

Wireless Top-Mounted Ultrasonic Level Sensor R718PE Data Sheet

Wireless Sensor Network Based on LoRa Technology



Fig. R718PE Appearance (subject to the actual object)

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Introduction

R718PE is a wireless communication device that uses ultrasonic to measure distance.

The ultrasonic propagation medium of R718PE ultrasonic sensor is air, so the measured object can be any liquid or solid with a certain flat. The device can be used for liquid level detection, material level detection, etc. The host body and the ultrasonic sensor communicate through the UART serial port and transmit the detected data to other devices through the wireless network for display. It adopts a wireless communication method that conforms to the LoRa™ protocol standard.

Operating Principle

Module R100H (R100L) and ultrasonic sensor communicate through UART serial port.

The principle of ultrasonic ranging is based on sending out ultrasonic waves from an ultrasonic transmitter device, and the time difference that the receiver receives the ultrasonic waves. The ultrasonic transmitter emits ultrasonic waves in a certain direction, and starts timing at the same time. The ultrasonic waves propagate in the air and return immediately when encountering obstacles on the way. The ultrasonic receiver immediately stops timing when it receives the reflected waves.

(The propagation speed of ultrasonic waves in the air is 340m/s. According to the time (t seconds) recorded by the timer, the distance (s) between the launch point and the obstacle can be calculated, namely the formula: $s=340t/2$)

Main Characteristic

- Adopt SX1276 wireless communication module
- 2 ER14505 batteries AA SIZE (3.6V / section) in parallel power supply
- Main unit protection level IP65/IP67 (optional)
Ultrasonic probe protection level IP67
- The base is attached with a magnet that can be attached to a ferromagnetic material object
- Compatible with LoRaWAN™ Class A
- Frequency hopping spread spectrum technology
- Configuring parameters and reading data via third-party software platforms, and set alarms via SMS text and email (optional)
- Applicable to third-party platforms: Actility / ThingPark, TTN, MyDevices / Cayenne
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Application

- Water level of water tank monitoring
- Water level of water well monitoring
- Horizontal distance detecting
- The level of material detecting
- Other

Dimension

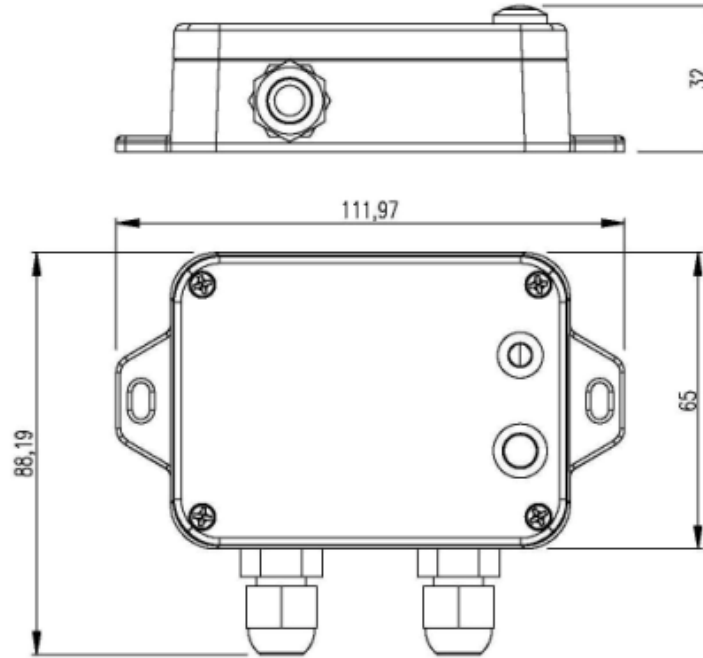


Fig. Main Unit Dimension (Unit: mm)

Electric

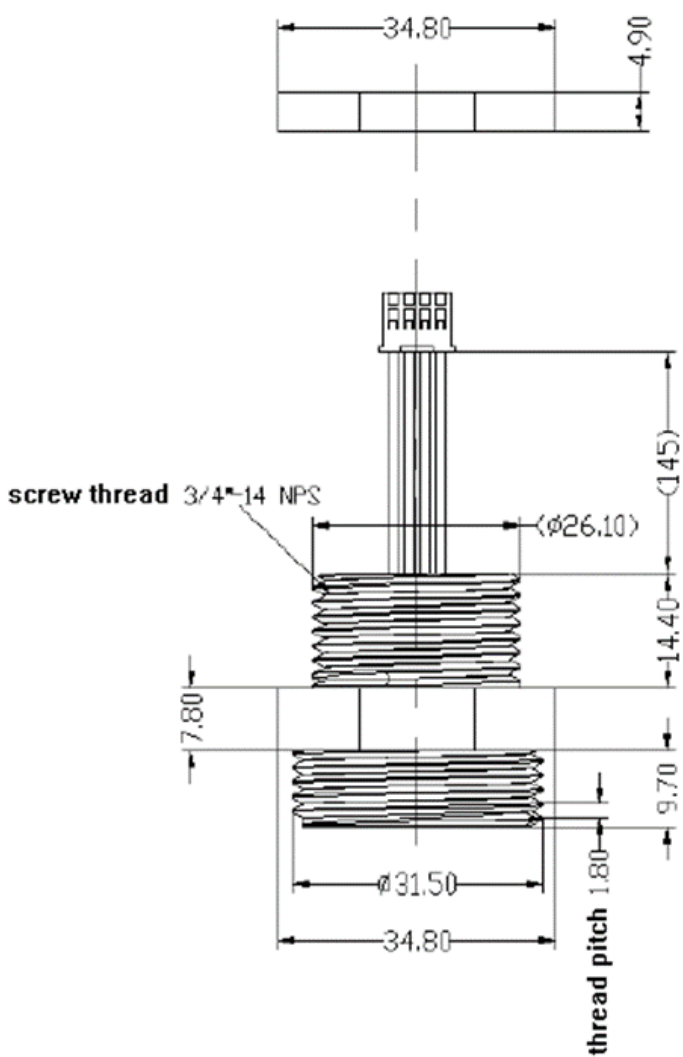
Power Supply	2 ER14505 lithium batteries AA SIZE (3.6V, 2400mAh / section) in parallel
Battery Life	3 years (Conditions: ambient temperature 25 °C, 15 min report once, TX power = 20dBm, LoRa spreading factor SF = 10)
Standby Current	20uA
Wakeup Current	Wakeup current range 0.8mA-20 mA
Low Voltage Threshold	3.2V
Battery Measurement Accuracy	±0.1V

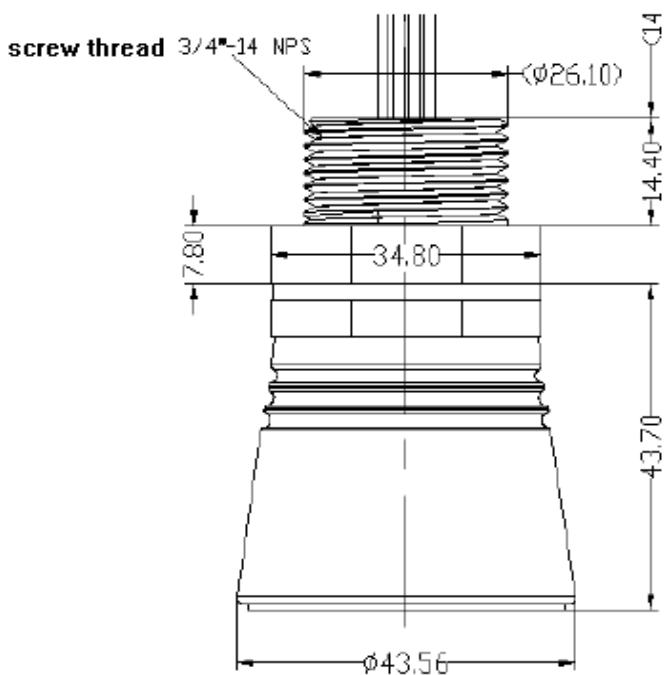
Module-R100H

Wake-up Current	0.8mA - 8mA@3.3V
RF Receiving Current	11mA/3.3V
RF Transmitting Current	120mA/3.3V

*Specific electrical characteristics will vary depending on the power supply voltage.

Ultrasonic Ranging Sensor

Power Supply	DC 3.3V~5V
Operating Current	Less than 15mA
Measurement Range	0.25-8m
Blind Distance	0-0.25m
Detection Angle	About 15°
Measurement Accuracy	$\pm(1+S*0.3\%)$ cm , S is the detected distance between the device and the detected liquid/solid (The measured object is a flat surface or a static horizontal surface.)
Dimension (wire length subject to the actual product)	 <p>The technical drawing shows a side view of the sensor with the following dimensions and specifications:</p> <ul style="list-style-type: none"> Top section length: 34.80 Top section diameter: 4.90 Wire length: (145) Thread specification: screw thread 3/4"-14 NPS Thread diameter: (ø26.10) Thread length: 14.40 Bottom section diameter: ø31.50 Bottom section length: 34.80 Bottom section offset: 7.80 Bottom section diameter: 9.70 Thread pitch: 1.80

	
Operating Temperature	-15°C ~ 55°C
Operating Humidity	<80% RH
Installation	Top mounted

Frequency

Frequency Range	863MHz-928MHz 470MHz-510MHz
Power Output	US915 20dbm AS923 16dbm AU915 20dbm CN470 19.15dbm EU868 16dbm KR920 14dbm IN865 20dbm
Receiving Sensitivity	-136dBm(LoRa, Spreading Factor=12, Bit Rate = 293bps) -121 dBm(FSK, Frequency deviation=5kHz, Bit Rate=1.2kbps)
Antenna Type	Built-in antenna
Communication Distance	10 km (visible linear obstacle-free transmission distance, actual transmission distance depends on the environment)
Data Transfer Rate	0.3kbps to 50k bps

Modulation System Mode	LoRa/FSK (Note: choose one of them)
Supportable LoRaWAN Band	EU863-870, US902-928, AU915-928, KR920-923, AS923, CN470-510 (Note: The frequency band is optional and needs to be configured before shipment)

Physical

Dimension	L: 112 mm*W: 88.19 mm*H: 32 mm
Weight	0.24kg (including batteries)
Ambient Temperature Range	- 15°C to 55°C
Ambient Humidity Range	<90% RH (no condensation)
Storage Temperature Range	- 25°C ~ 70°C