Input Module User's Manual

T&D

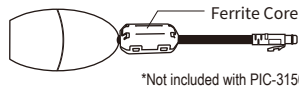| Compatible Devices | **RTR505B, TR-55i, RTR-505** |

Thermocouple Module (TCM-3010)
PT Module (PTM-3010)
4-20mA Module (AIM-3010)
Voltage Module (VIM-3010)
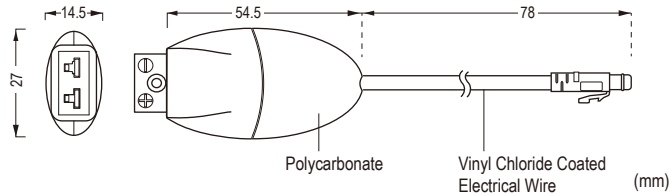Pulse Input Cable (PIC-3150)

T&D Corporation
https://tandd.com/
2024. 10 16504750034 (8th Edition)

Before using the product, please attach the supplied ferrite core* to the cable right next to the module to provide noise suppression.
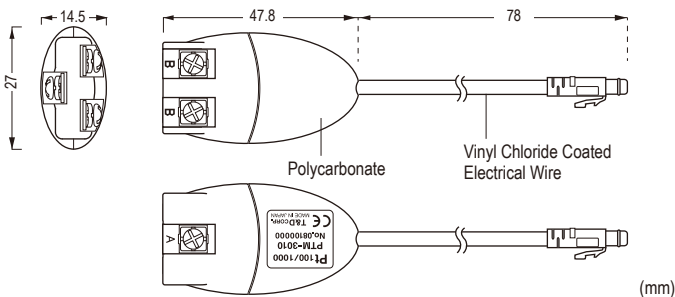
— Ferrite Core

*Not included with PIC-3150

Cautions about using Input Modules

- We are not responsible for any damage caused by connecting to a data logger other than those listed as compatible.
- Do not take apart, repair or modify an input module and its cable.
- These input modules are not waterproof. Do not allow them to become wet.
- Do not cut or twist the connection cable, or swing the cable around with a logger connected.
- Do not expose to a strong impact.
- If any smoke, strange smells or sounds are emitted from an input module, immediately stop using.
- Do not use or store input modules in places such as listed below. It may result in malfunction or unexpected accidents.

- Areas exposed to direct sunlight
- In water or areas exposed to water
- Areas exposed to organic solvents and corrosive gas
- Areas exposed to strong magnetic fields
- Areas exposed to static electricity
- Areas near fire or exposed to excessive heat
- Areas exposed to excessive dust or smoke
- Places within the reach of small children

- If you replace an input module that contains adjustment settings, make sure to remake any desired adjustment settings.
- When using an RTR505B and making changes to the type of input module or cable, it is necessary to initialize the data logger and remake all desired settings.

Thermocouple Module TCM-3010

(mm)

Polycarbonate

Vinyl Chloride Coated Electrical Wire

Measurement Item	Temperature
Compatible Sensors	Thermocouple: Type K , J , T , S
Measurement Range	Type K : –199 to 1370℃ Type T : –199 to 400℃ Type J : –199 to 1200℃ Type S : –50 to 1760℃
Measurement Resolution	Type K, J, T : 0.1℃ Type S : Approx. 0.2℃
Measuring Accuracy (*1)	Cold Junction Compensation: ±0.3 °C at 10 to 40 °C (*2) / ±0.5 °C at -40 to 10 °C, 40 to 80 °C (*2) Thermocouple Measurement: Type K, J, T : ±(0.3 + 0.003 × t) °C / Type S : ±(1.0 + 0.003 × t) °C / t = absolute value of measurement in °C
Sensor Connection	Make sure to use a thermocouple sensor with a miniature thermocouple plug attached. T&D does not make available these plugs or sensors for sale.
Operating Environment	Temperature: –40 to 80℃ Humidity: 90%RH or less (no condensation)

* 1 Sensor error is not included.
* 2 The above temperatures [°C] are for the operating environment of the input module.

Connecting the Sensor

1. Check the sensor type and polarity (plus and minus signs).
2. Insert the miniature thermocouple connector, aligning as shown on the input module.

Miniature Thermocouple Connector (Check the Sensor Type)
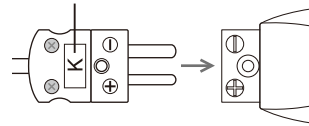
⚠
- When inserting a sensor into an input module, make sure to match the plus and minus signs on the sensor connector to those on the module.
- The data logger detects disconnection about every 40 seconds, causing it to display an incorrect temperature directly after a connector is removed.
- Make sure that the thermocouple type (K, J, T, or S) of the sensor to be connected to the input module, and the sensor type to be displayed on the LCD screen of the data logger are the same. If they are different, change the sensor type using the software or app.
- Measurement range is in no way a guarantee of the sensor heat-durability range. Please check the heat-durability range of the sensor being used.
- "Err" will appear in the display of the data logger when a sensor has not been connected, has been disconnected or a wire has been broken.

PT Module PTM-3010

(mm)

Polycarbonate

Vinyl Chloride Coated Electrical Wire

Pt100/1000
PTM-3010
No.08100000

Measurement Item	Temperature
Compatible Sensors	Pt100 (3-wire / 4-wire), Pt1000 (3-wire / 4-wire)
Measurement Range	–199 to 600℃ (within the sensor heat-durability range only)
Measurement Resolution	0.1℃
Measuring Accuracy (*1)	±(0.3 + 0.003 × t) °C at 10 to 40 °C (*2) ±(0.5 + 0.003 × t) °C at -40 to 10 °C, 40 to 80 °C (*2) t = absolute value of measurement in °C
Sensor Connection	Screw Clamp Terminal Block: 3-Terminal
Operating Environment	Temperature: –40 to 80℃ Humidity: 90%RH or less (no condensation)
Included	Protection Cover

* 1 Sensor error is not included.
* 2 The above temperatures [°C] are for the operating environment of the input module.

Connecting the Sensor

1. Loosen the screws of the terminal block.
2. Slide the sensor cable terminals through the input module protective cover.
3. Insert terminals A and B according to the diagram shown on the terminal block and re-tighten the screws.
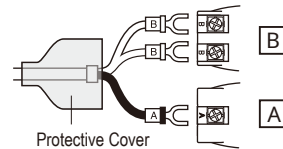
Protective Cover

In the case of a 4-wire sensor, one of the A wires will be left disconnected.

4. Cover the terminal block again with the protective cover.

Protective Cover
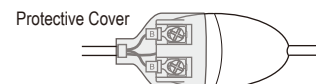
⚠
- Make sure that the sensor type (100Ω or 1000Ω) to be connected to the input module, and the sensor type to be displayed on the LCD screen of the data logger are the same. If they are different, change the sensor type using the software.
- Make sure to correctly connect the lead wires according to the diagram shown on the terminal block, and securely tighten the screws to the terminal block.
- The two "B" terminals have no polarity.
- Measurement range is in no way a guarantee of the sensor heat-durability range. Please check the heat-durability range of the sensor being used.
- "Err" will appear in the display of the data logger when a sensor has not been connected, has been disconnected or a wire has been broken.
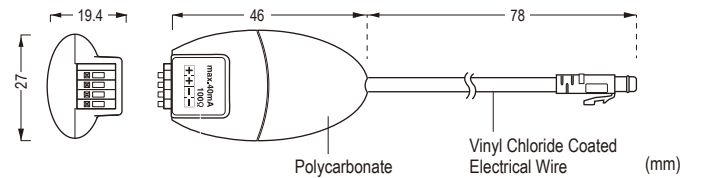
4-20mA Module AIM-3010

Polycarbonate
Vinyl Chloride Coated Electrical Wire
(mm)

| Measurement Item	4-20mA
Input Current Range	0 to 20mA (Operational up to 40mA)
Measurement Resolution	0.01mA
Measurement Accuracy	±(0.05 mA + 0.3 % of reading) at 10 to 40 °C (*1) ±(0.1mA + 0.3 % of reading) at -40 to 10 °C, 40 to 80 °C (*1)
Input Resistance	100Ω ±0.3Ω
Sensor Connection	Cable Insertion Connection: 2 plus (+) parallel terminals and 2 minus (-) parallel terminals for a total of 4 terminals
Compatible Wires	Single wire: φ0.32 to φ0.65㎜ (AWG28 to AWG22) Recommended: φ0.65㎜ (AWG22) Twisted wire: 0.32㎟ (AWG22) and φ0.12㎜ or more in diameter Strip length: 9 to10㎜
Operating Environment	Temperature: –40 to 80°C Humidity: 90%RH or less (no condensation)

*1 The above temperatures [°C] are for the operating environment of the input module.

Connecting the Sensor

Use a tool such as a screwdriver to press down on the terminal button and insert the wire through the hole.

Button
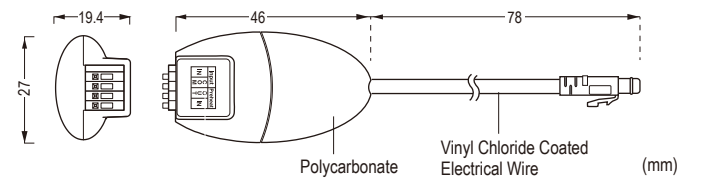Hole

Example of Sensor Connection
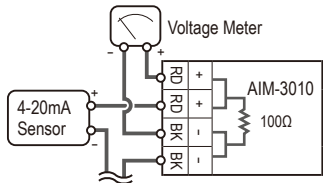
It is possible to connect a sensor and a voltage meter to the module at the same time.

⚠ • Do not apply electric current exceeding the input current range. Doing so may damage the input module, causing heat or fire to occur.
 • When removing, do not forcibly pull on the wire, but push down on the button as done when installing and gently pull the wire out of the hole.

Voltage Module VIM-3010

Polycarbonate
Vinyl Chloride Coated Electrical Wire
(mm)

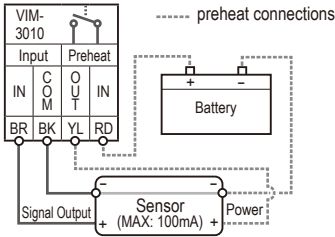| Measurement Item	Voltage
Input Voltage Range	0 to 999.9mV, 0 to 22V Breakdown Voltage: ±28V
Measurement Resolution	up to 400mV at 0.1mV up to 6.5V at 2mV up to 800mV at 0.2mV up to 9.999V at 4mV up to 999mV at 0.4mV up to 22V at 10mV up to 3.2V at 1mV
Measuring Accuracy	±(0.5 mV + 0.3 % of reading) at 10 to 40 °C (*1) ±(1 mV + 0.5 % of reading) at -40 to 10 °C, 40 to 80 °C (*1)
Input Impedance	mV Range: About 3MΩ V Range: About 1MΩ
Preheat Function	Voltage Range: 3V to 20V (up to 100mA) Time Range: 1 to 999 sec. (in units of one-second) Load Capacitance: less than 330μF
Sensor Connection	Cable Insertion Connection: 4-Terminal
Compatible Wires	Single wire: φ0.32 to φ0.65㎜ (AWG28 to AWG22) Recommended: φ0.65㎜ (AWG22) Twisted wire: 0.32㎟ (AWG22) and φ0.12㎜ or more in diameter Strip length: 9 to10㎜
Operating Environment	Temperature: –40 to 80℃ Humidity: 90%RH or less (no condensation)

*1 The above temperatures [°C] are for the operating environment of the input module.

Connecting the Sensor

Use a tool such as a screwdriver to press down on the terminal button and insert the wire through the hole.


Button
Hole

Example of Sensor Connection

⚠ • It is not possible to measure negative voltage with this module.
 • When the signal source output impedance is high, a gain error will occur due to the change in input impedance.
 • Voltage to be input to "Preheat" should be 20V or lower. Inputting a higher voltage may cause damage to the input module.
 • When the preheat function is not being used, do not connect anything to the "Preheat IN" or "Preheat OUT".
 • When using the preheat function, it is necessary that the output signal GND(-) and the power GND(-) are connected together.
 • The LCD refresh interval for the data logger is basically from 1 to 10 seconds, but when using the preheat function the LCD display will be refreshed based on the recording interval set in the data logger.
 • When you remove the lead wires from the VIM-3010, core wires will be exposed; be careful of electrical shocks and/or short circuits.
 • When removing, do not forcibly pull on the wire, but push down on the button as done when installing and gently pull the wire out of the hole.

Pulse Input Cable PIC-3150

M3.5 Crimp Terminal
Vinyl Chloride Coated Electrical Wire
(mm)
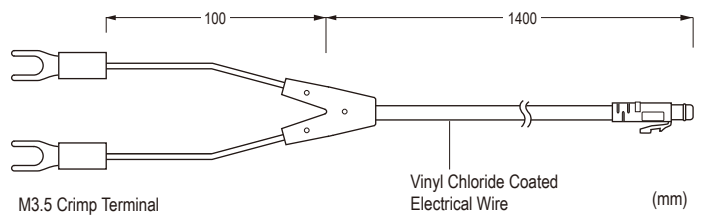
Measurement Item	Pulse Count
Input Signal:	Non-voltage Contact Input Voltage Input (0 to 27 V)
Detection Voltage	Lo: 0.5V or less, Hi: 2.5V or more
Chattering Filter	ON: 15 Hz or less OFF: 3.5 kHz or less (when using square wave signals of 0-3V or higher)
Response Polarity	Select either Lo→Hi or Hi→Lo
Maximum Count	61439 / Recording Interval
Input Impedance	Approx. 100kΩ pull up

⚠ • When connecting the cable to the measurement object, in order to wire properly make sure to match the terminal polarities (RD+, BK -).