

# Wireless Top-Mounted Ultrasonic Level Sensor

## R718PE DataSheet

---

Wireless Sensor Network Based on LoRa Technology



R718PE

**Copyright©Netvox Technology Co., Ltd.**

This document contains proprietary technical information which is the property of NETVOX Technology and is issued in strict confidential and shall not be disclosed to others parties in whole or in parts without written permission of NETVOX Technology. The specifications are subjected to change without prior notice.

---

## Wireless Top-Mounted Ultrasonic Level Sensor

---

### 1. Introduction

R718PE is a wireless communication device that uses ultrasonic wave to measure distance. The propagation medium of the R718PE ultrasonic sensor is air, so the measured object can be any liquid or solid object with an even surface. The device can be used for liquid level and material level measurement. The detection angle of R718PE is about 15°, which is suitable for distance measurement in a small space. The main 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.

### 2. 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.

Note: The speed of ultrasound in the air: 340m/s; Time: t (seconds); s: distance between the launch point and the obstacle. s could be calculated by following the formula,  $s = 340t/2$ .

### 3. Features

- SX1276 wireless communication module
- 2 ER14505 batteries AA size (3.6V / section) in parallel
- Main body: IP65/IP67 (optional); Ultrasonic probe: IP67
- UART serial communication
- Magnetic base

## Wireless Top-Mounted Ultrasonic Level Sensor

- 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

### 4. Applications

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

### 5. Dimensions

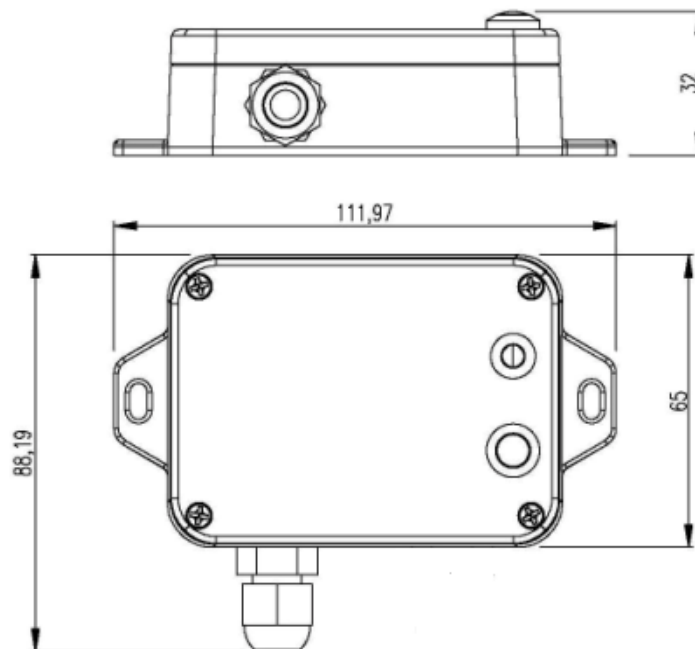


Fig. Main Body Dimensions

(Unit: mm)

## Wireless Top-Mounted Ultrasonic Level Sensor

### 6. Electrical Specifications

Power Supply	2 ER14505 3.6V AA 2400mAh batteries in parallel
Battery Life	About 3 years (conditions: ambient temperature 25 °C, 15 mins report once, TX power = 20dBm, LoRa spreading factor SF = 10)
Standby Current	20uA
Wakeup Current	0.8mA to 20mA (when Lora not transmitting and receiving data)
Low Voltage Threshold	3.2V
Battery Measurement Accuracy	±0.1V

### 7. Module R100H

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

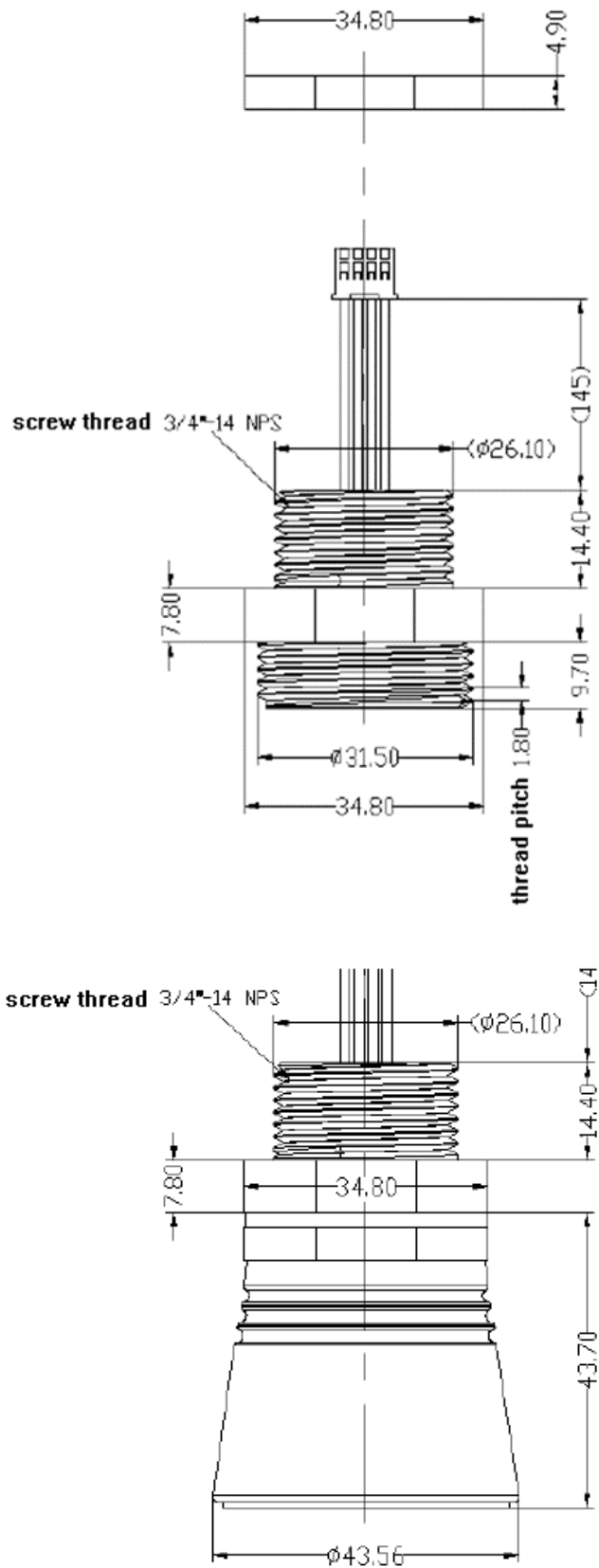
Note: Electrical specifications may vary depending on the power supply voltage.

### 8. Ultrasonic Ranging Sensor

Operating Current	Less than 15mA
Power Supply	DC 3.5V to 5V
Measurement Range	0.25m to 8m
Blind Distance	0m to 0.25m
Detection Angle	About 15°
Measurement Accuracy	±(1+S*0.3%) cm, S refers to the detected distance between the device and the detected object. (The surface of the object should be even and still.)

Wireless Top-Mounted Ultrasonic Level Sensor

Dimensions



**Wireless Top-Mounted Ultrasonic Level Sensor**

Operating Temperature	-15°C to 55°C
Operating Humidity	<80% RH
Sensor Cable Length	About 40 cm
Installation	Top mounted

**9. 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) -121dBm (FSK, Frequency deviation=5kHz, Bit Rate=1.2kbps)
Antenna Type	Built-in antenna
Communication Distance	10km (line of sight) Note: The actual distance depends on the environment.)
Data Transfer Rate	0.3kbps to 50kbps (LoRa) 1.2kbps to 300kbps (FSK)
Modulation	LoRa / FSK (Note: Please choose one modulation method.)
Supportable LoRaWAN Band	EU863-870, US902-928, AU915-928, KR920-923, AS923-1, AS923-2, AS923-3, IN865-867, CN470-510 (Note: optional, to be done in the factory configuration)

**Wireless Top-Mounted Ultrasonic Level Sensor**

**10. Physical Properties**

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

**11. Differences between R718PE & R718PE01& R718PE02**

Model	R718PE	R718PE01	R718PE02
Sensor type	Ultrasonic Level Sensor	Ultrasonic Level Sensor	LiDAR Material Level Detection Sensor
Measurement range	0.25 to 8m	0.25 to 8m	90% Reflectivity 0Klux, 0.1 to 25m
			10% Reflectivity 0Klux, 0.1 to 12m
			90% Reflectivity 100Klux, 0.1 to 25m
			10% Reflectivity 0Klux, 0.1 to 12m
Measurement dead zone	0 to 0.25m	0 to 0.25m	0 to 0.1m
Detect angle	about 15°	about 20°	3°
Sensor probe waterproof level	IP67	IP67	IP5X Not waterproof
Application	Liquid-level detection	Plane and material level detection	Material level detection.
Note	It is not suitable for scenarios where the liquid level fluctuates greatly or the measured object is uneven, nor is it suitable for high temperature, high pressure, and vacuum environments, and its performance is susceptible to electromagnetic interference and crosstalk.		<p>Advantages:</p> <p>Accurate measurement, not affected by the surface state of the detected object and can be used for slope measurement</p> <p>Disadvantages:</p> <p>Susceptible to dust, and steam. Unable to measure transparent liquids.</p>