

Wireless Ultrasonic Distance Sensor with Temperature Sensor

Wireless Sensor Network Based on LoRa Technology



R718X Data Sheet

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Introduction

The R718X is a LoRaWAN Class A device and it is compatible with LoRaWAN protocol. R718X has a built-in ultrasonic ranging sensor that can detect the distance from the sensor to the detected object (for example: detect the height of garbage in the waste bin).

R718X also has the temperature detection function, it can detect the temperature of the waste bin. R718X would send out the detected data through wireless network.

Main Characteristic

- Adopt SX1276 wireless communication module
- 2 ER14505 battery AA size (3.6V / section) in parallel
- Ultrasonic distance / temperature detection
- 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
- User can configure setting, read data and send alert SMS, E-mail, etc. through third-party platforms
- Applicable to third-party platforms: Actility / ThingPark / TTN / MyDevices / Cayenne
- Low power consumption and long battery life

Note:

Battery life is determined by the sensor reporting frequency and other variables.

Please refer to http://www.netvox.com.tw/electric/electric_calc.html

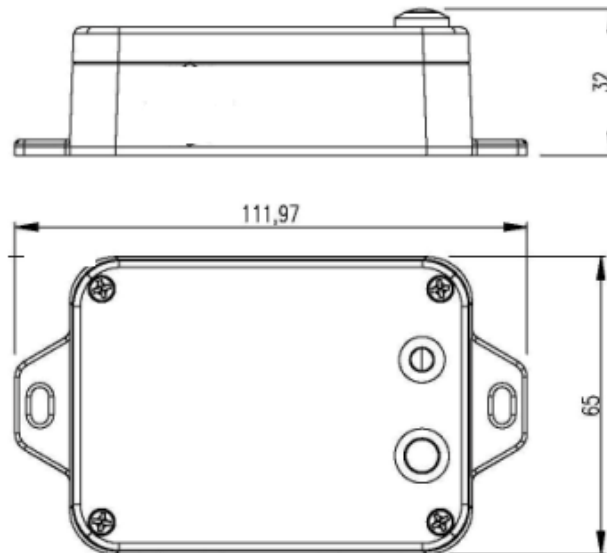
On this website, users can find various types of battery-life time in different configurations.

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Application

- Waste bin fill-level detection
- Others

Dimension



Unit: mm

Electric

Power Supply	2 ER14505 lithium batteries (3.6 V, 2400 mAh / section) in parallel
Battery Lifetime	Battery life is 4.7 years (condition: ambient temperature 25°C, report once every 15 minutes, TX power = 20 dBm , LoRa spreading factor SF = 10)
Standby Current	About 30 uA
Wake-up Current	7.11mA (Typical value) Wakeup current range 0.8mA-20 mA (When not transmitting /receiving LoRa data)
Low Battery Threshold	3.2V

Module-R100H

RF Receiving Current	11 mA @3.3V
RF Emission Current	120mA @3.3 V

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

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Ultrasonic Ranging Sensor

Model	40A16TR-1(integrated transceiver, waterproof)
Power Supply Mode	+3.3VDC
Nominal Frequency	40.0±1.0 kHz
Ringling	1.2ms max
Measuring Angle	80°±15°
Distance of Detection	0.2m to 3.5m
Accuracy	S ± 0.12m (The test object is cardboard)
Blind Zone	0 to 0.2m
Storage Temperature	-40°C~85°C
Cover Material	Aluminum Alloy

NTC Temperature Sensor

Model	NCP18WF104J03RB
Resistance@25°C	100k (typical value)
B-Constant	4250
Temperature Measurement Accuracy	Basic error limit of NTC thermistor: -20°C~55°C ±3°C

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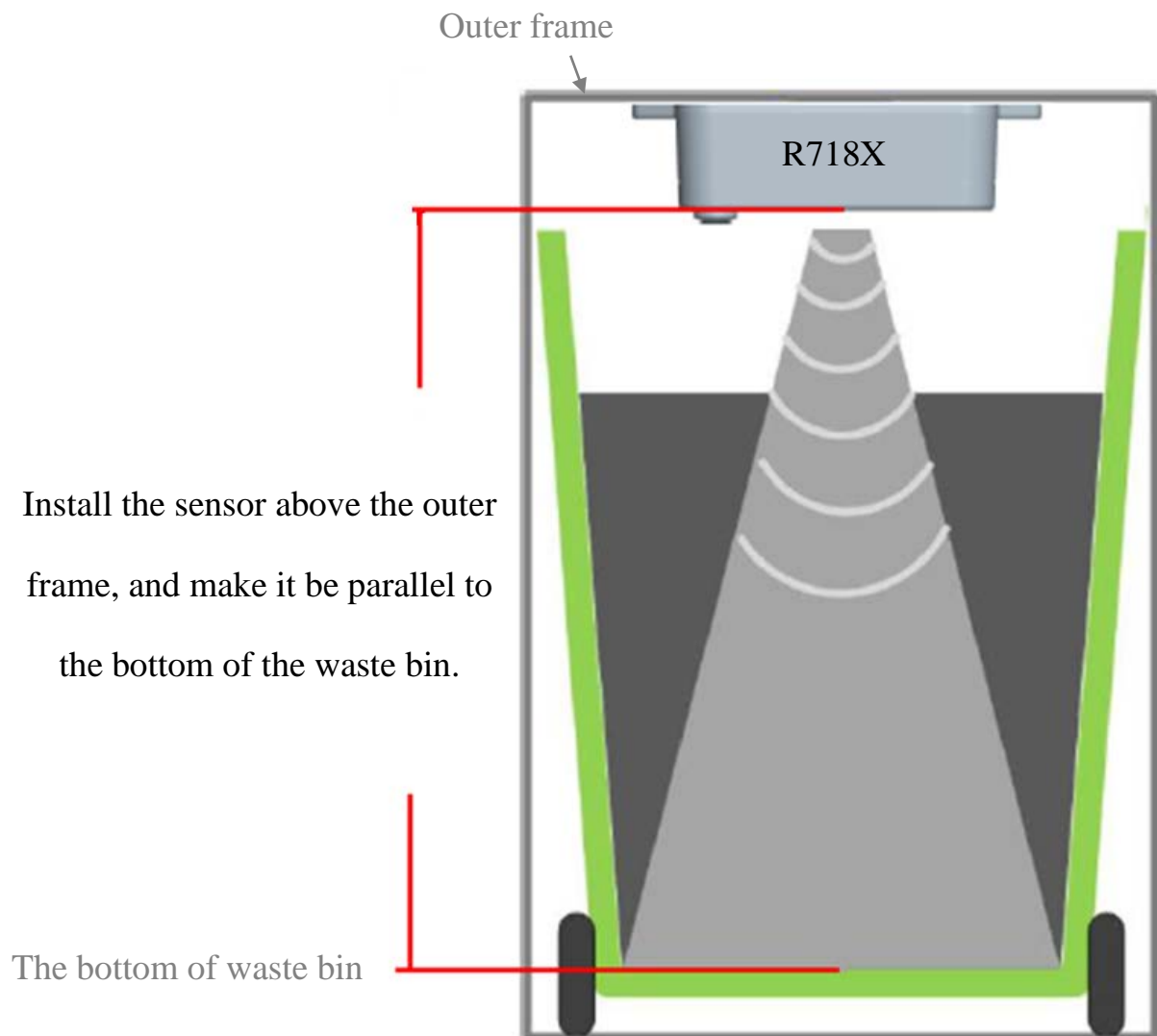
Frequency

Frequency Range	863MHz-928MHz 470MHz-510MHz
TX Power	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	Up to 10 km(The actual transmission distance depends on the real environment.)
Data Transfer Rate	0.3kbps~50kbps(LoRawan) 1.2kbps~300kbps(FSK)
Modulation Method	LoRa/FSK (Note: choose one of them)
Supportable LoRaWAN Band	EU863-870,US902-928,AU915-928,KR920-923,AS923-1, AS923-2,AS923-3,IN865-867,CN470-510, IN865 (Note: The frequency band is optional and needs to be configured before the shipment)

Physical

Dimension	L: 112 mm*W: 65 mm*H: 32 mm
Body Weight	About 143 g
Ambient Temperature Range	-20°C to 55°C
Ambient Humidity Range	<90% RH (No condensation)
Storage Temperature Range	-40 °C ~ 85 °C

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Device Installation**1. Installation of the waste bin with frame**

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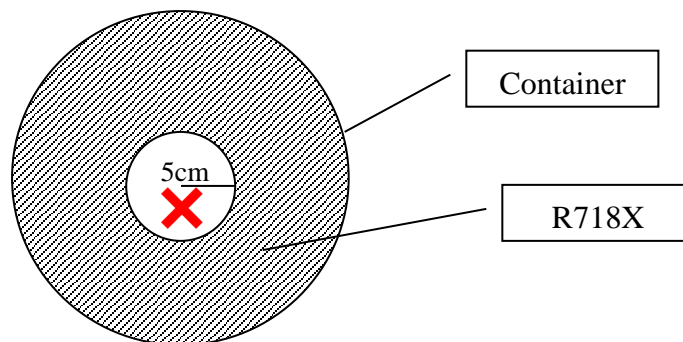
2. Installation of the waste bin with no outer frame and with an upper lid

R718X would need to drill the mounting holes in the upper lid to fix the ultrasonic sensor to the upper lid. When looking for the installation position, please pay attention to find the parallel position of the upper lid on the bottom of the waste bin. Ensure that the ultrasonic sensor is parallel to the bottom of the waste bin after installation, and the detection direction of the ultrasonic sensor is perpendicular to the bottom of the waste bin.

Note:

The installation position should not be installed in the center of the barrel, it is recommended to install the sensor 5 cm away from the center position as the hatched area shown below.

If the ultrasonic sensor is installed in the center, the ultrasonic signal will generate gain which will affect the measurement result.



Top view