

# Wireless Data Logging System

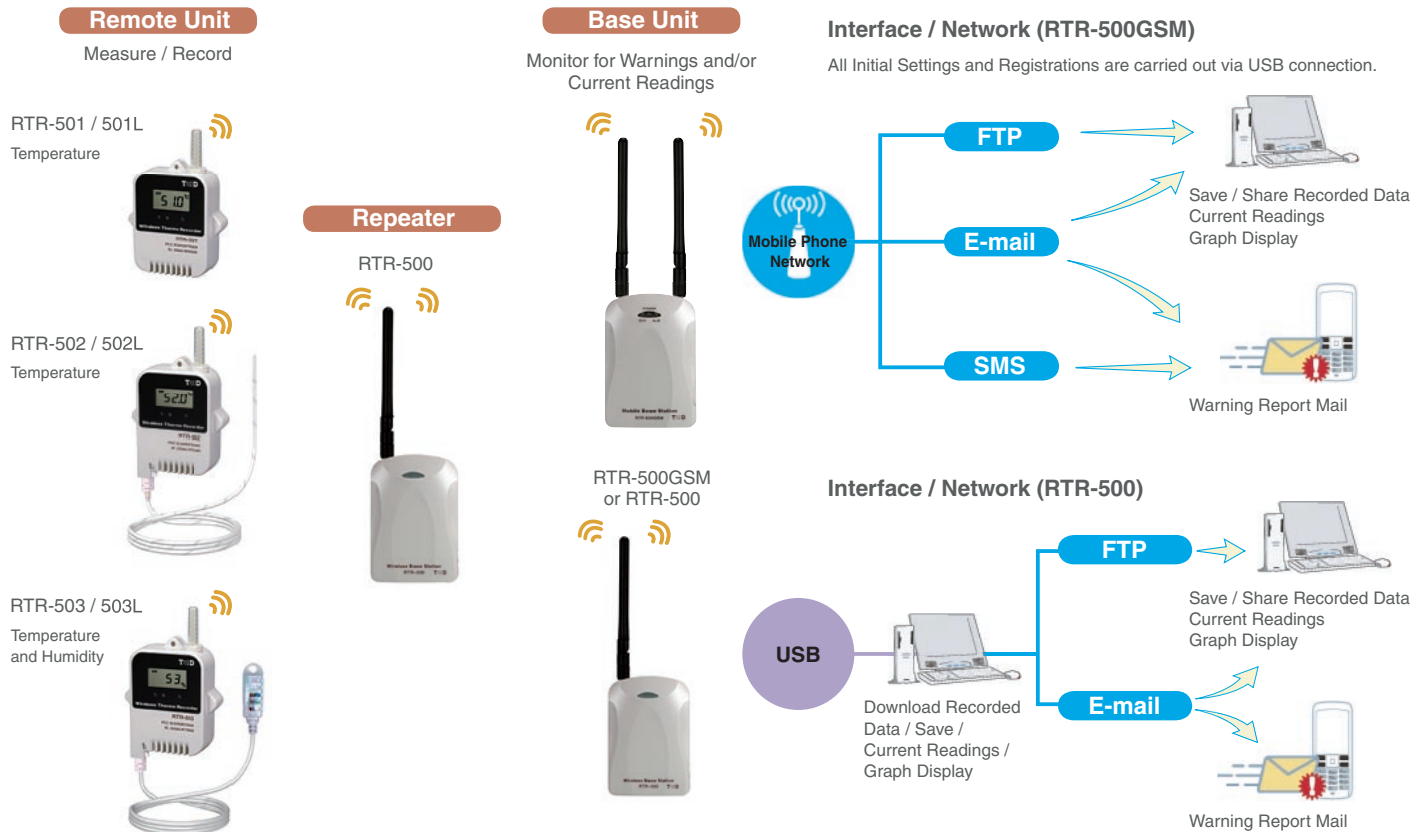
## RTR-500 Series



**Process and Manage your Important Data  
Anytime from Anywhere**

T&D Corporation

# For an Age that demands Accuracy in Measurement, Recording and Traceability T&D Wireless Data Logging Systems provide Low-Cost Monitoring and Warning Report Solutions for Distant Sites



## Remote Units and Base Units: What are they and what do they do?

Data Loggers are registered as Remote Units to a Base Unit. They measure and record temperature and humidity. Base Units can be set up to periodically and automatically download, via wireless communication, the recorded data logged in the Remote Units that are registered to it. They can also be set up to communicate via wireless communication to collect current readings at a set interval and monitor for measurement warnings. The Base Unit can then send the downloaded recorded data and/or the current readings by e-mail or FTP to a designated address. Moreover when a measurement exceeds an upper or lower limit and has been judged by the Base Unit to qualify as a warning, a warning report can be sent via e-mail to specified e-mail addresses enabling the user to always stay informed about important changes in measurement readings.

## Select the Type of Data Logger and Base Station to Fit your Needs

The Mobile Base Station RTR-500GSM is designed as a Base Unit for use with a GSM cellular phone network and is perfect for use in transportation or in areas where a LAN network is not available. The Wireless Base Station RTR-500 is an easy-to-use Base Unit for onsite use with a USB connection to a local computer. The RTR-500 Series Data Loggers are available in three types to match your measurement items and range. To further increase the possibilities, an array of optional sensors is also available.

## High Speed Wireless Communication means Quicker Data Downloads

The wireless communication range between a Base Unit and a Remote Unit, if unobstructed and direct, is about 150 meters (500 ft). It takes only about two minutes to download a full amount of recorded data from one Remote Unit. Our Wireless Data Logging System is designed to keep working in even harsh conditions; which is why wireless communication is still possible in conditions from minus 30°C (minus 22°F to 176°F).

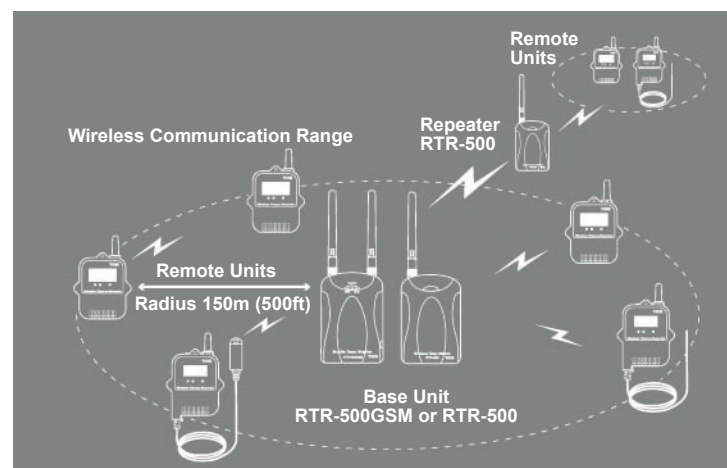
Note: This is the range of temperature in which wireless communication is possible and does not represent the measurement range of Remote Units, nor the range in which Remote Units or Base Units can be operated.

## Registering a Multiple Number of Remote Units to a Base Unit

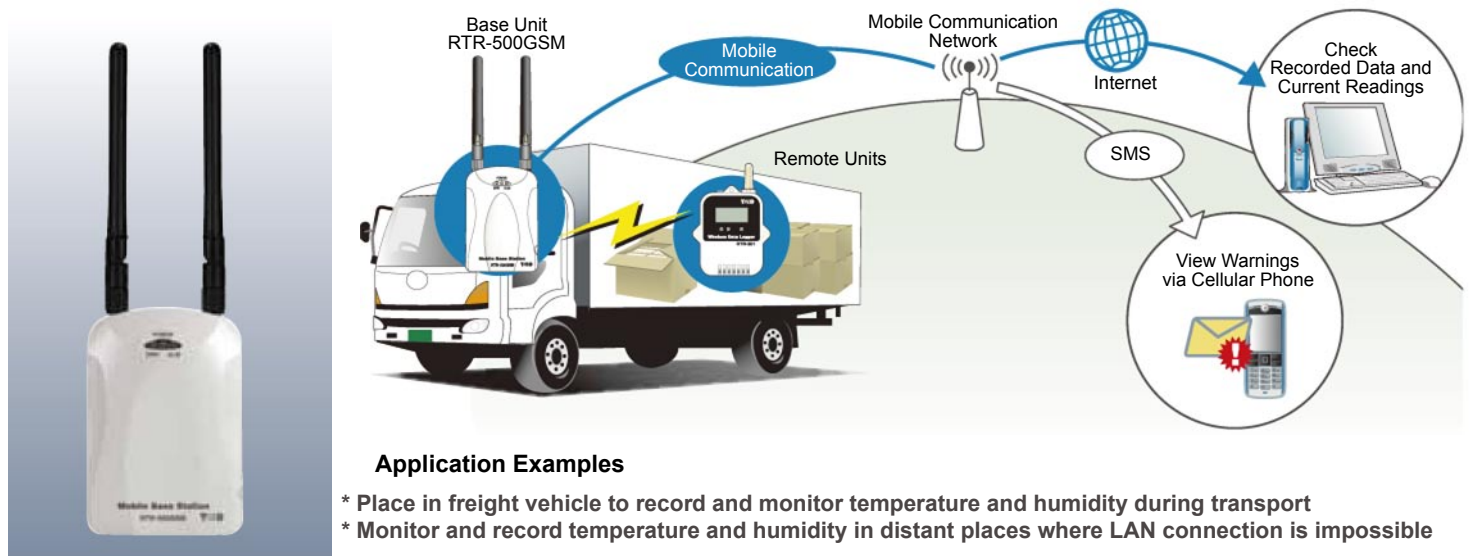
It is possible to organize Remote Units and register them as Groups into a Base Unit depending on their location, measurement items, or other category. When using an RTR-500GSM as a Base Unit it is possible to register up to 20 Remote Units in up to 4 Groups, and when using an RTR-500 it is possible to register up to 640 Remotes into up to 20 Groups.

## Expanding the Wireless Communication Range

It is possible to expand the wireless communication range by simply registering an RTR-500 as a Repeater to relay communication between a Base Unit and Remote Units.



### Base Unit equipped with GSM Cellular Phone Network Capabilities



#### GSM Cellular Phone Communication Function

By placing a Base Unit in the truck cabin and Remote Unit(s) in the cargo compartment(s), it is easy to monitor temperature and humidity while on the move. As long as the Base Unit is in communication range for cellular phone service it can be used to communicate with and manage Data Loggers that are within wireless communication range; perfect for during transport, in the mountains, on the sea or for any out of the way places where a LAN connection is impossible.



#### Warning Monitoring Function

When a measurement exceeds an upper or lower limit and has been judged by the RTR-500GSM to qualify as a warning; a warning report can be sent via E-mail or SMS to specified e-mail address enabling the user to always stay in the know about changes in measurement readings. Moreover, by connecting a siren or lamp to the external contact output connector when an important warning occurs, the people at the point of measurement can also quickly take any necessary action.



#### High Speed Wireless Communication and Data Downloading

The wireless communication range, if unobstructed and direct, is about 150 meters [500 ft]. Downloading recorded data from one full (16,000 readings) Remote Unit into the Base Unit takes only about two minutes. Placing a Repeater between the RTR-500GSM and Remote Units can easily expand the wireless communication range. When using Repeaters and downloading data, the same amount of time noted above is necessary for each Repeater.

#### Automatic Downloading of Recorded Data and Monitoring of Current Readings

Recorded Data and Current Readings can be automatically downloaded from Remote Unit(s) at a set interval and that data can then be sent by e-mail or FTP to a designated address.

#### Select a Power Source to meet your Application Needs

The user can select to run the unit on four AA alkaline batteries, or use the AC adaptor to connect to an AC outlet, or hook up to an external power source of their choice by connecting to the External Power Connector (DC 8 – 34V). Keeping batteries in the unit provides a backup source of power for when and if electrical power is cut from the AC or DC connection. If using batteries as the source of power, the estimated battery life is about 10 days.



- Note:**
- \* If necessary, please purchase separately our optional AC adaptor AD-0605..
  - \* When using an external power source, it is necessary to use a power source which meets the specifications of our External Power Cable BC-0201 supplied with the unit. We do not handle or sell external power sources; please purchase separately.
  - \* Battery Life will vary depending on the measuring environment, the quality of the battery being used, the frequency of communication and other settings made in the unit.

#### About SIM Cards

To use the RTR-500GSM, you first must purchase a SIM card from your cellular phone company or carrier and install it into the RTR-500GSM. After installing the card and making some necessary settings with the supplied software via PC, you are ready to connect to your cellular phone network.

- Note:** The SIM card must adhere to the following conditions:
- \* Compatible with GSM (GSM 850 or GSM 1900).
  - \* Able to use SMS (Short Message Service) and GPRS (General Packet Radio Service).
  - \* The card has been activated.

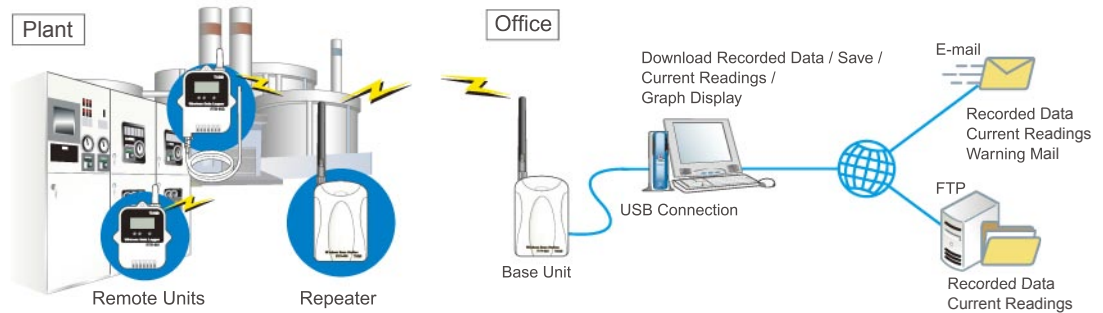
#### Attach GPS Info to Current Readings (Optional)

Current Readings from Remote Unit(s) can be sent via e-mail or FTP; with a GPS receiver connected current location info can also be attached to the transmission. It is necessary to purchase the GPS receiver separately.

- Note:** T&D Corporation does not handle or sell GPS receivers. The following receiver has been proven to work with our system: BR-355 Cable GPS (GlobalSat Corporation). For all inquiries and questions concerning sales of the product, please directly contact GlobalSat at ( <http://www.globalsat.com.tw/> ).



Can be set up to perform as a Base Station or a Repeater

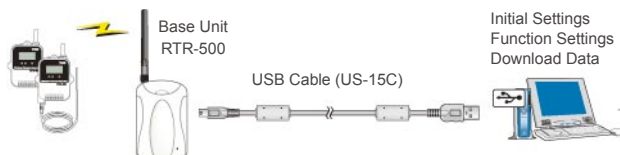


### Application Examples

- \* For Recording and Monitoring Temperature and Humidity in Factories and Buildings
- \* For Temperature and Humidity Management in Blood and Pharmaceutical Storage at Hospitals
- \* For Temperature Management of Refrigerated and Frozen Goods at Supermarkets and Convenience Stores

### As a Base Unit

The RTR-500 can be registered as a Base Unit so that it can download recorded data from Remote Units via wireless communication and then by connecting it to a PC with a USB cable, the data can be easily downloaded to your computer. Easy-USB connection means this type of Base Unit is perfect for on-site use. Downloading recorded data from one full (16,000 readings) Remote Unit into the Base Unit takes only about 2 minutes.



### Transmitting Data via a Network

Recorded Data and Current Readings can be automatically downloaded from Remote Unit(s) at a set interval and that data can then be sent by e-mail or FTP to a designated address.

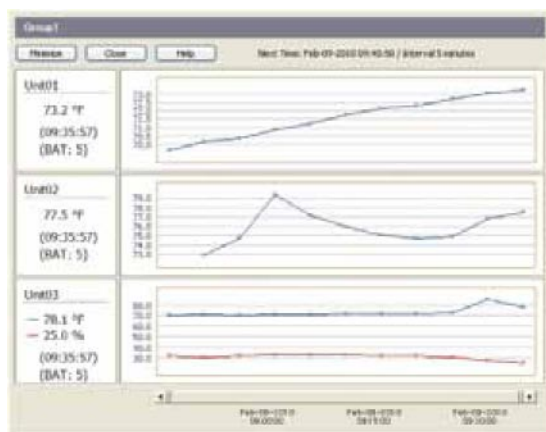
### Sending Warning Report Mails

By setting the Warning Monitoring Function to "ON", if the set upper or lower limits have been exceeded and that occurrence has been judged by the RTR-500 to qualify as a warning, a Warning Report Mail containing warning details can be sent to up to four specified addresses.

### Monitoring Current Readings

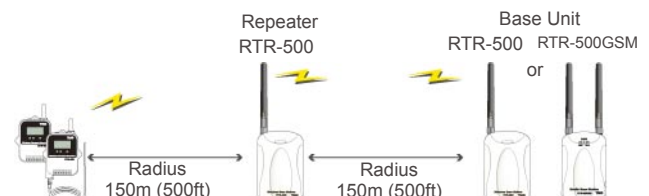
It is possible to monitor and view current readings for groups of Remote Units registered to a RTR-500 Base Unit on Computer Display.

Monitoring Graph Window



### As a Repeater

By registering an RTR-500 as a Repeater and placing it between a Base Station and a Remote or another Repeater, it can be used to expand the wireless communication range. When using as a Repeater, it is necessary to use two AA alkaline batteries or purchase the optional AC adaptor (AD-0638) as a power source. When the Repeater is used about five minutes a day, battery life expectancy is about six months. The wireless communication range, if unobstructed and direct, is about 150 meters [500 ft]. When downloading recorded data, it is necessary to add 2 minutes (when at full data) for every repeater in the route.

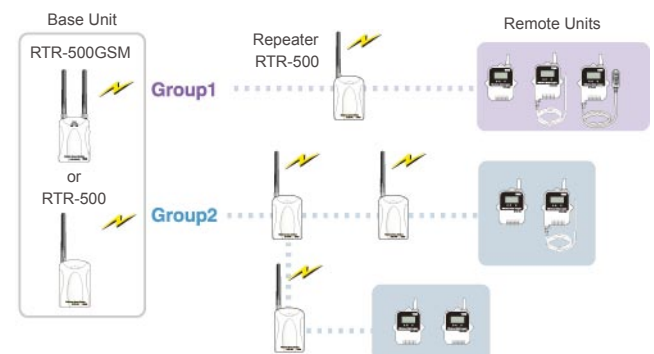


**Note:**

- \* Compatible Base Units: RTR-500GSM, RTR-500
- \* Battery Life will vary depending on the measuring environment, the quality of the battery being used, the frequency of communication and other settings made in the unit.

### Registering into Groups

When registering Remote Units and Repeaters to a Base Unit, it is helpful to organize and register them in Groups depending on location, purpose or other criteria. And assigning a Wireless Communication Frequency Channel for each Group helps avoid interference and poor transmission.



# Software Included with Base Unit



## RTR-500GSM for Windows

This software is made up of three applications:

- RTR-500GSM Settings Utility
- Temperature / Humidity Graph
- Adjustment Tools



## RTR-500 for Windows

This software is made up of four applications:

- RTR-500 Settings Utility
- RTR-500 for Windows
- Temperature / Humidity Graph
- Adjustment Tools

### ❖ "Settings Utility" Program makes Settings a Snap!

All the necessary settings can be done with this one program; from Base Unit, Remote Unit and Repeater Registration, the assigning of names and making of Groups, to setting up communication intervals for warning and current reading monitoring as well as set-up for the automatic downloading of data. After having registered and placed the Remote Units and Repeaters in the field, it is possible to run communication tests to check signal strength between the various units to ensure stable communication.

### ❖ Easy-to-Understand Operation Guide

The Operation Guide that is part of the software uses easy to understand terms to help lead you through all the necessary steps and setting procedures. If during setup you get confused or have trouble, just simply open the Operation Guide in the same on-screen window and proceed while consulting the guide.

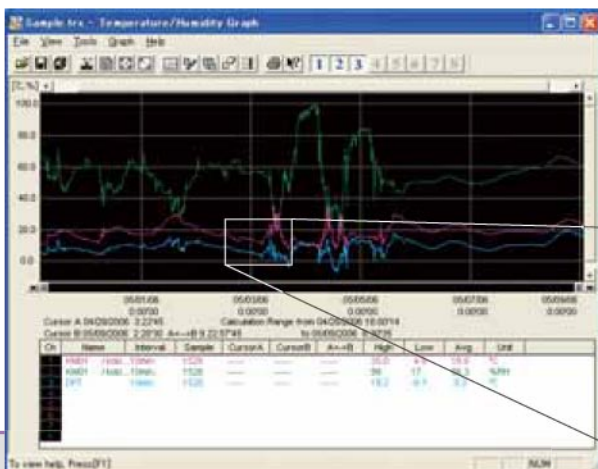
### ❖ Difficult Cellular Phone Network Settings made Easy

When using the RTR-500GSM, we have included an "Initial Settings Wizard" which guides you through what otherwise would be difficult process of setting up the unit for GSM network communication, just put in the SIM Card and turn on the Wizard.

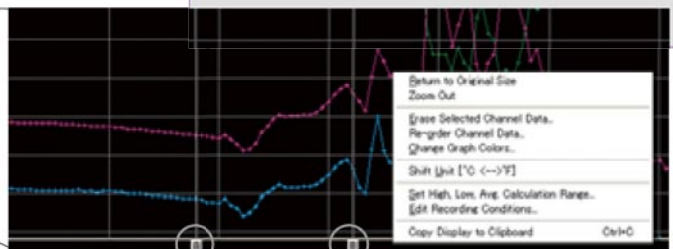
### ❖ Versatile User-Friendly Temperature / Humidity Graph

Up to eight channels of data can be viewed simultaneously in the same graph window. The easy intuitive operation allows you to check data in various ways by effortlessly scrolling data, zooming in and out, switching back and forth from °C to °F, and viewing in table form.

Graph Window



Zoom in on Graph

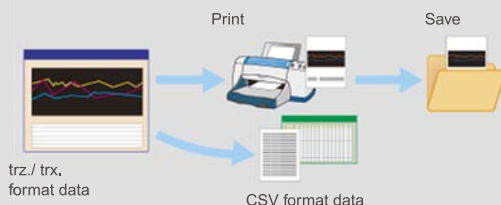


### Use Graph Tools and Editing Features for a Customized Look

It is possible to hide, re-order and delete channels, edit recording start times, and make changes to colors used for the graph scale lines, data lines and background. Also move the A and B cursor at the bottom of the graph to view data readings for those points and the calculated difference between the points.

### Save as Text File for Data Analysis

By saving graph data as CSV Format Text File data, that data can then be uploaded into common spreadsheet software for data analysis.





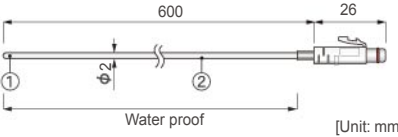

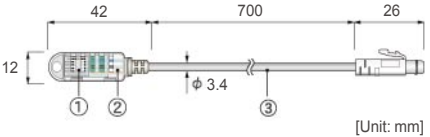
View in Table Form

Date / Time	FX401 ch.1 °C	/fx401 ch.2 °F	FX401 ch.3 %RH	/fx401 ch.4 °F	FX401 ch.5 °F	FX401 ch.6 °F	FX401 ch.7 °F	FX401 ch.8 °F
05/04/2006 03:00:24	11.0	52	10.5					
05/04/2006 03:10:24	11.1	52	10.7					
05/04/2006 03:20:24	10.9	52	10.5					
05/04/2006 03:30:24	11.1	52	10.9					
05/04/2006 03:40:24	10.9	52	10.7					
05/04/2006 03:50:24	11.1	52	10.9					
05/04/2006 04:00:24	11.0	52	10.6					
05/04/2006 04:10:24	10.7	50	10.3					
05/04/2006 04:20:24	10.7	52	10.5					
05/04/2006 04:30:24	10.4	50	10.0					
05/04/2006 04:40:24	10.4	52	9.3					
05/04/2006 04:50:24	10.2	50	9.3					

### ❖ Adjustment Tools

Adjustment is a function which allows the user to correct for inaccuracies found in measured values when compared to a standard or reference measurement. By entering adjustment values beforehand, measurements will be adjusted using the generated simple equation and only the adjusted measurements will be recorded and available for view.

## Data Loggers built to work and last in Harsh Environments

<p><b>RTR-501 / 501L</b></p>  <p><b>Measurement Range:</b> -40 to 80°C</p> <p><b>Water Resistance</b> IP67 (immersion proof) Not for continued immersion.</p> <p><b>Temperature Sensor</b> Internal Temperature Sensor</p>	<p><b>RTR-502 / 502L</b> External Temperature Sensor Included</p>  <p><b>Measurement Range:</b> -60 to 155°C</p> <p><b>Water Resistance</b> IP64 (rated for use in daily life) when the sensor is connected. Not for continued immersion.</p> <p><b>Temperature Sensor TR-5106</b></p>  <p>Water Resistance: The fluoropolymer-coated section is waterproof. Other sections are immersion proof (IPX4)</p> <p>Materials: ① Thermistor ② Fluoropolymer-coated Electrical Wire</p>	<p><b>RTR-503 / 503L</b> External Temperature / Humidity Sensor Included</p>  <p><b>Measurement Range:</b> Temperature : -0 to 55°C Humidity: 10 to 95%RH</p> <p><b>Water Resistance</b> IP64 (rated for use in daily life) when the sensor is connected. Not for continued immersion.</p> <p><b>Temperature / Humidity TR-3310</b></p>  <p>Water Resistance: None</p> <p>Materials: ① Temp/Humidity Sensor ② Polypropylene Resin ③ Vinyl Chloride Coated Electrical Wire</p>
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### RTR-501: Durable Waterproof and Dustproof Body

Internal Sensor provides Optimum Waterproof and Dustproof Capabilities. This is the perfect Data Logger for use in harsh environments: whether that may be indoor frozen or refrigerated storage or high humidity, high dust outdoor applications. And the compact lightweight design means it can be placed just about anywhere.

### RTR-502: Variety of Optional Sensors for Wide Range Measurement

We offer a variety of optional sensors to meet your needs; from ones with stainless protection to those that can be used in water. For details see the Optional Sensor Leaflet.

### RTR-503: For Humidity as well as Temperature

The RTR-503 uses a sensor that measures and records both temperature and humidity.

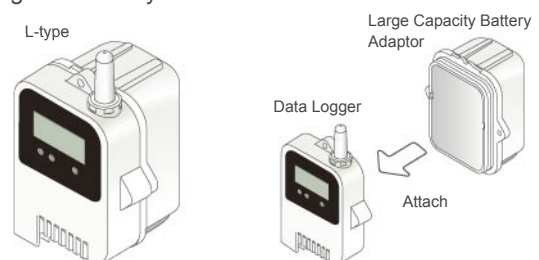
**Note:** The attached sensor is not waterproof.

### Large Recording Capacity: 16,000 Readings

The maximum number of data readings that can be recorded in one Data Logger is 16,000. For RTR-503, that means 8,000 readings x 2 channels. 16,000 readings means you can record every one second and still log four and a half hours of data; or at a recording interval of 60 minutes you can keep logging for 666 days. By using the software the recording interval for a Remote Unit can be set to one of fifteen recording intervals (1 second to 60 minutes).

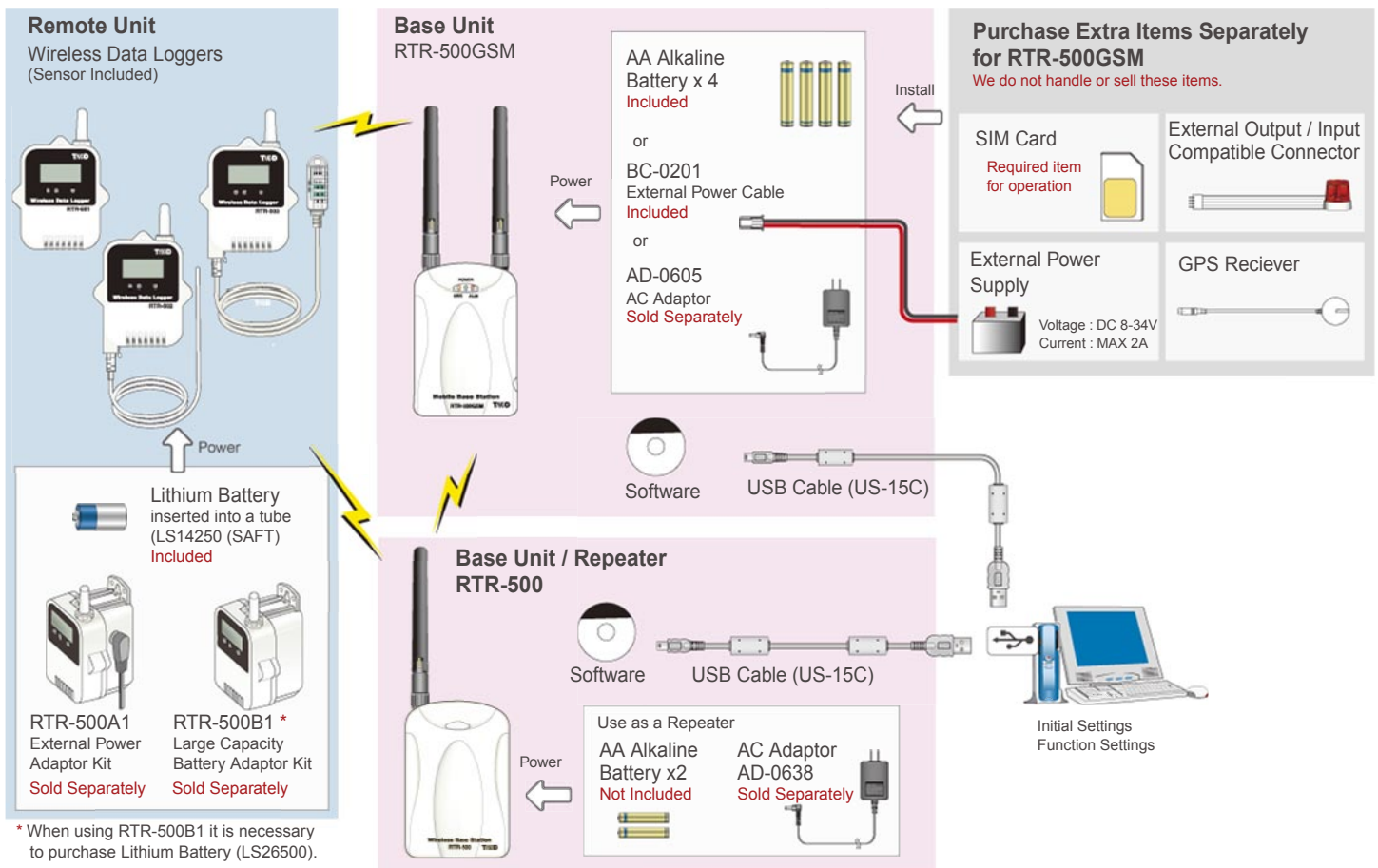
### Low Energy Consumption Design means Longer Continuous Operation

The Data Loggers are outfitted with a Lithium Battery (LS14250). Under normal temperatures, if recorded data is downloaded once a day or if monitoring is carried out once every ten minutes, the estimated battery life will be about ten months. Model names which include "L" are designed with a large capacity battery pack. Under the same conditions, L-type models will continue for about four years without the need to change the battery.



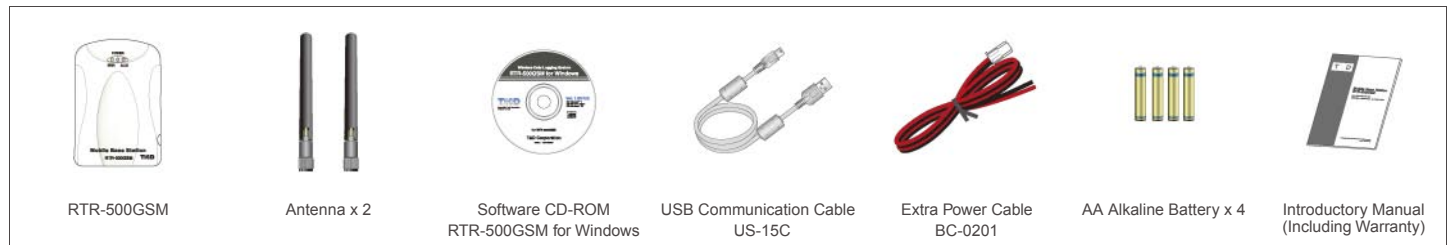
**Note:** Battery life varies depending upon the type of battery, the measuring environment, the frequency of communication, and the ambient temperature in which it is used. All estimates are based on operations carried out with a new battery and are in no way a guarantee of your actual battery life.

## System Setup

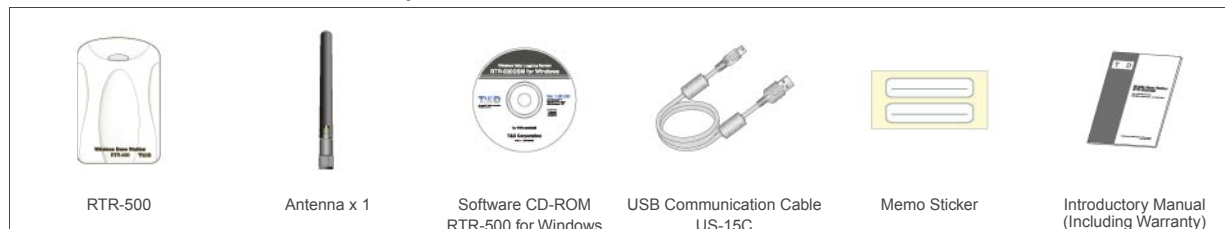


## Contents of Packages

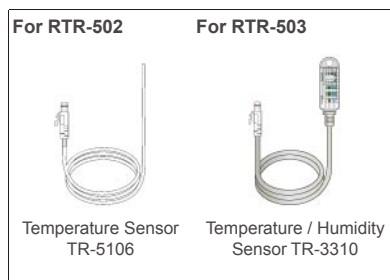
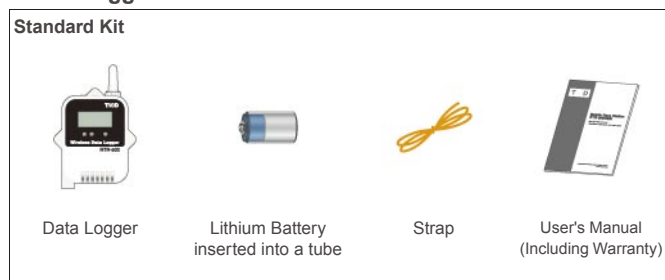
### RTR-500GSM Mobile Base Station



### RTR-500 Wireless Base Station / Repeater



### Data Logger





# Wireless Data Logging System RTR-500 Series

## Product Specifications

### Mobile Base Station RTR-500GSM

UNIT	
Compatible Devices	Remote Units: RTR-501/501L, RTR-502/502L, RTR-503/503L Repeater: RTR-500
Features and Functions	1. Auto-downloading of Recorded Data (E-mail or FTP), 2. Automatic Sending of Current Readings (E-mail or FTP), 3. Warning Monitoring (SMS, E-mail or Contacts) 4. SMS Remote Control - Stop and Start Functions 1, 2, 3, above - Request Immediate Download of Data to Set Address
Types of Warnings	Remote Unit Temperature / Humidity Measurement Warnings, Remote Unit Wireless Communication Error Warnings, Remote Unit Battery Level Warnings, Remote Unit Sensor Abnormality Warnings, Base Unit External Power Loss Warnings (only when batteries are installed), Base Unit Battery Level Warnings / Base Unit External Contact Input Warnings
Power	AA Alkaline Batteries x 4 External Power (DC8 - 34V) AC Adaptor AD-0605 (5V)
Current Consumption	At most 2A (5V, with GSM in operation)
Communication Interface	USB (with PC) Optical Communication (with Remote Unit)
LED Indicator	POWER: Green / ERR: Orange / ALM: Red
Battery Life	10 days of continued use if monitoring is carried out every 10 minutes (when not using GPS). * Battery life varies depending upon the frequency of communication, the measuring environment, and the quality of the batteries being used.
Dimensions	H 96 mm x W 65 mm x D 39 mm / Antenna Length : 109mm * Excluding protrusions
Weight	Approx. 220 g (including batteries)
Operating Environment	Temperature: 10 to 55°C (-10 to 55°C when external power connected) Humidity: 20 to 80%RH (No condensation)
Other	Not waterproof, moistureproof, or dustproof.

### Short Range Wireless Communication

RF Power	7mW
Wireless Specifications	FCC Part15 Section247 / IC RSS-210 (Frequency Range: 902 to 928MHz )
Transmission Range	About 150m (500 ft) (if direct and unobstructed)
Communication Speed	When downloading 1 Remote Unit of full data (16,000 readings): about 2 minutes * The same amount of time will be necessary for each added Repeater.

### Cellular Phone Communication

Network	GSM850/GSM1900(PTCRB Certified) GPRS(General Packet Radio Service)
Data Transfer Protocol	Auto-downloading of Recorded Data / Automatic Sending of Current Readings FTP (PASV mode also supported) SMTP (SMTP-AUTH, POP-Before) * SMTP-AUTH supports LOGIN only Warning Monitoring SMS / SMTP (SMTP-AUTH, POP-Before) * SMTP-AUTH supports LOGIN only

### Contacts (Warning Output/Input)

Output Terminal Open Drain Output	Voltage when OFF: DC less than 30V Current when ON: less than 0.1A Resistance when ON: 15Ω
Input Terminal	Internal Pull-up: 3V 100kΩ Maximum Input Voltage: 30V

### GPS Communication (Option)

GPS Interface	Connector: Mini DIN 6 Pin Female Communication Standard: ANSI / EIA/TIA-232-E Geographic Coordinate System: WSG84 Power Supply: 5V MAX 100mA
Other	Attach geographical positioning info to Current Readings

### Wireless Base Station RTR-500

UNIT	Base Unit	Repeater
Compatible Devices	Remote Units: RTR-501/501L, RTR-502/502L, RTR-503/503L Repeater: RTR-500	Base Unit: RTR-500GSM RTR-500
Features and Functions	When connected to a PC with "RTR-500 for Windows" running: 1. Auto-downloading of Recorded Data (E-mail or FTP), 2. Automatic Sending of Current Readings (E-mail or FTP), 3. Warning Monitoring (E-mail)	-
Types of Warnings	Remote Unit Temperature / Humidity Measurement Warnings, Remote Unit Wireless Communication Error Warnings, Remote Unit Battery Level Warnings, Remote Unit Sensor Abnormality Warnings	-
Power	USB bus power	AA alkaline batteries x 2 AC adaptor (AD-0638)
Operating Voltage	2.5V to 7.0V	
Current Consumption	Approx. 50mA (Wireless Communication)	
Communication Interface	USB (with PC) Optical Communication (with Remote Unit)	
LED Indicator	Blinking: During Wireless Communication or PC Communication Lamp ON: Connected PC via USB	
Battery Life	-	Six months*
Dimensions	H 96mm x W 65mm x D 25mm / Antenna Length : 109mm * Excluding protrusions	
Weight	Approx. 71g (Batteries not included)	
Operating Environment	Temperature:-10 to 60°C (-30 to 60°C when external power connected) Humidity: 20 to 80%RH (No condensation)	
Other	Not waterproof, moistureproof, or dustproof	

### Short Range Wireless Communication

RF Power	7mW
Wireless Specifications	FCC Part15 Section247 / IC RSS-210 (Frequency Range: 902 to 928MHz )
Transmission Range	About 150m (500 ft) (if direct and unobstructed)
Communication Speed	When downloading 1 Remote Unit of full data (16,000 readings): about 2 minutes * The same amount of time will be necessary for each added Repeater.

### Network Communication

#### Data Transfer Protocol

When connected to a PC as a Base Unit with "RTR-500 for Windows" running:

Auto-downloading of Recorded Data / Automatic Sending of Current Readings	FTP (PASV mode also supported) SMTP (SMTP-AUTH, POP-Before) * SMTP-AUTH supports PLAIN, LOGIN and MD5
Warning Monitoring	SMS / SMTP (SMTP-AUTH, POP-Before) * SMTP-AUTH supports PLAIN, LOGIN and MD5

\* When used for wireless communication five minutes a day. Battery life varies depending upon the measuring environment, the communication frequency, and the quality of the battery being used.

### Software Operating Environment

For installation, it is necessary to have Administrator (Computer Administrator) rights.  
IMPORTANT: If you are using a 64-bit OS, T&D can not in any way guarantee the operations of any application included in these Software.

Software Names and Compatible Devices	RTR-500GSM for Windows (RTR-500GSM) RTR-500 for Windows (RTR-500)
Compatible OS	Microsoft® Windows® 7 32bit English Microsoft® Windows Vista® 32bit English Microsoft Windows® XP 32bit (SP2 or above) English
PC/CPU	A Stable Windows Operating Environment
Memory	A Stable Windows Operating Environment
Hard Disk	More than 30 MB of free space (Data will need more space)
Monitor	SVGA (800 x 600) more than 256 colors



# Wireless Data Logging System RTR-500 Series

## Product Specifications

### Wireless Thermo Recorder

UNIT	RTR-501 / RTR-501L	RTR-502 / RTR-502L	RTR-503 / RTR-503L	
Measurement Channel	1 Temperature Channel	1 Temperature Channel	1 Temperature Channel	1 Humidity Channel
Sensor	Internal Temp. Sensor	External Temp. Sensor (TR-5106)	External Temp. and Humidity Sensor (TR-3310)	
Thermal Time Constant	15 minutes L Type: 25 minutes	Approx. 15 Sec. (in air) Approx. 2 Sec. (in agitated water)	-	
Sensor Response Time	-	-	About 7 min. (90% response)	
Measurement Range	- 40 to 80°C	- 60 to 155°C	0 to 55°C	10 to 95%RH
Measurement Accuracy	Avg. +/- 0.5°C	Avg. +/- 0.3°C (-20 to 80°C) Avg. +/- 0.5°C (- 40 to -20°C / 80 to 110°C) Avg. +/- 1.0 °C (- 60 to -40°C / 110 to 155°C)	Avg. +/- 0.3°C (at 25°C and 50%RH)	+/-5%RH (at 25°C and 50%RH)
Measurement Display Resolution	0.1°C	0.1°C	0.1°C	1%RH
Recording Interval	1, 2, 5, 10, 15, 20, 30 seconds / 1, 2, 5, 10, 15, 20, 30, 60 minutes (Total of 15 choices)			
Recording Capacity	16,000 Readings x 1 Channel	16,000 Readings x 1 Channel	8,000 Readings x 2 Channels	
Recording Mode	Endless (Overwrite oldest data when capacity is full) / One-time (Stop recording when capacity is full)			
LCD Display Items	Current Readings, Recording Settings, Battery Life Warning, Over Measurement Range Warning, Amount of Recorded Data			
Power	Lithium Battery (LS14250 (SAFT)) x 1 for L type: Large Capacity Battery Adaptor Kit (RTR-500B1) x 1(*1) External Power Adaptor Kit (RTR-500A1) (sold separately)			
Battery Life (*2)	Approx. 10 months / L type: Approx 4 years			
Interface	Wireless Communication / Optical Communication			
Wireless Specifications	FCC Part15 Section247 / IC RSS-210 ( Frequency Range: 902 to 928MHz )			
Transmission Range	Approx. 150m (500ft) : May vary with conditions			
Communication Speed	Collection of a full unit of data: Wireless communication = about 2 minutes (*3) / Optical communication = about 160 seconds			
Water Resistance	IP67 (immersion proof)	IP64 (rated for use in daily life) (*4)		
Dimensions	H62mm x W 47mm x D19mm / L type: with Large Capacity Battery Pack: D46.5mm (excluding protrusions / antenna length 24mm)			
Weight	Approx. 56g. (including 1 lithium battery) / L type (with Large Capacity Battery Pack) Approx. 109g			
Unit Temp. Resistance	Resistance -30 to 80°C (Unit temp resistance and measurement range is -40 to 80°C but wireless communication cannot occur in an environment of less than -30°C)			
Others	In order to download data via wireless communication, it is necessary to purchase Base Unit.			

(\*1) When using RTR-500B1 it is necessary to purchase Lithium Battery (LS26500). For details, contact your local authorized representative.

(\*2) The stated battery life is for when it is used in an environment of 25°C (77°F) and recorded data is downloaded at a rate of once a day or "Monitoring Current Readings" occurs at a rate of once every 10 minutes. Battery life depends on measurement environment, recording interval and battery performance.

(\*3) The same amount of time will be necessary for each added Repeater.

(\*4) The stated water resistance rating is for when the sensor is connected to the unit. However, this does not include the sensor areas for the RTR-503/503L models. Not for continued immersion.



**Caution regarding safety**

**For safe operation carefully read instructions before using this unit.**

**Web Site  
T&D Online**

Product information, FAQ and software update downloads. <http://www.tandd.com/>



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