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VaiNet Wireless Humidity and Temperature Data Logger RFL100

Features

- Industry-leading temperature and relative humidity measurement precision
- Detachable high-accuracy RH and temperature probes
- 30-day First In First Out (FIFO) memory buffer
- Optional magnetic mounting bracket available
- Typical battery life of 18 months
- Uses standard alkaline batteries
- Traceable to SI units through national metrology institutes [1]
- Cost-effective alternative to chart recorders

[1] *Measurement results are traceable to the International System of Units (SI) through national metrology institutes (NIST USA, MIKES Finland, or an equivalent) or accredited calibration laboratories.*

RFL100 is a data logger that uses Vaisala's proprietary VaiNet wireless technology. It can be used to monitor environments ranging from warehouses and production areas to cleanrooms and laboratories.

VaiNet Wireless

The loggers connect wirelessly to Vaisala viewLinc Monitoring System, which provides real-time trends, alarms, and historical reporting. The VaiNet wireless technology is based on the LoRa® modulation technique to provide a robust wireless signal that is extremely reliable over long distances and in complex, obstructed conditions. This wireless technology allows the data logger's signal to travel over 100 m (328 ft) indoors without the aid of signal amplifiers or repeaters. All communications are encrypted and then verified by the system before being stored to a secure database that ensures data integrity and security.

Measurements are updated and stored once every 60 seconds, and sent from the data logger every four minutes. In case of temporary network disruptions,

the data logger can record up to 30 days of measurements that are automatically transmitted to the viewLinc Enterprise Server software when communications are restored. Recorded data can also be downloaded directly from RFL100 through the USB port.

Versatility and Convenience

RFL100 requires no startup configuration or wiring, and the included mounting bracket supports several installation methods. Detailed custom display shows the latest measurement results, alarm and battery status, and signal strength of the current access point connection. The housing is classified IP54 to protect the device from dust and cleaning.

RFL100 is powered by two standard AA size 1.5 V batteries (LR6 alkaline or FR6 lithium) for 18 months of operation at approximately 20 °C (68 °F). There is no need for costly battery replacements between recommended calibrations.

Probe Options

Detachable probe is easily switched out to maintain accurate and complete historical records. Plastic HMP115 and stainless steel HMP110 probe options both use a Vaisala HUMICAP® humidity sensor and a platinum RTD temperature sensor for superior stability. HMP115 probe has both integrated and cabled probe options. HMP110, designed for extreme conditions, uses a cabled probe. Cable probe length options are 3 or 10 meters.

Technical Data

Wireless

Networking standards	Vaisala VaiNet
Modulation	LoRa™ chirp spread spectrum modulation
Output power	14 dBm (25 mW)
Antenna	Internal
Typical range (indoors)	At least 100 m (328 ft)
Frequency bands	868 MHz (Europe) 915 MHz (North America, Australia, and New Zealand)
Safety	
Electrical safety	EN/UL/IEC 61010-1
RF exposure	KDB 447498 (United States) RSS-102 Issue 5 (Canada)
EMC and Radio Standards	
EMC compliance	EN/IEC 61326-1, industrial environment
868 MHz model	ETSI EN 300 220-2 EN 301 489-1 EN 301 489-3
915 MHz model	FCC title 47 part 15.247 (FCC ID: 2AO39-RFL100A) ICE RSS-247 (IC: 23830-RFL100A) AS/NZS 4268

Memory

Sample capacity	30 days (43200 samples per channel)
Memory type	Non-volatile EEPROM
Memory mode	Ring buffer (FIFO)
Sampling rate	One sample / channel / minute (nonchangeable)

Operating Environment

Operating temperature	+2 ... +60 °C (+35.6 ... +140 °F) with alkaline batteries [1]
	-20 ... +60 °C (-4 ... +140 °F) with lithium batteries [1]
Storage temperature	-40 ... +60 °C (-40 ... +140 °F)
Operating humidity	0 ... 100 %RH, non-condensing

1) For both alkaline and lithium, battery temperature operating specifications apply.

General

Compatible probes	HMP115, HMP115T HMP110, HMP110T (cabled only)
Compatible viewLinc versions	5.0 and above
Batteries	2 × AA sized, 1.5 V (LR6 or FR6)
Clock battery	CR 1/3N (3 V lithium button cell)
Operation time at 20 °C (without external power supply)	18 months
Internal clock accuracy	±30 s/month Synchronizes with Network Time Protocol (NTP) server

Mechanical Specifications

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Housing color	White
Mounting methods	Screws, tie-wrap, hook, or magnetic mounting bracket (optional accessory)
Probe interface	4-pin female M8 connector
Service port	USB 2.0 with Micro-USB connector
IP Rating	
RFL100	IP54
HMP110	IP65
HMP115	IP54
Dimensions (H × W × D)	
Without mounting bracket	158 × 62 × 31 mm (6.22 × 2.4 × 1.22 in)
With mounting bracket	186 × 68 × 36.5 mm (7.32 × 2.68 × 1.44 in)
Weight	
With batteries (2 pcs alkaline) and HMP115 probe	190 g (6.7 oz)
With batteries (2 pcs alkaline), HMP115 probe, and magnetic mounting bracket	254 g (8.96 oz)
RFL100 Materials	
Housing	PC/ABS blend
Display window	PMMA (acrylic)
Sealings	TPE
HMP110 Probe Materials	
Body	Stainless steel (AISI 316)
Grid filter	Chrome coated ABS plastic
HMP115 Probe Materials	
Body	PC/ABS blend
Grid filter	PC (glass reinforced)
Sleeve	PC/ABS blend
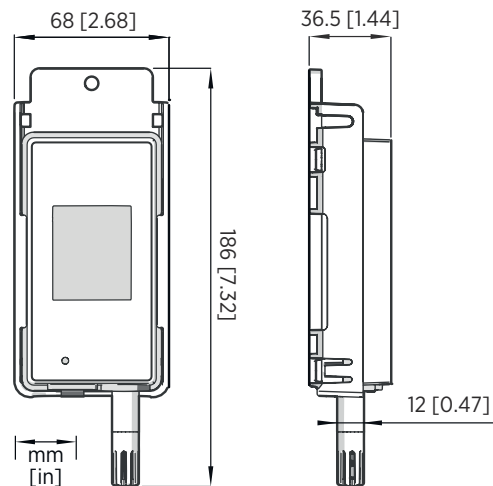
RFL100 Dimensions with HMP115 Probe

HMP110/T Probe Measurement Performance

Relative Humidity

Measurement range	0 ... 100 %RH

Accuracy in Temperature Range 0 ... +40 °C (+32 ... +104 °F) [1]

0 ... 90 %RH	±1.5 %RH
90 ... 100 %RH	±2.5 %RH

Accuracy in Temperature Range -40 ... 0 °C, +40 ... +80 °C (-40 ... +32 °F, +104 ... +176 °F) [1]

0 ... 90 %RH	±3.0 %RH
90 ... 100 %RH	±4.0 %RH

Factory Calibration Uncertainty at +20 °C (68 °F) [2]

0 ... 90 %RH	±1.1 %RH
90 ... 100 %RH	±1.8 %RH
Humidity sensor	Vaisala HUMICAP® 180R
Stability	±2 %RH over 2 years

Temperature

Measurement range	-40 ... +80 °C (-40 °F ... +176 °F)

Accuracy over Temperature Range

at 0 ... +40 °C (+32 °F ... +104 °F)	± 0.2 °C (0.36 °F)
at -40 ... 0 °C, +40 ... +80 °C (-40 ... +32 °F, +104 ... +176 °F)	± 0.4 °C (0.72 °F)
Factory calibration uncertainty [2]	± 0.2 °C (0.36 °F)
Temperature sensor	Pt1000 RTD Class F0.1 IEC 60751

1) Includes non-linearity, hysteresis, and repeatability.
2) Small variations possible; see also calibration certificate.

HMP115/T Probe Measurement Performance

Relative Humidity

Measurement range	0 ... 100 %RH

Accuracy in Temperature Range 0 ... +40 °C (+32 ... +104 °F) [1]

0 ... 90 %RH	±1.5 %RH
90 ... 100 %RH	±2.5 %RH

Accuracy in Temperature Range -40 ... 0 °C, +40 ... +60 °C (-40 ... +32 °F, +104 ... +140 °F) [1]

0 ... 90 %RH	±3.0 %RH
90 ... 100 %RH	±4.0 %RH

Factory Calibration Uncertainty at +20 °C (68 °F) [2]

0 ... 40 %RH	±0.6 %RH
40 ... 75 %RH	±1.0 %RH
Humidity sensor	Vaisala HUMICAP® 180R
Stability	±2 %RH over 2 years

Temperature

Measurement range	-40 ... +60 °C (-40 °F ... +140 °F)

Accuracy over Temperature Range

at 0 ... +40 °C (+32 °F ... +104 °F)	± 0.2 °C (0.36 °F)
at -40 ... 0 °C, +40 ... +60 °C (-40 ... +32 °F, +104 ... +140 °F)	± 0.4 °C (0.72 °F)
Factory calibration uncertainty [2]	± 0.1 °C (0.18 °F)
Temperature sensor	Pt1000 RTD Class F0.1 IEC 60751

1) Includes non-linearity, hysteresis, and repeatability.
2) Small variations possible; see also calibration certificate.

RFL100 Spare Parts and Accessories

Mounting bracket (5 pcs)	DRW244769SP
Magnetic mounting bracket (5 pcs)	ASM211527SP
Battery cover (5 pcs)	DRW244766SP
Mounting kit	245679SP

HMP110/T Probe Spare Parts and Accessories

Probe cable for RFL100, 3 m	CBL210555-3MSP
Probe cable for RFL100, 10 m	CBL210555-10MSP
Plastic grid filter	DRW010522SP
Plastic grid with membrane filter	DRW010525SP
Sintered stainless steel filter	HM46670SP
PTFE filter	DRW244938SP
Mounting nuts (2 pcs), hex M12 × 1 Pa 6.6	18350SP
Probe mounting clamps, heavy duty (10 pcs)	226067
Duct installation kit	215619

HMP115/T Probe Spare Parts and Accessories

Plastic grid filter	DRW240185SP
Plastic grid with membrane filter	ASM210856SP
PTFE filter	219452SP

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