Radar Distance/Level Sensor

EM41x-RDL

EM41x-RDL is a non-contact Radar Distance/Level Sensor that adopts Millimeter Wave Radar technology. By measuring millimeter-wave signals at higher frequencies, it provides more stable performance over longer distances, and is less affected by environmental conditions. It can detect the distance between the sensor and liquid of various types, unaffected by temperature, dust, condensate etc. With IP68 waterproof and sealed enclosure, it can withstand the worst environment, while maintaining the measurement accuracy, and does not require routine maintenance. It also complies with ATEX(Zone 0) standards and offers excellent resistance to corrosion and wear.

Milesight offers LoRaWAN® version and Cellular version to meet different communication needs. The LoRaWAN® version can be integrated with Milesight LoRaWAN® gateway and Milesight Development Platform, enabling remote and visual management of all sensor data. The Cellular version supports multiple application modes to be compatible with IoT platforms.

EM41x-RDL can used in sewers, rivers, impounding reservoir, storage tanks and high-salt mist environments (including seawater, high-concentration brine), and other locations that require to measure distance and level.



◆ Features

- 8° Radar beam angle can be focused on the target fluid, enabling accurate measurement of liquid level
- Wide measuring range of 0.3m to 12m with small blind zone
- Not affected by dust, condensate, temperature, acoustic noise, etc
- Non- invasive liquid level monitoring, can detect hazardous or non-hazardous liquids
- External antenna or internal antenna versions are optional for various applications
- Built-in 3-axis accelerometer sensor to monitor device tilt status
- Support to check radar-echo curve and one-click diagnostic to calibrate the distance, ensuring the accurate measurement under different environments
- Support blind zone alarm when the ranging results are within the blind zone
- Adopt PVDF material, offering excellent corrosion resistance, wear resistance and compressive strength for harsh environments
- IP68 waterproof design, resistant in fresh water to a maximum depth of 1m for up to 48 hours
- Supports ATEX Zone 0, and is suitable for special requirements for the performance of the product. Ex marking as below: Ex ia IIC T4 Ga (EM411-RDL Only)
- Thread design for common tank installation without extra accessories needed
- Store historical records locally and support retransmission to prevent data loss
- Easy configuration via NFC and Bluetooth
- Support management and OTA upgrade via Milesight Development Platform (EM410-RDL Only)

LoRaWAN® Version Only

- Function well with standard LoRaWAN® gateways and network servers

Cellular Version Only

- Support multiple network protocols to be compatible with IoT platforms

◆ Specifications

Model	EM411-RDL	EM410-RDL	EM410-RDL-L0CEU
Measurement			
Distance			
Technology	Millimeter Wave Radar		
Target	Liquids or Smooth Surface Solid		

Radar Frequency Band	60GHz	
Detection Angle	8°	
Detection Distance	0.3m ~ 12m	
Accuracy	Up to ± 2mm[1] Up to ± 5mm[2]	
Resolution	1mm	
Device Position		
Status	Normal/Tilt	
Wireless Transmission		
Frequency	CN470/IN865/EU868/RU864/US915/AU915/ KR920/AS923-1&2&3&4	LTE (CAT 1): B1/B3/B5/B7/B8/B20/B28 for EMEA/Australia/New Zealand
Tx Power	16 dBm (868 MHz)/20 dBm (915MHz)/19 dBm (470MHz)	/
Sensitivity	-137dBm @300bps	
Mode	OTAA/ABP Class A	
SIM Slot	/	1 x Nano SIM (4FF) Slot, 1.8V/3V
Application Mode		TCP/UDP/MQTT/ AWS/Milesight Development Platform
Antenna	Internal Antenna or External Antenna (Hardware Optional) External Antenna (EA) Version: 1 × 50 Ω SMB Male Connector	
Others		
LED Indicator	1 × LED indicator (Internal)	
Configuration	Mobile App via NFC or Bluetooth, Downlink	
Advanced Feature	Distance Threshold Alarm, Distance Change Alarm, Blind Zone Alarm, Radar-echo Curve, Diagnostic, Data Storage (2,000 entries), Data Retrievability (LoRaWAN® Version), Data Retransmission	
Physical Characteristics		
Power Supply	1 × 19000 mAh ER34615 Li-$SOCl_2$ Battery	
Battery Life[3]	Around 7 Years	Around 5 Years

(15-min collection Interval+1440-report interval, 25°C)			
Operating Temperature	-20°C ~ 60°C	-40°C ~ 70°C	-35°C ~ 70°C
Relative Humidity	0 ~ 100% (non-condensing)		
Process Pressure	-1~3 bar		
Ingress Protection	IP68 (1m underwater, 48 hours), ATEX (Zone0)	IP68 (1m underwater, 48 hours)	
Dimension	Φ 101 × 87 mm (Φ 3.98 × 3.43 in)		
Weight	400g		
Housing&Color	PVDF (UL94 V0), Blue + Grey		
Supported Tank Thread	G 1½" or NPT 1½" (Hardware Optional)		
Installation	Wall Bracket Mounting, Tank Threaded Installation		
Approvals			
Regulatory	CE, FCC, ATEX (Zone0)	CE, FCC	CE
Environmental	RoHS		

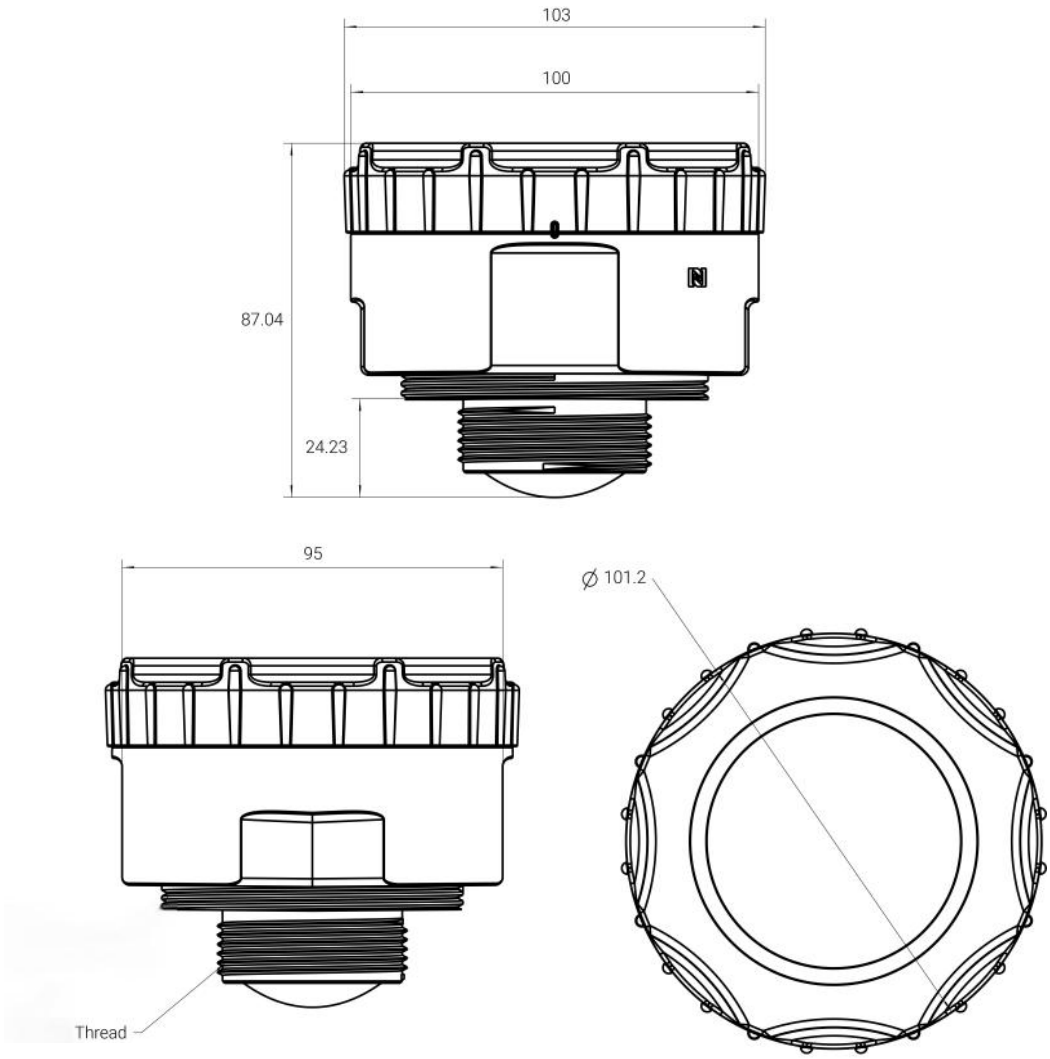
[1] Perfectly smooth flat-surfaced solid, or still liquid surface.
[2] Relatively smooth flat-surfaced surface or stable liquid surface.
[3] The battery life based on test results under laboratory conditions using the standard battery provided by Milesight. Actual performance may vary depending on battery brand and environmental factors.

◆ Ordering Information

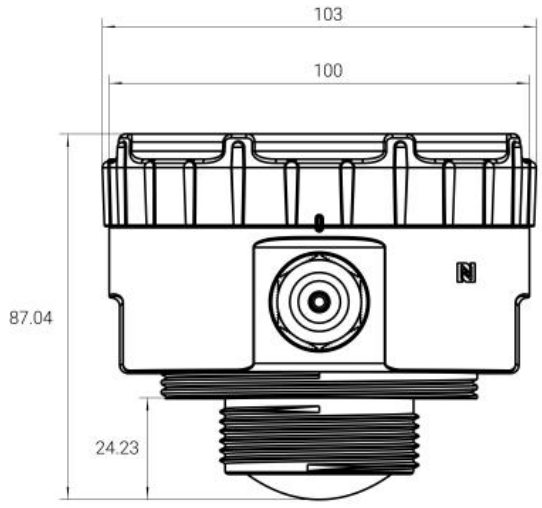
Model	PN	Description
EM41x-RDL	/	G 1½" , Internal Antenna
	EA	G 1½" , External Antenna
	NPT	NPT 1½" , Internal Antenna
	EA-NPT	NPT 1½" , External Antenna

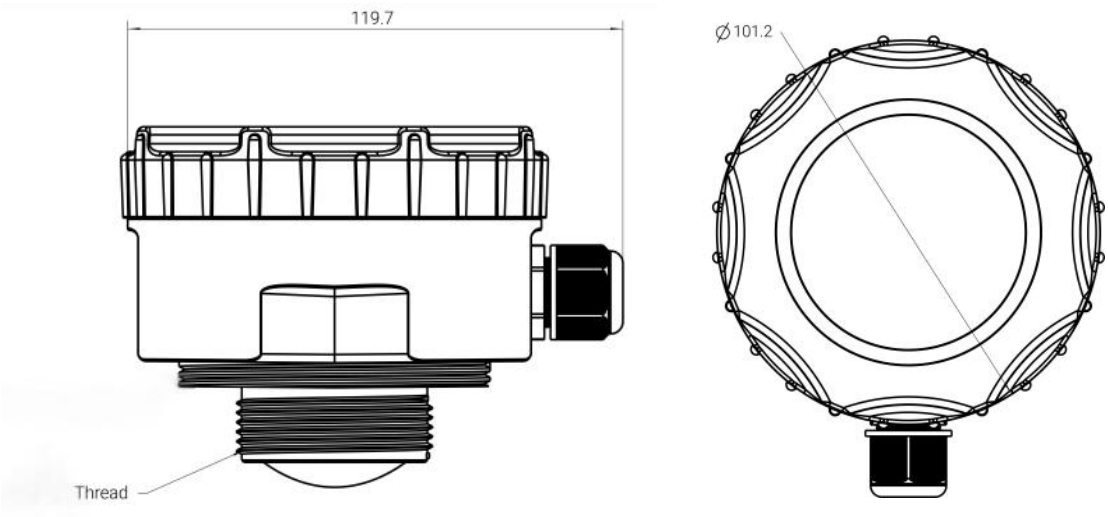
◆ Dimensions (mm)

Internal Antenna Version:



External Antenna Version:




119.7
Thread
Ø101.2