Wireless Data Logger

RTR-500 Series Data Loggers Features and Specs

Measurement Items
Temp / Humidity / Illuminance / UV / CO2 / Voltage / 4-20mA / Contact / Pulse Count

Data Collection
Wireless Communication with Data Collectors

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.

| Model	Measurement Items	Measurement Range	Notes
RTR-501 /501L	Temperature 1ch (internal sensor)	–40 to 80°C **EN 12830 Compliant**	Gradual Response Time Optimum Waterproof and Dustproof Capabilities
RTR-502 / 502L	Temperature 1ch	–60 to 155°C **EN 12830 Compliant**	External Sensor for Quicker Response Time / Splashproof Wide Selection of Optional Sensors
RTR-503 / 503L	Temperature / Humidity 1ch Each	0 to 55°C / 10 to 95%RH	Measure Temperature and Humidity
RTR-507S / 507SL	Temperature / Humidity 1ch Each	–25 to 70°C / 0 to 99%RH	Measure Temperature and Humidity (High Precision)
RTR-505-TC / 505-TCL	Temperature 1ch (Thermocouple)	–199 to 1760°C	For use with Thermocouple Sensor Types: K, J, T, S
RTR-505-Pt / 505-PtL	Temperature 1ch (Pt100, Pt1000)	–199 to 600°C	Supports 3-wire and 4-wire Sensors High Precision Measurement in Wide Temperature Range
RTR-505-V / 505-VL	Voltage 1ch	DC 0 to 22V Min Resolution: 0.1mA	Preheat Function / Scale Conversion
RTR-505-mA / 505-mAL	4-20mA 1ch	0 to 20 mA	Operational up to 40 mA / Scale Conversion
RTR-505-P / 505-PL	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.

The RTR-501 and RTR-502 data loggers 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.

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 130,000 lx 0 to 30 mW/cm² 0 to 55°C 10 to 95%RH	0 to 130,000 lx 0 to 30 mW/cm² –30 to 80°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	CO2 Concentration Temperature Humidity 1ch each	0 to 9,999 ppm 0 to 55°C 10 to 95%RH	0 to 9,999 ppm –30 to 80°C 0 to 99%RH	For measuring CO2 concentration in living environments. Auto Calibration Function

Collect Data via Wireless Communication with a Base Unit

Data loggers in our RTR-500 Series only function as Remote Units and need to be used with one of our collection devices (Base Unit).

Remote Unit(s)   Base Unit   Remote Unit(s)
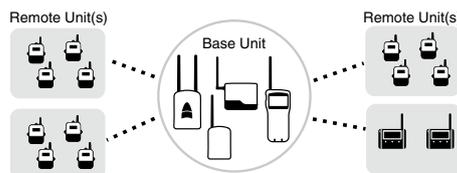
The collected data can then be transmitted to a PC by a variety of methods such as USB, E-mail, or FTP. Moreover, various functions, such as the monitoring of current readings and warning notification, make it a powerful data management system.

* 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 (RTR-507S / 507SL / 574-S / 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.

RTR-501 / 502 / 503 / 507S Specifications

	RTR-501 / 501L	RTR-502 / 502L	RTR-503 / 503L		RTR-507S / 507SL	
Measurement Channels	Temperature 1ch (Internal)	Temperature 1ch	Temperature 1ch	Humidity 1ch	Temperature 1ch (High Precision Type)	Humidity 1ch
Sensor	Thermistor	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		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 ·FCC Part15 Section247 / IC RSS-210 Frequency Range: 902 to 928MHz, RF Power: 7mW ·ETSI EN 300 220 Frequency Range: 869.7 to 870MHz, RF Power: 5mW Optical Communication					
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) (*3) External Power Adaptor Kit (RTR-500A2: sold separately) (*4)					
Battery Life (*5)	Approx. 10 months L Type: About 4 years					
Dimensions	H 62 ㎜ x W 47 ㎜ x D 19 ㎜ L type: H 62 ㎜ x W 47 ㎜ x D 46.5 ㎜ Antenna length: 24 ㎜					
Weight	Approx. 50 g L Type: approx. 65 g					
Operating Environment	−40 to 80°C −30 to 80°C during wireless communication				−40 to 80°C −10 to 80°C during wireless communication (*6)	
Waterproof Capacity	IP67: Immersion proof	IP64: Splash proof (rated for use in daily life) (*7)	IP64: Splash proof (rated for use in daily life) (*7)		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	
	Lithium Battery LS14250 or Large Capacity Battery Adaptor Kit RTR-500B1, Strap (Not included with L type models), Manual (Warranty included)					
Compatible Base Units	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: Only "Endless" is available when using RTR-500W for Windows or RTR-500MBS 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, as it will cause the RTR-501 to display a higher than actual temperature reading of up to 3°C.
*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: 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.
The specifications listed above are subject to change without notice.

T and D

RTR-505 Specifications

	RTR-505-TC/ 505-TCL	RTR-505-Pt/ 505-PtL	RTR-505-V / 505-VL	RTR-505-mA/ 505-mAL	RTR-505-P/ 505-PL
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
					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 KΩpull up
					
					Chattering Filter:
					  ON 15 Hz or less
					  OFF 3.5 kHz or less

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
		±(0.3 °C+0.3 % of reading)
		  at 10 to 40 °C
		±(0.5 °C+0.3 % of reading)
		  at −40 to 10 °C, 40 to 80 °C
			±(0.5 mV+0.3% of reading)
			  at 10 to 40 °C
			±(1 mV+0.5% of reading)
			  at −40 to 10 °C, 40 to 80 °C
				±(0.05 mA+0.3% of reading)
				  at 10 to 40 °C
				±(0.1mA+0.3% of reading)
				  at −40 to 10 °C, 40 to 80 °C	

	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

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	Short Range Wireless Communication
	 •FCC Part15 Section247 / IC RSS-210
	   Frequency Range: 902 to 928MHz, RF Power: 7mW
	 •ETSI EN 300 220
	   Frequency Range: 869.7 to 870MHz, RF Power: 5mW
	Optical Communication

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

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

*1: In the case of a 4-wire sensor, one wire will be left unused.
*2: For RTR-505-TC and RTR-505-Pt, 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.

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^2			
Measurement Range	Illuminance: 0 lx to 130 klx / UV Intensity: 0 to 30 mW/cm^2			
Units of Cumulative Measurement	Cumulative Illuminance: lxh, klxh, Mlxh / Cumulative amount of UV Light: mW/cm^{2}h, W/cm^{2}h			
Display Range of Cumulative Measurement	Illuminance: 0 lxh to 90 Mlxh / UV Intensity: 0 mW to 62 W/cm^{2}h			
Accuracy	Illuminance 10 lx to 100 klx: ±5 % at 25°C, 50 %RH			
	UV Intensity 0.1 to 30 mW/cm^2 : ±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^2			
Responsiveness	Response Time (90%) 3 sec. at recording interval of 1 sec., 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 •FCC Part15 Section247 / IC RSS-210 Frequency Range: 902 to 928MHz, RF Power: 7mW •ETSI EN 300 220 Frequency Range: 869.7 to 870MHz, RF Power: 5mW Optical Communication 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	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 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 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.
The specifications listed above are subject to change without notice.

T and D

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
	  •FCC Part15 Section247 / IC RSS-210
	    Frequency Range: 902 to 928MHz, RF Power: 7mW
	  •ETSI EN 300 220
	    Frequency Range: 869.7 to 870MHz, RF Power: 5mW
	Optical Communication
	Serial Communication: RS-232C (*5)			

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 ㎜ x W 66 ㎜ x D 46 ㎜ Antenna Length: 60 ㎜			
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	RTR-500, RTR-500NW/500AW, RTR-500MBS-A, RTR-500DC			

*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 RTR-500W for Windows or RTR-500MBS for Windows.
*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, 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.

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