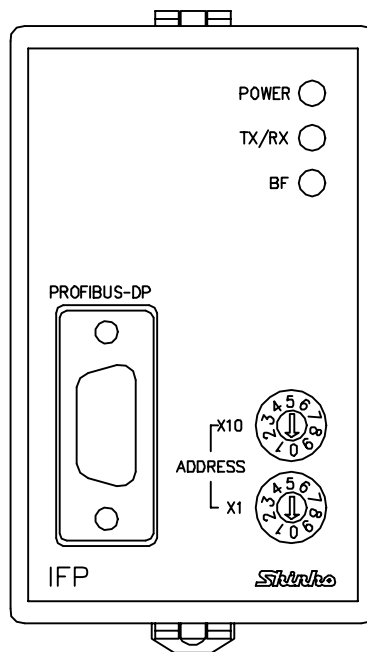


INSTRUCTION MANUAL
FOR
COMMUNICATION CONVERTER FOR PROFIBUS
IFP-100



Thank you for your purchase of our communication converter for PROFIBUS, **IFP-100**. This manual contains instructions for the mounting, functions, operations and notes when operating the **IFP-100**.

For your confirmation of the model and specifications of the units, please read and understand this instruction manual before starting operation.

To prevent the accident by mishandling of the unit, please arrange to give this manual into the hands of the operator who actually uses our product.

******* Notes to users *******

Before operating the IFP-100, please understand about following matters.

**Warning**

Turn the power supplied to the instrument OFF before wiring or checking.
If working or touching the terminal with the power ON status, there is a possibility of Electric Shock which can cause severe injury or death.

**Notice**

Set a PROFIBUS address of IFP-100 before the power supplied to the unit is turned ON.

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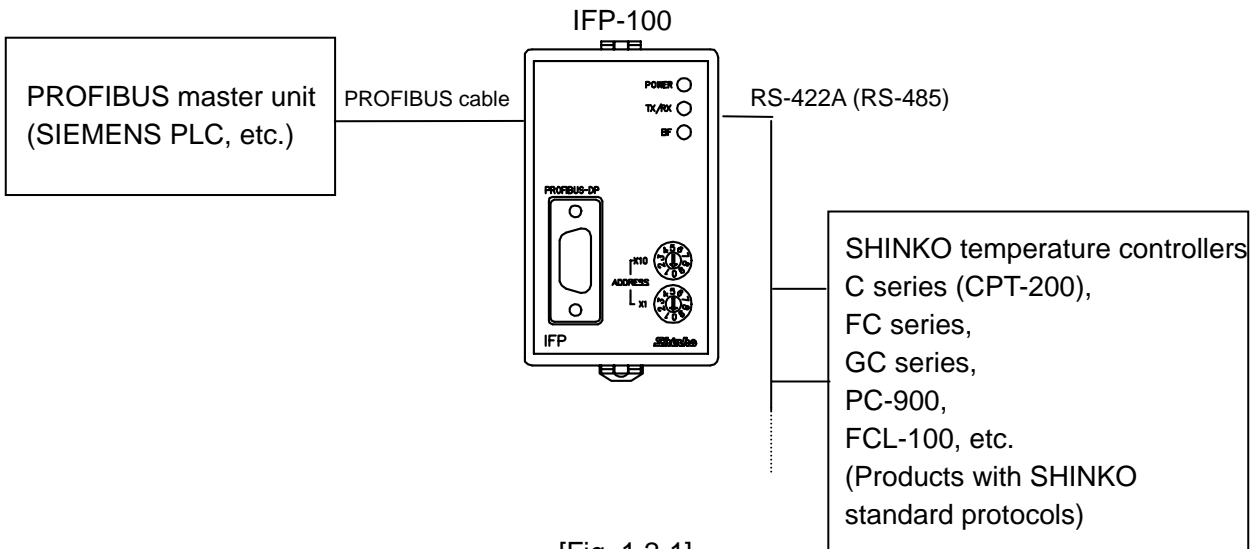
1. Overview

1.1 Overview of the IFP-100

IFP-100 is a communication converter, which is connected to the PROFIBUS master unit (SIEMENS PLC, etc.) as a PROFIBUS-DP slave unit to exchange data.

Maximum 31 units of temperature controller (for C series, 16 units of CPT-200) with SHINKO standard protocol can be connected.

1.2 System configuration



2. Model name

2.1 Model name

IFP-100: Communication converter for PROFIBUS.

2.2 How to indicate the model name label



Warning

Turn the power supplied to the instrument OFF before confirming the model name label. If working with the power ON status, there is a possibility of Electric Shock which can cause severe injury or death.

Model name labels are put on the case and inner assembly.

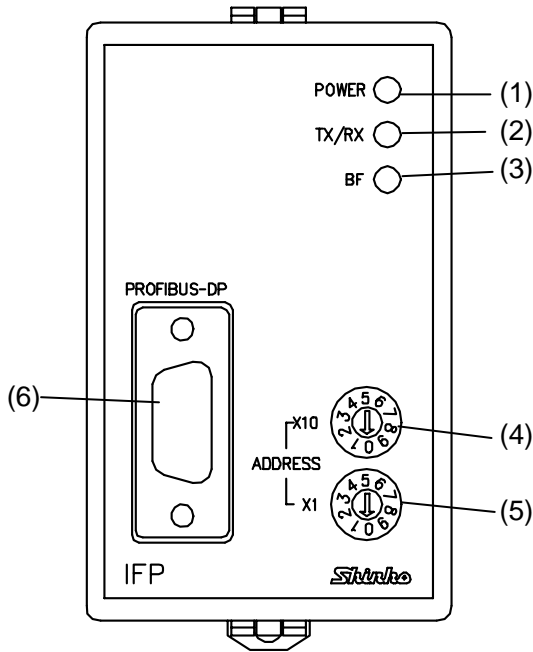
[Example]

IFP-100
No. x x x x x x

Model name: IFP-100

Instrument number (indicated only on the inner assembly.)

3. Name and functions of the sections



[Fig. 3-1]

- (1) Instrument power indicator (POWER)
While the power is turned on, green indicator lights.
- (2) Communication confirming indicator (TX/RX)
During communication between IFP and controller, yellow indicator blinks.
- (3) Buffer fail indicator (BF)
When the PROFIBUS error occurred, red indicator lights.
- (4) Rotary switch for PROFIBUS address setting (the 2nd digit)
Sets an own address of IFP-100.
- (5) Rotary switch for PROFIBUS address setting (the 1st digit)
Sets an own address of IFP-100.
- (6) PROFIBUS-DP
9-pin D sub connector
Refer to the following arrangement.

	O5	1: NC
O9		2: NC
	O4	3: RxD/TxD-P
O8		4: NC
	O3	5: DGND
O7		6: NC
	O2	7: NC
O6		8: RxD/TxD-N
	O1	9: NC

4. Setup



Warning

Turn the power supplied to the instrument OFF before setup.
If working with the power ON status, there is a possibility of Electric Shock which can cause severe injury or death.



Notice

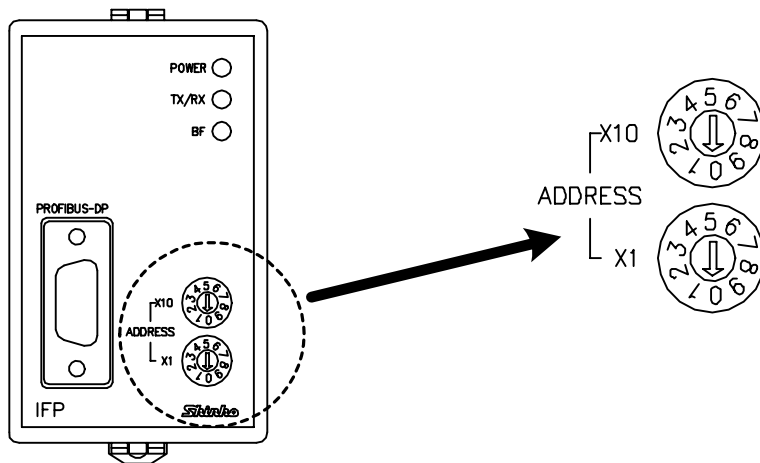
Set a PROFIBUS address of IFP-100 before the power supplied to the unit is turned ON.

Set up the switch.

Using a small flat bladed screwdriver, set a PROFIBUS address of IFP-100.

Setting range: 0 to 99

Maximum 127 units are connectable on a PROFIBUS specification basis, however, maximum 99 units can be covered by the IFP-100.



[Fig. 4-1]

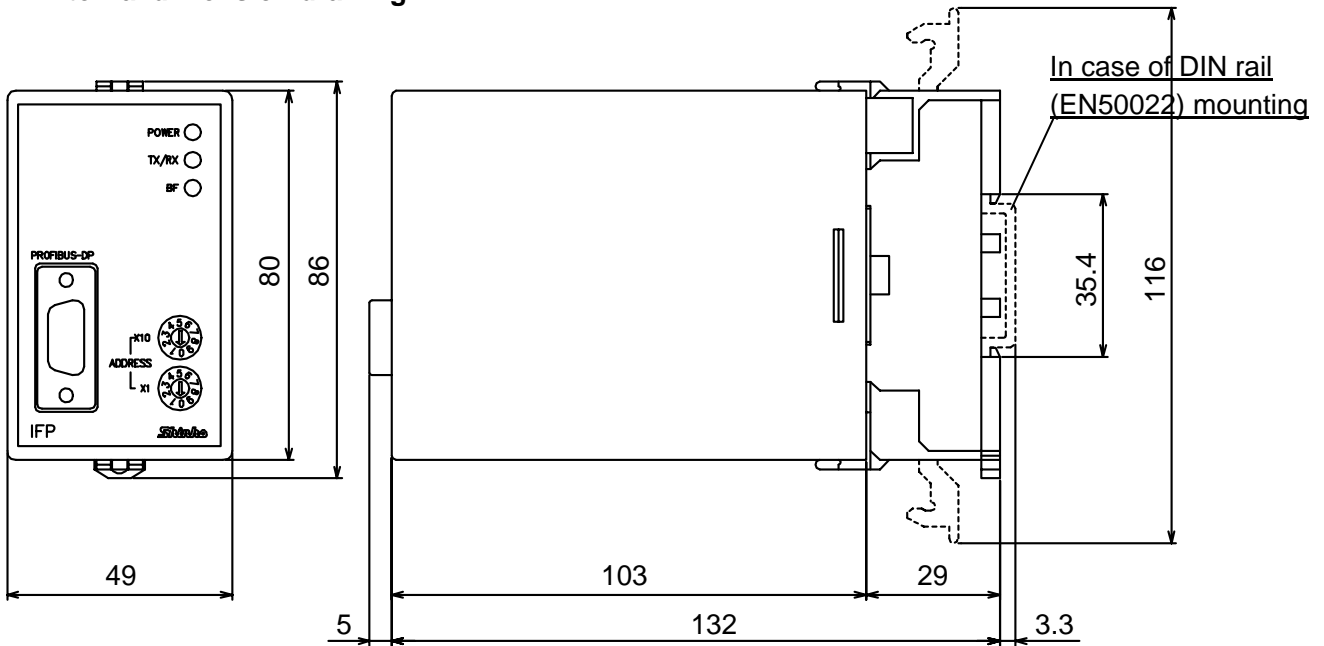
5. Mounting

5.1 Site selection

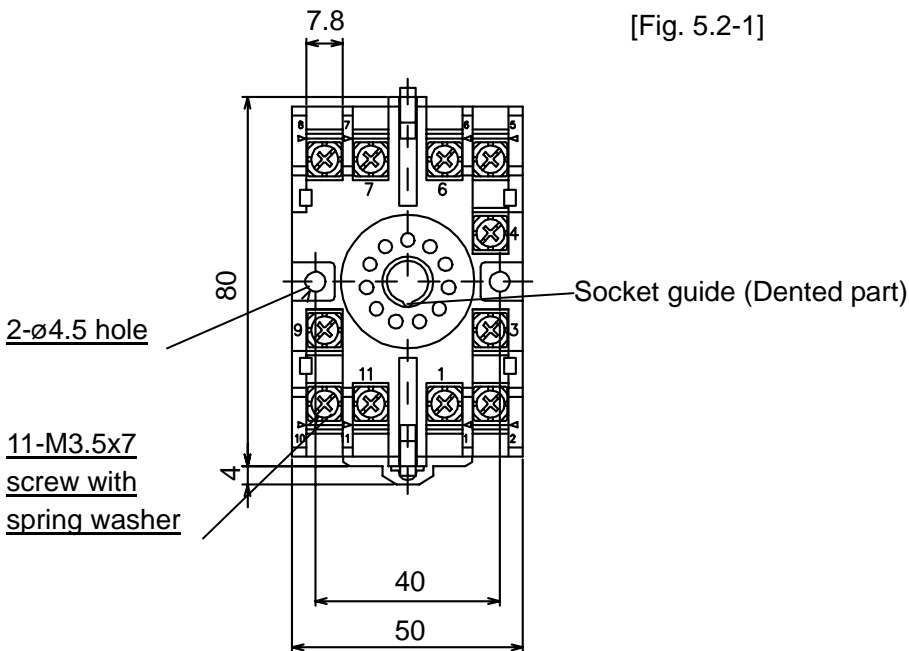
Mount the units in a place with:

- (1) A minimum of dust, and an absence of corrosive gases.
- (2) No mechanical vibrations or shocks.
- (3) No exposure to direct sunlight, an ambient temperature is 0 to 50°C (32 to 122°F) and it does not change suddenly.
- (4) An ambient humidity is 85%RH or less, and non-condensing.
- (5) The units should be away from the electromagnetic switch of large capacity or cables through which large current flows.
- (6) No water, oil nor chemicals and their vapor directly splash.

5.2 External dimension drawing



[Fig. 5.2-1]



[Fig. 5.2-2]

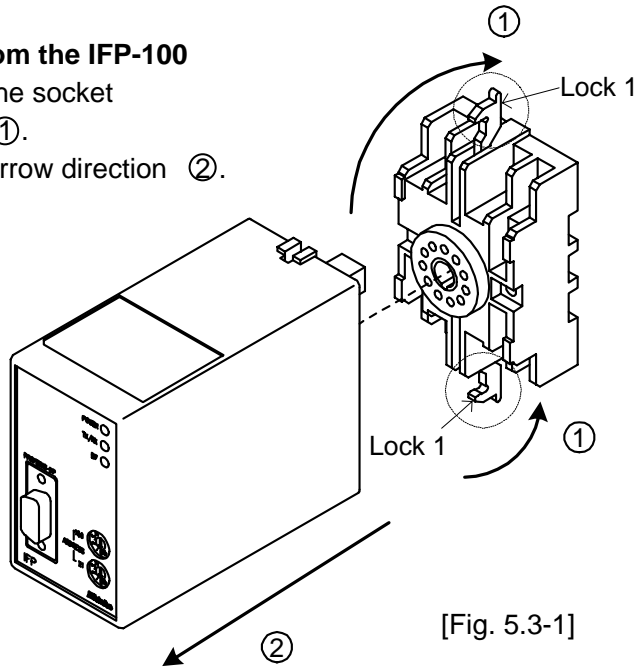
5.3 Mounting of Round socket

When shipped, IFP-100 is inserted into the Round socket.

(1) How to dismount the Round socket from the IFP-100

Unlock Lock 1 at the top and bottom of the socket by moving them as the arrow direction ①.

If unlocked, pull out the IFP-100 as the arrow direction ②.



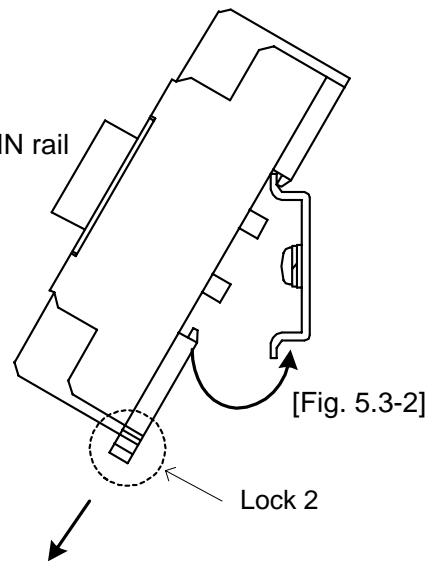
[Fig. 5.3-1]

(2) How to mount the Round socket to the DIN rail

Set the socket upper side into the DIN rail first, then the lower side into the DIN rail.

See [Fig. 5.3-2].

The Round socket will be completely locked to the DIN rail with a sound of click.



How to dismount the Round socket from the DIN rail:

By using a flat bladed screwdriver, pull down the Lock 2 located at the bottom of the socket, and pull the socket up.

When mounting the Round socket to the control panel, make the Socket guide (dented) downward. Drill 2 holes of \varnothing 4.5mm in 40mm pitch on the control panel, and mount the Round socket by tightening with screws and nuts (M4 x 20).

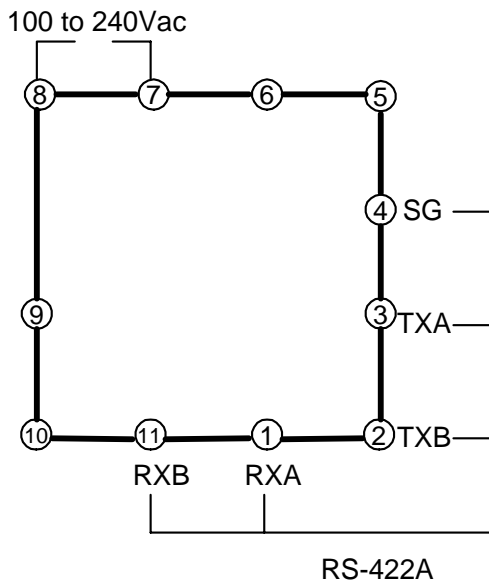
6. Wiring connection

6.1 Terminal arrangement



Warning

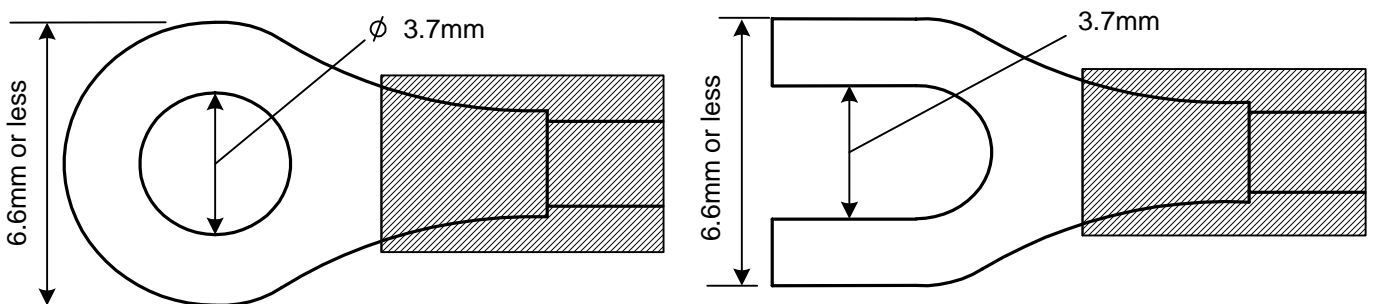
Turn the power supplied to the instrument OFF before wiring or checking.
 If working or touching the terminal with the power ON status, there is a possibility of Electric Shock which can cause severe injury or death.



[Fig. 6.1-1]

• Recommended terminal

Use a solderless terminal with isolation sleeve in which the M3.5 screw fits as shown below.



[Fig. 6.1-2]

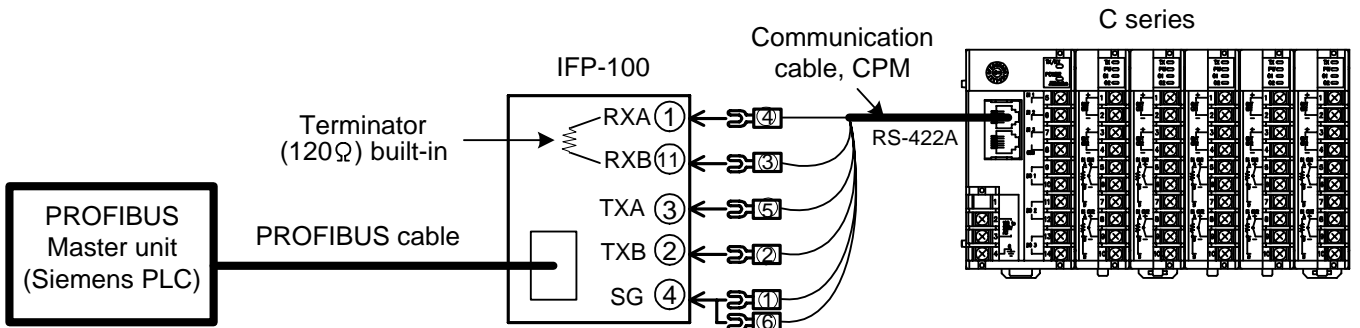
Solderless terminal	Manufacturer	Model name	Tightening torque
Y type	Nichifu Terminal Industries CO., LTD.	1.25Y-3.5	0.7N•m (7kgf•cm) Max. 1.0N•m (10kgf•cm)
	Japan Solderless Terminal MFG CO., LTD.	V1.25-YS3A	
Round type	Nichifu Terminal Industries CO., LTD.	1.25-3.5	
	Japan Solderless Terminal MFG CO., LTD.	V1.25-M3	

6.2 Wiring connection examples

Notices

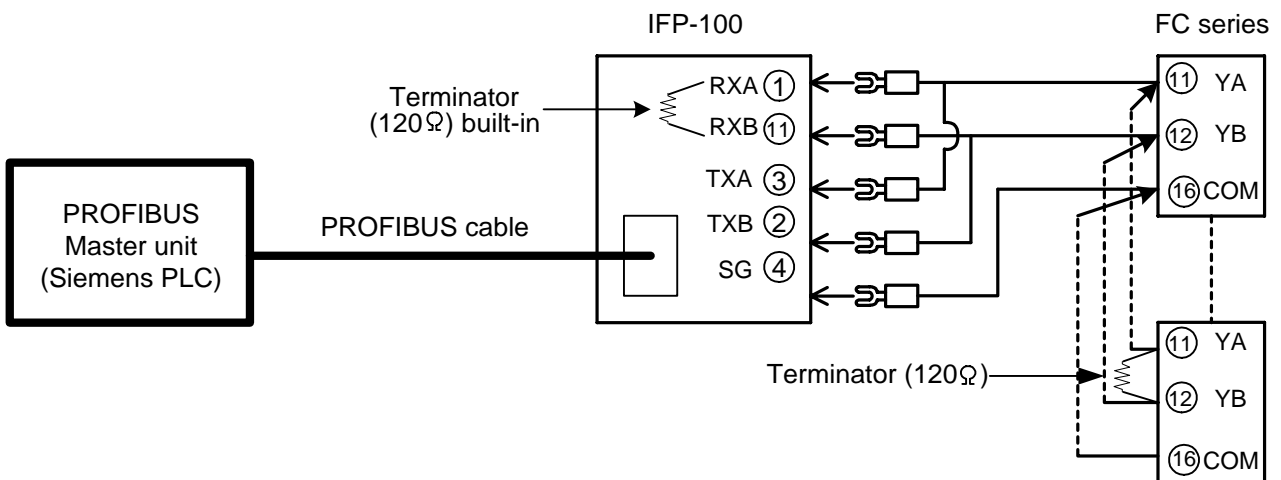
- Use a qualified PROFIBUS cable to connect PROFIBUS master unit and IFP-100.
- Use communication cable CPM to connect IFP-100 and C series.
- Connect terminators to both end units. Refer to [Fig. 6.2-1 to 6.2-3].
- Use a thick wire (1.25 to 2.0mm²) as a ground wire.

[Connection of PROFIBUS master unit, IFP-100 and 1 block of C series]



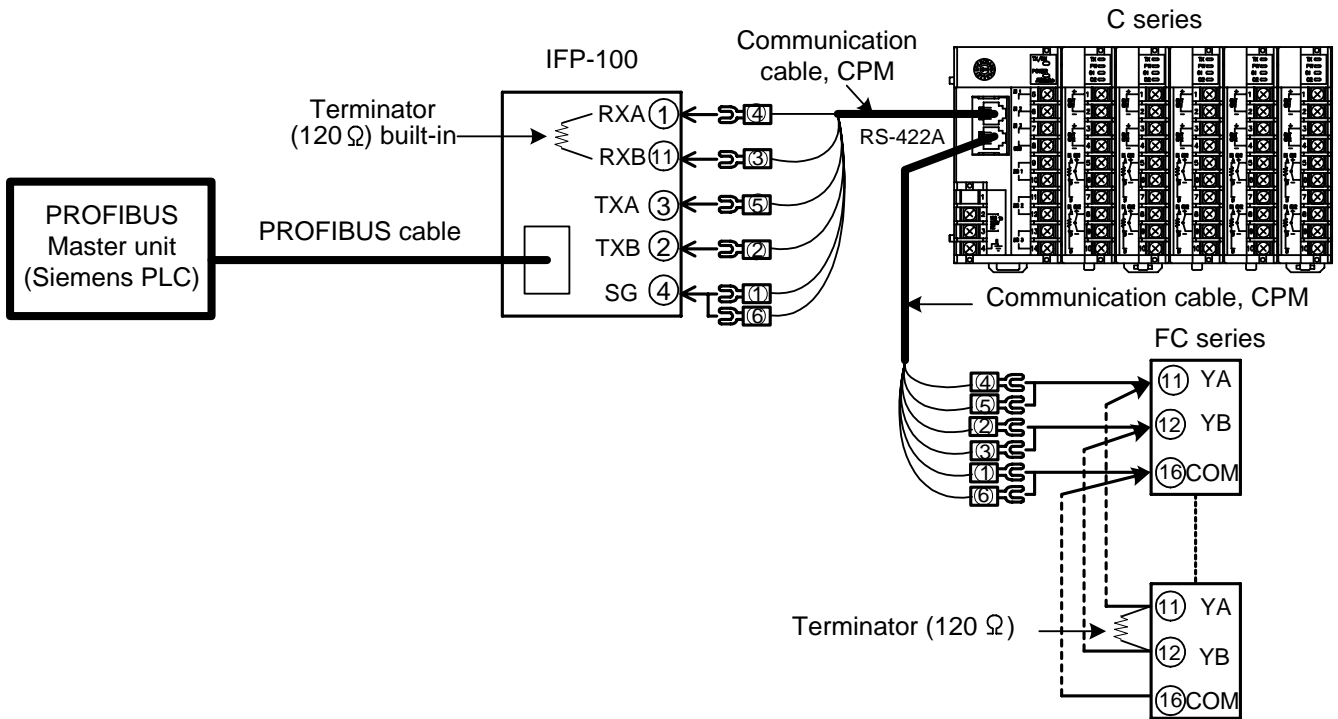
[Fig. 6.2-1]

[Connection of PROFIBUS master unit, IFP-100 and multiple FC series]



[Fig. 6.2-2]

[Connection of PROFIBUS master unit, IFP-100, 1 block of C series and multiple FC series]



[Fig 6.2-3]

Use a qualified PROFIBUS cable to connect IFP-100 and PROFIBUS master unit.

[Connection of terminals between Communication cable CPM and IFP-100]

[Table 6.2-1]

Communication cable CPM	IFP-100
Terminal 4	Terminal 1 (RXA)
Terminal 3	Terminal 11 (RXB)
Terminal 5	Terminal 3 (TXA)
Terminal 2	Terminal 2 (TXB)
Terminal 1, 6	Terminal 4 (SG)

[Connection of terminals between Communication cable CPM and SHINKO controller]

[Table 6.2-2]

Communication cable CPM	SHINKO controller
Terminal 4, 5	(YA) terminal
Terminal 2, 3	(YB) terminal
Terminal 1, 6	(COM) terminal

Use Communication cable CPP to connect (multi-drop) multiple blocks of C series.

7. Communication data

When using the IFP-100 as a PROFIBUS-DP slave, users register the parameters to the master unit by using the GSD file in which the contents, data form, etc. that IFP-100 is covering are defined.

7.1 Data form

Fixed length code form: 1 or 20-item of data length can be selected.

For [FC, GC series, etc.], select 1-data length.

For [C series], select 20-data length.

If using [FC, GC series, etc.] and [C series] together, select 20-data length.

7.2 Data structure

There are 2 buffers:

- Output buffer to output the data from the PROFIBUS master unit to the IFP-100.
- Input buffer to input the data from the IFP-100 to the PROFIBUS master unit.

When configuring the output buffer and input buffer with the Hardware configuration, configure the output buffer first. If the input buffer is configured first, the PROFIBUS communication cannot be performed, and the BF indicator lights up.

The structure of Fixed length code form is as follows.

[Output buffer]

Data structure when the number of data is 1.

1 byte	Information
1 byte	Address
1 byte	Sub address
1 byte	Command type
2 byte	Data item
2 byte	Data

Data structure when the number of data is 20.

1 byte	Information
1 byte	Address
1 byte	Sub address
1 byte	Command type
2 byte	Data item
2 byte	Data 1
2 byte	Data 2
2 byte	Data 3
2 byte	Data 4
2 byte	Data 5
2 byte	Data 6
2 byte	Data 7
2 byte	Data 8
2 byte	Data 9
2 byte	Data 10
2 byte	Data 11
2 byte	Data 12
2 byte	Data 13
2 byte	Data 14
2 byte	Data 15
2 byte	Data 16
2 byte	Data 17
2 byte	Data 18
2 byte	Data 19
2 byte	Data 20

Information

	b7	b6	b5	b4	b3	b2	b1	b0
Command flag	0	Number of data (01H to 32H)						

- Address : Instrument number, 0 to 95 (20H to 7FH), by which PROFIBUS master unit identifies controllers.
The number is used by giving 20H of bias (20H to 7FH), because 0 to 31 (00H to 1FH) are used for control code.
95 (7FH) is called as **Global address**, which is used when sending the same command to all controllers connected. However, the response is not returned.
- Sub address : 20H fixed
- Command type: Code to identify the reading command or setting command.
22H/20H: Reading command
52H/50H: Setting command
- Data item : Refer to the Communication command of the controller connected to IFP-100.
- Data : Setting value, binary

[Input buffer]

Data structure when the number of data is 1.

1 byte	Information
1 byte	Address
1 byte	Sub address
1 byte	Command type
2 byte	Data item
2 byte	Data

Data structure when the number of data is 20.

1 byte	Information
1 byte	Address
1 byte	Sub address
1 byte	Command type
2 byte	Data item
2 byte	Data 1
2 byte	Data 2
2 byte	Data 3
2 byte	Data 4
2 byte	Data 5
2 byte	Data 6
2 byte	Data 7
2 byte	Data 8
2 byte	Data 9
2 byte	Data 10
2 byte	Data 11
2 byte	Data 12
2 byte	Data 13
2 byte	Data 14
2 byte	Data 15
2 byte	Data 16
2 byte	Data 17
2 byte	Data 18
2 byte	Data 19
2 byte	Data 20

Information

	b7	b6	b5	b4	b3	b2	b1	b0
Response flag	0	0	0			Error code		

- Address : The origin of the response.
The same code as the received command is used for the response.
- Sub address : 20H fixed
- Command type: Code to identify the reading command or setting command.
22H/20H: Reading command
52H/50H: Setting command
- Data item : Refer to the Communication command of the controller connected to IFP-100.
- Data : Setting value, binary
- Error code : Refer to the following.

Error code	Contents
0H	No error (Acknowledgement)
1H	Command not existent
2H	Wrong designation of pattern or step
3H	Setting value out of the range
4H	Unsettable status (during AT)
5H	During the setting mode by key operation
6H	No response
7H	Number of data out of the range
8H	Unpredictable status

7.3 Data setting procedure

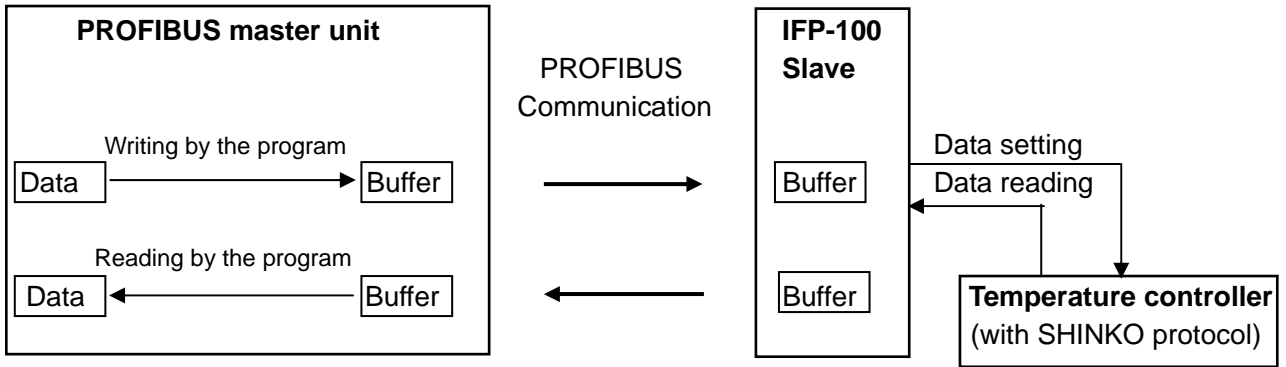
- (1) Confirm that Command flag=0 and Response flag=0.
- (2) Set the address, sub address, command type and data item (output buffer).
- (3) Set the setting value to the data section (output buffer).
- (4) Set the number of the data (output buffer).
- (5) Set the command flag to 1.
- (6) Wait until the Response flag becomes 1.
- (7) Confirm that the error code is 0, which means normal setting (input buffer).
- (8) Set the command flag to 0.
- (9) The procedure is completed after response flag becomes 0.

7.4 Data reading procedure

- (1) Confirm that Command flag=0 and Response flag=0.
- (2) Set the address, sub address, command type and data item (output buffer).
- (3) Set the number of the data (output buffer).
- (4) Set the command flag to 1.
- (5) Wait until the Response flag becomes 1.
- (6) Confirm that the error code is 0, and pick up the reading value from the data section (input buffer).
- (7) Set the command flag to 0.
- (8) The procedure is completed after response flag becomes 0.

7.5 Data transfer

Data transfer of setting value and reading value



[Fig. 7.5-1]

8. Specifications

Model	Communication converter for PROFIBUS
Name	IFP-100
Supply voltage	100 to 240Vac, 50/60Hz
External dimensions	49 x 80 x 132mm (W x H x D) (including Round socket)
Mounting method	DIN rail mounting
Case	Flame resisting resin, Black

Indicators

- While the power is turned on, green LED (POWER) lights.
- During communication between IFP-100 and controller, yellow LED (TX/RX) blinks.
- PROFIBUS is in error, red LED (BF) lights.

Setting PROFIBUS address setting by the Rotary switch
 Setting range: 0 to 99

Functions

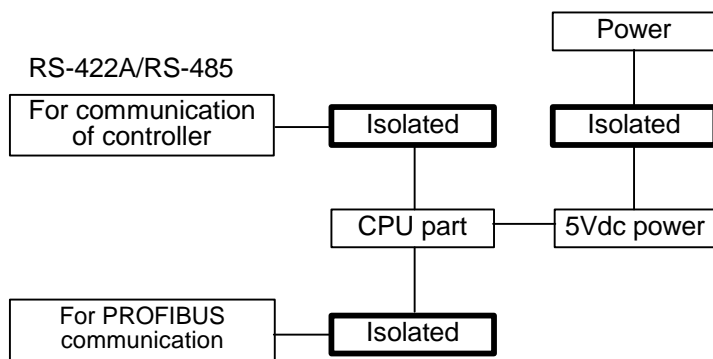
Communication function between the IFP-100 and PROFIBUS master unit

Communication circuit PROFIBUS (Based on RS-485)
 Transfer rate 9.6k, 19.2k, 93.75k, 187.5k, 500k, 1.5M, 3M, 6M, 12Mbps
 Automatically selected.
 The lowest transfer rate of the instrument connected to the same PROFIBUS communication line is selected as a transfer rate.

Communication function between the IFP-100 and controller

Communication circuit Based on RS-422A (or RS-485)
 Transfer rate 19.2kbps fixed
 Data format Stop bit 1
 Data length 7
 Parity Even
 Stop bit 1

Circuit insulation configuration



[Fig. 8.1-1]

Insulation resistance

- 10MΩ or greater at 500Vdc
- Between power terminal and ground terminal
- Between power terminal and controller's communication terminal
- Between power terminal and PROFIBUS communication terminal
- Between controller's communication terminal and ground terminal
- Between PROFIBUS communication terminal and ground terminal

Dielectric strength

Between power terminal and ground terminal ----- 1.5kVac for 1 minute

Power consumption Approx. 5VA

Ambient temperature 0 to 50°C (32 to 122°F)

Weight Approx. 200g

Accessories Instruction manual, 1 copy

9. When troubled

When troubled, check if the power is supplied to the PROFIBUS master unit, IFP and SHINKO controllers. If not, check the following.



Warning

Turn the power supplied to the instrument OFF before wiring or checking. If working or touching the terminal with the power ON status, there is a possibility of Electric Shock which can cause severe injury or death.

● **Phenomenon: It is unable to communicate.**

Presumed cause	Action
<ul style="list-style-type: none"> • The breaking of the communication cable or imperfect contact between the cable and terminal • The PROFIBUS address of IFP-100 is not set. • The wiring of communication cable is not correct. • The terminators are not connected to both end units. 	<ul style="list-style-type: none"> • Change the cables, or tighten the screw of the terminal surely. • Set the address. (See page 7.) • Proper wiring is needed. (See pages 11 to 12.) • Connect terminators. (See pages 11 and 12.)

• **If happened unclear phenomenon other than above mentioned, make inquiries about the matters at our agency or the shop where you purchased.**

******* Inquiry *******

For any inquiry about this unit, please contact the shop where you purchased or our agency after checking the following.

- Model name ----- IFP-100
- Instrument number ----- No. XXXXXX

In addition to the above, please let us know the details of malfunction, if any, and the operating conditions.

**SHINKO TECHNOS CO.,LTD.
OVERSEAS DIVISION**

Reg. Office : 2-48, 1-Chome, Ina, Minoo, Osaka, Japan

Mail Address : P.O.Box 17, Minoo, Osaka, Japan

URL : <http://www.shinko-technos.co.jp>

E-mail : overseas@shinko-technos.co.jp

Tel : 81-72-721-2781

Fax: 81-72-724-1760

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