



Wireless Base Station / Repeater RTR-500

Introductory Manual

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

Details about how to use the software and its
functions, can be found in the Software "Help".

For product information or questions contact us at:

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We have opened an English Website 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.

Wireless Base Station / Repeater RTR-500 Introductory Manual

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Wireless Base Station RTR-500 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, or it can be obtained by contacting TandD 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.

T&D Corporation

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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.



- All rights of this User's Manual belong to T&D Corporation. It is prohibited to use, duplicate and/or arrange a part or whole of this User's Manual without the permission of T&D Corporation.
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- Company names and product names are trademarks or registered trademarks of each company.
- Specifications, design and other contents are subject to change without notice.
- On screen messages in this manual may vary slightly from the actual messages.
- Please notify the shop where you purchased this product or T&D Corporation of any mistakes, errors or unclear explanations in this manual. T&D Corporation accepts no responsibility for any damage or loss of income caused by the use of our product.
- This product has been designed for private or industrial use only. It is not for use in situations where strict safety precautions are necessary such as in connection with medical equipment, whether directly or indirectly.
- We are not responsible for any malfunction or trouble caused by the use of our product or by any problem caused by the use of measurement results of our unit. Please be fully aware of this before using our product.
- Some of our products, which come under the category of strategic goods in foreign trade law, need the permission of the Japanese government to be exported outside of Japan.
- The Manual itself can be downloaded from our Home Page:
<http://www.tandd.com/>

Safety Precautions and Instructions







Before using please read the following precautions and instructions. 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.

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 a forbidden action. (EX :  stands for CAUTION AGAINST ELECTRIC SHOCK)
	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. (EX :  Unplug power plug from outlet)

 **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 unit.
Doing so may cause fire or electrocution.



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



Do not use this unit in wet or humid places, such as a bathroom.
It may cause a fire or other trouble including malfunction.



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



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 disconnect the cables from the unit, remove 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 disconnect the cables from the unit, remove batteries, and stop using.
Continued use may cause fire or electrocution.





Make sure to periodically remove dust and dirt from the AC adaptor plug.
If dust is allowed to accumulate on the plug, moisture may cause poor insulation and result in fire.





Do not unplug the AC adaptor with wet hands.
This may cause electrocution.


 **CAUTION**


 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.


 Harmful gases or chemicals may cause corrosion and/or other danger to the unit. Also, by coming in contact with hazardous substances, harm may occur to the people handling the unit. Therefore, do not use in any environment that is exposed to chemicals and harmful gases.


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


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


 Make sure that the cable and AC adaptor are inserted fully, so as not to cause an improper connection. Also, when unplugging the cable from the main unit, do not pull the cord, but hold the connector to disconnect.


 Battery life depends on the easurement environment, communication frequency, recording interval and battery quality.

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

 Do not put anything on top of the AC adaptor.
This may cause overheating.

 Remove batteries from any unit that is not to be used for a long period of time.
Batteries left in a unit not being used for a long time may leak and cause a 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.



To prevent damage to the unit from static electricity, remove static electricity from your body by touching metal around you (door knob, window frame) before touching the unit.

Static electricity may cause not only damage to the unit, but may cause breaks in or a loss of data.



Do not use or store the Unit 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 static electricity.

This may cause damage including malfunction.

- Areas exposed to excessive vibration.

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

- Areas that are not flat or level.

This may cause the unit to fall and result in injury and/or damage.

- 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.



Notes and Precautions for Installing Wireless Communication Devices

When installing wireless communication devices take special care in selecting locations so as to ensure proper communication.

Note that even after a successful installation, due to changes in environmental conditions, communication errors may occur when restarting the system.

Keep wireless communication devices away from metals and computers.

- Please take note that in many instances, walls, floors, stairs, barriers of all types and desks will contain metals.
- Please install these devices at least 30 cm away from walls or boards containing metal.
- Please place units more than 1 meter away from computers.

Objects which contain lots of water, such as plants or soil, absorb radio waves. We highly recommend that such objects not be placed between or near wireless communication units.

- A study made in measuring temperature in a greenhouse has shown that as tomatoes grew, communication errors also increased.
- Do not place units directly on the ground. Set them up in a high unobstructed position.

If wireless communication units are placed in a metal container such as a freezer or refrigerator, the wireless communication range will be shortened.

- Please check wireless signal strength to find the best possible communication points.
- In most cases radio waves are transmitted via doors and door openings so place devices as near to doors as possible.

Keep all wires as far away as possible from wireless communication devices.

- Be careful about placing devices near any wiring or cables such as power supply cables, telephone wires or LAN cables.

Do not place devices which are using the same communication frequency channel in the same area.

- If more than one device is being used make sure to set a different communication frequency channel for each device. If the same channel is used for multiple devices not only will more communication errors occur, but battery life will also be shortened.

Keep the devices away from noise-emitting sources.

- Equipment such as some industrial instruments, electronic devices or fluorescent lamps generate noise. Place devices at least 30 cm away from any noise-emitting sources.

After having made an installation check the wireless signal strength.

- The software application includes a function to check wireless signal strength.

If you are transmitting between indoors and outdoors we suggest installing the device near a window or some such place where signals can easily pass through.

- Note that moving units 10 cm in any one direction may result in communication results being significantly changed.
If no change occurs after moving the units to several nearby locations, we strongly suggest adding one or more Repeaters to enhance communication.

Radio, EMC and Safety Regulations



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.

Changes or Modifications not expressly approved by the manufacturer for compliance could void the user's authority to operate the equipment.

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.
-

What are Base Units, Remote Units and Repeaters?

Base Units

A Base Unit can collect data measured by and recorded in Remote Units via wireless communication, and send the collected data either by FTP or e-mail to a server whereby the data can be downloaded to your computer via an external network, such as the internet. Also, by setting Upper and Lower Limits, warning monitoring can be carried out for each Remote Unit at each Location.

Remote Units

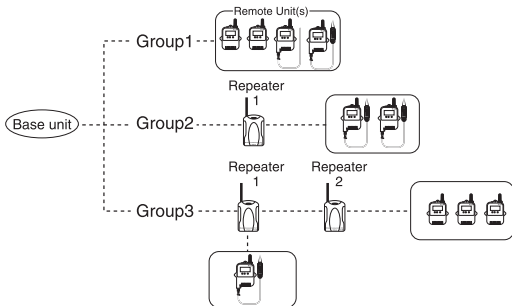
A Remote Unit is a Data Logger designed to measure and record temperature and humidity. The wireless communication range between a Remote Unit and a Base Unit, if unobstructed and direct, is about 500ft.

Repeaters

If wireless communication cannot successfully be carried out due to obstacles, or if you wish to extend the wireless communication range, please add Repeater(s) between Remote Unit(s) and the Base Unit.

About Registration

It is first necessary to register the desired Remote and Repeater Units (where needed) to a Base Unit. It is possible to register them into Groups by place or by purpose. Assign a Wireless Communication Frequency Channel for each Group. Remote Units and Repeaters can only be registered to one Group at a time.

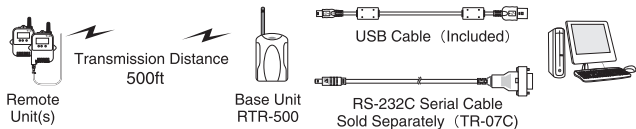


Features of RTR-500

RTR-500 can be used both as a Base Unit and a Repeater.

Using as a Base Unit

An RTR-500 Base Unit can collect data measured by and recorded in Remote Units via wireless communication, and send the collected data to your computer connected to the Base Unit with a USB or Serial Communication Cable.



- * If you wish to communicate by serial communication, an optional cable (TR-07C) is needed.
- * The RS-232C communication cable connector is a D-Sub 9 pin female.
- * Make sure to connect it to the correct place to ensure communication, and also make sure the cable is inserted fully, so as not to cause an improper connection.
- * The USB / Serial Ports on your computer have markings as shown below.

for USB

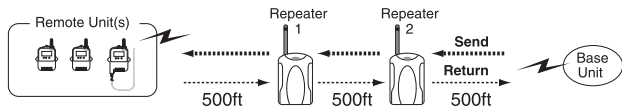


for Serial (RS-232C)

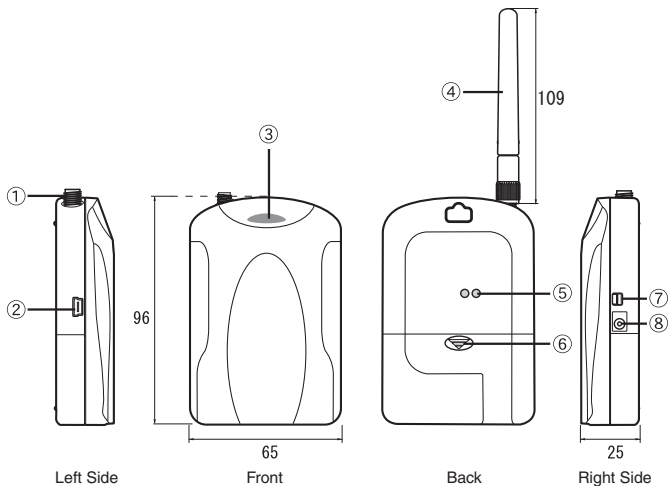


Using as a Repeater

If the distance between an RTR-500 Base Unit and an Remote Unit exceeds the possible range of wireless communication, it is possible to set up one or, if necessary, multiple RTR-500 unit(s) as Repeater(s) between them in order to route wireless communication from the Base Unit to the Remote Unit. Compatible Base Units are RTR-500GSM and RTR-500 models.



RTR-500 Appearance Diagrams and Part Names



Unit: mm

- ① Antenna Connector
- ② USB (MiniB) Jack
- ③ Monitor LED
- ④ Antenna
- ⑤ Optical Communication Area
- ⑥ Battery Cover
- ⑦ RS-232C (mini) Jack
- ⑧ AC Adaptor Connection Jack

Package Contents

The following items are included in the package:

RTR-500 x 1

Antenna x 1

USB Communication Cable x 1

Introductory Manual (Warranty) x 1

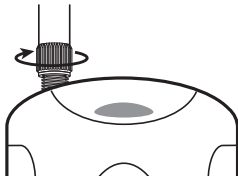
Memo Sticker x 1

* Please write Repeater names, numbers or any other memos on the sticker and fasten it to the unit.

Getting the RTR-500 Ready to Use

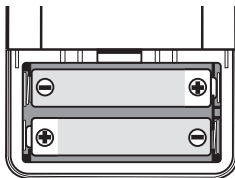
Connect the Antenna

Connect the supplied antenna to the antenna connector.



Install Batteries

Insert 2 AA alkaline batteries as shown in the figure.



- * When the RTR-500 is connected by a USB communication cable to your computer or power is supplied by an optional AC Adaptor to the RTR-500, there is no need to insert batteries.
- * Always use two batteries of the same type.
- * Make sure not to mistake + / -.
- * A battery cannot be charged inside the RTR-500.
- * The Monitor LED will blink once when usable batteries are installed.

About the Software



Before connecting an RTR-500 to your computer, make sure to install the software into the computer.

If you have connected an RTR-500 to your computer before installing the software, make sure to click the [Cancel] button in the Wizard window when it pops up on the computer display.

► When using an RTR-500 as a Base Unit

It is necessary to go to our Website and download the software designed for RTR-500.

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

For information about how to download or install the software and other details, please see the download page.

► When using an RTR-500 as a Repeater

Please install the software designed for the Base Unit you are using. For information about how to install the software and other details, please see the Introductory Manual that came with the Base Unit or the Help Menu in the Software.

After the software installation has been completed, please install the USB Device Driver. (See the pages hereafter for details.)

Installing the USB Device Driver



Have you already installed the software?

Before connecting an RTR-500 to your computer via USB, make sure to install the software into the computer.

Connecting an RTR-500 to a Computer

Connect the RTR-500 with the supplied USB communication cable to the computer.



- Make sure that the USB cable is inserted fully, so as not to cause an improper connection.
- Please login using a User Account with Administrator (Computer Administrator) rights.

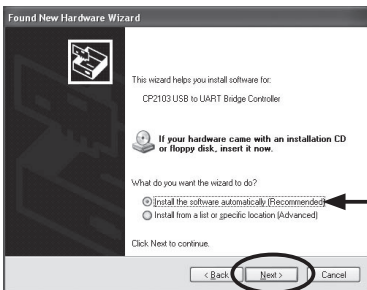
For Windows XP (SP2 or higher)

1. **By connecting the RTR-500 to the computer, the [Found New Hardware] Wizard will automatically open.**
 - If that window does not automatically open, installation may have been completed or failed. Please check whether the USB device driver has been properly installed by following the directions on page 16.
2. **Check "No, not this time" and then click the [Next] button.**



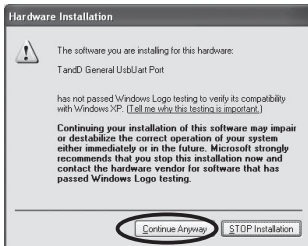
Check the "No, not this time".

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



Check the "Install the software automatically (Recommended)"

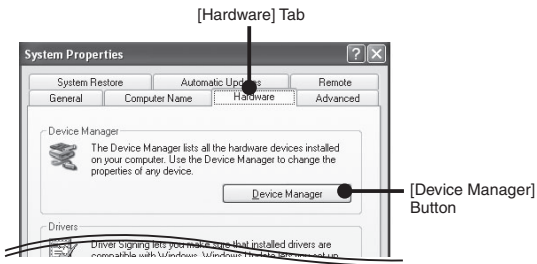
4. If a window appears such as the one below during installation, click the [Continue Anyway] button.



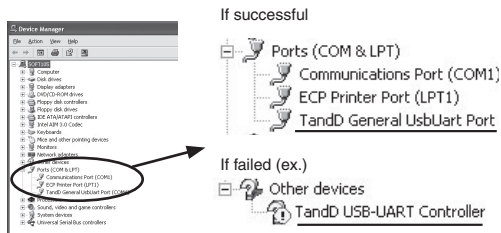
5. After installation has been completed, please check whether the USB device driver has been properly installed.

Checking the USB Device Driver Installation (XP Sp2 or higher)

1. Open the System Properties Window by opening the [Control Panel] and double click on [System] to display that window.
2. In the [System Properties] window, click the [Hardware] tab, and then click the [Device Manager] button in the Device Manager area.



3. If under "Port (COM & LPT)" appears "TandD General UsbUart Port" the USB device driver has been properly installed.



- "TandD General UsbUart Port" will not appear if the RTR-500 has not been connected to the computer.
- If "? Other Device" - "?! TandD USB-UART Controller" appears, it means the USB device driver was not properly installed. Please reinstall by following the directions on page 18.

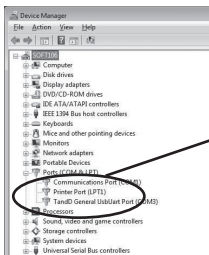
For Windows Vista

For Windows Vista, by installing the software, the USB device driver will also be automatically installed.

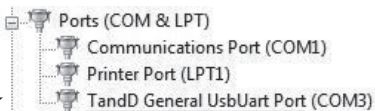
Please check whether the USB device driver has been properly installed.

Checking the USB Device Driver Installation (Vista)

1. Connect the RTR-500 with the supplied USB communication cable to the computer.
2. Open the Device Manager Window by Opening the [Control Panel] and click on [System and Maintenance] - [System] - [Device Manager].
3. If under "Port (COM & LPT)" appears "TandD General UsbUart Port" the USB device driver has been properly installed.



If successful



If failed (ex.)



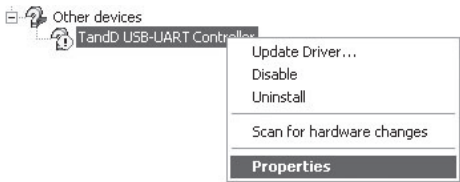
- "TandD General UsbUart Port" will not appear if the RTR-500 has not been connected to the computer.
- If "? Other Device" - "?! TandD USB-UART Controller" appears, it means the USB device driver was not properly installed.
Please reinstall by following the directions on page 21.

Re-installing the USB Device Driver

For Windows XP (SP2 or higher)

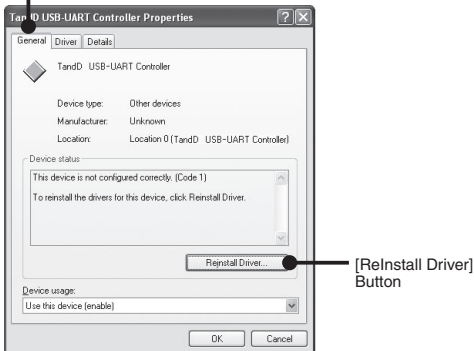
1. In the Device Manager window, right click on the unknown device "TandD USB-UART Controller".

From the pop-up menu click on "Properties".



2. In the "TandD USB-UART Controller Properties" window, click the [General] tab, and then click on the [Reinstall Driver] button to display the [Found New Hardware] Wizard.

[General] Tab

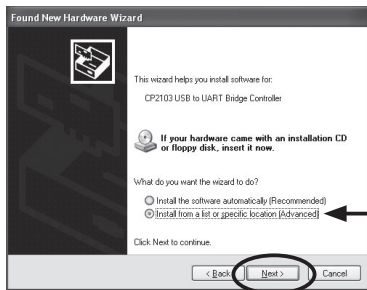


3. Check "No, not this time" and then click the [Next] button.



Check the "No, not this time".

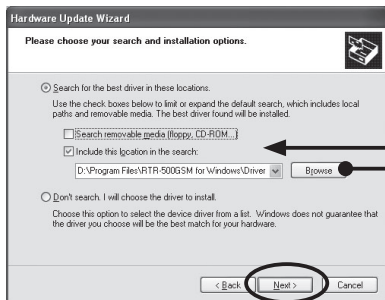
4. Check "Install from a list or specific location (Advanced)" and then click the [Next] button.



Check the "Install from a list or specific location (Advanced)"

5. Check "Include this location in the search" and then click the [Browse] button to specify the location of the device driver.

Click [Next] to start the installation.

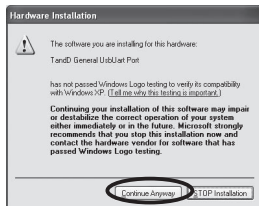


Check the "Include this location in the search."

[Browse] Button to specify the location of the device driver

- In the software folder, select "Driver RTR-500".
EX: C:\Program Files\software name\Driver RTR-500

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

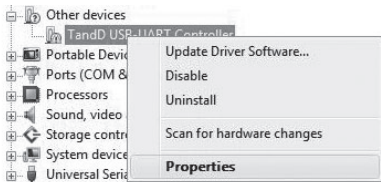


7. After the installation has been completed, please check whether the USB device driver has been properly installed.

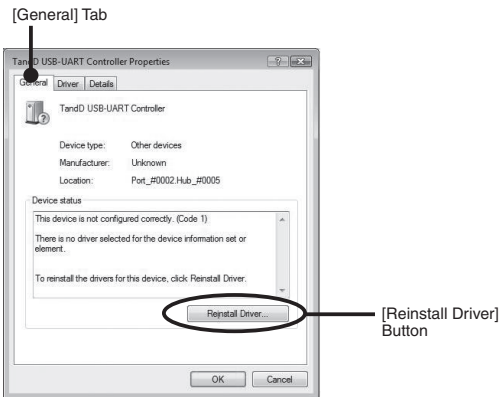
For Windows Vista

1. In the Device Manager window, right click on the unknown device "TandD USB-UART Controller".

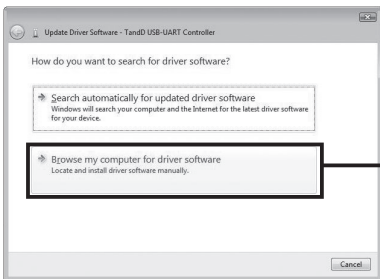
From the pop-up menu click on "Properties".



2. In the "TandD USB-UART Controller Properties" window, click the [General] tab, and then click on the [Reinstall Driver] button to display the [Update Driver Software TandD USB UART Controller].



3. Click the "Browse my computer for driver software".



Click the "Browse my computer for driver software"

4. Click the [Browse] button to specify the location of the device driver.

Click [Next] to start the installation.

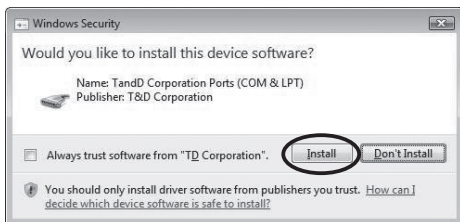


[Browse] button to specify the location of the device driver.

Check here

- In the Software folder, select "Driver RTR-500".
EX: C:\Program Files\software name\Driver RTR-500

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

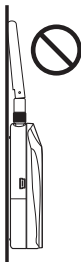


6. After the installation has been completed, please check whether the USB device driver has been properly installed.

Tips for placing the RTR-500

We strongly suggest setting the RTR-500 unit up in a high, unobstructed position to enhance the radio signal strength.

When positioning the units try to keep the antennas away from objects or walls.



Please carry out a "Signal Strength Test" to check the radio signal strength before using the product and adjust the antenna direction accordingly. For more details please see "Notes and Precautions for Installing Wireless Communication Devices" on page 7.

* Signal Strength Tests are tests carried out for checking the wireless signal strength between Base, Remote, and Repeater Units after the units have been deployed and settings had been completed. Use the Application function in the software to carry out this test.

Product Specifications

Compatible Devices	Remote Unit : RTR-501, RTR-502, RTR-503, RTR-502Pt Base Unit : RTR-500, RTR-500GSM
Power	Base Unit : USB bus power / AC Adaptor (AD-0638) Repeater : 2 AA batteries / AC Adaptor (AD-0638)
Battery Life	6 Months of continued use on 2 AA alkaline batteries when used as Repeater for five minutes a day. * It depends on measurement environment, recording interval and battery performance.
PC Interface (*1)	USB miniB Connector Serial [Mini serial] (19200bps)
Wireless Communication Time	1 unit of full data takes about 120 seconds (when Repeater not used) When communicating via Repeaters, the approximate time for that communication is calculated as follows: "120 seconds + (Number of Repeaters 120seconds)".
Wireless Specifications	FCC Part15 Section247 / IC RSS-210 [Frequency Range: 902 to 928MHz]
Transmission Range	Approx. 500ft (May vary with conditions)
LED	Green LED Blinks during Wireless Communication and PC Communication.
Operating Environment	Temperature: -10 to 60°C (-30 to 60°C when external power connected) Humidity: 20 to 80%RH (No condensation)
Operating Voltage	2.5V to 7.0V
Consumption Current	Approx. 50mA (Wireless Communication)
Dimensions	H 96mm x W 65mm x D 39mm / Antenna Length : 109mm
Weight	Approx. 71g (Batteries not included)

(*1) If you wish to communicate by serial communication, an optional cable (TR-07C) is needed.

Options

RS-232C (Serial) Communication Cable

Type : TR-07C

Cable Length:1.0m

Connector Type:

Specialized Connector D-sub9pin

For communication with computer



AC Adaptor

Type: AD-0638

Input: AC100-240V

Output: DC6V 500mA

Frequency: 50/60Hz

Cable length: 74in (1.85m)

Plug Figure: A

