# Radar Distance/Level Sensor EM410-RDL



EM410-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.

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.

EM410-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
- > 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

## 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

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 <sup>1</sup>	

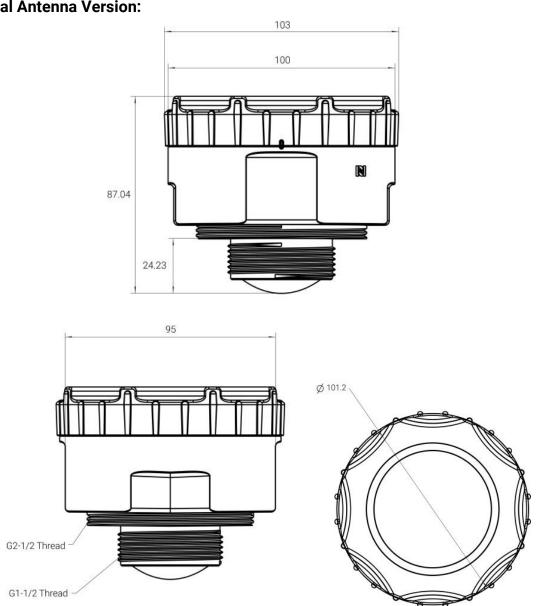
Resolution         Imm           Device Position           Status         Normal/Tilt           Wireless Transmission           LoRaWAN® Version           Frequency         CN470/IN865/EU868/RU864/US915/AU915/KR920/AS923-1828.384           Tx Power         16 dBm (868 MHz)/20 dBm (915MHz)/19 dBm (470MHz)           Sensitivity         -137dBm @300bps           Mode         OTAA/ABP Class A           Internal Antenna or External Antenna (Hardware Optional)         External Antenna (EA) Version: 1 × 50 Ω SMB Male Connector           Cellular Version           Trequency Band         LTE (CAT 1): B1/B3/B5/B7/B8/B20/B28 for EMEA/Australia/New Zealand           SIM Slot         1 × Nano SIM (4FF) Slot, 1.8V/3V           Application Mode         TCP/UDP/MQTT/AWS/Milesight Development Platform           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           Distance Threshold Alarm, Distance Change Alarm, Blind Zone Alarm, Retrievability (LoRaWAN® Version), Data Retransmission           Physical Characteristic				
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Frequency       CN470/IN865/EU868/RU864/US915/AU915/KR920/AS923-1828.384         Tx Power       16 dBm (868 MHz)/20 dBm (915MHz)/19 dBm (470MHz)         Sensitivity       -137dBm @300bps         Mode       OTAA/ABP Class A         Internal Antenna or External Antenna (Hardware Optional) External Antenna (EA) Version: 1 × 50 Ω SMB Male Connector         Cellular Version         Frequency Band       LTE (CAT 1): B1/B3/B5/B7/B8/B20/B28 for EMEA/Australia/New Zealand         SIM Slot       1 x Nano SIM (4FF) Slot, 1.8V/3V         Application Mode       TCP/UDP/MQTT/AWS/Milesight Development Platform         Internal Antenna or External Antenna (Hardware Optional)       External Antenna (EA) Version: 1 × 50 Ω SMB Male Connector         Others         LED Indicator         LED Indicator       1 × LED indicator (Internal)         Configuration       Mobile App via NFC or Bluetooth, Downlink         Distance Threshold Alarm, Distance Change Alarm, Blind Zone Alarm,         Advanced Feature       Radar-echo Curve, Diagnostic, Data Storage (2,000 entries), Data Retrievability (LoRaWAN® Version: Around 7 Years         Physical Characteristics         Power Supply       1 × 19000 mAh ER34615 Li-SOCL2 Battery         LoRaWAN® Version: Around 7 Years         Cellular Version: Around 7 Years	Wireless Transmission			
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Sensitivity   -137dBm @300bps	Frequency	CN470/IN865/EU868/RU864/US915/AU915/KR920/AS923-1&2&3&4		
Mode       OTAA/ABP Class A         Antenna       Internal Antenna or External Antenna (Hardware Optional)         External Antenna (EA) Version: 1 × 50 Ω SMB Male Connector         Cellular Version         Frequency Band       LTE (CAT 1): B1/B3/B5/B7/B8/B20/B28 for EMEA/Australia/New Zealand         SIM Slot       1 × Nano SIM (4FF) Slot, 1.8V/3V         Application Mode       TCP/UDP/MQTT/AWS/Milesight Development Platform         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         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-SOCL2 Battery         LoRaWAN® Version: Around 7 Years       Cellular Version: Around 5 Years         (15-min collection Interval+1440-report interval, 25°C)         Coperating Temperature       Cellular Version: -40°C ~ 70°C         Cellular Version: -35°C ~	Tx Power	16 dBm (868 MHz)/20 dBm (915MHz)/19 dBm (470MHz)		
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Operating Temperature		Cellular Version: Around 5 Years		
Operating Temperature  Cellular Version: -35°C ~ 70°C  Relative Humidity $0 \sim 100\%$ (non-condensing)  Ingress Protection  IP68 (1m underwater, 48 hours)  Dimension $\Phi 101 \times 87 \text{ mm } (\Phi 3.98 \times 3.43 \text{ in})$		(15-min collection Interval+1440-report interval, 25°C)		
Cellular Version: -35°C ~ 70°CRelative Humidity $0 \sim 100\%$ (non-condensing)Ingress ProtectionIP68 (1m underwater, 48 hours)Dimension $\Phi$ 101 × 87 mm ( $\Phi$ 3.98 × 3.43 in)	Operating Temperature	LoRaWAN® Version: -40°C ~ 70°C		
Ingress Protection IP68 (1m underwater, 48 hours)  Dimension $\Phi$ 101 × 87 mm ( $\Phi$ 3.98 × 3.43 in)		Cellular Version: -35°C ~ 70°C		
Dimension $\Phi 101 \times 87 \text{ mm } (\Phi 3.98 \times 3.43 \text{ in})$	Relative Humidity	0 ~ 100% (non-condensing)		
	Ingress Protection	IP68 (1m underwater, 48 hours)		
Weight 400g	Dimension	Φ 101 × 87 mm (Φ 3.98 × 3.43 in)		
	Weight	400g		

Housing&Color	PVDF (UL94 V0), Blue + Grey	
Supported Tank Thread	G1 ½"	
Installation	Wall Bracket Mounting, Tank Threaded Installation	
Approvals		
Regulatory	LoRaWAN® Version: CE, FCC	
	Cellular Version: CE	

<sup>&</sup>lt;sup>1</sup> Perfectly smooth flat-surfaced solid, or still liquid surface.

# ◆ Dimensions (mm)

### **Internal Antenna Version:**



<sup>&</sup>lt;sup>2</sup> Tested under laboratory conditions and for guideline purposes only.

### **External Antenna Version:**

