



# **RTR-50** Wireless Communication Port

## Notices

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.

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- On screen messages in this manual may vary slightly from the actual messages.
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- This product has been designed for private or industrial use only. It is not for use in situations where strict safety precautions are necessary such as in connection with medical equipment, whether directly or indirectly.
- We are not responsible for any malfunction or trouble caused by the use of our product or by any problem caused by the use of measurement results of our unit. Please be fully aware of this before using our product.
- Some of our products, which come under the category of strategic goods in foreign trade law, need the permission of the Japanese government to be exported outside of Japan.
- The Manual itself can be downloaded from our Home Page: <http://www.tandd.com/>

# Software User Agreement

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## Escape Clauses

- T&D Corporation does not guarantee the operation of RTR-50 for Windows®.
- 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.
- Specifications of RTR-50 for Windows® 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 RTR-50 for Windows®.
- T&D Corporation has no obligation to correct any defects found in RTR-50 for Windows.

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- Please do not attempt to make any changes or modifications to RTR-50 for Windows®.

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# Safety Precautions and Instructions



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





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

### Explanation of Symbols

#### Explanation of Warning Symbols

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

#### Explanation of Picture Symbols

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

**DANGER**

Be sure to follow the warnings and notices about use from your PC maker when installing and using this unit.



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



If water or a foreign body enters in this unit, turn the power off and remove the batteries. Continued use may cause fire or electrocution.



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



Store RTR-50 main units, batteries and communication cables out of the reach of children. It is dangerous to touch or swallow batteries.



Do not connect the communication cable to a telephone line. It may cause a fire or other trouble including malfunction.



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



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

## CAUTION

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

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

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

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

---



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

---



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

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

- Areas exposed to direct sunlight  
This will cause the inside of the device to become overheated and may cause fire, deformation, and/or other damage including malfunction.
  - Areas prone to strong magnetic fields  
This may cause damage including malfunction.
  - Areas exposed to water leakage  
This may cause electrocution or other damage including malfunction.
  - Areas exposed to excessive vibration  
This may cause injury, malfunction, damage or loss of proper electrical contact.
  - Areas near fire or exposed to excessive heat  
This may cause damage including malfunction and deformation.
  - Areas prone to smoke, dust and dirt  
This may cause damage including malfunction.
-

## Wireless Regulations

### Radio, EMC and Safety Regulations

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This device complies with part 15 of the Federal Communications Commission (FCC) rules and with RSS-210 of the Industry Canada (IC).

Operation is subject to the following conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

**Note:**

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

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

*The user is cautioned that changes or modifications not expressly approved by T&D Corporation, could void the user's authority to operate the equipment.*

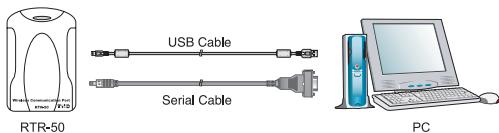
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# 1. Introduction

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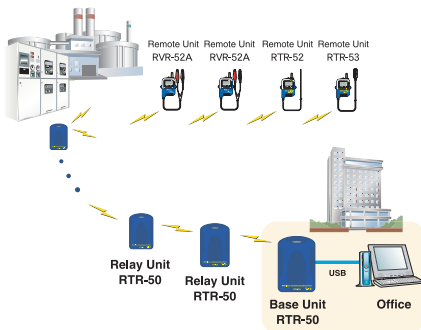
## What is Wireless Communication Port RTR-50?

The Wireless Communication Port RTR-50 is a base unit designed to carry out wireless communication with our compact waterproof Wireless Data Loggers, RTR-5 Series (RTR-51/52/53/RVR-52A) and to be connected to a computer via a USB or serial communication cable to gather data from and control the loggers. Also, by setting up an RTR-50 between the RTR-50 designated as the Base Unit and the RTR-5 Series Remote Data Logger unit, you can use any RTR-50 as a Relay Unit for wireless communication.



### Application Examples

- For the gathering of recorded data via wireless communication from long distances and the controlling of data loggers in places where handling of data loggers is difficult or impossible
- For downloading recorded data and monitoring current readings from moving or rotating data loggers on production lines



\* The communication range for each RTR-50 Relay Unit is up to 100m.

# What is RTR-50 for Windows®?

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## Outline

The easy-to-use software, RTR-50 for Windows® offers a variety of useful functions for any RTR-5 series data logger: including control of data logger recording settings, data downloading, graph display, table creation, printing, and file output.

Using our exclusive short-wave wireless technology it is possible to carry out Remote Unit Registrations and make Operational Settings between an RTR-50 Base and any RTR-5 Series Data Logger via wireless communication. If you wish to use an RTR-50 as a Relay Unit, it is also possible to carry out Relay Unit Registration and make other Operational Settings.

## Basic Functions

### Wireless Communication

Start Recording / Download Recorded Data / Monitor Current Readings / Warning Alarm / Auto-Download / Get Remote Unit Status / Wireless Communication Test / Get Radio Wave Strength of Relay Unit / Get Remaining Battery Life in Relay Unit

### Optical Communication---Carried out by placing a data logger (Remote Unit) face down on an RTR-50 (Base Unit).

Remote Unit Registration and/or Initialization / Start Recording / Download Recorded Data / Get Remote Unit Info

### Direct Cable Communication---Communication carried out via cable between the computer and the Base Unit / Relay Unit(s) for the initial settings.

Relay Unit Registration and/or Initialization (Returning RTR-50 to Base Unit) / Relay Route Name Settings/ Communication Frequency Channel Settings / Get Remaining Battery Life

### Data Operation

- Easy processing of the data downloaded from a Remote Unit into graphs, saving to files and/or printing.
- Convert the Remote / Relay Unit Registration Info to file format.
- Display current measurements in graph form / Warning Status Log
- The downloading of data can be set to be automatically carried out at a specified time or at a set interval of time.

## Others

-Monitoring at each location for warnings is carried out and if any of the gathered data exceeds the set limit, a notification can be sent via E-mail.

### **To properly use this software, the following operational environment is necessary.**

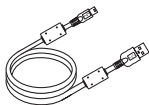
Compatible OS	Microsoft Windows® 98SE/Me (English) Microsoft Windows® XP/2000 (English)
Software	Microsoft Internet Explorer ver.5.01 or higher
PC / CPU	IBM Compatible equipped with more than Pentium 90MHz or NEC 98 Series USB Communication or Serial Communication (RS232-C D-sub 9pin)
Operating Environment	A Stable Windows® Operating Environment

## Package Contents

The following items are included in the package:



Wireless Communication Port RTR-50 × 1



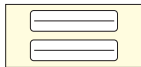
USB Communication Cable × 1



Software  
CD-ROM × 1



Manual × 1



Memo Sticker\*1

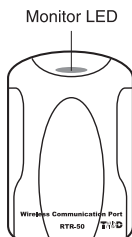
\*1: Please write Relay Unit Names, Numbers or any other memos on the sticker and fasten it to the unit.

# Part Names and Functions

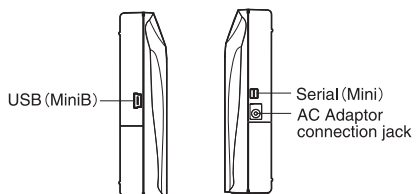
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## Appearance Diagram

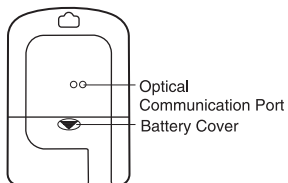
[Front]



[Left Side / Right Side]



[Back]



## 2. Getting Ready

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This section provides instructions on getting the RTR-50 ready to use.

# General Procedure

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- 1.** Install RTR-50 for Windows® into the computer.

**P.11**

- 2.** Connect the Communication Cable to the RTR-50.

When using the USB Communication Cable :

Installing the USB Device Driver /

Setting up the Communication Port

When using the Serial Communication Cable :

Setting up the Communication Port

**P.12 ~**

- 3.** Connect the Communication Cable to the Computer.

For Serial Communication install batteries or connect the AC adaptor in advance.

**P.12 ~**

- 4.** Remote Unit / Relay Unit Registration, Various Settings by Optical Communication from RTR-50 for Windows.

**P.28 ~**

- 5.** Remote Unit / Relay Unit Installation

**P.28 ~**

- 6.** Various Settings by Wireless Communication from RTR-50 for Windows

**P.46 ~**

- 7.** Post-downloading Data Management and Processing in Graphs

**P.71 ~**

# Getting Ready

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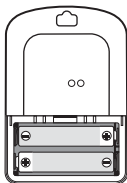
## Install Batteries

For serial communication with your computer and to use as a Relay Unit, make sure to install batteries.

**NOTE:**

*When the RTR-50 is connected by a USB communication cable to your computer or power is supplied by an AC adaptor to the RTR-50, there is no need to insert batteries.*

Insert 2 AA alkaline batteries as shown in the figure.



**NOTE:**

- Always use two batteries of the same type.
- Make sure not to mistake + / -.
- A battery cannot be charged inside the RTR-50.

*\*The Monitor LED will blink once when usable batteries are installed.*

# Install RTR-50 for Windows®

---

## - Is Windows® operating properly ?

If Windows® is not operating properly, RTR-50 for Windows® may not be installed correctly or it may not operate properly.

## - Please quit all other applications.

If you are running other applications, make sure to quit them before installation. If you have any permanently active software, such as a virus check or scan program in your computer, make sure to also quit it.

**1.** Open Windows® .

**2.** Insert the attached CD-ROM in the CR-ROM drive.

In a few seconds, the [Install Program] window will appear.

*\*If that window does not automatically open, please open it by double clicking the CD-ROM icon in [My Computer] on your desktop.*

**3.** Select [RTR-50 for Windows® ] and click the [Execute] button to start the installation.

**4.** Continue the installation by following the directions as they appear.

After installation has been completed, "RTR-50 for Windows®" will be registered in Windows' [Start] Menu.

When connecting the RTR-50 to your computer for direct communication to download or make setting changes, etc..., please use the USB communication cable (provided) or the optional serial communication cable (TR-07C).

## Connect the RTR-50 with a USB communication cable to your computer

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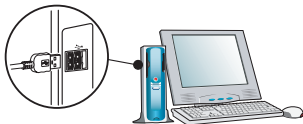
1. Connect the RTR-50 with the provided USB communication cable (US-15C) to your computer.

*\*It is not possible to simultaneously use both RTR-57U and RTR-50.*

### USB Port Mark



The USB communication cable is a USB-A plug ⇔ USB mini-B plug. Connect to a place with a mark as such.



*\* Make sure that the USB cable is inserted fully, so as not to cause an improper connection.*

2. Install the USB Device Driver

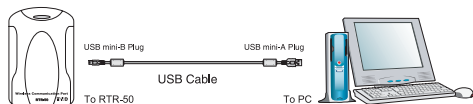
*\* For details about the driver installation, see the next section.*

# Installing the USB Device Driver

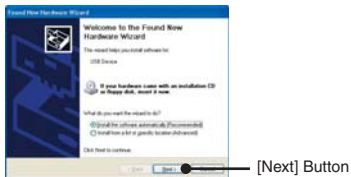
You will need to install this driver in order to use the device with a USB cable and Windows. The USB device driver must be installed for communication via USB between your computer and an RTR-50. After installing the USB device driver, your computer will be able to detect and recognize RTR-50 devices that have been connected with a USB cable.

## For Windows® XP

1. Turn on your computer and open Windows. After Windows has been completely started up, connect the supplied USB cable to a USB port on the RTR-50 and your computer.



2. Insert the attached CD-ROM in the CR-ROM drive. If the Installation Window opens, close it.
3. By connecting an RTR-50 unit to the USB cable already connected to your computer, the [Found New Hardware Wizard] will automatically open.
4. By checking [Install the software automatically (Recommended)] and clicking [Next], the software will automatically be installed.



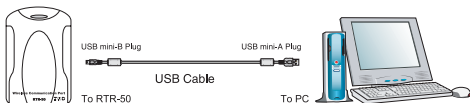
5. After completing installation, click the [Finish] button.  
Confirm the Connections (See p.18).

## If the Driver is not automatically detected

Please search by specifying the place as "[Device Driver \ RTR-50] in the CD-ROM drive" and install manually from there.

## For Windows® 2000

1. Turn on your computer and open Windows. After Windows has been completely started up, connect the supplied USB cable to a USB port on the RTR-50 and your computer.



2. Insert the attached CD-ROM in the CR-ROM drive. If the Installation Window opens, close it.
3. By connecting an RTR-50 unit to the USB cable already connected to your computer, the [Found New Hardware Wizard] will automatically open.
4. By clicking the [Next] button, a window will open where you can choose how you wish to find the driver file.



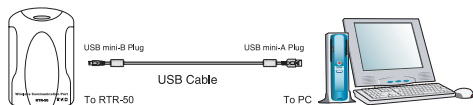
5. Check [Search for a suitable driver for my device (Recommended)] and click the [Next] button.
6. Check [CD-ROM drive] and then click the [Next] button.
7. Click [Next] to start the installation.
8. After completing installation, click the [Finish] button  
Confirm the Connections (See p.18).

### If the Driver is not automatically detected

Please search by specifying the place as "[Device Driver\ RTR-50] in the CD-ROM drive" and install manually from there.

## For Windows® Me

1. Turn on your computer and open Windows. After Windows has been completely started up, connect the supplied USB cable to a USB port on the RTR-50 and your computer.



2. Insert the attached CD-ROM in the CR-ROM drive. If the Installation Window opens, close it.
3. By connecting an RTR-50 unit to the USB cable already connected to your computer, the [Add New Hardware Wizard] will automatically open.
4. By clicking the [Next] button, a window will open where you can choose how you wish to find the driver file.
5. Check [Automatic search for a better driver (Recommended)] and click the [Next] button.



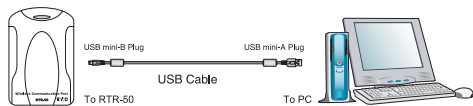
Check [Next] Button

### If the Driver is not automatically detected

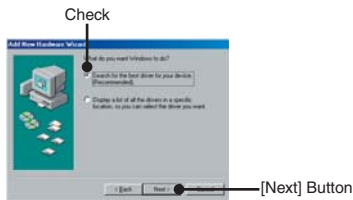
Please search by specifying the place as "[Device Driver\ RTR-50] in the CD-ROM drive" and install manually from there.

## For Windows® 98SE

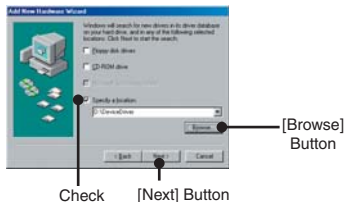
1. Turn on your computer and open Windows. After Windows has been completely started up, connect the supplied USB cable to a USB port on the RTR-50 and your computer.



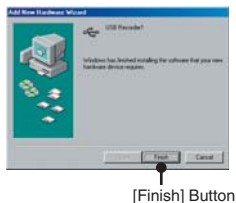
2. Insert the attached CD-ROM in the CR-ROM drive. If the Installation Window opens, close it.
3. By connecting an RTR-50 unit to the USB cable already connected to your computer, the [Add New Hardware Wizard] will automatically open.
4. By clicking the [Next] button, a window will open where you can choose how you wish to find the driver file.
5. Check [Search for the best driver for your device (Recommended)] and click the [Next] button.



6. Place a check next to [Specify a location] and click the [Browse] button. Select "[Device Driver\RTR-50] in the CD-ROM drive" and click [Next].



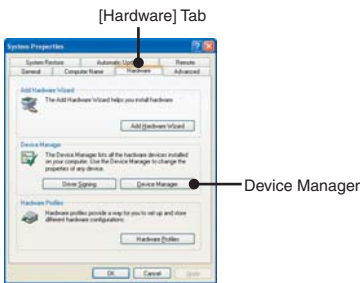
7. After completing installation, click the [Finish] button  
Confirm the Connections (See p.19).



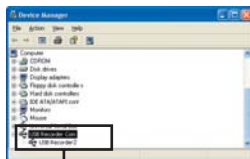
# Confirming the USB Device Driver Connection to the Computer

## Windows® XP / 2000

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



3. In the Device Manager Window, check to see if [USB Recorder 2] is listed under [USB Recorder 2 COM].



### NOTE:

If the following tree items appear, see the "If USB Device Driver Installation Fails" (p.20).



## Windows® Me/98SE

1. Open the [Control Panel] and double click on [System], the [System Properties] will be displayed.
2. In the Device Manager Window, check to see if [USB Recorder 2] is listed under [USB Recorder 2 COM].



**NOTE:**

*If the following tree items appear, see the "If USB Device Driver Installation Fails" (p.20).*



## If USB Device Driver Installation Fails

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



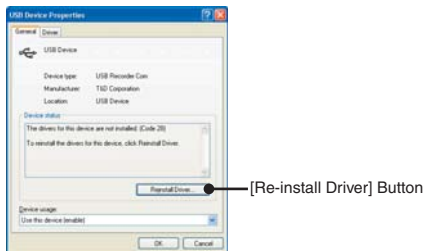
If this occurs, the USB device driver must be re-installed. Please follow the directions below to carry out the operation.

### How to Re-install

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



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



# Connecting the RTR-50 with a serial communication cable to your computer

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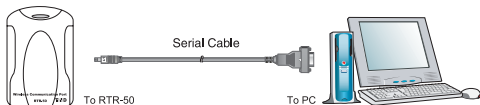
1. Connect to your computer using the optional serial communication cable (TR-07C).

*\*It is not possible to simultaneously use both RTR-57U and RTR-50.*

## Examples of Serial Port Symbols



The cable connection is a D-sub 9pin male.  
Please connect to the place that has such a symbol.



### NOTE:

- 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.
- For Serial Communication make sure to insert 2 AA batteries or use the optional AC Adaptor (For details, contact your local representative or dealer.).

2. Make Communication Port Settings.

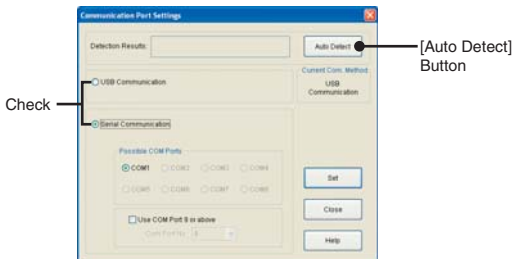
For details about Communication Port Settings, see the next page.

# Setting up the Communication Port

1. From the [Communication] Menu, select [Communication Port Settings].



2. Place a check next to: [Serial Communication] when communicating via serial communication cable, [USB Communication] when communicating via USB. Then click the [Auto Detect] button to automatically find an RTR-50 using the currently set communication method (USB or Serial).



3. After the search, if the message "Found RTR-50 Unit" appears in the [Detection Results] box, settings have been successfully completed.

Click the [Close] button to close the Window.

## NOTE:

- If the USB driver has not been properly installed, USB communication will not be possible.
- If no port is detected, see [Troubleshooting] on page 107.



## 3. How to use "RTR-50 for Windows"

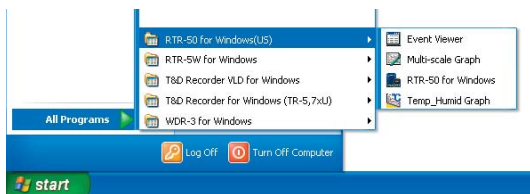
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This section guides you through how to use the software, "RTR-50 for Windows", included with each RTR-50 unit. The software is designed to allow for easy data processing, creation of Graphs and management of all settings and registrations necessary to create Remote Units and Relay Units.

# Basic Functions

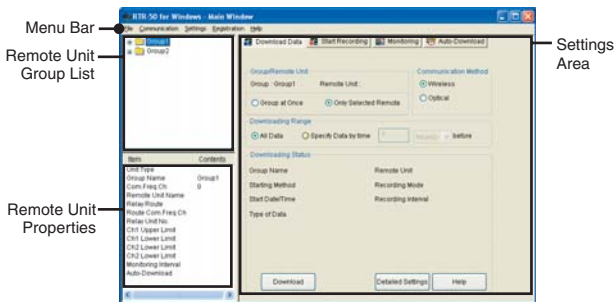
## Open "RTR-50 for Windows"

From the list of programs in the Window's Start Menu, click on [RTR-50 for Windows] - [RTR-50 for Windows] to open.



## Explanation of Display

"RTR-50 for Windows" Main Window



## Menu Bar

### [File] Menu

Open Temp/Humidity Graph / Open Multi-scale Graph / Open Event Viewer / Open Remote Registration File / Save Registration File as... / Quit

### [Communication] Menu

Wireless Communication:

Download Recorded Data / Start Recording / Monitoring/Warning Monitoring / Auto Download / Get Remote Current Status / Wireless Communication Test

Optical Communication:

Download Recorded Data / Start Recording / Get Remote Unit Info / Communication Port Settings

### [Settings] Menu

Monitoring:

Monitoring Graph Settings / View Warning Log / Warning Report Mail Settings / Mail Server Settings

Auto Download:

View Auto Download Log

Display Format Settings

### [Registration] Menu

Remote Unit / Relay Unit Registration

### [Help] Menu

Search by Topic / RTR-50 for Windows Version Info / Main Unit Info

## Remote Unit Group List

The Group and Remote Unit names will be displayed for all Remote Units that are registered to that Group in the [Remote Unit / Relay Unit Registration].

By right clicking on the Remote Unit icon, a menu will appear with commands for that type of unit.



## Remote Unit Properties (Remote Unit Info List)

View Remote Unit Info for the unit(s) selected from the Remote Unit List.

Unit Type ----- The type of unit (RTR-51/52/53 or RVR-52A) for the selected Remote Unit(s) will be displayed.

Group Name ----- The Group Name appears.

Com. Freq. Ch.----- The Communication Frequency Channel for communication between the Base Unit and the Remote Units appears.

Remote Unit Name-- Displays the name of the selected Remote Unit.

Relay Route ----- Displays the Name of the Relay Route via which the Remote Units communicate.

Route Com. Freq. Ch.

Displays the Communication Frequency Channel of the Relay Route via which the Remote Units communicate.

Relay Unit No. ----- Displays the No. of the Relay Unit via which the Remote Unit is connected.

Ch1 Upper Limit----- Displays the Upper Limit set in [Monitoring / Warning Monitoring] for Warning Report.

Ch1 Lower Limit----- Displays the Lower Limit set in [Monitoring / Warning Monitoring] for Warning Report.

Ch2 Upper Limit (For RTR-53 only)

Displays the Upper Limit set in [Monitoring / Warning Monitoring] for Warning Report.

Ch2 Lower Limit (For RTR-53 only)

Display the Lower Limit set in [Monitoring / Warning Monitoring] for Warning Report.

Monitoring Interval--- Displays the currently set Monitoring Interval.

Auto-Download ----- Displays the currently set Auto-Download Interval.

## Settings Area

There are four different types of Settings windows: [Download Data] tab, [Start Recording] tab, [Monitoring] tab, and [Auto-Download] tab.

## Main Unit Info

Open the [Main Unit Info] in the [Help] menu to view the Version Info for the currently connected RTR-50 Unit. It is also possible to view the battery status in the RTR-50 Unit.

# Remote Unit / Relay Unit Registration

## Basic Procedure for Registration

1. Connect an RTR-50 Unit with a USB or Serial communication cable to your computer.

*\*The default setting for an RTR-50 unit is as a Base Unit.*



For details about connecting the RTR-50 with a USB communication cable to your computer see p.12.

For details about connecting the RTR-50 with a Serial communication cable to your computer see p.21.

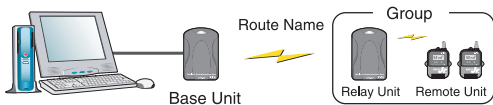
2. Register Remote Unit Name and Group Name.

Register all Remote Units to be placed.



For details about registering units as Remote Unit(s) see p.31.

3. Register Relay Unit Names and Relay Routes.

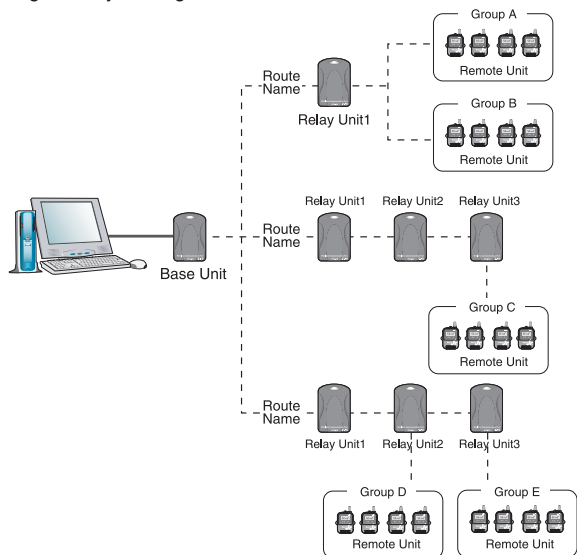


For details about Registering Relay Unit(s) see p.37.

### NOTE:

*There is no need to register a Relay Unit if there are no Relay Units between a Remote Unit and the RTR-50 Base Unit. However, if communication cannot be successfully carried out due to poor radio wave reception, please place Relay Unit(s) between the Remote Unit and the Base Unit.*

## Image of Relay Unit Registration



Once the registration of a Relay Unit is complete, a Relay Unit Number will automatically be assigned to each Relay Unit.

Also, when carrying out Relay Unit Registration it is possible to assign a "Relay Route Name" that can be used to make sure that data is transmitted through a multiple number of Relay Units in the specified route.

### **NOTE :**

*It is possible to set up so that more than one Relay Unit acts as a relay for the same Remote Units. However because wireless communication is carried out in Groups of Remote Units, the same Group will be relayed through different Relay Units causing inefficiency and an increase in the amount of communication time to more than necessary.*

*In order to reduce the communication time, please design Relay Routes so that a particular Group of Remote Units uses the same Relay Unit(s).*

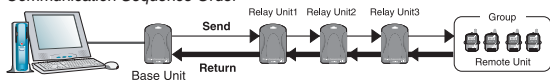
**NOTE :**

A Relay Unit Number will be automatically assigned to Relay Units in the order that they were registered to each Route.

When positioning the Relay Units, please keep in mind that communication is not carried out in order of distance from a Base Unit but rather in the numerical sequence of the Relay Unit's registration number, hence they should be placed in sequential order.

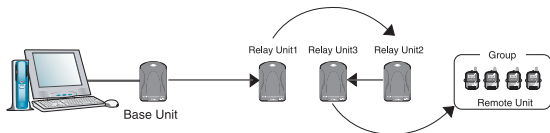
Example :

Communication Sequence Order



Communication will occur sequentially from the first Relay Unit as shown above.

If the Relay Units are not arranged in numerical sequence from the Base Unit, the communication route will be as seen below. This will cause not only the communication distance to increase but also the communication time to increase to longer than necessary.



4. After each Registration has been completed, please check the communication status by carrying out a "Wireless Communication Test."

## Registering a Remote Unit

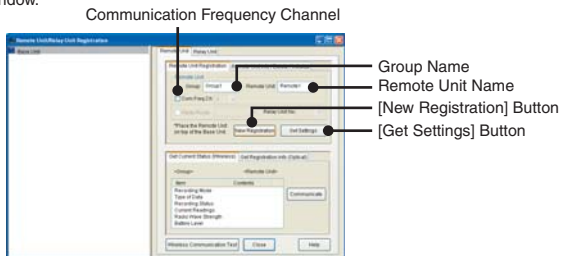
1. Connect the RTR-50 Main Unit with a USB or Serial Communication Cable to your computer.



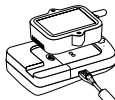
2. In the Main Window, click [Registration] – [Remote Unit / Relay Unit Registration].



3. The [Remote Unit / Relay Unit Registration] display will be opened in a new window.



4. Place the Remote Unit (data logger) you wish to register face down on top of the RTR-50. After entering the Group Name and Remote Unit Name, click the [New Registration] button.



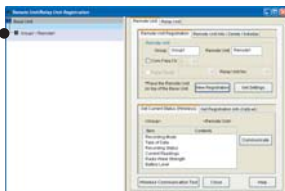
*\*Up to 8 characters can be entered for Group Name / Remote Unit Name.*

*A distinction will be made between upper and lower case alphabet. Ex. abc123 and ABC123 will be treated as different.*

*\*In order to register a Remote Unit, it is also necessary to register a Group Name.*

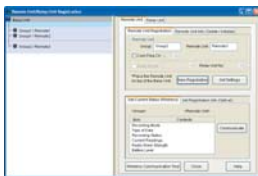
5. When successful communication has occurred, the Remote Unit will be registered in the Registration List at the left side of the Main Window.

The registered Remote Unit



*\*The registered Remote Unit(s) will appear as [Group Name / Remote Unit Name].*

6. Register Remote Units Sequentially.



### Com. Freq. Ch. (Communication Frequency Channel)

- It is possible to set one Communication Frequency Channel (channel 0-21) to each Group.
- If no setting is made, an unused frequency channel will automatically be assigned. If there are no unused frequency channels, the channel that is used the least shall be automatically assigned.
- Communication Frequency Channel settings can only be made when registering a new Group. Once a Communication Frequency Channel setting has been made it cannot be changed.

### [Get Settings] Button

Clicking this button will receive the Registration Info for already registered Remote Units (current settings).

Place the Remote Unit (data logger) for which you wish to receive settings face down on top of the Base Unit and click the [Get Settings] button.

When successful communication has occurred, the Group Name and Remote Unit Name will appear.

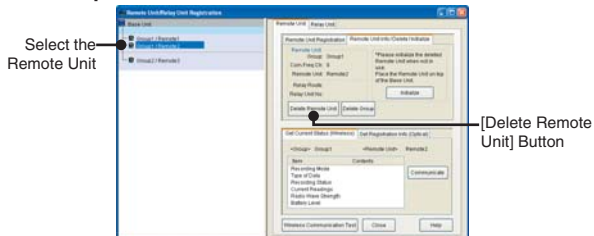
If you wish to register the currently displayed Remote Registration Contents without any changes, click the [New Registration] button to add the received registration info.

## Deletion and Initialization of Remote Unit

Registered Remote Units can be deleted, initialized, or deleted in Groups. Click on the [Remote Unit] – [Remote Unit Info / Delete / Initialize] tab to open the [Remote Unit Info / Delete / Initialize] window.

### Remote Unit Deletion

Select the Remote Unit to be deleted from the Registration List and click the [Delete Remote Unit] button.

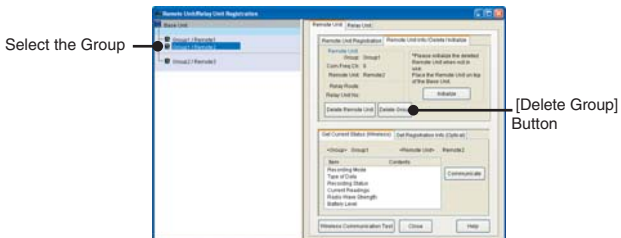


### Group Deletion

Select the Group to be deleted from the Registration List and click the [Delete Group] button.

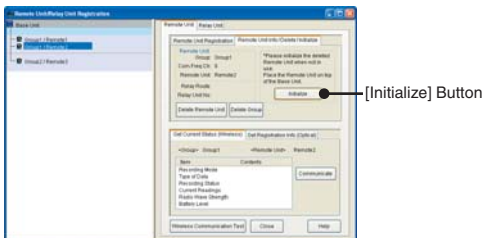
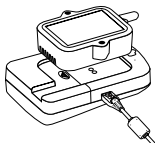
#### NOTE:

*By deleting a Group, it will become impossible to communicate with all Remote Units registered to that Group. If you wish to carry out communication with any such units they must be re-registered or initialized.*



## Remote Unit Initialization

Place the Remote Unit that you wish to initialize on top of the Base Unit connected to your computer and click the [Initialize] button.



### NOTE :

- By initializing, all info saved in the Remote Unit will be erased and will be returned to as it was when it left the factory.  
The Default Settings are Group Name: GROUP 1 / Remote Unit Name: Sr001 / Communication Frequency Channel: 0
- When initializing a currently registered Remote Unit, the Registration Info will also be erased from the Registration List.

## Getting Remote Unit Current Status (Wireless Communication)

It is possible to gather the current Remote Unit Recording Settings: Recording Mode / Type of Data / Recording Status / Current Readings / Radio Wave Strength / Battery Level by selecting [Get Current Status (Wireless)].

Recording Mode -- The selected recording mode will be displayed: Endless or One Time.

### Endless Mode:

When the logger has reached its maximum number of readings (16,000 readings possible / 8,000 of Temp and Humidity for RTR-53), the oldest data reading will be overwritten and recording will continue.

### One-time Mode:

Recording will automatically stop when the logger has reached its maximum number of readings (16,000 readings possible / 8,000 of Temp and Humidity for RTR-53).

Type of Data ----- Temperature, Humidity, Voltage, Pulse, Event, Moisture can be viewed here.

Recording Status - Displays Recording in Progress, Waiting for Programmed Start or Recording Stop.

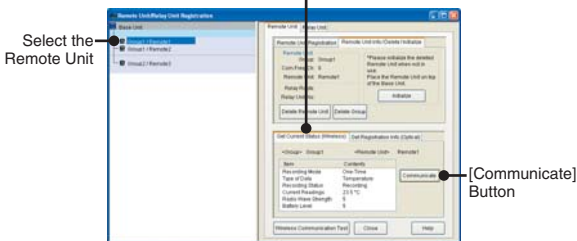
Current Readings- The currently recorded data is displayed here.

Radio Wave

Strength ----- Displays the Radio Wave Strength of wireless communication between Units. (0 – Weak < 5 – Strong)

Battery Level ----- The remaining battery level for the Remote Unit will be displayed. (0 – No Battery < 5 – Full)

1. Check if the Base Unit is properly connected to the computer.
2. From the Registration List, select the Remote Unit which you wish to view the Registration Recording Settings from and click the [Get Current Status (Wireless)] tab. [Get Current Status (Wireless)] Tab



3. Click the [Communicate] button.

### NOTE :

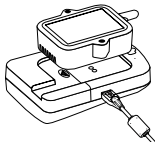
If a communication error has occurred, please check the communication status by carrying out a "Wireless Communication Test." (See p.44 for details)

## Getting Registration Info (Optical Communication)

It is possible to gather the current Remote Unit Info: Group Name / Frequency Channel / Remote Unit Name / Registration Status by selecting [Get Registration Info (Optical)].

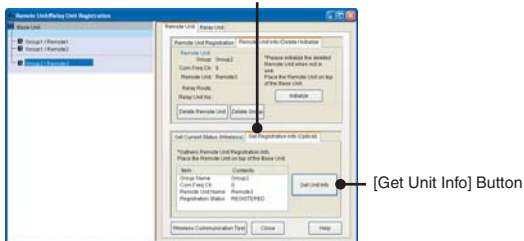
- Group Name -----Group Name will be displayed.  
 Com. Freq. Ch.-----Frequency Channel will be displayed.  
 Remote Unit Name--Remote Unit Name will be displayed.  
 Registration Status --Displays whether the Remote Unit has been registered in the Remote Unit Registration List or not.

1. Place the Remote Unit you wish to view the Registration Info from face down on the Base Unit that is connected to your computer.



2. Select the [Get Registration Info (Optical)] tab and click the [Get Unit Info] button.

[Get Registration Info (Optical)] Tab

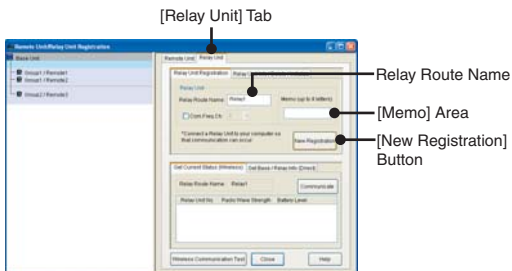


## Registering a Relay Unit

1. Connect the Relay Unit you wish to register to your computer with a USB or Serial Communication Cable.



2. Click the [Relay Unit] tab and enter a Relay Route Name. Then click the [New Registration] button.



### [Memo]

It is helpful to make a memo entry here in order to distinguish between Relay Units.

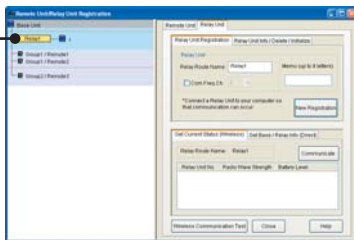
(Up to 8 characters can be entered.)

You may leave this field blank if not necessary and should note that changes cannot be made after registering a Relay Unit. If you wish to make changes, it is necessary to create the Relay Route again.

3. When successful communication has occurred, the Relay Route and Relay Unit will be registered.

*\*A Relay Unit Number for all registered Relay Units will be automatically assigned in the order that they were registered. (Not possible to change)*

Registered Relay Route and Relay Unit



The registered Relay Unit and Remote Unit Group will appear in different background colors so as to be easily distinguishable.



## Deletion and Initialization of Relay Unit

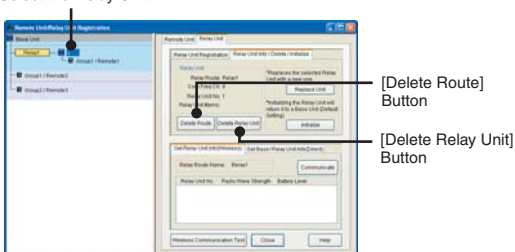
Registered Relay units can be deleted or initialized.

Click on the [Relay Unit] – [Relay Unit Info / Delete / Initialize] tab to open the [Relay Unit Info / Delete / Initialize] window.

### Relay Unit / Relay Route Deletion

Select the Relay Unit to be deleted from the Registration List. Click the [Delete Relay Unit] if you wish to delete only the Relay Unit and click the [Delete Route] if you wish to delete the Relay Route.

Select the Relay Unit



#### NOTE :

If you wish to delete a Relay Route, the location of all Remote Units belonging to it will be returned to just under the Base Unit in the Registration List.

## Relay Unit Replacement (For changing a Relay Unit with a new one due to malfunction or trouble)

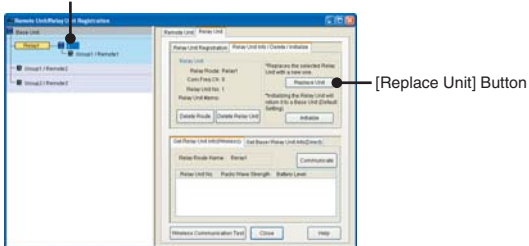
Select the Relay Unit you wish to replace from the Registration List and connect the one you wish to newly register to your computer with a USB or Serial Communication Cable.

Click the [Replace Unit] button.

### NOTE :

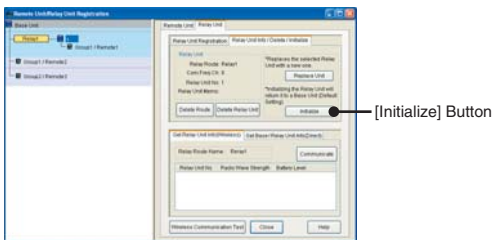
The newly replaced Relay Unit will be registered with exactly the same registration contents as the old one.

Select the Relay Unit



## Relay Unit Initialization (Returning to Base Unit)

Connect the Relay Unit you wish to initialize to your computer with a USB or Serial Communication Cable, and click the [Initialize] button.



### NOTE :

By initializing all info saved in the Relay Unit will be erased and will be returned to as it was when it left the factory.

The default setting for an RTR-50 unit is as a Base Unit.

## Getting Relay Unit Current Status (Wireless Communication)

The Status of Relay Units which belong to the selected Relay Route will be gathered and displayed here.

Relay Unit Number -----The number of the Relay Unit will appear.

Radio Wave Strength --The Radio Wave Strength between Units will appear.  
(0 – Weak < 5 – Strong)

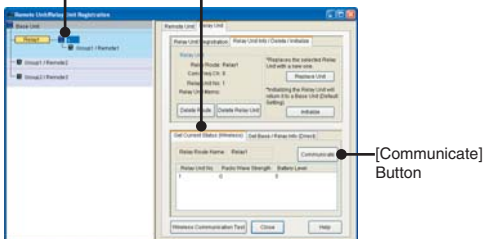
\*This is the Radio Wave Strength for wireless communication between a Relay Unit and the next Relay Unit with the previous number (located closer to the computer) or between the Relay Unit and the Base Unit.

Battery Level-----The remaining amount of battery power will be displayed for the Relay Unit. (0 – No Battery < 5 – Full)

1. From the Registration List, select the Relay Route that contains the Relay Units from which you wish to get their Status.
2. Select the [Get Current Status (Wireless)] tab and click the [Communicate] button.

Select the Relay Units

[Get Current Status (Wireless)] Tab



3. The communication results will appear.

### NOTE:

If a communication error has occurred, please check communication status by carrying out the [Wireless Communication Test]. (See p.44 for details)

## Getting Base Unit / Relay Unit Info (Direct Communication)

It is possible to view the Relay or Base Unit Registration Info.

### For the Base Unit

Battery Level ----- The remaining amount of battery power will be displayed for the Base Unit. (0 – No Battery < 5 – Full)

### For a Relay Unit

Relay Route Name ----- The name of the Relay Route to which the Relay Unit belongs will appear.

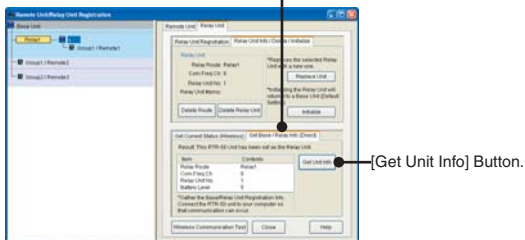
Com. Freq. Ch. ----- Communication frequency channel of Relay Route to which the Relay Units belong will appear.

Relay Unit No. ----- The number of the Relay Unit will appear.

Battery Level ----- The remaining amount of battery power will appear for the Relay Unit. (0 – No Battery < 5 – Full)

1. With a USB or Serial Communication Cable, connect the Relay Unit or Base Unit you wish to view the Registration Info to your computer.
2. Select the [Get Base / Relay Info (Direct)] tab and click the [Get Unit Info] button.

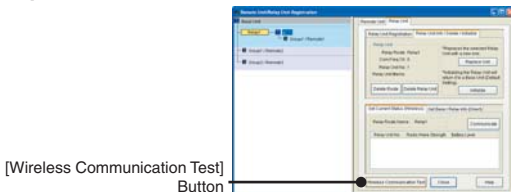
[Get Base / Relay Info (Direct)] Tab



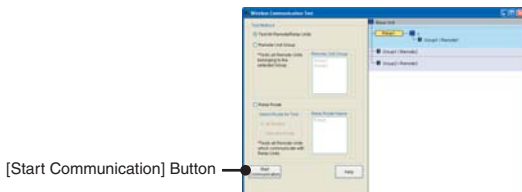
3. The communication results will appear.

## Wireless Communication Test

1. In the [Remote / Relay Unit Registration] window, click the [Wireless Communication Test] button.



2. Select the mode you wish to use for testing wireless communication from: [Test All Remote / Relay Units] / [Remote Unit Group] / [Relay Route] and then click the [Start Communication] button.



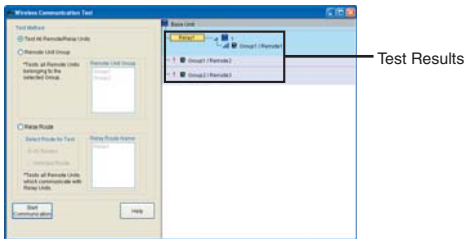
Test All Remote / Relay Units----- The wireless communication test will be carried out for all registered Remote and Relay Units.




Remote Unit Group----- The Radio Wave Strength for the Remote Units which belong to the Group selected from the Remote Group Name List will be displayed.

Relay Route ----- If you have checked "All Routes" in the [Select Route for Test] box, the Radio Wave Strength Test for all Relay and Remote Units that belong to each of the Routes will be carried out. If you have checked "Selected Route", please select the Relay Route for which you wish to carry out the Radio Wave Strength Test.

\*A test for Remote Units which communicate directly with the Base Unit (no Relay Units) cannot be carried out here.

3. A window will appear in which you can view the test results.



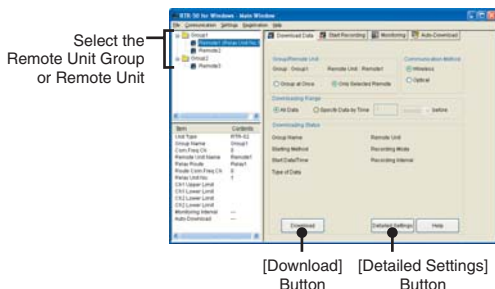
-  --- Communication Successful The number of vertical lines shows the Radio Wave Strength. (Min:1 / Max:5)  
If testing is of a Relay Unit, the Radio Wave Strength shown will be for between that Unit and the Unit with one number before it. (If the Relay Unit Number is 1 then the Strength shown will be for communication with the Base Unit).
-  --- Communication Failure Appears in front of the Remote or Relay Unit Name for which a communication failure has occurred.
-  --- Appears in front of the Remote or Relay Unit Name for which the test has not been selected in the test mode (communication does not occur).

*\* If a communication failure has occurred, check the Relay / Remote Unit location and the remaining battery life.*

# Data Download Settings

Data Download Settings for each Remote Unit or for a Group at Once can be made in the Main Window.

1. When downloading data from one Remote Unit, in the Remote Unit Group List at the left side of the window select the Remote Unit from which you wish to download data. When downloading data via a Group, in the Remote Unit Group List select the group folder which you wish to download from.



2. By making Communication Method and Downloading Settings and then clicking the [Download] button, downloading will begin. During download, the current downloading progress will appear in the [Downloading Status Box] of the Main Window.

## Group / Remote Unit (Only for Wireless Communication)

Only Selected Remote

Download only that data saved in the one selected Remote Unit from the [Remote Unit Group List].

Group at Once

Download all data saved in the Remote Units belonging to the selected Group in the [Remote Unit Group List].

### NOTE:

*\*The downloaded data will be automatically saved in a file with the following format "Group Name\_Remote Unit Name \_Date / Time.ext" in the same Folder into which RTR-50 for Windows was installed.*

## Downloading Range

All Data ----- Download all data saved in the Unit.

Specify Data by time --- Download only that data recorded during a specified period back from the last recorded data reading. You can specify the periods in units from 1 hour or from 1 day. If a period is specified that includes a time of data that is not saved in the Unit, all data will be downloaded.

## Downloading Status (Info for the Group or Remote Unit from which data is being downloaded will appear.)

Group Name ----- Displays the Group Name in which the Remote Unit belongs.

Remote Unit Name ---- Displays the Remote Unit Name from which data is being downloaded.

Starting Method ----- Immediate Start / Programmed Start

Recording Mode ----- Endless / One Time

Start Date / Time ----- Displays the date and time when recording was started.

Recording Interval ----- Displays the set recording interval.

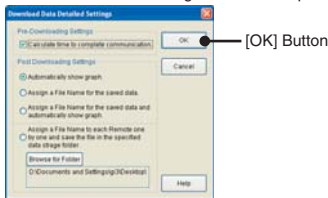
Type of Data----- Temperature / Humidity / Voltage / Pulse / Event / Moisture

### NOTE:

- Only when using optical communication will the downloading progress bar show the percent of data downloaded as it occurs.
- If it is waiting to start a programmed recording, an error message will appear saying there is no data.
- Recording of data will continue during downloading and after downloading has been completed. The data recorded in a Remote Unit is erased when a new recording is started.
- The data recorded in a Remote Unit is erased when a new recording is started. The downloaded data is also erased when the software is closed or the computer is turned off. Therefore, we suggest saving the data to a file as soon as possible.
- If the amount of battery life is low or if on the LCD display of the unit the BAT mark appears, please replace the batteries as soon as possible. All recorded data may be erased when the batteries are changed and the unit automatically resets. Before replacing the batteries please make sure to download any necessary data and save it in a file.
- When communicating via USB, if a forced cancellation occurs in the application while downloading of data is in progress, USB Communication may become jammed and unstable. If this is the case, insert the USB cable again.

## [Detailed Settings] Button

Here, it is possible to make Pre-Downloading settings and settings for the processing of downloaded data to be followed after downloading has been completed.



Check the desired items and click the [OK] button to finish the settings.

## Pre-Downloading Settings

Calculate time to complete communication.

These settings are only for when communicating via Relay Unit(s). If a check has been placed in the checkbox, the total time for a wireless communication session to be completed will be displayed in the [Communication Status] Dialog Box. Note that in order to display the time to complete the communication it is necessary for the Remote Unit to carry out one communication with the Relay Unit(s) before the start of downloading. The approximate time for that communication is calculated as follows: (Number of Relay Units x 20 seconds). This time will be added to the time for the downloading of data itself. The total communication time is the sum of "the added time as calculated above" and "the actual time that the download will take". If you wish to view the estimated time to complete a communication, place a check in the box.

## Post Downloading Settings

Automatically show graph.

Downloaded data will automatically be displayed in graph form. If you wish to save data, go to the [File] Menu in the Graph display to save it.

Assign a File Name for the saved data.

After data has been downloaded from the Remote Unit, the [Save File] dialog box will appear wherein you can save the data to a specified file. Please assign a file name for the saved data. The saved data can be viewed in a Graph form later. (See "Chapter 4 Graph Operation" for details.)

Assign a File Name for the saved data and automatically show graph.

"Assign a File Name for the saved data." and "Assign a File Name for the saved data and automatically show graph." written above will be carried out in order.

Assign a File Name to each Remote one by one and save the file in the specified data storage folder.

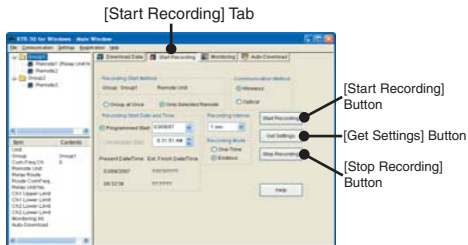
After downloading data, the data will automatically be assigned a File Name (Group Name / Remote Unit Name / Date Time. Extension) and stored in the specific Folder. Even if the settings for the data storage folder have not been made here, that file will automatically be stored in the same Folder into which the application was installed. The saved data can be viewed in a Graph form later. (See "Chapter 4 Graph Operation" for details.)

# Recording Start Settings

You can make Recording Start settings via Wireless or Optical Communication.

Click on the [Start Recording] tab to open the [Start Recording] window.

## When using Wireless Communication



1. When making Start Recording settings for one Remote Unit, select the Remote Unit for which you wish to make Start Recording settings from the Remote Unit Group List at the left side of the window. When making Start Recording settings for Group at once, select the group folder for which you wish to make Start Recording settings from the Remote Unit Group List at the left side of the window.
2. Make the desired settings and click the [Start Recording] button.

The confirmation message dialog box will appear. Click the [OK] button to send the settings to the Remote Unit(s) and then start recording. (If you do not wish to have the dialog box displayed, check [Do not show this message the next time a recording session is started.].) It is possible to return the hidden confirmation message to view by holding down the <Shift> key and right clicking with the mouse in the empty area. Then this message will appear again the next time a recording session is started.

### [Start Recording] Button

Recording will start for the one selected Remote Unit.

*\*If the Remote Unit has been set for [Forbid Recording Start via Wireless Communication], [Start Recording] cannot be carried out. See the "[Detailed Settings] button" (p.55) for details.*

### [Get Settings] Button

Receive and Display the current settings from the selected Remote Unit.

## [Stop Recording] Button

By clicking you can stop the recording of the selected Remote Unit or Group at any time during recording.

*\*If the Remote Unit has been set for [Forbid Recording Start via Wireless Communication], [Start Recording] cannot be carried out.*

*For more details, see the User's Manual that accompanies the Remote Unit.*

## Recording Device Selection (Only for wireless communication)

Group -----Displays the Group Name selected from the [Remote Unit Group List].

Remote Unit-----Displays the Remote Unit Name(s) selected from the [Remote Unit Group List].

Only Selected

Remote -----Starts the recording of one selected Remote Unit.

Group at Once-----Starts recording of all registered Remote Units in the selected Group.

## Recording Start Date / Time

Programmed Start---The Remote Unit will begin recording at the time and date programmed. Enter the hour, minute and second of the date, month and year you wish to begin recording. Upon opening the dialog box the first time, the default setting will be the time and date it was opened. (The default setting will round up to the nearest minute)

When making settings for the date and time to start recording under a programmed start, make sure to take into account the time necessary for wireless communication between the Remote Unit(s) and the Base Unit to occur.

A Programmed Start can not begin if the Programmed Start Time has been set to a time that is before wireless communication can be completed with all units in the Group. (An Error Message will appear.) As a general rule the amount of time necessary to start communication for each route should probably take (the number of Relay Units in the route + 1) multiplied by 20 seconds. Also, if Remote Units which communicate via different numbers of Relay Units and one which communicates directly with the Base Unit are mixed when starting a recording session via Group, please make settings for the Programmed Recording Start Time using the amount of time calculated for the Remote Unit that communicates via the largest number of Relay Units.

Present

Date / Time -----The time set in your computer's system will appear here. If you have selected a Programmed Start, the Recording Start Time must be set to a time coming after the present time.

Est. Finish

Date / Time -----The finish date and time of recording will be automatically calculated from the set recording interval and starting time. (If you are recording under the Endless Loop method this will not appear.)

### Recording Interval

Selection can be made from any of the following:

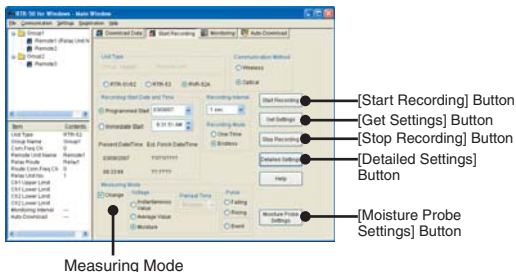
1, 2, 5, 10, 15, 20, 30 seconds or 1, 2, 5, 10, 15, 20, 30, 60 minutes.

### Recording Mode

One-time Mode-----With One-time Mode, upon reaching capacity of 16,000 readings (8,000 of Temp and Humidity for RTR-53), "FULL" will appear on the LCD display and recording will automatically stop.

Endless Mode -----With Endless Mode, when the number of recorded readings reaches 16,000 (8,000 of Temp and Humidity for RTR-53), the oldest data readings will be overwritten and recording will continue.

## When using Optical Communication



### 1. Select the Unit Name.

*\*If you select RVR-52A, the setting items for the Measuring Mode will appear.*

### 2. By clicking the [Detailed Settings] button which appears only when using optical communication, the [Wireless Communication Protection] display will appear. (See p.55 for details)

### 3. Make the desired settings and click the [Start Recording] button to finish.

## [Start Recording] Button

Clicking here will start a recording session for the Remote Unit using all of the set recording conditions.

*\*If you choose to hide a confirmation message, by holding down the <Shift> key, right click with the mouse in the empty area and this message will appear again the next time a recording session is started.*

## [Get Settings] Button

Receive and display the settings of the Remote Unit that is currently placed on the Base Unit.

## [Stop Recording] Button

By clicking, you can stop the recording of the Remote Unit that is currently placed on the Base Unit.

## Recording Start Date / Time

**Programmed Start** --The Remote Unit will begin recording at the time and date programmed. Enter the hour, minute and second of the date, month and year you wish to begin recording.

Upon opening the dialog box the first time, the default setting will be the time and date it was opened.

(The default setting will round up to the nearest minute.)

**Immediate Start**-----The Remote Unit will begin recording immediately. There is no need to make the recording start date and time settings.

**Present**

**Date / Time** -----The time set in your computer's system will appear here. If you have selected a programmed start, recording start time must be set at a time following to the present time.

**Est. Finish**

**Date / Time** -----The finish date and time of recording will be automatically calculated from the set recording interval and starting time.  
(If you are recording under the Endless Loop method this will not appear.)

## Recording Interval

Selection can be made from any of the following:

1, 2, 5, 10, 15, 20, 30 seconds or 1, 2, 5, 10, 15, 20, 30, 60 minutes.

## Recording Mode

**One-time Mode**-----With One-time Mode, upon reaching capacity of 16,000 readings (8,000 of Temp and Humidity for RTR-53), "FULL" will appear on the LCD display and recording will automatically stop.

**Endless Mode** -----With Endless Mode, when the number of recorded readings reaches 16,000 (8,000 of Temp and Humidity for RTR-53), the oldest data readings will be overwritten and recording will continue.

## [Detailed Settings] Button (For optical communication only)

### Forbid Recording Start via Wireless Communication

If a Remote Unit has been set for [Forbid Recording Start via Wireless Communication], the starting / stopping of recording via wireless communication will not be allowed for that Remote Unit. Also, makes impossible the stopping of recording via wireless communication.

### Permit Recording Start via Wireless Communication

If a Remote Unit has been set for [Forbid Recording Start via Wireless Communication], clicking here will allow the starting / stopping of recording via wireless communication.

#### **NOTE :**

*By click the [OK] button, the settings will become effective the next time the recording is started via optical communication.*

## Measuring Mode (For optical communication only)

**\*Appears for RVR-52A only.**

### Voltage

**(The unit of measurement on the display will show [V] for Voltage.)**

Instantaneous Value ---Records the voltage at the instant of measurement.

Preheat Time-----When recording Voltage using the instantaneous value method. The choices for the preheat time setting are "deactivate", "50 msec", or from "1 to 200 seconds" in units of one second. If the sensor you are using needs power, it is possible to make settings to allow for a specified preheat time.

Average Value -----Records the voltage as a value of the average of the measurements within a specified recording range.

### Pulse

Falling-----Records falling pulse edge.

Rising-----Records rising pulse edge.

### Event

**(The unit of measurement on the display will show (Hi or Lo) to signify an event.)**

Records the time of a pulse event.

## Moisture

**(The unit of measurement on the display will show [P] for Percent.)**

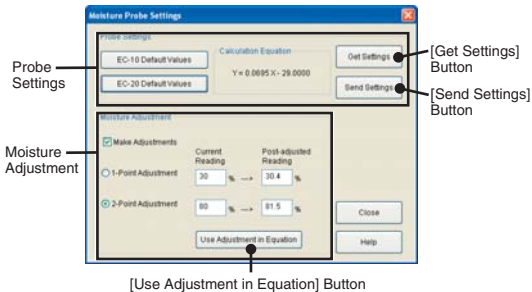
It is possible to measure soil moisture using Decagon Devices Inc, Soil Moisture Sensor ECHO Probes (EC-10, EC-20). T&D Corporation does not handle or sell the Soil Moisture Sensors ECHO Probe (EC-10, EC-20). All inquiries and questions concerning sales of and the operational specifications of the sensors should be made to Decagon Devices Inc. [<http://www.decagon.com>].

Record Moisture by Percentage.

*\*When measuring moisture with the RVR-52A, it is necessary to make sensor settings in [Settings] – [Moisture Probe Settings] or [Moisrure Probe Settings] button.*

### [Moisture Probe Settings] Button (For optical communication only)

If you have selected "Moisture" as the Measuring Mode, then here you should set into the Data Logger the moisture percentage calculation equation for the moisture sensor you are using.



### Probe Settings

Select which sensor you are using, either EC-10 or EC-20 and click the [EC-xx Default Values] button and [Send Settings] button for that sensor.

- EC-10 Default Values:  $Y = 0.0936 X - 37.6$
- EC-20 Default Values:  $Y = 0.0695 X - 29$

#### NOTE :

*For more details about these values, please see the User's Manual that came with your sensor.*

### [Get Settings] Button

This allows you to gather the equation that is currently set in the RVR-52A logger.

### **[Send Settings] Button**

This sends the currently displayed moisture percentage calculation equation to the RVR-52A logger.

*\* Before sending settings, use the [Get Settings] button to receive the current settings.*

### **Moisture Adjustment**

Before making adjustments, use the [Get Settings] button to receive the current settings.

By placing a check next to [Make Adjustments], it is possible to make corrections for measurement errors that may occur.

This function allows you correct or adjust for errors in measurement values. The Data Logger will record only the adjusted value.

Current Reading: Enter the actual measurement before adjustment

Post-adjusted Reading: Enter the desired measurement after adjustment.

### **[Use Adjustment in Equation] Button**

The newly adjusted equation will appear in the Moisture Percentage Calculation Equation Area.

### **[Send Settings] Button**

The adjusted equation will be sent to the Data Logger.

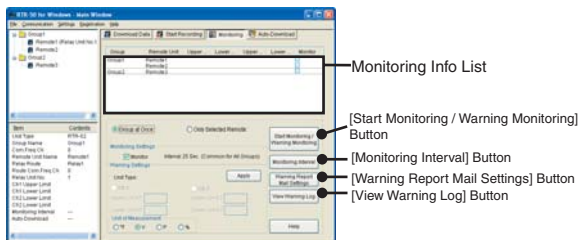
#### **NOTE :**

- *When you are carrying out adjustments and formulating equations please take care with the settings and take personal responsibility for the process.*
- *We cannot guarantee that after carrying out adjustment the measuring accuracy will improve for all measuring ranges.*
- *For details about Moisture Adjustment, see the [Help Menu] in the provided software T&D Recorder for Windows® .*

# Monitoring / Warning Monitoring Settings

It is possible to monitor and view current readings in a new window. Click on the [Monitoring] tab to open the [Monitoring / Warning Monitoring] window.

Select the Remote Unit or Group to be monitored from the Monitoring Info List.



## Monitoring Info List

- Group Name ----- Displays the Group Name registered.
- Remote Unit Name -- Displays the Remote Unit Name registered.
- Upper Limit 1 ----- Displays the Upper Limit setting for the Warning Monitoring of Channel 1.
- Lower Limit 1 ----- Displays the Lower Limit setting for the Warning Monitoring of Channel 1.
- Upper Limit 2 ----- Displays the Upper Limit setting for the Warning Monitoring of Channel 2.
- Lower Limit 2 ----- Displays the Lower Limit setting for the Warning Monitoring of Channel 2.
- Monitor ----- Check the Remote Unit to be monitored.

## [Monitoring Settings]

### Monitor

Operates simultaneously with Monitoring Info List. Place a check to make changes to the Monitoring settings for the specified Remote Unit.

### Interval

Displays the Monitoring Interval set in the [Monitoring Interval Settings] dialog box. The set Monitoring Interval will become the common one for all Groups.

## [Monitoring Interval] Button

It is possible to specify the monitoring interval.

Check [Monitor] and click the [Monitoring Interval] button to make monitoring interval settings.



### **NOTE:**

*If you wish to set the monitoring interval in units of seconds, please assign a value of 20 seconds or higher, and if units of minutes, assign a value of 1 minute or higher. Also please assign an interval time that is longer than communication time necessary for the currently selected Remote Unit(s).*

## [Warning Settings]

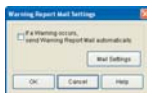
When making upper and lower limit settings for Warning Report, select the Remote Unit from the Monitoring Info List, select the unit of measurement, make a check next to Ch.1 or Ch.2 and enter the desired values. Click the [Apply] button to save the settings.

## [Warning Report Mail Settings] Button

When current readings have exceeded upper and lower limit settings, a warning report mail can be sent. Check [Send a Warning Report Mail automatically if a Warning occurs], and click [OK].

Make any necessary mail settings in the [Mail Settings] window.

*\*For details about Mail Settings, see p.65.*





## [Start Monitoring / Warning Monitoring] Button

Opens the [Monitoring Graph] in a new window with all settings previously made by clicking this button.

### NOTE:

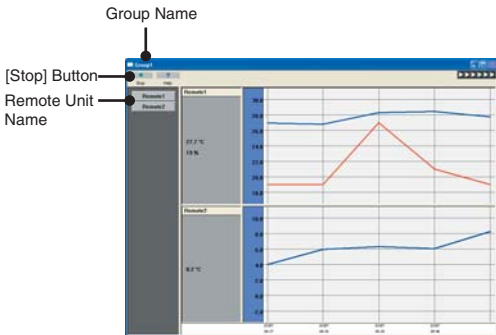
Clicking the [Start Monitoring / Warning Monitoring] button opens the [Monitoring Graph] in new windows for the number of Groups you have registered.

## Monitoring Graph Window

By making the desired settings in the [Monitoring / Warning Monitoring] window and then clicking the [Start Monitoring / Warning Monitoring] button the [Monitoring Graph] window will be opened in a new window.

### NOTE:

Opens the [Monitoring Graph] in a new window for the number of Groups you have registered.



The Group Name will be displayed in the window title area.

### NOTE:

- Do not make any changes to the Remote Registration Contents during Monitoring.
- Other communication cannot be carried out during a monitoring session. Click the [Stop] button once before closing the [Monitoring Graph] window.
- If Auto-Download has started during a monitoring session, Monitoring and Warning Monitoring will be temporarily stopped and be started again upon the completion of the Auto-Download session.

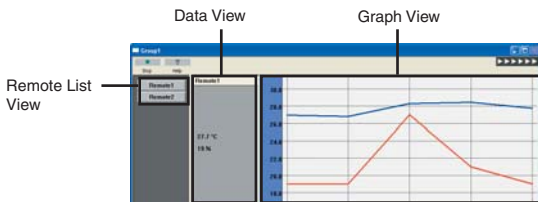
## [Stop] Button

Click to stop the current Monitoring / Warning Monitoring. Clicking the [Stop] button in a window stops Monitoring / Warning Monitoring for all groups in which it is currently being conducted.

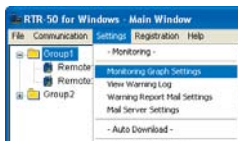
*\*It is not possible to stop Monitoring / Warning Monitoring for only one window.*

## Monitoring Graph Settings

It is possible to make all the necessary view settings in the [Monitoring Graph] window.



Click [Monitoring Graph Settings] in the [Settings] Menu.



## Remote Unit List View Settings

Make changes to the Remote Unit List settings.



Font Color -----Set font color.

Background Color -----Make background color settings.

Warning Button Color--Make warning button color settings.

Font Size-----Set font size.

Preview-----The current settings for the [Remote List View], [Data List View] and [Graph View] can be viewed in the Preview Display.

\*Clicking on each list can shift the display to view the desired settings display.

## Data List View Settings

Make changes to the Data Display Area settings.



### Current Data Settings

Data Color -----Make character color settings for the display of current data.

Warning Data Color ----Make character color settings for warning data.

Font Size-----Make settings for font size of the current data.

### Remote Unit Name Settings

Data Color -----Make settings for Remote Unit Name character color.

Font Size-----Make settings for font size of the current data.

Background Color -----Make settings for background color in the data display area.

Preview-----The current settings for the [Remote List View], [Data List View] and [Graph View] can be viewed in the Preview Display.

\*Clicking on each list can shift the display to view the desired settings display.

## Graph View Settings



### Graph Color Settings

Line Color 1 / Line Color 2--- Make settings for the color of that channel's data lines in the graph. Line Color 1 is for Remote Unit Ch.1 and Line Color 2 is for Remote Unit Ch.2 (for RTR-53 only). Each click of the [ ▲ ] button will make that channel's line thicker and each click of the [ ▼ ] button will make it thinner.

Background Color ----- Make settings for the graph's background color.

Vertical Background Color--- Make background color settings for the vertical axis.

### Graph Display Size Settings

Auto Setting ----- In one window display the graphs for the number of Remote Units in which monitoring is being carried out by changing the height of each graph.

Manual Setting (%) ---- Display the size of one graph in proportion to the currently used window size (height).

\*For example, if the height of the currently used window is 400, by making the settings 50%, the height of the graph display will be 200. It is possible to scroll up and down to bring all graph displays into view. However, if the total height of all graph windows is smaller than the currently used window size, the height of the graph at the bottom will be automatically enlarged to fill up the window.

Displayed Data ----- The number of data points to be displayed in the Graph for one channel.

\*Graph lines will not be displayed for any period when Monitoring resulted in a failure.

Preview ----- The current settings for the [Remote List View], [Data List View] and [Graph View] can be viewed in the Preview Display.

\*Clicking on a list will shift the display to view the desired settings display.

## Mail Server Settings

Here is where all settings for sending warning report E-mail can be made. Click [Mail Server Settings] in the [Settings] Menu.

### Mail Server Settings Window



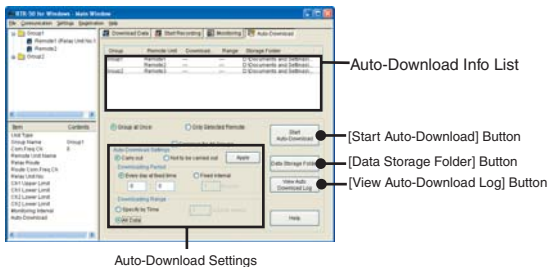
#### NOTE:

- In order to send E-mails, it is necessary to have set up a SMTP server (for sending) and a POP3 server (for receiving) in the network. Also, a Mail Account Name, User Name and Password are needed. A POP3 sever can only be used when the POP before SMTP settings have been set as active. Please contact your local provider for more details.
- The encryption of content is not supported.
- Because no Dialup Connection Settings have been made, to have warning report mails sent automatically, you must be connected to the Internet (normally connected).

- Receiving Server (POP3)---If the POP before SMTP setting has been set to active, enter the POP3 server you wish to use to send E-mail.
- Sending Server (SMTP)---Enter from which SMTP server you wish to send E-mail.
- E-Mail Address -----Enter the mail address to which warning report mails should be sent.
- User Name -----If the POP before SMTP setting has been set as active, enter the User Name and Password for your mail account.
- Password -----If the POP before SMTP setting has been set as active, enter the User Name and Password of your mail account.
- Save the Password -----By checking this button, the Password will be saved. POP If the POP before SMTP setting has been set as active, place a check in the box to save the Password.
- Activate POP before SMTP-----The POP before SMTP settings will be set to active. \*The POP before SMTP settings vary depending upon your server. Please contact your local provider for more details.
- Subject -----Enter a subject name for the E-mail. (OK to leave blank)
- Content -----Enter any comments which you wish to appear in the upper part of the warning display. (OK to leave blank)

# Auto-Download Settings

Auto-Download Settings can be made in the Main Window. Click on the [Auto-Download] tab to open the [Auto-Download] window. Select the Remote Unit or Group for which you wish to carry out Auto-downloading from the Auto-Download Info List.



## [Auto-Download Settings]

1. Check [Carry out].
2. Select the download interval.  
Every Day at Fixed Time-- Download data automatically every day at a fixed time.  
Fixed Interval ----- Download data automatically at a fixed interval of time.
3. Specify Period for Downloading.  
Specify by Time ----- Select this if you wish to download only part of the data by specifying to download only data recorded from a set number of hours before the present time. If a period of time is selected which is larger than that of the actual recorded data, all data will be downloaded.  
All Data----- Select this if you wish to download all of the data that is recorded in the Remote Unit(s).
4. Click the [Apply] button to apply the settings. You can view the current settings in the Auto-Download Info List.

## **[Start Auto-Download] Button**

Clicking this button will start the Auto-Downloading of data.

Click the [Start Auto-Download] button.

*\*If you wish to make the same Auto-Download settings for all registered Remote Units in all Groups, check [Common for All Groups].*

### **NOTE:**

*If Auto-Download has started during a monitoring session, Monitoring and Warning Monitoring will be temporarily stopped. They will be started again upon the finishing of the Auto-Download session.*

## **[Data Storage Folder] Button**

When using Auto-Download, specify the folder into which the data file should be saved.

### **NOTE:**

- *Specify the folder into which the data will be saved for each Group.*
- *If you do not specify the data storage folder, the data will be saved in the same folder where RTR-50 for Windows was automatically installed.*

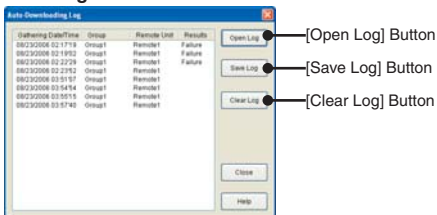
## [View Auto-Download Log] Button

View the Auto-Download Log (the time and result of downloading).

### NOTE:

An Auto-Download Log can hold up to 1000 records. Upon exceeding 1,000 records, the log stored in the RTR-50 will be automatically erased. If you wish to save the Log, click the [Save Log] and save the contents to a file.

## Auto-Download Log Window



## Auto-Download Log

Gathering Date/Time ----- View the Date and Time of Auto-Downloading.

Group Name ----- View the Name of the Group for which the Auto-Downloading has been completed.

Remote Unit Name ----- View the Name of the Remote Unit(s) for which the Auto-Downloading has been completed.

Results ----- A Successful download returns a blank and failed download returns "Failure".

## [Open Log] Button

Open existing Log Files (file extension ".glf").

## [Save Log] Button

Save the data in the current display to the desired location.

## [Clear Log] Button

Clicking this will delete all records from the currently selected log and the display will be refreshed.



## 4. Graph Operations

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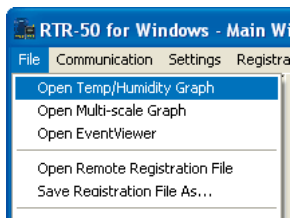
Here operations can be carried out to view in graph form the data recorded by RTR-5 Series Data Loggers.

Depending on the type of data, from the [File] Menu, select one of the commands [Open Temp/Humidity Graph], [Open Multi-scale Graph], or [Open Event Viewer] to open a graph.

# Temperature / Humidity Graph

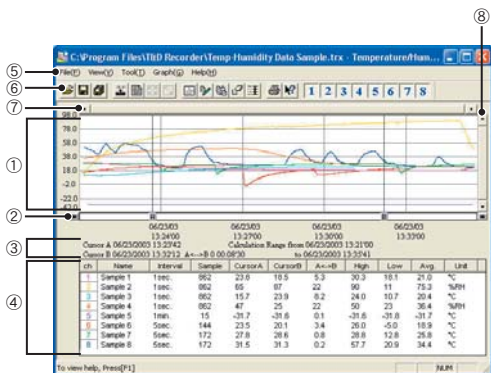
Here operations can be carried out to view in graph form the temperature and humidity data recorded by RTR-5 Series Data Loggers.

From the [File] Menu, select [Open Temp/Humidity Graph] to open.



*\*If a check has been placed next to [Automatically show graph] in ([Download Data] tab – [Detailed Settings] – [Post Downloading Settings]), the graph will automatically be displayed after downloading. (The default setting is for a check to be next to [Automatically show graph].)*

## Main Window 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. 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.

## 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 Display

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

## 5. 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.

## 6. Toolbar

Buttons appear for frequently used commands.

## 7. 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.

## 8. 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.

## Channel Info Display Items

ch	[Channel Number] button. 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	CursorA	Cursor A position data
CursorB	Cursor B position data	A<->B	Calculated Temp / Humidity Difference between Cursor A and B
High	Highest Reading	Low	Lowest Reading
Avg.	Average Reading	Unit	Unit of measurement

## Zooming In and Out on the Graph

### Zooming In and Out on the Graph with Mouse

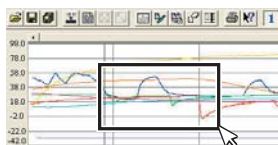
With the left button drag the mouse to outline the area you want to zoom in on.

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 as above.*

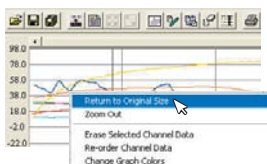
#### [Zoom In]

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



#### [Zoom Out]

With the mouse, right click on the graph and select [Return to Original Size] in the pop-up Menu that appears.



### About the Horizontal Axis

The entire graph shows in the horizontal axis the recording start data and recording finish data for channels 1-8. This represents the full scale of the horizontal axis.

### About the Vertical Axis

The farthest you can zoom out on the graph is to the display that shows the lowest possible measurement value and the highest possible measurement value in the vertical axis for channels 1-8. This represents the full scale of the vertical axis.

## [Graph] Menu

### [Zoom In / Zoom Out]

Step-by-step zooms in or out one step at a time.

### [Move A/B Cursors to the Left / Right]

Simultaneously move the AB Cursors to the left or right.

With each click the cursor moves the distance of the smallest recording interval. The AB cursors can be moved until one of them reaches the left or right edge of the graph.

### [Move Graph Left / Move Graph Right]

While maintaining the present display zoom scale, moves the horizontal axis to the left or right.

The movement range is the full scale of the horizontal axis which begins with the earliest recorded data and ends with the latest recorded data for channels 1~8.

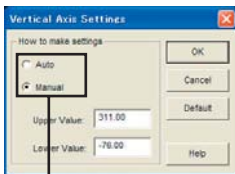
### [Move Graph Up / Move Graph Down]

While maintaining the present display zoom scale, moves the vertical axis up or down.

The movement range is the full scale of the vertical axis; that is the lowest possible measurement value and the highest possible measurement value for channels 1~8.

### [Vertical Axis Settings] (Default is "Auto")

The [Vertical Axis Settings] Dialog Box appears where you can change settings for the vertical axis scale (temperature and humidity). Select either [Auto] or [Manual]. (These operations can be carried out by clicking the [Vertical Axis Settings] icon in the Toolbar.



Check [Auto] or [Manual].

Auto:

The vertical axis will automatically be changed according to the values of the data.

Manual:

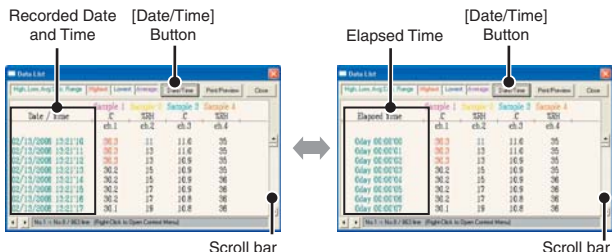
You can set the upper and lower values of the vertical axis scale.

## Data List Display

Shows all recorded data displayed in the graph as a list. Click [Data List Display] in the [View] Menu. (The same window can be displayed by clicking on the [Data List Display] icon in the Toolbar.) You can view all the recorded data including time and date as a list. The green colored dates and times are those that fall within the High, Low, Avg. Calculation Range.

### [Date / Time] Button

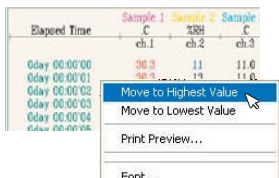
By clicking this button, you can shift the display between the recorded date and the amount of elapsed time since recording started.



### Color Coded Display

- GREEN : Dates and times which fall within the calculation range for determining high, low and average measurements
- BLACK : Dates and times outside the calculation range for determining high, low and average measurements
- RED : Highest Value    BLUE : Lowest Value    PINK : Average Value

### Move to Highest Value / Move to Lowest Value



By right clicking on the Data List Display, a Menu will appear. Click [Move to Highest Value] or [Move to Lowest Value] to move to the Highest or Lowest values. By dragging the Scroll Bar up and down you can view the corresponding part of the displayed data in the list.

### [Print Preview]

By clicking, the List Print Preview Dialog Box will appear. After confirming, click the [Print] button to start the printing.

### [Font]

Changes can be made to the Fonts used in the Data List Display. Changes made here will not take effect Fonts used in printing.

### [Show Lines]

Divides fields of data (channels) by lines

### [Change Colors]

Make changes to the letter and background colors used in the Data List. Changes made here will not effect colors used in printing

## Switching the Graph Display Mode

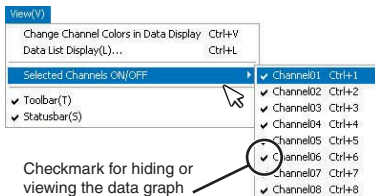
It is possible to hide or view the data graph for selected channel(s) and change the colors of data display. Select the commands in the [View] Menu to make these settings.

### [Change Channel Colors in Data Display]

Change to black and white or change the colors of the detailed info list for each channel that appears below the graph area. (The same operation can be done by clicking on the [Changing Colors of Data Display Area] icon in the Toolbar.)

### [Selected Channel Graph ON/OFF]

Hide or view the data graph for selected channel(s). By moving the mouse to [Selected Channels Graph ON / OFF] in the [View] Menu, the channel numbers are displayed. Those channels with a check mark next to the number will be displayed in the Graph. If you wish to only hide the data graph for that channel, remove the check.



Checkmark for hiding or viewing the data graph for selected channel(s)

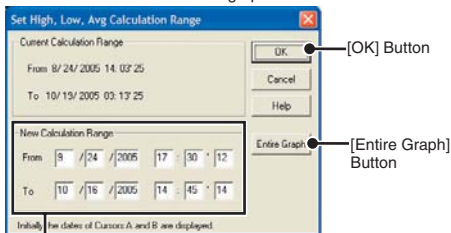
The same operation can be done by clicking on the [Channel Number] icons in the Toolbar. Click the channel No. of the channel you wish to view.



Those channels with a check mark next to the number will be displayed in the Graph.

## High, Low, Avg. Calculation Range

Set the calculation range for determining high, low and average measurements. If no setting is made the values within the entire graph will be used as the calculation range.



Enter the numerical values

1. Select [Set High, Low, Average Calculation Range] in the [Tools] Menu to open the settings window.

(This settings window can be opened by clicking the [Set High, Low, Average Calculation Range] icon in the Toolbar.)

2. In the [Set New High, Low, Avg. Calculation Range] box, the dates and times that appear are those of the AB Cursors when the dialog box is opened.

On the graph display, the calculation range that you have set will be displayed.

3. Change the range by entering the desired dates and times and click [OK]. From that point the High, Low and Average readings will be calculated within that range.

The graph display will also show only that data within the calculation range.

### [Entire Graph] Button

By clicking the [Entire Graph] button, the dates and times in the [New High, Low, Avg. Calculation Range] box will display those of the entire graph.

## Editing Recording Conditions

Change channel names and/or adjust recording start times. Select [Edit Recording Conditions] in the [Tools] Menu to open the editing window.

(This editing window can be opened by clicking the [Edit Recording Conditions] icon in the Toolbar.)



1. By clicking the Channel Number you wish to edit, the [Name] and [Started Date / Time] in the "Edit Items" display will show info for that channel number.
2. Enter the [Name] and [Started Date / Time] in the "Edit Items" and click the [OK] button.  
Name: Up to 32 letters can be entered.
3. If you wish to continue to change other channels, repeat the process as in 1 and 2.

### [Restore] Button

By clicking this button, the settings will return to those when the dialog box was opened.

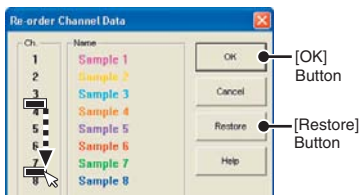
## Re-ordering Channel Data

You can re-order the data during graph display. Select [Re-order Channel Data] in the [Tools] Menu to open the settings window.

There are two methods to use when re-ordering channels: [Re-order by Dragging a Channel Number] and [Specify the Channel Numbers to be Moved].

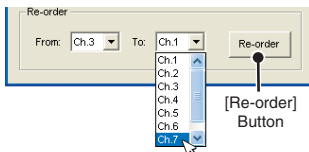
Ex : If you wish to move Ch.3 to Ch.7

### Re-order by Dragging a Channel Number



Drag the channel number you wish to move (Ch 3) to the newly desired channel number position (Ch 7) and drop it. Click the [OK] button to complete the settings.

### Specify the Channel Numbers to be Moved



Set as such: "From" → Ch.3 (original position), "To" → Ch.7 (desired position); then click the [Re-order] button. Click the [OK] button to complete the settings.

### [OK] Button

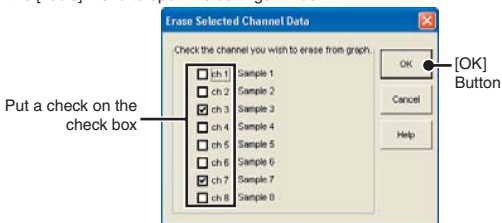
After making the necessary settings, by clicking the [OK] button, the channels will be re-ordered and the graph will be re-drawn.

### [Restore] Button

This command will become invalid after the settings procedure has been completed and the [OK] button has been clicked. If you wish to restore channels, please re-order channels again by following the above procedures.

## Erasing Selected Channel Data

You can erase selected channel data from the graph. Select [Erase Selected Channel Data] in the [Tools] Menu to open the settings window.

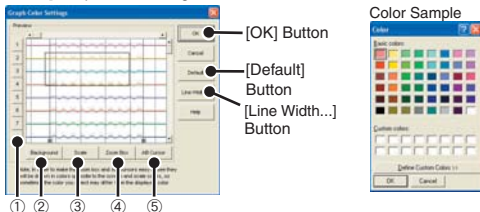


### [OK] Button

By clicking on the [OK] button, the selected data will be erased and the graph will be re-drawn.

## Changing Graph Colors and Widths of Lines

It is possible to change colors for the background, graph and scale lines and also change the width of the data lines and the scale lines. In the [Tools] Menu, select [Change Graph Colors] to open the settings window.



Color-customizable Items

- ① Data Line Colors (Channel No.1–8) ② Graph Background Color  
③ Scale Line Colors ④ Zoom Box Color ⑤ AB Cursor Color

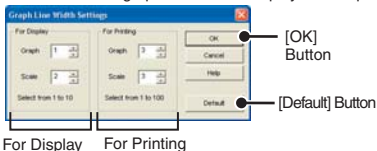
1. Click the channel number of which you wish to change the color and the [Color Settings] dialog box will appear. Select a standard color or create a desired color.
2. In order to change the width of the lines, click the [Line Width] button to open the [Graph Line Width Settings] dialog box where you change the width of the data lines and the scale lines. (See diagram below)
3. By clicking the [OK] button, the settings will be completed and the graph will be re-drawn.

### [Default] Button

By clicking the [Default] button, you will return to the color settings when the software was opened.

### [Line Width] Button

Change the widths of the graph lines in the display and for printing.



For Display: Settings for Display  
Graph: Width of the Graph Data Lines

For Printing: Settings for Printing  
Scale: Width of the Scale Lines

Clicking the [Default] button return the line widths to their factory default settings.

## Shift Unit (°C / °F)

Clicking on [Shift Unit (°C / °F)] in the [Tools] Menu will shift the unit of display between Celsius (°C) and Fahrenheit (°F). You can automatically change the temperature unit scale in the graph display and in the channel info list.

## Copy Display to Clipboard

By clicking [Copy Display to Clipboard] in the [Tools] Menu, you can copy the currently displayed window to the clipboard and make use of the graph by pasting to other software. By copying data to the clipboard, the previously saved data contents will be overwritten with the new contents.

## Print Preview and Print

### Print Graph / Graph Print Preview

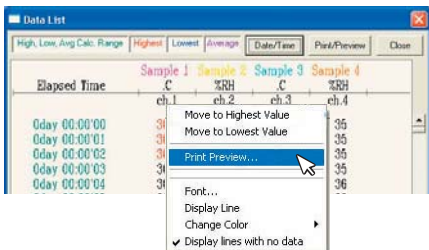
Print the graph in the current display. Printing will occur with the same aspect ratio as in the currently displayed graph. The image of the graph to be printed can be viewed in the Print Preview Display before printing ([File] Menu – [Graph Print Preview]).

If you wish to carry out printing without checking the preview window, click on the [Print] icon in the toolbar or click [Print Graph] in the [File] Menu.

### Display Data List Preview and Print

Carry out the printing of a data list by opening Data List Display.

1. By right clicking on the Data List Display, the Menu will appear. Click [List Print / Preview] in the Menu and the [List Print Preview] window will be displayed.



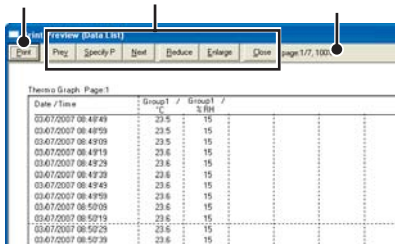
2. After confirming, click the [Print] button in the Preview window to start the printing.

[Print Preview] window

[Print]  
Button

Other Buttons  
(See below)

Page Number / Total Number of Pages  
and Percent of Enlargement / Reduction



### Other Buttons

[Previous] Button

Preview the previous page.

[Specify P] Button

Specify the page you wish to preview in the [Specify Page to be Viewed] box and a preview of that page will appear.

[Next] Button

Preview the next page.

[Reduce] Button

Reduce the currently displayed page.

[Enlarge] Button

Enlarge the currently displayed page.

[Close] Button

Close the Print Preview display and return to the Main Window.

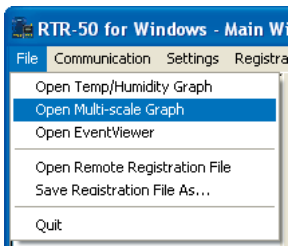
## Multi-scale Graph

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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.

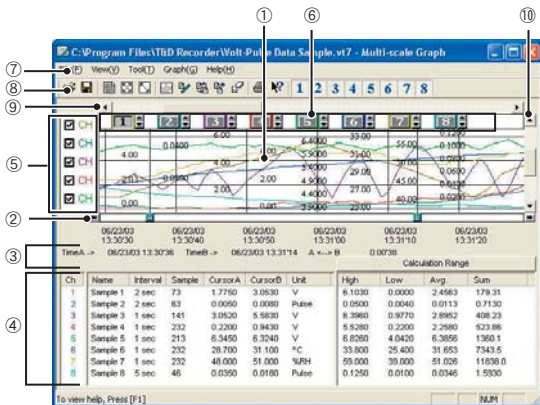
The [Multi-scale Graph] program will read data files that have been created from the downloaded data from the loggers and to help you analyze that data will allow you to create graphs, data lists, text files and print data. It is also possible to scroll across the graph and make scale settings for each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

From the [File] Menu, select [Open Multi-scale Graph] to open.



- For detailed information about the compatible data file types for the [Multi-scale Graph], see the Multi-Scale Help Menu.
- If a check has been placed next to [Automatically show graph] in ([Download Data] tab – [Detailed Settings] – [Post Downloading Settings]), the graph will automatically be displayed after downloading. (The default setting is for a check to be next to [Automatically show graph].)

## Main Window Names and Functions



### 1.Graph Area

The area in which the Graph is displayed. The horizontal axis shows time and the vertical axis shows voltage data in units as calculated by the selected conversion equation.

### 2.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.

### 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 Display

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

### 5.Hide or View the Vertical Scale for each Channel

It is possible to hide or view the scale on the graph for each channel.

## 6.Vertical Axis Scale for each Channel



The vertical axis scale can be displayed for each channel into which data has been read. By clicking the arrow at the corners of the gauge bar you can scroll up or down on the current display while maintaining the present zoom.

## 7.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.

## 8.Toolbar (Icons)

Buttons appear for frequently used commands.

## 9.Horizontal Gauge Bar and Button for Moving Horizontal Axis

The time axis moves by clicking these arrow 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.

## 10.Vertical Gauge Bar and Button for Moving Vertical Axis

The vertical axis moves up or down by clicking these arrow 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.

## Channel Info Display Items

Ch [Channel Number] button, 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	CursorA	Cursor A position data
CursorB	Cursor B position data	A<->B	Calculated Temp / Humidity Difference between Cursor A and B
Max.	Highest Reading	Min.	Lowest Reading
Avg.	Average Value	Unit	Unit of measurement
Sum	Total Data Value		

## Zooming In and Out on the Graph

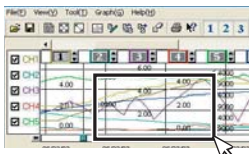
### Zooming In and Out on the Graph with Mouse

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

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.

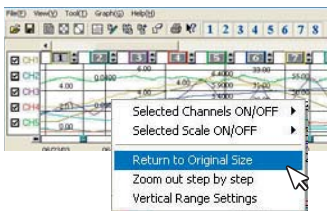
[Zoom In]

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



[Zoom Out]

With the mouse, right click on the graph and select [Return to Original Size] in the pop-up Menu that appears.



*\*These operations can be carried out via commands in the [Graph] Menu or by clicking icons in the Toolbar as above.*

## Data List Display

Shows all recorded data displayed in the graph as a list. Click [Data List Display] in the [View] Menu. You can view all the recorded data including its time and date as a list. The green colored dates and times are those that fall within the High, Low, Avg. Calculation Range. (The same operation can be carried out by clicking on the [Data List Display] icon in the toolbar.)

### [Date / Time] Button

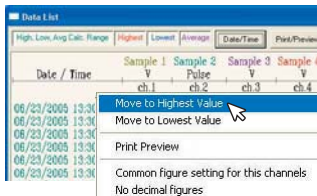
By clicking this button, you can shift the display between the recorded date and the amount of elapsed time since recording started.



### Color Coded Display

- GREEN : Dates and times which fall within the calculation range for determining high, low and average measurements
- BLACK : Dates and times outside the calculation range for determining high, low and average measurements
- RED : Highest Value    BLUE : Lowest Value    PINK : Average Value

### Move to Highest Value / Move to Lowest Value



By right clicking on the Data List Display, a Menu will appear. Click [Move to Highest Value] or [Move to Lowest Value] to move to the Highest or Lowest values. By dragging the Scroll Bar up and down you can view the corresponding part of the displayed data in the list.

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

## Changing Graph Display Mode

It is possible to hide or view the data graph for selected channel(s) and the scales in the Graph Area. From the [View] menu, select [Scale Display ON/OFF] to make the necessary settings.

*\*The settings here are the same as those in "Temperature / Humidity Graph".*

## High, Low, Avg. Calculation Range

Set the calculation range for determining high, low and average measurements. If no setting is made the values within the entire graph will be used as the calculation range.

Select [Set High, Low, Average Calculation Range] in the [Tools] Menu to make the necessary settings.

(This settings window can be opened by clicking the [Set High, Low, Average Calculation Range] icon in the Toolbar.)

*\*The settings here are the same as those in "Temperature / Humidity Graph".*

## Editing Recording Conditions

Change channel names and/or adjust recording start times. Select [Edit Recording Conditions] in the [Tools] Menu to make the necessary settings.

(This editing window can be opened by clicking the [Edit Recording Conditions] icon in the Toolbar.)

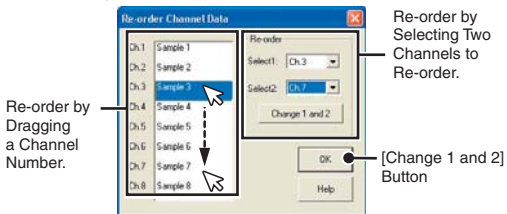
*\*The display layout of the "Multi-scale Graph" is different from that of "Temperature / Humidity Graph". However, the settings here are the same as those in "Temperature / Humidity Graph". See p.78 for details.*

## Re-ordering Channel Data

You can change the order of the data in channels as viewed in the graph. Select [Re-order Channel Data] in the [Tools] Menu to make the necessary settings.

*\*The display layout of the "Multi-scale Graph" is different from that of "Temperature / Humidity Graph". However, the settings here are the same as those in "Temperature / Humidity Graph".*

Multi-scale Graph [Re-order Channel Data] Window



## Erasing Selected Channel Data

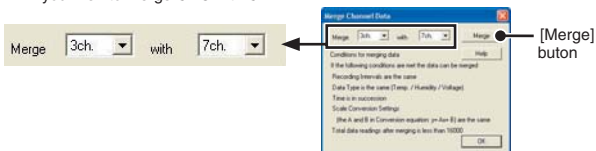
You can erase the selected channel data from the graph. Select [Erase Selected Channel Data] in the [Tools] Menu to make the necessary settings.

*\*The settings here are the same as those in "Temperature / Humidity Graph".*

## Merging Channel Data

Use this function when you wish to merge one channel of data with another channel of data. Select [Merge Channel Data] in the [Tools] Menu to open the editing window.

Ex: If you wish to merge Ch.3 with Ch.7



1. Select channel 7 from the selection box at the left side. Upon selection, the channels, which are capable of being merged, will appear in a list on the right. Select channel 3.
2. By clicking the [Merge] button, the Ch.3 Data on the right will be added to the end of the Ch.7 Data.

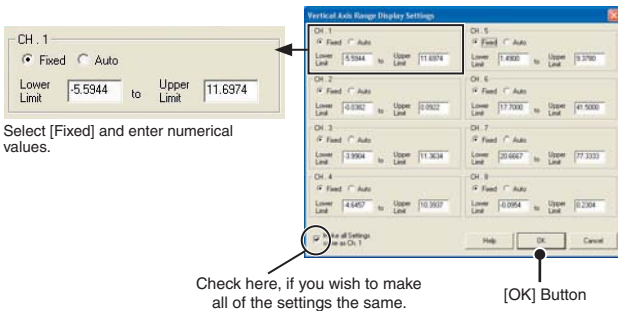
Please make sure to select a channel with older data for the left side.

### NOTE:

- The channel data selected for the box on the right will not be deleted. If you wish to delete, go to [Erase Selected Channel Data] in the [Tools] menu to delete that data.
- The following data cannot be merged.  
The total number of readings after merging exceeds 16,000 data readings. / The recording intervals are different. / The data is of different types. / The recording intervals are different. / The measuring times overlap (This can be adjusted by using the [Edit Recording Conditions]. See the previous page for details.)

## Setting Vertical Axis Display Range

Set the Vertical Axis Scale Range to Auto or Fixed for each channel. Make settings to have the Vertical Axis Scale Range automatically assigned according to type of data or have it remain fixed at the same values every time it is opened. In the [Tools] Menu, select [Set Vertical Axis Display Range] to open the settings window.



1. Put a check next to [Fixed] for the channel(s) you wish to make settings for and enter the top and bottom values.
2. If you wish to use fixed values for all channels, choose fixed values for Ch.1 and put a check next to [Make all settings same as Ch. 1]. Then the settings will become the same for all other channels.
3. Click the [OK] button to finish the setting process.

### NOTE:

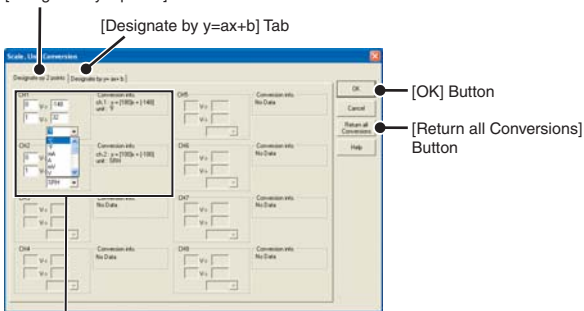
- If you have chosen fixed values for all channels, the data graph lines may, under certain circumstances, stick out of the graph. Settings for the upper limit must be 40,000 or lower and settings for the lower limit must be -40,000 or higher.
- The values assigned here will be active and used when saving the graph to a file. If you wish to have the vertical axis scale range automatically assigned, by clicking "AUTO" for each channel, the vertical scale will automatically be determined and set according to the upper and lower values of the data being viewed.

## Scale / Unit Conversion

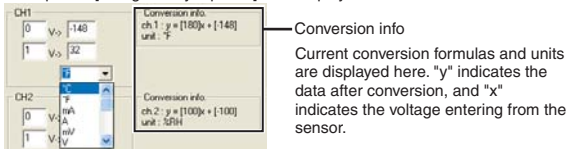
It is possible to make settings for the conversion of units and scales for each channel of downloaded data. This can be used when no conversion formula settings were made before recording or when you wish to make changes to the conversion formula that was set in the Scale Settings Display.

In the [Tools] Menu, select [Scale / Unit Conversion] to open the settings window.

[Designate by 2 points] Tab



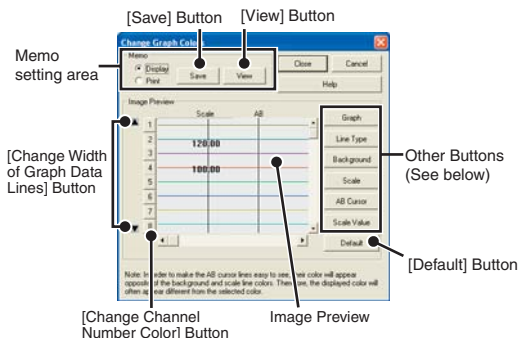
Example of "[Designate by 2 points] Tab" display



1. Select to use 2 voltage points to convert the scale, by clicking on the [Convert using 2 points] tab or use the simple conversion equation by clicking on the [Convert with  $y=Ax+B$ ] tab.
2. Make settings for the conversion equation and unit.
3. Click the [OK] button to finish the setting process. By clicking the [Return all Conversions] button, the settings for all channels will return to those when the dialog box was opened.

## Changing Graph Colors and Widths of Lines

It is possible to change the colors of the graph background, the lines, the AB cursors and the width of the lines. You can make settings for both display and for printing. In the [Tools] Menu, select [Change Graph Colors] to open the settings window.



1. In the "Memo" setting area, select either "Display" or "Print". Click the [Save] button to save the settings, and by clicking the [Load] button, you can call up a saved pattern. One pattern can be stored for each application.
2. If you wish to make changes to the graph colors, line types, or line widths, click on the [Channel No.] button first and then click on the topic you wish to make changes to. See below for details about each button.

### Image Preview

This area will show the display with the newest settings. An image showing the new settings will appear and it can be used to check the graph.

### Changing the widths of the graph lines: [ ▲ ] [ ▼ ] Button

Change the width of the data lines. Please use this feature when printing with a monochrome laser printer or any other printer where narrow lines may be difficult to see. Each click of the [ ▲ ] button will make the lines wider and each click of the [ ▼ ] button will make them thinner. Click on the [Channel No.] button first and then click the [ ▲ ] [ ▼ ] button to change the widths.

**[Graph] Button**

Change the color of that channel's data lines. The standard Windows color selection dialog box will appear. Choose the standard color you want or make any desired colors. Click on the [Channel No.] button first and then make settings to the colors of the graph lines.

**[Line Type] Button**

You can select from five types of lines such as a standard line or a dotted line. (However, if the line has been made wider by the [ ▲ ] [ ▼ ] button it will appear as a standard line no matter the setting.) Click on the [Channel No.] button first and then make settings to the types of the graph lines.

**[Background] Button**

Change the graph's background color. The standard Windows color selection dialog box will appear. Choose the standard color you want or make any desired colors.

**[Scale] Button**

Change the horizontal and vertical graph scale line colors. The standard Windows color selection dialog box will appear. Choose the standard color you want or make any desired colors.

**[AB Cursor] Button**

Change the AB Cursor line colors. The standard Windows color selection dialog box will appear. Choose the standard color you want or make any desired colors.

**[Scale Value] Button**

Change the Scale Value colors. The standard Windows color selection dialog box will appear. Choose the standard color you want or make any desired colors.

**[Default] Button**

Returns the colors to the default [Multi-scale Graph] colors.

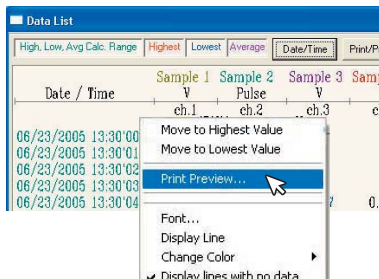
## Print Preview and Print

### Print Graph / Graph Print Preview

The image of the graph to be printed can be viewed in the Print Preview Display before printing ([File] Menu – [Graph Print Preview]). When carrying out printing, click the [Print] button in the Preview window to start the printing. (The same operation can be done by clicking on the Print Preview icon in the Toolbar.)

### Display the Data List Preview and Print

Carry out the printing of a data list by opening the Data List Display.



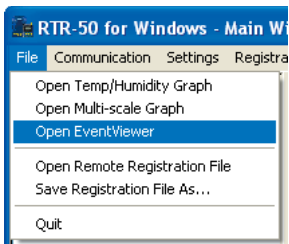
1. By right clicking on the Data List Display, the Menu will appear. Click [List Print / Preview] in the Menu and the [List Print Preview] window will be displayed.
2. After confirming, click the [Print] button in the Preview window to start the printing. By using the Print Preview Display Toolbar you can change the page being displayed, enlarge or reduce the display as desired, and start printing.

## Event Viewer

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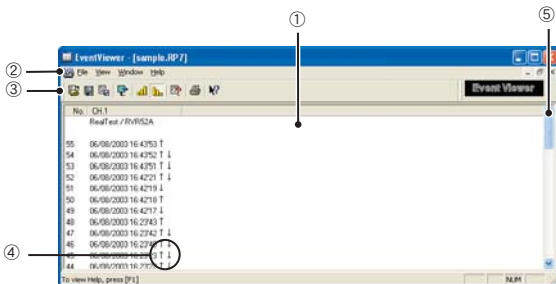
Here you can manage (view data lists, print, and save as text file) recorded event data.

This software is designed as a tool to allow you to view event time data for RVR-52A data files (\*.rp7). With Event Viewer you can view Recorded Event Time Data in a List (up to 64 channels), Print the List, or Save as Text File. From the [File] menu, select [Open Event Viewer].



*\*If a check has been placed next to [Automatically show graph] in ([Download Data] tab – [Detailed Settings] – [Post Downloading Settings]), the graph will automatically be displayed after downloading. (The default setting is for a check to be next to [Automatically show graph].)*

## Main Window Names and Functions



### 1.Data Window

In the data window are displayed the Data Number, Channel Name, Recorded Date and Time, Rising Edge/Falling Edge.

### 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. ↑ · ↓ · ↑ ↓ (Rising Edge or Falling Edge)

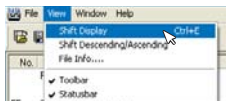
- [↑] Shows Polarity Changes from Low to High. (Rising Edge)
- [↓] Shows Polarity Changes from High to Low. (Falling Edge)
- [↑ ↓] Shows the Simultaneous Occurrence of Rising and Falling.

### 5.Scroll Bar

By using the up and down scroll bar you can move the display position to the desired one.

## Changing the Event Viewer Method of Display

By using the commands in the [View] Menu, you can shift the display to view the recorded data.



### [Shift Display]

You can shift the display to view either by the recorded date/time or by the elapsed time from the last recorded data. Select [Shift Display] in the [View] Menu to make these settings.

Example of "Date/Time" display

No.	CH.1
	RealTest / RVR52A
55	06/08/2003 16:43'53 ↑
54	06/08/2003 16:43'52 ↑ ↓
53	06/08/2003 16:43'51 ↑ ↓
52	06/08/2003 16:42'21 ↑ ↓



Example of "Elapsed Time" display

No.	CH.1
	RealTest / RVR52A
55	0day 00:00'00 ↑
54	0day 00:00'01 ↑ ↓
53	0day 00:00'01 ↑ ↓
52	0day 00:01'30 ↑ ↓

### [Shift Descending / Ascending ]

Shift the order to display the data in descending order or ascending order. In "Descending order", event data is arranged in order from the newest to the oldest. In "Ascending order", event data is arranged in order from the oldest to the newest.



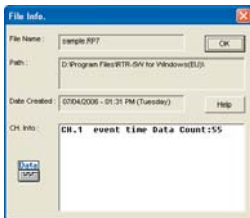
The same operation can be done by clicking on the [Display in ascending / descending order] icon in the Toolbar.

## File Info

### View file info about data in the currently displayed data list.

By clicking [File Info] in the [View] Menu, a Dialog Box will appear.

(The same operation can be carried out by clicking on the [File Info] icon in the toolbar.)



File Name	File name of data currently in display
Path	Location where file is saved
Date Created	The date and time when the data file was created
CH.Info	Channel Number, Recording Method and Data Count

## Open multiple sets of data

It is possible to open and display a number of data windows at the same time. Also, data can be displayed in a systematic manner in the window. This is particularly helpful when you wish to compare data. Make selections from the [Window] Menu.

### [Open New Window]

Open a new window with the same contents as in the currently opened window. It is possible to simultaneously display different parts of the same file.

### [Stacked Display] / [Arranged Display]

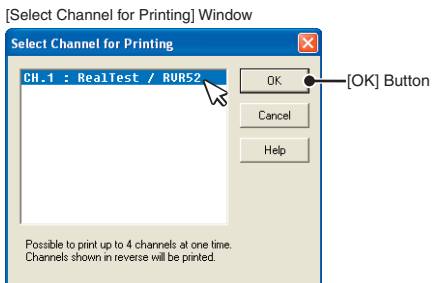
Display all of the open files in windows layered on top of one another or display all of the open files in windows so they are not stacked directly on each other. Particularly by using [Arranged Display], you can compare data more easily.

### [Put Icons in Order]

When a plural number of windows are opened and minimized (iconized), this arranges the icons in order in the lower left corner.

## Print Preview and Print

Select the channels of data you wish to print from the channels displayed in the Event Viewer; view them in the Print Preview, and Print. In the [File] Menu, select [Print Preview and Print].



1. In the [Select Channel for Printing] window, select the channels you wish to print and click the [OK] button.
  - The same operation can be done by clicking on the Print Preview and Print icon in the Toolbar.
2. After confirming, click the [Print] button to start the printing.

## Other Functions

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### Saving Recorded Data

If you have checked [Automatically show graph.], make sure to save data after displaying the graph or editing any data. In the [File] Menu, select the way to save data.

#### Temp / Humidity Graph or Multi-Scale Graph

##### [Overwrite All Data]

Will save any changes to file without changing File Name and Saving Location.

If you are saving the data for the first time, the [Assign Data File Name] Dialog Box will appear. Please enter an appropriate file name and save.

*\*The same operation can be carried out from [Save] in the Toolbar.*

##### [Save All Data as...]

Save all downloaded or edited data to a new file. After data has been downloaded, the "Assign Data File Name" Dialog Box will appear wherein you can save the data to a specified file. Save by assigning a file name and location.

(Only with the Temperature / Humidity Graph, can the same operation be carried out from [Save Data as...] in the Toolbar.)

##### [Save Displayed Data]

Save the data currently in the displayed time range (Horizontal axis is time range) into a new file. After data has been downloaded, the "Assign Data File Name" Dialog Box will appear wherein you can save the data to a specified file. Save by assigning a file name and location.

### Saving Data for Event Viewer

##### [Save All Data as...]

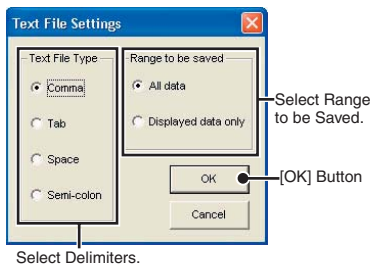
Click [Save Data as...] in the [File] Menu. The "Assign Data File Name" Dialog Box will appear wherein you can save the data to a specified file. Save by assigning a file name and location.

*\*The same operation can be carried out from [Save Data as...] in the Toolbar.*

## Saving Data as Text File

By saving the recorded data as text file, you can create a file type that can be read by common spreadsheet software. You can save the entire graph data or the data currently displayed in the graph in Text File (CSV) Format. (File will have extension [.txt]) However, [Event Viewer] cannot read text type files. Select [Save Data in Text File] in the [File] Menu to open the settings window.

### Creating Text File for Temp / Humidity Graph or Multi-Scale Graph



1. By selecting the [Delimiters] and [Range to be Saved], and clicking [OK], a dialog box will appear where you can choose text file name.

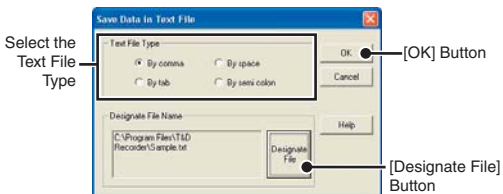
**Delimiters** : Select to divide data with a comma, tab, space, or a semi-colon. Comma, Tab, Space, and Semi-colon are codes used by common spreadsheet software, such as Excel and Lotus, when reading Text File to divide cells.

**Range to be saved** : Choose to save all data or to save range of data displayed in graph.

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

## Creating Text File for Event Viewer

(Only for the Event Viewer, this settings window can be opened by clicking the [Save as Text File] icon in the Toolbar.)



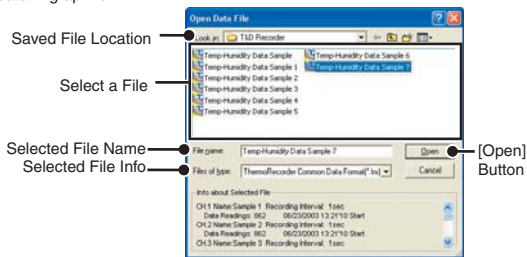
1. By selecting the [Delimiters] (See the previous page), and clicking [Designate File], the [Save as...] dialog box will appear where you can specify the saving location.
2. Designate the file name and the location to which the file should be saved and click [Save] to return the window to the previous [Save Data in Text File] dialog box. Click the [OK] button to finish the creation of the text file document.

## Opening a Saved File

Opens already existing data files. It is possible to open more than one file at a time. While holding down the <Ctrl> key click the files you wish to open. For detailed information about the data file types, see the Help Menu for each type of Graph. In the [File] Menu, select [Open]. The same operation can also be carried out from [Open File] in the Toolbar.

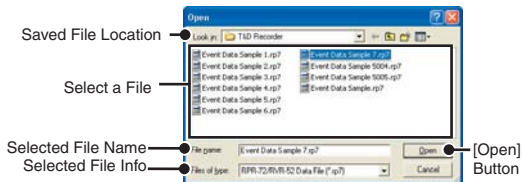
### Opening a Saved File for Temp / Humidity Graph or Multi-Scale Graph

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



### Opening a Saved File for Event Viewer

Select the location and name of the data file you wish to open and click [Open] and a list will appear.





**Others**

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**Others**

# Troubleshooting

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**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 the connection between the computer and the Unit. 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 device 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. Especially on NEC brand PC98 notebook computers the default setting maybe such.
- 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.

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How to check 1: Open the Device Manager

For Windows® XP / 2000

1. In the [Start] Menu, right click on [My Computer] and click on [Properties].
2. In the System Properties Window, click on the [Hardware] tab, then click on the [Device Manager] button to view the Device Manager Window.

For Windows Me or 98SE

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

## How to check 2

In the [Device Manager], click on [Port (COM&LPT)] and check to see if under that appears [Com Port (COM1)] or [Com Port (COM2)].

If a port appears, it should be usable.

- If a mark [ ! ] or [ × ] appears next to the port, this communication port is unusable. If you cannot use a communication port please contact your computer company.
- To find out more details about an unusable communication port: Select the port with a [ ! ] mark, and then click on [Properties] to view the details about that port.

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.



Example of modem using a communication port (COM 1).

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.

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

A: RTR-50 units have 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 from your computer's clock. If your computer's clock is not correct, it will affect the recorded data.

**Q: Wireless communication cannot be carried out. What should I do?**

- A: If you are using an RTR-50 as a Relay Unit and a battery to power to the Unit, the battery power may be low. Connect the RTR-50 unit to your computer and open the [RTR-50 Unit Info] in the [Help] menu. Click the [Gather] button, and if the message [Battery Power is low.] appears, please change the battery.
- A: If you are using the optional serial communication cable (TR-07C), it is necessary to incorporate batteries in the Unit or to connect the AC adaptor to the RTR-50 Unit. Check to make sure that the setting has been made correctly.
- A: When communicating via Relay Unit(s), even if communication has been cancelled from the computer, wireless communication may still be in progress. Wireless communication among Relay Units and between a Relay Unit and Remote Units finishes automatically. Note however that a period exists before a communication is finished in which no new wireless communication can be started. Please allow enough time for this period and try again. Illumination of the Monitor LED on the front of the Relay Unit indicates that wireless communication is in progress.

# Specification

## RTR-50 for Windows

Compatible Devices	RTR-50, RTR-51, RTR-52, RTR-53, RVR-52A
Communication Functions:RTR-5	Start Recording (Immediate Start, Programmed Start) / Stop Recording / Get Unit Recording Settings (Recording Interval, Recording Mode, Remaining Battery Life, Radio Wave Strength, Gather Current Readings) / Wireless Recording Start Settings, Saving / Download Recorded Data
Communication Functions:RVR-5	Start Recording (Programmed Start / Immediate Start) / Stop Recording / Get Unit Recording Settings (Recording Interval, Recording Mode, Remaining Battery Life, Radio Wave Strength, Voltage Measurement Data (Measuring Mode: instantaneous value or average value), Pulse Measurement Data (Measuring Mode: Rising [Lo to Hi] or Falling [Hi to Lo]) Recording Start Settings, Saving / Download Recorded Data via Wireless Communication
Communication Functions:RTR-50	Remote Unit and Group Settings / Communication Frequency Channel Settings / Monitoring / Warning Monitoring / Sending Warning Report Mail / Auto-Download
Other Functions	Auto detect of Serial Communication Port and USB Port

## Temp/Humidity Graph

Graph	Temperature / Humidity Graphs for each Channel (Zoom in/out and scroll with mouse or keyboard) Change Display Colors for Channels, View / Hide Channels
Data	Channel Name, Recording Interval, Number of Data, Highest, Lowest and Average, Unit of Measurement AB Cursor Dates/Times and Temp/Humidity Readings Calculated Temp/Humidity Difference between Cursor A and B
Number of Channels	8 Channels Simultaneous Display / Processing (4 Units for RTR-53 and 8 Units for each RTR-51/52/RVR-52A of data can be viewed and processed at one time.)
Other Functions	Data List Display / Calculation Range (Time Period) Settings / Edit Recording Conditions / Delete Data by Channel / Re-order Data by Channel / Vertical Axis Settings

Multi-scale Graph	
Graph	Data Graphs for each Channel (Zoom in/out and scroll with mouse or keyboard) / Change Display Colors for Channels / Hide or View Channels
Data Display	Channel Name / Recording Interval / Number of Data / Highest, Lowest and Average / Sum / Unit of Measurement / A and B Cursor Dates/Times and Measurements / Calculated Differences in Measurements between Cursor A and B
Number of Channels	8 Channels Simultaneous Display / Processing (4 Units for RTR-53 and 8 Units for each RTR-51/52/RVR-52A of data can be viewed and processed at one time.)
Other Functions	Data List Display / Calculation Range(Time Period) Settings / Edit Recording Conditions / Delete Data by Channel / Re-order Data by Channel / Vertical Axis Settings

Event Viewer	
Data List	View Event Time Data List for Each Channel (Zoom in/out and scroll with mouse or keyboard) / View Rising (Lo to Hi) Waves and Falling (Hi to Lo) Waves
Number of Channels	64 Channels Simultaneous Display / Processing (Only for Recorded Event Time Data with the RVR-52A)
Other Functions	Change the LCD Display / Shift between Descending and Ascending

Others	
Printing	Graphs / Data List
Compatible OS	Microsoft Windows 98SE / Me English Microsoft Windows 2000/XP English
PC/CPU	IBM Compatible equipped with more than Pentium 90MHz or NEC 98 Series / USB Communication or Serial Communication is possible (RS232-C D-sub 9pin)
Operating Environment	A Stable Windows Operating Environment

## RTR-50

Compatible Devices	RTR-51, RTR-52, RTR-53, RVR-52A
Functions	Wireless Communication: Download Data, Monitoring / Warning Monitoring, Start / Stop Recording, Wireless Relay Unit Function Optical Communication: Download Data / Start / Stop Recording
Power	USB bus power, 2 AA batteries, External Power Voltage Input (DC 5.0-7.0 V) [EIAJ-02 connector]
Interface	USB miniB Connector / Serial [Mini serial] (19200bps)
Wireless Communication Method	FCC Part15 Section249 / IC RSS-210
Wireless Transmission Range	About 330ft (About 100m) If direct and unobstructed
Communication Time	Wireless Communication: 1 unit of full data takes about 420 seconds (when Relay Units Not Used) When communicating via Relay Units, the approximate time for that communication is calculated as follows: "420 seconds + (Number of Relay Units x 420 seconds)". Optical Communication: 1 unit of full data takes about 160 seconds
LED Specifications	Green LED (Blink during Wireless Communication and PC Communication)
Battery Life	6 Months of continued use on two AA alkaline batteries when used as Relay Unit for five minutes a day.
Dimensions	H 3.78 in (95mm) × W 2.60 in (65mm) × D 0.98 in (24.5mm)
Weight	Approx. 2.12 oz (60g) *Batteries not included
Operating Voltage	2.5V to 7.0V
Consumption Current	Approx. 50mA (Wireless Communication)
Operating Environment	Temperature: -10 to 60°C (-30 to 60°C when external power connected) Humidity: 20 to 80%RH (No condensation)
Accessories included	USB Communication Cable × 1, RTR-50 for Windows Software CD-ROM × 1, Users Manual × 1
Optional Accessories	Serial Communication Cable TR-07C AC Adaptor (For details, contact your local representative or dealer.)



■ For product information or questions contact us at:

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### **Website/T&D Online**

We have opened an English Website called "T&D Online" for your convenience. Here you can find information about our company, news, product, news, products, upcoming events, software and user's manuals downloads, as well as, other support. Please stop by and see what we have to offer.

**<http://www.tandd.com/>**

## **Wireless Communication Port RTR-50 User's Manual**

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## Wireless Communication Port RTR-50 Warranty

Customer's name:	
Address:	
Phone No.:	
Dealer's name:	
Address:	
Phone No.:	
Guarantee period	12 months from date of purchase
Date of purchase	

### Statement of Limited Warranty

1. This product is warranted to be free from defects in materials and workmanship for a period of one (1) year following the date of purchase. Should the product fail to operate per specification in normal use during this period T&D will repair the unit or provide a replacement free of charge. T&D will not accept returns for any reason other than defects during the warranty period, and will not accept any product that has been misused, dropped, abused or inappropriately used or mistreated at any time.
2. This warranty is strictly limited to repair or replacement-in-kind for defective product. T&D makes no other warranty, either express or implied, and will not accept liability beyond the remedies stated herein. Specifically, T&D will not accept liability for direct, indirect, special, consequential or incidental damages arising from the use of this product.
3. Customers wishing to submit a defective product for repair or replacement during the warranty period should first contact the dealer from whom it was originally purchased. After receiving a return authorization the defective product should then be packaged along with a description of the difficulties being experienced, proof of purchase and all included accessories and materials, and return it to the dealer. In the event of difficulty contacting the original dealer, customers should contact the nearest authorized T&D sales representative. A list of these can be found on the company's website, [www.tandd.com](http://www.tandd.com), or it can be obtained by contacting TandD US directly.
4. This limited warranty statement gives the customer specific legal rights. The customer may also have other rights which vary from state to state in the United States, from province to province in Canada, and from country to country elsewhere in the world. To the extent this limited warranty statement is inconsistent with local law, this statement shall be deemed modified to be consistent with such local law.
5. For further information relating to product repair or replacement, or for other service questions after the termination of the warranty period, customers should contact their local authorized T&D sales representative.

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