# **R718PE02 Data Sheet**

Wireless Sensor Network Based on LoRa Technology



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#### Introduction

R718PE02 is a wireless communication device that uses LiDAR radar for single-point ranging for the material level detection industry. Based on the ToF (Time of Flight) schematic, the R718PE02 provides stable, accurate, and reliable ranging performance by optimizing the optical system and built-in algorithms. It is not easily affected by the surface state of the detected object, and the ranging performance can reach up to 25m. The product is equipped with a unique dust-removal wiper structure. The radar-driven dust-removal wiper can complete the dust removal operation of the optical mirror, so it can maintain the accuracy of distance measurement in an environment with severe dust pollution and dust accumulation. The R718PE02 body and the LiDAR sensor communicate through the UART serial communication and transmit the detected data to other devices for display through the wireless network. It adopts a wireless communication method that conforms to the LoRa<sup>TM</sup> protocol standard.

#### Features

- SX1276 wireless communication module
- 8 Sections ER14505 batteries AA size (3.6V / section) in parallel power supply
- Main unit protection level IP65/IP67 (optional); sensor: IP5X
- UART serial communication
- Compatible with LoRaWAN<sup>TM</sup> 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

#### Applications

- Material level detection
- Other ranging occasions

## **Netvox**<sup>™</sup> LiDAR For Material Level Detection Sensor

## Dimensions

**R718** 









**LiDAR Sensor** 





## **Electrical Specifications**

Dower Supply	8 * ER14505 lithium batteries in parallel
rower suppry	(3.6V, 2400mAh / section)
Battery Life	3 years
	(conditions: ambient temperature 25 °C, 60 min report once, TX power
	= 20dBm, LoRa spreading factor SF = 10)
Standby Current	$\leq 20 u A$
Wakeup Current	Range: 0.8mA – 20mA
	(when no LoRa transmits and receives data)
Low Voltage Threshold	3.2V
Battery Measurement Accuracy	±0.1V

#### Module R100H

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

Note: The electrical specifications may vary due to the power supply voltage.

#### **LiDAR Sensor Parameters**

Operating Current	$\leq$ 400mA, Peak current 1A	
Measurement Range	90%Reflectivity, 0K lux	0.1m - 25m
	10%Reflectivity, 0K lux	0.1m - 12m
	90%Reflectivity, 100K lux	0.1m - 25m
	10%Reflectivity, 100K lux	0.1m - 12m
Blind Zone	0 - 0.1 m	
Range Resolution	1cm	
Detection Angle	3°	
Measurement Accuracy	$\pm 6 \text{ cm } (0.1 - 6\text{m}); \pm 1\% (6 - 25\text{m})$	

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## LiDAR For Material Level Detection Sensor

Operating Temperature	-20°C– 60°C
Storage Temperature	-30°C– 80°C
Storage Humidity	<60%RH
Line Length	120 cm

## Frequency

Frequency Range	863MHz-928MHz 470MHz-510MHz		
	US915 20dbm		
	AS923 16dbm		
	AU915 20dbm		
Power Output	CN470 19.15dbm		
	EU868 16dbm		
	KR920 14dbm		
	IN865 20dbm		
	-136 dBm (LoRa, Spreading Factor = 12, Bit Rate = 293bps)		
Receiving Sensitivity	-121 dBm (FSK, Frequency deviation= 5kHz, Bit Rate= 1.2kbps)		
Antenna Type	Built-in antenna		
Communication Distance	10 km (line of sight)		
	Note: The distance may vary due to the environment.		
Data Transfer Rate	0.3 kbps – 50 kbps (LoRaWAN)		
	1.2 kbps – 300 kbps (FSK)		
Modulation System Mode	LoRa / FSK		
	Note: One modulation is required.		
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		

## **Physical Properties**

Dimensions	L: 112 mm x W: 88.19 mm x H: 32 mm	
Battery Box Dimensions	117mm x 89.05mm x 82mm	
LiDAR Sensor Dimensions	85mm x 59mm x 43mm	
Battery Box Line Length	About 25cm	
Ambient Temperature Range	-15°C – 55°C	
Ambient Humidity Range	< 60% RH (no condensation)	
Storage Temperature Range	$-25^{\circ}\mathrm{C}-70^{\circ}\mathrm{C}$	

## Comparison between R718PE & R718PE02

Model	R718PE	R718PE02
Sensor Type	Ultrasonic Level Sensor	LiDAR Material Level Detection Sensor
Measurement Range		90% Reflectivity 0Klux, 0.1–25m
	0.25 8	10% Reflectivity 0Klux, 0.1–12m
	0.25–8111	90% Reflectivity 100Klux, 0.1–25m
		10% Reflectivity 0Klux, 0.1–12m
Measurement Dead Zone	0–0.25m	0–0.1m
Detect Angle	about 15°	3°
Sensor Probe Waterproof Level	IP67	IP5X Not waterproof
Application	Liquid-level detection	Material level detection.
Note	It is not suitable for	Advantages:
	scenarios where the liquid	Accurate measurement, not
	level fluctuates greatly or	affected by the surface state of the
	the measured object is	detected object, and can be used for
	uneven, nor is it suitable	slope measurement.
	for high temperature, high	
	pressure, and vacuum	Disadvantages:
	environments, and its	Susceptible to dust, and steam.
	performance is susceptible	Unable to measure transparent
	to electromagnetic	liquids.
	interference and crosstalk.	