Compact Waterproof Data Logger

TR-5*i* Series

Easy-to-Read Display
Durable Waterproof Loggers

T AND D

C E

Simple Standalone Compact Logger
No Network Necessary!

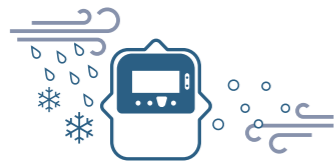**Communication done the simple way provides battery life of up to 4 years**
Tough compact design for wider measurement applications

Communication Port
TR-50U2

Thermo Recorder
TR-51i

CE S/N
T&D CORPORATION
MADE IN JAPAN

https://tandd.com/product/series/tr5i.html

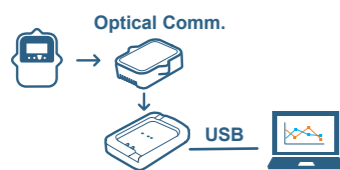## TR-5i Series Features

Waterproof and Robust Body

Ideal for measurement in harsh environments, transport and outdoor use.
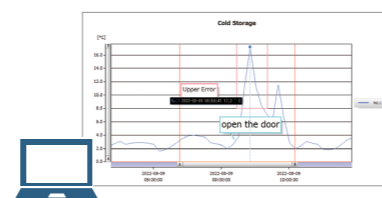
Alarm LED and LCD Display

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

Optical Comm.

USB

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

Pt100 / Pt1000   Thermocouple

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

TR-55i-Pt
Measurement Range: -199 to 600 °C
Input Module PTM-3010 Included (Sensor sold separately)

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.

Communication Port
TR-50U2

CE S/N 665C0000
T&D CORPORATION
MADE IN JAPAN

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)

Waterproof
[Unit: mm]

Underwater Sensor

TR-5530

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

Submersible
[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)

Submersible   Immersion proof
[Unit: mm]

Stainless Protection Sensor

TR-5220

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

Submersible   Immersion proof
[Unit: mm]

TR-5320

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

Submersible   Immersion proof
[Unit: mm]

TR-5420

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

Submersible   Immersion proof
[Unit: mm]

Extension Cable

TR-2C30

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

PVC Cable
[Unit: mm]

Note: Only one extension cable per Temperature sensor.

Pt100 Sensor for TR-55i-Pt

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

Ⓐ Ⓑ Ⓒ Ⓓ

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

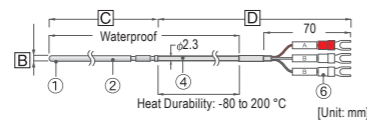|		
Sensor Device	Pt100	Range of Error: ±(0.15 + 0.002 × t) °C
Electrical Current	less than 2mA	t = absolute value of measurement
Insulation Resistance	DC100V over 100 MΩ / TR-8130: over 10 MΩ at DC500 V	Water Resistance: TR-8200: Waterproof / Others: Only stainless protection tube is water resistant.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

To order, create the model number by selecting Ⓐ, Ⓑ, Ⓒ, Ⓓ (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.
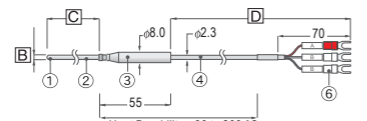
Ⓐ Sensor Type

TR-8200 (Waterproof Type)

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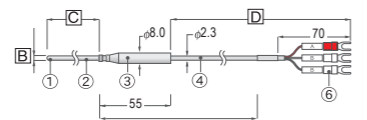 Approx. 13 sec.* (in agitated water)

Waterproof
Heat Durability: -80 to 200 °C
[Unit: mm]

TR-8210 (Regular Type)

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

Heat Durability: -80 to 200 °C
[Unit: mm]
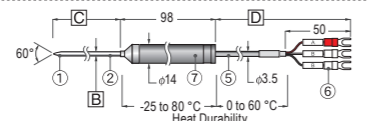
TR-8220 (Low to High Temp Type)

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

Heat Durability: -80 to 200 °C
[Unit: mm]

TR-8130 (Handy Type)

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

-25 to 80 °C   0 to 60 °C
Heat Durability
[Unit: mm]

* Stated response time (90 %) is for sensors with a protection tube diameter of φ3.2.

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

Ⓑ Protection Tube Diameter

	TR-8200	TR-8210	TR-8220	TR-8130
φ 2.0	-	○	-	-
φ 2.3	-	○	-	-
φ 3.0	○	○	-	-
φ 3.2	◎	◎	◎	◎
φ 4.8	○	○	○	○
φ 6.0	○	○	○	-
φ 6.4	-	-	○	-

◎ Recommended   ○ Avaiable   - Not available

Ⓒ Protection Tube Length

TR-8220: 50 to 2000 millimeters
Others: 50 to 1000 millimeters

Can be specified in 50 mm units.

Ⓓ Cable Length

1 to 99 meters

Can be specified in 1 m units.

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 mm² (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

Pt Module

PTM-3010

[Unit: mm]

Compatible Sensors:
  Pt100 (3-wire, 4-wire), Pt1000 (3-wire, 4-wire)
  In the case of a 4-wire sensor, one wire will be left unused.
Measurement Resolution: 0.1 °C
Measurement Accuracy* : Ambient Temperature of Input Module
  -40 to 10 °C: ±0.5 °C + 0.3 % of reading
  10 to 40 °C: ±0.3 °C + 0.3 % of reading
  40 to 80 °C: ±0.5 °C + 0.3 % of reading
Included Items: Protection Cover
* Does not include inaccuracies of sensor actually connected.

Voltage Module

VIM-3010

[Unit: mm]

Measurement Item: Voltage 0 to 22 V
Measurement Resolution:
  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
Measurement Accuracy: Ambient Temperature of Input Module
  -40 to 10 °C: ±1 mV + 0.5 % of reading
  10 to 40 °C: ±0.5 mV + 0.3 % of reading
  40 to 80 °C: ±1 mV + 0.5 % of reading
Preheat Function:
  Voltage Range (Preheating): 3 V to 20 V (up to 100 mA)
  Time Range (Preheating): 1 to 999 seconds (in units of one-second)
  Capacitor Load: 330 μF or less

Extention Cable

TR-3C30

PVC Cable
[Unit: mm]

Waterproof Capacity:
  Splash proof (rated for use in daily life)
Temperature Durability:
  -25 to 60 °C
Note: Only one cable per module.

Common for Data Loggers

Maintenance Set

TR-00P1

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

Wall Attachment

TR-05K3

Polycarbonate

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

T&D Software

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)
	Lithium Battery LS14250, Strap, Manual Set (Warranty Included)	
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	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 Maximum Count 61,439 / Recording Interval
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	
	Note: The temperature range shown above represents the operating environment of the Input Module.				
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	
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
	Lithium Battery LS14250, Strap, Manual Set (Warranty Included)				
Data Collection Devices	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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