

MELSEC A/AnS series

Programmable Controllers

User's Manual

PROFIBUS-DP Interface Module AJ71PB92D / A1SJ71PB92D

Additional Manual for PROFIBUS-DP interface module type AJ71PB92D/A1SJ71PB92D User's Manual

This manual explains the functions added to the AJ71PB92D software Version B and the A1SJ71PB92D software Version F.

The functions other than those added are explained in the AJ71PB92D/A1SJ71PB92D User's Manual (IB-66773-B or IB-66773-C). Please refer to that manual in addition to this manual.

1. Added functions

1.1 AJ71PB92D/A1SJ71PB92D remote parameter setting function using configuration software MELSEC ProfiMap (Ver. 3.0 and above)

When the AJ71PB92D (software Ver. B and above)/A1SJ71PB92D (software Ver. F and above) and MELSEC ProfiMap (Ver. 3.0 and above) are used together, the remote parameters can be set via the CPU module's RS-422 connector and via MELSECNET/10.

With the conventional product (AJ71PB92D (software Ver. A) or A1SJ71PB92D (software Ver. E and below) or MELSEC ProfiMap Ver. 2.0 and below), the parameters could be set only via the AJ71PB92D/A1SJ71PB92D RS-232-C interface.

Refer to the MELSEC ProfiMap (Ver. 3.0 and above) manual for details on this function.

Parameter setting method

		MELSEC ProfiMap			
		Ver. 2.0 and below	Ver. 3.0 and above	Ver. 2.0 and below	Ver. 3.0 and above
		Parameter setting via RS-232-C interface		Remote parameter setting	
AJ71PB92B	Ver. B and above	○	○	×	×
	Ver. A	○	○	×	○
A1SJ71PB92D	Ver. F and above	○	○	×	×
	Ver. E and before	○	○	×	○

○ : Setting possible, × : Setting not possible

1.2 Operation mode changeover during operation function

By using the input/output signal XY and buffer memory, the AJ71PB92D/A1SJ71PB92D operation mode can be changed without resetting the CPU module's key switch.

Furthermore, by designating in the buffer memory, the operation mode after changes can be registered in the EEPROM built into the AJ71PB92D/A1SJ71PB92D. With this function, when the operation mode is registered in the EEPROM, even if the mode setting switch is set to 0 (Normal service mode), 1 (Parameter setting mode), or E (Extended service mode) when the system is started up, the AJ71PB92D/A1SJ71PB92D will operate with the EEPROM operation mode.

Note that if the mode setting switch is set to 2 (Self-diagnosis mode), the AJ71PB92D/A1SJ71PB92D will operate in the self-diagnosis mode.

Operation mode changeover function

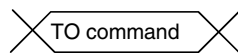
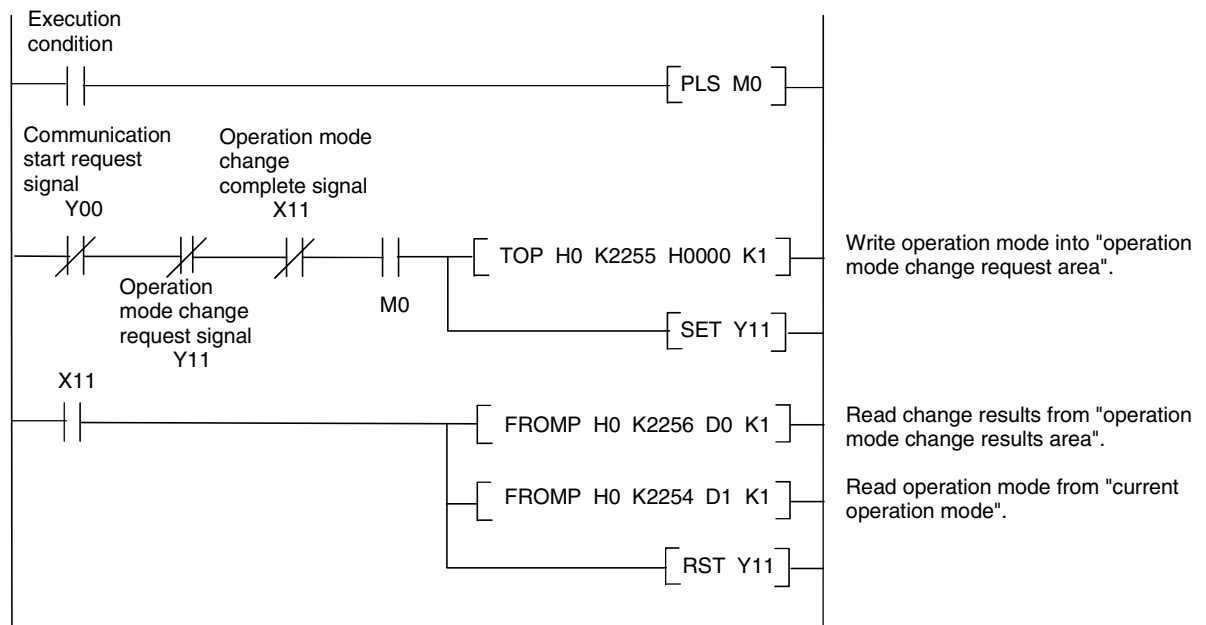
		Operation mode changeover function
AJ71PB92B	Ver. B and above	×
	Ver. A	○
A1SJ71PB92D	Ver. F and above	×
	Ver. E and before	○

○ : Operation possible × : Operation not possible

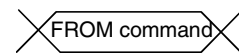
The following procedure is used to change the operation mode.

- (1) Before changing the operation mode, turn the communication start request signal Y00 OFF, and stop the communication.
- (2) Set the operation mode to be changed to in the buffer memory's "operation mode change request area" (address 2255/8CFh).
- (3) Turn the operation mode change request signal Y11 ON.
- (4) The AJ71PB92D/A1SJ71PB92D will change to the requested operation mode.
- (5) The AJ71PB92D/A1SJ71PB92D will turn the operation mode change complete signal X11 ON.
- (6) When X11 turns ON, the buffer memory's "current operation mode" (address 2254/8CEh) and "operation mode change results area" (address 2256/8D0h) will be read out. Changing of the operation mode can then be confirmed.

<Program example>



Set operation mode in "operation mode change request area".



Confirm results with "operation mode change result area" and "current operation mode".

2. Added input/output signals

X signal (AJ71PB92D/A1SJ71PB92D→CPU)		Y signal (CPU→AJ71PB92D/A1SJ71PB92D)	
X10	Operation mode signal	Y10	Not usable
X11	Operation mode change complete signal	Y11	Operation mode change request signal

The other input/output signals are the same as the conventional product.

2.1 Operation mode signal (X10)

This indicates whether the current operation mode is the Parameter setting mode.

ON : setting mode

OFF: Normal service mode/Extended service mode

2.2 Operation mode change request signal (Y11), operation mode change complete signal (X11)

This is used to change the operation mode without resetting the CPU module's key switch.

This function is valid only when the system is started up with mode setting switch set to 0, 1 or E.

(1) Operation mode change request signal (Y11)

OFF → ON: This requests the mode to change to the operation mode designated in the buffer memory's operation mode change request area (address 2255/8CFh).

ON → OFF: This turns X11 OFF.

(2) Operation mode changeover complete signal (X11)

This turns ON when the results are stored in the buffer memory's operation mode change results area (address 2256/8D0h). This signal turns ON even if the operation mode change is completed normally or completed abnormally.

This signal turns OFF when Y11 changes from ON to OFF.

3. Added buffer memories

Address		Explanation
dec	hex	
2254	8CEh	Current operation mode
2255	8CFh	Operation mode change request area
2256	8D0h	Operation mode change results area

3.1 Current operation mode (Buffer memory address: 2254/8CEh)

The following values are stored in the current operation mode depending on the operation mode in which the AJ71PB92D/A1SJ71PB92D is started up.

Value	Explanation
0000h	Mode is temporarily changed from CPU module, and module starts up in the Normal service mode (32 byte communication mode).
0001h	Mode is temporarily changed from CPU module, and module starts up in the Parameter setting mode.
000Eh	Mode is temporarily changed from CPU module, and module starts up in the Extended service mode (244 byte communication mode).
0100h	Module starts up in the Normal service mode (32 byte communication mode) registered in the EEPROM.
0101h	Module starts up in the Parameter setting mode registered in the EEPROM.
010Eh	Module starts up in the Extended service mode (244 byte communication mode) registered in the EEPROM.
1000h	Module starts up in Normal service mode (32 byte communication mode) set with Mode setting switch.
1001h	Module starts up in Parameter setting mode set with Mode setting switch.
100Eh	Module starts up in Extended service mode (244 byte communication mode) set with Mode setting switch.

3.2 Operation mode change request area (Buffer memory address: 2255/8CFh)

By writing the operation mode to be changed to in this area and turning the operation mode change request signal Y11 ON, the AJ71PB92D/A1SJ71PB92D operation mode can be changed.

It can also be designated whether to register the setting in the EEPROM.

Set the following values in the operation mode change request area for the operation mode to be changed to.

(When the power is turned ON or the CPU is reset, an invalid value FFFh will be set in the operation mode change request area. If the operation mode change request signal Y11 is turned ON inadvertently, the AJ71PB92D/A1SJ71PB92D will detect the error and the operation mode will not change.)

Value	Explanation
0000h	Change to Normal service mode (32 bytes communication mode) without registering mode in EEPROM.
0001h	Change to Parameter setting mode without registering mode in EEPROM.
000Eh	Change to Extended service mode (244 bytes communication mode) without registering mode in EEPROM.
0100h	Change to Normal service mode (32 bytes communication mode), and register mode in EEPROM.
0101h	Change to Parameter setting mode, and register mode in EEPROM.
010Eh	Change to Extended service mode (244 bytes communication mode), and register mode in EEPROM.
FFFFh	Erase the mode setting set in EEPROM, and change to Mode setting switch mode.

When the power is turned ON or the CPU key is reset, if the Mode setting switch is set to 0, 1 or E and the operation mode is set in the EEPROM, the Mode setting switch setting will be ignored, and the operation mode registered in the EEPROM will be valid.

Specifically, the operation mode after changing over will be as shown below.

		"Current operation mode" before operation mode change							
		0000h	0001h	000Eh	0100h	0101h	010Eh	1000h	1001h
Operation mode change request area	0000h	0000h							
	0001h	0001h							
	000Eh	000Eh							
	0100h	0100h							
	0101h	0101h							
	010Eh	010Eh							
	FFFFh	100Xh: X is the operation mode designated with Mode setting switch					1000h	1001h	100Eh
CPU reset	(1) When Mode setting switch is 0, 1 or E and mode is registered in EEPROM = 010Xh X is the mode registered in the EEPROM			0100h	0101h	010Eh	1000h	1001h	100Eh
	(2) When Mode setting switch is 0, 1 or E and mode is not registered in EEPROM = 100Xh X is the mode set with the Mode setting switch								
	(3) When Mode setting switch is not 0, 1 or E = 0000h (Invalid. The AJ71PB92D/A1SJ71PB92D will start up in the Self-diagnosis mode.)								

3.3 Operation mode change results area (Buffer memory address: 2256/8D0h)

The results of the operation mode change request execution are stored.

0: Normal completion

1: Abnormal completion (A mode with an illegal value was requested.)

When the process is completed abnormally, the AJ71PB92D/A1SJ71PB92D will not change the mode. The operation mode before the change was requested will be maintained.

4. Precautions

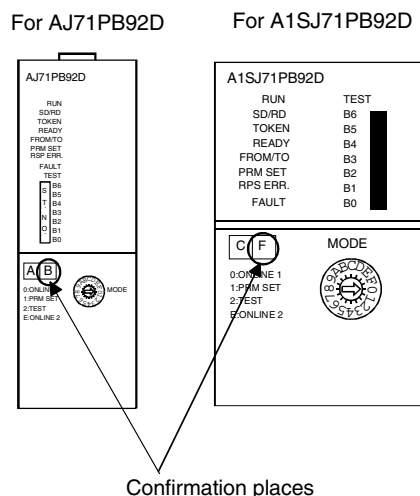
- (1) In the following cases, read/write the AJ71PB92D/A1SJ71PB92D buffer memory with the sequence program while the AJ71PB92D/A1SJ71PB92D module READY signal X1D is ON.
 - When changing the operation mode with the sequence program using Y11/X11.
 - When connecting ProfiMap to a port other than the AJ71PB92D/A1SJ71PB92D RS-232-C port, and setting the parameters. (When connecting ProfiMap to the CPU module's RS-422 connector and setting the parameters, etc.)

If the buffer memory is read/written while ignoring X1D, the CPU module will detect the "SP UNIT DOWN" error, and the sequence operation may stop.
- (2) Do not set the parameters via the buffer memory and set the parameters via the AJ71PB92D/A1SJ71PB92D RS-232-C port simultaneously.
 If set simultaneously, after the operation mode is changed to the parameter setting mode, the Profibus that started the parameter writing earlier will obtain the parameter writing rights. The other Profibus will not be able to write the parameters, and an error will be detected.
 If parameter writing via the CPU is valid, this state will be automatically canceled 15 seconds after parameter writing is completed. If parameter writing from the RS-232-C is valid, this state will be automatically canceled 3 seconds after parameter writing is completed.
- (3) Do not simultaneously access the AJ71PB92D/A1SJ71PB92D from multiple ProfiMaps. If executed, the AJ71PB92D/A1SJ71PB92D may not be accessed correctly.
- (4) If the remote parameters are set from the MELSEC ProfiMap in respect to an AJ71PB92D/A1SJ71PB92D in the communication process, the PROFIBUS communication will stop while the parameters are being set.
- (5) In a system that sets the remote parameters from the MELSEC ProfiMap, do not execute the mode changeover function from the program.
 If the mode changeover function is executed in the program, an interlock will not be established with the remote parameter settings, so the mode may not change over.

5. Confirming the AJ71PB92D/A1SJ71PB92D software version.

The AJ71PB92D/A1SJ71PB92D software version can be confirmed by checking the version stickers at the following places.

The AJ71PB92D is software Version B, and the A1SJ71PD92D is software Version F.



● SAFETY PRECAUTIONS ●

(Read these precautions before using.)

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

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

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




DANGER

Procedures which may lead to a dangerous condition and cause death or serious injury if not carried out properly.



CAUTION

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

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

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

[DESIGN PRECAUTIONS]

DANGER

- When a communication error occurs in the PROFIBUS network, the status of the faulty station is as follows. Configure an interlock circuit in the sequence program using the communication status information (input X1, buffer memory 2040 to 2079) so that the system can operate safely. Erroneous outputs and mis-operation could cause accidents.
 - (1) The input data of the master station maintains the data before abnormality of the communication.
 - (2) When the master station is down, the output state of each slave station will be in accordance with the parameter settings.
 - (3) When any slave station is down, the output state of other slave stations will be in accordance with the parameter settings of the master station.

CAUTION

- When the PROFIBUS cable is laid, do not lay it close to main circuits or power lines. They should be installed 100mm(3.9inch) or more from each other. Not doing so could result in noise that would cause malfunctioning.

[INSTALLATION PRECAUTIONS]

CAUTION

- Use the module in the environment given in the general specifications of the CPU module's User's Manual. Using the module outside the range of the general specifications may result in electric shock, fire or malfunctioning, or may damage or degrade the module.
- Insert the tabs at the bottom of the module into the mounting holes in the base unit before installing the module. (The AnS series module shall be fastened by screws in the base unit at the specified torque.) Not installing the module correctly could result in malfunctioning, breakdowns or pieces of the product falling
- Tighten the fixing screws of the PROFIBUS cable with the specified torque. If the screws are loose, it could result in malfunction of the module.
- Do not touch the conductive area or electric parts of the module. Doing so may cause module malfunctioning or breakdowns.

[WIRING PRECAUTIONS]

CAUTION

- Switch all phases of the external power supply of the PC system off before connecting the PROFIBUS cable. Not doing so could cause failure or malfunctioning of the module.
- Be careful not to let foreign matter such as filings or wire chips get inside the module. These can cause fire, breakdowns and malfunctioning.
- The PROFIBUS cable which is connected to the module must be protected with a duct or secured in position with clamps.
Unless the cable is thus protected or secured, the module or the cable could be damaged when the cable swings, moves or it is strained with careless pulls, or it could cause malfunction when the cable contacts with any undesirable objects.
- When disconnecting the PROFIBUS cable from the module, do not pull by holding the cable section. To disconnect the cable, make sure to hold the connector which is coupled with the module. Do not attempt to pull the cable to disconnect it from the module. It could damage the module or the cable, or cause malfunction due to a poor contact of the cable.

[STARTING AND MAINTENANCE PRECAUTIONS]

DANGER

- Switch all phases of the external power supply off before cleaning. Not doing so could cause electric shock.

 **CAUTION**

- Never disassemble or modify the module.
This may cause breakdowns, malfunctioning, injury and/or fire.
- Switch all phases of the external power supply off before mounting or removing the module. If you do not switch off the external power supply, it will cause breakdowns or malfunction 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 PC CPU. Writing data into the "not usable area" or outputting an "not usable" signal may cause system malfunctions in the PC.

 **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 it as industrial waste.

Revisions

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

Print Date	*Manual Number	Revision
May, 1997	IB (NA)-66773-A	First printing
Sep., 1997	IB (NA)-66773-B	<div style="border: 1px solid black; display: inline-block; padding: 2px;">Correction</div> Section 2.3, Chapter 3 <div style="border: 1px solid black; display: inline-block; padding: 2px;">Addition</div> Appendix 2
Oct., 1998	IB (NA)-66773-C	<div style="border: 1px solid black; display: inline-block; padding: 2px;">Model Addition</div> AJ71PB92D <div style="border: 1px solid black; display: inline-block; padding: 2px;">Correction</div> SAFTY PRECAUTIONS, Chapter 1, 2, 3, 4, Section 5.1, 5.2, 5.3, 5.5.1, 5.5.2, 5.6, 6.1, Chapter 7, 8, 9 <div style="border: 1px solid black; display: inline-block; padding: 2px;">Addition</div> Appendix 1 <div style="border: 1px solid black; display: inline-block; padding: 2px;">Chapter Alteration</div> Appendix 1 → Appendix 3

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Introduction

Thank you for purchasing the Mitsubishi Programmable Controller MELSEC-A Series.

Before using the equipment, please read this manual carefully to develop full familiarity with the functions and performance of the graphic operation terminal you have purchased, so as to ensure correct use.

Please forward a copy of this manual to the end user.

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About This Manual

The following are manuals related to this product.

Request for the manuals as needed according to the chart below.

Related Manual

Manual Name	Article No.
MELSEC ProfiMap Configuration System for Open Networks Software Manual	65778-B

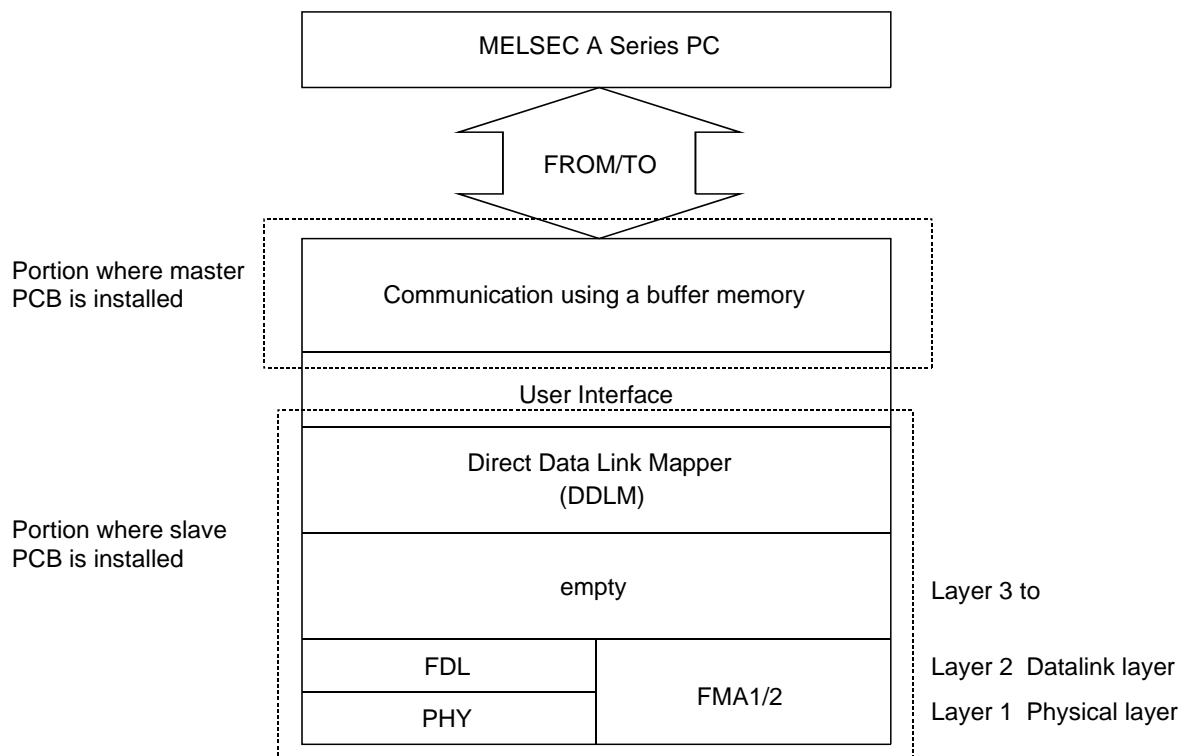
- * Inquiries can be made to :
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Gothaer Strasse 8 D-40880 Ratingen Germany
Phone : +49(21 02)486-0
Fax : +49(21 02)486-717

1. OVERVIEW

This is the user's manual for the AJ71PB92D/A1SJ71PB92D PROFIBUS-DP interface module (hereafter abbreviated as "AJ71PB92D/A1SJ71PB92D. When explain separately, however, abbreviated as AJ71PB92D, A1SJ71PB92D), which is used to connect a MELSEC-A series programmable controller to a PROFIBUS-DP network.

The AJ71PB92D/A1SJ71PB92D operates as a master station (class 1) in the PROFIBUS-DP network.

1.1 Software Configuration



The AJ71PB92D/A1SJ71PB92D has a physical layer, data link layer, DDLML, and user interface that conform to PROFIBUS-DP, and communicates data with the PC CPU by using a buffer memory. The main application of PROFIBUS-DP is networks that execute high-speed communication at the level of sensors and actuators, and the AJ71PB92D/A1SJ71PB92D has been designed with this in mind: its functions are mainly related to data I/O with slave stations.

1.2 AJ71PB92D/A1SJ71PB92D Features

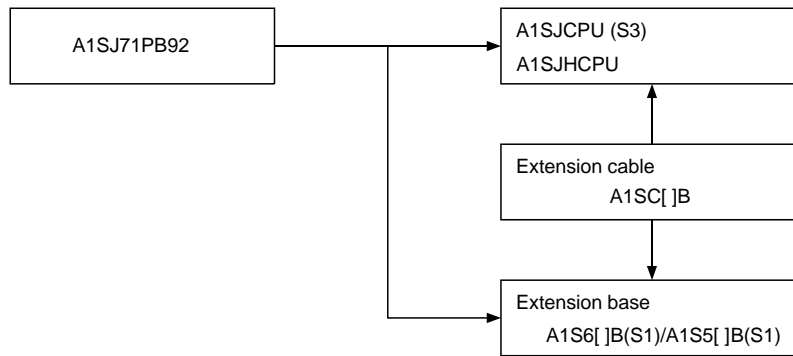
- (1) Operates as a PROFIBUS-DP master (class 1) station.
- (2) Makes possible the exchange of input and output data to and from the slave station without the need to be aware of the PROFIBUS-DP protocol by using I/O signals X/Y and the buffer memory.
- (3) Supports 3M, 6M, 12M [bps] network communication speeds in addition to the 9.6k, 19.2k, 93.75k, 187.5k, 500k, and 1,500k [bps] supported by the AJ71PB92D/A1SJ71PB92D. These can be selected using a configurator.
- (4) Station Nos. from 0 to 125 can be set using the configurator.
- (5) Trouble information can be read from the slave station using the I/O signal X/Y and the buffer memory.
- (6) The global control function makes it possible to maintain all slave I/O at the same time. In addition, this can also be canceled.
- (7) The module contains a self-diagnosis function that can be used to test the hardware such as the internal memory.

2. SYSTEM CONFIGURATION

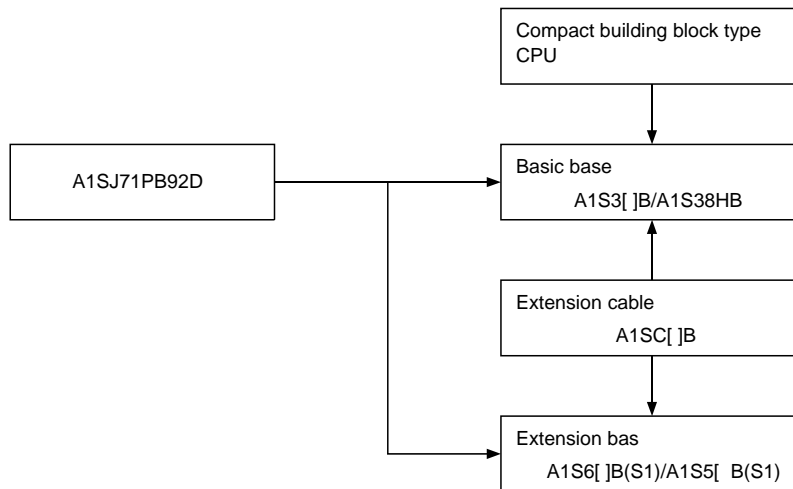
This section explains system configuration for the AJ71PB92D/A1SJ71PB92D

2.1 Whole System Configuration

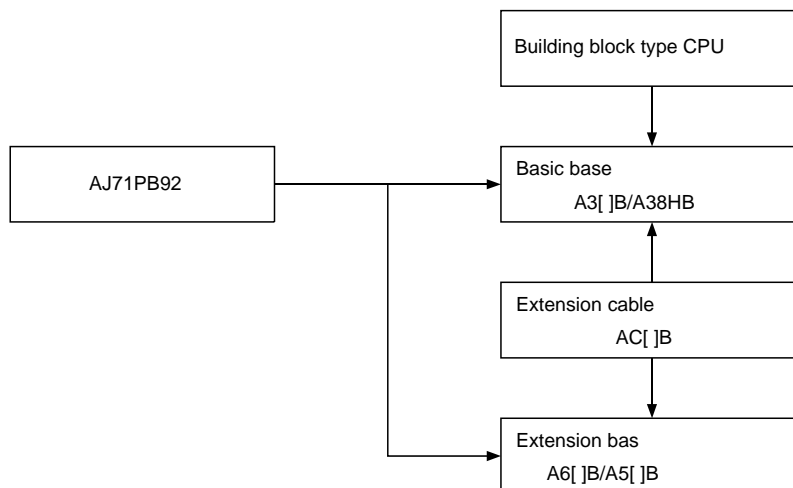
(1) For the A1SJCPU



(2) For the compact building block type CPU



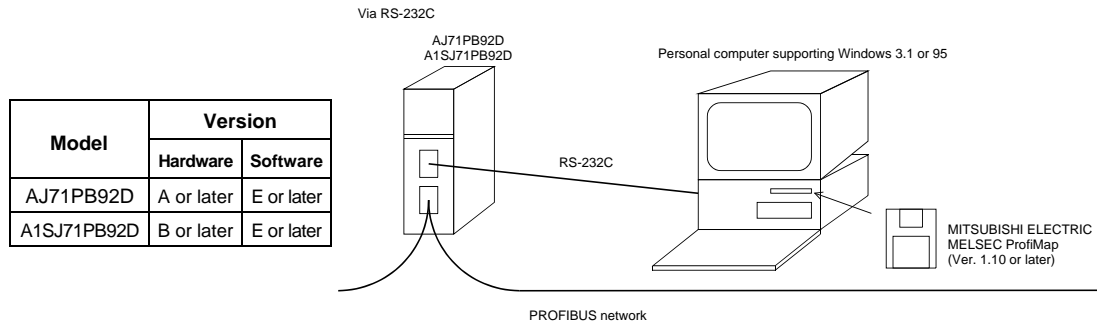
(3) For the building block type CPU



2.2 System Configuration Example

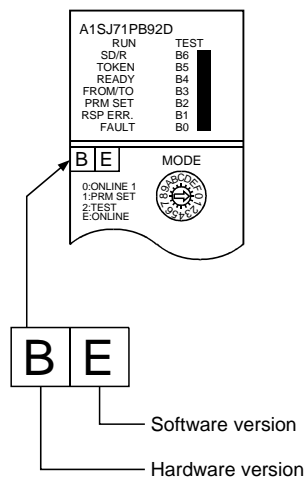
The following describes the A1SJ71PB92D system configuration example.

A communication parameter file is created in Windows using the Configurator software package, this parameter file can then be down-loaded via an RS-232C cable to the AJ71PB92D/A1SJ71PB92D.



Point Refer to "About This Manual" for inquiry for MELSEC ProfiMap.

* Version confirmation method of AJ71PB92D/A1SJ71PB92D



2.3 Applicable CPU Modules

The following table shows the CPUs that the AJ71PB92D/A1SJ71PB92D can use.

(1) AJ71PB92D

Applicable CPU Modules
A1SCPUC24-R2
A1SJCPU, A1SJCPU-S3, A1SJCPU-S8, A1SCPU, A1SCPU-S1, A2SCPU, A2SCPU-S1, A1SJHCPU, A1SHCPU, A2SHCPU, A2SHCPU-S1, A1NCPUC, A1NCPUC P21/R21, A2NCPUC, A2NCPUC P21/R21, A2NCPUC-S1, A2NCPUC P21/R21-S1, A3NCPUC, A3NCPUC P21/R21
A2ASCPU, A2ASCPU-S1, A2ASCPU-S30, A2ACPU, A2ACPU P21/R21, A2ACPU-S1, A2ACPU P21/R21-S1, A3ACPU, A3ACPU P21/R21, A2UCPU, A2UCPU-S1, A3UCPU, A4UCPU
Q2ASCPU, Q2ASCPU-S1, Q2ASHCPU, Q2ASHCPU-S1, Q2ACPU, Q2ACPU-S1, Q3ACPU, Q4ACPU, Q4ARCPU

(2) A1SJ71PB92D

Applicable CPU Modules
A1SCPUC24-R2
A1SJCPU, A1SJCPU-S3, A1SJCPU-S8, A1SCPU, A1SCPU-S1, A2SCPU, A2SCPU-S1, A1SJHCPU, A1SHCPU, A2SHCPU, A2SHCPU-S1
A2ASCPU, A2ASCPU-S1, A2ASCPU-S30
Q2ASCPU, Q2ASCPU-S1, Q2ASHCPU, Q2ASHCPU-S1

2.4 Installable Base Units

The base modules that can be installed in the AJ71PB92D/A1SJ71PB92D are shown below.

(1) AJ71PB92D

Installable Base Units	
Basic base unit	Extension base unit
A32B, A32B-S1, A35B, A38B, A38HB	A52B, A55B, A58B, A62B, A65B, A68B

(2) A1SJ71PB92D

Installable Base Units	
Basic base unit	Extension base unit *1
A1S32B, A1S33B, A1S35B, A1S38B, A1S38HB	A1S52B (S1), A1S55B (S1), A1S58B (S1), A1S65B (S1), A1S68B (S1)

*1: The no power supply module extension base unit A1S5 [] B (S1) may not have sufficient power supply capacity, so use the A1S6 [] B (S1) when installing a AJ71PB92D/A1SJ71PB92D in the extension base unit.

When the A1S5 [] B (S1) must be installed, do so after referring to the chapter covering power supplies in the respective CPU Module User's Manual.

2.5 Combining with MELSECNET (II), MELSECNET/B, and MELSECNET/10

The AJ71PB92D/A1SJ71PB92D can be installed in the MELSECNET (II) and MELSECNET/B master stations and local stations, and in the MELSECNET/10 control stations and normal stations. However, the AJ71PB92D/A1SJ71PB92D cannot be installed in the MELSECNET (II), MELSECNET/B, and MELSECNET/10 remote stations, so be careful.

3. SPECIFICATIONS

This section explains the AJ71PB92D/A1SJ71PB92D the general specifications, performance specifications, and transmission specifications.

3.1 General Specification

This section explains the AJ71PB92D/A1SJ71PB92D general specifications.

Table 3.1 General Specification

Item	Specification					
Usage environment temperature	0 to 55°C					
Storage environment temperature	-20 to 75°C					
Usage environment humidity	10 to 90%RH, No condensation formation					
Storage environment humidity	10 to 90%RH, No condensation formation					
Anti-vibration	Complies with JIS B3501, IEC1131-2	When there is intermittent vibration				
		Frequency	Acceleration	Amplitude	Sweep count	
		10 to 57Hz	—	0.075mm (0.003in.)	10 times in each direction for X, Y, Z (80 minutes)	
		57 to 150Hz	9.8m/s ² (1G)	—		
		Where there is continuous vibration				
		10 to 57Hz	—	0.035mm (0.001in.)		
57 to 150Hz	4.9m/s ² (0.5G)	—				
Anti-shock	Complies with JIS B3501, IEC1131-2 (147m/s ² (15G), 3 times in the direction for each of X, Y, Z)					
Usage environment	No corrosive gas, etc.					
Usage altitude	2000m or less					
Installation location	Inside the control panel					
Over voltage category ^{*1}	II or less					
Pollution level ^{*2}	2 or less					
Cooling method	Self cooling					

*1 Shows if an estimate has been made for which distribution areas the connections will be done for the equipment from the public power grid to the equipment installation area inside the configuration.

Category II applies to equipment that receives its power from fixed facilities. The surge resistance voltage for equipment rated to 300V is 2500V

*2 Shows the index for inductive matter generation in the environment in which the equipment is used. Pollution level 2 is for dirt that is non-inductive. However, occasionally inductance can be generated in the environment by condensation.

3.2 Performance Specifications

Item		Specifications			
Model		AJ71PB92D		A1SJ71PB92D	
Transmission specifications	Electrical standards and characteristics	Complies with EIA-RS485			
	Medium	Shielded twisted cable			
	Network configuration	Bus (however, tree type when a repeater is used)			
	Data link method	<ul style="list-style-type: none"> • Token passing method (master side) • Polling method (master/slave side) 			
	Transmission encoding method	NRZ			
	Transmission speed/maximum transmission distance *1 *2	Transmission speed	Transmission distance [m/segment]	Maximum transmission distance when 3 repeaters are used	
		9.6 [kbps]	1200	4800	
		19.2 [kbps]			
		93.75 [kbps]			
		187.5 [kbps]	1000	4000	
		500 [kbps]	400	1600	
		1500 [kbps]	200	800	
		3 [Mbps]	100	400	
	6 [Mbps]				
	12 [Mbps]	100 *3			
Maximum number of repeaters/network	3 units *2				
Maximum number of stations/segment	32 stations *3 (See "Important")				
Maximum number of slave stations/master station	60 slaves				
Number of connection nodes (number of repeaters)	32, 62 (1), 92 (2), 126 (3)				
Transmittable data	32 bytes/1 station				
Number of occupied I/O	32 points				
5VDC Internal power consumption (A)	0.54		0.56		
Noise durability, dielectric withstand voltage insulation resistor	Depending on the AJ71PB92D/A1SJ71PB92D installation system power supply module specifications. (refer to the CPU Module User's Manual.)				
External dimensions (mm)	250 (9.84 in.)(H) × 37.5 (1.48 in.)(W) × 106 (4.17 in.)(D)		130 (5.12 in.)(H) × 34.5 (1.36 in.)(W) × 97.6 (3.84 in.)(D)		
Weight (kg)	0.37 (0.82 lb)		0.27 (0.60 lb)		

*1 Transmission speed control within +/- 0.3% (PROFIBUS part 1)

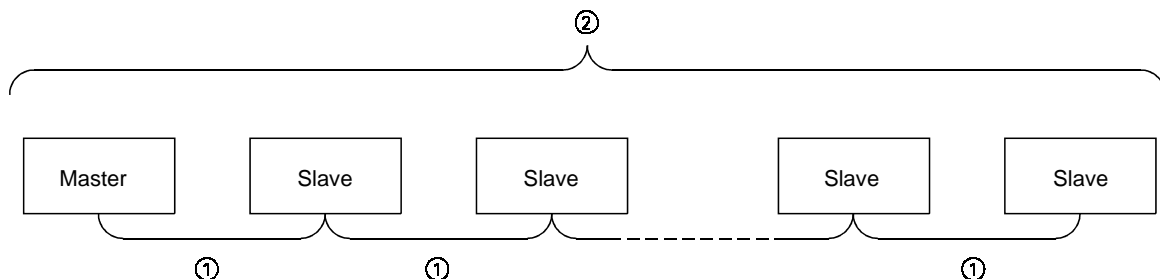
*2 Distance that the transmission distance can be expanded by (m/network) using repeaters
 Transmission distance (m/network) = (number of repeaters + 1) × transmission distance (m/segment)

*3 The *3 restriction will cease to exist when the system is configured exclusively by the master and slave stations of the hardware version B or later versions.

Important

*3 When using 12Mbps transmission speed, restriction of the cable length and the number of connector stations described below is necessary.

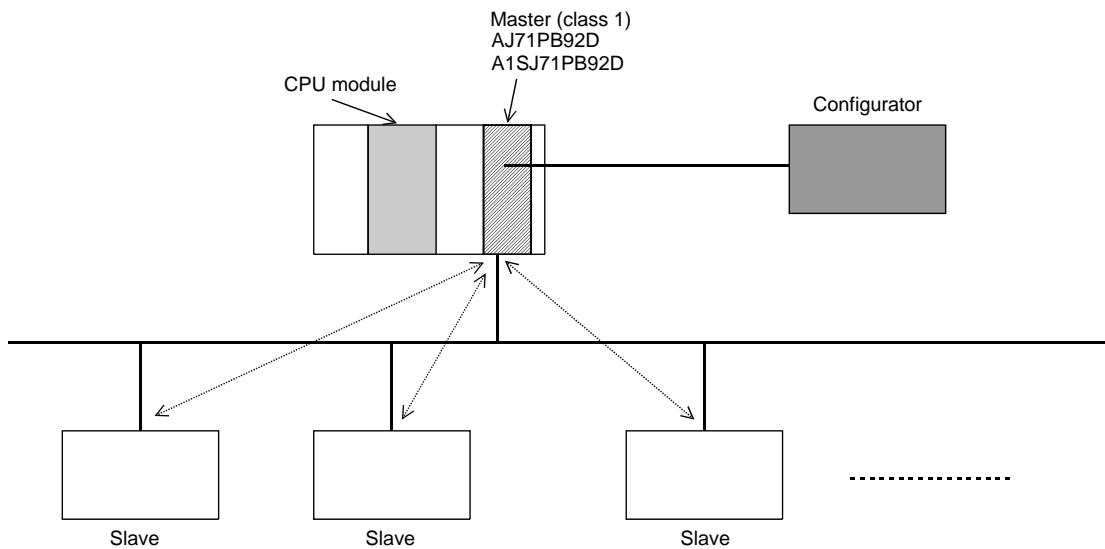
- ① Minimum length of the cable between stations is greater than or equal to one meter.
- ② Maximum number of the connection stations are smaller than or equal to 11.



3.3 Network Configuration

3.3.1 Basic configuration

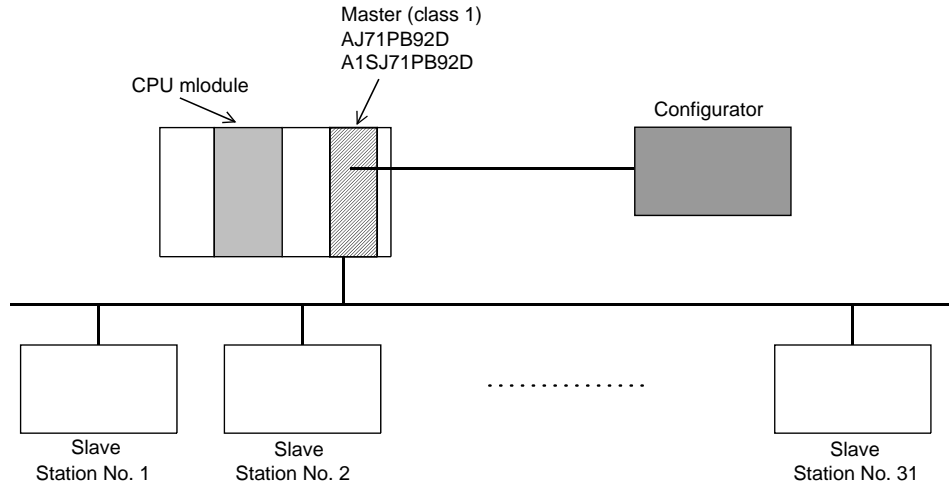
- 1) Equipment types
 - Class 1 master
 - Configurator
 - Slave
 - Repeater
- 2) Number of units that can be connected to the entire network (when repeaters are used)
Master+slave \leq 126 units
- 3) Number that can be connected for 1 segment
Master+slave+repeaters \leq 32 units
- 4) Communications can be conducted via a maximum of 3 repeaters from an arbitrary master or arbitrary slave to an arbitrary master or arbitrary slave (Not 3 units in the entire network).
- 5) The maximum number of slaves that can be connected to 1 AJ71PB92D/A1SJ71PB92D is 60 stations.



- The PROFIBUS-DP cable is provided by the user.

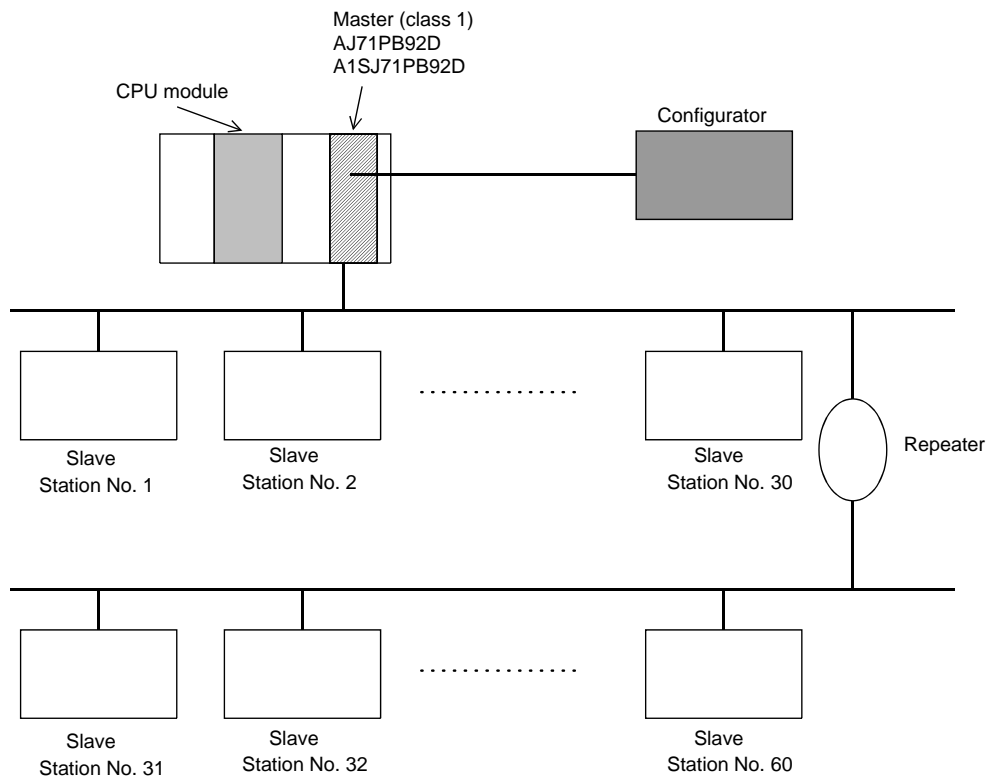
3.3.2 Applicable configuration

1) When 1 master (class 1) station is connected



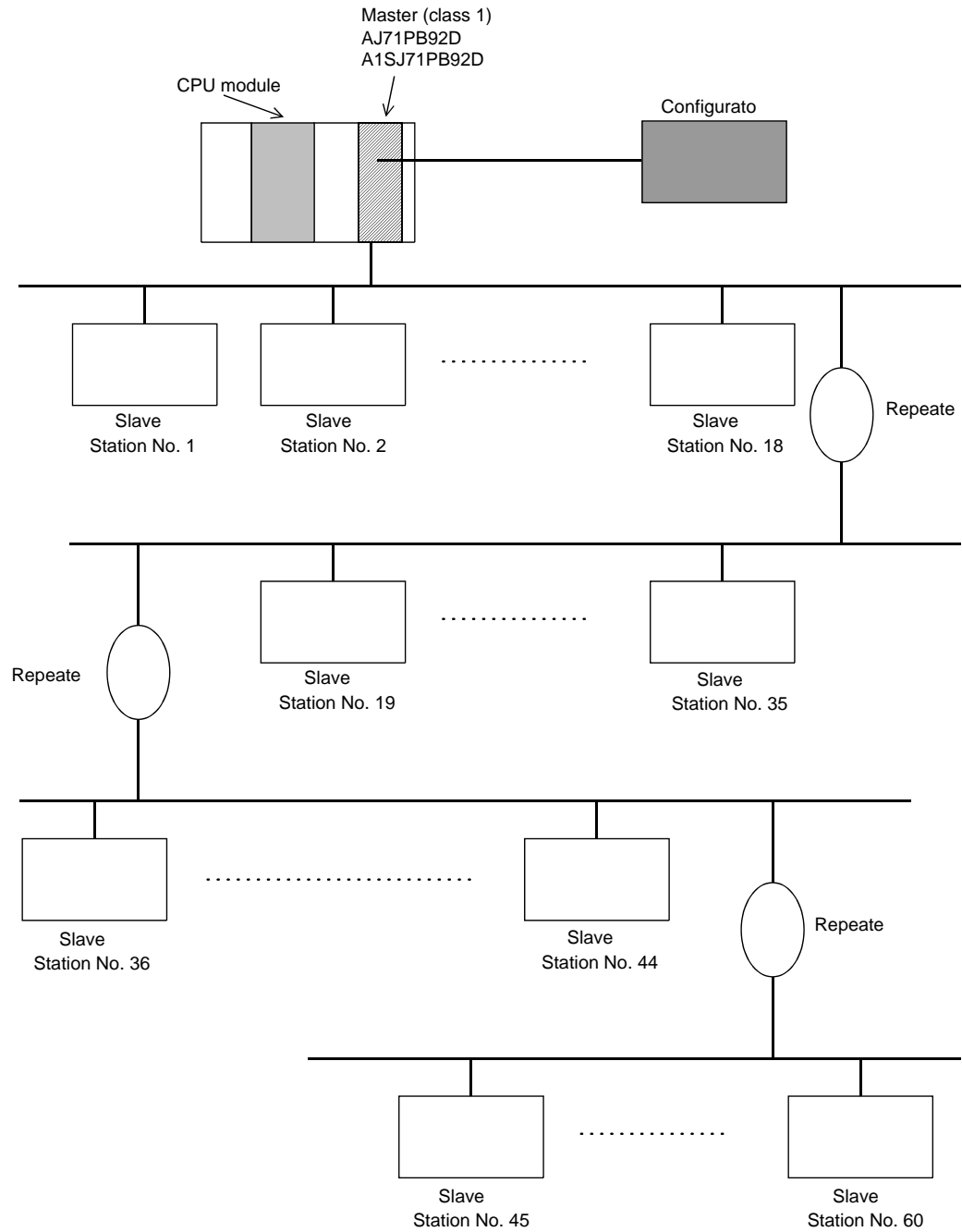
* A maximum of 32 stations can be connected to 1 segment.

2) When 1 master (class 1) station and 1 repeater are connected



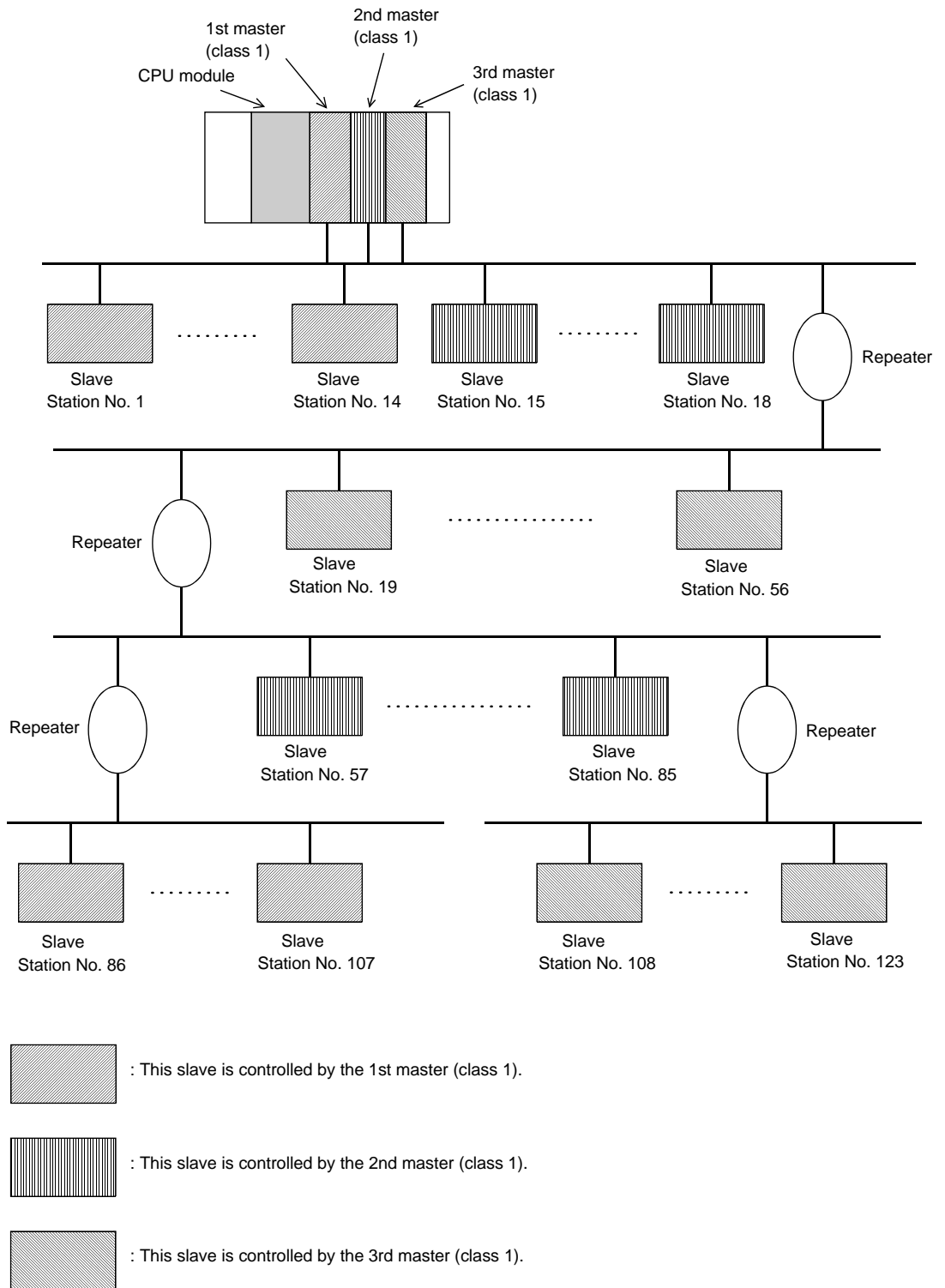
* In the above configuration a maximum of 60 slaves can be connected.

3) When 1 master (class 1) station and 3 repeaters are connected



* In the above configuration a maximum of 60 slaves can be connected. The difference between this configuration and the one in 2) is that the possible communication distance can be extended.

- 4) When 126 master (class 1) and slave stations are connected
 (When 60 or more slaves are connected)



* In the above configuration a maximum of 123 slave stations can be connected.

Important

In configurations that use multiple master stations (multimaster configuration), when reconnecting a cable after disconnecting a PROFIBUS cable for 1 master that is exchanging data at a low baud rate, the communications of the master for which the cable is not disconnected could stop and the slave output could be turned off. To prevent this, the master PROFIBUS cable must be secured with a screw.

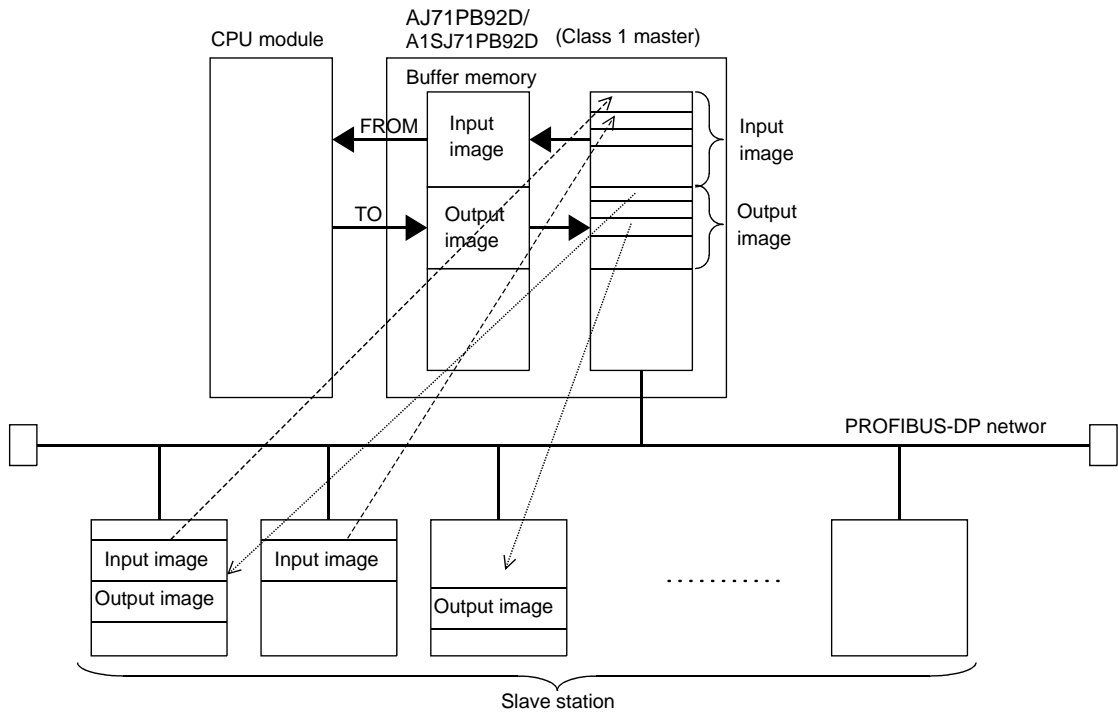
In addition, there is a high possibility that the above phenomena can be avoided if care is taken with the following points when configuring a system.

- (1) Set the slave watchdog timer setting value to larger than $(T_{Tr} \times G)/BR$. However,
 - T_{Tr} : Target token rotation time (Unit: Bit Time)
 - G : Gap update factor
 - BR : Baud rate (Unit: bps)
- (2) Use a high baud rate.
- (3) The HSA (Highest Station Address) value is made to match the maximum station No. that is actually connected.

4. FUNCTIONS

4.1 Functions for Exchanging with Slaves

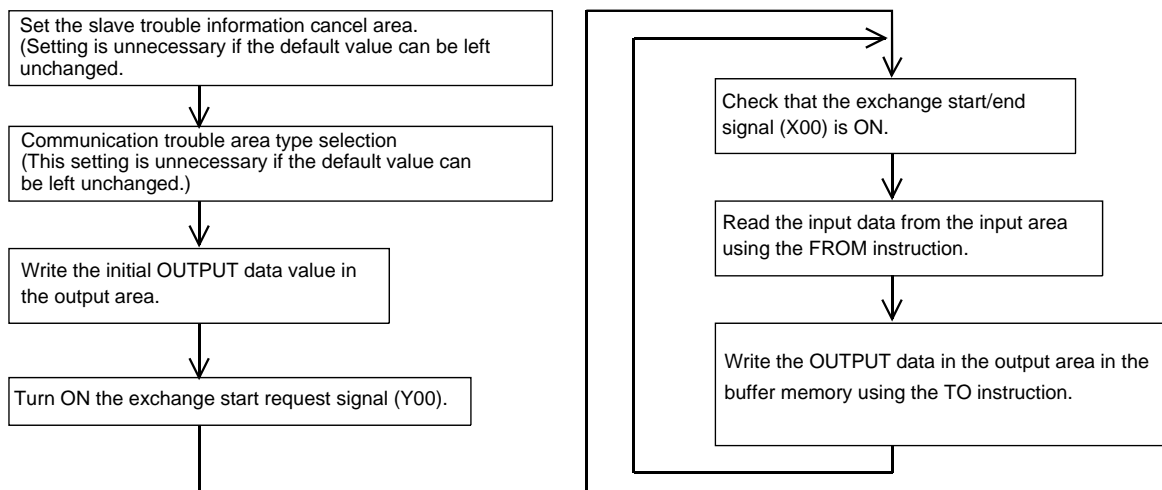
The main function in the AJ71PB92D/A1SJ71BP92D is for exchanging I/O data with slave stations connected to the PROFIBUS-DP network. The method used for this exchange is to read/write the I/O image in the buffer memory using FROM/TO instructions. A schematic drawing of this exchange function is as follows.



4.1.1 Exchange flow

The I/O data exchange flow with slave station is shown below.

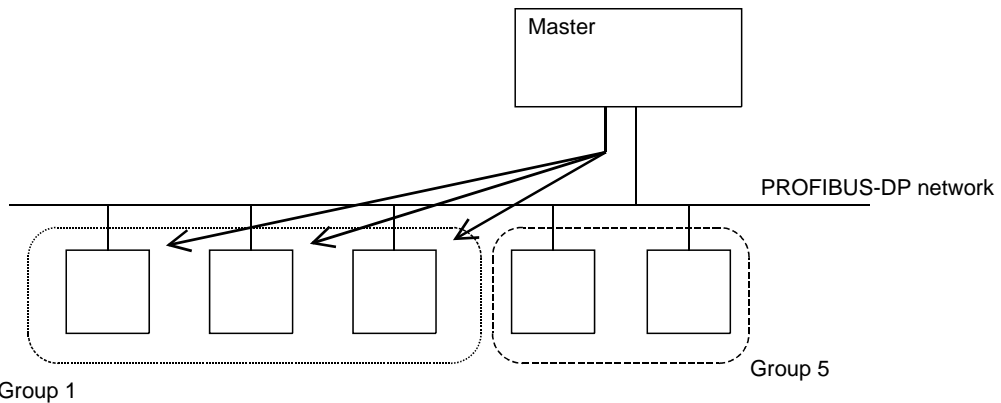
* The buffer memory refresh with the FROM/TO instructions is conducted asynchronously.



4.1.2 Global control functions

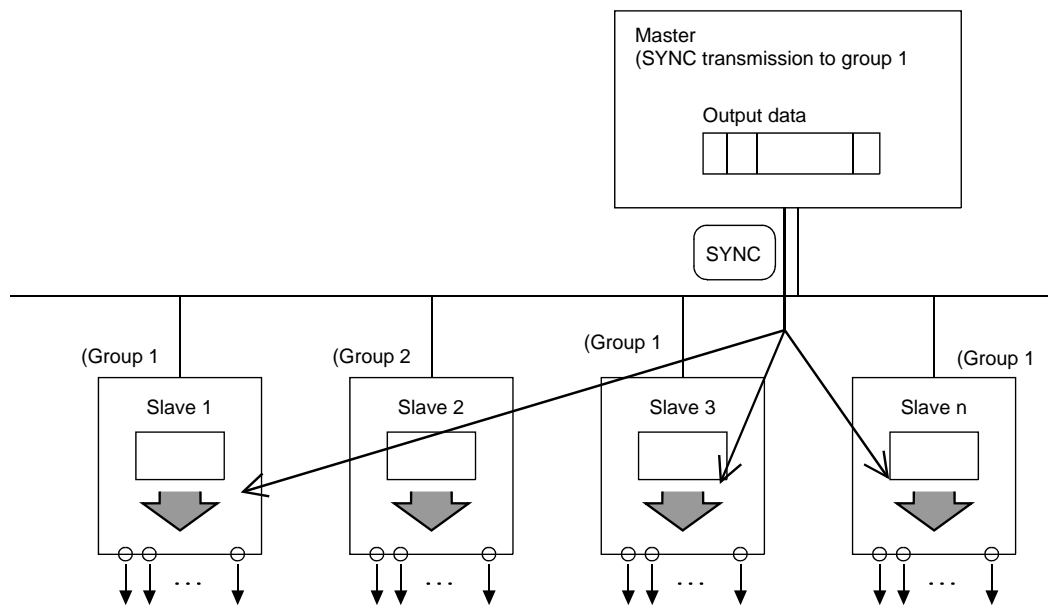
Global control contains the four functions of SYNC, UNSYNC, FREEZE, and UNFREEZE, which are functions that are used to maintain/cancel slave I/O for which multicast communication is conducted at the same time.




The slaves that execute the global control function are those located in one or more groups of the eight groups. The group No. of the group containing the slaves is set by the configurator. In the AJ71PB92D/A1SJ71PB92D the group can be arbitrary specified and the global control commands transmitted using multicast communication. This makes it possible to select a slave and conduct global control.



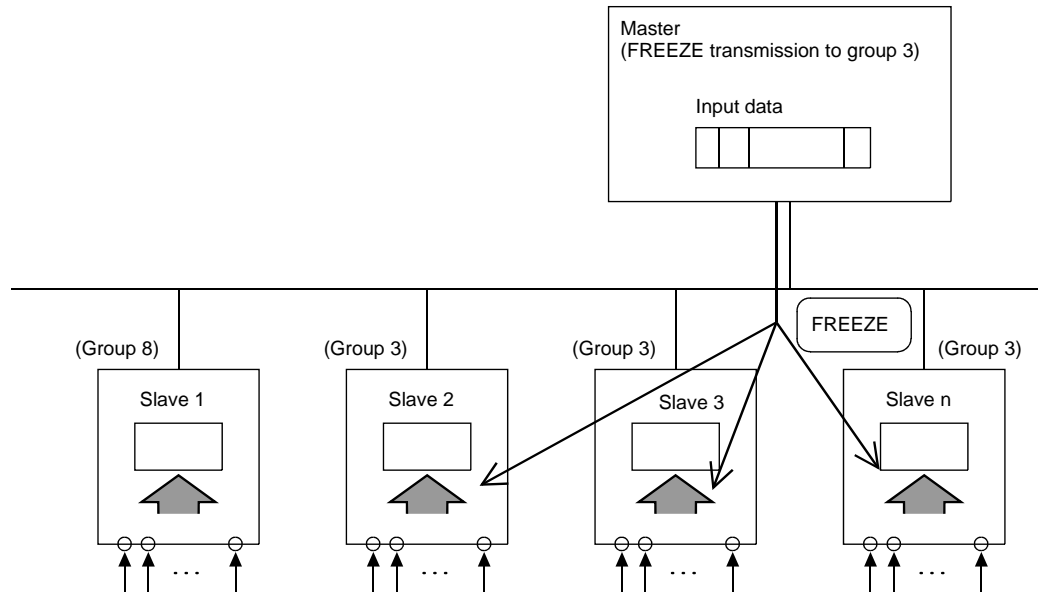
The global control function is executed using X, Y, and FROM/TO instructions from the sequence program.

(1) Service SYNC, UNSYNC



-  ... Output image memory: Data is always refreshed using polling.
-  ... <During UNSYNC execution/default>The output image memory value is output unchanged (normal condition)
 <During SYNC execution>The output image memory value is only output once during the SYNC service timing.
-  ... Service SYNC (issued in the same group)

(2) Service FREEZE, UNFREEZE



... Input image memory: The data is always refreshed by polling.



... <during FREEZE cancel/default>The actual input is input to the input memory unchanged (normal condition)

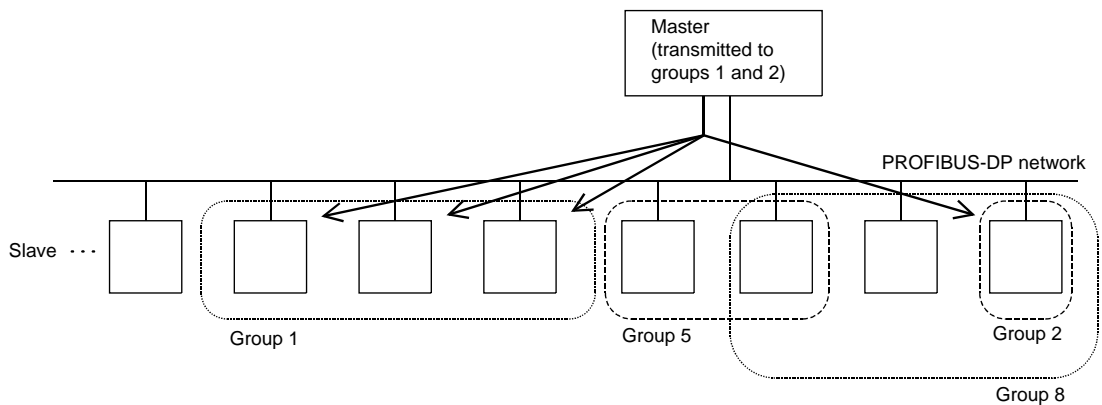
<during FREEZE execute>The actual input is input once into the input image memory at the FREEZE service timing.



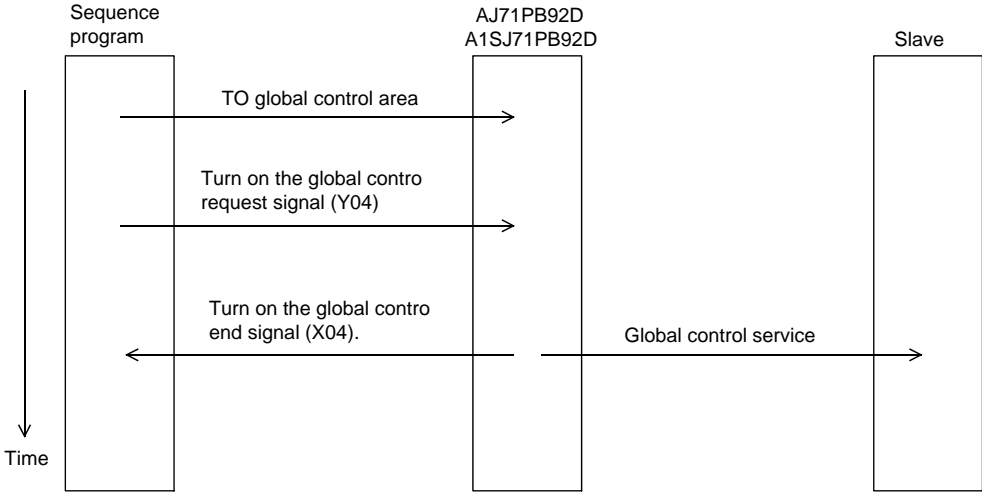
... Service FREEZE (issued within the same group)

(3) Group selection

- The number of groups is from 1 to 8 if with a total of 8 groups.
- The slave can exist in arbitrary group of the 8 groups. They can also exist in multiple groups. (The configurator specifies in which group which slaves exist.)
- Multiple groups can be arbitrarily selected from the sequence program and global control executed.
- When selecting group 0 and transmitting the service is transmitted to all slave stations.



(4) Procedure for issuing a global service.



4.2 I/O Signal

4.2.1 I/O signal list

The I/O signal configuration used in the AJ71PB92D/A1SJ71PB92D and the data communications with the PC CPU are described below.

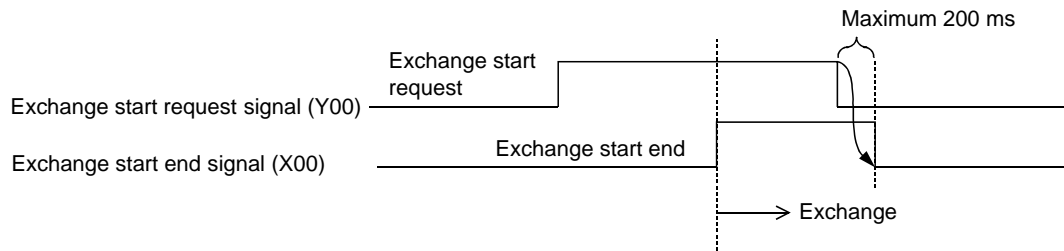
Signal direction: AJ71PB92D/A1SJ71PB92D → PC CPU		Signal direction: PC CPU → AJ71PB92D/A1SJ71PB92D	
Device No.	Description	Device No.	Description
X00	Exchange start end signal	Y00	Exchange start request signal
X01	Communication trouble detection signal	Y01	Communication trouble detection signal reset
X02	Communication trouble area clear end signal	Y02	Communication trouble area clear request signal
X03	Not usable	Y03	Communication trouble area type selection
X04	Global control end signal	Y04	Global control request signal
X05	Global control error end	Y05	Not usable
X06	Not usable	⋮	
X0C		Y0C	
X0D	Watchdog timer error signal	Y0D	Startup request signal
X0E	Not usable	Y0E	Not usable
⋮			
⋮			
⋮			
X1A			
X1B	Communication READY signal	⋮	
X1C	Not usable		
X1D	Module READY signal		
X1E to X1F	Not usable		

Point	If a device which is not usable is accidentally turned on and off in the sequence program, it cannot guarantee as the AJ71PB92D/A1SJ71PB92D function.
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4.2.2 I/O signal detail description

(1) Exchange start request signal (Y00), exchange start end signal (X00)

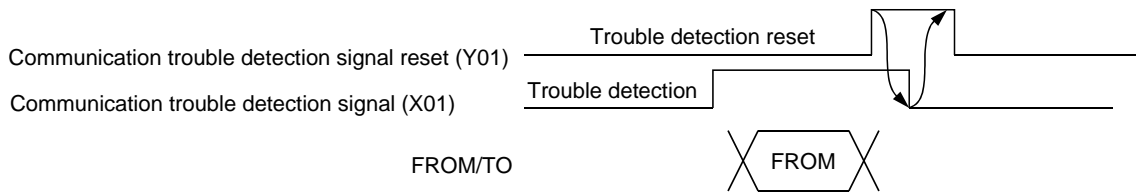
- (a) After the exchange start request signal (Y00) is turned on by the sequence program the exchange start end signal (X00) is turned on when cyclic exchange starts.
- (b) When the exchange start request signal (Y00) is turned off by the sequence program or when an error occurs that stops the exchange, the exchange start end signal (X00) turns off.



- (c) An interlock is used for FROM/TO of the I/O data.
- (d) Before the exchange start request signal is turned on the output data initial value must be written to the buffer memory.

(2) Communication trouble detection signal (X01), communication trouble detection signal reset (Y01)

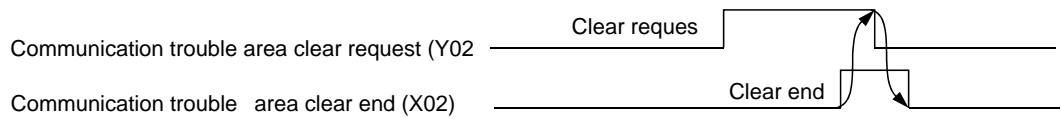
- (a) The communication trouble detection signal (X01) is turned on when a communication trouble occurs. At the same time the RSP ERR.'s LED turns on. At this time the error code and detailed data are stored in the buffer memory communication trouble area.
- (b) The communication trouble detection signal (X01) is turned off when the communication trouble detection signal reset (Y01) is turned on from the sequence program. At this time the RSP ERR.'s LED is turned off.
- (c) The communication trouble detection signal reset (Y01) is turned off by the sequence program after it has been confirmed that the communication trouble detection signal (X01) has been turned off.
- (d) The following sequence is used.



The error code is read from the buffer memory to the PC CPU.

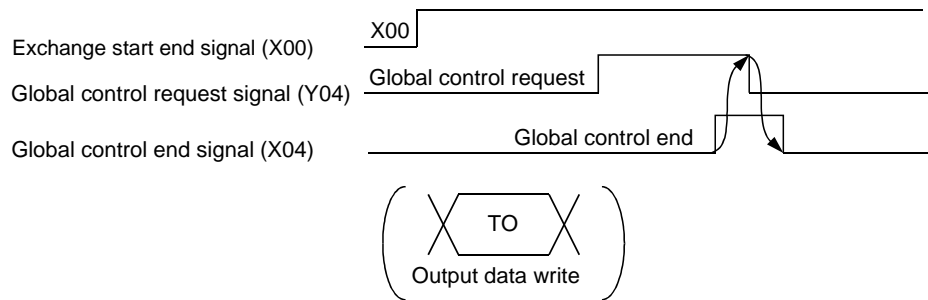
(3) Communication trouble area clear request (Y02), communication trouble area clear end (X02)

- (a) The communication trouble area clear request (Y02) is turned on by the sequence program when all of the communication trouble areas and extension trouble areas are cleared.
- (b) The communication trouble clear end signal (X02) is turned on after all of the communication trouble area and extension trouble areas are cleared by turning on the communication trouble area clear request signal (Y02).
- (c) The communication trouble area clear request (Y02) is turned off by the sequence program after it has been confirmed that the communication trouble area clear end signal (X02) has been turned on.
- (e) When the communication trouble area clear request signal (Y02) is turned off the communication trouble area clear end signal is turned off.
- (d) A sequence like the one below is used.



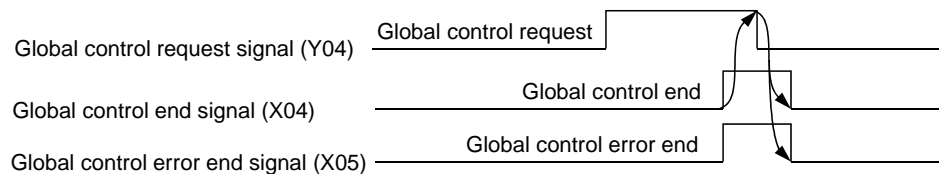
(4) Global control request signal (Y04), global control end signal (X04)

- (a) The global control end signal (X04) is turned on after service processing has ended when the global control request signal (Y04) is turned on by the sequence program.
- (b) The global control request signal (Y04) is turned off by the sequence program after it has been confirmed that the global control service end signal (X04) has turned on.
- (c) When the global control request signal (Y04) is turned off the global control end signal (X04) turns off.
- (d) The global control request signal (Y04) cannot be received if the exchange starting (X00) is not on. If Y04 is turned on when X00 is off then both X04 and X05 will turn on.
- (e) A sequence like the one below is used.



(5) Global control error end signal (X05)

- (a) If global control is requested when exchange start (X00) is not on then global control error end (X05) and the global control service end signal (X04) will turn on at the same time.
- (b) The slave I/O is not held/deleted when the global control error end signal (X05) is on.



(6) Watchdog timer error end (X0D)

- (a) This turns on when a Watchdog timer error occurs.
- (b) This will not turn off until the module is reset or its power supply is turned off and on.

(7) Communication READY signal (X1B)

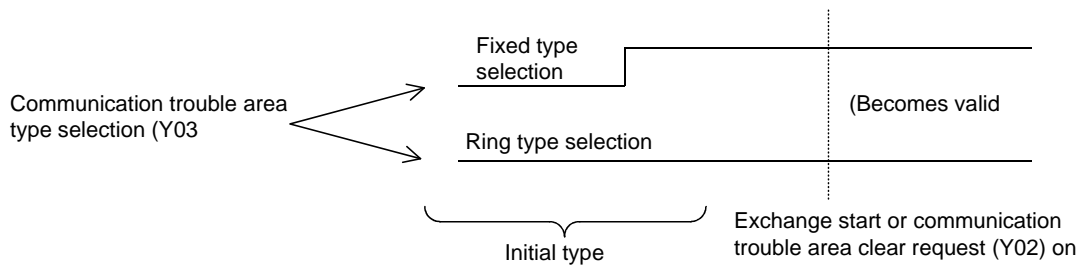
- (a) This is turned on when the station enters the exchange start possible state after the AJ71PB92D/A1SJ71PB92D has started up and the module READY signal (X1D) has turned on. (Only during the normal transmission mode.)
- (b) This turns off when a exchange continuation impossible error occurs.
- (c) The exchange start request signal (Y00) is used as an interlock when turned on by the sequence program.

(8) Module READY signal (X1D)

- (a) This is turned on when the AJ71PB92D/A1SJ71PB92D is started up. Therefore, it is turned on regardless of the operation mode.
- (b) This is turned of when the AJ71PB92D/A1SJ71PB92D goes down.

(9) Communication trouble area type selection (Y03)

- (a) This is used to select the communication trouble area type (ring type or fixed type).
- (b) This is turned off when ring type is selected and on when fixed type is selected.
- (c) This signal becomes valid when the exchange start or communication trouble area clear request (Y02) is on.



(10) Restart request signal (Y0D)

- (a) When the AJ71PB92D/A1SJ71PB92D goes down for some reason (when the FAULT LED turns on and X1D is off) then turning Y0D on and then off again will make it possible to restart the AJ71PB92D/A1SJ71PB92D.
- (b) The same state will be entered if after start up the power supply is turned off and then on again.

4.3 Buffer Memory List

4.3.1 Buffer memory/configuration

The configuration of the buffer memory used to receive and send data with the AJ71PB92D/A1SJ71PB92D and the PC CPU is described below.

Buffer memory address
(decimal/hexadecimal)

0/	0h	Input area (Description) This is the area that stores the input data from the slave.
959/	3BFh	
960/	3C0h	Output area (Description) This is the area that stores the output data to the slave.
1919/	77Fh	
1920/	780h	Address information area (Description) This is the area that shows the slave address and I/O data length.
2039/	7F7h	
2040/	7F8h	Communication trouble area (Description) This is the area that shows the trouble information that occurred during communication.
2079/	81Fh	
2080/	820h	Slave error information cancel area (Description) This is the area that sets the data that masks the slave trouble information.
2081/	821h	Global control area (Description) This is the global control function hold/cancel selection area.
2082/	822h	Not usable
2083/	823h	Time out time setting area (Closed to users because this is a debugging function.) (Description) This is used to set the time out time when an exchange start/stop is executed.
2084/	824h	Trouble no information time setting area (Description) This is used to set the time that does not inform the communication trouble after the exchange start.
2085/	825h	Not usable
2095/	82Fh	
2096/	830h	Expansion communication trouble area (Description) This area shows the expansion information of the trouble information which is occurred during the communication.
2110/	83Eh	
2111/	83Fh	Not usable
2112/	840	Slave status area (Description) This is the area that shows the status information of each slave.
2116/	844	
2117/	845	Not usable
2127/	84F	
2128/	850	Input/Output start address area (Extended service mode only) (Description) This is the area that shows the addresses to start the input area and output area of each slave.
2247/	8C7	
2248/	8C8	
3775/	EBF	Not usable

Point

Don't read and write to the buffer memory which is not usable.
If you perform it, it cannot guarantee as the AJ71PB92D/A1SJ71PB92D function.

4.3.2 Buffer memory detailed description

(1) INPUT area

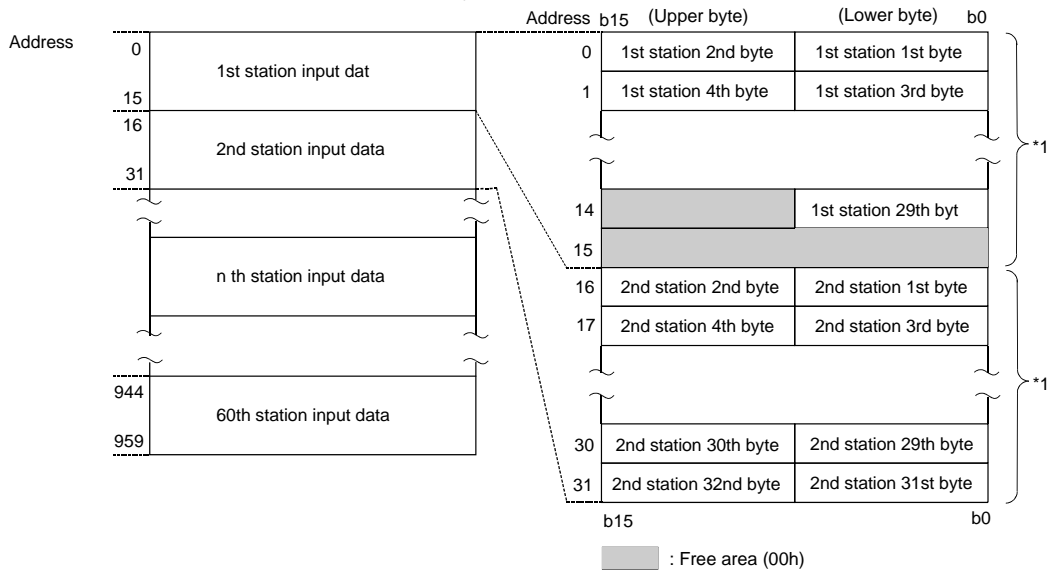
Either normal service mode or extended service mode can be selected via the mode switch on the main unit.

(a) Normal service mode (MODE switch : No. 0)

This is the area that stores the input data from the slave station.

This area is fixed to an allocation of 32 bytes (16 words) per station for a total of 60 stations worth. This input area configuration is as follows.

Example : When the input data length for the first station is set to 29 bytes and that for the second station to 32 bytes



*1 Since the data area is fixed to 32 bytes, all unused areas will become free.

(b) Extended service mode (MODE switch : No. E)

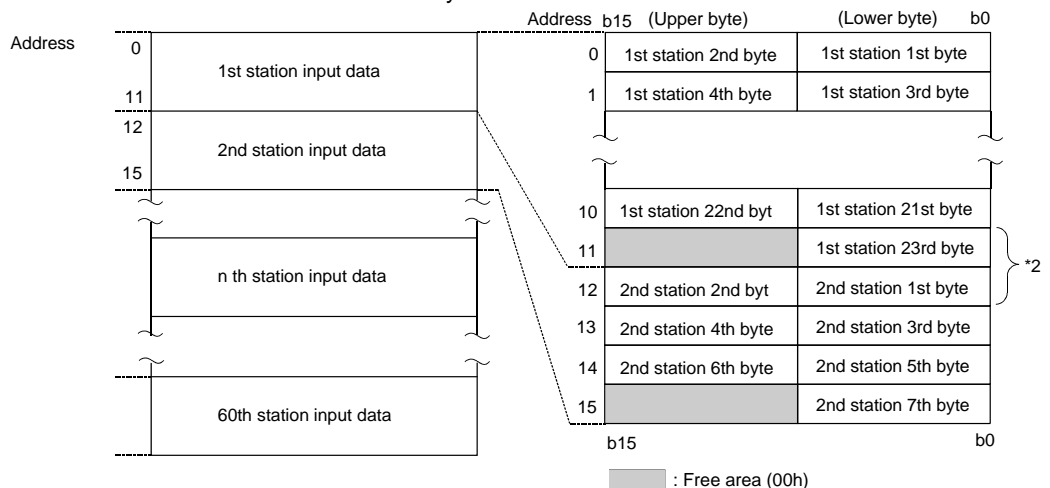
This is the area that stores the input data from the slave station.

In this area, the data length (in byte units) for each station is assigned in variable length according to the parameter file set in the configurator software package.

The data length can be set in the range of 0 to 244 bytes.

Number of stations that can be set will vary in the range of 1 to 60, depending on the specified data length. For example, seven stations can be set if the data length for each station is 244 bytes, and 60 stations if the data length is 32 bytes.

Example : When the input data length for the first station is set to 23 bytes and that for the second station to 7 bytes



*2 When the data length is set to an odd number of bytes, the last upper byte becomes a free area and data for the next station is assigned from the next address.

(2) **OUTPUT area**

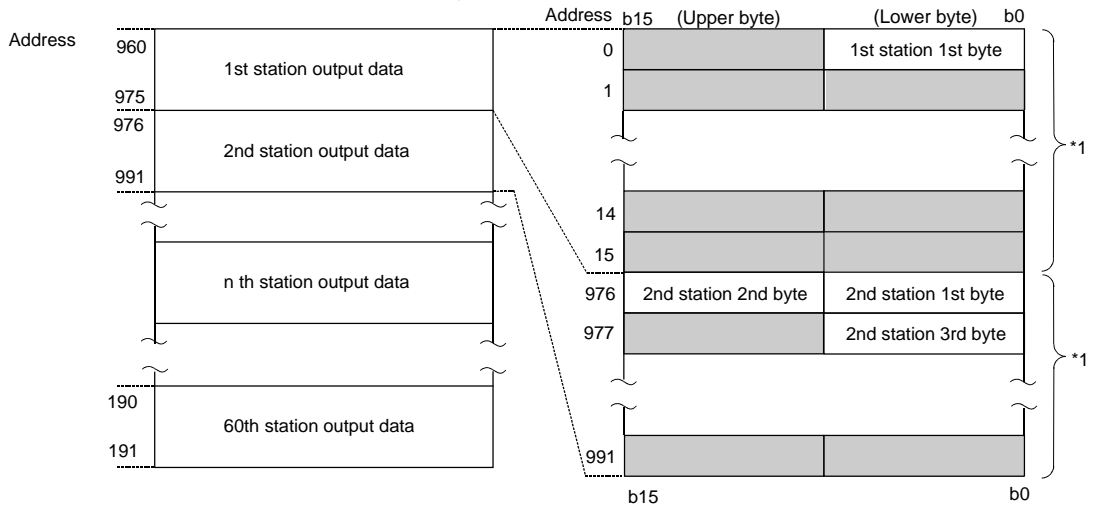
Either normal service mode or extended service mode can be selected via the mode switch on the main unit.

(a) Normal service mode (MODE Switch : No. 0)

This is the area that stores the output data to the slave station.

This area is fixed to an allocation of 32 bytes (16 words) per station for a total of 60 stations worth. This output area configuration is as follows.

Example : When the output data length for the first station is set to 1 bytes and that for the second station to 3 bytes



*1 Since the data area is fixed to 32 bytes, all unused areas will become free.

(b) Extended service mode (MODE switch : No. E)

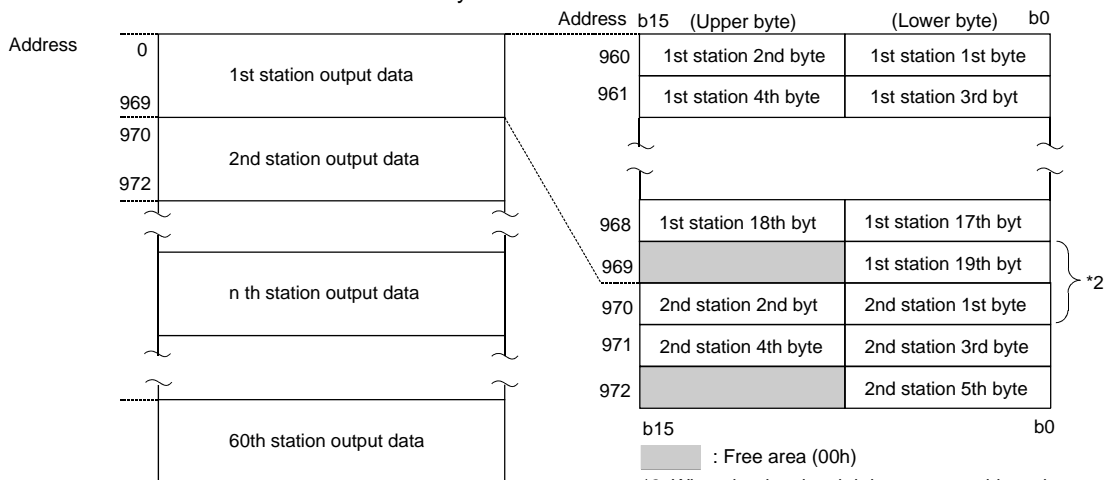
This is the area that stores the output data to the slave station.

In this area, the data length (in byte units) for each station is assigned in variable length according to the parameter file set in the configurator software package.

The data length can be set in the range of 0 to 244 bytes.

Number of stations that can be set will vary in the range of 1 to 60, depending on the specified data length. For example, seven stations can be set if the data length for each station is 244 bytes, and 60 stations if the data length is 32 bytes.

Example : When the output data length for the first station is set to 19 bytes and that for the second station to 5 bytes



*2 When the data length is set to an odd number of bytes, the last upper byte becomes a free area and data for the next station is assigned from the next address.

(3) Address information area

This area shows the station address, input byte length, and output byte length for each slave station. This allocation is set by the configurator. The station addresses for the 1st through the 60th stations are stored in the order of registration in the configurator. (Station addresses: 1 to 126, do not need to be sequential numbers.)

The address information area configuration is shown below. For details refer to Section 4.3.2 (4).

Address		
1920	Station address of 1st station	
1921	1st station input byte length	1st station output byte length
1922	Station address of 2nd station	
1923	2nd station input byte length	2nd station output byte length
	~	
	~	
	Station address of n station	
	n th station input byte length	n th station output byte length
	~	
	~	
2036	Station address of 59th station	
2037	59th station input byte length	59th station output byte length
2038	Station address of 60th station	
2039	60th station input byte length	60th station output byte length

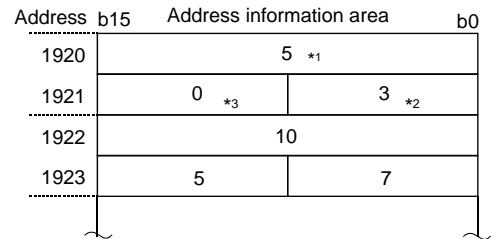
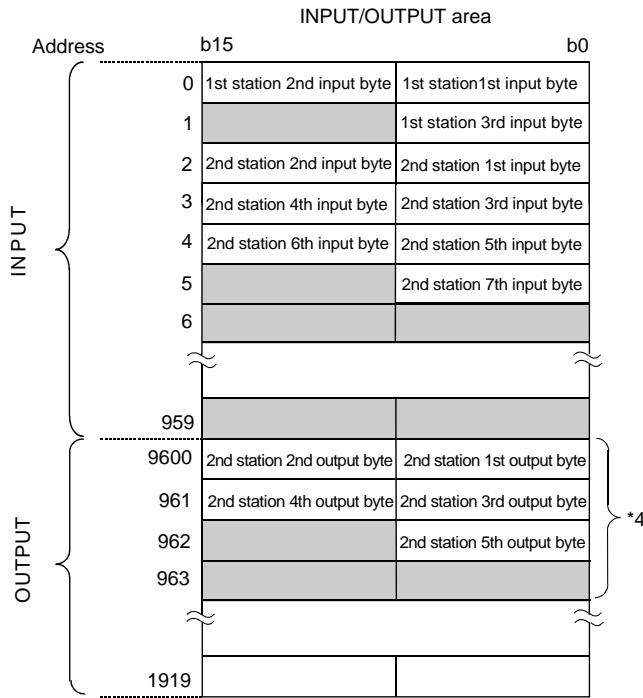
- (a) The station address of unallocated stations is FFFFh, and the I/O byte is FFh.
- (b) When the I/O byte length of allocated stations is 0, a 0 is stored for the byte length.
- (c) The n does not show the station address but represents a number (the nth number) used for the input/output area.

(4) Example address information area, INPUT area, and OUTPUT area

The AJ71PB92D/A1SJ71PB92D reads the slave station address and I/O byte length set by the parameter file which is set by the configurator and stores these in the buffer memory address information area.

With the AJ71PB92D/A1SJ71PB92D, I/O areas are assigned to each slave station based on the I/O byte length information in the address information area, and each I/O data will be stored in the corresponding buffer memory area.

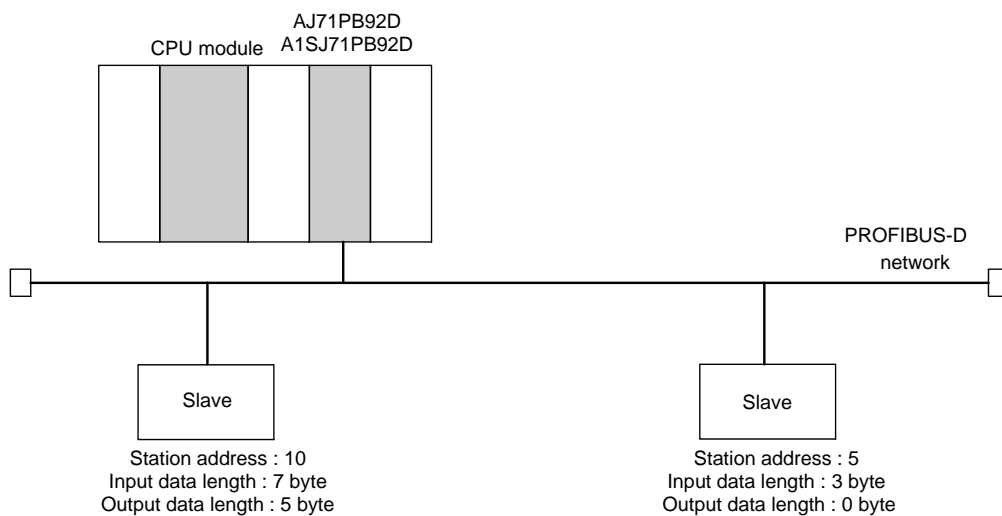
Example : At extended service mode



- *1 Station address (FFFFh if not assigned)
- *2 Input byte length (FFh if not assigned)
- *3 Output byte length (FFh if not assigned)
- *1, *2 and *3 are also set in a reserved station.

: Vacant area
(The free areas in the INPUT area are initialized with [00h].)

*4 Since output from the first station has a byte length of 0 no area is allocated in the OUTPUT area



(5) Communication trouble area

When some kind of trouble occurs during communication the AJ71PB92D/A1SJ71PB92D stores the contents of the trouble in this area. Fixed type or ring type can be selected for this area by turning the communication trouble area type selection (Y03) on or off (refer to Section 4.2.2 (9)). As shown in the following diagram, a total of 8 pieces of trouble information that consist of the trouble code, detailed data length, and detailed data can be stored in the basic configuration regardless of whether for fixed or ring data.

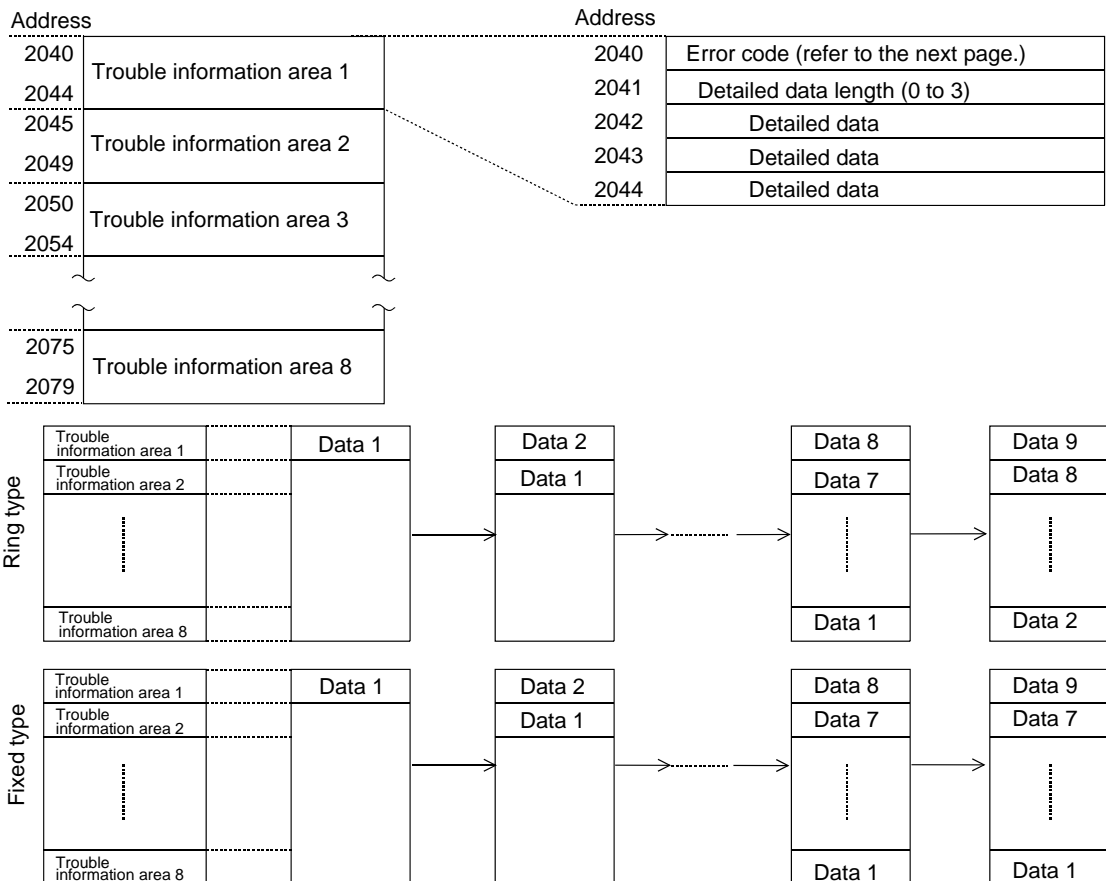
Ring type data is stored in order from the header with the header always being the latest trouble information.

With fixed type data, when 8 pieces of trouble information are stored the areas 2 to 8 (data 1 to 7) are fixed, so when the next new trouble occurs only header area 1 (data 8) is updated.

All trouble information for either type can be cleared by turning on the communication trouble detection signal reset (X01). When communication trouble detection signal reset (Y01) is on, the contents of the communication trouble area are hold though the communication trouble detection signal (X01) turns off.

The communication trouble area configuration is as follows.

(a) Communication trouble area configuration



(b) Error codes

The error codes are shown below.

Error Code	Data length	Detailed data			Description	Communication state	User processing
		1	2	3			
0200h	(c) Ref.	(c) Ref.	(c) Ref.	(c) Ref.	(c) Ref.	△	(c) Ref.
1121h	1	03h	—	—	The slave address specified in the parameter is the same as that of the master. This error occurs immediately after the power supply is turned on or the CPU is reset. Even though this error is occurring, if the exchange start (Y00) is on then error of error code 3000h will occur, the FAULT LED will turn on, and operation will stop.	×	
1300h	2	Contents ref.	Contents ref.	—	Not even 1 active slave station is set in the parameter. When this error occurs the detailed data is set to: Detailed data 1: Number of slaves set in the parameter. Detailed data 2: Number of active slaves set in the parameter. This error occurs immediately after the power supply is turned on or the CPU is reset. Even though this error is occurring, if the exchange start (Y00) is on then error of error code 3000h will occur, the FAULT LED will turn on, and operation will stop.	×	1) Set 1 or more active slaves in the parameter. 2) When the FAULT LED is turned on, reset is enabled by turning OFF→ON→OFF the Y0D
3000h	1	Ignored	—	—	1) When the above errors 1300h or 1121h have occurred before this error: Refer to errors 1300h, 1121h above. 2) Otherwise An unexpected error has occurred.	×	For 1) Refer to the above 1300h, 1121h errors. For 2) Contact the nearest Mitsubishi Electric branch office or dealer.

×: Exchange stops after the error occurs. △: Exchange continues.



(c) When the trouble code = 0200h

For a slave trouble information occurrence (error code = 0200h), the slave trouble information is stored in the detailed data. The communication trouble area configuration for this case is shown below. In addition, the expansion communication trouble information is stored in buffer memory 2096 to 2110 for only the latest trouble information of the error code = 0200h trouble information. For information regarding the expansion communication trouble information refer to Section 4.3.2 (6).

	Error code = slave trouble information occurrence	
	Detailed data length = 3	
Detailed data 1	Master address (*1)	Slave address (*2)
Detailed data 2	Trouble information	
Detailed data 3	Slave ID (*3)	

- *1 The station address of the master station that controls the slave station in which this trouble information occurred is stored. However, FFh is stored when the trouble information shows the exchange with the slave is failed.
- *2 The station address of the slave station in which this trouble information occurred is stored.
- *3 Individual slave inherent ID No. from the PNO is stored. However, FFh is stored for trouble information that shows that the exchange with the slave failed.

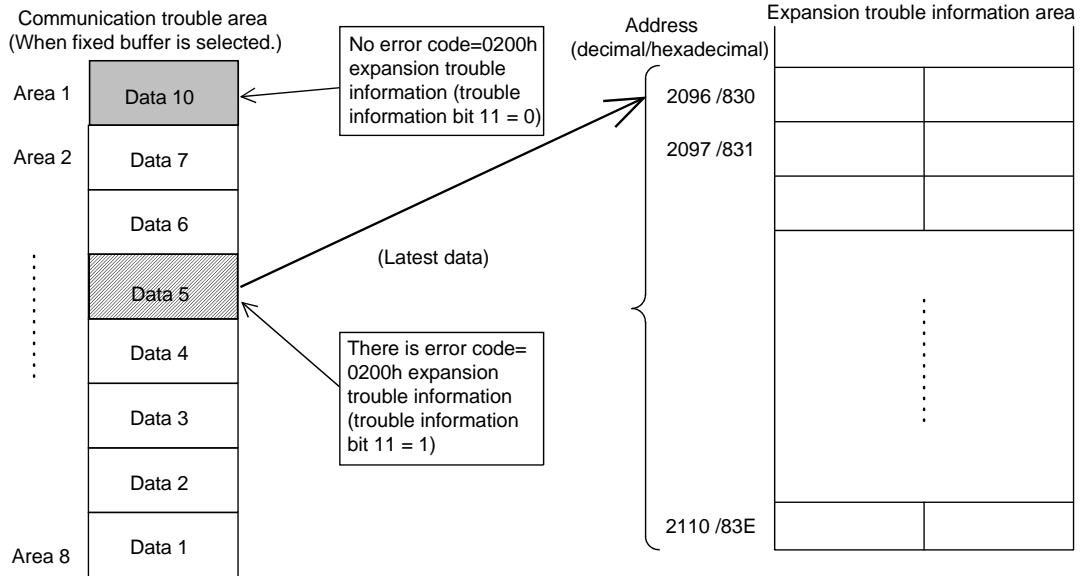
The trouble information is shown in a 16-bit bit string, and the bits that correspond to the respective trouble occurrences are set. A description of the error information is given below.

△ : Exchange continues even if trouble occurs.

bit	Description	Communi- cation state	Processing	Setting station
15	Controlled by another master.	△	Multiple masters are trying to communicate with the same slave, so recheck the parameter.	Master
14	The parameter transmitted by the master is incorrect.	△	Check the parameter.	Slave
13	The response from the slave is incorrect.	△	Check the slave or network status.	Master
12	The function requested by the master is not supported.	△	Check the slave specifications. Especially if global control is supported.	Slave
11	Expansion trouble information exists.	△	Check the slave status. (refer to User's Manual.)	Master
10	The I/O byte size parameter received from the master does not match that of the slave.	△	Check the slave parameter.	Slave
9	The slave is not ready to exchange.	△	This trouble information will always occur at exchange start, so it can be ignored. If this trouble occurs during exchange, check the slave status and communication circuit.	Slave
8	Exchange with the slave cannot be conducted.	△	Check the slave status and communication circuit. And check the parameter.	Master
7	Separated from the cyclic exchange by the parameter setting.	△	This trouble information will always occur at exchange start, so it can be ignored. Check if the parameter on the network was changed by a class 2 master.	Master
6	0 (reserved)	—	—	Slave
5	The slave has entered the SYNC mode.	△	(Normal operation)	Slave
4	The slave has entered the FREEZE mode.	△	(Normal operation)	Slave
3	Watchdog monitoring is being conducted in the slave.	△	(Normal operation)	Slave
2	0 (fixed)	—	—	Slave
1	Diagnostic data read request.	△	Check the slave status.	Slave
0	Parameter allocation request from a slave.	△	This error information will always occur at exchange start, so it can be ignored. If this error occurs during exchange, check the slave status and communication circuit.	Slave

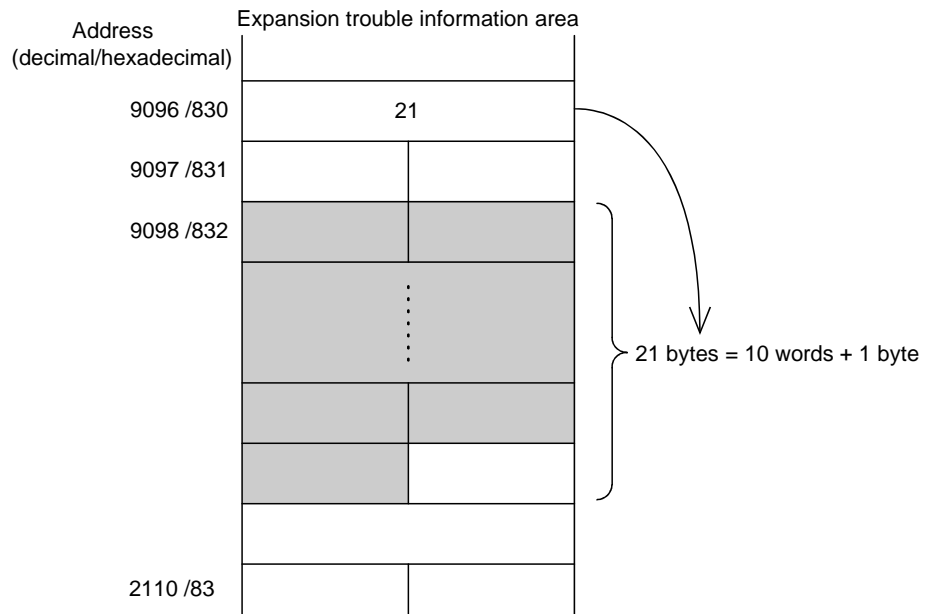
(6) Expansion communication trouble area

This area shows the latest expansion trouble information for only one of the latest expansion trouble information in the error code 0200h error information stored in buffer memory K2040 to K2079 communication error area (Refer to Section 4.3.2 (5)).



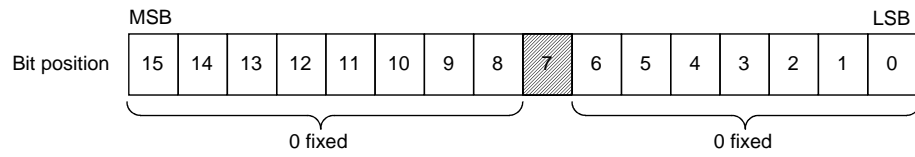
(a) Buffer Memory K2096

The latest expansion communication trouble information length stored from buffer memory K2098 is stored as a byte length unit.



(b) Buffer memory K2097

Only bit 7 is valid. Other bit is fixed in 0. Bit 7 is turned on when the slave sends expansion trouble information that is 27 bytes or more.



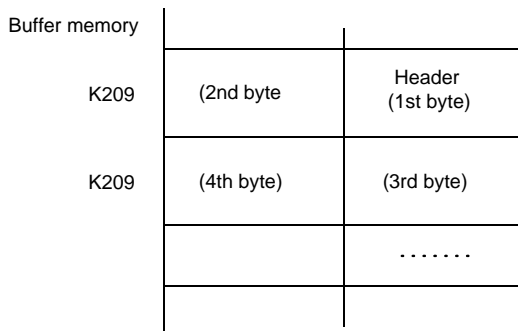
(c) Buffer memory K2098 to K2110

The following informations are stored in this area:

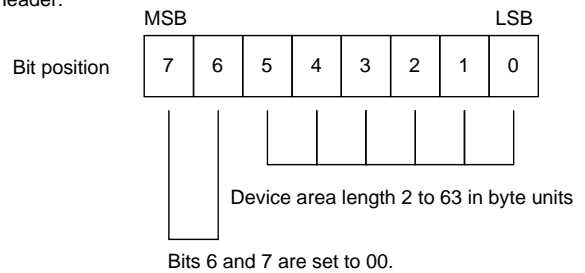
- Device related trouble information
- This area stores the slave station inherent self-diagnostic information that is not set by the PROFIBUS-DP standards.
- Identifier related trouble information
- For module type slave stations, whether or not a module error has occurred is stored as bit information.
- Channel related trouble information
- For module type slave station, this stores the, error information of all modules outputting an error.

1) Device Related trouble information

This stores the slave module inherent trouble information that is not set by the PROFIBUS-DP standards. The device related trouble can be divided by header and trouble information. This area stores a 2 bit value that is the device related trouble information in the header, including the header (1 byte), and the device related trouble information for this area.

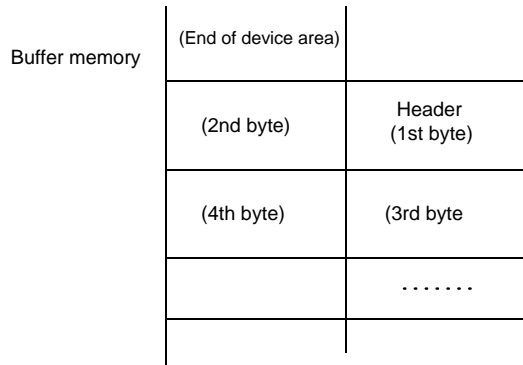


Header:

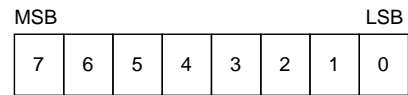


2) Identifier related trouble information

For module type slave stations, this stores as bit information whether or not a module is outputting an error. The identifier related trouble information can be divided into header and trouble information. This area stores a 2 bit value that is the identifier related trouble information in the header, including the header (1 byte), and the device related trouble information for this area.



Header:

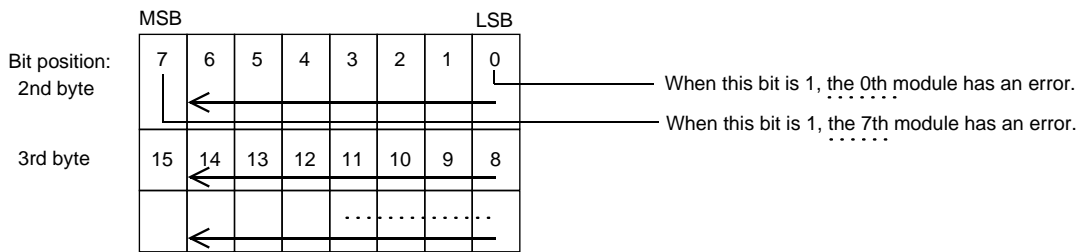


Bit position



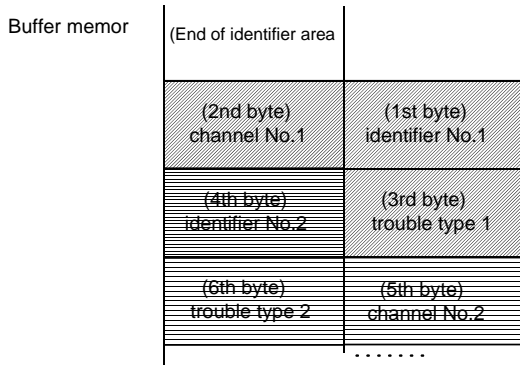
Identifier area length 2 to 63 in byte unit

Bits 6 and 7 are set as 01.

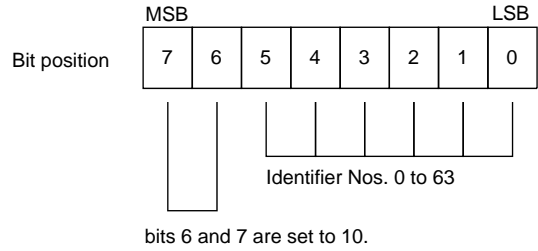


3) Channel related trouble information

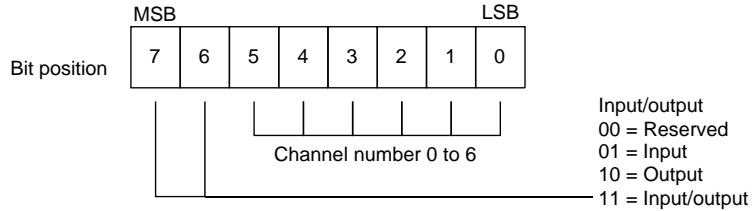
When a module type slave station, this area stores the trouble information for each module that is outputting an error. This area does not have a header and stores this information at the end of the identifier related trouble information. Each channel trouble information consists of an identifier No., channel No., and error type of 3 bytes.



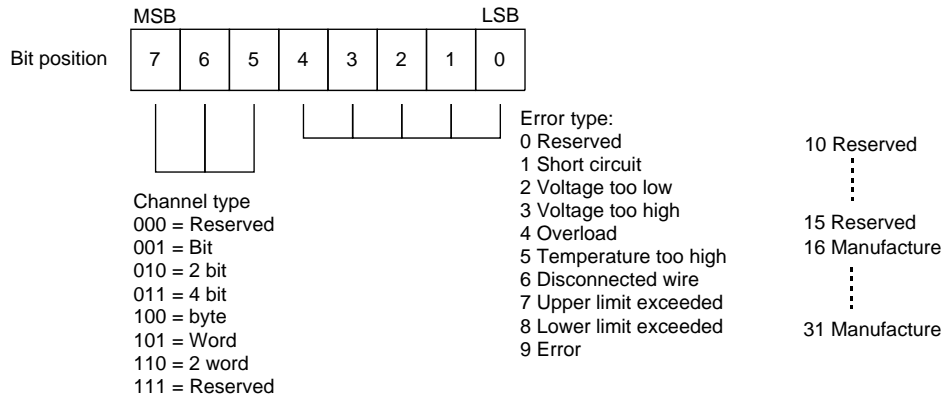
1st byte: Identifier No.



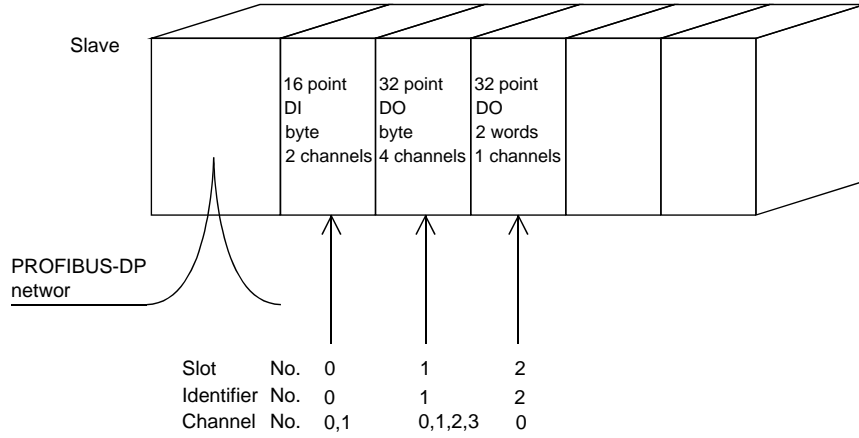
2nd byte: Channel No.



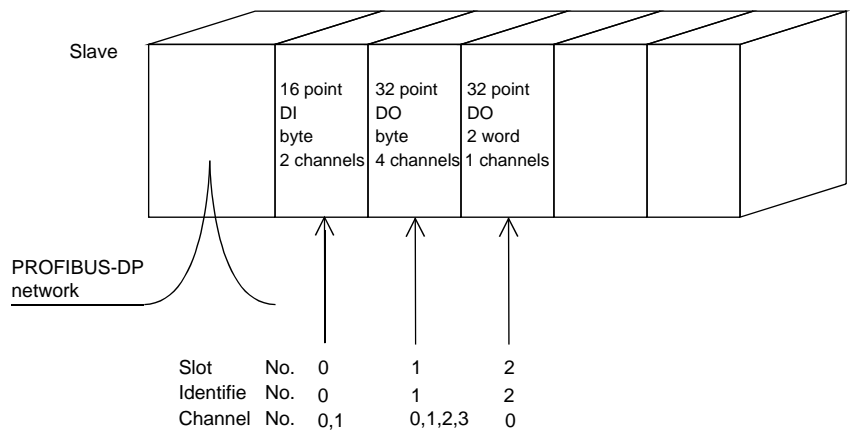
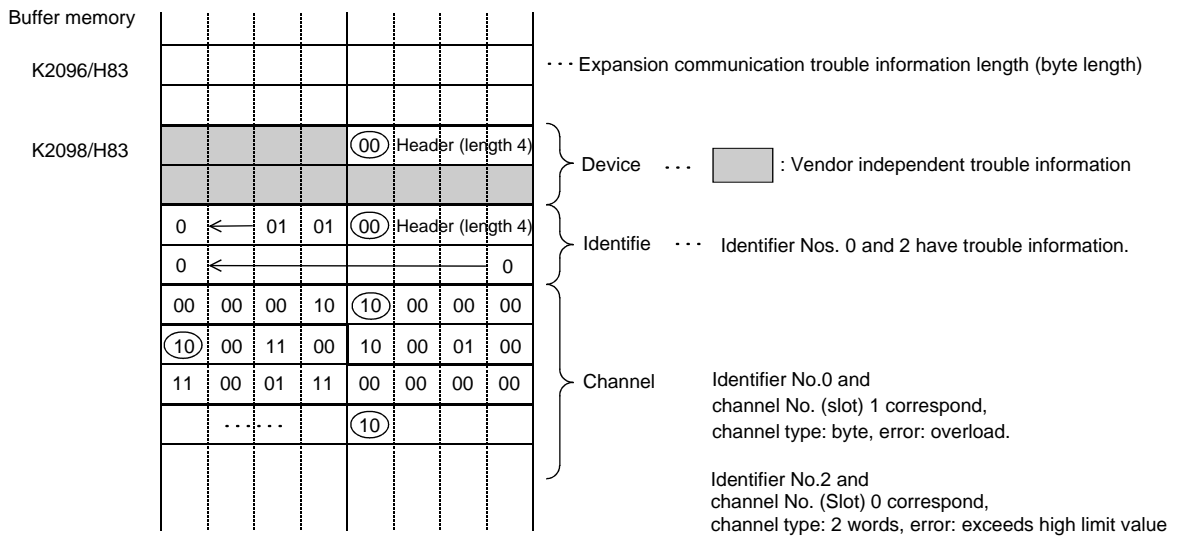
3rd byte: Trouble type



- 4) Identifier No., channel No.
 The slave identifier No. and channel No. are discussed below. The identifier No. is the No. that is attached from the header of each slave module. Each module can have multiple channels. Refer to the each slave specifications regarding to the channel numbering method.



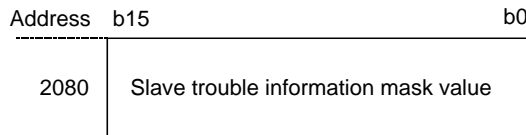
(7) Example expansion communication trouble area



(8) Slave trouble information cancel area

This stores the value that masks the slave trouble information (error code = 0200h detailed data 2). Even if the slave trouble information corresponding to this area bit occurs the slave trouble information detection signal (X01) and RSP.ERR LED do not turn on. In addition, the trouble information is not stored in the trouble information area. The default value is 02B9h.

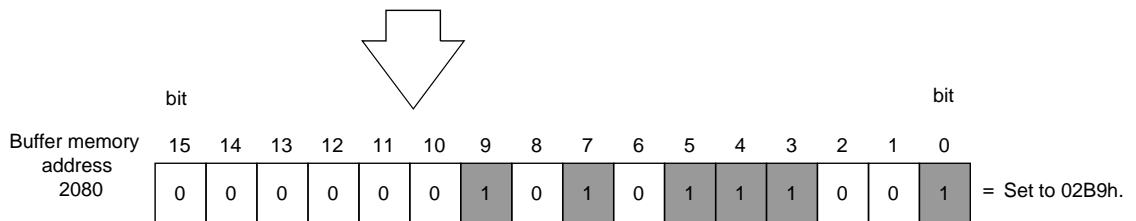
This 02B9h trouble information also occurs during normal situations and is masked. This value can only be changed when exchange start is off. (When on, changes are ignored.)



Slave trouble information

bit	Description
15	Controlled by another master.
14	The parameter sent by the master is incorrect.
13	The response from the slave is incorrect.
12	The function requested by the master is not supported.
11	Expansion trouble information exists.
10	The environment data received from the master does not match that of the slave.
9	The slave is not ready to exchange.
8	Cannot exchange with slave.
7	Separated from the cyclic exchange by the parameter.
6	0 (reserved)
5	The slave has entered the SYNC mode.
4	The slave has entered the FREEZE mode.
3	Watchdog timer monitoring is being conducted in the slave.
2	0 (fixed)
1	Diagnostic data read request
0	Parameter allocation request from the slave

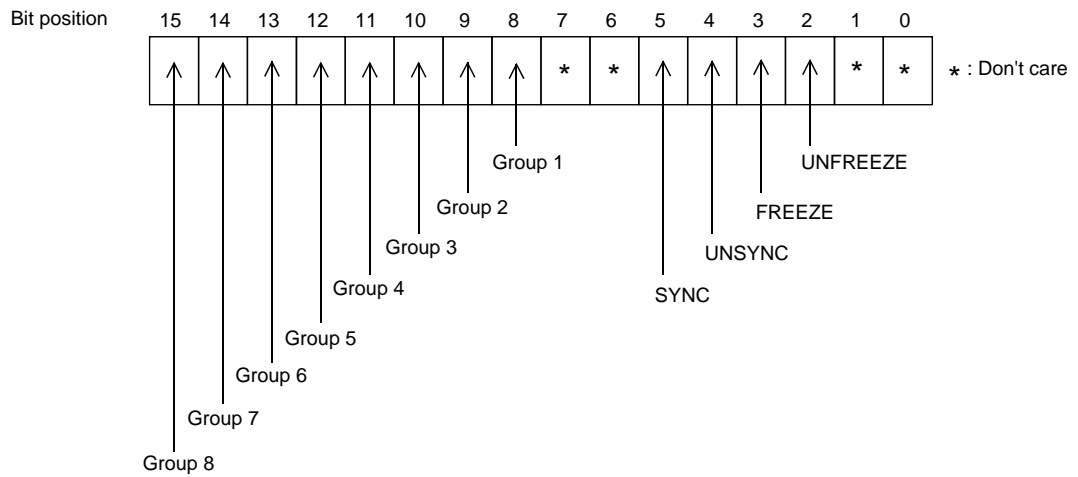
To mask this trouble informatio



(9) Global control area

The buffer memory (821h) value and corresponding command table are shown below.

Bit position	Value (valid/invalid)	Command	Description
8 to 15	1/0	Group 1 to 8 selection	Bits 8 to 15 correspond respectively to groups 1 to 8 and shows that the bit value is transmitted by the global control command to the 1 group (refer below). More than one group at a time can be selected from groups 1 to 8. When all bits 8 to 15 are 0, global control commands are sent to all the slaves.
5	1/0	SYNC	The actual output data is written and held.
4	1/0	UNSYNC	The actual output data hold is canceled.
3	1/0	FREEZE	The actual input data is held and read.
2	1/0	UNFREEZE	The actual input data hold is canceled.



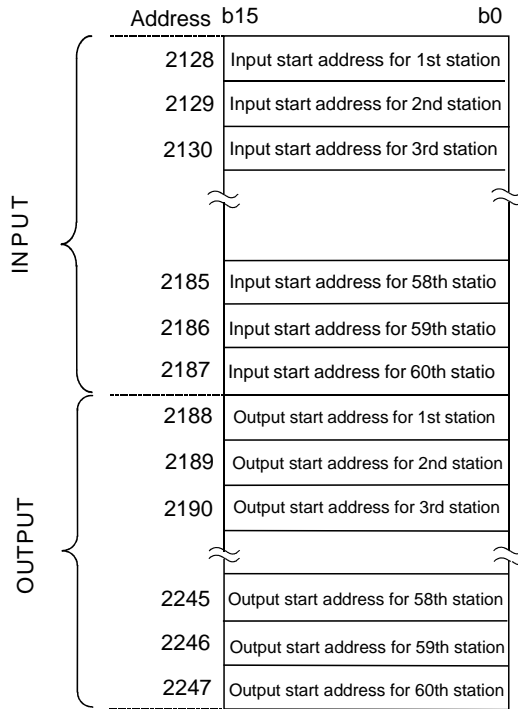
* Bit specifications for UNSYNC/SYNC and UNFREEZE/FREEZE

5	4	3	2	SYNC	UNSYNC	FREEZE	UNFREEZE
0	0	0	0	×	×	×	×
0	0	*	1	×	×	×	
0	0	1	0	×	×		×
*	1	0	0	×		×	×
1	0	0	0		×	×	×
*	1	*	1	×		×	
*	1	1	0	×			×
1	0	*	1		×	×	
1	0	1	0		×		×

* : Don't care
 : Conducted
 × : Not conducted

(12) I/O start address area (Extended service mode only)

This area stores the start addresses of I/O areas for each slave station.



- This area is used while in the extended service mode (MODE switch: No. E) only. When in the normal service mode (MODE switch: No. 0), 0 is stored in all areas.
- Data is set in this area during module startup according to the parameters stored in the master station.
- The start address is set in 1 word units for both input and output. The data range is from 0 to 1919 (0 to 77Fh).
- The start addresses are stored in the INPUT area, starting from the head.
- When nothing is assigned, -1 (FFFFh) will be set.

Example: When the input byte length and output byte length for the first station are 3 bytes and 5 bytes, and those for the second station are 7 bytes and 3 bytes, respectively:

Address 2128 : 0 (0h) } Input start address
 Address 2129 : 2 (2h) }
 Address 2188 : 6 (6h) } Output start address
 Address 2189 : 9 (9h) }

• Input area

Address		
0	1st station 2nd input byte	1st station 1st input byte
1		1st station 3rd input byte
2	2nd station 2nd input byte	2nd station 1st input byte
3	2nd station 4th input byte	2nd station 3rd input byte
4	2nd station 6th input byte	2nd station 5th input byte
5		2nd station 7th input byte

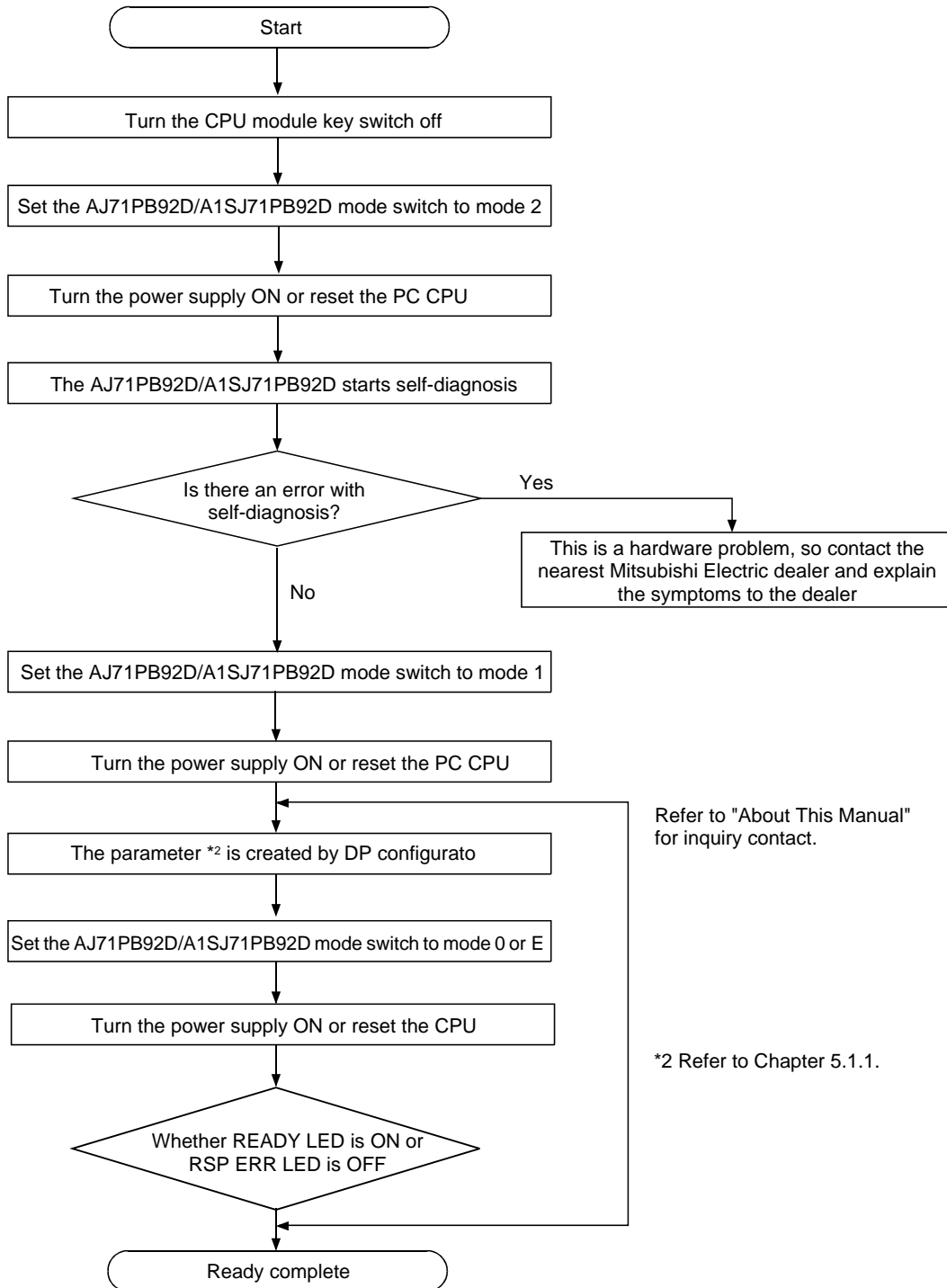
• Output area

Address		
6	1st station 2nd output byte	1st station 1st output byte
7	1st station 4th output byte	1st station 3rd output byte
8		1st station 5th output byte
9	2nd station 2nd output byte	2nd station 1st output byte
10		2nd station 3rd output byte

5. PROCEDURES BEFORE SYSTEM OPERATION

5.1 Procedures before Operation

The procedure for newly connecting AJ71PB92D/A1SJ71PB92D to an existing PROFIBUS-FMS network is explained below.

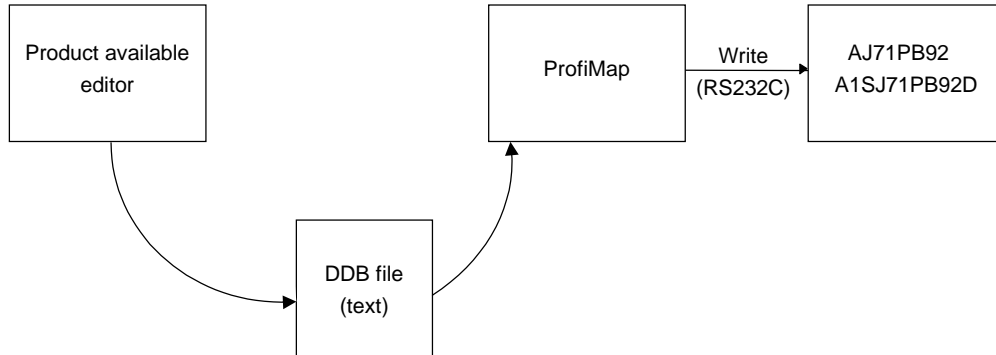


Refer to "About This Manual" for inquiry contact.

*2 Refer to Chapter 5.1.1.

5.1.1 Parameter setting procedure

The procedure for setting the AJ71PB92D/A1SJ71PB92D parameters is described below.



Max ST delay resp (Max Tsdr), Quiet Time (Tqui), Setup Time (Tset) in the parameter to be set by the configurator ProfiMap must be match the maximum value connected to the network, including master station.

The value of the AJ71PB92D/A1SJ71PB92D is shown below.

	Below 187.5Kbps	500Kbps	1.5Mbps	3Mbps	6Mbps	12Mbps
Max Tsdr	60	100	150	250	450	800
Tqui	0	0	0	3	6	9
Tset	1	1	1	4	8	16

5.2 Handling Precautions

This section explains handling precautions for A1SJ71PB92D.

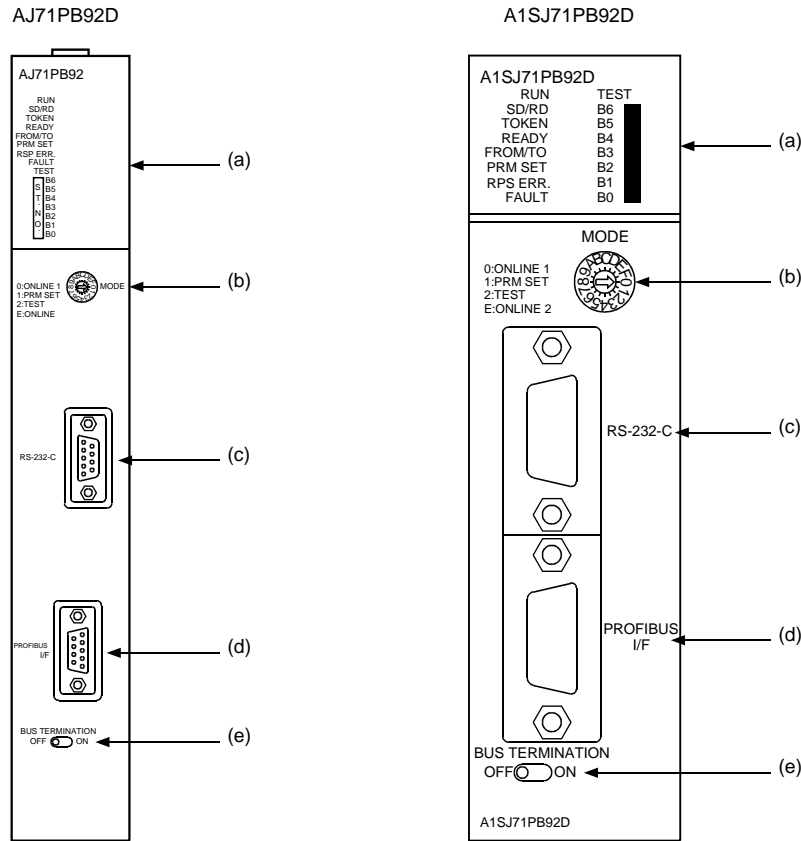
CAUTION

- Use the module in the environment given in the general specifications of the CPU module's User's Manual. Using the module outside the range of the general specifications may result in electric shock, fire or malfunctioning, or may damage or degrade the module.
- Do not touch the conductive area or the electronic parts of the module. Doing so may cause malfunctioning or breakdowns.
- Switch all phases of the external power supply of the PC system off before connecting the PROFIBUS cable. Not doing so could cause failure or malfunction of the module.
- Be careful not to let foreign matter such as filling or wire chips get inside the module. These can cause fire, breakdowns and malfunctioning.
- Never disassemble or modify the module.
This may cause breakdowns, malfunctioning, injury and/or fire.
- Insert the tabs at the bottom of the module into the mounting holes in the base unit before installing the module. (The AnS series module shall be fastened by screws in the base unit at the specified torque.)
Not installing the module correctly could result in malfunctioning, breakdown or pieces of the product falling.
- Switch all phases of the external power supply off before mounting or removing the module. If you do not switch off the external power supply, it will cause breakdowns or malfunction 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.

- (1) **The AJ71PB92D/A1SJ71PB92D's case is made of resin, so be careful not to drop it or strike it hard.**
- (2) **The module fixing screw (M4) fastening torque should be tighten within the range of 78.4 to 117.6N•cm {8 to 12kg•cm} [6.93 to 10.4lb•inch]**

5.3 Part Names and Settings

Following is an explanation of the AISJ71PB92D part names and settings.



No.	Name	Description	Remark
(a)	LED	Displays the AJ71PB92D/A1SJ71PB92D status.	
		Name	Display description
		RUN	Displays the AJ71PB92D/A1SJ71PB92D operation status. ON: During normal operation OFF: When there is an error
		SD/RD	Flashing during communicating with slave on the PROFIBUS network. The flashing interval is the time interval of the bus parameter's Data Control Time.
		TOKEN	Turns on when token is maintained.
		READY	Turns on when the PROFIBUS-DP network subscription preparation is completed and during subscription.
		FROM/TO	Turns on when a FROM/TO instruction from the PC CPU.
		PRM.SET	Turns on (PARAMETER SET), when the parameter setting mode. When flashing during normal operation, the parameter is not written.
		RSP ERR.	Turns on when communication error is occurred.
		FAULT	Turns on when an error occurs.
		TEST	Turns on when a self-diagnosis is executing.
	B0 to B6	Displays the station address during normal operation (Binary). Displays the test type during a self-diagnosis.	

No.	Name	Description	Remark
(b)	Mode setting switch	This sets the AJ71PB92D/A1SJ71PB92D operation status. (at time of shipment: 0)	
		Switch No. MODE	
		0 ONLINE 1 (Normal service mode) (refer to Section 4.3.2(1), (2))	
		1 Parameter setting mode	
		2 Self-diagnosis mode (refer to section 5.4)	
		3 to D Not usable	
		E ONLINE 2 (Extended service mode) (refer to Section 4.3.2 (1), (2))	
F Not usable			
(c)	RS-232C interface connector	Connector for connecting the peripheral equipment that conduct the AJ71PB92D/A1SJ71PB92D parameter setting.	*1
(d)	PROFIBUS interface connector	Connector for connecting the table for the PROFIBUS-DP network.	*2
(e)	PROFIBUS network terminal resistance setting switch	This sets whether or not there is terminal resistance inside the AJ71PB92D/A1SJ71PB92D. (at time of shipment: OFF) ON: has terminal resistance OFF: no terminal resistance	Always ON for both ends of the station on the PROFIBUS-DP network.

*1: For the connector type, use a male B-Sub 9 pin. The user makes the RF-232C cable. (for information regarding cable wiring, refer to ProfiMap Operating Manual.)
The size of the screw which can be used for the connector is as follows. #4-40 UNC.

*2: For the connector type, use a male D-Sub 9 pin. The user creates the PROFIBUS cable. (for information regarding the cable wiring, refer to Item 5.5.)
The size of the screw which can be used for the connector is as follows. #4-40 UNC.

5.4 Execution Method for Self-diagnosis

This section covers the procedure for entering the self-diagnosis mode and the LED displays descriptions.

A self-diagnosis is automatically performed by setting the rotary switch to 2 and starting up (using the power supply on or reset switch).

During an internal diagnosis the LED display corresponds to the B0 to B6 statuses and the test responses being conducted are shown below.

Meaning		B6	B5	B4	B3	B2	B1	B0	TEST
(a) MPU test	During test	○	○	○	○	○	●	●	●
	Error	●	○	○	○	○	●	○	●
(b) Timer test	During test	○	○	○	○	●	○	●	●
	Error	●	○	○	○	●	○	○	●
(c) Interrupt test	During test	○	○	○	○	●	●	●	●
	Error	●	○	○	○	●	●	○	●
(d) DRAM test	During test	○	○	○	●	○	●	●	●
		○	○	○	●	●	○	●	●
	Error	●	○	○	●	●	●	○	●

○ : Turned off ● : Turned on

When the test results are normal, tests (a) to (d) are repeated. If an error is detected, then the LED status at the time the error occurs for that test will be displayed.

5.5 Wiring

5.5.1 PROFIBUS cable wiring

This section explains the wiring to PROFIBUS connector for the AJ71PB92D/A1SJ71PB92D

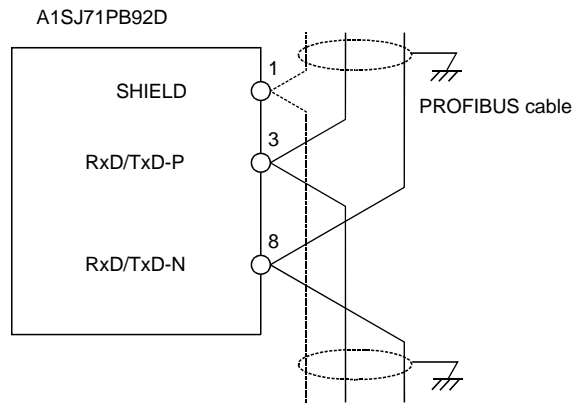
(1) Pin assignments for the connector

Pin No.	Symbol	Name	Application
1		SHIELD	Shield, Protective Ground
2		RP *1	Reserved for Power
3	B/B'	RxD/TxD-P	Receive/Transmit Data-P
4		CNTR-P *1	Control-P
5	C/C'	DGND	Data Ground
6		VP *2	Voltage-Plus
7		RP *1	Reserved for Power
8	A/A'	RxD/TxD-N	Receive/Transmit Data-N
9		CNTR-N *1	Control-N

*1 Signal is optional.

*2 Signal is only necessary at station at the end of the bus cable.

(2) Wiring



Remark

- To apply to the EMC standard:
Read the Section for the Installation in the A1S/A2SCPU User's Manual (Hardware) (after the IB-66468-E)
- Please use the PROFIBUS cable with braided shield.

5.5.2 Terminator switch

(1) Whether or not to set the built-in module terminal resistance (1/2W 220 Ω x 2 units) can be selected by connecting a switch. (The stations on both ends of the PROFIBUS segment must be connected with terminal resistor.)

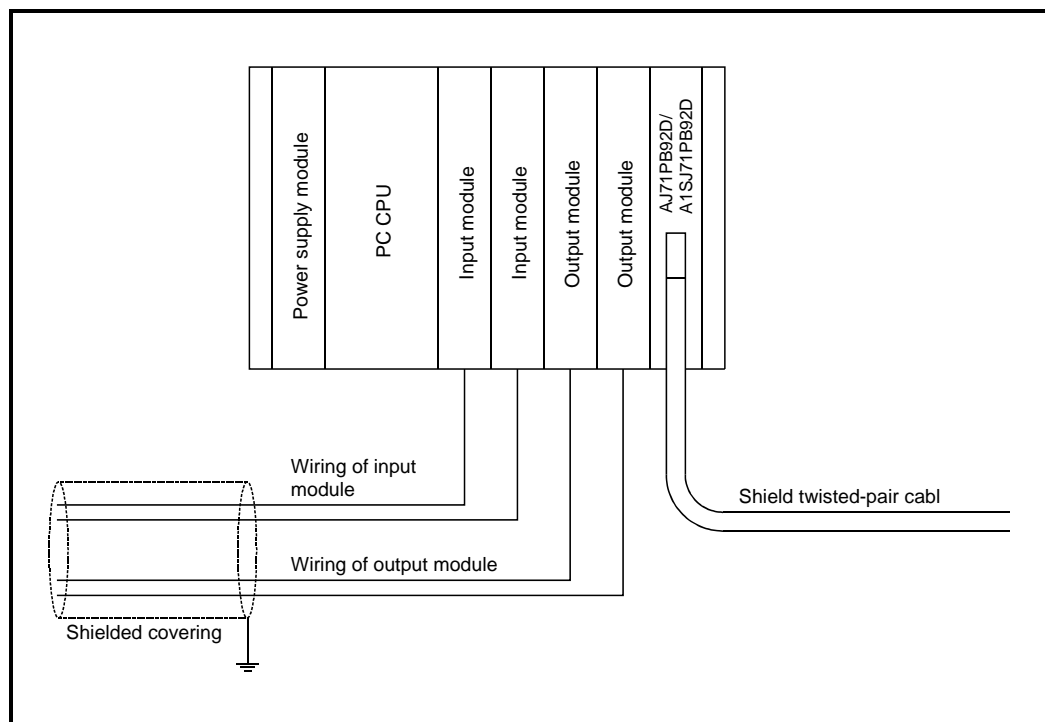
Silk display	ON	OFF
TERMINATOR	Connects terminals resistor	Disconnects terminal resistor (setting at time of shipment)

(2) When the AJ71PB92D/A1SJ71PB92D's bus termination switch is set to on (has terminal resistor), do not remove the PROFIBUS cable from the AJ71PB92D/A1SJ71PB92D during PROFIBUS-DP network operation. If the cable is removed, then the terminal resistor in the network will disappear, causing an error and bringing down the network.

5.5.3 Precautions against wiring

As one of the requirements to give full play to AJ71PB92D/A1SJ71PB92D's functions and make up the system with high reliability, it is necessary to have an external wiring unsusceptible to an influence of noise. Precautions against external wiring of AJ71PB92D/A1SJ71PB92D is described below.

- (1) Do not route the wire of AJ71PB92D/A1SJ71PB92D close to or bundle it together with the main circuit and high-tension lines, or the load-carrying lines from other than the PC. Otherwise, the module may be susceptible to an influence of noise and surge induction.
- (2) The wires from the input/output modules of the PC should be away from the communication cable of PROFIBUS-DP interface module as far as possible as shown in the figure below.



(3) Grounding

- (a) When the PROFIBUS-DP interface module is used, the FG and LG terminals of the power supply module of the PC should basically be grounded.
- (b) If communication cannot be performed after grounding because of abnormal voltage applied to the FG terminal, the module may be used without grounding.

- (4) When the AJ71PB92D/A1SJ71PB92D's BUS TERMINATION SWITCH is set to on (has terminal resistor), do not remove the PROFIBUS cable from the AJ71PB92D/A1SJ71PB92D during PROFIBUS-DP network operation. If the cable is removed, then the terminal resistor in the network will disappear, causing an error and bringing down the network.**

5.6 Maintenance and Inspection

For the AJ71PB92D/A1SJ71PB92D, eliminate the check of cable connection and looseness and do not include it as an inspection item. Otherwise, follow the inspection item instructions in the PC CPU User's Manual to always use the system in good condition.

DANGER

- Switch all phases of the external power supply off before cleaning. Not doing so could cause failure or malfunction of the module.

CAUTION

- Never disassemble or modify the module.
This may cause breakdowns, malfunctioning, injury and/or fire.
- Switch all phases of the external power supply off before mounting or removing the module. If you do not switch off the external power supply, it will cause failure or malfunction of the module.
- Do not touch the conductive area or the electronic parts of the module.
Doing so may cause malfunctioning or breakdowns.

6. COMMUNICATION TIME

6.1 Transmission Delay Time When There is One Master Station

An explanation of the transmission delay time when there is one master station is given in the following diagram. The following diagram (Fig. 6.1) shows an example for when there are 3 slave stations.

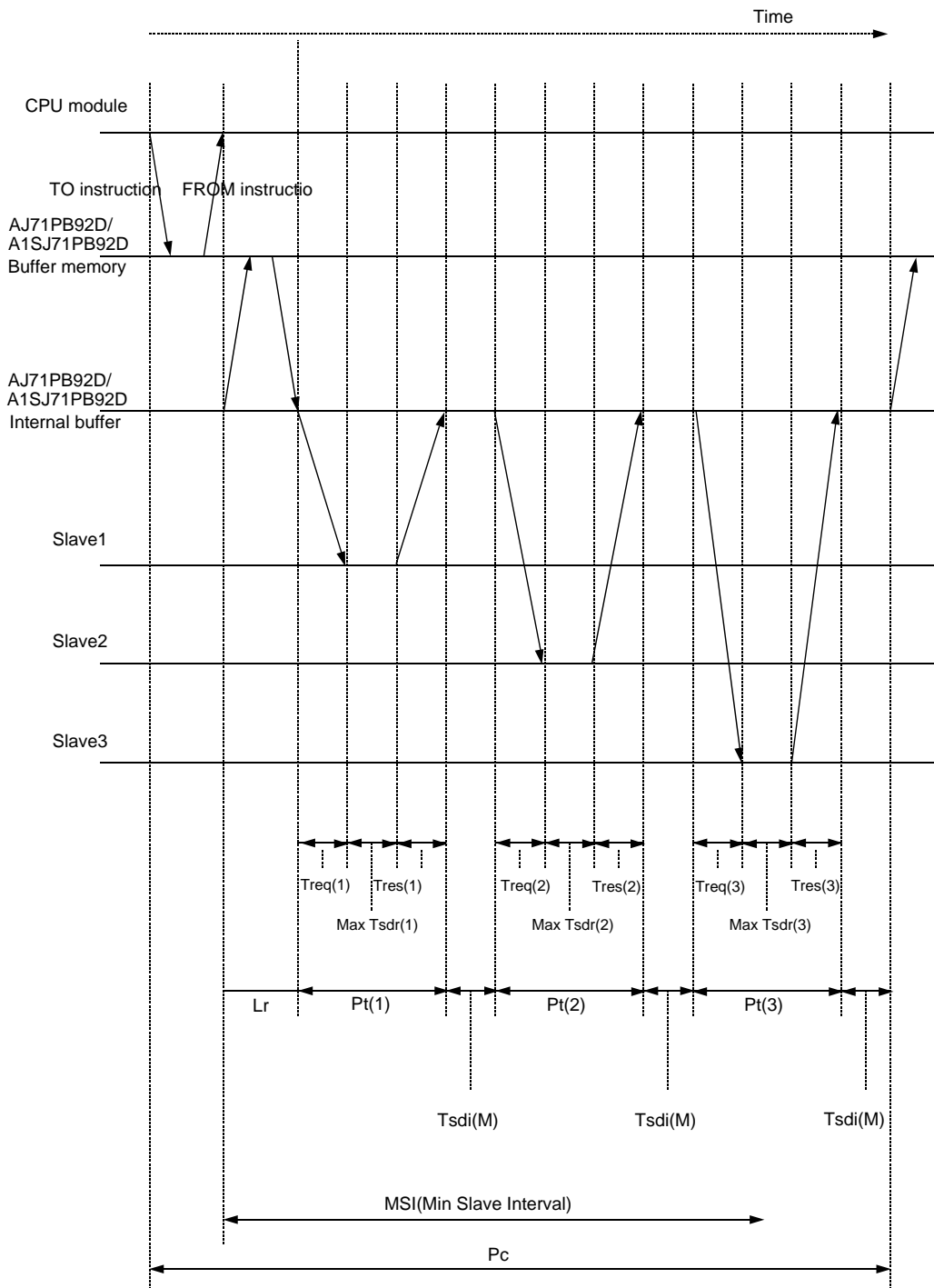


Fig. 6.1 The transmission delay time when there is one master station

The master polling cycle time P_c can be calculated as:

$$P_c = \text{Max} (\text{MSI}, \sum_{i=1}^{\text{Number of the slave stations}} (\text{Pt} (i) + \text{Tsd}i (M))) + L_r + \text{From/To time.}$$

However,

The largest of A and B = Max (A, B)

$\text{Pt} (i)$ = No.i station polling time = $\text{Treq}(i) + \text{Max Tsd}r (i) + \text{Tres} (i)$

$\text{Treq} (i)$ No.i station request transmission time = $((\text{number of output bytes to No.i station} + 9) \times 11) / \text{baud rate}$

$\text{Max Tsd}r (i)$ = No.i station response time (This value is recorded in the slave DDB file.) / baud rate

$\text{Tres} (i)$ No.i station response transmission time = $((\text{Number of input bytes from No.i station} + 9) \times 11) / \text{baud rate}$

$\text{Tsd}i (M)$ = master request/response processing time (This value is recorded in the master DDB file.) / baud rate

L_r = data refresh time = 1.2 (ms) number of slave stations \times 1.2 (μs)

MSI = polling cycle minimum cycle (set by configurator)

From/To time = Time required for From/To instruction = 3.3 (ms) \times number of From/To commands.

Point
For the explanation the From/To instruction and polling cycle are draw as synchronous in the diagram, but they actually operate asynchronously. In other words, if the memory in the buffer is overwritten by a To instruction during a polling cycle, that value will be transmitted to the internal buffer by the next buffer memory and internal buffer data transmission.

6.2 Transmission Delay Time When There are Multiple Master Stations

Following is an explanation of the transmission delay time when multiple masters are connected to the same network. The following diagram (Fig. 6.2) shows when 2 masters are connected to the same network. Pc(1) and Pc(2) in the following diagram (Fig. 6.2) are the master 1 and master 2 polling cycle times respectively, and their transmission delay time is calculated using the formula presented in Section 6.1.

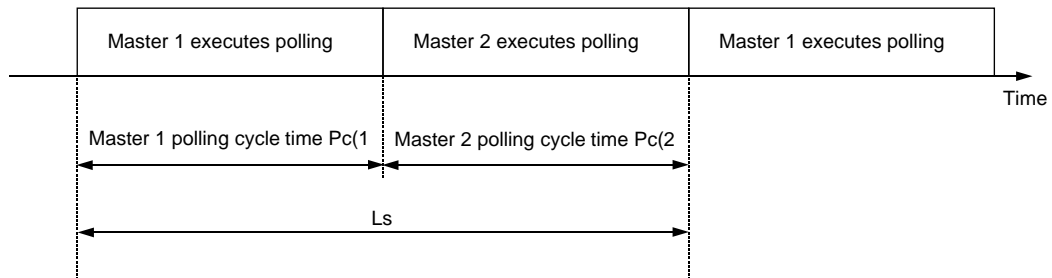


Fig. 6.2 The transmission delay time when multiple masters are connected

As shown in this diagram, each master 1 link scan time is calculated as:

$$Ls = \sum_{n=1}^{\text{Number of the master stations}} Pc(n)$$

7. DDB FILE

The DDB file for the AJ71PB92D/A1SJ71PB92D is required to create the communication parameter for the AJ71PB92D/A1SJ71PB92D with the configurator. A product available editor is used to create the following contents for the DDB file.

File name: PB92F036.GSD

```

,*****
;
; Device Data Base for A1SJ71PB92D
,*****
;

#Profibus_DP

Vendor_Name      = "MITSUBISHI ELECTRIC CORPORATION"
Model_Name       = "A1SJ71PB92D"
Revision         = "AA"
Ident_Number     = 0xF036
Protocol_Ident   = 0
Station_Type     = 1
FMS_supp        = 0
Hardware_Release = "A"
Software_Release = "A"

9.6_supp        = 1
19.2_supp       = 1
93.75_supp      = 1
187.5_supp      = 1
500_supp        = 1
1.5M_supp       = 1
3M_supp         = 1
6M_supp         = 1
12M_supp        = 1

MaxTsd_9.6      = 60
MaxTsd_19.2     = 60
MaxTsd_93.75    = 60
MaxTsd_187.5    = 60
MaxTsd_500      = 100
MaxTsd_1.5M     = 150
MaxTsd_3M       = 250
MaxTsd_6M       = 450
MaxTsd_12M     = 800

Redundancy      = 0
Repeater_Ctrl_Sig = 0
24V_Pins        = 0

Download_supp   = 0
Upload_supp     = 0
Act_Para_Brct_supp = 0
Act_Param_supp   = 0

Max_MPS_Length  = 32736
Max_Lsdu_MS     = 244
Max_Lsdu_MM     = 244
Min_Poll_Timeout = 50

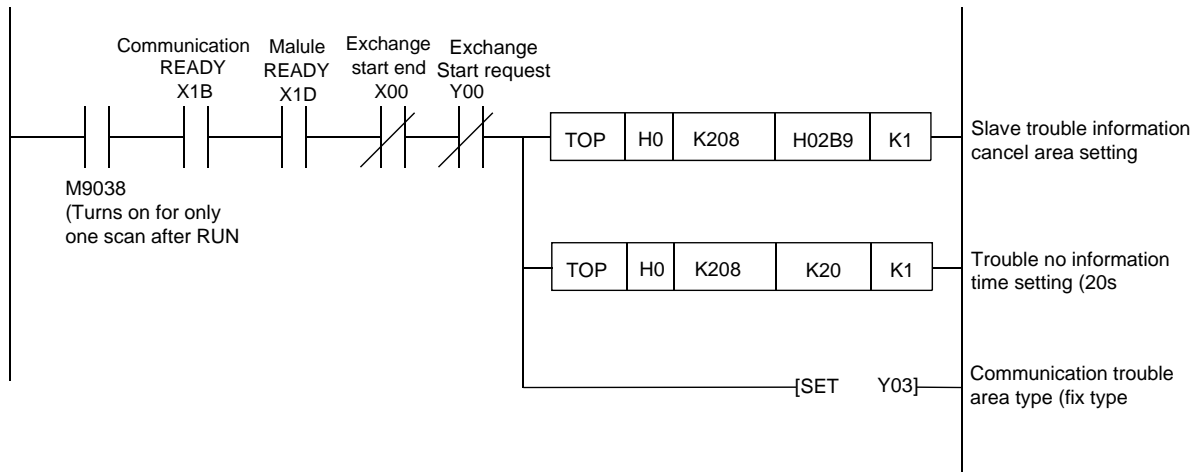
```

Trdy_9.6	= 1
Trdy_19.2	= 1
Trdy_93.75	= 1
Trdy_187.5	= 1
Trdy_500	= 1
Trdy_1.5M	= 1
Trdy_3M	= 1
Trdy_6M	= 1
Trdy_12M	= 1
Tqui_9.6	= 0
Tqui_19.2	= 0
Tqui_93.75	= 0
Tqui_187.5	= 0
Tqui_500	= 0
Tqui_1.5M	= 0
Tqui_3M	= 3
Tqui_6M	= 6
Tqui_12M	= 9
Tset_9.6	= 1
Tset_19.2	= 1
Tset_93.75	= 1
Tset_187.5	= 1
Tset_500	= 1
Tset_1.5M	= 1
Tset_3M	= 4
Tset_6M	= 8
Tset_12M	= 16
LAS_Len	= 127
Tsdi_9.6	= 10
Tsdi_19.2	= 15
Tsdi_93.75	= 15
Tsdi_187.5	= 80
Tsdi_500	= 80
Tsdi_1.5M	= 150
Tsdi_3M	= 150
Tsdi_6M	= 150
Tsdi_12M	= 150
Max_Slaves_supp	= 126

8. PROGRAMMING

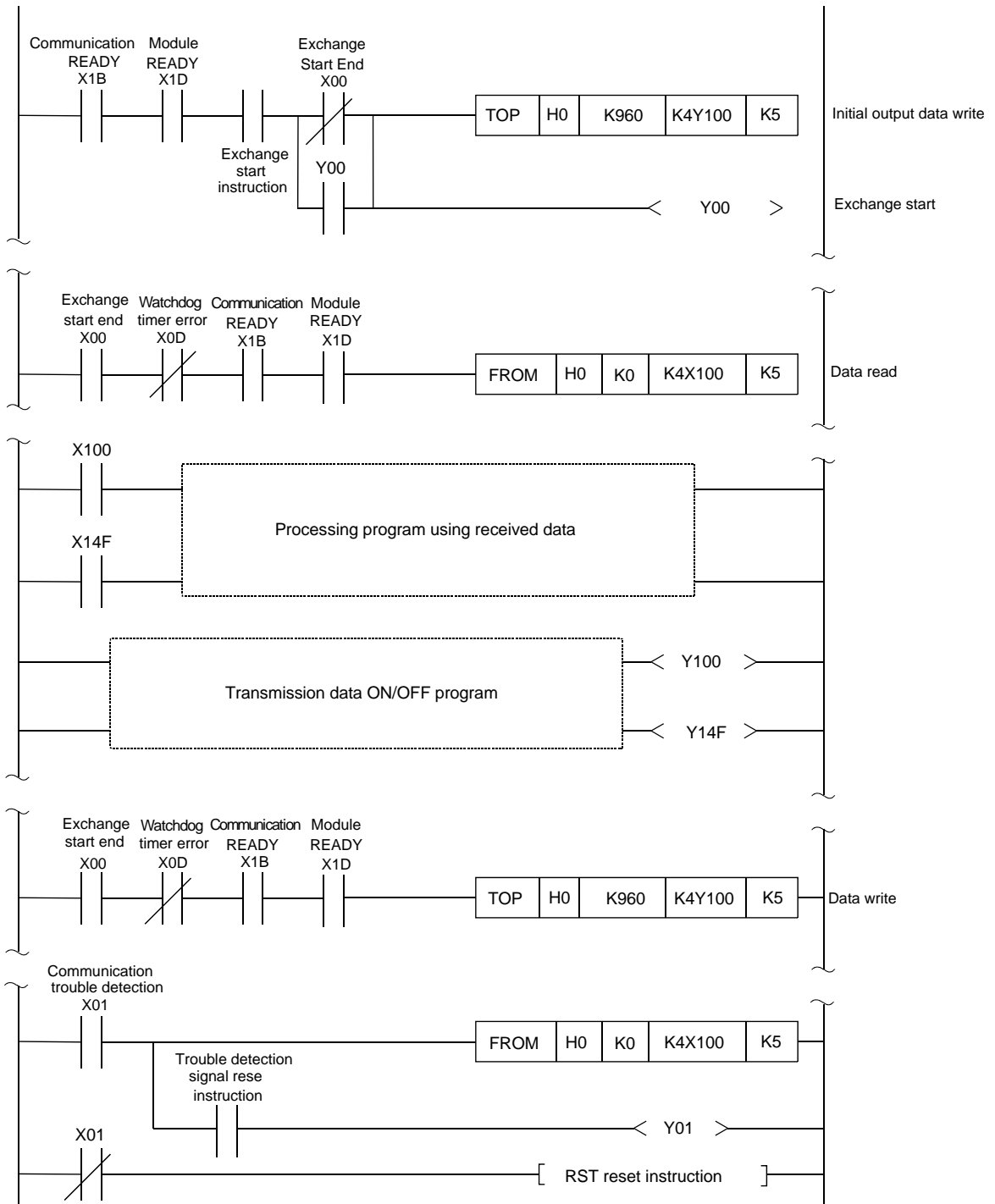
A programming example is detailed below.
 In this example, the AJ71PB92D/A1SJ71PB92D is attached to the No.0 slot on the base unit.

8.1 Initial Program



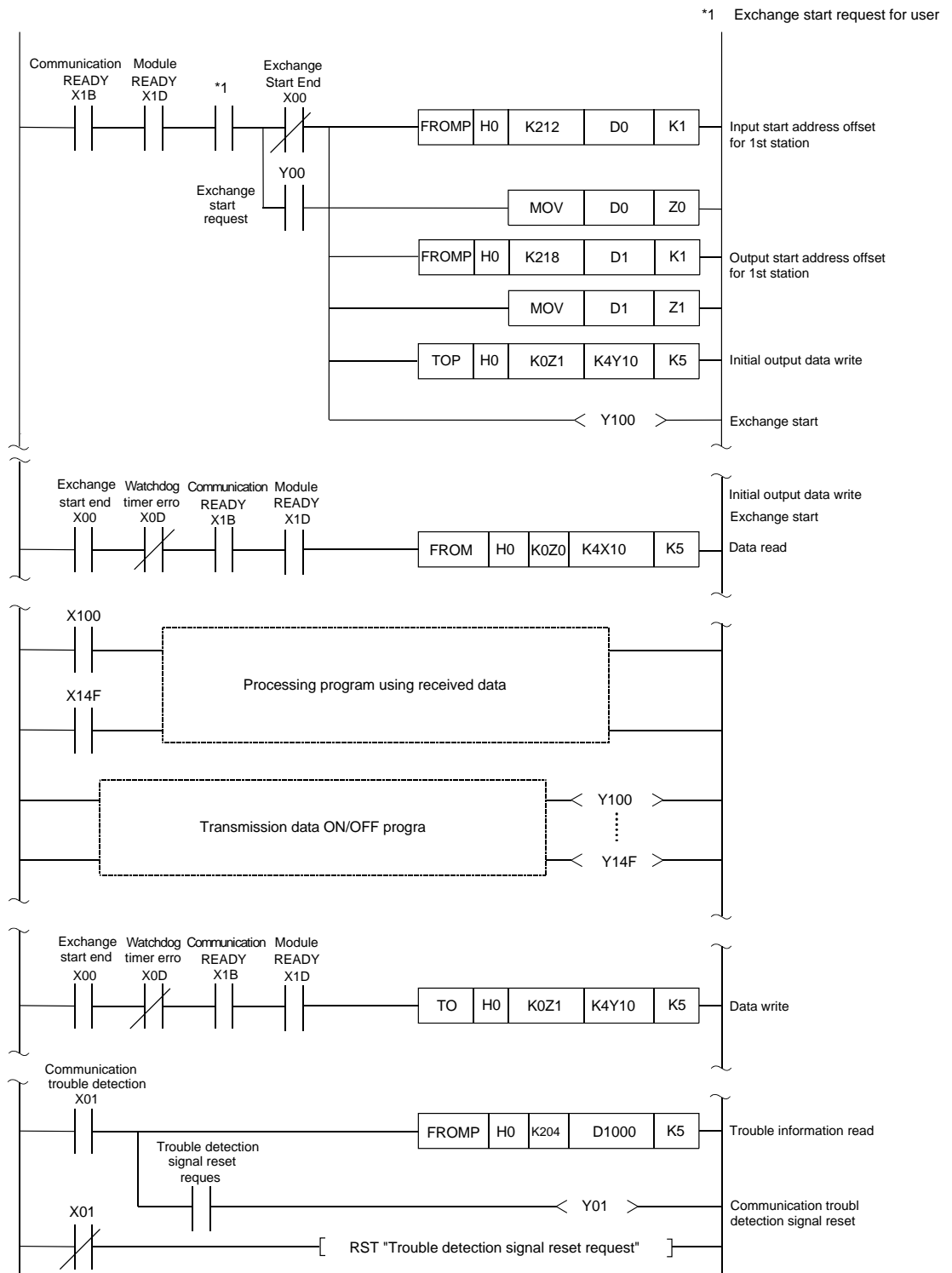
8.2 Data I/O with Slave

8.2.1 Normal service mode (MODE switch : No. 0)



Important
 FROM/TO instructions for the A1SJ71PB92D can be performed once by each one sequence scanning.

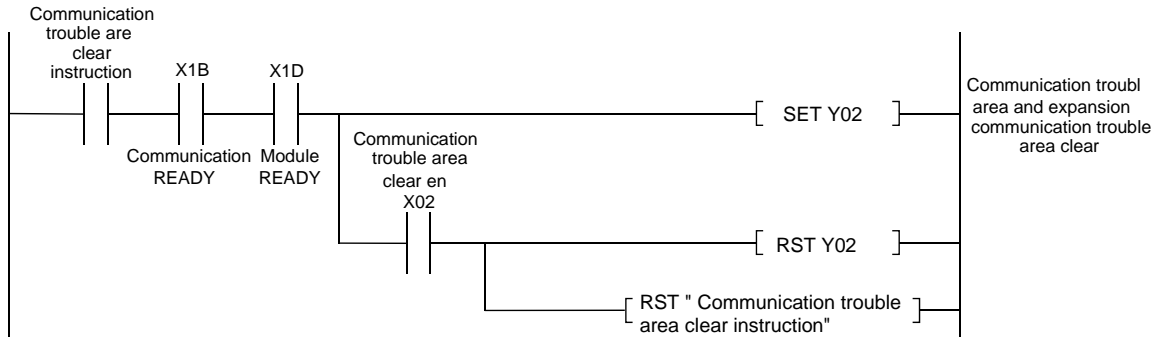
8.2.2 Extend service mode (MODE switch : No. E)



Important

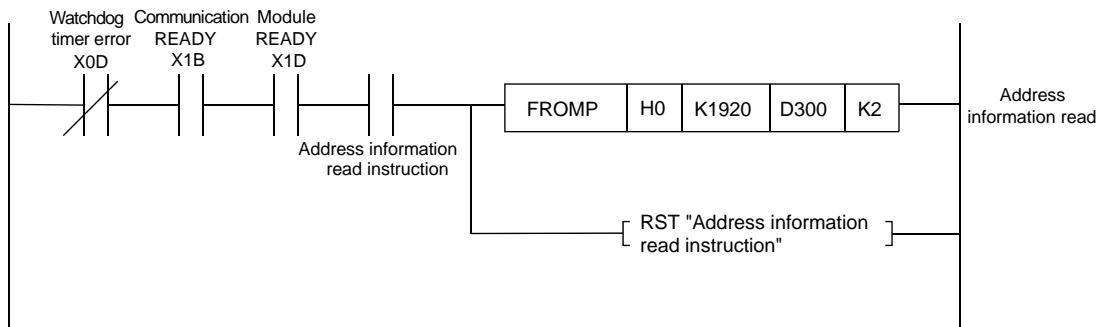
- (1) FROM/TO instructions for the AJ71PB92D/A1SJ71PB92D can be performed once by each one sequence scanning.
- (2) If the network configuration allows the power supplies to the A1SJ71PB92D and to the slave station to be on simultaneously, there may be cases in which the slave side is not completely started at the time the X1B turns on. In this case, consider the time lag for the slave station to completely start up when estimating the time period from the point the X1B turns on until the communication start "Y00" turns on.

8.3 Communication Trouble Area and Expansion Communication Trouble Area Clear



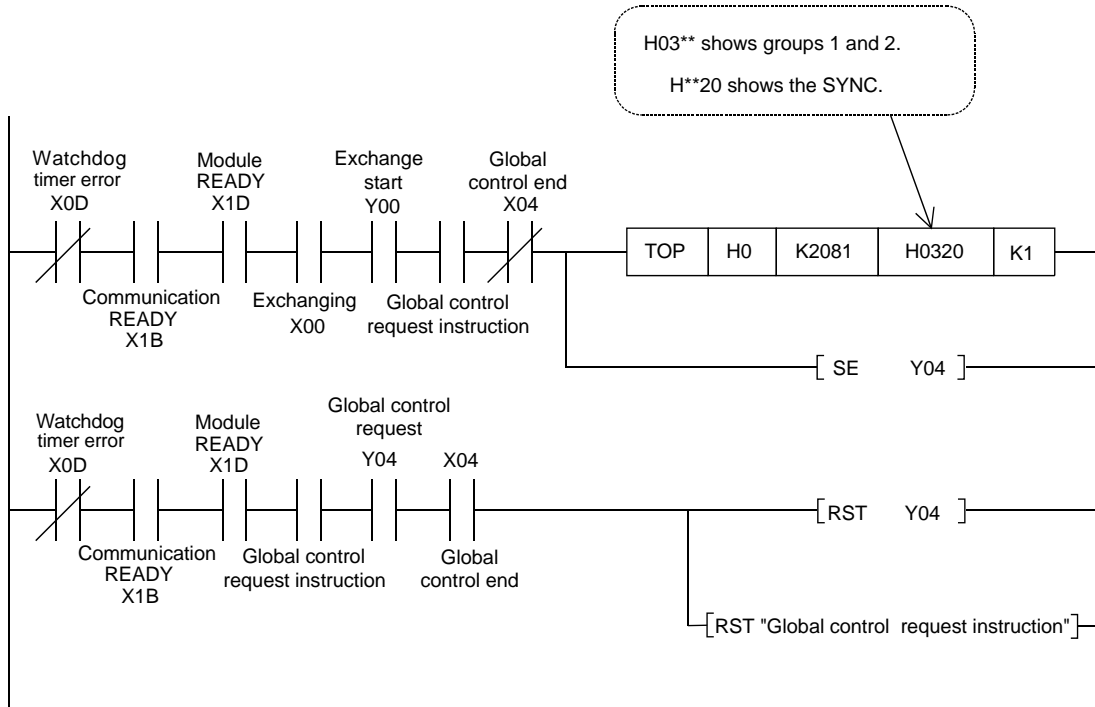
8.4 Address Information Read

Example: When reading the No.1 station address



8.5 Global Control

Following is shown an example of when a global control service (SYNC) is transmitted to each slave station in groups 1 and 2. (For information regarding service commands refer to Section 4.3.2.9.)



9. TROUBLESHOOTING

This chapter explains the troubleshooting for the use of the A1SJ71PB92D.

LED type	Normal Abnormal	Conditions	Cause	Measures
RUN	Normal	Turns on.	—	—
	Abnormal	Turns off.	The watchdog timer timed out.	Contact the nearest service center or dealer.
READY	Normal	<ul style="list-style-type: none"> Turns on when mode 0, E. Turns off when not mode 0, E. 	—	—
	Abnormal	<ul style="list-style-type: none"> Turns on when not mode 0, E. 	Offline or did not enter the self-diagnosis mode	Contact the nearest service center or dealer.
SD/RD	Normal	<ul style="list-style-type: none"> Flashes during exchange. Turns on during exchange start processing. Turns on during exchange stop processing. 	—	—
	Abnormal	<ul style="list-style-type: none"> Turns on during data exchange. 	There is a slave station with which initial exchange cannot be done. (The parameter and actual slave do not match.)	Check the parameter.
TOKEN	Normal	<ul style="list-style-type: none"> Turns on when mode 0, E. Turns off when not mode 0, E. Flashes when a multimaster configuration in mode 0 or E. 	—	—
	Abnormal	Turns off when mode 0, E.	Token does not cycle.	<ul style="list-style-type: none"> Check the cable and terminal resistor. Check for duplicate addresses. Check if the HSA exceeds the network maximum station No.
PRM SET	Normal	Turns off when mode 0, E. Turns on when mode 1.	—	—
	Abnormal	Flashes when mode 0, E.	There is no parameter in the module.	Write a parameter in the module.
RSP ERR	Normal	Turns off.	—	—
	Abnormal	Turns on.	A communication trouble occurred.	Refer to the buffer memory communication trouble information.
FAULT	Normal	Turns off.	—	—
	Abnormal	An RSP ERR LED turned on before exchange start and turned on during exchange start processing.	<ul style="list-style-type: none"> Not even 1 active slave is set in the parameter. There is a slave with the same address as a master in the parameter. 	Correct the parameter.
		Turns on when other than the above.	An unexpected error occurred.	Contact the nearest service center or dealer.

APPENDIX

Appendix 1 Dissimilarities Between the New A1SJ71PB92D Products (Software Version E and Later) and Conventional Products (Software Version D and Earlier)

1.1 Dissimilarities between the new A1SJ71PB92D products and conventional products

- (1) A new service mode, the "extended service mode," has been added to support transmission of communication data with a length of up to 244 bytes between master and slave stations.

Buffer memory	New product	Conventional product
INPUT area (Address : 0 to 959)	<ul style="list-style-type: none"> Normal service mode : 32 bytes, fixed length (MODE switch : No. 0) Extended service mode : 244 bytes, variable length (MODE switch : No. E) 	<ul style="list-style-type: none"> Normal service mode : 32 bytes, fixed length (MODE switch : No. 0)
OUTPUT area (Address : 960 to 1919)	<ul style="list-style-type: none"> Normal service mode : 32 bytes, fixed length (MODE switch : No. 0) Extended service mode : 244 bytes, variable length (MODE switch : No. E) 	<ul style="list-style-type: none"> Normal service mode : 32 bytes, fixed length (MODE switch : No. 0)

* Since the new products use the extended service mode, a new setting position "No. E" has been added to the MODE switch. However, the operation of the conventional A1SJ71PB92D product cannot be guaranteed if the MODE switch is set to No. E. Do not set the MODE switch on the conventional product to No. E.

- (2) An area that displays the status of the slave station has been added.

Buffer memory	New product	Conventional product
Slave status area (Address : 2112 to 2116)	<ul style="list-style-type: none"> Displays the status of individual slave stations. 	<ul style="list-style-type: none"> Not usable
I/O start address area (Address : 2128 to 2247) (Extended service mode only)	<ul style="list-style-type: none"> Displays the start addresses of I/O areas for each slave station. 	<ul style="list-style-type: none"> Not usable

1.2 Precautionary items when new and conventional A1SJ71PB92D products are used in the same system

- (1) Precautionary items when new and conventional A1SJ71PB92D products are used in the same system

The only difference between the new and conventional products is that the new product can handle communication data with a length of 244 bytes between master and slave stations. Therefore, there will be no problem if new and conventional A1SJ71PB92D products are used in the same system.

- (2) Precautionary items when setting the parameters using the software package (configurator)

In order to set parameters for A1SJ71PB92D using the software package (configurator), a correct software version of A1SJ71PB92D must be used for the version of configurator used.

If the A1SJ71PB92D and the software package (configurator) not compatible with each other are used, communication data of 244 bytes cannot be handled.

		MELSEC ProfiMap	
		Version 1.10 or later	Version 1.0 or earlier
New product	Normal service mode	32 byte	32 byte
	Extended service mode	244 byte	Setting exceeding 32 bytes is not supported.
Conventional product	Normal service mode	32 byte	32 byte

- (3) Precautionary items when the module is operated in normal service mode using the parameter that has been set for the extended service mode

The following table indicates the operating conditions (for one slave station) when running the new product in the normal service mode (MODE switch: No. 0) or the conventional product using the parameter that has been set for the extended service mode.

O: Supported ×: Not supported

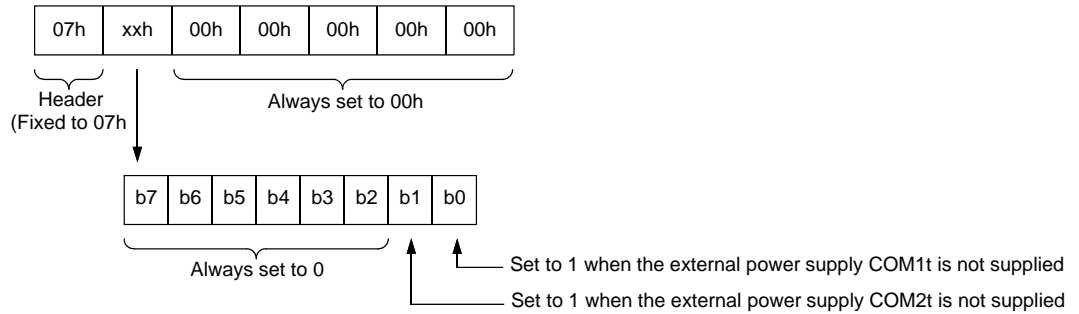
Operating condition A1SJ71PB92D	Parameter size		Communication data length	
	(Less than 122 byte)	(Less than 244 byte)	(Less than 32 byte)	(Less than 244 byte)
New product Normal service mode	O	O	O	×
Conventional product Normal service mode	O	×	O	×

▪

Appendix 2 Extended Trouble Information of Mitsubishi's Slaves

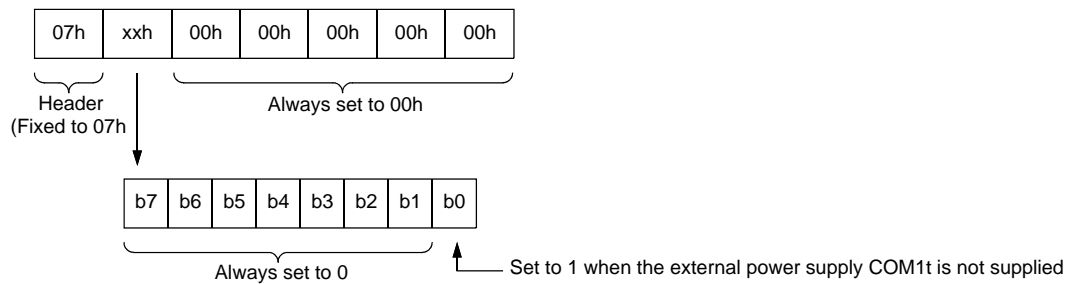
(1) AJ95TB2-16T

AJ95TB2-16T notifies device-related trouble information to the master. The information consists of seven bytes including the header (one byte) as shown below:



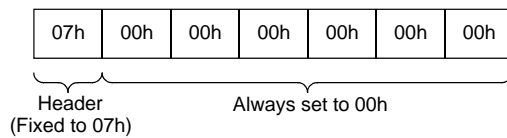
(2) AJ95TB32-16DT

AJ95TB32-16DT notifies device-related trouble information to the master. The information consists of seven bytes including the header (one byte) as shown below:



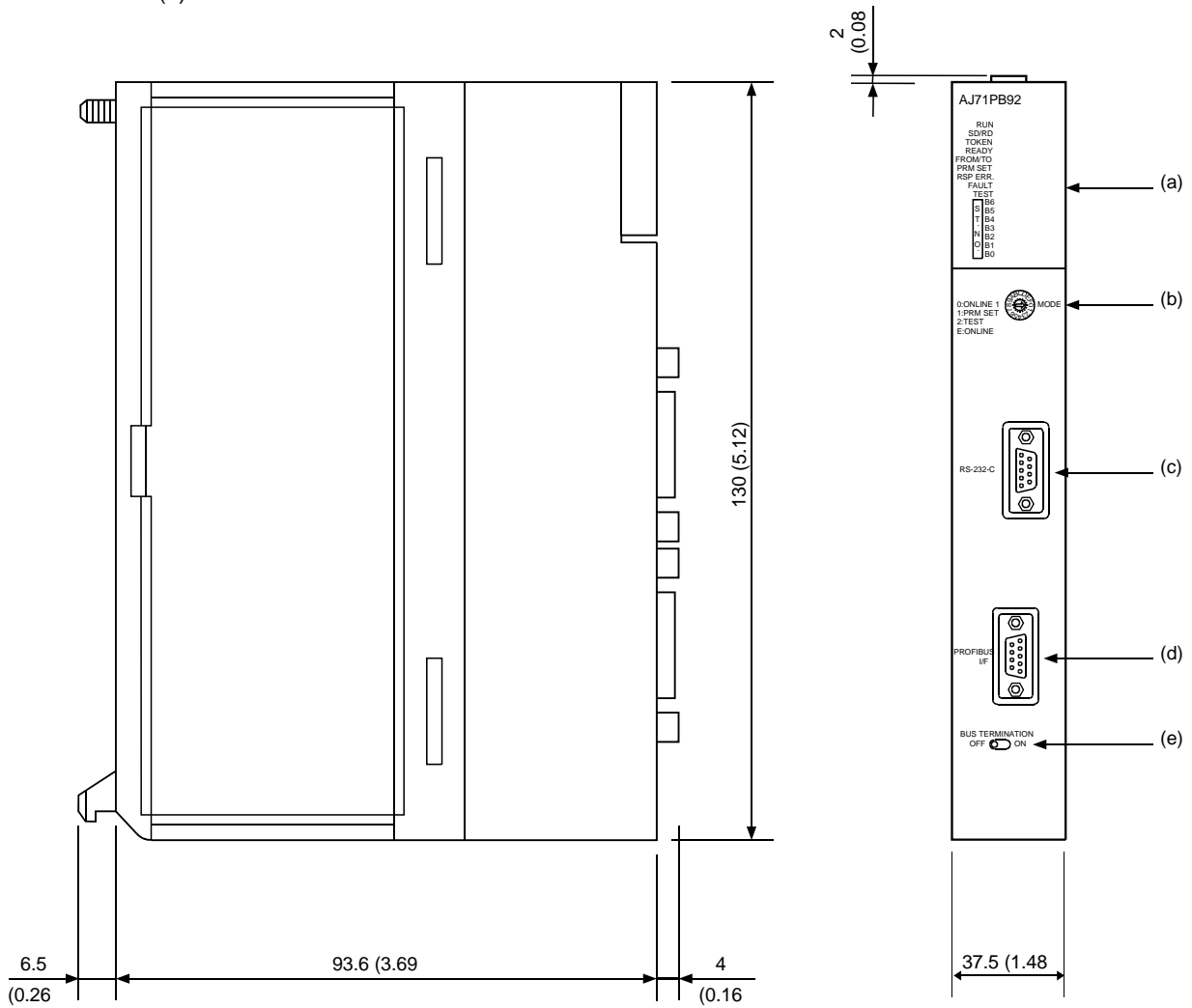
(3) AJ95TB3-16D

AJ95TB3-16D notifies device-related trouble information to the master. The information consists of seven bytes including the header (one byte) as shown below:



Appendix 3 External Dimensions

(1) AJ71PB92D



Unit : mm (inch)

APPENDIX 1

Appendix 1 Dissimilarities Between the New A1SJ71PB92D Products (Software Version E and Later) and Conventional Products (Software Version D and Earlier) 1

1.1 Dissimilarities between the new A1SJ71PB92D products and conventional products 1

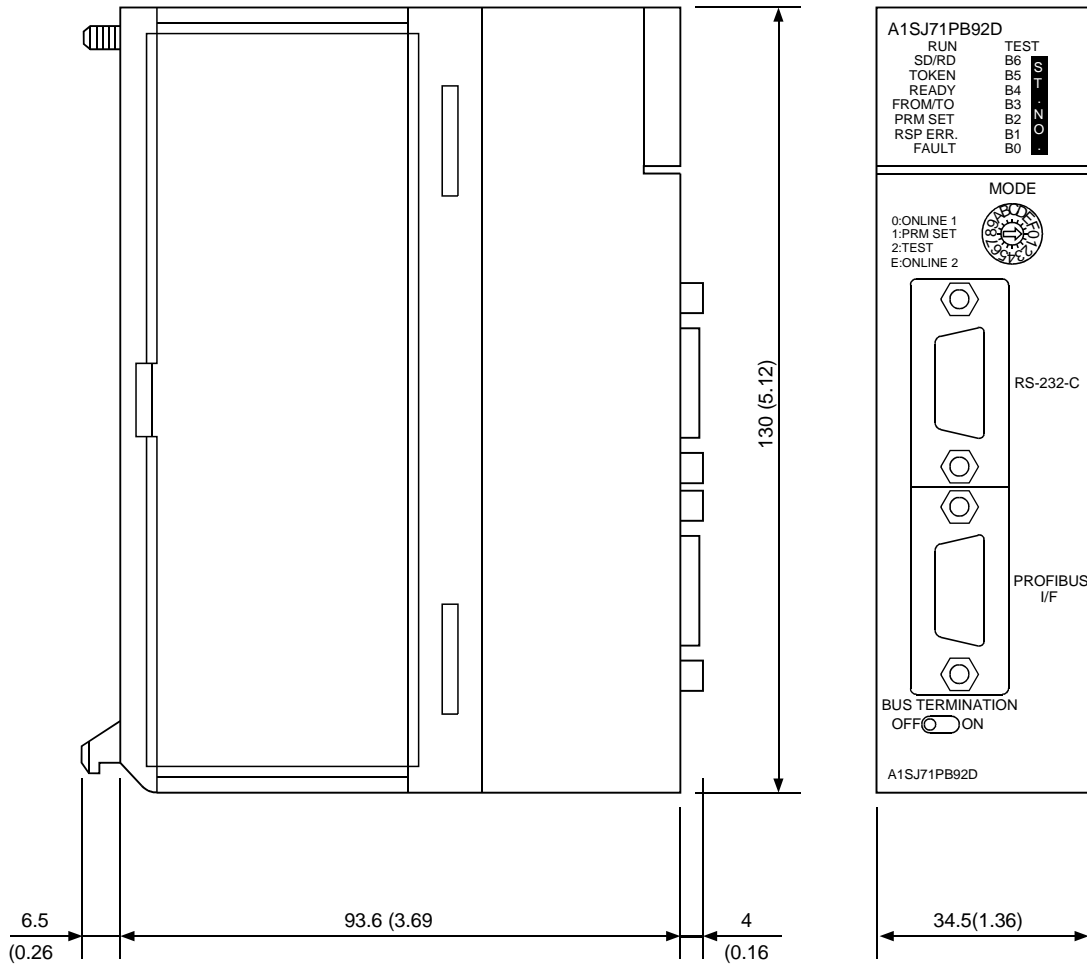
1.2 Precautionary items when new and conventional A1SJ71PB92D products are used in the same system 1

..... 2

Appendix 2 Extended Trouble Information of Mitsubishi's Slaves..... 3

Appendix 3 External Dimensions 4

(2) A1SJ71PB92D



Unit : mm (inch)

