Exclusively for RTR-505 / TR-55i

Input Module User's Manual

Carefully read this instruction manual before using any of these products.

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

In this manual, the modules listed above are collectively referred to as (an / the) "Input Module(s)" and RTR-505 / TR-55i as the "Data Logger".

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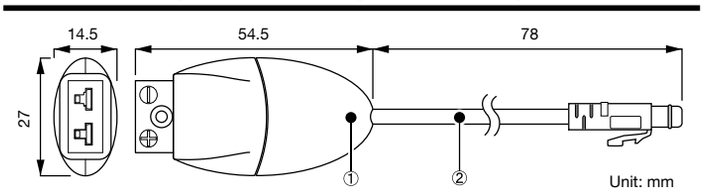
2016. 02 16504750015 (3rd Edition)

Cautions about using Input Modules

The following items should be strictly obeyed for the safe usage of these products, and for protecting yourself and other people from bodily harm and/or damage to property. Before using any of these products, please read the following carefully and fully understand the contents.

- Do not connect any of the Input Modules in this manual to any Data Logger other than RTR-505 / TR-55i.
- Do not take apart, repair or modify an Input Module.
- Use Input Modules only in an environment where the ambient temperature is from -40 to 80°C and the humidity is 90%RH (no condensation) or less.
- For information about handling sensors and their necessary operating environments, see the User's Manual included with the sensor.
- 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
- The sensor connection of Input Modules is not water resistant; make sure not to get wet.
- Do not use alcohol to clean Input Modules. If an Input Module gets dirty, wipe it with a soft cloth dipped in water and tightly wrung out.
- Do not drop or expose an Input Module to a strong impact.
- Do not use an Input Module on the human body.
- Store Input Modules out of the reach of children.
- If any smoke, strange smells or sounds are emitted from an Input Module, immediately stop using.
- When making "Adjustment Settings" using the software, the adjustment values will be saved to the Input Module. Therefore, when an Input Module is replaced, it is necessary to re-make any desired adjustment settings to be written into the newly connected module.

Thermocouple Module (TCM-3010)



Materials: ①Polycarbonate ②Vinyl Coated Electrical Wire

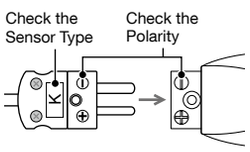
Measurement Item		Temperature
Compatible Sensors		Thermocouple: Type K, J, T, S
Measurement Range		−199 to 1700°C (only within the sensor heat-durability range)
Measurement Resolution		Type K, J, T : 0.1°C Type S : about 0.2°C
Measurement Accuracy*	Thermocouple Measurement	±(0.3 °C + 0.3 % rdg) [Type K, J, T] ±(1 °C + 0.3 % rdg) [Type S]
	Cold Junction Compensation	±0.3 °C [10 to 40 °C] ±0.5 °C [−40 to 10 °C / 40 to 80 °C]
Sensor Connection		Miniature Thermocouple Connector
Operating Environment		Temperature: −40 to 80°C, Humidity: 90%RH or less (no condensation)

* Sensor error is not included. "rdg" stands for reading.
The above temperatures [°C] are for the operating environment of the Input Module.

CAUTION

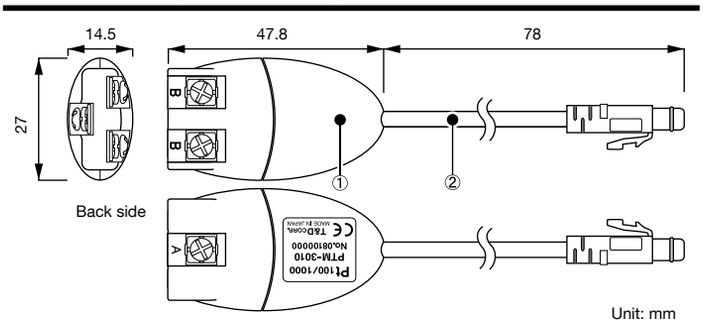
- When inserting a sensor into an Input Module, ensure that the polarity is correct by aligning the plus and minus signs on the sensor connector and the module.
- The Data Logger detects the break of wire every 40 seconds or so, causing it to display an uncertain temperature directly after a connector is removed.
- After connecting an Input Module to a Data Logger, check the thermocouple type (K, J, T, or S) of the sensor to be used and the sensor type to be displayed on the LCD screen of the Data Logger; make sure they are the same. If they are different, change the sensor type using the software.
- Measurement range is in no way a guarantee of the sensor heat-durability range. Check and confirm the heat durability of the sensor.
- When the sensor is broken or unconnected, the message "Err" will appear on the LCD screen of the Data Logger.

Connecting the Sensor



1. Check the sensor type and the polarity (plus and minus signs).
2. Insert the sensor connector, aligning as shown on the Input Module.

PT Module (PTM-3010)



Materials: ①Polycarbonate ②Vinyl Coated Electrical Wire

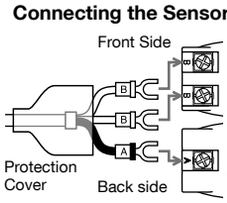
Measurement Item	Temperature
Compatible Sensors	Pt100 (3-wire,4-wire), Pt1000 (3-wire,4-wire)
Measurement Range	−199 to 600°C (only within the sensor heat-durability range)
Measurement Resolution	0.1°C
Measurement Accuracy*1	±(0.3 °C + 0.3 % rdg) [10 to 40 °C] ±(0.5 °C + 0.3 % rdg) [−40 to 10 °C / 40 to 80 °C]
Sensor Connection	Screw Clamp Terminal Block (3-Terminal)
Operating Environment	Temperature: −40 to 80°C, Humidity: 90%RH or less (no condensation)
Accessories	Protection Cover

*1 Sensor error is not included. "rdg" stands for reading.
The above temperatures [°C] are for the operating environment of the Input Module.

CAUTION

- After connecting an Input Module to a Data Logger, check the type (100Ω or 1000Ω) of the sensor to be used and the sensor type to be displayed on the LCD screen of the Data Logger; make sure that they 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. Check and confirm the heat durability of the sensor.
- When the sensor is broken or unconnected, the message "Err" will appear on the LCD screen of the Data Logger.

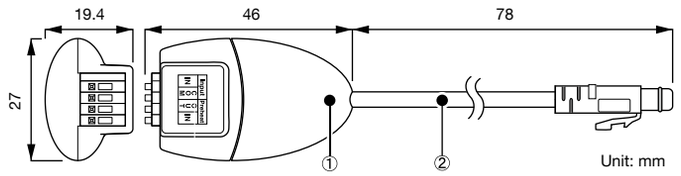
Connecting the Sensor



1. Loosen the screws of the terminal block.
2. Remove the protection cover from the Input Module, and place it through the sensor cable.
3. Insert terminals A and B according to the diagram shown on the terminal block.
4. Firmly tighten the screws to the terminal block.
5. Replace the protection cover over the terminal block.

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

Voltage Module (VIM-3010)



Materials: ①Polycarbonate ②Vinyl Coated Electrical Wire

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 800mV: at 0.2mV, up to 999mV: at 0.4mV, up to 3.2V: at 1mV, up to 6.5V: at 2mV, up to 9.999V: at 4mV, up to 22V: at 10mV
Measurement Accuracy	±(0.5 mV + 0.3 % rdg) [10 to 40 °C] ±(1 mV + 0.5 % rdg) [-40 to 10 °C / 40 to 80 °C]
Input Impedance	mV Range: About 3MΩ, V Range: About 1MΩ
Preheat Function	Voltage Range (Preheating): 3V to 20V100mA, Time Range (Preheating): 1 to 999 seconds (in units of one-second) Load Capacitance: less than 330μF
Sensor Connection	Cable Insertion Connection: 4-Terminal
Compatible Wires	Single wire: ϕ0.32 to ϕ0.65mm (AWG28 to AWG22), ϕ0.65mm (AWG22) recommended Twisted wire: 0.32mm² (AWG22), ϕ0.12mm or more in diameter Strip length: 9 to 10mm
Operating Environment	Temperature: −40 to 80°C / Humidity: 90%RH or less (no condensation)

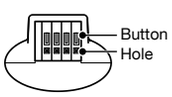
* "rdg" stands for reading. The above temperatures [°C] are for the operating environment of the Input Module.

CAUTION

- 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.
- For details about the preheat function, see the User's Manual that comes with the software or the Help Menu in the software you are using.
- 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, output signal GND(-) and power GND(-) need to be 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 Input Module, core wires will be exposed; be careful of electric shock or short circuits.

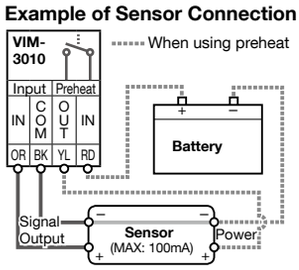
Connecting the Sensor

1. Using a screwdriver or tweezers, while pressing down on the terminal button, insert the wire into the hole.

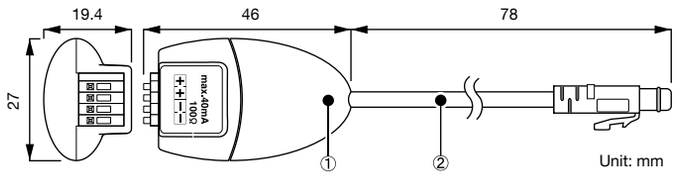


2. Also when removing, gently pull the wire out of the hole while pressing down on the terminal button.

Example of Sensor Connection



4-20mA Module (AIM-3010)



Materials: ①Polycarbonate ②Vinyl Coated Electrical Wire

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 % rdg) [10 to 40 °C] ±(0.1mA + 0.3 % rdg) [−40 to 10 °C / 40 to 80 °C]
Input Resistance	100Ω ±0.3Ω
Sensor Connection	Cable Insertion Connection: Plus(+) 2 Parallel Terminals, Minus(-) 2 Parallel Terminals: Total 4 Terminals
Compatible Wires	Single wire: ϕ0.32 to ϕ0.65mm (AWG28 to AWG22), ϕ0.65mm (AWG22) recommended Twisted wire: 0.32mm² (AWG22), ϕ0.12mm or more in diameter Strip length: 9 to 10mm
Operating Environment	Temperature: −40 to 80°C / Humidity: 90%RH or less (no condensation)

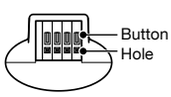
* "rdg" stands for reading. The above temperatures [°C] are for the operating environment of the Input Module.

CAUTION

- Do not apply electric current exceeding the input current range. Doing so may damage the Input Module, causing heat or fire to occur.

Connecting the Sensor

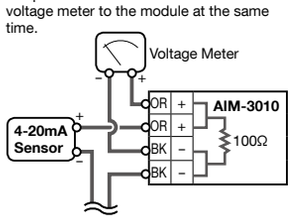
1. Using a screwdriver or tweezers, while pressing down on the terminal button, insert the wire into the hole.



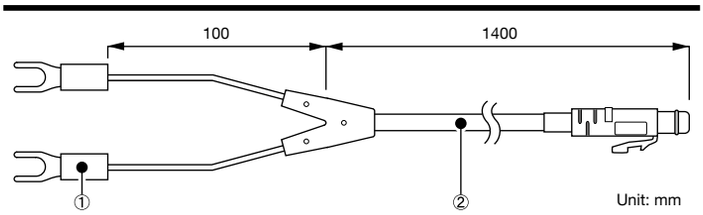
2. Also when removing, gently pull the wire out of the hole while pressing down on the terminal button.

Example of Sensor Connection

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



Pulse Input Cable (PIC-3150)



Materials: ①M3.5 Crimp Terminal ②Vinyl Coated Electrical Wire

Measurement Item	Pulse Count
Input Signal	Non-voltage Contact Input / Voltage Input (0 to 27 V) Breakdown voltage: -5V, +27V
Detection Voltage	Lo: 0.5V or less, Hi: 2.5V or more
Chattering Filter	ON (15Hz or less) / OFF (3.5kHz or less) 0-3V Rectangular Wave Signal
High Level Pulse Width	Chattering Filter ON: 35ms or more, Chattering Filter OFF: 180μs or more
Low Level Pulse Width	Chattering Filter ON: 12ms or more, Chattering Filter OFF: 100μs or more
Response Polarity	Select either Lo->Hi or Hi->Lo
Maximum Count	61439 / Recording Interval
Input Impedance	Approx. 100kΩ pull up
Max Jitter	Normal: About 0.01 seconds, During Communication: About 0.1 seconds

CAUTION

- Note that the specifications listed above are for the RTR-505 / TR-55i being connected to this pulse input cable.
- When connecting the cable to the measurement object, make sure to check the terminal polarity (RD: +, BK: −) in order to wire properly.