

Instruction Manual (Installation)



Multi-loop module type Temperature Controller
Enhanced Communication Module (PROFIBUS)

Model: PUMCP

Fuji Electric Co., Ltd.

INP-TN1PUMCP-E

Thank you for purchasing the Fuji module type temperature controller. Once you have confirmed that this is the product you ordered, please use it in accordance with the following instructions. For detailed information on operating this equipment, please refer to the separate operations manual. In addition, please keep this instruction manual within easy reach of the actual person using this equipment.

CAUTION

The contents of this manual are subjected to change without notice. This manual is compiled with possible care in the interests of accuracy, however, Fuji Electric Systems shall not be held liable for any damages, including indirect damage, caused by typographical errors, absence of information or use of information in this manual.

Confirming Specifications and Accessories

Before using the product, confirm that it matches the type ordered. (Refer to page 4 for model codes.) Confirm that all of the following accessories are included.

Temperature Controller Enhanced Communication Module (PROFIBUS)	1 Unit
Instruction Manual	1 Copy

Related Information

Refer to "Module Type Temperature Controller Enhanced Communication Module (PROFIBUS) Operation Manual" for details about the items described in this manual.

Content	Material name	Material No.
Specification	Catalog	ECNO 1162
Operating instruction	Enhanced Communication Module (PROFIBUS) User's manual	INP-TN5A0489-E
Tool	PUM parameter loader	INP-TN5A0201-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 or property damage.
Risk of Electrical Shock	Indicates that a risk of electrical shock is present and the associated warning should be observed.

1 Warning

1-1 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/s ² (1G)
Warm-up time	30 min. or more
Installation category	IEC1010-1: class II
Pollution level	IEC1010-1: degree 2

- The insulation class of the equipment is as below. Before installing, confirm that the insulation class for the equipment meets usage requirements.

Power source	PROFIBUS
Loader communication	

—— Functional insulation (AC1000V) ——— Functional insulation (AC500V)

- 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 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.
- When using a AWG-16 cable, you should use the crimp terminal that material thickness is 0.9 mm or less.

1-2 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.

2 Caution

2-1 Cautions when Installing

- For install in UL listed enclosure only. Please avoid installing in the following locations.
- Where the ambient temperature is beyond the range of 0 to 50 degree C when the equipment is in use.
 - Where the ambient humidity is beyond the range of 45 to 85% RH when the equipment is in use.
 - With rapid temperature changes, leading to dew condensation.
 - Where corrosive gas (sulfide gas, ammonia, etc., especially) or farmable gas is generated.
 - With direct vibration or shock to the equipment.
 - Where contacts with water, oil, chemicals, steam or hot water. (If the equipment gets wet, since there is a risk of electric leakage or fire, have it inspected by Fuji distributor.)
 - With high concentration of atmospheric dust, salt or iron particles.
 - With inductive interference, resulting in static electricity, magnetic fields or noise.
 - In direct sunlight.
 - Where accumulation of heat due to radiant heat is generated.
 - A switch or circuit Breaker shall be included in the building installation. Please be it in close proximity to the equipment and within easy reach of the operator, and mark it as the disconnecting device for the equipment.

2-2 Cautions when Mounting to Cabinets / DIN rails

- After mounting modules onto DIN rails, make sure to fasten it firmly by pushing up the locking tabs.
- When connecting modules, first, connect them with release of all modules' locking tabs, and then push all of them up to lock.
- Make sure to turn the power OFF, when removing the front terminal block from the main body or removing the main body from the base part.
- In order not to prevent heat dissipation, do not block the air vents on the top and bottom of the equipment.
- For mounting / dismounting modules to / from DIN rails, space more than 30mm should be provided.
- Use attached screws to the equipment only.

2-3 Cautions for Wiring

- For wiring to the terminal block, use crimp terminals of screw size M3. The screw size of the terminal block: M3 × 7 (with a square washer) Cramp torque: 0.78N-m (8kgf-cm)
- To avoid the influence of inductive noise, signal wires should be separated from electric power lines or load lines.
- If you use RS-232C communication, use it with attaching the noise filter to AC power line. (This is not necessary if implementing the complete preparation for noise of power line.)
- To comply with CE marking (EMC), attaching ferritic cores to the communication cable and the power supply cable is recommended.

2-4 Error Operation

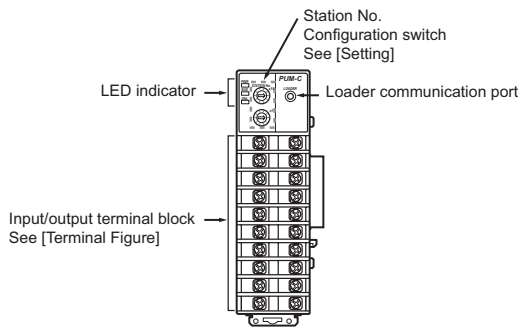
- The alarm function does not work properly when an error occurs unless the correct settings are made. Make sure to verify its setting prior to starting operation.

2-5 Others cautions

- Do not wipe the equipment with organic solvent, such as alcohol or benzene, etc. Use a neutral cleaning agent for cleaning it.
- Do not use mobile phones near the equipment (within 50cm). Otherwise the malfunction may result.
- The use of the equipment near radios, TVs, or wireless devices may cause malfunctions.
- After turning the power ON, it needs 20 sec. until it starts communication.
- Prior to wiring / connecting the equipment, always take a countermeasure against static electricity (ESD).

Part names and functions

- Main unit

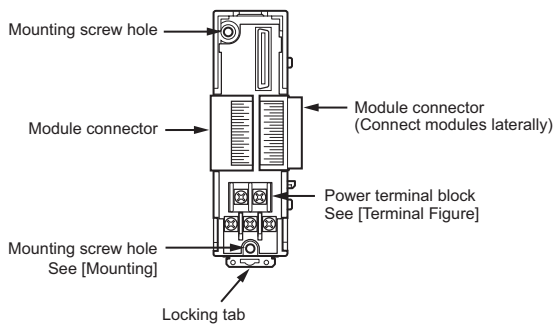


LED indicator

Three color 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	-	-

- Base part

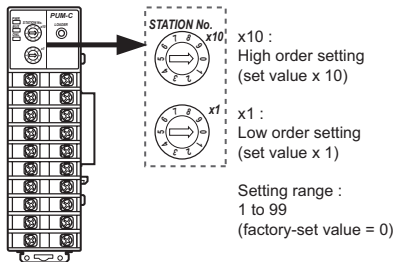


Setting

- Setting PROFIBUS Station No.

Station No. of PROFIBUS can be set using the Station No. configuration switch. Setting range is 1 to 99.

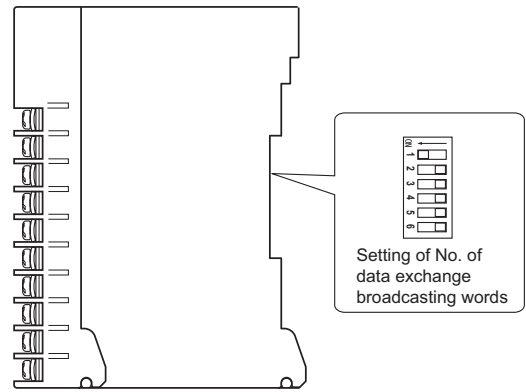
Apply a fine tip flat-head screwdriver to turn the Station No. configuration switch.



- When factory-set value is "0", parameter setting is enable.

- Setting No. of data exchange broadcasting words

Set No. of data exchange broadcasting words by DIP switches on the back front of the module (SW1 to SW3).



SW1	SW2	SW3	No. of data exchange broadcasting words
OFF	OFF	OFF	parameter setting mode
ON	OFF	OFF	8 words (16 bytes)
OFF	ON	OFF	16 words (32 bytes)
ON	ON	OFF	32 words (64 bytes)
OFF	OFF	ON	64 words (128 bytes)
ON	OFF	ON	108 words (216 bytes)
OFF	ON	ON	using banned
ON	ON	ON	using banned

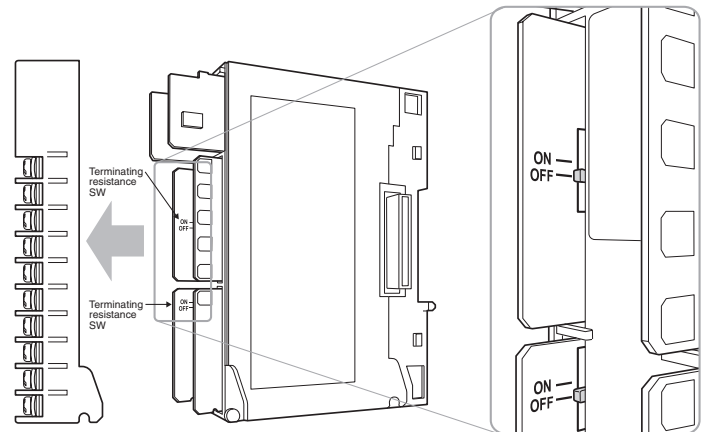
Note : SW4 to SW6 are not used.

Number of words to be sent/received are same.

If set in the combination of "using banned", SW setting error occurs.

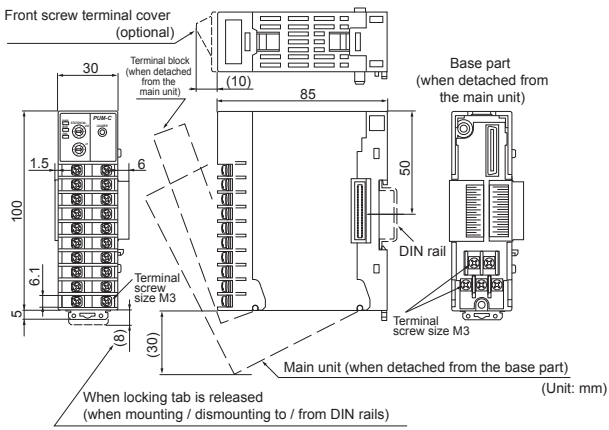
- Setting the PROFIBUS line termination.

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 below to turn ON the terminating resistance of PROFIBUS module.



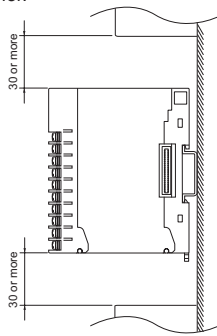
Mounting

- Dimensions



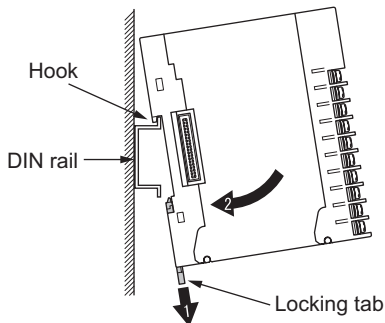
- Cautions when mounting

Make sure to secure clearance space more than 30mm (50mm is recommended) above/below the equipment for.



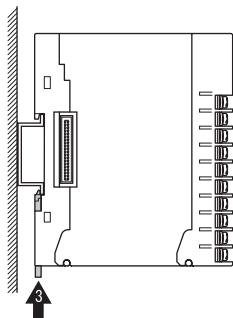
- Mounting to DIN rails

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



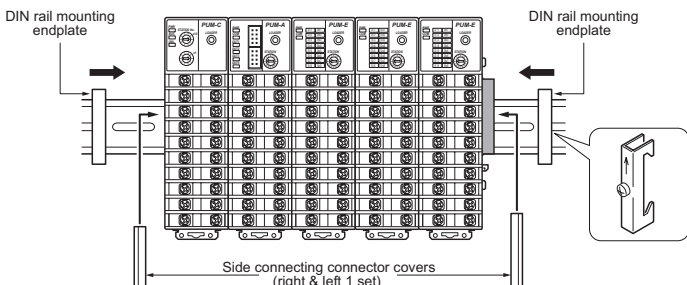
3. Pull up the locking tab of the base part to fasten the equipment onto the DIN rails.

- When connecting the equipment after mounting it to the DIN rail, do not pull the locking tab up at this point yet.



- Attaching end plates

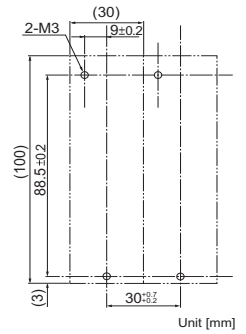
When attaching controllers to DIN rails, we recommend to attach side connecting terminal covers (right and left 1set), then end plates (option) to the ends of the right most and left most controllers.



- Fixing with screws

When fixing the equipment on the wall with using screw, connect module base parts first, which are intended to mount.

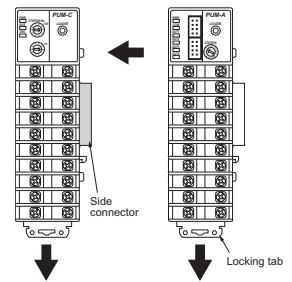
1. Decide the mounting position, referring to the figure below for the mounting screw hole.



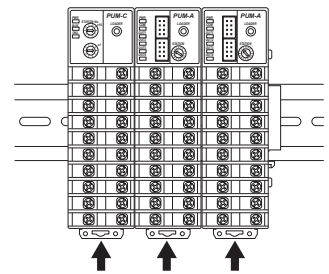
2. Remove the main unit from the base part.
- See [How to detach the base part]
3. Connect the base part, and then pull all the locking tabs up to fasten.
4. Fixate the base part onto the mounting position on the wall with screws.
5. Attach the module main unit to the base part.

- Connecting modules

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



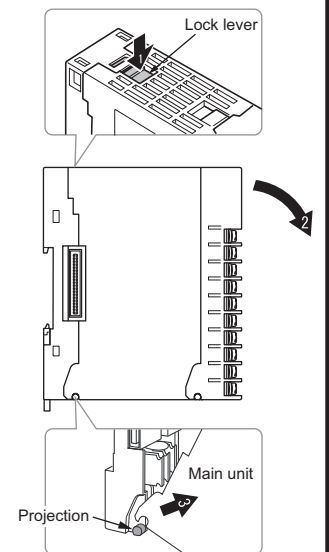
3. After mounting modules to the DIN rails, pull the all locking tabs up.
Modules are fastened to the DIN rails and to each other on the same time.
4. The power supplies are connected each other inside connected modules.



How to detach the base part

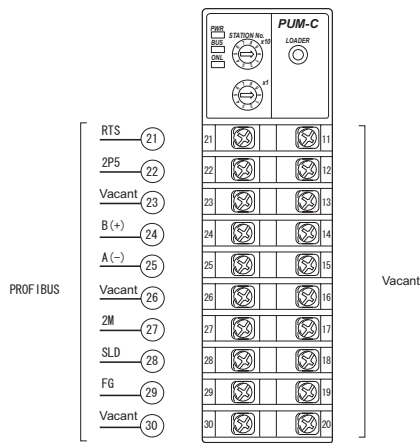
1. Press the lock lever on the top of the equipment.
2. Pulling down the upper part of main unit.
3. Detach the cutout on the lower end of the back of the main unit from the projection on the base part.

- Attaching the main unit to the base part take 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 after attaching.

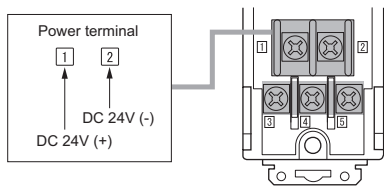


Terminal Figure

- Front face terminal block



- Base part (power terminal)

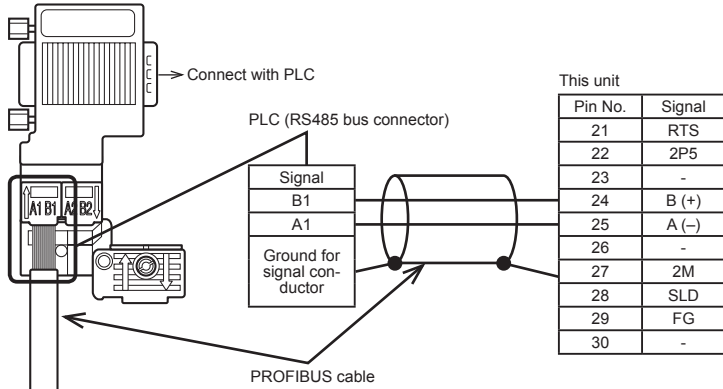


Note: Power cables more than one should not be connected between power terminals.

Wiring

Connection with PLC

Example of use:
SIMATIC S7-300
90° cable outlet (FastConnect system) with GP port



Specification

General Specification

Power Supply	: DC24V±10%
Power Consumption	: Maximum 3.2W (135mA) [when 24Vdc is applied]
Dimensions	: 30(W)×100(H)×85(D) mm (excluding projection and terminal cover)
Weight	: Approx. 200g
Installation Method	: DIN rail mounting or mounting with M3 screws inside a cabinet
Ambient Temperature*	: -10 to 50 degrees C
	* "Ambient temperature" is the temperature underneath the controller inside the equipment or the cabinet where the controller is installed.
Ambient Humidity	: 90%RH or less (no condensing)
System maximum modules	: Up to max. 17 modules of any Model PUMA/B/C/CL/CM/V/N/T plus to max 16 modules of Model PUME
System power	: 24V dc, 100W maximum, Class 2
Memory Backup	: Nonvolatile memory (EEPROM) backup
	No. of updates: 100,000

Communication Functions

Compatible version : PROFIBUS DP-V0 (cyclic communication)
Device type : Slave device

Communication speed and distance

Communication speed	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

*Refer to " PROFIBUS type A cable ".

Station No.: 1 to 99

Communication data length (cyclic communication)

Remote input/output bit	Remote input/output word
64 bits	8 words
128 bits	16 words
256 bits	32 words
512 bits	64 words
864 bits	108 words

Connecting cable : PROFIBUS type A compatible PROFIBUS connecting cable
Connecting method : M3 screw terminal block
Terminating resistance : External (220 ohm, 1/2W) or internal switch setting.

Crimp terminal size

Please prepare cables and crimp terminals of the size indicated below.

Power cable

Cable type	Size
Power supply, output, others	0.25 to 1.25mm ² (AWG 22 to 16)

Crimp terminal

Cable size	Screw tightening torque
0.25 to 1.25mm ² (AWG 22 to 16)	0.8 N·m



Model code

Enhanced communication module (PROFIBUS)

1	2	3	4	5	6	7	8	9	10	Contents	
P	U	M									Module type
											Enhanced communication module
											Communication functions
											PROFIBUS communication
											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 connector termination cover (right & left 1 set)
								A	0	4	Front face screw terminal cover
								L	0	1	Loader connecting cable (RS-232C)

Fuji Electric Co., Ltd.

International Sales Div Sales Group

Gate City Ohsaki, East Tower, 11-2, Osaki 1-chome,
Shinagawa-ku, Tokyo 141-0032, Japan
http://www.fujielectric.com
Phone: 81-3-5435-7280, 7281 Fax: 81-3-5435-7425
http://www.fujielectric.com/products/instruments/