

Thermo Recorder



Compact Water Resistant
Temperature Data Logger

Easy to Measure, Record, and Analyze Temperature

Our TR-51A and TR-52 Thermo Recorders are compact, water resistant one channel temperature data loggers. Can be used in both normal outdoor conditions and in harsh environments such as underground, in snow and frozen conditions as well as in environments where temperature varies greatly.

(Pat. P.)



TR-51A

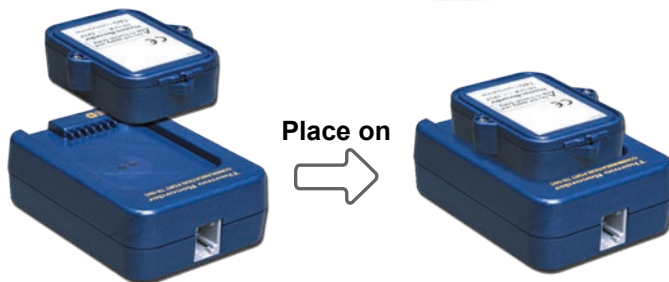


TR-52

**Compact ■ Water Resistant
Current Conditions on LCD**

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

Measure/Record



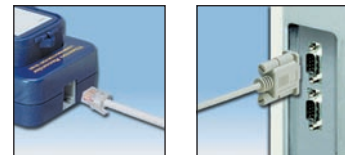
Place on TR-50C

Download and Analyze



Connect

Connect



Connect to a Computer

Compact / Lightweight / Water Resistant!

The lightweight yet durable water resistant construction allows you to use this unit under the harshest of conditions. It can be reliably used in high condensation areas, refrigerated and frozen environments as well as underground.

Note: The waterproofing is sufficient for most situations, but is not for continued immersion.

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

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

Large Data Capacity: up to 16,000 Readings

With one unit you can record up to 16,000 readings. If set at a one hour recording interval that gives you 666 days or almost two years of readings.

Wide Selection of Recording Intervals Two Recording Methods

The TR-51A gives you eight recording intervals (1 minute - 1 hour) to choose from, while the TR-52 stretches those choices to fifteen (1 second - 1 hour). Each unit allows you two choices of recording method:

One Time Method: When 16,000 readings have been reached recording stops.

Endless Loop Method: When 16,000 readings have been reached it automatically overwrites oldest data.

Convenient Battery Warning Display

Calculates remaining battery life and displays a battery warning to indicate the need for a battery change.

Note: Battery life will depend on the recording environment, recording interval, communication frequency, and ambient temperature. Removing the batteries will result in a loss of recorded data.

No Switches means No Fuss No Mistakes / No Tampering

We have removed all switches from the main unit to assure nothing gets accidentally pushed during use, thus assuring you of no mistakes, no tampering and no loss of data.

Two Types to meet your Needs

We offer two types to fit your needs: the TR-51A with internal sensor and a water resistant rating for temporary immersion also the TR-52 outfitted with external sensor and a splash resistant rating.

Battery Life Good for up to Two Years of Continued Use.

Using our specially designed low energy consumption circuit this unit can run on one Lithium battery for up to two years of continued use. No need to worry about where you place it, as the battery will allow you to measure and record over long periods of time no matter if the unit is in transit or in a distant place.

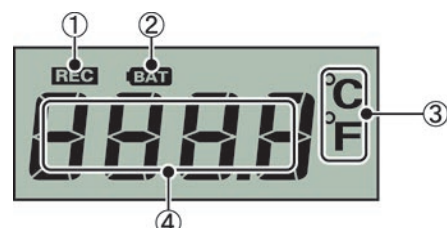
Note: Battery life will depend on the recording environment, recording interval, communication frequency, and ambient temperature. The above battery life test was carried out using brand new batteries and in no way do we guarantee a battery's life.

Low Cost Expandable System

With the TR-5 series any number of main units (TR-51A, TR-52) can be used with just one Communication Port (TR-50C). Hence by simply buying the main unit you can expand your system easily and affordably.

Easy to Read Multi- Functional Display

The easy to read LCD displays present temperature, recording conditions, battery life warning, and unit of measurement.



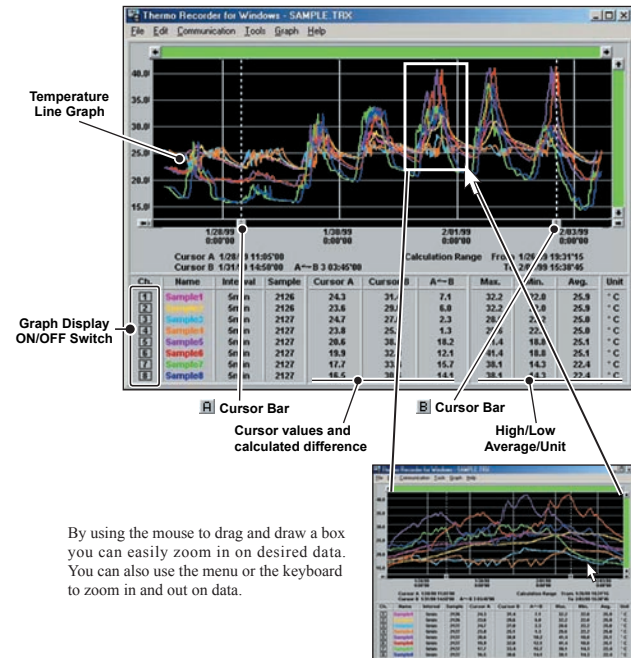
- (1) Displayed during recording. Flashes when waiting to start recording.
- (2) Displayed when time to change the battery. (Battery Life Warning)
- (3) Displays unit of temperature.
Can be changed between Celsius and Fahrenheit via computer.
- (4) Displays Present Temperature

Software included with TR-50C Thermo Recorder for Windows

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 main unit 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.

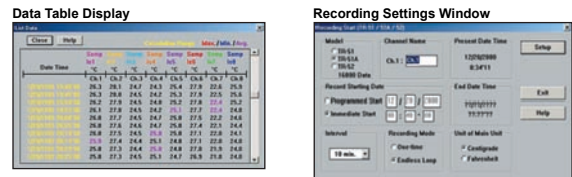


By using the mouse to drag and draw a box you can easily zoom in on desired data. You can also use the menu or the keyboard to zoom in and out on data.

- By moving the cursors onto specific date and time you can easily view recorded temp. data as well as the calculated differences between date A and B.
- By selecting a calculation range you can have displayed the High, Low and Average Temperatures for that chosen period.

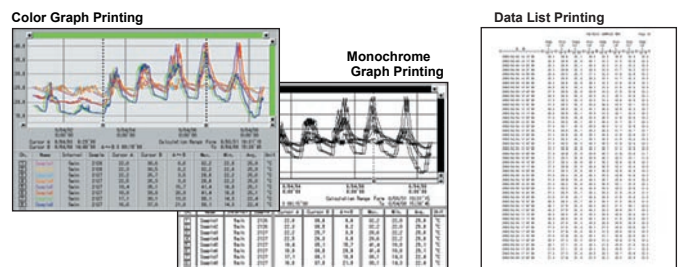
Data Tables / Programmed Recording Start

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. By using the Programmed Start function you can set up recording for a unit to begin on a certain day at a desired time.



Graph / Table Printing Function

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.



Creating Text Files

You can create Text Files (CSV format, etc...) to allow you the option of processing and managing your data using Excel, Lotus or any other popular spreadsheet software.

Options for TR-5 Series

TR-05K1

Wall Attachment

TR-05K2

Wall Attachment

TR-00P1

Maintenance Set

Contents:

- Rubber packing x 1
- Silica gel x 1
- Double-sided adhesive tape x 1
- Lock Screw x 2

TR-00P2

Low-Temperature Battery Set

Contents:

- Lithium battery ER3VM x 1
- Tube x 1
- Maintenance Set x 1

Optional Sensors for TR-52

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: 0.6m
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.

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

TR-2C30

Sensor Extension Cable

Cable length: 3.0m
Splash Resistant

Materials: (1) Vinyl Chloride Coated Wire

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

■ TR-51A/52 Product Specifications

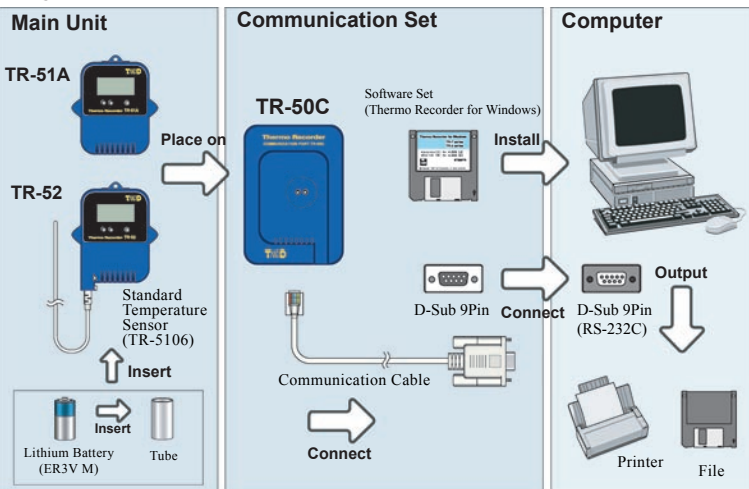
Unit	TR-51A	TR-52
Measurement Channel	1 Temperature Channel	1 Temperature Channel
Internal Sensor	-40 to 80°C	--
External Sensor	--	-60 to 155°C
Measurement Accuracy	±0.5°C	Average ±0.3°C (-20 to 80°C) Average ±0.5°C (-40 to -20°C / 80 to 110°C) Average ±1.0°C (-60 to -40°C / 110 to 155°C)
Measurement Resolution	0.1°C	
Display	Thermistor	
Recording Interval	1,2,5,10,15,20,30,60 minutes (8 variations)	1,2,5,10,15,20,30 seconds / 1,2,5,10,15,20,30,60 minutes (15 variations)
Recording Capacity	16,000 Readings × 1 Channel	
Measurement method **1	Endless Loop Method (Overwrite from the oldest data when recording capacity is full) One Time Method (Stop recording when recording capacity is full)	
LCD display	Current Temperature, Recording Condition, Battery Life Warning, and Unit of Temperature (°F and °C)	
Battery	Lithium battery (ER3V M) × 1 (Also available with CR2)	
Battery Life **2	Approximately 2 years	Maximum 2 years
Interface	Optical Communication (Between a unit and TR-50C)	
Communication Speed	2,400bps (Communication Period of 3 minutes or less)	
Water Resistant Capacity	Water Resistant **3	Splash Resistant
Dimensions	H62mm × W47mm × D19mm (Excluding Protrusions)	
Weight	Approx. 53g (Including battery)	Approx. 55g (Including battery)
Temp. Resistance of Unit	-40 to 80°C	
Standard Sensor	Built-in	TR-5106 : (Teflon resin sensor)
Accessories Included	Lithium Battery (ER3V M) × 1 • Tube × 1 • Strap × 1 • Instruction Manual × 1	

**1 Lithium Battery (CR2) can be used for this unit, however the possible temperature measurement will be -20 to 60°C.
If you are measuring below -20°C or above 60°C, we recommend the Optional Battery Set TR-00P2
**2 Battery Life differs depending on measurement environment and battery performance.
**3 Not for continued immersion.

■ TR-50C (Communication Port) Product Specifications

Unit	TR-50C
Interface	Optical Communication (Between TR-50C and TR-51A / 52) Serial Communication (RS-232C) (Between TR-50C and Computer)
Communication Speed	2,400 bps (160 Seconds when data capacity is full)
Dimensions	H92mm × W66mm × D29mm (Excluding Protrusions)
Weight	Approx. 60g (TR-50C)
Operating Environment	Temp.: -10 to 40°C Humidity: less than 90%RH
Accessories Included	Communication Cable (RS-232C: D-Sub 9 pin Female Cable Length 1.5m) × 1 Instruction Manual × 1 • Software × 1

■ System Setup



■ Software Specifications

Software	Thermo Recorder for Windows
Compatible Devices	TR-51A • TR-52 • TR-71S • TR-72S
Number of Channels	8 Channel Simultaneous Display and Processing Up to 8 units for TR-5 • 4 units for TR-7 • Can process up to 8 channels of data from both TR-5 and TR-7 in the same screen
Communication Functions	Recording Start (Programmed Start / Immediate Start) and Recording Stop Recording Settings (Channel Name • Recording Interval • Recording Method) Download Recorded Data.
Graph Display	Temperature and Humidity Graphs for each Channel (Zoom in, out and scroll with mouse or keyboard) 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
File Out Put	TR-Series Common Data Files (*.trx) / Text File (CSV, etc) Selected Range: (File for selected time period)
Printing	Graphs (Color / Monochrome) • Tables
Others	Data Table Display • Calculation Range Settings • Data Maintenance Delete Data by Channel • Re-order data by Channel
Compatible OS	Microsoft Windows 3.1 / 95 / 98 / Me English Microsoft WindowsNT 3.51 / 4.0 English
PC / CPU	Microsoft Windows 2000 English IBM Compatible with higher than Pentium 90MHz
Memory	Serial Port (RS-232C D-Sub 9pin)
Hard Disk	More than 8 MB (16MB recommended)
Monitor	More than 1 MB of free space (Data will need more space) VGA (640 × 480) more than 256 colors

■ Related Products

TR-7U Series 2 Channel Data Logger for Temperature and Humidity



Using a single AA battery this USB connected unit shows current values for both channels on the large, easy to read LCD. Control recording from front panel buttons.

Temp Measurement Range: -60 to 155°C (TR-71U)
Humidity Measurement Range: 10 to 95%RH (TR-72U)

TR-81 For Higher and Lower Temperature Measurements



Measure and record 2 channels using Pt100 sensors. Wide range of Temperature from -200°C to 600°C. Quick disconnect for probes available.

Temp Measurement Range: -200 to 600°C

RTR-5 Series Wireless Data Logging System



Our revolutionary wireless series (RTR) allows you to transfer recorded data via short wave wireless communication to your computer for processing. Includes Auto Downloading, Warning and Monitoring function.

Measure and Record Temperature, Humidity, Voltage, Pulses, Events, Soil Moisture, etc.

Web Site T&D Online

Product information, FAQ and software update downloads.
<http://www.tandd.com/>



Caution regarding safety

To ensure safe operation, carefully read instructions before using this unit.



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