Thermo Recorder

Compact Water Resistant Temperature Data Logger

Easy to Measure, Record, and Analyze Temperature

Excellent water resistance coupled with the capability to measure and record temperature in normal outdoor conditions as well as harsher frozen environments and high humidity situations is sure to make our compact data logger a favorite the world over.
In response to our users' voices, a new Thermo-Recorder Series "TR-5S" has been born.

CE

Compact・Water Resistant
Current Conditions on LCD

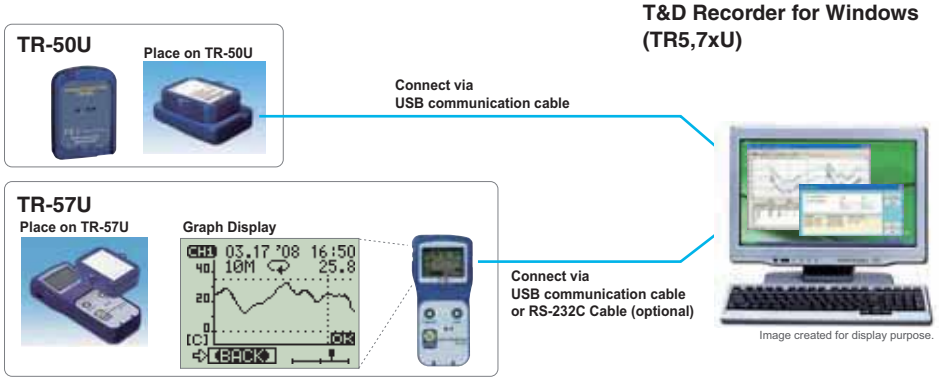
T&D CORPORATION

Thermo Recorder Temperature Data Logger TR-51S/52S

TR-5 Series makes Downloading and Analyzing Temperature Data as easy as 1-2-3.

Measure and Record

Collect Data



Download and Analyze

T&D Recorder for Windows (TR5,7xU)

Features

Our new TR-5S is based on our popular user-friendly Thermo Recorder series but now when used in conjunction with our new Communication Port TR-50U it is possible to take full advantage of a host of new functions.

Wide Temperature Measuring Range: - 60°C to 155°C

The TR-51S with its internal sensor can measure and record from -40°C to 80°C and the TR-52S model with its standard external sensor can measure and record from -60°C to 155°C.

15 Recording Intervals and High Recording Capacity

With one unit you can measure and record up to 16,000 readings. Select from 15 recording intervals (from 1 second to 1 hour) to meet your needs.
If set at a one hour recording interval that gives you 666 days or almost two years of readings.

Impressive Four-year Battery Life

When set with a recording interval of more than one minute and communication occurring four times a month the battery life will last for about four years. The unit comes with a useful battery change icon which appears when the battery life is calculated to be just about completed.
If the battery is new and communication takes place four times a month the battery life can be estimated as follows:

Recording Interval	1 second	2 seconds	5-30 seconds	1 minute or over
Battery Life	about 16 months	about 2 years	about 3 years	about 4 years

The battery change icon will appear based upon the calculation of battery use. It may appear sooner than noted above.

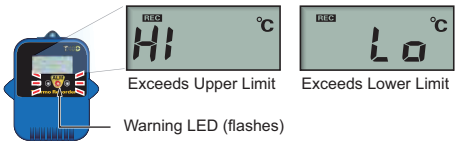
Note: Battery life varies depending upon the type of battery, the measuring environment, the frequency of communication, and the ambient temperature in which it is used. The above battery life test was carried out using brand new batteries and in no way is the above estimate chart any guarantee of a battery's life.

Waterproof / Compact / Durable

Ideal for measuring and recording temperature in normal outdoor conditions as well as harsher frozen environments, frozen storage and high humidity situations. The compact design makes it no problem to place almost anywhere.

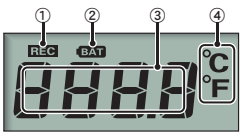
Warning Monitoring Function

Warnings can be received whenever a set Upper or Lower Limit has been exceeded. The warning LED on the Logger face will flash on and an error icon will appear in the display. Because the warning LED and icon will remain ON until the data is downloaded, there is no way to miss any important warnings.



Basic LCD Display

① Recording Status （REC）
LIT UP: displayed during recording or when FULL of data
BLINKING: displayed when waiting for a programmed recording to start
② Battery Replacement Icon （BAT）
displayed when time to change the battery
③ Measurement Reading and Message Display
④ Unit of Measurement: displays unit of measurement



In order to carry out the downloading of data from a TR-51S/TR-52S unit, it is necessary to purchase one of the PC Communication Interfaces "TR-50U" or "TR-57U" (sold separately).

High Speed Data Downloading
Communication Port TR-50U

Up to 8 times the speed of our conventional models means downloading of Full Data takes a mere 20 seconds. The downloaded data can then be easily viewed in graph form and saved as desired.

Package of Contents

- Communication Port TR-50U
- USB communication cable US-15C (USB-A plug / USB mini-B plug)
- User's Manual and Warranty
- Software CD-ROM and Manual

Easy Data Collection, Easy Graph Display
Data Collector TR-57U

Data that has been collected from the logger can be easily displayed in graph form, which enables you to view the data onsite. It is easy to change of the date format and temperature unit (˚C / ˚F) settings.

Package of Contents

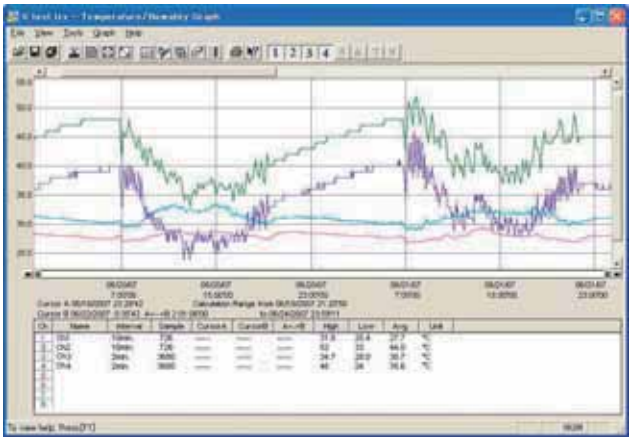
- Data Collector TR-57U
- USB communication cable US-15C (USB-A plug / USB mini-B plug)
- Communication Cable TR-6C10 (mini-RS / mini-RS)
- AAA Alkaline Batteries (LR03)
- User's Manual and Warranty
- Software CD-ROM and Manual

T&D Recorder for Windows(TR-5,7xU) Software included with TR-57U or TR-50U

Easy to use Windows compatible software allows you to control all aspects of set up, recording, and downloading, as well as, printing, creating text files, tables, and colorful graphs from the recorded data.

Up to 8 Channels of Data can be Processed at One Time

By simply downloading the data from the Data logger a colorful graph representing that data will be automatically created. Up to 8 channels (8 units) of data can be represented in one graph. TR-7 series data can also be processed and represented at the same time.



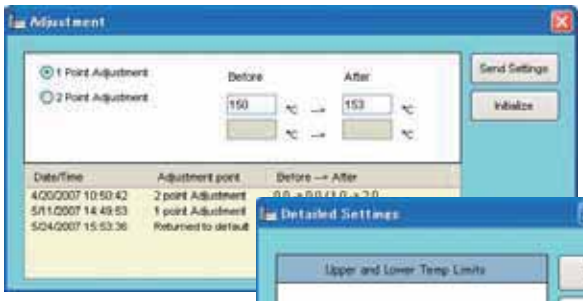
- You can display the data in table form. In the table the High, Low and Average temperatures will be displayed in different colors for easy viewing.
- You can print out in color or monochrome the graphs just as they appear on your screen. You can also print out in table form all of the data in order of date and time.

Auto-Detect of a Remote opens Software

Simply by placing a logger on a TR-57U/TR-50U that is connected to your computer, the Remote Unit will be detected and the necessary software program will open automatically.

Adjustment Function and Warning Settings

By making Adjustment Settings, it is possible to record adjusted measurements and by making settings for Upper and Lower Limits it is possible to receive warnings when those limits are exceeded.



Adjustment Settings Display

Upper and Lower Limit Settings Display

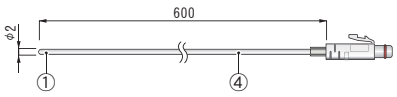
Options

Optional Sensors for TR-52S

Unit : mm

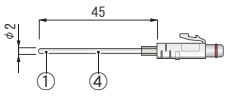
TR-5106

Teflon-Shielded Sensor
Cable Length: 0.6m
Thermal Time Constant
In the air: Approx 15 Sec.
In agitated water: Approx 2 Sec.



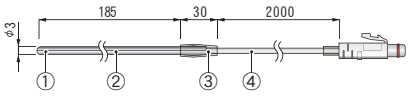
TR-5101

Teflon-Shielded Sensor
Cable Length: 0.45m
Thermal Time Constant
In the air: Approx 15 Sec.
In agitated water: Approx 2 Sec.



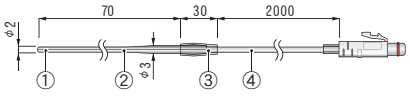
TR-5220

Stainless Protection Sensor
Cable Length: 2.0m
Thermal Time Constant
In the air: Approx 36 Sec.
In agitated water: Approx 7 Sec.



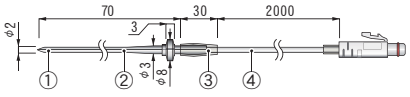
TR-5320

Stainless Protection Sensor
Cable Length: 2.0m
Thermal Time Constant
In the air: Approx 12 Sec.
In agitated water: Approx 2 Sec.



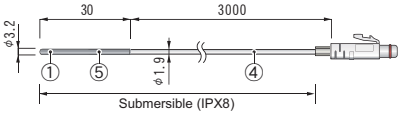
TR-5420

Stainless Protection Sensor
Cable Length: 2.0m
Thermal Time Constant
In the air: Approx 12 Sec.
In agitated water: Approx 2 Sec.



TR-5530

Water Immersible Sensor
Cable Length: 3.0m
Thermal Time Constant
In the air: Approx 120 Sec.
In agitated water: Approx 6 Sec.



Materials: ①Thermistor ②Stainless pipe (SUS316) ③Teflon Compaction Tube
④Teflon Resin (FEP)-Shielded ⑤Teflon Resin (FEP)-Mold

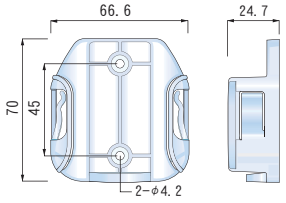
Possible Measurement Range: −60 to 155℃
Sensor Temperature Durability: −70 to 180℃
Water Resistance: Splash Proof (Sensor and Cable)
Measurement Accuracy: Average ±0.3℃ (−20 to 80℃)
Average ±0.5℃ (−40 to −20℃ / 80 to 110℃)
Average ±1.0℃ (−60 to −40℃ / 110 to 155℃)

for TR-5 Series

Unit : mm

TR-05K3

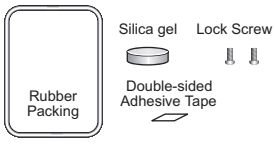
Wall Attachment
Contents:
Double-sided adhesive tape ×1
Lock Screw×2
Operational Environment Temp:
-40°C to 80°C



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

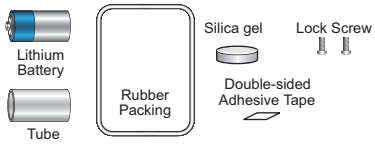
TR-00P1

Maintenance Set
Contents:
Rubber packing×1
Silica gel×1
Double-sided adhesive tape×1
Lock Screw×2



TR-10P2

Optional Battery Set
Contents:
Lithium Battery×1
Tube×1
Rubber packing×1
Silica gel×1
Double-sided adhesive tape×1
Lock Screw×2

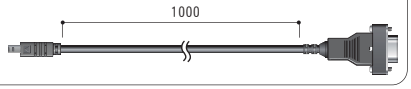


for TR-57U

Unit : mm

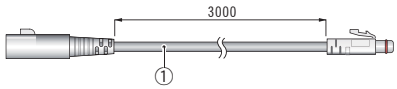
TR-07C

RS-232C (Serial) cable
Cable Length:1.0m
mini-RS
D-Sub 9Pin Femail



TR-2C30

Sensor Extension Cable
Cable length: 3.0m
Splash Resistant



Materials: ①Vinyl Chloride Coated Wire

Note: Only one cable per sensor. When using the extension cable there will be a +0.3℃ at normal temperature and at −50℃ a gap of +0.5℃ may occur.

Specifications

■TR-51S/52S Products

	TR-51S	TR-52S
Measurement Item	Temperature	Temperature
Measurement Channels	1 Ch (Internal Sensor Type)	1 Ch (External Sensor type)
Measurement Range	-40 to 80°C	−60°C to 155°C
Measurement Accuracy	Avg. ±0.5°C	Avg. ±0.3°C: – 20°C to 80°C Avg. ±0.5°C: – 40°C to – 20°C 80°C to 110°C Avg. ±1.0°C: – 60°C to – 40°C 110°C to 155°C
Measurement Display Resolution	0.1°C	
Recording Capacity	16000 data	
Recording Start Method	Immediate / Programmed	
Recording Mode	Endless / One-time	
Recording Interval	Select from 1,2,5,10,15,20 and 30 seconds or from 1,2,5,10,15,20,30 and 60 minutes	
LCD Display Items	Temperature measured, recording conditions, battery life warning, memory FULL, sensor unconnected, over measurement range, temperature unit (°F / °C) and Upper / Lower limit over	
Power *1	Lithium battery ER3V M x 1 (Lithium battery CR2 also okay)	
Battery Life *2	Maximum 4 years	
Waterproof Capacity	IP67 (Immersion proof)	IP64 (Splash resistant)
External Dimensions	H: 62mm x W: 47mm x D: 19mm (Excluding protrusions)	
Weight	Approx. 54g including battery	Approx. 55g including battery
Unit Temp. Resistance	-40 to 80°C	
Standard Sensor	Built-in	TR-5106: Teflon resin sensor
Accessories Included	Lithium Battery ER3V M ×1, Tube ×1, Strap ×1, User's Manual (Warranty) ×1	

*1: The lithium battery (ER3V M) is not sold in stores. It can be purchased through our distributors as "Optional Battery Set TR-10P2". Normal lithium batteries sold in stores (CR2) can be used, but the operating range is reduced to -20°C to 60°C. If you will be using the logger in an environment where temperatures may be lower than -20°C or higher than 60°C, we strongly suggest purchasing and using the "Optional Battery Set TR-10P2".
*2: Battery life depends upon the measuring environment, recording interval, and quality of the battery being used.

■Software

T&D Recorder for Windows (TR-5, 7xU)

Compatible Devices	
Data Loggers:	TR-51S/TR-52S, TR-51A/TR-52, (TR-71U/TR-72U/TR-73U)
Data Collectors:	TR-57U, TR-50U/TR-50C
Communication Functions	
TR-5S Series:	Start Recording (Immediate Start / Programmed Start), Stop Recording, Get Unit Settings, Download Recorded Data, Warning Settings, Adjustment, Application Settings
TR-5 Series:	Start Recording (Immediate Start, Programmed Start) , Download Recorded Data
Temp / Humidity Graph	
Graph:	Temp / Humidity Graphs for Each Channel (Zoom out / in and scroll), Change Channel Colors, Turn ON and OFF Channel Display
Data Display:	Channel Name, Recording Interval, Number of Readings, Highest/Lowest and Average Reading, Unit of Measurement, AB Cursor Dates / Times and Data Readings, Calculated Difference between Cursor A and B
Number of Channels:	8 Channel Simultaneous Display and Processing
Others:	Data List Display, Calculation Range Settings, Data Maintenance, Edit Recording Conditions, Delete Data by Channel, Re-order Data by Channel
File Output	TR-Series Common Data Files (*.trx) , Text File (CSV, etc) , Selected Range: (File for selected time period)
Printing	Graphs / Tables
Compatible Devices	
OS:	Microsoft Windows® 98SE/Me/2000/XP/Vista (English)
PC / CPU:	IBM Compatible equipped with more than Pentium 90MHz USB Port / Serial Port (RS-232C D-sub 9pin)
Software:	Microsoft Internet Explore 5.01or higher
RAM:	More than 32MB
Operating Environment:	A Stable Windows Operating Environment

Caution regarding safety
For safe operation carefully read instructions before using this unit.

Web SiteT&D Online
Product information, FAQ and software update downloads.
http://www.tandd.com/

■PC Communication Interfaces

TR-50U

Type	Communication Port
Compatible Devices	TR-51S/TR-52S, TR-51/TR-51A/TR-52
PC Interface	USB Communication: USB 1.1 (with PC)
Communication Speed TR-5S Series Loggers: TR-5 Series Loggers:	 MAX speed 19200bps Download Time at Full Data: about 20 seconds MAX speed 2400bps Download Time at Full Data: about 160 seconds
Dimensions	H: 80mm × W: 56mm × D: 16.5mm (Excluding protrusions)
Weight	Approx. 30g
Operating Environment *3	Temperature: -10 to 60°C Humidity: less than 90%RH (No condensation)

TR-57U

Type	Data Collector
Compatible Devices	TR-51S/TR-52S, TR-51A/TR-52/TR-51 (TR-71U/72U)
Recording Capacity	256,000 data readings 16 units of TR-5S at full data (16,000 readings x 16) Collect and manage data from up to 250 separate collections.
Functions	Downloading Data (possible to display results of upper and lower limit check after downloading) Display Saved Data Graphs, Set Recording Start for Remote Data Loggers, Display Saved Data Highest and Lowest measurement values *These Upper and Lower Limit settings are for the TR-57U and will be used by it when downloading data to determine if a reading is within the acceptable range.
LCD Display	Contrast Adjustment, Backlight Function
Battery Life	Used 30 minutes daily is about 160 days Used 1 hour daily is about 100 days Used 2 hours daily is about 50 days *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	For about 1 year with batteries in use (If all battery power is lost the stored data will be lost)
Communication Interface PC: Data Logger:	 USB / RS-232C: 19200bps RS-232C Communication (Speed : 9600bps) Optical Communication (Speed : 2400bps)
Communication Time (One Full Logger's Data)	Data from TR-57U to Computer : USB : 5 sec. RS-232C : 25 sec. Data from TR-5S, TR-5 Series to TR-57U : Optical : 160sec
Dimensions	H125mmx W58mm x D23.8mm (excluding protruding part)
Weight	Approx. 115g (Including 2 AAA Alkaline batteries)
Operating Conditions *3	Temperature : 0 ˚C to 50˚C Humidity : Less than 90%RH (Without dew condensation)

*3: Do not use if the Data Logger is wet.

TandD's TR-71U/72U/73U and TR-51S/52S have been tested for electro-magnetic radiation and confirmed to comply with the requirement of RTCA DO-160E, Section 21: Emission of Radio Frequency Energy.

What is "RTCA DO-160E, Section 21"?
RTCA stands for "Radio Technical Commission for Aeronautics", a not-for-profit corporation formed to advance the art and science of aviation and aviation electronic systems for the benefit of the public, helps to develop standards to assure the safety and reliability of all airborne equipment. (http://www.rtca.org)
The "DO-160E", published by RTCA, is widely used as a standard for environmental qualification testing to show compliance with appropriate airworthiness requirements. "Section 21 of DO-160E" concerns the "Emission of Radio Frequency Energy". The tests in this section are performed to determine that the device does not emit radio frequency interference in excess of the specified limits. Every carry-on electronic device must comply with radio frequency emission and susceptibility guidelines outlined in "Section 21 of the RTCA DO-160E" document, whether it flies in the passenger cabin or cargo hold. The "DO-160E" is recognized by the International Organization for Standardization (ISO) as a de facto for international standard "ISO-7137".

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