



Silicon Wireless Systems Pvt Ltd

SWS501 Waste Bin Sensor User's Manual

NB-IoT & 4G & Multi Tech



V1.3

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Disclaimer

keep own his best the solved manual should be accurate and very close to the configuration, protocol and installation process. The Silicon Wireless reserved all the rights to modify the hard ware software and specification, color, guide and package and other all about the devices of Silicon wireless products.

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1. Overview

These documents are helpful to understand the SWS501 Waste Bin Detector's following:

- SWS501 sensor parameter setting by default
- SWS501 sensor function description
- Install SIM card
- Hardware Interface
- Connect power
- Reboot SWS501 sensor by magnet
- Installation

2. SWS501 Default Configuration

Parameters	Default Configuration	Description
Periodic upload time	24 hours	Sensor will report at the 24 hour interval, and report the reading of the moment.
Periodic detection time	10min	Sensor detects once every 10 minutes, but will only send right away if there's a change of status, if no change of status, it will report at the 24 hour interval.
Full alarm threshold	30cm	Used to determine if sensor is full. When the height is more than 30cm, the sensor is considered to be full;
Fire alarm threshold	75°C	Used to determine if sensor is fire. When the temperature is more than 75 °C , the sensor is considered to be fire;
Fall alarm threshold	30°	Used to determine if sensor is fall. When the angle of the sensor tilted is more than 30°, the sensor is considered to be fall;
Battery alarm threshold	20%	Used to determine if the battery is lower. When the percentage of the battery is less than 20%, the battery is considered to be battery lower;
GPS function	Turned off by default	It is turned off by default; Note: standard version without GPS function;
Fall function	Turned off by default	It is turned off by default;



3. SWS501 Sensor Function Description

3.1 Reporting rules

The SWS501 sensor reports data in the following two cases,

- 1) upload time: report the data at upload time. Default upload time is 24 hours.
- 2) Trigger reporting: During the periodic detection interval. If there is a status changed, it will report the data. If not status changed, it will only report data at the upload time. Status changed means the status change from full to empty or from empty to full and so on.

Default cycle detection time is 10 minutes.

3.2 Full Alarm Function (Height Detection)

This sensor can detect the air height from the probe of the sensor to the surface of the garbage. According to this distance, it can be judged whether the trash bin is full or not.

By default (the full alarm threshold is 30cm), when the sensor measure that the height is less than 30cm, the garbage bin is considered to be full alarm. Otherwise, there is no alarm.

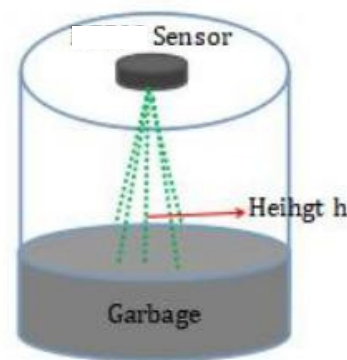


Figure 3.1 SWS501Height detection



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Cardboard items can be used for simulation testing before actual installation.

Figure 3.2, test height with one cardboard or face ground;

Figure 3.3, test height with one cardboard or face ceiling without led;

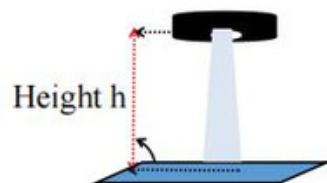


Figure 3.2 Height testing

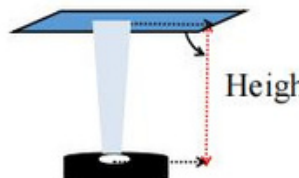


Figure 3.3 Height testing

Note: The test process ensures that the SWS501 sensor is vertical to the object being measured, so that it can get accurate height.

3.3 Fire Alarm Function

The sensor can detect the temperature value to determine whether catch fire. The default alarm threshold is 75 °C. When the temperature is detected to be greater than 75 °C, sensor will report this data.

If you need to verify this feature, it is recommended to change the alarm threshold. In order to avoid improper damage to the sensor. Suggested method:

- 1) Modify the alarm threshold to a temperature lower than indoor temperature, so the sensor can be triggered to report alarm data.



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3.4 Fall Alarm Function

Fall function is disabled by default. If need to use the fall function, please enable it first.

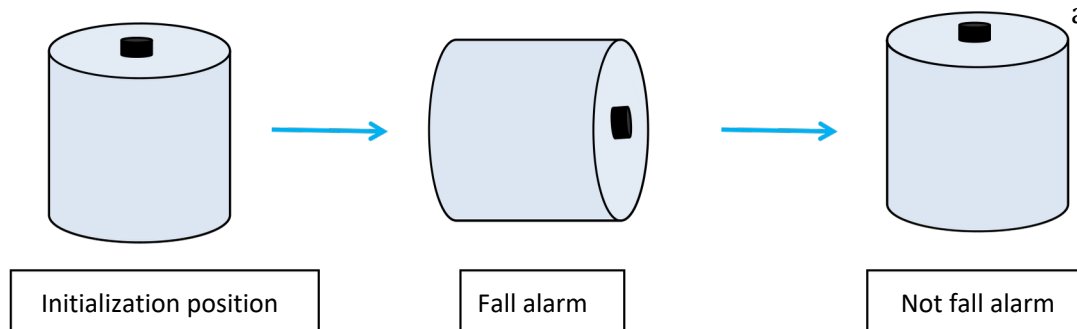
Initialization:

After installing the SWS501 sensor on the trash bin, please restart it by magnet and do not move the bin and sensor. After the restart, the current position will be learned. The position is considered to be the standard position of the trash bin, the angle is 0° , and it is

Test Fall alarm function after initialization: not fall.

Step 1: When the trash bin is tilted and the angle greater than 30° , the sensor will report the fall alarm data immediately.

Step 2: When place the trash bin to the standard position or angle is less than 30° . The sensor will report the data immediately.



3.5 GPS function

Note: This is only applicable to SWS501 GPS version. The standard version does not have GPS. You can ignore this part.

Positioning interval: Positioning at upload time or restart/power on..

Working environment:

Open outdoor environment, no obstructions around the SWS501 sensor, that is, the GPS antenna is facing up and is not blocked;

Installation :

The sensor is installed outside the trash bin, and the antenna is not covered by the trash bin cover. The GPS antenna position is shown in Figure 3.4

Testing method:

1. Place the sensor outdoor, restart it with a magnet, and wait for about 1-2 minutes to view the data.



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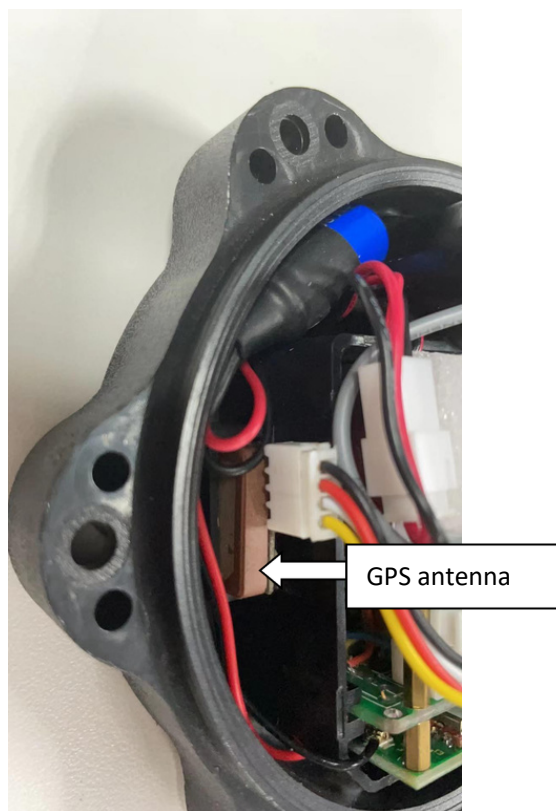


Figure3.4

4. SWS501 Hardware Interface

The detailed of power interface , parameter configuration interface are given here.

4.1 For TTL Version

- 1.Power socket: Connect to the battery.
- 2.Battery connector
- 3.UART interface: Used to configure/debug
- 4.SIMcardslot:InstallSIMcard.
- 5.Backup battery box connector: When users replace batteries without cables, they need to connect this connector.

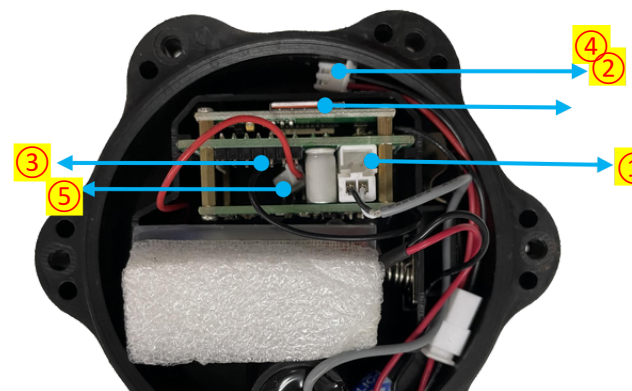


Figure4.1 TTL version



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4.2 For Bluetooth Version

1. Power socket: Connect to the battery.
2. Battery connector
3. SIMcardslot: Install SIM card.
4. Backup battery box connector: When users replace batteries without cables, they need to connect this connector.

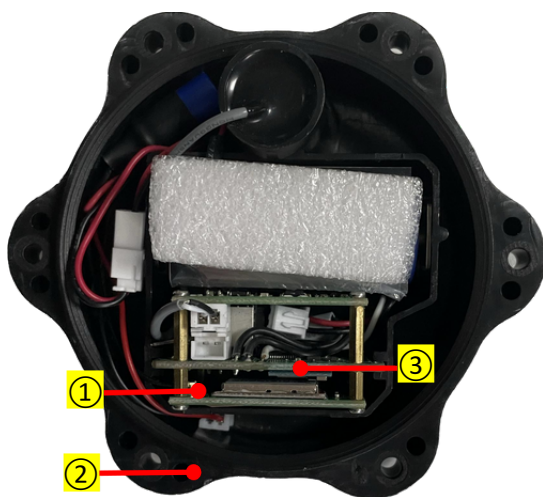


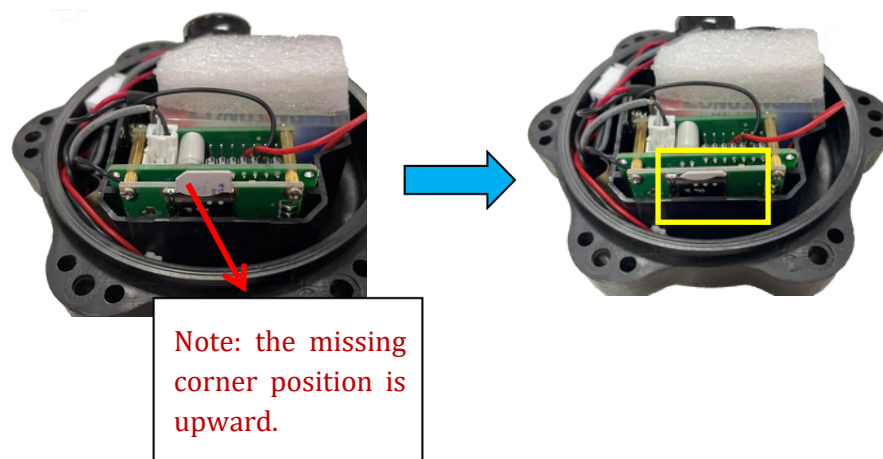
Figure4.2 Bluetooth Version

5 Install SIM card

SIM card: MICRO card; the frequency band of the card used needs to be the same as the device frequency band.

Note: please confirm the SIM card can support sensor's network first.

Insert SIM card : sensor use self-elastic card slot, please find the card slot and insert the SIM card (If you want to change or remove the card, please press the card and it will pop up automatically.).



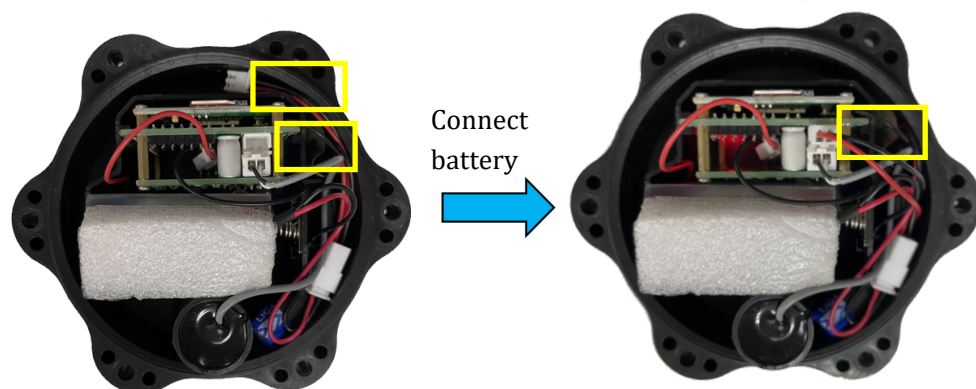


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6 Power On

Please first connect the battery before using, as following picture:

Note: If you need to restart sensor, please use magnet. DONOT unplug/plug battery frequently.



7 Reboot Sensor by Magnet

Magnet:



Move the magnet around the probe side, then remove the magnet. If the device is successfully rebooted, the device will report a data.





8 Installation

8.1 SWS501 Sensor housing installation

When installing the upper and lower shells of the sensor, please pay attention to the following:

1. Before installation, please check that the battery foam and gaskets are intact and placed correctly; make sure that there are no internal cables, such as power cords, stuck, otherwise it will easily cause gaps after installation, easy water leakage, and even failure to work properly.
2. Before fixing the screws, check whether the edge of the housing is squeezed by the antenna cable, power cord, etc., to avoid breaking the cable and causing the device to fail to work normally;
3. After installation, the gap between the upper and lower covers is less than **0.2mm**, which has achieved the purpose of waterproofing.

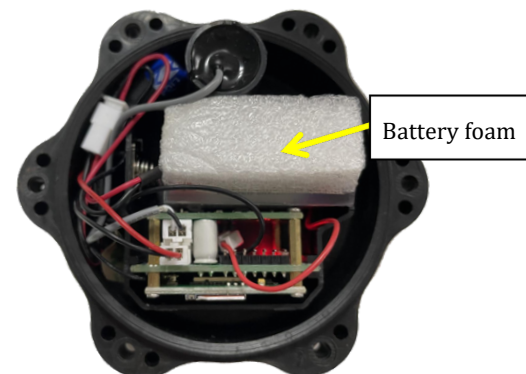


Figure 8.1



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8.2 SWS501 Sensor Installation

First install the SWS501 sensor to the bracket, as shown in the figure below,

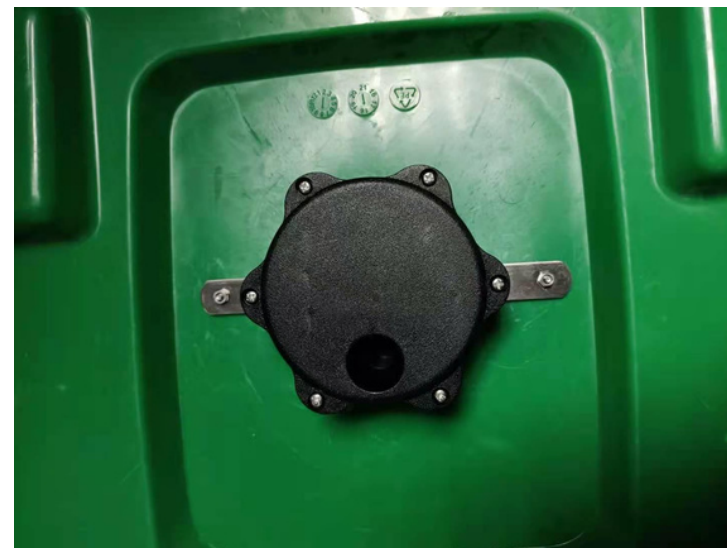


Drill holes on the top of the trash bin according to the hole position of the mounting bracket, and fix the sensor on the top of the trash bin.

Note

1. Place the SWS501 sensor in the center of the top cover of the trash bin and make it vertically downward. If it is tilted or too close to the side of the trash bin, it will affect the accuracy of distance detection.
2. If the top cover of the trash bin is curved, spacers can be added to adjust the height, and finally the SWS501 device will be perpendicular to the bottom of the trash bin.
3. After installation, you can restart the sensor again by magnet and check whether the data is normal on the platform.

4. If you use the fall detection function, after installation, you must use a magnet to restart to initialize its position.





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