DATASHEET

RTR503BL

T&D

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Wireless Data Logger

RTR500B Series Data Loggers Features and Specs

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

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 Wide Selection of Optional Sensors Splashproof
RTR503B / 503BL	Temperature 1ch Humidity 1ch	0 to 55 °C 10 to 95 %RH	Measure Temperature and Humidity
RTR507B / 507BL	Temperature 1ch Humidity 1ch	-25 to 70 °C 0 to 99 %RH	Measure Temperature and Humidity (High Precision)
RTR505B / 505BL + Input module TCM-3010	Temperature 1ch (Thermocouple)	-199 to 1760 °C	For use with Thermocouple Sensor Types: K, J, T, S
RTR505B / 505BL + Input module 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 / 505BL + Input module VIM-3010	Voltage 1ch	DC 0 to 22 V Min Resolution: 0.1 mV	Preheat Function Scale Conversion
RTR505B / 505BL + Input module AIM-3010	4-20mA 1ch	0 to 20 mA	Operational up to 40 mA Scale Conversion
RTR505B / 505BL + Input cable 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.

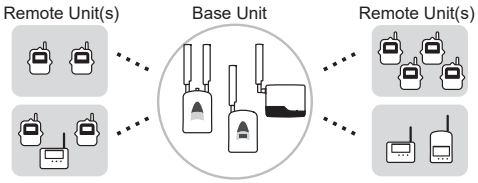
* Input module/cable for RTR505B is sold separately.

Model	Measurement Items	Measurement Range for Normal Type	Measurement Range for S Type	Notes
RTR-574 / 574-S	Illuminance UV Intensity Temperature Humidity 1ch each	0 to 130 klx 0 to 30 mW/cm^2 0 to 55 °C 10 to 95 %RH	0 to 130 klx 0 to 30 mW/cm^2 -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	CO2 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 CO2 concentration in living environments. Auto Calibration Function

* S-type models (model names which include "S") come with a high precision temp-humidity sensor.

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	Response Time (90 %): Approx. 35 min. Approx. 47 min. (L Type)	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), Recording Status, Battery Life Warning, etc.			
Communication Interfaces (*3)	Short Range Wireless Communication US Model: Frequency Range: 902 to 928 MHz RF Power: 7 mW Transmission Range: Approx. 150 meters (500 ft) if direct and unobstructed EU Model: Frequency Range: 869.7 to 870 MHz RF Power: 5 mW Transmission Range: Approx. 150 meters if direct and unobstructed Bluetooth 4.2 (Bluetooth Low Energy) (*4) Optical Communication			
Power	Lithium Battery: LS14250 x 1 L Type: Large Capacity Battery Kit RTR-500B1 (*5) AC Adaptor used with External Power Adaptor Kit RTR-500A2 (*6)			
Battery Life (*7)	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) (*8)		
Included Items	-	Temperature Sensor TR-5106	Temperature-Humidity Sensor TR-3310	High Precision Temp-Humidity Sensor SHB-3101
	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 Other devices (*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: There are US models and EU models in the RTR500B Series. They cannot be used together because they have different wireless specifications.
*4: Bluetooth is available when using the RTR500BW or RTR500BM as a Base Unit and making device settings in the mobile app (T&D 500B Utility).
*5: When using RTR-500B1 it is necessary to purchase Lithium Battery (LS26500). For details, contact your local authorized distributor.
*6: RTR-500A2 should not be used with the RTR501B, as it will cause the RTR501B to display a higher than actual temperature reading of up to 3 °C.
*7: The listed battery life is based on the following usage conditions: Recording at 10 second (or longer) intervals, Current Readings Transmission every 10 minutes, and Recorded Data Transmission once a day. Battery life also varies depending on ambient temperature, radio environment, frequency of communication, etc.
*8: This is the waterproof capacity of the data logger with the sensor connected. Note that the temperature-humidity sensor is not water resistant.
*9: Also compatible with the following discontinued products: RTR-500DC, RTR-500, RTR-500NW/AW, and RTR-500MBS-A. Please refer to "Compatibility Info for RTR500B and RTR-500 Series" at https://tandd.com/information/compatible-rtr500b-loggers.html.

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), Recording Status, Battery Life Warning, etc.
Communication Interfaces (*3)	Short Range Wireless Communication US Model: Frequency Range: 902 to 928 MHz RF Power: 7 mW Transmission Range: Approx. 150 meters (500 ft) if direct and unobstructed EU Model: Frequency Range: 869.7 to 870 MHz RF Power: 5 mW Transmission Range: Approx. 150 meters if direct and unobstructed Bluetooth 4.2 (Bluetooth Low Energy) (*4) Optical Communication
Power	Lithium Battery LS14250 x 1 L Type: Large Capacity Battery Kit RTR-500B1 (*5) AC Adaptor used with External Power Adaptor Kit RTR-500A2
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	IP64: Splash proof (rated for use in daily life) (*7)
Included Items	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 Other devices (*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: There are US models and EU models in the RTR500B Series. They cannot be used together because they have different wireless specifications.
*4: Bluetooth is available when using the RTR500BW or RTR500BM as a Base Unit and making device settings in the mobile app (T&D 500B Utility).
*5: When using RTR-500B1 it is necessary to purchase Lithium Battery (LS26500). For details, contact your local authorized distributor.
*6: The listed battery life is based on the following usage conditions: Recording at 10 second (or longer) intervals, Current Readings Transmission every 10 minutes, and Recorded Data Transmission once a day. Battery life also varies depending on ambient temperature, radio environment, frequency of communication, etc.
*7: Input module (sold separately) is not water resistant.
*8: Also compatible with the following discontinued products: RTR-500DC, RTR-500, RTR-500NW/AW, and RTR-500MBS-A. Please refer to "Compatibility Info for RTR500B and RTR-500 Series" at https://tandd.com/information/compatible-rtr500b-loggers.html.

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Input Modules for RTR505B

	Thermocouple Module **TCM-3010**	Pt Module **PTM-3010**	Voltage Module **VIM-3010**	4-20mA Module **AIM-3010**	Pulse Input Cable **PIC-3150**
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	Type K : -199 to 1370 °C Type J : -199 to 1200 °C Type T : -199 to 400 °C Type S : -50 to 1760 °C	-199 to 600 °C	0 to 22 V	0 to 20 mA Operational up to 40 mA	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 Maximum Count 61,439/Recording Interval
Accuracy (*2)	Thermocouple Measurement Type K, J, T : ±(0.3 + 0.003 × t) °C Type S : ±(1.0 + 0.003 × t) °C t = absolute value of measurement in °C 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 + 0.003 × t) °C at 10 to 40 °C ±(0.5 + 0.003 × t) °C at −40 to 10 °C, 40 to 80 °C t = absolute value of measurement in °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 ±(0.1 mA + 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	
Input Terminal Preheat Terminal* (*VIM-3010)	Miniature Thermocouple Connector	M3.5 Screw Terminal Block with Square Washer (3 terminals)	Screwless Terminal Block (Push-in Type, 4 terminals) Compatible Wires: AWG 28 – 22 (Single wire: Ø0.32 – Ø0.64 mm, Twisted wire: 0.08 – 0.32 mm², Ø0.12 mm or more in diameter) Recommended Wire Size: AWG 22		M3.5 Y-type Crimp Terminal

*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.
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. 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, Recording Status, Recording Mode, 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 (*4)	Short Range Wireless Communication US Model: Frequency Range: 902 to 928 MHz RF Power: 7 mW Transmission Range: About 150 meters (500 ft) if unobstructed and direct EU Model: Frequency Range: 869.7 to 870 MHz RF Power: 5 mW Transmission Range: About 150 meters if unobstructed and direct USB 2.0 (Mini-B connector)			
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 (excluding protrusions) Antenna Length: 60 mm			
Weight	Approx. 45 g			
Operating Environment	Temperature: –10 to 60 °C, Humidity: 90 %RH or less (no condensation)			
Included Items	AA Alkaline Battery LR6, USB Mini-B Cable US-15C, Illuminance-UV Sensor ISA-3151, Temperature-Humidity Sensor THA-3151 or SHA-3151, Manual Set (Warranty Included)			
Compatible Base Units	RTR500BC, RTR500BW, RTR500BM Other devices (*6)			

*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: There are US models and EU models in the RTR500B Series. They cannot be used together because they have different wireless specifications.
*5: The listed battery life is based on the following usage conditions: Recording at 10 second (or longer) intervals, Current Readings Transmission every 10 minutes, and Recorded Data Transmission once a day. Battery life also varies depending on ambient temperature, radio environment, frequency of communication, etc.
*6: Also compatible with the following discontinued products: RTR-500DC, RTR-500, RTR-500NW/AW, and RTR-500MBS-A.
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 (*1)	0 to 55 °C	10 to 95 %RH	-25 to 70 °C	0 to 99 %RH (*2)
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 Units	ppm			
Measurement Range	0 to 9,999 ppm			
Accuracy	±(50 ppm + 5 % of reading) at 5,000 ppm or less (*3)			
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, Recording Status, Recording Mode, Battery Level, etc. Measurements: CO2 concentration, Temperature or Humidity (fixed or alternating display)			
Communication Interfaces (*5)	Short Range Wireless Communication US Model: Frequency Range: 902 to 928 MHz RF Power: 7 mW Transmission Range: About 150 meters (500 ft) if unobstructed and direct EU Model: Frequency Range: 869.7 to 870 MHz RF Power: 5 mW Transmission Range: About 150 meters if unobstructed and direct USB 2.0 (Mini-B connector)			
External Alarm Terminal (*6)	Output Terminal: Open Drain Output (Voltage when OFF: DC less than 30 V / 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 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 (excluding protrusions and sensor) Antenna Length: 60 mm			
Weight	Approx. 125 g			
Operating Environment	Temperature: 0 to 45 °C Humidity: 90 %RH or less (no condensation)			
Included Items	AA Alkaline Battery LR6 x 4, AC Adaptor AD-06A1 or AD-06C1, USB Mini-B Cable US-15C, Temperature-Humidity Sensor THA-3001 or SHA-3151, Manual Set (Warranty Included)			
Compatible Base Units	RTR500BC, RTR500BW, RTR500BM Other devices (*8)			

*1: Make sure to use the data logger within the operating environment as listed in the specifications.
*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: 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 10 hPa 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 for the Base Unit.
*4: Only "Endless" is available when using the RTR500BW, RTR500BM, RTR-500NW/AW or RTR-500MBS-A as a Base Unit.
*5: There are US models and EU models in the RTR500B Series. They cannot be used together because they have different wireless specifications.
*6: In order to use the external alarm terminal, please purchase the optional alarm connection cable (AC0101).
*7: The listed battery life is based on the following usage conditions: Recording at 10 second (or longer) intervals, Current Readings Transmission every 10 minutes, and Recorded Data Transmission once a day. Battery life also varies depending on ambient temperature, radio environment, frequency of communication, etc.
*8: Also compatible with the following discontinued products: RTR-500DC, RTR-500, RTR-500NW/AW and RTR-500MBS-A.
The specifications listed above are subject to change without notice.