

Protocol Transducer MODEL TF-PC

INSTRUCTION MANUAL



Warning

This marking indicates that the erroneous operation of this transducer may result in death or serious injury.



Precautions

- (1) If voltage or current exceeding the input allowable voltage or current is applied to the input terminals, the transducer may be damaged.
- (2) Apply power within the applicable range of the transducer. Otherwise fire, electric shock or transducer damage may result.
- (3) The contents of this instruction manual are subject to change without prior notice.
- (4) This instruction manual is carefully prepared. However, if any mistake or omission is found, contact your nearest Watanabe Electric Industry sales agent or Watanabe Electric Industry directly.

General Outline

The TF-PC protocol converter will write data from converters, panel meters (Watanabe Electric Industry), or other units that have an RS-485 output section in the sequencer's memory.

Because it writes data to the memory directly, creation of a program for a write is not required.

The case can also be mounted on a DIN rail in a one-touch operation.

Configuration of Type

The instrument's code and standard specifications are as shown below. First check the type of the product received against the specifications you have ordered.

TF-PC-□□-□□

Power supply specification code4 : DC24V

Corresponding sequencer

MQ: Mitsubishi MELSEC-Q, -A, or -FX series PLC

Setting Method

Before operating the product, it is necessary to set up the TF-PC and sequencer. For the sequencer, make settings in accordance with the output specifications of the TF-PC. For more information, see the sequencer's Operation Manual.

Set the total number of instruments to be connected to the TF-PC.

Referring to the following table, set up the DIP switches on the front panel of the TF-PC.

Number of Instruments Connected		1	2	3	4	5	6	7	8
DIP Switch									
1		ON	OFF	ON	OFF	ON	OFF	ON	OFF
2		OFF	ON	ON	OFF	OFF	ON	ON	OFF
3		OFF	OFF	OFF	ON	ON	ON	ON	OFF
4		OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON

Number of Instruments Connected		9	10	11	12	13	14	15
DIP Switch								
1		ON	OFF	ON	OFF	ON	OFF	ON
2		OFF	ON	ON	OFF	OFF	ON	ON
3		OFF	OFF	OFF	ON	ON	ON	ON
4		ON	ON	ON	ON	ON	ON	ON

Precautions:

- Always assign serial numbers to the RS-485 IDs of the instruments connected to the TF-PC starting at "1".
- Always ensure that the setting of the number of instruments connected to the TF-PC agrees with the number of converters, panel meters, or other units actually connected. Also, do not set the number of instruments connected to "0".
- Dip switches setting is applied after power-on.

Sequencer's Memory

Set up the sequencer model to be used.

Set up the DIP switches on the front panel of the TF-PC as shown in the table below.

These switches are configured for the Mitsubishi MELSEC-Q series PLC upon shipment from the factory.

Dip switches setting is applied after power-on.

Set up the sequencer

SW5	SW6	Start address	Ending address	Write mode	Sequencer model
OFF	OFF	7000	7224	QW	Q.A2
ON	OFF	1000	1224	WW	FX Series,Q.A2,A1S(To 1016)
OFF	ON	700	924	WW	A1S.FX Series,A2,Q
ON	ON	1000	1224	QW	Q.A2

Sequencer's Memory address table

from 7,000		from 1,000		from 700	
ID : 01	7000	ID : 01	1000	ID : 01	700
ID : 02	7016	ID : 02	1016	ID : 02	716
ID : 03	7032	ID : 03	1032	ID : 03	732
ID : 04	7048	ID : 04	1048	ID : 04	748
ID : 05	7064	ID : 05	1064	ID : 05	764
ID : 06	7080	ID : 06	1080	ID : 06	780
ID : 07	7096	ID : 07	1096	ID : 07	796
ID : 08	7112	ID : 08	1112	ID : 08	812
ID : 09	7128	ID : 09	1128	ID : 09	828
ID : 10	7144	ID : 10	1144	ID : 10	844
ID : 11	7160	ID : 11	1160	ID : 11	860
ID : 12	7176	ID : 12	1176	ID : 12	876
ID : 13	7192	ID : 13	1192	ID : 13	892
ID : 14	7208	ID : 14	1208	ID : 14	908
ID : 15	7224	ID : 15	1224	ID : 15	924

Note: To check operations, select On-line, Monitor, and then All

Devices in the GX-Developer (Mitsubishi Electric PLC debugger software), set the device address D to 7000 (for the Q series), and then conduct an operation check in the environment of multipoint words, 16-bit integers, and hexadecimal.

Then text data as shown below will be sent from the converter, panel meter, or other connected unit.

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
STX	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	ETX	BCC	BCC	CR	LF

The TF-PC writes these text data to the sequencer (PLC) as follows:

Address	+0	+1	+2	+3	+4	+5	+6	+7
D7000	(2)(1)	(4)(3)	(6)(5)	(8)(7)	(10)(9)	(12)(11)	Unassigned	Unassigned

For more information on data sent from the converters, panel meters, or other units connected, see the operation manual of the relevant instrument used.

Example: The following shows an example of writing ID1 instrument data to the Mitsubishi MELSEC Q series PLC. If the text data of [-1.2345] is sent from a converter or panel meter connected,

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
STX	(Blank)	(Blank)	(-)	(.)	(2)	(3)	(4)	(5)	(Blank)	(Blank)	(Blank)	(Blank)	ETX	BCC	BCC	CR	LF

the FT-PC writes it to the PLC's memory as shown in the table below. An area with no data will be left blank (20H).

Address	+0	+1	+2	+3	+4	+5	+6	+7
D7000	(Blank)(Blank)	(1)(-)	(2)(.)	(4)(3)	(Blank)(5)	(Blank)(Blank)	Unassigned	Unassigned

General specifications

Power supply voltage : 24VDC \pm 10 %

Consuming current : Less than 50 mA(At 24VDC)

Insulation resistance : Between power supply and meter and sequencer / power supply ;
More than 100M Ω at 500 VDC

Dielectric strength : Between power supply and meter and sequencer / power supply ;

For 1 min. at 1500VAC

Operating ambient temperature : -5 to 50°C

Operating ambient humidity : Less than 90 %RH (No-condensing)

Storage temperature : -10 to 70°C

Storage humidity : Less than 60%RH (No-condensing)

Terminal screw : Terminal screw M4

Case material : ABS (Black)

Weight : Approx. Less than 250 g

Input and Output Specifications

The input/output setup method differs depending on the sequencer. For more information, see the sequencer (PLC) operation manual. The TF-PC's communication protocol is as follows:

RS-485 input

- Electric characteristics : Compatible with EIA RS-485
- Communication method : Two-wire half-duplex
- Synchronization : Start-stop
- Transmission rate : 9600bps
- Number of start bits : 1bit
- Data lngrth : 7bits
- Error detection : Even parity, BCC(Block,check,character) checksum
- Number of stop bits : 2bits
- Character code : ASCII code
- Number of units that can be connected : 15 for transducers

RS-232C output

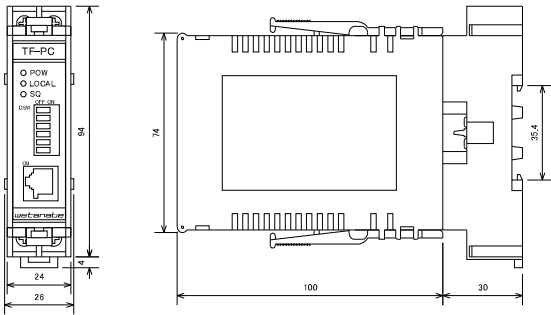
- Electric characteristics : Compatible with EIA RS-232C
- Communication method : Full-duplex
- Synchronization : Start-stop
- Protocols : Computer link(dedicated protocol : format 4)
- Related I/O points : 0
- Transmission rate : 9600bps
- Number of start bits : 1bit
- Data lngrth : 8bits
- Error detection : Even parity
- Number of stop bits : 1bits
- Character code : ASCII code

LED Output

- POW: lights up when power is supplied to the TF-PC.
- LOCAL: lights up when the TF-PC is communicating with a converter, panel meter, or other unit connected via the RS-485 interface.
- SQ: lights up when the TF-PC is communicating with the sequencer (PLC).

Note: The instruments that can be connected to the TF-PC are those allowing use of the MES command (Watanabe Electric Industry command).

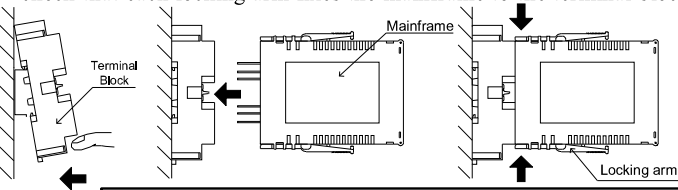
Dimensions



Mounting/Dismounting

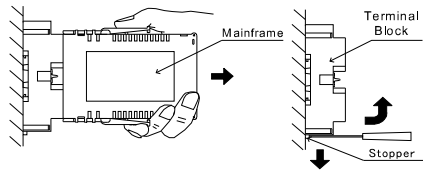
Mounting

Engage the terminal block with the DIN rails as shown in the following Fig., and then insert the mainframe into the terminal block. Lastly, check that each locking arm fixes the mainframe to the terminal block.

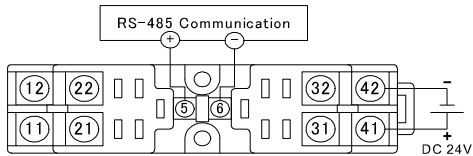


Dismounting

The mainframe can be disengaged from the terminal block if pulled out toward you while pushing the locking arms in the mainframe. Remove the terminal block from the DIN rails after moving the stopper in the arrow direction with a screwdriver.



Connection diagram



Note: Pay attention to the connection polarity.

Connection Cable

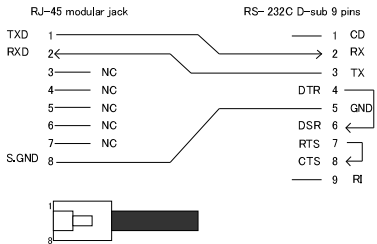
The connection between the TF-PC and the sequencer's RS-232C connector is as shown below. Make connections by referring to the connection diagram below.

Insert the RJ-45 modular jack into the connector on the TF-PC's front panel and connect the D-sub 9-pin connector to the sequencer's connector.

TF-PC side: RJ-45 modular jack

Sequencer side: D-sub 9-pin connector

Connection



Caution

- a) Store the transducer at a storage temperature of -10 to +70°C and a humidity of less than 60 % RH.
- b) Use the transducer at a location where there are no chemicals or gases harmful to electrical parts or there is no dust.
- c) Do not apply any vibration or impact to the transducer.
- d) In order to lessen the effect of noise, etc., do not bundle the input/output/communication wires with the power supply wires, nor put these wires in the same duct.

After-sale service

This transducer is delivered after being manufactured, tested and inspected, under strict quality control. However, if any problem does occur, contact your nearest Watanabe Electric Industry sales agent or Watanabe Electric Industry directly giving as much information on problem as possible.

Warranty

This transducer is warranted for a period of one year from date of delivery. Any defect which occurs in this period and is undoubtedly caused by Watanabe Electric Industry faults will be remedied free of charge. This warranty does not apply to the transducer showing abuse or damage which has been altered or repaired by others except as authorized by Watanabe Electric Industry.

* The TF-PC is not officially approved by Mitsubishi Electric.