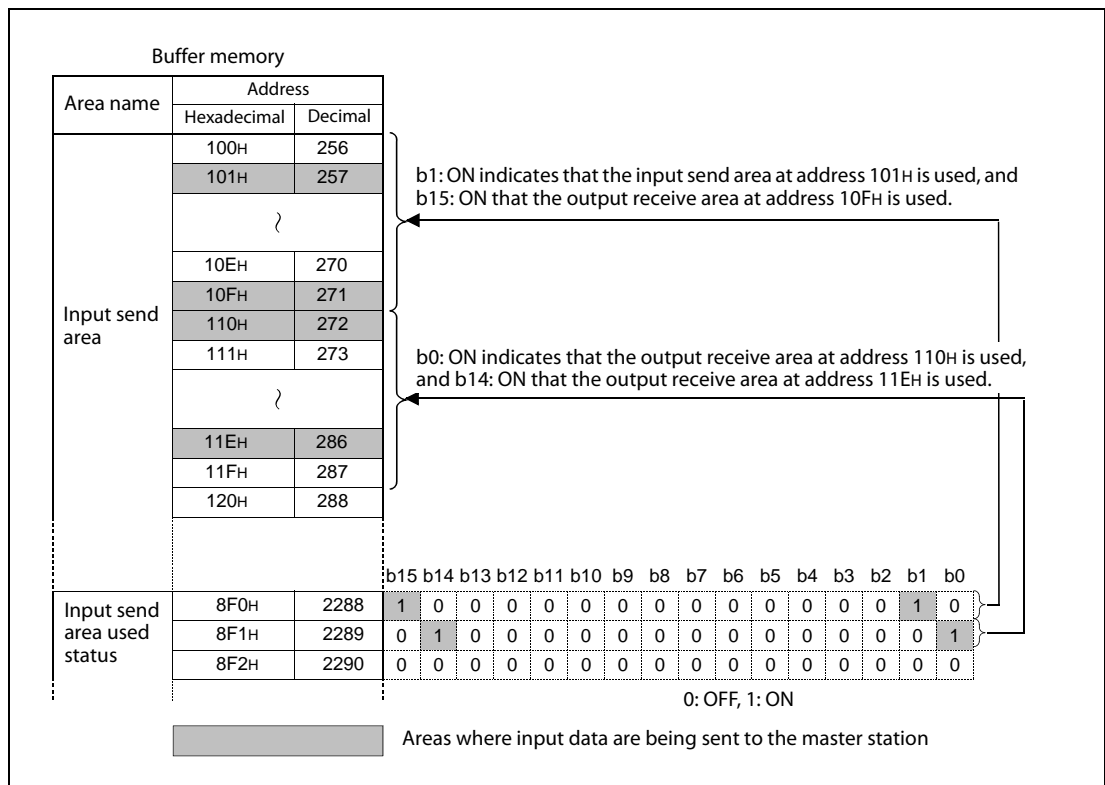


Fig. 3-15: Example for indication of the input send area used status

### 3.5 Operation Mode

The ME2PB1-L has two operation modes, normal operation mode and selfdiagnostic mode.

Operation mode	Description	Reference (Section)
Normal operation mode	In this mode, communication is made as in the slave parameters set to the master station. Communication can be made if the slave parameters are within the setting ranges. (Set only the station number in a sequence program or GX Configurator-DP.) After power is switched on or the programmable controller CPU is reset, the ME2PB1-L operates in the normal operation mode.	4.1.1
Self-diagnostic mode	In this mode, the ME2PB1-L is tested alone to diagnose a hardware fault. No communication is made with the master station.	5.6

**Tab. 3-20:** Operation modes of the ME2PB1-L

**When setting operation mode using the output signal**

Set the operation mode using the operation mode change request area (Buffer memory address Un\G2255) and the operation mode change request signal (Y(n+1)1).

**When setting operation mode using GX Configurator-DP**

Set the operation mode using GX Configurator Client of GX Configurator-DP.

**NOTE**

Refer to section 5.6 for changing the operation mode.



# 4 Functions

The following table gives an overview of the functions of the ME2PB1-L.

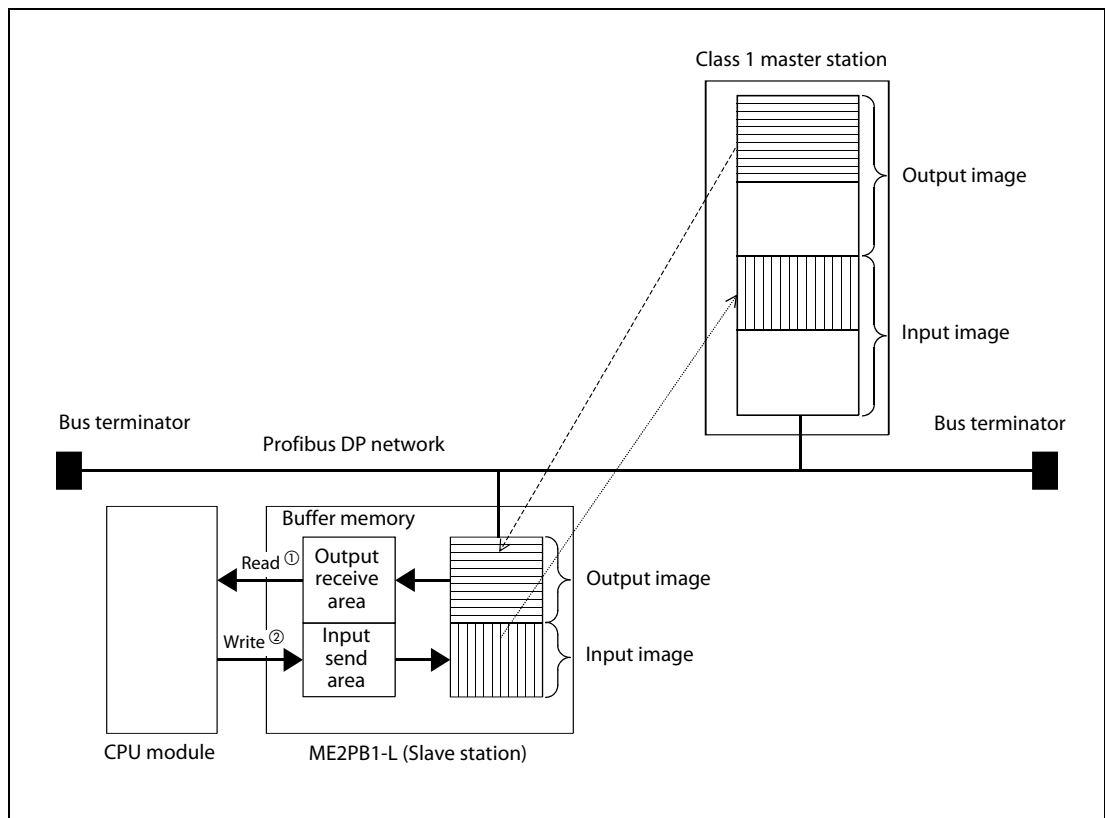
Function	Description	Reference (section)
I/O data exchange	This function allows the ME2PB1-L to operate as a Profibus DP slave station and to communicate I/O data with the master station.	4.1
I/O data separation prevention	The I/O data separation prevention function is a function to prevent the I/O data of the CPU module from being unmatched with the I/O data of the master station.	4.2
Word data swap function	The high and low bytes are swapped in word units when input or output data are sent to or received from the master station.	4.4

**Tab. 4-1:** Functions of the ME2PB1-L

## 4.1 I/O Data Exchange

- This function allows the ME2PB1-L to operate as a Profibus DP slave station and to communicate I/O data with the master station. The ME2PB1-L can handle the following size of data.

Input data: Max. 122 words } Max. 192 words in total  
 Output data: Max. 122 words



**Fig. 4-1:** I/O data exchange between the Profibus DP master and a ME2PB1-L

- ① Reads with BBLKRD/MOV/FROM instruction or automatic refresh.
- ② Writes with BBLKWR/MOV/TO instruction or automatic refresh.

### 4.1.1 Reading/writing I/O data

#### Storing of I/O data

The I/O data are stored in the buffer memory of the ME2PB1-L.

- Input data: Input send area (Un\G256 to Un\G447)
- Output data: Output receive area (Un\G0 to Un\G191)

#### Read/write methods

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

Read/write methods	Setting location	Data consistency function
Automatic refresh	Intelligent function utility	Available
Dedicated instructions (BBLKRD, BBLKWR)	Sequence program	
MOV or FROM/TO instructions	Sequence program	Not available

**Tab. 4-2:** Read/write methods for I/O data

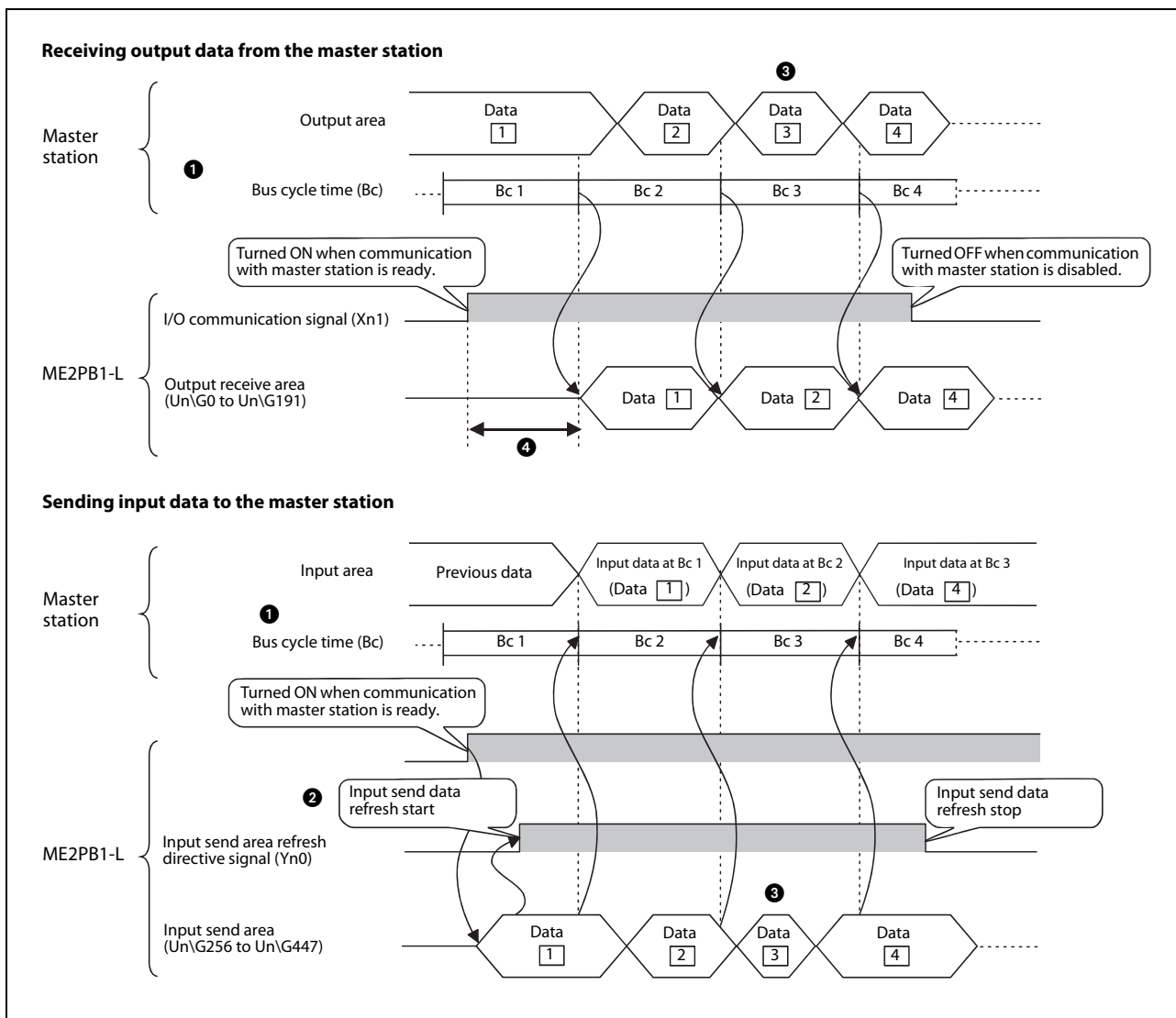
#### Sending/receiving I/O data

The sending and receiving process is described below.

- The I/O communication signal (Xn1) turns ON when the ME2PB1-L is ready to communicate with the master station.
- When the I/O communication signal (Xn1) turns ON, data output from the master station are stored into the output receive area in the buffer memory (Un\G0 to Un\G191).
- When sending input data to the master station, write the initial value to the input send area in the buffer memory (Un\G256 to Un\G447).
- Turning ON the input send area refresh directive signal (Yn0) starts input data communication. Turning OFF the signal stops the input data communication.



- The I/O communication signal (Xn1) of the ME2PB1-L is turned OFF when communication with the master station is stopped.



**Fig. 4-2:** I/O data exchange processing

- 1 For the bus cycle time calculation formula, refer to the manual for the Profibus DP module used as the master station.
- 2 Yn0 must be turned ON after Xn1 turns ON and data are stored in the input send area.
- 3 Hold the data for more than 1 bus cycle time. If the data are held for the time less than 1 bus cycle time, they may not be sent.
- 4 Transmission delay equal to 1 bus cycle time occurs to read the data in the output receive area after Xn1 turns on.

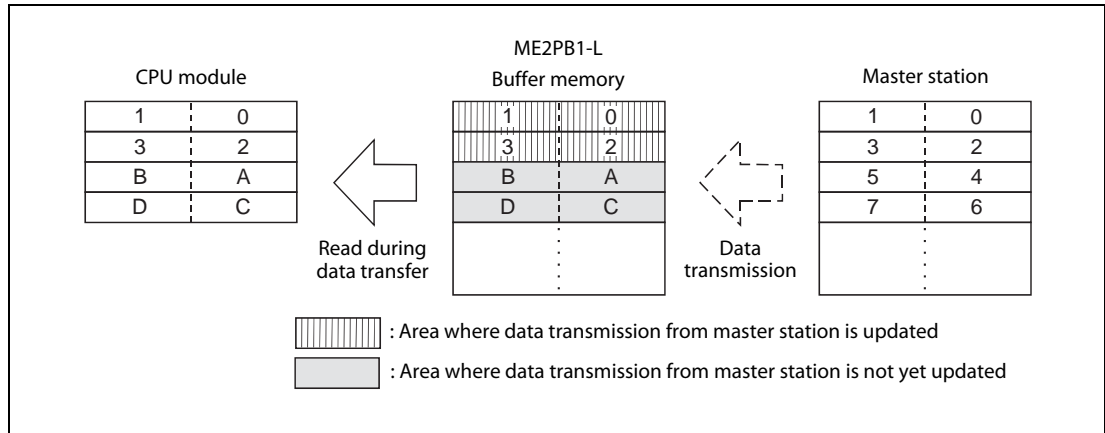
Transmission delay equal to a maximum of 1 bus cycle time occurs to store data in the input receive area after Xn1 turns on.

**NOTE**

For program examples of the I/O data exchange, refer to section 7.3.

## 4.2 I/O Data Separation Prevention Function

The I/O data separation prevention function is a function to prevent the I/O data of the CPU module from being unmatched with the I/O data of the master station.

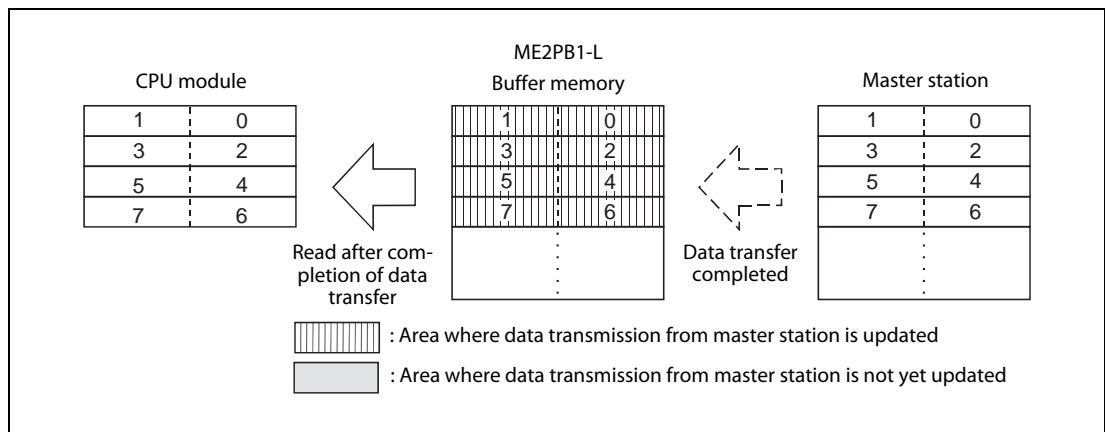


**Tab. 4-3:** Example of output data separation when not using the separation prevention function

### 4.2.1 Using the I/O data separation prevention function

- The separation of I/O data occurs when the buffer memory is also read from/written to the CPU module during the data transmission between the buffer memory of the ME2PB1-L and the master station.
- When the separation prevention function is used, the reading from the CPU module is stopped during the data transmission from the master station to the buffer memory (output receive area) of ME2PB1-L, and executed after the data transmission has been completed.

Also, the data transmission to the master station is stopped until the writing from the CPU module to the buffer memory (input send area) of the ME2PB1-L is completed, and executed after the writing has been completed.



**Tab. 4-4:** Example of data exchange when using the separation prevention function (Output data)

## 4.2.2 How to prevent data inconsistency

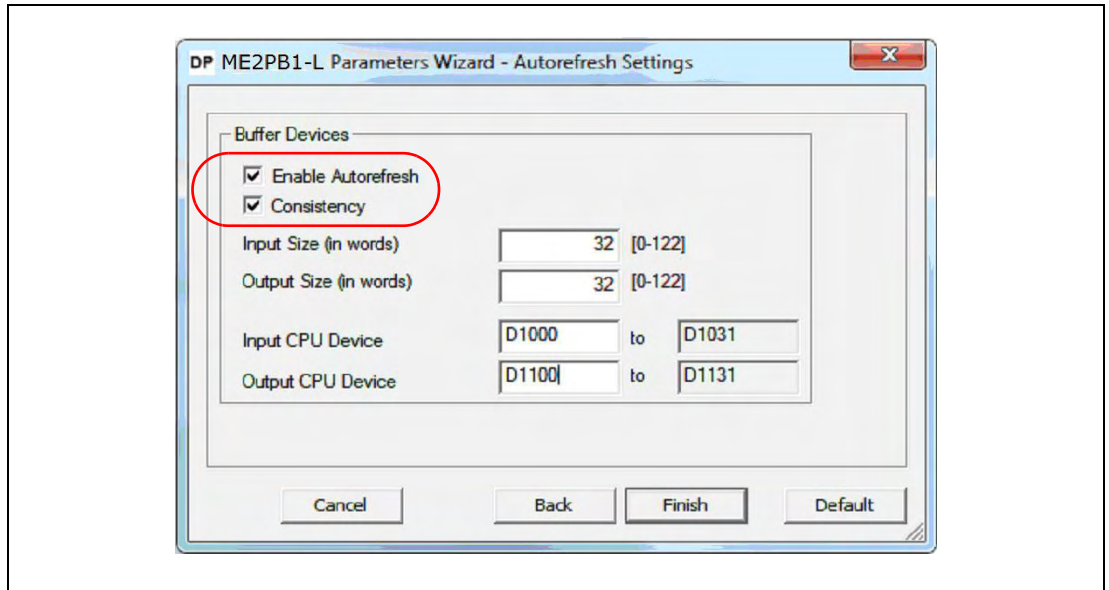
The I/O data separation prevention function is executed during automatic refresh or when dedicated instructions are used.

This function is not available when MOV or FROM/TO instructions are used for buffer memory reading/writing.

- Using automatic refresh

Automatic refresh can be set in the intelligent function utility.

To use the data separation prevention function by automatic refresh, select the **Consistency** checkbox.



**Fig. 4-3:** Automatic refresh setting in the intelligent function utility

### NOTE

For the automatic refresh setting method, refer to section 5.4.1.

- Data consistency function by dedicated instructions

Use the BBLKRD (read) and BBLKWR (write) instructions as dedicated instructions for reading/writing ME2PB1-L buffer memory to execute the data consistency function.

For details on dedicated instructions, refer to chapter 8.

### NOTE

For program examples on the I/O data exchange using dedicated instructions, refer to sections 7.3.1 and 7.3.2.

### 4.2.3 Precautions

- Transmission delay time when the data consistency function is used

The delay time in transmission between the CPU module and master station is lengthened because the ME2PB1-L has to wait for reading from or writing to the CPU module and data transfer from/to the master station. (Refer to chapter 6)

The data consistency function can be disabled in the automatic refresh setting. If this function is unnecessary, disable it.

- 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.

- MOV or FROM/TO instruction

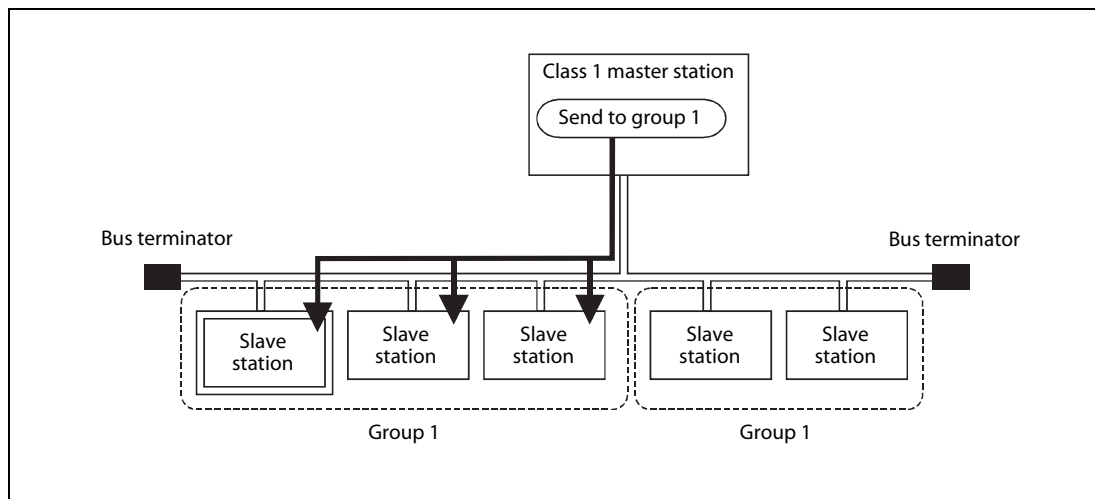
The data consistency function is not usable when data refresh is performed between the LCPU and the ME2PB1-L buffer memory by MOV or FROM/TO instructions.

### 4.3 Global Control Function

The inputs/outputs of slave stations are controlled simultaneously for each specified group by multicasting (broadcasting) from the master station. (Refer to section 4.3.1)

Set group numbers when using the global control function.

The group numbers are set to the slave parameters of the master station. (Refer to section 4.3.2.)



**Fig. 4-4:** The global control function is used to send data to the slaves of group 1

#### 4.3.1 Global control services available for the ME2PB1-L

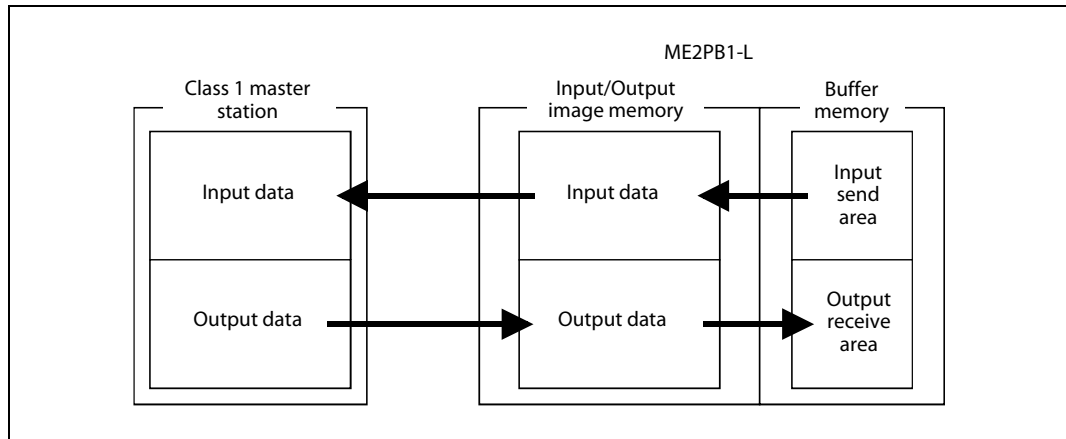
The following table describes the global control services available for the global control function of the ME2PB1-L.

Global control service	Description
SYNC	Starts the SYNC (output synchronization) mode. During the SYNC mode, the output status is refreshed every time the SYNC service is received. The output status is held as long as the SYNC service is not received.
UNSYNC	Ends the SYNC (output synchronization) mode.
FREEZE	Starts the FREEZE (input synchronization) mode. During the FREEZE mode, the input status is refreshed every time the FREEZE service is received. The input status is held as long as the FREEZE service is not received.
UNFREEZE	Ends the FREEZE (input synchronization) mode.

**Tab. 4-5:** Global control services for the ME2PB1-L

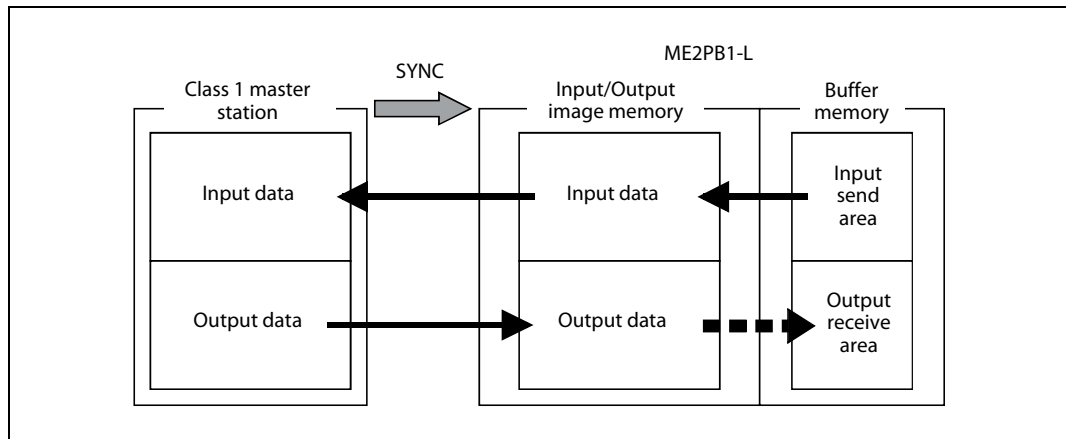
**When receiving SYNC and UNSYNC services**

① Before receiving SYNC service



**Fig. 4-5:** Before receiving SYNC service, the output receive area is refreshed

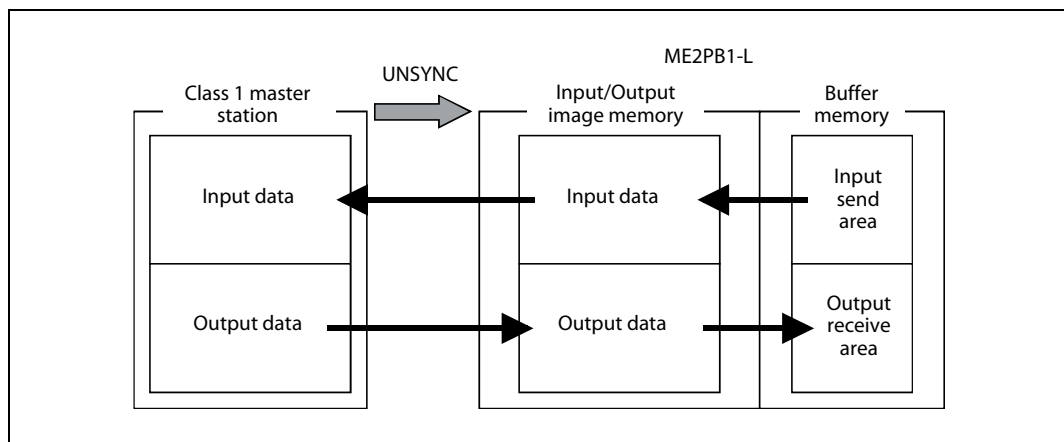
② After receiving SYNC service



**Fig. 4-6:** After receiving SYNC, refresh of the output receive area is stopped

- Upon reception of the SYNC service, the SYNC mode is started and refresh from the output data area to the output receive area is stopped.
- During the SYNC mode, the SYNC LED of the ME2PB1-L is ON.
- When the SYNC service is received during the SYNC mode, refresh to the output receive area is performed only once.
- Even during the SYNC mode, refresh from the input send area to the input data area is executed continuously.

## ③ After receiving UNSYNC service

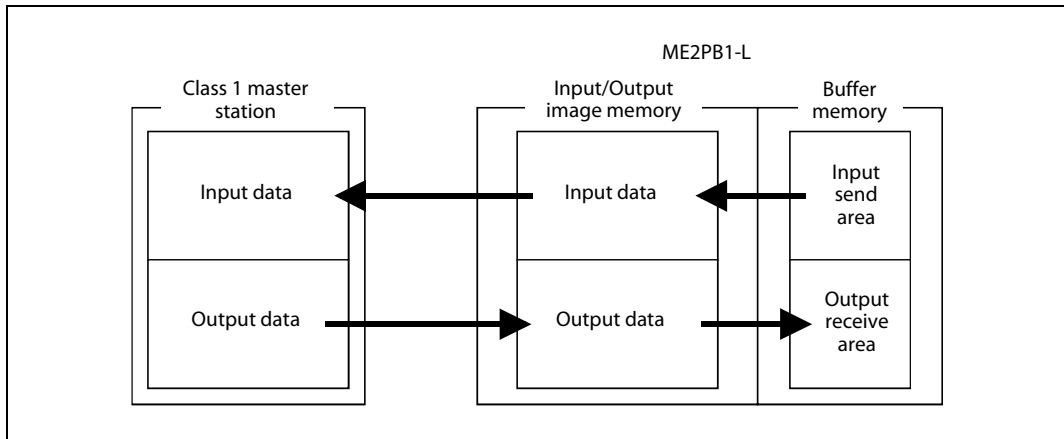


**Fig. 4-7:** After receiving UNSYNC, refresh of the output receive area is restarted

- Upon reception of the UNSYNC service, the SYNC mode is terminated and refresh from the output data area to the output receive area is restarted.
- When the UNSYNC service is received, the SYNC mode is ended and the SYNC LED of the ME2PB1-L turns OFF.

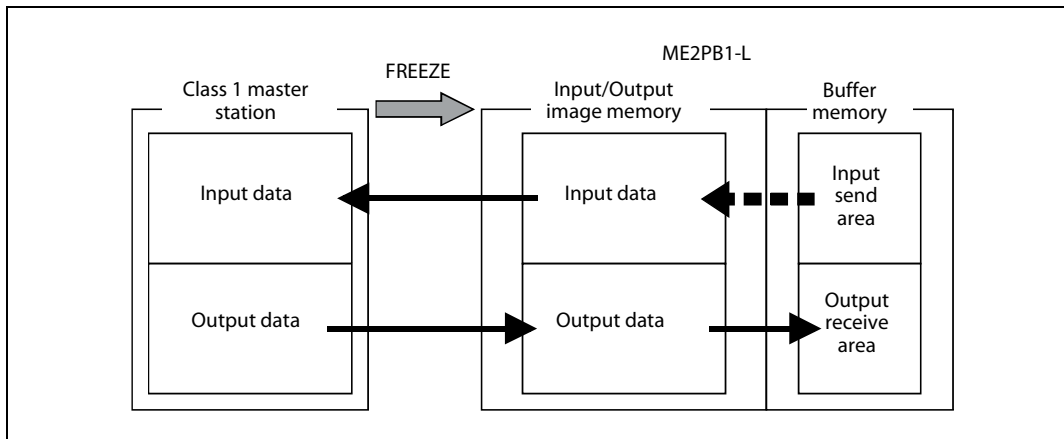
**When receiving FREEZE and UNFREEZE services**

① Before receiving FREEZE service



**Fig. 4-8:** Before receiving FREEZE service, input data is refreshed

② After receiving FREEZE service

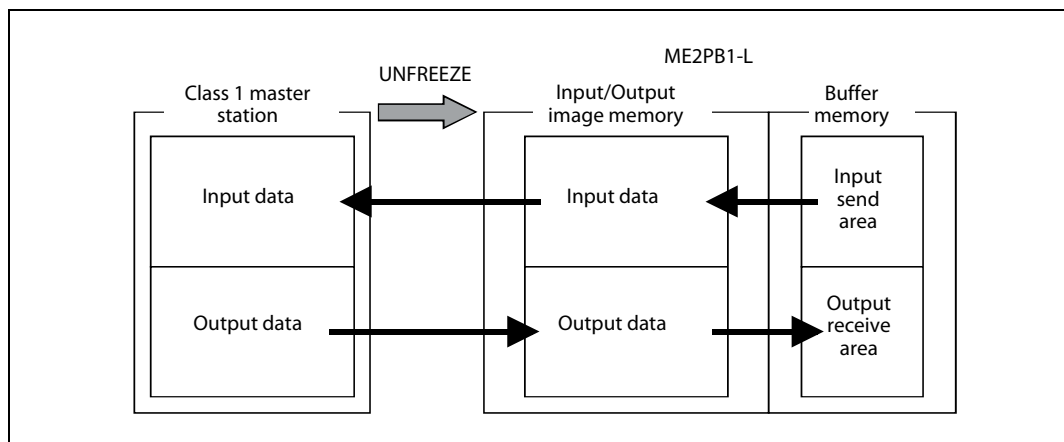


**Fig. 4-9:** After receiving FREEZE, refresh of the input data is stopped

- Upon reception of the FREEZE service, the FREEZE mode is started and refresh from the input send area to the input data area is stopped.
- During the FREEZE mode, the FREEZE LED of the ME2PB1-L is ON.
- When the FREEZE service is received during the FREEZE mode, refresh to the input sending area is performed only once.
- Even during the FREEZE mode, refresh from the output data area to the output receive area is executed continuously.



## ③ After receiving UNFREEZE service



**Fig. 4-10:** After receiving UNFREEZE, refresh of the input data is restarted

- Upon reception of the UNFREEZE service, the FREEZE mode is terminated and refresh from the input send area to the input data area is restarted.
- When the UNFREEZE service is received, the FREEZE mode is ended and the FREEZE LED of the ME2PB1-L turns OFF.

### 4.3.2 Group selection

There are a total of 8 groups from 1 to 8.

The ME2PB1-L is allowed to belong to any of the 8 groups. (Specify the group using the configuration tool of the master station.)

## 4.4 Data Swap Function

The high and low bytes are swapped in word units when input or output data are sent to or received from the master station.

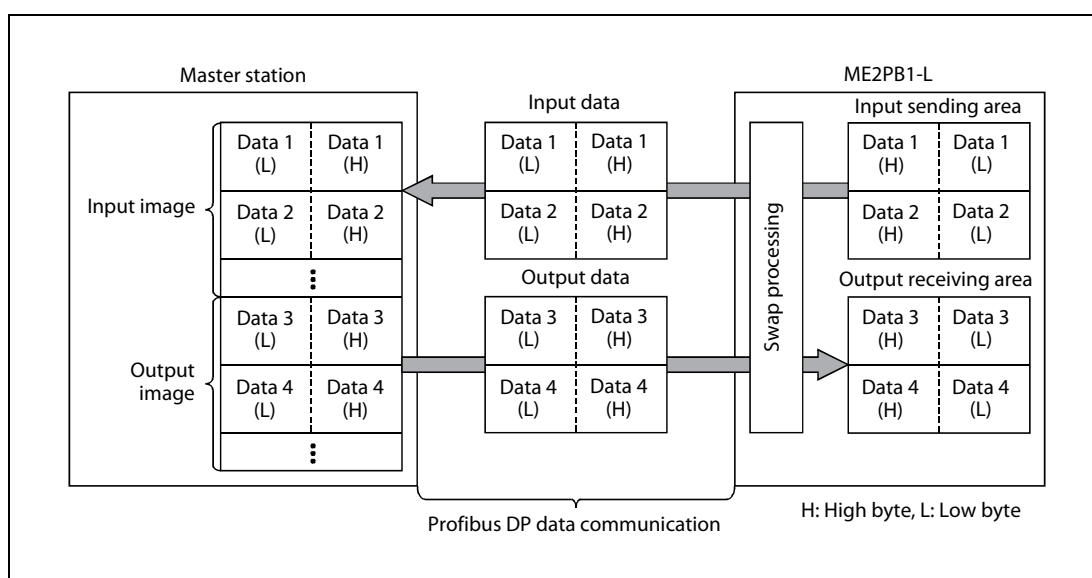
Use this function when the used master station handles the high and low bytes of word data in reverse to those of the ME2PB1-L.

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.

### Operation outline for swap function

The data stored in the input sending area are sent to the master station after their high and low bytes have been swapped.

The data received from the master station are stored into the output receiving area after their high and low bytes have been swapped.



**Fig. 4-11:** Data are swapped between the ME2PB1-L and the master station

### 4.4.1 Data swap setting

The setting required for swapping I/O data, the setting by master station type and the operation outline are described below.

#### Swap function setting by master station type

The swap function setting changes depending on the master station type as described below.

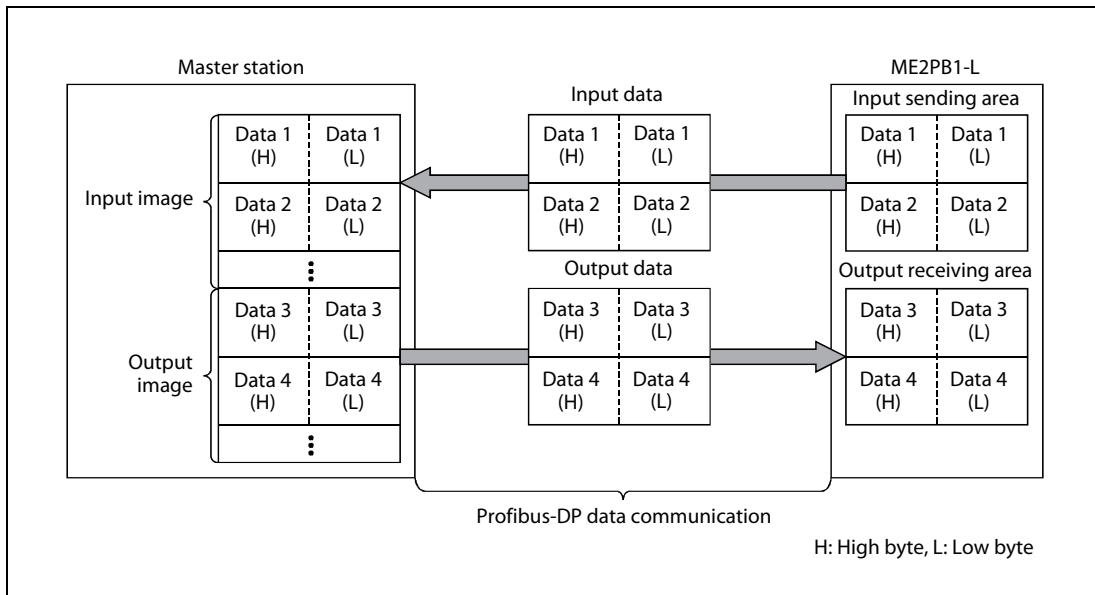
Master station type		Swap function setting of ME2PB1-L
ME1PB1-L	When swap is not executed on master station side (Default setting)	Disable (Not swapped)
QJ71PB92V		
QJ71PB92D	When swap is executed on master station side	Enable (Swapped)
A1SJ71PB92D, AJ71PB92D		Disable (Not swapped)
Other master station		Set according to the specifications of the master station

**Tab. 4-6:** Swap function setting depending on master station type

**Operation outline**

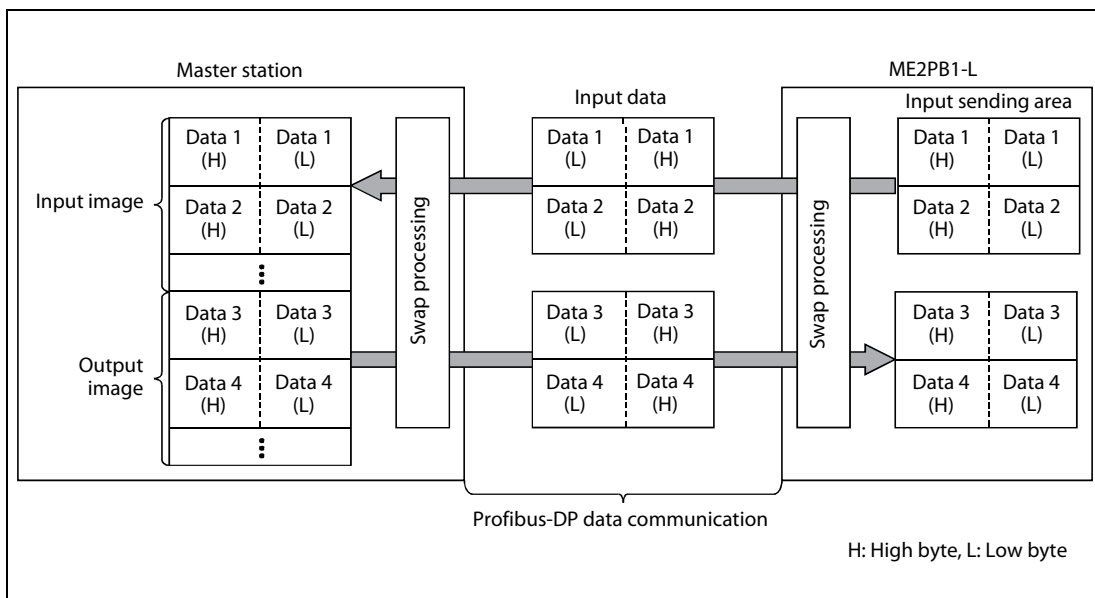
When the ME1PB1-L, QJ71PB92V, QJ71PB92D, A1SJ71PB92D or AJ71PB92D is used as the master station, the operation outline is as shown below.

- When the data is not swapped inside the master station (ME1PB1-L, QJ71PB92V, QJ71PB92D, A1SJ71PB92D or AJ71PB92D)



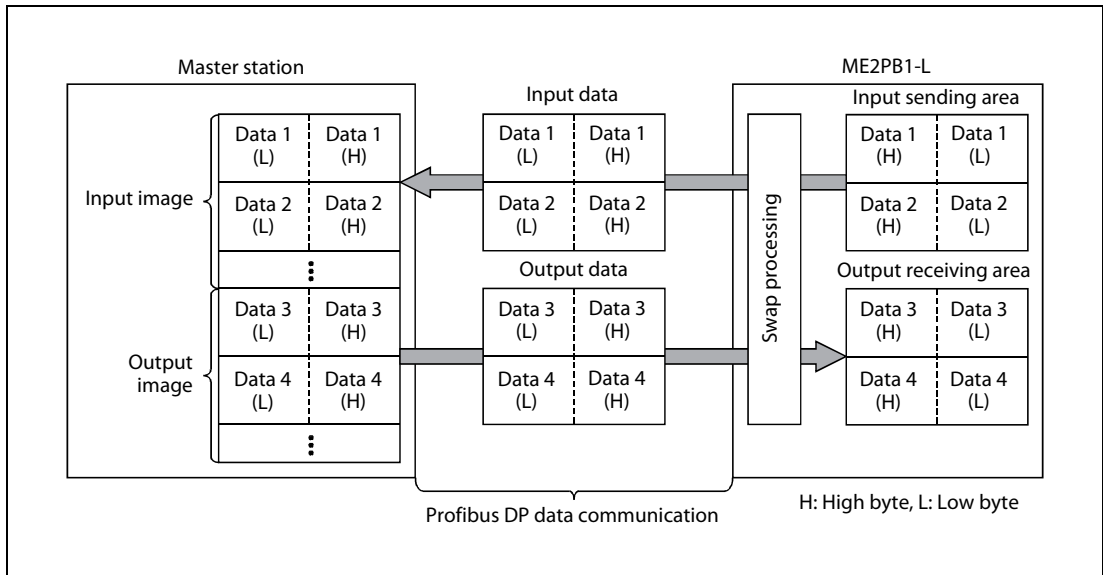
**Fig. 4-12:** Data are not swapped between the ME2PB1-L and the master station

- When the data is swapped inside the master station (ME1PB1-L, QJ71PB92V/QJ71PB92D)



**Fig. 4-13:** Data are not swapped between the ME2PB1-L and the master station

- When high and low bytes of word data are reversed (swap) between the master station and the ME2PB1-L

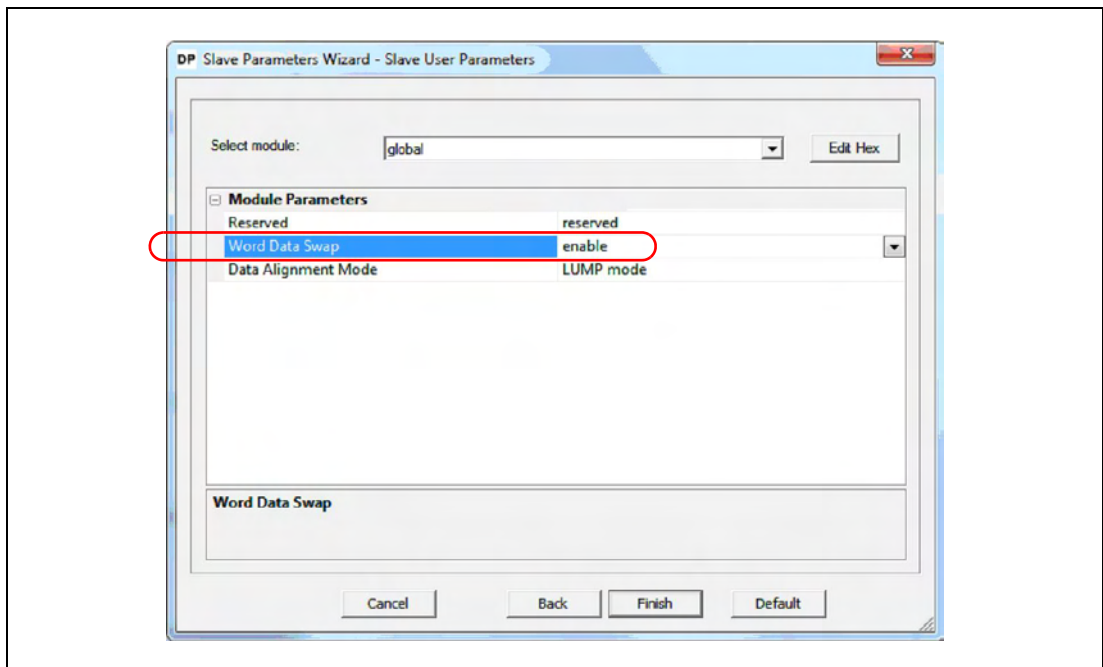


**Fig. 4-14:** Data are swapped between the ME2PB1-L and the master station

**How to set the swap function**

The swap function can be set as a slave parameter of the master station (Word Data Swap in the user parameters setting).

Slave parameters of the master station are set from the configuration tool on the master station. Select "Word Data Swap" to enable the swap setting for a DP-Slave.



**Fig. 4-15:** Data swap setting

**NOTE**

Refer to section 5.3.3 for a setting example using the intelligent function utility. When using another configuration tool, refer to the relevant manual.

# 5 Settings and Procedures before System Operation

This chapter explains the procedures for connecting the ME2PB1-L to Profibus DP, wiring and other information.

## 5.1 Implementation and Installation

This section provides the handling precautions, from unpacking to installation of the ME2PB1-L.

For details on the implementation and installation of the ME2PB1-L, refer to the user's manual (Hardware design, maintenance and inspection) for the CPU module used.

### 5.1.1 Handling precautions

The following are precautions for handling the ME2PB1-L as a unit.

- Do not drop the module case or subject it to heavy impact.
- Do not remove the printed-circuit board of each module from its case.

This may cause a failure in the module.

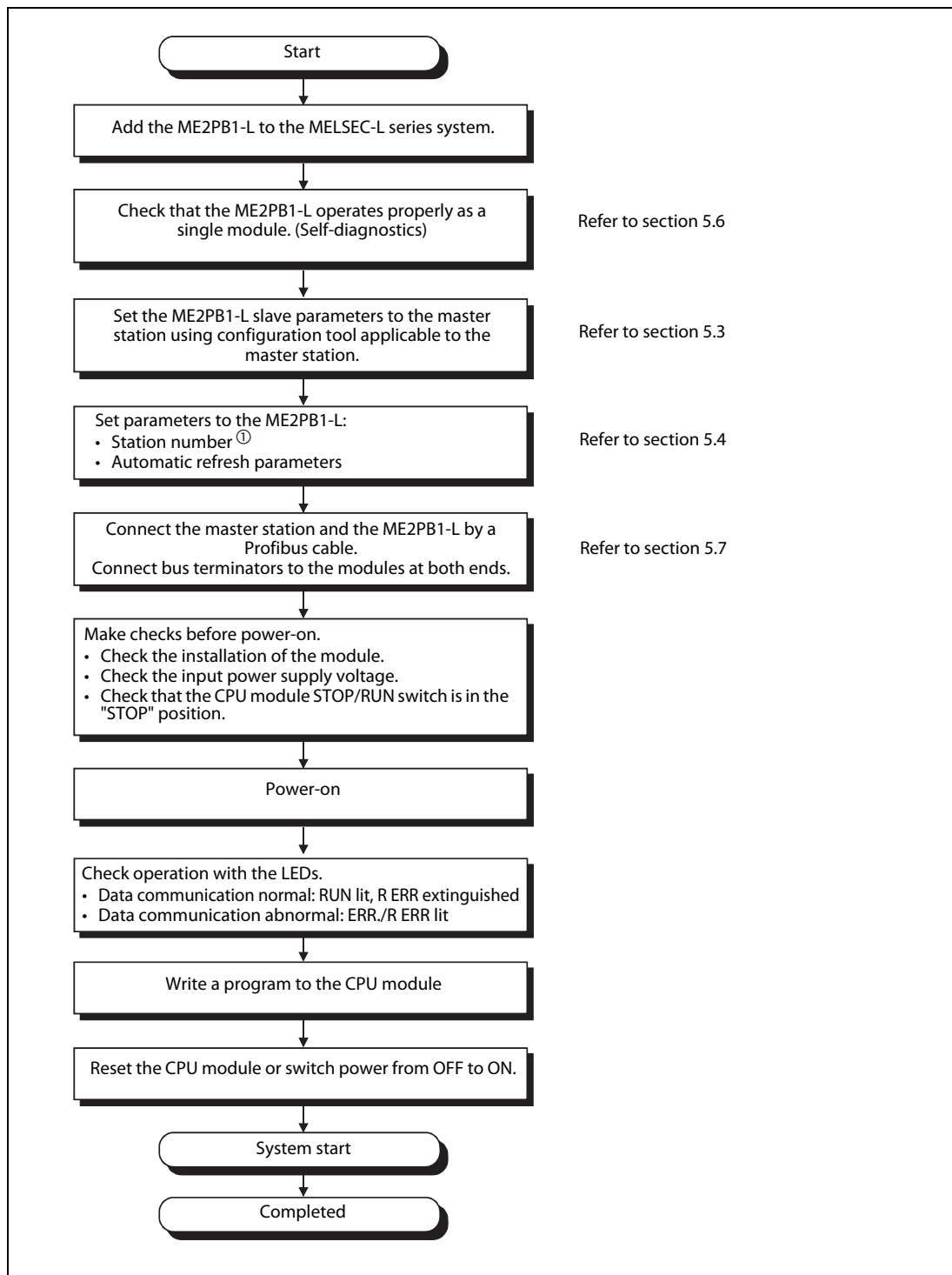
- Be careful not to let foreign objects such as wire chips enter the module during wiring. In the event any foreign object enters, remove it immediately.
- Tighten the screws within the following torque ranges.

Screw location	Tightening torque range
Profibus cable connector screw (#4 - 40UNC screws)	0.20 to 0.28 Nm

**Tab. 5-1:** Screw tightening torque

## 5.2 Procedures Before System Operation

The following diagram illustrates the procedure before system operation.



**Tab. 5-2:** Procedures before system operation

① When setting the station number from a class 2 master station, connect the Profibus cable to the ME2PB1-L before the setting.

### 5.3 Parameter Setting to Master Station

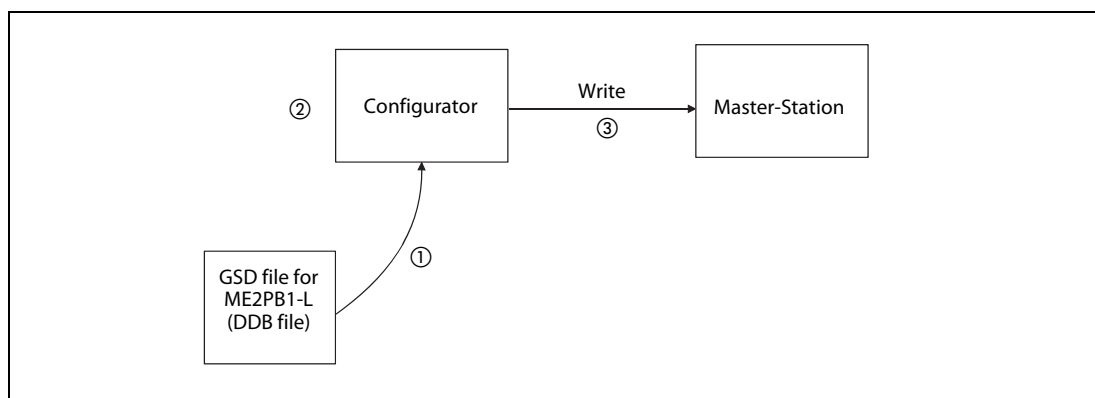
In Profibus DP systems, slave parameters for the ME2PB1-L must be set to the master station. For the setting method, refer to the manual of the configuration tool to be used.

Item	Description	Setting range	Reference (Section)
FDL Address	Set the station number of the ME2PB1-L	0 to 125	—
Watchdog	Set the watchdog timer period of the communication watchdog timer. The ME2PB1-L detects a communication error if data cannot be received from the master station within the configured time. If the communication watchdog timer has not been set, no error is detected.	2 to 65025 (set value × 10ms)	—
Min T_sdr	Set the minimum response time during which the response frame is sent from the ME2PB1-L to the master station. Usually the default value is used.	1 to 255	—
Group identification number	Specify groups (Grp1 to Grp8) to which the ME2PB1-L belongs.	Multiple groups (Grp1 to Grp 8) can be set.	—
Data module setting	Set the I/O configuration information (set to "Cfg_Data" of the master station).	Setting type: 96 pattern Number of setting: 1 to 40	5.3.1
Data assignment mode setting	Set the data layout of the output receive area/input send area of the buffer memory (set to "User_Prm_Data" of the master station).	0: LUMP mode (default) 1: DIVIDED mode	5.3.2
Swap setting	Set whether the word data sent/received on the ME2PB1-L side will be swapped or not (set to "User_Prm_Data" of the master station)	0: Without swap (default) 1: With swap	5.3.3

**Tab. 5-3:** Slave parameter required for the ME2PB1-L

#### Procedure for setting the slave parameters for ME2PB1-L to the master station

- ① Read the GSD (DDB) file of the ME2PB1-L to the configurator corresponding to the master station used. (Refer to the description below.)
- ② Set the ME2PB1-L slave parameters using the configurator.
- ③ Write the parameters to the master station.



**Fig. 5-1:** Setting slave parameters for ME2PB1-L to the master station

**NOTE**

Refer to sections 5.3.1 to 5.3.3 for setting examples using the intelligent function utility. When using another configuration tool on the master station, refer to the relevant manual.

**GSD (DDB) file**

- When using the intelligent function utility of GX Works2  
GSD files have been incorporated into GX Works2. GSD file installation is, therefore, unnecessary.
- When using another configuration tool for the master station  
Please consult your local system service center or representative for the GSD (DDB) file of the ME2PB1-L.

**5.3.1 Data module setting**

Set the I/O configuration information of the master station and ME2PB1-L.

**Number of data modules to be set**

Set the data modules per ME2PB1-L within the following range.

- Number of data modules: Max. 40 modules
- Total data size

Input data: Max. 122 words      }  
Output data: Max. 122 words      } Max. 192 words in total

**Data module setting pattern**

For data module setting, choose the corresponding one from among 96 patterns made available by combining I/O designation (3 types), data size (16 types) and separation prevention setting (2 types).

Setting Item	Types
I/O designation	<ul style="list-style-type: none"> <li>● Input</li> <li>● Output</li> <li>● Input/output</li> </ul>
Data size	1 to 16 words
Separation prevention setting	<ul style="list-style-type: none"> <li>● Word unit (con word)</li> <li>● Data module unit (con whole)</li> </ul>

**Tab. 5-4:** Data module settings

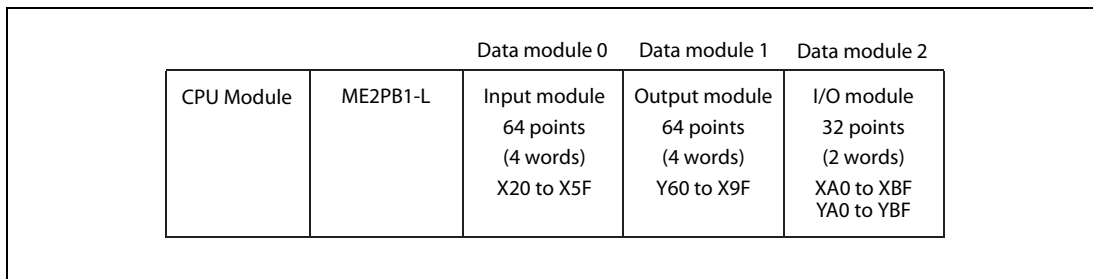
**NOTE**

When even one data module is set to “data module unit (con whole)” in the separation prevention setting, data inconsistency is prevented based on the specified data size.



**Data module setting example**

The data module setting example given here assumes the following configuration.



**Fig. 5-2:** Configuration for this example

Data Module Setting	ME2PB1-L Buffer Memory
Data module 0 (Input, 4 words, word unit)	Data module 0 area (4 words) is reserved in the input send area.
Data module 1 (Output, 4 words, word unit)	Data module 1 area (4 words) is reserved in the output receive area.
Data module 2 (Input/output, 2 words, word unit)	Data module 2 areas (2 words each) are reserved in the output receive area and input send area.

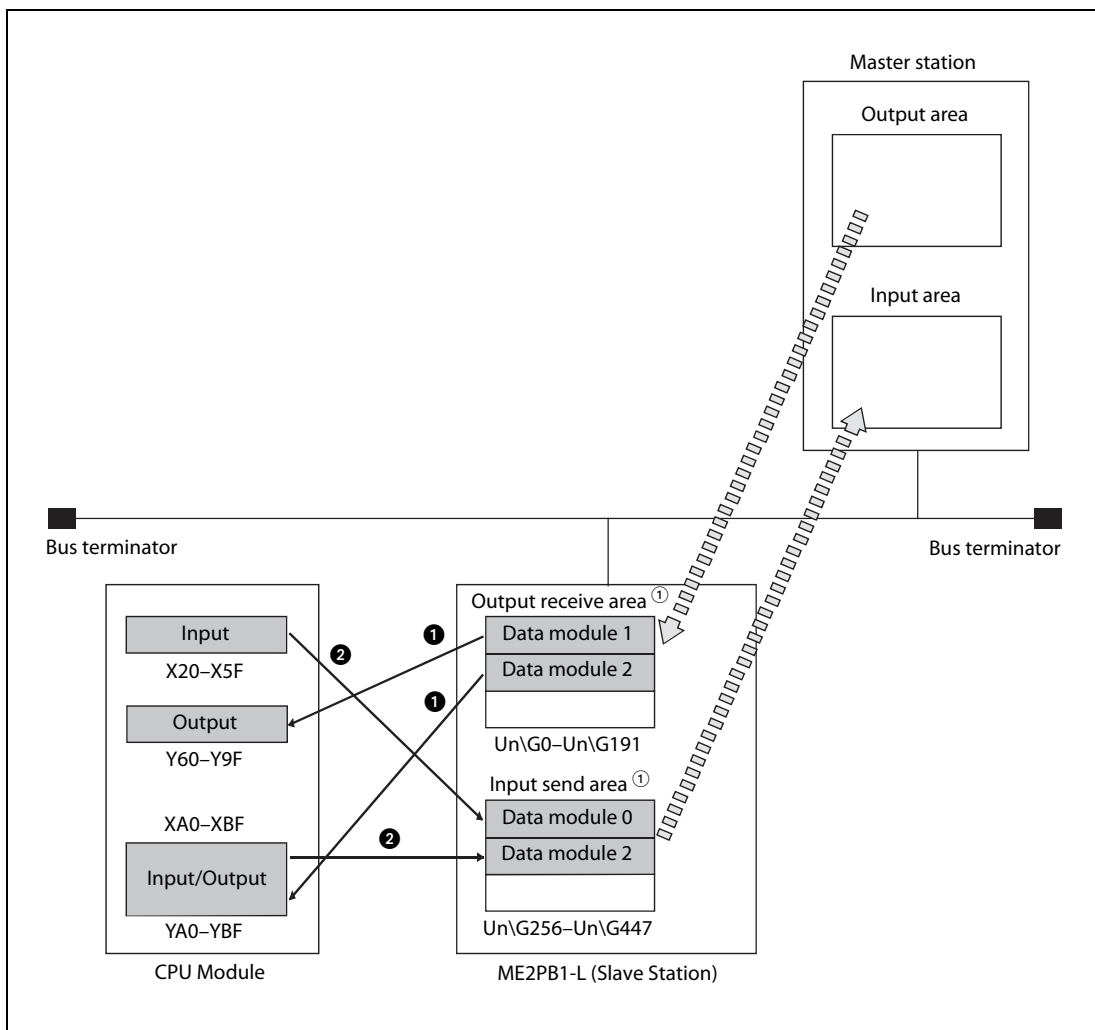
**Tab. 5-5:** Settings for this example

● Total data size

The total data size of the data modules 0 to 2 is as follows.

- Input data size: Data module 0 (input, 4 words) + data module 2 (input, 2 words) = 6 words
- Output data size: Data module 1 (output, 4 words) + data module 2 (output, 2 words) = 6 words
- Total data size: Input data size (6 words) + output data size (6 words) = 12 words

● Data flow



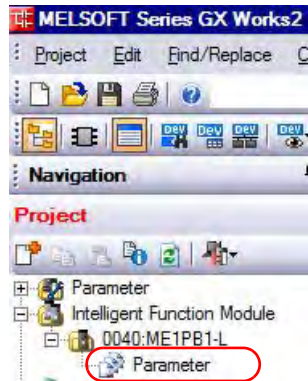
**Fig. 5-3:** Data flow for this example

- ① Use the data assignment mode setting to set the layout on the buffer memory. (Refer to section 5.3.2)
- ① Reads with BBLKRD/MOV/FROM instruction or automatic refresh.
- ② Writes with BBLKWR/MOV/TO instruction or automatic refresh.

**Setting method when using the intelligent function utility**

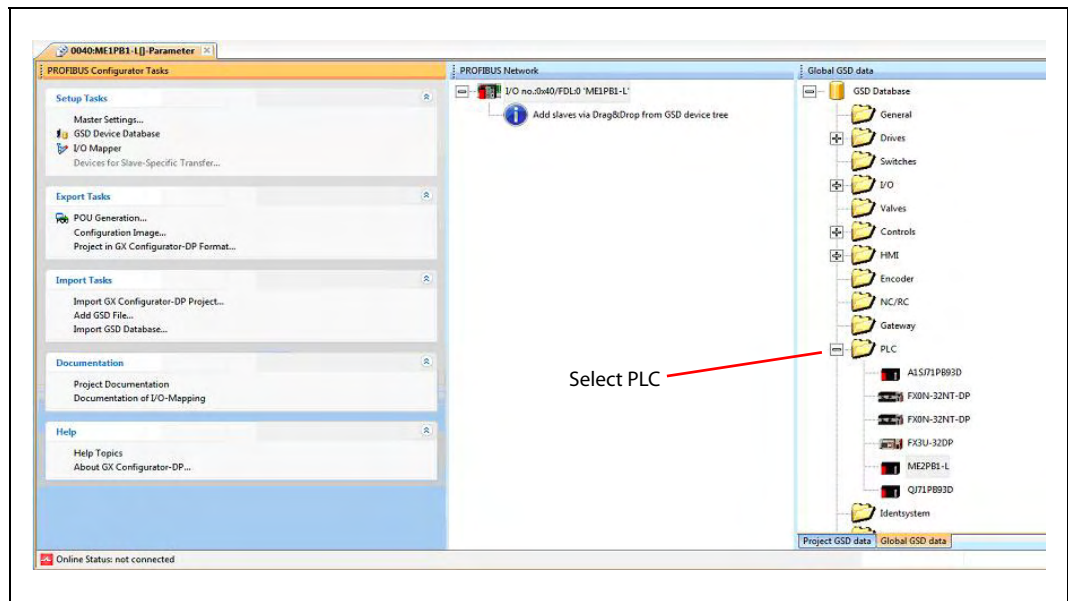
This section describes how to make settings using GX Works2. When using another configuration tool, refer to the relevant manual.

- ① Select the Profibus DP master modul.



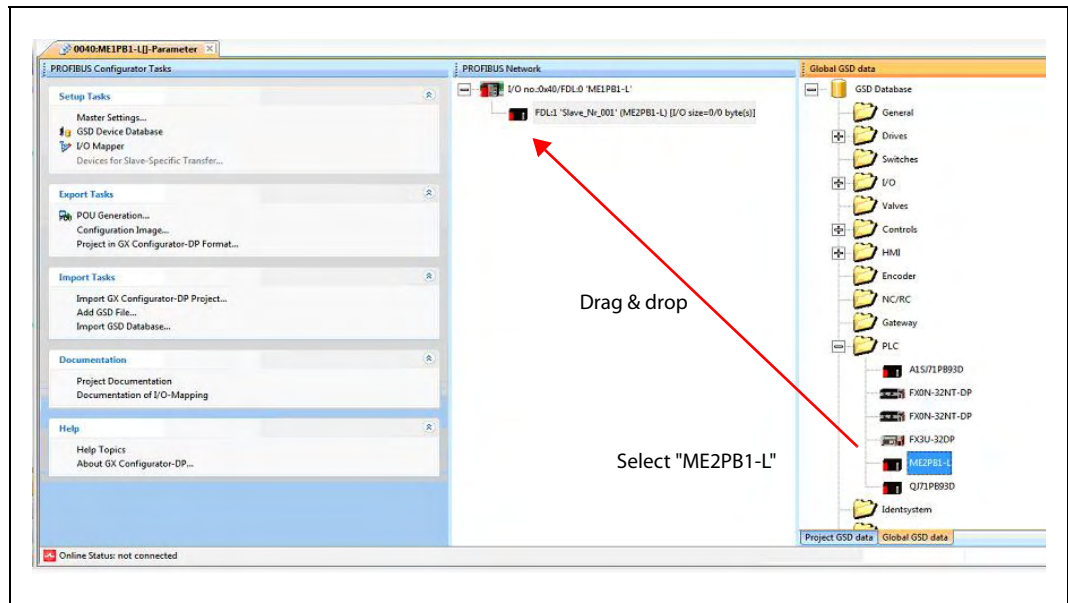
**Fig. 5-4:** Double click on **Parameter**

- ② Add a slave station on the graphical network editor.



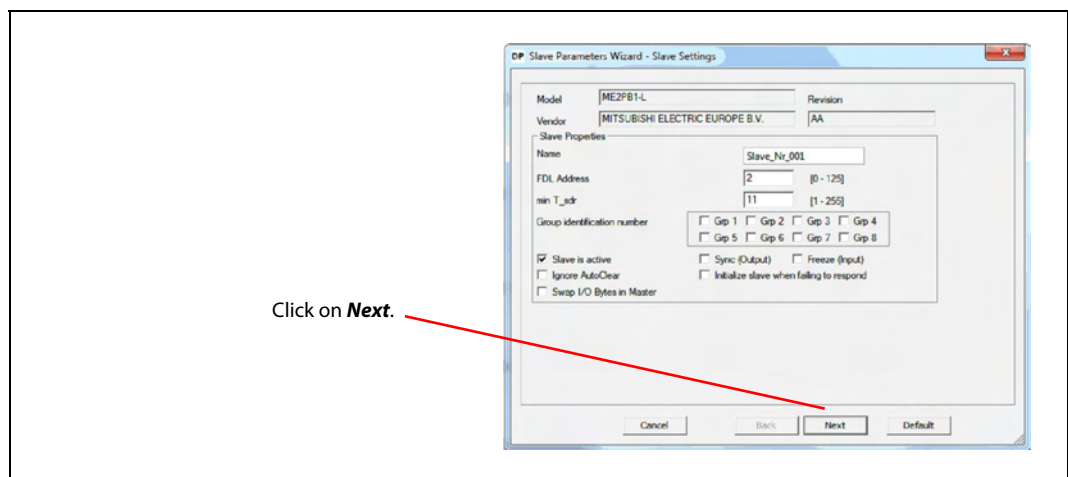
**Fig. 5-5:** Insertion of a DP-Slave

- ③ Select the ME2PB1-L and place it in the network using drag & drop.



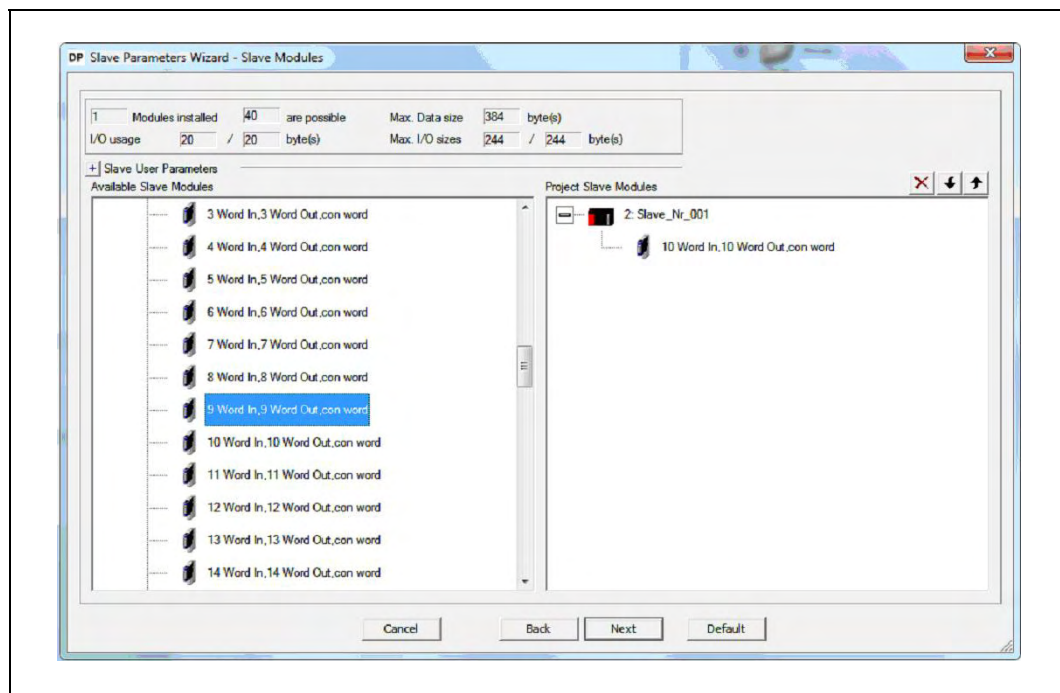
**Fig. 5-6:** Selection of the ME2PB1-L

- ④ The dialog box for Slave Parameter Settings opens.



**Fig. 5-7:** Slave parameter for ME2PB1-L

- ⑤ Perform the data module setting.



**Fig. 5-8:** Data module settings

- ⑥ Write the configured parameters into the master station.

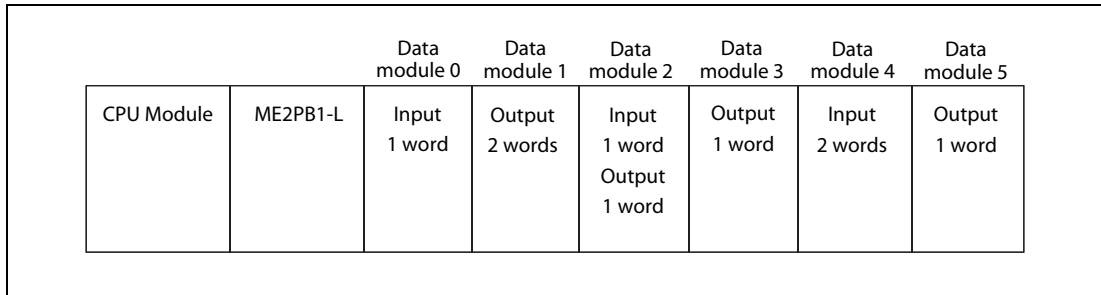
**NOTE**

Refer to the GX Works2 Operating Manual for creating projects and writing parameters to the master station.

### 5.3.2 Data assignment mode setting

Set how to assign each module in the output receive area or the input send area of the buffer memory.

This section gives an example of the output receive area and the input send area in the following data module setting.



**Fig. 5-9:** Configuration for this example

Data Module Setting		Output Data	Input Data
Data module 0	1 word, input	—	1 word
Data module1	2 words, output	2 words	—
Data module2	1 word, input/output	1 word	1 word
Data module3	1 word, output	1 word	—
Data module4	2 words, input	—	2 words
Data module5	1 word, output	1 word	—

**Tab. 5-6:** Input and output data for this example

**Data assignment modes**

The ME2PB1-L supports the DIVIDED mode and the LUMP mode.

● DIVIDED mode

In DIVIDED mode, storage location of I/O data is assigned in the same way as the actual input/output of data modules.

Since arrangement in the assignment is the same as that of the actual inputs and outputs, reading from or writing to I/O modules and/or intelligent function modules can be done with a single instruction.

Buffer memory of the ME2PB1-L				
Address	Output receive area		Address	Input send area
Un\G0			Un\G256	Used by data module 0
Un\G1	Used by data module 1		Un\G257	
Un\G2			Un\G258	
Un\G3	Used by data module 2		Un\G259	Used by data module 2
Un\G4	Used by data module 3		Un\G260	
Un\G5			Un\G261	Used by data module 4
Un\G6			Un\G262	
Un\G7	Used by data module 5		Un\G263	
Un\G8			Un\G264	
Un\G9			Un\G265	
:			:	
Un\G191			Un\G447	

**Tab. 5-7:** Buffer memory occupation in DIVIDED mode

● LUMP mode (Default)

In LUMP mode, the areas for storing input and output data are assigned in order of the data modules without allowing any empty space.

Because of this, reading from or writing to I/O modules and/or intelligent function modules may not be executable with a single instruction. When storing data in the output receive area and the input send area, device areas can be used effectively.

Buffer memory of the ME2PB1-L				
Address	Output receive area		Address	Input send area
Un\G0	Used by data module 1		Un\G256	Used by data module 0
Un\G1			Un\G257	Used by data module 2
Un\G2	Used by data module 2		Un\G258	Used by data module 4
Un\G3	Used by data module 3		Un\G259	
Un\G4	Used by data module 5		Un\G260	
Un\G5			Un\G261	
Un\G6			Un\G262	
Un\G7			Un\G263	
Un\G8			Un\G264	
Un\G9			Un\G265	
:			:	
Un\G191			Un\G447	

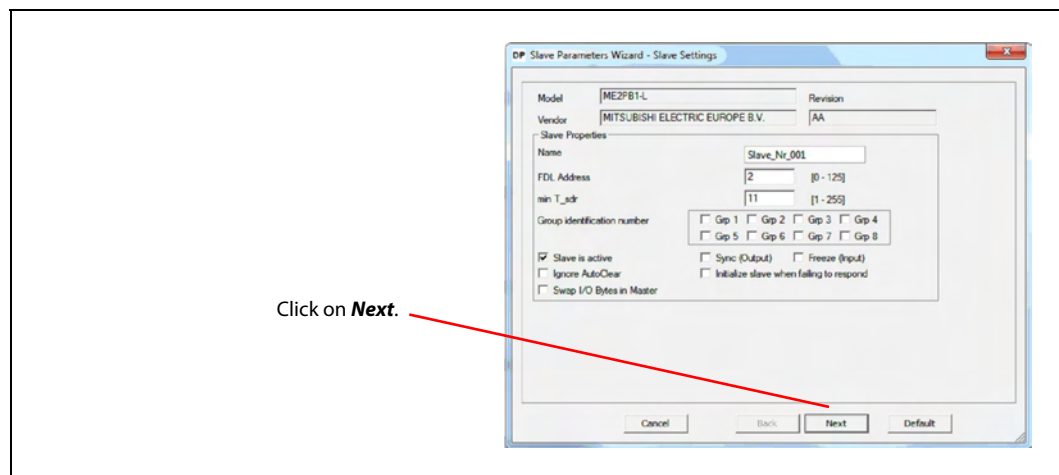
**Tab. 5-8:** Buffer memory occupation in LUMP mode

**Setting method when using the intelligent function utility**

This section describes how to make settings using GX Works2. When using another configuration tool, refer to the relevant manual.

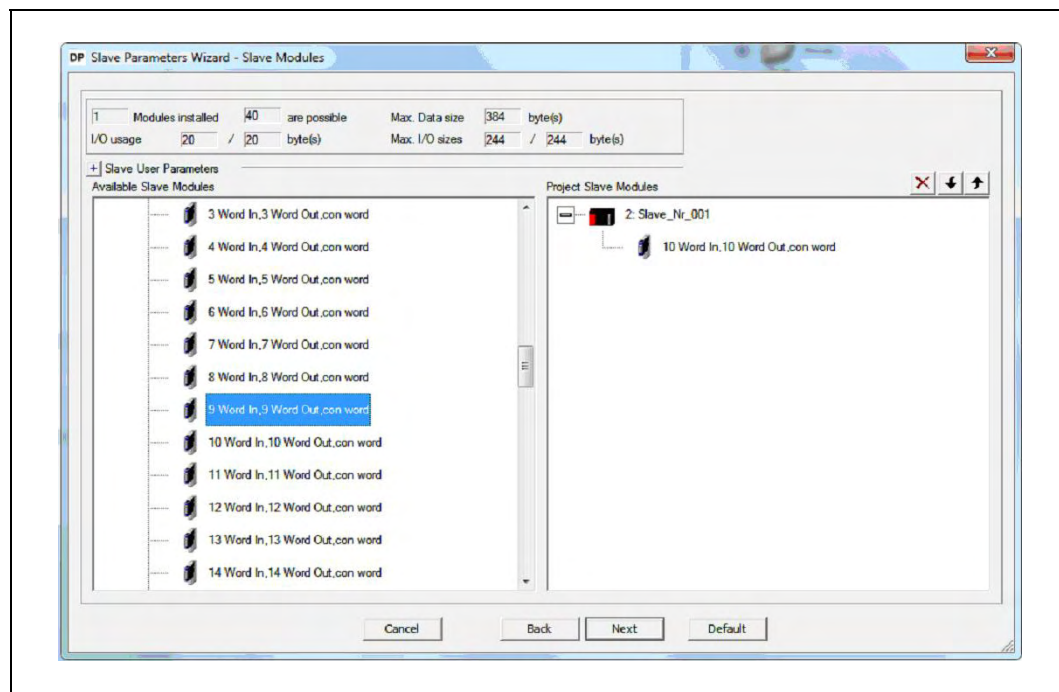
- ① From the intelligent function utility, open the Slave Parameter Settings dialog box. (Refer to section 5.3.1).

Click the **Next** button in the Slave Parameter Settings dialog box.



**Fig. 5-10:** Selection of the user parameters

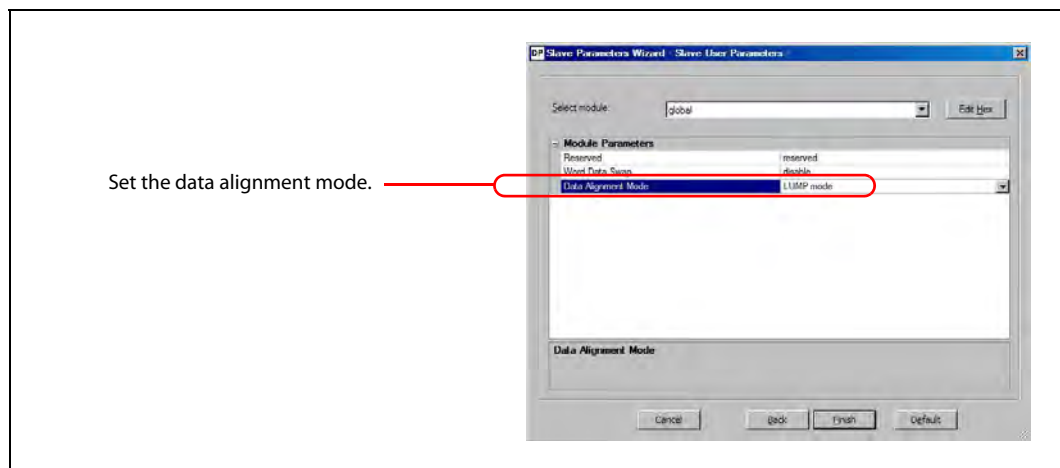
- ② Perform the data module setting.



**Fig. 5-11:** Data module settings



③ Set the Data Alignment Mode.



**Fig. 5-12:** Selection of the data alignment mode

Item	Description	
Data Alignment Mode	LUMP mode	Assigns data as a lump. (Default)
	DIVIDED mode	Assigns data individually.

**Tab. 5-9:** Data Alignment Modes

④ Write the configured parameters into the master station.

**NOTE**

Refer to the GX Works2 Operating Manual for creating projects and writing parameters to the master station.

### 5.3.3 Swap setting

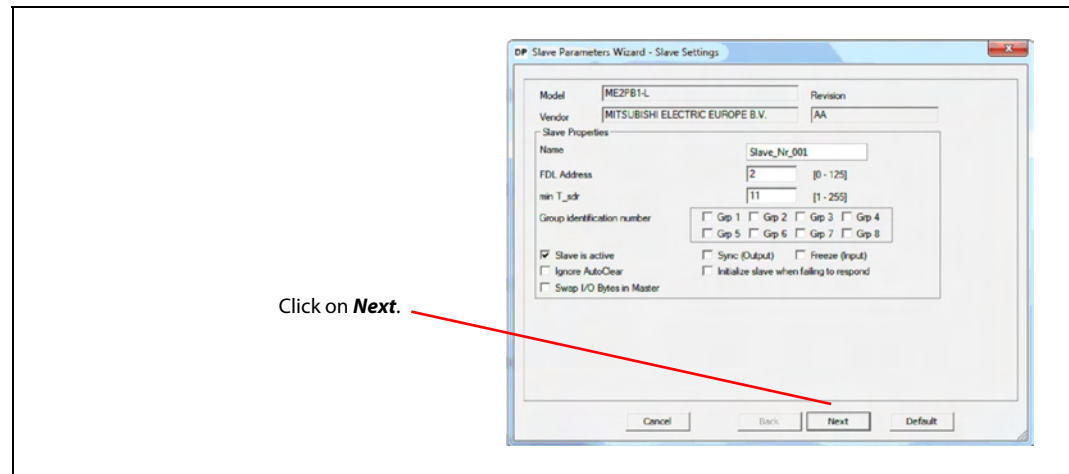
Set whether the word data swap function will be used or not. (Refer to section 4.4.1)

#### Setting method when using the intelligent function utility

This section describes how to make settings using GX Works2. When using another configuration tool, refer to the relevant manual.

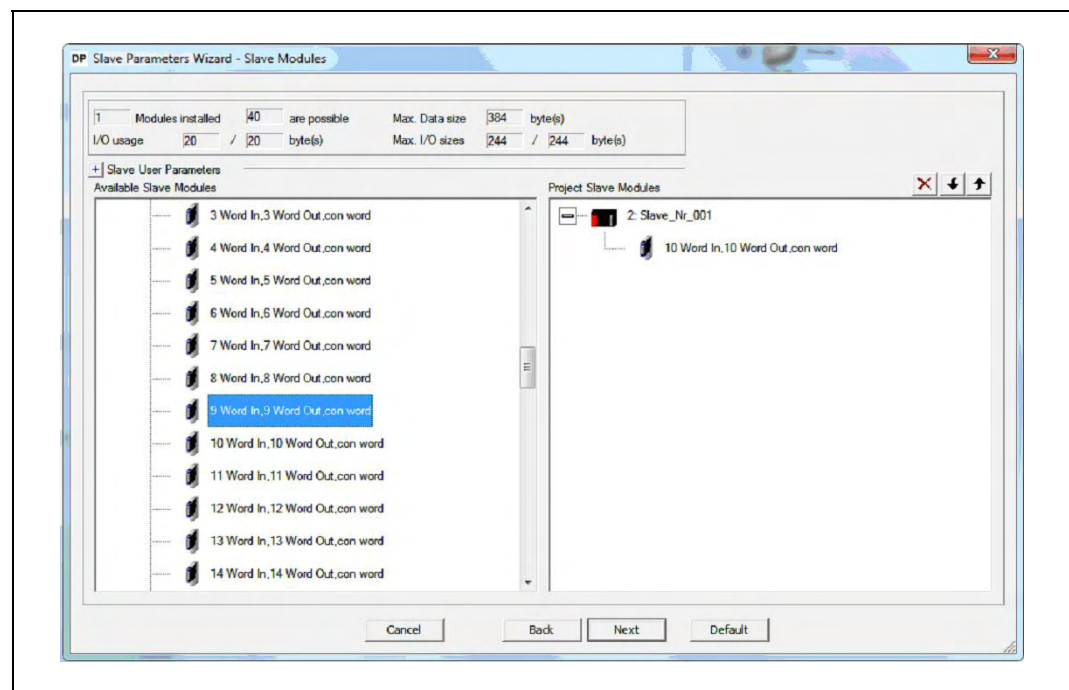
- ① From the intelligent function utility, open the Slave Parameter Settings dialog box. (Refer to section 5.3.1).

Click the **Next** button in the Slave Parameter Settings dialog box.



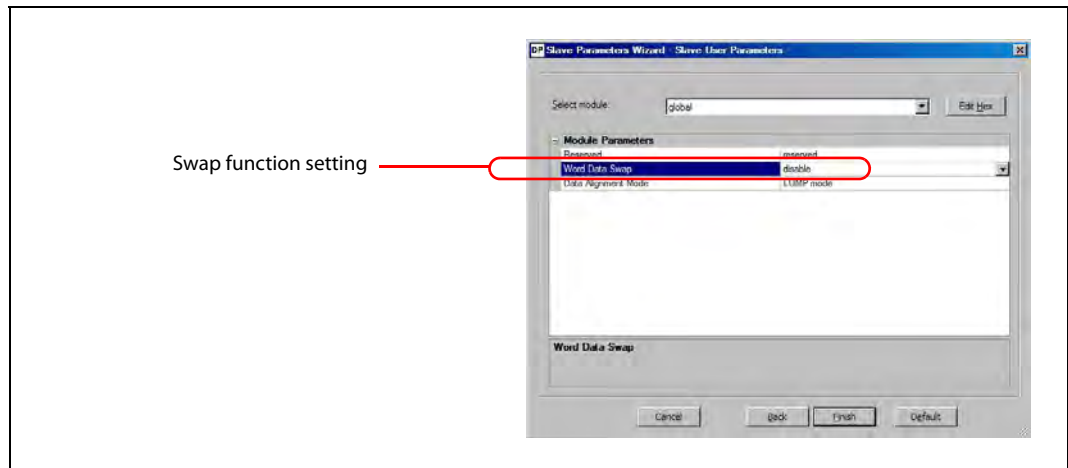
**Fig. 5-13:** Selection of the user parameters

- ② Perform the data module setting.



**Fig. 5-14:** Data module settings

- ③ Make the desired setting for Word Data Swap.



**Fig. 5-15:** Selection of the swap function

Item	Description	
Word Data Swap	enable	Swaps the high and low bytes of data in units of words when receiving or sending I/O data.
	disable	Sends or receives I/O data as they are. (Default).

**Tab. 5-10:** Word data swap modes

- ④ Write the configured parameters into the master station

**NOTE**

Refer to the GX Works2 Operating Manual for creating projects and writing parameters to the master station.

## 5.4 Parameter Setting to Slave Station (ME2PB1-L)

Set the parameters shown in the following table to the ME2PB1-L.

Item	Description
Station number (FDL Address)	Set the station number of the ME2PB1-L. <ul style="list-style-type: none"><li>• Setting range: From 0 to 125</li></ul>
Automatic refresh parameters (Autom. Refresh) ①	Set the parameters to automatically refresh the I/O data between the ME2PB1-L and the CPU module.

**Tab. 5-11:** Required parameters for the ME2PB1-L

① Set the automatic refresh parameters only when using the automatic refresh.

### Parameter setting method

#### ● FDL address

The FDL address can be set by either of the following:

- Profibus Network settings of GX Works2 (Refer to the following section 5.4.1)
- Sequence program (Refer to section 7.2)

#### ● Automatic refresh parameters

The automatic refresh parameters can be set only in the Profibus Network settings of GX Works2. (Refer to the following section 5.4.1)

### 5.4.1 Setting FDL address and automatic refresh parameters

The following explains the procedure for setting the FDL address (station number) and automatic refresh parameters using GX Works2. For the Profibus Network settings refer to the GX Works2 Operating Manual.

#### NOTE

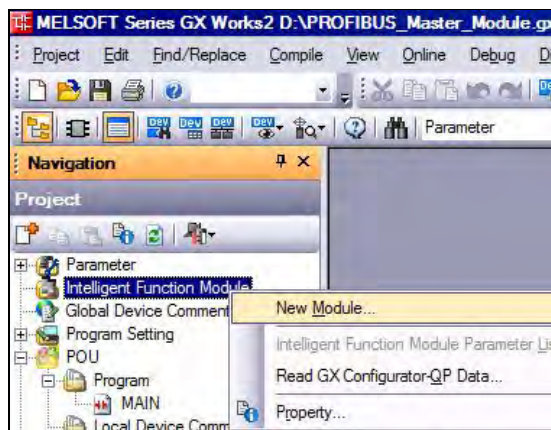
To change the FDL address, perform the following to stop the refresh of the I/O data between the master and slave stations.

- Turn off the Input send area refresh directive signal (Yn0) of the ME2PB1-L.
- Stop I/O data communication on the master station side.

A new FDL address becomes effective right after the setting. If the FDL address is changed during system operation, I/O data may be updated to those for the new FDL address.

#### Start procedure

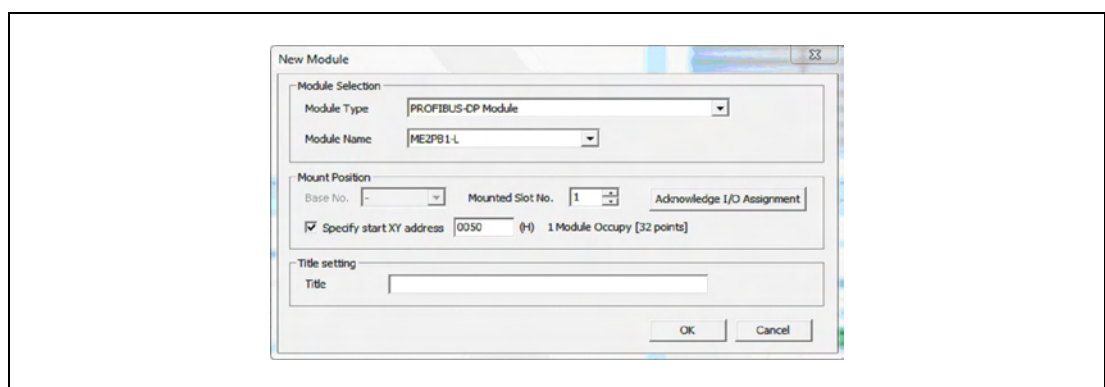
To add a new intelligent function module to a GX Works2 project, click on **Intelligent Function Module** in the Project Navigation window.



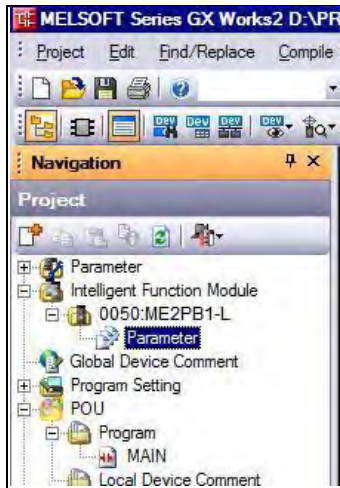
**Fig. 5-16:**

*Addition of a new intelligent function module*

After a right click, select **New Module**. Then select the Profibus DP Modul ME2PB1-L.

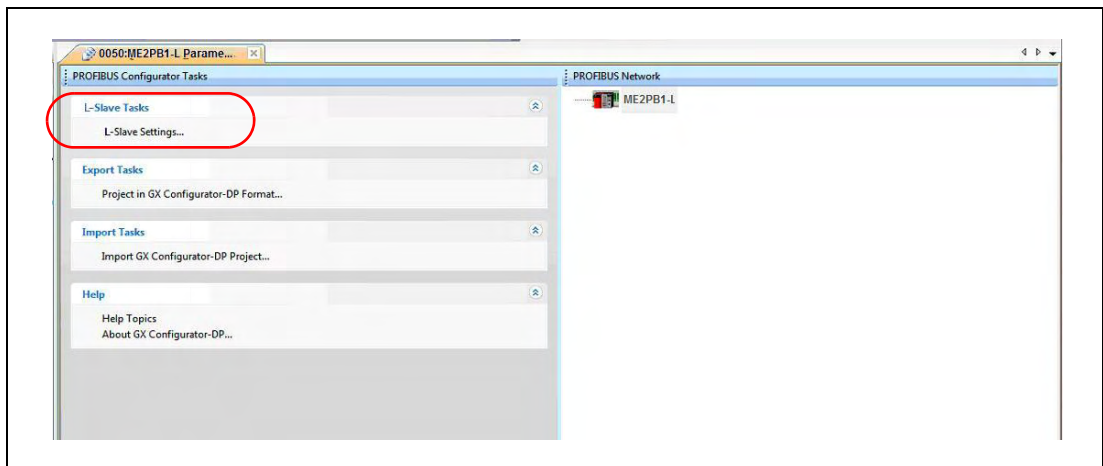


**Fig. 5-17:** Selection of the ME2PB1-L



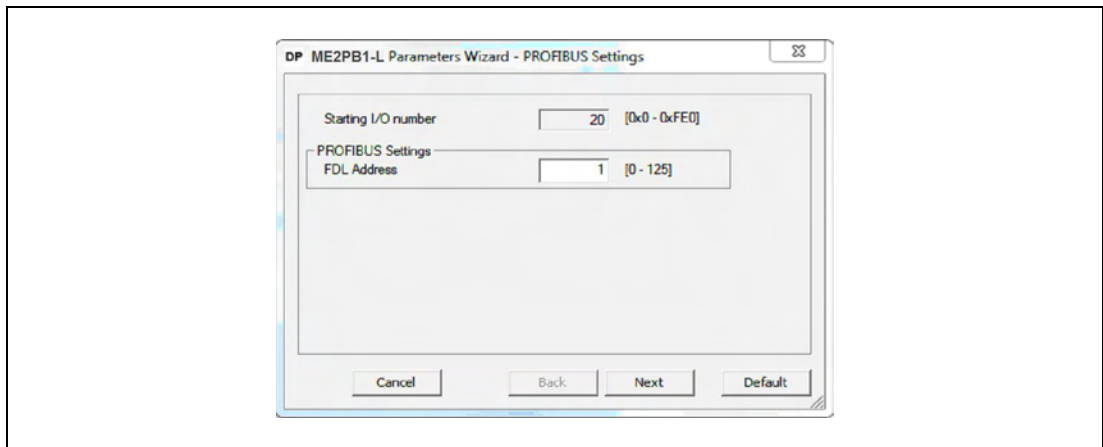
**Fig. 5-18:**  
Double-click on **Parameter** to start the wizard.

On the parameter setting screen, select **L-Slave Settings**

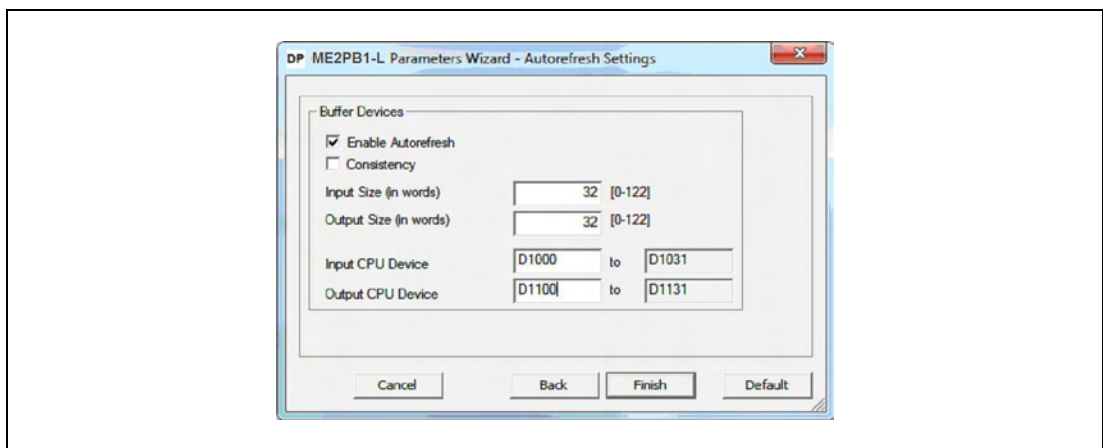


**Fig. 5-19:** Parameter setting screen

**Setting items**



**Fig. 5-20:** Slave settings for a ME2PB1-L (1st page)



**Fig. 5-21:** Slave settings for a ME2PB1-L (2nd page)

Item	Description
Starting I/O number	Head X/Y address of the ME2PB1-L
FDL Address	Set the station number of the ME2PB1-L. • Setting range: From 0 to 125
Autom. Refresh	Set the automatic refresh.
Enable	Enable the automatic refresh.
Consistency	Enable the separation prevention at the time of automatic refresh. (Refer to section 4.2.1)
Input Size (in words)	Set the number of words of the data to be transferred from the ME2PB1-L to the CPU module.
Output Size (in words)	Set the number of words of the data to be transferred from the CPU module to the ME2PB1-L.
Input CPU Device	Set the target storage device for the case where the data in the output receive area (buffer memory addresses Un\G0 to Un\G191) of the ME2PB1-L are transferred to the CPU module.
Output CPU Device	Set the target storage device for the case where the CPU module data are transferred to the input send area (buffer memory address: Un\G256 to Un\G447) of the ME2PB1-L.

**Tab. 5-12:** Slave parameter setting items

## 5.4.2 Writing the intelligent function module settings to the PLC

When writing the settings for the intelligent function module to the PLC, make sure that the "Intelligent Function Module Parameter" are tagged in the **Online Data Operation** dialog box.

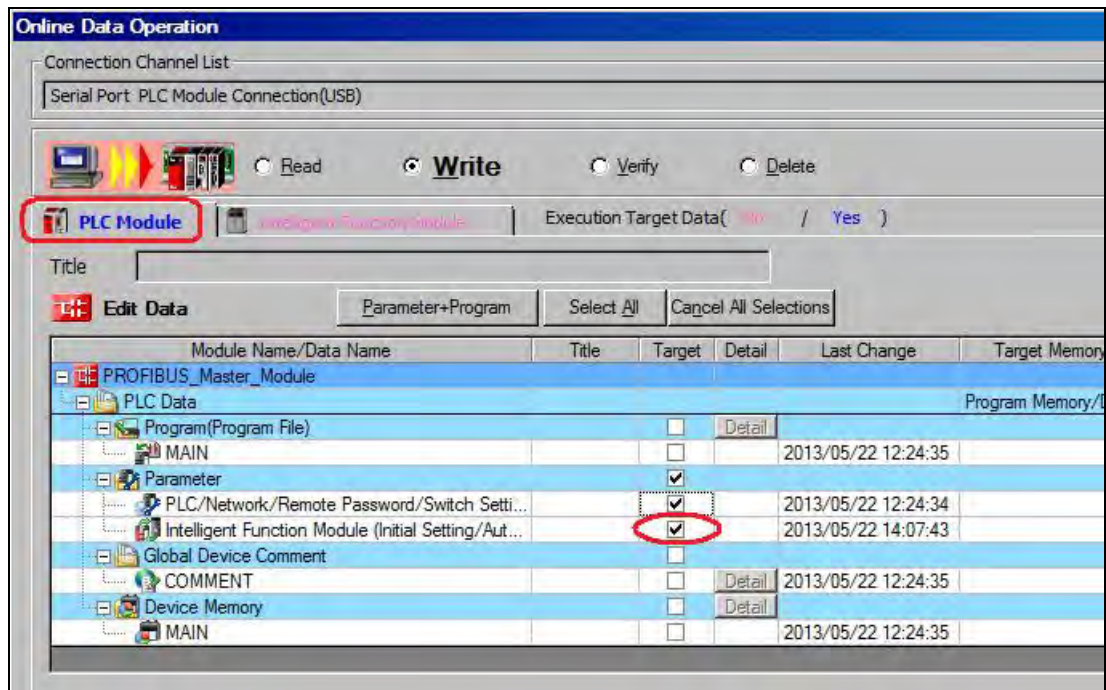


Fig. 5-22: Selection of intelligent function module parameters on the tab "PLC Module"

On the tab "Intelligent Function Module", select the ME2PB1-L.

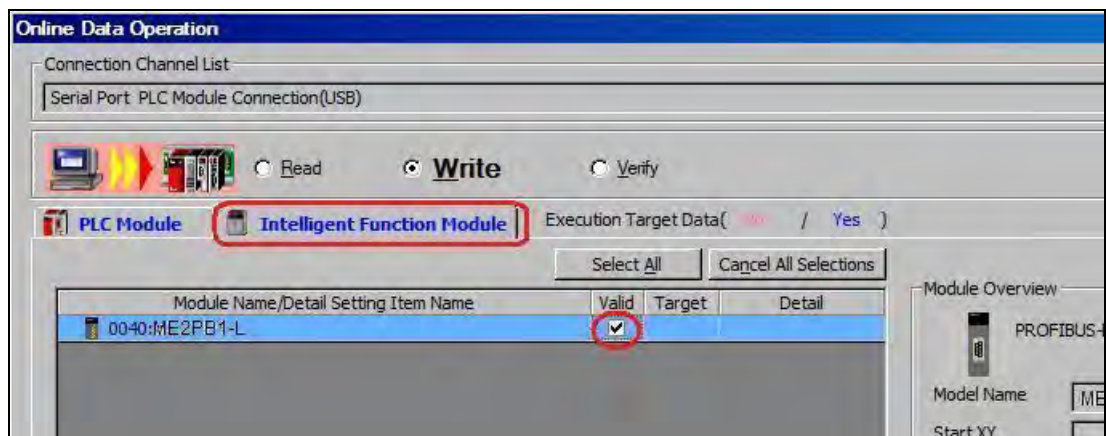


Fig. 5-23: Selection of the PROFIBUS DP slave module

### NOTE

Station numbers (FDL addresses) can also be set from a class 2 master station.

When setting the station number from the class 2 master station, setting "TRUE" for "No\_Add\_Chg" disables the station number change on the ME2PB1-L.

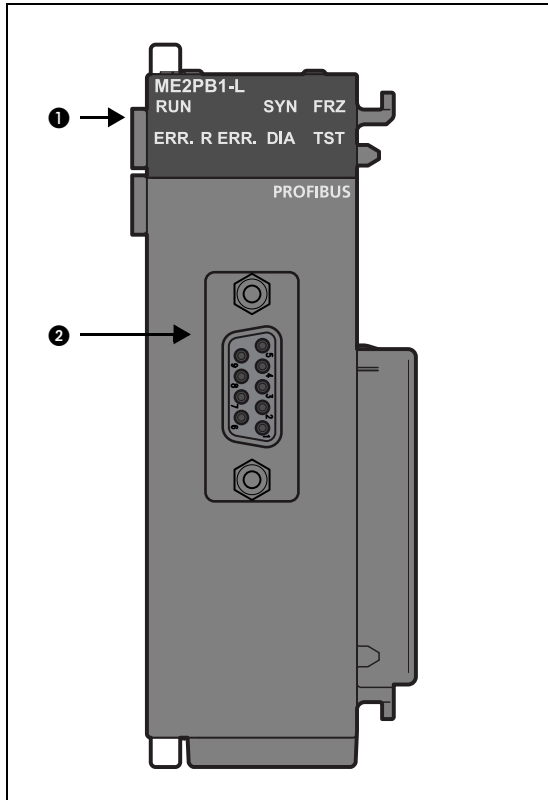
The station number of the ME2PB1-L cannot be changed with the station number change disabled.

To change the station number again, clear it by a station number change request area (buffer memory address Un\G515 and then cancel the disabled status. (Refer to section 3.4.7).



## 5.5 Part Names and Settings

This section explains the names and settings of each part of the ME2PB1-L.

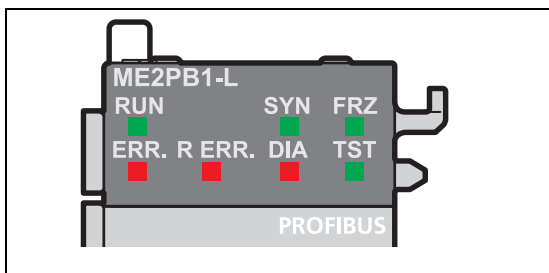


**Fig. 5-24:**  
ME2PB1-L appearance

No.	Name	Description
①	Indicator LEDs	These LEDs indicate the operation status of the ME2PB1-L. For details, refer to section 5.5.1.
②	Profibus interface connector (D-sub 9-pin female connector)	This connector connects the Profibus cable to the ME2PB1-L.

**Tab. 5-13:** Names of parts

### 5.5.1 Indicator LEDs



**Fig. 5-25:**  
Indicator LEDs of the ME2PB1-L

LED	Status	Description	Reference (section)
RUN	ON	Normally operating	—
	OFF	Hardware error or power failure	9.1
SYN	ON	SYNC mode active	4.3.1
	OFF	—	—
FRZ	ON	FREEZE mode active	4.3.1
	OFF	—	—
ERR.	ON	An error has occurred.	9.1
	OFF	Normally operating	—
R ERR.	ON	A communication error has occurred.	9.1
	OFF	No communication error	—
DIA	ON	Diagnostic information present	3.4.10
	OFF	No diagnostic information	—
TST	ON	Executing self-diagnostics	5.6 9.5
	OFF	Not executing self-diagnostics	—

**Tab. 5-14:** Indicator LEDs

## 5.6 Self-diagnostics

The self-diagnostics of the ME2PB1-L performs a self-test on the unit. It takes about 5 seconds to complete the self-diagnostics.

### 5.6.1 Self-diagnostics execution procedure

The following shows how to execute the self-diagnostics.

- Set the CPU module to STOP.
- Set the operation mode of the ME2PB1-L to Self-diagnostics mode by the following method:
  - Store 02H in the Operation mode change request area (Un\G2255).
  - Turn on the Operation mode change request signal (Y(n+1)1).
- When the operation mode is set to Self-diagnostics mode, the self-diagnostics is automatically started.

During execution of self-diagnostics, the TST LED is ON.

Upon completion of the self-diagnostics, the LEDs on the ME2PB1-L change as shown below, storing the test result to the Offline test status area (Un\G2258).

- When normally completed: The TST LED turns OFF.
- When failed: The TST and ERR. LEDs are ON.

### 5.6.2 Execution result of self-diagnostics

#### TST LED OFF (When normally completed)

When the TST LED turns OFF after execution of self-diagnostics, this indicates a normal completion.

Set the operation mode of the ME2PB1-L to operation mode by the following method:

- Store 0H in the Operation mode change request area (Un\G2255).
- Turn on the Operation mode change request signal (Y(n+1)1).

#### TST and ERR. LEDs ON (When failed)

If the TST and ERR. 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 ME2PB1-L 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.

#### 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.

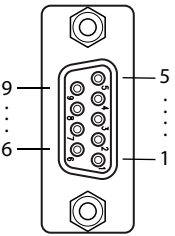
Stored value	Description
0H	Normal completion
8001H to 8006H	Hardware error
8007H	Swap test error

**Tab. 5-15:** Self-diagnostics result

## 5.7 Wiring

This section explains the pin assignments of the Profibus interface connector on the ME2PB1-L, the Profibus cable wiring specifications, bus terminator and other information.

### 5.7.1 Pin assignments of the Profibus interface connector

Profibus Interface connector	Pin no.	Signal code	Name	Description	Wire color
	1	—	—	Open	—
	2	—	—	Open	—
	3	B/B'	RxD/TxD-P	Receive/send data -P	Red
	4	—	—	Open	—
	5	C/C'	DGND <sup>①</sup>	Data Ground	—
	6	—	VP <sup>①</sup>	Voltage +	—
	7	—	—	Open	—
	8	A/A'	RxD/TxD-N	Receive/send data -N	Green
	9	—	—	Open	—

**Tab. 5-16:** Pin assignments of the Profibus interface connector (D-sub 9-pin female connector) on the ME2PB1-L

<sup>①</sup> Signal used to connect the bus terminator.

### 5.7.2 Profibus cable

Use a Profibus cable that meets the following specifications (Type A (IEC 61158-2) compliant).

Item	Transmission line
Applicable cable	Shielded twisted pair cable
Impedance	135 to 165 $\Omega$ (f=3 to 20 MHz)
Capacity	Less than 30 pF/m
Conductor resistance	Less than 110 $\Omega$ /km
Cross-sectional area	0.34 mm <sup>2</sup> or more (22AWG)

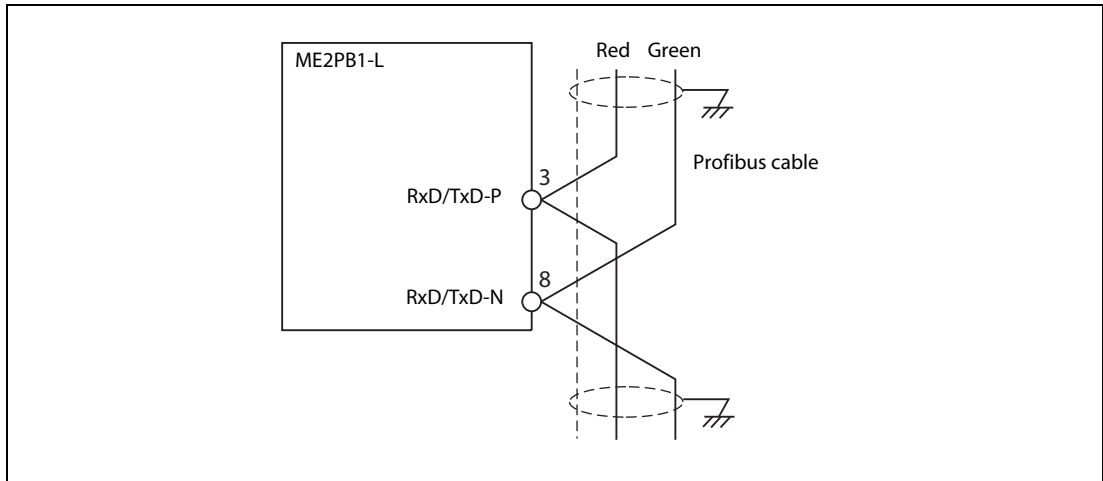
**Tab. 5-17:** Specifications of the Profibus cable

#### Applicable connector

Use a D-sub 9-pin male connector for the Profibus cable.

The applicable screw size is #4-40 UNC.

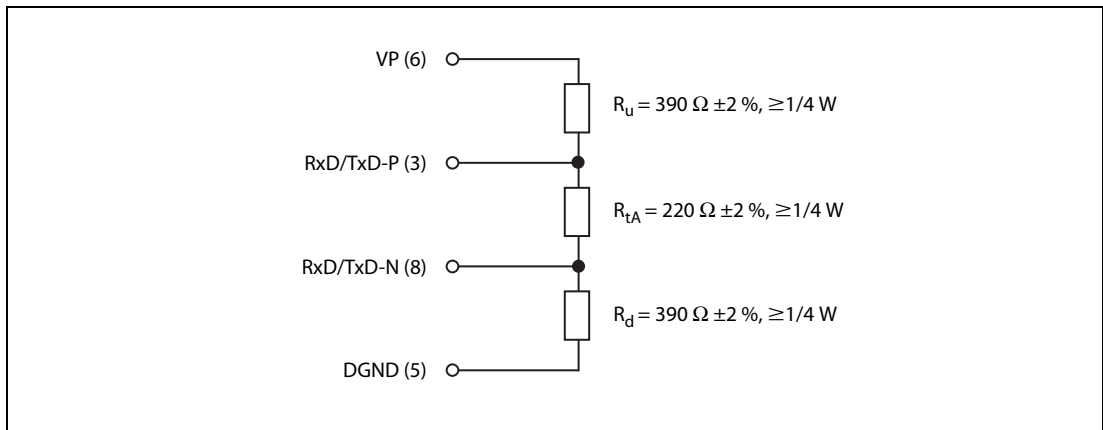
**Wiring specifications**



**Fig. 5-26:** Connection of the Profibus cable

**Wiring specifications for bus terminator**

When the ME2PB1-L is a terminal station, it is recommended to use a connector with built-in bus terminator resistors that meets the following wiring specifications.



**Fig. 5-27:** Wiring specifications for bus terminator

**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/>

### 5.7.3 Wiring precautions

As one of the requirements to give full play to ME2PB1-L'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 ME2PB1-L.

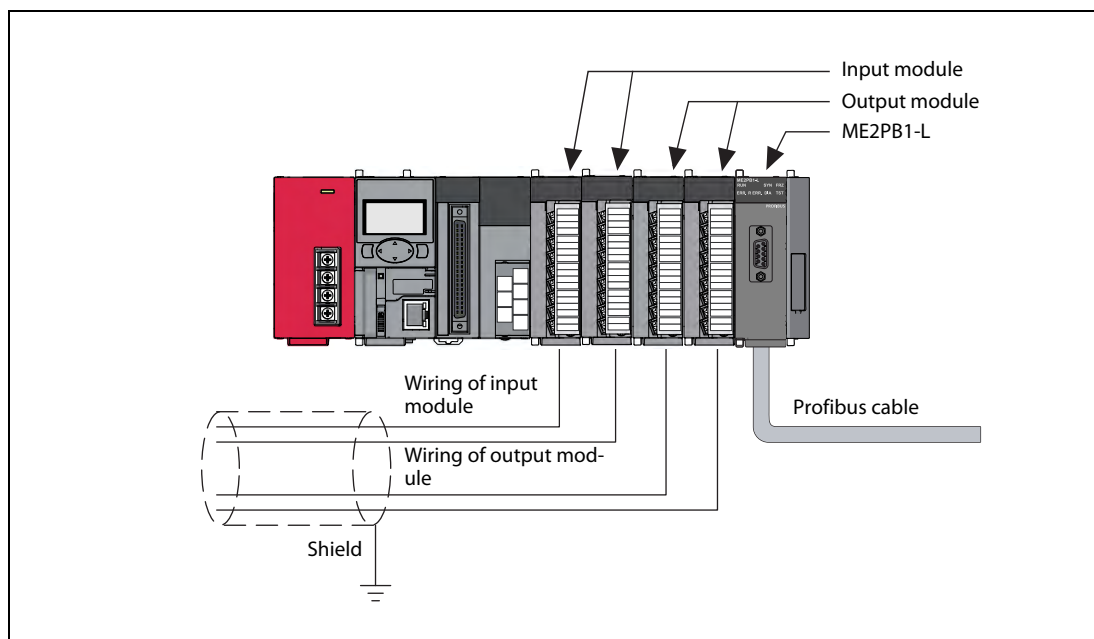
#### Communication cable wiring

Do not install the Profibus 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 ME2PB1-L to be affected by noise and surge induction.

#### Wirings from programmable controller and I/O modules

Keep the Profibus cable away from I/O module cables as much as possible.



**Fig. 5-28:** Programmable controller wiring

#### Grounding

For use of the ME2PB1-L, ground the FG and LG terminals of the programmable controllers power supply module.

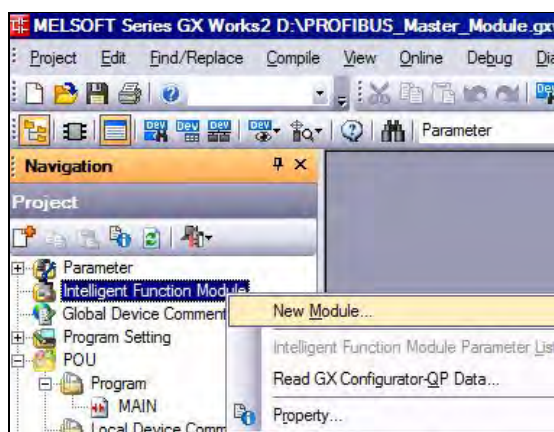
## 5.8 Intelligent Function Utility (GX Works2)

The programming software GX Works2 allows the quick and easy parameter setting for intelligent function modules like the ME2PB1-L.

Programming is reduced because the initial setting and automatic data exchange between PLC CPU and ME2PB1-L can be configured on the screen. In addition, the "switches" of intelligent function modules can be set easily.

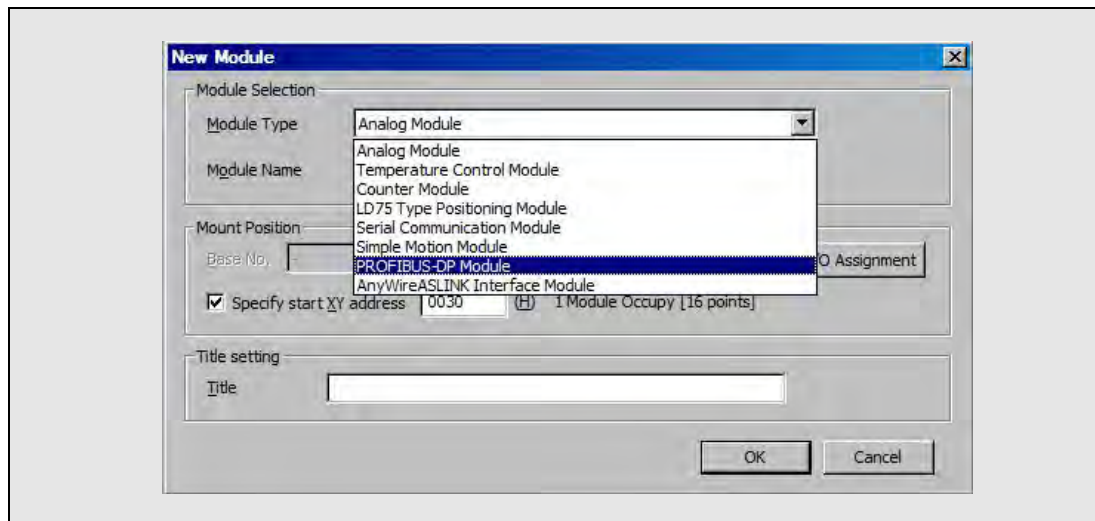
### 5.8.1 Addition of a new module to the project

To add a new intelligent function module to a project, click on **Intelligent Function Module** in the Project Navigation window. After a right click, select **New Module**.



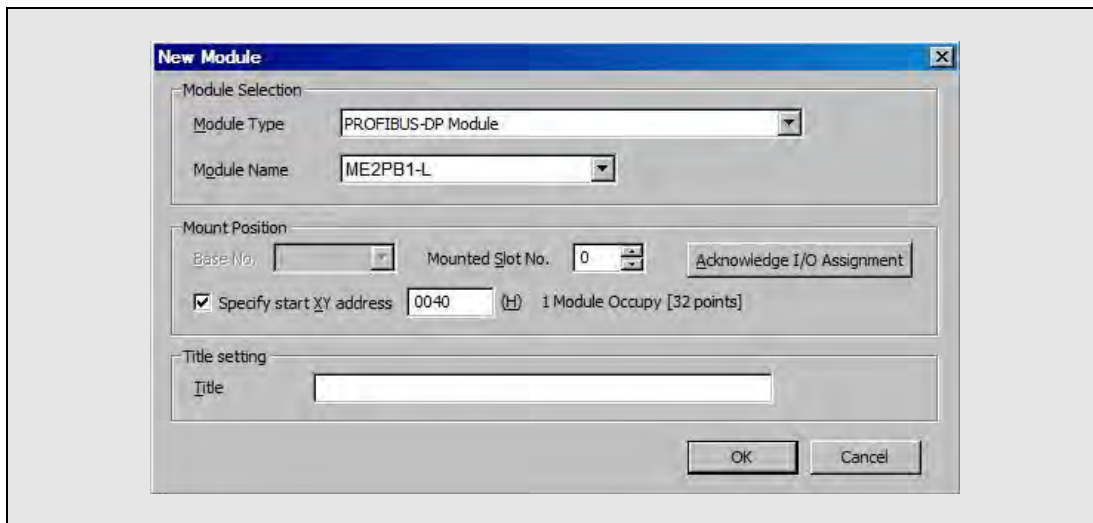
**Fig. 5-29:** Addition of a new intelligent function module

The window **New Module** is displayed.



**Fig. 5-30:** Selection of an intelligent function module

Select **Profibus-DP Module**.

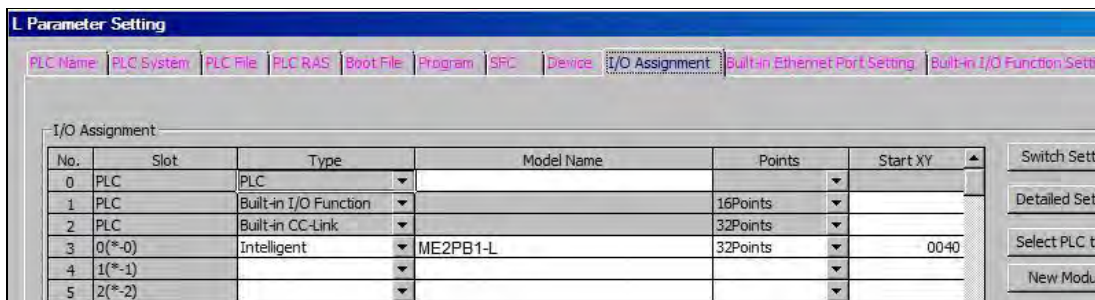


**Fig. 5-31:** Selection of the Profibus DP slave module

Enter the slot No. where the module is mounted (**Mounted Slot No.**) and the start I/O number. As **Title** you can, for instance, enter an individual name for the module. This name is then displayed in the Project Navigation window.

Afterwards click on **OK**.

The information entered on the **New Module** screen can be checked in the PLC parameters.



**Fig. 5-32:** Display of the I/O assignment in the PLC parameters



# 6 Processing Times

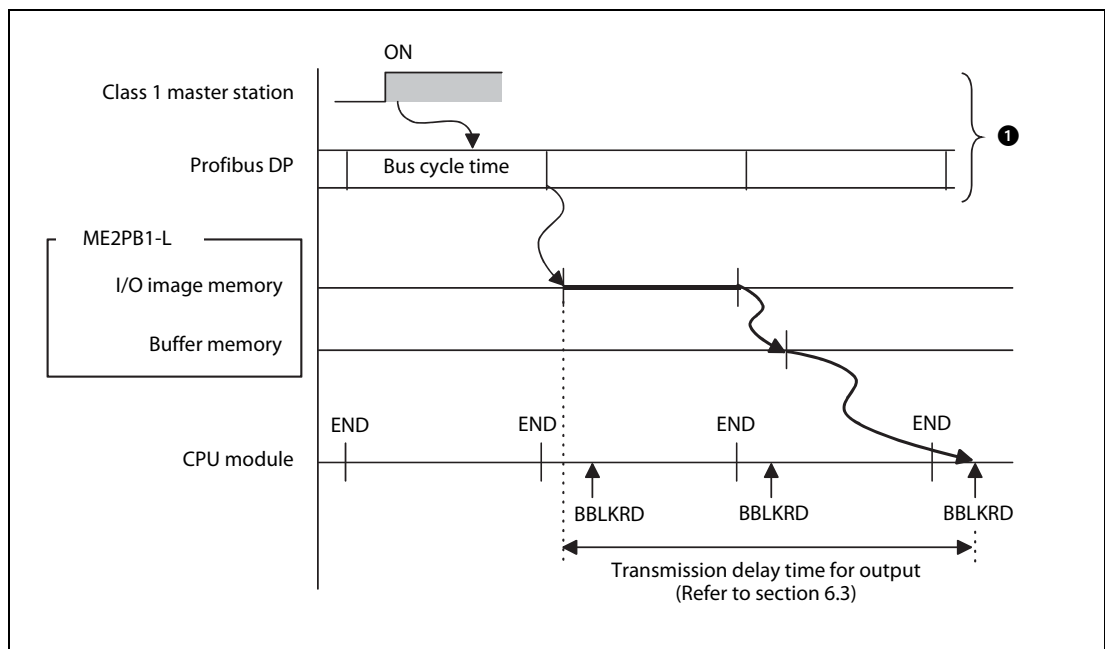
This section explains the processing time of the ME2PB1-L.

Communication processing between the master station and ME2PB1-L is shown below.

## 6.1 Processing of the Output Receive Data

The following shows how the output data from the master station are read out to a CPU module.

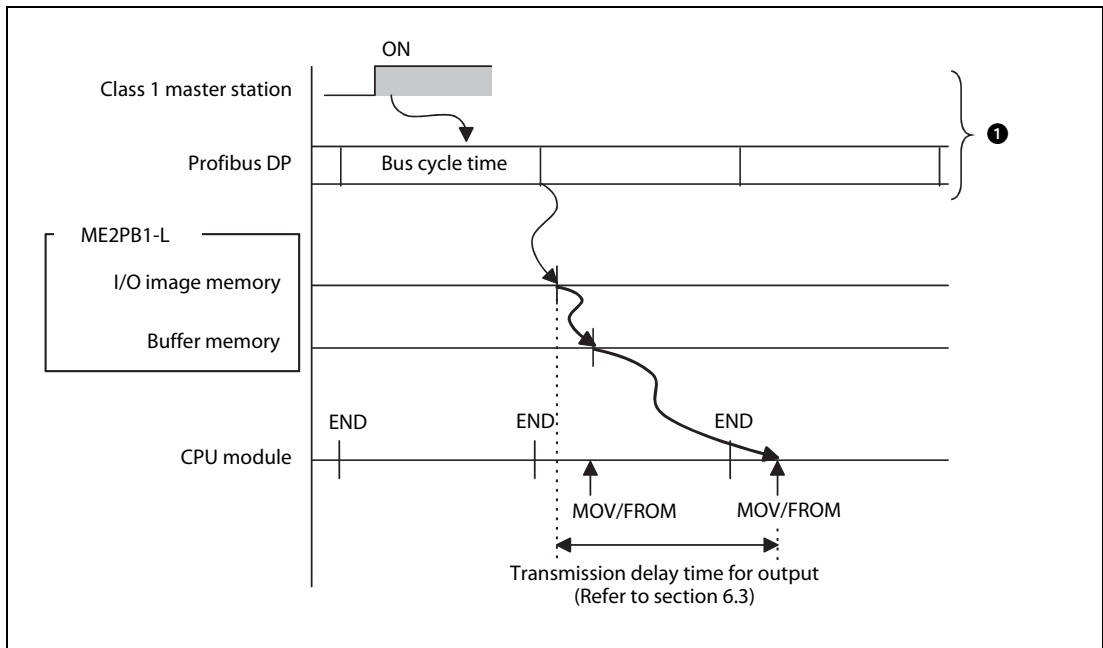
### When BBLKRD instruction is used



**Fig. 6-1:** Reading of output receive data using a BBLKRD instruction

① Refer to the relevant manual for the processing time of the master station.

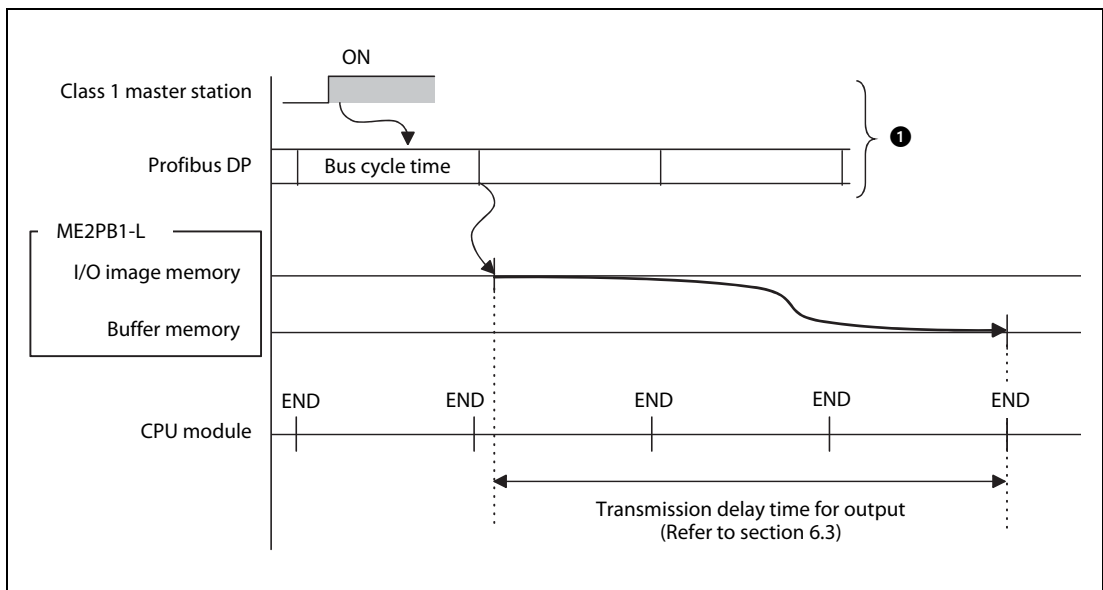
**When a MOV or FROM instruction is used**



**Fig. 6-2:** Reading of output receive data using a MOV or FROM instruction

① Refer to the relevant manual for the processing time of the master station.

**When automatic refresh is used**



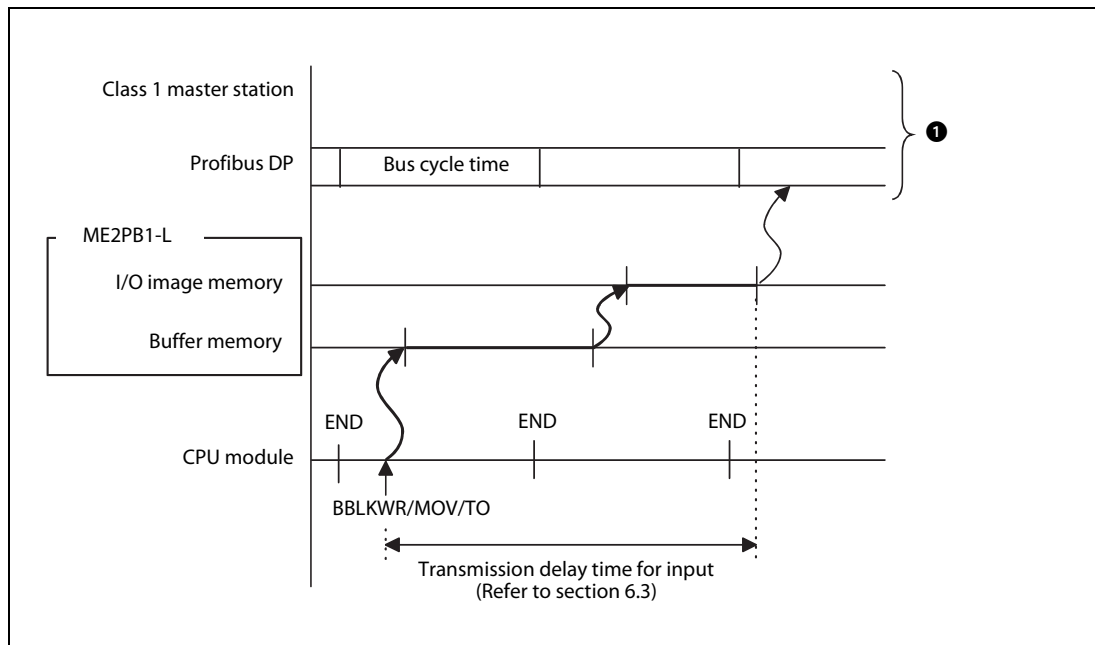
**Fig. 6-3:** Reading of output receive data using automatic refresh

① Refer to the relevant manual for the processing time of the master station.

## 6.2 Processing of the Input Send Data

The following shows how the CPU module data are sent to the master station.

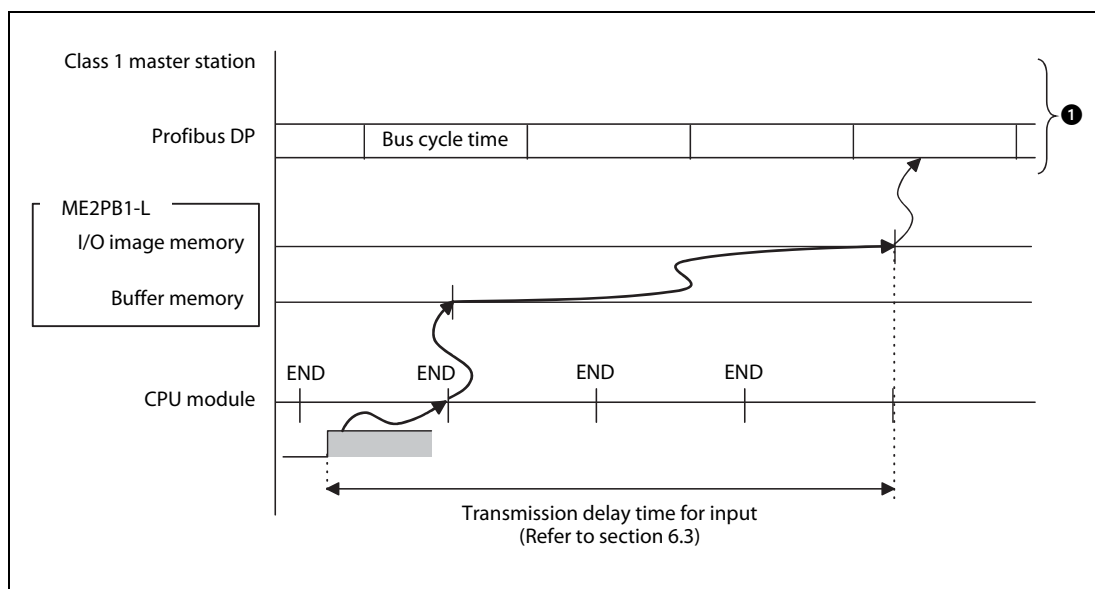
### When BBLKWR/MOV/TO instruction is used



**Fig. 6-4:** Sending of input data using a BBLKWR/MOV/TO instruction

1 Refer to the relevant manual for the processing time of the master station.

### When automatic refresh is used



**Fig. 6-5:** Sending of input data using automatic refresh

1 Refer to the relevant manual for the processing time of the master station.

## 6.3 Transmission Delay Times

The formulas for calculating the delay time for the output receive data transmission and the input send data transmission are shown below.

### Transmission delay time of output receive (Master station → ME2PB1-L)

Type of data transmission		Transmission delay time
BBLKRD instruction		Bus cycle time + Scan time + 0.2 [ms]
MOV/FROM instruction		Scan time + 0.2 [ms]
Automatic refresh	When separation prevention function is not used	Normal value: Scan time × 0.5 + 0.2 [ms] Max. value: Scan time + 0.2 [ms]
	When separation prevention function is used	Normal value: Scan time × 1.5 + 0.2 [ms] Max. value: Scan time × 3 + 0.2 [ms]

**Tab. 6-1:** Delay of output receive data

### Transmission delay time of input send (ME2PB1-L → Master station)

Type of data transmission		Transmission delay time
BBLKWR instruction	Scan time ≤ Bus cycle time	Bus cycle time × 3 + 0.2 [ms]
	Scan time > Bus cycle time	Bus cycle time × 2 + Scan time + 0.2 [ms]
MOV/FROM instruction		Bus cycle time × 2 + 0.2 [ms]
Automatic refresh	When separation prevention function is not used	Normal value: Scan time × 0.5 + 0.2 [ms] Max. value: Scan time + 0.2 [ms]
	When separation prevention function is used	Normal value: Scan time × 1.5 + 0.2 [ms] Max. value: Scan time × 4 + 0.2 [ms]

**Tab. 6-2:** Delay of input send data

#### NOTE

For the calculation formula of the bus cycle time (Bc), refer to the manual of the Profibus DP module used on the master station.

# 7 Programming

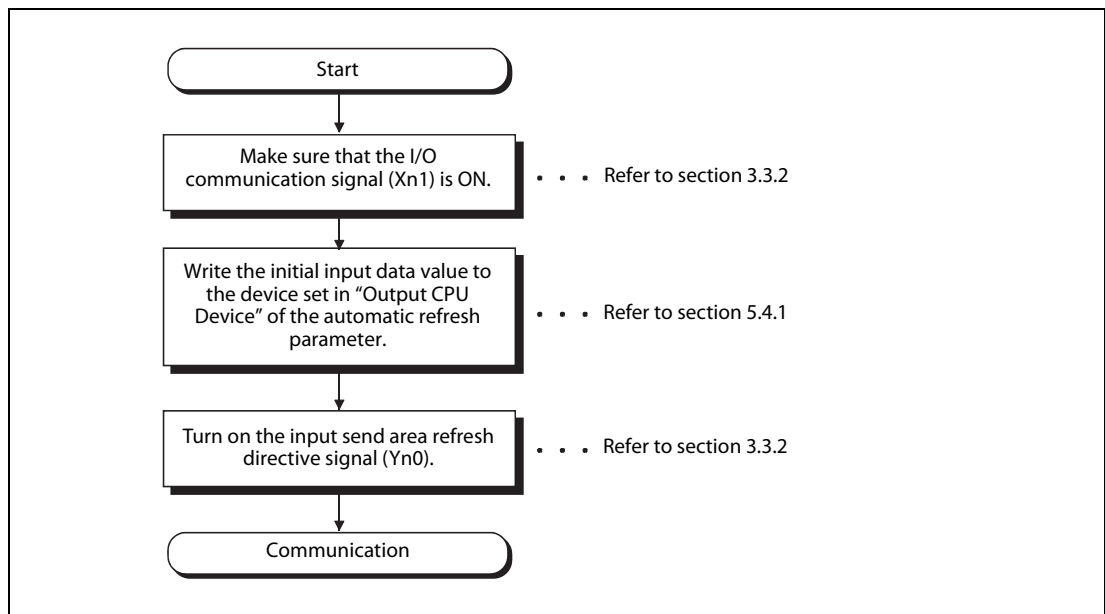
This chapter describes the programming for the PROFIBUS DP slave module ME2PB1-L and gives program examples of station number setting, I/O data communication, and global control-driven program execution.

**NOTE** When applying any of the program examples introduced in this chapter to the actual system, verify the applicability and confirm that no problems will occur in the system control.

## 7.1 Communication Sequence

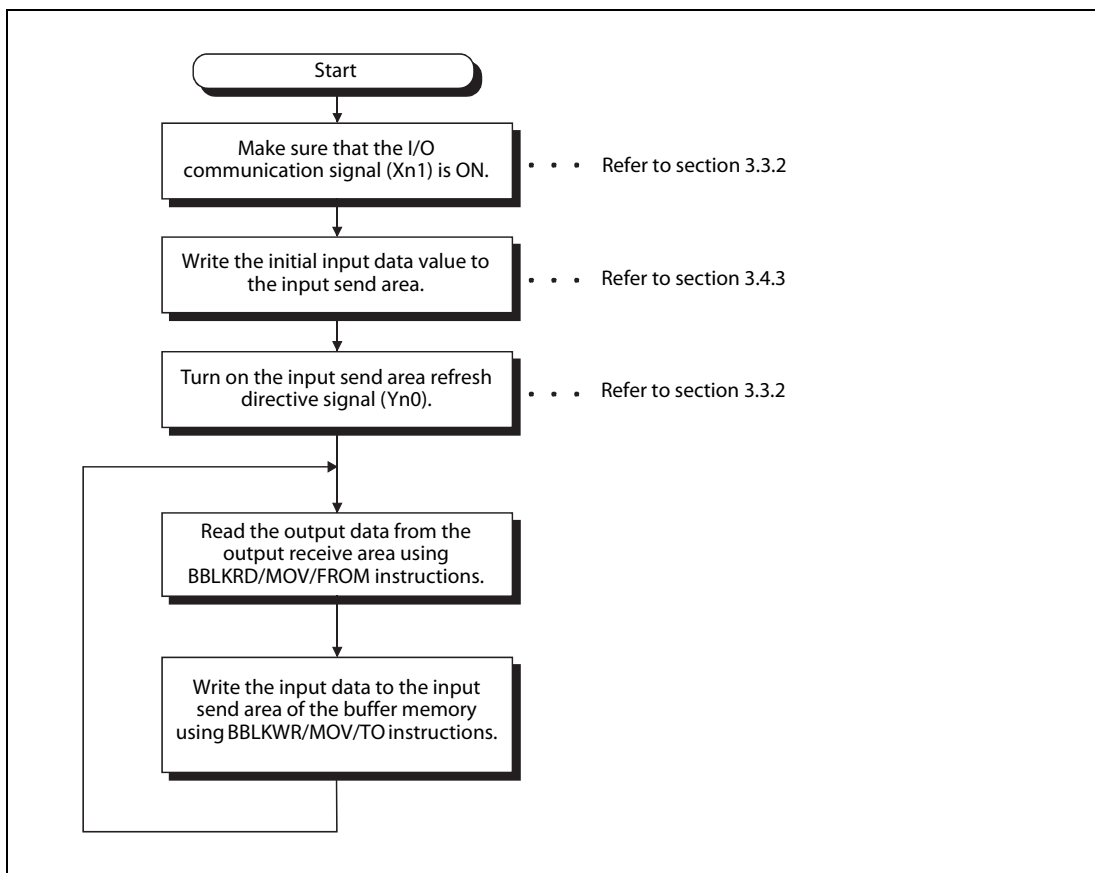
The following is the sequence of I/O data communication with the master station. Refresh between the programmable controller CPU and ME2PB1-L and refresh of the ME2PB1-L buffer memory (output receive area, input send area) are executed asynchronously.

### When using the automatic refresh



**Fig. 7-1:** Communication using automatic refresh

**When not using the automatic refresh**

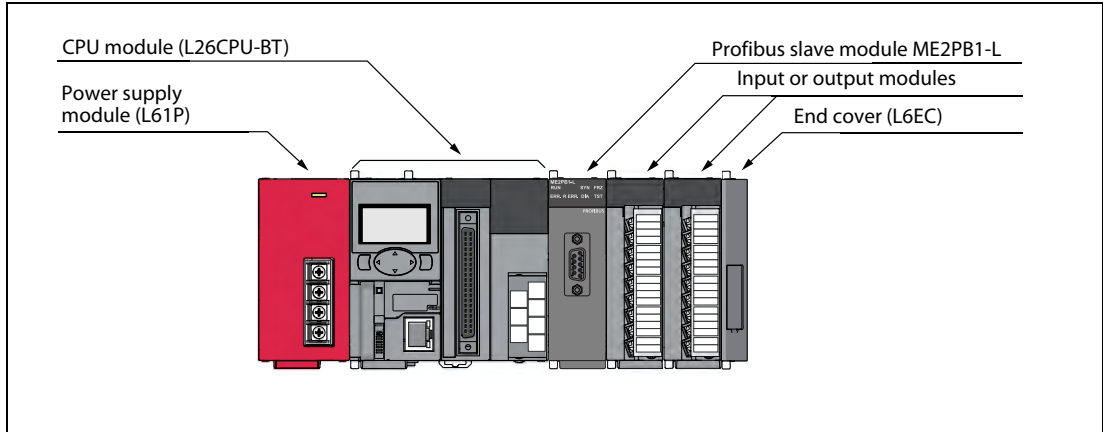


**Fig. 7-2:** Communication without automatic refresh

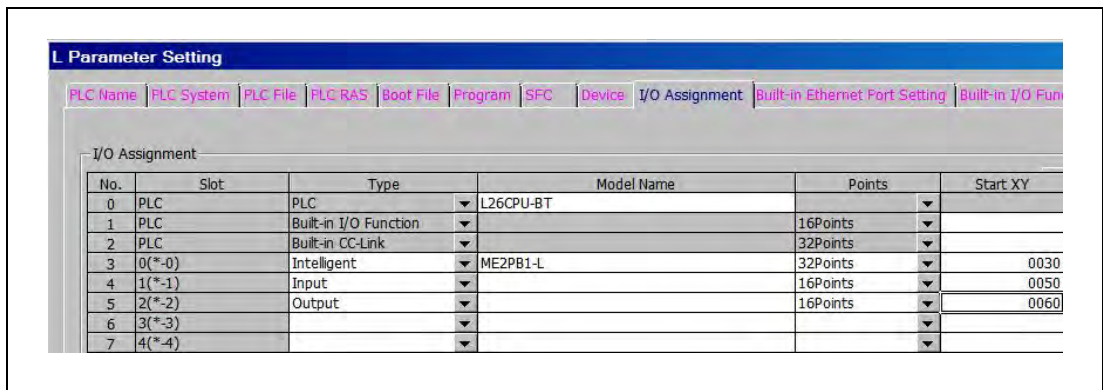
## 7.2 Station Number Setting

This section gives a program example for setting a station number to the ME2PB1-L.

### System configuration for the example



**Fig. 7-3:** The ME2PB1-L is mounted to the CPU module together with input or output modules



**Fig. 7-4:** I/O assignment in the program example

Module	Input signals	Output signals
Profibus DP slave module ME2PB1-L	X30 to X4F	Y30 to Y4F

**Tab. 7-1:** Assignment of input and output signals for the ME2PB1-L

### Settings

In the program example, the station number of the ME2PB1-L is set to 1.

**Assignment of devices in this program example**

- Devices occupied by the ME2PB1-L

Device (Input)	Description	Device (Output)	Description
X30	Watchdog timer error	—	—
X43	Station number change completion	Y43	Station number change request
X4D	Module READY signal	—	—

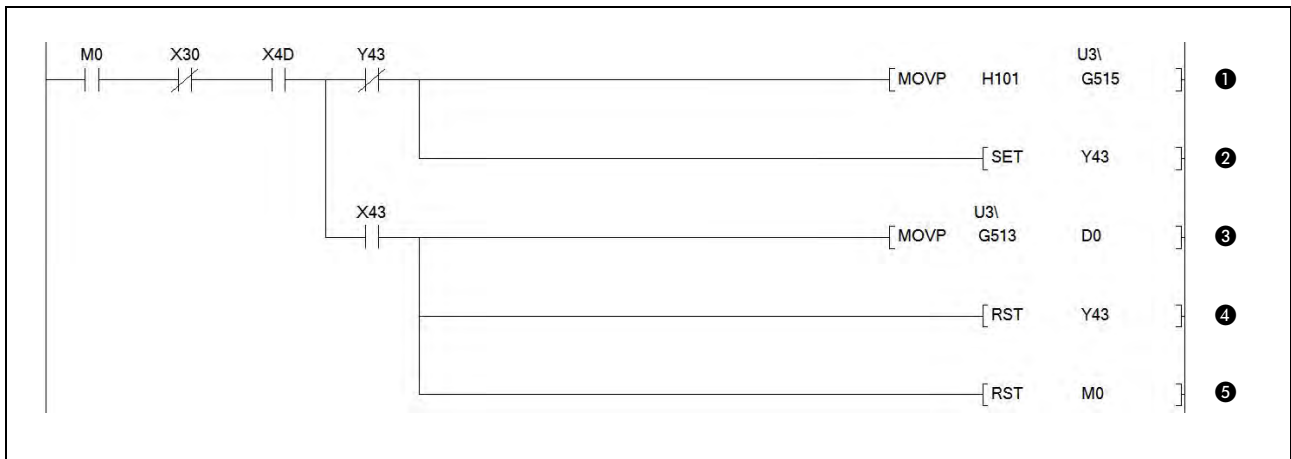
**Tab. 7-2:** List of devices from/to the ME2PB1-L

- Devices for the user

Device	Description	Device	Description
M0	Station number setting flag	D0	Operation station number storage device

**Tab. 7-3:** List of devices for the user

**Program example**



**Fig. 7-5:** Station number setting program example

No.	Description
①	Sets the station number to 1. (The station number is stored in the flash ROM. When the station number should not be stored to the flash ROM, replace "H101" with "H1".)
②	The Station number change request is set.
③	The operating station number is stored in D0.
④	The Station number change request is reset.
⑤	The station number setting flag is reset.

**Tab. 7-4:** Description of fig. 7-5

**NOTES**

Storing a station number in the flash ROM allows the ME2PB1-L to operate as the station number even if the power is switched from OFF to ON or if the CPU module is reset.

The station number can be also set from the configuration tool (Refer to section 5.4.1) However, if the station number is changed in the program as shown in this example, do not perform it from the configuration tool.

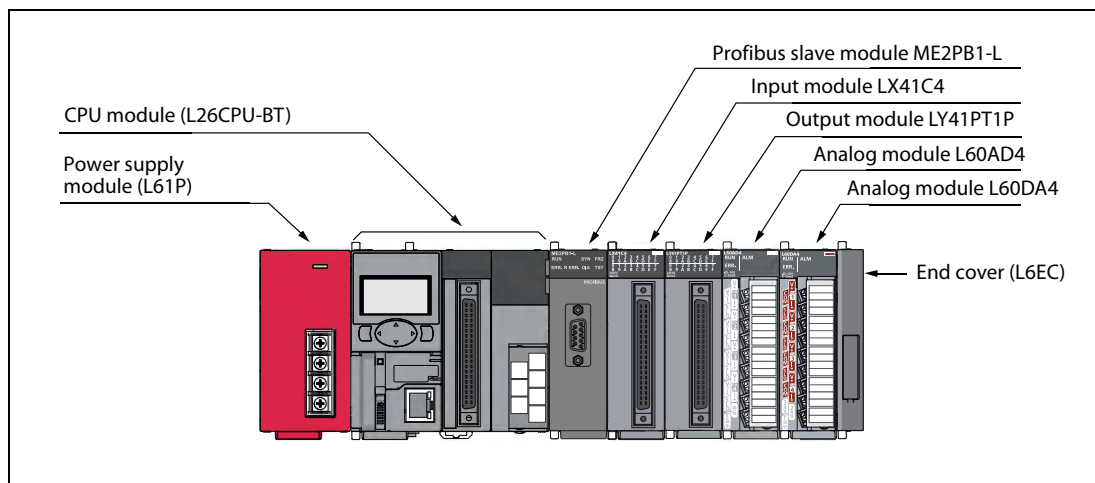


## 7.3 Communication of I/O Data

### 7.3.1 LUMP mode

A program example for I/O data communication is provided here to show the case where the LUMP mode (refer to section 5.3.2) is used for data assignment of the following configuration.

#### System configuration for the example



**Fig. 7-6:** In this example the ME2PB1-L is mounted to the CPU module together with digital I/O modules and analog modules

L Parameter Setting										
PLC Name	PLC System	PLC File	PLC RAS	Root File	Program	SFC	Device	I/O Assignment	Built-in Ethernet Port Setting	Built-in I/O Fun
I/O Assignment										
No.	Slot	Type	Model Name			Points	Start XY			
0	PLC	PLC	L26CPU-BT							
1	PLC	Built-in I/O Function				16Points				
2	PLC	Built-in CC-Link				32Points				
3	0(*-0)	Intelligent	ME2PB1-L			32Points				
4	1(*-1)	Input	LX41C4			32Points	0050			
5	2(*-2)	Output	LY41PT1P			32Points	0070			
6	3(*-3)	Intelligent	L60AD4			16Points	0090			
7	4(*-4)	Intelligent	L60DA4			16Points	0100			

**Fig. 7-7:** I/O assignment in the program example

Module	Input signals	Output signals
Profibus DP slave module ME2PB1-L	X30 to X4F	Y30 to Y4F
Input module LX41C4	X50 to X6F	—
Output module LY41PT1P	—	Y70 to Y8F
Analog-Digital converter module L60AD4	X90 to X9F	Y90 to Y9F
Digital-Analog converter module L60DA4	X100 to X10F	Y100 to Y10F

**Tab. 7-5:** Assignment of input and output signals

**Settings**

- Data module setting of ME2PB1-L

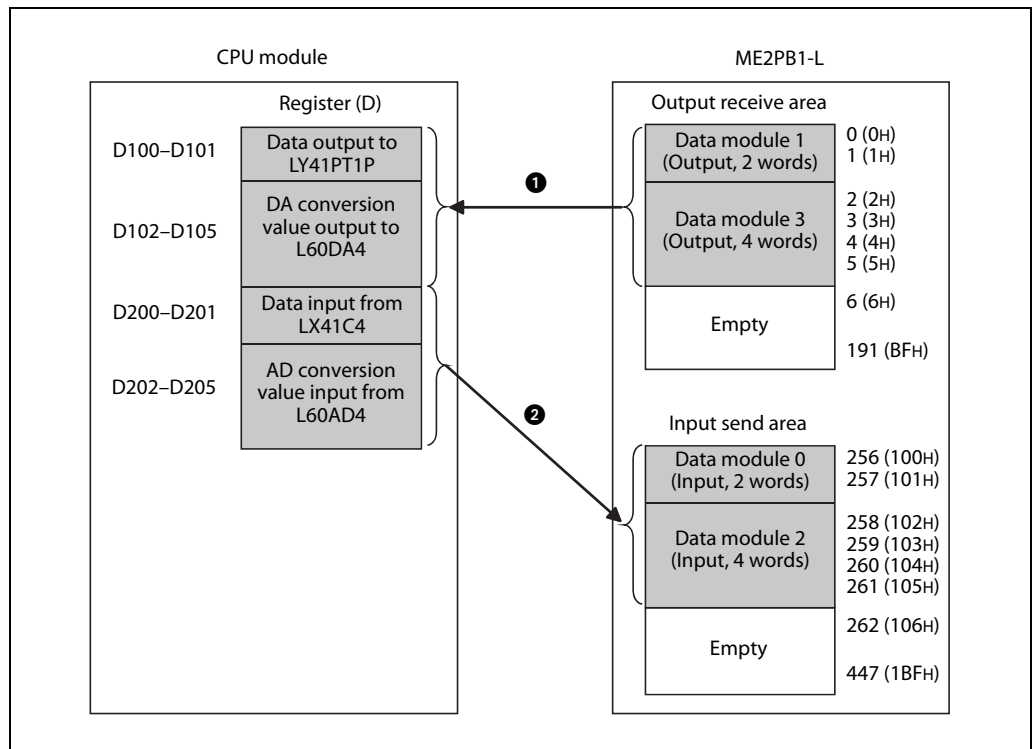
Data Module Setting		Output Data	Input Data
Data module 0	Input, 2 words, word unit	—	2 words
Data module1	Output, 2 words, word unit	2 words	—
Data module2	Input, 4 words, word unit	—	4 words
Data module3	Output, 4 words, word unit	4 words	—

**Tab. 7-6:** Input and output data for this example

**NOTE**

For the data module setting please refer to section 5.3.1

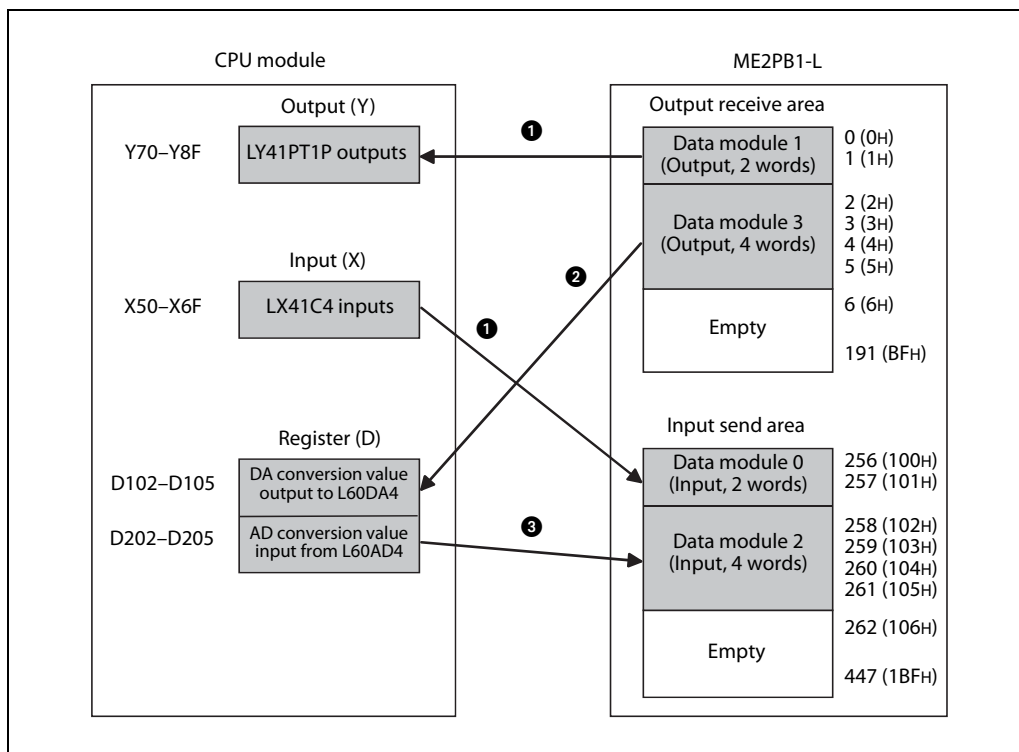
- Used states of ME2PB1-L output receive area and input send area
  - When dedicated instructions (BBLKRD/BBLKWR) are used.



**Fig. 7-8:** Occupation of output receive and input send area when using dedicated instructions

- 1 The output receive area data are read to D100 to D105 using a BBLKRD instruction. The data in D100 to D105 are written to the LY41PT1P and L60DA4.
- 2 Data of the LX41C4 and L60AD4 are read to D200 to D205 beforehand. The data in D200 to D205 are written to the input send area using a BBLKWR instruction.

- When MOV instructions are used.



**Fig. 7-9:** Usage of output receive and input send area when using MOV instructions

- 1 Data are read from Input (X) or written to Output (Y) using a BMOV instruction.
- 2 The output receive area data are read to D102 to D105 using a BMOV instruction. The data in D102 to D105 are written to the L60DA4.
- 3 Data of the L60AD4 are read to D202 to D205 beforehand. With a BMOV instruction, the data in D202 to D205 are written to the input receive area.

**Assignment of devices in the program examples**

- Devices occupied by the ME2PB1-L

Device (Input)	Description	Device (Output)	Description
X30	Watchdog timer error	Y30	Input send area refresh directive
X31	I/O communication	—	—
X32	Extension trouble notification completion	Y32	Extension trouble notification request
X33	Module error	Y33	Module error reset request
X3A	BBLKRD start request acceptance completion	Y3A	BBLKRD start request
X3B	BBLKWR start request acceptance completion	Y3B	BBLKWR start request
X41	Operation mode change completion	Y41	Operation mode change request
X4D	Module READY	—	—

**Tab. 7-7:** List of devices from/to the ME2PB1-L

● Devices occupied by the LX41C4

Device (Input)	Description	Device (Output)	Description
X50–X6F	Inputs of LX41C4	—	—

**Tab. 7-8:** List of devices for the input module LX41C4

● Devices occupied by the LY41PT1P

Device (Input)	Description	Device (Output)	Description
—	—	Y70–Y8F	Outputs of LY41PT1P

**Tab. 7-9:** List of devices for the output module LY41PT1P

● Devices occupied by the L60AD4

Device (Input)	Description	Device (Output)	Description
X90	Module READY	—	—

**Tab. 7-10:** Device used for the Analog-Digital conversion module L60AD4

● Devices occupied by the L60DA4

Device (Input)	Description	Device (Output)	Description
X100	Module READY	—	—

**Tab. 7-11:** Device used for the Digital-Analog conversion module L60DA4

● Devices for the user

Device	Description	Device	Description
M10	Operation mode change flag	M40	Extension trouble notification flag
M11	Operation mode change storage	M41	Extension trouble notification completion flag
M20	Initial input data write	M42	Extension trouble cancel flag
M30	Error handling flag	M100	Self-diagnosis mode change

**Tab. 7-12:** List of devices for the user

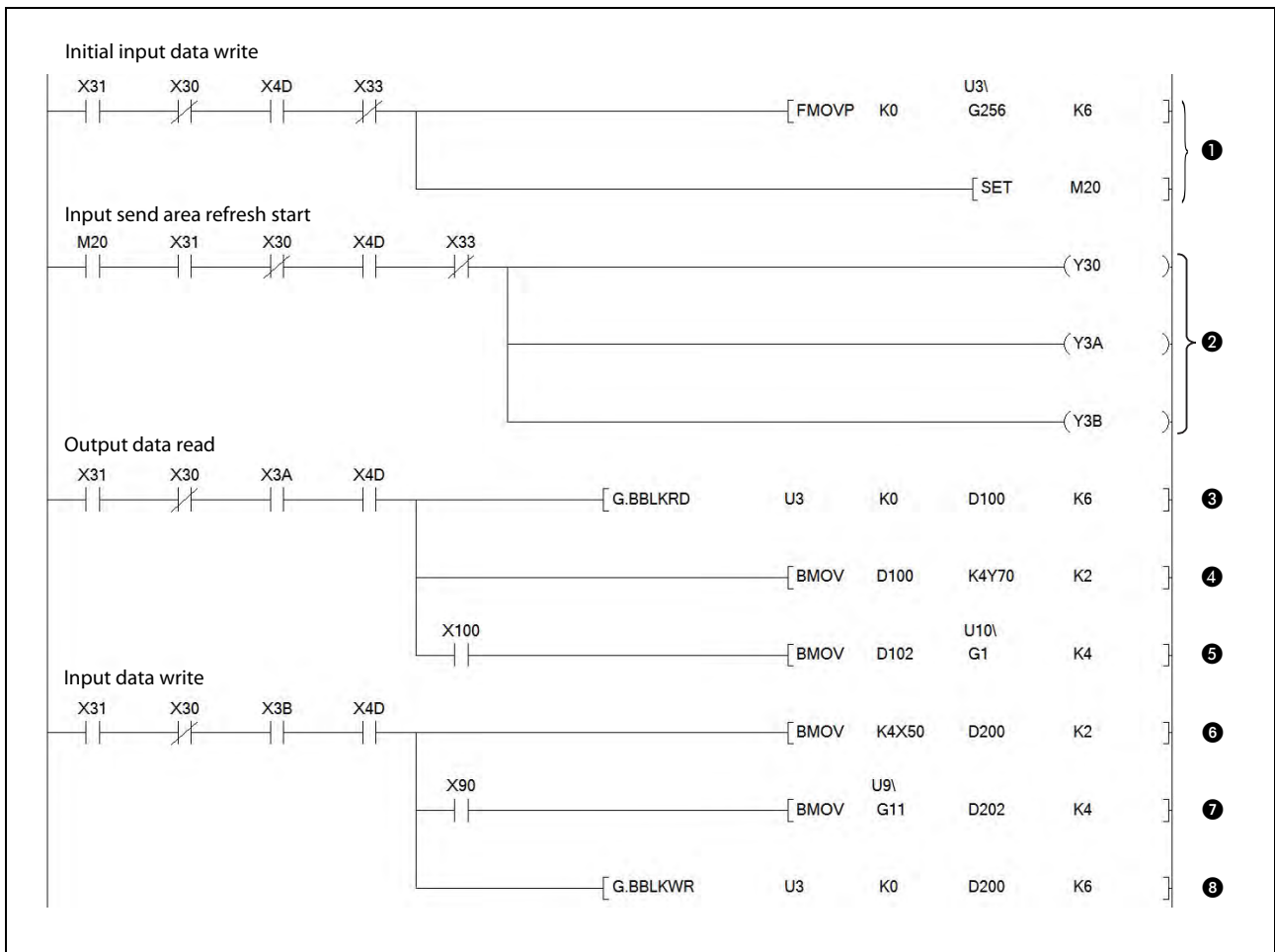
● Devices used for automatic refresh or buffer memory reading

Device	Description	Device	Description
D10	Operation mode storage	D200, D201	LX41C4 (X50 to X6F) input data storage
D11	Operation mode change result	D202–D205	Analog-to-digital conversion value to be input from the L60AD4 (CH. 1 to 4)
D20	Error code storage	D300	Extension trouble information data length
D100, D101	LY41PT1P (Y70 to Y8F) output data storage	D301	Extension trouble information data
D102–D105	Digital-to-analog conversion value to be output to L60DA4 (CH. 1 to 4)	—	

**Tab. 7-13:** List of devices for the user

**Program example (when using dedicated instructions (BBLKRD/BBLKWR))**

- Output data read and input data write



**Fig. 7-10:** Reading of output data and writing of input data in LUMP mode using dedicated instructions

No.	Description
①	Initial input data write
②	Input send area refresh start
③	Data for the LY41PT1P.
④	Outputs data to LY41PT1P (Y70 to Y8F)
⑤	Writes digital values to L60DA4.
⑥	Stores data from LX41C4 (X50 to X6F) into D200 and D201
⑦	Reads digital values from L60AD4.
⑧	Input data write

**Tab. 7-14:** Description of fig. 7-10

● Error handling



Fig. 7-11: Error handling for the ME2PB1-L

No.	Description
①	The error code is read and stored.
②	The error is reset

Tab. 7-15: Description of fig. 7-11

● Extension trouble information notification

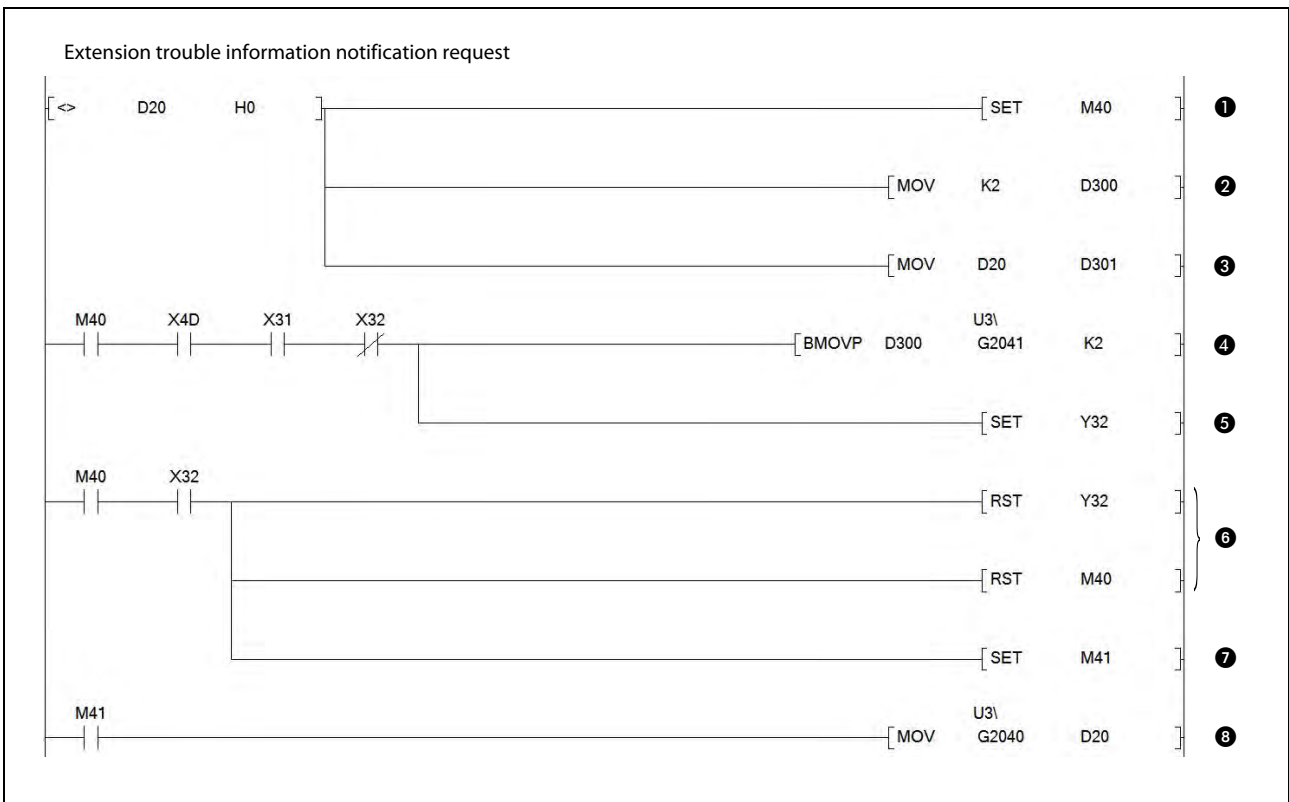


Fig. 7-12: Requesting extension trouble information notification

No.	Description
①	Turns on extension trouble notification flag when error code is other than 0.
②	Sets extension trouble notification data length.
③	Sets extension trouble notification data.
④	Stores extension trouble notification data in buffer memory.
⑤	Extension trouble notification request.
⑥	Resets extension trouble notification request.
⑦	Extension trouble notification completion flag.
⑧	Stores error code.

Tab. 7-16: Description of fig. 7-12

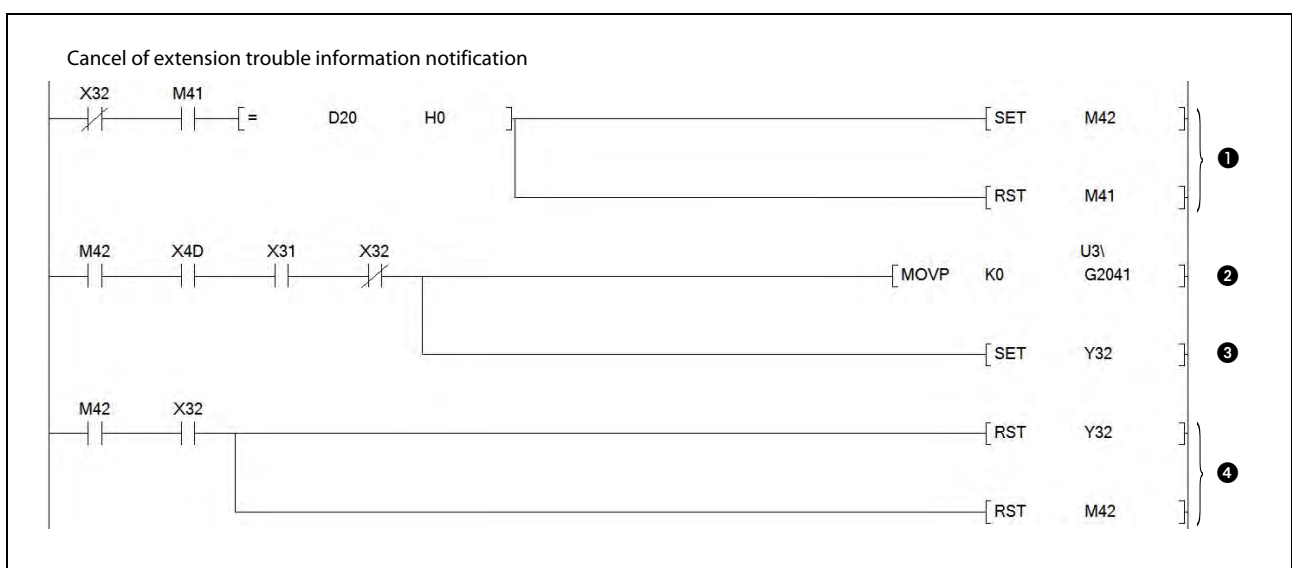


Fig. 7-13: Canceling of extension trouble information notification

No.	Description
①	Cancel extension trouble information notification.
②	Notifies master station of canceling extension trouble notification.
③	Extension trouble notification request.
④	Resets extension trouble information notification flag.

Tab. 7-17: Description of fig. 7-13

● Operation mode change (Self-diagnosis mode)

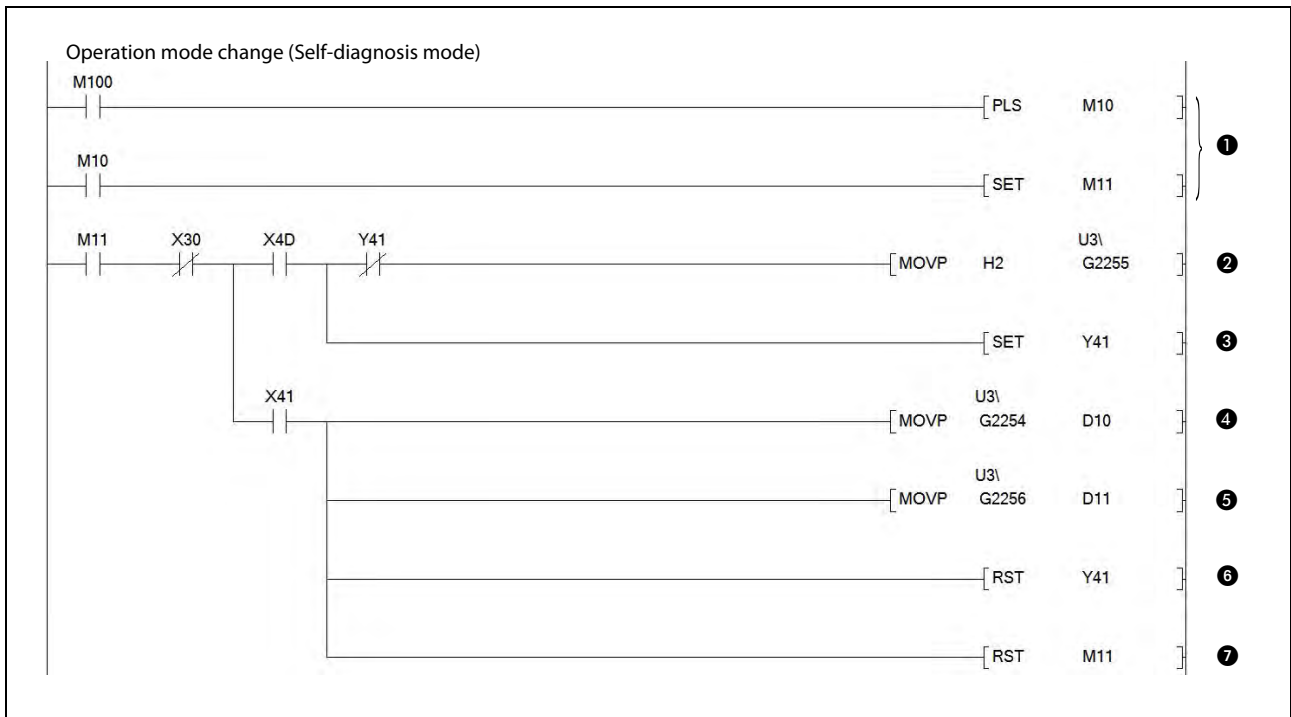


Fig. 7-14: Changing the operation mode

No.	Description
①	The operation mode change request is stored.
②	Self-diagnosis mode setting.
③	Operation mode change request.
④	Stores operation mode data in D10
⑤	Stores change result data.
⑥	Resets operation mode change request.
⑦	Resets operation mode change storage.

Tab. 7-18: Description of fig. 7-14

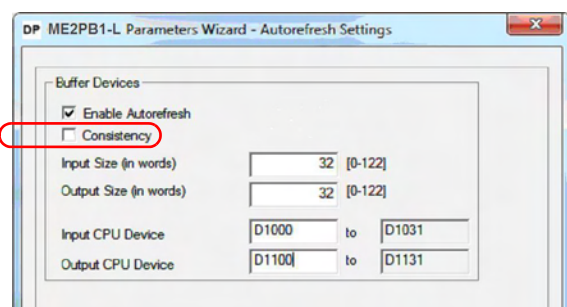
**NOTES**

If changing the operation mode as shown in this program example, do not change it from the Profibus DP configuration tool.

When using dedicated instructions, confirm that *Consistency* is disabled with *Autom. Refresh* enabled. (Refer to section 5.4.1)

When the automatic refresh and data separation prevention functions are enabled, dedicated instructions are not processed.

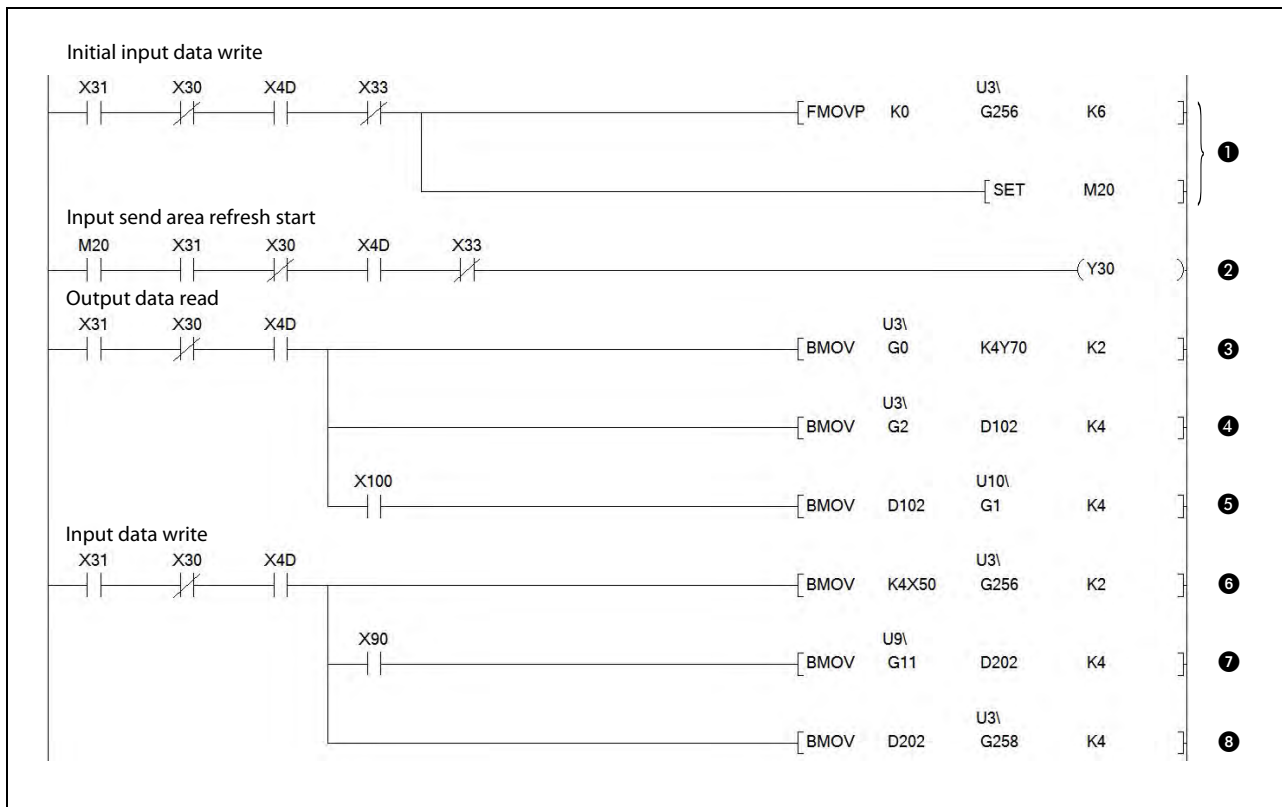
Make sure the box is unchecked.





**Program example (when using MOV instructions)**

- Output data read and input data write



**Fig. 7-15:** Reading of output data and writing of input data in LUMP mode using MOV instructions

No.	Description
①	Initial input data write
②	Input send area refresh start
③	Outputs data to LY41PT1P (Y70 to Y8F).
④	Reads digital value from output data.
⑤	Writes digital values to L60DA4.
⑥	Write data from LX41C4 (X50 to X6F) to the input send area.
⑦	Reads digital values from L60AD4.
⑧	Write data in digital value to the input send area.

**Tab. 7-19:** Description of fig. 7-15

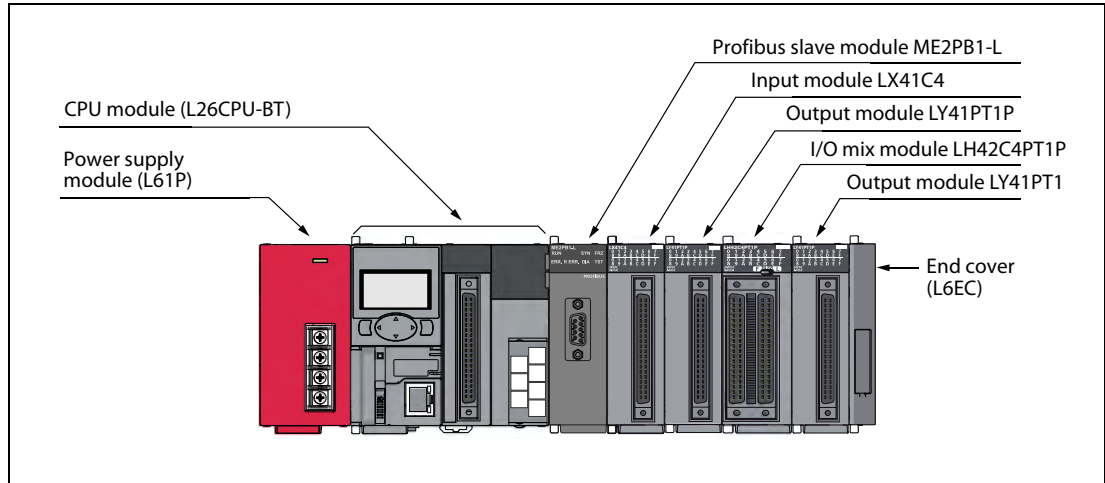
**NOTE**

When using MOV instructions, the program parts for error handling, extension trouble information notification and operation mode change are identical to the program, in which the dedicated instructions BBLKRD and BBLKWR are used (refer to figures 7-11 to 7-14).

### 7.3.2 DIVIDED mode

A program example for I/O data communication is provided here to show the case where the DIVIDED mode (refer to section 5.3.2) is used for data assignment of the following configuration.

#### System configuration for the example



**Fig. 7-16:** In this example the ME2PB1-L is mounted to the CPU module together with various I/O modules

I/O Assignment						
No.	Slot	Type	Model Name	Points	Start	XY
1	PLC	Built-in I/O Function		16Points		
2	PLC	Built-in CC-Link		32Points		
3	0(*-0)	Intelligent	ME2PB1-L	32Points		0030
4	1(*-1)	Input	LX41C4	32Points		0050
5	2(*-2)	Output	LY41PT1P	32Points		0070
6	3(*-3)	I/O Mx	LH42C4PT1P	32Points		0090
7	4(*-4)	Output	LY41PT1P	32Points		0110
8	5(*-5)					

**Fig. 7-17:** I/O assignment in the program example

Module	Input signals	Output signals
Profibus DP slave module ME2PB1-L	X30 to X4F	Y30 to Y4F
Input module LX41C4	X50 to X6F	—
Output module LY41PT1P	—	Y70 to Y8F
I/O combined module LH42C4PT1P	X90 to X10F	Y90 to Y10F
Output module LY41PT1P	—	Y110 to Y12F

**Tab. 7-20:** Assignment of input and output signals

**Settings**

- Data module setting of ME2PB1-L

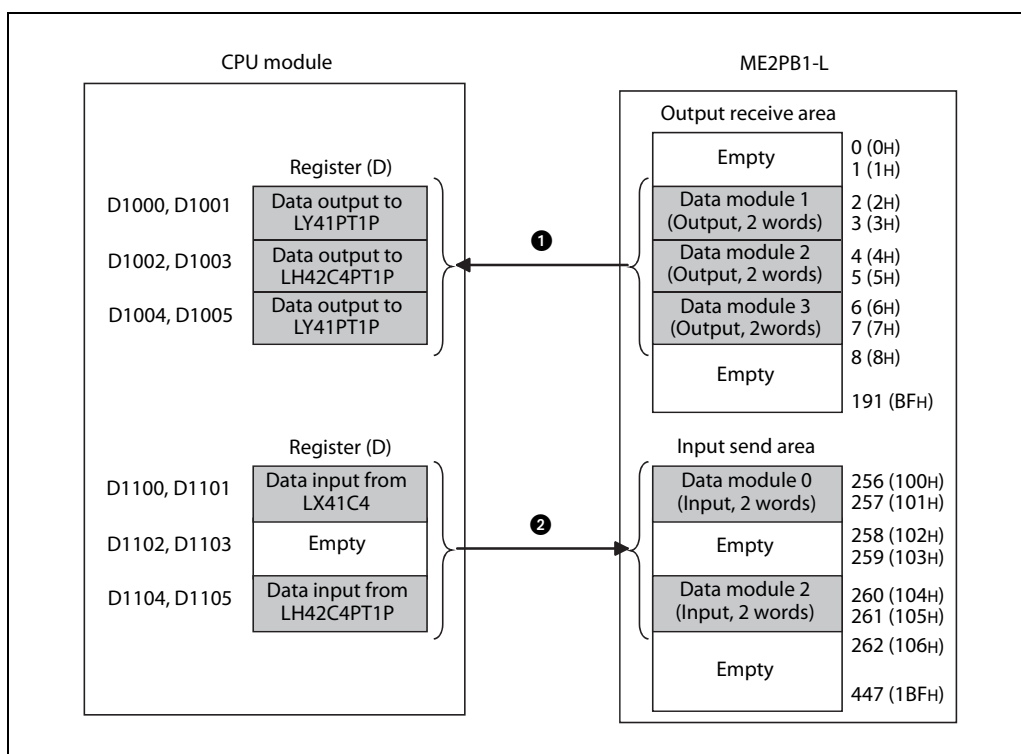
Data Module Setting		Output Data	Input Data
Data module 0	Input, 2 words, word unit	—	2 words
Data module1	Output, 2 words, word unit	2 words	—
Data module2	Input/Output, 2 words, word unit	2 words	2 words
Data module3	Output, 2 words, word unit	2 words	—

**Tab. 7-21:** Input and output data for this example

**NOTE**

For the data module setting please refer to section 5.3.1

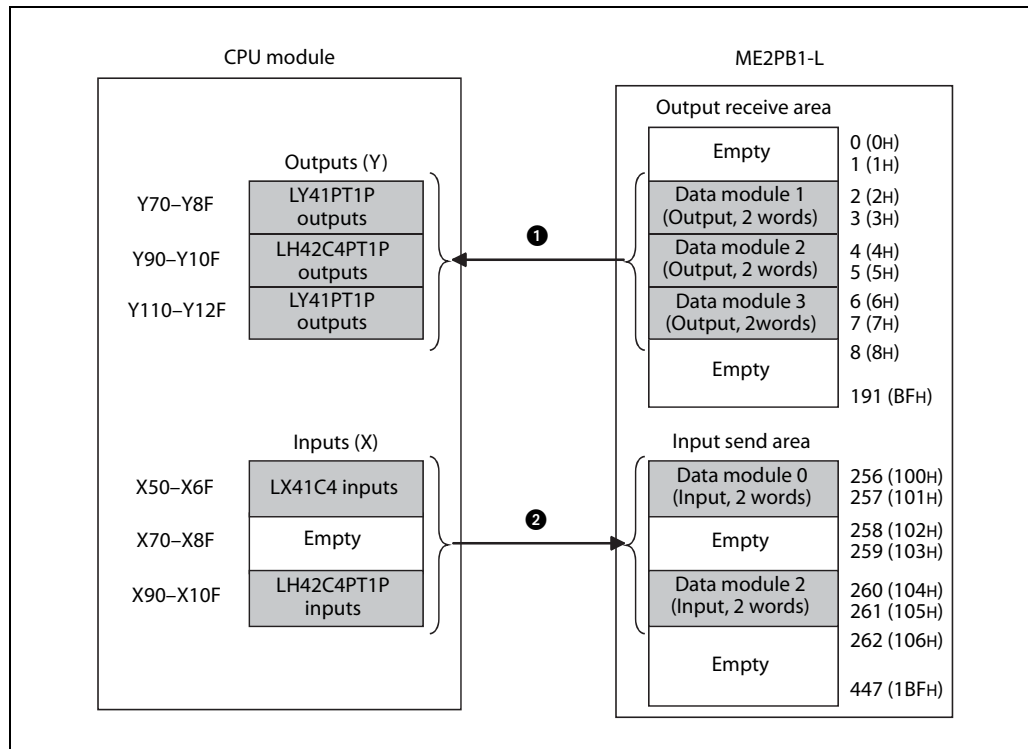
- Used states of ME2PB1-L output receive area and input send area
  - When dedicated instructions (BBLKRD/BBLKWR) are used.



**Fig. 7-18:** Occupation of output receive and input send area when using dedicated instructions

- 1 The output receive area data are read to D1000 to D1005 using a BBLKRD instruction. The data in D1000 to D1005 are written to the LY41PT1P and LY42C4PT1P.
- 2 Data of the LX41C4 and LY42C4PT1P are read to D1100 to D1105 beforehand. The data in D1100 to D1105 are written to the input send area using a BBLKWR instruction.

- When MOV instructions are used.



**Fig. 7-19:** Occupation of output receive and input send area when using MOV instructions

- ① The output receive area data are read to outputs (Y) using BMOV instructions.
- ② With BMOV instructions, the data in inputs (X) are written to the input receive area.

**Assignment of devices in the program examples**

- Devices occupied by the ME2PB1-L

Device (Input)	Description	Device (Output)	Description
X30	Watchdog timer error	Y30	Input send area refresh directive
X31	I/O communication	—	—
X32	Extension trouble notification completion	Y32	Extension trouble notification request
X33	Module error	Y33	Module error reset request
X3A	BBLKRD start request acceptance completion	Y3A	BBLKRD start request
X3B	BBLKWR start request acceptance completion	Y3B	BBLKWR start request
X41	Operation mode change completion	Y41	Operation mode change request
X4D	Module READY	—	—

**Tab. 7-22:** List of devices from/to the ME2PB1-L

- Devices occupied by the LX41C4

Device (Input)	Description	Device (Output)	Description
X50-X6F	Inputs of LX41C4	—	—

**Tab. 7-23:** List of devices for the input module LX41C4

- Devices occupied by the LY41PT1P (slot 2)

Device (Input)	Description	Device (Output)	Description
—	—	Y70–Y8F	Outputs of LY41PT1P

**Tab. 7-24:** List of devices for the output module LY41PT1P at slot 2

- Devices occupied by the LH42C4PT1P

Device (Input)	Description	Device (Output)	Description
X90–X10F	Inputs of LH42C4PT1P	Y90–Y10F	Outputs of LH42C4PT1P

**Tab. 7-25:** Device used for the I/O combined module LH42C4PT1P

- Devices occupied by the LY41PT1P (slot 4)

Device (Input)	Description	Device (Output)	Description
—	—	Y110–Y12F	Outputs of LY41PT1P

**Tab. 7-26:** List of devices for the output module LY41PT1P at slot 4

- Devices for the user

Device	Description	Device	Description
M10	Operation mode change flag	M40	Extension trouble notification flag
M11	Operation mode change storage	M41	Extension trouble notification completion flag
M20	Initial input data write	M42	Extension trouble cancel flag
M30	Error handling flag	M100	Self-diagnosis mode change

**Tab. 7-27:** List of devices for the user

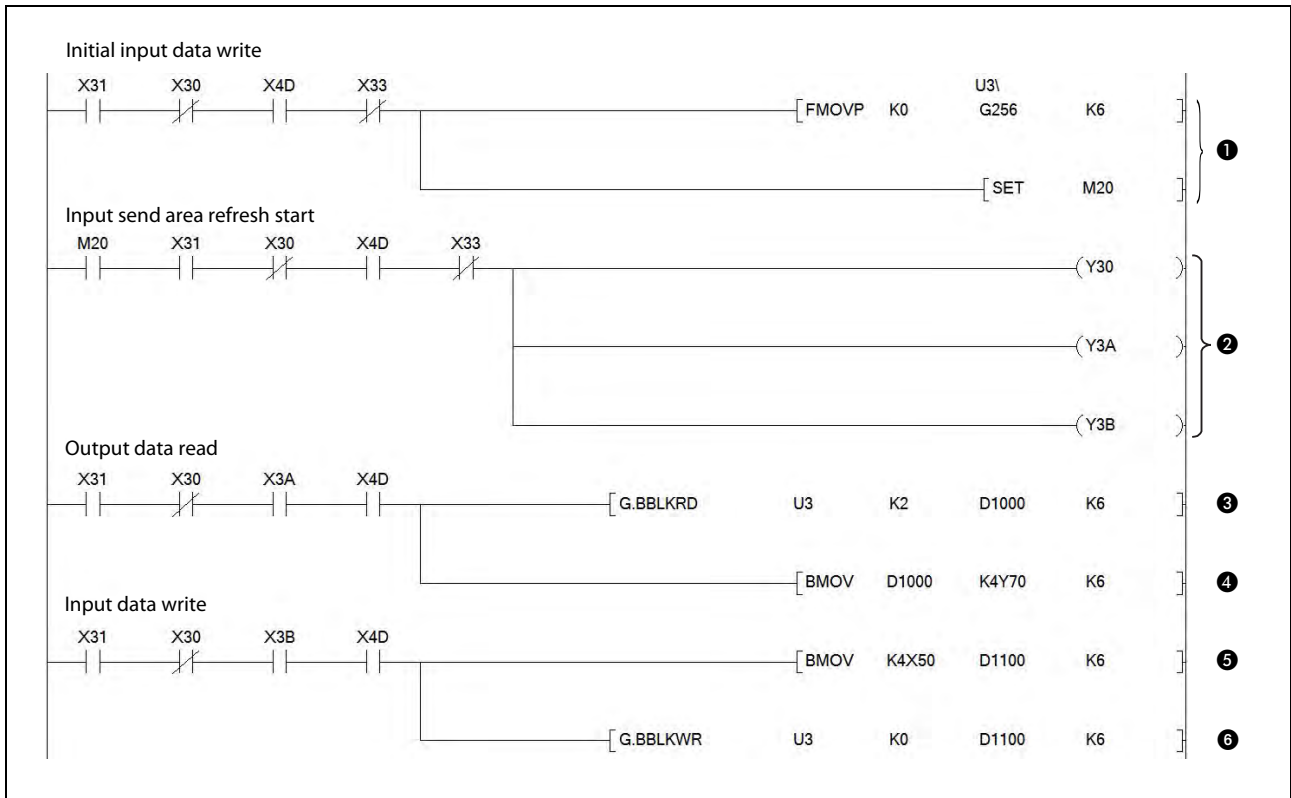
- Devices used for automatic refresh or buffer memory reading

Device	Description	Device	Description
D10	Operation mode storage	D301	Extension trouble information data
D11	Operation mode change result	D1000–D1005	Output data storage
D20	Error code storage	D1100–D1105	Input data storage
D300	Extension trouble information data length	—	—

**Tab. 7-28:** List of devices for the user

**Program example (when using dedicated instructions (BBLKRD/BBLKWR))**

- Output data read and input data write



**Fig. 7-20:** Reading of output data and writing of input data in DIVIDED mode using dedicated instructions

No.	Description
①	Initial input data write
②	Input send area refresh start
③	Output data read.
④	Outputs data to Y70 to Y12F.
⑤	Stores data in X50 to X10F into D1100 to D1105.
⑥	Input data write

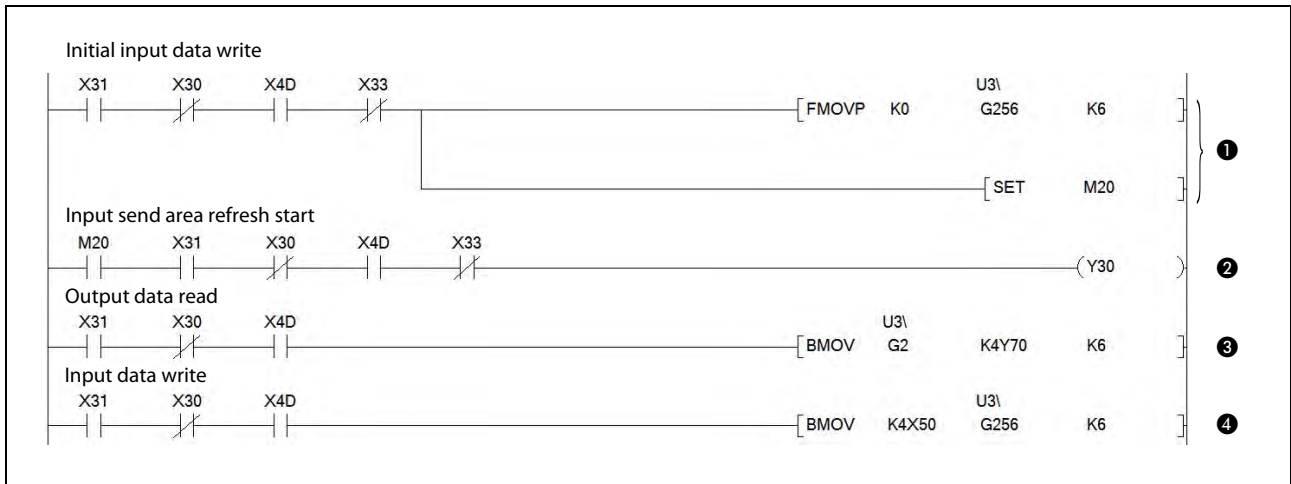
**Tab. 7-29:** Description of fig. 7-20

**NOTE**

The program parts for error handling, extension trouble information notification and operation mode change are identical to the program, in which the dedicated instructions BBLKRD and BBLKWR are used in LUMP mode (refer to figures 7-11 to 7-14).

**Program example (when using MOV instructions)**

- Output data read and input data write



**Fig. 7-21:** Reading of output data and writing of input data in DIVIDED mode using MOV instructions

No.	Description
①	Initial input data write.
②	Input send area refresh start.
③	Outputs data to Y70 to Y12F.
④	Write data in X50 to X10F to the input send area.

**Tab. 7-30:** Description of fig. 7-21

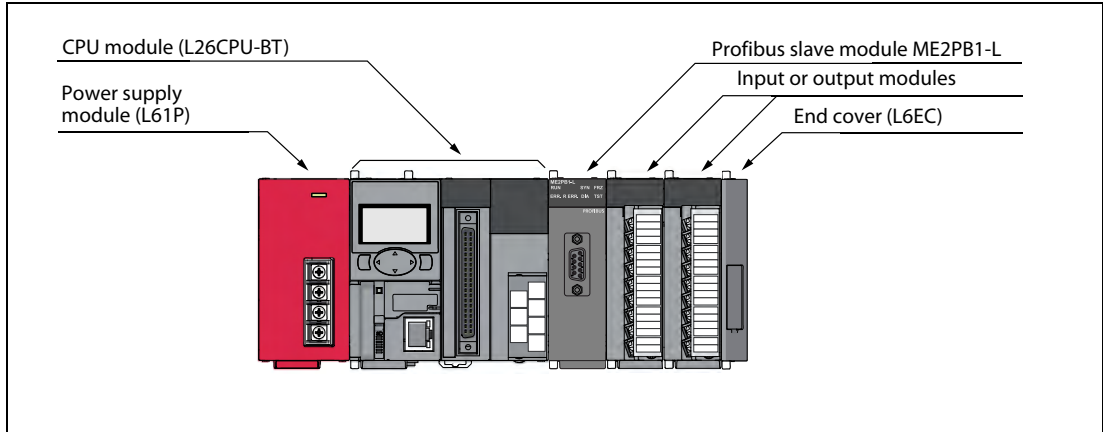
**NOTE**

The program parts for error handling, extension trouble information notification and operation mode change are identical to the program, in which the dedicated instructions BBLKRD and BBLKWR are used in LUMP mode (refer to figures 7-11 to 7-14).

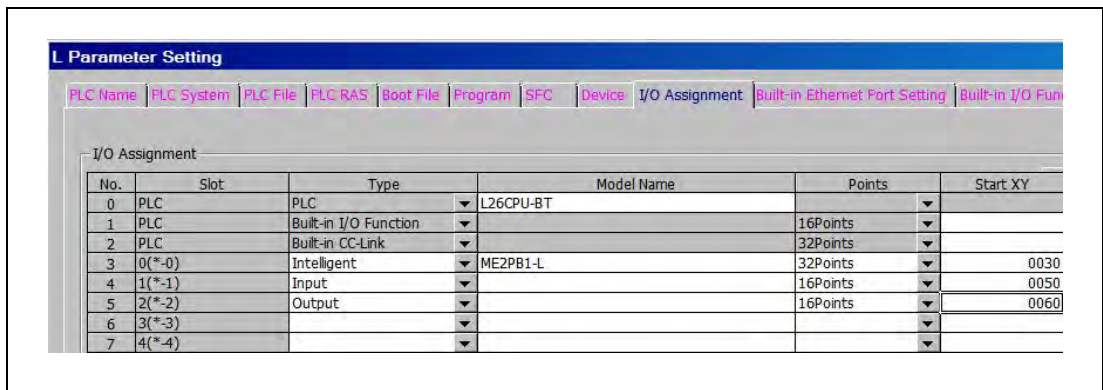
## 7.4 Global Control-driven Program Execution

This section shows a program example added using global control reception as a trigger.

### System configuration for the example



**Fig. 7-22:** The ME2PB1-L is mounted to the CPU module together with input or output modules



**Fig. 7-23:** I/O assignment in the program example

Module	Input signals	Output signals
Profibus DP slave module ME2PB1-L	X30 to X4F	Y30 to Y4F

**Tab. 7-31:** Assignment of input and output signals for the ME2PB1-L



**Assignment of devices in this program example**

- Devices occupied by the ME2PB1-L

Device (Input)	Description	Device (Output)	Description
X30	Watchdog timer error	—	—
X31	I/O communication		
X35	SYNC mode		
X36	SYNC receive		
X37	FREEZE mode		
X4D	Module READY		

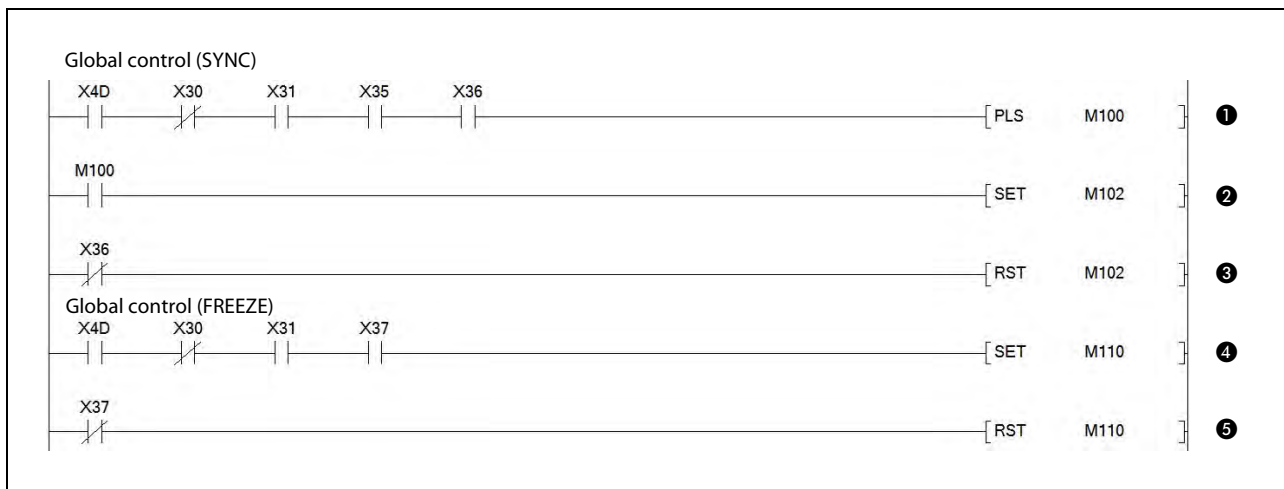
**Tab. 7-32:** List of devices from/to the ME2PB1-L

- Devices for the user

Device	Description	Device	Description
M100	Switch to SYNC mode	M110	FREEZE processing
M102	SYNC processing	—	—

**Tab. 7-33:** List of devices for the user

**Program example**



**Fig. 7-24:** Global control services SYNC and FREEZE

No.	Description
①	Receives SYNC service.
②	M102 is ON during SYNC service.
③	M102 is OFF before SYNC service reception.
④	M110 is on during FREEZE service.
⑤	M110 is off before FREEZE service reception.

**Tab. 7-34:** Description of fig. 7-24



## 8 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 ME2PB1-L.

### List of dedicated functions

The following list shows the dedicated instructions available for the ME2PB1-L.

Dedicated instruction	Description	Reference
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

**Tab. 8-1:** List of dedicated instructions

### Usable devices

The following devices are available for dedicated instructions.

Internal device		File register	Constant <sup>①</sup>
Bit	Word		
—	T, ST, C, D, W	R, ZR	K, H

**Tab. 8-2:** Usable devices

<sup>①</sup> Available devices are given in the field "Constant" in each section.

## 8.1 Precautions for Dedicated Instructions

### Before executing a dedicated instruction

Before executing a dedicated instruction, be sure to confirm the following.

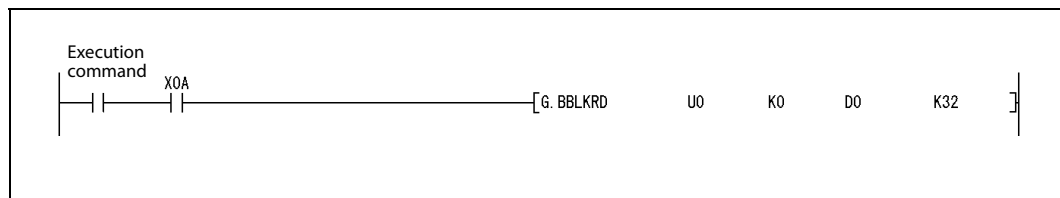
- Turn ON the start request signal for the dedicated instruction
  - Turn ON the following signal before executing a dedicated instruction.
    - When using BBLKRD: Turn ON the BBLKRD start request signal (YnA)
    - When using BBLKWR: Turn ON the BBLKWR start request signal (YnB)

Attempting to execute a dedicated instruction with the above signal OFF results in no processing (no execution).

Note that, as interlock signals for execution of dedicated instructions, the following signals must be used.

- When using BBLKRD: The BBLKRD start request acceptance completion signal (XnA)
- When using BBLKWR: The BBLKWR start request acceptance completion signal (XnB)

Example: BBLKRD instruction

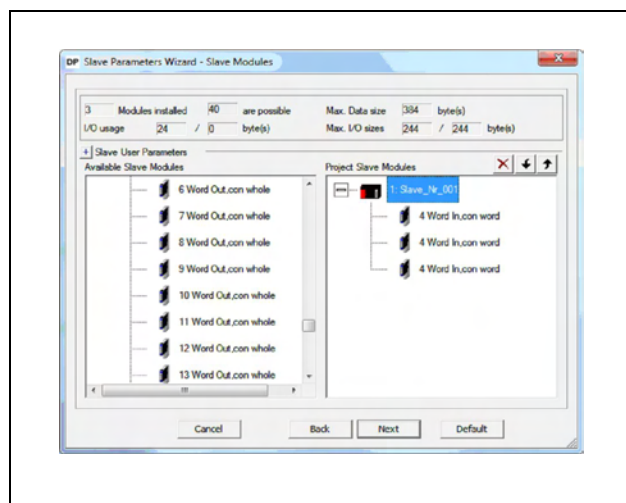


**Fig. 8-1:** Interlock example for dedicated instruction

- Check that consistency is disabled with automatic 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. (Refer to section 5.4.1)



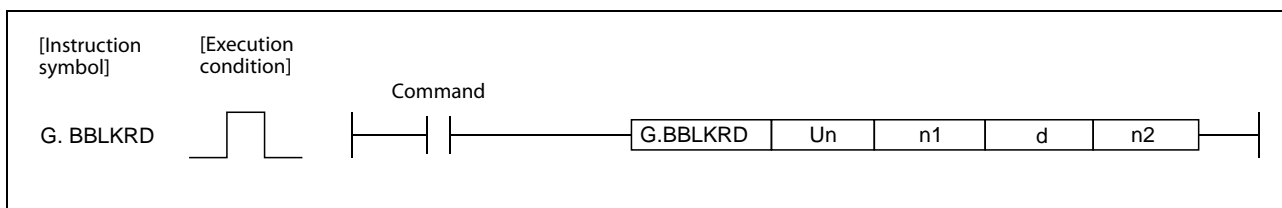
**Fig. 8-2:** Make sure that all selected slave modules have "con word" and that there is no "con whole".

- Data module setting  
Configure the data modules in the slave parameter setting on the master station.  
Dedicated instructions are not executable if this data module setting is incomplete.
  - When using BBLKRD: Set an output or I/O module
  - When using BBLKWR: Set an input or I/O module
- Execution of the BBLKRD and BBLKWR instructions  
The BBLKRD and BBLKWR instructions work independently.
- Number of executions within one scan  
Execute dedicated instructions only once in one scan.
- Execution timing  
Execute the BBLKRD and BBLKWR instructions all the time.  
While the ME2PB1-L is implementing the data consistency function, the dedicated instruction is not processed (not executed). (Refer to section 4.2.1)  
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.
- Transmission delay time when using a dedicated instruction  
Use of the data consistency function increases the transmission delay time. (Refer to section 6.3)

## 8.2 G. BBLKRD

Set data	Usable device								
	Internal device (System, user)		File register	Link direct device J□□		Intelligent function module device U□\G□	Index register Zn	Constant K, H	Other
	Bit	Word		Bit	Word				
n1	—	●	●	—	—	—	—	●	—
d	—	●	●	—	—	—	—	—	—
n2	—	●	●	—	—	—	—	●	—

**Tab. 8-3:** Devices usable in the BBLKRD instruction



**Fig. 8-3:** BBLKRD instruction

### Set data

Set data	Description	Setting range	Data type
Un	ME2PB1-L 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 of reading data	Specified device range	
d	Start No. of the device to which read data are stored	Specified device range	Device name
n2	Number of read data	1 to 122 (word)	BIN 16 bits

**Tab. 8-4:** Set data in the BBLKRD instruction

### Function

This instruction allows data reading from the buffer memory of a specified module with data consistency ensured.

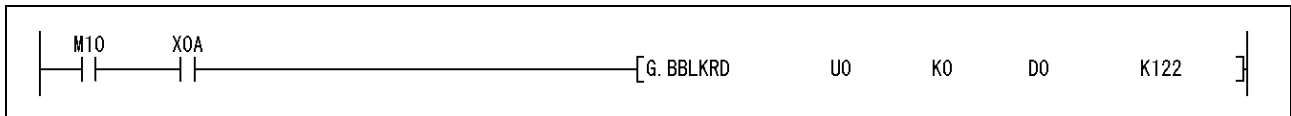
### Error

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.

**Example** ▾ Program example

At the timing of M10 = ON, 122 points of data are read starting from address U0\G0 in the output receive area of the ME2PB1-L (module start I/O No. 0) to D0 to D121 with data consistency ensured.



**Fig. 8-4:** BBLKRD instruction program example



### 8.3 G. BBLKWR

Set data	Usable device								
	Internal device (System, user)		File register	Link direct device J□□		Intelligent function module device U□\G□	Index register Zn	Constant K, H	Other
	Bit	Word		Bit	Word				
n1	—	●	●	—	—	—	—	●	—
s	—	●	●	—	—	—	—	—	—
n2	—	●	●	—	—	—	—	●	—

Tab. 8-5: Devices usable in the BBLKWR instruction

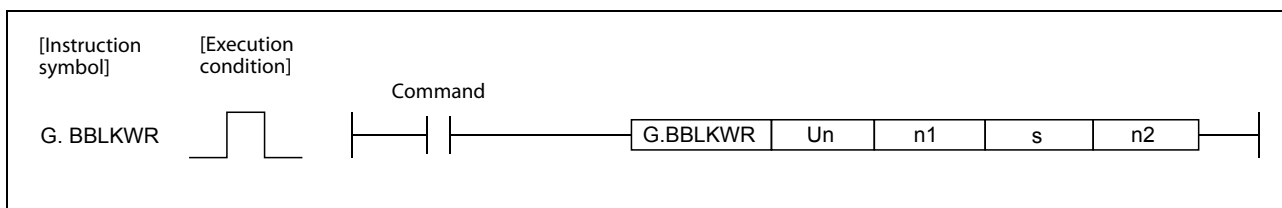


Fig. 8-5: BBLKWR instruction

#### Set data

Set data	Description	Setting range	Data type
Un	ME2PB1-L 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 Set start address as the offset address from 0H. Example: Set 256H as 0H	Specified device range	
s	Start No. of the device storing write data	Specified device range	Device name
n2	Number of write data	1 to 122 (word)	BIN 16 bits

Tab. 8-6: Set data in the BBLKWR instruction

#### 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)

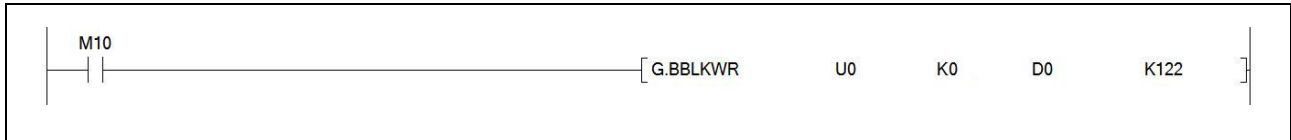
- When a value outside the setting range is set to the set data field
- When the size, which is obtained by adding the number of write data to the start address for writing data, exceeds the buffer memory size
- When the points available for the start address for writing data or after is less than the number of write data.



**Example** ▾

## Program example

At the timing of M 10 = ON, 122 points of data stored in D0 to D121 are written to the input send area of the ME2PB1-L (module start I/O No.0) with data consistency ensured, starting at address U0\G256.



**Fig. 8-6:** BBLKWR instruction program example





## 9 Troubleshooting

This chapter explains the troubleshooting and error codes of the ME2PB1-L.

Before troubleshooting the ME2PB1-L, check that no errors have occurred on the LCPU or the power supply module.

If any error is identified, check the error details and take corrective actions.

When the CPU has no fault, refer to the following sections 9.1 to 9.4.

### 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 the programming software.

#### 9.1.1 Causes and actions

The following table summarizes causes that can be thought from the LED status of the ME2PB1-L and corrective actions to be taken.

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.
ERR.	ON	Parameter setting error or module error occurred.	Check the error code and take corrective actions. (Refer to section 9.4)
R ERR.	ON	A communication error was detected or data communication is not yet started.	<ul style="list-style-type: none"> <li>• Check the parameter setting and cable wiring and check for open cable and like. (Refer to section 9.2)</li> <li>• Start data communication.</li> <li>• Set the station number.</li> </ul>

**Tab. 9-1:** Faults indicated by the LEDs of the ME2PB1-L

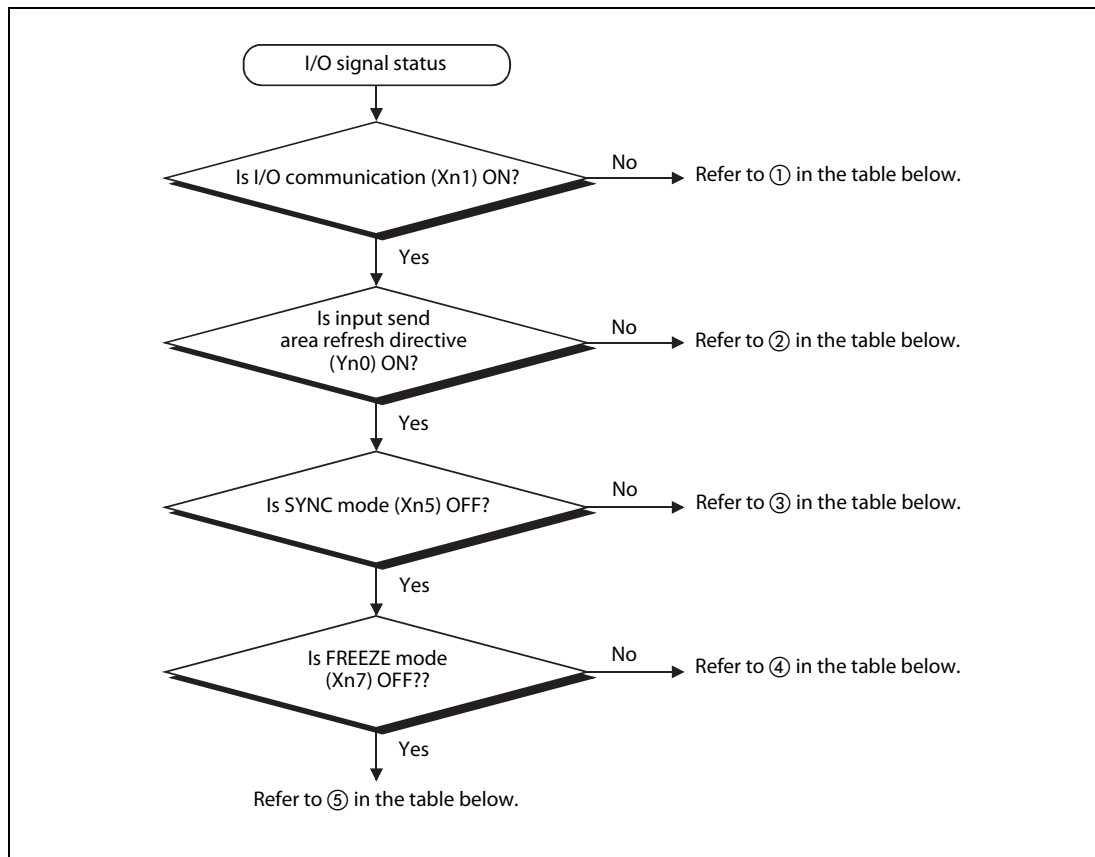
## 9.2 Checks and Actions for Network-related Faults

Checked area	Action
Transmission path	Use three or less repeaters to be relayed (Refer to section 3.2).
	Use each segment within the specified length (Refer to section 3.2).
	Install one bus terminator at each end (Refer to section 3.2).
	Use within the specified number of devices connected in each segment (Refer to section 3.2).
	Check the cable wiring and check for open cable (Refer to section 5.7).
	Check whether the cables are of Type A or not.
LED	Confirm the error with the on/off status of the LEDs and take the corrective action (Refer to section 9.1).
Module error information of buffer memory (Un\G2040)	Confirm the error with the error code and take the corrective action (Refer to section 9.4).
Master station	Confirm the error of the master station and take the corrective action (Refer to the master station manual).

**Tab. 9-2:** Checks and actions for network-related faults

### 9.3 Causes of Failure to Make Normal Data Communication and Actions to Be Taken

The following I/O signal status flowchart indicates the causes of a failure to make normal data communication and the actions to be taken.



**Tab. 9-3:** Checking the I/O status of the ME2PB1-L

Item	Status	Cause	Action
①	No I/O communication.	A communication start request is not given from the master station.	<ul style="list-style-type: none"> <li>• Check the master station.</li> <li>• Check the transmission path (Refer to section 9.2).</li> </ul>
②	Output data is not sent to master station.	<ul style="list-style-type: none"> <li>• The output refresh directive is not given.</li> <li>• Any of the slave parameters of the master station is wrong.</li> </ul>	<ul style="list-style-type: none"> <li>• Turn on the input send area refresh directive signal (Yn0).</li> <li>• Check the slave parameters of the master station.</li> </ul>
③	Output data is held and data does not change.	SYNC mode is activated.	Execute the UNSYNC service from the master station.
④	Input data is held and data does not change.	FREEZE mode is activated.	Execute the UNFREEZE service from the master station.

**Tab. 9-4:** Causes of failures to make normal data communication

Item	Status	Cause	Action
⑤	Data is not communicated to the correct area.	The buffer memory address of the MOV/FROM/TO instruction is wrong.	<ul style="list-style-type: none"> <li>• Check the used status of the data modules in the input send area used status (Un\G2288 to Un\G2299) and output receive area used status (Un\G2272 to Un\G2283) ①.</li> <li>• Check the sequence program.</li> </ul>
	Error does not occur in ME2PB1-L when master station becomes faulty.	The communication watchdog timer setting in the parameter is 0.	<ul style="list-style-type: none"> <li>• Check the current setting with the current communication watchdog timer value (Un\G2257) ①.</li> <li>• Set the communication watchdog timer in the master station parameter.</li> </ul>
	Upper and lower bytes of data sent and received are inverse.	The swap setting in the slave parameter of the master station is not appropriate for the data sent/received by the master.	<ul style="list-style-type: none"> <li>• Check the current setting with the swap function setting status (Un\G2259) ①.</li> <li>• Set "Yes/No" of swap setting in the master station parameter according to the data sent/received by the master station.</li> </ul>

**Tab. 9-4:** Causes of failures to make normal data communication

① Check during I/O communication (when Xn1 is ON).

## 9.4 Error Codes

This section explains the error codes of the ME2PB1-L.

Any of the error codes is stored into the module error information (Un\G2040) at error occurrence.

Error code	Error Name	Error description	Action
1001H	Station number error	The station number saved on the flash ROM is outside the range.	Set the station number to within the range again.
1002H		An attempt was made to change the station number to the one outside the range.	Set the station number to within the range.
1006H	Station number rewrite error	A station number change request was given (Y(n+1)3 turned ON) in the following station number rewrite disabled status. <ul style="list-style-type: none"> <li>"TRUE" was set for "No_Add_Chg" in the station number setting from the class 2 master station.</li> </ul>	Clear the station number with a station number change request.
2001H	Station number rewrite count excess error	Station number rewrite to the flash ROM was performed more than 60 times consecutively.	<ul style="list-style-type: none"> <li>Switch power on again.</li> <li>Give a station number change request to clear the station number. (Refer to section 3.4.7)</li> </ul>
2002H	Flash ROM memory access error	Hardware fault.	Change the module.
3002H	Illegal receive parameter error	The setting of the communication watchdog timer is too long.	Check the slave parameters of the master station.
3003H		The "Min T_sdr" value is outside the setting range.	
3004H		The data length of a user parameter is incorrect.	Check "User_Prm_Data_Size" in the configuration tool. (Refer to sections 5.3.2 and 5.3.3.)
3006H	Communication chip fault	Hardware fault.	Change the module.
3007H	Communication timeout error	Time-out occurred in communication with the master station.	<ul style="list-style-type: none"> <li>Check the master station status.</li> <li>Check the cable connection status.</li> <li>Increase the setting of the communication watchdog timer.</li> </ul>
3061H	I/O configuration information error	The data module is not a word type.	Check the slave parameters of the master station.
3062H		The swap setting is outside the range.	
3063H		The data assignment mode setting is outside the range.	
3064H		The data module count setting is outside the range.	
3065H		The data module setting is outside the range.	
3066H		The station number set in the parameter is illegal.	

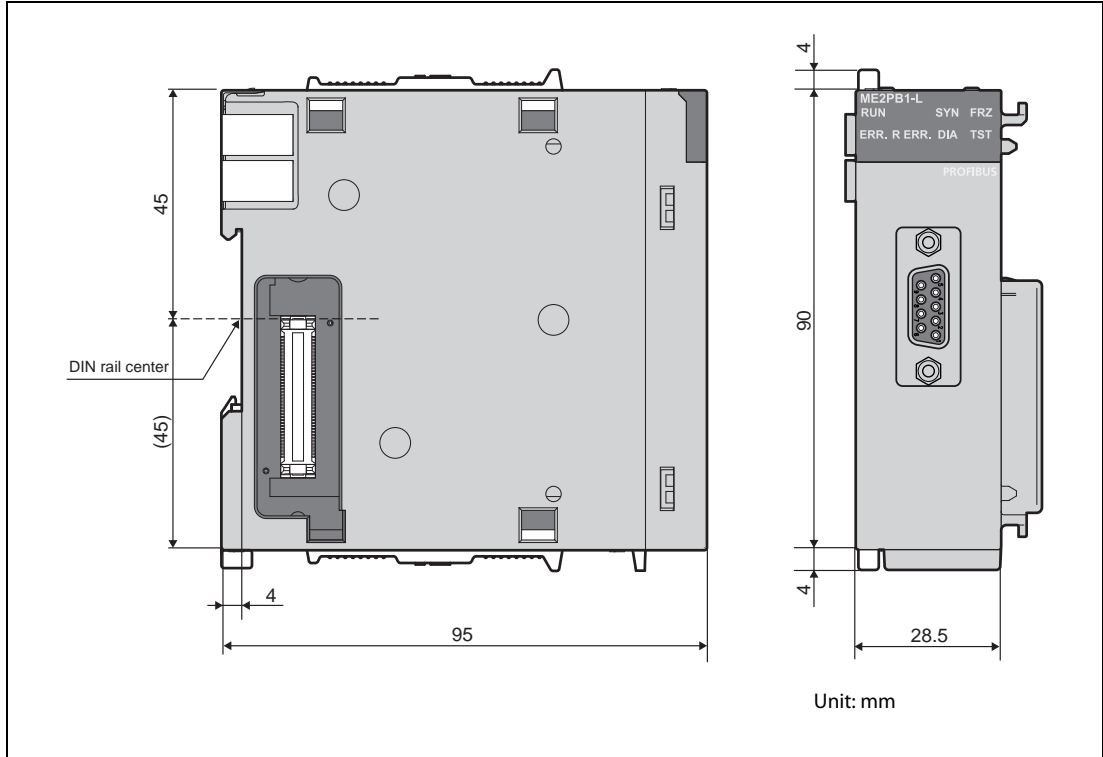
**Tab. 9-5:** Error codes of the ME2PB1-L





# A Appendix

## A.1 External Dimensions



**Fig. A-1:** External dimensions of the ME2PB1-L



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