

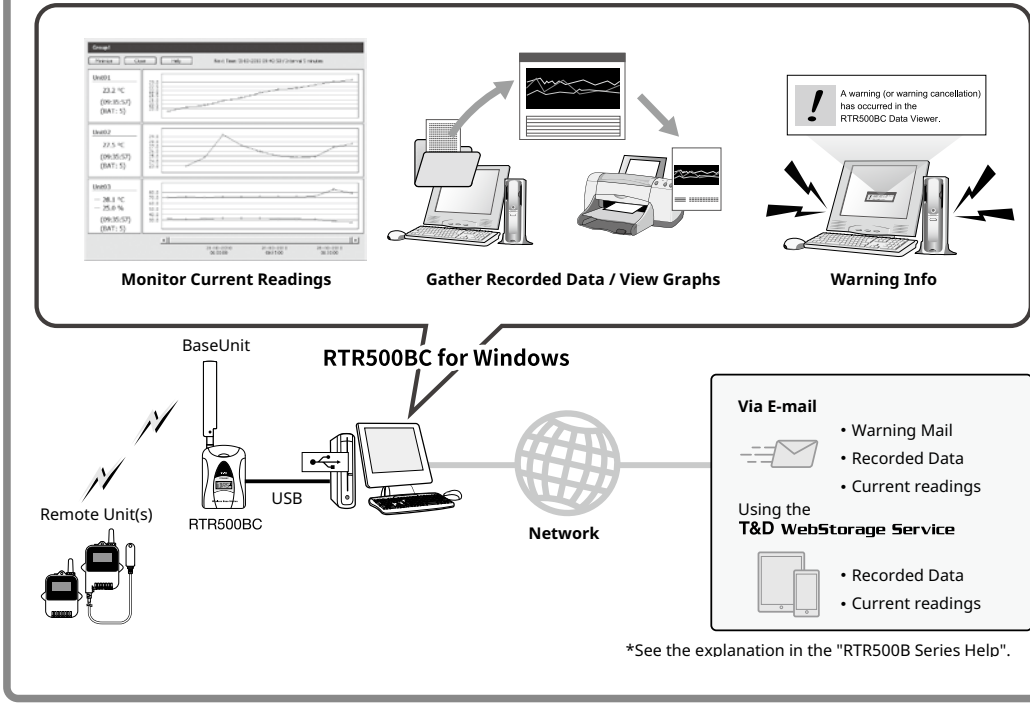
Wireless Base Station

RTR500BC User's Manual

The RTR500BC can be used either as a Base Unit or a Repeater. If you are going to use this product as a Repeater there is no need to install the software RTR500BC for Windows for this product. Please see section “Using as a Repeater” on the back side of the printed version of this manual.

What can the RTR500BC do?

1. Using as a Base Unit



For operating details, please see the **RTR500B Series Help** shown below.
<https://tandd.com/support/webhelp/rtr500b/eng/>

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<https://tandd.com/>

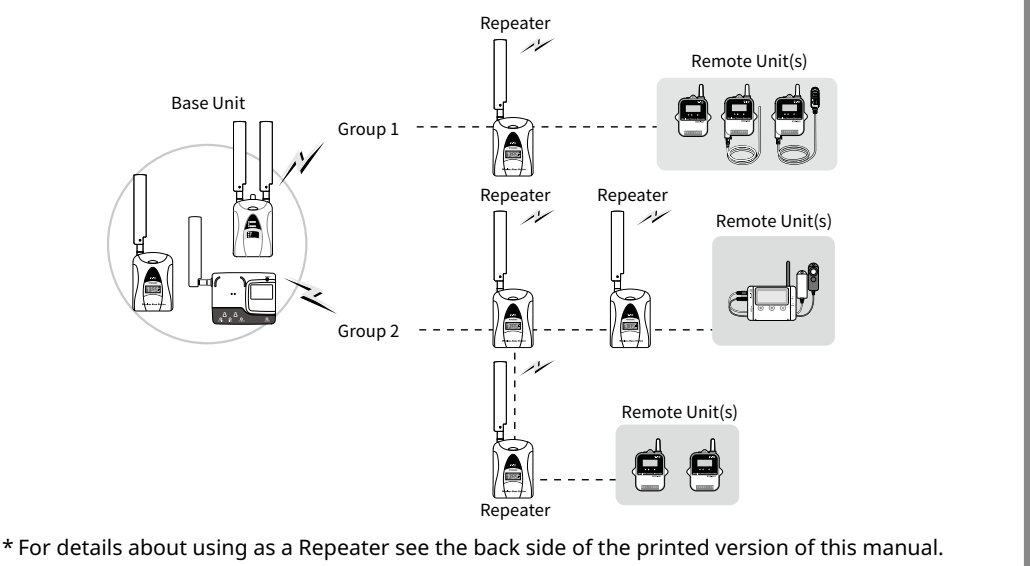
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Product Specifications (US Model)	
Compatible Devices	Remote Units: RTR500B Series (RTR501B / 502B / 503B / 505B / 507B) Including L Type RTR-500 Series (RTR-574 / 576) Including S Type RTR-600 Series (RTR-602S / 602L / 602ES / 602EL) (*1) Repeaters: RTR500BC Other devices (*2)
Maximum Number of Registrations	Remote Units: 32 units (*3) x 20 groups Repeaters: 30 units x 20 groups
Communication Interfaces	Short Range Wireless Communication Frequency Range: 902 to 928MHz RF Power: 7 mW Transmission Range: About 150 meters (500 ft) if unobstructed and direct Bluetooth 4.2 (Bluetooth Low Energy) (*4) USB 2.0 (Mini-B connector) Optical Communication (proprietary protocol) Serial Communication (*5)
Communication Time	Data Download Time (for 16,000 readings) Via wireless communication: About 2 minutes The same amount of time should be added for each Repeater.
Communication Protocol (*6)	SMTP (TLS 1.2 supported), FTP
Power (*7)	USB Bus Power, AA Alkaline Battery LR6 x 2, AC Adaptor AD-06A1, External Battery (DC 9-38V) with the Connection Adaptor (BC-0204)
Battery Life (*8)	As a Repeater: Approx. 6 months (When downloading full data once a day from one Remote Unit with one Repeater)
Dimensions	H 96 mm x W 65.8 mm x D 24.4 mm (excluding antenna) Antenna Length: 135 mm
Weight	Approx. 80 g
Operating Environment	Temperature: -10 to 60°C (when using AA batteries) / -30 to 60 °C (when using AC adaptor) Humidity: 90 %RH or less (no condensation)
Software (*9)	PC Software (Windows) RTR500BC for Windows, T&D Graph
*1: Customers wishing to use the RTR500BC as a Base Unit in conjunction with the RTR-600 series devices, please contact your local distributor for the communications protocol specifications to write your own software.	
*2: Also compatible with the following discontinued products: RTR-501/502/503/507S/505, RTR-500, RTR-601-110/130/E10/E30. Please refer to “Compatibility Info for RTR500B and RTR-500 Series” https://tandd.com/information/compatible-rtr500b-loggers.html	
*3: For RTR-574 and RTR-576, registration of one unit will be counted as two units.	
*4: Bluetooth is available when using the RTR500BW or RTR500BM as a Base Unit and making device settings in the mobile app (T&D 500B Utility).	
*5: Customers wishing to write their own software, please contact your local distributor for the serial communications protocol specifications. (Note: Optional serial communication cable TR-07C is also required.)	
*6: Client Function. The protocol is implemented in the software application (RTR500BC for Windows).	
*7: When using the RTR500BC as a Base Unit, it works on the USB bus power and it is not necessary to use another power source.	
*8: Battery life depends on several factors, including ambient temperature, radio environment, frequency of communication, and quality of the battery being used. All estimates are based on operations carried out with a new battery and are in no way a guarantee of actual battery life.	
*9: Free software download and information on OS compatibility is available on the Software page of our website at https://tandd.com/software/ .	
The specifications listed above are subject to change without notice.	

Terms used in this Manual	
Base Unit	RTR500BC / RTR500BW / RTR500BM
Remote Unit	RTR501B / 502B / 503B / 505B / 507B RTR-574 / 576
Repeater	RTR500BC (when used as a Repeater)
Current Readings	The most recent measurements recorded by a Remote Unit
Recorded Data	Measurements stored in the Remote Unit

2. Using as a Repeater

The wireless communication range can be easily expanded by placing a Repeater in between the Base Unit and a Remote Unit. When using as a Repeater, please prepare a power supply separately.



* For details about using as a Repeater see the back side of the printed version of this manual.

Package Contents

Before using this product, please confirm that all of the contents are included.

Part Names

① Antenna

② USB Connector (Mini-B)

③ LED*

④ LCD Display

⑤ Optical Communication Area

⑥ Battery Cover

⑦ Serial Connector

⑧ Power Connector

* The appearance of the lamp in the LED changes to show the current status of the product.

Color	Status	Contents
Blue	BLINKING	Bluetooth Communication in progress...
Green	BLINKING	Wireless Communication in progress...

LCD Display

① Unit Status	BAS: Operating as a Base Unit RPT: Operating as a Repeater The display will change every 2 seconds in the following pattern: [RPT] → [User set number or character (when an RTR500BW / RTR500BM is being used as Base)] → [Repeater No.]
②	Will blink when either Wireless Communication or Bluetooth Communication is in progress.
③ GR	Will appear when displaying the arbitrary alphanumeric characters set in the Repeater Registration.
④ No	Will appear when displaying the Repeater Number.
⑤	Will appear when the Bluetooth Passcode is set.
⑥	Will appear while connected to an external power source.
⑦	BLINKING: Will blink when battery power is becoming low. Lamp ON: This appears when the battery level is too low to operate.

Before Using as a Base Unit

STEP 1 Installing the Software

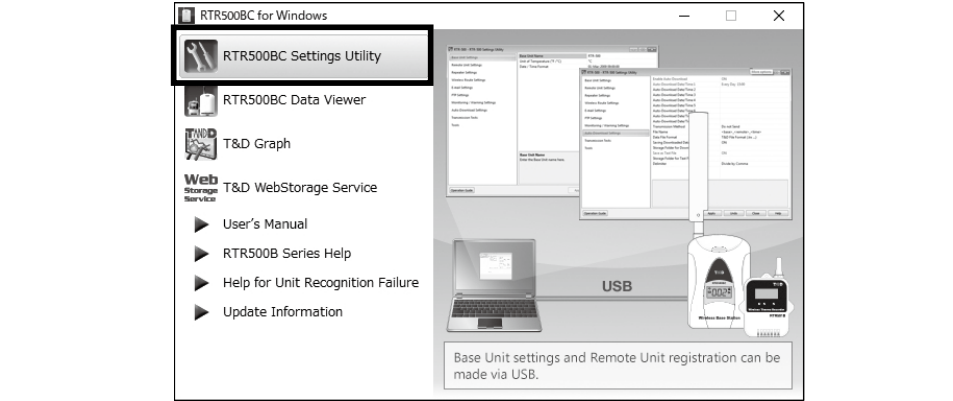
Download RTR500BC for Windows and T&D Graph from the T&D Web-site and install them to your PC.

* Do not connect the Base Unit to your computer until the software has been installed.

<https://tandd.com/software/rtr500bcwin.html>
<https://tandd.com/software/td-graph.html>

STEP 2 Software Settings

1. Open the RTR500BC for Windows, and then open RTR500BC Settings Utility.



2. Connect the RTR500BC with the supplied USB cable to your computer.
- The USB driver installation will start automatically.
 - When the USB driver installation is completed, the RTR500BC settings window will automatically open.

Base Unit Settings	Base Unit Name	RTR500BC-5F500001
Remote Unit Settings	Unit of Temperature (°F / °C)	°C
Repeater Settings	Date / Time Format	2020-07-30 09:00:00
Wireless Route Settings		
E-mail Settings		
FTP Settings		
Current Readings / Warning Settings		
Recorded Data Download Settings		

If the above settings window does not appear automatically:
The USB driver may not have been installed correctly. Please see [Help for Unit Recognition Failure] and check the USB driver.

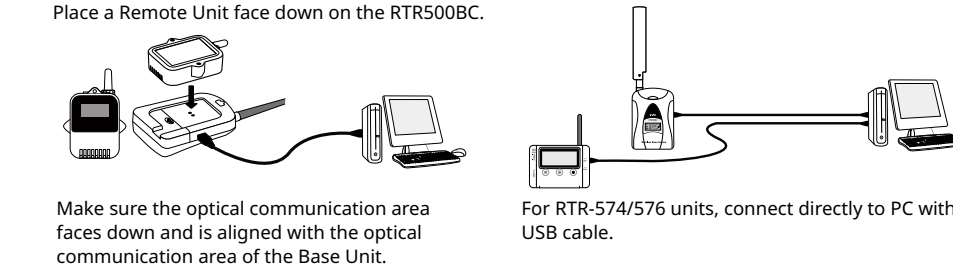
3. In the [Base Unit Settings] window, assign a unique name for each Base Unit and click [Apply].
4. Make any necessary changes to settings in the [Current Readings / Warning Settings] and [Recorded Data Download Settings] windows. Check the contents of your selection and click [Apply].

The default settings are as follows:

- Monitoring Current Readings: ON, Monitoring Interval: 10 min.
- Auto-download of Recorded Data: ON, everyday at 9:00 a.m.
- Warning Monitoring : OFF

STEP 3 Registering a Remote Unit

1. Have the target data logger on hand and in the [Remote Unit Settings] window click on the [Register] button.
2. Follow the on-screen instructions and connect the Remote Unit to the RTR500BC.
Upon recognition of the logger the [Remote Unit Registration] window will appear.



If the screen does not change after connecting RTR-574 / 576:
The USB driver installation may not have been installed correctly. Please see [Help for Unit Recognition Failure] and check the USB driver.

3. Enter the following information, and click [Register].

Upon Remote Unit Registration, changes in Recording Interval, and the starting of a new recording, all recorded data stored in the Remote Unit will be deleted.

Group Name	Enter a name for each Group to make it identifiable depending on which frequency channel it is using. If you wish to register a logger to an already registered Group, select the name of the target Group.
Remote Unit Name	Assign a unique name for each Remote Unit.
Communication Frequency Channel*	Select a frequency channel for wireless communication between the Base Unit and Remote Units. When installing multiple Base Units, make sure to select channels that are far apart in order to prevent interference of wireless communication between the Base Units.
Recording Mode	Upon reaching logging capacity, recording will automatically stop.
Endless mode	Upon reaching logging capacity, the oldest data will be overwritten and recording will continue.
Recording Interval	Select the desired interval.
Warning Monitoring	To carry out Warning Monitoring, select ON. Settings can be made in each Remote Unit for "Upper Limit" or "Lower Limit" and for "Judgment Time".
Auto Download	To enable auto-download of recorded data, select ON.
Channels for Alternating Display	Here you can select the measurement items you wish displayed in the RTR-574 LCD when the unit is using "Alternating Display" as the display mode.
Button Lock	To lock the operation buttons on RTR-574/576 units, select ON. Only the <DISPLAY> button will be functional for Remote Units when the button lock has been set to ON.

* This setting can only be made when creating a New Group. Once a Registration has been made, changes cannot be made. If you wish to make changes to the communication frequency channel, you must re-register the Repeater into a New Group.

Below are some examples of recording intervals and maximum recording times.

RTR501B / 502B / 505B (Logging Capacity: 16,000 readings)
EX: Recording Interval of 10 minutes x data readings of 16,000 = 160,000 minutes or about 111 days.

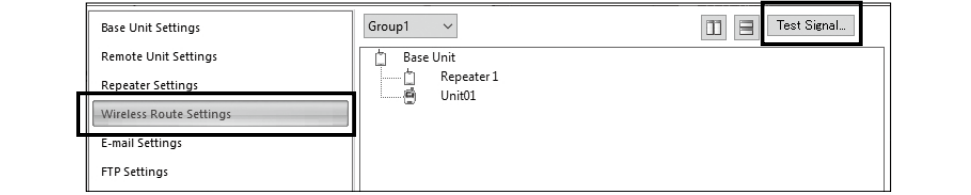
RTR503B / 507B / RTR-574 / 576 (Logging Capacity: 8,000 readings)
EX: Recording Interval of 10 minutes x data readings of 8,000 = 80,000 minutes or about 55.5 days.

4. Upon completion of Remote Unit Registration, the logger will automatically start recording. If you wish to register other Remote Units, repeat procedures from 1..

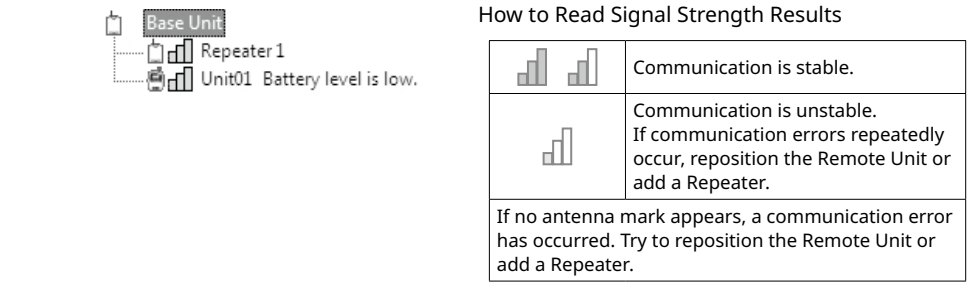
If you want to start recording at a desired time, open the [Remote Unit Settings] widow, and click the [Start Recording] button to start a new recording session.

STEP 4 Installing the Device

1. Place the device in the measurement location.
The wireless communication range, if unobstructed and direct, is about 150 meters (500ft.).
2. In the Settings window, open [Wireless Route Settings]-[Test Signal Strength].



3. Click [Start] to begin the signal check.
When completed, click [Close]. The result will appear.



Please refer to section [Notes and Precautions for Installing Wireless Communication Devices] under [RTR500B Series Safety Information]

By using a Repeater, it is possible to bypass obstacles and extend the wireless communication range. For details, please see **Using as a Repeater** on the back of this page.

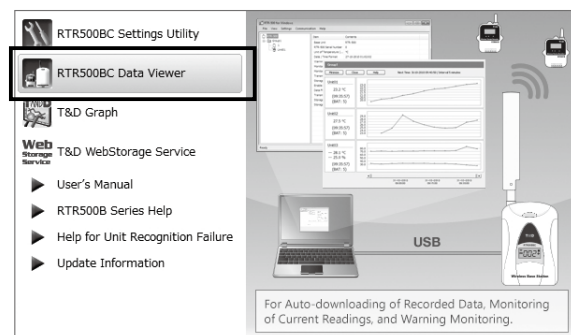
Using as a Base Unit

Monitoring Current Readings

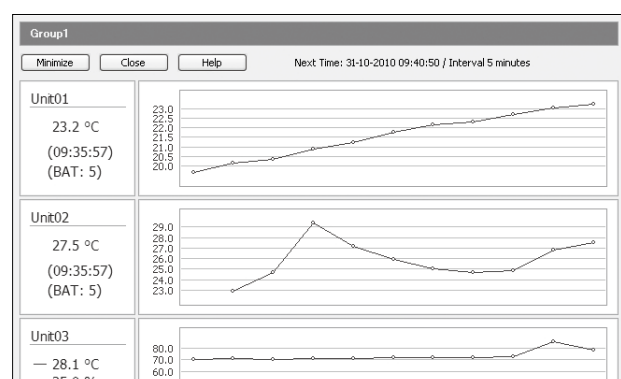
When the RTR500BC Data Viewer is running or is open in the Quick Start menu, current readings (latest recorded values) are automatically obtained, and can be checked at any time.

Default Setting Monitoring Interval: 10 min.

1. Open RTR500BC for Windows, and then open RTR500BC Data Viewer.



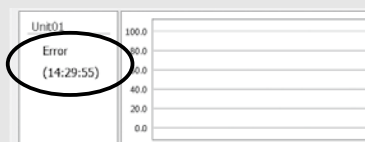
2. Click [View] - [Monitor Current Readings].
3. A window will open showing the current readings by group.



- In [Current Readings / Warning Settings] by setting warning to "ON" and in [Remote Unit Settings] by setting upper and lower limit values, a warning will be issued when a measurement value exceeds a set limit.
- By making e-mail settings, warning notification mail will be sent to the specified addresses.

For details, please see the section [RTR500BC for Windows] in **RTR500B Series Help**.

If "Error" appears:
See section **4 Installing the Device**.



Downloading Recorded Data

When the RTR500BC Data Viewer is running or is open in the Quick Start menu, recorded data will be automatically downloaded and saved to the specified location. Make sure the app is running when the download is scheduled to begin.

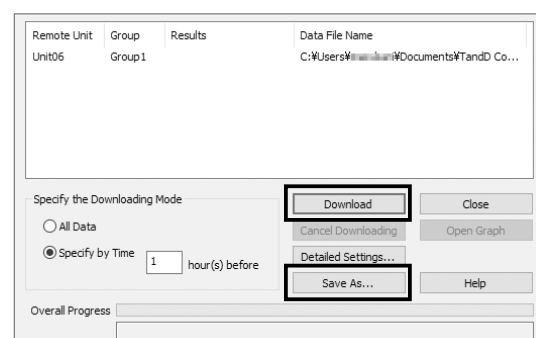
Default Settings

Auto-Download Schedule: Every day at 9 a.m.

Saving Location: In Documents Folder (Documents\TandD Corp\RTR500BC for Windows\data)

To download data manually, please follow the directions below.

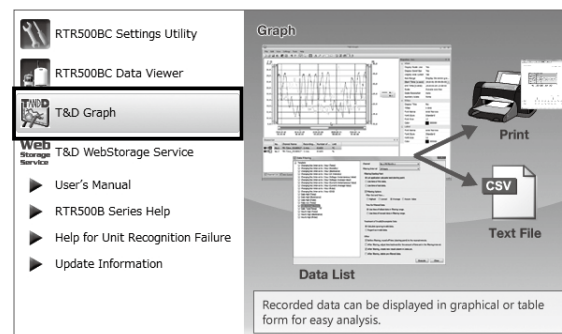
1. Open RTR500BC Data Viewer.
2. Click on the target Remote Unit.
 - It is possible to select multiple Remote Units by holding down the <Shift> key or <Ctrl> key and clicking on the Remote Units from which you wish to download.
3. In the [Communication] Menu, select [Download Data (Wireless)].
4. Click the [Save As...] button and after specifying the saving location and file name click the [Download] button.



Viewing and Analyzing Recorded Data

Viewing Recorded Data

1. Open RTR500BC for Windows, and then open T&D Graph.



2. Click on [Open with Search] in the [File] menu and after selecting the search conditions, such as folder name or time period, click the [Search] button.

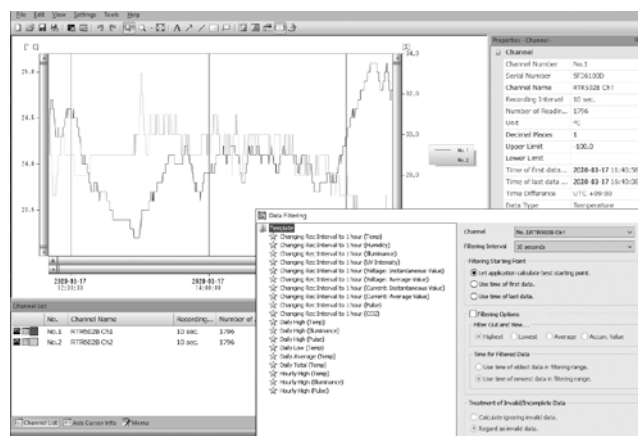
Open files by double-clicking directly on a recorded data file or drag and drop a file into the graph display area.

3. A list of data that matches the search criteria will appear. By double clicking on the desired data file, T&D Graph will open and display the selected data in a graph.

If you wish to view multiple files at once, use the Ctr key or Shift key to select multiple files and select [Open] from the right click menu.

Analyzing Recorded Data

There are many features available to help analyze data; such as viewing and saving by time period, inserting comments, shapes and memos in graph area, creating graphs for daily changes in average, viewing averages between A and B, viewing cumulative values, and so on. For details, see the T&D Graph Help.

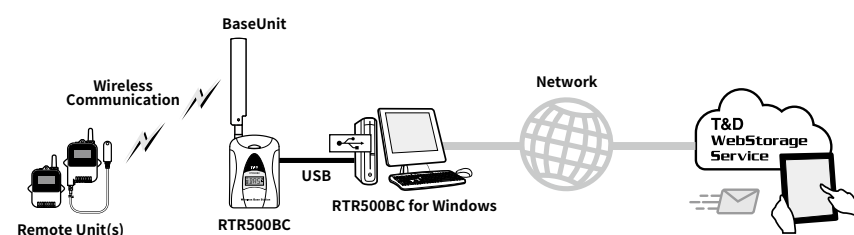


Printing Recorded Data

1. Open the recorded data, and make any desired adjustments to the graph enlargement, position and aspect ratio to be reflected in the printed graph.
2. By clicking on the [Print Graph] icon or selecting [Print Graph] in the [File] Menu, the Print Preview window will appear.
3. Using the Print Preview Toolbar, make settings for the paper orientation, margin, items to be printed, etc. The graph title, items to be printed, and margin can be set in [Page Setup].
4. Click the [Print] button.

Tips Utilizing the Cloud

With RTR500BC Data Viewer, it is possible to automatically transfer downloaded data to our free cloud server "T&D WebStorage Service". The transferred data can then be viewed on any smartphone or PC browser, making it possible to check data from anywhere and anytime. For settings details, please see the **RTR500B Series Help**.



Using as a Repeater

Use the Base Unit software to make Repeater settings. If you are not going to use the RTR500BC as a Base Unit there is no need to install the software "RTR500BC for Windows".

STEP 1 Getting Ready

Before registering a unit as a Repeater, please refer to the user's manual for your Base Unit and complete both the Base Unit Settings and Remote Unit Registration.

When using an RTR500BW / RTR500BM as a Base Unit, Repeater Registration can be done via LAN or Bluetooth Communication, as well as, via the cloud. If you wish to carry out registration via Bluetooth or the cloud, use the mobile app "T&D 500B Utility". For details, please see **RTR500B Series Help**.

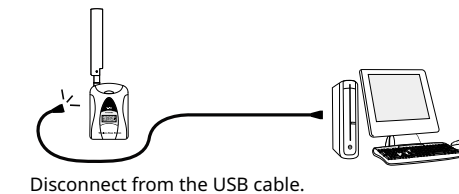
STEP 2 Registering a Repeater

Do not connect more than one RTR500BC to your computer at one time.

If the Base Unit is an RTR500BC

1. Open RTR500BC Settings Utility.
2. Disconnect the RTR500BC that is being used as the Base Unit from your PC.

RTR500BC set as Base Unit

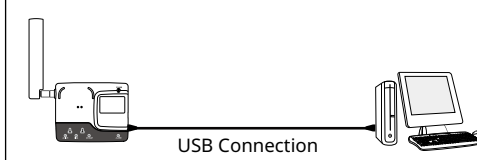


Disconnect from the USB cable.

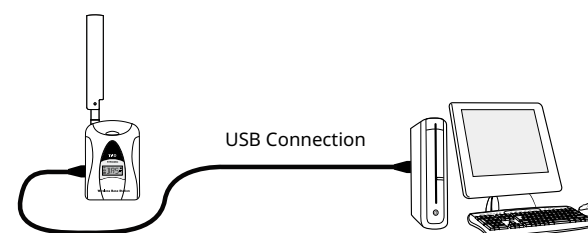
* After Repeater registration has been completed make sure to reconnect the RTR500BC Base Unit.

If the Base Unit is not an RTR500BC

1. Open the appropriate Settings Utility. RTR500BW Settings Utility RTR500BM Settings Utility
2. Connect the Base Unit with the supplied USB cable to your computer.



3. Select the [Repeater Settings] Menu and click the [Registration] button.
4. When the [Repeater Settings] window appears, connect the RTR500BC you wish to register as a Repeater to your PC with the supplied USB cable.



5. After the USB driver installation is completed, the [Repeater Registration] screen will appear. Enter the following information, and click [Register].

Group Name	Specify the Group in which the Remote Units are registered that you wish to add a Repeater to their route.
Repeater Name*	Assign a unique name to distinguish the Repeater when using Bluetooth communication.
LCD Display*	You can assign up to three alphabet or numbers to be displayed in the unit's LCD display.
Bluetooth*	To use the Bluetooth communication function, select "ON".
Bluetooth Passcode*	Assign an arbitrary number with up to 8 digits to be used for Bluetooth communication.

* These can be specified when an RTR500BW / RTR500BM is being used as the Base Unit.

If the screen does not change after connecting the Repeater:

The USB driver installation may not have been installed correctly. Please see [Help for Unit Recognition Failure] in the software launcher for your software and check the USB driver.

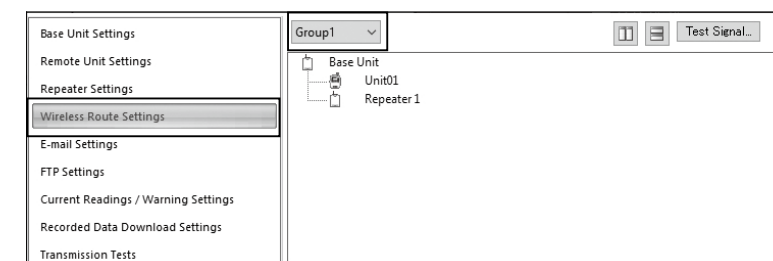
6. Disconnect the RTR500BC that was registered as a Repeater from your PC.

When an RTR500BC is being used as Base Unit, reconnect the device (Base Unit) to your PC that has [BAS] displayed in its LCD.

STEP 3 Making Wireless Route Settings

When using an RTR500BW / RTR500BM as a Base Unit, this can be omitted because it has a feature to automatically detect and communicate using the optimal route.

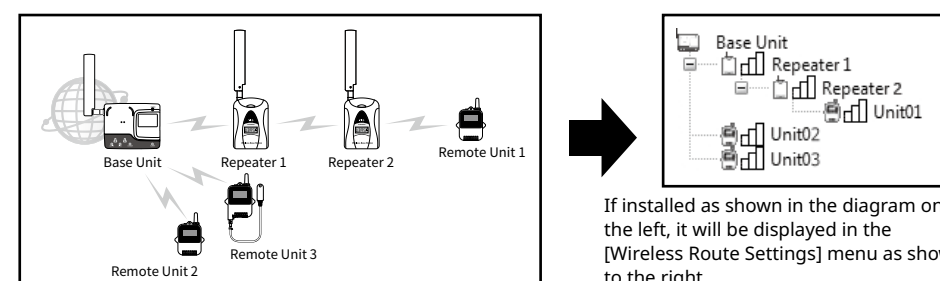
1. In the [Wireless Route Settings] window, select the Group Name for which you wish to make settings.



2. The wireless route can be changed by dragging and dropping the Remote Unit and Repeater icons.



Example of Wireless Route Settings

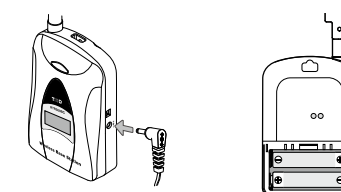


If installed as shown in the diagram on the left, it will be displayed in the [Wireless Route Settings] menu as shown to the right.

3. Click [Apply] to apply the settings.

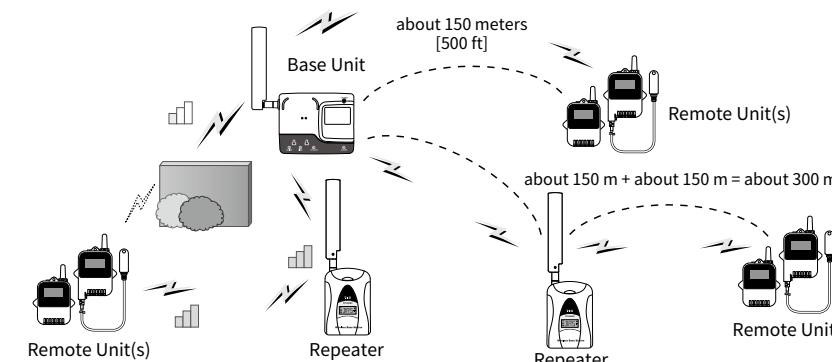
STEP 4 Installing the Device

1. Prepare a power supply for the Repeater. In addition to the two AA alkaline batteries and the optional AC adaptor AD-06A1, power can be supplied from a car battery, etc. by using the optional battery connection adaptor BC-0204 (DC9-38V).



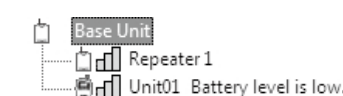
- When using batteries estimated usage time is 6 months if wireless communication is carried out for 5 minutes every day.
- Battery life varies depending upon the type of battery, the battery performance, the measuring environment, and the frequency of use.

2. Deploy the Repeater in between the Base Unit and the target Remote Unit(s).



Please refer to section [Notes and Precautions for Installing Wireless Communication Devices] under [RTR500B Series Safety Information].

3. Open [Wireless Route Settings] and click [Test Signal Strength].
4. Click [Start] to begin the signal check. When completed, click [Close]. The result will appear.



How to Read Signal Strength Results

	Communication is stable.
	Communication is unstable. If communication errors repeatedly occur, reposition the Remote Unit or add a Repeater.
If no antenna mark appears, a communication error has occurred. Try to reposition the Remote Unit or add a Repeater.	