T&D CORPORATION

RTR-500 Series - Wireless Thermo Recorder

Specifications

FCC model / CE model	RTR-501/501L	RTR-502/502L	RTR-503/503L	
Measurement Channels	Temperature 1ch (Internal)	Temperature 1ch (External)	Temperature 1ch, Humidity 1ch (External)	
Sensor	Thermistor	Thermistor	Thermistor	Polymer Resistance
Measurement Units	°C, °F	°C, °F	°C, °F	%
Measurement Range	-40 to 80°C	-60 to 155°C	0 to 55°C	10 to 95%RH
Accuracy	Avg±0.5°C	Avg±0.3°C [-20 to 80°C] Avg±0.5°C [-40 to -20°C / 80 to 110°C] Avg±1.0°C [-60 to -40°C /110 to 155°C]	Avg±0.3°C	±5%RH [at 25°C and 50%RH]
Measurement Resolution	0.1°C	0.1°C	0.1°C	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.	
Logging Capacity	16,000 readings		8,000 data sets (One data set consists of readings for multiple channels.)	
Recording Intervals	Select from 15 choices: 1,2,5,10,15,20,30 sec. or 1,2,5,10,15,20,30,60 min.			
Recording Mode (*1)	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	Wireless Communication (Short Range Radio 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) USB Communication Serial Communication(RS-232C)(*4)			
Wireless Transmission Range	Approx. 150 meters (500 ft) if direct and unobstructed			
Power	Lithium Battery: LS14250(*2) x 1 L Type: Large Capacity Battery Adaptor Kit (RTR-500B1)(*3) External Power Adaptor Kit (RTR-500A1: sold separately)			

Battery Life (*4)	About 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. 56g L Type: approx. 109g (including battery / excluding sensor)		
Operating Environment	-30 to 80°C (The environmental operating range of the logger unit is -40 to 80°C, but wireless communications cannot be utilized in an environment less than -30°C.)		
Waterproof Capacity	IP67: immersion proof	IP64: Splash proof (rated for use in daily life) (*5)	IP64: Splash proof (rated for use in daily life) (*6) Note: Sensor is not water resistant.
Accessories	-	Temperature Sensor (TR-5106)	Temperature/Humidity Sensor (TR-3310)
	Lithium Battery (LS14250) or Large Capacity Battery Adaptor Kit (RTR-500B1), Strap, User's Manual (Warranty Included)		
Compatible Base Units	RTR-500, RTR-500NW/500AW, RTR-500DC, RTR-500GSM		

(*1) Only "Endless" is available when using RTR-500W for Windows or RTR-500GSM for Windows.

(*2) The included lithium battery (LS14250) is not sold in stores. Please purchase the optional battery set for low-temperature use (TR-11P2) for replacement.

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

(*4) 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.

(*5) This is the waterproof capacity of the data logger with the sensor connected.

FCC model / CE model	**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)	-	-	-
Measurement Units	°C, °F	°C, °F	V, mV	mA	P
Measurement Range	-199 to 1700°C	-199 to 600°C	0 to 22V	0 to 20mA (Operational up to 40mA)	
Accuracy	**Thermocouple Measurement** ±(0.3°C + 0.3 % of reading) [Type K, J, T] ±(1°C + 0.3 % of reading) [Type S] **Cold Junction Compensation** ±0.3°C [10 to 40°C] ±0.5°C [-40 to 10°C / 40 to 80°C]	±(0.3°C + 0.3 % of reading)[10 to 40°C] ±(0.5°C + 0.3 % of reading)[-40 to 10°C / 40 to 80°C]	±(0.5 mV + 0.3 % of reading)[10 to 40°C] ±(1 mV + 0.5 % of reading) [-40 to 10°C / 40 to 80°C]	±(0.05 mA + 0.3 % of reading)[10 to 40°C] ±(0.1mA + 0.3 % of reading) [-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: 2.5V 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
	Note: The above mentioned temperature is the operating environment for Input Module only.				
Measurement Resolution	Type K, J, T : 0.1 °C Type S : Approx. 0.2 °C	0.1 °C	up to 400mV: at 0.1mV, up to 800mV: at 0.2mV, up to 999mV: at 0.4mV, up to 3.2V: at 1mV, up to 6.5V: at 2mV,	0.01 mA	

			up to 9.999V: at 4mV, up to 22V: at 10mV		Interval
Module Specifications	TCM-3010	PTM-3010	VIM-3010	AIM-3010	PIC-3150
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	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	Wireless Communication (Short Range Radio 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 (proprietary protocol)				
Wireless Transmission Range	Approx. 150 meters (500 ft) if direct and unobstructed				
Power	Lithium Battery: LS14250(*2) or CR2(*3) x 1 L Type: Large Capacity Battery Adaptor Kit (RTR-500B1)(*4) External Power Adaptor Kit (RTR-500A1: sold separately)				
Battery Life(*5)	About 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. 56g L Type: approx. 109g (including battery / excluding sensor)				
Operating Environment	-30 to 80°C (The environmental operating range of the logger unit is -40 to 80°C, but wireless communications cannot be utilized in an environment less than -30°C.)				
Waterproof Capacity(*6)	IP64: Splash proof (rated for use in daily life) Note: Sensor 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), Strap, User's Manual (Warranty Included)				
Compatible Base Units	RTR-500, RTR-500NW/500AW, RTR-500DC, RTR-500GSM		RTR-500, RTR-500NW/500AW, RTR-500DC		

(*1) Only "Endless" is available when using RTR-500W for Windows or RTR-500GSM for Windows.

(*2) The included lithium battery (LS14250) is not sold in stores. Please purchase the optional battery set for low-temperature use (TR-11P2) for replacement.

(*3) Only use the CR2 within temperature range of -20 to 60°C, avoiding exposing the CR2 to excessive vibration such as transportation.

(*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 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.

(*6) This is the waterproof capacity of the data logger with the sensor connected.

FCC model / CE model	**RTR-507/507L**	
Measurement Channels	Temperature 1ch, Humidity 1ch (External)	
Sensor	Platinum Resistance	Electrostatic Capacitance
Measurement Range	-30 to 80°C	0 to 99%RH

Accuracy	±0.3°C (at 0 to 50°C) ±0.5°C (at all other temperatures)	2.5 %RH [at 25°C, 10 to 85 %RH] 4.0 %RH [at 25°C, 0 to 10 or 85 to 99 %RH] At temperatures other than 25°C and ≥ 0°C, add 0.1 %RH per degree of difference from 25. Humidity Hysteresis: ±1.5 %RH or lower (*1)
Measurement Resolution	0.1°C	0.1 %RH
Responsiveness	Response Time (90%): Approx. 7 min.	Response Time (90%): Approx. 20 sec.
Logging Capacity	8000 data sets (One data set consists of readings for both temperature and humidity.)	
Recording Intervals	Select from 15 choices: 1, 2, 5, 10, 15, 20, 30sec. or 1, 2, 5, 10, 15, 20, 30, 60min.	
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	・Wireless Communication (Short Range Radio 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 (proprietary protocol)	
Wireless Transmission Range	Approx. 150 meters (500 ft) if direct and unobstructed	
Power	Lithium Battery: LS14250(*3) L Type: Large Capacity Battery Adaptor Kit (RTR-500B1)	
Battery Life (*4)	About 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. 56g L Type: approx. 109g (including battery / excluding sensor)	
Operating Environment	-40 to 80°C (-10 to 80°C during wireless communication)(*5)	
Waterproof Capacity	IP64: Splash proof (rated for use in daily life)(*6) Note: Sensor is not water resistant.	
Accessories	Lithium Battery (LS14250) or Large Capacity Battery Adaptor Kit (RTR-500B1), Temperature/Humidity Sensor (HHB-3101), Strap, User's Manual (Warranty Included)	
Compatible Base Units	RTR-500, RTR-500NW/500AW, RTR-500DC	

(*1)When used in environments where temperature and humidity are over the values of 50°C 75%, 60°C 50%, 70°C 35%, and 80°C 25%, sensor hysteresis may fluctuate by values greater than ±1.5%RH. Under certain circumstances, it may take some time to return to normal measurement capability.

(*2) Only "Endless" is available when using RTR-500W for Windows.

(*3) The included lithium battery (LS14250) is not sold in stores. Please purchase the optional battery set (TR-11P2) for replacement.

(*4) 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.

(*5) When wireless communication is performed in an environment below -10°C, measurement may fail or may not be accurate.

(*6)This is the waterproof capacity of the data logger with the sensor connected.

Product	**RTR-574**		**RTR-574-H**	
Temperature/Humidity Sensor (External)	THA-3151		HHA-3151(High-Precision Type)	
	Thermistor	Polymer Resistance	Platinum Resistance	Electrostatic Capacitance
Measurement Channels	Temperature 1ch	Humidity 1ch	Temperature 1ch	Humidity 1ch
Units of				

Measurement	°C, °F	%RH	°C, °F	%RH
Measurement Range	0 to 55 °C	10 to 95 %RH	-30 to 80 °C	0 to 99 %RH
Accuracy	±0.5 °C	±5 %RH [at 25 °C, 50 %RH]	±0.3°C [0 to 50 °C) ±0.5°C [all other temperatures]	±2.5 %RH[at 25 °C, 10 to 85 %RH] ±4.0 %RH[at 25 °C, 0 to 10 % or 85 to 99 %RH] At temperatures other than 25 °C and ≥ 0 °C, add ±0.1 %RH per degree of difference from 25. Humidity Hysteresis: ±1.5 %RH or lower(*1)
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.	Response Time(90%): Approx. 20 sec.
Illuminance/UV Sensor (External)	ISA-3151			
Measurement Channels	Illuminance: 1ch UV intensity: 1ch			
Units of Measurement	Illuminance: lx, Klx UV intensity: mW/cm2			
Measurement Range	Illuminance: 0 lx to 130 Klx UV Intensity: 0 to 30 mW/cm2			
Units of Cumulative Measurement	Cumulative Illuminance: lxh, Klxh, Mlxh Cumulative amount of UV Light: mW/cm2, W/cm2			
Display Range of Cumulative Measurement	Illuminance: 0 lxh to 90 Mlxh UV Intensity: 0 mW to 62 W/cm2h			
Accuracy	Illuminance: 10 lx to 100 Klx：±5 % [at 25°C, 50 %RH] UV Intensity: 0.1 to 30 mW/cm2：±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			
Measurement Resolution	Illuminance: Minimum of 0.01 lx UV Intensity: Minimum of 0.001 mW/cm2			
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	Wireless Communication (Short Range Radio 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) USB Communication Serial Communication (RS-232C) (*5)			
Wireless Transmission Range	Approx. 150 meters (500 ft) if direct and unobstructed			

Power	AA Alkaline Battery (LR6) x 1
Battery Life (*4)	Approx. 4 months
Dimensions	H 55 mm x W 78 mm x D 18 mm(excluding protrusions) Antenna Length: 60 mm
Weight	About 68 g (including battery, excluding sensor)
Operating Environment	Temperature: -10 to 60 °C Humidity: 90 %RH or less (no condensation)
Accessories	AA alkaline battery (LR6), USB Communication Cable (US-15C), Illuminance/UV Sensor (ISA-3151), Temperature/Humidity Sensor (THA-3151 or HHA-3151), Software (CD-ROM), User's Manual Set (Warranty Included)
Compatible Base Units	RTR-500, RTR-500NW/500AW, RTR-500DC

*1 When used in environments where temperature and humidity are over the values of 50°C 75%, 60°C 50%, 70°C 35%, and 80°C 25%, sensor hysteresis may fluctuate by values greater than ±1.5%RH. Under certain circumstances, it may take some time to return to normal measurement capability.

*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.

*4 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.

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

Product	**RTR-576**		**RTR-576-H**	
Temperature / Humidity Sensor(External)	THA-3001		HHA-3151(High-Precision Type)	
	Thermistor	Polymer Resistance	Platinum Resistance	Electrostatic Capacitance
Measurement Channels	Temperature 1ch	Humidity 1ch	Temperature 1ch	Humidity 1ch
Measurement Range(*2)	0 to 55 °C	10 to 95 %RH	-30 to 80 °C	0 to 99 %RH
Accuracy	±0.5 °C	±5 %RH (at 25 °C, 50 %RH)	±0.3°C (at 10 to 50 °C) ±0.5°C (at all other temperatures)	±2.5 %RH(at 25 °C, 10 to 85 %RH) ±4.0 %RH(at 25 °C, 0 to 10 % or 85 to 99 %RH) At temperatures other than 25 °C and ≥ 0 °C, add ±0.1 %RH per degree of difference from 25. Humidity Hysteresis: ±1.5 %RH or lower(*3)
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.	Response Time(90%): Approx. 20 sec.
Sensor	**NDIR**			
Measurement Channels	CO2 Concentration 1ch			
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	Wireless Communication （Short Range Radio 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) USB Communication Serial Communication (RS-232C) (*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 0.1A / Resistance when ON: about 15Ω)
Power	AC Adaptor （AD-0638 or AD-0638-C）, AA Alkaline Battery (LR6) x 4
Battery Life (*6)	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. 220 g (including battery, excluding sensor)
Operating Environment	Temperature: 0 to 45 °C Humidity: 90 %RH or less （no condensation）
Accessories	AA Alkaline Battery (LR6) x 4, AC Adaptor （AD-0638 or AD-0638-C）, USB Communication Cable (US-15C), Temperature/Humidity Sensor (THA-3001 or HHA-3151), User's Manual Set (Warranty Included）
Compatible Base Units	RTR-500C, RTR-500NW/500AW, 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 the software supplied with the Base Unit.

*2 Make sure to use the data logger within the operating environment as listed in the specifications.

*3 When used in environments where temperature and humidity are over the values of 50°C 75%, 60°C 50%, 70°C 35%, and 80°C 25%, sensor hysteresis may fluctuate by values greater than ±1.5%RH. Under certain circumstances, it may take some time to return to normal measurement capability.

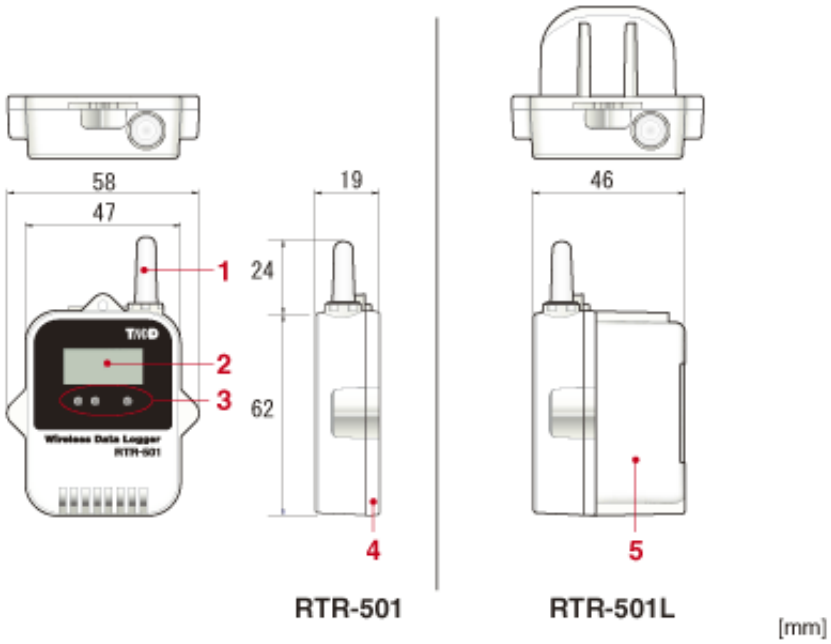
*4 Only "Endless" is available when using RTR-500W for Windows.

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

*6 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.

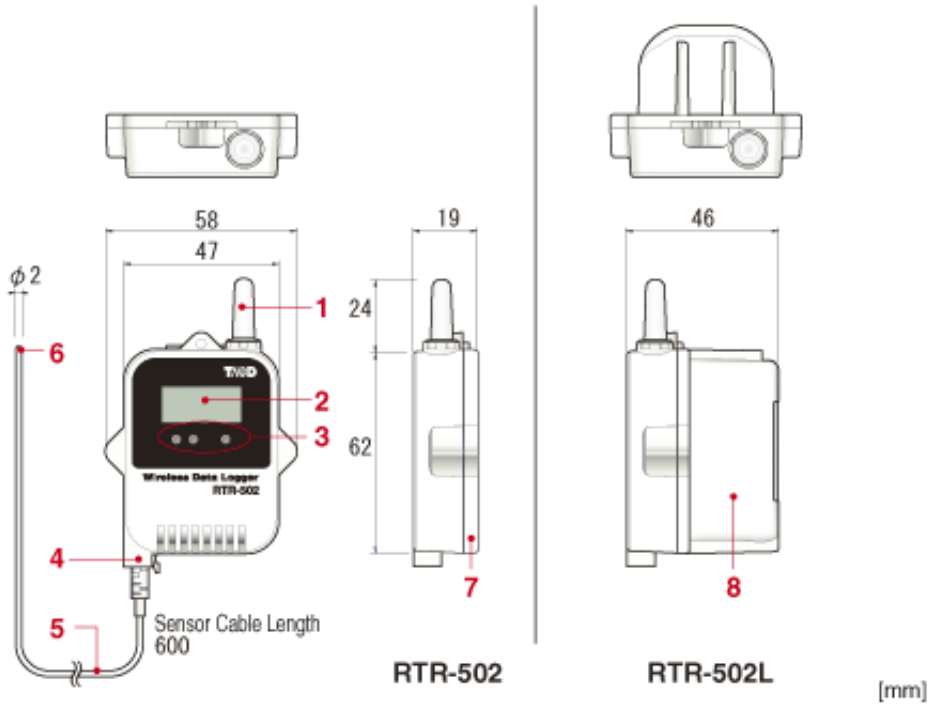
Dimensions

RTR-501 / 501L



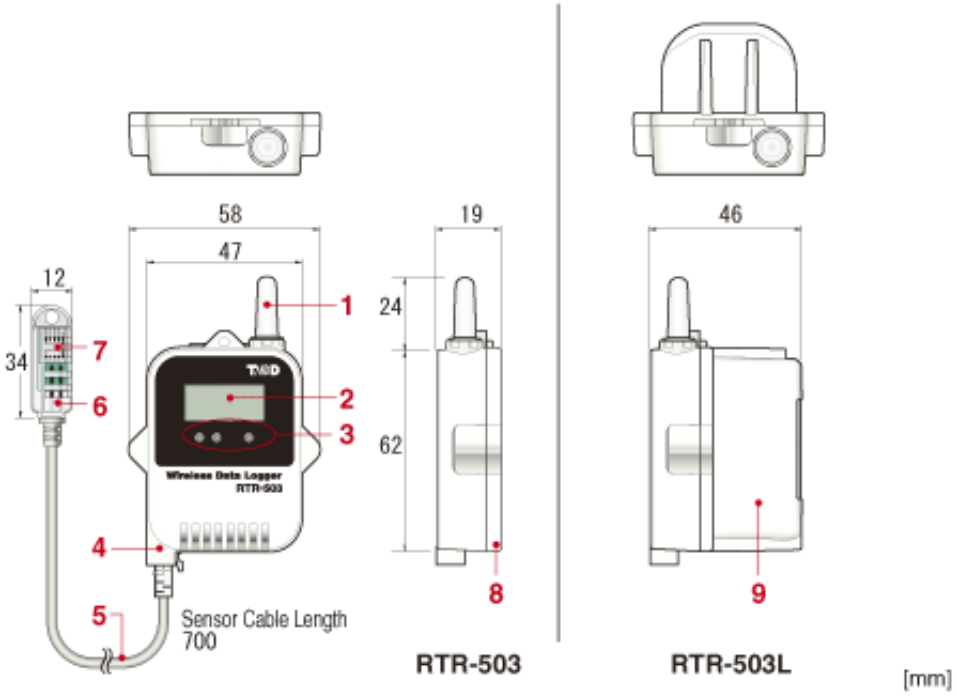
1: Antenna
2: LCD Display
3: Optical communication Area
4: Back Case
5: Large Capacity Battery Case

RTR-502 / 502L



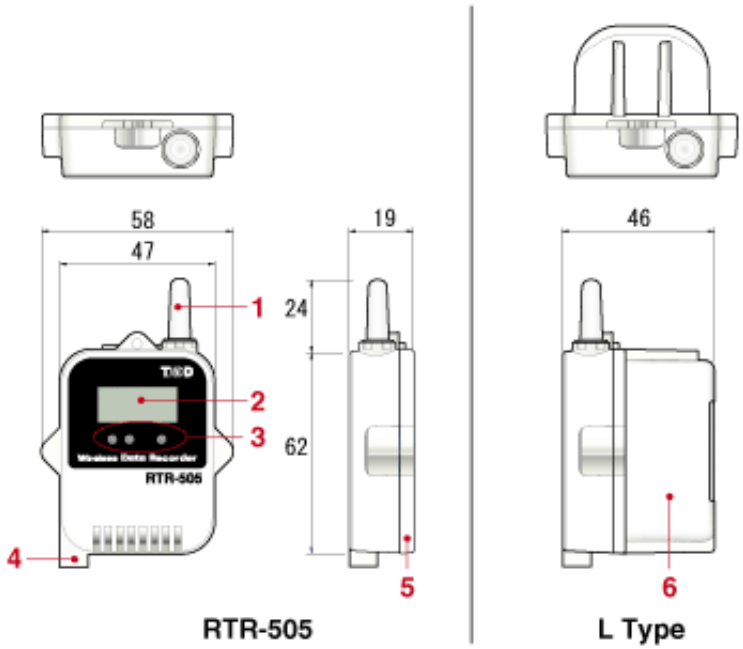
1: Antenna
2: LCD Display
3: Optical communication Area
4: Sensor Jack
5: Fluoropolymer-coated Electrical Wire
6: Thermistor
7: Back Case
8: Large Capacity Battery Case

RTR-503 / 503L



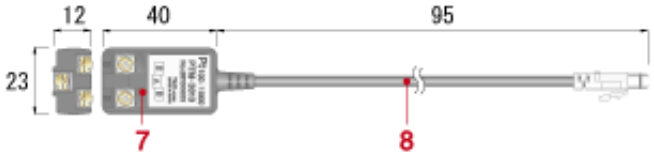
1: Antenna
2: LCD Display
3: Optical communication Area
4: Sensor Jack
5: Vinyl Chloride Coated Electrical Wire
6: Polypropylene Resin
7: Temperature/Humidity Sensor
8: Back Case
9: Large Capacity Battery Case

RTR-505 / 505L



RTR-505-TC : Thermocouple Module (TCM-3010)

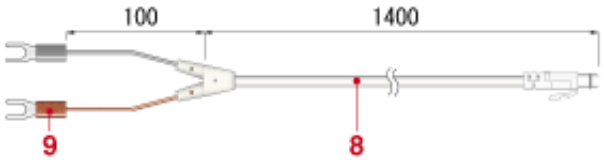
RTR-505-Pt : Pt Module (PTM-3010)



RTR-505-V : Voltage Module (VIM-3010)

RTR-505-mA : 4-20mA Module (AIM-3010)

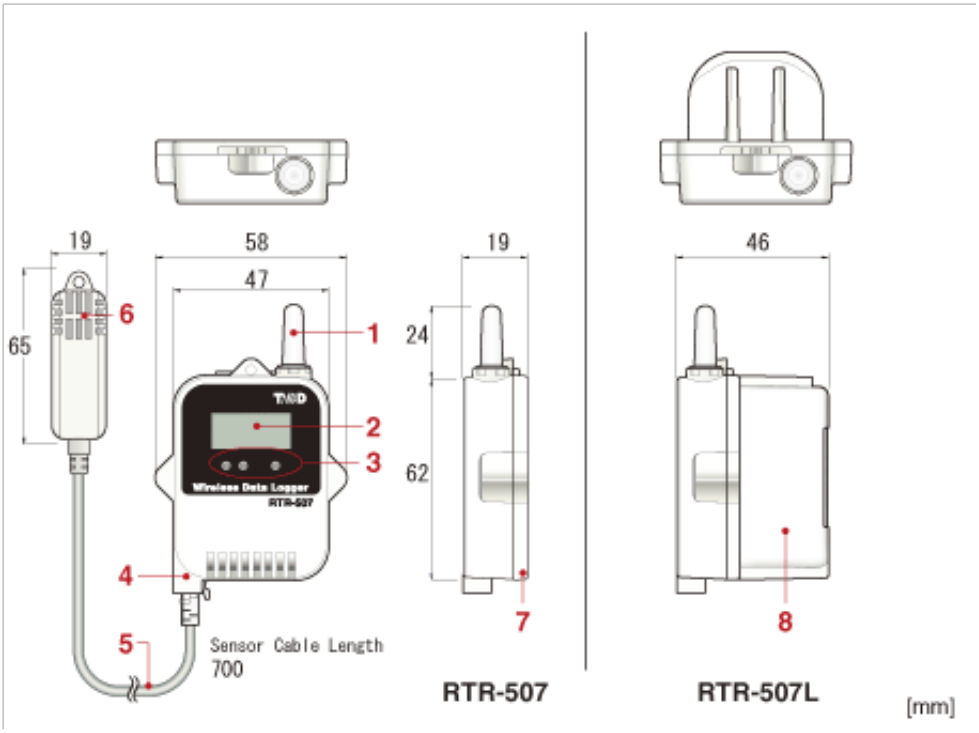
RTR-505-P : Pulse Input Cable (PIC-3150)



[mm]

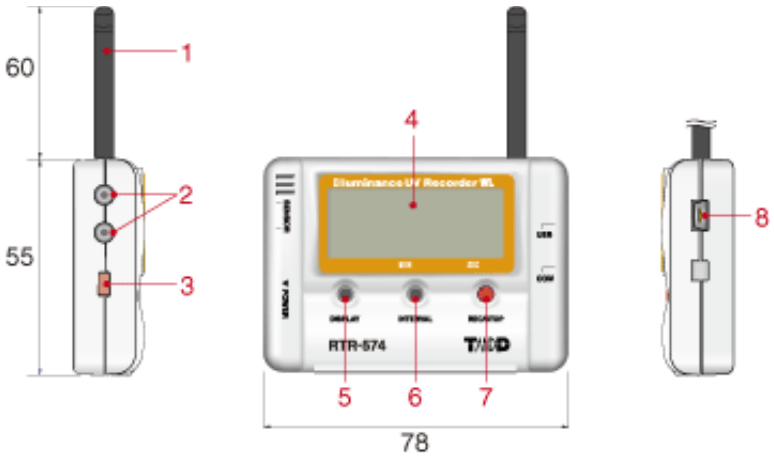
1: Antenna
2: LCD Display
3: Optical communication Area
4: Sensor Jack
5: Back Case
6: Large Capacity Battery Case

RTR-507 / 507L

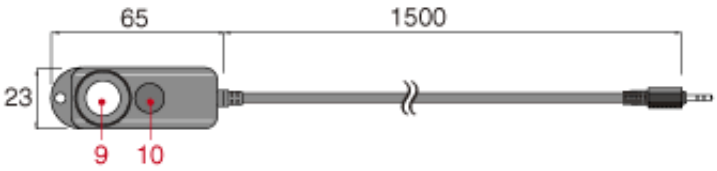


1: Antenna
2: LCD Display
3: Optical communication Area
4: Sensor Jack
5: Vinyl Chloride Coated Electrical Wire
6: Temperature/Humidity Sensor
7: Back Case
8: Large Capacity Battery Case

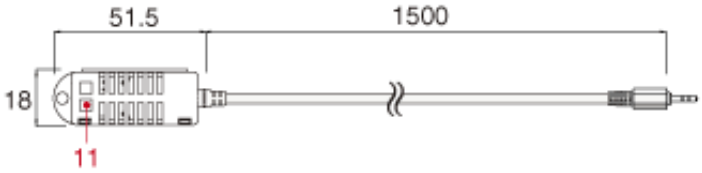
RTR-574



ISA-3151 (Illuminance UV Sensor)



THA-3151 (Temperature / Humidity Sensor)

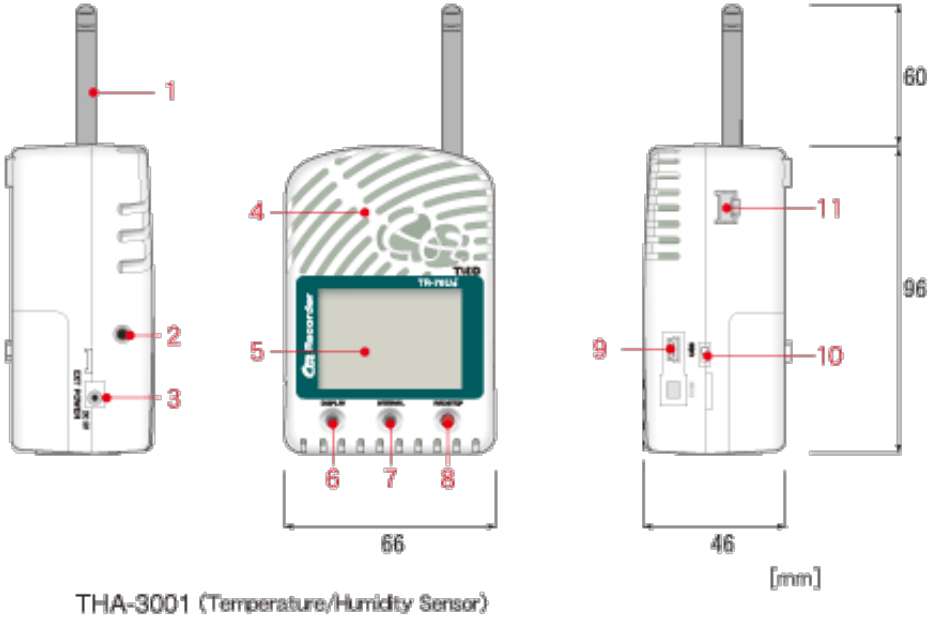


HHA-3151 (Temperature / Humidity Sensor)

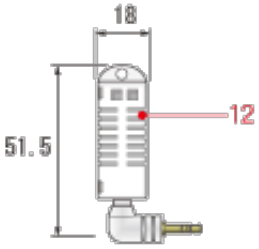
[mm]

1: Antenna
2: Sensor Jack
3: POWER Button
4: LCD Display
5: DISPLAY Button
6: INTERVAL Button
7: REC/STOP Button
8: USB Communication Cable Jack
9: Illuminance Sensor Area
10: Ultraviolet Sensor Area
11: Temperature/Humidity Sensor Area

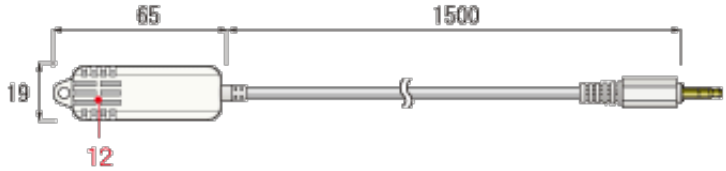
RTR-576



THA-3001 (Temperature/Humidity Sensor)



HHA-3151 (Temperature/Humidity Sensor High-Precision Type)



1.Antenna
2.Temperature/Humidity Sensor Area Jack
3.AC Adaptor Jack
4.CO2 Sensor (Internal)
5.LCD Display
6.DISPLAY Button
7.INTERVAL Button
8.REC/STOP Button
9.USB Communication Cable Jack
10.POWER Button
11.External Alarm Terminal (EXT ALM)
12.Temperature/Humidity Sensor Area