

Compact Waterproof Data Logger

TR-5*i* Series



Infrared Interface
Easy-to-Read Display
Durable Waterproof Loggers



User Friendly Interface means: Power through Simplicity

The TR-5i Series is a family of data loggers designed to measure and record a variety of items: from temperature to pulse. The recorded data can then be easily collected with a compatible portable Data Collector or downloaded directly to a PC with a Communication Port.

Record → Collect → Analyze
The TR-5i Series makes it easy as 1-2-3

Data Loggers

Measure / Record

- Temperature • Pt100 / Pt1000
- Thermocouple • Voltage • 4-20mA
- Pulse



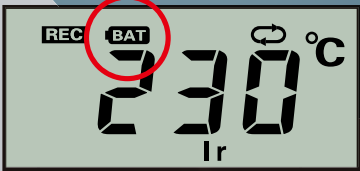
Compact Design means Wider Application Possibilities

The compact size allows it to be placed almost anywhere. Also, its durable body with water-proof and dust proof capacity makes it possible to be used in harsh environments.



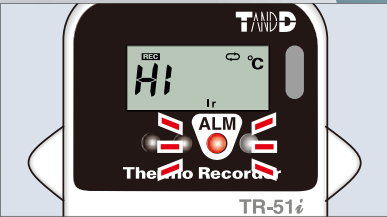
Low Energy Consumption Design means Longer Battery Life

Over one year of continuous use possible. Battery replacement mark lets you know when it is time for a new battery.



Warning LED on Unit

When a set limit has been exceeded the Warning LED will flash and a message will be displayed to give you the cause.



Data Collection Devices

Collect and Download Data

Via Infrared or Optical Communication

On-site Data Collection
On-the-spot Data Checking

Data collection via IR communication makes it possible to collect recorded data without ever having to move or touch the logger. The collected data can then be checked there on the spot...no need for a PC.




Simple!
Quick!

Recorded Data can be downloaded directly to a PC using a Communication Port: just connect and place logger on port. One unit of full data can be downloaded in just 25 seconds!



Software

Manage Settings and Analyze Data

This free of charge software is bundled with the Data Collection Device. Our user-friendly software makes all types of settings a snap: from setting up recording conditions and warning monitoring to carrying out adjustments and other functions. An easy to use graph program is also included for viewing, analyzing, and printing data.

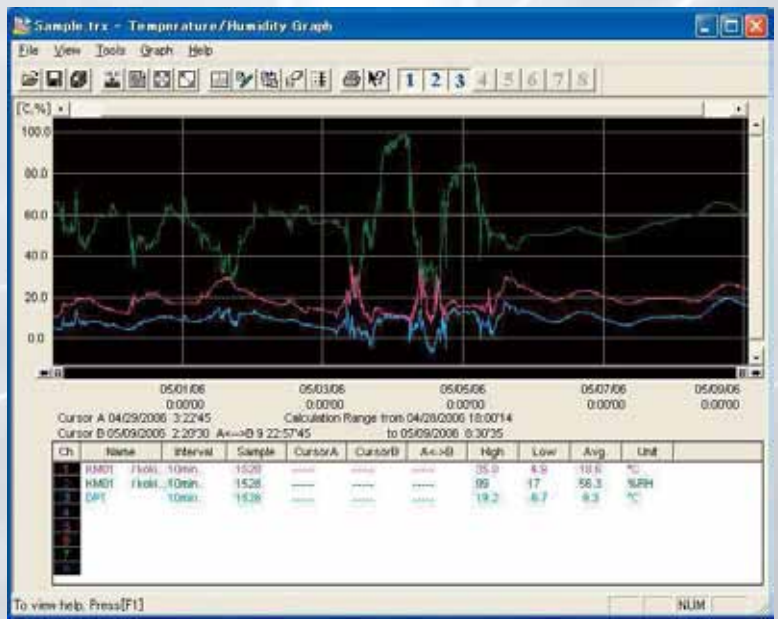
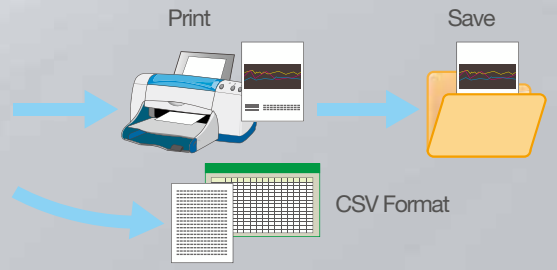


Table View

Date/Time	TMD1 / °C	HMD1 / %RH	DPT
05/04/2006 02:00:24	11.0	97	10.5
05/04/2006 03:12:24	11.1	95	10.7
05/04/2006 01:25:24	10.9	94	10.5
05/04/2006 03:30:24	11.3	95	10.9
05/04/2006 02:40:24	10.9	99	10.7
05/04/2006 03:50:24	11.1	99	10.9
05/04/2006 04:00:24	11.0	99	10.6
05/04/2006 04:10:24	10.7	99	10.3
05/04/2006 04:20:24	10.7	97	10.6
05/04/2006 04:30:24	10.4	99	10.0
05/04/2006 04:40:24	10.4	95	9.7

Table View



Temperature



TR-51i

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

TR-52i

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

Voltage



4-20mA



TR-55i-V

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

TR-55i-mA

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

Portable Data Collector TR-57DCi

- ▶ Collect data on site; No PC necessary.
- ▶ Data can be downloaded via Infrared or Optical Communication.
- ▶ One logger at full storage capacity can be downloaded via IR communication in 55 seconds or via optical communication in about 24 seconds.
- ▶ The collected data can be immediately viewed on site and checked for warning occurrences.
- ▶ The Data Collector can store recorded data from up to 16 loggers at full capacity.



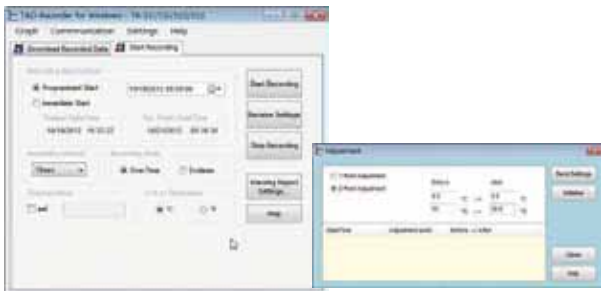
Communication Port TR-50U2

- ▶ 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.



Intuitive User Friendly Graph

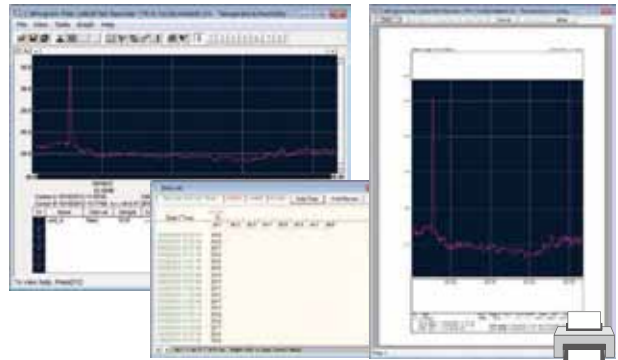
- The software makes it possible to make various detailed recording settings such as the interval at which you want recording to occur and the timing of recording start.



- By making upper and lower limit settings it is possible to monitor measurements for warnings and when one occurs the unit's LED will flash. It is also possible to find out the time of the warning.



- The included Graph application enables easy analysis of the recorded data.

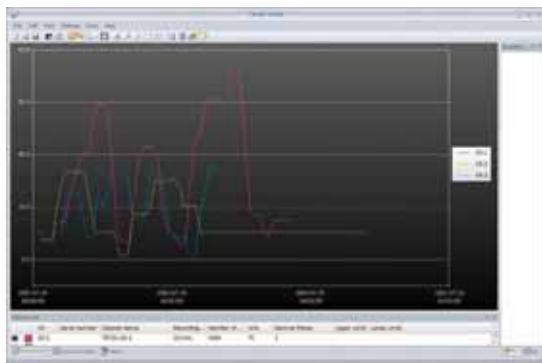


- It is possible to output data as text format file (CSV) for use with common spreadsheet software.



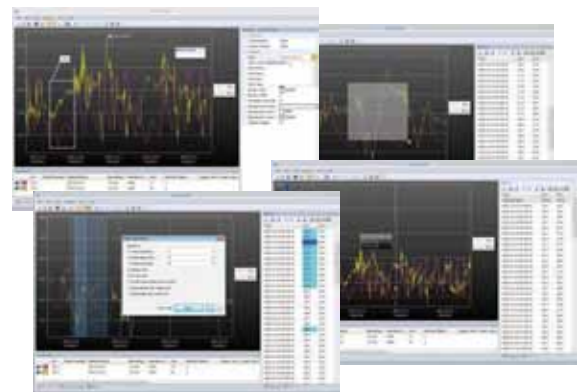
Next Generation Graph Application: "T&D Graph (beta version)"

- All data can be viewed in one graph window, regardless of the data format or from what type of device the data came from.



- Compatible with recorded data of any format from all T&D loggers
- Even from multiple sets of data it is possible to open only the data you wish to view by specifying filters.

- Provides even more visual ways to display and analyze recorded data.

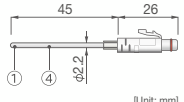
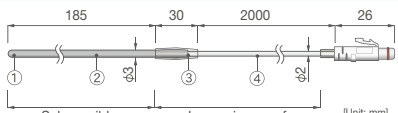
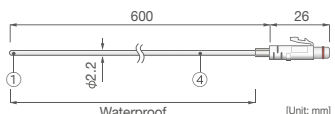
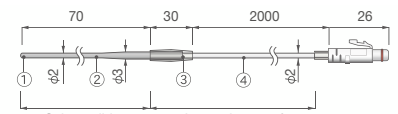
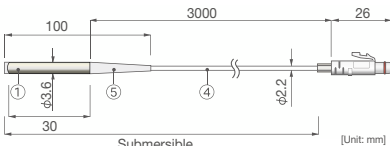
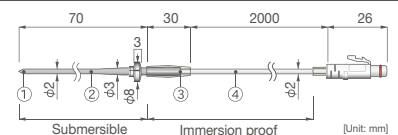


- Save memos, comments and figures with the graph.
- Search and filter recorded data to get only the data you need
- Merge multiple sets of data

TR-5i Series - Options

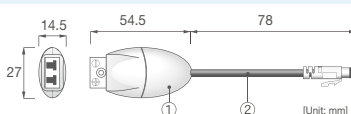
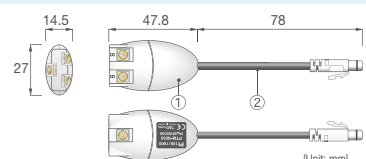
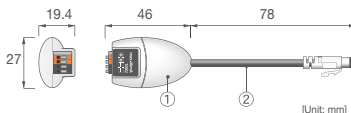
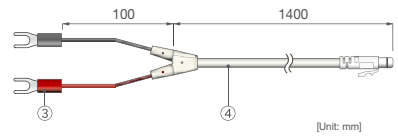
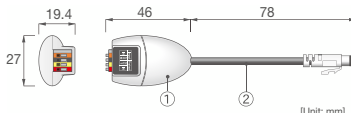
Temperature Sensors for TR-52i

Measurement Range: -60 to 155°C / Sensor Temperature Durability: -70 to 180°C
 Accuracy: Avg. ± 0.3°C (-20 to 80°C), Avg. ± 0.5°C (-40 to -20°C / 80 to 110°C), Avg. ± 1.0°C (-60 to -40°C / 110 to 155°C)
 Materials: ①Thermistor ②Stainless pipe (SUS316) ③Fluoropolymer Compaction Tube ④Fluoropolymer Coated Electrical Wire ⑤Fluoropolymer Mold

<p>Fluoropolymer Coated Sensor</p> <p>TR-5101</p> <p>Response Time (90%): Approx. 80 sec. (in air)</p>  <p>[Unit: mm]</p>	<p>Stainless Protection Sensor</p> <p>TR-5220</p> <p>Response Time (90%): Approx. 150 sec. (in air) Approx. 7 sec. (in agitated water)</p>  <p>[Unit: mm]</p>
<p>TR-5106</p> <p>Response Time (90%): Approx. 80 sec. (in air) Approx. 7 sec. (in agitated water)</p>  <p>[Unit: mm]</p>	<p>TR-5320</p> <p>Response Time (90%): Approx. 90 sec. (in air) Approx. 3 sec. (in agitated water)</p>  <p>[Unit: mm]</p>
<p>Underwater Sensor</p> <p>TR-5530</p> <p>Response Time (90%): Approx. 150 sec. (in air) Approx. 15 sec. (in agitated water)</p>  <p>[Unit: mm]</p>	<p>TR-5420</p> <p>Response Time (90%): Approx. 90 sec. (in air) Approx. 3 sec. (in agitated water)</p>  <p>[Unit: mm]</p>
<p>Temperature Sensor Extension Cable for TR-52i</p> <p>TR-2C30</p> <p>Cable Length: 3m Waterproof Capacity: Splash proof (rated for use in daily life) Temperature Durability: -25 to 60 °C</p> <p>Note: Only one extension cable per sensor. Using an extension cable may lead to measurement errors of +0.3°C at room temperature, and +0.5°C at -50°C.</p>	

Input Modules for TR-55i

Materials: ①Polycarbonate ②Vinyl Coated Electrical Wire ③M3.5 Crimp Terminal ④Vinyl Coated Electrical Wire
 Note: Input Module is not water resistant.

<p>Thermocouple Module (TR-55i-TC)</p> <p>TCM-3010</p> <p>Compatible Sensors: Thermocouple: Type K, J, T, S Sensor Connection: Miniature Thermocouple Connector Operating Environment: Temperature: -40 to 80°C Humidity: 90%RH or less (no condensation)</p>  <p>[Unit: mm]</p>	<p>Pt Module (TR-55i-Pt)</p> <p>PTM-3010</p> <p>Compatible Sensors: Pt100 (3-wire), Pt1000 (3-wire) Sensor Connection: Screw Clamp Terminal Block: 3-Terminal Operating Environment: Temperature: -40 to 80°C Humidity: 90%RH or less (no condensation)</p>  <p>[Unit: mm]</p>
<p>4-20mA Module (TR-55i-mA)</p> <p>AIM-3010</p> <p>Measurement Range: 0 to 20mA (Operational up to 40 mA) Accuracy: ± (0.5 mV + 0.3 % of reading) (for Input Module operating environment of 10 to 40°C) ±0.05 mA + 0.3 % of reading Operating Environment: Temperature: -40 to 80°C Humidity: 90%RH or less (no condensation)</p>  <p>[Unit: mm]</p>	<p>Pulse Input Cable (TR-55i-P)</p> <p>PIC-3150</p>  <p>[Unit: mm]</p>
<p>Voltage Module (TR-55i-V)</p> <p>VIM-3010</p> <p>Measurement Range: 0 to 22 V Accuracy: ± (0.5 mV + 0.3 % of reading) (for Input Module operating environment of 10 to 40°C) ±0.5 mV + 0.3 % of reading Measurement Resolution: Minimum of 0.1mV Preheat Function: 3V to 20V, 100mA Operating Environment: Temperature: -40 to 80°C Humidity: 90%RH or less (no condensation)</p>  <p>[Unit: mm]</p>	<p>Input Module Extension Cable</p> <p>TR-3C30</p> <p>Cable Length: 3m Waterproof Capacity: Splash proof (rated for use in daily life) Temperature Durability: -25 to 60 °C</p> <p>Note: Up to 1 extension cables can be connected to one sensor.</p>

Common for TR-51i / 52i / 55i

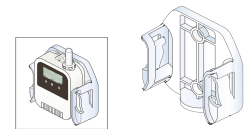
Wall Attachment

TR-05K3

Accessories: Screws and Double-sided adhesive tape
 Operational Environment Temp: -40 to 80°C

Materials: Polycarbonate

Note: Cracking may occur if polycarbonate is exposed to strong impact at temperatures of -30°C or lower.

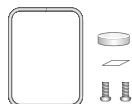


Common for TR-51i / 52i / 55i

Maintenance Set

TR-00P1

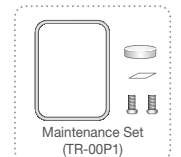
Package Contents:
 Rubber packing (for underside of logger lid)
 Silica gel (drying agent)
 Double-sided tape (for affixing silica gel)
 Screws (spare for back of data logger)



Battery Set

TR-11P2

Package Contents:
 Lithium Battery (LS14250)
 Maintenance Set (TR-00P1)



Pt100 Sensors for TR-55i-Pt

Sensor Element: Pt 100, Specified current: 2mA or below, Insulation resistance: DC500V 10MΩ or below, Conductor wire: 3-wire type, Measurement accuracy: ±(0.15-0.002×t) °C (t= temperature measurement absolute value), Water resistance: None (Stainless Protection part is waterproof)
 Materials: ①Sensor (Pt100) ②Stainless Protection Sensor (SUS316) ③Sleeve (SUS304) ④Fluoropolymer Coated Electrical Wire ⑤Vinyl Coated Electrical Wire ⑥Crimp Terminal

Optional Pt100 Sensors

TR-8100 Economical Type
 Temperature Measurement Range: -50 to 200°C
 Thermal Time Constant: Approx. 4.5 sec. (in agitated water)
 Heat Resistance: -70 to 180°C [Unit: mm]

TR-8110 Room Temperature Type
 Temperature Measurement Range: -50 to 350°C
 Thermal Time Constant: Approx. 2 sec. (in agitated water)
 Heat Resistance: -70 to 180°C [Unit: mm]

TR-8120 Low to High Temperature Type
 Temperature Measurement Range: -20 to 600°C
 Thermal Time Constant: Approx. 2 sec. (in agitated water)
 Heat Resistance: -70 to 180°C [Unit: mm]

TR-8130 Handy Type
 Temperature Measurement Range: -50 to 200°C
 Thermal Time Constant: Approx. 2.5 sec. (in agitated water)
 Heat Resistance: -25 to 80°C / -25 to 60°C [Unit: mm]

Note: Stated thermal time constant is for sensors with a protection pipe diameter of φ3.2.

Sensor Configuration & Ordering

Pt100 Sensors are produced only upon receipt of order; therefore please allow three weeks from the time of order until shipping.

When ordering Pt100 optional sensors, please determine the order number in the following manner: [A: Sensor Type] - [B: Protection Pipe Diameter] - [C: Protection Pipe Length] - [D: Cable].

TR-81 A - B - C - D M

A Sensor Type
00, 10, 20, or 30

B Sensor Protection Pipe Diameter
Please select from below:

	TR-8100	TR-8110	TR-8120	TR-8130
2.0mm	×	○	×	×
2.3mm	○	○	×	×
3.0mm	○	○	×	×
3.2mm	◎	◎	◎	◎
4.8mm	○	○	○	○
6.0mm	○	○	×	×
6.4mm	×	×	○	×

◎: Recommended ○: Available ×: Not available

C Sensor Protection Pipe Length
The protection pipe is available in 50 millimeter units in lengths from 50mm to 2000mm.

D Sensor Cable Length
The sensor cable is available in 1 meter units in lengths from 1 meter to 99 meters.

EX1:
TR-8100 with 2.3mm diameter x 50mm sheath with 1m of cable:
Order Number: "TR-8100-2.3-50-1M"

EX2:
TR-8120 with 3.2mm diameter x 200mm sheath with 5m of cable:
Order Number: "TR-8120-3.2-200-5M"

TR-51i / 52i Specifications

Unit Type	TR-51i	TR-52i
Measurement Channels	Temperature 1ch (Internal)	Temperature 1ch (External)
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 [-20 to 80°C] Avg.±0.5°C [-40 to -20°C / 80 to 110°C] Avg.±1.0°C [-60 to -40°C / 110 to 155°C]
Measurement Resolution	0.1°C	0.1°C
Responsiveness	Thermal Time Constant: Approx. 15 min. Response Time (90%): Approx. 35 min.	Thermal Time Constant: Approx. 30 sec. (in air) Approx. 4 sec. (in agitated water) Response Time (90%): Approx. 80 sec. (in air) Approx. 7 sec. (in agitated water)
Logging Capacity	16,000 readings	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 (proprietary protocol), Infrared Communication (IrPHY 1.2 low power)	
Power (*1)	Lithium Battery (LS14250) x 1	
Battery Life (*2)	Approx. 4 years (2 years with Infrared Communication Enabled)	
Dimensions	H 62 mm x W 47mm x D 19 mm (excluding protrusions and sensor)	
Weight	Approx. 54 g (including battery)	Approx. 55 g (including battery / excluding sensor)
Operating Environment	-40 to 80°C	
Waterproof Capacity	IP67: Immersion proof	IP64: Splash proof (rated for use in daily life) (*3)
Accessories	Lithium Battery (LS14250), Strap, User's Manual (Warranty Included)	
Data Collection Devices	Communication Port: TR-50U2, TR-50U Data Collector: TR-57DCi, TR-57U, RTR-57U	

*1: The included lithium battery (LS14250) is not sold in stores. Please purchase the optional battery set (TR-11P2) for replacement.
 *2: Battery life depends upon the measuring environment, recording interval, and quality of the battery being used. When infrared communication function is enabled, battery life may be further shortened if the unit is used under the inverter type fluorescent lighting.
 *3: This is the waterproof capacity of the data logger with the sensor connected.
 The specifications listed above are subject to change without notice.