

## Wireless Data Logger

# RTR500B Series Data Loggers Features and Specs

### Measurement Items

Temp / Humidity / Voltage / 4-20mA /  
Pulse Count / Illuminance / UV / CO<sub>2</sub>

### Data Collection

Wireless Communication  
with Data Collectors

The RTR500B 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.

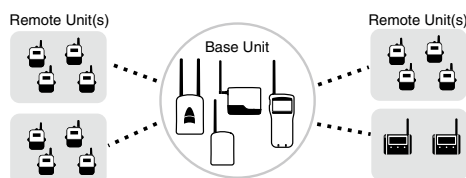
Model	Measurement Items	Measurement Range	Notes
RTR501B / 501BL	Temperature 1ch (internal sensor)	-40 to 80°C	Gradual Response Time Optimum Waterproof and Dustproof Capabilities
RTR502B / 502BL	Temperature 1ch	-60 to 155°C	External Sensor for Quicker Response Time / Splashproof Wide Selection of Optional Sensors
RTR503B / 503BL	Temperature / Humidity 1ch Each	0 to 55°C / 10 to 95%RH	Measure Temperature and Humidity
RTR507B / 507BL	Temperature / Humidity 1ch Each	-25 to 70°C / 0 to 99%RH	Measure Temperature and Humidity (High Precision)
RTR505B + TCM-3010	Temperature 1ch (Thermocouple)	-199 to 1760°C	For use with Thermocouple Sensor Types: K, J, T, S
RTR505B + PTM-3010	Temperature 1ch (Pt100, Pt1000)	-199 to 600°C	Supports 3-wire and 4-wire Sensors High Precision Measurement in Wide Temperature Range
RTR505B + VIM-3010	Voltage 1ch	DC 0 to 22V Min Resolution: 0.1mV	Preheat Function / Scale Conversion
RTR505B + AIM-3010	4-20mA 1ch	0 to 20 mA	Operational up to 40 mA / Scale Conversion
RTR505B + PIC-3150	Pulse Count 1ch	Pulse Count: 0 to 61439 Input Signal: Contact Input / Voltage Input	

\* 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.

Model	Measurement Items	Measurement Range for Normal Type	Measurement Range for H Type	Notes
RTR-574 / 574-S	Illuminance UV Intensity Temperature Humidity 1ch each	0 to 130 klx 0 to 30 mW/cm <sup>2</sup> 0 to 55°C 10 to 95%RH	0 to 130 klx 0 to 30 mW/cm <sup>2</sup> -25 to 70°C 0 to 99%RH	While recording possible to view cumulative illuminance and cumulative UV Possible to detect changes in illuminance even under moonlight
RTR-576 / 576-S	CO <sub>2</sub> Concentration Temperature Humidity 1ch each	0 to 9,999 ppm 0 to 55°C 10 to 95%RH	0 to 9,999 ppm -25 to 70°C 0 to 99%RH	For measuring CO <sub>2</sub> concentration in living environments. Auto Calibration Function

### Collect Data via Wireless Communication with a Base Unit

Data loggers in our RTR500B Series function as Remote Units and need to be used with one of our collection devices (Base Unit).



The collected data can then be transmitted to a PC, our free cloud service or your FTP server using a variety of methods such as USB, LAN and 3G network. Moreover, various functions, such as the monitoring of current readings and warning notification, make it a powerful data management system.

\* Select a Base Unit according to the type and scale of the measuring environment.

### Measure and Record Temperature and Humidity in a Wider Range with Greater Accuracy (RTR507B / RTR507BL / RTR-574-S / RTR-576-S)

The supplied sensor for the S-model provides higher accuracy to ±2.5%RH.

Measurement Range for temperature is -25 to 70°C and 0 to 99 %RH for humidity.

## RTR501B / 502B / 503B / 507B Specifications

	RTR501B / 501BL	RTR502B / 502BL	RTR503B / 503BL		RTR507B / 507BL	
Measurement Channels	Temperature 1ch	Temperature 1ch	Temperature 1ch	Humidity 1ch	Temperature 1ch	Humidity 1ch
Sensor	Thermistor (Internal)	Thermistor	Thermistor	Polymer Resistance	Thermistor	Polymer Resistance
Measurement Units	°C, °F	°C, °F	°C, °F	%RH	°C, °F	%RH
Measurement Range	-40 to 80°C	-60 to 155°C	0 to 55 °C	10 to 95 %RH	-25 to 70 °C	0 to 99 %RH (*1)
Accuracy	Avg.±0.5°C	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	Avg.±0.3 °C	±5 %RH at 25 °C, 50%RH	±0.3°C at 10 to 40 °C ±0.5°C all other temperatures	±2.5 %RH at 15 to 35 °C, 30 to 80 %RH
Measurement Resolution	0.1°C	0.1°C	0.1°C	1 %RH	0.1 °C	0.1 %RH
Responsiveness	Thermal Time Constant: Approx. 15 min. Approx. 25 min. (L Type) Response Time (90%): Approx. 35 min. Approx. 47 min. (L Type)	Thermal Time Constant: Approx. 30 sec. (in air) Approx. 4 sec. (in agitated water) Response Time (90%): Approx. 80 sec. (in air) Approx. 7 sec. (in agitated water)	Response Time (90%): Approx. 7 min.		Response Time (90%): Approx. 7 min.	
Logging Capacity	16,000 readings	16,000 readings	8,000 data sets (One data set consists of readings for multiple channels.)		8,000 data sets (One data set consists of readings for multiple channels.)	
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 (*2)	Endless (Overwrite oldest data when capacity is full) or One Time (Stop recording when capacity is full)					
LCD Display Items	Measurements (alternating display for multiple channel devices), Battery Life Warning, etc.					
Communication Interfaces	Short Range Wireless Communication <For US> Frequency Range: 902 to 928MHz RF Power: 7mW Transmission Range: Approx. 150 meters (500 ft) if direct and unobstructed <For EU> Frequency Range: 869.7 to 870MHz RF Power: 5mW Transmission Range: Approx. 150 meters (500 ft) if direct and unobstructed Bluetooth 4.2 (Bluetooth Low Energy) (*3) Optical Communication					
Power	Lithium Battery: LS14250 x 1 L Type: Large Capacity Battery Kit RTR-500B1 (*4) External Power Adaptor Kit RTR-500A2 (*5)					
Battery Life (*6)	Approx. 10 months L Type: About 4 years					
Dimensions	H 62 mm x W 47 mm x D 19 mm L type: H 62 mm x W 47 mm x D 46.5 mm (excluding protrusions and sensor) 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	IP67: Immersion proof		IP64: Splash proof (rated for use in daily life) (*7)			
Accessories			Temperature Sensor TR-5106	Temperature-Humidity Sensor TR-3310	High Precision Temperature-Humidity Sensor SHB-3101	
Compatible Base Units	RTR500BC, RTR500BW, RTR500BM RTR-500DC, RTR-500MBS-A, RTR-500NW/AW (*8) (*9) RTR-500 (*9)					

\*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 the RTR500BW, RTR500BM, RTR-500NW/AW or RTR-500MBS-A as a Base Unit.

\*3: Bluetooth is available when using the RTR500BW as a Base Unit and making device settings in the mobile app (T&D 500B Utility).

\*4: When using RTR-500B1 it is necessary to purchase Lithium Battery (LS26500). For details, contact your local authorized distributor.

\*5: RTR-500A2 should not be used with the RTR501B, as it will cause the RTR-501 to display a higher than actual temperature reading of up to 3°C.

\*6: Battery life depends on several factors, including ambient temperature, radio environment, frequency of communication, recording interval, and quality of the battery being used. All estimates are based on operations carried out with a new battery and are in no way a guarantee of actual battery life.

\*7: This is the waterproof capacity of the data logger with the sensor connected. Note that the temperature-humidity sensor is not water resistant.

The specifications listed above are subject to change without notice.



## RTR505B Specifications

	RTR505B / 505BL
Measurement Item	Temperature, Voltage, 4–20mA, or Pulse Count (*1)
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 (*2)	Endless (Overwrite oldest data when capacity is full) or One Time (Stop recording when capacity is full)
LCD Display Items	Measurements (alternating display for multiple channel devices), Battery Life Warning, etc.
Communication Interfaces	Short Range Wireless Communication <For US> Frequency Range: 902 to 928MHz RF Power: 7mW Transmission Range: Approx. 150 meters (500 ft) if direct and unobstructed <For EU> Short Range Wireless Communication Frequency Range: 869.7 to 870MHz RF Power: 5mW Transmission Range: Approx. 150 meters (500 ft) if direct and unobstructed Bluetooth 4.2 (Bluetooth Low Energy) (*3) Optical Communication
Power	Lithium Battery LS14250 x 1 L Type: Large Capacity Battery Kit RTR–500B1 (*4) External Power Adaptor Kit RTR–500A2
Battery Life (*5)	Approx. 10 months L Type: About 4 years
Dimensions	H 62 mm x W 47 mm x D 19 mm L type: H 62 mm x W 47 mm x D 46.5 mm (excluding protrusions and sensor) 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	IP64: Splash proof (rated for use in daily life) (*6)
Accessories	Lithium Battery LS14250 or Large Capacity Battery Kit RTR–500B1, Strap (Not included with L type models), Manual Set (Warranty included)
Compatible Base Units	RTR500BC, RTR500BW, RTR500BM RTR–500DC, RTR–500MBS-A, RTR–500NW/AW (*7) (*8) RTR–500 (*8)

\*1: Measurement item depends on the input module (sold separately).

\*2: Only “Endless” is available when using the RTR500BW, RTR500BM, RTR-500NW/AW or RTR-500MBS-A as a Base Unit.

\*3: Bluetooth is available when using the RTR500BW as a Base Unit and making device settings in the mobile app (T&D 500B Utility).

\*4: When using RTR-500B1 it is necessary to purchase Lithium Battery (LS26500). For details, contact your local authorized distributor.

\*5: Battery life depends on several factors, including ambient temperature, radio environment, frequency of communication, recording interval, and quality of the battery being used. All estimates are based on operations carried out with a new battery and are in no way a guarantee of actual battery life.

\*6: Input module (sold separately) is not water resistant.

\*7: A firmware update is required to a RTR500B series compatible version.

\*8: A software update is required to a RTR500B series compatible version.

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## Input Modules for RTR505B

	Thermocouple Module <b>TCM-3010</b>	Pt Module <b>PTM-3010</b>	Voltage Module <b>VIM-3010</b>	4-20mA Module <b>AIM-3010</b>	Pulse Input Cable <b>PIC-3150</b>
Measurement Channels	Temperature 1ch	Temperature 1ch	Voltage 1ch	4-20mA 1ch	Pulse Count 1ch
Sensor	Thermocouple: Type K, J, T, S	Pt100, Pt1000 3-wire, 4-wire (*1)	-	-	-
Measurement Units	°C, °F	°C, °F	V, mV	mA	P
Measurement Range	K -199 to 1370 °C J -199 to 1200 °C T -199 to 400 °C S -50 to 1760 °C	-199 to 600 °C	0 to 22 V	0 to 20 mA Operational up to 40mA	
Accuracy (*2)	Thermocouple Measurement K, J, T: $\pm(0.3\text{ °C} + 0.3\% \text{ of reading})$ S: $\pm(1\text{ °C} + 0.3\% \text{ of reading})$ Cold Junction Compensation $\pm 0.3\text{ °C}$ at 10 to 40 °C $\pm 0.5\text{ °C}$ at -40 to 10 °C, 40 to 80 °C	$\pm(0.3\text{ °C} + 0.3\% \text{ of reading})$ at 10 to 40 °C $\pm(0.5\text{ °C} + 0.3\% \text{ of reading})$ at -40 to 10 °C, 40 to 80 °C	$\pm(0.5\text{ mV} + 0.3\% \text{ of reading})$ at 10 to 40 °C $\pm(1\text{ mV} + 0.5\% \text{ of reading})$ at -40 to 10 °C, 40 to 80 °C	$\pm(0.05\text{ mA} + 0.3\% \text{ of reading})$ at 10 to 40 °C $\pm(0.1\text{ mA} + 0.3\% \text{ of reading})$ at -40 to 10 °C, 40 to 80 °C	Input Signal: Non-voltage Contact Input Voltage Input (0 to 27 V)  Detection Voltage: Lo 0.5 V or less Hi 2.5 V or more  Input Impedance: Approx.100 KΩ pull up  Chattering Filter: ON 15 Hz or less OFF 3.5 kHz or less
Note: The temperature range shown above represents the operating environment of the Input Module.					
Measurement Resolution	K, J, T: 0.1 °C S: 0.2 °C	0.1 °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	0.01 mA	Maximum Count: 61,439/Recording Interval

\*1: In the case of a 4-wire sensor, one wire will be left unused.

\*2: For TCM-3010 and PTM-3010, sensor inaccuracies are not included.

\*3: In the case of a 4-wire sensor, one wire will be left unused.

The specifications listed above are subject to change without notice.

# RTR-574 / 574-S Specifications

	RTR-574		RTR-574-S	
Temperature-Humidity Sensor				
Measurement Channels	Temperature 1ch	Humidity 1ch	Temperature 1ch	Humidity 1ch
Sensor	THA-3151		SHA-3151 High-Precision Type	
	Thermistor	Polymer Resistance	Thermistor	Polymer Resistance
Measurement Units	°C, °F	%RH	°C, °F	%RH
Measurement Range	0 to 55 °C	10 to 95%RH	-25 to 70 °C	0 to 99 %RH (*1)
Accuracy	±0.5 °C	± 5%RH at 25°C, 50%RH	±0.3°C at 10 to 40 °C ±0.5°C all other temperatures	±2.5 %RH at 15 to 35 °C, 30 to 80 %RH
Measurement Resolution	0.1 °C	1%RH	0.1 °C	0.1 %RH
Responsiveness	Response Time (90%): Approx. 7 min.		Response Time (90%): Approx. 7 min.	
Illuminance-UV Sensor				
Measurement Channels	Illuminance: 1ch UV Intensity: 1ch			
Sensor	ISA-3151			
Measurement Units	Illuminance: lx, klx UV Intensity: mW/cm <sup>2</sup>			
Measurement Range	Illuminance: 0 lx to 130 klx UV Intensity: 0 to 30 mW/cm <sup>2</sup>			
Units of Cumulative Measurement	Cumulative Illuminance: lxh, klxh, Mlxh Cumulative amount of UV Light: mW/cm <sup>2</sup> h, W/cm <sup>2</sup> h			
Display Range of Cumulative Measurement	Illuminance: 0 lxh to 90 Mlxh UV Intensity: 0 mW to 62 W/cm <sup>2</sup> h			
Accuracy	Illuminance 10 lx to 100 klx: ±5 % at 25°C, 50 %RH UV Intensity 0.1 to 30 mW/cm <sup>2</sup> : ±5% at 25°C, 50 %RH (*2)			
Relative Spectral Response	Illuminance : Approximated to the CIE standard response function V (λ) UV Intensity: 260 to 400 nm (UVA / UVB)			
Measurement Resolution	Illuminance : Minimum: 0.01 lx UV Intensity : Minimum of 0.001 mW/cm <sup>2</sup>			
Responsiveness	Response Time (90%): 3 sec. at recording interval of 1 sec. or 6 sec. at other intervals			
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 (*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. •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			
Communication Interfaces	Short Range Wireless Communication <For US> Frequency Range: 902 to 928MHz Power: 7mW Transmission Range: About 150 meters (500 ft) if unobstructed and direct <For EU> Frequency Range: 869.7 to 870MHz RF Power: 5mW Transmission Range: About 150 meters (500 ft) if unobstructed and direct USB 2.0 (Mini-B connector) Serial Communication: RS-232C (*4)			
Wireless Transmission Range	Approx. 150 meters (500 ft) if direct and unobstructed			
Power	AA Alkaline Battery LR6 x 1			
Battery Life (*5)	Approx. 4 months			
Dimensions	H 55 mm x W 78 mm x D 18 mm Antenna Length: 60 mm			
Weight	Approx. 45 g			
Operating Environment	Temperature: -10 to 60°C, Humidity: 90 %RH or less (no condensation)			
Accessories	Temperature-Humidity Sensor THA-3151 Illuminance-UV Sensor ISA-3151		High Precision Temperature-Humidity Sensor SHA-3151 Illuminance-UV Sensor ISA-3151	
	AA Alkaline Battery LR6, USB Mini-B Cable US-15C, Manual (Warranty Included)			
Compatible Base Units	RTR500BC, RTR500BW, RTR500BM RTR-500, RTR-500NW/500AW, RTR-500DC, RTR-500MBS-A			

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

\*3: Only "Endless" is available when using the RTR500BW, RTR500BM, RTR-500NW/AW or RTR-500MBS-A as a Base Unit.

\*4: For communication with the Data Collector RTR-500DC (Note: Optional serial communication cable TR-6C10 is required.)

\*5: Battery life varies depending upon multiple factors including ambient temperature, radio environment, 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.

The specifications listed above are subject to change without notice.



## RTR-576 / 576-S Specifications

	RTR-576		RTR-576-S	
Temperature-Humidity Sensor				
Measurement Channels	Temperature 1ch	Humidity 1ch	Temperature 1ch	Humidity 1ch
Sensor	THA-3001		SHA-3151 High-Precision Type	
	Thermistor	Polymer Resistance	Thermistor	Polymer Resistance
Measurement Units	°C, °F	%RH	°C, °F	%RH
Measurement Range (*2)	0 to 55 °C	10 to 95%RH	-25 to 70 °C	0 to 99 %RH (*3)
Accuracy	±0.5 °C	5 %RH at 25 °C, 50 %RH	±0.3°C at 10 to 40 °C ±0.5°C all other temperatures	±2.5 %RH at 15 to 35 °C, 30 to 80 %RH
Measurement Resolution	0.1 °C	1 %RH	0.1 °C	0.1 %RH
Responsiveness	Response Time (90%): Approx. 7 min.		Response Time (90%): Approx. 7 min.	
CO2 Sensor (Internal)				
Measurement Channels	CO2 Concentration 1ch			
Sensor	NDIR			
Measurement Channels	CO2 Concentration 1ch			
Measurement Units	ppm			
Measurement Range	0 to 9,999 ppm			
Accuracy	±(50 ppm + 5% of reading) at 5,000 ppm or less (*1)			
Measurement Resolution	Minimum of 1 ppm			
Responsiveness	Response Time (90%): Approx. 1 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 (*4)	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	Short Range Wireless Communication <For US> Frequency Range: 902 to 928MHz Power: 7mW Transmission Range: About 150 meters (500 ft) if unobstructed and direct <For EU> Frequency Range: 869.7 to 870MHz RF Power: 5mW Transmission Range: About 150 meters (500 ft) if unobstructed and direct USB 2.0 (Mini-B connector) Serial Communication: RS-232C (*4)			
Wireless Transmission Range	Approx. 150 meters (500 ft) if direct and unobstructed			
External Alarm Terminal (*6)	Output Terminal: Open Drain Output (Voltage when OFF: DC less than 30V / Current when ON: less than 0.1A / Resistance when ON: about 15Ω)			
Power	AC Adaptor AD-06A1 or AD-06C1, AA Alkaline Battery LR6 x 4			
Battery Life (*7)	Approx. 2 days (batteries only without AC adaptor)			
Dimensions	H 96 mm x W 66 mm x D 46 mm Antenna Length: 60 mm			
Weight	Approx. 125 g			
Operating Environment	Temperature: 0 to 45°C Humidity: 90 %RH or less (no condensation)			
Accessories	Temperature-Humidity Sensor THA-3001		High Precision Temperature-Humidity Sensor SHA-3151	
	AA Alkaline Battery LR6 x 4, AC Adaptor AD-06A1 or AD-06C1, USB Mini-B Cable US-15C, Software CD-ROM, User's Manual Set (Warranty Included)			
Compatible Base Units	RTR500BC, RTR500BW, RTR500BM RTR-500, RTR-500NW/500AW, RTR-500DC, RTR-500MBS-A			

- \*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 CO2 Recorder for Windows.
- \*2: Make sure to use the data logger within the operating environment as listed in the specifications.
- \*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.
- \*4: Only "Endless" is available when using the RTR500BW, RTR500BM, RTR-500NW/AW or RTR-500MBS-A as a Base Unit.
- \*5: For communication with the Data Collector RTR-500DC (Note: Optional serial communication cable TR-6C10 is required.)
- \*6: In order to use the external alarm terminal, please prepare a compatible connector: JST PAP-04V-S.
- \*7: Battery life varies depending upon multiple factors including ambient temperature, radio environment, 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.
- The specifications listed above are subject to change without notice.

