

Thermo Recorder

TR-71U/ TR-72U

User's Manual

Thank you for purchasing our product.
Carefully read this instruction manual
before using this unit.



Notices about this User's Manual

In order to properly use this product, please carefully read this manual before using. T&D Corporation accepts no responsibility for any malfunction of and/or trouble with this product or with your computer that is caused by the improper handling of this product and will deem such trouble or malfunction as falling outside the conditions for free repair outlined in the attached warranty.

- All rights of this User's Manual belong to T&D Corporation. It is prohibited to use, duplicate and/or arrange a part or whole of this User's Manual without the permission of T&D Corporation.
- Microsoft® and Windows® are registered trademarks of Microsoft Corporation USA and are binding in the USA and all other countries. Company names and product names are trademarks or registered trademarks of each company.
- Specifications, design and other contents outlined in this manual are subject to change without notice.
- On screen messages in this manual may vary slightly from the actual messages.
- Please notify the shop where you purchased this product or T&D Corporation of any mistakes, errors or unclear explanations in this manual. T&D Corporation accepts no responsibility for any damage or loss of income caused by the use of our product.
- This product has been designed for private or industrial use only. It is not for use in situations where strict safety precautions are necessary such as in connection with medical equipment, whether directly or indirectly.
- We are not responsible for any malfunction or trouble caused by the use of our product or by any problem caused by the use of measurement results of our unit. Please be fully aware of this before using our product.
- Some of our products, which come under the category of strategic goods in foreign trade law, need the permission of the Japanese government to be exported outside of Japan.
- This User's Manual cannot be reissued, so please keep it in a safe place.
- Please read the warranty and provisions for free repair carefully.

FCC Compliance Statement for American Users

This device complies with Part 15 of the FCC Rules.

Operation is subject to following two conditions: (1) this device may not cause harmful interference. and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class A Digital Device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Warning

This equipment has been verified to comply with the limits for a Class A personal digital device, pursuant to Subpart B of Part 15 of FCC Rules. Only peripherals (computer input/output devices, terminals, printers, etc.) certified or verified to comply with the Class A or B limits may be attached to this equipment. Operation with non-certified or non-verified personal computer and/or peripherals is likely to result in interference to radio and TV reception. The connection of a non-shielded equipment interface cable to this equipment will invalidate the FCC Certification of this device and may cause interference levels which exceed the limits established by the FCC for this equipment. You are cautioned that changes or modifications not expressly approved by party responsible for compliance could void your authority to operate the equipment.



Safety Precautions and Instructions

To ensure safety be sure to obey all of the following warnings.





The following items should be strictly obeyed for the safe usage of this unit, and for protecting yourself and other people from bodily harm and/or damage to property. To ensure the proper use of our product, please read the following carefully and fully understand the contents.

■ Explanation of Symbols

Explanation of Warning Symbols

 DANGER	These entries are actions that absolutely under no circumstance should be taken. The taking of such an action may cause serious personal physical damage or death.
 CAUTION	These entries are actions that if taken may lead to physical injury or damage to persons or things.

Explanation of Picture Symbols

	Denotes an important warning or caution.
	Denotes a forbidden action. Inside or near the symbol will appear another symbol giving details. (EX:  stands for DO NOT TAKE APART)
	Denotes an action that you must take.

DANGERS



Do not take apart, repair or modify the main unit.
Doing so may cause fire or electrocution.



If water or a foreign body enters into this unit, immediately remove the batteries and stop using.
Continued use may cause fire or electrocution.



Do not use this unit in wet or humid places, such as a bathroom.



Store main units, sensors, batteries and communication cables out of the reach of children.
It is dangerous to touch or swallow batteries.



If any smoke or strange smells are emitted from the unit, immediately remove the batteries and stop using.
Continued use may cause fire or electrocution.



Do not drop the unit, or expose the unit to a strong impact. If that happens to the unit, immediately remove the batteries and stop using.
Continued use may cause fire or electrocution.



This device is designed to measure and record temperature and humidity. Do not use it for any other purpose than to measure and record temperature and humidity.



This unit is not water-resistant.
If the unit gets dirty, wipe it with a clean cloth and a mild detergent.



Do not expose the unit to harmful gases or chemicals. It may cause corrosion and/or other danger to the unit and to people handling the unit.

CAUTIONS



Do not use batteries other than specified. Doing so may cause fire or damage.



Battery terminals may provide insufficient contact due to age or vibration.
This may lead to data loss.



Condensation may occur if the unit is moved from one environment to another where the difference in temperature is great.
Use the unit in an environment where the ambient temperature is from -10 to 60°C and the humidity is 90% RH (no condensation) or less.



To prevent damage to the unit from static electricity, remove static electricity from your body by touching metal around you (door knob, window frame) before touching the unit.
Static electricity may cause not only damage to the unit, but may cause breaks in or a loss of data.



If the unit will not be used for period of time, for safety reasons please remove the battery.
If left in the unit, it may leak and lead to malfunctioning.



Please take extra caution when plugging in and pulling out the USB plug while another USB device such as CD-RW/HDD is in operation.
It may cause problems to your CD-RW or other device.



We shall not guarantee the operation of our device if you have connected it to your computer using a USB hub or a USB extension cable.



Please do not insert your fingers or any foreign objects into any of the devices' jacks.

CAUTIONS



Do not use any other batteries than those that are specified in this User's Manual.
It may cause a fire or other trouble including malfunction.



Do not use or store the Thermo Recorder in any of the following places. Doing so may cause electrocution, fire and/or other adverse effects to the device and/or your computer.

- Areas exposed to direct sunlight

This will cause the inside of the device to become overheated and may cause fire, deformation, and/or other damage including malfunction.

- Areas prone to strong magnetic fields

This may cause damage including malfunction.

- Areas exposed to water leakage

This may cause electrocution or other damage including malfunction.

- Areas exposed to excessive vibration

This may cause injury, malfunction, damage or loss of proper electrical contact.

- Areas near fire or exposed to excessive heat

This may cause damage including malfunction and deformation.

- Areas prone to smoke, dust and dirt

This may cause damage including malfunction.

Cautions about using the Sensors

Cautions about using the temperature sensor TR-0106



The possible temperature measurement range for this sensor is -40 to 110°C . Please use it within this range.



It is possible to use just one extension cable per temperature sensor.

Cautions about using the temperature/humidity sensor TR-3100



The sensor can measure temperature within the range of 0 to 50°C and humidity within the range of 10 to 95% RH. Only use the sensor within these ranges.



If extremely severe temperature changes occur, the humidity measurements may appear abnormal. Once the sensor's temperature becomes stable, the measurements will return to normal.



This sensor is not waterproof. Do not get wet.



The temperature/humidity sensor cable cannot be extended.

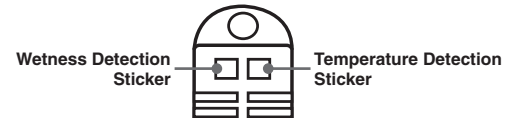


When measuring with the temperature/humidity sensor in an environment of 0 to 50°C and less than 30% RH, the measurements may sometimes fluctuate. This is not abnormal.

Cautions about using the Sensors

[Handling the temperature/humidity sensor]

- The temperature/humidity sensor should probably be changed after a period of about one year. After removing the sensor from its package, please change the temperature/humidity sensor after one year's usage. During use the temperature/humidity sensor will accumulate impurities (dirt) on the surface of the sensor causing the sensor's accuracy and sensitivity to decrease. If the sensor is being used in a bad environment (smoky or dusty places) it may be necessary to change the sensor sooner.
- When the temperature/humidity sensor is not being used, please place it in the attached vinyl bag with the drying agent included and store it in a cool dark place with a temperature of between 5 to 25°C and a humidity of below 30% RH.
- Attached to the temperature/humidity sensor are two stickers: a wetness detection sticker and a temperature detection sticker. If either of the stickers shows abnormality, you should change the old sensor to a new one immediately.



- Wetness Detection Sticker

Informs you that the sensor has been wet.



Normal:
Under normal conditions, black dots will appear on a white background.



Abnormal:
Under abnormal conditions, it will turn to red.

- Temperature Detection Sticker

Informs you that the sensor measured a temperature measurement over 60°C .



Normal:
Under normal conditions, the number 「60」 will lightly appear on a pinkish white background.



Abnormal:
Under abnormal conditions, the number 「60」 will clearly appear on a red background.

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About Thermo Recorder TR-71U/72U

Outline

TR-71U/TR-72U Thermo Recorders are data loggers capable of measuring, displaying and recording temperature and humidity data. TR-71U has two temperature channels and TR-72U has one temperature and one humidity channel. The data recorded into the TR-71U/TR-72U units can then be downloaded quickly via USB cable to your computer whereby with our exclusive software you can easily process the data into graphs, tables, save to files and/or print it out. Moreover, it is possible to connect more than one unit at the same time.

Basic Functions

Temperature Measuring Range : -60 to 155°C (TR-71U)

The TR-71U with the sensor included in this package can measure and record in a range of -40 to 110°C , but by purchasing one of our optional sensors it is possible to measure and record in the wider range of -60 to 155°C . Please take a look at our full range of optional sensors to find one to match your application.

Humidity Measuring Range : 10 to 95% RH (TR-72U)

The TR-72U with the sensor included in this package can simultaneously measure and record temperature in a range of 0 to 50°C and humidity in a range of 10 to 95% RH.

Data Recording Capacity : 8000 readings × 2 channels

One channel can record and hold up to 8000 measurement readings. If set at a recording interval of 1 hour, a unit can continuously record for about one year.

1 Year of Operation with just 1 AA Alkaline Battery

Our low energy consumption design gives you one year of continuous operation with only one AA alkaline battery. This gives you the freedom to use the data loggers in places where they can be left alone for long periods of time, such as, in transportation or refrigeration.

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. Specifications and explanations used in this User's Manual are based on operations carried out with a new battery and are in no way a guarantee of your actual battery life.

Battery Life Warning Display

When the battery power becomes low, a battery life warning signal will appear in the unit's LCD display. If the battery power becomes even lower the unit will automatically go into sleep mode in order to protect the data.

15 Recording Intervals

Select from 15 Recording Intervals (from 1 second to 1 hour) to meet your needs. Select from 2 Recording Modes

One-time Mode :When the number of recorded readings reaches 8000, *FULL* " will appear in the unit's LCD display and recording will automatically stop.

Endless Mode :When the number of recorded readings reaches 8000, the oldest data reading will be overwritten and recording will continue.

Backup Function

When battery power becomes low, a battery life warning signal will appear in the unit's LCD display and if the battery power becomes even lower the unit will automatically go into sleep mode in order to protect the data. In sleep mode all normal operations will stop and it will become impossible to switch on the power of the main unit.

Note: If the main unit remains in sleep mode for about 1 month without a change of battery, or if the battery is left out of the unit for more than 2 minutes, all recorded data will be lost.

Current Readings Monitoring Display

With our exclusive software, you cannot only monitor the current measurements at a set interval, but can view those measurements in a continually changing graph. You can simultaneously display the current measurements and corresponding graphs for the number of units you have connected.

Adjustment Function

By setting adjustment values beforehand, you can record and display the post-adjusted measurement values. You can choose from two adjustment methods: 1-point and 2-point. Adjustment will be carried out using an adjustment equation of $Y = aX + b$; where X is the pre-adjusted measurement value and Y is the post-adjusted value.

Package Contents

The following items are included in the package:

[TR-71U]



Thermo Recorder TR-71U × 1 unit

T&D Recorder for Windows Software CD-ROM × 1



AA Alkaline Battery (LR6) × 1

USB Communication Cable US-15C × 1

Temperature Sensor TR-0106 × 1



Hardware User's Manual (Warranty) × 1

Software User's Manual × 1

[TR-72U]



Thermo Recorder TR-72U × 1 unit



T&D Recorder for Windows
Software CD-ROM × 1



AA Alkaline Battery
(LR6) × 1



USB Communication Cable
US-15C × 1



Temperature Sensor
TR-3100 × 1



Hardware User's Manual (Warranty) × 1

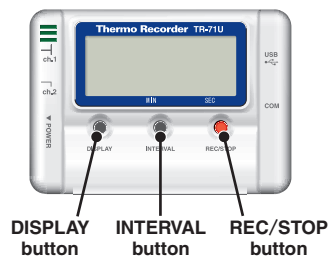


Software User's Manual × 1

Part Names and Functions

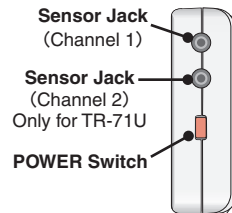
Part Names

[FRONT]

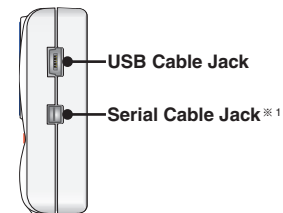


- DISPLAY :Pressing this button will change the LCD display mode.
- INTERVAL :Pressing this button will display the currently set recording interval.
- REC/STOP:Pressing this button will start or stop recording.

[RIGHT SIDE]

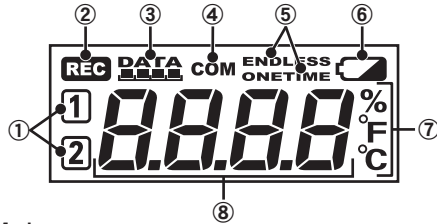



[LEFT SIDE]



※ 1 : Serial Communication Cable is an Optional Accessory.

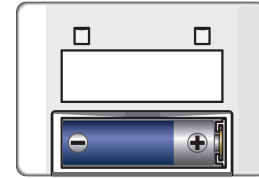
LCD Display



- ① **Channel Mark**
The channel number of the measurement being displayed will appear.
- ② **Recording Mark**
The recording condition will appear.
ON: Recording in progress. BLINKING: Waiting for programmed start.
- ③ **Data Capacity Scale**
After every 2000 readings the scale will be marked from left to right.
- ④ **COM Mark**
This will appear when data is being sent or received.
ON: USB cable is connected. BLINKING: In communication with computer.
- ⑤ **Recording Mode**
ONETIME: When the number of recorded readings reaches 8000, "FULL" will appear in the unit's LCD display and recording will automatically stop.
ENDLESS: When the number of recorded readings reaches 8000, the oldest data reading will be overwritten and recording will continue.
- ⑥ **Battery Life Warning Signal**
When the battery power becomes low, this will appear in the LCD display. If the battery power becomes even lower, SLP will appear and normal operations will stop. If the  signal appears, please change the battery as soon as possible.
- ⑦ **Unit of Measurement**
The unit of measurement (°C, °F, %) for the display will appear.
- ⑧ **Measurements and Messages Area**
Current measurements or operational messages such as FULL or SLP will appear.

Installing the Battery

1. Remove the battery cover from the back of the unit.
2. Insert 1 AA alkaline battery, making sure that the + and - are in the correct direction.
- Always use a new battery.



3. Replace and close the battery cover.

[Changing the Battery]

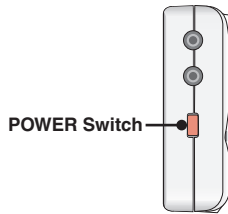
1. When battery power becomes low, a battery life warning signal will appear in the unit's LCD display.
If, at this time you change the battery, recording will continue uninterrupted and all data will be saved for downloading.
2. If the battery is not changed and power becomes even lower, SLP will appear in the LCD display.
The unit will automatically go into sleep mode in order to protect the data and all normal operations will stop.
If you change the battery at this point, it is still possible to download all saved recorded data.
3. If the battery is further left unchanged, the display will automatically shut off.
If all battery power is lost, all data will be lost as well.

Note:

If a unit is left without a battery for more than 2 minutes, all data will be lost, so please work quickly when changing the battery.

Turning on the Power

1. By holding in the POWER switch at the left side, the unit will turn on.



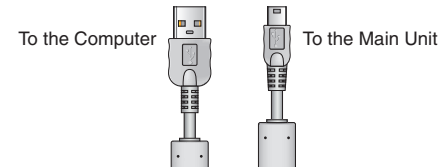
[Turning OFF the Power]

By holding in the POWER switch, the unit will turn off.

- During recording, the power cannot be turned off. Please stop recording first and then turn off the power.
- Even if the power has been turned off, the recorded data will be saved. However, if the battery power is totally lost, all data will be lost, so please download data as soon as possible to avoid losing any necessary data.

Installing the USB Device Driver

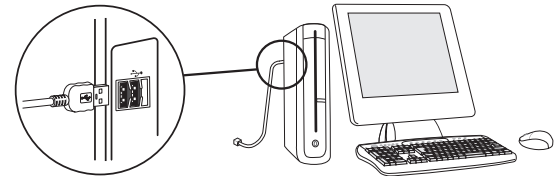
You will need to install this driver in order to use the device with a USB cable and Windows. It is necessary for communication via USB between your computer and any TR-71U/72U device. After installing, your computer will be able to detect and recognize TR-71U/72U devices that have been connected with a USB cable.



- When installing the software [T&D Recorder for Windows], the USB Device Driver will also be copied to your hard disc. So, even if you do not have the CD-ROM but have already installed [T&D Recorder for Windows] you can easily install the USB Device Driver.

For Windows® XP:

1. Turn on your computer and open Windows.
2. After Windows has been completely started up, connect the supplied USB cable to a USB port on your computer.



3. Insert the attached CD-ROM in the CD-ROM drive.

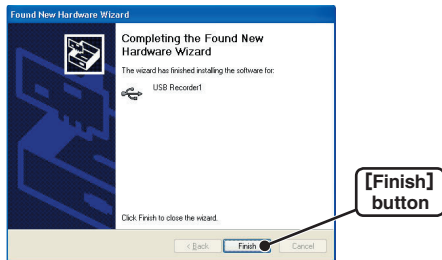
Caution: If the Installation Window opens, close it.

4. By connecting a data logger to the USB cable already connected to your computer, the [Add Hardware Wizard] will automatically open.

5. By checking [Install the Software automatically (Recommended)] and clicking [Next], the software will automatically be installed.



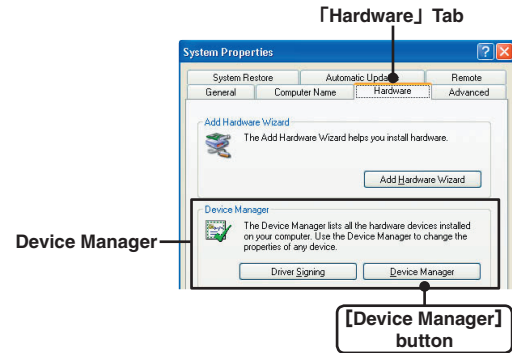
6. After installation has been completed, click the [Finish] button.



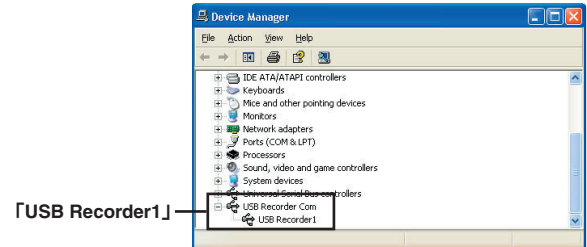
Caution: If the Driver is not automatically detected, please search by specifying the place as (CD-ROM [Device Driver]) and install manually from there.

Checking After Connecting

1. Open the [Control Panel] and double click on [System] ; the system properties will be displayed.
2. Click the [Hardware] Tab, and click the [Device Manager] button in the Device Manager Area.



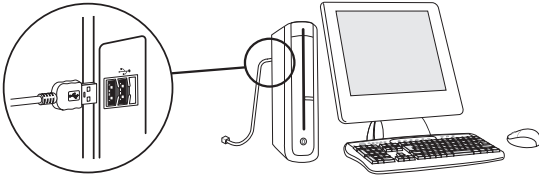
3. In the Device Manager Window, check to see if [USB Recorder 1] is listed under [USB Recorder COM].



For Windows® 2000:

1. Turn on your computer and open Windows.

2. After Windows has been completely started up, connect the supplied USB cable to a USB port on your computer.



3. Insert the attached CD-ROM in the CR-ROM drive.

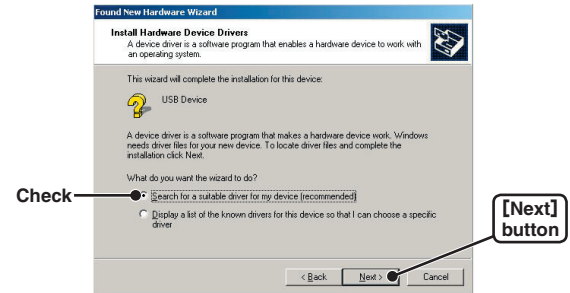
※ If the Installation Window opens, close it.

4. By connecting a data logger to the USB cable already connected to your computer, the [Found New Hardware Wizard] will automatically open.

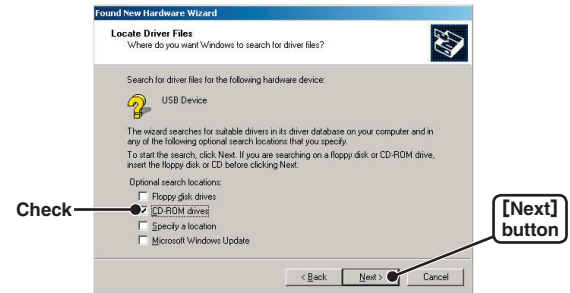
5. By clicking the [Next] button, a window will open where you can choose how you wish to find the driver file.



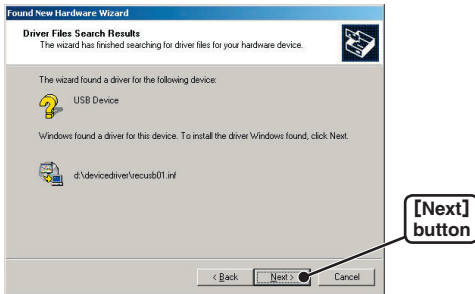
6. Check [Search for a suitable driver for my device (recommended)] and click the [Next] button.



7. Check [CD-ROM] and then click the [Next] button.



8. By clicking the [Next] button, installation will begin.



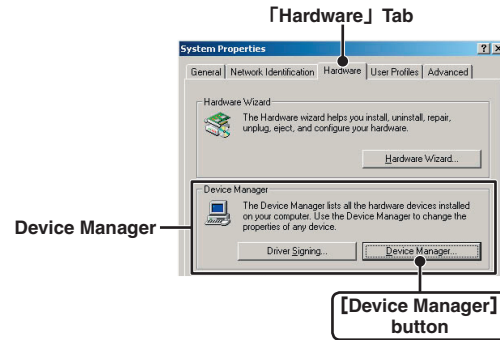
Caution: If the Driver is not automatically detected, please search by specifying the place as (CD-ROM [Device Driver]) and install manually from there.

9. After completing installation, click the [Finish] button.



Checking After Connecting

1. Open the [Control Panel] and double click on [System]; the system properties will be displayed.
2. Click the [Hardware] Tab, and click the [Device Manager] button in the Device Manager Area.



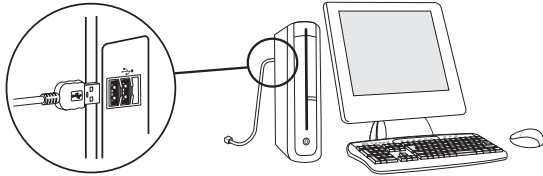
3. In the Device Manager Window, check to see if [USB Recorder 1] is listed under [USB Recorder COM].



For Windows® Me:

1. Turn on your computer and open Windows.

2. After Windows has been completely started up, connect the supplied USB cable to a USB port on your computer.



3. Insert the attached CD-ROM in the CR-ROM drive.

※ If the Installation Window opens, close it.

4. By connecting a data logger to the USB cable already connected to your computer, the [Add New Hardware Wizard] will automatically open.

5. Check [Automatic search for a better driver (Recommended)] and click the [Next] button to begin installation.



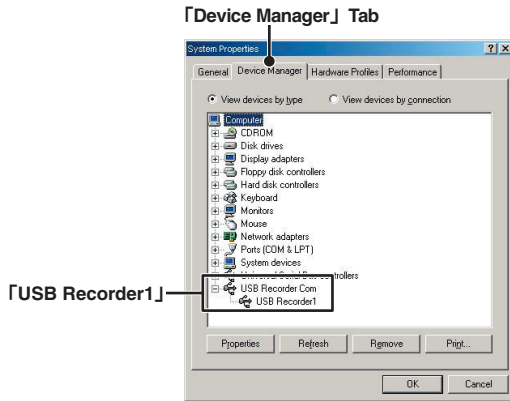
6. After completing installation, click the [Finish] button.



Caution: If the Driver is not automatically detected, please search by specifying the place as (CD-ROM [Device Driver]) and install manually from there.

Checking After Connecting

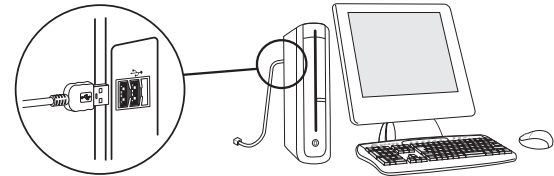
1. Open the [Control Panel] and double click on [System]; the system properties will be displayed.
2. Click the [Device Manager] Tab, and the [Device Manager] Window will appear.



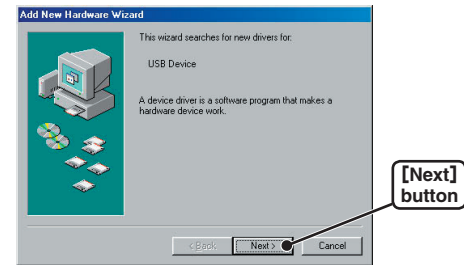
3. Check to see if [USB Recorder 1] is listed under [USB Recorder COM].

For Windows® 98:

1. Turn on your computer and open Windows.
2. After Windows has been completely started up, connect the supplied USB cable to a USB port on your computer.



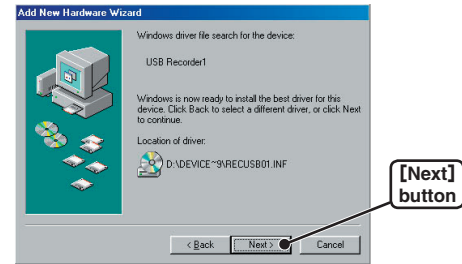
3. Insert the attached CD-ROM in the CR-ROM drive.
※ If the Installation Window opens, close it.
4. By connecting a data logger to the USB cable already connected to your computer, the [Add New Hardware Wizard] will automatically open.
5. By clicking the [Next] button, a window will open where you can choose how you wish to find the driver file.



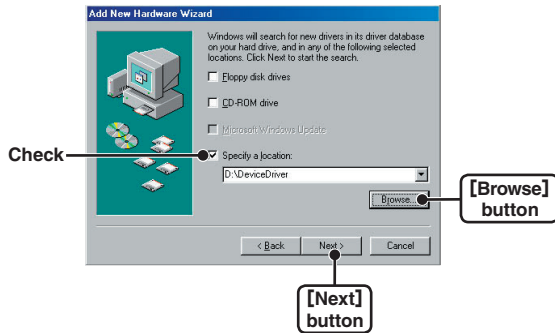
6. Check [Search for the best driver your device (Recommended)] and click the [Next] button.



8. Click [Next] to start the installation.



7. Check [Specify a location] and click the [Browse] button. Select the [Device Driver] in the CD-ROM drive and click [Next].



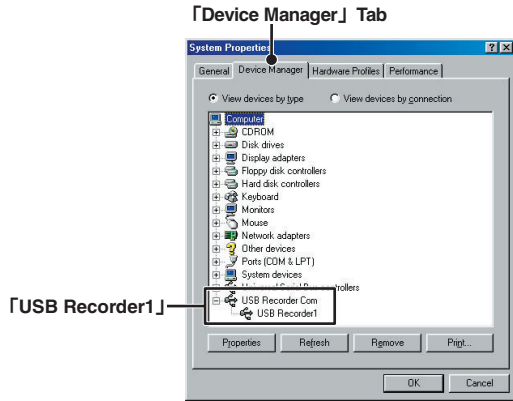
9. After completing installation, click the [Finish] button.



Caution: If the Driver is not automatically detected, please search by specifying the place as (CD-ROM [Device Driver]) and install manually from there.

Checking After Connecting

1. Open the [Control Panel] and double click on [System]; the system properties will be displayed.
2. Click the [Device Manager] Tab, and the [Device Manager] Window will appear.

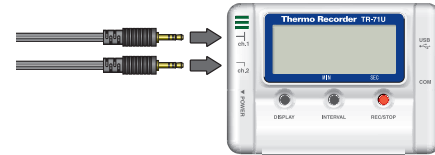


3. Check to see if [USB Recorder 1] is listed under [USB Recorder COM].

Connecting the Sensor

Connecting the Sensor.

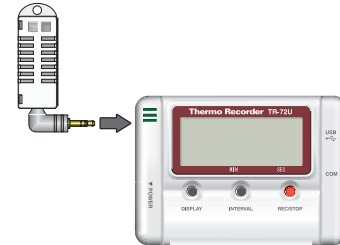
[TR-71U]



- If a temperature sensor is connected to only the ch. 2 jack, the internal sensor will be used to measure for ch. 1.
- To avoid poor connections, be sure to push the sensor connector securely into the jack.

Note: If a sensor extension cable is being used with the data logger connected by USB to your computer, electromagnetic waves may cause large errors in measurements.

[TR-72U]

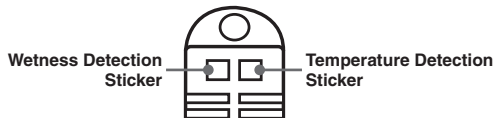


Caution: When using the temperature/humidity sensor in environments where the temperature is 0 to 15 and humidity under 30 RH, there may occur changes in measurement readings. This is not a malfunction.

- To avoid poor connections, be sure to push the sensor connector securely into the jack.

[Handling the temperature/humidity sensor]

- The temperature/humidity sensor should be changed after a period of about one year. After removing the sensor from its package, please change the temperature/humidity sensor after one year's usage. During use, the temperature/humidity sensor will accumulate impurities (dirt) on the surface of the sensor causing the sensor's accuracy and sensitivity to decrease. If the sensor is being used in a bad environment (smoky or dusty places) it may be necessary to change the sensor sooner.
- When the temperature/humidity sensor is not being used, please place it in the attached vinyl bag with the drying agent included and store it in a cool dark place with a temperature of between 5 to 25°C and a humidity of below 30% RH.
- Attached to the temperature/humidity sensor are two stickers: a wetness detection sticker and a temperature detection sticker. If either of the sticker shows abnormality, you should change the old sensor with a new one immediately.



- Wetness Detection Sticker

Informs you that the sensor has been wet.



Normal:

Under normal conditions, black dots will appear on a white background.



Abnormal:

Under abnormal conditions, it will turn to red.

- Temperature Detection Sticker

Informs you that the sensor measured a temperature measurement over 60°C.



Normal:

Under normal conditions, the number 「60」 will lightly appear on a pinkish white background.



Abnormal:

Under abnormal conditions, the number 「60」 will clearly appear on a red background.

Starting Recording from Main Unit Switch

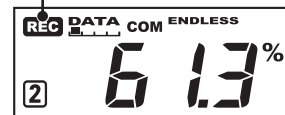
By pressing the REC switch on the main unit you can start a recording session immediately.

Caution: If you wish to make changes to the device name, channel name, recording mode or to any other recording conditions, you must make those settings by connecting the device to your computer.

[Starting a Recording Session]

Press in the [REC/STOP] button on the front of the unit until the REC mark appears in the display. When displayed, recording has begun.

REC mark lights up



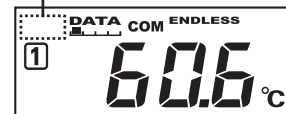
Note:

- By starting a new recording session, all data currently saved in the unit will be erased.
- Even if the unit is waiting for a programmed start, by pressing the [REC/STOP] button until the REC mark appears, you can start a new recording session immediately.

[Stop Recording]

You can stop a recording session by pressing the [REC/STOP] button until the REC mark disappears from the display. When it has disappeared, recording has stopped.

REC mark disappears



Setting Recording Interval from Main Unit Switch

You can make or change recording interval settings from the "INTERVAL" switch on the front of the TR-71U/72U main unit.

1. Press in the [INTERVAL] button on the front of the device until the recording interval appears in the display.
2. With each pressing of the [INTERVAL] button the recording interval time will change. Press until the desired setting appears.



«15 minutes»



«15 seconds»

3. When the desired recording interval appears, stop pressing the [INTERVAL] button. Within a few seconds, the current measurement readings will return to the display and the setting will be finished.

- By pressing the [INTERVAL] button during recording or while waiting for a programmed recording to start, the currently set recording interval will be displayed.

If Installation Fails

If, during USB device driver installation, some trouble occurs that results in a failure to install properly, the following display will appear in the Device Manager.



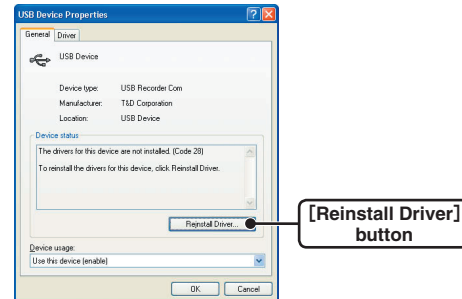
If this occurs, please re-install from the [USB Device] properties.

How to Re-install

1. In the Device Manager Window, right click on [USB Device] under [Other Devices] to display the USB Device Properties.



2. In the USB Device Properties Window, click on the [Reinstall Driver] button to display the Installation Window. Follow the directions to install.



Specifications

Device Type	TR-71U	TR-72U	
No. of Measurement Channels	2 Channels (Select from ch1. internal / ch.2 external)	2 Channels (1 Temperature / 1 Humidity)	
Measurement Items	Temperature	Temperature	Humidity
Internal Temperature Sensor	-10 to 60°C	-10 to 60°C	—
Attached Sensor	-40 to 110°C	0 to 50°C	10 to 95% RH
Optional Temp. Sensor	-60 to 155°C ※1	-40 to 110°C	—
Measuring Accuracy (with Attached Sensor)	Average ± 0.3°C (-20 to 80°C) Average ± 0.5°C (-40 to -20 / 80 to 110°C)		± 5% RH (at 25°C 50% RH)
Measuring / Display Resolution	0.1°C		1% RH
Sensor	Thermistor		Macromolecular Humidity Sensor
Recording Interval	Select from 15 choices: 1 · 2 · 5 · 10 · 15 · 20 · 30 seconds 1 · 2 · 5 · 10 · 15 · 20 · 30 · 60 minutes		
Recording Capacity	8000 readings × 2 channels		
Recording Modes	Endless Mode / One-time Mode		
LCD display	(Ch1 only, Ch2 only, alternating display) Measurements, Recording Status, Battery Life Warning, Amount of Recorded Data, Unit of Measurement		
Power	AA alkaline battery (LR6)		
Battery Life	About 1 year ※2		
Data Backup	Activated when battery power is low or when switch is off (About 1 year)		
Interface	USB Communication Cable (option: RS-232C)		
USB Communication Time	When downloading (1 unit of full data-about 8 seconds)		
Dimensions / Weight of Main Unit	H55 × W78 × D18 mm / about 62 g (including one AA battery)		
Working Environment for Main Unit	Temperature: -10 to 60°C Humidity: under 90%RH (without condensation)		
Attached Sensors	TR-0106 × 2	TR-3100 × 1	
Accessories included in package	AA alkaline battery (LR6) × 1 / User's Manual (Warranty) × 1 USB cable × 1 (US-15C; length 1.5 m) Software set × 1 / User's Manual (Warranty) × 1		

※1: There are two types of temperature sensor for TR-71U depending on measurement range. For details see Optional Accessories on p.29.

※2: Battery life depends upon the measuring environment, recording interval, and quality of the battery being used.

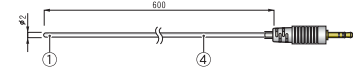
Optional Accessories

Temperature Sensors (For TR-71U)

unit : millimeters

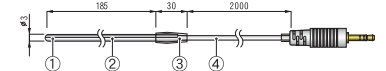
TR-1106 Teflon-Shielded Sensor

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



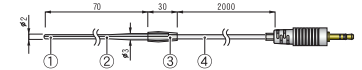
TR-1220 Stainless Protection Sensor

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



TR-1320 Stainless Protection Sensor

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



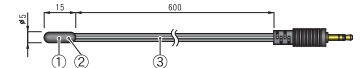
Materials: ① Thermistor ② Stainless pipe (SUS316) ③ Teflon Compaction Tube
④ Teflon Resin (FEP) Shielded

Possible Measurement Range : -60 to 155°C Sensor Temperature Durability : -70 to 180°C
Water Resistance : Splash Proof (Sensor and Cable)
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)

unit : millimeters

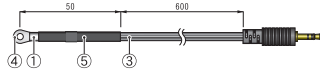
TR-0106 TPE resin-Shielded Sensor

Cable Length: 0.6m
Thermal-Constant Time :
In the air : Approx. 75 Sec.



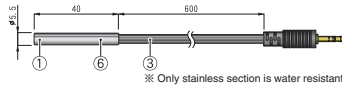
TR-0206 Stainless Protection Sensor

Cable Length : 0.6m
 Thermal-Constant Time :
 In the air : Approx. 75 Sec.



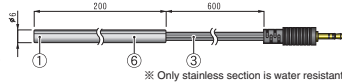
TR-0306 Stainless Protection Sensor

Cable Length : 0.6m
 Thermal-Constant Time :
 In agitated water : Approx 18 Sec.



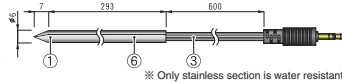
TR-0406 Stainless Protection Sensor

Cable Length : 0.6m
 Thermal-Constant Time :
 In agitated water : Approx 20 Sec.



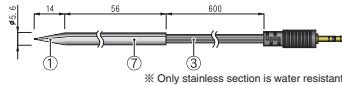
TR-0506 Stainless Protection Sensor

Cable Length : 0.6m
 Thermal-Constant Time :
 In agitated water : Approx 20 Sec.



TR-0706 Stainless Protection Sensor

Cable Length : 0.6m
 Thermal-Constant Time :
 In agitated water : Approx 18 Sec.



Materials: ① Thermistor ② TPE resin-shielded sensor ③ TPE resin-shielded wire ④ M3Screw Hole
 ⑤ Compacion Tube ⑥ Stainless pipe (SUS304) ⑦ Stainless pipe (SUS316)

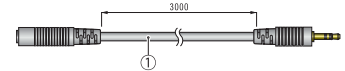
Possible Measurement Range : -40 to 110°C Sensor Temperature Durability: -50 to 115°C
 Measurement Accuracy : Average $\pm 0.3^{\circ}\text{C}$ (-20 to 80°C) · Average $\pm 0.5^{\circ}\text{C}$ (-40 to -20°C / 80 to 110°C)

Sensor Extension Cable (Temp Sensor Only)

unit : millimeters

TR-1C30

Cable length : 3.0m



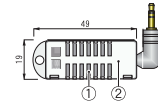
Materials: ① Vinyl Coated Electrical Wire

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.
- If a sensor extension cable is being used with the data logger connected by USB to your computer, electromagnetic waves may cause large errors in measurements.
- Do not use the Extension Cable with TR-72U.

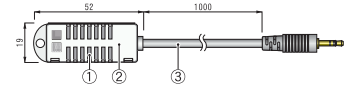
Temp / Humidity Sensors (For TR-72U)

TR-3100 Temp / Humidity Sensor



TR-3110 Temp / Humidity Sensor

Cable length : 1m



Materials: ① Temperature/humidity sensor ② Polypropylene resin ③ Vinyl Coated Electrical Wire

Possible temperature measurement range : 0 to 55°C

Possible humidity measurement range : 10 to 95% RH

Sensor temperature resistance : -10 to 55°C

humidity measurement accuracy : $\pm 5\%$ RH (At 25°C 50% RH)

Service life : 1 year (under normal operational conditions)

Operational conditions : Without dew condensation, water leakage or effect from corrosive gas or organic solvents.

Note: An Extension Cable cannot be used with Temperature/Humidity Sensors.

Serial Communication Cable (for TR-71U/72U)

TR-07C Serial Communication Cable

Cable Length : about 1.0 m

Connector Type : Specialized Connector
D-sub9pin

For communication with computer



TR-4C10 Serial Communication Cable

Cable Length : about 1.0 m

Connector Type : Specialized Connector
D-sub9pin

For communication with RTR-57C

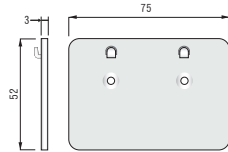


Wall Attachment (for TR-71U/72U)

unit : millimeters

TR-07K2 Wall Attachment

Included : screws × 2
double-sided tape × 1
Compatible Devices : TR-71U/72U



For product information or questions contact us at:

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Thermo Recorder TR-71U/TR-72U User's Manual

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