

Compact Waterproof Data Logger

# TR-5*i* Series



Easy-to-Read Display  
Durable Waterproof Loggers



# Simple Standalone Compact Logger No Network Necessary!

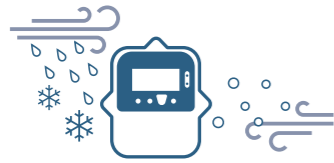
Communication done the simple way provides battery life of up to 4 years  
Tough compact design for wider measurement applications



<https://tandd.com/product/series/tr51.html>

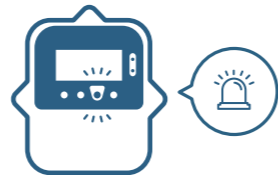
## TR-5i Series Features

### Waterproof and Robust Body



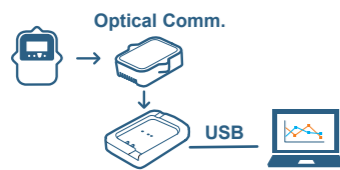
Ideal for measurement in harsh environments, transport and outdoor use.

### Alarm LED and LCD Display



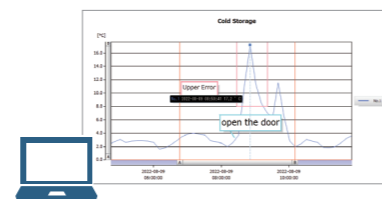
Easily view settings and device status on LCD.  
Alarm LED flashes when measurement exceeds set range.  
Quickly check time and type of warnings on software.

### Data Collection



Collecting data is made easy with the use of the TR-50U2 Communication Port connected to a PC.

### User-Friendly Software Available Free of Charge



**T&D Graph**  
A powerful graphical tool for viewing and analyzing data recorded by T&D data loggers.

**T&D Recorder for Windows (TR-5,7xU)**  
Software for making various detailed recording settings and downloading data.

## Product Lineup

### Data Loggers

#### Temperature



#### TR-51i

Measurement Range: -40 to 80 °C  
Water Resistance: IP67 (Immersion proof)  
Temperature Sensor (Internal): Thermistor



#### TR-52i

Measurement Range: -60 to 155 °C  
Water Resistance: IP64 (Splash proof / rated for use in daily life)  
Temperature Sensor TR-5106 Included



#### Pt100 / Pt1000



#### TR-55i-Pt

Measurement Range: -199 to 600 °C  
Input Module PTM-3010 Included (Sensor sold separately)

#### Thermocouple



#### TR-55i-TC

Measurement Range:  
K: -199 to 1370 °C  
J: -199 to 1200 °C  
T: -199 to 400 °C  
S: -50 to 1760 °C  
Input Module TCM-3010 Included (Sensor not sold by T&D)

#### Voltage



#### TR-55i-V

Measurement Range: 0 to 22 V  
Input Module VIM-3010 Included  
Measurement Resolution: Minimum of 0.1 mV  
Preheat Function

#### 4-20mA



#### TR-55i-mA

Measurement Range: 0 to 20 mA (Operational up to 40 mA)  
Input Module AIM-3010 Included

#### Pulse Count



#### TR-55i-P

Measurement Range: Pulse count 0 - 61439  
Input Signal: Contact Input / Voltage Input  
Input Frequency: 0 - 3.5 kHz  
Input Cable PIC-3150 Included  
For use with Voltmeters, Flow Meters and Passage Counters



EN 12830 Compliance  
TR-51i and TR-52i data loggers comply with EN12830, the European Standard regarding temperature recorders for the transport, storage and distribution of chilled, frozen, deep-frozen and quick-frozen food.

### Data Collection Device

You will need a Communication Port and the software "T&D Recorder for Windows (TR-5,7xU)" in order to change the recording settings and download recorded data.

#### USB Communication Port

#### TR-50U2

Between Unit - Data Loggers: Optical Communication  
Between Unit - PC: USB Communication

- Use for downloading data directly to a PC.
- Download data from a logger at full storage capacity in about 25 seconds.
- The unit operates via USB bus power so no need for more wires and plugs.
- Possible to specify a time period of data for downloading so you get only the data you want.



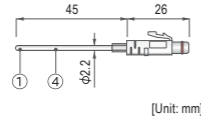
**Temperature Sensors for TR-52i**

Measurement Range: -60 to 155 °C,  
 Sensor Temperature Durability: -70 to 180 °C  
 Accuracy (TR-5620 excluded): Avg. ±0.3 °C at -20 to 80 °C, Avg. ±0.5 °C at -40 to -20 °C / 80 to 110 °C, Avg. ±1.0 °C at -60 to -40 °C / 110 to 155 °C  
 Materials: ① Thermistor ② Stainless Tube (SUS316) ③ FEP Shrink Tube ④ FEP Cable ⑤ Fluoropolymer Mold

**Fluoropolymer Coated Sensor**

**TR-5101**

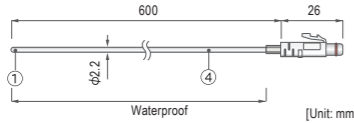
Response Time (90 %):  
 Approx. 80 sec. (in air)



[Unit: mm]

**TR-5106**

Response Time (90 %):  
 Approx. 80 sec. (in air)  
 Approx. 7 sec. (in agitated water)

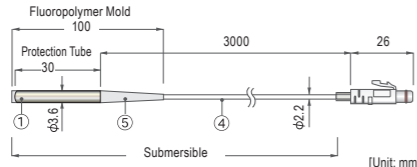


[Unit: mm]

**Underwater Sensor**

**TR-5530**

Response Time (90 %):  
 Approx. 150 sec. (in air)  
 Approx. 15 sec. (in agitated water)

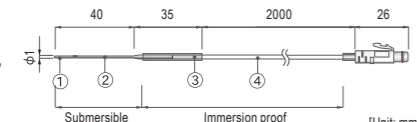


[Unit: mm]

**High Sensitivity Ultra-thin Sensor**

**TR-5620**

Accuracy:  
 Avg. ±0.5 °C at -20 to 60 °C  
 Avg. ±1.0 °C at -60 to -20 °C,  
 60 to 80 °C  
 Avg. ±2.0 °C at 80 to 155 °C  
 Response Time (90 %):  
 Approx. 50 sec. (in air)  
 Approx. 1 sec. (in agitated water)

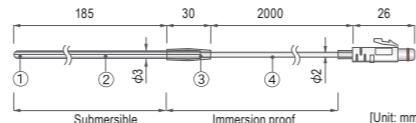


[Unit: mm]

**Stainless Protection Sensor**

**TR-5220**

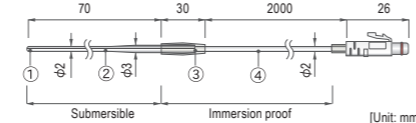
Response Time (90 %):  
 Approx. 150 sec. (in air)  
 Approx. 7 sec. (in agitated water)



[Unit: mm]

**TR-5320**

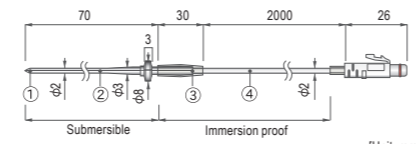
Response Time (90 %):  
 Approx. 90 sec. (in air)  
 Approx. 3 sec. (in agitated water)



[Unit: mm]

**TR-5420**

For Core Temperature  
 Response Time (90 %):  
 Approx. 90 sec. (in air)  
 Approx. 3 sec. (in agitated water)

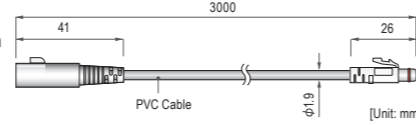


[Unit: mm]

**Extension Cable**

**TR-2C30**

Waterproof Capacity:  
 Splash proof (rated for use in daily life)  
 Temperature Durability:  
 -25 to 60 °C

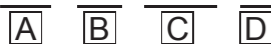


[Unit: mm]

Note: Only one extension cable per Temperature sensor.

**Pt100 Sensor for TR-55i-Pt**

TR-8###-##-####-##M



- A Sensor Type (3 digits)
- B Protection Tube Diameter (2 digits)
- C Protection Tube Length (2 - 4 digits)
- D Cable Length (1 - 2 digits)

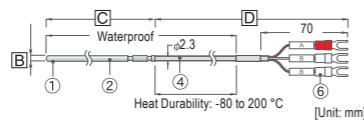
To order, create the model number by selecting A, B, C, D (See below). Pt100 Sensors are produced only upon receipt of order; therefore please allow four weeks from the time of order until shipping.  
 The thermistor (temperature detection section) is mounted in the tip of the sensor.

Sensor Device	Pt100	Range of Error	±(0.15 + 0.002 × t) °C t = absolute value of measurement
Electrical Current	less than 2mA	Water Resistance	TR-8200: Waterproof Others: Only stainless protection tube is water resistant.
Insulation Resistance	DC100V over 100 MΩ		
Conductor	TR-8130: over 10 MΩ at DC500 V 3 wire type		

**A Sensor Type**

**TR-8200 (Waterproof Type)**

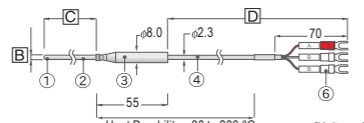
Measurement Range: -50 to 200 °C  
 Response Time (90 %):  
 Approx. 13 sec.\* (in agitated water)



[Unit: mm]

**TR-8210 (Regular Type)**

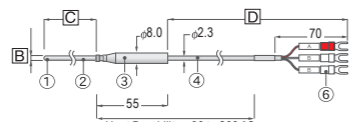
Measurement Range: -200 to 300 °C  
 Response Time (90 %):  
 Approx. 6 sec.\* (in agitated water)



[Unit: mm]

**TR-8220 (Low to High Temp Type)**

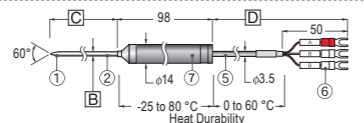
Measurement Range: -200 to 500 °C  
 Response Time (90 %):  
 Approx. 6 sec.\* (in agitated water)



[Unit: mm]

**TR-8130 (Handy Type)**

Measurement Range: -50 to 200 °C  
 Response Time (90 %):  
 Approx. 6 sec.\* (in agitated water)



[Unit: mm]

\* Stated response time (90 %) is for sensors with a protection tube diameter of 2.3mm.

Materials: ① Sensor (Pt100) ② Stainless Protection Tube (SUS316) ③ Sleeve (SUS304) ④ FEP Cable ⑤ PVC Cable ⑥ Crimp Terminals ⑦ Grip (Bakelite)

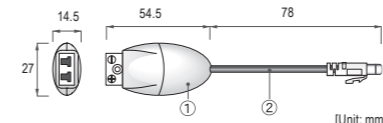
**Input Modules for TR-55i**

Operating Environment (PIC-3150 excluded): Temperature -40 to 80 °C, Humidity 90 %RH or less (no condensation)  
 Note: Input Module is not water resistant.

Materials: ① Polycarbonate ② PVC Cable ③ M3.5 Crimp Terminal

**Thermocouple Module**

**TCM-3010**



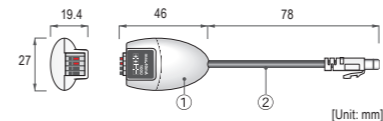
[Unit: mm]

Compatible Sensors: Thermocouple: Type K, J, T, S  
 Measurement Range: within the sensor heat-durability range only  
 Measurement Resolution: Type K, J, T: 0.1 °C, Type S: about 0.2 °C  
 Measurement Accuracy\*  
 Cold Junction Compensation:  
 -40 to 10 °C: ±0.5 °C, 10 to 40 °C: ±0.3 °C, 40 to 80 °C: ±0.5 °C  
 Thermocouple Measurement:  
 Type K, J, T ±0.3 °C + 0.3 % of reading, Type S ±1 °C + 0.3 % of reading

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.  
 \* Does not include inaccuracies of sensor actually connected.

**4-20mA Module**

**AIM-3010**



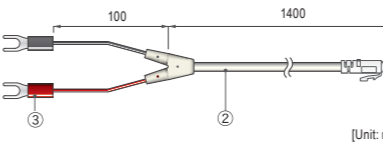
[Unit: mm]

Input Resistance: 0 to 20 mA (Operational up to 40 mA)  
 Measurement Resolution: 0.01mA  
 Measurement Accuracy: Ambient Temperature of Input Module  
 -40 to 10 °C: ±0.1 mA + 0.3 % of reading  
 10 to 40 °C: ±0.05 mA + 0.3 % of reading  
 40 to 80 °C: ±0.1 mA + 0.3 % of reading  
 Input Resistance: 100 Ω ±0.3 Ω  
 Sensor Connection: Cable Insertion Connection: Plus(+) 2 Parallel Terminals,  
 Minus(-) 2 Parallel Terminals: Total 4 Terminals

Compatible Wires:  
 Single wire: φ 0.32 to φ 0.65 mm (AWG 28 to AWG 22),  
 φ 0.65 mm (AWG 22) recommended  
 Twisted wire: 0.32 mm<sup>2</sup> (AWG 22), φ 0.12 mm or more in diameter  
 Strip length: 9 to 10 mm

**Pulse Input Cable**

**PIC-3150**



[Unit: mm]

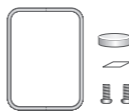
Measurement Item: Pulse Count  
 Input Signal: Non-voltage Contact Input, Voltage Input (0 to 27 V)  
 Detection Voltage: Lo: 0.5 V or less, Hi: 2.5 V or more  
 Chattering Filter: ON: 15 Hz or less, OFF: 3.5 kHz or less (when using square wave signals of 0-3 V or higher)  
 Response Polarity: Select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

**Common for Data Loggers**

**Maintenance Set**

**TR-00P1**

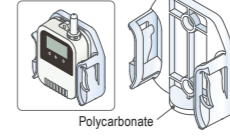
Included Items:  
 Rubber Packing,  
 Silica Gel, Double-Sided Adhesive Tape, Screws



**Wall Attachment**

**TR-05K3**

Included Items:  
 Double-sided adhesive tape,  
 Screws  
 Note: Cracking may occur if polycarbonate is exposed to strong impact at temperatures of -30 °C or lower.



**Software DVD-ROM**

**T&D Software**

**SO-TD1**

Includes Windows application software for all the current T&D products.  
 T&D Recorder for Windows (TR-5, 7xU),  
 T&D Graph, etc.





Data Loggers		
	TR-51i	TR-52i
Measurement Channels	Temperature 1ch (Internal)	Temperature 1ch
Sensor	Thermistor	Thermistor
Measurement Units	°C, °F	°C, °F
Measurement Range	-40 to 80 °C	-60 to 155 °C
Accuracy	Avg.±0.5 °C	Avg.±0.3 °C at -20 to 80 °C Avg.±0.5 °C at -40 to -20 °C, 80 to 110 °C Avg.±1.0 °C at -60 to -40 °C, 110 to 155 °C
Measurement Resolution	0.1 °C	0.1 °C
Reponsiveness	Response Time (90 %): Approx. 35 min.	Response Time (90 %): Approx. 80 sec. (in air) Approx. 7 sec. (in agitated water)
Logging Capacity	16,000 readings	
Recording Interval	Select from 15 choices: 1, 2, 5, 10, 15, 20, 30 sec. or 1, 2, 5, 10, 15, 20, 30, 60 min.	
Recording Mode	Endless (Overwrite oldest data when capacity is full) or One Time (Stop recording when capacity is full)	
LCD Display Items	Measurements, Recording Status, Battery Life Warning, etc.	
Communication Interfaces	Optical Communication	
Power	Lithium Battery LS14250 x 1	
Battery Life (*1)	Approx. 4 years	
Dimensions	H 62 mm x W 47mm x D 19 mm (excluding protrusions and sensor)	
Weight	Approx. 45 g	
Operating Environment	-40 to 80 °C	
Waterproof Capacity	IP67: Immersion proof	IP64: Splash proof (rated for use in daily life) (*2)
Included Items	-	Temperature Sensor (TR-5106)
Data Collection Devices	TR-50U2 Other devices (*3)	

\*1: Battery life depends upon multiple factors including measuring environment, recording interval, and quality of the battery being used.  
 \*2: This is the waterproof capacity of the data logger with the sensor connected.  
 \*3: Also compatible with the following discontinued products: TR-57DCi, TR-57U, RTR-57U, TR-50U, and TR-50C.  
 The specifications listed above are subject to change without notice.

Data Collection Devices	
	TR-50U2
Compatible Devices	R-51i / 52i / 55i-TC / 55i-Pt / 55i-V / 55i-mA / 55i-P Other devices (*1)
Communication Interfaces	Optical Communication USB 2.0 (Mini-B connector)
Communication Time	Data Download Time About 20 sec.
Power	USB bus power
Dimensions	H 80 mm x W 56 mm x D 16.5 mm (excluding protrusions)
Weight	Approx. 25 g
Operating Environment	Temperature: -10 to 60 °C Humidity: 90 %RH or less (no condensation)
Included Items	USB Mini-B Cable US-15C, Manual Set (Warranty Included)
Software (*2)	PC Software (Windows): T&D Recorder for Windows (TR-5, 7xU), T&D Graph

\*1: Also compatible with the following discontinued products: TR-51S/52S, and TR-51A/52.  
 \*2: Free software download and information on OS compatibility is available on the Software page of our website. <https://tandd.com/software/>  
 The specifications listed above are subject to change without notice.

Data Loggers					
	TR-55i-TC	TR-55i-Pt	TR-55i-V	TR-55i-mA	TR-55i-P
Measurement Channels	Temperature 1ch	Temperature 1ch	Voltage 1ch	4-20mA 1ch	Pulse Count 1ch
Sensor	Thermocouple: Type K, J, T, S	Pt100, Pt1000 (3-wire, 4-wire *1)	-	-	-
Measurement Units	°C, °F	°C, °F	V, mV	mA	P
Measurement Range	K: -199 to 1370 °C J: -199 to 1200 °C T: -199 to 400 °C S: -50 to 1760 °C	-199 to 600 °C	0 to 22 V	0 to 20 mA Operational up to 40 mA	
Accuracy (*2)	Thermocouple Measurement K, J, T : ±(0.3 °C + 0.3 % of reading) S : ±(1 °C + 0.3 % of reading)  Cold Junction Compensation ±0.3 °C at 10 to 40 °C ±0.5 °C at -40 to 10 °C, 40 to 80 °C	±(0.3 °C + 0.3 % of reading) at 10 to 40 °C ±(0.5 °C + 0.3 % of reading) at -40 to 10 °C, 40 to 80 °C	±(0.5 mV + 0.3 % of reading) at 10 to 40 °C ±(1 mV + 0.5 % of reading) at -40 to 10 °C, 40 to 80 °C	±(0.05 mA + 0.3 % of reading) at 10 to 40 °C ±(0.1 mA + 0.3 % of reading) at -40 to 10 °C, 40 to 80 °C	Input Signal: Non-voltage Contact Input Voltage Input (0 to 27 V)  Detection Voltage Lo: 0.5 V or less Hi: 2.5 V or more  Input Impedance Approx. 100 kΩ pull up  Chattering Filter: ON: 15 Hz or less OFF: 3.5 kHz or less
Measurement Resolution	K, J, T: 0.1 °C S: approx. 0.2 °C	0.1 °C	Up to 400 mV: 0.1 mV Up to 800 mV: 0.2 mV Up to 999 mV: 0.4 mV Up to 3.2 V: 1 mV Up to 6.5 V: 2 mV Up to 9.999 V: 4 mV Up to 22 V: 10 mV	0.01 mA	Maximum Count 61,439 / Recording Interval
Logging Capacity	16,000 readings				
Recording Interval	Select from 15 choices: 1, 2, 5, 10, 15, 20, 30 sec. or 1, 2, 5, 10, 15, 20, 30, 60 min.				
Recording Mode	Endless (Overwrite oldest data when capacity is full) or One Time (Stop recording when capacity is full)				
LCD Display Items	Measurements, Recording Status, Battery Life Warning, etc.				
Communication Interfaces	Optical Communication				
Power	Lithium Battery: LS14250 x 1				
Battery Life (*3)	Approx. 14 months	Approx. 24 months	Approx. 16 months	Approx. 16 months	Approx. 16 to 24 months
Dimensions	H 62 mm x W 47 mm x D 19 mm (excluding protrusions and Input Module)				
Weight	Approx. 45 g				
Operating Environment	-40 to 80 °C				
Waterproof Capacity	IP64: Splash proof (rated for use in daily life) (*4)				
Included Items	Input Module TCM-3010 (Sensor not provided)	Input Module PTM-3010 (Sensor available as option)	Input Module VIM-3010	Input Module AIM-3010	Input Module PIC-3150
Data Collection Devices	Lithium Battery LS14250, Strap, Manual Set (Warranty Included) TR-50U2 Other devices (*5)				

\*1: In the case of a 4-wire sensor, one wire will be left unused.  
 \*2: For TR-55i-TC and TR-55i-Pt, sensor inaccuracies are not included.  
 \*3: Battery life varies depending upon multiple factors including ambient temperature, recording interval, frequency of communication, and battery performance. All estimates are based on operations carried out with a new battery and are in no way a guarantee of actual battery life.  
 \*4: This is the waterproof capacity of the data logger with the Input Module connected. Input Module itself is not water resistant.  
 \*5: Also compatible with the following discontinued products: TR-57DCi, and TR-50U.  
 The specifications listed above are subject to change without notice.

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 **T&D Corporation**

817-1 Shimadachi, Matsumoto, Nagano 390-0852, Japan

Please send your inquiries to:

E-mail : [sales@tandd.com](mailto:sales@tandd.com)

URL: <https://tandd.com/>

