

Compact Temperature Data Logging System

TR-5*i* Series

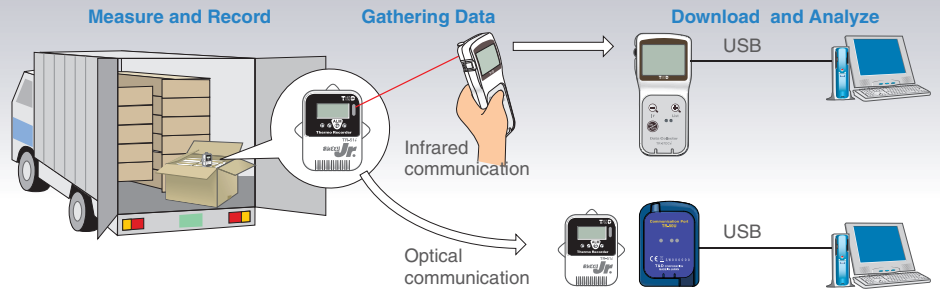


Infrared Interface
Easy-to-Read Display
Durable Waterproof Loggers

T&D Corporation



Compact Waterproof Data Loggers



Place Anywhere Compact Waterproof Type

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

TR-51i :

The TR-51i with an internal temperature sensor offers superior waterproof capacity and moderate response time; it is suitable for use in transportation and storage, as well as, in harsh environments.

TR-52i :

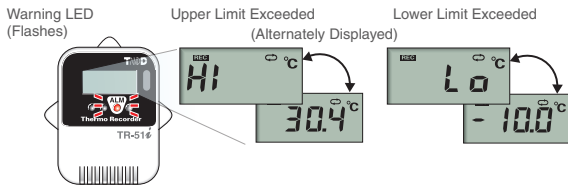
The TR-52i with an external temperature sensor is highly versatile and ideal for use in situations where a quicker response (compared to TR-51i) is required.

Wide Measurement Range: -60 to 155°C

The TR-51i can measure and record temperature from -40°C to 80°C and the TR-52i can measure and record in the even wider range of -60°C to 155°C.

Warning Monitoring Function

Using the dedicated software "T&D Recorder for Windows (TR-5, 7xU)", you can make Upper / Lower Limits and Judgment Time settings for the TR-51i/52i. If a measurement exceeds one of the set limits, the warning LED and message will be displayed. Because the warning LED and message will remain ON until the data is downloaded, there is no way to miss any important warnings.



Storage Capacity of 16,000 Readings

One Data Logger can store up to 16,000 readings. At a recording interval of 10 minutes that would equal about 111 days, and at an interval of 60 minutes that would equal about 22 months of non-stop consecutive recording.

Note: * The dedicated software "T&D Recorder for Windows" provides 15 recording interval choices (from 1 second to 60 minutes) to meet your needs.

Low Energy Consumption Design

The low energy consumption design of the TR-5i series provides continuous operation for up to 4 years. When the battery needs to be replaced, the battery replacement mark will appear.

Estimated Battery Life:

When a new battery is being used and data downloading occurs four times a month (with infrared communication switched OFF)

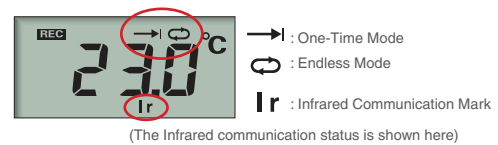
Recording Interval	1 Second	2 seconds	5 seconds	10 seconds or longer
Battery Life	About 18 months	About 2 years	About 3 years	About 4 years

Note: * The battery replacement mark will appear based upon the calculation of battery use. It may appear sooner than noted above.

* Battery life varies depending upon frequency of communication, infrared communication settings, blinking of the warning LED, and measuring environments such as the ambient temperature.

Recording Settings Display

Recording mode (One-Time or Endless) and Infrared Communication settings will be displayed in the LCD.



Temperature Sensors for TR-52i

Possible Temperature Measurement Range: -60 to 155°C / Sensor Temperature Resistance: -70 to 180°C

Temp Measurement Accuracy: Average +/-0.3°C (-20 to 80°C) Average +/-0.5°C (-40 to -20°C / 80 to 110°C) Average +/-1.0°C (-60 to -40°C / 110 to 155°C)

① Thermistor ② Stainless pipe (SUS316) ③ Fluoropolymer Compaction Tube ④ Fluoropolymer Coated Electrical Wire ⑤ Fluoropolymer Coated Mold

Fluoropolymer Coated Sensor

[Unit : mm]

TR-5101
Cable Length: 45mm (1.8in)
Thermal Time Constant:
Approx. 30 Sec. (in air)
Approx. 4 Sec. (in agitated water)

TR-5106
Cable Length: 0.6m (24in)
Thermal Time Constant:
Approx. 30 Sec. (in air)
Approx. 4 Sec. (in agitated water)

* Water Resistance: The fluoropolymer-coated section is waterproof.

Water Immersible Sensor

TR-5530
Cable Length: 3.0m (120in)
Thermal Time Constant:
Approx. 120 Sec. (in air)
Approx. 6 Sec. (in agitated water)

Stainless Protection Sensor

[Unit : mm]

TR-5220
Cable Length: 2.0m (80in)
Thermal Time Constant:
Approx. 36 Sec. (in air)
Approx. 7 Sec. (in agitated water)

TR-5320
Cable Length: 2.0m (80in)
Thermal Time Constant:
Approx. 12 Sec. (in air)
Approx. 2 Sec. (in agitated water)

TR-5420
Cable Length: 2.0m (80in)
Thermal Time Constant:
Approx. 12 Sec. (in air)
Approx. 2 Sec. (in agitated water)

Temperature Sensor Extension Cable for TR-52i

TR-2C30 (Only use for Temperature Sensors)
Cable Length: 3.0m (120in)
Splash Resistant (IP64)

Materials:
① Vinyl Coated Electrical Wire

[Unit : mm]

Note: * An error of about +0.3°C occurs at normal temperature while an error of about +0.5°C will occur at around -50°C.

Others for TR-51i / 52i

<p>TR-05K3: Wall Attachment</p>	<p>TR-00P1: Maintenance Set</p> <p>A set of replacement parts for maintaining water resistance.</p>	<p>TR-11P2 : Battery Set</p> <p>Lithium Battery and Maintenance Set (TR-00P1)</p>
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Communication Interfaces for Gathering Data

These interfaces enable the collecting of recorded data for monitoring on site or saving to a PC.

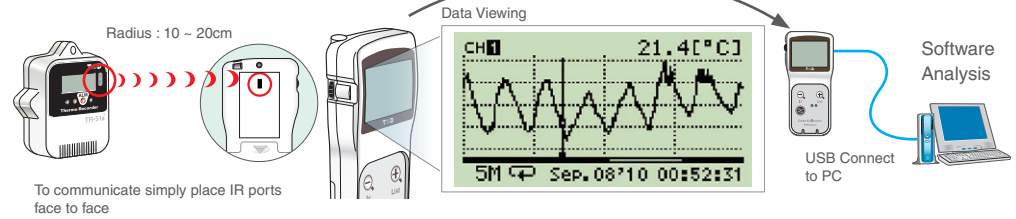
Data Collector TR-57DCi

Easy Data Collection, Easy Graph Display

- Collect Data anywhere, at anytime; No PC necessary
- One Logger at full storage capacity can be downloaded via Infrared communication in 55 seconds or via optical communication in just 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
- All operations can be carried out with one hand
- Can also collect data from older versions of our Data Loggers



Image of gathering data via Infrared communication



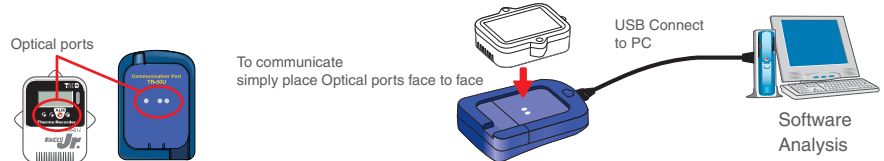
Communication Port TR-50U

High Speed Data Downloading Data

- Use for downloading data directly to a PC
- Download data from a Logger at full storage capacity in about 20 seconds
- Extremely lightweight at only 30 grams



Image of gathering data via Optical communication



Free-of-Charge Software Included with PC Communication Interfaces

Software Updates and Info Available on Our Website

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. The Graph Tools program intuitive operation allows the User to easily hide or view channels, zoom in and out on data, switch back and forth from °C to °F, and view data in table form.

Temperature / Humidity Graph

Enlarged View

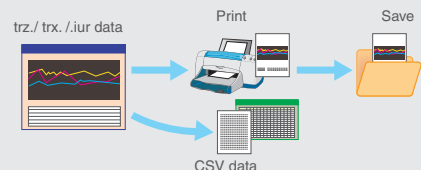
View in Table Form

Date/Time	ch.1	ch.2	ch.3	ch.4	ch.5	ch.6	ch.7	ch.8
05/04/2008 03:00:24	11.0	97	10.5					
05/04/2008 03:10:24	11.1	98	10.7					
05/04/2008 03:20:24	11.1	98	10.5					
05/04/2008 03:30:24	10.9	98	10.7					
05/04/2008 03:40:24	11.1	98	10.5					
05/04/2008 03:50:24	11.0	98	10.6					
05/04/2008 04:00:24	10.7	98	10.3					
05/04/2008 04:10:24	10.7	98	10.5					
05/04/2008 04:20:24	10.4	98	10.0					
05/04/2008 04:30:24	10.4	94	9.3					

View in Table Form
Graph data can be easily viewed as a data list. The highest and lowest values are shown in easily distinguishable colors.

From Graph Editing to Data Analysis

It is possible to hide, re-order and delete channels, edit recording start times, and make changes to colors used for the graph scale lines, data lines and background. Also you can move the A and B cursor at the bottom of the graph to view data readings for those points and the calculated difference between the points. By saving graph data as CSV Format Text File data, that data can then be uploaded into common spreadsheet software for further data analysis.



Adjustment Settings for the TR-51i / 52i

The software enables you to use the measurement adjustment function to correct for TR-51i and TR-52i measurement inaccuracies. When using multiple measuring devices, this function allows the user to correct for inaccuracies found in measured values when compared to a standard measurement (the value measured by the standard device). Measurements can be adjusted and recorded based on a standard measurement. The software allows for adjustment settings to be made to Remote Unit measurements by simply selecting the adjustment method from either "1 Point Adjustment" or "2 Point Adjustment" and entering the values for "Before Adjustment" and "After Adjustment".

Product Specifications

Thermo Recorder

Device Name	TR-51i	TR-52i
Measurement Item	Temperature	Temperature
Number of Channels	1 Ch (Internal Sensor Type)	1 Ch (External Sensor Type)
Measurement Range	- 40 to 80°C	- 60 to 155°C
Unit of Measurement	°C, °F	°C, °F
Response Time (in 90% still air)	About 35 minutes	-
Measuring 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 Display Resolution	0.1°C	
Recording Intervals	Select from 15 choices: 1, 2, 5, 10, 15, 20 and 30 seconds / 1, 2, 5, 10, 15, 20, 30 and 60 minutes	
Storage Capacity	Up to 16,000 readings	
Recording Start Method	Immediate Start / Programmed Start	
Recording Modes	Endless / One Time	
LCD Displayed Items	Measured Temperature, Recording Status, Recording Mode Infrared Communication Status Battery Life Warning, Unit of Measurement, Full (Storage Capacity FULL), Unconnected Sensor Measurement Range Exceeded, Upper / Lower Limit Exceeded	
Communication Interfaces	Optical / Infrared Communication	
Infrared Communication	IrPHY 1.2 low power	
Communication Time	When downloading a Unit at full storage capacity: Optical Communication : about 25 seconds (TR-50U) about 150 seconds (other devices) Infrared Communication: about 55 seconds (TR-57DCi)	
Power (*1)	Lithium Battery (LS14250) / Lithium Battery (CR2)	
Battery Life (*2)	About 4 years (2 years if it's been selected to "Permit" infrared communication)	
Waterproof Capacity	Immersion proof	Splash proof
Dimensions	H62 x W47 x D19mm (excluding protrusions and sensor part)	
Weight	About 54g (including battery)	About 55g (including battery / excluding sensor)
Operating Environment	- 40 to 80°C When using Lithium Batteries (CR2) sold in stores : -20 to 60°C	
Data Collection Devices	Data Collectors: TR-57DCi Communication Ports: TR-50U	

(*1) The included Lithium Battery (LS14250) is not sold in stores. Please purchase the "Optional Battery Set TR-11P2" for replacement.

(*2) Battery life varies depending upon measuring environment, frequency of communication, Unit settings, and battery performance.

Software Operating Environment

For installation, it is necessary to have Administrator (Computer Administrator) rights.

Software Names	T&D Recorder for Windows (TR-5, 7xU)
Compatible OS	Microsoft® Windows® 7 32bit/64bit English Microsoft® Windows Vista® 32bit English Microsoft Windows® XP 32bit (SP2 or above) English
PC/CPU	A Stable Windows Operating Environment
Memory	A Stable Windows Operating Environment
Hard Disk	More than 30 MB of free space (Data will need more space)
Monitor	SVGA (800 x 600) more than 256 colors

Data Collector

Device Name	TR-57DCi
Compatible Devices	TR-51i / 52i, TR-51S / 52S, TR-51 / 51A / 52, TR-74Ui / 77Ui, TR-71U / 72U / 73U, TR-71S / 72S, TR-71 / 72, VR-71, RTR-501 / 502 / 503 / 574, RTR-51A / 52A / 53A, RVR-52A, RTR-51 / 52 / 52Pi / 53, RVR-52
Storage Capacity	Up to 256,000 readings 16 units of TR-51i at full storage capacity (16,000 readings x 1ch) 16 units of TR-71U at full storage capacity (8,000 readings x 2ch) 10 units of TR-73U at full storage capacity (8,000 readings x 2ch) 7 units of TR-74Ui at full storage capacity (8,000 readings x 4ch) When downloading units at non-full storage capacity, it can store and manage up to 250 downloading sessions.
Functions	Downloading Recorded Data, Viewing Saved Data in Graph Form, Recording Start Settings, Displaying Highest and Lowest Measurement
LCD Displayed Items	Operation Menu, Graph Display, Battery Life Warning Display, Calendar and Clock, Contrast Adjustment, Backlight
Power	AAA Alkaline Battery (LR03) x 2 (AAA Ni-Cd batteries or AAA Ni-MH batteries (1.2V) may also be used.) AC Adaptor (optional)
Battery Life	About 100 days at 1 hour of daily use * Battery life varies depending upon the type of battery, the measuring environment, the frequency of communication, and the ambient temperature in which it is used.
Data Backup	About 1 month (Saved data will be erased if all battery power is lost.)
PC Communication Interfaces	USB Communication, RS-232C Communication 19,200 bps
Data Logger Communication Interfaces	RS-232C Communication: 9,600 to 19,200 bps Optical Communication: 2,400 to 19,200 bps Infrared Communication
Communication Time	- Between PC and TR-57DCi USB Communication (16,000 readings x 1ch): approx. 12 seconds USB Communication (8,000 readings x 4ch): approx. 24 seconds RS-232C Communication (16,000 readings x 1ch): approx. 22 seconds RS-232C Communication (8,000 readings x 4ch): approx. 42 seconds -TR-5i Series Optical Communication (16,000 readings x 1ch): approx. 24 seconds Infrared Communication (16,000 readings x 1ch): approx. 55 seconds -TR-7Ui Series Infrared Communication (8,000 readings x 2ch): approx. 55 seconds Infrared Communication (8,000 readings x 4ch): approx. 77 seconds -TR-5S Series Optical Communication (16,000 readings x 1ch): approx. 24 seconds
Dimensions	H125mm x W58mm x D23.8mm (excluding protrusions)
Weight	About 110g (including two AAA batteries)
Operating Environment	Temperature: 0 to 50°C Humidity: 90 RH% or less (no condensation)
Accessories	US-15C (USB communication cable / USB-A plug<->USB mini-B plug) x 1 TR-6C10 (Serial communication cable / mini-RS<->mini-RS) x 1 AAA Alkaline Battery (LR03) x 2 User's Manual (Warranty) x 1, Software (CD-ROM) x 1

Communication Port

Device Name	TR-50U
Compatible Devices	TR-51i / 52i, TR-51S / 52S, TR-51 / 51A / 52
PC Communication Interfaces	USB Communication: USB 1.1
Communication Time	When downloading units at full storage capacity: TR-51i / 52i, TR-51S / 52S: About 20 seconds (19200bps) TR-51A / 52 : About 160 seconds (2400bps)
Dimensions	H80mm x W56mm x D16.5mm (excluding protrusions)
Weight	About 30g
Operating Environment	Temperature: -10 to 60 °C Humidity: less than 90%RH (No condensation)
Accessories	US-15C (USB communication cable / USB-A plug<->USB mini-B plug) x 1 User's Manual (Warranty) x 1, Software (CD-ROM) x 1

Web Site
T&D Online

For product information, software update and FAQ's:
<http://www.tandd.com/>



Caution regarding safety

For safe operation carefully read instructions before using this unit.

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