Compact Waterproof Data Logger

TR-5*i* Series

Infrared Interface
Easy-to-Read Display
Durable Waterproof Loggers

CE

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.
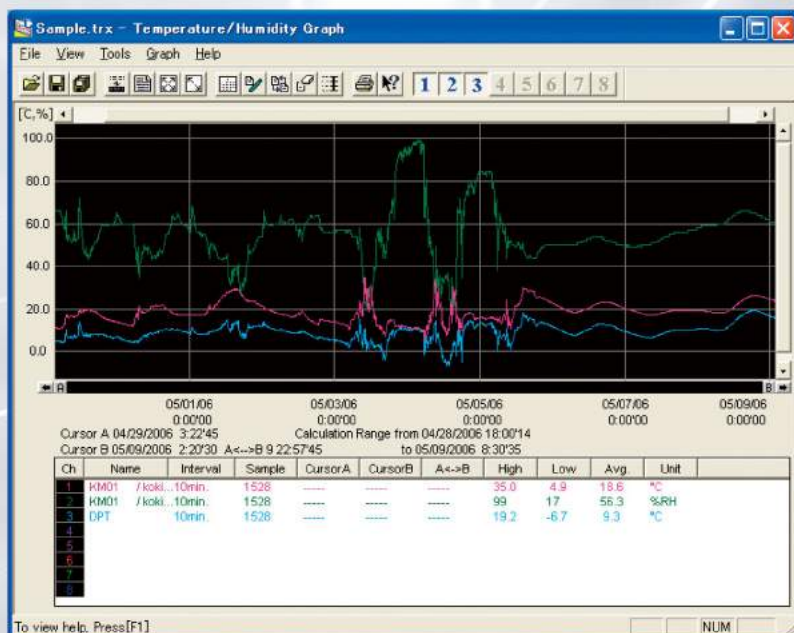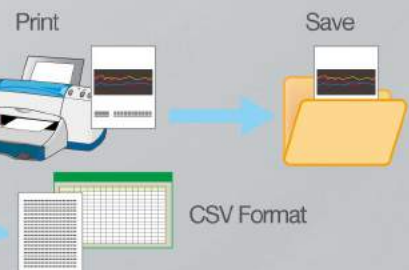
Table View

Graph View

Print

Save

CSV Format

Variety of Data Loggers to Meet Your Needs

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

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

Temperature - Thermocouple

°C

TR-55i-TC

Measurement Range:
  K: −199 to 1300 °C
  J: −199 to 750 °C
  T: −199 to 400 °C
  S: −20 to 1700 °C
Input Module (TCM−3010) Included (Sensor not sold by T&D)

Temperature - Pt100 / Pt1000

°C

TR-55i-Pt

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

Pulse Count

Pulse

TR-55i-P

Measurement Range: Pulse count 0−61,439
Signal Input: 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** 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.

D a t a
C o l l e c t i o n
D e v i c e s

Downloading Recorded Data / Graph Display

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.

# High Performance Software

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.

The included Graph application enables easy analysis of the recorded data.
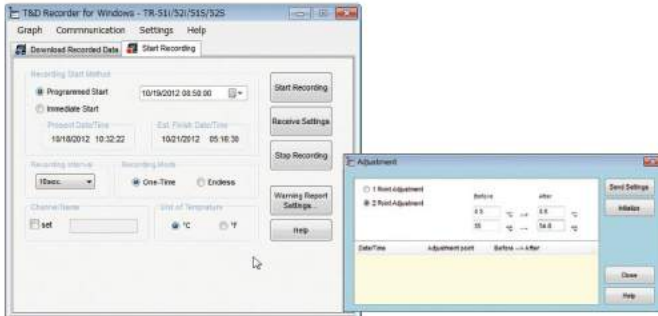
By making upper and lower limit settings it is possible to monitor measurements for warnings and when one occurs the unit's LED will flash. It is also possible to find out the time of the warning.
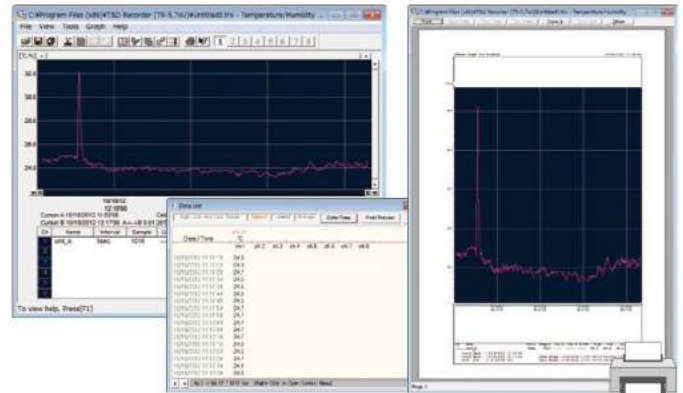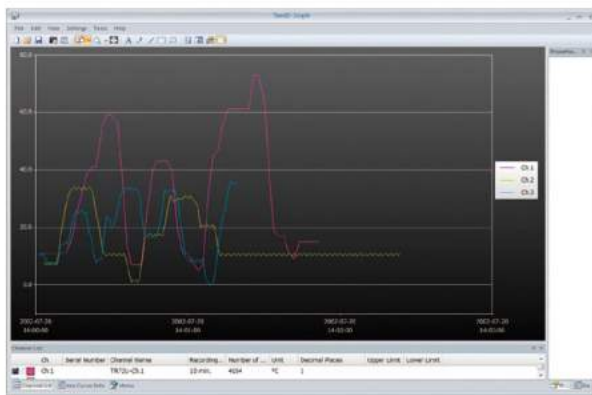
It is possible to output data as text format file (CSV) for use with common spreadsheet software.

Next Generation Graph Application: " 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.

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

- Compatible with recorded data of any format from all loggers
- Even from multiple sets of data it is possible to open only the data you wish to view by specifying filters.
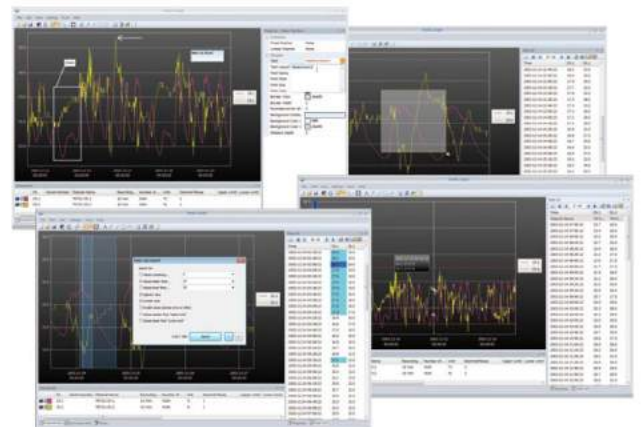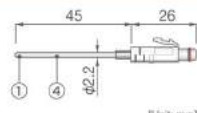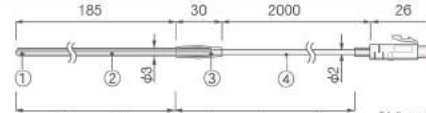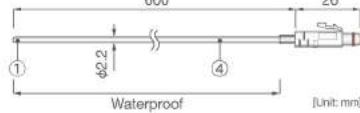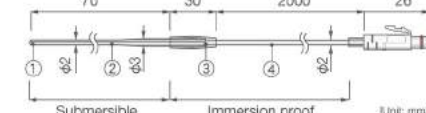
- Save memos, comments and figures with the graph.
- Search and filter recorded data to get only the data you need
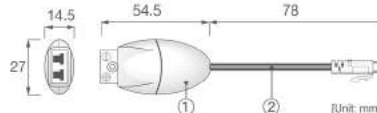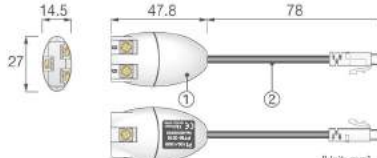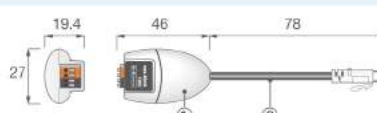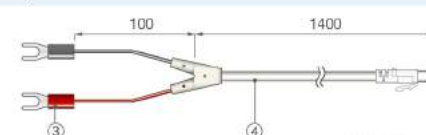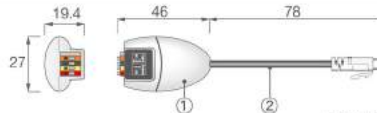- Merge multiple sets of data

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

Fluoropolymer Coated Sensor

TR-5101

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

TR-5106

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

Underwater Sensor

TR-5530

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

Stainless Protection Sensor

TR-5220

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

TR-5320

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

TR-5420

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

Temperature Sensor Extension Cable for TR-52i

TR-2C30

Cable Length: 3m
Waterproof Capacity: Splash proof (rated for use in daily life)
Temperature Durability: –25 to 60 °C

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.

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.

Thermocouple Module (TR-55i-TC)

TCM-3010

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)

4-20mA Module (TR-55i-mA)

AIM-3010

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)

Voltage Module (TR-55i-V)

VIM-3010

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)

Pt Module (TR-55i-Pt)

PTM-3010

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)

Pulse Input Cable (TR-55i-P)

PIC-3150

Input Module Extension Cable

TR-3C30

Cable Length: 3m
Waterproof Capacity: Splash proof (rated for use in daily life)
Temperature Durability: –25 to 60 °C

Note: Up to 1 extension cables can be connected to one sensor.

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)

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
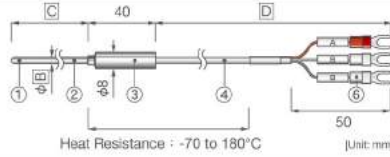
Optional Pt100 Sensors

TR-8100
Economical Type

Temperature Measurement Range: –50 to 200°C
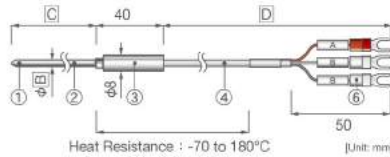Thermal Time Constant:
Approx. 4.5 sec. (in agitated water)

Heat Resistance : -70 to 180°C [Unit: mm]
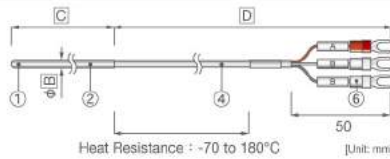
TR-8110
Room Temperature Type

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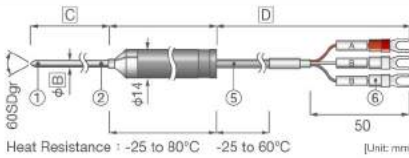
Heat Resistance : -70 to 180°C [Unit: mm]

TR-8120
Low to High Temperature Type

Temperature Measurement Range: –200 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Ⓐ - Ⓑ - Ⓒ - ⒹM

Ⓐ Sensor Type
00, 10, 20, or 30

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

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

Ⓑ 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

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

	TR-51i	TR-52i
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
Reponsiveness	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	-	Temperature Sensor (TR-5106)
	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.

Specifications for TR-55i

Unit Type	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)	-	-	-
Measurement Units	°C, °F	°C, °F	V, mV	mA	P
Measurement Range	−199 to 1700 °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: 2.5V 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 (*1)	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]	±(0.3 °C + 0.3 % rdg) [10 to 40 °C] ±(0.5 °C + 0.3 % rdg) [−40 to 10 °C / 40 to 80 °C]	±(0.5 mV + 0.3 % rdg) [10 to 40 °C] ±(1 mV + 0.5 % rdg) [−40 to 10 °C / 40 to 80 °C]	±(0.05 mA + 0.3 % rdg) [10 to 40 °C] ±(0.1mA + 0.3 % rdg) [−40 to 10 °C / 40 to 80 °C]	
	Note: The above temperatures [__°C] are for the operating environment of the Input Module.				
Measurement Resolution	Type K, J, T: 0.1 °C Type 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 (proprietary protocol) Infrared(IR) Communication (IrPHY 1.2 low power)				
Power (*2)	Lithium Battery: LS14250 x 1				
Battery Life (*3)	Approx. 14 months (10 months with IR Communication Enabled)	Approx. 24 months (14 months with IR Communication Enabled)	Approx. 16 months (11 months with IR Communication Enabled)	Approx. 16 months (11 months with IR Communication Enabled)	Approx. 16 to 24 months (11 to 18 months with IR Communication Enabled)
Dimensions	H 62 mm x W 47 mm x D 19 mm (excluding protrusions and Input Module)				
Weight	Approx. 55 g (including battery / excluding Input Module)				
Operating Environment	−40 to 80°C				
Waterproof Capacity (*4)	IP64: Splash proof (rated for use in daily life) Note: Input Module is not water resistant.				
Accessories	Input Module (TCM-3010)	Input Module (PTM-3010)	Input Module (VIM-3010)	Input Module (AIM-3010)	Input Module (PIC-3150)
	Lithium Battery (LS14250), Strap, User's Manual (Warranty Included)				
Data Collection Devices	Communication Port: TR-50U2, TR-50U Data Collector: TR-57DCi				

*1: "rdg" stands for reading.
*2: The included lithium battery (LS14250) is not sold in stores. Please purchase the optional battery set (TR-11P2) for replacement.
*3: Battery life varies depending upon the ambient temperature in which it is used, the recording interval, the frequency of communication, and the 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. Battery life may be shortened further if the unit is used under inverter type fluorescent lighting.
*4: This is the waterproof capacity of the data logger with the Input Module connected.
The specifications listed above are subject to change without notice.

Data Collection Device Specifications

Device Name	TR-57DCi	TR-50U2
Compatible Devices	TR-5i Series: TR-51i / 52i / 55i-TC / 55i-Pt / 55i-V / 55i-mA / 55i-P TR-5S Series: TR-51S / 52S TR-5 Series: TR-51A / 52 RTR-5 Series: RTR-51 / 51A / 52 / 52A / 52Pt / 53 / 53A, RVR-52A (Including L Type) TR-7Ui Series: TR-71Ui / 72Ui /74Ui / 76Ui / 77Ui TR-7U Series: TR-71U / 72U / 73U TR-7S Series: TR-71S / 72S VR-71	TR-5i Series: TR-51i / 52i / 55i-TC / 55i-Pt / 55i-V / 55i-mA / 55i-P TR-5S Series: TR-51S / 52S TR-5 Series: TR-51A / 52
Storage Capacity	Up to 256,000 readijngs When downloading from units filled to logging capacity: - 16 units of TR-51i/52i - 15 units of TR-55i - 16 units of TR-71Ui/72Ui/77Ui - 10 units of TR-73U/76Ui - 7 units of TR-74Ui When downloading from units of any type containing small amounts of data, it can store and manage up to 250 download sessions.	-
Communication Interfaces	<Between TR-57DCi - Data Logger(s)> Optical Communication (proprietary protocol) TR-5i/5S/5 Series, RTR-5 Series Infrared Communication (IrPHY 1.2 low power) TR-5i Series, TR-7Ui Series (*1) Serial Communication (RS-232C) TR-7Ui/7U/7S Series, VR-71(*2) <Between TR-57DCi - PC> USB Communication Serial Communication (RS-232C) (*3)	<Between TR-50U2 - Data Logger(s)> Optical Communication (proprietary protocol) <Between TR-50U2 - PC> USB Communication
Power	AAA Alkaline Battery (LR03) x 2 AAA Ni-MH batteries, AC adaptor (AD-0638), or USB bus power may also be used.	USB bus power
Battery Life	About 100 days at 1 hour of daily use (*4)	-
Dimensions	H 125 mm x W 58 mm x D 25.8 mm (excluding protrusions)	H 80 mm x W 56 mm x D 16.5 mm (excluding protrusions)
Weight	Approx. 110 g (including batteries)	Approx. 30 g
Operating Environment	Temperature: 0 to 50 °C Humidity: 90 %RH or less (no condensation)	Temperature: -10 to 60 °C Humidity: 90 %RH or less (no condensation)
Accessories	AAA Alkaline Battery (LR03) x 2, USB Communication Cable (US-15C), Serial Communication Cable (TR-6C10), Software (CD-ROM), User's Manual Set (Warranty Included) x 1	USB Communication Cable (US-15C), Software (CD-ROM), User's Manual Set (Warranty Included) x 1
Software	T&D Recorder for Windows (TR-5, 7xU)	
Compatible OS (*5)(*6)	Microsoft Windows 8 32 / 64 bit English Microsoft Windows 7 32 / 64 bit English Microsoft Windows Vista 32 bit (SP1 or later) English Microsoft Windows XP 32 bit (SP3 or later) English	

*1: Infrared Communication can be used only to download recorded data, and not to make recording settings.
*2: The following cables are necessary for serial communication with data loggers : TR-6C10 (included) for TR-7Ui/7U series, and TR-6C10 (optional) for TR-7S series and VR-71.
*3: The optional serial communication cable TR-07C is necessary for serial communication with PC.
*4: Battery life varies depending upon the ambient temperature in which it is used, the frequency of communication, and the 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.
*5: For installation, it is necessary to have Administrator (Computer Administrator) rights.
*6: If you are using Windows 8, please note that our software is designed to be used in "Desktop" mode only.
The specifications listed above are subject to change without notice.

Website:www.tashika.co.jp

DUE TO CONTINUOUS PRODUCT IMPROVEMENT, THE DESIGN AND TECHNICAL SPECIFICATIONS
ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.

TASHIKA CO., LTD.

1-12, Kaiyo-cho, Ashiya, 659-0035, JAPAN

Tel: + 81-797-23-9035 Fax: + 81-797-23-2105

e-mail: sales@tashika.co.jp URL: www.tashika.co.jp