



WLRI-S61



Wireless Ultrasonic Distance Sensor with Temperature Sensor

The WLRI-S61 is a LoRaWAN Class A device and it is compatible with LoRaWAN protocol. The WLRI-S61 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). The WLRI-S61 also has the temperature detection function, it can detect the temperature of the waste bin. The WLRI-S61 would send out the detected data through wireless network.

Features:



- Low power consumption and long battery life
- Ultrasonic distance / temperature detection
- Easy Installation
- Frequency Hopping Spread Spectrum (FHSS)
- Frequency hopping spread spectrum technology
- Encrypt-RF™ Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages)
- Over-the-air updates
- Interactive WatchNET IoT platform with dashboard, search and notification settings
- * Magnetized ABS enclosure for easy installation

Applications:

- Waste bin fill-level detection

Schematic Diagram:



Technical Specifications

Electrical	
Input Power	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)
Receiving current (max)	11mA @3.3V
Low Battery Threshold	3.2V

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

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

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 / -40°F ~ 185°F
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 / -4°F ~ 131°F ±3°C
Environment Humidity Range	<90%RH (No condensation)
Storage Temperature	-40°C ~ 85°C / -40°F ~ 185°F

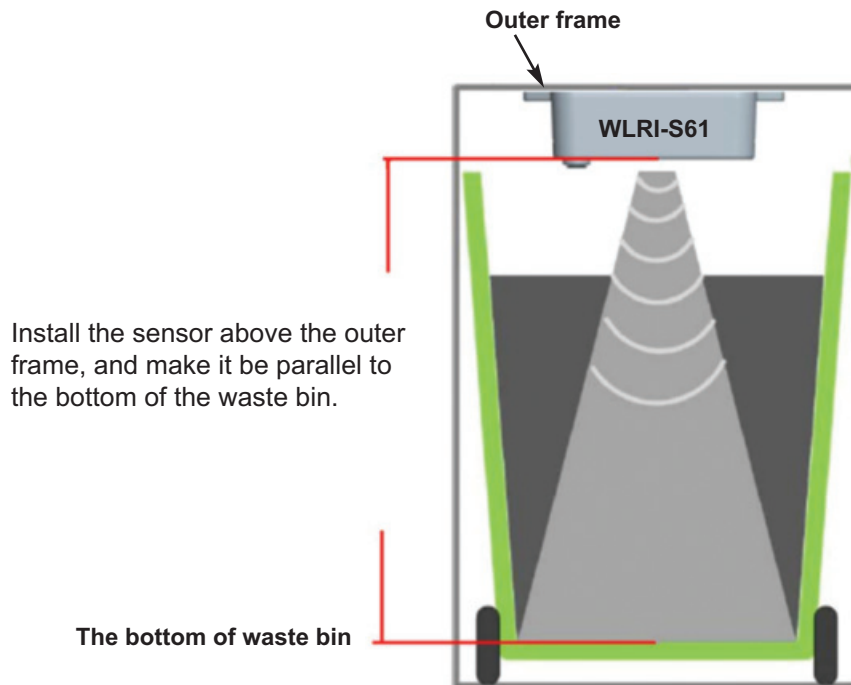
Frequency	
Frequency Range	863MHz-928MHz 470MHz-510MHz
TX Power	US915 20db / EU868 16dbm
Receiving Sensitivity	-136dBm (LoRa, Spreading Factor=12, Bit Rate = 293bps); -121 dBm (FSK, Frequency deviation=5kHz, Bit Rate=1)
Antenna Type, built-in	Up to 500m/0.310miles, the actual transmission distance depends on the environment*
Data Transfer Rate	0.3kbps~50kbps(LoRawan) / 1.2kbps~300kbps(FSK)
Spread Technique	LoRa/FSK (Note: choose one of them)
Available Frequency	EU863-870, US902-928. Configured before shipment
Physical	
Dimension	L:112mm x W:65mm x H:32mm / L:4.41" x W:2.6" x H:1.26"
Weight	143g / 0.31lb
Environment Temperature Range	-20°C ~ 55°C / -4°F ~ 131°F
Environment Humidity Range	<90%RH (No condensation)
Storage Temperature	-40°C ~ 85°C / -40°F ~ 185°F

* Actual signal range may vary depending on the environment.

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

Device Installation

1. Installation of the waste bin with frame



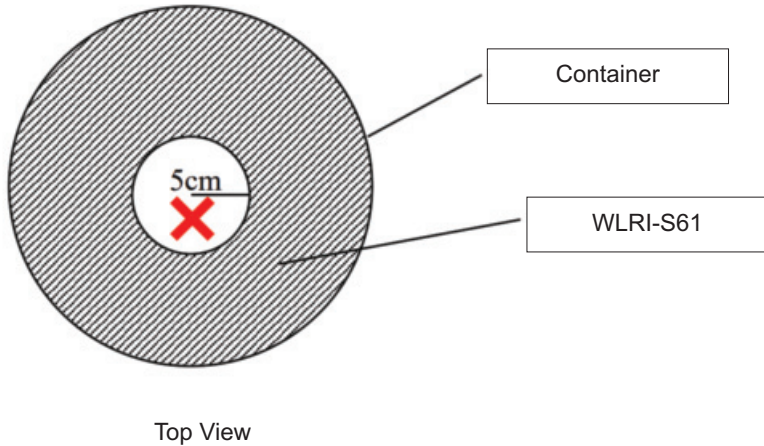
2. Installation of the waste bin with no outer frame and with an upper lid

WLRI-S61 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.



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