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

User's Manual

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

■ Notices about this User's Manual

Carefully read this manual so that you can properly use this product.

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 of the attached warranty.

Software User Agreement

■ Disclaimers

- T&D Corporation does not guarantee the operation of "T&D Recorder for Windows TR-5,7xU".
- T&D Corporation shall not accept any responsibility for any damage, whether direct or indirect, that results from the usage of "T&D Recorder for Windows TR-5,7xU".
- Specifications of "T&D Recorder for Windows TR-5,7xU" may be subject to change and service may be terminated without advance notice to the user. In such a case, T&D Corporation shall not be responsible for any damages, whether direct or indirect, from the inability to use "T&D Recorder for Windows TR-5,7xU".
- T&D Corporation has no obligation to correct any defects found in "T&D Recorder for Windows TR-5,7xU".

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Using this software

■ Notes about graph operation

Opening a Temp / Humidity Graph or other data file (.trx, etc...) by dropping it into the Graph window

If you wish to open a file by dropping it into a Graph, it will not appear if the Graph has been opened using [Run as Administrator]. Please open the Graph as a general User. In general, we suggest to only use [Run as Administrator] to open the Graphs the first time in order to link the type of data files (extension) to the Graph programs. After that please open as a general user and carry out the opening of data as usual.

■ About the Saving Location for Data Files

The application automatically creates a new data file each time an Auto-Download session occurs. Note that the [Virtual Store] function will redirect files from the default folder into which the program was installed to separate folders under [Program Files] for each user, as shown below: [C:\User\(AccountName)\AppData\Local\VirtualStore\Program Files\(Application)].

EX:

If login was carried out using the account name [myname] and [T&D Recorder for Windows] is the application being run, the saving location will appear in the application window as: [C:\Program Files\(Application)] but due to the [Virtual Store] function the actual saving location will be [C:\User\myname\AppData\Local\VirtualStore\Program Files\(Application)].

If the login was carried out from [Run as Administrator], the file will be saved to the folder as it appears in the application window.

Before Using...

Important Notes about the Installation Procedure (for using this product with USB communication).

Thank you for choosing T&D Products.

In order to use a USB connection to communicate between this product and a PC, it is necessary to install the application and the USB driver.

Before connecting this product to a PC with a USB cable, it is necessary to first install the application and the USB driver.

If you connect your device to your computer before installing the USB driver and the Wizard window pops up on the computer display, make sure to click the [Cancel] button in the window. Then disconnect the USB cable from the Unit.

For details about how to use, see [Basic Procedures] on P.10.

What is "T&D Recorder for Windows TR-5,7xU"?

■ An Overview

"T&D Recorder for Windows TR-5,7xU" is a software program that enables you to easily make recording settings for our Data Loggers, download recorded data from the loggers, and then process that data into graphs, tables and / or save that data to files or print. Upon opening "T&D Recorder for Windows TR-5,7xU", a launcher program will appear with several icons lined up. By clicking on an icon, a settings / communication display for the selected type of device or a graph display will appear.In order to use the software, the following operational environment is necessary.

Compatible OS: (*1)	Microsoft Windows 10 32 / 64bit English
	Microsoft Windows 8 32 / 64bit English
	Microsoft Windows 7 32 / 64bit English
	Microsoft Windows Vista 32bit (SP1 or later)English
Others	.NET Framework 3.5 SP1 is required.

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

■ Basic Functions

Recording Settings

Settings can be made for recording conditions such as channel name, recording interval, and recording mode. By making a recording start (date and time) setting in the main unit(s), the unit(s) will begin recording at that time on that date.

Graph Display / Printing

- **Simultaneous Display of 8 Ch. of Data**

It is possible to display up to 8 channels of downloaded data in 1 graph.

- **Zoom-in on Data by Mouse**

By simple mouse operations, you can easily zoom in and out on data as well as change the display.

- **View the High, Low, and Average Calculations for any Specified Period**

Make settings to specify the calculation range you desire and view the high, low and average value for that range in each channel displayed in the graph.

Graph Printing

It is possible to print in full-color the graph as you see it on display.

Data List Display / Printing

You can view the data displayed in the graph window as a list and then choose to print.

View in Easy to Distinguish Colors

In the data list, the highest value will appear in red, the lowest in blue, and the average in pink.

Printing the Data List

It is possible to print the entire list as displayed or to select pages for printing.

Creating Text File

It is possible to convert the data for a specified range (time period) to common text file format (CSV type format), so that it can be exported to spreadsheet software such as Excel or Lotus.

Possible to use with a mixture of device types (TR-5i Series, TR-73U)

It is possible to process recorded data from a mixture of device types.

> This manual has been written using °C as the standard unit of temperature. User's in the United States and elsewhere who would like to change the unit to Fahrenheit, can easily do so by making changes in the "Shift Unit" under "Editing the Graph".

Basic Procedures

■ USB Communication

TR-73U, TR-50U2, TR-57DCi

┌───┐
│ **Installing the provided software** see P.14 │
└───┘

Please follow the directions to install "T&D Recorder for Windows TR-5,7xU" .

▼

┌───┐
│ **Connecting the device** │
│ For TR-50U2, TR-57DCi: see P.21, For TR-73U: see P.23 │
└───┘

Enable communication by connecting the Data Logger / Data Collector or Communication Port to the computer with a USB cable.

Once the USB cable is connected, the USB driver will automatically be installed.

▼

┌───┐
│ **Making Recording Start Settings** │
│ See [Basic Functions] for each type of device │
└───┘

IMPORTANT:

Before making [Record Start] Settings make sure that your computer clock settings are correct. If your computer's clock is not correct, it will effect the date and time of the recording start.

▼

┌───┐
│ **Downloading Recorded Data** │
│ See [Basic Functions] for each type of device │
└───┘

Before downloading it is possible to make settings in the [Detailed Settings] to specify the what kind of processing should be done with the data after downloading, i.e. open a Graph or assign a file name and save.

IMPORTANT:

Before making Downloading Data make sure that your computer clock settings are correct. If your computer's clock is not correct, it will effect the date and time of the data being downloaded.

■ Communicating via RS-232C

TR-57DCi

Installing the provided software see P.14

Please follow the directions to install "T&D Recorder for Windows TR-5,7xU".

▼

Connecting the device
see P.21,

Enable communication by connecting the Data Logger / Data Collector or Communication Port to the computer with the provided or optional Serial Communication Cable.

▼

Setting Up the Communication Port see P.24

Please follow the directions to install "T&D Recorder for Windows TR-5,7xU" .

▼

Making Recording Start Settings
see [Basic Functions] for each type of device

IMPORTANT:
Before making [Record Start] Settings make sure that your computer clock settings are correct. If your computer's clock is not correct, it will effect the date and time of the recording start.

▼

Downloading Recorded Data
See [Basic Functions] for each type of device

Before downloading it is possible to make settings in the [Detailed Settings] to specify the what kind of processing should be done with the data after downloading, i.e. open a Graph or assign a file name and save.

IMPORTANT:
Before making Downloading Data make sure that your computer clock settings are correct. If your computer's clock is not correct, it will effect the date and time of the data being downloaded.

Getting Ready

Installing the Software

IMPORTANT:

In order to install Software, it is necessary to have Administrator rights (Computer Administrator) for the computer in which you wish to install it.

1. Start Windows.

2. Place the CD-ROM in the appropriate drive.

 * If the window automatically appears, under [Install or run program], click on [Run start.exe].

3. The [Install Program] window will appear.

 * If the [Install Program] Window does not automatically open, please open it by double clicking on the CD-ROM icon in [Computer].

Install T&D Recorder for Windows TR-5,7xU
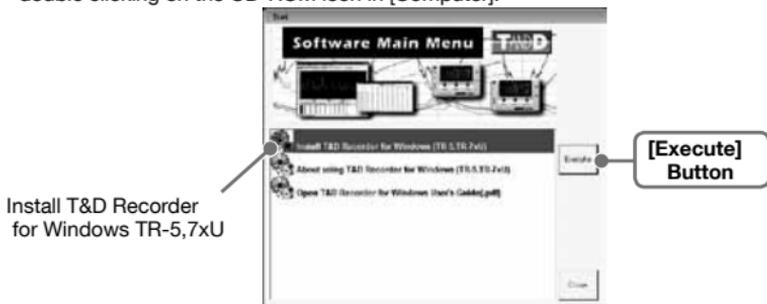
[Execute] Button

4. Select [Install "T&D Recorder for Windows TR-5,7xU"], then click the [Execute] Button, the [User Account Controls] window should appear.

5. Click [Next] to start the installation. Confirming the contents as you

go, install the software according to the directions.

6. If a window appears such as the one below during installation, click [Install] .

[Install] Button

7. After installation has been completed, "T&D Recorder for Windows TR-5,7xU" will be registered in the Windows Start Menu or Start Screen.

Operating the Software

■ Opening the Software

Open the program from "T&D Recorder for Windows TR-5,7xU" in the Windows Start Menu or Start Screen.
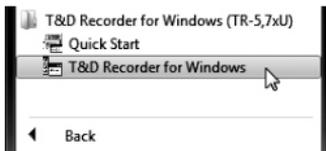
■ Main Window

Upon opening "T&D Recorder for Windows TR-5,7xU", a launcher window in which icons are displayed will appear. By clicking an icon, the graph, settings, and / or communication screen for that type of unit will be displayed.
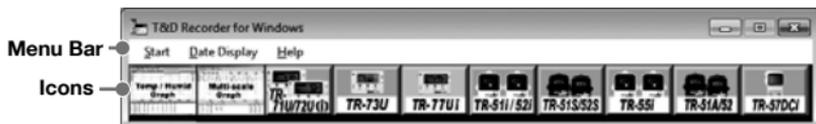
[Menu Bar]

In the [Menu] Bar are Menus containing an array of commands. Click on the desired menu in the menu bar to set or display functions for each type of device.

[Icons]

By clicking on an icon, the graph or communication display will appear for that type of unit. The graph and communication displays for each type of unit can also be viewed by clicking on that unit's type name in [Start] of the [Menu] Bar.

■ Quick Start (TR-73U/TR-50U2)

When Windows is started, the [Quick Start] will be automatically started.
When a TR-50U2 or TR-73U Series device is connected to your
computer, the Quick Start will make a search and automatically open
the application.

How to Quit / Restart Quick Start

Please see below for how to quit the Quick Start function and how to restart it
again.

[Quitting from the Taskbar]

1. Click the Quick Start icon in the Task tray to view the popup menu; in the
popup menu click on [Quick Start Settings] .

Click the Quick
Start icon

| Open TR-71U(i)/72U(i), TR-77Ui |
| Open TR-73U |
| Quick Start Settings... |
| Version Info... |
| Exit Quick Start |
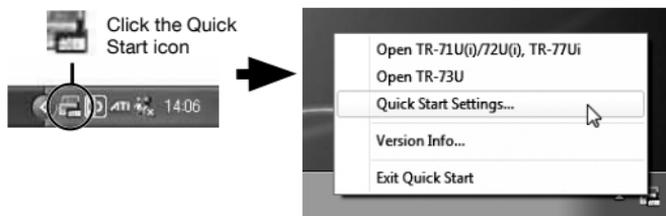
2. Place a check next to [Do not use "Quick Start] and click the [OK] Button.

Check
here

☑ Do not use "Quick Start"

If you are not using TR-71U(i)/72U(i)/73U/77U/50U/50U2 units,
you do not need to have this Quick Start application open.
(It is used to find TR-71U(i)/72U(i)/73U/77U/50U/50U2 units that
have been connected.)

If you would like to open it at a later time,
in the [Software Settings Window] put a check in the check box
next to [Upon connecting a ThermoRecorder, open the software
program].

[OK]
Button

OK

Cancel

[Re-start from the Start Menu or Start Screen]

In the Window's Start Menu, from the list of programs click on [T&D Recorder for Windows (TR-5,7xU)] - [Quick Start] to restart the application. In the Start Screen, click on [Quick Start] directly. .

[Quit / Start from each application]

1. Click on one of the icons (TR-73U, TR-51i / 52i or TR-55i) in the Launcher Window.

2. Click [Software Settings] in the [Settings] Menu.

[Settings] Menu
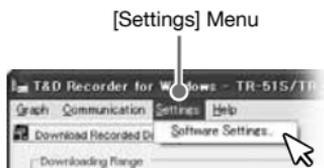
3. Remove the check mark from next to [Upon Connecting a Thermo Recorder, open the software program.] and click the [OK] Button.

With no checkmark: Quick Start will be disabled
With a checkmark: Quick Start will be enabled

[OK] Button
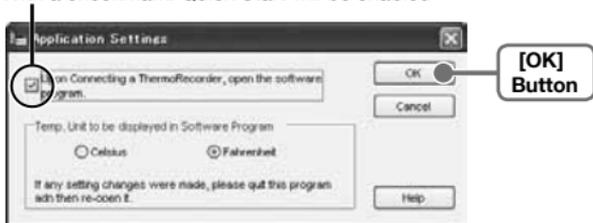
■ Help

Detailed information on the software can be found in the Software Help Menu.

"T&D Recorder for Windows Help"

See the [Help] Menu of the software for more detailed information about how to use the software.

To search for unclear words or terms, click the [Help] Menu that appears in the [Menu] Bar and then click on one of the tabs [Contents], [Index] or [Search].

[Contents]   [Index]   [Search]
Tab   Tab   Tab
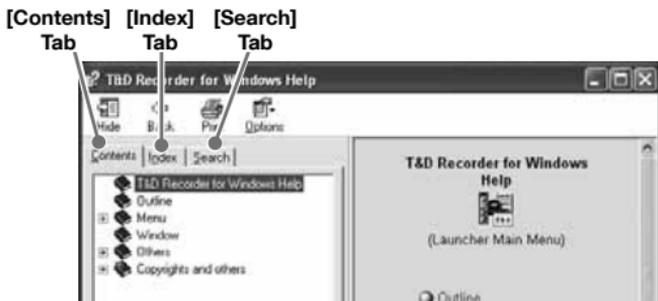
[Contents] Tab
By clicking the mark of the classified topic, an explanation will be displayed.

[Index] Tab
Select a key word from the key word list and by clicking the [Display] Button, the explanation will be displayed.

[Search] Tab
Enter the key word you wish to search for and click the [Start Search] Button and the topic in which the key word is included will be displayed. Then select the topic and click the [Display] Button to have the explanation displayed.

* Click on the [Help] Button in any dialog box and explanations about the dialog box will be displayed.

* In the graph display window, after clicking on the [🔼] in the toolbar, you can click on any Menu, any Icon, or any part of the Main window and an explanation will be displayed.

"Help for Unit Recognition Failure"

This contains information about how to check whether the USB driver has been properly installed.

About "T&D Recorder for Windows"

This shows the Version Info for the software.

■ Date Display Format Settings: [Date Display] Menu

The date format chosen will be applicable for all sections of the software including graphs and setting displays.

1. In the [Date Display] Menu, select [Format Settings] .

2. Check either [Month / Date / Year] or [Date / Month / Year] .
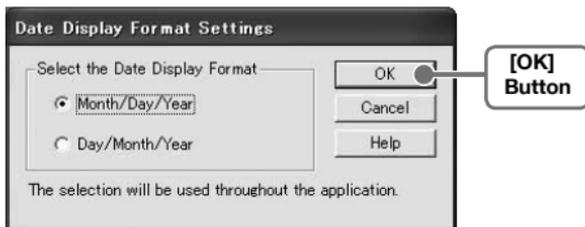
[OK] Button

3. By clicking the [OK] Button, the setting will be completed.

Connecting a Data Collector or Communication Port to the Computer

■ For TR-50U, TR-57DCi

Connect the USB cable (US-15C) to your computer.

USB Port Mark

The USB cable is a USB-A Plug / USB mini-B plug type.
Please connect to a place with this kind of mark.

USB Port

Data Collector **TR-57DCi**

Communication Port **TR-50U2**

USB mini-B Plug

USB Cable (US-15C)

USB-A Plug
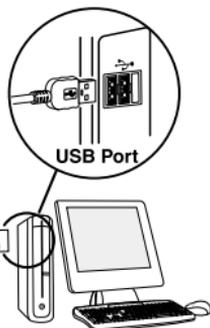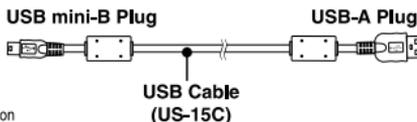
- *Before using, it is necessary to have installed the USB device driver.*
- *Make sure that the USB cable is inserted fully, so as not to cause an improper connection.*

■ For TR-57DCi

Connect the RS-232C (Serial) communication cable to your computer.

Examples of serial port

The communication cable connector is a D-Sub 9 pin female. Connect to a place with a mark as such.

D-Sub 9 pin female

Data Collector **TR-57DCi**

RS-232C Serial Cable (option: TR-07C)
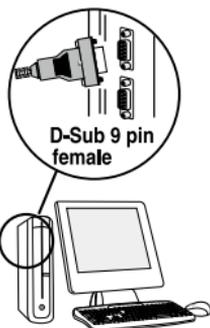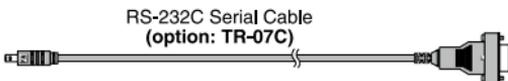
- *Make sure to connect it to the correct place to ensure communication.*
- *Make sure that the cable is inserted fully, so as not to cause an improper connection.*
- *Make all necessary Communication Port Settings in the Settings / Communication window for the Data Logger you are using. For details, see [Communication Port Settings] P.24.*

Connecting the Data Logger to the Computer

Connect the Data Logger to the computer using the appropriate method for that type of Data Logger.

■ For Data Logger with Optical Communication

Compatible Loggers: TR-51i / 52i / 55i

1. Connect the Communication Port to your computer using the provided communication cable.

Communication Cable

Data Collector or Communication Port
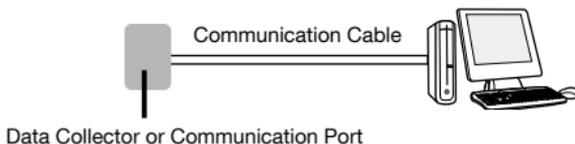
2. Place the Data Logger on top of the Communication Port device as shown in the figure, making sure that the optical communication spots are aligned properly.

TR-57DCi (Data Collector)

Place the Data Logger face down

Communication cable connected to your computer
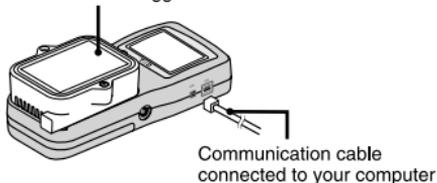
TR-50U2 (Communication Port)

Place the Data Logger face down

Communication cable connected to your computer
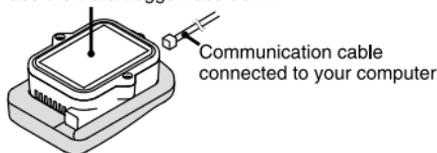
- Among the above Data Collector and Communication Port devices, the TR-55i is compatible with TR-57DCi, TR-50U2 only.

■ For TR-73U

Connect the TR-73U to your computer with the USB Communication Cable (US-15C).

If necessary, serial communication can be established by using our TR-73U communication protocol (contact your local dealer) to write a software program. In this case, it will be necessary to connect to your computer using our optional serial communication cable (TR-07C). Please contact your local provider for more details.

USB Port Mark

The USB cable is a USB-A Plug <->USB mini-B plug type. Please connect to a place with this kind of mark.

USB Port

USB mini-B Plug

USB-A Plug

TR-73U

USB Cable (US-15C)
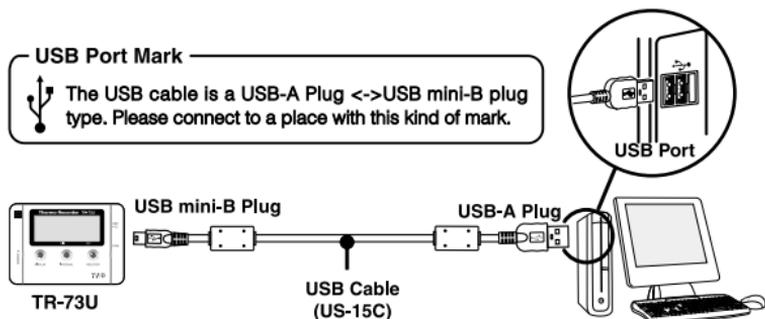
IMPORTANT:

- To ensure proper communication, make sure that the USB cable connection is secure.
- For more details about the use of "Thermo Recorder for Windows (E)" please refer to the PDF file contained in the CD-ROM.
- If the place of connection is incorrect, communication will not occur.
- To ensure proper communication, make sure that the communication cable connection is secure.

Serial cable already connected to computer.
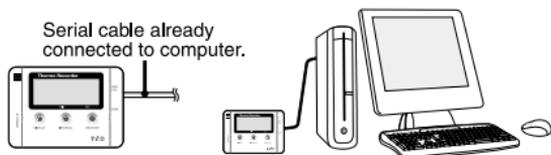
- The optional serial communication cable TR-07C is necessary for serial communication with PC.

Setting Up the Communication Port

Settings for both USB and RS-232C communication can be made from the same window. It is also possible to confirm current communication settings.

IMPORTANT:
- *When using TR-7U / 7Ui Series units, it is not necessary to make COM Port Settings.*
- *When using USB, the USB driver must be properly installed for USB communication to properly work.*

■ For using USB

1. Place the Data Logger face down on top of the Data Collector or Communication Port to enable optical communication.

2. Connect the USB cable to your computer.

3. Open the appropriate application for the type of device being used.

Make settings with TR-5i Series, TR-57DCi units. By making settings for one unit the same COM Port settings will be made for all device types.

4. In the [Communication] Menu open [Communication Port Settings].

[Communication] Menu

5. Check [USB].
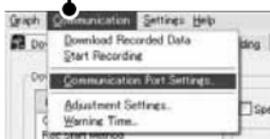
Check [USB]

[Set] Button

6. Click the [Set] button to finish settings.

■ For using RS-232C

Make necessary Serial Port Settings to enable communication via RS-232C serial communication cable.

1. Place the Data Logger face down on top of the Data Collector or Communication Port to enable optical communication.

2. Connect the RS-232C serial communication cable to your computer.

3. Open the appropriate application for the type of device being used.

Make settings with TR-5i Series, TR-57DCi units. By making settings for one unit the same COM Port settings will be made for all device types.

4. In the [Communication] Menu open [Communication Port Settings].

[Communication] Menu
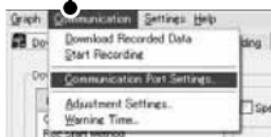
5. Check [Communicate via RS-232C].

6. Make settings for "Possible COM Ports".

Check [Communicate via RS232C]

[Set] Button

Setting [Possible COM Ports]

Check here, when using Communication Port above COM9

7. Click the [Set] button to finish settings.

■ For an Automatic Search: [Auto-Detect] button

1. Place the Data Logger face down on top of the Data Collector or Communication Port to enable optical communication.

2. Connect the communication cable (USB or RS-232C) to your computer.

3. In the [Communication Port Settings] Window, check [USB] or [Communicate via RS-232C] and click on the [Auto-Detect] button.

[Auto Detect] Button

4. After the search has been completed, a message will appear.

5. If the unit has properly been detected click the [Yes] button.

IMPORTANT:

- If no unit was detected, see "Troubleshooting" on P.94

- If the port number being used is COM9 or above the unit can not be automatically detected.

Basic Function

TR-73U: Basic Functions

■ Display Names and Functions

[Menu Bar, Toolbar, Device List, Device Properties labels point to the application window, with Settings Area label]
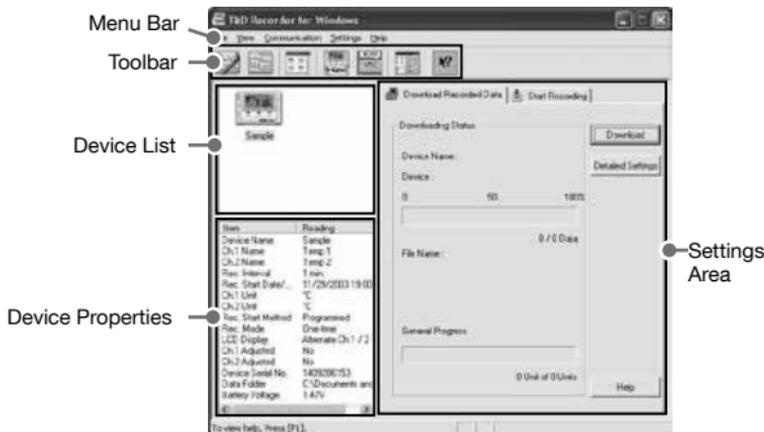
[Menu Bar]

The menus along the bar contain various helpful commands. From each menu, you can select commands to view or make settings for each of the device types.

[Toolbar]

The commands that are used most frequently have been arranged as buttons.

[Device List]

TR-73U connected to the computer by USB cable will be displayed as icons here. In order to make recording settings or download recorded data, it is necessary to first select a device from the device list. The type of icon used in the display can be changed in the [View] Menu.

[Device Properties]

Information about the device selected in the device list will be displayed here. If more than one data logger has been selected no information will be displayed.

[Settings Area]

By clicking on the [Download Recorded Data] Tab or the [Start Recording] Tab, you can open the settings display for that function.

TR-73U: Starting Recording

Connect a TR-73U to your computer so that communication can occur. Please make sure that your computer clock settings are correct.

- Please see P.23 for more information about how to connect.
- The first time you connect it is necessary to install the USB device driver. For information about how to install the device driver please see the TR-73U User's Manual.

1. In the Main Window, click on the [TR-73U] icon.

2. Click on the icon of the Data Logger you wish to make settings for.

3. Click the [Start Recording] Tab, and make the necessary settings.
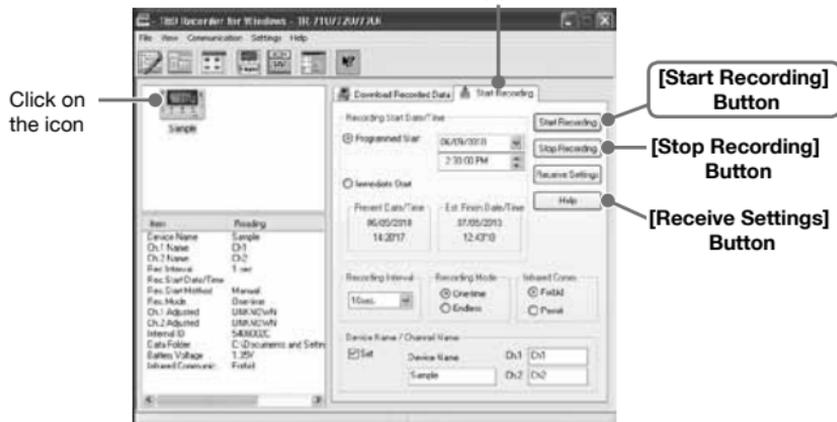
Recording Start Date / Time

(Selections from: Programmed Start / Immediate Start)
Programmed Start: recording will start on the specified date and time.
Immediate Start: recording will start immediately upon completion of settings.

Recording interval

(Select from:1, 2, 5, 10, 15, 20, 30 seconds1, 2, 5, 10, 15, 20, 30, 60 minutes)
Click on [▼] and select the desired recording interval from the drop-downlist.

Recording Mode

(Selections from: One-time / Endless)

One-time: When the possible number of recorded data readings(8,000 readings per channel) is reached, recording stops.

Endless: When the possible number of recorded data readings is reached, the oldest data is overwritten and recording continues.

Device Name / Channel Name

Make settings for each data logger concerning the device names and channel names.

Device Name: Up to 32 characters

Channel Name: Up to 16 characters

4. After having completed the recording conditions settings, transmit the settings to the data logger by clicking the [Start Recording] Button.

5. After the transmission has been completed, a message will appear; click the [OK] Button to activate the settings.

[Stop Recording] Button

Clicking this Button will stop a recording session already in progress.

[Receive Settings] Button

Clicking this will allow you to view recording condition settings and recording status information from the data logger.

TR-73U: Downloading Recorded Data

Connect a TR-73U to your computer so that communication can occur.

- *Please see P.23 for more information about how to connect.*
- *The first time you connect it is necessary to install the USB device driver. For information about how to install the device driver please see the TR-73U User's Manual.*

1. In the Main Window, click on the [TR-73U] icon.

2. Click on the icon of the Data Logger you wish to download data from.

3. Click the [Download Recorded Data] Tab.

[Download Recorded Data] Tab

Select a data logger

[Download] Button

[Detailed Settings] Button
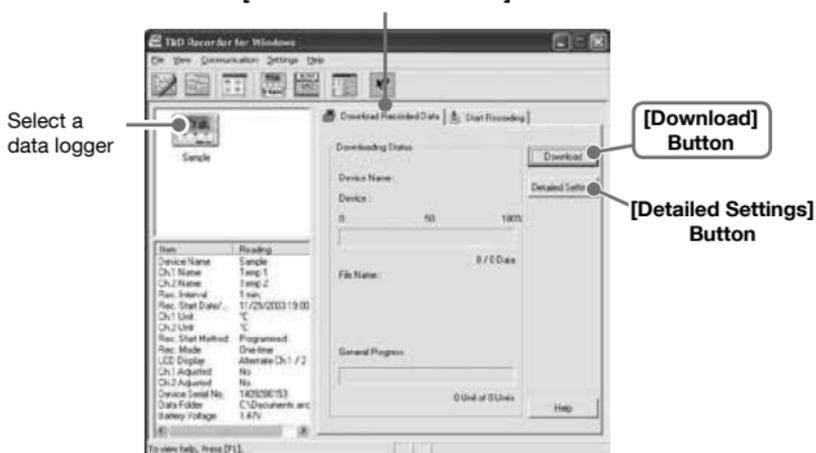
4. If you wish to automatically display the graph upon the completion of downloading, click the [Detailed Settings] Button to make such a setting.

* For more information about [Detailed Settings] see next page.

5. Click the [Download] Button to begin downloading data.

6. After downloading has been completed a graph will be displayed.

■ Detailed Settings

Make settings about how to process downloaded recorded data.
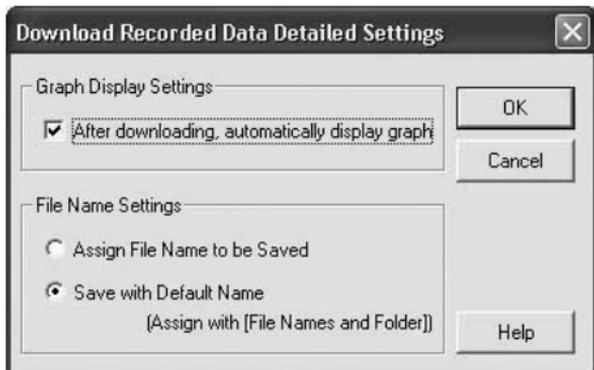
[Graph Display Settings]

By checking here, the graph for the downloaded data will automatically appear after downloading is completed.

Up to 8 channels of data can be simultaneously displayed.

IMPORTANT:
If there are more than 8 channels of data, that data cannot be displayed automatically and must be opened from the data file.

[File Name Settings]

You can choose to save downloaded data using a default file name or by assigning a name each time.

1. Choose the type of processing you desire.

2. By clicking the [OK] Button the setting will be completed.

 * You can specify the type of default file name under [File]– [File Names and Folders].

TR-73U: Other Functions

■ Open Temp / Humidity Graph: [File] Menu

Opens the Temperature / Humidity Graph.

■ File Names and Folders: [File] Menu

Specify how you wish the files to be named upon downloading recorded data. Also you can select in which folder to use to save data for each device.

[Default File Name Settings]

Check one from the [Default File Name Settings]

[OK] Button
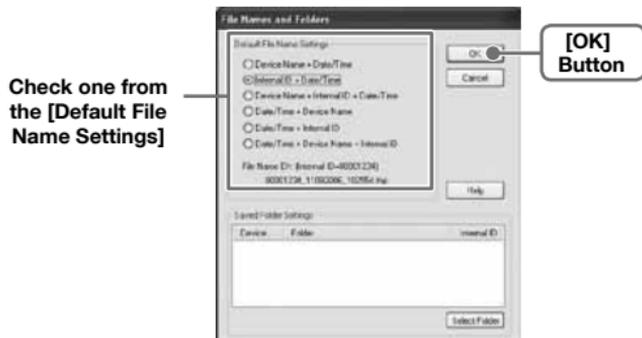
1. Check which type of file name you wish to use to save data.

Example:

Device Name: Refrigerator / Serial No.: 00001234 / Date and Time:
2003 / 05 / 12(yyyy,mm,dd)at 14:30: 15 / with Data Format Extension: TRX

- *Device Name+Date / Time: Refrigerator_20030512_143015.trx*
- *Internal ID +Date / Time: 00001234_20030512_143015.trx*
- *Device Name+ Internal ID +Date / Time: Refrigerator_00001234_20030 512_143015.trx*
- *Date / Time+Device Name: 20030512_143015_Refrigerator. trx*
- *Date / Time+Internal ID: 20030512_143015_00001234.trx*
- *Date / Time+Device Name + Internal ID: 20030512_143015_Refrigerator_00001234.trx*

2. By clicking the [OK] Button, the settings will be completed.

[Saved Folder Settings]

Assign a saving location for the data file.

Saving Location

Click here

[OK] Button

[Select Folder] Button

1. The TR-73U connected by USB cable to your computer will appear in the list.

2. Click the name of the device and then click the [Select Folder] Button.

3. The [Browse Folders] dialog box will appear where in you can select the folder into which you wish to save the data, then click [OK].

4. A [Data Folder] will then appear under Device Properties in the Main Window.

   * The default setting will create and save data to a folder with the device's serial number in the same folder where T&D Recorder for Windows was installed.

■ Large Icon / Small Icon: [View] Menu

Changes the icon size in the Device List between large and small.

Large Icon

Small Icon
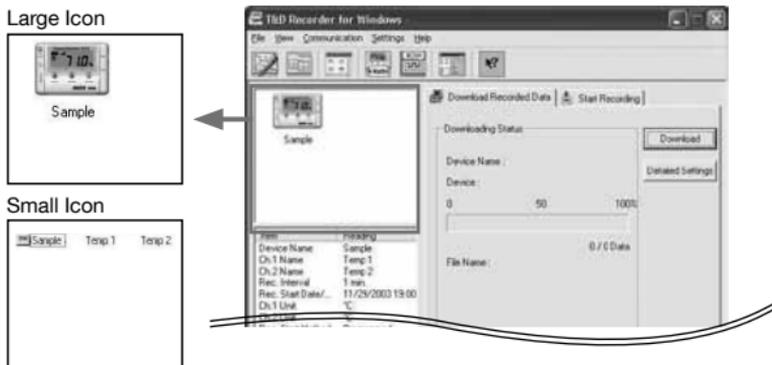
■ Monitor Current Readings: [Communication] Menu

You can monitor at set intervals the current readings of Data Logger or loggers selected from the device list and have those readings displayed.

[Clear] **Button**
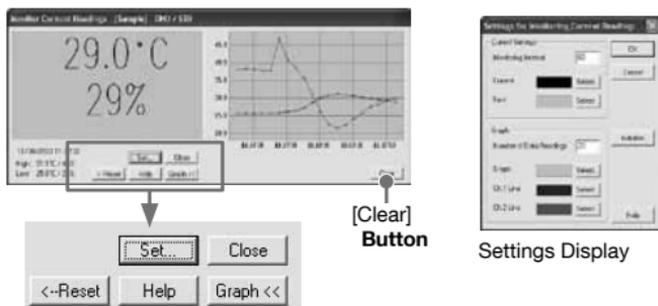
Settings Display

[Settings] Button:

This opens a window where settings can be made for the display colors and the monitoring interval for current readings.

[Close] Button:

Quit the Monitoring of Current Readings.

[Reset] Button:

Click to reset the display for highest and lowest measurements; the new display will show highest and lowest measurements from the time of resetting.

[Graph] Button:

Click this to hide or view the graph.

[Clear] Button:

Clicking this will clear the graph and a new graph will be drawn from that point.

■ Search for TR-73U: [Communication] Menu

If a TR-73U is connected, but does not show up in the Device List, click this to search for Thermo Recorders by scanning the USB ports.

■ Device Name Settings: [Settings] Menu

Settings can be made for Device Names and Channel Names.

Enter a name →

[Send Settings] Button

1. Enter a name.

- *Device Name: up to 32 characters*
- *Channel Name: up to 16 characters.*

2. By clicking the [Send Settings] Button, the changes will be completed.

■ LCD Display Settings: [Settings] Menu

Settings can be made for the Thermo Recorder's LCD display, such as, changing the temperature unit and turning the display on or off.

[Temp. Unit in Display]

Check one of these

[Send Settings] Button
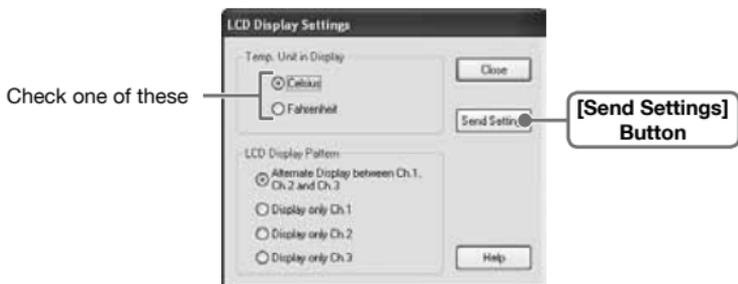
1. Check either Celsius or Fahrenheit.

2. By clicking the [Send Settings] Button, the changes will be completed.

[LCD Display Pattern]

[Send Settings] Button
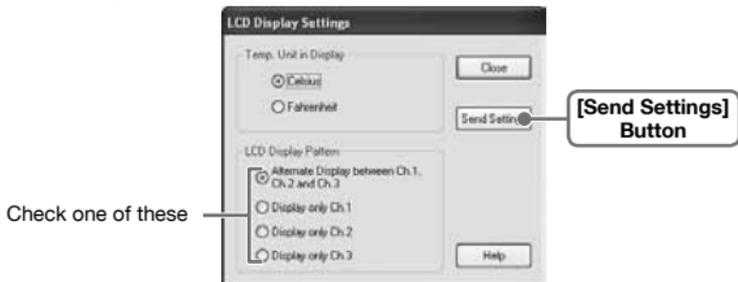
Check one of these

* You can select the LCD display from 4 patterns: Alternate display among Ch.1, Ch.2 and Ch.3, Display Ch.1 only, Display Ch.2 only or Display Ch.3 only.

1. Check one of the patterns.

2. By clicking the [Send Settings] Button, the changes will be completed.

■ Adjustment Settings: [Settings] Menu

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.

Rough Guidelines for Adjustment

1. point Adjustment: Use when measuring in a range of ±20ºC.

2. point Adjustment: Use when measuring in a wide range.

IMPORTANT:
- *When adjusting at 2 points, make sure the difference in points is at least 10ºC.*
- *When measuring in a wide range and adjusting at 2 points, make sure that the adjustment values reflect the range you are measuring.*
- *We cannot guarantee that after carrying out adjustment the measuring accuracy will improve for all measuring ranges.*

1. Check the channel you wish to adjust.

2. Place a checkmark next to either [1 Point Adjustment] or [2 Point Adjustment] and enter the [Before] and [After] values.

3. By clicking the [Send Settings] Button, the adjustment settings will be completed.

> * The Data Logger can store up to 4 adjustment values, the adjustment history will display up to 4 channels at one time.

[1 Point Adjustment]

This adjustment method changes only the offset (b) where the slope (a) is considered 1.

For example, TR-73U is measuring 10ºC, but the standard says the actual measurement should be 10.2ºC. Enter 10 in the Before Adjustment box and 10.2 in the After Adjustment box. The conversion equation will be $Y=X + 0.2$ and for all measurements an adjustment to the offset of +0.2 will be made.

[2 Point Adjustment]

The adjustment equation will be calculated from two points: the slope (a) and the offset(b).

For example, the TR-73U reads 0ºC when the standard thermometer reads 0.4ºC, and TR-73U reads 10ºC when the standard says the true measurement is 10.2ºC. In this case the slope(a)is $10.2 - 0.4 / 10-0 = 0.98$. The offset is 0.4, so the conversion equation becomes $Y = 0.98X + 0.4$. The range of the slope is $0 < a <= 2$. Entries are valid to one decimal point, but after calculation up to four digits are valid for the slope and offset.

[Initialize] Button

This returns the control settings back to their original factory default settings.

[Save File] Button

Assign a name to the adjustment setting values and save them to a file.

[Read File] Button

Read adjustment setting values from a saved file.

■ Software Settings: [Settings] Menu

General software settings for TR-73U can be made here.

[Upon connecting a Thermo Recorder, open the Software Program]

This setting opens the software program upon the connection of a TR-73U unit via USB cable. If the setting is ON, the Quick Start Program will periodically communicate with the device driver and upon the detection of a USB connection will open the main software program.

* For more details about [Quick Start] and how to quit it, see P.17.

1. Place a check next to [Upon connecting a Thermo Recorder, open the Software Program].

With no checkmark: Quick Start will be disabled
With a checkmark: Quick Start will be enabled

[OK] Button

2. Click [OK] to complete the setting.

[Temp. Unit to be displayed in Software Program]

Select whether to use Celsius or Fahrenheit as the displayed unit of temperature when monitoring current readings and using the adjustment function.

1. Check either unit of temperature (Celsius or Fahrenheit).

Check here

[OK] Button
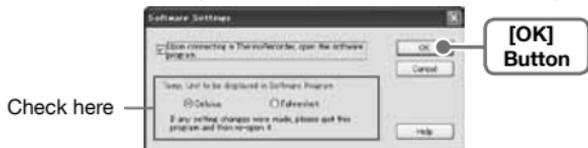
2. Click [OK] to complete the setting.

3. After completing settings, please close the TR-73U program and reopen it to make settings effective.

TR-51i/52i/55i: Starting Recording

IMPORTANT:

If the computer system clock is incorrect, a programmed recording start may not start properly. Please make sure that your computer clock settings are correct.

1. Connect the Data Logger you wish to make settings for to your computer.

* For details about connecting to your computer, see P.22.

2. In the Launcher Window, click on one of the icons [TR-51i/52i], [TR-55i], and the settings window will appear.

For TR-51i / 52i

[Start Recording] Tab

[Start Recording] Button

[Receive Settings] Button

[Stop Recording] Button

[Warning Settings] Button

For TR-55i

[Detailed Settings] Button

Recording Start Method

- Programmed Start: Recording starts on the set date and time.
- Immediate Start: Recording starts immediately upon completion of the settings.

Recording Interval

Select from 15 choices: 1, 2, 5, 10, 15, 20 and 30 (seconds) / 1, 2, 5, 10, 15, 20, 30 and 60 (minutes). Select the desired interval from the list in the Recording Interval Box. (Default setting is 10 min.)

Recording Mode

One-time: Upon reaching the storage capacity of 16,000 readings, the word [FULL] will appear on the LCD display and recording will automatically stop.

Endless: Upon reaching the storage capacity of 16,000 readings, the oldest data is overwritten and recording continues.

  * The estimated finish date and time of recording in One-time mode will be automatically calculated from the set recording interval and starting time.

Channel Name

By placing a check in the [Set] box, you can enter a channel name with up to 8 characters.

Unit of Temperature

(Selections from : Celsius [$^{\circ}C$] or Fahrenheit [$^{\circ}F$])

Change the display of temperature on the data logger between [$^{\circ}C$] and [$^{\circ}F$].

Infrared Comm.

Forbid: Infrared Communication will not be possible.

Permit: Infrared Communication will be possible.

  - If you are using TR-57DCi and do not wish to use infrared communication, we suggest selecting "Forbid". (Battery life will be longer.)
  - Forbid / Permit settings for infrared communication can also be made from [Infrared Communication Settings] in the [Communication] menu.

3. After making the necessary recording condition settings, click the [Start Recording] button and the settings will be transmitted to the Data Logger.

4. When a transmission result message appears, click the [OK] button to complete the setting procedure.

[Receive Settings] Button

Use this button to read the settings from the connected Logger.

[Stop Recording] Button

Use this button to stop recording.

[Warning Settings] Button (TR-51i/52i)

See the next page.

[Detailed Settings] Button (TR-55i)

See P.44.

[Warning Settings] Button (TR-51i/52i): Warning Monitoring Function

Starting the Warning Monitoring Function

If these settings are made in an environment where one of the limits is being exceeded and recording is started, the monitoring function will enter "wait" mode. Once a measurement returns to within the set limits, the monitoring function will begin to operate.

1. By clicking the [Warning Settings] button in the [Start Recording] tab, the settings window will appear.

2. Place a check in the [Set Limits] box after entering the Upper and Lower Limits and the Judgment Time.

[OK] Button

By placing a checkmark here the settings will become active.
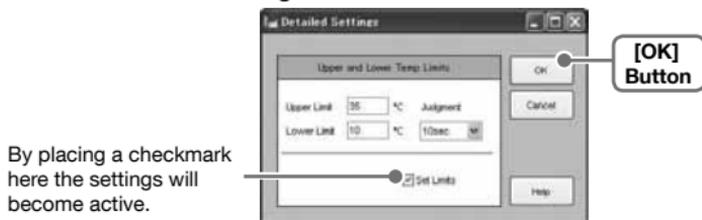
[Upper Limit / Lower Limit]

The Upper / Lower Limits can be set in a range from -60ºC to 155ºC.

When you wish to change the unit of temperature, go to the [Settings] Menu, open the [Software Settings], and edit temp. unit.

[Judgment Time]

A warning occurs when a measurement exceeds one of the set Upper / Lower Limits for longer than the time set as the Judgment Time. The warning LED will flash and a warning message will appear on the LCD screen.

  * The judgment time can be set from the following selections: 10, 15, 20, 30 seconds or 1, 2, 5, 10, 15, 20, 30, 60 minutes.

3. By clicking the [OK] button, a confirmation message will appear.

4. By clicking the [OK] button again, you will be returned to the [Start Recording] Tab Window and the settings will be completed.

[Detailed Settings] Button (TR-55i): Detailed settings can be made for each type of measurement item.

About the Detailed Settings

The [Detailed Settings for Recording Start] window will appear with different setting items depending on the measurement item. After having made the necessary settings, click the [OK] button. You will be returned to the [Start Recording] Tab Window. By clicking the [Start Recording] button, the settings will be transmitted to the Data Logger.

When TR-55i-TC/55i-Pt Connected:

When TR-55i-mA Connected:

When TR-55i-V Connected:

When TR-55i-P Connected:

[Sensor Type] (TR-55i-TC/55i-Pt)

Select the type of sensor to be used for the measurement.

[Recording Method] (TR-55i-V/55i-mA)

Select the recording method to be used by the Data Logger.
Instantaneous Value: Records the instantaneous value at the set recording interval.
Average Value: Records the value as the average of the measurements taken during the set recording interval.

[Measurement Range] (TR-55i-V)

Select the range to be used for measurement and in the display of the Data Logger.
V: Measurement range for the Input Module is set to V Range. The LCD for the TR-55i-V can display from 0.000V to 22.00V (auto decimal point).
mV: Measurement range for the Input Module is automatically switched from "mV Range" to "V Range" depending on the measurement. Input voltage range in the TR-55i-V LCD is 0.0mV to 999.9mV (fixed decimal point).

[Preheat] (TR-55i-V)

Select whether to use the preheat function or not. For details about the preheat function, see below.

[Preheat Time] (TR-55i-V)

When using the preheat function, make settings for the length of time to send current to the sensor. See below for details.

What is the Preheat Function?

Preheat is a function which allows the Data Logger to control power to the connected sensor. It transmits a preheat signal that is synchronized with the recording interval to turn sensors ON before and OFF after measuring and recording.

What is the Preheat Time?

When using the preheat function, this stands for the length of time to send current to the sensor before measurement and recording is set to occur. Setting the preheat time to a value that is equivalent to or longer than the recording interval will supply current to the sensor at all times.
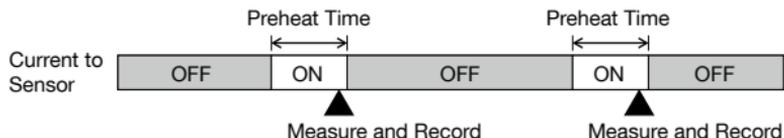
IMPORTANT:

- *When using the preheat function, the LCD display will be refreshed based on the recording interval set in the Data Logger (because sensors only carry out measurement at the set recording time).*
- *The necessary preheat time varies depending upon the sensor to be used; please check the specifications of the sensor before making settings for the preheat time.*

[Pulse Signal Type] (TR-55i-P)

Make settings for the pulse signal type to be recorded.
Rising: Records the number of rising pulses during the set recording interval.
Falling: Records the number of falling pulses during the set recording interval.

[LCD Display] (TR-55i-P)

Make settings for the display method for what value is to be shown in the LCD of the Data Logger.
Pulse Rate: Displays the most recent pulse count in the amount of time set as the recording interval. The display will be refreshed every one-sixtieth of the recording interval. (When the recording interval is less than one minute, the refresh interval will be one second.)
Total Pulse Count: Displays the cumulative number of pulses from 0 to 9999. The displayed count will be refreshed every one second, and upon exceeding 9999, the count will start over again from 0.

[Chattering Filter] (TR-55i-P)

Select whether or not to use the filter circuit for the chattering which occurs due to changes in polarity.

[Target Item for Warning Monitoring] (TR-55i-P)

Select the target item from Pulse or Event (rising or falling) and judgement time for warning monitoring.

For Pulse
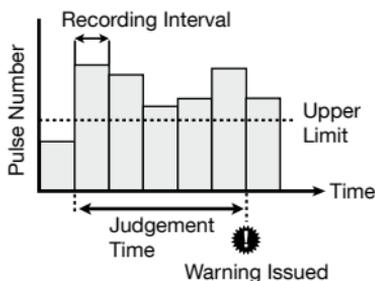
For Event
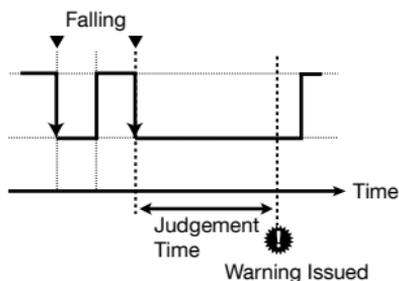
[Warning Monitoring] (The setting items vary depending upon the measurement item.)

If these settings are made in an environment where one of the limits is being exceeded and recording is started, the monitoring function will enter "wait" mode. Once a measurement returns to within the set limits, the monitoring function will begin to operate.

[Upper Limit / Lower Limit]

The possible setting range varies for each sensor. If the entered value is outside the acceptable range, a warning message will appear.

[Warning Judgement Time]

A warning occurs when a measurement exceeds one of the set Upper / Lower Limits for longer than the set Judgement Time. The warning LED will flash and a warning mark will appear on the LCD screen.

* The judgement time can be set from the following selections: 10, 30 sec. or 1, 2, 5, 10, 15, 20, 30, 45, 60 min.

TR-51i/52i/55i: Downloading Recorded Data

IMPORTANT:
If the Data Collector clock is incorrect, the date and time for wireless recording start and the downloading of data may be incorrect. Please make sure that the Data Collector clock is correct.

1. Connect the Data Logger you wish to make settings for to your computer.

* For details about connecting to your computer, see P.22.

2. By clicking on one of the icons [TR-51i/52i], [TR-55i] in the Launcher, the settings window will appear.

3. Click the [Download Recorded Data] Tab to make settings for the download conditions.

[Download Recorded Data] Tab

Place a check here to specify data by time.

[Download] Button

[Detailed Settings] Button

4. Click the [Download] button to start downloading.

[Detailed Settings] Button:
Making Settings for Processing after Downloading

Settings can be made for the data processing method after downloading.
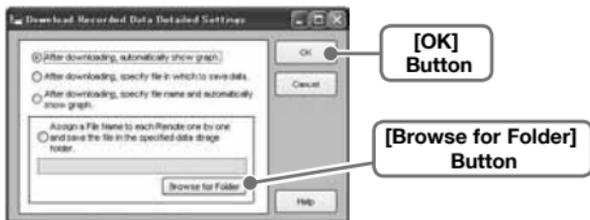
[After downloading, automatically show graph.]

Downloaded data will be automatically saved into a file, and the graph will appear.

* File names cannot be specified.

[After downloading, specify file in which to save data.]

The [Save File] dialog box will appear after downloading, where you can assign a name to the file to be saved.

* Graph will not be displayed.

[After downloading, specify file name and automatically show graph.]

Downloaded data will be saved into a specified file, which can then be automatically viewed in graph form.

[Automatically save file.]

Downloaded data will be automatically saved into a specified folder.Click the [Saved Folder Settings] button to select the folder you wish to save the data into.

* If the folder has not been specified, the file will automatically be stored to the same folder into which the application was installed.

TR-51i/52i/55i: Other Functions

■ Checking for Warning Occurrences: [Warning Times] Button

IMPORTANT:
- When using Communication Port TR-50C, this function cannot be used.
- Even if more than one warning occurred, only the first one will be shown in the most recent list.

1. Connect the Data Logger to your computer to carry out communication. (See P.22.)

2. In the [Download Recorded Data] Tab Window, click the [Warning Times] Button.

[Download Recorded Data] Tab

[Warning Times] Button

3. By clicking the [Receive Most Recent Time] Button, it is possible to check warning times in the [Warning Occurrence Times] Column.

[Warning Occurrence Time] Column

**[Receive most recent time] Button**
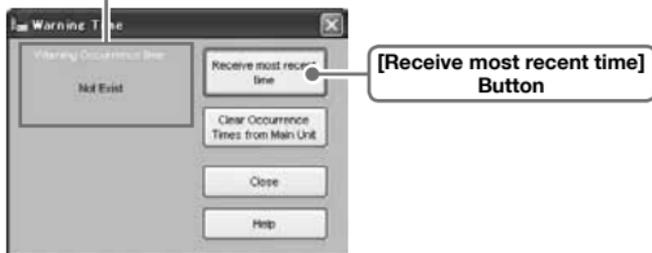
■ Removing a Warning Mark from the Data Logger Display

A warning LED can be removed from the Data Logger display by one of the following three methods:

[Clear Occurrence Times from Main Unit] Button

Connect the Data Logger to your computer, and click the [Clear Occurrence Times from Main Unit] button in the [Warning Time] display to complete the removal.

[Clear Occurrence Times from Main Unit] Button
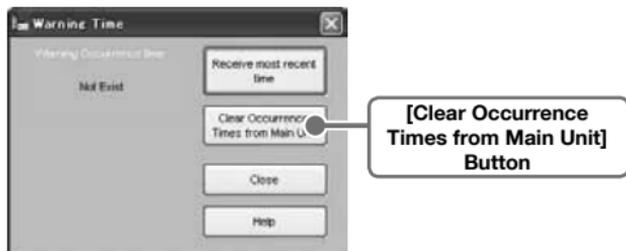
- *This will have no effect on the already recorded data; measurement and recording will continue without interruption.*
- *Confirm that in the Warning Occurrence Time Column, [None] appears.*

[Download Data]

Once data downloading has been successfully completed, the warning mark will disappear.

[Re-start a Recording Session]

The mark will disappear whenever a new recording session is started. (Recorded data will be erased.)

■ Software Settings: [Settings] Menu

[Upon Connecting a Thermo Recorder, open the Software Program]

This setting opens the software program upon the connection of a TR-51i/52i/55i unit via USB cable. If the setting is ON, the Quick Start Program will periodically communicate with the device driver and upon the detection of a USB connection will open the main software program.

  * For more details about [Quick Start] and how to quit it, see P.17.

1. Place a check next to [Upon Connecting a Thermo Recorder, open the Software Program].

[Settings] Menu

With no checkmark: Quick Start will be disabled
With a checkmark: Quick Start will be enabled

[OK] Button

2. Click [OK] to complete the setting.

[Temp. Unit to be displayed in Software Program]

Select whether to use Celsius or Fahrenheit as the displayed unit of temperature when monitoring current readings and using the adjustment function.

1. Check either unit of temperature (Celsius or Fahrenheit).

[OK] Button
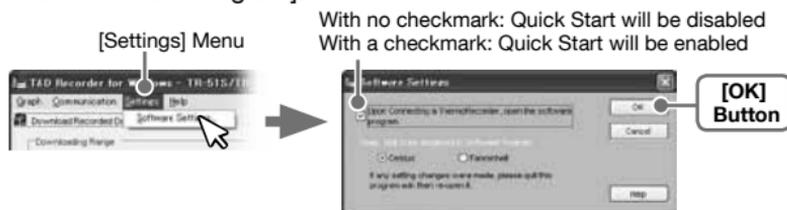
Selection
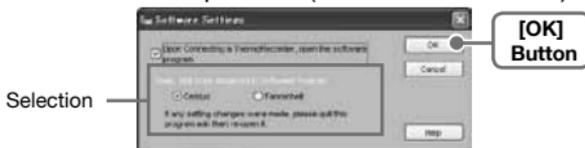
2. Click [OK] to complete the setting.

3. After completing settings, please close the TR-51i/52i/55i program and reopen it to make settings effective.

■ Adjustment Settings: [Communication] Menu

Adjustment is a function used to make adjustments to Remote Unit measurements. By making adjustments to measurements, the adjusted measurements will be displayed and recorded.

> ### *IMPORTANT:*
> - *We cannot guarantee that after carrying out adjustment the measurement, accuracy will improve for all measuring ranges.*
> - *If you remove a sensor that was connected when adjustment was carried out and then connect a different sensor, make sure to make new adjustment settings to reflect the actual situation.*
> - *When making "Adjustment Settings" for the TR-55i, the adjustment values will be saved to the Input Module. Therefore, when an Input Module is replaced, it is necessary to re-make any desired adjustment settings to be written into the newly connected module.*
> - *If new adjustment settings are made on already adjusted values, the probability of measurement errors will increase. Make sure to click the [Initialize] button before making any new adjustment settings on already adjusted values.*
> - *When you are carrying out adjustments and formulating equations, please take care with the settings and take personal responsibility for the process.*

1. Connect the Data Logger to your computer. (See P.22.)

2. In the [Communication] Menu, click [Adjustment Settings] to open the settings window.

Select the adjustment method and enter the values.

[Communication] Menu

[Send Settings] Button

[Initialize] Button

[History] Column
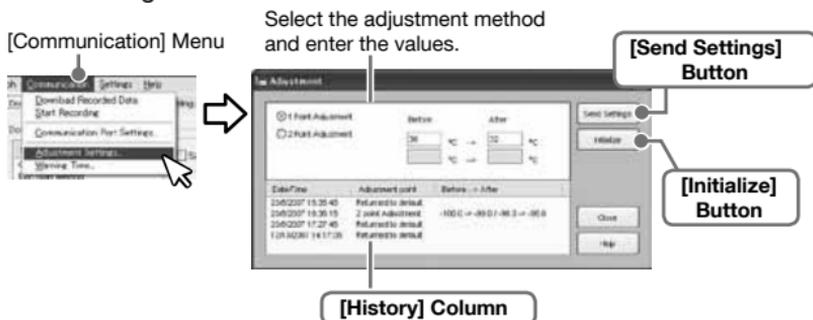
3. Check the Method of Adjustment: [1 Point Adjustment] or [2 Point Adjustment].
- *1 Point Adjustment: Use when measuring in a range of ±20ºC.*
- *2 Point Adjustment: Use when measuring in a wide range.*

4. Enter the actual measurement before adjustment in the [Before] box

and the desired measurement after adjustment in the [After] box.

* For "Rough Guidelines for Adjustment", see the next page.

5. By clicking the [Send Settings] button, a confirmation message will appear. Then click the [OK] button to transmit the adjustment settings.

[Initialize] Button

Clears any previous adjustment equation(s) and initializes the device.

[History] Column

The latest 4 adjustment history records will be displayed. The records show the date and time that adjustment settings were made, the adjustment point(s), and the values for "Before" and "After" adjustment.

■ Communication Port Settings: [Communication] Menu

Make settings for USB and / or RS-232C communicationIn the TR-51i/52i/55i [Communication] Menu open [Communication Port Settings].

Communication Port Settings Window
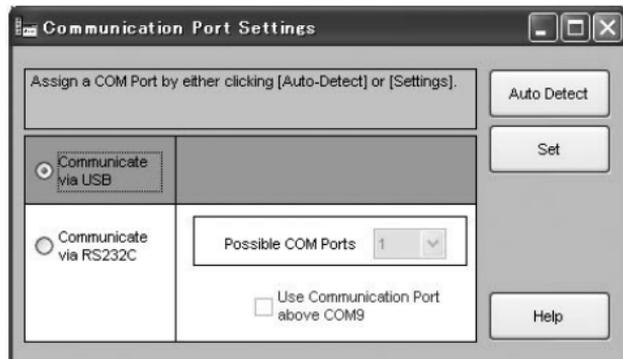
* For details about Communication Port Setting Procedures see P.24.

■ Scale Conversion: [Communication] Menu (TR-55i) Settings can be made here when measuring Voltage, 4-20mA, or Pulse with the TR-55i

This is the equation to be used for scale conversion. If desired, a string of characters can be input directly to show the "Unit of Measurement" for the value after scale conversion.

IMPORTANT:

The TR-55i LCD will not reflect changes in the value or unit of measurement after conversion.

Convert by using the equation: y=ax+b

Select this when the values for both the slope (a) and intercept (b) for the conversion equation are already known.

Enter these values in the equation where "x" is the actual input value (in V, m-A, or Pulse) from the sensor and "y" is the result of the conversion (in the specified unit).

IMPORTANT:

Make sure that the slope and intercept are values between –9,999 and +9,999. It is possible to enter decimals or minus values, but "zero" cannot be entered as the slope.

Convert by specifying 2 points:

Select this when both the input values from the sensor (in V, m-A, or Pulse) and the post-conversion values (in the specified unit) are known at two points. Please make settings after having consulted your sensor manual for details.


IMPORTANT:

- Make sure to enter values for the two points so that the slope and the y-intercept of the conversion equation fall within the range of –9999 to +9999.
- It is possible to enter decimals or minus values, but the slope cannot be zero. Also, make sure to make settings such that the value for "y" will fall between –80,000 and + 80,000.

TR-57DCi: Setting the Clock

IMPORTANT:

If the Data Collector clock is incorrect, the date and time for wireless recording start and the downloading of data may be incorrect. Please make sure that the Data Collector clock is correct.

1. Connect the Data Collector to the Computer.

   * For details about connecting to your computer, see P.21.

2. By clicking the icon for the "Data Collector" being used in the Launcher, the settings window will appear.

3. Click the [Set Clock] tab, and make the necessary clock settings.
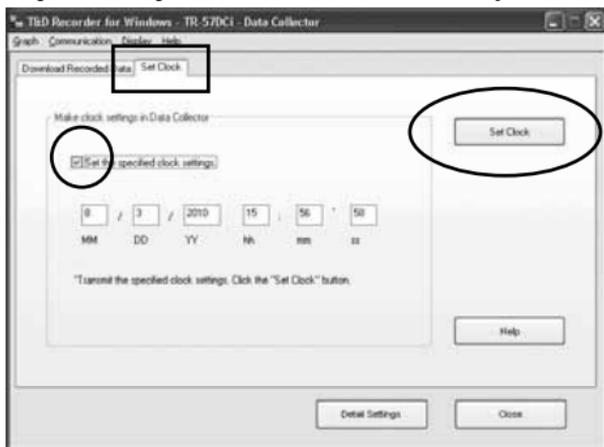
⊜ **Set the specified clock settings.**

If checked:

The date / time entered will be set as the date / time in the Data Collector.

If not checked:

The current date / time of your computer will be set as the date / time in the Data Collector.

4. After entering the settings, click the [Set Clock] button to have the settings sent to the Data Collector. When the confirmation message appears, click the [OK] button to complete the setting procedure.

TR-57DCi: Downloading Recorded Data

Here it is possible to download the collected data from the Data Collector to your computer.

IMPORTANT:
- If the computer system clock is incorrect, the date and time of the downloaded data may be incorrect. Please make sure that the computer system clock is correct.
- If you are unsure of what version you have, please check the version information in the Data Collector's [Help] menu.
- When using TR-57DCi (Data Collector) to collect data from TR-73U, TR-74Ui and TR-76Ui(Remote Units), the "Unit Type" in the recorded data list will be shown as "TR-73U" / "TR-74Ui" / "TR-76Ui". TR-57DCi is the only compatible Data Collector for TR-73U/74Ui/76Ui.

■ Gathering Data Collector Info

1. Connect the Data Collector to your computer.

  * For details about connecting to your computer, see P.21.

2. By clicking the icon for the "Data Collector" being used in the Launcher, the settings window will appear.

3. Click the [Download Recorded Data] tab, and then click the [Collect Data Info] button to start the gathering of info.

[Download Recorded Data] Tab

Data Collector Contents List
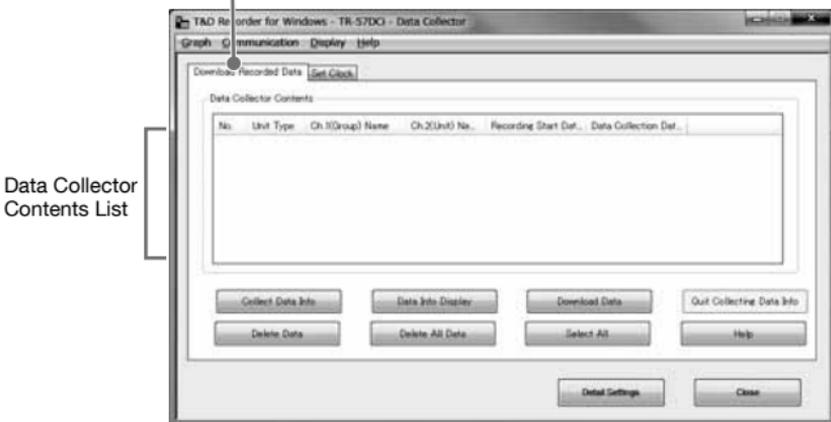
IMPORTANT:
By using TR-57DCi, it is also possible to collect data from TR-73U/TR-74Ui/TR-76Ui.

4. When communiscation has been completed, the data info will appear in the "Data Collector Contents" List.

No.	Indicates the data number (1 to 250) assigned in the order of collection. By clicking the [No.] title area you can change the order between ascending and descending.
Unit Type	TR-51S, etc... indicates the type of unit, such as TR-51S.
ch.1 (Group) Name	Shows the Channel 1 Name.
ch.2 (Remote) Name	Shows the Channel 2 Name.
Recording Start Date / Time	Displays the recording start date and time for the data gathered by the Data Collector.
Data Collection Date / Time	Displays the date and time the data was downloaded from the Data Collector to Computer.

IMPORTANT:

- When using the event recorder function, the recording start time will be displayed even if in the Data Collector you have selected to download a specific range by time. For details about how to download to the Data Collector, see the User's Manual supplied with the Collector.
- After gathering data info, it will be saved until the application is closed. However, if you do not close the application and connect to and transmit info with a different Data Collector or manipulate data from the Data Collector Unit, the data info stored in the application will be different from that in the Data Collector Unit. Please gather the data information again.

■ To quit collecting data info already in progress:

By clicking [Quit Collecting Data Info], the collection will be stopped. For data beyond that point, detailed information cannot be collected and therefore will not appear in the display.

Example of [Data Collector Contents] display

1. Collection of data info has been completed. Any operation can be performed.

2. Collection was stopped and therefore data info cannot be displayed. Data can be collected and deleted.

■ Downloading Recorded Data

1. By clicking on the [Detailed Settings] button, it is possible to make settings for what type of process you wish to occur after downloading. (See the next page.)

2. Select the desired data from the data list and click the [Download Data] button to start the downloading.

Select data from "Data Collector Contents" list.

[Download Data] Button

[Detailed Settings] Button
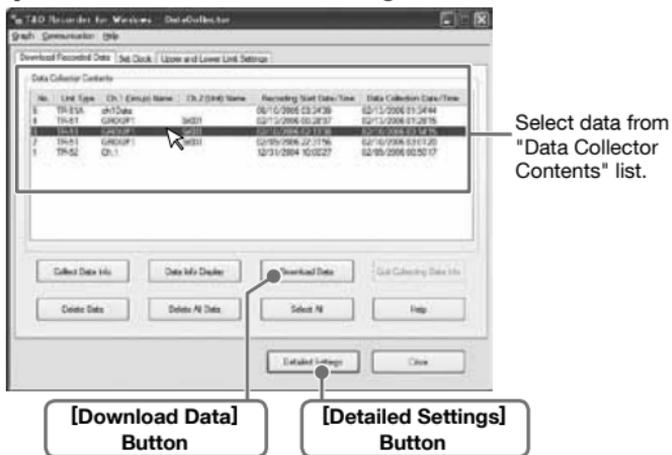
During downloading, the [Downloading Status] Box will appear. By clicking the [Cancel Downloading] button, you can stop the downloading at any time.

■ When simultaneously downloading multiple sets of data:

By holding down the <Shift> key or <Ctrl> key and clicking on the data you wish to download in the data list, it is possible to select a multiple sets of data to download at one time.

No.	Unit Type	Ch.1 (Group) Name	Ch.2 (Unit) Name
8	TR-53	GROUP2	Sample 8
7	TR-52	GROUP2	Sample 7
6	TR-52	GROUP2	Sample 6
5	TR-51A	ch1Data	
4	TR-51	GROUP1	Sr003
3	TR-51	GROUP1	Sr002
2	TR-51	GROUP1	Sr001
1	TR-52	Ch.1	

1.By holding down the <Ctrl> key …

2.By holding down the <Shift> key …

1. If you wish to download files not in a row (such as No.6 and No.8), hold down the <Ctrl> key and click on the files [No.6] and [No.8].

2. If you wish to download files in a row (such as No.1 to No.3), hold down the <Shift> key and click on the files [No.1] and [No.3].

■ Settings for Processing after Downloading: [Detailed Settings] Button

You can make settings for the processing of the downloaded recorded data. If you are downloading multiple sets of data at one time, all operations will be carried out according to the settings made in [Detailed Settings].


[OK] Button

Check one
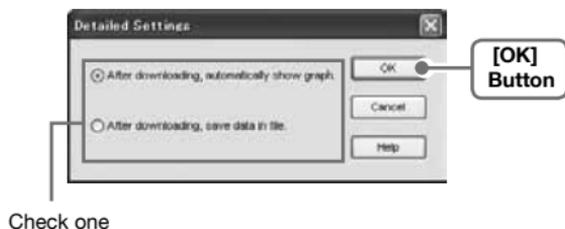
After downloading, automatically show graph:

Up to 8 channels of data can be viewed in the same graph window. Moreover, if you save the graph window using "Save As" command, it is possible to save multiple sets of data into one file.

After downloading, save data in file:

[Assign Data File Name] box will appear. Here you can assign a folder and file name in which to save the data. It will be saved with 3-digit data No. at the end of the file name.

Example: When saving data No.6, 10, and 150, at the end of the file name will be added [006], [010], and [150].
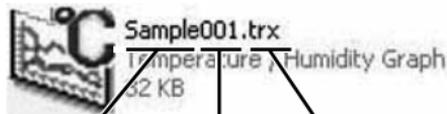
File Name   Data No.   Extension Code
.trx : Common Thermo Recorder Type
.vt7 : Voltage Recorder Type File
.thp : TR-73U Type File
.iur : Illuminance UV Recorder Type File

■ Other Buttons under [Download Recorded Data] Tab
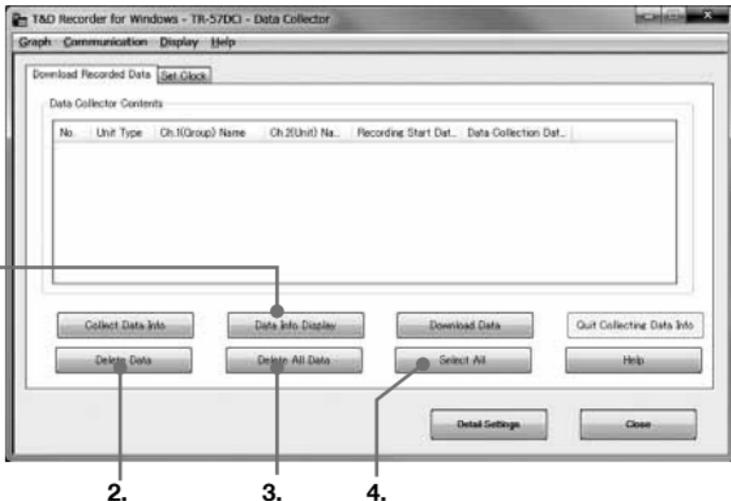
1. [Data Info Display] Button

Detailed info will be displayed in the "Data Info Box" about the selected data

from the list for downloading. This can only be done with one set of selected data at a time.

* However, info cannot be shown for Event Data.

2. [Delete Data] Button

Selected data saved in the TR-57 Series will be deleted from the Data Collector.

3. [Delete All Data] Button

All data saved in the TR-57 Series will be deleted from the Data Collector.

4. [Select All] Button

All data in the list will be selected at one time. Use this button to simultaneously download all data.

■ Communication Port Settings

Make settings for USB and / or RS-232C communication. In the TR-57U/TR-57DCi [Communication] Menu open [Communication Port Settings].

[Communication] Menu

Communication Port Settings Window
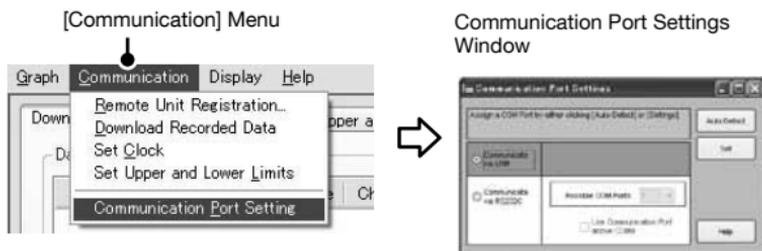
* For details about Communication Port Setting Procedures see P.24.

Graph

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Temperature / Humidity Graph

Open the Graph display by clicking the icon [Temp / Humid Graph] in the Main Window.

Click

- Open by selecting [Open Temp / Humidity Graph] in the [File] Menu of the TR-73U, TR-51i/52i/55i Settings and Communication Window.
- If you have checked [After downloading, automatically display graph] in the detailed settings, the graph program will automatically open.

IMPORTANT:
When viewing a Graph, small differences in time may occur. For details see "Troubleshooting" on P.94.

■ Display Names and Functions
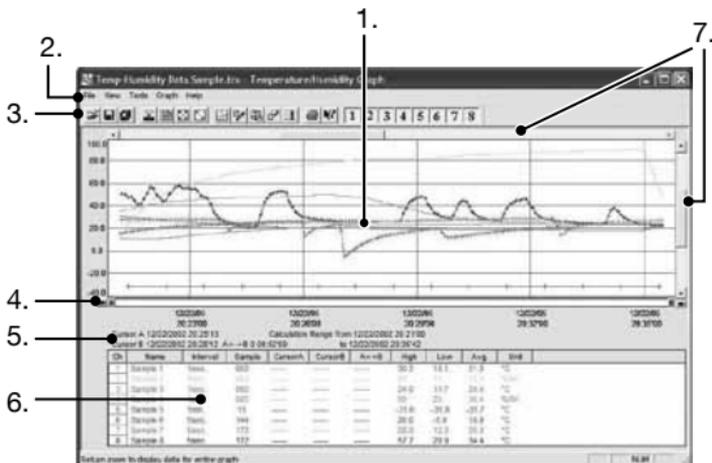
1. Graph Area

The area in which the Graph is displayed The horizontal axis shows time and the vertical axis shows temperature / humidity data.

2. Menu Bar

Menus are lined up which contain various commands. They are used to view data or to make settings for the various functions in each menu.

3. Toolbar (Icons)

Buttons appear for frequently used commands.

4. A and B Cursor Bars

By clicking the arrow buttons at the left and right of the bar, you can simultaneously move the A / B cursors. Click and drag the A or B Button on the bar to move the cursor to the left or right.

5. A and B Cursor Position Information

The approximate date and time for the A and B cursor positions and the time difference between the A cursor and the B cursor is displayed.

6. Channel Info Display

The detailed data info for each channel 1 to 8 is displayed below the Graph Display.

[Channel Info Display Items]			
ch	Drag the channel name / number you wish to move to the newly desired channel name / number position and drop it.		
Name	Channel Data Name	Interval	Recording Interval
Sample	Number of data	Max.	Highest Reading
CursorA	Cursor A position data	Min.	Lowest Reading
CursorB	Cursor B position data	Avg.	Average Value
A<->B	Calculated Temp / Humidity Difference between Cursor A and B	Unit	Unit of measurement

7. Horizontal Gauge Bar and Button for Moving Horizontal Axis

The time axis moves by clicking the [◀] , [▶] buttons at the left and right of the bar. By dragging the gauge you can move left and right to the data you want to be displayed.

The vertical axis moves up or down by clicking the [▲] , [▼] buttons at the upper and lower sides of the bar. By dragging the gauge you can move up and down to the data you want to be displayed.

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When opening data recorded in TR-73U units into a graph

When opening a file containing barometric pressure data ([thp]format file), the window is different from the standard, with the scale for barometric pressure appearing on the right side.

 * For details, see Temperature / Humidity Graph [Help] - [Keyword] - [About Barometric Pressure].

Scale for Barometric Pressure
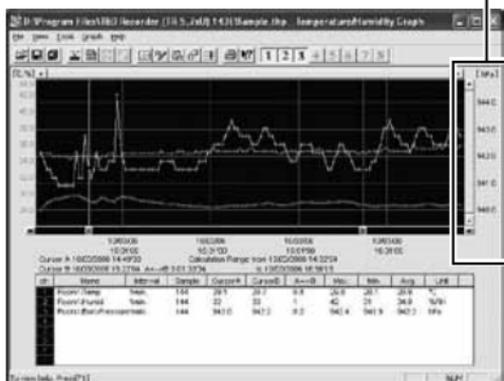
■ Zooming In and Out on the Graph

Zoom in Using the Mouse

With the left Button drag the mouse to outline the area you want to zoom in on.
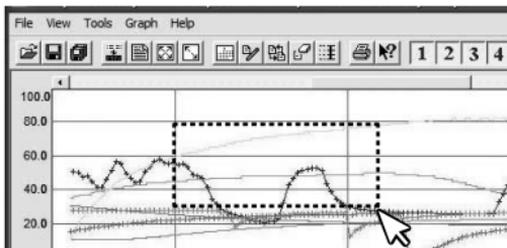
Menu Display Using the Mouse

By right clicking on the graph, the Menu will be displayed. With [Return to Original Size] or [Step-by Step Return to Original] you can return both the vertical and horizontal axis back to show the entire graph.

* These operations can be carried out via commands in the [Graph] Menu or by clicking icons in the Toolbar.
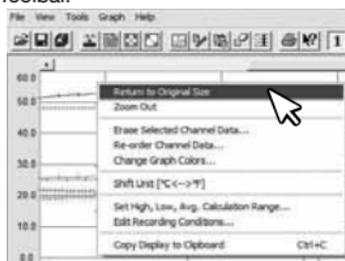
About the Horizontal Axis

The entire graph shows in the horizontal axis the nearest data to the recording start time and the latest data nearest the recording finish time for each channel 1 to 8. This represents the full scale of the horizontal axis.

About the Vertical Axis

The entire graph shows in the vertical axis the lowest possible measurement value and the highest possible measurement value for channels 1 to 8. This represents the full scale of the vertical axis.

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■ Data List Display

[Date / Time] Button

By clicking this Button, you can shift the display between the recorded date and amount of elapsed time since recording started.

[Date / Time] Button

Recorded Date Display

Elapsed Time Display
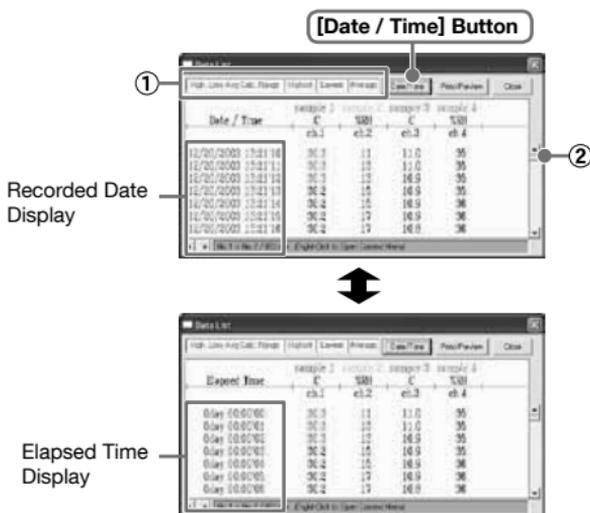
① This is a list of the data that was displayed in graph form. The highest value is in RED, lowest is in BLUE, and the average is in PINK.

② Scroll Bar: By dragging it up and down you can move to the data you want.

Menu Display Using the Mouse

By right clicking on the list, the Menu will be displayed.
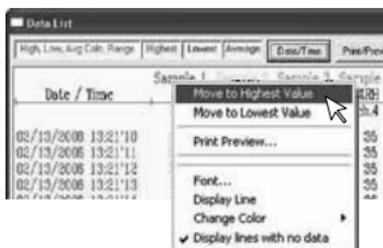
Editing the Graph: [View] Menu

[View] Menu
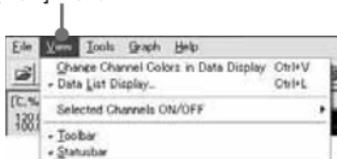
■ Changing graph display colors: [View] Menu

You can change the letters used in the data list display for each channel between monochrome and channel color.

■ Selected Channels ON / OFF: [View] Menu

1. The channel numbers are displayed in the pull down menu of [Selected Channels ON / OFF].

2. Check the channel numbers you wish to display.

* By clicking a Channel Number in the Toolbar, you can carry out the same operation.

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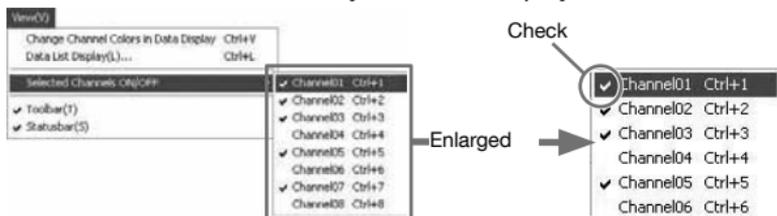
Editing the Graph: [Tools] Menu

[Tools] Menu

■ Set High, Low, Average Calculation Range: [Tools] Menu

1. Set the calculation range in the [Set High, Low, Avg. Calculation Range] box.

2. By clicking the [OK] Button, the high, low, average calculation range of each channel data will be changed. On the graph display, the calculation range that you have set will be displayed.

Enter the numerical value

[OK] Button

[Entire Graph] Button

[Entire Graph] Button

To make the Calculation Range that of the Entire Graph, click the [Entire Graph] Button. The dates and times in the [Set High, Low, Avg. Calculation Range] box will be displayed as those of the entire graph.

Set by using the AB Cursors

In the Graph Display, open the [Set High, Low, Average Calculation Range] box adjusting the AB cursors to the desired start and end positions. The dates and times of those cursors will be displayed automatically.

■ Edit Recording Conditions: [Tools] Menu

1. By clicking the [Ch.] Button you wish to change, the information for that number will be displayed in the [Edit Items].

2. By clicking the [OK] Button after changing, the setting will be completed.
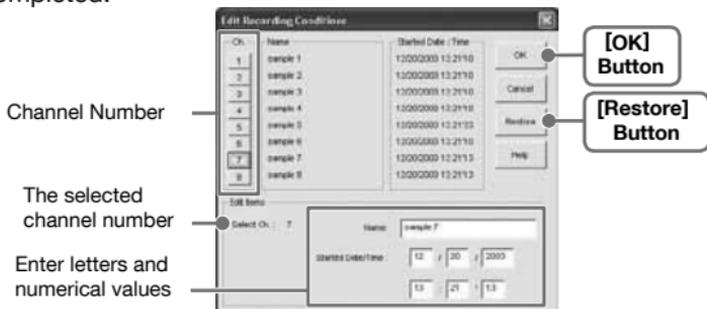
IMPORTANT:

- Name: Up to 32 letters can be entered.

- Starting Date / Time: The month, day, year, hour, minute and second can be changed.

- If you wish to continue to change other channels, repeat the process as in 1.

- The [Restore] Button is effective only during the setting, and cannot return to the condition it was after the [OK] Button has been clicked.

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■ Re-order Channel Data: [Tools] Menu

There are two ways for re-ordering.

- Move by dragging the channel number
- Move by selecting the channel number

[Move by dragging the channel number]

Click on the channel of data you wish to move and drag and drop it to the desired new channel position.

[Move by selecting the channel number]

1. Enter in From: _, the Channel number you wish to move from, and enter the Channel number to which you want to move in To: _.

**2.** By clicking the [Re-order] Button, the movement will be completed.

IMPORTANT:
The [Restore] Button is effective only during the setting, and cannot return to the condition it was by clicking the [OK] Button.
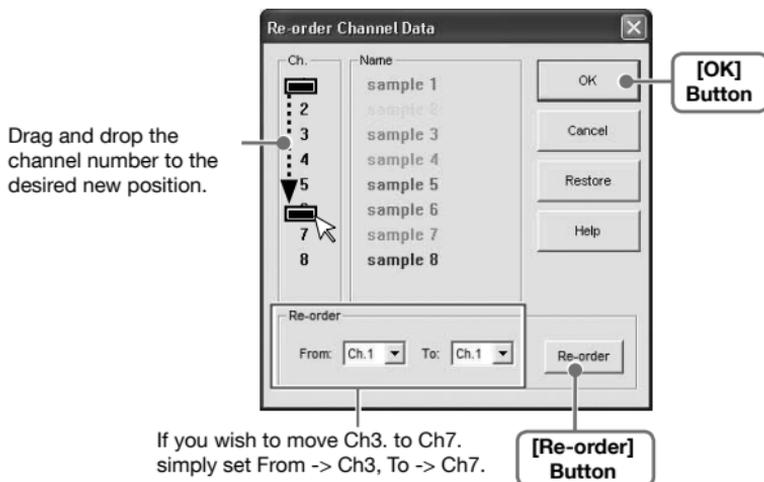
Drag and drop the channel number to the desired new position.

[OK] Button

[Re-order] Button

If you wish to move Ch3. to Ch7. simply set From -> Ch3, To -> Ch7.

■ Erase Selected Channel Data: [Tools] Menu

1. Put a check on the channel number you wish to erase.

2. By clicking on the [OK] Button, the deletion will be completed.

Put a check on the check box

[OK] Button
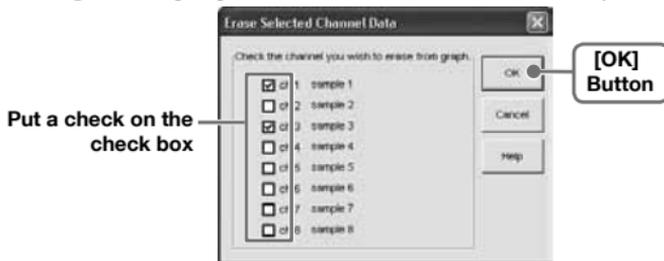
■ Shift Unit (°C / °F): [Tools] Menu

By clicking on [Shift Unit(°C / °F)], you can automatically change the temperature unit scale in the graph display and in the channel info list.

Graph   73

■ Change Graph Colors: [Tools] Menu

1. Click the channel number of which you wish to change the color.

2. By clicking each Button, color samples will be displayed. Choose the color you want and click the [OK] Button.

3. After confirming the color, by clicking the [OK] Button the change will be completed.

[Channel No.] Button

[OK] Button

[Default] Button
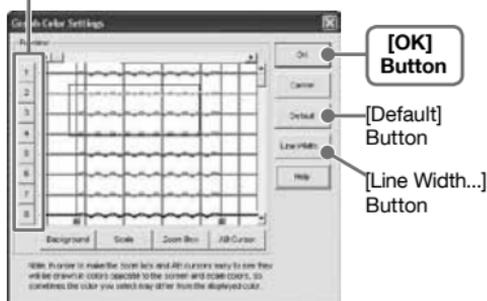
[Line Width...] Button

Color Sample

IMPORTANT:
By clicking the [Return to Default] Button, you will return to the color settings when the software was opened.

[Line Width...] Button

Change the width of the data lines and the scale lines.
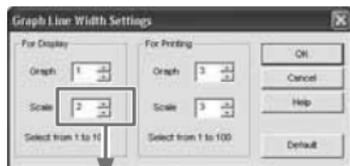
Every time you click on
- Every time you click on ▲, the numerical value gets larger.
- Every time you click on ▼, the numerical value gets smaller.

■ Copy Display to Clipboard: [Tools] Menu

By clicking [Copy Display to Clipboard], you can copy the currently displayed window to the clipboard and make use of the graph by pasting to other software.

■ Operating the Graph: [Graph] Menu

Return to Original Size

Return from zooming in on one part of data

Zoom In / Zoom Out

Zooms in or out one step at a time

Move Cursor Right / Left

Simultaneously move the AB Cursors to the right or left.

Move Graph Right / Left

Move the Graph Display to the right or left.

Move Graph Up / Down

Move the Graph Display up or down.

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Vertical Axis Settings (AUTO in Default Settings)

Set the vertical axis scale (temperature)

*1.* Check either [Auto] or [Manual].

- AUTO: The vertical axis will automatically be changed according to the values of the data.
- MANUAL: You can set the upper and lower values of the vertical axis scale.

For TR-51i/52i/55i

Enter the range of the vertical axis scale.

[OK] Button

For TR-73U

Enter the range of the vertical axis scale.

[OK] Button
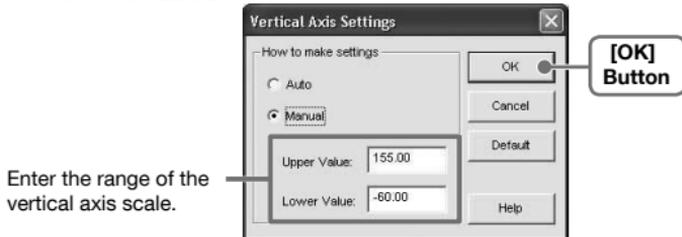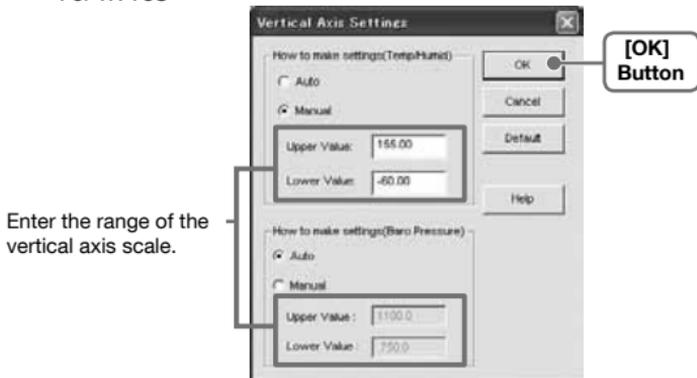
2. Click [OK] to complete the settings.

Multi-scale Graph

This software, Multi-scale Graph is designed to allow you to view simultaneous display of graph channels with different scales such as temperature, humidity, voltage, pulse and moisture data in one window.

The [Multi-scale Graph] program will read data files that have been created from the downloaded data from the loggers and to help you analyze that data will allow you to create graphs, data lists, text files and print data. It is also possible to scroll across the graph and make scale settings for each channel.

IMPORTANT

For detailed information about the compatible data file types for the [Multi-scale Graph], see the Multi-Scale Help Menu.

Open the Multi-scale Graph by clicking the [Multi-scale Graph] icon in the Main Window.

Click
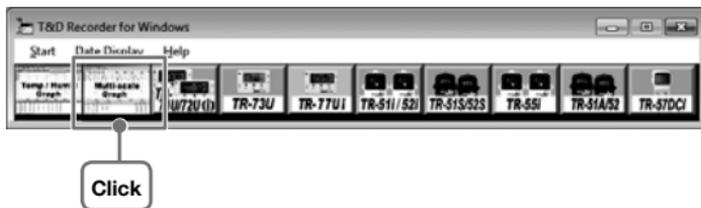
IMPORTANT

If you have checked [After downloading, automatically display graph] in the detailed settings, the graph program will automatically open.

■ Display Names and Functions
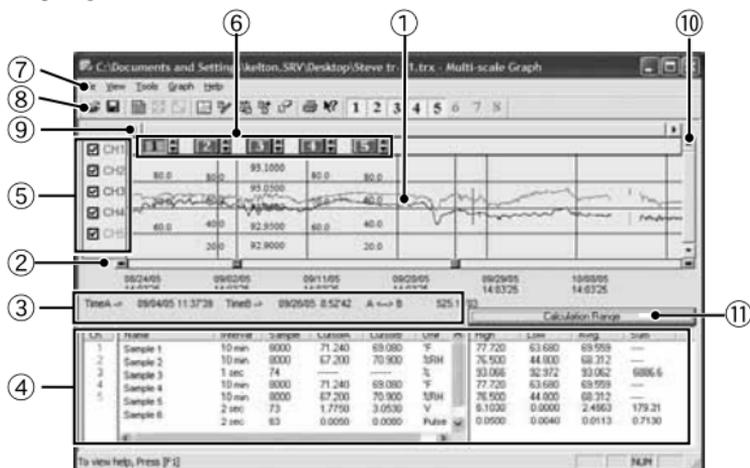
① Graph Area

The area in which the Graph is displayed. The horizontal axis shows time and the vertical axis shows the unit of data after having used the conversion equation to convert the original measured voltage.

② A / B Cursor Movement Buttons and A / B Cursor Buttons

By clicking one of the arrow buttons at either side of the bar, you can simultaneously move the A / B cursors. Click and drag the A or B Button to move the cursor to the left or right.

③ A and B Cursor Position Information

The approximate date and time for the A and B cursor positions and the time difference between the A cursor and the B cursor is displayed.

④ Channel Info List Display

Displays data information for Channels 1 to 8. The list contains the following info: Channel Name, Recording Interval, Amount of Data, Data Values for AB Cursor positions, the High, Low and Average values for the set calculation range.

⑤ The Vertical Axis Display ON / OFF

Shift the vertical axis scale display ON / OFF.

⑥ Vertical Axis of Each Channel

The vertical axis scale is displayed for each channel. By clicking [▲▼], the axis can be scrolled for each channel.

⑦ Menu Bar

Click on the desired menu in the Menu Bar to set or display each function from which you can choose from an array of commands.

⑧ Toolbar

Buttons appear for frequently used commands.

① Open File
② Overwrite Data
③ Data List Display
④ Return to Original Size
⑤ Step by Step to Original
⑥ Set High, Low, Avg. Calculation Range
⑦ Edit Recording Conditions

⑧ Re-order Channels
⑨ Merge Channel Data
⑩ Erase Selected Channel Data
⑪ Print Preview
⑫ Help
⑬ Hide / View Channels

⑨ Horizontal Gauge Bar and Button for Moving Horizontal Axis

By dragging the gauge you can move left and right to the data you want to be displayed. The time axis moves by clicking these arrow buttons.

⑩ Vertical Gauge Bar and Button for Moving Vertical Axis

By dragging the gauge you can move up and down to the data you want to be displayed. The vertical axis moves up or down by clicking these arrow buttons.

⑪ Calculation Range Button

By clicking the [Calculation Range] Button, the high, low, average calculation range of each channel data will be changed. On the graph display, the calculation range that you have set will be displayed. This operations can be carried out via commands in the [Tools] Menu. See P.70 for details.

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■ Zooming In and Out on the Graph

Zoom in Using the Mouse

With the left Button drag the mouse to outline the area you want to zoom in on.
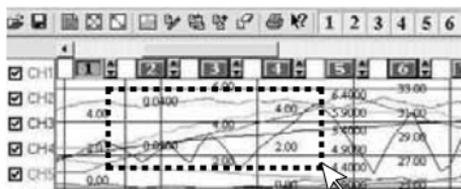


Menu Display Using the Mouse

By right clicking on the graph, the Menu will be displayed. With [Return to Original Size] or [Step-by Step Return to Original] you can return both the vertical and horizontal axis back to show the entire graph.

■ Data List Display

[Date / Time] Button

By clicking this Button, you can shift the display between the recorded date and amount of elapsed time since recording started.

[Date / Time] Button

Recorded Date Display

Elapsed Time Display

① This is a list of the data that was displayed in graph form.

The highest value is in RED, lowest is in BLUE, and the average is in PINK.

② Scroll Bar: By dragging it up and down you can move to the data you want.

Menu Display Using the Mouse

By right clicking on the list, the Menu will be displayed.

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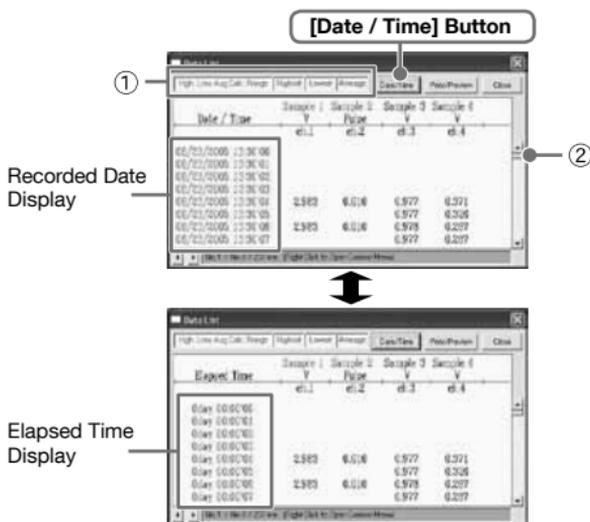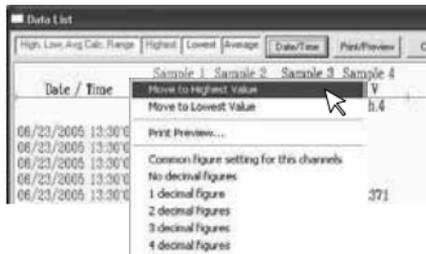
Editing the Graph

■ Selected Channels ON / OFF: [View] Menu

1. The channel numbers are displayed in the pull down menu of [Selected Channels ON / OFF].

2. Check the channel numbers you wish to display.
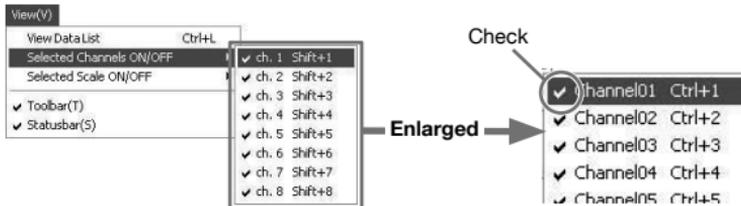
IMPORTANT

By clicking a Channel Number in the Toolbar, you can carry out the same operation.

■ Scale Display ON / OFF: [View] Menu

1. The channel numbers are displayed in the pull down menu of [Selected Scale ON / OFF].

2. Put a check next to the channel number(s) you wish to be displayed.
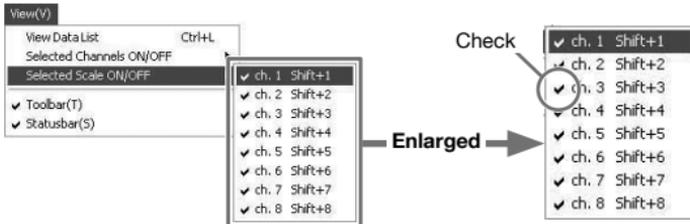
IMPORTANT

You can also hide or view channel scales by checking the channel number of the left of the graph.

■ Setting High, Low, Average Calculation Range: [Tools] Menu

*1.* Set the calculation range in the [Set High, Low, Avg. Calculation Range] box.

2. By clicking the [OK] Button, the high, low, average calculation range of each channel data will be changed. On the graph display, the calculation range that you have set will be displayed.

Enter the numerical value.

[OK] Button

[Entire Graph] Button

[Entire Graph] Button

To make the Calculation Range that of the Entire Graph, click the [Entire Graph] Button. The dates and times in the [Set High, Low, Avg. Calculation Range] box will be displayed as those of the entire graph.

Set by using the AB Cursors

In the Graph Display, open the [Set High, Low, Average Calculation Range] box adjusting the AB cursors to the desired start and end positions. The dates and times of those cursors will be displayed automatically.

Graph   83

■ Editing Recording Conditions: [Tools] Menu

1. By clicking the [Ch.] Button you wish to change, the information for that number will be displayed in the "Edit Items".

2. By clicking the [OK] Button after changing, the setting will be completed.

Channel Number

The selected channel number

[OK] Button

[Restore] Button

Enter letters and numerical values

- Name: Up to 32 letters can be entered.
- Starting Date / Time: The month, day, year, hour, minute and second can be changed.

IMPORTANT

- *If you wish to continue to change other channels, repeat the process as in 1.*
- *The [Restore] Button is effective only during the setting, and cannot return to the condition it was after the [OK] Button has been clicked.*

■ Re-ordering Channel Data: [Tools] Menu

There are two ways for re-ordering.

- Move by dragging the channel number
- Move by selecting the channel number

Move by dragging the channel number

Click on the channel of data you wish to move and drag and drop it to the desired new channel position.

Move by selecting the channel number

1. Enter in From: _, the Channel number you wish to move from, and enter the Channel number to which you want to move in To: _.

2. By clicking the [Re-order] Button, the movement will be completed.

If you wish to move Ch3 to Ch7. simply set From→Ch3, To→Ch7.

[Change 1 and 2] Button

[OK] Button

Drag and drop the channel number to the desired new position.

Graph   85
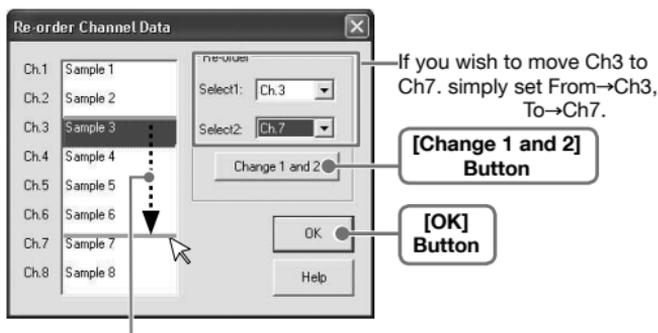
■ Merging Channel Data: [Tools] Menu

You can merge two different sets of data into one set of data.

1. Click the [▼] Button, and select the channels you wish to merge.

The following kinds of data cannot be merged:

- Recording intervals are different
- Measurement times overlap (Merging is possible after adjusting the times in [Editing Recording Conditions])
- Data types are different (Merging is possible between same types of data; like temperature / humidity)

Example)
If you wish to merge
Ch.3 with Ch.7

[Merge] Button
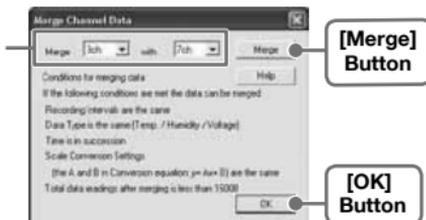
[OK] Button

2. By clicking the [Merge] Button, the merging will be completed.

*3.* Click the [Close] Button to finish the merging.

IMPORTANT

The channel number and other conditions of the merged data will become those conditions set in the channel that you selected in the second box.

■ Erasing Selected Channel Data: [Tools] Menu

1. Put a check on the channel number you wish to erase.

2. By clicking on the [OK] Button, the deletion will be completed.

Check

[OK] Button
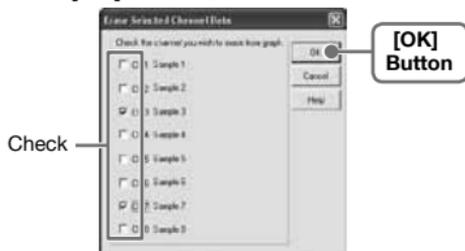
## ■ Vertical Axis Range Display Settings: [Tools] Menu

You can set the upper and the lower limits of the graph's vertical axis scale for each channel.

1. Check [Fixed] of the channel you wish to set.

2. Enter upper and lower limit values.

Set the lower limit at more than -40,000 and set the upper limit at less than 40,000.

Select [Fixed] and enter numerical values.

If you wish to make all of the settings the same.
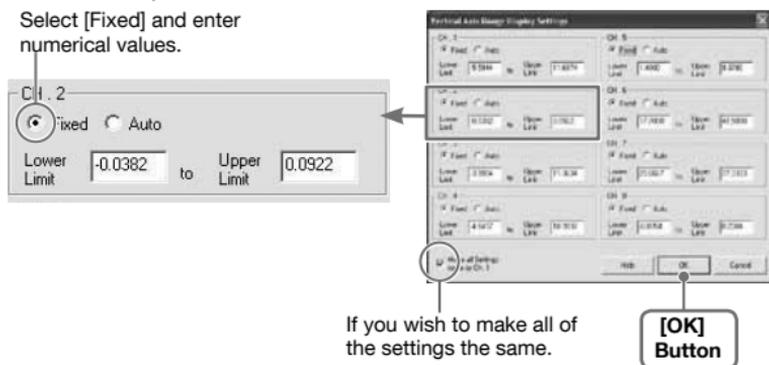
[OK] Button

3. By clicking the [OK] Button, the setting will be completed.

IMPORTANT

If you have put a check on [Fixed], the lines in the graph may exceed the boundaries of the graph.

[Making all channel settings the same as Ch.1]

Set CH.1 [Fixed] and by putting a check on [Make all Settings the same as Ch.1]; all channel settings will be the same as CH.1 regardless of other channel settings.

Graph   87

■ Scale and Unit Conversion: [Tools] Menu

You can convert the scale and the unit of downloaded data for each channel.

1. Select from [Designate by 2 points] Tab or [Designate by y=ax+b] Tab.

[Designate by 2 points] Tab

[Designate by y=ax+b] Tab

[OK] Button
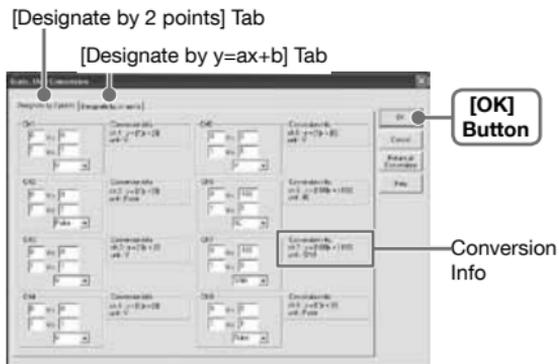
Conversion Info

***2.*** Set conversion formulas and units.

3. By clicking the [OK] Button, the setting will be completed.

[Conversion Info]

Current conversion formulas and units are displayed here.

Y indicates the data after conversion, and x indicates the voltage entering from the sensor.

■ Changing Graph Colors: [Tools] Menu

Memo

[Close] Button

[▲] Button

[Channel Number] Button

[▼] Button

[Default] Button

Image Preview
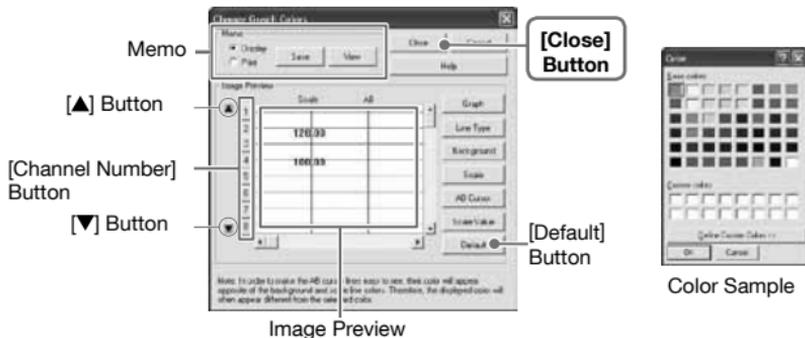
Color Sample

1. Click the [Channel Number] Button, and click the Button of the item that you wish to change.

- When changing colors, click on a Button to display the color samples. Choose the desired color and click the [OK] Button to change the color.
- If you wish to change line width, every time you click the [▲] Button, the width gets wider, and every time you click the [▼] Button, the width becomes more narrow.

2. Confirm the width in the image preview and click the [Close] Button to complete the change.

By clicking the [Return to Default] Button, the color settings will return to the default settings.

[Memo]

You can save the settings for Display and / or Print respectively.

1. Select Display or Print.

2. By clicking the [Save] Button, the settings will be saved.

 * By clicking the [View] Button, you can see the settings that had been previously saved.

Select one

[Save] Button   [View] Button

Graph   89
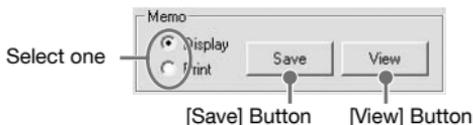
Saving Recorded Data

If you have checked [After downloading, automatically show graph.], make sure to save data after displaying the graph or editing any data.

■ 3 Ways to Save Files: [File] Menu

In the [File] Menu, select [Overwrite All Data]
Will save any changes to file without changing File Name and Saving Location.
The same operation can be carried out from [Save] in the Toolbar.

In the [File] Menu, select [Save All Data as...]
Save with a new File Name.

### In the [File] Menu, select [Save Displayed Data]
Save only that data in the current display. This is handy when you wish to save only the desired data.

EX: [Save All Data as...]

1. Select [Save All Data as...] in the [File] Menu.

2. Specify the [Location] and enter a [File Name].

3. Click [Save] to complete the saving process.

Specify Location
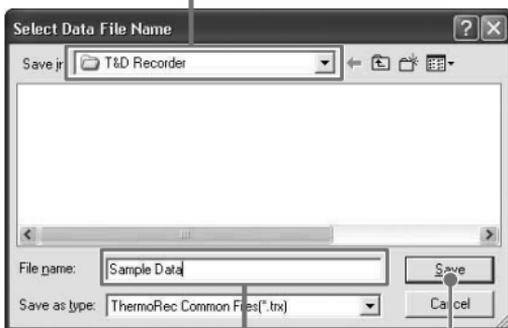
Enter a File Name

[Save] Button

Creating Text File

By saving the recorded data as text file, you can create a file type that can be read by common spreadsheet software.

1. Click [Save Data in Text File] in the [File] Menu.

2. Select the [Text File Type] and [Range to be saved], and click [OK].

  * Comma, Tab, Space, and Semi-colon are codes used by common spreadsheet
    software, such as Excel and Lotus, when reading Text File to divide cells.

Select the Delimiters → **Text File Settings**

Text File Type
- ⦿ Comma
- ○ Tab
- ○ Space
- ○ Semi-colon

Range to be saved
- ⦿ All data
- ○ Displayed data only

← Select the Range to be Saved

OK → **[OK] Button**

Cancel
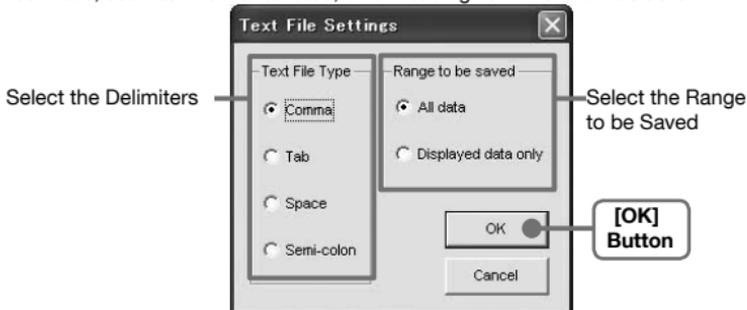
3. Designate the location to which the file should be saved and click [Save] to create and save the data as a Text File document.

Select Text File Name

Save in: 🗀 T&D Recorder

File name: Text File Sample.trx

Save as type: Text Format Files[*.txt]

Save → **[Save] Button**

Cancel
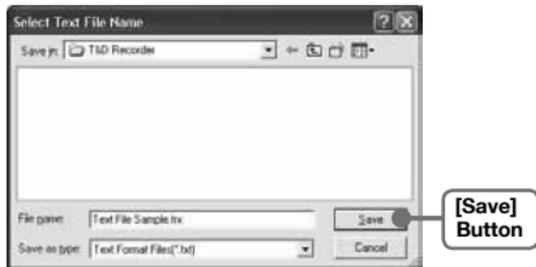
IMPORTANT:

- *The extension for the created file will be [.txt].*
- *Text File cannot be read into T&D Recorder for Windows graphs.*

Graph   91

Opening a File

To open a previously saved file, designate the file name to open it.
To open multiple files at once, hold down the <Ctrl> key and select
the files you wish to open.

1. Select [Open] in the [File] Menu.

2. Select the name of the data you wish to open and click [Open] to
view the data in graph form.

Select a File

Selected File Name

Selected File Info

[Open] Button
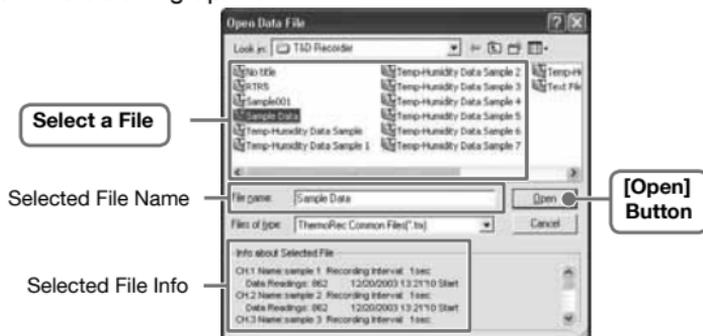
Other

Troubleshooting

Q: The computer won't communicate via the Serial Port. What should I do?

A: Try two or three times to find the port connection by using the Auto-detect function.

A: Check to make sure that the power of the main unit is ON.

A: Check to make sure that the connection is proper. Communication will take place only through the serial port (RS-232C) and will not work through the printer port or any other port.

A: Check to make sure that you can control the Thermo Recorder via the software.

A: If you have access to another computer, try seeing if communication works with the other computer.

A: If you have a computer with energy saving function settings, make sure that the serial port has not been turned off.

A: Check to make sure that the serial port has not been rendered unusable by the BIOS setting.

A: Make sure that the serial port setting has not been made to render the port unusable. With some computers, especially all-in-one computers the serial port serves as the modem jack.

A: If your computer has an internal modem, make sure that the communication port is not being used by it. When the communication port is being used as the modem port, that port cannot be used. Either quit using the modem or use another port.

A: Sometimes communication will not work if a switch has been added to the serial port (RS-232C) or an extension cable has been added to the communication cable.

A: Check to see if some other communication software is in use.

A: If your desktop computer has two serial ports, try connecting the communication cable to the other port and try communicating again.

How to check the status of a COM port

1. Open the Device Manager.

For Windows 10 and Windows 8.1
Right click the [Start] button and select
[Device Manager].

For Windows 7 and Windows Vista
Click the [Start] button, and select [Control Panel] - [System and Maintenance]
- [System] - [Device Manager].

2. In the Device Manager, click on [Ports (COM & LPT)] and check to see that if under that appears [Communications Port (COM1)]. (Note that COM1 is an example. The actual COM port number will vary depending on the available ports.) If a port appears, it should be usable.

3. If a mark "!" or "x" appears next to the port, this communication port is unusable. If you cannot use a communication port please contact the manufacturer of your computer.
To find out details about any communication port with "!", right click on the port and select [Properties] where you can check the status of the device.

Q: The date and the time of the recorded data are different from the actual date and time of recording. Why?

A: The Thermo Recorder has no internal clock. When you set up a programmed recording start or when you download data, the date and time that are shown are taken form your computer's clock. If your computer's clock is not correct, it will affect the recorded data.

A: When recording mode has been set to [Endless] and Recording Start was carried out via PC, the time for recorded data is calculated from the recording start date and time and will appear correctly in the Graph as long as recording capacity has not reached its limit. However, once data capacity has become full and the oldest data is overwritten, the date and time for downloaded data in the Graph will be calculated using the PC's clock for the latest recorded data and subtracting backward. Hence the time for the displayed data will be different from the actual time the data was recorded.

Specifications

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

Compatible Devices	Data Loggers: TR-51i / 52i / 55i, TR- 73U / 74Ui* / 76Ui* *For TR-74Ui and TR-76Ui,only the data downloaded via TR-57DCi Base Unit can be used with "T&D Recorder for Windows". Data Comm.Devices: TR-57DCi, TR-50U2
Compatible OS: (*1)	Microsoft Windows 10 32 / 64bit Microsoft Windows 8 32 / 64bit Microsoft Windows 7 32 / 64bit Microsoft Windows Vista 32bit (SP1 or later)
Display Languages (*2)	English
Other	The Microsoft .NET Framework 3.5 SP1 is required.

*1: For installation, it is necessary to have Administrator (Computer Administrator) rights.
*2: We recommend using an operating system in the same languages as the display language. Operation in different languages is not guaranteed.
The specifications listed above are subject to change without notice.

For product information or questions contact us at:

T&D CORPORATION

[Web Site]
Product information, FAQ and software update downloads.

http://www.tandd.com/

T&D Recorder for Windows (TR-5,7xU)
User's Manual