Wireless Data Logging System

RTR-500 Series
Remote Unit (Data Logger)
Measure / Record
- Temperature
- Pt100 / Pt1000
- Thermocouple
- Humidity
- Voltage
- 4-20mA
- Pulse
- Illuminance
- UV
- CO2

Wireless Communication

Base Unit
Data Collection
- Recorded Data Collection via Wireless Communication
- Warning Monitoring Function
- Monitoring Function

RTR-500DC
Portable Data Collector

RTR-500
Wireless Base Station

Viewing Graph on Site

Reading Data from a Graph and Spreadsheet

Monitoring for Warning and Current Readings on PC

USB Connection
Versatile Next Generation Design for Today

The RTR-500 Series includes data loggers designed to measure and record a wide variety of items as well as a range of base stations to enable wireless collection of recorded data.

The collected data can be easily accessed via PC, Cloud, and/or E-mail.

Moreover, various functions, such as the monitoring of current readings and warning notification, make it a powerful data management system.
Variety of Wireless Data Logger Selections to

**Temperature**

RTR-501 / RTR-501L
- Measurement Range: -40 to 80°C
- Water Resistance: IP67 (Immersion Proof)
- Temperature Sensor: Thermistor

RTR-502 / RTR-502L
- Measurement Range: -60 to 155°C
- Water Resistance: IP64 (splash proof / rated for use in daily life)
- Attached Sensor: Temperature Sensor (TR-5106)

RTR-503 / RTR-503L
- Measurement Range: Temperature: 0 to 55°C
- Humidity: 10 to 95 %RH
- Attached Sensor: Temperature / Humidity Sensor (SHB-3101)

**Voltage**

RTR-505-V / RTR-505-VL
- Measurement Range: 0 to 22 V
- Attached Module: Input Module (VIM-3010)
- Measurement Resolution: Minimum of 0.1 mV
- Preheat Function

**4-20mA**

RTR-505-mA / RTR-505-mAL
- Measurement Range: 0 to 20 mA (Operational up to 40 mA)
- Attached Module: Input Module (AIM-3010)

**Pulse Count**

RTR-505-P / RTR-505-PL
- Measurement Range: Pulse count 0 to 61,439
- Signal Input: Contact Input / Voltage Input
- Input Frequency: 0 to 3.5 kHz
- Attached Cable: Input Cable (PIC-3150)
- For use with Voltmeters, Flow Meters and Passage Counters

**Temperature / Humidity**

RTR-507S / RTR-507SL
- Measurement Range:
  - Temperature: -25 to 70°C
  - Humidity: 0 to 99 %RH
- Attached Sensor: High Precision Temperature/Humidity Sensor (SHB-3101)

RTR-505-Pt / RTR-505-PtL
- Measurement Range: -199 to 600°C
- Attached Module: Input Module (PTM-3010)
- Sensor sold separately

RTR-505-TC / RTR-505-TCL
- Measurement Range:
  - K: -199 to 1370°C
  - J: -199 to 1200°C
  - T: -199 to 400°C
  - S: -50 to 1760°C
- Attached Module: Input Module (TCM-3010)

**Remote Units**

- **Wireless**
- **Data Logger**

- **Variety of Wireless Data Logger Selections to Meet Your Needs**

- **Products with this mark comply with EN12830, the European Standard regarding Temperature recorders for the transport, storage and distribution of chilled, frozen, deep-frozen/quick-frozen food and ice cream. (Excluding L Type)**

- **L-type models (model names which include “L”) are designed with a large capacity battery pack. Battery life of the L type is four times longer than that of the normal type.**

**Data Logger (with the rear cover and battery removed)**

**Attach Large Capacity Battery Kit**

**L-type**
Meet Your Needs

**Temperature / Humidity**
- High Precision
- Wide Range

**Temperature - Pt100 / Pt1000**

**Temperature - Thermocouple**

**Illuminance / UV Intensity / Temperature / Humidity**

**CO2 / Temperature / Humidity**

**RTR-507S / RTR-507SL**
- Measurement Range:
  - Temperature: −25 to 70°C
  - Humidity: 0 to 99 %RH
- Attached Sensor:
  - High Precision Temperature/Humidity Sensor (SHB-3101)

**RTR-505-Pt / RTR-505-PtL**
- Measurement Range: −199 to 600°C
- Attached Module:
  - Input Module (PTM-3010)
- Sensor sold separately (For details about Pt sensors see the T&D Web Site)

**RTR-505-TC / RTR-505-TCL**
- Measurement Range:
  - K: −199 to 1370°C
  - J: −199 to 1200°C
  - T: −199 to 400°C
  - S: −50 to 1760°C
- Attached Module: Input Module (TCM-3010)
  - (Please purchase sensor separately)

**RTR-574 / RTR-574-S**
- S type comes with our high precision temp/humidity sensor.
- Measurement Range:
  - Illuminance: 0 to 130,000 lx
  - UV Intensity: 0 to 30 mW/cm²
  - Temperature: 0 to 55°C (S: −25 to 70 °C)
  - Humidity: 10 to 95 %RH (S: 0 to 99 %RH)
- Display Range of Cumulative Measurement
  - Illuminance: 0 lxh to 90 Mlxh
  - UV Intensity: 0 mW to 62 W/cm²/h
- Attached Sensor:
  - Illuminance UV Sensor ISA-3151
  - Temperature / Humidity Sensor THA-3151 (S: High Precision Temp/Humidity Sensor SHA-3151)

**RTR-576 / RTR-576-S**
- S type comes with our high precision temp/humidity sensor.
- Measurement Range:
  - CO2 Concentration: 0 to 9,999 ppm
  - Temperature: 0 to 55°C (S: −25 to 70°C)
  - Humidity: 10 to 95 %RH (S: 0 to 99 %RH)
- Attached Sensor:
  - CO2 Sensor: NDIR type
  - Temperature / Humidity Sensor THA-3001 (S: High Precision Temperature/Humidity Sensor SHA-3151)
Mobile Base Station RTR-500MBS-A

RTR-500MBS-A
- Increased communication speeds and lower monthly costs
- All data loggers in the RTR-500 Series are supported

"Mobile" makes it possible to...
- Gather recorded data and monitor for warnings even in environments where network or PCs are not available.
- Check data from your smart phone or mobile device
- Get GPS location Info

Number of Possible Registrations (One Base)
Remote Units: Up to 20
(For RTR-574 and RTR-576, registration of one unit will be counted as two units.)
Repeaters: Up to 5 units per Group
Number of Groups : Up to 4 Groups

Application Examples
- Monitoring and Recording Temperature, Humidity and Location of Goods while in Transport
- Monitoring and Recording Temperature and Humidity in Distant Places where LAN Connection is Impossible
- Monitoring and Recording Temperature and Humidity in Buildings or Environments where LAN Connections are not Possible or not Desirable.

Coverage to Areas where LAN Connection is Difficult
On-Site Warnings & Alert Notifications to Mobile Devices
Portable Data Collector - RTR-500DC

- From the RTR-500DC it is possible via wireless communication to make recording interval settings, and collect and save data.
- Includes a monitoring function whereby at a set interval the Collector communicates with data loggers and gathers current readings.
- An alarm buzzer sounds when a warning occurs.
- On the spot graphical viewing of recorded data.

Number of Possible Registrations (One Base)
Remote Units: Up to 32 units per Group
(For RTR-505, RTR-574, and RTR-576, registration of one unit will be counted as two units.)
Repeaters: Up to 15 units per Group
Number of Groups : Up to 7 Groups

Application Examples
- For Collecting Recorded Data and Monitoring Current Readings of Products while Moving on Production Lines
- For Collecting Recorded Data and Monitoring Current Readings of Packages in Cargo Compartments from a Truck’s Cabin
- For Collecting Recorded Data at Construction Sites and other Places where PCs are not Available
Remote Management via Network

Network Base Station - RTR-500NW (for wired LAN) / RTR-500AW (for wireless LAN - 802.11 b/g)

- The system is designed to allow for the automatic sending of recorded data to an e-mail or FTP server without the need for a PC.
- Current readings can be monitored via in-company LAN.
- Registering with our “T&D WebStorage Service” makes it possible to view current readings on a PC or mobile device.
- The warning monitoring function with notification via e-mail or external contact ensures that important warnings are never missed by those nearby or far away.
- Being able to make and change settings via a network provides increased flexibility.

Number of Possible Registrations (One Base)
- Remote Units: Up to 100
  (For RTR-574 and RTR-576, registration of one unit will be counted as two units.)
- Repeaters: Up to 10 units per Group
- Number of Groups : Up to 10 Groups

Application Examples
- For Monitoring Temperature in Refrigerators and Freezers
- For Monitoring and Recording or Temperature, Humidity and Instrumentation Signals in Factories, Warehouses and other Building Facilities
- For Managing Temperature and Humidity in Server Rooms
Wireless Base Station - RTR-500

- This system allows for the automatic collection of recorded data by simply connecting to a PC via USB.
- It is possible to check current readings and warning occurrences on the PC monitor or by e-mail.
- By using the supplied software, recorded data can easily be sent to an e-mail or FTP server.
- All Base Units can be set up to act as Repeaters.

Number of Possible Registrations (One Base)

Remote Units: Up to 32 units per Group
(For RTR-574 and RTR-576, registration of one unit will be counted as two units.)
Repeaters: Up to 30 units per Group
Number of Groups: Up to 20 Groups

Application Examples

- For Temperature and Humidity Management in Blood and Pharmaceutical Storage
- For Temperature Management of Refrigerated and Frozen Goods at Supermarkets and Convenience Stores
- For Preservation and Prevention of Deterioration of Exhibits in Museums and other Exhibit Forums
Never Miss Warning Notification System

Variety of Warning Notifications provides Reliable Oversight

Types of Warning Reports

Network

E-mail

Warnings from Remote Units

Communication Errors

Warnings from Base Units

LAN

Warnings from Remote Units

RTR-500MBS-A
RTR-500NW
RTR-500AW
RTR-500
RTR-500DC

Upper Limit / Lower Limit Exceeded

Settings can be made in each Remote Unit for “Upper and/or Lower Limits” and well as for “Judgement Time”. This ensures that every instantaneous exceeding is not counted as a warning.

Sensor Error

This type of notification helps prevent loss of measurements due to sensor disconnection, malfunction or wire breakage.

Remote Unit Battery Level

This notifies the user that battery level is low before wireless communication can no longer be carried out.

Warnings from Base Units

Contact Input ON

It is possible to connect to an external device which has a warning output terminal to notify when a warning has occurred and the contact switches ON.

Recovery from Warning Status

This notifies the user when recovery from a warning has occurred; saving time and effort.

Communication Error Warnings

Wireless Communication Failures

This notifies the user that wireless communication has repeatedly failed.

Range of Notification Tools means “No Miss” Management

By E-mail / SMS

With an External Alarm Device

On a PC

On a Data Collector

Note: SMS can only be used with RTR-500MBS-A.
Monitor Measurement Readings from Any Location

Auto-Display of Current Readings at Set Interval

### Via the Software

![Software Interface]

Note: Software is available for download from T&D Website.

Measurement readings can be monitored using the dedicated software installed on the PC.

### On a Data Collector

![Data Collector Display]

It is possible to view Current Readings on the LCD screen of the data collector.

### Via a Web Browser

Access Anytime Anywhere

**T&D WebStorage Service**

![Web Interface]

http://www.webstorage-service.com/

"T&D Web Storage" is a free web-based storage service provided by T&D Corporation. By sending downloaded recorded data to "T&D Web Storage", it is possible to access your important data from anyplace in the world at any time you wish.

Registration is required to use T&D WebStorage Service.
### Temperature Sensors for RTR-502 / 502L

**Measurement Range:** -60 to 155°C
**Sensor Temperature Durability:** -70 to 180°C
**Accuracy (TR-5620 excluded):**
- Avg. ±0.3°C at -20 to 80°C
- Avg. ±0.5°C at -40 to -20°C / 80 to 110°C
- Avg. ±1.0°C at -60 to -40°C / 110 to 155°C

**Materials:**
1. Thermistor
2. Stainless Tube (SUS316)
3. FEP Shrink Tube
4. FEP Cable
5. Fluoropolymer Mold

### Fluoropolymer Coated Sensor

**TR-5101**
- Response Time (90%): Approx. 80 sec. (in air)

**TR-5106**
- Response Time (90%): Approx. 8 sec. (in air)
- Approx. 7 sec. (in agitated water)

### Underwater Sensor

**TR-5530**
- Response Time (90%): Approx. 150 sec. (in air)
  
  Approx. 15 sec. (in agitated water)

### High Sensitivity Ultra-thin Sensor

**TR-5620**
- **Accuracy**
  - Avg. ±0.5°C at -20 to 60°C
  - Avg. ±1.0°C at -60 to 80°C
  - Avg. ±2.0°C at 80 to 155°C
- **Response Time (90%):** Approx. 50 sec. (in air)
  
  Approx. 1 sec. (in agitated water)

### Temperature / Humidity Sensor for RTR-503 / 503L

**Measurement Range:**
- **Temperature:** 0 to 55°C
- **Humidity:** 10 to 95 %RH

**Response Time (90%):** Approx. 7 min.
**Temperature Durability:** -10 to 60°C

* Do not expose to condensation, dampness, corrosive gases or organic solvents.

**Materials:**
1. Temp/Humidity Sensor
2. Polypropylene Resin
3. PVC Cable

### Stainless Protection Sensor

**TR-5220**
- Response Time (90%): Approx. 150 sec. (in air)
- Approx. 7 sec. (in agitated water)

**TR-5320**
- Response Time (90%): Approx. 90 sec. (in air)
- Approx. 3 sec. (in agitated water)

### Temperature Sensor Extension Cable for RTR-502 / 502L

**TR-2C30**
- **Waterproof Capacity:** Splash proof
- **(rated for use in daily life)**
- **Temperature Durability:** -25 to 60°C

**Materials:**
1. Temp/Humidity Sensor Extension Cable
2. ABS Resin
3. Halogen-Free Flame Resistant Seath
4. PVC Cable

**Note:** Only one extension cable per sensor.

### High Precision Temperature / Humidity Sensor for RTR-507S / 507SL

**TR-3C30**
- **Waterproof Capacity:** Splash proof
- **(rated for use in daily life)**
- **Temperature Durability:** -25 to 60°C

**Note:** Only one extension cable per Temp/Humidity sensor.
**Input Modules for RTR-505 / 505L**

Materials: Polycarbonate, PVC Cable

Note: Input Module is not water resistant.

### Thermocouple Module (RTR-505-TC / 505-TCL)

**TCM-3010**

- **Compatible Sensors:** Thermocouple: Type K, J, T, S
- **Sensor Connection:** Miniature Thermocouple Connector
- **Operating Environment:**
  - Temperature: -40 to 80°C
  - Humidity: 90%RH or less (no condensation)

### Pt Module (RTR-505-Pt / 505-PtL)

**PTM-3010**

- **Compatible Sensors:** Pt100 (3-wire, 4-wire), Pt1000 (3-wire, 4-wire)
- **Sensor Connection:** Screw Clamp Terminal Block: 3-Terminal
- **Operating Environment:**
  - Temperature: -40 to 80°C, Humidity: 90%RH or less (no condensation)

### 4-20mA Module (RTR-505-mA / 505-mAL)

**AIM-3010**

- **Measurement Range:** 0 to 20mA (Operational up to 40 mA)
- **Accuracy:** ±0.05 mA + 0.3 % of reading (10 to 40 °C)
- **Preheat Function:** DC500V over 10M
- **Sensor Connection:** 3-Terminal Square Washer (3-M3.5)
- **Operating Environment:**
  - Temperature: -40 to 80°C, Humidity: 90%RH or less (no condensation)

### Voltage Module (RTR-505-V / 505-VL)

**VIM-3010**

- **Measurement Range:** 0 to 22V
- **Accuracy:** ±0.5 mV + 0.3 % of reading (10 to 40°C)
- **Measurement Resolution:** Minimum of 0.1mV
- **Preheat Function:** 3V to 20V, 100mA
- **Operating Environment:**
  - Temperature: -40 to 80°C, Humidity: 90%RH or less (no condensation)

### Pt100 Sensor for RTR-505-Pt / 505-PtL

TR-81##

- **Sensor Type (2 digits)
- **Protection Tube Diameter (2 digits)
- **Protection Tube Length (2 - 4 digits)
- **Cable Length (1 - 2 digits)

To order, create the model number by selecting [A], [B], [C], [D]. (See below.) Pt100 Sensors are produced only upon receipt of order; therefore please allow three weeks from the time of order until shipping.

**Sensor Specification**

- **Sensor Device:** Pt100
- **Electrical Current:** less than 2mA
- **Insulation Resistance:** DC500V over 10MΩ
- **Conductor:** 3 wire type

**Water Resistance:** None (only stainless protection tube is water resistant)

**TR-8110 (Regular Type)**

- **Measurement Range:** -200 to 350°C
- **Thermal Constant Time:** Approx. 2 sec. * (in agitated water)
- **Heat Durability Range:** -70 to 180°C

**TR-8120 (Low to High Temp Type)**

- **Measurement Range:** -200 to 500°C
- **Thermal Constant Time:** Approx. 2 sec. * (in agitated water)
- **Heat Durability Range:** -80 to 200°C

**TR-8130 (Handy Type)**

- **Measurement Range:** -50 to 200 °C
- **Thermal Constant Time:** Approx. 2.5 sec. * (in agitated water)
- **Heat Durability Range:** -25 to 80°C

* Stated thermal constant time is for sensors with a protection tube diameter of φ3.2.

**Materials:**

**Note:** Only one extension cable per input module.
## Sensors for RTR-574 / 576

**Note:** Do not expose to condensation, dampness, corrosive gases, or organic solvents.

### Temperature / Humidity Sensor

#### THA-3001
- **Measurement Range:**
  - Temperature: 0 to 55 °C
  - Humidity: 10 to 95 %RH (No condensation)
- **Measurement Accuracy:**
  - Temperature: ±0.5 °C
  - Humidity: ±5 %RH at 25 °C and 50 %RH
- **Response Time (90%):** Approx. 7 min.
- **Materials:**
  - Temp/Humidity Sensor
  - Polypropylene Resin

#### SHA-3151
- **Measurement Range:**
  - Temperature: -25 to 70 °C
  - Humidity: 0 to 99 %RH at 0 to 60 °C
- **Measurement Resolution:**
  - Temperature: 0.1 °C
  - Humidity: 0.1 %RH
- **Accuracy:**
  - Temperature: ±0.3 °C at 10 to 40 °C
  - Humidity: ±3.5 %RH at all other temperatures
- **Response Time (90%):** Approx. 7 min.
- **Long Term Stability:** ±1 %RH/yr, ±0.1 °C/yr
- **Materials:**
  - Temp/Humidity Sensor
  - ABS Resin
  - Halogen-Free Flame Resistant Sheath Cable

### Temperature / Humidity Sensor

#### THA-3151
- **Measurement Range:**
  - Temperature: 0 to 55 °C
  - Humidity: 10 to 95 %RH (No condensation)
- **Measurement Resolution:**
  - Temperature: 0.1 °C
  - Humidity: 1 %RH
- **Accuracy:**
  - Temperature: ±0.5 °C
  - Humidity: ±5 %RH at 25 °C and 50 %RH
- **Response Time (90%):** Approx. 7 min.
- **Materials:**
  - Temp/Humidity Sensor
  - Polypropylene Resin
  - Vinyl Chloride Coated Electrical Wire

### Illuminance / UV Sensor (RTR-574)

#### ISA-3151
- **Measurement Range:**
  - Illuminance: 0 lx to 130 klx
  - UV Intensity: 0 to 30 mW/μm²
- **Measurement Resolution:**
  - Illuminance: Minimum of 0.01 lx
  - UV Intensity: Minimum of 0.001 mW/μm²
- **Accuracy:**
  - Illuminance: ±5 % at 25°C, ±5 % at 25°C, ±5 % at 25°C
  - UV Intensity: ±5 % at 25°C
- **Relative Spectral Response:**
  - Illuminance: Approximated to the CIE standard response function V(λ).
  - UV Intensity: 260 to 400 nm (UVA / UVB)
- **Operating Environment:**
  - Temperature: -10 to 60°C
  - Humidity: ±90 %RH or lower
- **Materials:**
  - Polycarbonate
  - Glass
  - PVC Cable

*Compared to the value measured by the T&D standard sensor for calibration under our calibration light source.*

### Serial Communication Cable (RTR-574 / 576)

#### TR-6C10
- **For communication between RTR-500DC and RTR-574 / 576 (including S type)**
- **Length:** 1000 mm

#### TR-1C30
- **For communication between RTR-500MBS-A and RTR-574 / 576 (including S type)**
- **Length:** 3000 mm
- **Temperature Durability:** -25 to 60 °C

### Sensor Extension Cable (RTR-574 / 576)

#### TR-500NW / 500AW / 500 / 500DC, RTR-576

#### AC Adaptors

<table>
<thead>
<tr>
<th>Model</th>
<th>Cable Length</th>
<th>Input Voltage</th>
<th>Output Voltage</th>
<th>Frequency</th>
<th>Plug Type</th>
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<tbody>
<tr>
<td><strong>AD-06A1</strong> (FCC)</td>
<td>1.8m</td>
<td>AC 100 - 240V</td>
<td>DC 6V 500mA</td>
<td>50 / 60 Hz</td>
<td>A</td>
</tr>
<tr>
<td><strong>AD-06C1</strong> (CE)</td>
<td>1.8m</td>
<td>AC 100-240V</td>
<td>DC 6V 1.0A</td>
<td>50 / 60 Hz</td>
<td>C</td>
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<tr>
<td><strong>AD-05A3</strong> (FCC)</td>
<td>1.2m</td>
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<td>50 / 60 Hz</td>
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<td>1.6m</td>
<td>AC 100 - 240V</td>
<td>DC 6V 1.0A</td>
<td>50 / 60 Hz</td>
<td>C</td>
</tr>
</tbody>
</table>
Other Options for RTR-501 / 502 / 503 / 505 / 507S

Maintenance Set

**TR-00P1**
- **Included:**
  - Rubber Packing (for the rear cover of the data logger)
  - Silica Gel (drying agent)
  - Double-Sided Adhesive Tape (to fix the silica gel)
  - Lock Screw (extra screws to tighten the rear cover of the data logger)

External Power Adaptor Kit

**RTR-500A2**
- **Input Voltage:** DC 6 V
- **Backup Power:**
  - Ni-MH Battery (in case of power loss)
  - Back-up Time: About 4 days
  - Charging Method: Trickelle Charge
  - Operational Environment Temp: 0 to 60°C
  - Water Resistance: None
- **Weight:** About 37g (without AC Adaptor)
- **Included:**
  - AC Adaptor (AD-06A1 or AD-06C1), Case, Rubber Packing, Lock Screw

Large Capacity Battery Kit

**RTR-500B1**
- **Power:** Lithium Battery x 1 (LS26500)
- **Battery Life:** about 4 years
- **Waterproof Capability:** Splash proof
- **Operating Temperature:** -40 to 80 ˚C
- **Weight:** about 75g (including Lithium Battery)
- **Included:**
  - Maintenance Set TR-00P1, Case

* Varies depending on the amount of charge in the Ni-MH battery.
* Varies depending on the amount of charge in the Ni-MH battery.

Wall Attachment for Data Logger

**TR-05K3** (RTR-501 / 502 / 503 / 505 / 507S)
- **Included:**
  - Lock Screw x 2,
  - Double-Sided Adhesive Tape x 1
- **Operational Environment Temp:** -40 to 80°C
- **Materials:** Polycarbonate

**TR-05K3L** (for L Types)
- **Included:**
  - Lock Screw x 2,
  - Double-Sided Adhesive Tape x 1
- **Operational Environment Temp:** -40 to 80°C
- **Materials:** Polycarbonate

**TR-07K2** (RTR-574 / 574-S)
- **Included:**
  - Lock Screw x 2,
  - Double-Sided Adhesive Tape x 1
- **Materials:** Polycarbonate

**AT-76K1** (RTR-576 / 576-S)
- **Included:**
  - Lock Screw x 2,
  - Double-Sided Adhesive Tape x 1
- **Materials:** Aluminum

Wall Attachment for Base Unit

**TR-5GK1** (RTR-500MBS-A)
- **Included:**
  - O-Ring (rubber) x 1
  - Lock Screw x 2
  - Double-Sided Adhesive Tape x 1
- **Materials:** Double-Sided Adhesive Tape x 1

**AT-50K1** (RTR-500)
- **Included:**
  - O-Ring (rubber) x 1
  - Lock Screw for fastening to wall x 2
  - Double-Sided Adhesive Tape x 1
- **Materials:** Aluminum

**TR-5WK1** (RTR-500NW / 500AW)
- **Included:**
  - Lock Screw for fastening to wall x 2
  - Double-Sided Adhesive Tape x 1
  - Lock Screw for fastening the device x 1
- **Materials:** Polycarbonate

Note: Cracking may occur if polycarbonate is exposed to strong impact at temperatures of -30°C or lower.
## Remote Units (Data Logger)

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Temperature 1ch</td>
<td>Temperature 1ch</td>
<td>Temperature 1ch, Humidity 1ch</td>
<td>Temperature 1ch, Humidity 1ch (High Precision Type)</td>
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<tr>
<td>Sensor</td>
<td>Thermistor (Internal)</td>
<td>Thermistor</td>
<td>Thermistor</td>
<td>Polymer Resistance</td>
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<td>Measurement Units</td>
<td>°C, °F</td>
<td>°C, °F</td>
<td>°C, °F</td>
<td>%RH</td>
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<td>Measurement Range</td>
<td>-40 to 80 °C</td>
<td>-60 to 155 °C</td>
<td>0 to 55 °C</td>
<td>10 to 95 %RH</td>
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<td></td>
<td>-25 to 70 °C</td>
<td>0 to 99 %RH (*)</td>
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<tr>
<td>Accuracy</td>
<td>Avg.±0.5 °C</td>
<td>Avg.±0.3 °C</td>
<td>±5 %RH</td>
<td>±0.3 °C</td>
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<tr>
<td></td>
<td>at -20 to 80 °C</td>
<td>at -40 to -2 °C</td>
<td>at 10 to 40 °C</td>
<td>at 10 to 40 °C</td>
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<tr>
<td></td>
<td>Avg.±0.5 °C</td>
<td>80 to 110 °C</td>
<td>±0.5 °C</td>
<td>all other temperatures</td>
</tr>
<tr>
<td></td>
<td>Avg.±1.0 °C</td>
<td>110 to 155 °C</td>
<td>±2.5 %RH</td>
<td>at 15 to 35 °C, 30 to 80 %RH</td>
</tr>
<tr>
<td>Measurement Resolution</td>
<td>0.1 °C</td>
<td>0.1 °C</td>
<td>0.1 °C</td>
<td>1 %RH</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.1 °C</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.1 %RH</td>
</tr>
<tr>
<td>Responsiveness</td>
<td>Thermal Time Constant: Approx. 15 min. (L Type)</td>
<td>Approx. 25 min. (L Type)</td>
<td>Approx. 30 sec. (in air)</td>
<td>Approx. 4 sec. (in agitated water)</td>
</tr>
<tr>
<td></td>
<td>Response Time (90%): Approx. 35 min. (L Type)</td>
<td>Approx. 47 min. (L Type)</td>
<td>Approx. 80 sec. (in air)</td>
<td>Approx. 7 sec. (in agitated water)</td>
</tr>
<tr>
<td></td>
<td>Response Time (90%): Approx. 7 min.</td>
<td>Response Time (90%): Approx. 7 min.</td>
<td>Response Time (90%): Approx. 7 min.</td>
<td>Response Time (90%): approx. 20 sec.</td>
</tr>
<tr>
<td>Logging Capacity</td>
<td>16,000 readings</td>
<td>8,000 data sets (One data set consists of readings for multiple channels)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recording Interval</td>
<td>Select from 15 choices: 1, 2, 5, 10, 15, 20, 30 sec. or 1, 2, 5, 10, 15, 20, 30, 60 min.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recording Mode (*)</td>
<td>Endless (Overwrite oldest data when capacity is full) or One Time (Stop recording when capacity is full)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LCD Display Items</td>
<td>Measurements (alternating display for multiple channel devices), Battery Life Warning, etc.</td>
<td>Measurements (alternating display), Battery Life Warning, etc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication Interfaces</td>
<td>- Wireless Communication (Short Range Radio Communication)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>FCC Part15 Section247 / IC RSS-210 (Frequency Range: 902 to 928 MHz, RF Power: 7 mW)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ETSI EN 300 220 (Frequency Range: 869.7 to 870 MHz, RF Power: 5 mW)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Optical Communication (proprietary protocol)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wireless Transmission Range</td>
<td>Approx. 150 meters (500 ft) if direct and unobstructed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power</td>
<td>Lithium Battery: LS14250 x 1</td>
<td>L Type: Large Capacity Battery Adaptor Kit (RTR-500B1) (*)</td>
<td>External Power Adaptor Kit (RTR-500A2: sold separately) (*)</td>
<td></td>
</tr>
<tr>
<td>Battery Life (*)</td>
<td>About 10 months</td>
<td>L Type: About 4 years</td>
<td>About 4 years</td>
<td></td>
</tr>
<tr>
<td>Dimensions</td>
<td>H 62 mm x W 47 mm x D 19 mm</td>
<td>H 62 mm x W 47 mm x D 46.5 mm (excluding protrusions and sensor)</td>
<td>L Type:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Antenna length: 24 mm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>Approx. 50 g</td>
<td>L Type: approx. 65 g</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Environment</td>
<td>-40 to 80 °C (-30 to 80 °C during wireless communication)</td>
<td>-40 to 80 °C (-10 to 80 °C during wireless communication) (*)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waterproof Capacity</td>
<td>IP67: Immersion proof</td>
<td>IP64: Splash proof (rated for use in daily life) (*)</td>
<td>IP64: Splash proof (rated for use in daily life) (*)</td>
<td>IP64: Splash proof (rated for use in daily life) (*)</td>
</tr>
<tr>
<td></td>
<td>Note: Sensor is not water resistant.</td>
<td>Note: Sensor is not water resistant.</td>
<td>Note: Sensor is not water resistant.</td>
<td></td>
</tr>
<tr>
<td>Accessories</td>
<td>Temperature Sensor (TR-5106)</td>
<td>Temperature / Humidity Sensor (TR-3310)</td>
<td>Temperature / Humidity Sensor (SHB-3101)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lithium Battery (LS14250) or Large Capacity Battery Adaptor Kit (RTR-500B1), Strap (Not included with L type models), User’s Manual (Warranty included)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compatible Base Units</td>
<td>RTR-500, RTR-500NW / 500AW, RTR-500DC, RTR-500MBS-A, RTR-500GSM</td>
<td>RTR-500, RTR-500NW / 500AW, RTR-500DC, RTR-500MBS-A</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1: When continually used in environments with temperatures above 60°C, accuracy of humidity measurements will decrease over time. Also, humidity cannot be measured at temperatures below -20°C.  
2: Only "Endless" is available when using RTR-500W for Windows, RTR-500MS for Windows or RTR-500GSM for Windows.  
3: When using RTR-500B1 it is necessary to purchase Lithium Battery (LS26500). For details, contact your local authorized distributor.  
4: RTR-500A2 should not be used with the RTR-501.  
5: Battery life varies depending upon the ambient temperature in which it is used, the recording interval, the frequency of communication, and the 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.  
6: When wireless communication is performed in an environment below -10°C, measurement may fail or may not be accurate.  
7: This is the waterproof capacity of the data logger with the sensor connected. Note that the temperature-humidity sensor is not water resistant.  
8: The specifications listed above are subject to change without notice.
# RTR-500 Series - Specifications

## Remote Units (Data Logger)

<table>
<thead>
<tr>
<th>Measurement Channels</th>
<th>RTR-505-TC / 505-TCL</th>
<th>RTR-505-PI / 505-PIL</th>
<th>RTR-505-V / 505-VL</th>
<th>RTR-505-mA / 505-mAL</th>
<th>RTR-505-P / 505-PL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature 1ch</td>
<td>Temperature 1ch</td>
<td>Voltage 1ch</td>
<td>4-20 mA 1ch</td>
<td>Pulse Count 1ch</td>
<td></td>
</tr>
</tbody>
</table>

### Sensor
- Thermocouple: Type K, J, T, S
- PT100, PT1000
- 3-wire, 4-wire (*1)

### Measurement Units
- °C, °F
- V, mV, mA

### Measurement Range
- Temperature: K: -199 to 1370 °C, J: -199 to 1200 °C, T: -199 to 400 °C, S: -50 to 1760 °C
- Voltage: 0 to 22 V
- Pulse Count: 0 to 20 mA (Operational up to 40 mA)

### Accuracy (*2)
- Thermocouple Measurement
  - K, J, T: ±(0.3°C+0.3% of reading)
  - S: ±(1°C+0.3% of reading)
- Cold Junction Compensation
  - ±0.3°C at 10 to 40 °C
  - ±0.5°C at -40 to 10 °C, 40 to 80 °C

### Measurement Resolution
- K, J, T: 0.1 °C
- S: 0.2 °C
- Up to 400 mV: 0.1 mV
- Up to 800 mV: 0.2 mV
- Up to 999 mV: 0.4 mV
- Up to 3.2 V: 1 mV
- Up to 6.5 V: 2 mV
- Up to 9.999 V: 4 mV
- Up to 22 V: 10 mV

### Logging Capacity
- 16,000 readings

### Recording Interval
- Select from 15 choices: 1, 2, 5, 10, 15, 20, 30 sec. or 1, 2, 5, 10, 15, 20, 30, 60 min.

### Recording Mode (*3)
- Endless (Overwrite oldest data when capacity is full) or One Time (Stop recording when capacity is full)

### LCD Display Items
- Measurements, Battery Life Warning, etc.

### Communication Interfaces
- Wireless Communication (Short Range Radio Communication)
  - FCC Part15 Section 247 / IC RSS-210 (Frequency Range: 902 to 928 MHz, RF Power: 7 mW)
  - ETSI EN 300 220 (Frequency Range: 869.7 to 870 MHz, RF Power: 5 mW)
- Optical Communication (proprietary protocol)

### Wireless Transmission Range
- Approx. 150 meters (500 ft) if direct and unobstructed

### Power
- Lithium Battery LS14250 x 1
- L Type: Large Capacity Battery Adaptor Kit RTR-500B1 (*4)
- External Power Adaptor Kit RTR-500A2

### Battery Life (*5)
- About 10 months
- L Type: About 4 years

### Dimensions
- L 62 mm x W 47 mm x D 19 mm
- L Type: L 62 mm x W 47 mm x D 46.5 mm (excluding protrusions and Input Module)
- Antenna length: 24 mm

### Weight
- Approx. 50 g
- L Type: approx. 65 g

### Operating Environment
- -40 to 80 °C
- (-30 to 80°C during wireless communication)

### Waterproof Capacity (*6)
- IP64: Splash proof (rated for use in daily life) Note: Input Module is not water resistant.

### Accessories
- Input Module TCM-3010
- Input Module PTM-3010
- Input Module VIM-3010
- Input Module AIM-3010
- Input Module PIC-3150
- Lithium Battery LS14250 or Large Capacity Battery Adaptor Kit RTR-500B1, Strip (Not included with L type models), Manual (Warranty included)

### Compatible Base Units
- RTR-500, RTR-500NW/500AW, RTR-500DC, RTR-500MBS-A

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*1: In the case of a 4-wire sensor, one wire will be left unused.
*2: For RTR-505-TC and RTR-505-PI, sensor inaccuracies are not included.
*3: Only “Endless” is available when using RTR-500W for Windows or RTR-500MBS for Windows.
*4: When using RTR-500B1 it is necessary to purchase Lithium Battery (LS26500). For details, contact your local authorized distributor.
*5: Battery life varies depending upon multiple factors including ambient temperature, recording interval, 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.
*6: This is the waterproof capacity of the data logger with the Input Module connected. The Input Module itself is not water resistant.

The specifications listed above are subject to change without notice.
## Remote Units (Data Logger)

<table>
<thead>
<tr>
<th></th>
<th>RTR-574</th>
<th>RTR-574-S</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sensor</strong></td>
<td>ISA-3151</td>
<td></td>
</tr>
<tr>
<td><strong>Measurement Channels</strong></td>
<td>Illuminance: 1ch</td>
<td>UV Intensity: 1ch</td>
</tr>
<tr>
<td><strong>Units of Measurement</strong></td>
<td>Illuminance: lx, klx</td>
<td>UV Intensity: mW/cm²</td>
</tr>
<tr>
<td><strong>Measurement Range</strong></td>
<td>Illuminance: 0 lx to 130 klx</td>
<td>UV Intensity: 0 to 30 mW/cm²</td>
</tr>
<tr>
<td><strong>Units of Cumulative Measurement</strong></td>
<td>Cumulative Illuminance: lxh, klxh, Mlxh</td>
<td>Cumulative amount of UV Light: mW/hr, W/hr</td>
</tr>
<tr>
<td><strong>Display Range of Cumulative Measurement</strong></td>
<td>Illuminance: 0 lxh to 90 Mlxh</td>
<td>UV Intensity: 0 mW to 62 W/hr</td>
</tr>
<tr>
<td><strong>Accuracy</strong></td>
<td>Illuminance: Approximated to the CIE standard response function V(λ)</td>
<td>UV Intensity: ±5 % at 25 °C, 50 %RH (*1)</td>
</tr>
<tr>
<td><strong>Relative Spectral Response</strong></td>
<td>Illuminance: Minimum of 0.1 lx</td>
<td>UV Intensity: Minimum of 0.001 mW/cm²</td>
</tr>
<tr>
<td><strong>Measurement Resolution</strong></td>
<td>Response Time (90%): 3 sec. at recording interval of 1 sec.</td>
<td>6 sec. at other intervals</td>
</tr>
<tr>
<td><strong>Responsiveness</strong></td>
<td>Response Time (90%): Approx. 7 min.</td>
<td></td>
</tr>
<tr>
<td><strong>Temperature/Humidity Sensor</strong></td>
<td>THA-3151</td>
<td>SHA-3151 (High-Precision Type)</td>
</tr>
<tr>
<td><strong>Sensor</strong></td>
<td>Thermistor</td>
<td>Polymer Resistance</td>
</tr>
<tr>
<td><strong>Units of Measurement</strong></td>
<td>°C, °F</td>
<td>%RH</td>
</tr>
<tr>
<td><strong>Accuracy</strong></td>
<td>±0.5 °C</td>
<td>± 5 %RH at 25 °C, 50 %RH</td>
</tr>
<tr>
<td><strong>Measurement Resolution</strong></td>
<td>0.1 °C</td>
<td>1 %RH</td>
</tr>
<tr>
<td><strong>Responsiveness</strong></td>
<td>Response Time (90%): Approx. 7 min.</td>
<td></td>
</tr>
<tr>
<td><strong>Logging Capacity</strong></td>
<td>8,000 data sets (One data set consists of readings for all channels in that type of unit.)</td>
<td></td>
</tr>
<tr>
<td><strong>Recording Interval</strong></td>
<td>Select from 15 choices: 1, 2, 5, 10, 15, 20, 30 sec. or 1, 2, 5, 10, 15, 20, 30, 60 min.</td>
<td></td>
</tr>
<tr>
<td><strong>Recording Mode</strong> (*3)</td>
<td>Endless (Overwrite oldest data when capacity is full) or One Time (Stop recording when capacity is full)</td>
<td></td>
</tr>
<tr>
<td><strong>LCD Display Items</strong></td>
<td>Measurements, Battery Life Warning, etc. - Measurements: Illuminance / UV Intensity / Temperature / Humidity / Cumulative Illuminance / Cumulative amount of UV Light - Display Pattern: Alternating or Fixed display - Display Digits: Up to 4 digits</td>
<td></td>
</tr>
<tr>
<td><strong>Communication Interfaces</strong></td>
<td>- Wireless Communication (Short Range Radio Communication)</td>
<td></td>
</tr>
<tr>
<td><strong>Wireless Transmission Range</strong></td>
<td>Approx. 150 meters (500 ft) if direct and unobstructed</td>
<td></td>
</tr>
<tr>
<td><strong>Power</strong></td>
<td>AA Alkaline Battery x1</td>
<td></td>
</tr>
<tr>
<td><strong>Battery Life</strong> (*5)</td>
<td>Approx. 4 months</td>
<td></td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td>H 55 mm x W 78 mm x D 18 mm (excluding protrusions)</td>
<td></td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>Approx. 45 g</td>
<td></td>
</tr>
<tr>
<td><strong>Operating Environment</strong></td>
<td>Temperature: -10 to 60 °C</td>
<td>Humidity: 90 %RH or less (no condensation)</td>
</tr>
<tr>
<td><strong>Accessories</strong></td>
<td>Temperature / Humidity Sensor THA-3151</td>
<td>Temperature / Humidity Sensor SHA-3151</td>
</tr>
<tr>
<td><strong>Compatible Base Units</strong></td>
<td>RTR-500, RTR-500NW/500AW, RTR-500DC, RTR-500MBS-A</td>
<td></td>
</tr>
</tbody>
</table>

*1: Compared to the value measured by the T&D standard sensor for calibration under our calibration light source.
*2: When continually used in environments with temperatures above 60 °C, accuracy of humidity measurements will decrease over time. Also, humidity cannot be measured at temperatures below -20 °C.
*3: Only “Endless” is available when using RTR-500W for Windows or RTR-500MBS for Windows.
*4: For communication with the Data Collector RTR-500DC (Note: Optional serial communication cable TR-6C10 is required.)
*5: Battery life varies depending upon the ambient temperature in which it is used, the recording interval, the frequency of communication, and the 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.

The specifications listed above are subject to change without notice.
### Remote Units (Data Logger)

<table>
<thead>
<tr>
<th>RTR-576</th>
<th>RTR-576-S</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CO2 Sensor</strong></td>
<td>(Internal)</td>
</tr>
<tr>
<td><strong>Measurement Channels</strong></td>
<td>CO2 Concentration 1ch</td>
</tr>
<tr>
<td><strong>Units of Measurement</strong></td>
<td>ppm</td>
</tr>
<tr>
<td><strong>Measurement Range</strong></td>
<td>0 to 9,999 ppm</td>
</tr>
<tr>
<td><strong>Accuracy</strong></td>
<td>±(50 ppm + 5% of reading) at 5,000 ppm or less (\text{(*)1})</td>
</tr>
<tr>
<td><strong>Measurement Resolution</strong></td>
<td>Minimum of 1 ppm</td>
</tr>
</tbody>
</table>

#### Temperature/Humidity Sensor

<table>
<thead>
<tr>
<th>RTR-576</th>
<th>RTR-576-S</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sensor</strong></td>
<td>THA-3001</td>
</tr>
<tr>
<td><strong>Units</strong></td>
<td>C, °F</td>
</tr>
<tr>
<td><strong>Accuracy</strong></td>
<td>±0.5 °C</td>
</tr>
<tr>
<td><strong>Measurement Resolution</strong></td>
<td>0.1 °C</td>
</tr>
</tbody>
</table>

**Responsiveness**

- Response Time (90%): Approx. 7 min.

**Logging Capacity**

- 8,000 data sets (One data set consists of readings for all channels in that type of unit.)

**Recording Interval**

- Select from 15 choices: 1, 2, 5, 10, 15, 20, 30 sec. or 1, 2, 5, 10, 15, 20, 30, 60 min.

**Recording Mode**

- Endless (Overwrite oldest data when capacity is full) or One Time (Stop recording when capacity is full)

**LCD Display Items**

- Measurements, Battery Level, etc.
  - Measurements: CO2 concentration, Temperature or Humidity (fixed or alternating display)

**Communication Interfaces**

- Wireless Communication (Short Range Radio Communication)
  - FCC Part15 Section 247 / IC RSS-210 (Frequency Range: 902 to 928 MHz, RF Power: 7 mW)
  - ETSI EN 300 220 (Frequency Range: 869.7 to 870 MHz, RF Power: 5 mW)
- USB Communication
- Serial Communication (RS-232C) \(\text{(*)5}\)

**Wireless Transmission Range**

- Approx. 150 meters (500 ft) if direct and unobstructed

**External Alarm Terminal**

- Output Terminal: Open Drain Output (Voltage when OFF: DC less than 30V / Current when ON: less than 0.1 A / Resistance when ON: about 15 Ω)

**Power**

- AC Adaptor AD-06A1 or AD-06C1, AA Alkaline Battery x 4

**Battery Life**

- Approx. 2 days (batteries only without AC adaptor)

**Dimensions**

- H 96 mm x W 86 mm x D 46 mm (excluding protrusions and sensor)
- Antenna Length: 60 mm

**Weight**

- Approx. 125 g (including battery, excluding sensor)

**Operating Environment**

- Temperature: 0 to 45 °C
- Humidity: 90% RH or less (no condensation)

**Accessories**

- Temperature / Humidity Sensor: THA-3001
- Temperature / Humidity Sensor: SHA-3151
- AA Alkaline Battery LR6 x 4, AC Adaptor AD-06A1 or AD-06C1, USB Mini-B Cable US-15C, Manual (Warranty Included)

**Compatible Base Units**

- RTR-500, RTR-500NW/500AW, RTR-500DC, RTR-500MBS-A

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\(\text{(*)1}\): Stated value is the measurement accuracy of the CO2 sensor when Auto Calibration is operating properly. A change in atmospheric pressure directly influences the reading of CO2, which can cause measurement errors; a decrease in pressure by 10hPa results in a relative decrease in CO2 by 1.6%. In such a case, we recommend carrying out the "Atmospheric Pressure Correction" function found in the software supplied with the Base Unit.

\(\text{(*)2}\): Make sure to use the data logger within the operating environment as listed in the specifications.

\(\text{(*)3}\): When continually used in environments with temperatures above 60°C, accuracy of humidity measurements will decrease over time. Also, humidity cannot be measured at temperatures below -20°C.

\(\text{(*)4}\): Only "Endless" is available when using RTR-500W for Windows or RTR-500MBS for Windows.

\(\text{(*)5}\): For communication with the Data Collector RTR-500DC (Note: Optional serial communication cable TR-6C10 is required)

\(\text{(*)6}\): In order to use the external alarm terminal, please prepare a compatible connector: JST PAP-04V-S.

\(\text{(*)7}\): Battery life varies depending upon the ambient temperature in which it is used, the recording interval, the frequency of communication, and the 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. The specifications listed above are subject to change without notice.
### RTR-500 Series - Specifications

<table>
<thead>
<tr>
<th>Base Unit</th>
<th>RTR-500MBS-A</th>
<th>RTR-500NW / RTR-500AW</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Maximum Number of Registrations</strong></td>
<td>Remote Units: 20 units (*)</td>
<td>Remote Units: 100 units (*)</td>
</tr>
<tr>
<td><strong>Communication Interfaces</strong></td>
<td>&lt;Mobile Data Communication&gt; US: WCDMA/HSDPA: 850 / 1900 MHz GSM/GPRS: 850 / 900 / 1800 / 1900 MHz EU: WCDMA/HSDPA: 900 / 2100 MHz GSM/GPRS: 850 / 900 / 1800 / 1900 MHz</td>
<td>&lt;Between Base Unit(s) - (Repeaters) - Remote Unit(s)&gt; - Wireless Communication (short range radio communication) US: FCC Part15 Section247 / IC RSS-210 (Frequency Range: 902 to 928 MHz, RF Power: 7 mW) EU: ETSI EN 300 220 (Frequency Range: 869.7 to 870 MHz, RF Power: 5 mW) - Optical Communication (proprietary protocol) (With compatible Remote Units except RTR-574 and RTR-576)</td>
</tr>
<tr>
<td><strong>Wireless Transmission Range</strong></td>
<td>Approx. 150 meters (500 ft) if direct and unobstructed</td>
<td>Approx. 150 meters (500 ft) if direct and unobstructed</td>
</tr>
<tr>
<td><strong>External Alarm Input/Output Terminal</strong></td>
<td>&lt;Input Terminal: Contact Input&gt; Internal Pull-up: 3 V 100 kΩ Maximum Input Voltage: 30 V &lt;Output Terminal: Photo Mos Relay Output&gt; Voltage when OFF: AC / DC 50V or less Current when ON: 0.1 A or less Resistance when ON: 35Ω</td>
<td>&lt;Input Terminal&gt; Internal Pull-up: 3 V 100 kΩ Maximum Input Voltage: 30 V &lt;Output Terminal&gt; Voltage when OFF: AC / DC 50V or less Current when ON: 0.1 A or less Resistance when ON: 35Ω</td>
</tr>
<tr>
<td><strong>Communications Protocol</strong></td>
<td>SMTP (POP before SMTP), SMTP AUTH &lt;LOGIN&gt;, SMTPS (SMTP over SSL), FTP, SMS (*3)</td>
<td>SMTP (POP before SMTP), SMTP AUTH &lt;LOGIN&gt;, FTP, SMTP, DHCP, DNS</td>
</tr>
<tr>
<td><strong>Power</strong></td>
<td>AA Alkaline Battery x 4 AC Adaptor AD-05A3 or AD-05C1 External Power Supply DC 10-24V</td>
<td>AC Adaptor (AD-06A1 or AD-06C1)</td>
</tr>
<tr>
<td><strong>Battery Life</strong></td>
<td>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)</td>
<td>-</td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td>H 96 mm x W 66 mm x D 39 mm (excluding antenna) Antenna Length (Cellular / Local): 109 mm</td>
<td>H 83 mm x W 102 mm x D 28 mm (excluding antenna) Antenna Length: 87.3 mm</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>Approx. 130 g</td>
<td>Approx. 120 g</td>
</tr>
<tr>
<td><strong>Operating Environment</strong></td>
<td>Temperature: 10 to 55 °C (-10 to 55 °C with external power connected) Humidity: 90 %RH or less (no condensation)</td>
<td>Temperature: -10 to 60 °C Humidity: 90 %RH or less (no condensation)</td>
</tr>
<tr>
<td><strong>Accessories</strong></td>
<td>AA Alkaline Battery LR6 x 4, Antenna x 2 (Cellular/Local), USB Mini-B Cable US-15C, External Power Cable BC-0302, Software CD-ROM, Manual (Warranty Included)</td>
<td>Antenna, USB Mini-B Cable US-15C, LAN Cable LN-20W (RTR-500NW only), AC Adaptor AD-06A1 or AD-06C1, Software CD-ROM, Manual (Warranty Included)</td>
</tr>
<tr>
<td><strong>GPS Interface</strong></td>
<td>Connector: SMA Male Plug Power Supply: 2.9 to 2.7V</td>
<td>-</td>
</tr>
<tr>
<td><strong>SIM Card</strong></td>
<td>Standard Size SIM Card (WCDMA or GSM)</td>
<td>-</td>
</tr>
<tr>
<td><strong>Software Compatible OS</strong></td>
<td>Microsoft Windows 10 32 / 64 bit Microsoft Windows 8 32 / 64 bit Microsoft Windows 7 32 / 64 bit</td>
<td>Microsoft Windows 10 32 / 64 bit Microsoft Windows 8 32 / 64 bit Microsoft Windows 7 32 / 64 bit</td>
</tr>
<tr>
<td><strong>Display Languages</strong></td>
<td>English</td>
<td>RTR-500W for Windows (US) English, Spanish, Portuguese RTR-500W for Windows (EU) English, Spanish, French, German, Italian</td>
</tr>
</tbody>
</table>

*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 the number of warning reports sent, the ambient temperature in which it is used, the frequency of communication, and the 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.

*8: We recommend using an operating system in the same language as the display language. Operation in different languages is not guaranteed. The specifications listed above are subject to change without notice.
## RTR-500 Series - Specifications

### Base Unit / Repeater

<table>
<thead>
<tr>
<th>RTR-500DC</th>
<th>RTR-500</th>
</tr>
</thead>
</table>
| **Compatible Devices** | **Remote Units:**  
Repeater: RTR-500  
**Remote Units:**  
Repeater: RTR-500 |
| **Maximum Number of Registrations** | Remote Units: 32 units x 7 groups  
Repeaters: 15 units x 7 groups  
Remote Units: 32 units x 20 groups  
Repeaters: 30 units x 20 groups |
| **Storage Capacity** | When downloading from units filled to logging capacity:  
- 15 units of RTR-501 / 502 / 503 / 507S / 7 units of RTR-574 / 10 units of RTR-576  
When downloading from units of any type containing small amounts of data, it can store and manage up to 250 download sessions. |
| **Communication Interfaces** | <Between Base Unit(s) - (Repeaters) - Remote Unit(s)>  
- Wireless Communication (short range radio communication)  
US: FCC Part 15 Section 247 / IC RSS-210  
Frequency Range: 302 to 928 MHz, RF Power: 7 mW  
EU: ETSI EN 300 220  
(Frequency Range: 869.7 to 870 MHz, RF Power: 5 mW)  
- Optical Communication (proprietary protocol)  
(With compatible Remote Units except RTR-574 and RTR-576)  
- Serial Communication (RS-232C) (3)  
<Between RTR-574 and RTR-576>  
<Between Base Unit - PC>  
- USB Communication  
- Serial Communication (RS-232C) (4) |
| **Wireless Transmission Range** | Approx. 150 meters (500 ft) if direct and unobstructed  
Approx. 150 meters (500 ft) if direct and unobstructed |
| **Communications Protocol** | SMTP (POP before SMTP, SMTP-AUTH <LOGIN / Plain / CRAM-MD5>, SMTP over SSL/TLS, STARTTLS), FTP (5)  
USB Bus Power,  
AA Alkaline Battery x 2,  
AC Adaptor (AD-06A1 or AD-06C1) (6) |
| **Power** | AAA Alkaline Battery (LR03) x 2  
- AAA Ni-MH batteries, AC adapter (AD-06A1 or AD-06C1), or USB bus power may also be used.  
- Wireless Communication (short range radio communication)  
US: FCC Part 15 Section 247 / IC RSS-210  
Frequency Range: 302 to 928 MHz, RF Power: 7 mW  
EU: ETSI EN 300 220  
(Frequency Range: 869.7 to 870 MHz, RF Power: 5 mW)  
- Optical Communication (proprietary protocol)  
(With compatible Remote Units except RTR-574 and RTR-576)  
- Serial Communication (RS-232C) (4)  
AA Alkaline Battery (LR03) x 2  
- Wireless Communication (short range radio communication)  
US: FCC Part 15 Section 247 / IC RSS-210  
Frequency Range: 902 to 928 MHz, RF Power: 7 mW  
FCC Part 15 Section 247 / IC RSS-210 (Frequency Range: 902 to 928 MHz, RF Power: 7 mW)  
ETSI EN 300 220 (Frequency Range: 869.7 to 870 MHz, RF Power: 5 mW)  
- Optical Communication (proprietary protocol)  
(With compatible Remote Units except RTR-574 and RTR-576)  
- Serial Communication (RS-232C) (4) |
| **Battery Life (7)** | Expected battery life with 2 AAA alkaline batteries:  
- Monitoring Current Readings and Remote Unit Status: 96 hours of continuous use  
(For communication without Repeaters at 60 second intervals)  
- Monitoring Radio Waves: 32 hours of continuous use  
- Downloading Data via Wireless Communication: 730 consecutive sessions  
(When downloading RTR-501 at full logging capacity, without Repeaters, with LCD backlight Off)  
As a Repeater: Approx. 6 months  
(When downloading full data once a day with one Repeater) |
| **Dimensions** | H 125 mm x W 58 mm x D 26.3 mm (excluding antenna)  
Antenna Length: 109 mm  
H 96 mm x W 65 mm x D 25 mm (excluding antenna)  
Antenna Length: 109 mm |
| **Weight** | Approx. 105 g  
Approx. 70 g |
| **Operating Environment** | Temperature: 0 to 50 °C  
Humidity: 90 %RH or less (no condensation)  
Temperature: -10 to 60 °C (-30 to 60 °C with external power connected)  
Humidity: 90 %RH or less (no condensation) |
| **Accessories** | AAA Alkaline Battery LR03 x 2, USB Mini-B Cable US-15C, Software CD-ROM, Manual (Warranty Included)  
Antenna, USB Communication Cable (US-15C), Software (CD-ROM), Memo Sticker, Introductory Manual Set (Warranty Included) |
| **Software Compatible OS (9)** | Microsoft Windows 10 32 / 64 bit  
Microsoft Windows 8 32 / 64 bit  
Microsoft Windows 7 32 / 64 bit  
Microsoft Windows 10 32 / 64 bit  
Microsoft Windows 8 32 / 64 bit  
Microsoft Windows 7 32 / 64 bit |
| **Display Languages (10)** | RTR-500DC for Windows (US)  
English, Spanish, Portuguese  
RTR-500DC for Windows (EU)  
English, Spanish, French, German, Italian  
RTR-500 for Windows (US)  
English, Spanish, Portuguese  
RTR-500 for Windows (EU)  
English, Spanish, French, German, Italian |

1: For RTR-505, RTR-574, and RTR-576, registration of one unit will be counted as two units.  
2: For RTR-574 and RTR-576, registration of one unit will be counted as two units.  
3: Optional communication cable TR-6C10 is required for serial communication with RTR-574 and RTR-576.  
4: Customers wishing to write their own software, please contact your local distributor for the serial communications protocol specifications. (Note: Optional serial communication cable TR-07C is also required.)  
5: When using a USB connection, the RTR-500 requires neither batteries nor AC adaptor. Please prepare two AA batteries or an AC adaptor when using the RTR-500 as a Repeater.  
6: Battery life varies depending upon the ambient temperature in which it is used, the frequency of communication, and the 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.  
7: Battery life varies depending upon the ambient temperature in which it is used, the frequency of communication, and the 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.  
8: For installation, it is necessary to have Administrator (Computer Administrator) rights.  
9: We recommend using an operating system in the same language as the display language. Operation in different languages is not guaranteed.  
10: The specifications listed above are subject to change without notice.
Our new easy-to-use high performance software “T&D Graph” gives you all the power you need for effective management and analysis of recorded data. It can also be used in conjunction with T&D WebStorage Service.

Open Only the Data you Need

It is possible to specify search conditions to find and open only the data you want from all recorded data stored in a local folder or in the T&D WebStorage Service. The merging of multiple sets of data is also possible.

Open data directly from T&D WebStorage Service

Open only data that matches search conditions

Data is automatically merged and opened.

Analyze

Use the filtering feature to get only the data you want to view and work with. Pre-designed filtering templates are provided; or create your own.

Use the text and figure editing feature to create memos and comments within graphs.

Save / Output

Save

Print

CSV format data