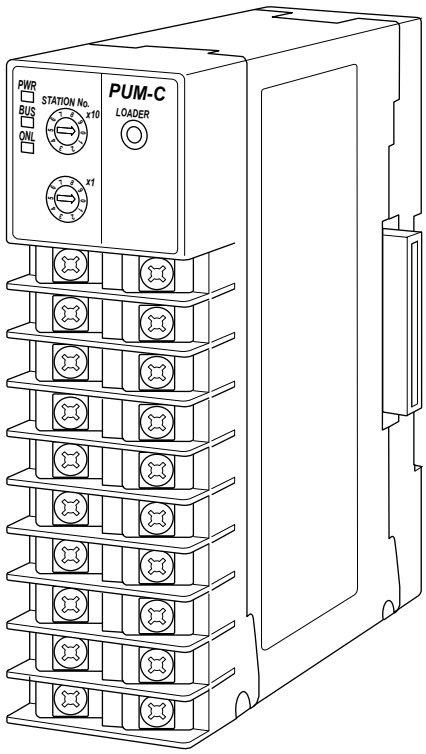
e-Front runners

User's Manual

MULTI-LOOP MODULE TYPE TEMPERATURE CONTROLLER

<Enhanced Communication Module (PROFIBUS)>

TYPE: PUMCP



Fuji Electric Co., Ltd.

INP-TN5A0489a-E

Please Read First (Safety Warnings)

Please read this section thoroughly before using and observe the mentioned safety warnings fully.

Safety warnings are categorized as "Warning", "Caution" or "Risk of Electrical Shock".

⚠Warning	Improper use of the equipment may result in death or serious injuries.
⚠Caution	Improper use of the equipment may cause injury to the user or property damage.
Risk of ⚠Electrical Shock	Indicates that a risk of electrical shock is present and the associated warning should be observed.

⚠ Warning

Installation and Wiring

- This equipment is intended to be used under the following conditions.

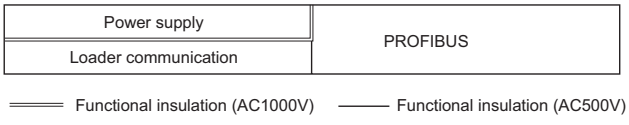
Ambient temperature	–10 to 50 degree C
Ambient humidity	90% RH or below (with no condensation)
Vibration	10 to 70Hz less than 9.8m/s² (1G)
Warm-up time	30 min. or more
Installation category	IEC1010-1: class II
Pollution level	IEC1010-1: degree 2

- Between the temperature sensor and the location where the voltage reaches or generates the values described below, secure clearance space and creepage distance as shown in the table below.

  If such space cannot be secured, the EN61010 safety compliance may become invalid.

Voltage used or generated by any assemblies	Clearance Space [mm]	Creepage Space [mm]
Up to 50 Vrms or Vdc	0.2	1.2
Up to 100 Vrms or Vdc	0.2	1.4
Up to 150 Vrms or Vdc	0.5	1.6
Up to 300 Vrms or Vdc	1.5	3.0
Above 300 Vrms or Vdc	Please consult our distributor	

- For the above, if voltage exceeds 50Vdc (called danger voltage), functional insulation is required between the earth and all terminals of the equipment.
  Note that the insulation class for this equipment is as follows. Before installing, please confirm that the insulation class for equipment meets usage requirements.



- In cases where damage or problems with this equipment may lead to serious accidents, install appropriate external protective circuits.
- To prevent damage and failure of the equipment, provide the rated power voltage.
- To prevent electric shock and equipment failure, do not turn the power ON until all wiring is complete.
- Before turning the power ON, confirm that clearance space has been secured to prevent shock or fire.
- Do not touch the terminal while the machine is ON. Doing so risks shock or equipment errors.
- Never disassemble, convert, modify or repair this equipment.Doing so risks abnormal operation, shock or fire.
- All of the wiring should be class 1 type wiring or the low voltage wires are routed separately from the hazardous voltage wires to ensure separation of circuits.

Maintenance

- When installing or removing the equipment, turn the power OFF. Otherwise, shock, operational errors or failures may be caused.
- Periodic maintenance is recommended for continuous and safe use of this equipment.
- Some parts installed on this equipment have a limited life and/or may deteriorate with age.
- The warranty period for this unit (including accessories) is one year, if the product is used properly.

⚠ Caution

Cautions when Installing

For install in UL listed enclosure only.

Please avoid installing in the following locations.

- Locations in which the ambient temperature falls outside the range of 0 to 50 degrees C when equipment is in use.
- Locations in which the ambient humidity falls outside the range of 45 to 85% RH when equipment is in use.
- Locations with rapid temperature changes, leading to dew condensation.
- Locations with corrosive gases (especially sulfide gas, ammonia, etc.) or flammable gases.
- Locations with vibration or shock directly.
- Locations in contact with water, oil, chemicals, steam or hot water.
  (If the equipment gets wet, there is a risk of electric shock or fire, so have it inspected by Fuji distributor.)

- Locations with high concentrations of atmospheric dust, salt or iron particles.
- Locations with large inductive interference, resulting in static electricity, magnetic fields or noise.
- Locations in direct sunlight.
- Locations that build up heat from radiant heat sources, etc.
- A switch or circuit breaker shall be included in the building installation. Please be it in close proximately to the equipment and within easy reach of the operator, and mark it as the disconnecting device for the equipment.

Cautions when Mounting to Cabinets/DIN Rails

- In case of mounting the temperature controllers to DIN rails, remember to push up the locking tabs to fasten the controllers onto DIN rail.
- To connect controllers, first release all locking tabs. Then, connect controllers and push up all locking tabs. Make sure that all locking tabs are fastened.
- Never fail to turn the power OFF, before detaching the terminal block or removing the main unit from the base part.
- In order to aid heat dissipation, do not block the top and the bottom of the equipment.
- When mounting/dismounting controllers to /from DIN rails, 30mm of clearance above and under the controllers should be provided.

Cautions for Wiring

- For wiring to the terminal block, apply crimp type terminals size M3.
  Use terminal screws in this product only.
  Screw size: M3×7 (with square washer)
  Screw tightening torque: 0.78 N • m (8kgf • cm)
- To avoid the influence of inductive noise, input signal wires should be separated from electric power lines or load lines.
- To comply with CE marking (EMC), we recommend to attach ferrite core to communication cable and power cable.

Error Operation

- The alarm function does not work properly when an error occurs unless the settings are made correctly. Always verify its setting before operation.

Others

- Please do not wipe the equipment with organic solvents such as alcohol or benzene, etc. If wiping is necessary, use a neutral cleaning agent.
- Do not use mobile phones near this equipment (within 50cm). Otherwise a malfunction may result.
- Malfunctions may occur if the equipment is used near a radio, TV, or wireless device.
- This equipment requires approx. 20 seconds before it starts to output.
- Before installing and wiring, take necessary measures for electrostatic discharge (ESD).
- The power supply for this product is 24V DC. Please use the power source of appropriate volume depending on the number of units you connect.
  Recommended power supply:
  Cosel Electronics Co., Ltd. PBA Series
  Omron Corporation S8VM Series

Contents

1 Overview

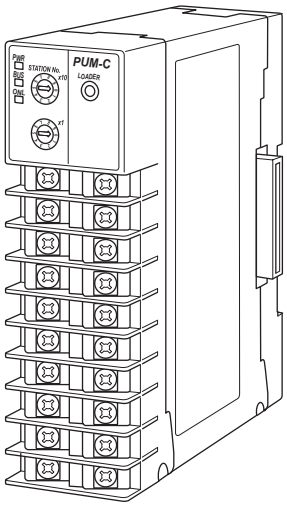
1.1 Overview

An Enhanced communication module, PUMCP is for enabling the control equipment which is compatible with PROFIBUS-DP protocol (hereinafter PROFIBUS-DP master equipment) and a multi-loop module type temperature controller, PUM series, to communicate each other using PROFIBUS communication.

Point

PROFIBUS communication is the protocol that is approved by International Standard "IEC61158" and European Norm "EN50170", and communication of max.12Mbps and Max.108 words is possible by employing the master-slave mode.

Using side connectors for the enhanced communication module, PUMCP, or the temperature control module(PUM series) are connected enables a wiring to only one power terminal and a labor saving wiring.



Hereinafter, PUMCP will be also referred as to “the equipment” or “PROFIBUS module”.

Confirming Accessories

Before using the product, please confirm that all of following accessories are included.

Description	Quantity
Temperature Controller Enhanced Communication Module (The equipment)	1 unit
Instruction Manual (Installation)	1 copy

1.2 Model Code

PROFIBUS Module

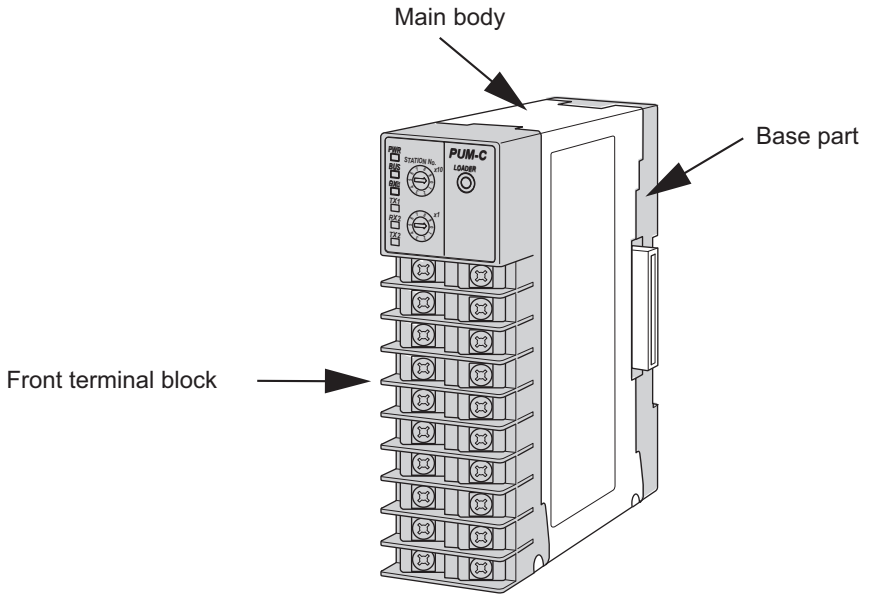
1	2	3	4	5	6	7	8		9	10	Contents
P	U	M			Y	Y	1	–	0		
											Module type
			C								Enhanced communication module
											Communication functions
				P							PROFIBUS communications
											Instruction manual
									A		Japanese
									B		English

Accessories (Optional)

1	2	3	4	5	6	7	8		Contents
P	U	M	Z	*					
					A	0	2		DIN rail mounting endplate
					A	0	3		Side connecting terminal covers (right & left 1set)
					A	0	4		Front face screw terminal cover
					L	0	1		Loader connecting cable (RS-232C)

1.3 Part Names and Functions

External View



Front Terminal Block

The front terminal block consists of screw terminals, a loader communication port, a station No. configuration switch and LED indicator lamps.

- The front terminal block is removable from the main body through one-touch operation.

Main Body

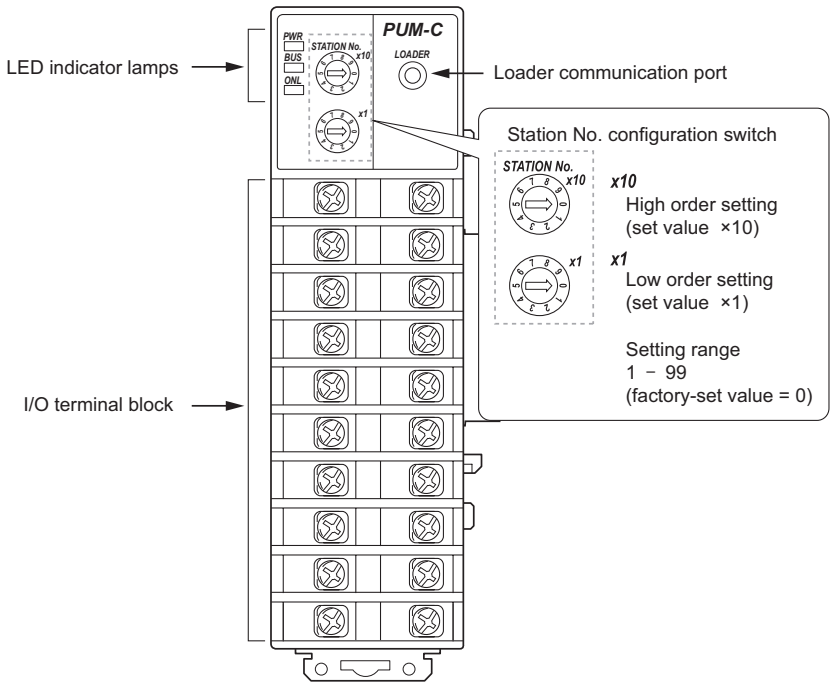
It is the main body of a module containing circuits for PROFIBUS.

- The main body is removable from the base part through one-touch operation.
- Communication behavior configuration switches are on the back face (the base part).

Base Part

The base part consists of power terminals, module connectors for connecting modules and the structure of fixing a module to DIN rails.

Front Terminal Block



LED Indicator Lamps

LED lamps indicate the following operational conditions.

LED	Green	Red	Orange
PWR	ON: Normal operation Blinking (0.5-sec period): During initial polling Blinking (1.0-sec period): Waiting initial polling	ON: PROFIBUS Error Blinking (0.5-sec period): All of temperature control modules dropped out Blinking (1.0-sec period): Parameter/SW setting registered on communication module is invalid value	—
BUS	ON: Inter-module communication being sent	—	ON: Inter-module communication being received
ONL	ON: During PROFIBUS communication Blinking (0.5-sec period): PROFIBUS communication is in a standby state	—	—

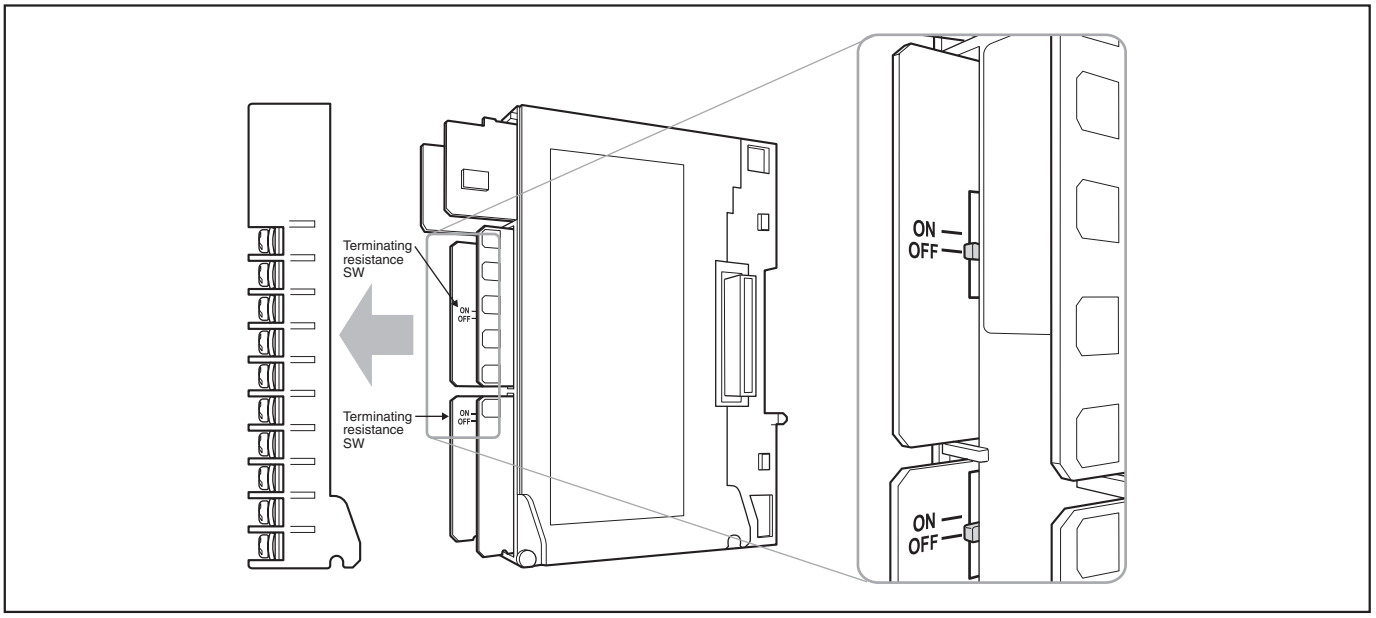
Loader communication port

Connecting the equipment to the PC that is installed PUM parameter loader software with a loader connecting cable (optional).

Station No. configuration switch

Set the station number (0 to99) to this equipment. If set "0", it comes to be the station number set by PROFIBUS communication St. No. parameter ▶▶ 5-3 .

Main part (Front face)

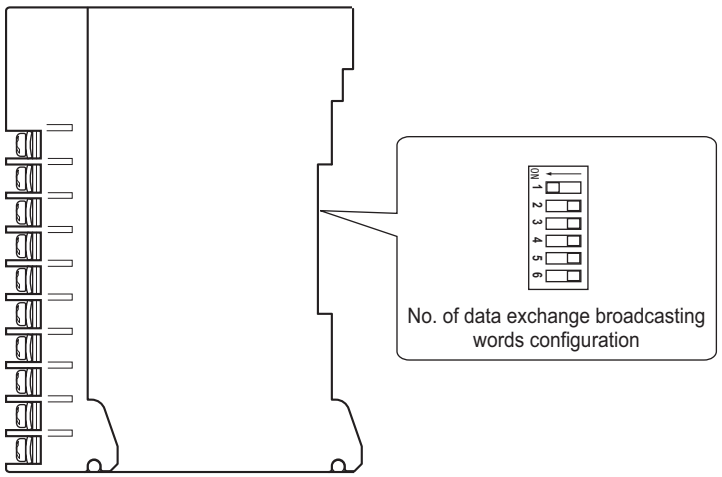


PROFIBUS terminating resistance

For PROFIBUS module, a terminating resistance should be set depends on the place that PROFIBUS communication line is installed.

Slide up (towards ON) 2 switches showed in the figure above to turn ON the terminating resistance of PROFIBUS module.

Main part (Back face)



No. of data exchange broadcasting words configuration switch

No. of data exchange broadcasting words is set by DIP switch (SW1 to SW3) on the back face of the module.

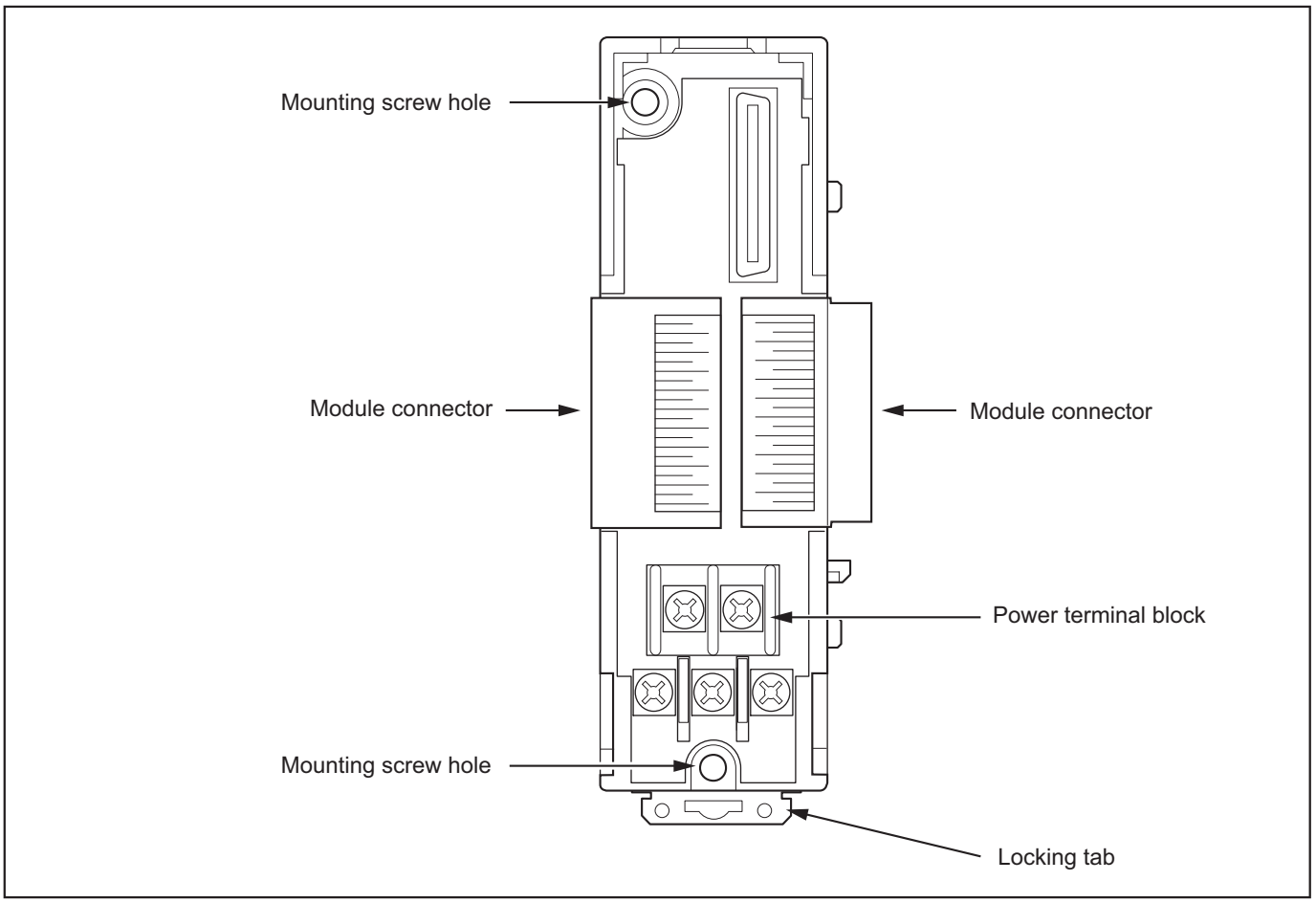
SW No. *1			Functions
1	2	3	
OFF	OFF	OFF	Parameter specification is enable (Loader specification)
ON	OFF	OFF	8-word communication *2
OFF	ON	OFF	16-word communication *2
ON	ON	OFF	32-word communication *2
OFF	OFF	ON	64-word communication *2
ON	OFF	ON	108-word communication *2
OFF	ON	ON	using banned *3
ON	ON	ON	using banned *3

*1 : SW4 to SW6 are not used

*2 : No. of words to be sent/received are same

*3 : SW setting error occurs

Base Part



Module connector

These connectors are for connecting modules laterally.

Power terminal block

The power terminal block is for connecting the equipment to a module's power supply.

Connection with the only one module enables all modules to be supplied power via module connectors.

Locking tab

The locking tab is for fastening a module to DIN rails and fastening each module connected laterally when mounting a module to DIN rail.

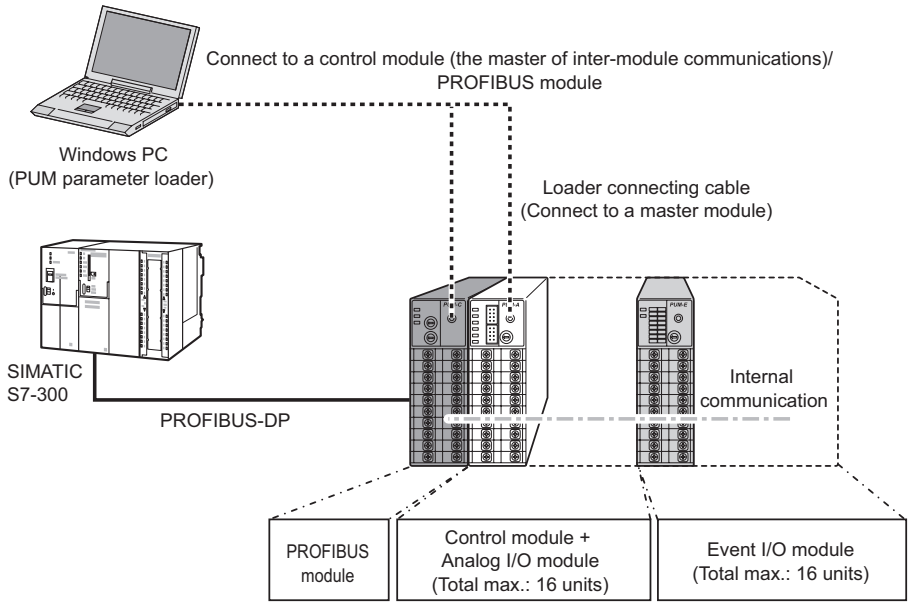
2 System Configuration Example

2.1 System Configuration Example

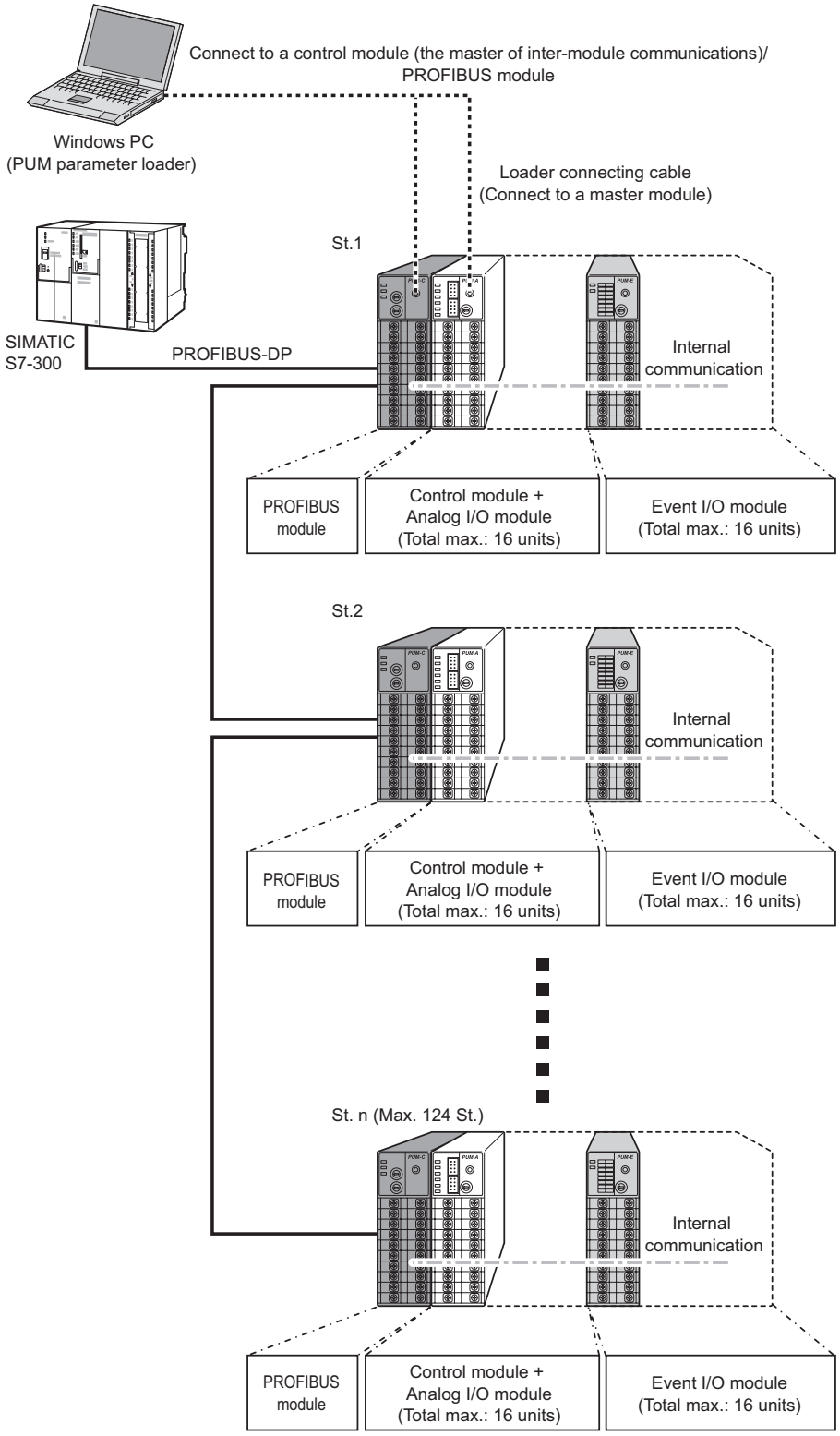
The figure below shows the example of system configuration connecting PLC and the multi-loop module type temperature controller.

- Data in a control module/an event module is possible to read out/write from/into PLC using PROFIBUS module.
- No. of PROFIBUS modules subtracting no. of CPU units from 1 to 125 units are connectable to 1 port of CPU unit.

Usage example of SIMATIC S7-300 made by SIEMENS (Example of 1 unit)



Usage example of SIMATIC S7-300 made by SIEMENS (Example of several units)



Point

- Connecting several PROFIBUS modules to 1 port on the CPU unit enable a module type temperature controller system to be set up dispersively.
- When using several units, slide both of the terminating resistance switches of PROFIBUS module located on the end of unit up towards ON. Slide both of the terminating resistance switches down towards OFF. If the equipment located on the end of unit is not PROFIBUS module, all terminating resistance switches of PROFIBUS module in the unit should be OFF.
- Control or Analog I/O module station number (“1” to “16”)

  For proper communication, station number configuration is required. Set the leftmost module to “1” and set the rest of modules to “2” to “16” consecutively starting from the left. Make sure not to duplicate station numbers in the system.

- Event I/O module station number (“17” to “32”)

  Event I/O module station number always starts from “17” and be set to the rest of unit consecutively form “18” to “32”. Make sure not to duplicate station numbers in the system.

- To use a PROFIBUS module, “connection permission of enhanced communication module (PUMCP)” parameter should be set to “1: PUMCP connected (RS-485:disable)” with the PUM parameter loader.

Basic Setting Items

With this configuration, the following settings are required.

- Communication module station number setting ▶▶ 5-3
- Memory setting ▶▶ 5-4
- RS-485 communication setting ▶▶ "Control module user’s manual"
  ▶▶ "Event module user's manual"
  ▶▶ "Analog module user’s manual"

3

Installation

3.1 Installation Procedure

The flowchart below shows the setting procedure for startup via PUM parameter loader.

PUM Configuration and Installation

- Connection permission for an enhanced communication module should be set to “connected” with all temperature control modules of the system. (Control/Event/Analog module)
- When setting parameters for a PROFIBUS module, connect PUM parameter loader to PROFIBUS module directly.

1 Installation

Confirm installation dimensions

●External dimensions ▶▶ 3-5

Decide installation method

●DIN rail mounting ▶▶ 3-8

●Mounting with screws ▶▶ 3-12

Connect the temperature control module performs communication with PROFIBUS-DP master equipment on the right of the PROFIBUS module. ▶▶ 3-9

●Connecting modules

2 Wiring

It is for power supply to the connection between PROFIBUS module and PROFIBUS-DP master equipment, and PROFIBUS module. Turn OFF all the power of the equipment or any other modules, when wiring.

●Connection with PROFIBUS-DP master equipment ▶▶ 3-13

●Wiring for power supply ▶▶ 3-27

▶▶ See “Manual of PROFIBUS-DP master equipment” about wiring for PROFIBUS-DP master equipment.

3 Loader soft preparations for PUM

Prepare a loader connecting cable between the PC installed a PUM parameter loader, PC and PROFIBUS module or a temperature control module.

▶▶ See “Parameter loader for PUM use’s manual”

4 Temperature control module setting

Set the “enhanced communication module (PUMC) connection permission” parameter of the temperature control module connected to PROFIBUS module to “1: PUMC connected (RS-485: disable)”.

▶▶ See “Control module user’s manual 3.1 Installation procedure”.
See “Event module user’s manual 3.1 Installation procedure”.
See “Analog module user’s manual 3.1 Installation procedure”.

* In order to install the parameter loader of the temperature control module, connect a parameter loader for a PUM directly to the loader communication port.
One-unit connection: Connect to the only module.
Several-unit connection: Connect to the module set as a “master” by “Connected module master/slave setting” parameter.

Go to the next page

Continued from the previous page

5 PROFIBUS module setting

This setting is for performing communication between PROFIBUS module and PROFIBUS-DP master equipment.

- ●St. No. configuration SW setting ▶▶ 1-6
- ●Setting of No. of data exchange broadcasting words setting SW ▶▶ 1-8

Register parameters of the temperature control module that reads/writes form PROFIBUS-DP master equipment.

- ●PROFIBUS module St. No. setting ▶▶ 5-3
- ●PROFIBUS communication setting for "output area" ▶▶ 5-5
- ●Output area device size ▶▶ 5-5
- ●PROFIBUS communication setting for "input area" ▶▶ 5-7
- ●Input area device size ▶▶ 5-7
- ●Output area entry St. No ▶▶ 5-6
- ●Output area entry register No. ▶▶ 5-6
- ●Input area entry St. No. ▶▶ 5-8
- ●Input area entry register No. ▶▶ 5-8

* When setting the parameters of a PROFIBUS module, connect a parameter loader for PUM directly to the loader communication port on the PROFIBUS module.

6 PROFIBUS-DP master equipment setting

This setting is for PROFIBUS-DP master equipment. ▶▶ 3-13

- ●St. No. setting
- ●Setting of no. of communication words
- ●Communication speed setting
- ●Address setting

*St. No. and No. of words should match the setting of PROFIBUS module.

▶▶ See “Manual of PROFIBUS-DP master equipment” for the advanced setting.

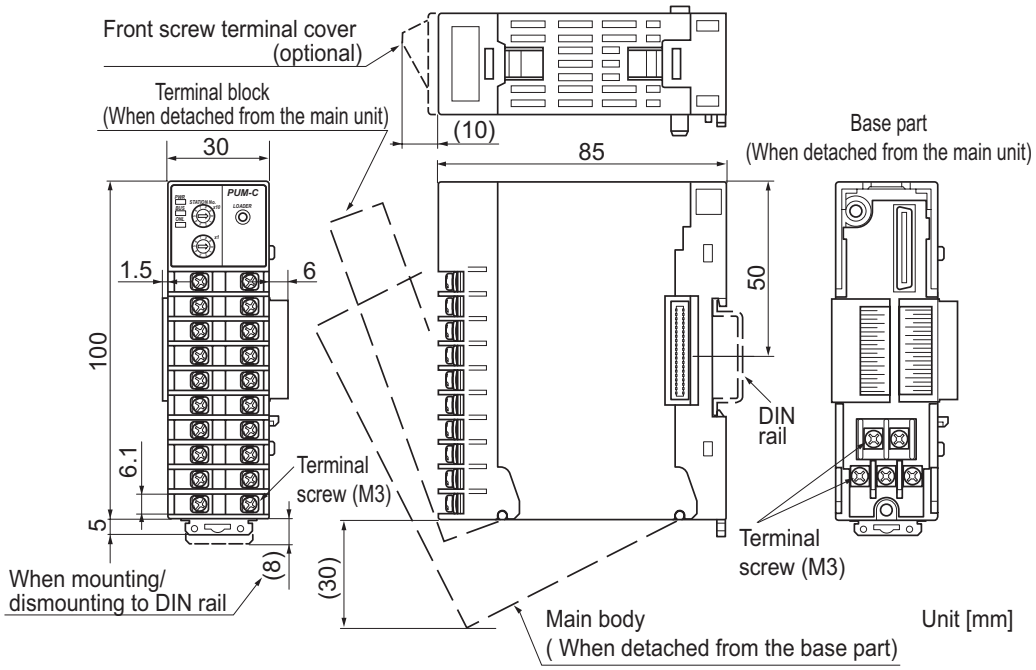
7 Communication behavior between PROFIBUS-DP master equipment and PROFIBUS module

- ●I/O communication behavior ▶▶ 4-3 to 4-15
- ●Window communication behavior ▶▶ 4-3 to 4-15

3.2 Dimensions

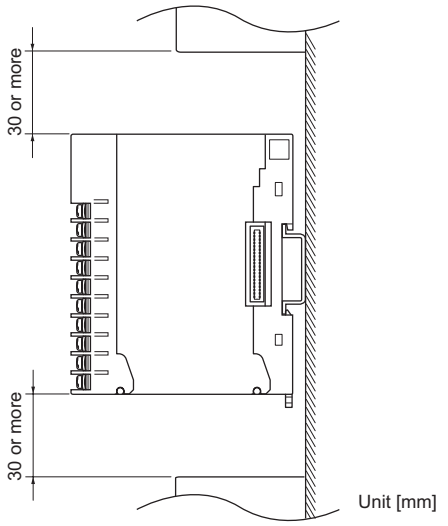
External dimension

Provide enough clearance space for installation referring to the diagram below.



Caution when mounting

In order to heat dissipation, provide clearance space of more than 30mm (50mm is recommended) above and under the equipment.



Point

Clearance space more than 30mm above and under a module should be provided when mounting/dismounting it to/from DIN rails.

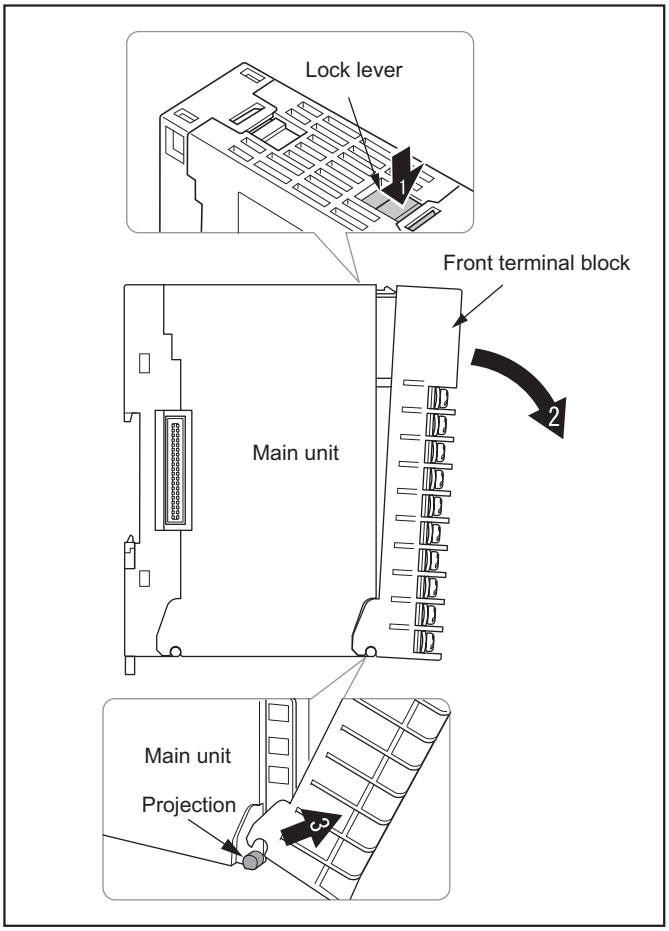
3.3 Mounting Modules

How to attach/detach the front terminal block/the base part from the main unit

Each module of Multi-Loop Module Type Temperature Controller, PUM series, has the configuration that both the front terminal block and the base part are detachable through one-touch operation for easy installation and maintenance.

How to detach the front terminal

1. Press the lock lever on the top of the main unit.
2. Pull down the front terminal block.
3. Detach the cutout at the lower end of the front terminal block from the projection on the main unit.



Point

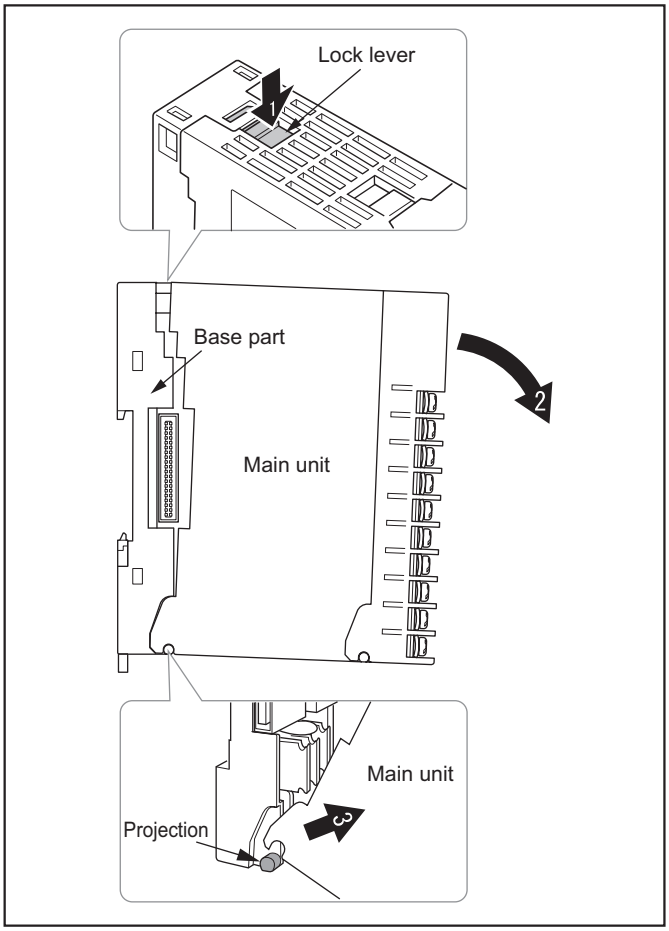
- Attaching the main unit to the base part takes the reverse procedure to removing the main unit from the base part.
- Make sure the locking lever on the main unit is fitted into the base part when attaching is completed.

How to detach the base part

1. Press the Lock lever on the top of the main unit.
2. Pull down the main unit.
3. Remove the cutout at the lower end of the main unit from the projection on the base part.

Point

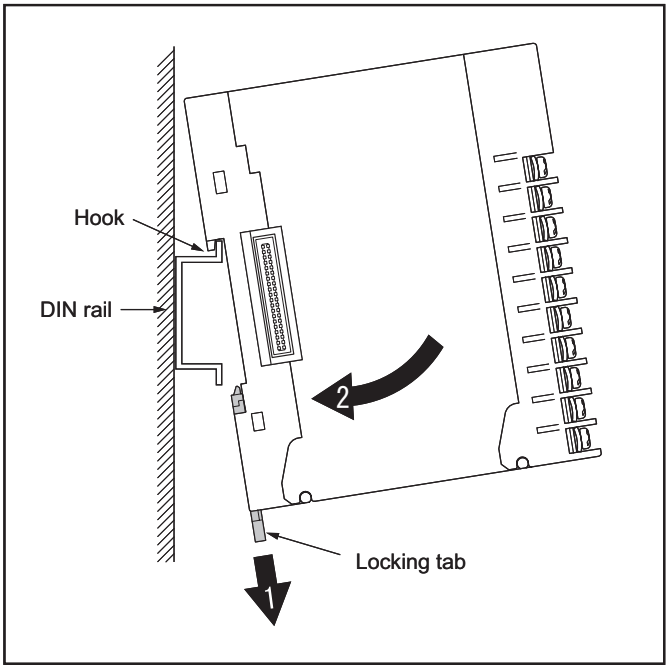
- Attaching the base part to the main unit takes a reverse procedure to detaching the base part from the main unit.
- Make sure the locking lever on the main unit is fitted into the base part when attaching is completed.



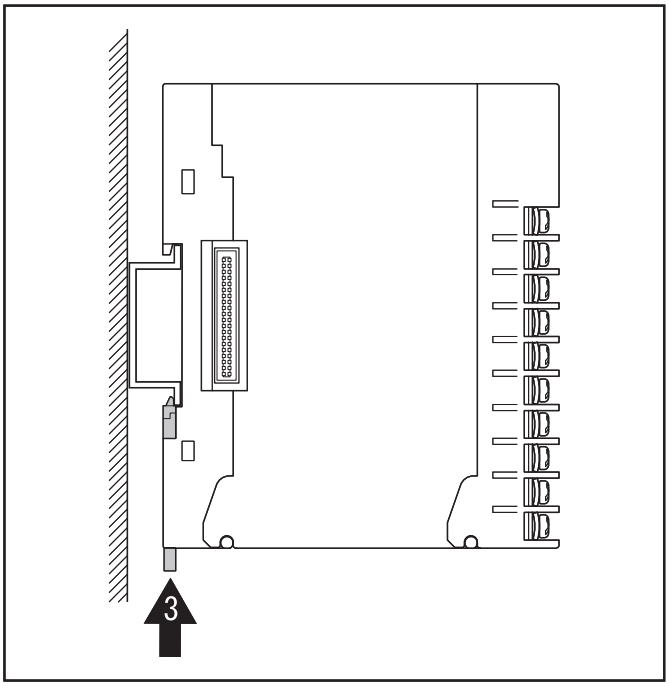
Mounting to DIN Rails

Mounting modules

1. Pull down the locking tab of the base part. Hook the back part of the module onto the upper part of the DIN rails.
2. Push the module towards the direction of the arrow 2.



3. Pull up the locking tab of the base part to fasten the module onto the DIN rails.

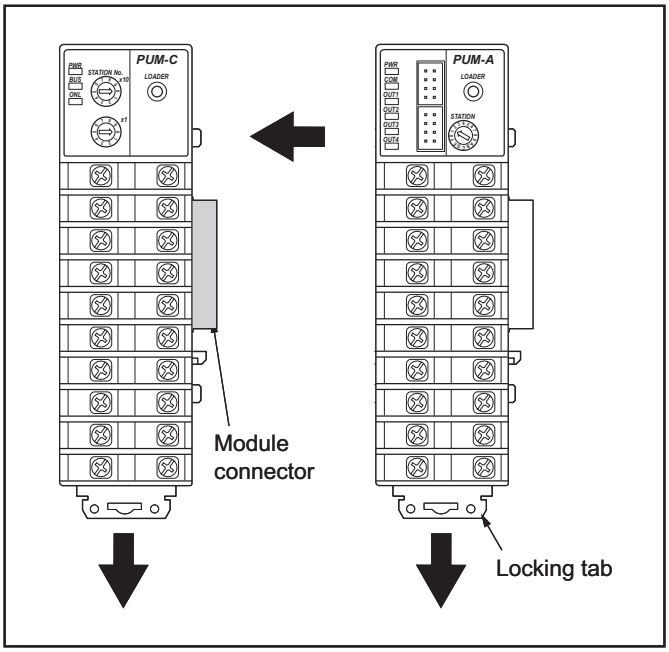


Point

- When connecting the module after mounting it to the DIN rail, pull the locking tab up after connecting modules each other.

Connecting modules

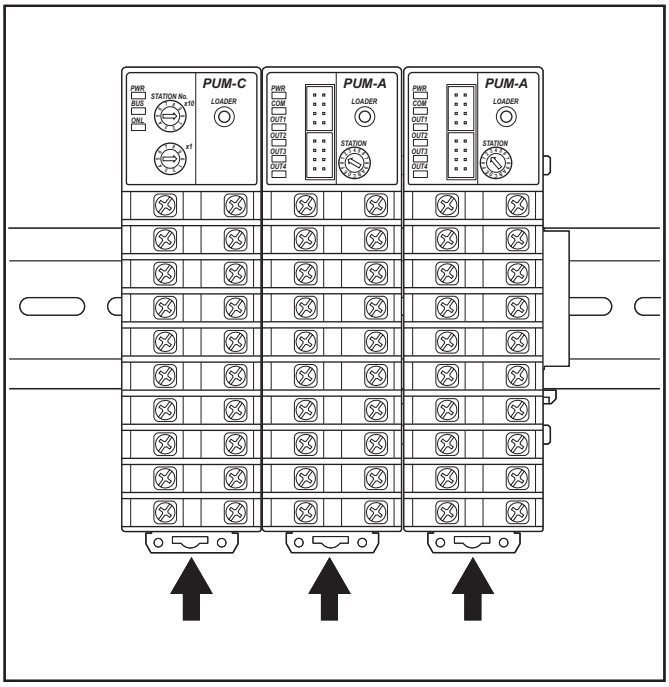
1. Check the locking tab is pulled down.
2. Connect modules by connecting module connectors with each other.



3. After mounting modules to the DIN rails, pull the all locking tabs up.

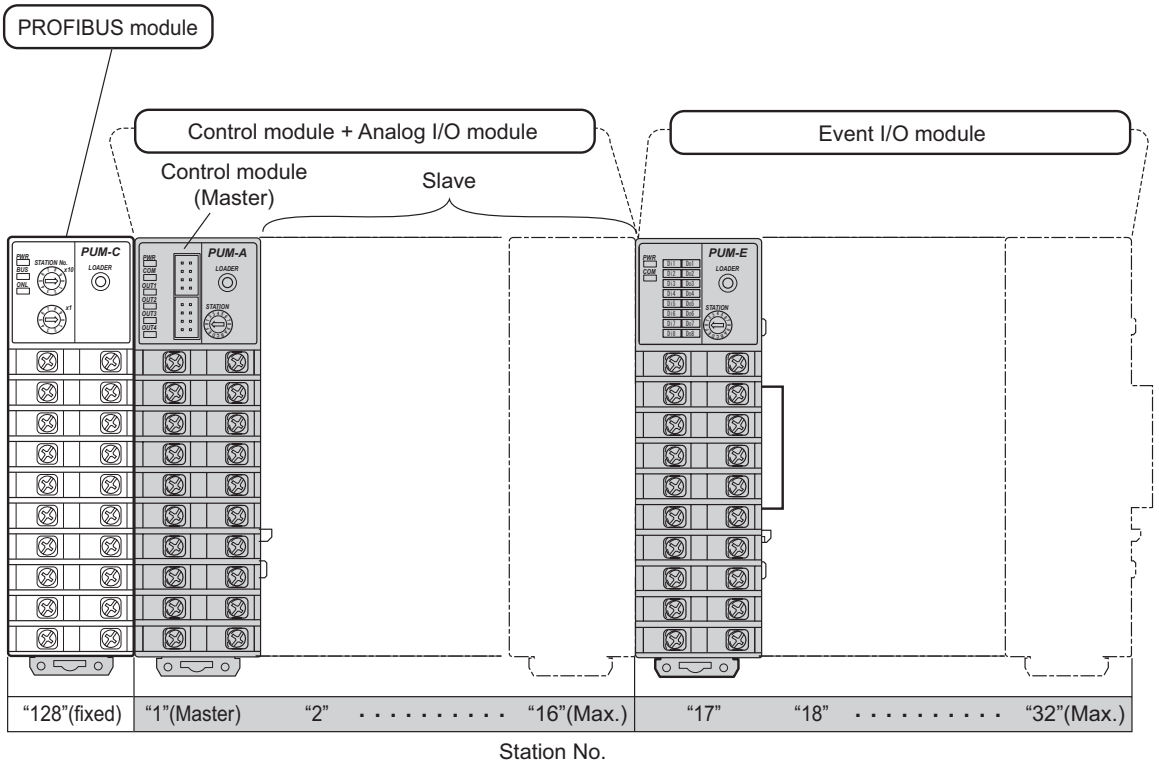
   Modules are fastened to the DIN rails and to each other on the same time.

4. The power supplies are connected each other inside connected modules.



Order of modules

Connecting a multi-loop module type temperature controller, PUM series, is shown as below.



Point

PROFIBUS module is always placed on the extreme left.

- PROFIBUS module should be on the left of the master control module: it is always placed on the left.

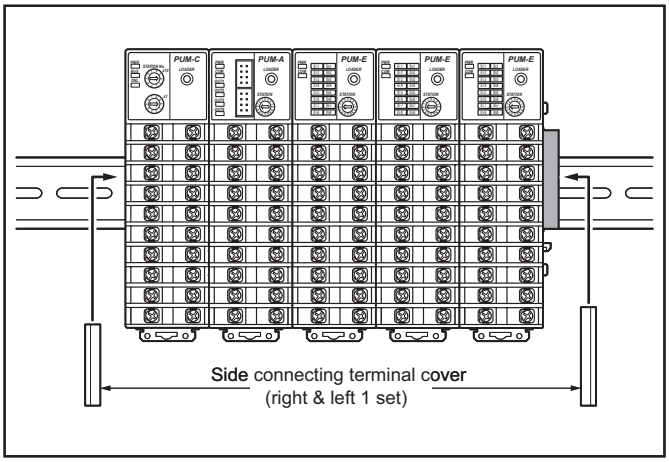
Modules are basically placed in the order of station numbers starting from the left.

- Set station number "1" to "16" to control modules and analog I/O modules. Max. 16 units are connectable. Make sure not to duplicate station numbers in the same system.
- When setting a master/a slave, the control module set to "1" should be a master. When not using PROFIBUS module, a master module should be placed on the extreme left of the system.
- Set station numbers for event I/O modules to "17" to "32". Max. 16 units are connectable.Make sure not to duplicate station numbers in the same system.

3.4 Attaching accessories (optional)

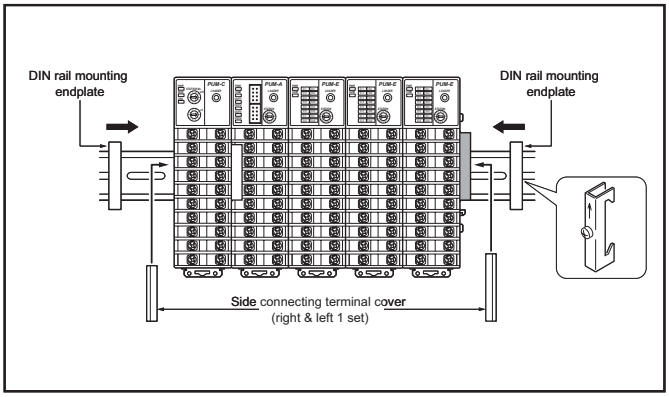
Attaching side connecting terminal covers

Side connectors on both ends of connected modules are exposed. To prevent accidents and protect connectors, attaching side connecting terminal covers (PUMZ * A03) is recommended.



Attaching endplates

In order to fix the equipment to a DIN rail more tightly, optional endplates (PUMZ * A02) can be used.



Note

- When attaching endplates, make sure to attach side connecting terminal covers prior to them.

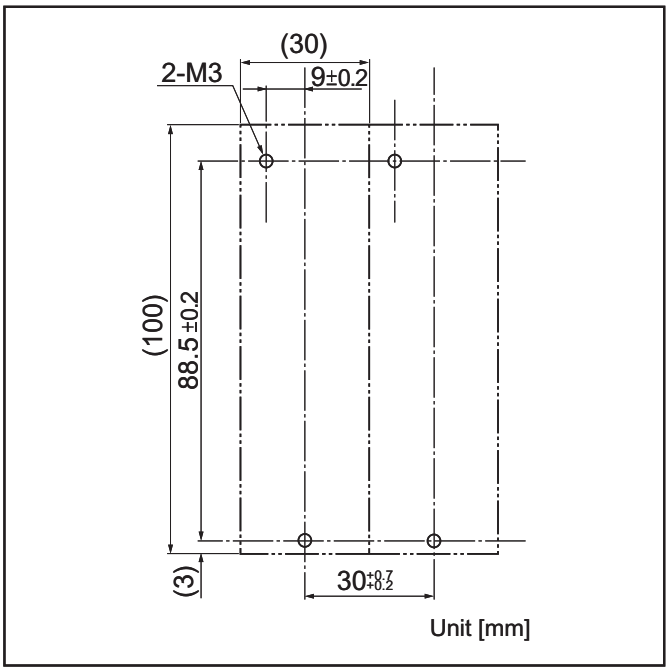
3.5 Mounting with screws

When mounting modules with screws on the wall, check for the base parts of it beforehand.

Point

- Mounting screws are not included the product. If necessary, prepare two screws (M3) per unit.

1. Refer to the right figure for mounting screw hole size and the pitch, to decide the mounting position.



2. Remove the module main unit from the base part.

   [3.3Mounting modules] ▶▶ 3-6

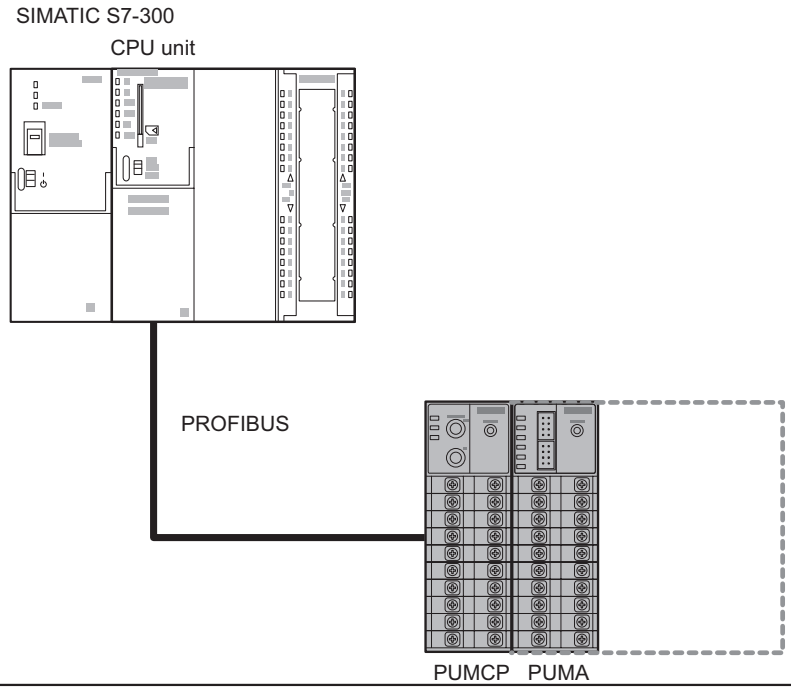
3. Connect the base parts and push the all locking tabs up to fix.
4. Fixate the base parts onto the mounting position with screws.
5. Fixate the base parts onto the mounting position with screws.

3.6 Connection

Connection with PROFIBUS-DP master equipment

Connect a PUM series Temperature control system to PROFIBUS-DP master equipment (Ex. PLC) via the equipment.

Usage example of SIMATIC S7-300 made by SIEMENS



Warning

Connect/separate PUM series, Temperature control system to/from PLC after turning OFF the power of the equipment or peripheral equipments to prevent electric shock and equipment failure.

Point

The communication speed and the maximum transmission distance are shown as below.

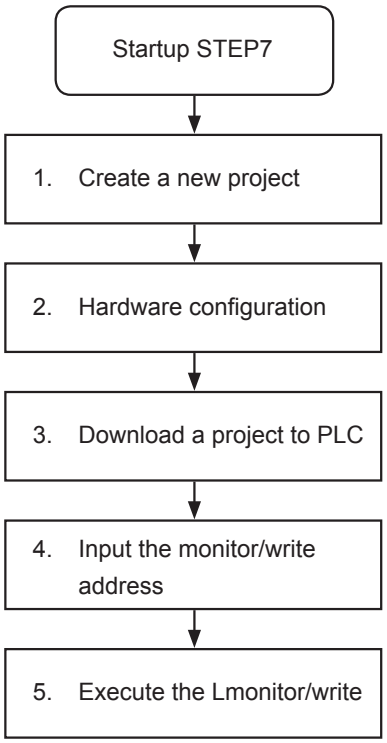
The communication speed and the maximum transmission distance

Communication speed setting	93.75kbps or less	187.5kbps	500kbps	1.5Mbps	3M/6M/12Mbps
Communication distance	1200m or less	1000m or less	400m or less	200m or less	100m or less

PROFIBUS-DP master equipment setting

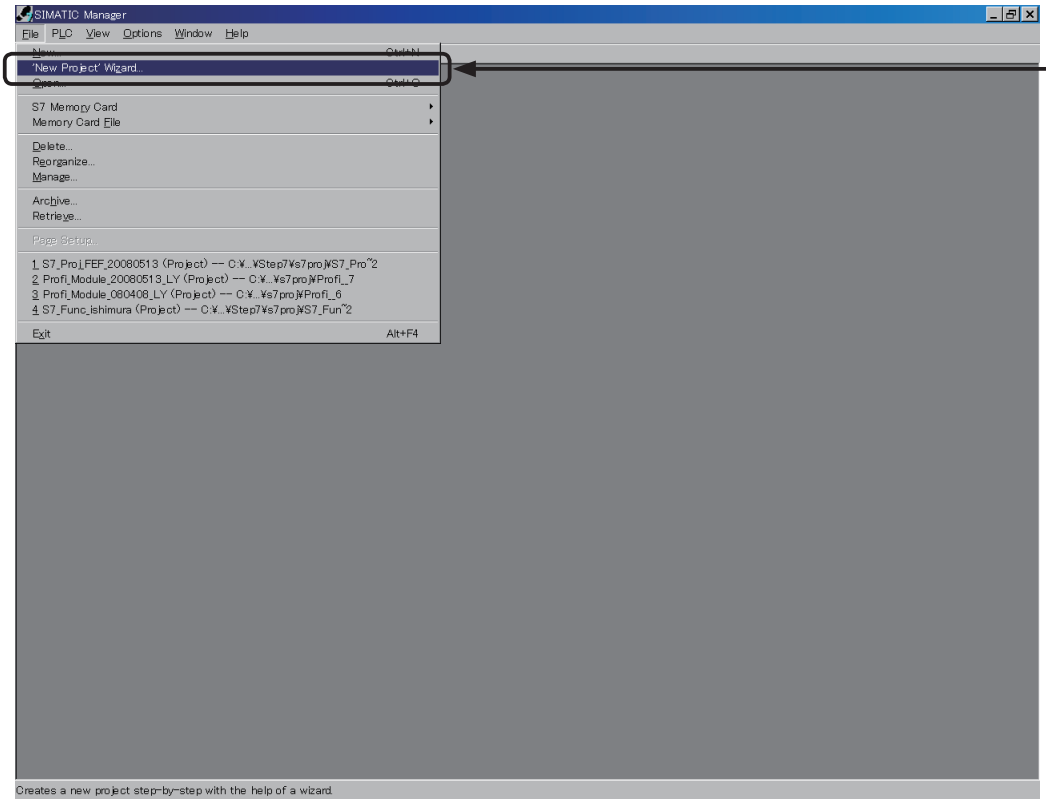
The usage example procedure when using SIEMENS SIMATIC S7-300, programming software STEP7 as the master equipment is shown below. Refer to the manual of Programming software STEP7 for details.

Setting procedure is as follows.



1. Creating a new project

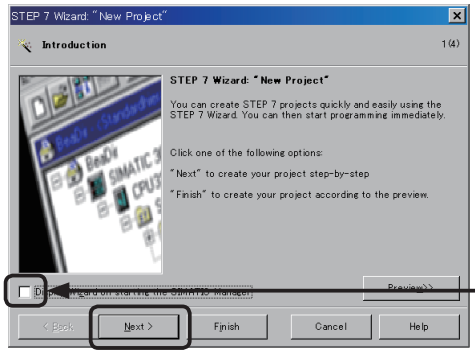
(1) Startup the New Project Wizard.



Click [File] - [New Project Wizard] in the Menu.

(2) STEP7 Wizard Screen

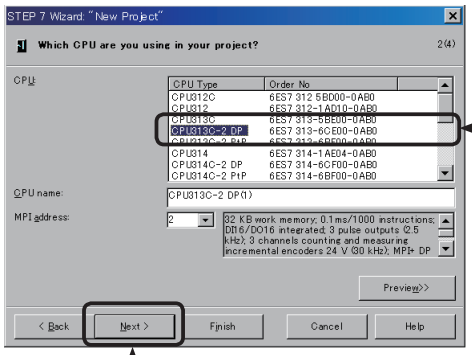
This screen appears at the first time only. Uncheck the checkbox at the bottom of the screen in order not to make it appear from the next time.



Uncheck the checkbox, and click [Next].

(3) CPU types setting screen

Select the CPU type

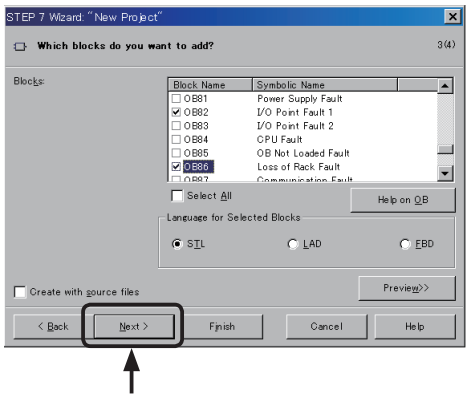


Select the CPU type to be used

Click [Next].

(4) Block select screen

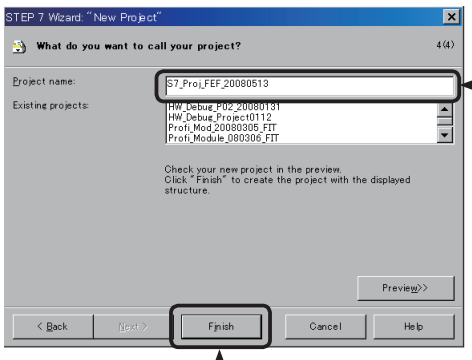
Select the data block to be added.



Click [Next] without changing the initial display information.

(5) Project name setting screen

Set the name for the created project.

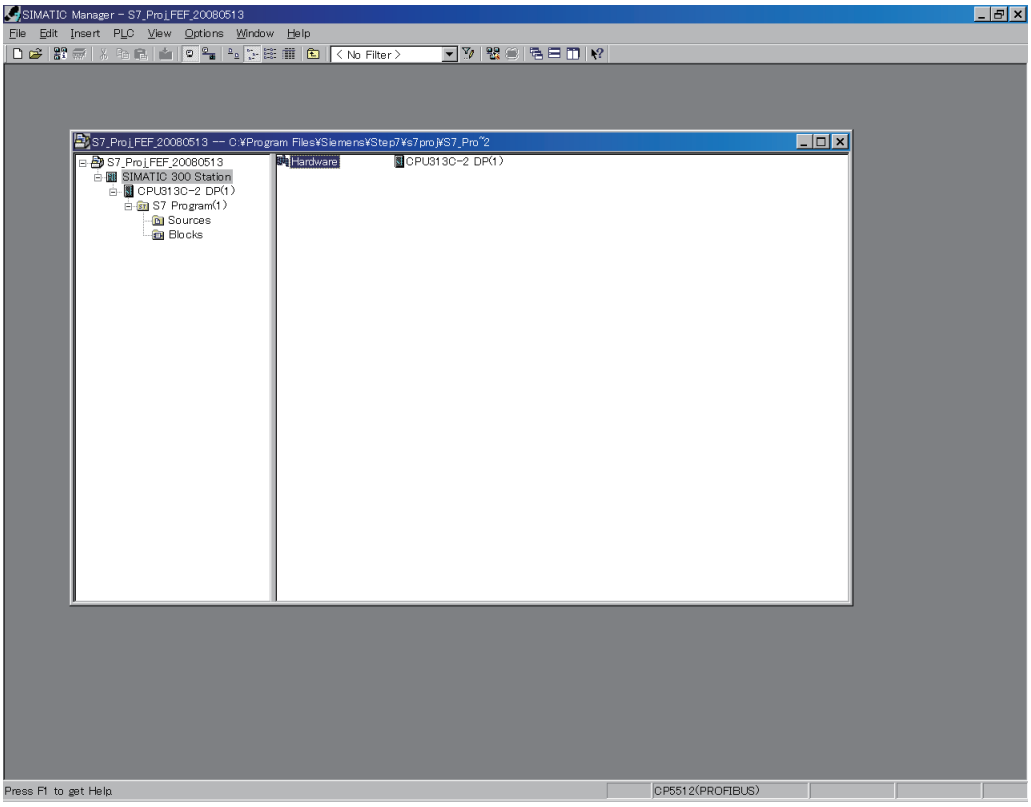


Enter the arbitrary project name.

Click [Finish].

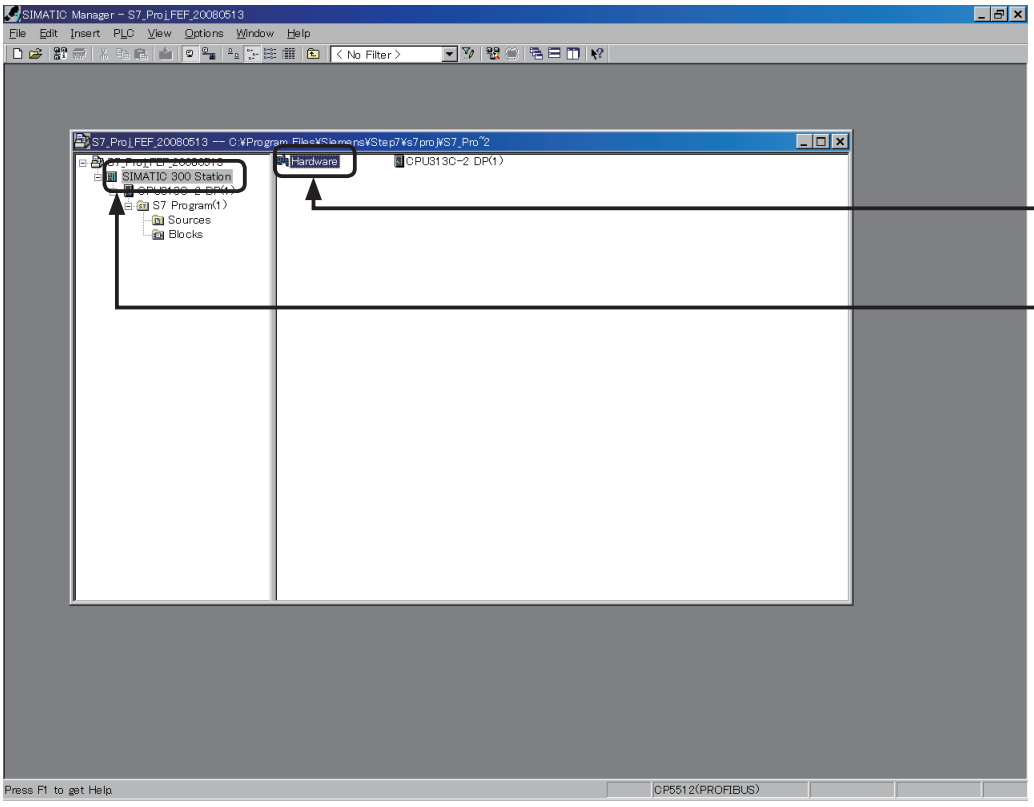
(6) Completion of a new project creation

The project was created newly and displayed on the SIMATIC Manager screen.



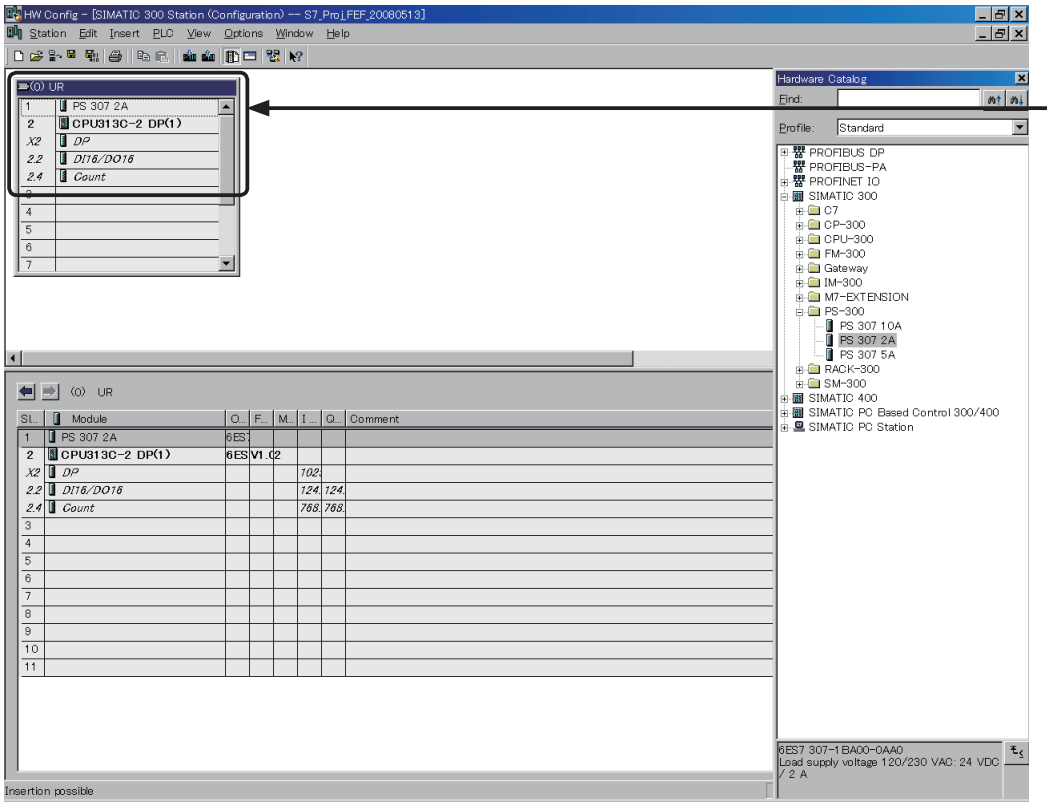
2. Hardware configuration

(1) Startup Hardware Configuration.



(2) Hardware Configuration setting

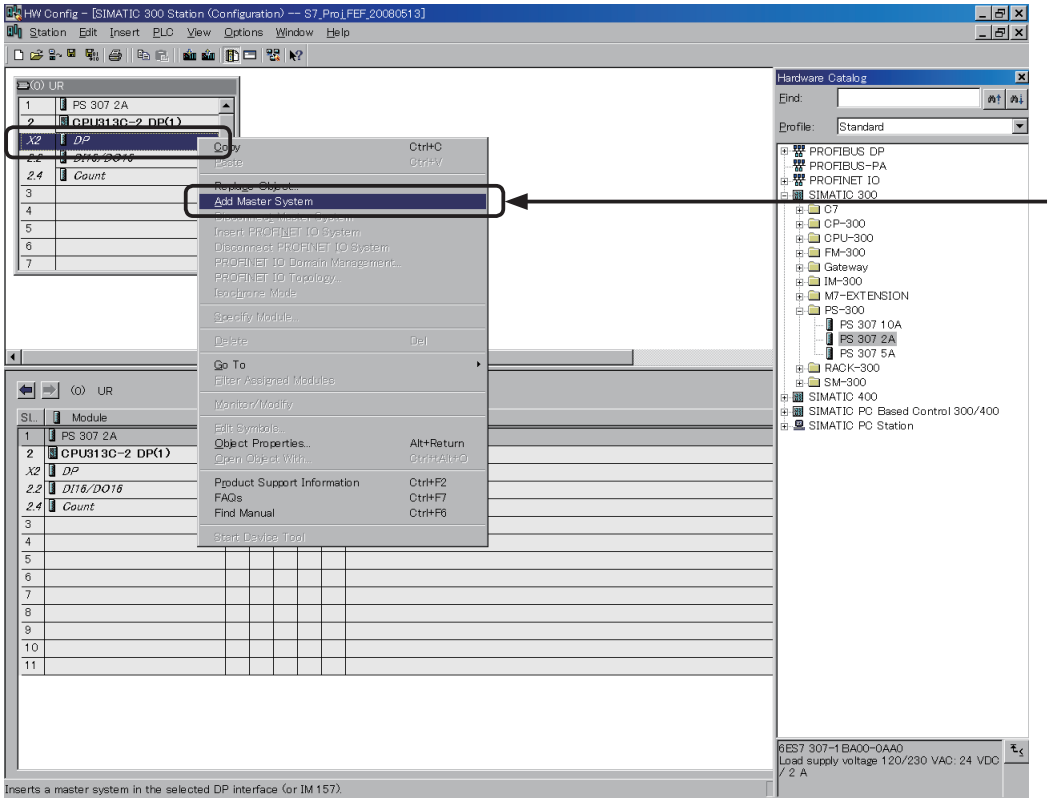
Hardware configuration startups, and setting hardware configuration.



Execute the hardware configuration setting that meets the hardware requirements.

(3) PROFIBUS-DP setting

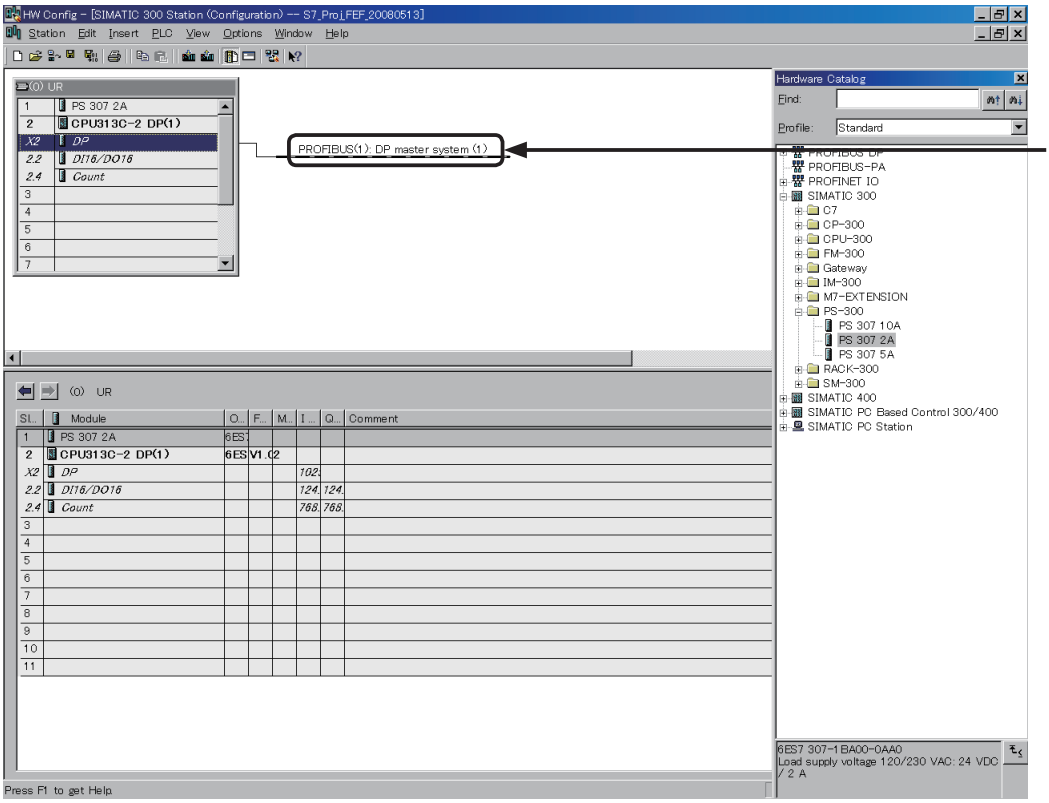
Add the PROFIBUS-DP master system.



Right-click [DP], and click [Add Master System].

(4) Addition result screen of ROFIBUS-DP master system

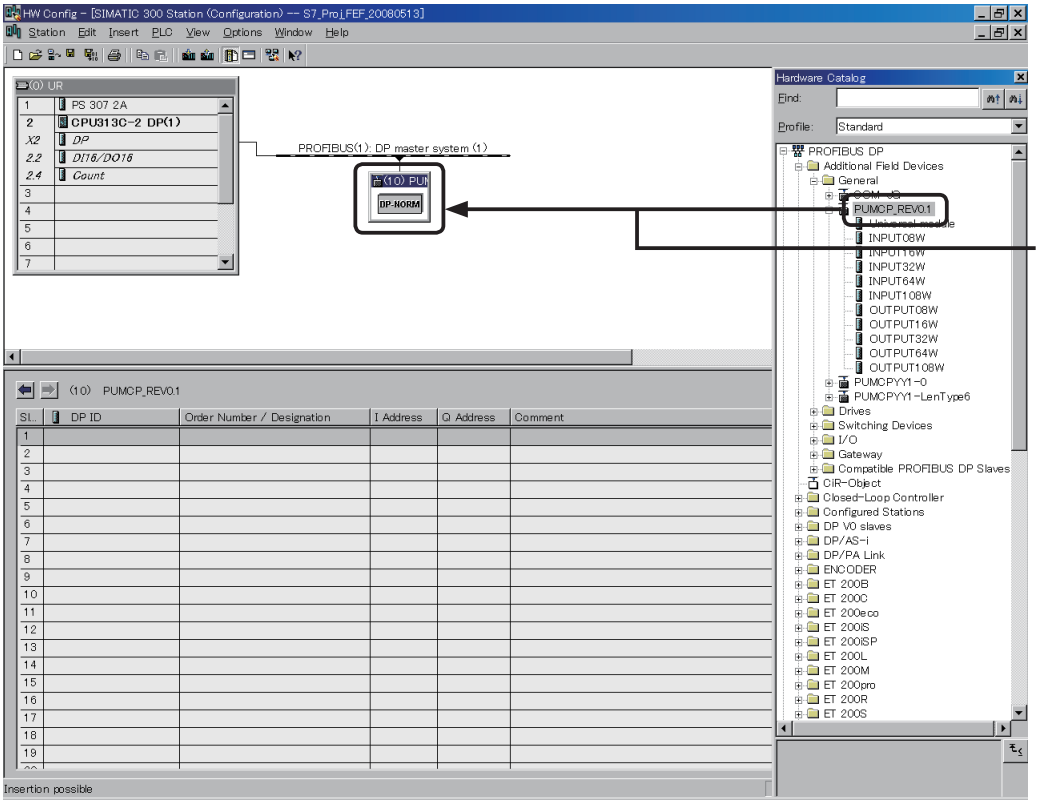
PROFIBUS-DP master system screen added by the procedure (3) is displayed on the screen.



PROFIBUS-DP line (Black-and-white line like a railway line) is displayed.

(5) DP slave registration

Register the DP slave (this equipment) to the PROFIBUS-DP master system.

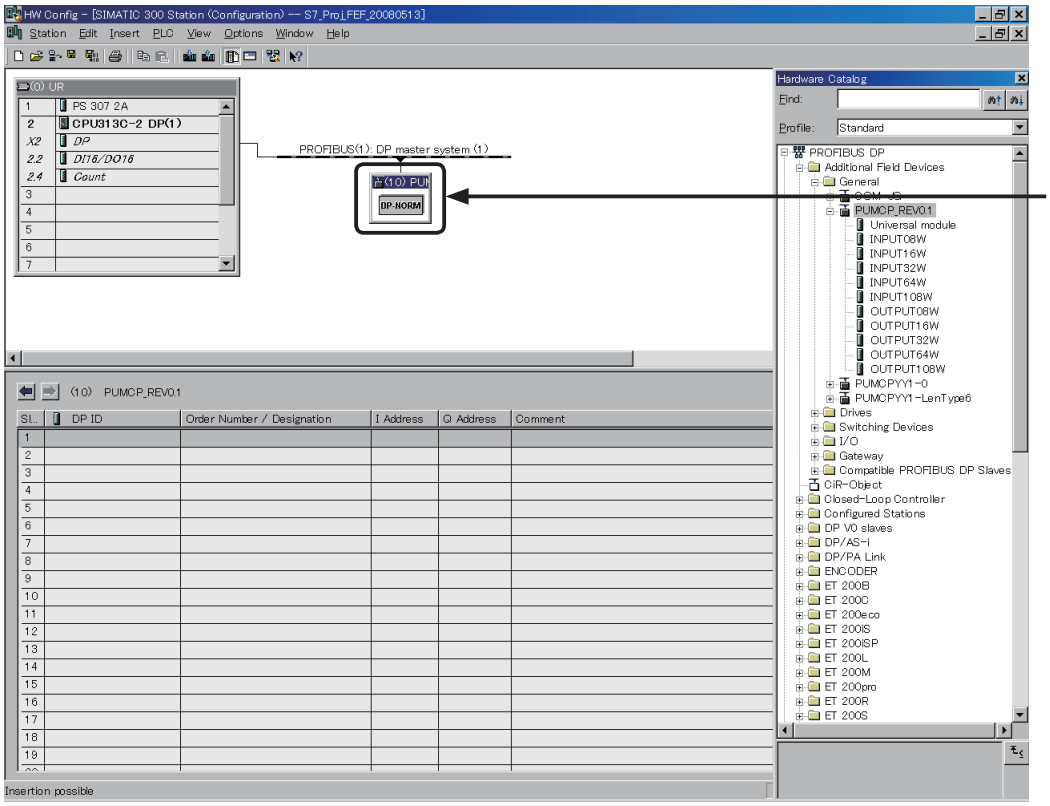


Select [PUMCP_REVx.x] from the Hardware Catalog, and drag and drop it to the PROFIBUS-DP line.

* You need to install the GSD file prior to this operation. You can download the GSD file from our website (http://www.fic-net.jp/eng/) (Refer to the manual of STEP7 for installation).

(6) PROFIBUS communication St. No. registration

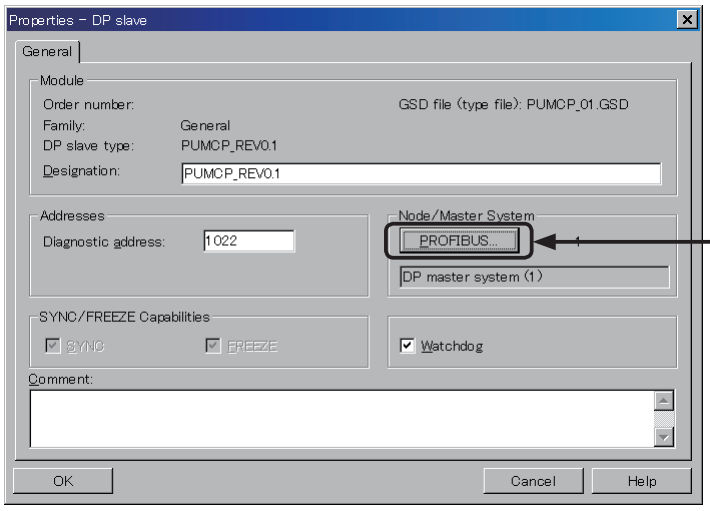
Display the PROFIBUS communication St. No. registration screen.



Double click the slave registered by the procedure (5).

(7) PROFIBUS-DP slave property screen

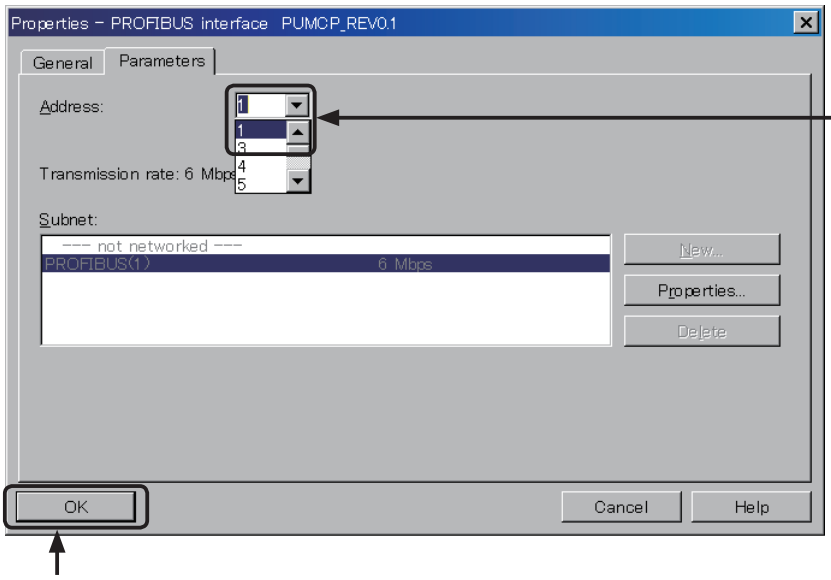
The PROFIBUS-DP property screen is displayed by the procedure (6).



Click [PROFIBUS…].

(8) PROFIBUS communication St. No. registration screen

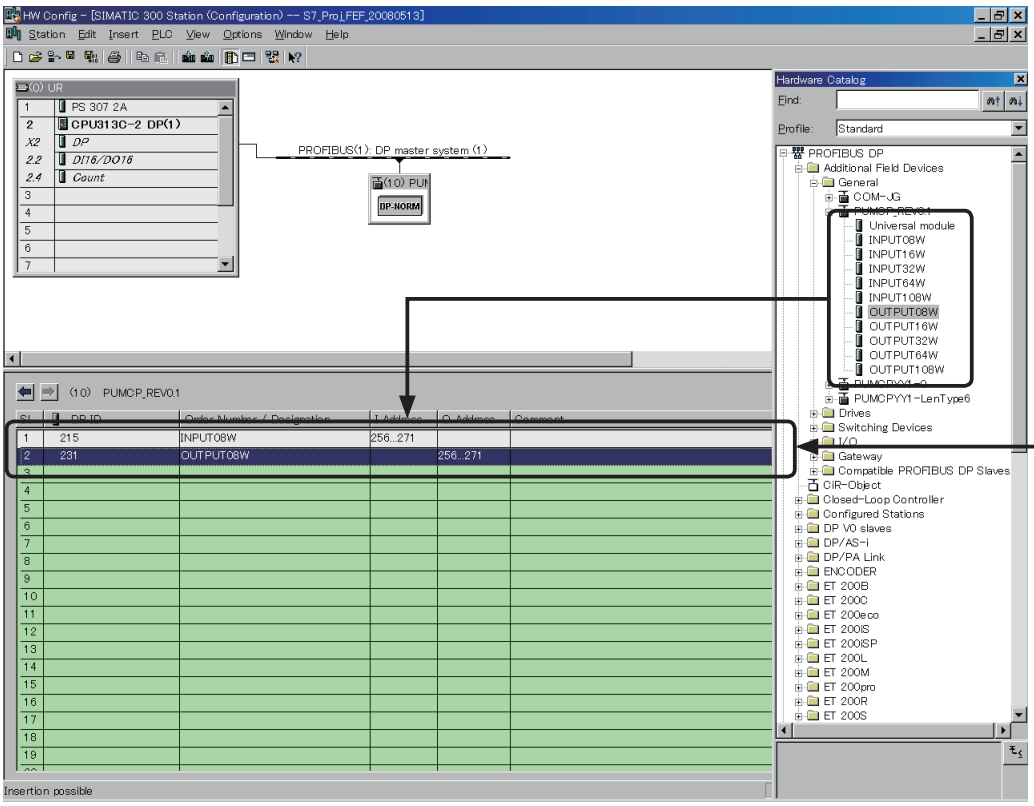
Set the same value as the PROFIBUS communication St. No. that is set for this equipment to the Address item.



Set the same value as the set value of the St. No. SW on the front terminal of this equipment (If "0", set the PROFIBUS communication St. No. parameter set value).

(9) Number of communication words setting

Set the same number of words as the one selected by the PROFIBUS communication setting for "output area" / "input area" parameter of this equipment.

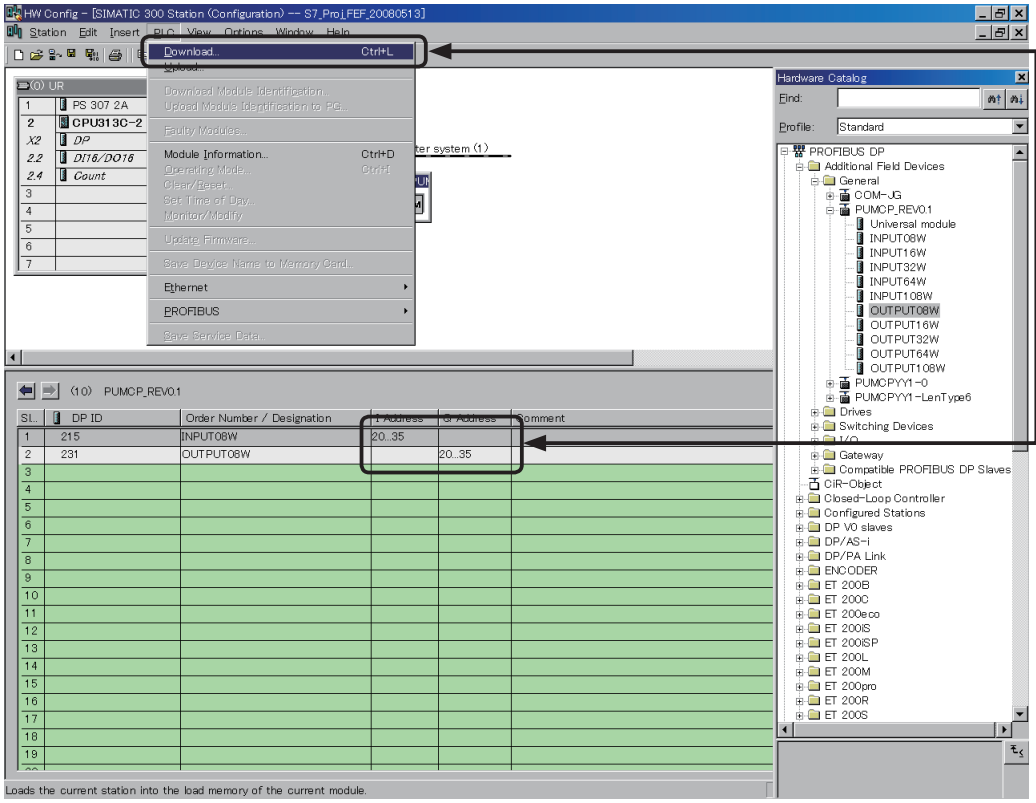


Select the number of words to be communicated from [PUMCP_REVx.x] of the Hardware Catalog, and drag and drop it to the rack detailed window.

3. Download a project to PLC

(1) Execute download to PLC

Reflect the value set for the hardware configuration to PLC.

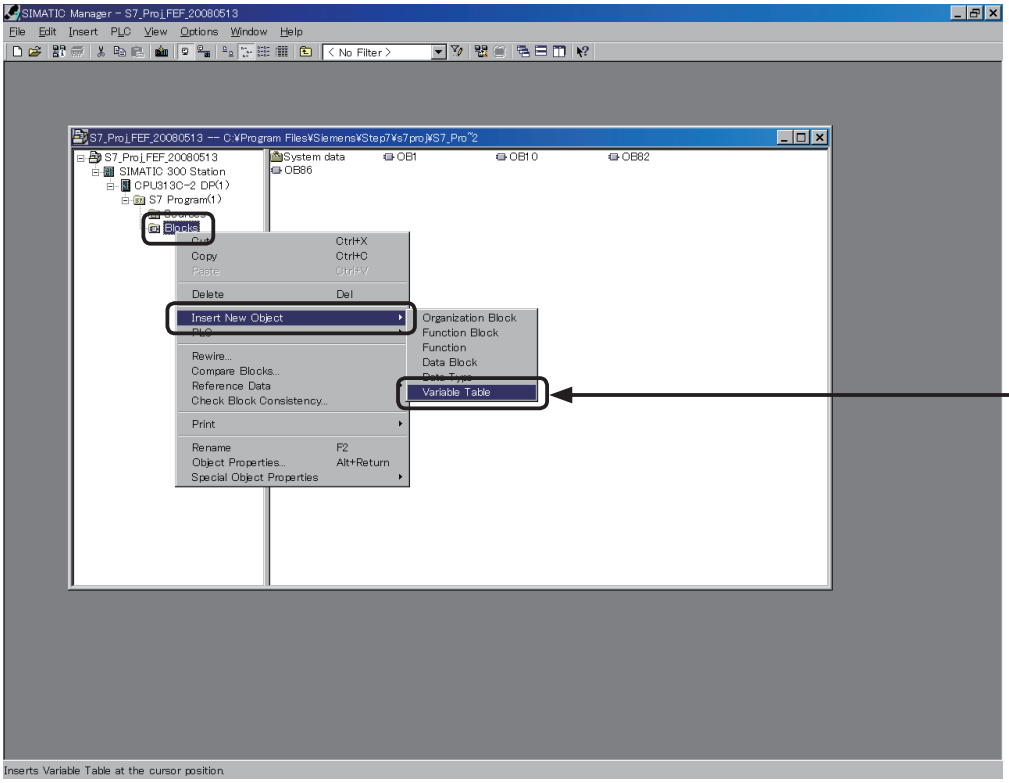


After setting of INPUT/ OUTPUT word address, select [PLC] - [Download] in the Menu and reflect the setting to PLC (Restart PLC)

4. Monitor/Write address entry

(1) A new Variable Table creation

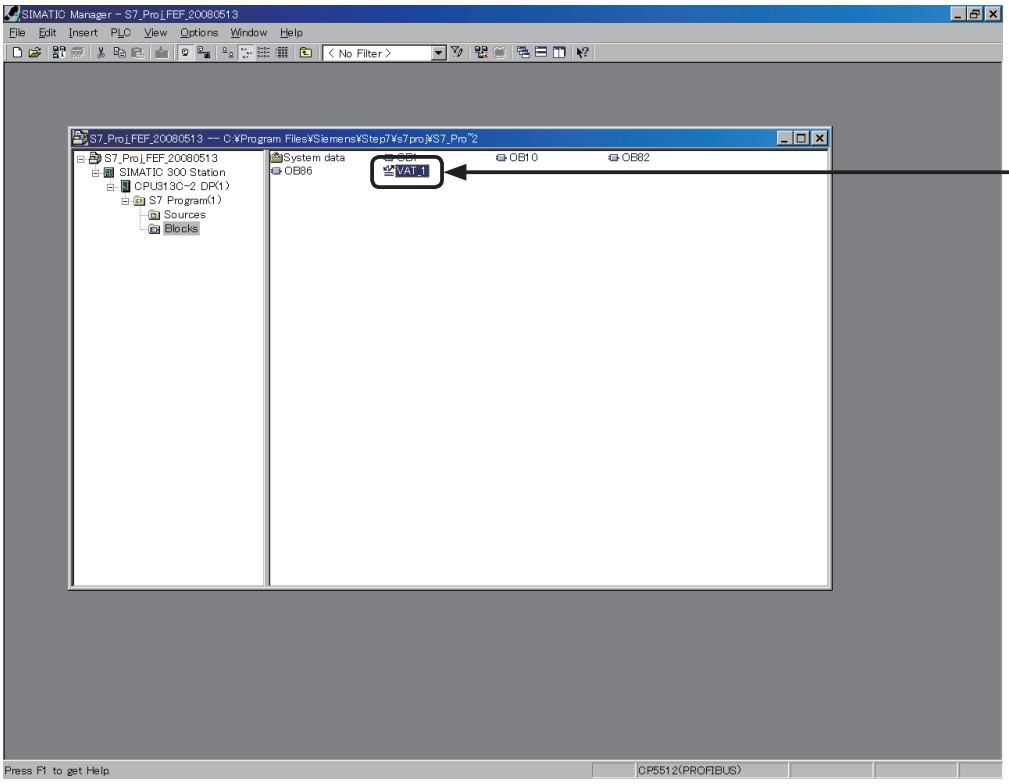
Create a Variable Table to be input the monitor/write address.



Select [Blocks] → [Insert New Object] → [Variable Table] from the created project screen.

(2) Open the Variable Table

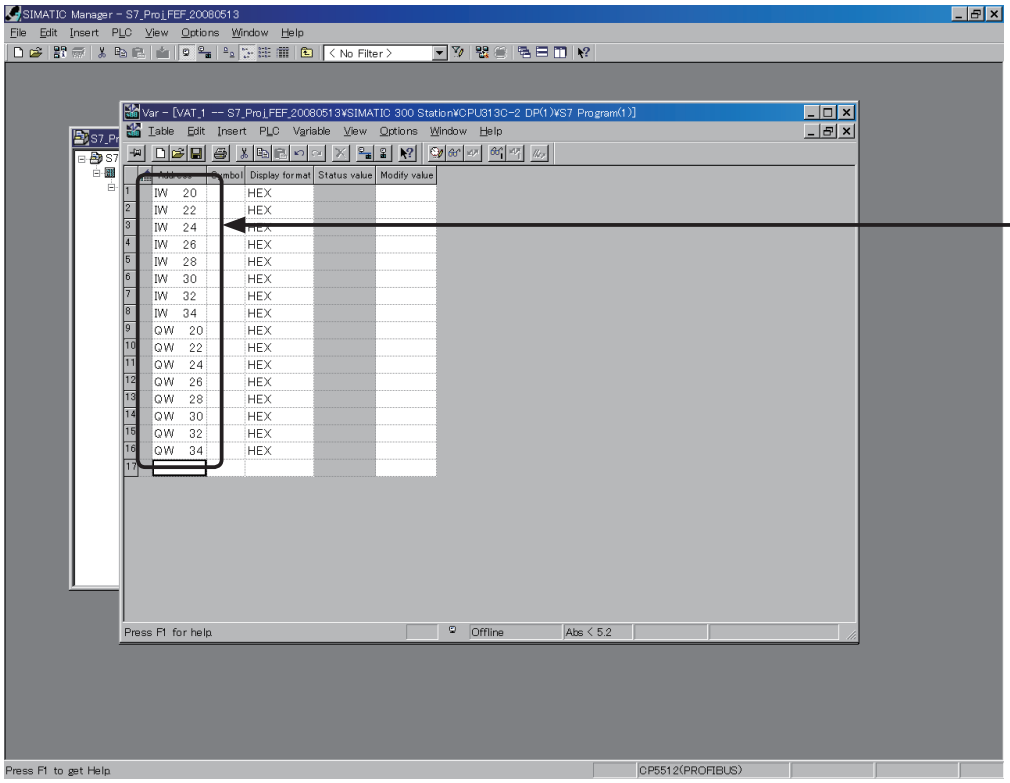
Open the Variable Table created by the procedure (1).



Double click the created Variable Table.

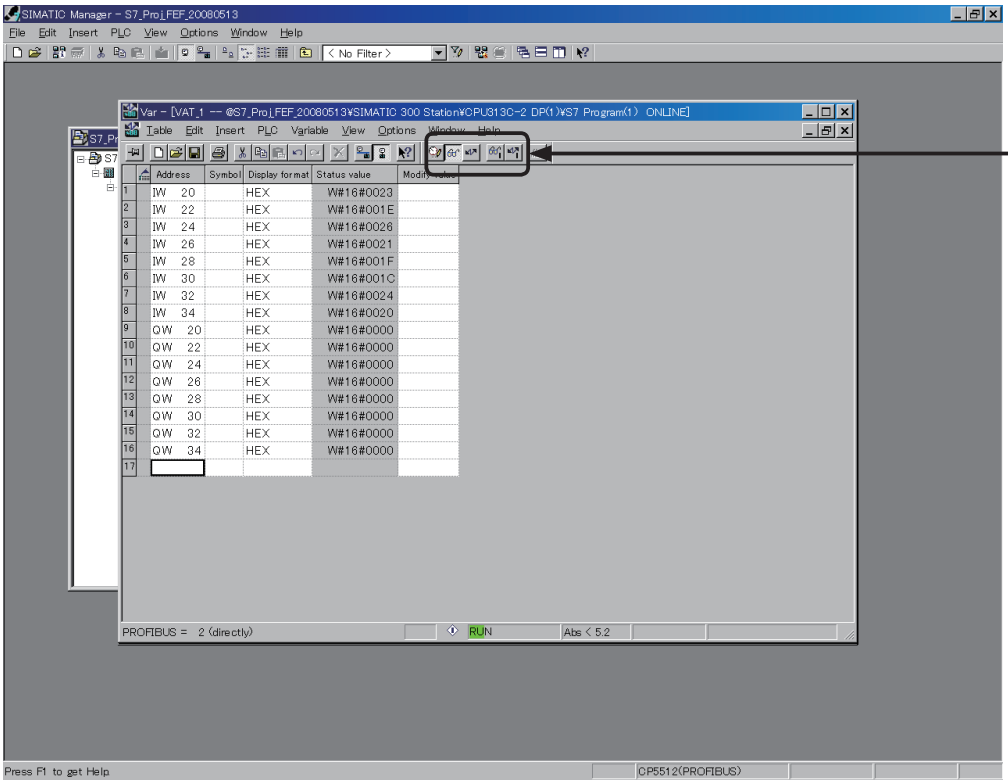
(3) Address input

Input the address to be monitored/written to the Address column.

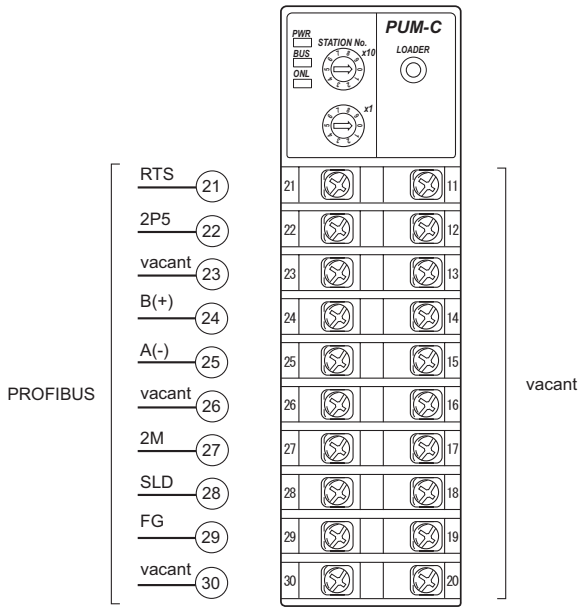


5. Execution of Monitor/write

(1) Click the execution icon of monitor/write to execute the monitor/write.



Terminal

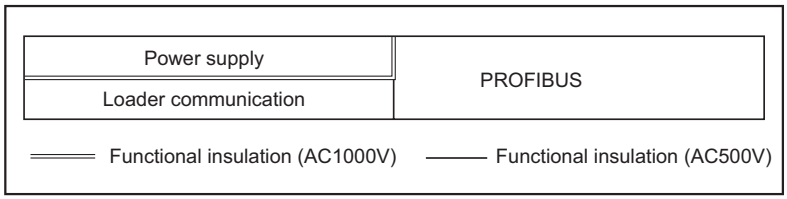


Terminal No.	Code	Communication interface
21	RTS	PROFIBUS
22	2P5	
23	Vacant	
24	B(+)	
25	A(-)	
26	Vacant	
27	2M	
28	SLD	
29	FG	
30	Vacant	

Point

Communication terminal numbers and signal contents

- The insulation between terminals is as follows. Before installing, confirm that the insulation for the equipment meets usage requirement.

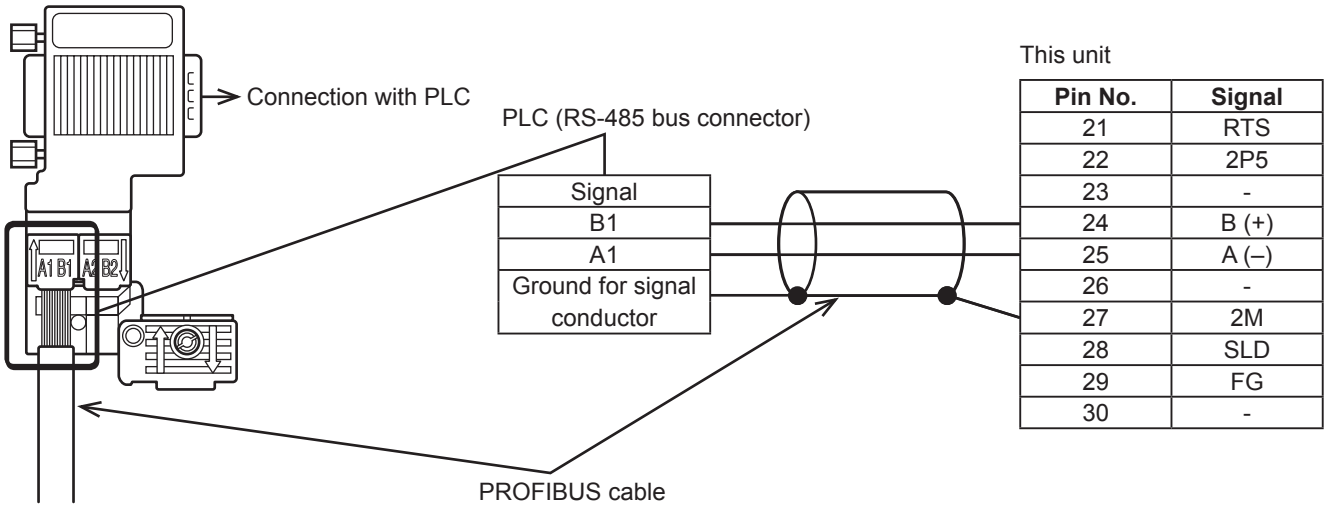


Connection with PLC (Usage example of SIMATIC S7-300)

Example of use:

SIMATIC S7-300

90° cable outlet (FastConnect system) with GP port



Pin No.	Signal
21	RTS
22	2P5
23	-
24	B (+)
25	A (–)
26	-
27	2M
28	SLD
29	FG
30	-

Connecting modules

Connectable modules to the equipment are as follows.

- PUMA/B (Control module), PUMV/N/T (Analog I/O module), PUME (Event I/O module)

Point

- Max. 32 units are connectable to the equipment. The number of connectable modules varies according to module types. Refer to user's manual for each module for details.
- When connected modules, power supplies are connected to other modules by connecting power supply lines to the one of the modules.

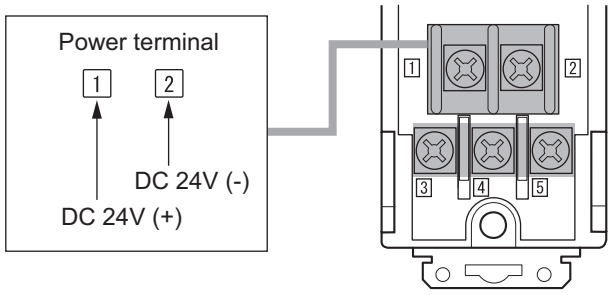
Wiring for power supply

Terminal layout

Power terminals are on the base part of each module.

Wiring is same for the all modules.

The power supplies to all connected modules by connecting this terminal to the only one of them.



Note

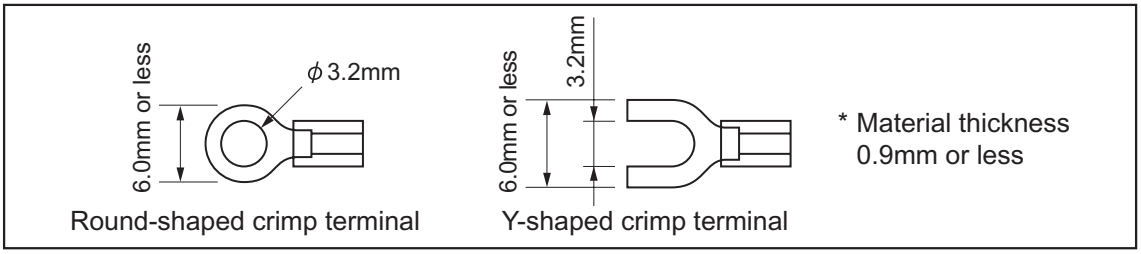
- Wiring to a terminal block, use crimp terminal (screw size: M3).
  Use the screws in this product only.
  Screw size on the terminal block: M3×7 (with square washer)
  Clamp torque: 0.78N-m (8kgf-cm)
- Apply power cable with allowable current capacity larger than total consumption current of all connected modules.
- Power cable more than one should not be connected to power terminals.
- Use the power cables and crimp terminal indicated below for wiring.

Power cable size

Cable type	Size
Power supply, output, others	0.25 to 1.25mm^2 (AWG22 to 16)

Crimp terminal size

Cable size	Clamp torque
0.25 – 1.25mm^2 (AWG22 to 16)	0.8Nm



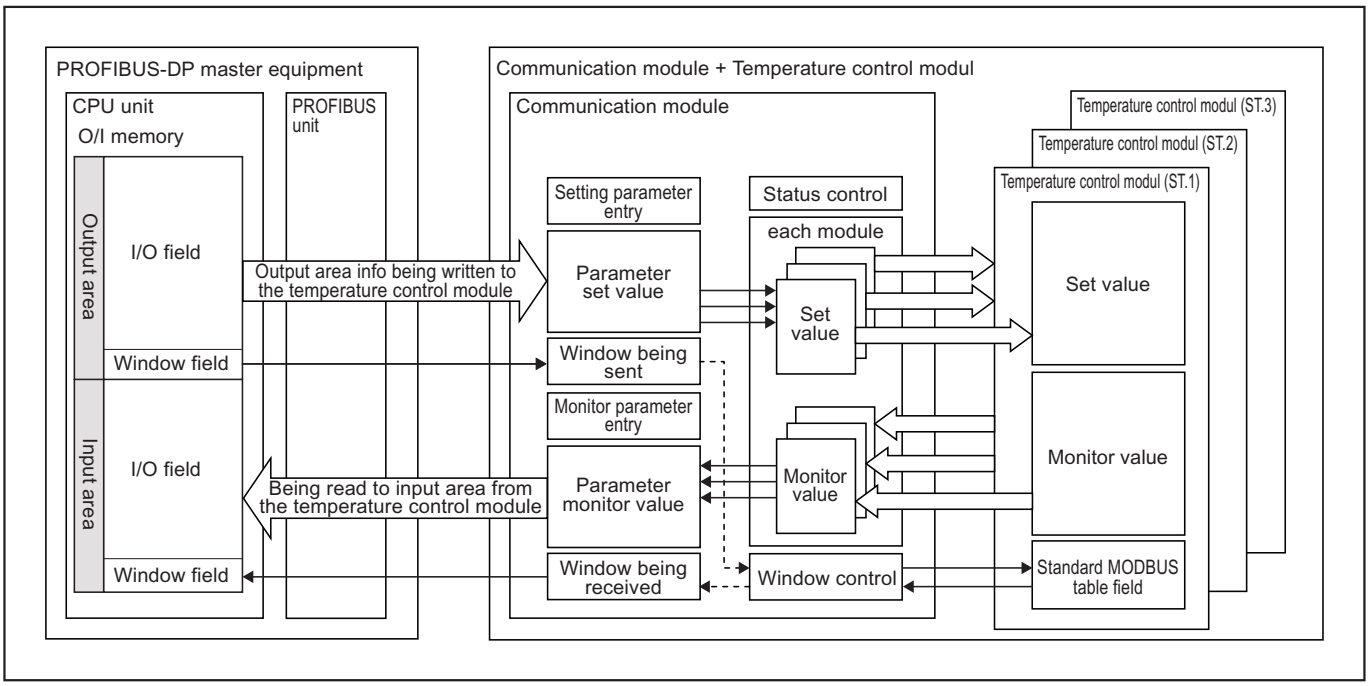
4

PROFIBUS Communication Operation

4.1 Output/Input Memory

PROFIBUS module operates as a slave of communication between a PROFIBUS-DP master equipment and a module, and receives reading/writing demand from the master equipment and executes them with connected temperature control modules and monitors the result of their executions.
There are 2 types of demands from the master equipments; one is I/O communication, which executes data read/write periodically, and other is window communication, which executes data read/write with specified parameters at the arbitrary timing.

Hereinafter, the communication between PROFIBUS module, PROFIBUS-DP master equipment and modules will be also referred as to “PROFIBUS communication”.



How to use the output/input memory

The output area and the input area set on the O/I memory of PROFIBUS-DP master equipment have the I/O field and the window field.

Output area	I/O field	Set data 1	
		Set data 2	
		. . .	
		Set data (n)	
	Window field	Sending demand flag	St. No.
		Function code	No. of words
		MODBUS register address No.	
		Write data (1)	
		Write data (2)	
		. . .	
		Write data (n)	
Total		108 words	

Input area	I/O field	Monitor data 1	
		Monitor data 2	
		. . .	
		Monitor data (n)	
	Window field	Communication result flag	St. No.
		Function code	No. of words
		MODBUS register address No.	
		Read data (1)	
		Read data (2)	
		. . .	
		Read data (n)	
Total		108 words	

Sending demand flag/St. No

Set a sending demand flag and the St. No. for window communication by using 1 word.

Refer to the figure below for each allocation of 16 bits.

St. No.
Set the St. No. of target communication module.

01h to 10h : Control/Analog module
11h to 20h : Event module

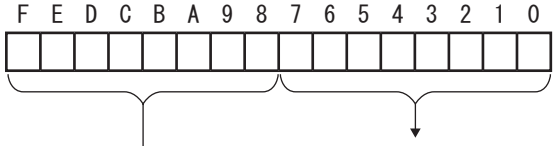
Request flag to send
Set the demand contents when performs a window communication by a flag.

0 : Sending invalid/cancel
1: Request to send
* Window communication executes demands when a sending demand flag switches from 0 to 1.
After performing communication with a sending demand flag: 1, it is necessary to perform communication with a sending demand flag: 0, and then put it into the sending invalid/cancel status prior to the next communication with a sending demand flag : 1.

Not used : "0" (fixed)
(even if setting "1", it is ignored)

Function code/No. of words

Set a function code and number of read/write words for window communication by using 1 word. Refer to the figure below for each allocation of 16 bits.



No. of read/write words
Set No. of read/write words.
It is not used for 1-word write.

FC=06h : Not used (1 word fixed)
FC=03h/04h/10h : 01h to 08h
Others : No. of words error
* FC= Function code
* No. of words that exceeds the one specified in the window field is the No. of words error.

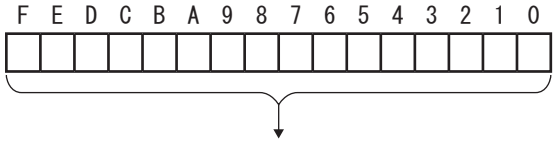
Function code
Set the function code for window communication.
Specify the window operation by setting the function codes below.

03h : Reading of holding register
04h : Reading of read-only register
06h : Writing of holding register (1word)
10h : Writing of holding register (continuous words)
Others : Error function code

MODBUS register address No

Set the MODBUS register address of communication target for a window communication.

Refer to the Chapter "5.5 Output/Input Area Register Numbers (Control module)", "5.6 Output/Input Area Register Numbers (Event module)" and "5.7 Output/Input Area Register Numbers (Analog module)" for the address lists.

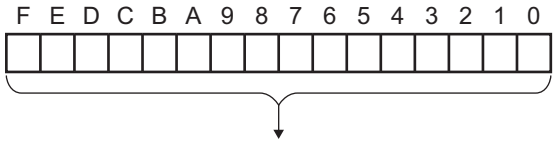


MODBUS register address No.
With the several words read/write, set the initial address No.
Execute the continuous address data read/write for No. of words from the set address.
* The range of MODBUS specification of each module (Control, Event, Analog)

Write data (1) to (8)

Set No. of write data.

With function code = 10h, data write for the No. of words is executed from the address set for the MODBUS register address No. in order.

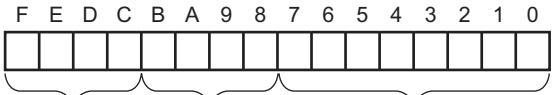


Write data
* Function code = 06h and 10h, data in the window field is written to the appropriate MODBUS register No.

Communication result flag/St. No.

Communication result flag/St. No. are sent to by using 1 word.

Refer to the figure below for the allocation of 16bits.



St. No.
St. No. set in the output area is echoed back.

01h to 10h : Control/Analog module
11h to 20h : Event module

Communication result of window message
Communication result (summary) can be monitored.

0h : Initial sate
1h : Normal completion of sending
Fh : Abnormal completion of sending

Communication result detail of window message
Communication result (details) can be monitored.

0h : Normal completion (and initial state)
When MODBUS communication error occurs, codes below are stored.
1h : Function code error
2h : Coil, register address error
3h : No. of coils/register addresses error
6h : Busy state (during write)
Dh : No response (timeout)
Eh : During specified station dropout
Fh : No specified station

Function code/No. of words/MODBUS register address No.

Each data set on the output area is echoed back.

Read data (1) to (8)

Function code 03h/04h (read) :

- The present value of appropriate MODBUS register item is stored.
- If read data is invalid (communication error), FFFFh is stored.

Function code 06h/10h (Write) :

- If write data is valid, write data is stored.
- If write data is invalid (communication error), FFFFh is stored.

Note

The configuring the output area device size/input area device size/window communication pattern used on the output/input memory of the PROFIBUS-DP master equipment is necessary prior to starting a PROFIBUS communication. ▶▶ 5-5, 5-7,5-9

I/O communication operation

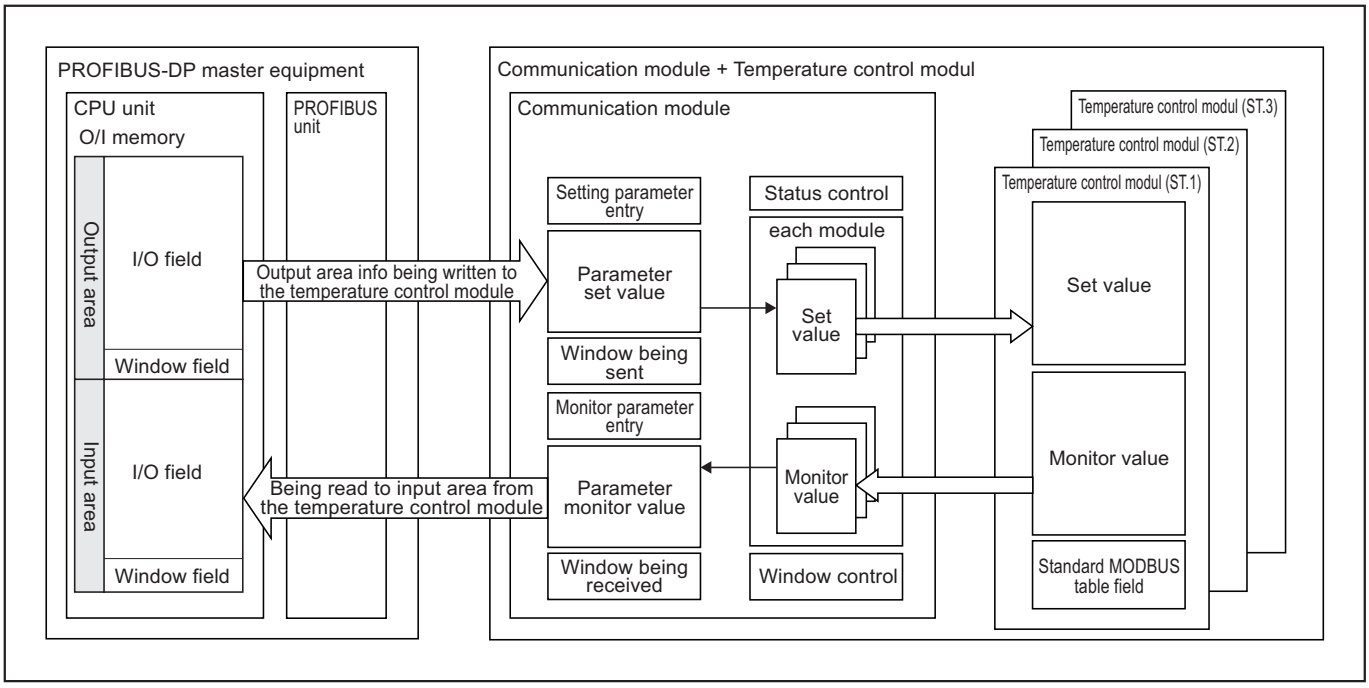
I/O communication executes the reading/writing of data to the specified station/address periodically. Proceed the I/O communication by the operation below.

Write/read the value of I/O field to/from the temperature control module

Writing the value of I/O field in the output area to the parameter of temperature control module registered in that area.

Also, reading the parameter of temperature control module registered in that area to the I/O field in the input area.

Refer to "5.2 Memory Setting" ▶▶ 5-4 for registration of write/read parameters.



Note

- With the written value from the PROFIBUS-DP master equipment, judge if the set value changed on the temperature control module, and modify the set value only when it changed.
- Do not modify the set value of the parameter entered as the setting parameter by the communication from the loader port. If changed it, the value written by the PROFIBUS-DP master equipment comes to be invalid. To make the written value by PROFIBUS-DP master equipment valid, modify it to a different value from the present one once.

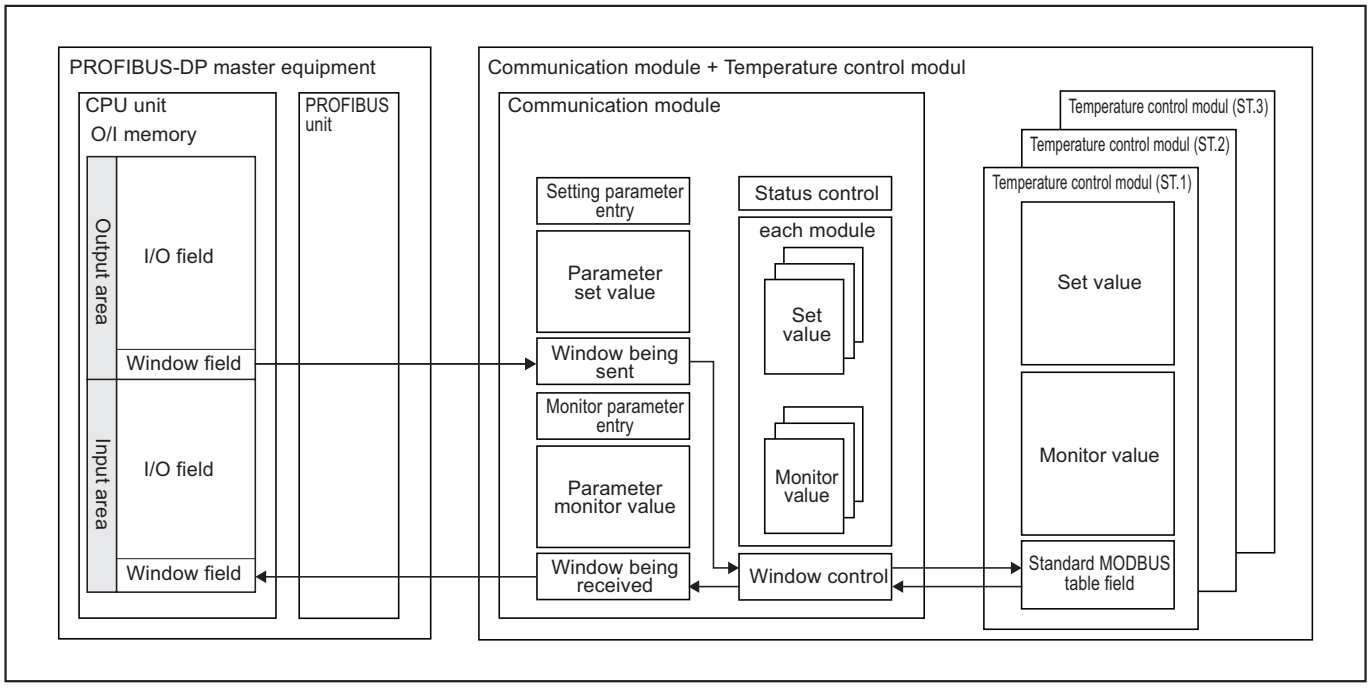
Window communication operation

Window communication executes the reading/writing of data to the specified station/address with random timing. Proceed the window communication by the operation below.

Write/read the value of window field to/from the temperature control module

Writing the value of window field in the output area to the parameter of specified temperature control module in that area.

Also, reading the parameter of specified temperature control module in that area to the window field in the input area.



Point

Although data reading of data by using the I/O field is executed periodically, data reading using the window communication is executed with random timing.

Therefore, continuous writing is not necessary. When read the parameter at the certain point, reading with a window parameter is suitable better than the reading/writing of data by using the I/O field, because of load reduction on a communication line.

Note

Window communication executes demands when a sending demand flag switches from 0 to 1.

It is necessary to perform communication with a sending demand flag: 0, and then put it into the sending invalid/cancel status after communication is performed with a sending demand flag : 1.

PROFIBUS communication operation suggestions

No. of exchangeable words of PROFIBUS communication is 108 words each for the output area or the input area.
(I/O communication field + window communication field)

Calculation formula of No. of words is as below.

I/O communication	Window communication	Calculation formula
○	○	Output (input) area device size + No. of words selected for the window communication setting + 3(*) ≦ PROFIBUS communication setting for "output area" ("input area")
○	×	Output (input) area device size ≦ PROFIBUS communication setting for "output area" ("input area")
×	○	No. of words selected for the window communication setting + 3 (*) ≦ PROFIBUS communication setting for "output area" ("input area")

* 3 words of Sending demand flag/St. No. ▶▶ 4-4 , Function code/No. of words ▶▶ 4-5 , MODBUS register address No. ▶▶ 4-5 in the output area used for a window communication, and 3 words of Communication result flag/ St. No. ▶▶ 4-6 , Function code/No. of words ▶▶ 4-6 , MODBUS register address No. ▶▶ 4-6 in the input area used for a window communication.

When using a window communication, necessary No. of words are set aside from the end of the output/input area.

If set the parameter as following examples, the memory configuration is as shown in the next page.

Ex) Output area device size = 17 (write 17 words with I/O communication)
Input area device size = 17 (read 17 words with I/O communication)
Window communication pattern = 1 (read/write 1 word with window communication)
PROFIBUS communication setting for "output area" = 3 (32-word communication : write)
PROFIBUS communication setting for "input area" = 3 (32-word communication : read)

Output area

Writing of I/O communication 1st word	I/O field Output area device size = 17	PROFIBUS communication setting for "output area" = 3 (32 words)
Writing of I/O communication 2nd word		
. . .		
Writing of I/O communication 17th word		
Vacancy : 11 words		
Window communication Sending demand flag/St. No.	Window field Window communication setting = 1 (1word + 3 words)	
Window communication Function code/No. of words		
Window communication MODBUS register address No.		
Window communication 1st word		

Input area

Reading of I/O communication 1st word	I/O field Input area device size = 17	PROFIBUS communication setting for "input area" = 3 (32 words)
Reading of I/O communication 2nd word		
. . .		
Reading of I/O communication 17th word		
Vacancy : 11 words		
Window communication Communication result flag/ St. No.	Window field Window communication setting = 1 (1word + 3 words)	
Window communication Function code/No. of words		
Window communication MODBUS register address No.		
Window communication 1st word		

4.2 Window Communication : Reading Demand/Response Flag

Setting a reading function code for "sending demand flag" of the window field in the output area of output/input memory enables the temperature control module parameters and the memory values specified as the input parameters to be read out to the window field in the input area of the output/input memory. The operation results are set for the "communication result flag" in the window field of the input area.

Reading of holding register (Function code : 03h)

Reading the data of address (data of No. 4xxxx) specified to the "MODBUS register address No." of temperature control module specified to the "St. No." to the window field in the input area of the output/input memory by setting "03h" to "function code" of the window field in the output area of output/input memory.

Reading of read-only register (Function code : 04h)

Reading the read-only data of address (data of No. 3xxxx) specified to the "MODBUS register address No." of temperature control module specified to the "St. No." to the window field in the input area of the output/input memory by setting "04h" to "function code" of the window field in the output area of output/input memory.

Read result response flag

The execution result of function codes "03h" and "04h" can be monitored by the "communication result flag" of window field in the input area of the output/input memory. Refer to "Communication result flag/St. No." ▶▶ 4-6 for the contents of "Communication result flag".

4.3 Window Communication : Writing Demand/Response Flag

Setting the write function code for the "sending demand flag" of the window field in the output area of output/input memory enables the value of the window field in the output area to be written to the temperature control module parameter specified as the output parameters.

The operation results are set for the "communication result flag" in the window field of input area.

1-word writing (Function code : 06h)

Setting "06h" to the "function code" of the window field in the output area of output/input memory enables 1-word data (the value of the window field in the output area) to be written to the "MODBUS register address No." (No. 4xxxx) of temperature control module parameter specified to "St. No."

Writing of continuous words (Function code : 10h)

Setting "10h" to the "function code" of the window field in the output area of output/input memory enables continuous data for No. of words specified by "No. of words" (the value of the window field in the output area) to be written to the "MODBUS register address No." (No. 4xxxx) of the temperature control module specified to "St. No".

Write result response flag

The execution result of function codes, "06h" and "10h", can be monitored by the "communication result flag" of the window field in the input area of output/input memory. Refer to the "Communication result flag/St. No." ▶▶ 4-6 for the contents of "Communication result flag".

4.4 Usage Example of Window Communication

The example of monitoring MV values of the control module (PUMA/B) connected to PROFIBUS module and manipulating P values is shown below.

Station No. of control module to be manipulated is "1", and operation channel is "Ch1".

Memory setting

Set parameters referring to the following table.

Parameter	MODBUS register No. (Relative address)	Set value
PROFIBUS communication setting for "output area"	40003(0002h)	2: 16 words
Output area device size	40104(0067h)	10
PROFIBUS communication setting for "input area"	40004(0003h)	2: 16 words
Input area device size	40105(0068h)	10
Window communication setting	40106(0069h)	1: 1-word communication

Output/input memory of PROFIBUS-DP master equipment is used as follows.

Reading of MV value

		15	0
Output area	I/O field	Writing of I/O communication 1st word	
		. . .	
		Writing of I/O communication 10th word	
	Vacancy:2 words		
	Window field	Sending demand flag : 1	St. No. : 01h
		Function code : 03h	No. of words : 01h
		MODBUS register address No. : 40005 *MV value (ch1)	
		Write data (1) : -	

		15	0
Input area	I/O field	Reading of I/O communication 1st word	
		. . .	
		Reading of I/O communication 10th word	
	Vacancy:2 words		
	Window field	Sending result flag : 1h	St. No. : 01h
		Function code : 03h	No. of words : 01h
		MODBUS register address No. : 40005 *MV value (ch1)	
		"Read data (1) : MV value (St. No. 1) (Ch1)	

* Input area is for the normal communication

Writing of P value

		15	0
Output area	I/O field	Writing of I/O communication 1st word	
		. . .	
		Writing of I/O communication 10th word	
	Vacancy:2 words		
	Window field	Sending demand flag : 1	St. No. : 01h
		Function code : 06h	No. of words : -
		MODBUS register address No. : 41102 *P value (ch1)	
		Write data (1) : 150 (15.0 % with a number of digits of decimal point is 1)	

		15	0
Input area	I/O field	Reading of I/O communication 1st word	
		. . .	
		Reading of I/O communication 10th word	
	Vacancy:2 words		
	Window field	Sending result flag : 1h	St. No. : 01h
		Function code : 06h	No. of words : -
		MODBUS register address No. : 41102 *P value (ch1)	
		Read data (1) : 150 (15.0 % with a number of digits of decimal point is 1)	

* Input area is for the normal communication

Reading of parameters

When "1" is set to the sending demand flag, and "03h" is set to the function code, "Ch1 MV value of the control module (St. No.1)" is read to the window field in the input area, and then "1h" is set to the communication result flag.

Point

Although data reading using the I/O field is executed periodically, the window communication is executed with random timing. Therefore, continuous reading is not necessary. When reading the parameter at the certain point, reading with a window parameter is suitable better than the reading of data by using the I/O field, because of load reduction on a communication line.

Note

Window communication executes demands when a sending demand flag switches from 0 to 1.
It is necessary to perform communication with a sending demand flag: 0, and then put it into the sending invalid/cancel status after communication is performed with a sending demand flag : 1.

Writing of set values

When "1" is set to the sending demand flag, and "06h" is set to the function code, the value of the window field in the output area is written to Ch1 P value on the control module (St. No. 1), and "1h" is set to the communication result flag.

Point

Although writing of data by using the I/O field is executed periodically, the window communication executes data writing with random timing.
Therefore, continuous writing is not necessary. When writing the parameter at the certain point, writing with a window parameter is suitable better than the writing of data by using the I/O field, because of load reduction on a communication line.

Note

- Window communication executes demands when a sending demand flag switches from 0 to 1.It is necessary to perform communication with a sending demand flag: 0, and then put it into the sending invalid/cancel status after communication is performed with a sending demand flag : 1.
- The value written to each module by using a window communication via PROFIBUS module is stored even after restart.

5 System Configuration

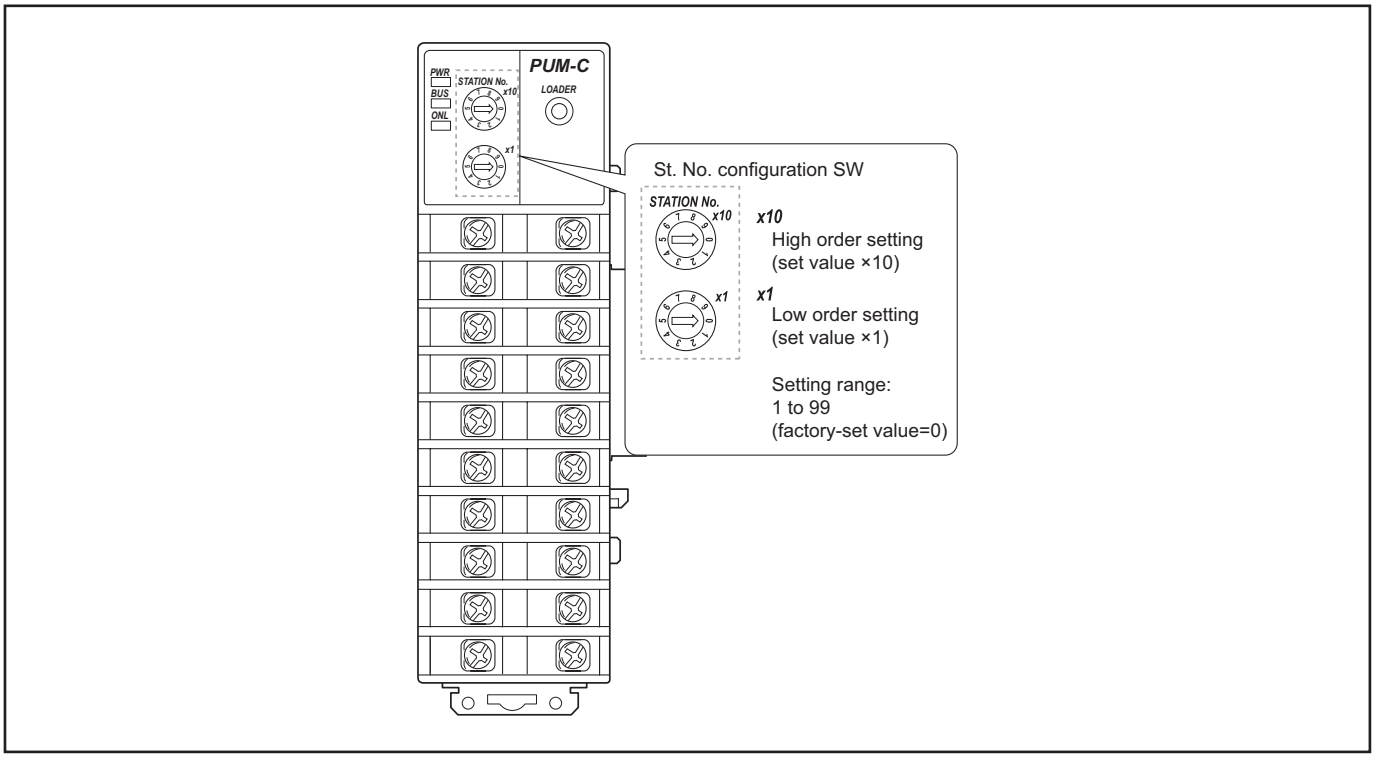
5.1 PROFIBUS Module Operation Setting

Explanation here is for performing PROFIBUS communication with a PROFIBUS module.

PROFIBUS module station number configuration switch

The station number configuration switch sets the station numbers for PROFIBUS module.

Set "1" to "99" to the station number. If set "0", it is to be the station number set by parameters. Turn the station number configuration switch with using a flathead screw driver, etc.



Parameter	Setting range	Unit	Factory-set value	Attribute	MODBUS register No. (relative address)
PROFIBUS communication St. No.	1 to 125	None	1	R/W	40001(0000h)

Note

The upper limit (99) of the St. No. which is settable by the St. No. configuration switch and the upper limit (125) of the St. No. which is settable by the parameter are different.

5.2 Memory Setting

Providing the area for a PROFIBUS communication in the output/input memory of the PROFIBUS-DP master equipment is necessary to perform a I/O communication/window communication.

Memory area

The memory area for PROFIBUS communication consists of the “output area” and the “input area”.

Output area

– Controlling PROFIBUS communication
– Setting the write value to a module type temperature controller (Setting demand information for a window communication)

Input area

– Displaying PROFIBUS communication status
– Storing the read value from a module type temperature controller (Storing demand result value for a window communication)

The memory area for the window communication has a "window communication area".

Window communication area

– Controlling the window communication

Output area definition

Define the PROFIBUS-DP master equipment memory type and the area used as the “output area”

Refer to the parameters below.

Parameter	Setting Range	Unit	Factory-set value	Attribute	MODBUS register No. (Relative Address)
PROFIBUS communication setting for "output area"	0: 0 word 1: 8 words 2: 16 words 3: 32 words 4: 64 words 5: 108 words	None	0	R/W	40003 (0002h)
Output area device size	0 to 108	word	0	R/W	40104 (0067h)

Note

Equal value should be set for the both of PROFIBUS communication setting for "output area" and the No. of output words to be set on a PROFIBUS-DP master equipment. Otherwise, communication error occurs.

Communication parameter entry (Output area)

Register the temperature control module parameter writing from a PROFIBUS-DP master equipment with a combination of “Output area entry St. No.” parameter and the “Output area entry register No.” parameter with I/O communication.

Refer to the parameters below.

Parameter	Setting Range	Unit	Factory-set value	Attribute	MODBUS register No. (Relative Address)
Output area entry St. No. The 1st word	0: Not used 1 to 16: Control/Analog module 17 to 32: Event module	None	0	R/W	41001 (03E8h)
Output area entry Register No. The 1st word	0,40000 to 49999 (*)	None	0	R/W	41002 (03E9h)
. . .					
Output area entry St. No. The 108th word	0: Not used 1 to 16: Control/Analog module 17 to 32: Event module	None	0	R/W	41215 (04BEh)
Output area entry Register No. The 108h word	0,40000 to 49999 (*)	None	0	R/W	41216 (04BFh)

* Only the address written in “Output/Input area register number” (Control module ▶▶ 5-19, Event module ▶▶ 5-32, Analog module ▶▶ 5-39) can be set. However, the parameter marked “*” in the “Entry ban” column cannot be set.

Note

- Number of registerable parameters per reference station is limited. Also, please note that maximum number of registerable parameters is depends on each module shown below.

Modeule Type	Maximum No.
Control module	32
Analog I/O module	32
Event I/O module	8

If register parameters more than the maximum number, communication with a target St. will not be possible. Modify the parameter's entry to the correct state and restart this equipment to restore the communication.

- Even if set each parameter of "Output area entry St. No." and "Output area entry register No." beyond the size set by "Output area device size" parameter, that part is not performed communication.

Non-registerable parameter to the output area

Even if the parameter is within the entry setting range of the “Output area entry St. No.” or the “Output area entry register No.”, the parameter marked “*” in the “Entry ban” column of the “Output/Input area register No.” (Control module ▶▶ 5-19 , Event module ▶▶ 5-32 , Analog module ▶▶ 5-39 cannot be set. Do not set such parameters, since they cannot be modified via PROFIBUS communications.

Input area definition

Define the memory type of PROFIBUS-DP master equipment and the field used as the “input area”.

Refer to the parameters below.

Parameter	Setting Range	Unit	Factory-set value	Attribute	MODBUS register No. (Relative Address)
PROFIBUS communication setting for "input area"	0: 0 word 1: 8 words 2: 16 words 3: 32 words 4: 64 words 5: 108 words	None	0	R/W	40004 (0003h)
Input area device size	0 to 108	word	0	R/W	40105 (0068h)

Note

Equal value should be set for the both of PROFIBUS communication setting for "input area" and the No. of input words to be set on a PROFIBUS-DP master equipment. Otherwise, communication error occurs.

Communication parameter entry (Input area)

Register the parameter of temperature control module reading from the PROFIBUS-DP master equipment with a combination of "Input area entry St. No." parameter and the "Input area entry register No." parameter with I/O communication.

Refer to the parameters below.

Parameter	Setting Range	Unit	Factory-set value	Attribute	MODBUS register No. (Relative Address)
Input area entry St. No. The 1st word	0 : Not used 1 to 16 : Control/Analog module 17 to 32 : Event module	None	0	R/W	43001 (0BB8h)
Input area entry Register No. The 1st word	0,30000 to 49999 (*)	None	0	R/W	43002 (0BB9h)
. . .					
Input area entry St. No. The 108th word	0 : Not used 1 to 16 : Control/Analog module 17 to 32 : Event module	None	0	R/W	43215 (0C8Eh)
Input area entry Register No. The 108th word	0,30000 to 49999 (*)	None	0	R/W	43216 (0C8Fh)

* Only the address written in the “Output/Input area register No.” (Control module ▶▶ 5-19 , Event module ▶▶ 5-32 , Analog module ▶▶ 5-39) is settable. However, parameters marked "*" in the "Entry ban" column are not settable.

Note

- Number of registerable parameters per reference station is limited. Also, please note that maximum number of registerable parameters is depends on each module shown below.

Modeule Type	Maximum No.
Control module	32
Analog I/O module	32
Event I/O module	8

If register parameters more than the maximum number, communication with a target St. will not be possible. Modify the parameter's entry to the correct state and restart this equipment to restore the communication.

- Even if set each parameter of "Input area entry St. No." and "Input area entry register No." beyond the size set by "Input area device size" parameter, that part is not performed communication.

Non-registrable parameter to the input area

Even if the parameter is within the entry setting range of "Input area entry St. No." or the "Input area entry register No.", the parameters marked "*" in the "Entry ban" column of "Output/Input area entry No." (Control module ▶▶ 5-19 , Event module ▶▶ 5-32 , Analog module ▶▶ 5-39) cannot be set. Do not set such parameters, since they cannot be modified via PROFIBUS communications.

Window communication area definition

Setting the size used as the "window communication area".

Refer to the parameters below.

Parameter	Setting Range	Unit	Factory-set value	Attribute	MODBUS register No. (Relative Address)
Window communication pattern	0: No window communication 1: 1-word data communication 2: 2-word data communication 3: 4-word data communication 4: 8-word data communication *The numbers above are the max. No. of words.	None	0	R/W	40106 (0069h)

5.3 Status Display

The status display is the parameter in order to monitor PROFIBUS module operation.

The status display is confirmed by reading out from the front face loader port or registering to the input area of PROFIBUS-DP master equipment.

Communication module status

PROFIBUS module operation status can be referred.

Refer to the parameters below.

Parameter	Unit	Attribute	MODBUS register No. (Relative Address)
Setting error	None	R	30232 (00E7h)

Parameters' explanation

– Parameter setting error
When the parameter read out from the EEPROM is the invalid value, the error code is stored.

Error code	Explanation
0101h	St. No. configuration SW (St. No.) is invalid value
0102h	DIP SW (No. of words to exchange data) is invalid value
0203h	St. No. stored in EEPROM is invalid value
0204h	No. of words to exchange data that is stored in EEPROM is invalid value
0205h	Exchange pattern of output data is invalid value
0206h	Exchange pattern of input data is invalid value
0207h	Output area device size is invalid value
0208h	Input area device size is invalid value
0209h	Window communication pattern is invalid value
020Ah	Output area St. No. is invalid value
020Bh	Output area register No. is invalid value
020Ch	Input area St. No is invalid value
020Dh	Input area register No. is invalid value
0211h	Window communication (EEPROM) is invalid value

5.4 Address Map and Data Format

PROFIBUS module status

Contents	Reading out/Writing data setting range	Factory-set value	Register No.
Setting fault	0101h: St. No. configuration SW (St. No.) is invalid value 0102h: DIP SW (No. of words to exchange data) is invalid value 0203h: St. No. stored in EEPROM is invalid value 0204h: No. of words to exchange data that is stored in EEPROM is invalid value 0205h: Exchange pattern of output data is invalid value 0206h: Exchange pattern of input data is invalid value 0207h: Output area device size is invalid value 0208h: Input area device size is invalid value 0209h: Window communication pattern is invalid value 020Ah: Output area St. No. is invalid value 020Bh: Output area register No. is invalid value 020Ch: Input area St. No is invalid value 020Dh: Input area register No. is invalid value 0211h: Window communication (EEPROM) is invalid value	-	30232

PROFIBUS communication setting

Contents	Reading out/Writing data setting range	Factory-set value	Register No.
PROFIBUS communication St. No.	1 to 125	1	40001
PROFIBUS communication setting for "output area"	0: 0 word 1: 8 words 2: 16 words 3: 32 words 4: 64 words 5: 108 words	0	40003
PROFIBUS communication setting for "input area"	0: 0 word 1: 8 words 2: 16 words 3: 32 words 4: 64 words 5: 108 words	0	40004
Output area device size	0 to 108 words	0	40104
Input area device size	0 to 108 words	0	40105
Window communication pattern	0: No window communication 1: 1-word data communication 2: 2-word data communication 3: 4-word data communication 4: 8-word data communication Note: The numbers above are the max. No. of words.	0	40106

Memory configuration (Output area)

Contents	Reading out/Writing data setting range	Factory-set value	Register No.
Output area entry St. No. (The 1st word)	0 : Not used 1 to 16 : Control/Analog module 17 to 32 : Event module Note : St. No. other than the above is not settable	0	41001
Output area entry register No. (The 1st word)	0, 40000 to 49999 (Note 1)	0	41002
Output area entry St. No. (The 2nd word)	0 : Not used 1 to 16 : Control/Analog module 17 to 32 : Event module Note : St. No. other than the above is not settable	0	41003
Output area entry register No. (The 2nd word)	0, 40000 to 49999 (Note 1)	0	41004
. . .			
Output area entry St. No. (The 107th word)	0 : Not used 1 to 16 : Control/Analog module 17 to 32 : Event module Note : St. No. other than the above is not settable	0	41213
Output area entry register No. (The 107th word)	0, 40000 to 49999 (Note 1)	0	41214
Output area entry St. No. (The 108th word)	0 : Not used 1 to 16 : Control/Analog module 17 to 32 : Event module Note : St. No. other than the above is not settable	0	41215
Output area entry register No. (The 108th word)	0, 40000 to 49999 (Note 1)	0	41216

Note 1: Only the address written in "Output/Input area entry number" (Control module ▶▶ 5-19 , Event module ▶▶ 5-32 , Analog module ▶▶ 5-39) can be set. However, the parameter marked * in the "Entry ban" column cannot be set.

Memory configuration (Input area)

Contents	Reading out/Writing data setting range	Factory-set value	Register No.
Input area entry St. No. (The 1st word)	0 : Not used 1 to 16 : Control/Analog module 17 to 32 : Event module Note : St. No. other than the above is not settable	0	43001
Input area entry register No. (The 1st word)	0, 30000 to 49999 (Note 2)	0	43002
Input area entry St. No. (The 2nd word)	0 : Not used 1 to 16 : Control/Analog module 17 to 32 : Event module Note : St. No. other than the above is not settable	0	43003
Input area entry register No. (The 2nd word)	0, 30000 to 49999 (Note 2)	0	43004
. . .			
Input area entry St. No. (The 107th word)	0 : Not used 1 to 16 : Control/Analog module 17 to 32 : Event module Note : St. No. other than the above is not settable	0	43213
Input area entry register No. (The 107th word)	0, 30000 to 49999 (Note 2)	0	43214
Input area entry St. No. (The 108th word)	0 : Not used 1 to 16 : Control/Analog module 17 to 32 : Event module Note : St. No. other than the above is not settable	0	43215
Input area entry register No. (The 108th word)	0, 30000 to 49999 (Note 2)	0	43216

Note 2 Only the address written in "Output/Input area entry number" (Control module ▶▶ 5-19, Event module ▶▶ 5-32, Analog module ▶▶ 5-39) can be set. However, the parameter marked * in the "Entry ban" column cannot be set.

Register number order

Contents	Register No.	Relative address
PROFIBUS communication St. No.	40001	0000h
PROFIBUS communication setting for "output area"	40003	0002h
PROFIBUS communication setting for "input area"	40004	0003h
Output area device size	40104	0067h
Input area device size	40105	0068h
Window communication pattern	40106	0069h
Output area entry St. No. The 1st word	41001	03E8h
Output area entry register No. The 1st word	41002	03E9h
Output area entry St. No. The 2nd word	41003	03EAh
Output area entry register No. The 2nd word	41004	03EBh
Output area entry St. No. The 3rd word	41005	03ECh
Output area entry register No. The 3rd word	41006	03EDh
Output area entry St. No. The 4th word	41007	03EEh
Output area entry register No. The 4th word	41008	03EFh
Output area entry St. No. The 5th word	41009	03F0h
Output area entry register No. The 5th word	41010	03F1h
Output area entry St. No. The 6th word	41011	03F2h
Output area entry register No. The 6th word	41012	03F3h
Output area entry St. No. The 7th word	41013	03F4h
Output area entry register No. The 7th word	41014	03F5h
Output area entry St. No. The 8th word	41015	03F6h
Output area entry register No. The 8th word	41016	03F7h
Output area entry St. No. The 9th word	41017	03F8h
Output area entry register No. The 9th word	41018	03F9h
Output area entry St. No. The 10th word	41019	03FAh
Output area entry register No. The 10th word	41020	03FBh
Output area entry St. No. The 11th word	41021	03FCh
Output area entry register No. The 11th word	41022	03FDh
Output area entry St. No. The 12th word	41023	03FEh
Output area entry register No. The 12th word	41024	03FFh
Output area entry St. No. The 13th word	41025	0400h
Output area entry register No. The 13th word	41026	0401h
Output area entry St. No. The 14th word	41027	0402h
Output area entry register No. The 14th word	41028	0403h
Output area entry St. No. The 15th word	41029	0404h
Output area entry register No. The 15th word	41030	0405h
Output area entry St. No. The 16th word	41031	0406h
Output area entry register No. The 16th word	41032	0407h
Output area entry St. No. The 17th word	41033	0408h
Output area entry register No. The 17th word	41034	0409h
Output area entry St. No. The 18th word	41035	040Ah
Output area entry register No. The 18th word	41036	040Bh
Output area entry St. No. The 19th word	41037	040Ch
Output area entry register No. The 19th word	41038	040Dh
Output area entry St. No. The 20th word	41039	040Eh
Output area entry register No. The 20th word	41040	040Fh
Output area entry St. No. The 21st word	41041	0410h
Output area entry register No. The 21st word	41042	0411h
Output area entry St. No. The 22nd word	41043	0412h
Output area entry register No. The 22nd word	41044	0413h
Output area entry St. No. The 23rd word	41045	0414h
Setting area entry register No. The 23rd word	41046	0415h

Contents	Register No.	Relative address
Setting area entry St. No. The 24th word	41047	0416h
Setting area entry register No. The 24th word	41048	0417h
Output area entry St. No. The 25th word	41049	0418h
Output area entry register No. The 25th word	41050	0419h
Output area entry St. No. The 26th word	41051	041Ah
Output area entry register No. The 26th word	41052	041Bh
Output area entry St. No. The 27th word	41053	041Ch
Output area entry register No. The 27th word	41054	041Dh
Output area entry St. No. The 28th word	41055	041Eh
Output area entry register No. The 28th word	41056	041Fh
Output area entry St. No. The 29th word	41057	0420h
Output area entry register No. The 29th word	41058	0421h
Output area entry St. No. The 30th word	41059	0422h
Output area entry register No. The 30th word	41060	0423h
Output area entry St. No. The 31st word	41061	0424h
Output area entry register No. The 31st word	41062	0425h
Output area entry St. No. The 32nd word	41063	0426h
Output area entry register No. The 32nd word	41064	0427h
Output area entry St. No. The 33rd word	41065	0428h
Output area entry register No. The 33rd word	41066	0429h
Output area entry St. No. The 34th word	41067	042Ah
Output area entry register No. The 34th word	41068	042Bh
Output area entry St. No. The 35th word	41069	042Ch
Output area entry register No. The 35th word	41070	042Dh
Output area entry St. No. The 36th word	41071	042Eh
Output area entry register No. The 36th word	41072	042Fh
Output area entry St. No. The 37th word	41073	0430h
Output area entry register No. The 37th word	41074	0431h
Output area entry St. No. The 38th word	41075	0432h
Output area entry register No. The 38th word	41076	0433h
Output area entry St. No. The 39th word	41077	0434h
Output area entry register No. The 39th word	41078	0435h
Output area entry St. No. The 40th word	41079	0436h
Output area entry register No. The 40th word	41080	0437h
Output area entry St. No. The 41st word	41081	0438h
Output area entry register No. The 41st word	41082	0439h
Output area entry St. No. The 42nd word	41083	043Ah
Output area entry register No. The 42nd word	41084	043Bh
Output area entry St. No. The 43rd word	41085	043Ch
Output area entry register No. The 43rd word	41086	043Dh
Output area entry St. No. The 44th word	41087	043Eh
Output area entry register No. The 44th word	41088	043Fh
Output area entry St. No. The 45th word	41089	0440h
Output area entry register No. The 45th word	41090	0441h
Output area entry St. No. The 46th word	41091	0442h
Output area entry register No. The 46th word	41092	0443h
Output area entry St. No. The 47th word	41093	0444h
Output area entry register No. The 47th word	41094	0445h
Output area entry St. No. The 48th word	41095	0446h
Output area entry register No. The 48th word	41096	0447h
Output area entry St. No. The 49th word	41097	0448h
Output area entry register No. The 49th word	41098	0449h

Contents	Register No.	Relative address
Output area entry St. No. The 50th word	41099	044Ah
Output area entry register No. The 50th word	41100	044Bh
Output area entry St. No. The 51st word	41101	044Ch
Output area entry register No. The 51st word	41102	044Dh
Output area entry St. No. The 52nd word	41103	044Eh
Output area entry register No. The 52nd word	41104	044Fh
Output area entry St. No. The 53rd word	41105	0450h
Output area entry register No. The 53rd word	41106	0451h
Output area entry St. No. The 54th word	41107	0452h
Output area entry register No. The 54th word	41108	0453h
Output area entry St. No. The 55th word	41109	0454h
Output area entry register No. The 55th word	41110	0455h
Output area entry St. No. The 56th word	41111	0456h
Output area entry register No. The 56th word	41112	0457h
Output area entry St. No. The 57th word	41113	0458h
Output area entry register No. The 57th word	41114	0459h
Output area entry St. No. The 58th word	41115	045Ah
Output area entry register No. The 58th word	41116	045Bh
Output area entry St. No. The 59th word	41117	045Ch
Output area entry register No. The 59th word	41118	045Dh
Output area entry St. No. The 60th word	41119	045Eh
Output area entry register No. The 60th word	41120	045Fh
Output area entry St. No. The 61st word	41121	0460h
Output area entry register No. The 61st word	41122	0461h
Output area entry St. No. The 62nd word	41123	0462h
Output area entry register No. The 62nd word	41124	0463h
Output area entry St. No. The 63rd word	41125	0464h
Output area entry register No. The 63rd word	41126	0465h
Output area entry St. No. The 64th word	41127	0466h
Output area entry register No. The 64th word	41128	0467h
Output area entry St. No. The 65th word	41129	0468h
Output area entry register No. The 65th word	41130	0469h
Output area entry St. No. The 66th word	41131	046Ah
Output area entry register No. The 66th word	41132	046Bh
Output area entry St. No. The 67th word	41133	046Ch
Output area entry register No. The 67th word	41134	046Dh
Output area entry St. No. The 68th word	41135	046Eh
Output area entry register No. The 68th word	41136	046Fh
Output area entry St. No. The 69th word	41137	0470h
Output area entry register No. The 69th word	41138	0471h
Output area entry St. No. The 70th word	41139	0472h
Output area entry register No. The 70th word	41140	0473h
Output area entry St. No. The 71st word	41141	0474h
Output area entry register No. The 71st word	41142	0475h
Output area entry St. No. The 72nd word	41143	0476h
Output area entry register No. The 72nd word	41144	0477h
Output area entry St. No. The 73rd word	41145	0478h
Output area entry register No. The 73rd word	41146	0479h
Output area entry St. No. The 74th word	41147	047Ah
Output area entry register No. The 74th word	41148	047Bh
Output area entry St. No. The 75th word	41149	047Ch
Output area entry register No. The 75th word	41150	047Dh
Output area entry St. No. The 76th word	41151	047Eh
Output area entry register No. The 76th word	41152	047Fh
Output area entry St. No. The 77th word	41153	0480h
Output area entry register No. The 77th word	41154	0481h

Contents	Register No.	Relative address
Output area entry St. No. The 78th word	41155	0482h
Output area entry register No. The 78th word	41156	0483h
Output area entry St. No. The 79th word	41157	0484h
Output area entry register No. The 79th word	41158	0485h
Output area entry St. No. The 80th word	41159	0486h
Output area entry register No. The 80th word	41160	0487h
Output area entry St. No. The 81st word	41161	0488h
Output area entry register No. The 81st word	41162	0489h
Output area entry St. No. The 82nd word	41163	048Ah
Output area entry register No. The 82nd word	41164	048Bh
Output area entry St. No. The 83rd word	41165	048Ch
Output area entry register No. The 83rd word	41166	048Dh
Output area entry St. No. The 84th word	41167	048Eh
Output area entry register No. The 84th word	41168	048Fh
Output area entry St. No. The 85th word	41169	0490h
Output area entry register No. The 85th word	41170	0491h
Output area entry St. No. The 86th word	41171	0492h
Output area entry register No. The 86th word	41172	0493h
Output area entry St. No. The 87th word	41173	0494h
Output area entry register No. The 87th word	41174	0495h
Output area entry St. No. The 88th word	41175	0496h
Output area entry register No. The 88th word	41176	0497h
Output area entry St. No. The 89th word	41177	0498h
Output area entry register No. The 89th word	41178	0499h
Output area entry St. No. The 90th word	41179	049Ah
Output area entry register No. The 90th word	41180	049Bh
Output area entry St. No. The 91st word	41181	049Ch
Output area entry register No. The 91st word	41182	049Dh
Output area entry St. No. The 92nd word	41183	049Eh
Output area entry register No. The 92nd word	41184	049Fh
Output area entry St. No. The 93rd word	41185	04A0h
Output area entry register No. The 93rd word	41186	04A1h
Output area entry St. No. The 94th word	41187	04A2h
Output area entry register No. The 94th word	41188	04A3h
Output area entry St. No. The 95th word	41189	04A4h
Output area entry register No. The 95th word	41190	04A5h
Output area entry St. No. The 96th word	41191	04A6h
Output area entry register No. The 96th word	41192	04A7h
Output area entry St. No. The 97th word	41193	04A8h
Output area entry register No. The 97th word	41194	04A9h
Output area entry St. No. The 98th word	41195	04AAh
Output area entry register No. The 98th word	41196	04ABh
Output area entry St. No. The 99th word	41197	04ACh
Output area entry register No. The 99th word	41198	04ADh
Output area entry St. No. The 100th word	41199	04AEh
Output area entry register No. The 100th word	41200	04AFh
Output area entry St. No. The 101st word	41201	04B0h
Output area entry register No. The 101st word	41202	04B1h
Output area entry St. No. The 102nd word	41203	04B2h
Output area entry register No. The 102nd word	41204	04B3h
Output area entry St. No. The 103rd word	41205	04B4h
Output area entry register No. The 103rd word	41206	04B5h
Output area entry St. No. The 104th word	41207	04B6h
Output area entry register No. The 104th word	41208	04B7h
Output area entry St. No. The 105th word	41209	04B8h
Output area entry register No. The 105th word	41210	04B9h

Contents	Register No.	Relative address
Output area entry St. No. The 106th word	41211	04BAh
Output area entry register No. The 106th word	41212	04BBh
Output area entry St. No. The 107th word	41213	04BCh
Output area entry register No. The 107th word	41214	04BDh
Output area entry St. No. The 108th word	41215	04BEh
Output area entry register No. The 108th word	41216	04BFh
Input area entry St. No. The 1st word	43001	0BB8h
Input area entry register No. The 1st word	43002	0BB9h
Input area entry St. No. The 2nd word	43003	0BBAh
Input area entry register No. The 2nd word	43004	0BBBh
Input area entry St. No. The 3rd word	43005	0BBCh
Input area entry register No. The 3rd word	43006	0BBDh
Input area entry St. No. The 4th word	43007	0BBEh
Input area entry register No. The 4th word	43008	0BBFh
Input area entry St. No. The 5th word	43009	0BC0h
Input area entry register No. The 5th word	43010	0BC1h
Input area entry St. No. The 6th word	43011	0BC2h
Input area entry register No. The 6th word	43012	0BC3h
Input area entry St. No. The 7th word	43013	0BC4h
Input area entry register No. The 7th word	43014	0BC5h
Input area entry St. No. The 8th word	43015	0BC6h
Input area entry register No. The 8th word	43016	0BC7h
Input area entry St. No. The 9th word	43017	0BC8h
Input area entry register No. The 9th word	43018	0BC9h
Input area entry St. No. The 10th word	43019	0BCAh
Input area entry register No. The 10th word	43020	0BCBh
Input area entry St. No. The 11th word	43021	0BCCh
Input area entry register No. The 11th word	43022	0BCDh
Input area entry St. No. The 12th word	43023	0BCEh
Input area entry register No. The 12th word	43024	0BCFh
Input area entry St. No. The 13th word	43025	0BD0h
Input area entry register No. The 13th word	43026	0BD1h
Input area entry St. No. The 14th word	43027	0BD2h
Input area entry register No. The 14th word	43028	0BD3h
Input area entry St. No. The 15th word	43029	0BD4h
Input area entry register No. The 15th word	43030	0BD5h
Input area entry St. No. The 16th word	43031	0BD6h
Input area entry register No. The 16th word	43032	0BD7h
Input area entry St. No. The 17th word	43033	0BD8h
Input area entry register No. The 17th word	43034	0BD9h
Input area entry St. No. The 18th word	43035	0BDAh
Input area entry register No. The 18th word	43036	0BDBh
Input area entry St. No. The 19th word	43037	0BDCh
Input area entry register No. The 19th word	43038	0BDDh
Input area entry St. No. The 20th word	43039	0BDEh
Input area entry register No. The 20th word	43040	0BDFh
Input area entry St. No. The 21st word	43041	0BE0h
Input area entry register No. The 21st word	43042	0BE1h
Input area entry St. No. The 22nd word	43043	0BE2h
Input area entry register No. The 22nd word	43044	0BE3h
Input area entry St. No. The 23rd word	43045	0BE4h
Input area entry register No. The 23rd word	43046	0BE5h
Input area entry St. No. The 24th word	43047	0BE6h
Input area entry register No. The 24th word	43048	0BE7h
Input area entry St. No. The 25th word	43049	0BE8h
Input area entry register No. The 25th word	43050	0BE9h

Contents	Register No.	Relative address
Input area entry St. No. The 26th word	43051	0BEAh
Input area entry register No. The 26th word	43052	0BEBh
Input area entry St. No. The 27th word	43053	0BECh
Input area entry register No. The 27th word	43054	0BEDh
Input area entry St. No. The 28th word	43055	0BEEh
Input area entry register No. The 28th word	43056	0BEFh
Input area entry St. No. The 29th word	43057	0BF0h
Input area entry register No. The 29th word	43058	0BF1h
Input area entry St. No. The 30th word	43059	0BF2h
Input area entry register No. The 30th word	43060	0BF3h
Input area entry St. No. The 31st word	43061	0BF4h
Input area entry register No. The 31st word	43062	0BF5h
Input area entry St. No. The 32nd word	43063	0BF6h
Input area entry register No. The 32nd word	43064	0BF7h
Input area entry St. No. The 33rd word	43065	0BF8h
Input area entry register No. The 33rd word	43066	0BF9h
Input area entry St. No. The 34th word	43067	0BFAh
Input area entry register No. The 34th word	43068	0BFBh
Input area entry St. No. The 35th word	43069	0BFCh
Input area entry register No. The 35th word	43070	0BFDh
Input area entry St. No. The 36th word	43071	0BFEh
Input area entry register No. The 36th word	43072	0BFFh
Input area entry St. No. The 37th word	43073	0C00h
Input area entry register No. The 37th word	43074	0C01h
Input area entry St. No. The 38th word	43075	0C02h
Input area entry register No. The 38th word	43076	0C03h
Input area entry St. No. The 39th word	43077	0C04h
Input area entry register No. The 39th word	43078	0C05h
Input area entry St. No. The 40th word	43079	0C06h
Input area entry register No. The 40th word	43080	0C07h
Input area entry St. No. The 41st word	43081	0C08h
Input area entry register No. The 41st word	43082	0C09h
Input area entry St. No. The 42ndh word	43083	0C0Ah
Input area entry register No. The 42nd word	43084	0C0Bh
Input area entry St. No. The 43rd word	43085	0C0Ch
Input area entry register No. The 43rd word	43086	0C0Dh
Input area entry St. No. The 44th word	43087	0C0Eh
Input area entry register No. The 44th word	43088	0C0Fh
Input area entry St. No. The 45th word	43089	0C10h
Input area entry register No. The 45th word	43090	0C11h
Input area entry St. No. The 46th word	43091	0C12h
Input area entry register No. The 46th word	43092	0C13h
Input area entry St. No. The 47th word	43093	0C14h
Input area entry register No. The 47th word	43094	0C15h
Input area entry St. No. The 48th word	43095	0C16h
Input area entry register No. The 48th word	43096	0C17h
Input area entry St. No. The 49th word	43097	0C18h
Input area entry register No. The 49th word	43098	0C19h
Input area entry St. No. The 50th word	43099	0C1Ah
Input area entry register No. The 50th word	43100	0C1Bh
Input area entry St. No. The 51st word	43101	0C1Ch
Input area entry register No. The 51st word	43102	0C1Dh
Input area entry St. No. The 52nd word	43103	0C1Eh
Input area entry register No. The 52nd word	43104	0C1Fh
Input area entry St. No. The 53rd word	43105	0C20h
Input area entry register No. The 53rd word	43106	0C21h

Contents	Register No.	Relative address
Input area entry St. No. The 54th word	43107	0C22h
Input area entry register No. The 54th word	43108	0C23h
Input area entry St. No. The 55th word	43109	0C24h
Input area entry register No. The 55th word	43110	0C25h
Input area entry St. No. The 56th word	43111	0C26h
Input area entry register No. The 56th word	43112	0C27h
Input area entry St. No. The 57th word	43113	0C28h
Input area entry register No. The 57th word	43114	0C29h
Input area entry St. No. The 58th word	43115	0C2Ah
Input area entry register No. The 58th word	43116	0C2Bh
Input area entry St. No. The 59th word	43117	0C2Ch
Input area entry register No. The 59th word	43118	0C2Dh
Input area entry St. No. The 60th word	43119	0C2Eh
Input area entry register No. The 60th word	43120	0C2Fh
Input area entry St. No. The 61st word	43121	0C30h
Input area entry register No. The 61st word	43122	0C31h
Input area entry St. No. The 62nd word	43123	0C32h
Input area entry register No. The 62nd word	43124	0C33h
Input area entry St. No. The 63rd word	43125	0C34h
Input area entry register No. The 63rd word	43126	0C35h
Input area entry St. No. The 64th word	43127	0C36h
Input area entry register No. The 64th word	43128	0C37h
Input area entry St. No. The 65th word	43129	0C38h
Input area entry register No. The 65th word	43130	0C39h
Input area entry St. No. The 66th word	43131	0C3Ah
Input area entry register No. The 66th word	43132	0C3Bh
Input area entry St. No. The 67th word	43133	0C3Ch
Input area entry register No. The 67th word	43134	0C3Dh
Input area entry St. No. The 68th word	43135	0C3Eh
Input area entry register No. The 68th word	43136	0C3Fh
Input area entry St. No. The 69th word	43137	0C40h
Input area entry register No. The 69th word	43138	0C41h
Input area entry St. No. The 70th word	43139	0C42h
Input area entry register No. The 70th word	43140	0C43h
Input area entry St. No. The 71st word	43141	0C44h
Input area entry register No. The 71st word	43142	0C45h
Input area entry St. No. The 72nd word	43143	0C46h
Input area entry register No. The 72nd word	43144	0C47h
Input area entry St. No. The 73rd word	43145	0C48h
Input area entry register No. The 73rd word	43146	0C49h
Input area entry St. No. The 74th word	43147	0C4Ah
Input area entry register No. The 74th word	43148	0C4Bh
Input area entry St. No. The 75th word	43149	0C4Ch
Input area entry register No. The 75th word	43150	0C4Dh
Input area entry St. No. The 76th word	43151	0C4Eh
Input area entry register No. The 76th word	43152	0C4Fh
Input area entry St. No. The 77th word	43153	0C50h
Input area entry register No. The 77th word	43154	0C51h
Input area entry St. No. The 78th word	43155	0C52h
Input area entry register No. The 78th word	43156	0C53h
Input area entry St. No. The 79th word	43157	0C54h
Input area entry register No. The 79th word	43158	0C55h
Input area entry St. No. The 80th word	43159	0C56h
Input area entry register No. The 80th word	43160	0C57h
Input area entry St. No. The 81st word	43161	0C58h
Input area entry register No. The 81st word	43162	0C59h

Contents	Register No.	Relative address
Input area entry St. No. The 82nd word	43163	0C5Ah
Input area entry register No. The 82nd word	43164	0C5Bh
Input area entry St. No. The 83rd word	43165	0C5Ch
Input area entry register No. The 83rd word	43166	0C5Dh
Input area entry St. No. The 84th word	43167	0C5Eh
Input area entry register No. The 84th word	43168	0C5Fh
Input area entry St. No. The 85th word	43169	0C60h
Input area entry register No. The 85th word	43170	0C61h
Input area entry St. No. The 86th word	43171	0C62h
Input area entry register No. The 86th word	43172	0C63h
Input area entry St. No. The 87th word	43173	0C64h
Input area entry register No. The 87th word	43174	0C65h
Input area entry St. No. The 88th word	43175	0C66h
Input area entry register No. The 88th word	43176	0C67h
Input area entry St. No. The 89th word	43177	0C68h
Input area entry register No. The 89th word	43178	0C69h
Input area entry St. No. The 90th word	43179	0C6Ah
Input area entry register No. The 90th word	43180	0C6Bh
Input area entry St. No. The 91st word	43181	0C6Ch
Input area entry register No. The 91st word	43182	0C6Dh
Input area entry St. No. The 92nd word	43183	0C6Eh
Input area entry register No. The 92nd word	43184	0C6Fh
Input area entry St. No. The 93rd word	43185	0C70h
Input area entry register No. The 93rd word	43186	0C71h
Input area entry St. No. The 94th word	43187	0C72h
Input area entry register No. The 94th word	43188	0C73h
Input area entry St. No. The 95th word	43189	0C74h
Input area entry register No. The 95th word	43190	0C75h
Input area entry St. No. The 96th word	43191	0C76h
Input area entry register No. The 96th word	43192	0C77h
Input area entry St. No. The 97th word	43193	0C78h
Input area entry register No. The 97th word	43194	0C79h
Input area entry St. No. The 98th word	43195	0C7Ah
Input area entry register No. The 98th word	43196	0C7Bh
Input area entry St. No. The 99th word	43197	0C7Ch
Input area entry register No. The 99th word	43198	0C7Dh
Input area entry St. No. The 100th word	43199	0C7Eh
Input area entry register No. The 100th word	43200	0C7Fh
Input area entry St. No. The 101st word	43201	0C80h
Input area entry register No. The 101st word	43202	0C81h
Input area entry St. No. The 102nd word	43203	0C82h
Input area entry register No. The 102nd word	43204	0C83h
Input area entry St. No. The 103rd word	43205	0C84h
Input area entry register No. The 103rd word	43206	0C85h
Input area entry St. No. The 104th word	43207	0C86h
Input area entry register No. The 104th word	43208	0C87h
Input area entry St. No. The 105th word	43209	0C88h
Input area entry register No. The 105th word	43210	0C89h
Input area entry St. No. The 106th word	43211	0C8Ah
Input area entry register No. The 106th word	43212	0C8Bh
Input area entry St. No. The 107th word	43213	0C8Ch
Input area entry register No. The 107th word	43214	0C8Dh
Input area entry St. No. The 108th word	43215	0C8Eh
Input area entry register No. The 108th word	43216	0C8Fh
Setting fault	30232	00E7h

5.5 Output/Input Area Entry Numbers (Control module)

The table below shows the control module entry No. that is settable for each parameter of the PROFIBUS module “Output/Input area entry St. No.” and “Output/Input area entry register No.”.

Note

The parameter marked “*” at the “Entry ban” in the table below is not changeable/referable via PROFIBUS communication. Do not set them for each parameter of the “Outout/Input area entry St. No.” or the “Output/Input area entry register No.”.

Operation parameter

Contents	Reading out/Writing data setting range	Depends on Input range	Factory-set value	Register No.1 (Ch1)	Register No.2 (Ch2)	Register No.3 (Ch3)	Register No.4 (Ch4)	Entry ban
Local SV value	0 to 100% FS	○	0	40001 41001	40002 42001	40003 43001	40004 44001	*
Communication SV value	0 to 100% FS	○	0	40023 41100	40024 42100	40025 43100	40026 44100	
MV value	-3.0 to 103.0%		-	40005 41002	40006 42002	40007 43002	40008 44002	
Manual mode switch	0: Auto 1: Manual		0 (Auto)	40013 41003	40014 42003	40015 43003	40016 44003	
RUN/Standby switch	0: RUN 1: Standby		0 (RUN)	40017 41004	40018 42004	40019 43004	40020 44004	
Remote mode switch	0: Local 1: Remote		0 (Local)	40009 41007	40010 42007	40011 43007	40012 44007	
Auto-tuning RUN command	0: Stop/End 1: Normal type 2: Low PV type		0	41005	42005	43005	44005	
DO output unlatch command	0: OFF 1: Unlatch		0	41031	42031	43031	44031	
ALM1 set value 1	-100 to 100% FS	○	2.5% FS	41033	42033	43033	44033	
ALM1 set value 2	-100 to 100% FS	○	2.5% FS	41034	42034	43034	44034	
ALM2 set value 1	-100 to 100% FS	○	2.5% FS	41041	42041	43041	44041	
ALM2 set value 2	-100 to 100% FS	○	2.5% FS	41042	42042	43042	44042	
ALM3 set value 1	-100 to 100% FS	○	2.5% FS	41049	42049	43049	44049	
ALM3 set value 2	-100 to 100% FS	○	2.5% FS	41050	42050	43050	44050	
ALM4 set value 1	-100 to 100% FS	○	2.5% FS	41057	42057	43057	44057	
ALM4 set value 2	-100 to 100% FS	○	2.5% FS	41058	42058	43058	44058	
ALM5 set value 1	-100 to 100% FS	○	2.5% FS	41065	42065	43065	44065	
ALM5 set value 2	-100 to 100% FS	○	2.5% FS	41066	42066	43066	44066	

Control (PID) Parameters

Contents	Reading out/Writing data setting range	Depends on Input range	Factory-set value	Register No.1 (Ch1)	Register No.2 (Ch2)	Register No.3 (Ch3)	Register No.4 (Ch4)	Entry ban
Proportional band [P]	0.0 to 999.9%		5.0	41102	42102	43102	44102	
Integration time [I]	0 to 3200sec		240	41103	42103	43103	44103	
Derivation time [D]	0.0 to 999.9sec		60.0	41104	42104	43104	44104	
ON/OFF control hysteresis	0 to 50% FS	○	0.25% FS	41105	42105	43105	44105	
Cooling proportional band coefficient [cool]	0.0 to 100.0		1.0	41106	42106	43106	44106	
Dead band	-50.0 to 50.0%		0	41107	42107	43107	44107	
Output convergence value	-100.0 to 100.0%		0	41108	42108	43108	44108	
Anti-reset windup [ARW]	0 to 100% FS	○	100% FS	41109	42109	43109	44109	
Direct/Reverse action setting [MV1/MV2]	0: Reverse/None 1: Direct/None 2: Reverse/Direct 3: Direct/Reverse 4: Reverse/Reverse 5: Direct/Direct		0	41110	42110	43110	44110	
SV Lower Limit	0 to 100% FS	○	0% FS	41218	42218	43218	44218	
SV Upper Limit	0 to 100% FS	○	100% FS	41219	42219	43219	44219	
MV1 Lower Limit	-3.0 to 103.0%		-3.0	41255	42255	43255	44255	
MV1 Upper Limit	-3.0 to 103.0%		103.0	41256	42256	43256	44256	
MV2 Lower Limit	-3.0 to 103.0%		-3.0	41257	42257	43257	44257	
MV2 Upper Limit	-3.0 to 103.0%		103.0	41258	42258	43258	44258	
Output limiter type setting	0: MV1 -3.0%/103.0% MV2 -3.0%/103.0% 1: MV1 Limit/103.0% MV2 -3.0%/103.0% 2: MV1 -3.0%/Limit MV2 -3.0%/103.0% 3: MV1 Limit/ Limit MV2 -3.0%/103.0% 4: MV1 -3.0%/103.0% MV2 Limit/103.0% 5: MV1 Limit/103.0% MV2 Limit/103.0% 6: MV1 -3.0%/Limit MV2 Limit/103.0% 7: MV1 Limit/Limit MV2 Limit/103.0% 8: MV1 -3.0%/103.0% MV2 -3.0%/Limit 9: MV1 Limit/103.0% MV2 -3.0%/Limit 10: MV1 -3.0%/Limit MV2 -3.0%/Limit 11: MV1 Limit/Limit MV2 -3.0%/Limit 12: MV1 -3.0%/103.0% MV2 Limit/Limit 13: MV1 Limit/103.0% MV2 Limit/Limit 14: MV1 -3.0%/Limit MV2 Limit/Limit 15: MV1 Limit/Limit MV2 Limit/Limit		0	41259	42259	43259	44259	

Setup Parameters

Contents	Reading out/Writing data setting range	Depends on Input range	Factory-set value	Register No.1 (Ch1)	Register No.2 (Ch2)	Register No.3 (Ch3)	Register No.4 (Ch4)	Entry ban
PV input type	0: JPt100 (0 to 150°C) 1: JPt100 (-150 to 600°C) 2: Pt100 (0 to 150°C) 3: Pt100 (-150 to 300°C) 4: Pt100 (-150 to 850°C) 5: J (0 to 400°C) 6: J (0 to 800°C) 7: K (0 to 400°C) 8: K (0 to 800°C) 9: K (0 to 1200°C) 10: R (0 to 1600°C) 11: B (0 to 1800°C) 12: S (0 to 1600°C) 13: T (-199 to 400°C) 14: E (-199 to 800°C) 18: N (0 to 1300°C) 19: PL-2 (0 to 1300°C) 21: Voltage (0 to 5V) 22: Voltage (1 to 5V) 23: Voltage (0 to 10V) 24: Voltage (2 to 10V)		7(TC/Pt) 22(VI)	40151 41029	40152 42029	40153 43029	40154 44029	*
PV input scale lower	-1999 to 9999		0% FS	41212	42212	43212	44212	*
PV input scale upper	-1999 to 9999		100% FS	41213	42213	43213	44213	*
Decimal place	0: No decimal point 1: One decimal place 2: Two decimal places		0	41214	42214	43214	44214	*
Temperature unit	0: °C 1: Not selectable		°C	41215	42215	43215	44215	*
PV input shift	-10 to 10% FS	○	0	41216	42216	43216	44216	
SV set value shift	-50 to 50% FS	○	0	41217	42217	43217	44217	
PV input filter	0.0 to 120.0sec		2.0	41220	42220	43220	44220	
PV display zero adjustment	-50 to 50% FS	○	0	41221	42221	43221	44221	
PV display span adjustment	-50 to 50% FS	○	0	41222	42222	43222	44222	
Cold junction compensation	0: OFF 1: ON		1 (ON)	41223	42223	43223	44223	
RSV zero adjustment	-50 to 50% FS	○	0	41225	42225	43225	44225	
RSV span adjustment	-50 to 50% FS	○	0	41226	42226	43226	44226	
Remote input master St. No.	0 to 255		0	41532	42532	43532	44532	*

Contents	Reading out/Writing data setting range	Depends on Input range	Factory-set value	Register No.1 (Ch1)	Register No.2 (Ch2)	Register No.3 (Ch3)	Register No.4 (Ch4)	Entry ban
Remote input master Ch. No.	0/1 to 4		Each Ch.	41533	42533	43533	44533	*
FAULT MV1 set value	-3.0 to 103.0%		-3.0	41260	42260	43260	44260	
FAULT MV2 set value	-3.0 to 103.0%		-3.0	41261	42261	43261	44261	
SoftStart MV1 value	-3.0 to 103.0%		103.0	41262	42262	43262	44262	*
SoftStart MV2 value	-3.0 to 103.0%		103.0	41263	42263	43263	44263	*
SoftStart time	0 to 99min. 59sec.		0	41264	42264	43264	44264	*
Standby MV1 value	-3.0 to 103.0%		-3.0	41268	42268	43268	44268	
Standby MV2 value	-3.0 to 103.0%		-3.0	41269	42269	43269	44269	
Standby mode setting	0: ALM=OFF 1: ALM=ON		0	41270	42270	43270	44270	
Linkage operation master St. No. setting	0 to 255		0	41536	42536	43536	44536	*
Linkage operation master Ch. No. setting	1 to 4		Each Ch.	41537	42537	43537	44537	*

System Parameters

Contents	Reading out/Writing data setting range	Depends on Input range	Factory-set value	Register No.1 (Ch1)	Register No.2 (Ch2)	Register No.3 (Ch3)	Register No.4 (Ch4)	Entry ban
Current output range	4: 0 to 20mA 5: 4 to 20mA		5 (4 to 20mA)	40166 41801	40167 42801	40168 43801	40169 44801	
Output type	0: Own St. PV 1: Own St. SV 2: Own St. DV 3: Own St. MV 1 4: Own St. MV 2 5: Other St. PV 6: Other St. SV 7: Other St. MV		3 (Own St. MV1)	40171 41803	40177 42803	40183 43803	40189 44803	
Proportional cycle	1 to 120sec.		2 (SSR drive) /30 (relay)	40176	40182	40188	40194	
Output master St.	0 to255 St.		0	40172 41804	40178 42804	40184 43804	40190 44804	*
Output master Ch.	1 to 4Ch		Each Ch.	40173 41805	40179 42805	40185 43805	40191 44805	*
Output scaling base	-100.0 to 100.0%		0.0	40175 41807	40181 42807	40187 43807	40193 44807	
Output scaling span	-100.0 to 100.0%		100.0	40174 41806	40180 42806	40186 43806	40192 44806	
Output shutdown	0000 to 1111 bit0: Output 1 shutdown bit1: Output 2 shutdown bit2: Output 3 shutdown bit3: Output 4 shutdown		0000	40201				

Contents	Reading out/Writing data setting range	Depends on Input range	Factory-set value	Register No.1 (Ch1)	Register No.2 (Ch2)	Register No.3 (Ch3)	Register No.4 (Ch4)	Entry ban
DI-1 function select	0: No function 1: RUN /Standby switch 2: Auto/Manual switch 3: Local /Remote switch 4: No function 5: No function 6: Start AT (Normal type) 7: Start AT (Low voltage PV) 8: No function 9: No function 10: Ramp SV ON/OFF 11: Ramp SV Hold 12: No function 13: No function 14: No function 15: No function 16: No function 17: Unlatch (All) 18: Unlatch (DO1) 19: Unlatch (DO2) 20: Unlatch (DO3) 21: Unlatch (DO4) 22: Unlatch (DO5) 23: No function 24: No function 25: No function 26: Start timer (DO1) 27: Start timer (DO2) 28: Start timer (DO3) 29: Start timer (DO4) 30: Start timer (DO5) 31: No function 32: No function 33: No function 34: No function 35: No function		0	41013	42013	43013	44013	

Contents	Reading out/Writing data setting range	Depends on Input range	Factory-set value	Register No.1 (Ch1)	Register No.2 (Ch2)	Register No.3 (Ch3)	Register No.4 (Ch4)	Entry ban
DI-1 function select	36: No function 37: No function 38: No function 39: No function 40: No function 41: No function 42: No function 43: No function 44: No function 45: No function 46: No function 47: No function 48: No function 49: Output1 shutdown 50: Output2 shutdown 51: Output3 shutdown 52: Output4 shutdown							
DI-2 function select	0 to 52		0	41014	42014	43014	44014	
DI-3 function select	0 to 52		0	41015	42015	43015	44015	
DI-4 function select	0 to 52		0	41016	42016	43016	44016	
DI-5 function select	0 to 52		0	41017	42017	43017	44017	
DI-6 function select	0 to 52		0	41018	42018	43018	44018	
DI-7 function select	0 to 52		0	41019	42019	43019	44019	
DI-8 function select	0 to 52		0	41020	42020	43020	44020	
DI-9 function select	0 to 52		0	41021	42021	43021	44021	
DI-10 function select	0 to 52		0	41022	42022	43022	44022	
DI-11 function select	0 to 52		0	41023	42023	43023	44023	
DI-12 function select	0 to 52		0	41024	42024	43024	44024	
DI-13 function select	0 to 52		0	41025	42025	43025	44025	
DI-14 function select	0 to 52		0	41026	42026	43026	44026	
DI-15 function select	0 to 52		0	41027	42027	43027	44027	
DI-16 function select	0 to 52		0	41028	42028	43028	44028	
DI master St. setting	0 to 255		0	41011	42011	43011	44011	*
DO1 output event type setting	0 to 102		0	41032	42032	43032	44032	*
DO1 option function setting	0000 to 1111 bit0: Alarm latch function bit1: Error input alarm function bit2: Non-excitation output function bit3: Hold reset function		0000	41036	42036	43036	44036	
DO2 output event type setting	0 to 102		0	41040	42040	43040	44040	*
DO2 option function setting	0000 to 1111 bit0: Alarm latch function bit1: Error input alarm function bit2: Non-excitation output function bit3: Hold reset function		0000	41044	42044	43044	44044	
DO3 output event type setting	0 to 102		0	41048	42048	43048	44048	*

Contents	Reading out/Writing data setting range	Depends on Input range	Factory-set value	Register No.1 (Ch1)	Register No.2 (Ch2)	Register No.3 (Ch3)	Register No.4 (Ch4)	Entry ban
DO3 option function setting	0000 to 1111 bit0: Alarm latch function bit1: Error input alarm function bit2: Non-excitation output function bit3: Hold reset function		0000	41052	42052	43052	44052	
DO4 output event type setting	0 to 102		0	41056	42056	43056	44056	*
DO4 option function setting	0000 to 1111 bit0: Alarm latch function bit1: Error input alarm function bit2: Non-excitation output function bit3: Hold reset function		0000	41060	42060	43060	44060	
DO5 output event type setting	0 to 102		0	41064	42064	43064	44064	*
DO5 option function setting	0000 to 1111 bit0: Alarm latch function bit1: Error input alarm function bit2: Non-excitation output function bit3: Hold reset function		0000	41068	42068	43068	44068	
Ramp SV ON/OFF	0: OFF 1: ON		1 (ON)	41299	42299	43299	44299	
Ramp SV-decline	0 to 100% FS	○	0	41300	42300	43300	44300	
Ramp SV-incline	0 to 100% FS	○	0	41301	42301	43301	44301	
Ramp SV slope time units	0: Slope deg/hr. 1: Slope deg/min.		0 (Slope deg/hr.)	41302	42302	43302	44302	
Control method	0: PID 1: FUSSY PID 2: PID against open-loop		0 (PID)	41291	42291	43291	44291	
ON/OFF hysteresis setting	0: OFF 1: ON		1 (ON)	41292	42292	43292	44292	
Mode at startup	0: Auto 1: Manual 2: Remote 3: Standby		0 (Auto)	41304	42304	43304	44304	*

Alarm Parameters

Contents	Reading out/Writing data setting range	Depends on Input range	Factory-set value	Register No.1 (Ch1)	Register No.2 (Ch2)	Register No.3 (Ch3)	Register No.4 (Ch4)	Entry ban
ALM1 hysteresis	0 to 50% FS	○	1°C	41035	42035	43035	44035	
ALM1 delay time	0 to 99min.59sec. / 0 to 99hr.59min.		0	41037	42037	43037	44037	
ALM1 delay time units	0: sec. 1: min.		0 (sec.)	41038	42038	43038	44038	
ALM2 hysteresis	0 to 50% FS	○	1°C	41043	42043	43043	44043	
ALM2 delay time	0 to 99min.59sec. / 0 to 99hr.59min.		0	41045	42045	43045	44045	
ALM2 delay time units	0: sec. 1: min.		0 (sec.)	41046	42046	43046	44046	
ALM3 hysteresis	0 to 50% FS	○	1°C	41051	42051	43051	44051	
ALM3 delay time	0 to 99min.59sec. / 0 to 99hr.59min.		0	41053	42053	43053	44053	
ALM3 delay time units	0: sec. 1: min.		0 (sec.)	41054	42054	43054	44054	
ALM4 hysteresis	0 to 50% FS	○	1°C	41059	42059	43059	44059	
ALM4 delay time	0 to 99min.59sec. / 0 to 99hr.59min.		0	41061	42061	43061	44061	
ALM4 delay time units	0: sec. 1: min.		0 (sec.)	41062	42062	43062	44062	
ALM5 hysteresis	0 to 50% FS	○	1°C	41067	42067	43067	44067	
ALM5 delay time	0 to 99min.59sec. / 0 to 99hr.59min.		0	41069	42069	43069	44069	
ALM5 delay time units	0: sec. 1: min.		0 (sec.)	41070	42070	43070	44070	
Object Ch. No. for interchannel ALM1	1 to 4		1	41039	42039	43039	44039	
Object Ch. No. for interchannel ALM2	1 to 4		1	41047	42047	43047	44047	
Object Ch. No. for interchannel ALM3	1 to 4		1	41055	42055	43055	44055	
Object Ch. No. for interchannel ALM4	1 to 4		1	41063	42063	43063	44063	
Object Ch. No. for interchannel ALM5	1 to 4		1	41071	42071	43071	44071	
CT[A]HB alarm set value	0.0 to 50.0(A)		0	41072	42072	43072	44072	
CT[A]HB alarm hysteresis	0.0 to 50.0(A)		0.5	41073	42073	43073	44073	
CT[A]HB load short-circuit alarm set value	0.0 to 50.0(A)		0	41074	42074	43074	44074	
CT[A]HB load short-circuit alarm hysteresis	0.0 to 50.0(A)		0.5	41075	42075	43075	44075	
CT[B]HB alarm set value	0.0 to 50.0(A)		0	41076	42076	43076	44076	
CT[B]HB alarm hysteresis	0.0 to 50.0(A)		0.5	41077	42077	43077	44077	
CT[B]HB load short-circuit alarm set value	0.0 to 50.0(A)		0	41078	42078	43078	44078	
CT[B]HB load short-circuit alarm hysteresis	0.0 to 50.0(A)		0.5	41079	42079	43079	44079	
Loop break detection time	0 to 9999sec		0 (Off)	41080	42080	43080	44080	
Loop break detection band	0 to 100% FS	○	2.5% FS	41081	42081	43081	44081	

Communication Parameters

Contents	Reading out/Writing data setting range	Depends on Input range	Factory-set value	Register No.1 (Ch1)	Register No.2 (Ch2)	Register No.3 (Ch3)	Register No.4 (Ch4)	Entry ban
RS-485 Parity setting	0: None 1: Odd 2: Even		0	40111				*
RS-485 Communication speed	0: 9.6kbps 1: 19.2kbps 2: 38.4kbps 3: Forbidden 4: 115.2kbps		1	40115				*
RS-485 Communication permission	0: Ready only 1: Read/Write		1 (R/W)	40114				*
RS-485 Response interval time	0 to 25 (20ms/1digit)		0	40113				*
Enhanced communication module (PUMC) connection permission	0: PUMC not connected (RS-485 Enable) 1: PUMC connected (RS-485 Disable)		0 (RS-485 Enable)	40116				*
Master/slave setting in connected modules	0: Master 1: Slave		1 (Slave)	40117				*
User address 01 : Register No. specification	30000 to 49999		30002(PV1)	40301				*
User address 02 : Register No. specification	30000 to 49999		30002(PV1)	40302				*
User address 03 : Register No. specification	30000 to 49999		30002(PV1)	40303				*
User address 04 : Register No. specification	30000 to 49999		30002(PV1)	40304				*
User address 05 : Register No. specification	30000 to 49999		30002(PV1)	40305				*
User address 06 : Register No. specification	30000 to 49999		30002(PV1)	40306				*
User address 07 : Register No. specification	30000 to 49999		30002(PV1)	40307				*
User address 08 : Register No. specification	30000 to 49999		30002(PV1)	40308				*
User address 09 : Register No. specification	30000 to 49999		30002(PV1)	40309				*
User address 10 : Register No. specification	30000 to 49999		30002(PV1)	40310				*
User address 11 : Register No. specification	30000 to 49999		30002(PV1)	40311				*
User address 12 : Register No. specification	30000 to 49999		30002(PV1)	40312				*
User address 13 : Register No. specification	30000 to 49999		30002(PV1)	40313				*
User address 14 : Register No. specification	30000 to 49999		30002(PV1)	40314				*
User address 15 : Register No. specification	30000 to 49999		30002(PV1)	40315				*
User address 16 : Register No. specification	30000 to 49999		30002(PV1)	40316				*
User address 17 : Register No. specification	30000 to 49999		30002(PV1)	40317				*

Contents	Reading out/Writing data setting range	Depends on Input range	Factory-set value	Register No.1 (Ch1)	Register No.2 (Ch2)	Register No.3 (Ch3)	Register No.4 (Ch4)	Entry ban
User address 18 : Register No. specification	30000 to 49999		30002(PV1)	40318				*
User address 19 : Register No. specification	30000 to 49999		30002(PV1)	40319				*
User address 20 : Register No. specification	30000 to 49999		30002(PV1)	40320				*
User address 21 : Register No. specification	30000 to 49999		30002(PV1)	40321				*
User address 22 : Register No. specification	30000 to 49999		30002(PV1)	40322				*
User address 23 : Register No. specification	30000 to 49999		30002(PV1)	40323				*
User address 24 : Register No. specification	30000 to 49999		30002(PV1)	40324				*
User address 25 : Register No. specification	30000 to 49999		30002(PV1)	40325				*
User address 26 : Register No. specification	30000 to 49999		30002(PV1)	40326				*
User address 27 : Register No. specification	30000 to 49999		30002(PV1)	40327				*
User address 28 : Register No. specification	30000 to 49999		30002(PV1)	40328				*
User address 29 : Register No. specification	30000 to 49999		30002(PV1)	40329				*
User address 30 : Register No. specification	30000 to 49999		30002(PV1)	40330				*
User address 31 : Register No. specification	30000 to 49999		30002(PV1)	40331				*
User address 32 : Register No. specification	30000 to 49999		30002(PV1)	40332				*
User address 01 : R/W field	User address 01 : Depends on Register No.		-	45001				*
User address 02 : R/W field	User address 02 : Depends on Register No.		-	45002				*
User address 03 : R/W field	User address 03 : Depends on Register No.		-	45003				*
User address 04 : R/W field	User address 04 : Depends on Register No.		-	45004				*
User address 05 : R/W field	User address 05 : Depends on Register No.		-	45005				*
User address 06 : R/W field	User address 06 : Depends on Register No.		-	45006				*
User address 07 : R/W field	User address 07 : Depends on Register No.		-	45007				*
User address 08 : R/W field	User address 08 : Depends on Register No.		-	45008				*
User address 09 : R/W field	User address 09 : Depends on Register No.		-	45009				*
User address 10 : R/W field	User address 10 : Depends on Register No.		-	45010				*
User address 11 : R/W field	User address 11 : Depends on Register No.		-	45011				*
User address 12 : R/W field	User address 12 : Depends on Register No.		-	45012				*

Contents	Reading out/Writing data setting range	Depends on Input range	Factory-set value	Register No.1 (Ch1)	Register No.2 (Ch2)	Register No.3 (Ch3)	Register No.4 (Ch4)	Entry ban
User address 13 : R/W field	User address 13 : Depends on Register No.		-	45013				*
User address 14 : R/W field	User address 14 : Depends on Register No.		-	45014				*
User address 15 : R/W field	User address 15 : Depends on Register No.		-	45015				*
User address 16 : R/W field	User address 16 : Depends on Register No.		-	45016				*
User address 17 : R/W field	User address 17 : Depends on Register No.		-	45017				*
User address 18 : R/W field	User address 18 : Depends on Register No.		-	45018				*
User address 19 : R/W field	User address 19 : Depends on Register No.		-	45019				*
User address 20 : R/W field	User address 20 : Depends on Register No.		-	45020				*
User address 21 : R/W field	User address 21 : Depends on Register No.		-	45021				*
User address 22 : R/W field	User address 22 : Depends on Register No.		-	45022				*
User address 23 : R/W field	User address 23 : Depends on Register No.		-	45023				*
User address 24 : R/W field	User address 24 : Depends on Register No.		-	45024				*
User address 25 : R/W field	User address 25 : Depends on Register No.		-	45025				*
User address 26 : R/W field	User address 26 : Depends on Register No.		-	45026				*
User address 27 : R/W field	User address 27 : Depends on Register No.		-	45027				*
User address 28 : R/W field	User address 28 : Depends on Register No.		-	45028				*
User address 29 : R/W field	User address 29 : Depends on Register No.		-	45029				*
User address 30 : R/W field	User address 30 : Depends on Register No.		-	45030				*
User address 31 : R/W field	User address 31 : Depends on Register No.		-	45031				*
User address 32 : R/W field	User address 32 : Depends on Register No.		-	45032				*

Configuration Parameters

Contents	Reading out/Writing data setting range	Depends on Input range	Factory-set value	Register No.1 (Ch1)	Register No.2 (Ch2)	Register No.3 (Ch3)	Register No.4 (Ch4)	Entry ban
Control when burnout is detected	0: Stop control 1: Continue control		0 (Stop control)	41407	42407	43407	44407	
LED2 Lamp Configuration	0 to 255		1	40222				*
LED3 Lamp Configuration	0 to 255		12	40223				*
LED4 Lamp Configuration	0 to 255		13	40224				*
LED5 Lamp Configuration	0 to 255		14	40225				*
LED6 Lamp Configuration	0 to 255		15	40226				*
Reset main unit	0: Do nothing 1: Reset main unit		0	40101				*

Monitor Parameters

Note

Monitor parameter can be entered to the input area only. Do not enter it to the output area.

Contents	Reading out/Writing data setting range	Depends on Input range	Factory-set value	Register No.1 (Ch1)	Register No.2 (Ch2)	Register No.3 (Ch3)	Register No.4 (Ch4)	Entry ban
SV value	0 to 100% FS	○	-	30905	30906	30907	30908	
Remote mode switch	0: Local 1: Remote		-	30030 31037	30031 32037	30032 33037	30033 34037	
System time	0 to 65535		-	30001				
Measurement value (PV)	-5 to 105% FS		-	30002 31001	30003 32001	30004 33001	30005 34001	
Measurement value (SV)	0 to 100% FS		-	30006 31002	30007 32002	30008 33002	30009 34002	
DV	-105 to 105% FS		-	30010 31003	30011 32003	30012 33003	30013 34003	
Output value (MV1)	-3.0 to 103.0%		-	30014 31004	30016 32004	30018 33004	30020 34004	
Output value (MV2)	-3.0 to 103.0%		-	30015 31005	30017 32005	30019 33005	30021 34005	
Remote SV (RSV)	0.0 to 100.0% FS		-	30022 31045	30023 32045	30024 33045	30025 34045	
RCJtemp	-3276.7 to 3276.7°C		-	30110 31016	30111 32016	30112 33016	30113 34016	
Heater current [A]	0.0 to 50.0A		-	30071 31046	30073 32046	30075 33046	30077 34046	
Heater current [B]	0.0 to 50.0A		-	30072 31047	30074 32047	30076 33047	30078 34047	
Leak current [A]	0.0 to 50.0A		-	30081 31048	30083 32048	30085 33048	30087 34048	
Leak current [B]	0.0 to 50.0A		-	30082 31049	30084 32049	30086 33049	30088 34049	

Contents	Reading out/Writing data setting range	Depends on Input range	Factory-set value	Register No.1 (Ch1)	Register No.2 (Ch2)	Register No.3 (Ch3)	Register No.4 (Ch4)	Entry ban
Error source display	0 to FFFF		-	31008	32008	33008	34008	
Alarm 1 to 5 status	0 to 001F		-	31007	32007	33007	34007	
Event input status	0 to FFFF		-	31061	32061	33061	34061	
Remaining time on timer 1	0 to 99min.59sec. / 0 to 99hr. 59min.		-	31011	32011	33011	34011	
Remaining time on timer 2	0 to 99min.59sec. / 0 to 99hr. 59min.		-	31012	32012	33012	34012	
Remaining time on timer 3	0 to 99min.59sec. / 0 to 99hr. 59min.		-	31013	32013	33013	34013	
Remaining time on timer 4	0 to 99min.59sec. / 0 to 99hr. 59min.		-	31014	32014	33014	34014	
Remaining time on timer 5	0 to 99min.59sec. / 0 to 99hr. 59min.		-	31015	32015	33015	34015	
Output value	-3.0 to 103.0%		-	30120	30121	30122	30123	
RS-485 communication permission	0: Read only 1: Read/ Write		-	30062				

5.6 Output/Input Area Entry Numbers (Event I/O module)

The table below shows the event I/O module entry No. that is settable for each parameter of PROFIBUS module “Output/Input area entry St. No.” and “Output/Input area entry register No.”.

Note

The parameters marked “*” in the “Entry ban” column is not changeable/referable via the PROFIBUS communication. Do not set them for each parameter of the “Output/Input area entry St. No.” or the “Output/Input area entry register No.”.

Operation Parameters

Contents	Reading out/Writing data setting range	Factory-set value	Register No.	Entry ban
RUN/Standby Switch	0: RUN 1: Standby	0	40021	
DI output unlatch command	0: OFF 1: Unlatch	0	40022	
DO output unlatch command	0: OFF 1: Unlatch	0	40023	

Digital Input Parameters

Contents	Reading out/Writing data setting range	Factory-set value	Register No.	Entry ban
DI1 input option	Bit 0 : LATCH Bit 1 : NOT Bit 2 : AND Bit 3 : OR	0	40701	
DI1 input logic operation AND	0-00FF	0	40703	
DI1 input logic operation OR	0-00FF	0	40704	
DI2 input option	0-15	0	40705	
DI2 input logic operation AND	0-00FF	0	40707	
DI2 input logic operation OR	0-00FF	0	40708	
DI3 input option	0-15	0	40709	
DI3 input logic operation AND	0-00FF	0	40711	
DI3 input logic operation OR	0-00FF	0	40712	
DI4 input option	0-15	0	40713	
DI4 input logic operation AND	0-00FF	0	40715	
DI4 input logic operation OR	0-00FF	0	40716	
DI5 input option	0-15	0	40717	
DI5 input logic operation AND	0-00FF	0	40719	
DI5 input logic operation OR	0-00FF	0	40720	
DI6 input option	0-15	0	40721	
DI6 input logic operation AND	0-00FF	0	40723	
DI6 input logic operation OR	0-00FF	0	40724	
DI7 input option	0-15	0	40725	
DI7 input logic operation AND	0-00FF	0	40727	
DI7 input logic operation OR	0-00FF	0	40728	
DI8 input option	0-15	0	40729	
DI8 input logic operation AND	0-00FF	0	40731	
DI8 input logic operation OR	0-00FF	0	40732	

Digital Output Parameters

Contents	Reading out/Writing data setting range	Factory-set value	Register No.	Entry ban
DO1 output type	0: Event output 1: Control output	0	40401	*
DO1 master St. No.	0-255	0	40402	*
DO1 master Ch. No.	1-4	1	40403	*
DO1 BIT position	0-FFFF	1	40404	
DO1 output option	Bit 0 : LATCH Bit 1 : NOT Bit 2 : AND Bit 3 : OR	0	40405	
DO1 output logic operation AND	0-00FF	0	40407	
DO1 output logic operation OR	0-00FF	0	40408	
DO1 scaling base	-100.0 - +100.0	0	40409	
DO1 scaling span	-100.0 - +100.0	1000	40410	
DO1 proportion cycle	1-120	30	40411	
DO1 output limit (lower)	0.0 - 100.0	0	40412	
DO1 output limit (upper)	0.0 - 100.0	1000	40413	
DO1 limit type	0: Lower limit -3%, Upper limit 103% 1: Lower limit, Upper limit 103% 2: Lower limit -3%, Upper limit 3: Lower limit, Upper limit	0	40414	
DO2 output type	0: Event output 1: Control output	0	40415	*
DO2 master St. No.	0-255	0	40416	*
DO2 master Ch. No.	1-4	1	40417	*
DO2 BIT position	0-FFFF	2	40418	
DO2 output option	0-15	0	40419	
DO2 output logic operation AND	0-00FF	0	40421	
DO2 output logic operation OR	0-00FF	0	40422	
DO2 scaling base	-100.0 - +100.0	0	40423	
DO2 scaling span	-100.0 - +100.0	1000	40424	
DO2 proportion cycle	1-120	30	40425	
DO2 output limit (lower)	0.0 - 100.0	0	40426	
DO2 output limit (upper)	0.0 - 100.0	1000	40427	
DO2 limit type	0-3	0	40428	
DO3 output type	0: Event output 1: Control output	0	40429	*
DO3 master St. No.	0-255	0	40430	*
DO3 master Ch. No.	1-4	1	40431	*
DO3 BIT position	0-FFFF	4	40432	

Contents	Reading out/Writing data setting range	Factory-set value	Register No.	Entry ban
DO3 output option	0-15	0	40433	
DO3 output logic operation AND	0-00FF	0	40435	
DO3 output logic operation OR	0-00FF	0	40436	
DO3 scaling base	-100.0 - +100.0	0	40437	
DO3 scaling span	-100.0 - +100.0	1000	40438	
DO3 proportion cycle	1-120	30	40439	
DO3 output limit (lower)	0.0 - 100.0	0	40440	
DO3 output limit (upper)	0.0 - 100.0	1000	40441	
DO3 limit type	0-3	0	40442	
DO4 output type	0: Event output 1: Control output	0	40443	*
DO4 master St. No.	0-255	0	40444	*
DO4 master Ch. No.	1-4	1	40445	*
DO4 BIT position	0-FFFF	8	40446	
DO4 output option	0-15	0	40447	
DO4 output logic operation AND	0-00FF	0	40449	
DO4 output logic operation OR	0-00FF	0	40450	
DO4 scaling base	-100.0 - +100.0	0	40451	
DO4 scaling span	-100.0 - +100.0	1000	40452	
DO4 proportion cycle	1-120	30	40453	
DO4 output limit (lower)	0.0 - 100.0	0	40454	
DO4 output limit (upper)	0.0 - 100.0	1000	40455	
DO4 limit type	0-3	0	40456	
DO5 output type	0: Event output 1: Control output	0	40457	*
DO5 master St. No.	0-255	0	40458	*
DO5 master Ch. No.	1-4	1	40459	*
DO5 BIT position	0-FFFF	16	40460	
DO5 output option	0-15	0	40461	
DO5 output logic operation AND	0-00FF	0	40463	
DO5 output logic operation OR	0-00FF	0	40464	
DO5 scaling base	-100.0 - +100.0	0	40465	
DO5 scaling span	-100.0 - +100.0	1000	40466	
DO5 proportion cycle	1-120	30	40467	
DO5 output limit (lower)	0.0 - 100.0	0	40468	
DO5 output limit (upper)	0.0 - 100.0	1000	40469	
DO5 limit type	0-3	0	40470	
DO6 output type	0: Event output 1: Control output	0	40471	*

Contents	Reading out/Writing data setting range	Factory-set value	Register No.	Entry ban
DO6 master St. No.	0-255	0	40472	*
DO6 master Ch. No.	1-4	1	40473	*
DO6 BIT position	0-FFFF	0	40474	
DO6 output option	0-15	0	40475	
DO6 output logic operation AND	0-00FF	0	40477	
DO6 output logic operation OR	0-00FF	0	40478	
DO6 scaling base	-100.0 - +100.0	0	40479	
DO6 scaling span	-100.0 - +100.0	1000	40480	
DO6 proportion cycle	1-120	30	40481	
DO6 output limit (lower)	0.0 - 100.0	0	40482	
DO6 output limit (upper)	0.0 - 100.0	1000	40483	
DO6 limit type	0-3	0	40484	
DO7 output type	0: Event output 1: Control output	0	40485	*
DO7 master St. No.	0-255	0	40486	*
DO7 master Ch. No.	1-4	1	40487	*
DO7 BIT position	0-FFFF	0	40488	
DO7 output option	0-15	0	40489	
DO7 output logic operation AND	0-00FF	0	40491	
DO7 output logic operation OR	0-00FF	0	40492	
DO7 scaling base	-100.0 - +100.0	0	40493	
DO7 scaling span	-100.0 - +100.0	1000	40494	
DO7 proportion cycle	1-120	30	40495	
DO7 output limit (lower)	0.0 - 100.0	0	40496	
DO7 output limit (upper)	0.0 - 100.0	1000	40497	
DO7 limit type	0-3	0	40498	
DO8 output type	0: Event output 1: Control output	0	40499	*
DO8 master St. No.	0-255	0	40500	*
DO8 master Ch. No.	1-4	1	40501	*
DO8 BIT position	0-FFFF	0	40502	
DO8 output option	0-15	0	40503	
DO8 output logic operation AND	0-00FF	0	40505	
DO8 output logic operation OR	0-00FF	0	40506	
DO8 scaling base	-100.0 - +100.0	0	40507	
DO8 scaling span	-100.0 - +100.0	1000	40508	
DO8 proportion cycle	1-120	1	40509	
DO8 output limit (lower)	0.0 - 100.0	0	40510	

Contents	Reading out/Writing data setting range	Factory-set value	Register No.	Entry ban
DO8 output limit (upper)	0.0 - 100.0	1000	40511	
DO8 limit type	0-3	0	40512	

Communication Parameters

Contents	Reading out/Writing data setting range	Factory-set value	Register No.	Entry ban
RS-485 parity setting	0: None 1: Odd 2: Even	0	40111	*
RS-485 response interval time	0 to 25 (1digit/20ms)	1	40113	*
RS-485 communication permission	0: Ready only 1: Read/Write	1	40114	*
RS-485 communication speed	0: 9.6kbps 1: 19.2kbps 2: 38.4kbps 3: Forbidden 4: 115.2kbps	1	40115	*
Enhanced communication module (PUMC) connection permission	0: PUMC not connected (RS-485 Enable) 1: PUMC connected (RS-485 Disable)	0	40116	*

Configuration Parameters

Contents	Reading out/Writing data setting range	Factory-set value	Register No.	Entry ban
FAULT output 1 set value	0: HOLD 1: OFF	0	40260	
Standby output set value	0000-FFFF	0	40268	
Standby mode setting	0: DI=input value DO= Standby output set value 1: DI=All OFF DO=Standby output set value	0	40270	
LED2 Lamp configuration	0-2	1	40222	*

Monitor Parameters

Note

Monitor parameter can be entered to the input area only. Do not enter it to the output area.

Contents	Reading out/Writing data setting range	Factory-set value	Register No.	Entry ban
Digital output calculated result monitor	0000 - FFFF	-	31002	
Digital input calculated result monitor	0000 - FFFF	-	31001	
Digital input terminal monitor	0000 - FFFF	-	31003	

Internal DO Data Area

Contents	Reading out/Writing data setting range	Factory-set value	Register No.	Entry ban
Internal DO data area 1	Event output 1: ON 2: OFF Control output 0.00 to 100.00	0	41001	
Internal DO data area 2		0	41002	
Internal DO data area 3		0	41003	
Internal DO data area 4		0	41004	
Internal DO data area 5		0	41005	
Internal DO data area 6		0	41006	
Internal DO data area 7		0	41007	
Internal DO data area 8		0	41008	
Internal DO data area 9		0	41009	
Internal DO data area 10		0	41010	
Internal DO data area 11		0	41011	
Internal DO data area 12		0	41012	
Internal DO data area 13		0	41013	
Internal DO data area 14		0	41014	
Internal DO data area 15		0	41015	
Internal DO data area 16		0	41016	

5.7 Output/Input Area Entry Numbers (Analog module)

The table below shows the analog module entry No. that is settable for each parameter of the PROFIBUS module "Output/Input area entry St. No." and "Output/Input area entry register No.".

Note

The parameters marked “*” in the “Entry ban” column is not changeable/referable via the PROFIBUS communication. Do not set them for each parameter of the “Output/Input area entry St. No.” or the “Output/Input area entry register No.”.

Operation Parameters

Contents	Readout/Write data setting range	Depends on input range	Factory-set value	Register No. 1 (Ch1)	Register No. 2 (Ch2)	Register No. 3 (Ch3)	Register No. 4 (Ch4)	Entry ban	Aio	Ai	Ao
RUN/Standby SW	0: RUN 1: Standby		0 (RUN)	40017 41004	40018 42004	40019 43004	40020 44004		○	○	○
Internal analog output field	-327.6 to 327.6%		0	40251	40252	40253	40254		○	×	○
Digital output latch release command	0: OFF 1: Release latch		0 (OFF)	41031	42031	43031	44031		○	○	×
ALM1 set value 1	-100 to 100% FS	○	2.5% FS	41033	42033	43033	44033				
ALM1 set value 2	-100 to 100% FS	○	2.5% FS	41034	42034	43034	44034				
ALM2 set value 1	-100 to 100% FS	○	2.5% FS	41041	42041	43041	44041				
ALM2 set value 2	-100 to 100% FS	○	2.5% FS	41042	42042	43042	44042				
ALM3 set value 1	-100 to 100% FS	○	2.5% FS	41049	42049	43049	44049				
ALM3 set value 2	-100 to 100% FS	○	2.5% FS	41050	42050	43050	44050				
ALM4 set value 1	-100 to 100% FS	○	2.5% FS	41057	42057	43057	44057				
ALM4 set value 2	-100 to 100% FS	○	2.5% FS	41058	42058	43058	44058				
ALM5 set value 1	-100 to 100% FS	○	2.5% FS	41065	42065	43065	44065				
ALM5 set value 2	-100 to 100% FS	○	2.5% FS	41066	42066	43066	44066				

Setup Parameters

Contents	Readout/Write data setting range	Depends on input range	Factory-set value	Register No. 1 (Ch1)	Register No. 2 (Ch2)	Register No. 3 (Ch3)	Register No. 4 (Ch4)	Entry ban	Aio	Ai	Ao
Analog input type	0: JPt100(0 to 150°C) 1: JPt100(-150 to 600°C) 2: Pt100(0 to 150°C) 3: Pt100(-150 to 300°C) 4: Pt100(-150 to 850°C) 5: J(0 to 400°C) 6: J(0 to 800°C) 7: K(0 to 400°C) 8: K(0 to 800°C) 9: K(0 to 1200°C) 10: R(0 to 1600°C) 11: B(0 to 1800°C) 12: S(0 to 1600°C) 13: T(-199 to 400°C) 14: E(-199 to 800°C) 18: N(0 to 1300°C) 19: PL-2(0 to 1300°C) 21: Voltage (0 to 5V) 22: Voltage (1 to 5V) 23: Voltage (0 to 10V) 24: Voltage (2 to 10V)		7 (TC/Pt) 22 (VI)	40151 41029	40152 42029	40153 43029	40154 44029	*	○	○	×
Analog input scale lower	-1999 to 9999		0% FS	41212	42212	43212	44212	*			
Analog input scale upper	-1999 to 9999		100% FS	41213	42213	43213	44213	*			
Decimal place	0: No decimal point 1: One decimal place 2: Two decimal places		0 (TC/Pt) 1 (VI)	41214	42214	43214	44214	*			
Temperature unit	0: Degree C 1: Not selectable		0 (°C)	41215	42215	43215	44215	*			
Analog input shift	-10 to 10% FS	○	0	41216	42216	43216	44216				
Analog input filter	0.0 to 120.0sec		2.0	41220	42220	43220	44220				
Analog input display zero adjustment	-50 to 50% FS	○	0	41221	42221	43221	44221				
Analog input display span adjustment	-50 to 50% FS	○	0	41222	42222	43222	44222				
Cold junction compensation	0: OFF 1: ON		1 (ON)	41223	42223	43223	44223				

Contents	Readout/Write data setting range	Depends on input range	Factory-set value	Register No. 1 (Ch1)	Register No. 2 (Ch2)	Register No. 3 (Ch3)	Register No. 4 (Ch4)	Entry ban	Aio	Ai	Ao
Analog output lower limit	-25.0 to 125.0%		-3.0	41255	42255	43255	44255		○	×	○
Analog output upper limit	-25.0 to 125.0%		103.0	41256	42256	43256	44256				
Standby analog output set value	-3.0 to 103.0%		-3.0	41268	42268	43268	44268				
Standby mode setting	0: ALM=OFF 1: ALM=ON		0	41270	42270	43270	44270		○	○	×
Linkage operation master St. No.	0 to 255		0	41536	42536	43536	44536	*	○	○	○
Linkage operation master Ch. No	1 to 4		Each Ch.	41537	42537	43537	44537	*			

System Parameters

Contents	Readout/Write data setting range	Depends on input range	Factory-set value	Register No. 1 (Ch1)	Register No. 2 (Ch2)	Register No. 3 (Ch3)	Register No. 4 (Ch4)	Entry ban	Aio	Ai	Ao
Current output range	4: 0 to 20mA 5: 4 to 20mA		5 (4 to 20mA)	40166 41801	40167 42801	40168 43801	40169 44801		○	×	○
Output type	0: Ai of own station 1: Output 0% 2: Output 0% 3: Output 0% 4: Internal analog output field 5: PV of other St. 6: SV of other St. 7: MV of other St.		3 (output 0%)	40171 41803	40177 42803	40183 43803	40189 44803				
Output master St.	0 to 255 stations		0	40172 41804	40178 42804	40184 43804	40190 44804	*			
Output master Ch.	1 to 4Ch		Each Ch.	40173 41805	40179 42805	40185 43805	40191 44805	*			
Output scaling base	-100.0 to 100.0%		0.0	40175 41807	40181 42807	40187 43807	40193 44807				
Output scaling span	-100.0 to 1000.0		100.0	40174 41806	40180 42806	40186 43806	40192 44806				
Output shutdown	0000 to 1111 bit 0 : Output 1 shutdown bit 1 : Output 2 shutdown bit 2 : Output 3 shutdown bit 3 : Output 4 shutdown		0000	40201							
DI-1 function select	0: No function 1: RUN/Standby SW 2: No function 3: No function 4: No function 5: No function 6: No function 7: No function 8: No function 9: No function 10: No function 11: No function 12: No function 13: No function 14: No function 15: No function 16: No function 17: Latch release (all) 18: Latch release (DO1) 19: Latch release (DO2) 20: Latch release (DO3) 21: Latch release (DO4) 22: Latch release (DO5) 23: No function		0	41013	42013	43013	44013		○	○	○

Contents	Readout/Write data setting range	Depends on input range	Factory-set value	Register No. 1 (Ch1)	Register No. 2 (Ch2)	Register No. 3 (Ch3)	Register No. 4 (Ch4)	Entry ban	Aio	Ai	Ao
DI-1 function select	24: No function 25: No function 26: Start timer(DO1) 27: Start timer(DO2) 28: Start timer(DO3) 29: Start timer(DO4) 30: Start timer(DO5) 31: No function 32: No function 33: No function 34: No function 35: No function 36: No function 37: No function 38: No function 39: No function 40: No function 41: No function 42: No function 43: No function 44: No function 45: No function 46: No function 47: No function 48: No function 49: Output 1 shutdown 50: Output 2 shutdown 51: Output 3 shutdown 52: Output 4 shutdown		0	41013	42013	43013	44013		○	○	○
DI-2 function select	0 to 52		0	41014	42014	43014	44014				
DI-3 function select	0 to 52		0	41015	42015	43015	44015				
DI-4 function select	0 to 52		0	41016	42016	43016	44016				
DI-5 function select	0 to 52		0	41017	42017	43017	44017				
DI-6 function select	0 to 52		0	41018	42018	43018	44018				
DI-7 function select	0 to 52		0	41019	42019	43019	44019				
DI-8 function select	0 to 52		0	41020	42020	43020	44020				
DI-9 function select	0 to 52		0	41021	42021	43021	44021				
DI-10 function select	0 to 52		0	41022	42022	43022	44022				
DI-11 function select	0 to 52		0	41023	42023	43023	44023				
DI-12 function select	0 to 52		0	41024	42024	43024	44024				
DI-13 function select	0 to 52		0	41025	42025	43025	44025				
DI-14 function select	0 to 52		0	41026	42026	43026	44026				
DI-15 function select	0 to 52		0	41027	42027	43027	44027				
DI-16 function select	0 to 52		0	41028	42028	43028	44028				
DI master St. setting	0 to 255		0	41011	42011	43011	44011	*			

Contents	Readout/Write data setting range	Depends on input range	Factory-set value	Register No. 1 (Ch1)	Register No. 2 (Ch2)	Register No. 3 (Ch3)	Register No. 4 (Ch4)	Entry ban	Aio	Ai	Ao
DO 1 output event type setting	0-102		0	41032	42032	43032	44032	*	○	○	×
DO1 option function setting	0000 to 1111 bit 0 : Alarm latch function bit 1 : Error input alarm function bit 2 : Non-excitation output function bit 3 : Hold reset function		0000	41036	42036	43036	44036				
DO2 output event type setting	0-102		0	41040	42040	43040	44040	*			
DO2 option function setting	0000 to 1111 bit 0 : Alarm latch function bit 1 : Error input alarm function bit 2 : Non-excitation output function bit 3 : Hold reset function		0000	41044	42044	43044	44044				
DO3 output event type setting	0-102		0	41048	42048	43048	44048	*			
DO3 option function setting	0000 to 1111 bit 0 : Alarm latch function bit 1 : Error input alarm function bit 2 : Non-excitation output function bit 3 : Hold reset function		0000	41052	42052	43052	44052				
DO4 output event type setting	0-102		0	41056	42056	43056	44056	*			
DO4 option function setting	0000 to 1111 bit 0 : Alarm latch function bit 1 : Error input alarm function bit 2 : Non-excitation output function bit 3 : Hold reset function		0000	41060	42060	43060	44060				
DO5 output event type setting	0-102		0	41064	42064	43064	44064	*			
DO5 option function setting	0000 to 1111 bit 0 : Alarm latch function bit 1 : Error input alarm function bit 2 : Non-excitation output function bit 3 : Hold reset function		0000	41068	42068	43068	44068				
Mode at startup	0: Auto mode 1: Standby 2: Standby 3: Standby		0 (Auto)	41304	42304	43304	44304	*	○	○	○

Alarm Parameter

Contents	Readout/Write data setting range	Depends on input range	Factory-set value	Register No. 1 (Ch1)	Register No. 2 (Ch2)	Register No. 3 (Ch3)	Register No. 4 (Ch4)	Entry ban	Aio	Ai	Ao
ALM1 hysteresis	0 to 50% FS	○	0.25% FS	41035	42035	43035	44035		○	○	×
ALM1 delay time	0 to 99 min. 59sec. /0 to 99hr. 59min.		0	41037	42037	43037	44037				
ALM1 delay time units	0: sec. 1: min.		0 (Second)	41038	42038	43038	44038				
ALM2 hysteresis	0 to 50% FS	○	0.25% FS	41043	42043	43043	44043				
ALM2 delay time	0 to 99 min. 59sec. /0 to 99hr. 59min.		0	41045	42045	43045	44045				
ALM2 delay time units	0: sec. 1: min.		0 (Second)	41046	42046	43046	44046				
ALM3 hysteresis	0 to 50% FS	○	0.25% FS	41051	42051	43051	44051				
ALM3 delay time	0 to 99 min. 59sec. /0 to 99hr. 59min.		0	41053	42053	43053	44053				
ALM3 delay time units	0: sec. 1: min.		0 (Second)	41054	42054	43054	44054				
ALM4 hysteresis	0 to 50% FS	○	0.25% FS	41059	42059	43059	44059				
ALM4 delay time	0 to 99 min. 59sec. /0 to 99hr. 59min.		0	41061	42061	43061	44061				
ALM4 delay time units	0: sec. 1: min.		0 (Second)	41062	42062	43062	44062				
ALM5 hysteresis	0 to 50% FS	○	0.25% FS	41067	42067	43067	44067				
ALM5 delay time	0 to 99 min. 59sec. /0 to 99hr. 59min.		0	41069	42069	43069	44069				
ALM5 delay time units	0: sec. 1: min.		0 (Second)	41070	42070	43070	44070				
Object Ch. No. for interchannel ALM1	1 to 4		1	41039	42039	43039	44039				
Object Ch. No. for interchannel ALM2	1 to 4		1	41047	42047	43047	44047				
Object Ch. No. for interchannel ALM3	1 to 4		1	41055	42055	43055	44055				
Object Ch. No. for interchannel ALM4	1 to 4		1	41063	42063	43063	44063				
Object Ch. No. for interchannel ALM5	1 to 4		1	41071	42071	43071	44071				

Communication Parameters

Contents	Readout/Write data setting range	Depends on input range	Factory-set value	Register No. 1 (Ch1)	Register No. 2 (Ch2)	Register No. 3 (Ch3)	Register No. 4 (Ch4)	Entry ban	Aio	Ai	Ao
RS-485 Parity setting	0: None 1: ODD 2: EVEN		0	40111				*	○	○	○
RS-485 Communication speed	0: 9.6kbps 1: 19.2kbps 2: 38.4kbps 3: Forbidden 4: 115.2kbps		1	40115				*			
RS-485 Communication permission	0: Read only 1: Read/Write		1 (R/W)	40114				*			
RS-485 Response interval time	0 to 25 (20ms/1digit)		0	40113				*			
Enhanced communication module (PUMC) connection permission	0: PUMC not connected (RS-485 Enable) 1: PUMC connected (RS-485 Disable)		0 (RS-485 Enable)	40116				*			
Master/slave setting in connected modules	0: Master 1: Slave		1 (Slave)	40117				*			
User address 01	30000 to 49999		30002(Ai1)	40301				*			
User address 02	30000 to 49999		30002(Ai1)	40302				*			
User address 03	30000 to 49999		30002(Ai1)	40303				*			
User address 04	30000 to 49999		30002(Ai1)	40304				*			
User address 05	30000 to 49999		30002(Ai1)	40305				*			
User address 06	30000 to 49999		30002(Ai1)	40306				*			
User address 07	30000 to 49999		30002(Ai1)	40307				*			
User address 08	30000 to 49999		30002(Ai1)	40308				*			
User address 09	30000 to 49999		30002(Ai1)	40309				*			
User address 10	30000 to 49999		30002(Ai1)	40310				*			
User address 11	30000 to 49999		30002(Ai1)	40311				*			
User address 12	30000 to 49999		30002(Ai1)	40312				*			
User address 13	30000 to 49999		30002(Ai1)	40313				*			
User address 14	30000 to 49999		30002(Ai1)	40314				*			
User address 15	30000 to 49999		30002(Ai1)	40315				*			
User address 16	30000 to 49999		30002(Ai1)	40316				*			
User address 17	30000 to 49999		30002(Ai1)	40317				*			
User address 18	30000 to 49999		30002(Ai1)	40318				*			
User address 19	30000 to 49999		30002(Ai1)	40319				*			

Contents	Readout/Write data setting range	Depends on input range	Factory-set value	Register No. 1 (Ch1)	Register No. 2 (Ch2)	Register No. 3 (Ch3)	Register No. 4 (Ch4)	Entry ban	Aio	Ai	Ao
User address 20	30000 to 49999		30002(Ai1)	40320				*	○	○	○
User address 21	30000 to 49999		30002(Ai1)	40321				*			
User address 22	30000 to 49999		30002(Ai1)	40322				*			
User address 23	30000 to 49999		30002(Ai1)	40323				*			
User address 24	30000 to 49999		30002(Ai1)	40324				*			
User address 25	30000 to 49999		30002(Ai1)	40325				*			
User address 26	30000 to 49999		30002(Ai1)	40326				*			
User address 27	30000 to 49999		30002(Ai1)	40327				*			
User address 28	30000 to 49999		30002(Ai1)	40328				*			
User address 29	30000 to 49999		30002(Ai1)	40329				*			
User address 30	30000 to 49999		30002(Ai1)	40330				*			
User address 31	30000 to 49999		30002(Ai1)	40331				*			
User address 32	30000 to 49999		30002(Ai1)	40332				*			
User data 01	Depends on "User address 01"		-	45001				*			
User data 02	Depends on "User address 02"		-	45002				*			
User data 03	Depends on "User address 03"		-	45003				*			
User data 04	Depends on "User address 04"		-	45004				*			
User data 05	Depends on "User address 05"		-	45005				*			
User data 06	Depends on "User address 06"		-	45006				*			
User data 07	Depends on "User address 07"		-	45007				*			
User data 08	Depends on "User address 08"		-	45008				*			
User data 09	Depends on "User address 09"		-	45009				*			
User data 10	Depends on "User address 10"		-	45010				*			
User data 11	Depends on "User address 11"		-	45011				*			
User data 12	Depends on "User address 12"		-	45012				*			
User data 13	Depends on "User address 13"		-	45013				*			
User data 14	Depends on "User address 14"		-	45014				*			

Contents	Readout/Write data setting range	Depends on input range	Factory-set value	Register No. 1 (Ch1)	Register No. 2 (Ch2)	Register No. 3 (Ch3)	Register No. 4 (Ch4)	Entry ban	Aio	Ai	Ao
User data 15	Depends on "User address 15"		-	45015				*	○	○	○
User data 16	Depends on "User address 16"		-	45016				*			
User data 17	Depends on "User address 17"		-	45017				*			
User data 18	Depends on "User address 18"		-	45018				*			
User data 19	Depends on "User address 19"		-	45019				*			
User data 20	Depends on "User address 20"		-	45020				*			
User data 21	Depends on "User address 21"		-	45021				*			
User data 22	Depends on "User address 22"		-	45022				*			
User data 23	Depends on "User address 23"		-	45023				*			
User data 24	Depends on "User address 24"		-	45024				*			
User data 25	Depends on "User address 25"		-	45025				*			
User data 26	Depends on "User address 26"		-	45026				*			
User data 27	Depends on "User address 27"		-	45027				*			
User data 28	Depends on "User address 28"		-	45028				*			
User data 29	Depends on "User address 29"		-	45029				*			
User data 30	Depends on "User address 30"		-	45030				*			
User data 31	Depends on "User address 31"		-	45031				*			
User data 32	Depends on "User address 32"		-	45032				*			

Configuration Parameters

Contents	Readout/Write data setting range	Depends on input range	Factory-set value	Register No. 1 (Ch1)	Register No. 2 (Ch2)	Register No. 3 (Ch3)	Register No. 4 (Ch4)	Entry ban	Aio	Ai	Ao
LED2 lamp allocation	0 to 255		1	40222				*	○	○	○
LED3 lamp allocation	0 to 255		12	40223				*			
LED4 lamp allocation	0 to 255		13	40224				*			
LED5 lamp allocation	0 to 255		14	40225				*			
LED6 lamp allocation	0 to 255		15	40226				*			
Reset main unit	0: Do nothing 1: Reset main unit		0	40101				*			

Monitor Parameters

Note

Monitor parameter can be entered to the input area only. Do not enter it to the output area.

Contents	Readout/Write data setting range	Depends on input range	Factory-set value	Register No. 1 (Ch1)	Register No. 2 (Ch2)	Register No. 3 (Ch3)	Register No. 4 (Ch4)	Entry ban	Aio	Ai	Ao
System time	0 to 65535		-	30001					○	○	×
Input value (Analog input)	-5 to 105% FS		-	30002 31001	30003 32001	30004 33001	30005 34001				
RCJtemp	-3276.7 to 3276.7°C		-	30110 31016	30111 32016	30112 33016	30113 34016				
Error source display	0 to FFFF		-	31008	32008	33008	34008				
Alarm 1-5 status	0 to 001F		-	31007	32007	33007	34007				
Event input status	0 to FFFF		-	31061	32061	33061	34061				
Remaining time on timer 1	0 to 99 min. 59 sec. /0 to 99hr. 59 min.		-	31011	32011	33011	34011				
Remaining time on timer 2	0 to 99 min. 59 sec. /0 to 99hr. 59 min.		-	31012	32012	33012	34012				
Remaining time on timer 3	0 to 99 min. 59 sec. /0 to 99hr. 59 min.		-	31013	32013	33013	34013				
Remaining time on timer 4	0 to 99 min. 59 sec. /0 to 99hr. 59 min.		-	31014	32014	33014	34014				
Remaining time on timer 5	0 to 99 min. 59 sec. /0 to 99hr. 59 min.		-	31015	32015	33015	34015				
Output value (Analog outout)	-3.0 to 103.0%		-	30120	30121	30122	30123		○	×	○
RS-485 Communication permission	0: Read only 1: Read/Write		-	30062					○	○	○

6 Loader Communications

6.1 Loader Communication Functions

The equipment equipped with communication functions via the loader interface, which enables data exchange to such devices as PC.

The communication system composed of the one to one communication between a master (such as, personal computer) and a slave (the equipment).

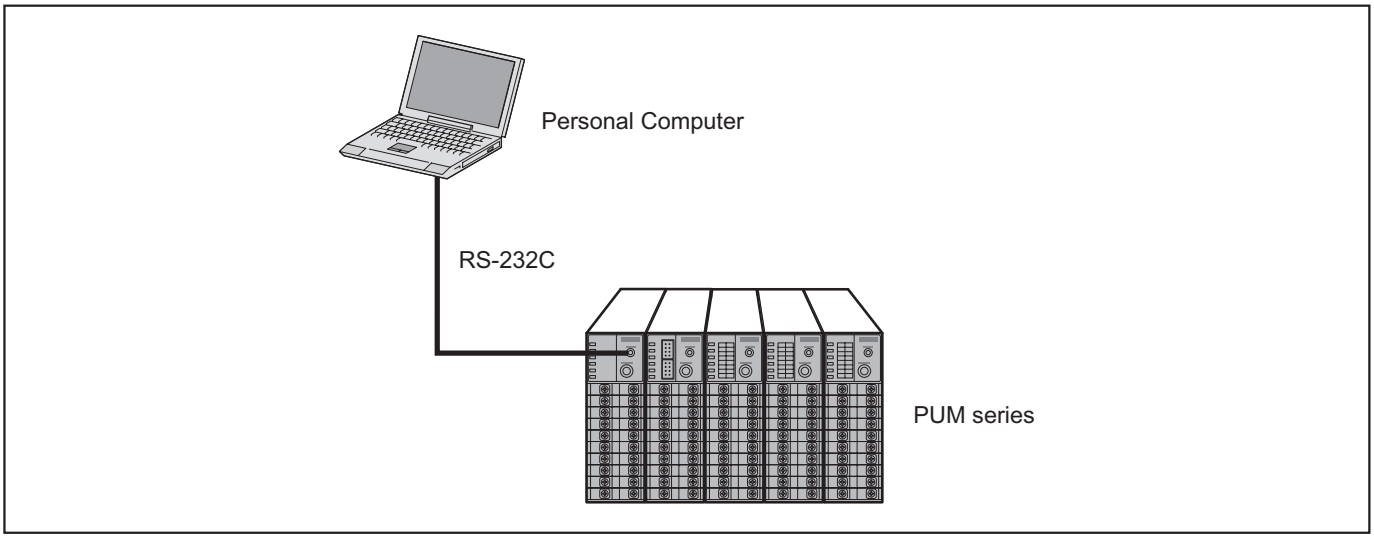
Note

- The system constructed with the equipment as slaves do not respond to messages issued by the master with broadcast queries where the station number is “0”.
- Communications with a loader interface should not be performed during production operation.
- The equipment can not perform communication to PROFIBUS module with it connected to a loader port on the control module.

The sending/receiving data format should be same to perform communication between a master and a slave. The communication data format by the MODBUS protocol is explained in this manual.

When performing the loader communication, connect an optional loader connecting cable (RS-232C, Type: PUMZ*L01) to the front face loader communication port of the main unit in order to perform RS-232C communication to the personal computer.

Connection with PC



6.2 Loader Communication Specifications

Loader interface

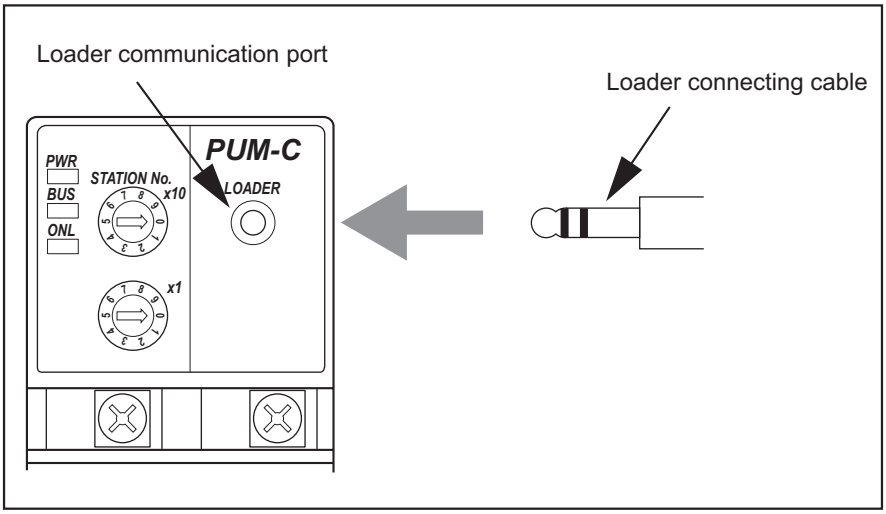
Item	Specifications	
Electrical specifications	EIA RS232C	
Transmission method	3-wire system, half duplex serial	
Synchronous method	Asynchronous	
Connection mode	1 : 1	
Station number	128	
Communication speed	19.2kbps (fixed)	
Data format	Data length	8 bits
	Stop bit	1 bits
	Parity	None (fixed)
Transmission code	HEX value (MODBUS RTU mode)	
Error detection	CRC-16	
Insulation	No insulation with the internal circuit	

6.3 Loader Connections

⚠ Warning

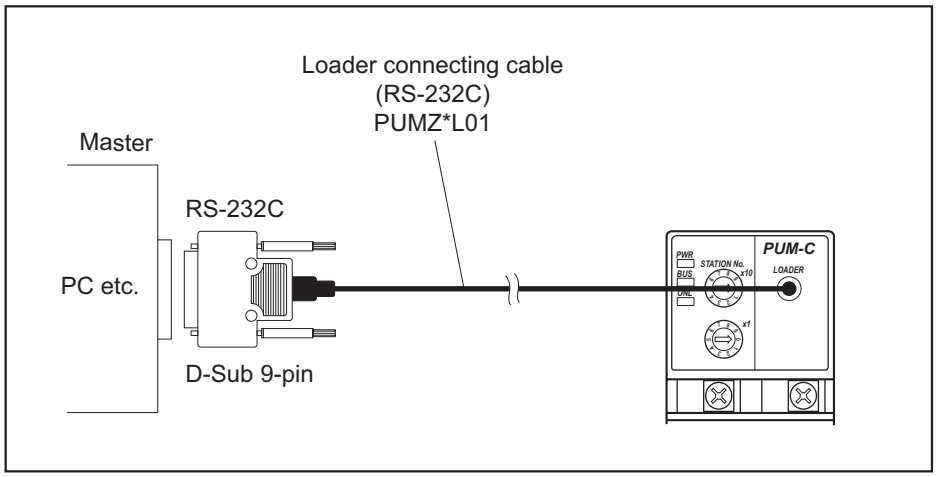
DO NOT TURN THE POWER ON UNTIL ALL OF THE WIRING IS COMPLETED.
THERE IS A RISK OF ELECTRICAL SHOCK OR DAMAGE.

Communication terminal



Connection with a loader communication port

• Use an optional loader connecting cable (RS-232C).



6.4 Setting Loader Communication Conditions

In order to perform communication between the master and the equipment properly, the setting below is necessary.

- All communication conditions settings for both of the master and the equipment should be the same.

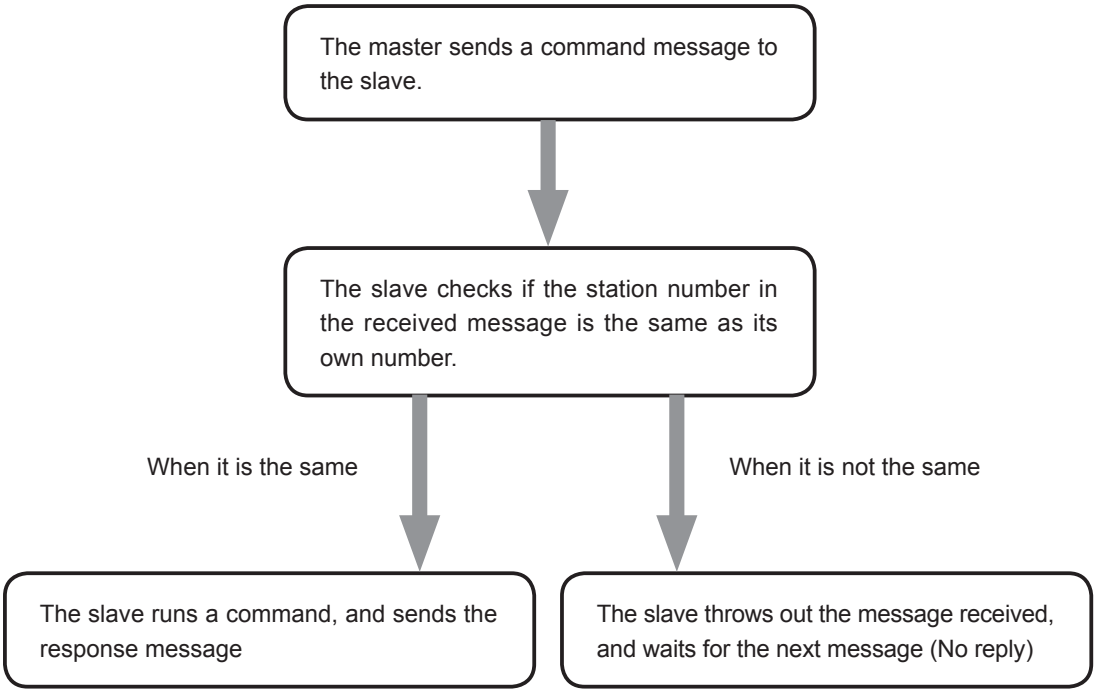
Setting items for loader interface (The equipment)

Items	Setting range	Factory-set value	Remarks column
Station No.	128	128	The value is fixed regardless of the setting of St. No. configuration SW.
Communication speed setting	19.2kbps (Fixed)	—	Not changeable
Data length	8 bits	—	Not changeable
Parity	None	—	Not changeable

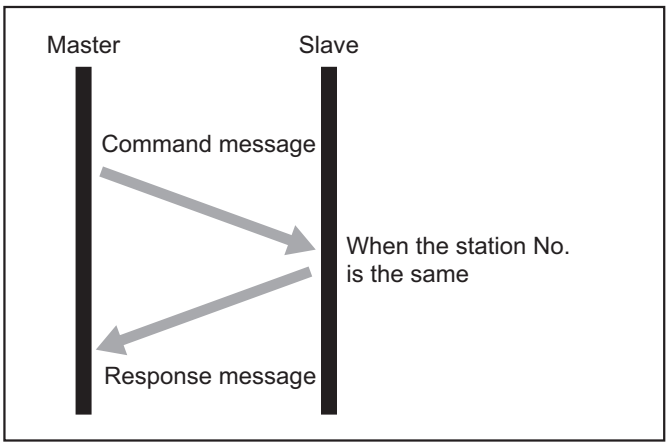
6.5 MODBUS Communication Protocol

The communication system with MODBUS protocol always performs communication by using the procedure that “the master sends a command message first, and the applicable slave sends a response message back”.

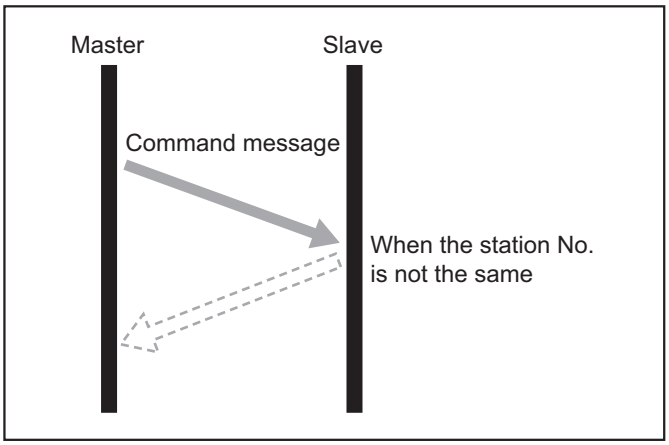
Communication procedure is shown in the flow chart below.



When the station number in the command massage received is the same as its own number.



When the station number in the command message received is not the same as its own number.



Message composition

Command messages are composed of four parts; a station number, a function code, a data part, and an error check code, and sent them in the order above.

Field Name	Number of Bytes
Station No.	1 byte
Function code	1 byte
Data part	2 to 64 bytes
Error check code (CRC-16)	2 bytes

Station No.

This is the number allocated to a slave. It is fixed to “128”.

Function code

This code specifies the function for the slave to perform.

Data part

These data is required to run the function code. The composition of the data part varies according to function codes. Coil number or register number is allocated to the data in the temperature controller, and specify those numbers to read out/write through communications.

The coil number or the register number in messages uses relative addresses.

The relative address is calculated using the formula below.

Relative address = (The last 4 digits of a coil No. / register No.) -1

Ex.) When a function code specifies a register number “40003”

Relative address = (The last 4 digits of 40003) – 1

= 0002

is used in the message.

Error check code

This code is for detecting the message error (changes in the bits) during the signal transmission process. MODBUS protocol mode (RTU mode) uses CRC-16 (Cyclic Redundancy Check).

Slave response

- **Normal slave response**

  A slave creates and replies the response message to each command message. The slave response message uses the same format as the command message. Contents inside the data part vary according to function codes.

- **Irregular slave response**

  If there are problems (such as specification of a nonexistent function code) with the contents of command messages other than transmission error, a slave creates and sends back an error response message without running the command.

  The composition of an error response message is as follows. The function code uses the value that the function code of the command message plus 80H.

Field Name	Number of Bytes
Station No.	1 byte
Function Code + 80H	1 byte
Error Code	1 byte
Error Check Code (CRC-16)	2 bytes

The error codes are shown below.

Error Code	Contents	Explanation
01H	Function code failure	A nonexistent function code was specified. Check the function code.
02H	Address failure for coil/register	The specified relative address for the coil No. /the register No. cannot be used by the specified function code.
03H	Coil/register/limit failure	The specified number of words is too many and specifies the range that does not contain the coil No./register No. The specified data is specified beyond the limit.
06H	Busy state	Data is been writing in the register. Retrying communication after more than 100- sec interval.

- **No slave response**

  In the following cases, a slave ignores the command message, and send the response message back neither.

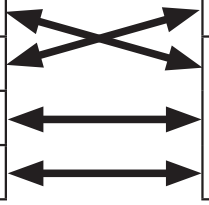
  - In the case that the station number specified by the command message is not the same as the station number specified for a slave.
  - In the case that the error check code does not correspond or the transmission error (such as parity error) is detected.
  - In the case that the interval between the message composing data is 24 bit time or more.

Function code

With MODBUS protocol, the different coil number/register number is allocated depends on the function code, and each function code is only available for a certain coil number/register number.

The diagram below is shown the correspondence between the function code and the coil number/register number.

Function code			Coil / Register No.	
Code	Function	Target	No.	Contents
03H	Read out (continuous)	Hold register	3xxxx	Read out word data
04H	Read out (continuous)	Input register	4xxxx	Read out/Write word data
06H	Write	Hold register		
10H	Write (continuous)	Hold register		



The message length on the each function is shown below.

Code	Contents	Number of allocatable data	Command message		Response message	
			Minimum	Maximum	Minimum	Maximum
03H	Read word data	125 words*	8 bytes	8 bytes	7 bytes	69 bytes
04H	Read out word data (Read out only)	125 words*	8 bytes	8 bytes	7 bytes	69 bytes
06H	Write word data	1 word	8 bytes	8 bytes	8 bytes	8 bytes
10H	Write series of word data	123 words*	11 bytes	73 bytes	8 bytes	8 bytes

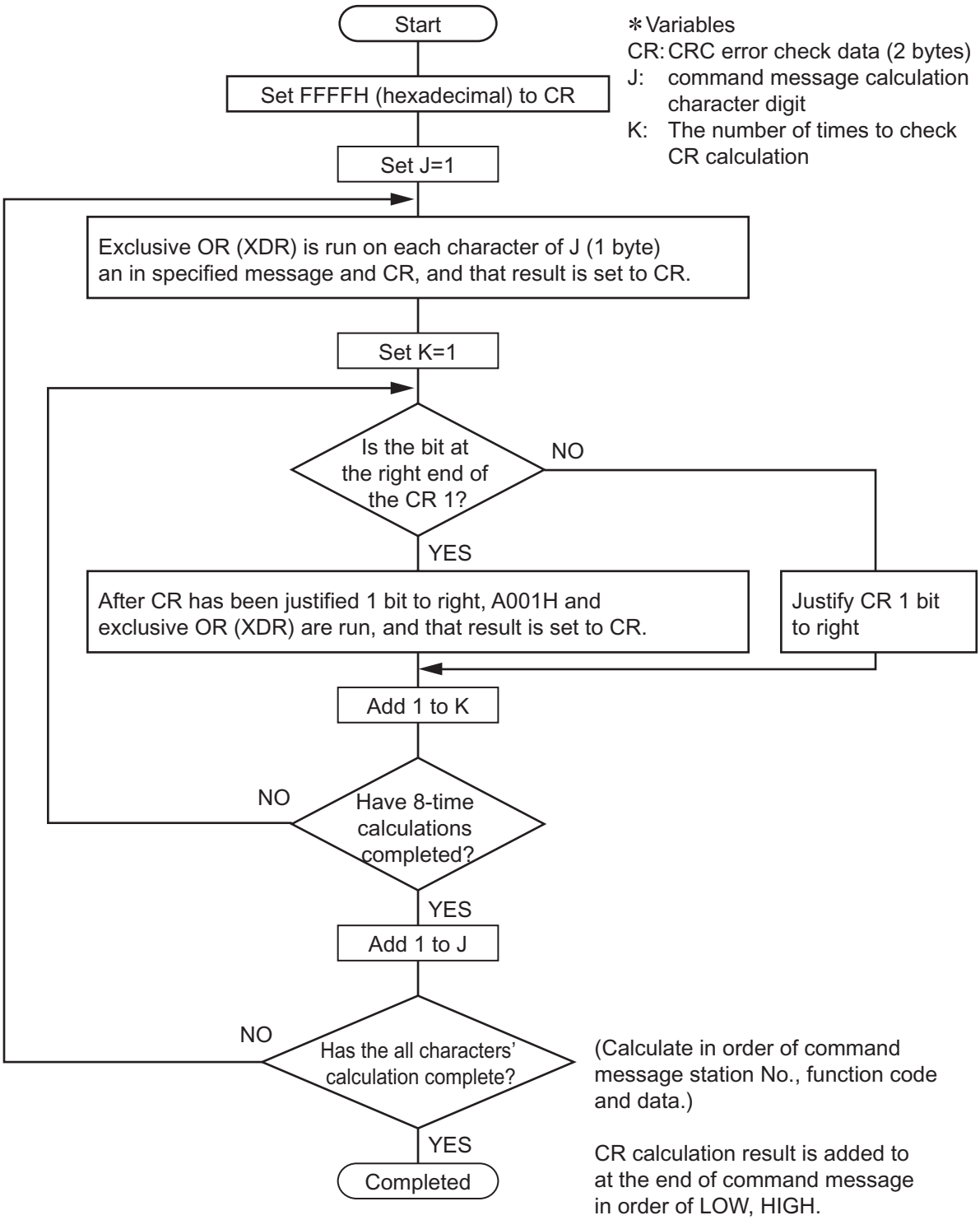
*: “Number of allocatable data” above is limited by the number of data that the equipment allocates for the coil/address number. (Excluding the function code 06H)

Error Check Code (CRC-16) Calculation

CRC-16 is 2-byte (16-bit) error check code. The calculating range is the starting position of the message (station number) to the end of the data part.

A slave calculates the CRC of the message received, and does not send the response message back, if the result is not the same as the CRC code received.

The flow for CRC-16 calculation is as below.



Transmission control procedure

Master communication method

Master should start communication following the rules below.

1. Provide more than 48-bit time blank state before sending the command message.
2. The interval between the sent messages should be less than 24 bit times.
3. The master will be in the receiving standby mode within 24 bit time after sending the command message.
4. Provide blank state more than 48 bit time prior to sending the next message after receiving the response message. (the same as the 1st rule)
5. For safety, create the framework where the master checks the response message, and if there is no response or errors occur, retry at least 3 times.

Note

The definition above is the minimum required value. For safety, creating the master side program with providing margins 2 to 3 times as large is recommended. For a concrete example, creating the blank state (the 1st rule above) more than 10ms, the interval between bytes (the 2nd rule above) and switching from sending to receiving (the 3rd rule) within 1ms for 19.2 kbps is recommended.

Frame detection

There are 2 states with the circuit as below.

- Blank state (no data on the circuit)
- Communication state (data running on the circuit)

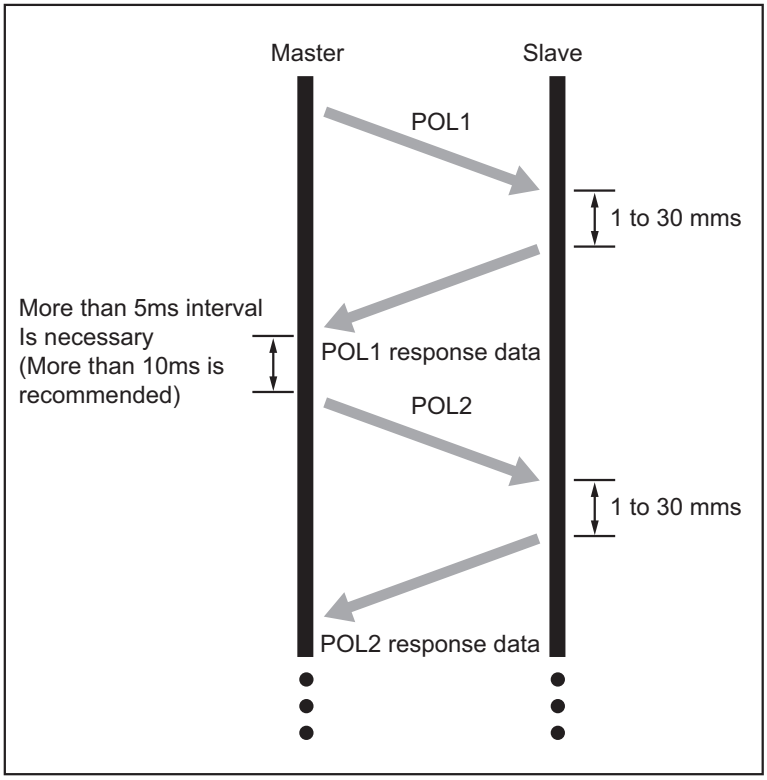
The equipment connected on the circuit is in the receiving state first and monitors the circuit. When the blank state more than 24 bit time appears, it detects the end of the previous frame and will be in the receiving standby mode within the next 24 bit time. When data appears on the circuit, it begins receiving and when the blank state more than 24 bit appears again, it detects the end of the frame. In other words, the data appears on the circuit during appearance of the first blank state more than 24 bit time to the next blank state more than 24 bit time is loaded as one frame (a bundle of data). Therefore, one frame should be sent following the rules below.

- Provide the blank state more than 48 bit time before sending the command message.
- The interval between bytes of the message sent should be less than 24 bit time.

The equipment response

The equipment, after detected the frame (detection of the blank state more than 24 bit time), runs that frame as the command message. In the case the frame message is for the own station, the equipment send the response message back; it takes about 1 to 30 ms for this operation. (How long it takes is depends on the contents of the command message.) Therefore, the master, after sending the command message, should follow the rules shown below

- After sending the command message, the master will be in the receiving standby mode within 24 bit time.



6.6 Command and Transmission Frame Details

Reading Data

Reading Word Data (Function Code: 03H)

The unit reads word data continuously for the specified number of words from the first number to start reading from.

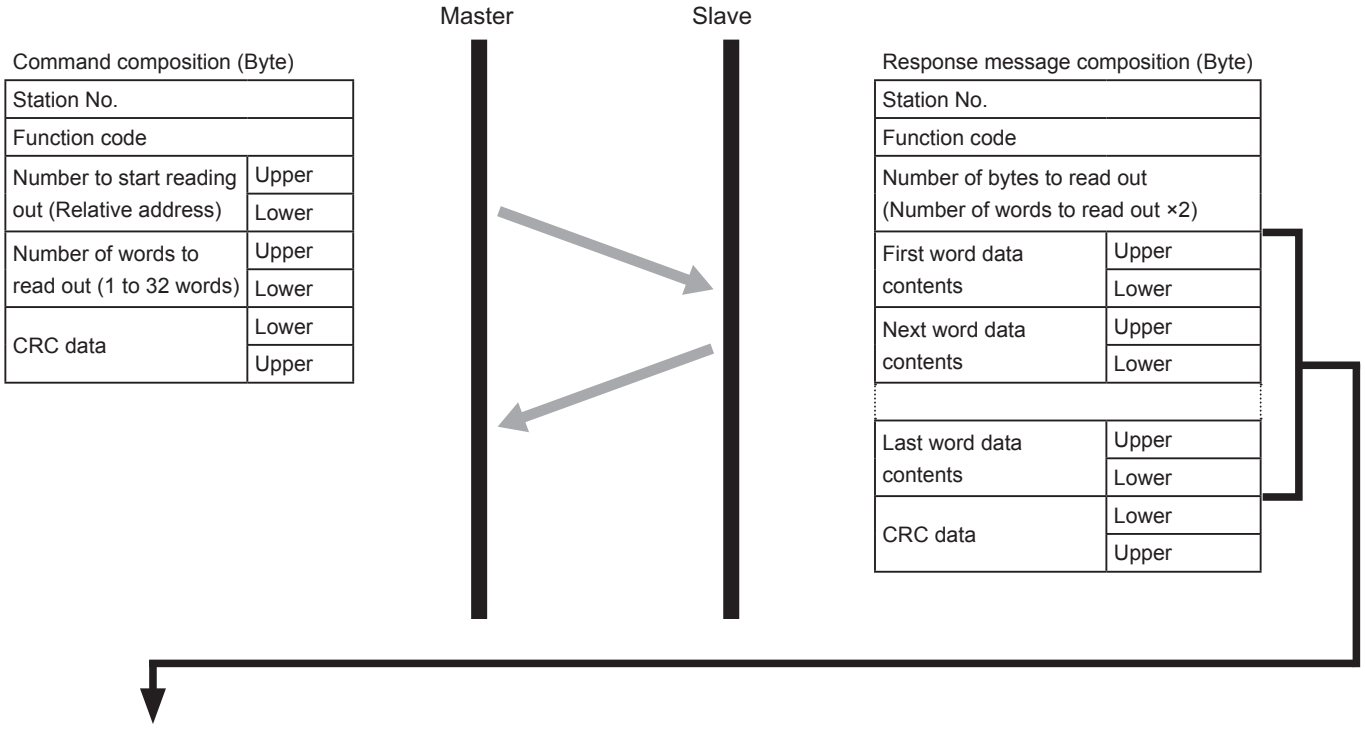
The slave forwards the read word data from the upper number of bytes to the lower number.

Note

- When reading out word data continuously, specification beyond the range of the relative address will result in no response.
- Do not write data to the number not listed on the MODBUS register numbers. (It might cause the equipment's abnormal operation.)

Function code	03H
Number of readable words in one message	125

• **Message composition**



Command composition (Byte)

Station No.	
Function code	
Number to start reading out (Relative address)	Upper
	Lower
Number of words to read out (1 to 32 words)	Upper
	Lower
CRC data	Lower
	Upper

Response message composition (Byte)

Station No.	
Function code	
Number of bytes to read out (Number of words to read out ×2)	
First word data contents	Upper
	Lower
Next word data contents	Upper
	Lower
Last word data contents	Upper
	Lower
CRC data	Lower
	Upper

The meaning of read out word

MSB	LSB
First word data contents upper byte	
First word data contents lower byte	
Next word data contents upper byte	
Next word data contents lower byte	
Last word data contents upper byte	
Last word data contents lower byte	

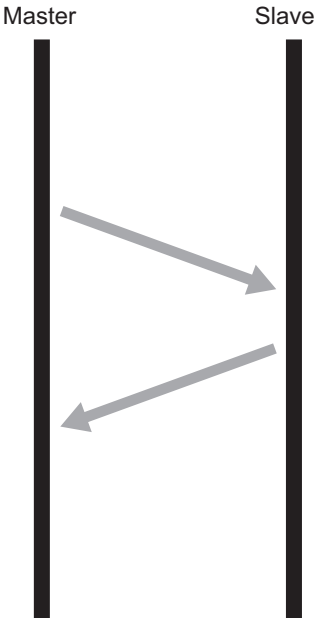
- **Example of message transmission**

  When reading out the set value of PROFIBUS communication setting for "output area" from PROFIBUS module, the message composition is as follows.

  - PROFIBUS communication setting for "output area" relative address: 0002h
  - PROFIBUS module St. No: 80h.

Command message (Byte)

Station No.		80H
Function code		03H
Number to start reading out (Relative address)	Upper	00H
	Lower	02h
Number of words to read out	Upper	00H
	Lower	01H
CRC data	Lower	BAH
	Upper	19H



Response Message (Byte)

Station No.		80H
Function code		03H
Number of bytes to read out		02H
First word data contents	Upper	00H
	Lower	03h
CRC data	Lower	85H
	Upper	E4H

The meaning of read out data

PROFIBUS communication setting for "output area" = 0003h (32 words)

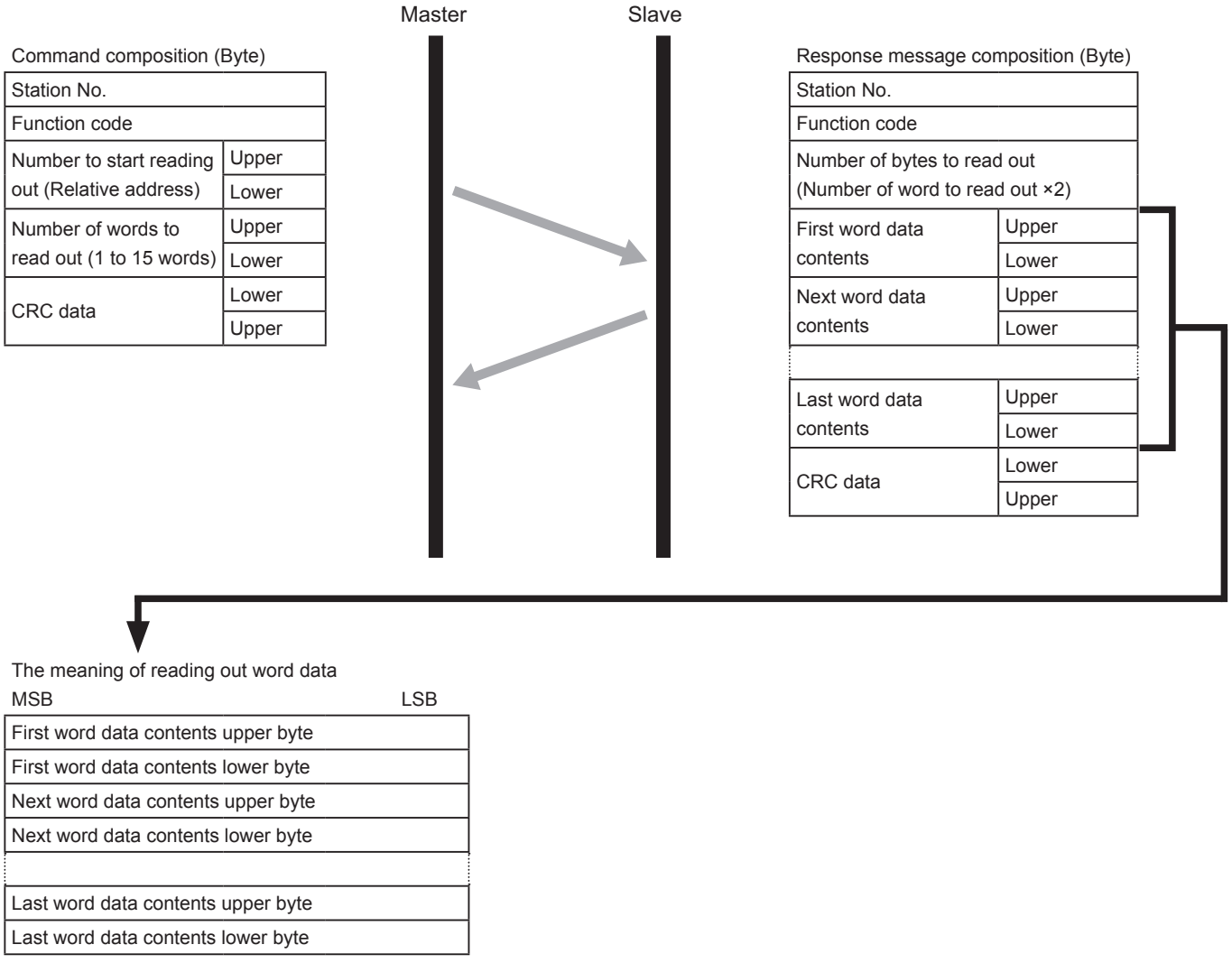
Reading out read-only word data (Function code: 04H)

The equipment reads out the word data specified by the number of words to read out continuously from the number to start reading out.

A slave sends the read out data in order of the upper bytes, the lower bytes.

Function code	04H
Max. number of readable words in one message	125
Relative address	00F7H to 03F2H
Register No.	30232 to 31011

- **Message composition**



The meaning of reading out word data

MSB	LSB
First word data contents upper byte	
First word data contents lower byte	
Next word data contents upper byte	
Next word data contents lower byte	
Last word data contents upper byte	
Last word data contents lower byte	

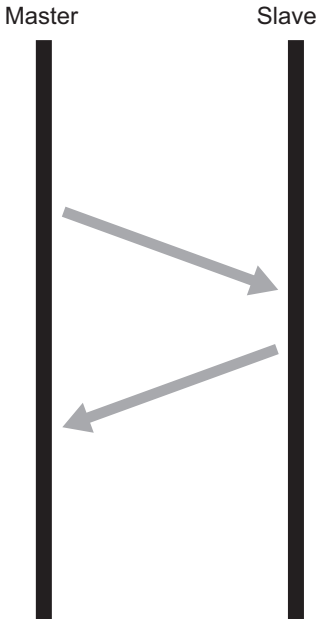
- **Example of message transmission**

  When reading out “Setting error” from PROFIBUS module, the message composition is as follows.

  - "Setting error" relative address: 00E7h
  - PROFIBUS module St. No.: 80h

Command message (Byte)

Station No.		80H
Function code		04H
Number to start reading out (Relative address)	Upper	00H
	Lower	E7H
Number of words to read out	Upper	00H
	Lower	01H
CRC data	Lower	9FH
	Upper	ECH



Response message (Byte)

Station No.		80H
Function code		04H
Number of bytes to read out		02H
First word data contents	Upper	01H
	Lower	02H
CRC data	Lower	BFH
	Upper	03H

The meaning of read out data

Setting error = 0102h

(DIP SW (No. of data exchange broad casting words) is invalid value)

Writing Data

Writing word Data (1 word, function code: 06H)

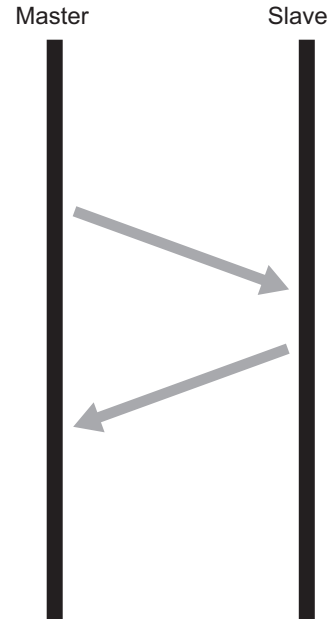
This writes the specified data to the specified number for word data. The master sends the data to be written from the upper number of bytes to the lower number.

Function code	06H
Max. number of readable words in one message	1

- **Message composition**

Command message composition (Byte)

Station No.	
Function code	
Number to specify writing (Relative address)	Upper
	Lower
Write word data	Upper
	Lower
CRC data	Lower
	Upper



Response message composition (Byte)

Station No.	
Function code	
Number to specify writing (Relative address)	Upper
	Lower
Write word data	Upper
	Lower
CRC data	Lower
	Upper

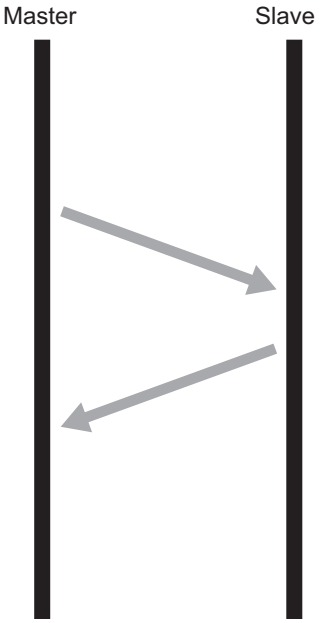
- **Example of message transmission**

  This example shows when setting "32 (0020h)" to "Output area device size" for PROFIBUS module.

  - "Output area device size" relative address: 0067h
  - PROFIBUS module St. No. : 80h

Command message (Byte)

Station No.		80H
Function code		06H
Number to specify writing (Relative address)	Upper	00H
	Lower	67H
Write word data	Upper	00H
	Lower	20H
CRC data	Lower	06H
	Upper	0FH



Response message (Byte)

Station No.		80H
Function code		06H
Number to specify writing (Relative address)	Upper	00H
	Lower	67H
Write word data	Upper	00H
	Lower	20H
CRC data	Lower	06H
	Upper	0FH

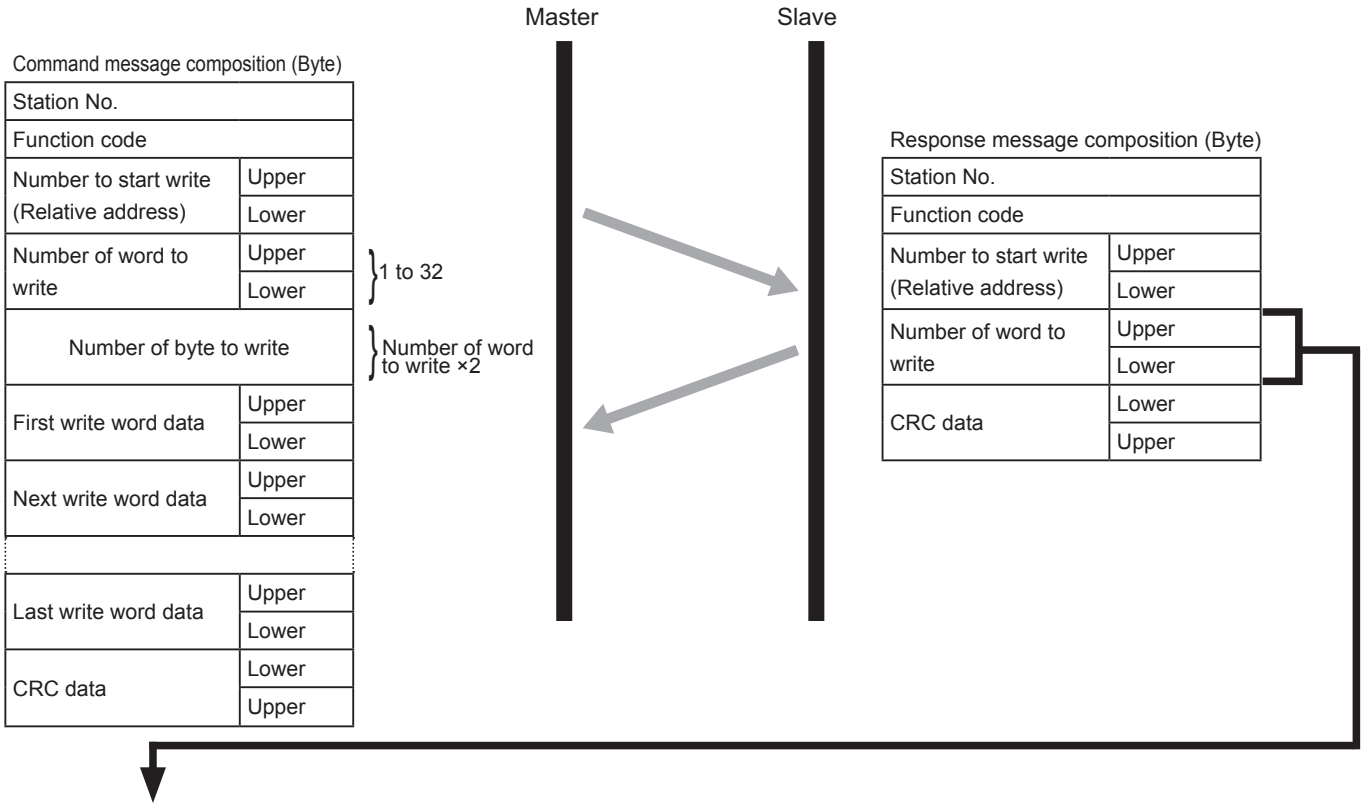
Write series of words (Function code: 10H)

Write how long it takes to write words and the series of word information beginning from the start writing number.

The master sent the writing word data in order of the upper, the lower.

Function code	10H
Max. number of readable words in one message	123

- **Message composition**



Meaning of write word data

MSB	LSB
First word data contents upper byte	
First word data contents lower byte	
Next word data contents upper byte	
Next word data contents lower byte	
Last word data contents upper byte	
Last word data contents lower byte	

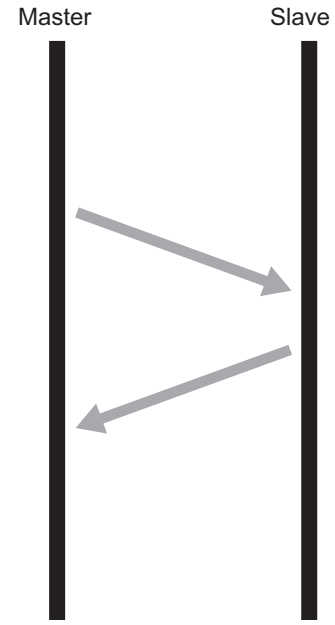
- **Example of message transmission**

  This example shows when setting "17 (0011h)" to "Output area entry St. No. (1st word)" and setting "40021 (0014h)" to "Output area entry register No. (1st word)" of the PROFIBUS module.

  - Output area entry St. No. (1st word) : 17 (0011h)
  - Output area entry register No. (1st word) : 21 (0014h)
  - PROFIBUS module St. No. :80h

Command message composition (Byte)

Station No.		80H
Function code		10H
Number to specify writing (Relative address)	Upper	00H
	Lower	0BH
Write word data	Upper	00H
	Lower	02H
Number of byte to write		04H
First write word data	Upper	00H
	Lower	11H
Last write word data	Upper	00H
	Lower	14H
CRC data	Lower	9FH
	Upper	52H



Response message composition (Byte)

Station No.		80H
Function code		10H
Number to specify writing (Relative address)	Upper	00H
	Lower	0BH
Number of word to write	Upper	00H
	Lower	02H
CRC data	Lower	2EH
	Upper	1BH

7

Trouble Shooting

7.1 Error Procedure

Trouble during operation

If troubles occur during operation, check the type of your module, its connection and parameter setting for any abnormalities. Refer to the manual of PROFIBUS-DP master equipment.

The dialog below shows the typical troubles and the solutions on their problems.

Troubles	Causes	Solutions
PWR indicator : No light (even if turning the power ON)	No power supply with the main unit.	Check if the power supply wiring is installed.
	Supply voltage is out of the allowable range.	Use the power supply conforming to the main unit specifications.
	Main unit failure.	Replace the module.
PWR indicator : Red light	PLC: Power OFF	Turn on PLC
	Connection failure	Check the "Connection with PLC" ▶▶ 3-13
	Connecting cable failure	Check the connection state of the connecting cable
		Check if the connecting cable breaks
		Check if the wiring of the signal conductor of the connecting cable is correct
	Communication setting of communication speed and communication data length is not same as the setting of PLC	Check if the setting of PLC communication speed/PLC transmission of PROFIBUS module matches CPU unit setting of PLC (Refer to STEP7 for setting)
PWR indicator : Red blinking (1.0-sec inter-cycle)	The parameter entered to the PROFIBUS module is invalid value.	Check the error codes of "Setting error" ▶▶ 5-10, write parameter's correct set value by the PUM parameter loader, and then restart"
	Setting of the data exchange broadcasting words is invalid value	Check the error codes of "Setting error" ▶▶ 5-10, modify it correctly, and then restart
Data in the all modules cannot be read out	Inter-module connection error	Check the state of inter-module connections
	The unit failure	Replace the module

Troubles	Causes	Solutions
Only certain connected modules cannot read out data	The applicable module is accessing to non-supported MODBUS address	Check the MODBUS address supported by the applicable module
	Access beyond the number of the device points of applicable module (Device size over)	Modify the parameter setting within the number of device points of the applicable module
	Incorrect St. No. setting of the applicable module	Set the applicable module St. No. correctly
	The applicable module has dropped out once after establishing the communication	Turn the power ON again
	The unit failure	Replace the applicable module
The read data to the input area of PROFIBUS-DP master equipment is incorrect	Duplication of the memory setting of the output area	If set the same St. or register No. with the output area entry St. No./register No., later setting will be enable Check the parameter set value and modify it
	O/I memory is overwritten on the sequence program of the PROFIBUS-DP master equipment	Check the area used on the sequence program of the PROFIBUS-DP master equipment, and modify the setting not to overwrite the O/I memory
	Even modified the parameter of PROFIBUS module, the power has not turned ON yet	Turn the power ON again
"0" is written to the set data for the certain period after the PROFIBUS-DP master equipment and the PROFIBUS module comes to be the online	Specification of the PROFIBUS communication	Control with the normal parameter is impossible after the certain period, because "0" is written to the set data. If you want to avoid to control with "0" setting after the power ON, make the setting below 1. Mode parameter setting for the all of target control modules at start-up should be "3" (standby). 2. Mode parameter setting for the all of target analog modules at start-up should be "3" (standby). 3. Check the set data (reading by a loader, trend display etc.), and standby until the value comes to be the one which is set originally. 4. Change the parameter set in 1 and 2 above to "0" (Auto). * Both of "1"(Manual) and "2"(Remote) can be set to the control module depending on the intended use.
With a window communication, communication result flag of the input area comes to be the abnormal response state (communication result of window message = Fh)	Invalid values were written to the control/event/analog module	Check the set value of the window field in the output area, and modify it

Troubles during connecting the loader

The diagram below shows the list of the cased frequently occurs and their solution.

Refer the parameter loader for PUM user's manual as well.

Troubles	Causes	Solutions
Communication with PUM parameter loader is not possible	Connection error to the parameter loader for PUM	Check the connection status of the parameter loader connecting cable for PUM Check if there is any connecting cable break
		Check if the assembly of the parameter loader connecting cable for PUM correct
	Communication conditions mismatch	Check such as communication speed set value, parity set value
	Wrong host	Check that the parameter loader connecting cable for PUM is connected to the loader port of PROFIBUS module
Parameter change is not possible	Attempting the parameter input value writes the value out of the setting range	Modify and write the input value within the setting range

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