



# Mobile Base Station RTR-500MBS-A

## Getting Started Guide

Thank you for purchasing our product.  
This manual explains the basic usage and features of RTR-500MBS-A.

Safety Precautions &  
Product Overview

STEP  
**1** Getting Ready

STEP  
**2** Installing the Software

STEP  
**3** Making Settings &  
Transmission Tests

STEP  
**4** Installing the Device

STEP  
**5** Checking Data on T&D  
WebStorage Service

STEP  
**6** Using T&D Graph to Access  
WebStorage Data

LED Display / FAQ's /  
Specifications / Options

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# I Important Notices and Disclaimers

In order to properly use this product, please carefully read all attached documents before using.



- All rights of the attached documents belong to T&D Corporation. It is prohibited to use, duplicate and/or arrange a part or whole of the attached documents without the permission of T&D Corporation.
- Microsoft and Windows are registered trademarks of Microsoft Corporation in the United States and/or other countries.
- All registered trademarks, company names, product names and logos mentioned herein or for products being used are the property of T&D Corporation or of their respective owners.
- Specifications, design and other contents outlined in the attached documents are subject to change without notice.
- Please follow the safety precautions outlined in the attached documents carefully.
- We cannot guarantee nor are we responsible for safety if this product is used in any manner other than was intended.
- On-screen messages in the attached documents 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 the attached documents.
- T&D Corporation accepts no responsibility for any damage or loss of income caused by the use of our product.
- Accompanying documents cannot be reissued, so please keep them in a safe place.
- Please read the warranty and provisions for free repair carefully.

# Safety Precautions and Instructions




The following items should be strictly obeyed for the safe usage of this product, and for protecting yourself and other people from bodily harm and/or damage to property.

## Explanation of Symbols

### Warning Symbols

 <b>DANGER</b>	Failure to follow the instructions with this symbol could cause serious injury or even death.
 <b>CAUTION</b>	Failure to follow the instructions with this symbol could cause personal injury or physical damage to equipment.

### Explanation of Picture Symbols

	Denotes an important warning or caution.
	Denotes a forbidden action.
	Denotes an action that should be carried out.

## Notes about Operation



To prevent unexpected accidents caused by radio waves, make sure to turn off the power when entering the following places and be sure not to use in said places.

- Areas where explosive gas may be present including gas stations
- Areas where the use of the unit has been prohibited including aircraft and hospitals



The SIM card stores the user's cell phone number and other unique user identification information. Please take adequate care to prevent the loss or theft of your SIM card. Also, be sure to keep your PIN number in a safe place.

When inserting or removing the SIM card, please be careful about the following.



- Avoid exposure to static electricity when handling the card.
- Make sure to disconnect all cables (AC adaptor, USB cable, and external power cable) from the RTR-500MBS-A before inserting or removing the card.
- Be careful not to touch or scratch the IC area of the card.
- Make sure to insert the card in the proper direction.
- Do not force the cover open or closed.



Please note that this document has been written based on the presupposition that the functions and specifications of the SIM card being used and the details of the contract have already been confirmed between the user and the cell phone carrier.



T&D Corporation shall not be responsible for any damages which a contractor, a user or a third party may suffer, whether direct or indirect, due to the inability to communicate or use communication devices.



To prevent unexpected communication charges, confirm the details of your carrier's contract before using the product over a mobile network.

# Safety Precautions and Instructions



**DANGER**

## To Prevent Serious Accidents



Do not disassemble, repair or modify the unit and accessories.



Do not use the unit in any environment that is exposed to chemicals and harmful gases. Doing so may cause corrosion and/or other danger to the unit. Also, coming in contact with hazardous substances may cause bodily harm to the user or people nearby.



Neither this unit nor any and all accessories are water resistant. If any liquid gets inside the case or the device gets wet, immediately remove batteries and stop using.



Do not handle the unit, remove batteries or cables with wet hands.



This product has been designed for private and/or industrial use only. It should not be used in situations where strict safety precautions are necessary such as with medical equipment, or in systems directly or indirectly connected with human life or well-being.



Do not drop or expose the unit to a strong impact.



Do not connect any communication cables connected to the unit to telephone line outlets. Continued use may cause fire or electrocution.



Do not cut or process the cords for the AC adaptor or the communication cables. Also, do not twist, pull or swing any of the cords or cables.



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



Place and store the unit and accessories out of the reach of children.



Further, T&D is not responsible for any damage, malfunction or trouble, whether direct or indirect, caused by the use of our products.



Do not use any power, battery, sensor, or cable other than those specified by T&D Corporation.



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



Do not disconnect the communication cable during wireless communication or USB communication. Doing so may cause adverse effects to the unit and/or PC.



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 unit, do not pull the cord, but hold the connector to disconnect.



If the unit produces heat, emits smoke or a strange smell, or makes unusual noises, immediately unplug the AC adaptor, remove the batteries, and stop using it. Also, disconnect the unit from the PC.

# Safety Precautions and Instructions



## CAUTION

### Do not place or store in the following areas:

- Areas exposed to direct sunlight
- Areas exposed to excessive heat or high temperatures such as near fire or heating equipment
- Areas exposed to static electricity
- Areas exposed to strong magnetic fields
- Areas exposed to dampness
- Areas subject to condensation or wet areas
- Areas exposed to excessive vibration
- Areas exposed to excessive smoke, dust or dirt.



## CAUTION

### Other Precautions

- Use the unit in the specified operating environment. Do not use it for any purpose other than for which it was designed.
- Condensation may occur inside the case when a unit is moved from one environment to another where there is a great difference in temperature. Do not use in areas susceptible to condensation.
- Do not use the unit in wet areas or places exposed to water such as bathroom.
- When connecting the unit to your PC, make sure to follow all warnings and directions from your computer manufacturer.
- We shall not guarantee the unit's operation if it has been connected to a PC using a USB hub or a USB extension cable.
- Do not insert any foreign objects into any of the units' jacks.
- If the unit gets dirty, wipe it with a clean cloth.
- Make sure to remove dust and dirt from plugs of the AC adaptor and/or any cables.
- Please note that this document has been written based on the presupposition that details about contracts with an Internet provider, specific network environments and the set-up of any other necessary equipment to enable network connection has already been taken care of by the User and that connection has been confirmed as workable.



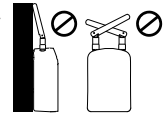
## CAUTION

### 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.

As far as possible, try to keep wireless communication devices away from metals and set them up in high unobstructed positions.

- Please take note that in many instances, walls, floors, stairs, fences and desks will contain metals. In order to carry out communication between indoor and outdoor units, please locate indoor units near a window so that radio waves can be easily transmitted.
- Please install these devices more than 30cm away from walls or boards containing metal.
- If wireless communication devices are placed in a metal container such as a freezer or refrigerator, the possible wireless communication range will be shortened. In most cases radio waves are transmitted via doors and door openings so place devices as near to doors as possible.



As far as possible, keep the devices away from noise-emitting sources.

- Equipment such as some industrial instruments, electronic devices or fluorescent lamps generate noise. Please place units more than one meter away from such devices.
- Please place units more than 1 meter away from computers and other devices which emit noise.
- Keep all wires as far away from wireless communication devices as possible. Be careful about placing near any wiring or cables such as power supply cables, telephone wires or LAN cables.

Because 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 devices.

- When measuring temperature in a greenhouse it has been reported that as plants grew, communication errors also increased.
- Do not place units directly on the ground.

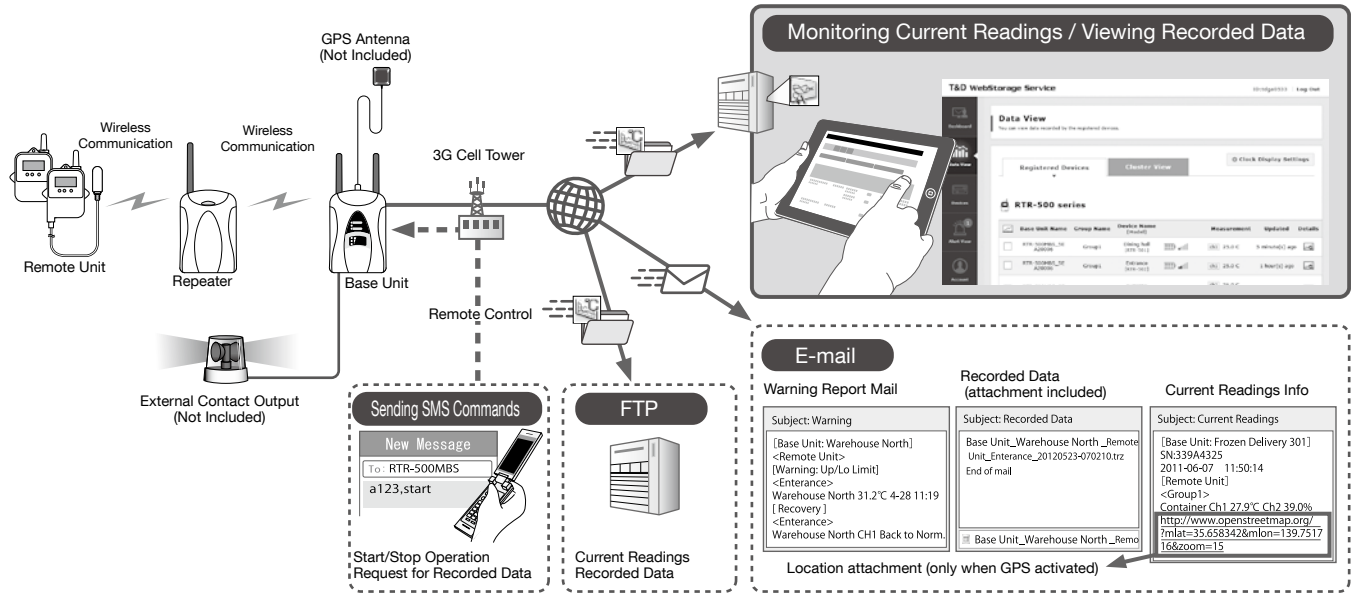
Do not place devices which are using the same communication frequency channel in the same area.

- If the same channel is used for multiple devices not only will more communication errors occur, but battery life will also be shortened.
- If there is a possibility that devices with the same frequency channel will be in wireless communication at the same time, please make sure to make changes to the frequency channels so they are not the same.

# What can the RTR-500MBS-A do?

RTR-500MBS-A is a Base Unit equipped with both wireless and 3G mobile communication capabilities. After collecting measured data (current readings and recorded data) from Remote Units via wireless communication, the Base Unit can transmit the collected data via 3G mobile networks to a server or e-mail account.

- This document explains the basic procedures and operations from set up to the monitoring of current readings and downloading of recorded data. Further explanation will be given in the Operation Guide.



Base Unit	RTR-500MBS-A
Remote Unit	Any of the RTR500B Series* / RTR-500 Series Loggers
Repeater	RTR500BC* / RTR-500 (to expand the wireless communication range)

Current Readings	The most recent measurements recorded by a Remote Unit
Recorded Data	Measurements stored in the Remote Unit
Wireless Communication	Short Range Radio Communication

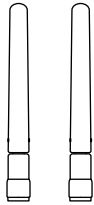
\* These devices are supported by the RTR-500MBS-A with firmware Ver.2.01.02.15 or later and RTR-500MBS for Windows Ver.2.01 or later.

\* References to the RTR-501 / 502 / 503 / 505 / 507S (in this document) also apply to the RTR501B / 502B / 503B / 505B / 507B (RTR500B Series Remote Units).

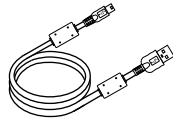
# Package Contents



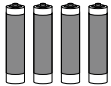
RTR-500MBS-A



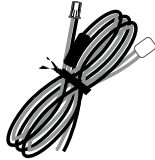
Antenna x 2



USB Mini-B Cable  
US-15C



AA Alkaline Battery  
LR6 x 4



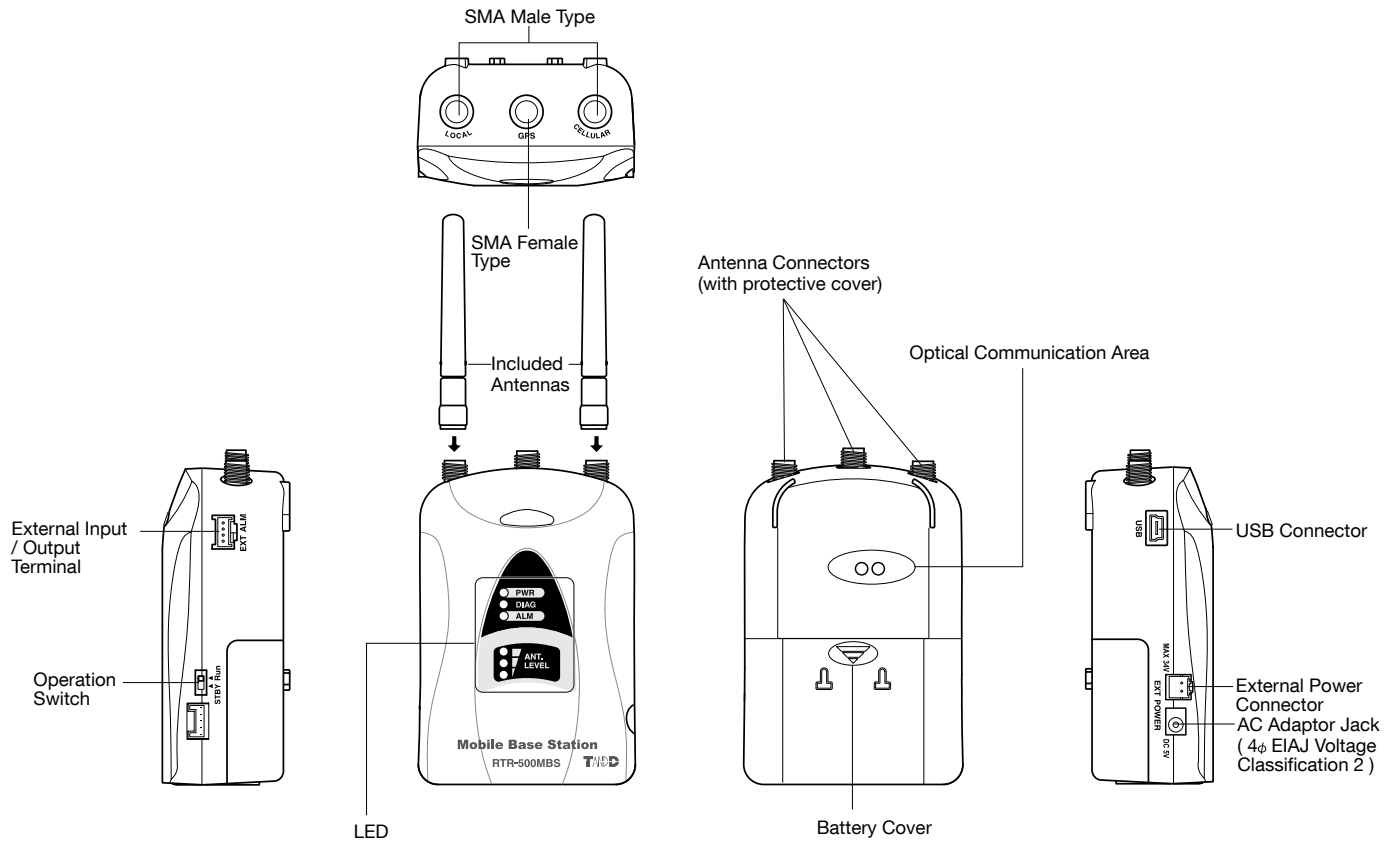
External Power Cable  
BC-0302



Getting Started Guide  
(Warranty Included)



# Part Names and Functions



**1 Preparing a SIM card****2 Setting up the Device**

Connecting the Antennas

Preparing a GPS Antenna if necessary

Installing a SIM Card and Batteries

**3 Registering with T&D WebStorage Service****4 Setting up a mail server (SMTP server)**

- Do not connect a RTR-500MBS-A to your computer until the software has been installed.

**1 Preparing a SIM card**


Please purchase a SIM card that meets the following requirements:

- The card is 3G mobile network compatible. (Voice call only SIM cards may not be used.)
- The card has been or can be activated
- It is a Standard size SIM card



Standard SIM

Micro SIM  
Nano SIM

- The SIM card must also have SMS (Short Message Service) capability if the following functions are desired.
    - Warning Notification via SMS
    - Remote control of the RTR-500MBS-A from a mobile device via SMS commands(\*)
- \* Available commands are the “start” command, “stop” command, and “read” command. For more details, see the Operation Guide that comes with the software.
-  [Operation Guide] > [Other Useful Functions] > [Controlling Base Unit via SMS Command]

**Tips**

For the estimated data usage, please see p.27 [FAQ's] > [Q&A about SIM Cards].

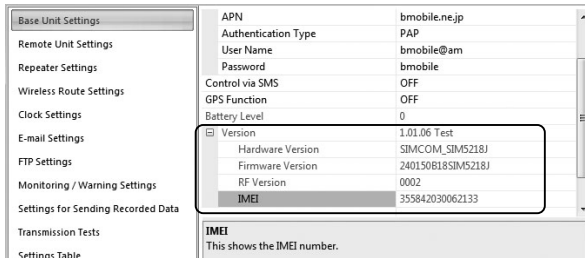
## When purchasing a SIM card, you may be asked for the IMEI number (depending on the type of SIM card).

The IMEI number for your RTR-500MBS-A can be found in the software settings window.

1. Install the software (see p.14 [STEP 2: Installing the Software])
2. Connect an RTR-500MBS-A to your computer.
3. Open the "RTR-500MBS for Windows" from the Start Screen or Start Menu of Windows.
4. Select "RTR-500MBS Settings Utility".



5. In the [Base Unit Settings] menu, the IMEI can be found under [Version].

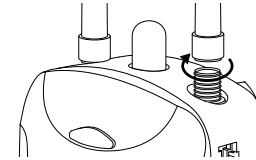


6. Close the software and disconnect the RTR-500MBS-A from your computer.

## ② Setting up the Device

### Connect the Antennas.

1. Remove the protective covers from the antenna connectors (LOCAL/CELLULAR) on the unit, and connect the supplied antennas.



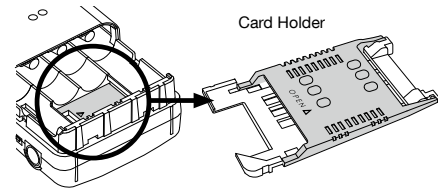
If you wish to use the GPS function, connect a GPS antenna with an SMA male plug (3V) to the GPS antenna connector on the unit.

### Install a SIM Card and Batteries.

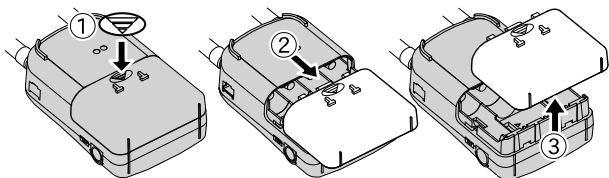


- When inserting or removing a SIM card, avoid exposure to static electricity.
- Make sure to disconnect all cables (AC adaptor, USB cable, and external power cable) from the RTR-500MBS-A before inserting or removing the card.
- Be careful not to touch or scratch the IC area of the card. This may cause poor contact.
- Make sure to insert the card in the proper direction.
- Do not force the cover open or closed.

2. Remove the battery cover to find the SIM card holder.

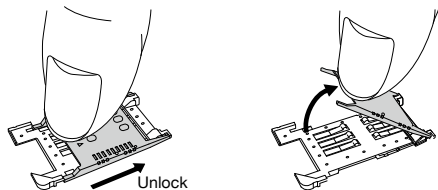


## How to Remove the Battery Cover

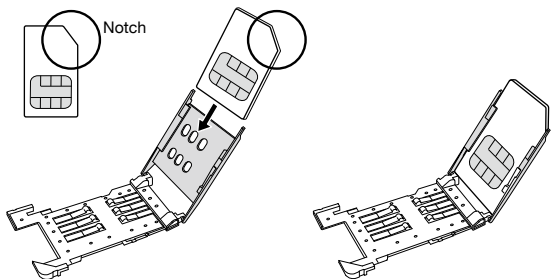


While pressing down on the triangular mark (①), slide the cover to the bottom of the unit (②). Lift off the cover (③).

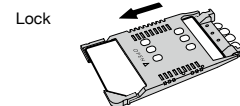
- 3.** Lightly slide the cover of the card holder to unlock it. Slowly lift up the cover to its open position.



- 4.** Making sure that the IC (gold area) is facing out, insert the SIM card into the card holder until it fits completely.

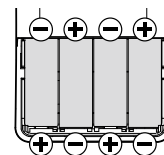


- 5.** Close the card holder and slide the cover to lock it.



If the cover is not properly locked, it may cause insufficient contact with the IC and result in a communication error.

- 6.** Insert the batteries, making sure they are in the proper direction (+ / -), then close the battery cover.



Keeping batteries in the unit allows a backup source of power in the event of power failure. If running only on batteries, the estimated battery life is about 2 days. For longer continuous operation, please use an external power source.

- Leaving alkaline batteries in the unit for a long period of time may cause battery leakage and corrosion. When using as a backup source of power, we recommend that the batteries be changed every few years.
- Make sure to use new batteries of the same kind.
- It is not necessary to set up an external power source before placing the device to the place it will be used. Please see [STEP4: Installing the Device] > [Connecting to an External Power Source] (p.21)

### ③ Registering with T&D WebStorage Service

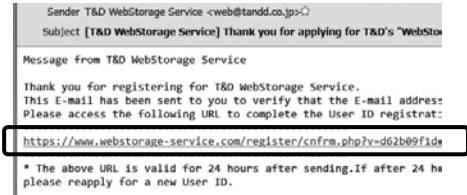
By using T&D WebStorage Service, a cloud service provided by T&D free of charge, it is possible to monitor the RTR-500MBS-A data over the Internet.



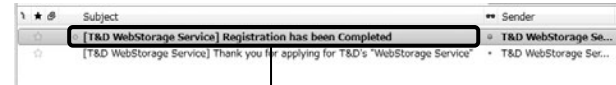
If you don't use T&D WebStorage Service, please arrange a provider's server or your own FTP server.

1. Open your web browser and access the site:  
<https://webstorage-service.com>
2. Click [Create Account] to go to the registration page.
3. Enter an e-mail address and password for registration, and click "Submit" after agreeing to the Service License Agreement and Privacy Policy.

4. An e-mail containing the necessary URL link will be sent to the address you entered. Access the displayed URL to get a User ID.



5. A completion notice will be sent to your registered address upon completion of the User ID registration.



This e-mail contains important information such as user ID, password, FTP server name, and settings information necessary for making settings.

### ④ Setting up SMTP mail server

An SMTP server is required to send Warning Report, Current Readings, and Recorded Data via e-mail.



- Check with your provider to make sure that the mail server you are using supports one of the following mail authentication methods: SMTP-AUTH (LOGIN), SMTPS (SMTP over SSL), or POP before SMTP.
- Some Internet service providers block port 25 (the default port for SMTP) in an attempt to control Spam and viruses. In this case, please use the outgoing mail submission port (SMTP port 587).
- To use SMTPS (SMTP over SSL), set the SMTP Port Number to 465.

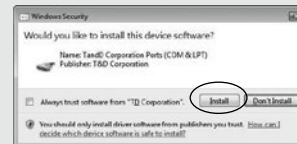
**1 Installing the Software****2 Connecting the Base Unit to a PC****1 Installing the Software**

1. Start Windows and login using a User Account with Administrator (Computer Administration) rights.
2. Download "RTR-500MBS for Windows" and "T&D Graph" from the T&D Website and install them to your PC.

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

[tandd.com/software/rtr500mbswin.html](http://tandd.com/software/rtr500mbswin.html)

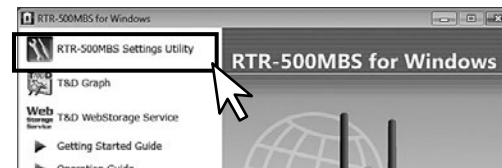
[tandd.com/software/td-graph.html](http://tandd.com/software/td-graph.html)



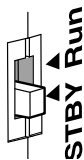
If a window like this appears during installation, click [Install].

**2 Connecting the Base Unit to a PC**

1. Open the "RTR-500MBS for Windows" from the Windows Start Screen or Start Menu.
2. In the displayed launcher window, click and open the "RTR-500MBS Settings Utility".



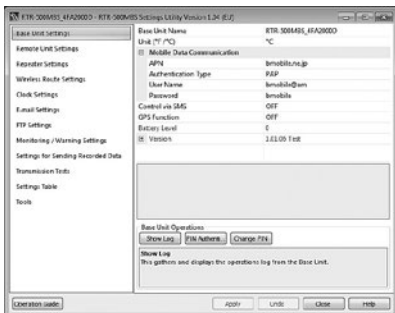
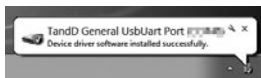
- Turn the operation switch on the Base Unit to <STBY>, and connect it to the computer with the supplied USB cable.



STBY Run



- The USB driver installation will start automatically.
- After the USB driver installation is completed, a window will open where you can make or change various settings related to the RTR-500MBS-A.

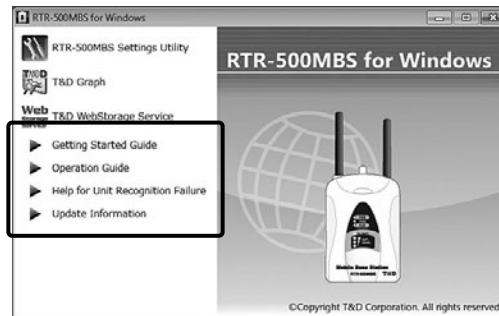


### If the settings window does not automatically open:

If the settings window does not appear after one minute of USB connection, try reconnecting the USB cable. If this does not work, please see [▶ Help for Unit Recognition Failure] in the launcher menu and check the USB driver.

## Tips Troubleshooting and Detailed Info

Detailed information about software settings is provided. Please select from the launcher.



### ▶ Getting Started Guide:

This document is available as a PDF file.

### ▶ Operation Guide:

This contains information about basic settings as well as advanced settings for many useful functions.

### ▶ Help for Unit Recognition Failure:

Click here for information on how to check and reinstall the USB driver.

### ▶ Update Information:

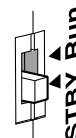
Click here to check for update info.

- ① Making Basic Settings for Base Unit
- ② Making Settings for T&D WebStorage Service
- ③ Registering a Remote Unit
- ④ Making Transmission Tests

## ① Making Basic Settings for Base Unit



- In order to prevent unnecessary or unexpected data transmission, we suggest turning the Operation Switch on the Base Unit to <STBY> until the units have all been set up and ready for communication.
- Once the Operation Switch has been turned to the <Run> position, auto-sending of current readings and/or recorded data becomes activated.



1. Open the "RTR-500MBS Settings Utility" and connect the Base Unit via USB to your PC.
2. The settings window will automatically open.
3. Open the [Base Unit Settings] menu and enter the necessary information such as the Base Unit Name and Mobile Data Communication info.

Base Unit Settings	Base Unit Name	RTR-500MBS_warehouse
Remote Unit Settings	Unit (°F/°C)	*F
Repeater Settings	Mobile Data Communication	
Wireless Route Settings	APN	imobile.ne.jp
Clock Settings	Authentication Type	PPP
E-mail Settings	User Name	imobile@am
FIP Settings	Password	imobile
	Control via SMS	OFF
	GPS Function	OFF
	Battery Level	0

Base Unit Name	Assign a unique name for the Base Unit.
Mobile Data Communication	Enter the information provided by your carrier.

4. After having completed all entries, click [Apply] at the bottom of the window to apply the settings(\*).



\* It is necessary to apply the settings in each setting menu.



**5.** Open the [Clock Settings] menu.

Make necessary settings for [Time Zone] and other items. If [Auto-Adjustment](\*) is turned OFF, the clock on the RTR-500MBS-A will not be adjusted automatically.

Base Unit Settings	Current Time	
Remote Unit Settings	Time Zone	(UTC+01:00) Central European Time
Repeater Settings	Daylight Savings Time	ON
Wireless Route Settings	Date / Time Format	01-03-2009 09:00:00
Clock Settings	Auto-Adjustment	ON

\* Auto-Adjustment is a function whereby the RTR-500MBS-A uses clock information sent from the carrier to automatically adjust the date and time. (This may not apply with some carriers.)

\* Adjustment is made when the Operation Switch is turned to the <Run> position, and also every night around 00:10 according to the Time Zone Setting of the RTR-500MBS-A.

**6.** After setting the necessary items, click [Apply].

**2 Making Settings for T&D WebStorage Service**

**1.** Open the [FTP Settings] menu and enter the following information.

\* If you have set up a different FTP server, enter the necessary information accordingly.

Base Unit Settings	FTP Server	ftp.webstorage-service.com
Remote Unit Settings	FTP User ID	your_id0123
Repeater Settings	FTP Password	*****
Wireless Route Settings	FTP Port Number	21
Clock Settings	Passive Mode	ON
E-mail Settings		
FTP Settings		

FTP Server	ftp.webstorage-service.com
FTP User ID	User ID issued by T&D WebStorage Service
FTP Password	Password for T&D WebStorage Service
FTP Port Number	21
Passive Mode	ON

**2.** After setting the necessary items, click [Apply].

**3.** Open the [Monitoring / Warning Settings] menu and enter the following information.

Base Unit Settings	Send Current Readings	ON
Remote Unit Settings	Sending Interval	10 min.
Repeater Settings	Transmission Method	FTP
Wireless Route Settings	File Name	<base>_<time>
Clock Settings	Destination Folder	
E-mail Settings	Warning Monitoring	OFF
FTP Settings		
Monitoring / Warning Settings		

Send Current Readings	ON
Sending Interval	Make settings for the interval of time between transmissions of current readings.
Transmission Method	FTP
File Name	<base>_<time>

**4.** After entering the necessary information, click [Apply].

**5.** Open the [Settings for Sending Recorded Data] menu and enter the following information.

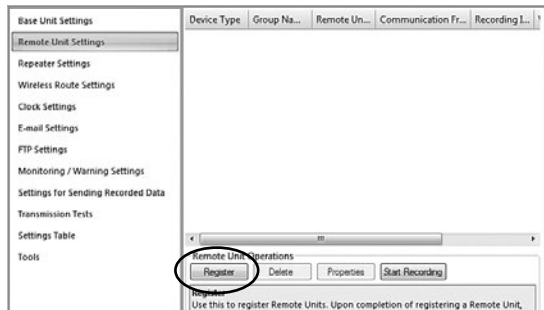
Base Unit Settings	Auto-Sending of Recorded Data	ON
Remote Unit Settings	Transmission Scheduling Method	Transmit by day and time
Repeater Settings	Day and Time 1	
Wireless Route Settings	Day and Time 2	<input checked="" type="checkbox"/> Every Day 5 : 0 OK
Clock Settings	Day and Time 3	
E-mail Settings	Day and Time 4	
FTP Settings	Day and Time 5	
Monitoring / Warning Settings	Day and Time 6	
Settings for Sending Recorded Data	Day and Time 7	
	Transmission Method	FTP
	File Name	<base>_<remote>_<time>
	Destination Folder	

Auto-Sending of Recorded Data	ON
Transmission Scheduling Method	Select either method.
Transmit by day and time	Make settings here for dates and times for the automatic downloading and sending of recorded data. Up to eight patterns can be set. If you select more than one date and time, make sure that they are six or more hours apart.
Transmit by Interval	Specify the interval at which you wish to have data automatically sent and choose at what minute of the hour you wish to have the next transmission occur.
Transmission Method	FTP
File Name	<base>_<remote>_<time>

6. After entering the necessary information, click [Apply].

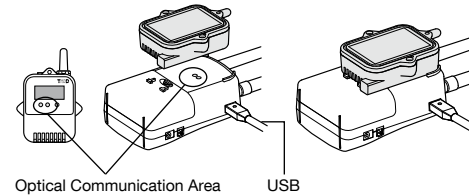
### 3 Registering a Remote Unit

1. Open the [Remote Unit Settings] menu.
2. Click [Register] to open the registration window.

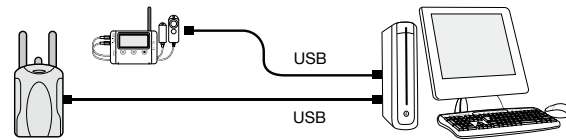


3. Click [Yes] to the confirmation message. Follow the on-screen instructions and connect the target Remote Unit.

- **Optical Communication: RTR-501 / 502 / 503 / 505 / 507S**  
Place the Remote Unit face down on the Base Unit connected to the computer so that the optical communication areas meet.



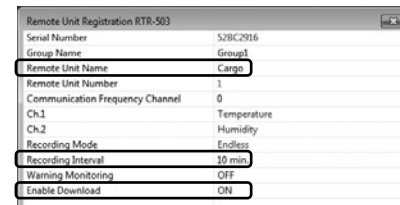
- **USB Communication: RTR-574 / 576**  
Connect the Remote Unit with a USB communication cable to the computer.



**If the screen does not change after connecting RTR-574 / 576:**

- Do not connect more than one Remote Unit to your computer at one time.
- The USB driver may not have been installed correctly. Please see [Help for Unit Recognition Failure], and check the USB driver.

4. Enter the following information in the [Remote Unit Registration] window.



Remote Unit Name	Assign a unique name for the Remote Unit.
Recording Interval	Select the desired interval.
Enable Download	ON

Below are some examples of recording interval and maximum recording time.

RTR-501 / 502 / 505 (Logging Capacity: 16,000 readings)

EX: Recording Interval of 30 seconds x data readings of 16,000 = 480,000 seconds (about 5 days and 13 hours)

RTR-503 / 507S / 574 / 576 (Logging Capacity: 8,000 readings)

EX: Recording Interval of 30 seconds x data readings of 8,000 = 240,000 seconds (about 2 days and 18 hours)

	Recording Interval			
	1 sec.	30 sec.	15 min.	60 min.
RTR-501 / 502 / 505	4 hr and 26 min	5 days 13 hr	166 days 16 hr	1 yr 10 mos
RTR-503 / 507S / 574 / 576	2 hr 13 min	2 days 18 hr	83 days 8 hr	11 mos

- Upon reaching the logging capacity, the oldest data in the Remote Unit will be overwritten and recording will continue.

5. After having completed all entries, click [Register] at the bottom of the window to register with the Base Unit.



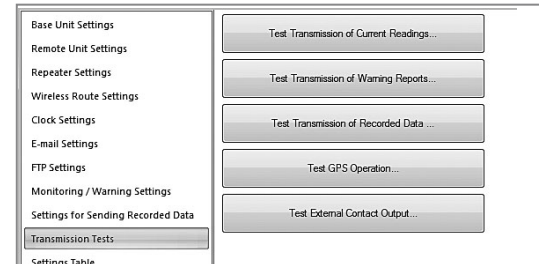
6. The registered Remote Unit starts recording automatically upon completion of the registration. If you wish to register other Remote Units, repeat the same procedures from 1.

- It is also possible to assign a date and time for a Remote Unit programmed recording start. For details, see the Operation Guide [Other Useful Functions] > [Starting Recording Manually].

- Remote Unit Settings can also be changed or added later. For details, see the Operation Guide [Other Useful Functions] > [Changing Remote Unit Registration Info].

## 4 Making Transmission Tests

1. Open the [Transmission Tests] menu.



2. Click the button of the desired test to open the corresponding test setup window.

Check the contents of the display, make any necessary changes, and click [Send].



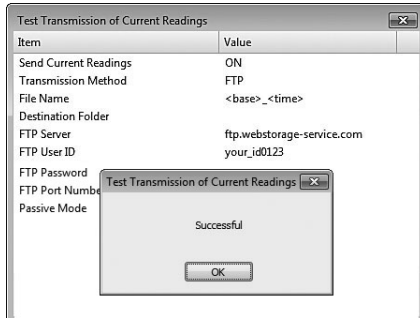
3. Check to make sure that the test was successful.

## How to Confirm Tests were Successful:

### For the Transmission of Current Readings, Warning Reports, and Recorded Data Tests

- **When the destination is T&D WebStorage Service:**

Check that a “Successful” message was displayed.



- **When the destination is an E-mail address:**

See if the test mail has been received by the specified recipient at the set e-mail address.

- **When the destination is an FTP server (other than T&D WebStorage Service):**

Check that the test data has arrived at the specified FTP Server.

### For the GPS Operation Test

See if the window with the location info (latitude/longitude) has been displayed.

\* To carry out the GPS operation test, it is necessary that the GPS antenna is properly connected to the Base Unit and then placed where it can properly receive a signal from a GPS satellite, such as outside, or inside by the window with an unobstructed view of the sky for optimal GPS performance.

\* It takes a few minutes to obtain the location data.

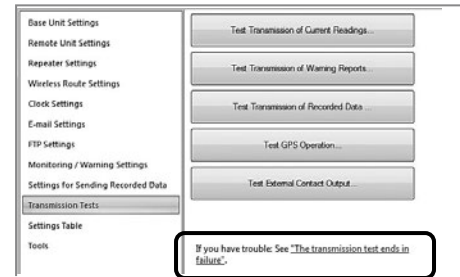
## For the External Contact Output Test

See if the warning device connected to the external contact output operated properly.

## If a Transmission Test Ends in Failure:

- Open [Base Unit Settings], and make sure the Mobile Data Communication info has been entered correctly.
- Open [FTP Settings], and make sure the information about T&D WebStorage Service has been entered correctly.

After checking above and making any necessary changes, if the transmission test still fails, click [If you have trouble, see “The transmission test ends in failure”.] in the [Transmission Test] menu.



### Tips Communication Tests via PC

See the Operation Guide for details about test procedures and results.

[Other Useful Functions] - [Checking Signal Strength (PC)]

[Sending Current Readings] - [Making Transmission Tests]

[Troubleshooting] - [Q&A about Settings]

- ① Connecting to an External Power Source (when applicable)
- ② Installing the Device
- ③ Turning Operation Switch to the <Run> Position
- ④ Accessing T&D WebStorage Service

## ① Connecting to an External Power Source (when applicable)

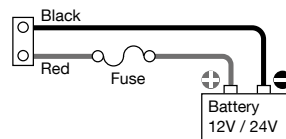
### Use an External Power Cable

The supplied external power cable can be used to connect to an external power source such as a car battery.

\* For cable specifications, see the [Option] page (p.29).

Connection Example

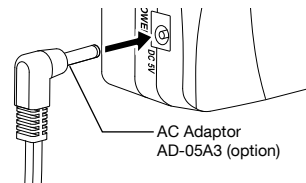
Power Source Conditions  
Voltage: 10 - 24V  
Current: MAX 2A



### Use an AC Adaptor

Connect an AC Adaptor AD-05A3 (sold separately).

- Do not use an AC adaptor other than the one specified.



### Caution about Power Supply

When using an external power supply, please use the included AA batteries as backup power supply in case of an external power outage.

When removing the external power supply or batteries from the RTR-500MBS-A, pay attention to the following:

- Do not disconnect the power supply when the operation switch on the device is in the "RUN" position.
- Before replacing the batteries, make sure to put the operation switch in the "STBY" position and that all LED lights are off (not on or blinking).

## ② Installing Devices

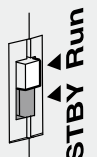
If the target Base Unit is connected to a PC, disconnect the USB cable. Place the Base Unit, Repeater(s), and Remote Unit(s) in their actual positions.

- Before placement, please read “Notes and Precautions for Installing Wireless Communication Devices” on page 6.

## ③ Turning Operation Switch to the <Run> Position

1. Turn the Operation Switch on the Base Unit to the <Run> position.

### Operation Switch

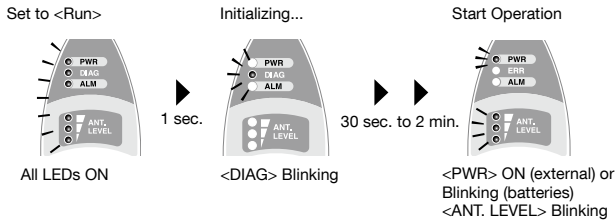


**<Run>**  
The following functions are operable: Auto-Downloading and Sending of Recorded Data, Warning Monitoring, and Auto-Sending of Current Readings.

**<STBY> (Standby)**  
The RTR-500MBS-A is in a low energy consumption mode and functions are not operable.

2. After the switch is set to <Run>, the unit will start operating in 2 minutes or less (\*).

\* Depends on the number of registered Remote Units and Repeaters.



## LED when in “Start Operation” Mode

- If other LED lamps come on or blink in the “Start Operation” mode, it means an error has occurred.
- To ensure stable 3G mobile signals, place the Base Unit at a place where more than two ANT. LEVEL lamps blink.
- For details about the LED lamps, see [LED Display] (p.26).
- Even if the LED display is OK, there may be cases in which the access point connection fails, as for example when the SIM card hasn't been activated. Therefore, make sure to carry out transmission tests (p.19).

## ④ Accessing T&D WebStorage Service

When a PC is not available at the actual location of the RTR-500MBS-A, it is possible to use a mobile device (such as a smart phone or tablet) to check the T&D WebStorage Service for signal strength.

1. Go to the site below from the web browser on your mobile device.

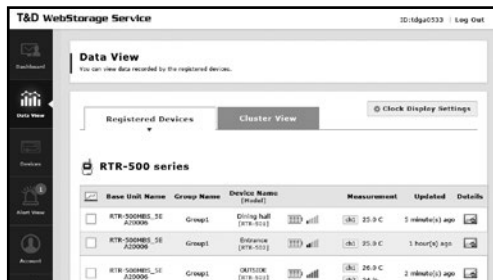
<https://webstorage-service.com/>

In about one minute after the Base Unit enters “Start Operation” mode, the first current readings data will be sent via FTP to the T&D WebStorage Service.

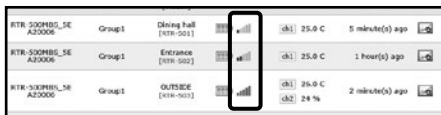
2. Log in to your account.



3. A list of current readings will appear in [Data View].



4. It is possible to check the signal strength between Base Unit and Remote Unit by color and number of antennas.

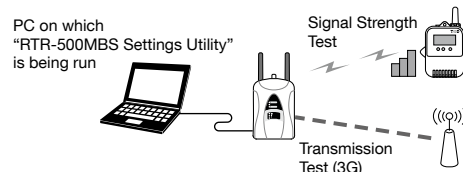


Blue (3-5 antennas)	Communication is stable.
Red (1-2 antennas)	Communication is unstable. Reposition the device(s) for more stable communication.
Red (no antenna)	Failed to check the signal strength due to wireless communication error.

- If wireless communication errors repeatedly occur, please read [Notes and Precautions for Installing Wireless Communication Devices] (p.6). Wireless communication can be affected by radio interference, such as noise from computers or noise from other wireless devices on the same frequency channel. Try keeping the device(s) away from all noise sources and changing the frequency channel of the RTR-500 series devices.
- A low battery on a Remote Unit may cause communication errors.

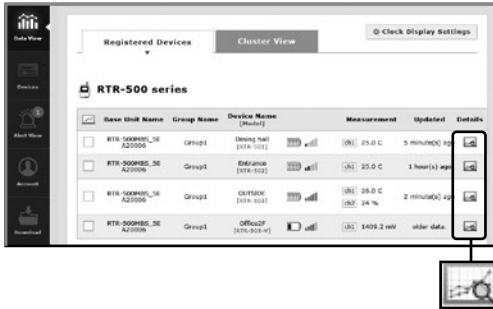


When using Repeaters, the signal strength which is displayed in the T&D WebStorage Service is only that for between the Remote Unit and the nearest Repeater. To check the signal strength between the Base Unit and Repeater or between Repeaters, please use the "RTR-500MBS Settings Utility".

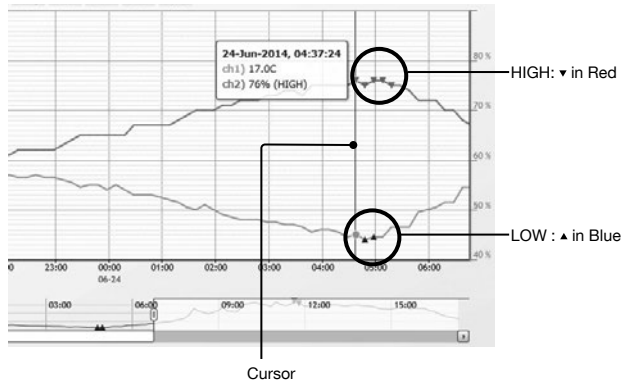


## Checking Data on T&D WebStorage Service

In [Data View] click the graph icon to view data in a graph.



### Graph Display



By moving the cursor right and left on the displayed graph, the recording date and time (X) and measurement (Y) values for each data point are displayed.

## Downloading Recorded Data

It is possible to download recorded data from T&D WebStorage Service, and open the downloaded data in T&D Graph (\*).

\* Please use the computer on which T&D Graph has been installed.

1. In [Download] menu you will see a list of recorded data files.
2. Click the [Download] button to download the desired file.



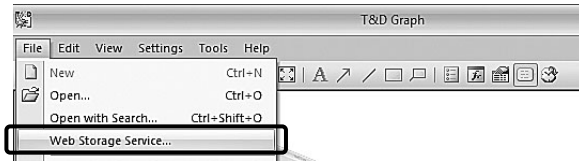


## Using T&D Graph to Access WebStorage Data

With T&D Graph, it is possible to directly access and open the recorded data stored on the T&D WebStorage Service.

\* Please use the computer on which T&D Graph has been installed.

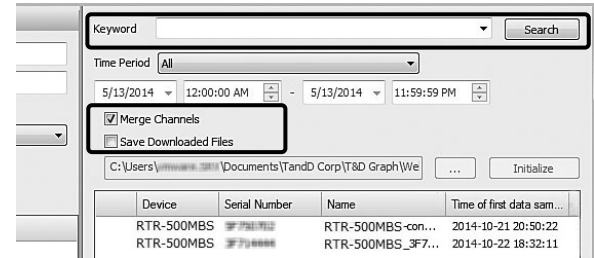
1. Open T&D Graph.
2. From the [File] menu, select [T&D WebStorage Service].



3. Enter the “User ID” and “Password” registered with T&D WebStorage Service, and click [Login].



4. The recorded data will be displayed in a list.
5. To search data by keyword or time period, specify the search criteria and click [Search].



- For example, if you wish to open recorded data from the same logger by merging channels, place a check mark next to [Merge Channels].
  - If you wish to simultaneously save recorded data in a PC upon downloading a file, check the [Save Downloaded Files] option.
6. Data will be downloaded, after which the downloaded data will be displayed in a graph.





### Tips T&D Graph allows the user to:

- insert shapes and post comments and/or memos directly on the displayed graph.
  - search and analyze data by user-defined criteria, and view the highest, lowest, and average measurements for a specified time span.
  - convert the data to CSV format so that it can be exported to spreadsheet software.
- See [T&D Graph Help] for details.

# LED Display

	Status	Operation Switch	Reason	Notes
PWR (POWER)	BLINKING	<Run>	Operation in progress	- Running on battery power only
	ON			- Running on AC Adaptor or external power source
	BLINKING (rapidly)		Communication in progress	- During 3G mobile communication or short range radio communication
	OFF	<STBY>	Operation stopped	- In low energy consumption mode (functions not operable)
	ON		Communication in progress	- In USB connection (LED blinks during USB communication)
DIAG (Diagnosis)	ON		Error	- No SIM card inserted - Poor SIM card contact
	OFF		Normal	
	BLINKING		Error	- Initializing after power on - No Remote Units have been registered. Auto-download of recorded data cannot be carried out due to other improperly made settings or unmade settings.
ALM (ALARM)	BLINKING		Warning issued	- A measurement has exceeded one of the set limits. - The contact input is ON. - There is trouble in the Remote Unit (battery level is low, a sensor connection is poor, etc...)
	OFF		Normal	

## 3G Network Reception Level <ANT. LEVEL>

LED	Reception Level
	Strong
	Average
	Weak
	Outside of communication range

## Q&A about RTR-500MBS-A

**Q1:** Can this be used in any country in the world?

**A:** The RTR-500MBS-A uses radio communication that is subject to local rules and regulations for the area in which it is being used. It is the responsibility of the user to make sure that the product complies with local rules and regulations before using it.

Also, the product can only be used in areas where WCDMA or GSM network is available.

For more details please contact the distributor from which you purchased the product.

**Q2:** The LED lamps do not come on, nor do they blink, what may be wrong?

**A:** If none of the three LED lamps come on nor do they blink, please check the following:

Check to make sure that the operation switch is set to the <Run> position.

Check to make sure that the batteries are installed in the proper direction.

Please try installing new batteries.

If you are using an optional AC adaptor or have a cable connected to an external power source, check that the connection to the RTR-500MBS-A is OK.

If after checking and trying the above, no change occurs to the LED, please contact the distributor where the product was purchased.

**Q3:** If I use batteries as the power source, about how long can I expect them to last?

**A:** Expected battery life will vary depending on the environment where it is being used and upon signal conditions. If warning monitoring is carried out every 10 minutes, you can expect new batteries to last about 10 days.

**Q4:** I want to use the device outdoors, is the device waterproof, moistureproof and dustproof?

**A:** The RTR-500MBS-A is not waterproof, moistureproof or dustproof. If you wish to use outdoors, or in areas where the device may come into contact with moisture, water or excessive dust, we suggest using some type of case to place the RTR-500MBS-A out of which cables can be passed.

**Q5:** Is it possible to change the batteries while the Device is in operation?

**A:** If the device is connected to an AC adaptor or some other external power source, it is possible to change the batteries.

If the device is running only on battery power, first turn the operation switch to <STBY> and then change the batteries.

## Q&A about SIM Cards

**Q1:** About how much are the communication costs?

**A:** Actual costs and fees will depend on which cell phone carrier you are using. Please refer to the following when contacting your cell phone carrier about estimated costs.

[Guidelines for Data Size]

Type	Data Size (*1)	Notes
Warning Report (*2)	Approx. 2 KB	For one Remote Unit
Current Readings Data	Approx. 3.5 KB	For one Remote Unit
Recorded Data	Approx. 7 KB	For one Remote Unit, with 1-min recording interval, downloaded once a day

\*1: Indicates the data size per transmission via e-mail or FTP. This does not include the e-mail header.

\*2: To send Warning Reports via SMS, SMS fees may be incurred. When sending via SMS, the report may be split into two or more separate reports (depending on the number of Remote Units).

# Specifications

Compatible Devices	Remote Units: RTR501B / 502B / 503B / 505B / 507B RTR-501 / 502 / 503 / 507S / 574 / 576 / 505-TC / 505-Pt / 505-V / 505-mA / 505-P (Including L Type and S Type)  Repeaters: RTR500BC, RTR-500
Maximum Number of Registrations	Remote Units: 20 units (*1) Repeaters: 5 units x 4 groups
Communication Interfaces	<Mobile Data Communication> WCDMA/HSDPA: 850 / 1900 MHz GSM/GPRS: 850 / 900 / 1800 / 1900 MHz <Between Base Unit(s) - (Repeaters) - Remote Unit(s)> - Short Range Wireless Communication FCC Part15 Section247 / IC RSS-210 Frequency Range: 902 to 928MHz, RF Power: 7 mW - Optical Communication With compatible Remote Units except RTR-574 and RTR-576 <Between Base Unit - PC> - USB Communication (For Setup)
Wireless Transmission Range	Approx. 150 meters ( 500 ft ) if direct and unobstructed
Communication Time	Data Download Time from Remote Unit ( for 16,000 readings ) - Via wireless communication: About 2 min. The same amount of time will be necessary for each Repeater. Does not include communication time from Base Unit to server or e-mail.
External Alarm Input/Output Terminal (*2)	<Input Terminal: Contact Input> Internal Pull-up: 3 V 100 kΩ Maximum Input Voltage: 30V <Output Terminal: Photo Mos Relay Output> Voltage when OFF: AC/DC 50V or less Current when ON: 0.1A or less Resistance when ON: 35 Ω
Communications Protocol	SMTP ( POP before SMTP, SMTP-AUTH ( LOGIN ) ), SMTPS ( SMTP over SSL ), FTP, SMS (*3)
Power	AA Alkaline Battery LR6 x 4 AC Adaptor AD-05A3 External Power Supply ( DC 10 - 24V )

Battery Life (*4)	Expected battery life with only AA alkaline batteries: Approx. 2 days under the following conditions ( only one Remote Unit and no Repeaters, warning monitoring ON, downloading data once a day, sending current readings at a 10 minute interval )
Dimensions	H 96 mm x W 66 mm x D 39 mm ( excluding antenna ) Antenna Length ( Cellular / Local ): 109 mm
Weight	Approx. 130 g
Operating Environment	Temperature: 10 to 55 °C ( -10 to 55 °C with external power connected) Humidity: 90 %RH or less ( no condensation )
GPS Interface (*5)	Connector: SMA Male Plug Power Supply: 2.5 to 2.7 V
SIM Card (*3)(*6)	Standard Size SIM Card ( WCDMA or GSM )
Software	RTR-500MBS for Windows
Compatible OS (*7)	Microsoft Windows 10 32 / 64 bit English Microsoft Windows 8 32 / 64 bit English Microsoft Windows 7 32 / 64 bit (SP1 or later) English

\*1: For RTR-574 and RTR-576, registration of one unit will be counted as two units.

\*2: In order to use the external alarm terminal, please prepare a compatible connector: JST PAP-04V-S.

\*3: SMS is required for some functions of the RTR-500MBS-A. If SMS is necessary, make sure that the contract you have with your carrier includes this service.

\*4: Battery life varies depending upon multiple factors including number of warning reports sent, ambient temperature, radio environment, frequency of communication, and battery performance. All estimates are based on operations carried out with a new battery and are in no way a guarantee of actual battery life.

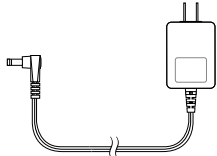
\*5: In order to use the GPS function (to attach geographical positioning info to current readings data), please purchase a compatible GPS antenna.

\*6: Please prepare a contracted SIM card separately.

\*7: For installation, it is necessary to have Administrator (Computer Administrator) rights.

The specifications listed above are subject to change without notice.

## AC Adaptor: AD-05A3

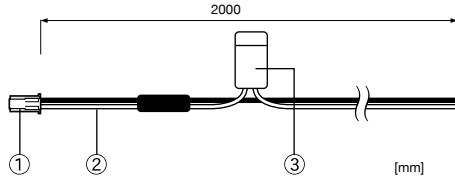


Input AC100-240V  
Output DC5V, 3A  
Frequency 50/60Hz  
Cable Length 1.2m  
Plug Type A



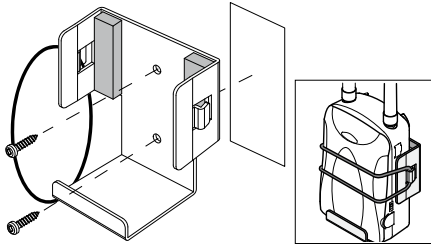
## External Power Cable: BC-0302

Power Source Conditions  
Voltage: 10 - 24V  
Current: MAX 2A



- ① Connector: Housing XAP-02V-1, Contacts SXA-01T-P0.6 ( J.S.T. )
- ② Cable (AWG#20) Red = Plus (+) / Black = Minus (-)
- ③ Flat mini-fuse: 2A / 32V

## Wall Attachment: TR-5GK1



Included:  
O-Ring ( rubber ) x 1  
Lock Screw x 2  
Double-Sided Adhesive  
Tape x 1  
Dimension:  
W73 x H72 x D43 mm  
Screw Holes: 2 -  $\phi$  4.2mm  
Materials: Aluminum

### **Product Support**

For support, please contact the distributor from which you purchased the product.

A list of distributors can be found at:

[tandd.com/purchasing/](http://tandd.com/purchasing/)

### **Product Information**

Product information can be found at:

[tandd.com/product/](http://tandd.com/product/)

## **Mobile Base Station RTR-500MBS-A Getting Started Guide**

## **T&D Corporation**

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FAX: +81-263-40-3152 E-mail: [support@tandd.com](mailto:support@tandd.com)