Shenzhen Fine Offset Electronics WN51E Soil Moisture Sensor User Manual

SHENZHEN

Fine Offset Electronics WN51E Soil Moisture Sensor User Manual

Contents

Introduction

Thanks for purchasing this WN51E soil moisture sensor. This device measures soil moisture. The data can be streamed by GW1000 Wi-Fi Gateway (sold separately) and can be viewed on our WS View mobile application after the Wi-Fi configuration is done. Or a receiver console can be used to display the received sensor value.
The sensor is equipped with a ceramic cap which acts as a breathing filter for exchanging soil moisture to its

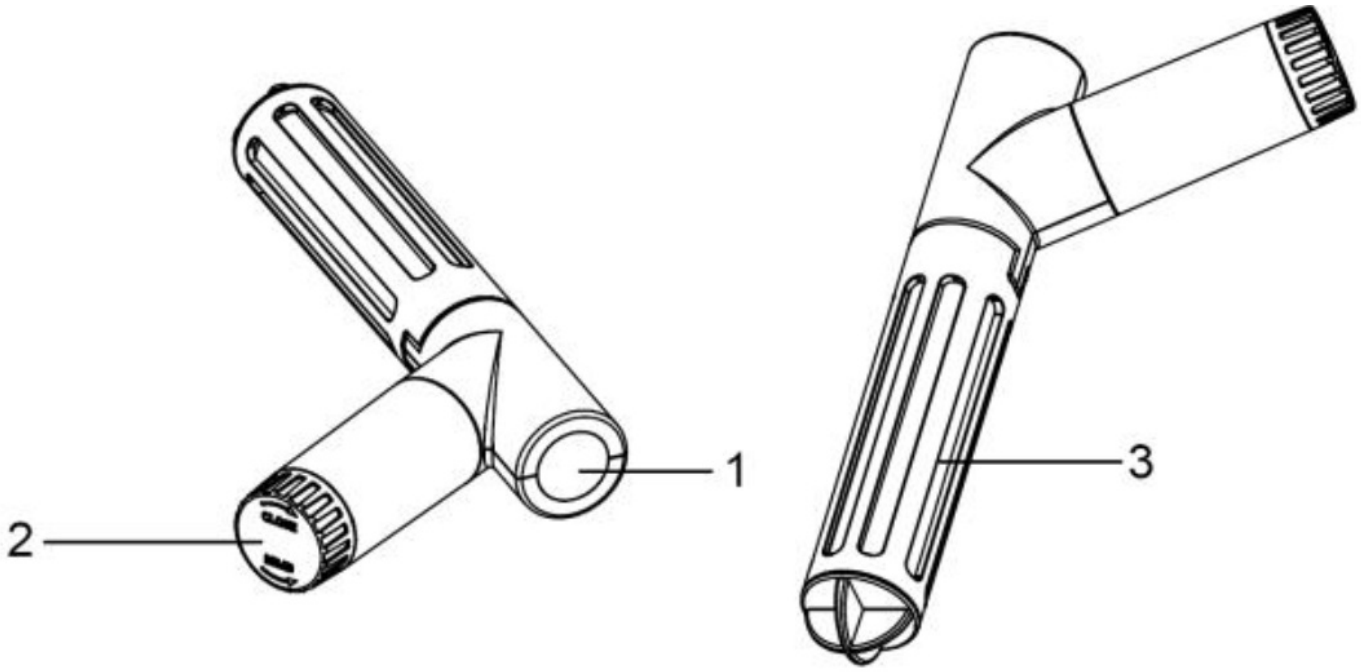
internal sensing media. This filter has the soil type isolated so that sensor is not sensitive to the type of soil(clay, sand, fertilization condition, etc.).
To ensure the best product performance, please read this manual and retain it for future reference.

Getting Started

2.1 Parts List

One Soil Moisture Sensor
One User Manual

Overview



1. LED Indicator (RF transmission)
2. Battery Cap
3. Soil Moisture Sensor cap

3.1 Features

Soil Moisture Sensor

- Measures soil moisture content every 71 seconds.
- Sensors are covered with ceramics for more accurate measurement.
- Custom Mode: with 0%AD and 100%AD custom mode to manually calibrate the low/high moisture value so that you can get more accurate results for different soil types. This mode can only be activated through WS View app and in live data display mode.
- Long wireless range, up to 300 feet (100 meters) in open areas

When paired with a GW1000 Wi-Fi Gateway:

- Monitor live sensor data on the Life Data page of the WS View app (requires the gateway and your phone is using the same Wi-Fi network)
- Up to 8 channels are supported. Channel names can be edited on the app.

When paired with a Weather Station Console (HP2551/HP3500/HP3501):

- View soil moisture data in real-time on the Display
- Up to 8 channels are supported. Channel names can be edited on the Display (for HP2551 only).

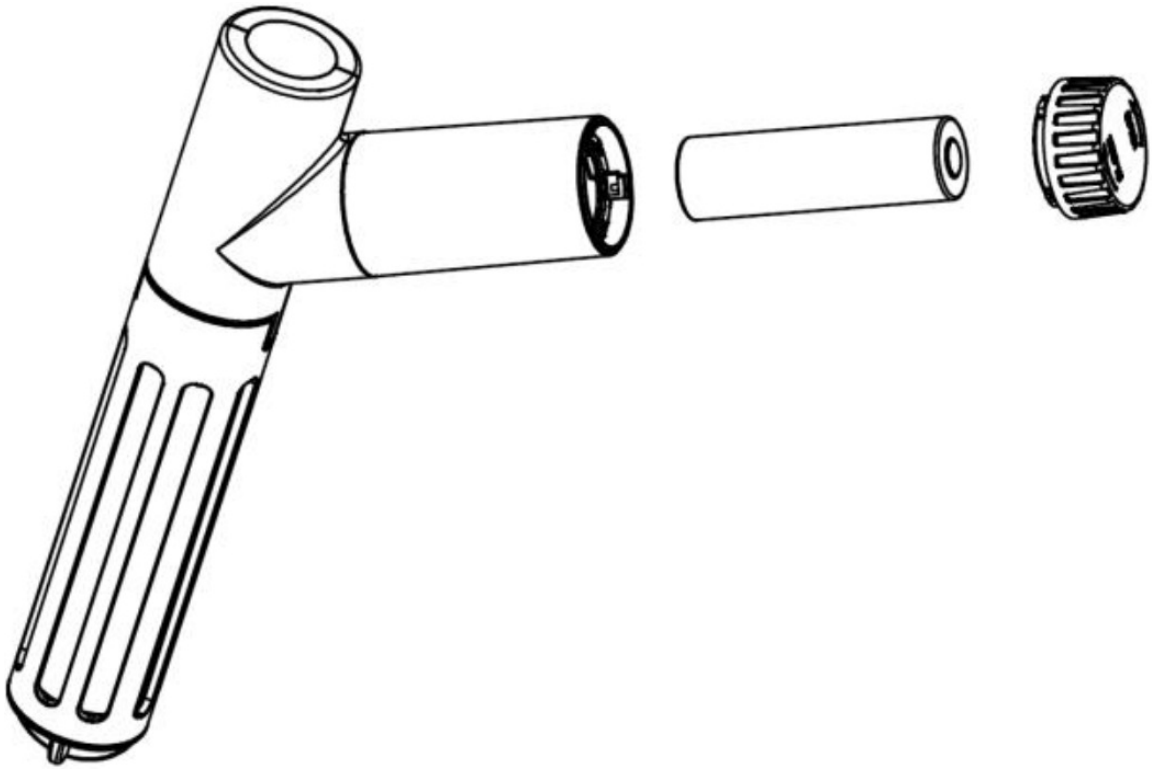
When uploaded to Ecowitt Weather Server:

- View current soil moisture data & history records & graphs on the website
- Set and receive email alerts from the server
- Channel names can be edited on the website
- Remote monitoring with a smartphone, laptop, or computer by visiting the website

Note: The WH51 and WN51E will be recognized as the same sensor type by the software. If you purchased both, they will share the eight channels together and the total quantity of the two sensors could not exceed eight.

Setup Guide

4.1 Install batteries



1. Open the battery cap of the soil moisture sensor
2. Insert one AA battery and close the battery door.
3. After inserting the battery, the remote sensor LED indicator will light for 4 seconds, and then flash once per 71 seconds thereafter. Each time it flashes, the sensor is transmitting data. You may go to Section 5 now to complete the GW1000 gateway configuration first to make its data displayed and resume the steps followed below.
4. Before installing the sensor into its permanent location, we would suggest testing the sensor in the air and seeing if moisture reading is 0. And then put the sensor into a cup of water, the sensor should have its reading

increased to 90% or above. Once the sensor detected a significant data change, the sensor will transmit every 10s. Once the sensor has been confirmed working correctly, then you can go to the next step.

5. Use a tool to dig a hole and put the sensor in the soil. The hole depth should be the same as the sensing cap size and bury the sensor completely in the soil. Please do not use excessive force to push the sensor into the soil this might have the ceramic cap broken.

Wi-Fi Configure with gateway

To view the soil moisture data on your mobile application and receive email alerts on our weather server, you need to pair this device with our GW1000 Wi-Fi Gateway or HP2551/HP3500/HP3501 Weather Station (sold separately).

5.1 Pair with Gateway

If GW1000 has been in operation, and you have never had any WN51E soil moisture sensor setup before, just power up the sensor and GW1000 will pick soil moisture data automatically. Please make sure your setup on GW1000 has this sensor enabled on the sensor ID setup page.

Note: The gateway can support max 8 soil moisture sensors. Each new sensor will be recognized as a new channel according to the Power-on sequence. You may attach a label of the channel on each sensor for distinction. The channel name can be edited both on the app and the Ecowitt Weather server (will not sync).

If you want to use a new WN51E sensor to replace the old one (already configured on a certain channel , please try the following:

1. Open the Sensor ID page on the WS View app, and find your old sensor ID.
2. Power off the old sensor and power on the new sensor.
3. Click Re-register on the Sensor ID page.

   Then the new sensor will be learned and the old sensor will be erased.

5.2 Wi-Fi Connection for the Gateway

For this part, please refer to the manual of the GW1000 Wi-Fi gateway.

Any questions, please contact customer service.

View Online Data on WS View

When the Wi-Fi configuration is done, you can view the live data of your soil moisture sensor on the WS View application.

Note: It requires your phone and the gateway to use the same network to view your sensor data on the WS View app.
To remote monitor the sensor data, please upload the data to our free Ecowitt Weather Server: **https://www.ecowitt.net**.
Detailed operation instructions can be found in the GW1000 manual.
Any questions, please feel free to contact our customer service at **support@ecowitt.com**

Custom mode

When in LIVE DATA display mode, you can calibrate the soil moisture sensor by enabling the Custom mode. (Click More – Choose Calibration – Choose Soil Calibration – Tick the box on the left side of the Customize).

Custom OFF:
The moisture level is calculated based on the default dry and wet definition:
Dry (0%AD) AD: 70
Wet (100% AD) AD: 500
Soil Moisture = (moisture AD – 0%AD) * 100% / (100% AD – 0%AD)
For example: when sensor moisture AD is 310, calculated moisture is:
(310 – 70)*100% / (500-70) = 56%.
This is a fixed slope rate linear system.
Custom ON:
When pot soil under dry or wet conditions is not giving the moisture sensor output value that is close to its default assumption, it will give inaccurate moisture level results. It is commonly happening with different soil types that give very different output values at the same moisture level condition. We introduced this custom mode to make this slope flexible so that it can match your soil type.
This becomes a variable slope rate linear system.
Adjusting principle:
0%AD is used to adjust for dry condition reading inconsistency.
When the displayed moisture readings are too high in dry soil conditions, you could lower the slope rate by increasing the 0%AD value.
100%AD is used to adapt for wet condition reading inconsistency.
When the displayed moisture readings are too low at extremely wet soil conditions, you could decrease the 100%AD value to fix it.
Please refer to the below example for a better understanding.
For example:
When you use this product for the first time, you may turn off the custom mode and test the product at the

following two situations:
Situation One:
Place the sensor into a glass of fresh water, and the displayed moisture readings are much lower than 95% (e.g.70%).
Solution:
Enable custom mode, and adjust the 100%AD value.
Calculate the 100%AD value with the formula:
Soil Moisture = (moisture AD – 0%AD) * 100% / (100% AD – 0%AD)
If:
Now AD = 183
0%AD = 70
Target Soil Moisture Reading = 95%
Then:
95% = (183 – 70)*100%/(100%AD – 70)
Result: 100%AD = 188(take the Integer part)
Then you can adjust the default 0%AD value to 188 and touch the screen once to update the data. When you get your expected moisture reading, click Save to save the setting.
Situation Two:
Leave the sensor aside without touching any water, and the displayed moisture readings are much higher than 10% (e.g.40%).
Solution:
Enable the custom mode and adjust the 0%AD value.
Calculate the 0%AD value with the formula:
Soil Moisture = (moisture AD – 0%AD) * 100% / (500 – 0%AD)
If:
Now AD = 183
100%AD = 500
Target Soil Moisture Reading = 10%
Then:
10% = (183 – 0%AD)*100%/(500 – 0%AD)
Result: 0%AD = 147(take the Integer part)
Then you can adjust the default 0%AD value to 147 and touch the screen once to update the data. When you get your expected moisture reading, click Save to save the setting.
Note: The soil moisture sensor should be inserted totally into the soil for accurate results.
Record the 0%AD and 100%AD values for future use (when the WIFI network changed).
Note: In general, the device has been calibrated in the factory, and you don't need to calibrate it on your side.

Specification

Moisture Range: 0~100%;
Resolution: 1% 0%AD setting range:0~200;
Initial value: default to factory calibration. 100%AD
setting range: 0%AD+10~1000;
Initial value: default to its factory calibration
Frequency: 433/915/868 MHz(optional)
Sensor reporting interval: 71 seconds
Transmission distance in the open field: 100m(300 feet)
IP66 waterproof
Power consumption

- Soil moisture sensor: 1xAA Alkaline batteries (not included)
- Battery life: Minimum 12 months

Warranty Information

We disclaim any responsibility for any technical error or printing error, or the consequences thereof.

All trademarks and patents are recognized.

We provide a 1-year limited warranty on this product against manufacturing defects or defects in materials and workmanship.

This limited warranty begins on the original date of purchase, and is valid only on products purchased, and only to the original purchaser of this product. To receive warranty service, the purchaser must contact us for problem determination and service procedures.

This limited warranty covers only actual defects within the product itself and does not cover the cost of installation or removal from a fixed installation, normal set-up or adjustments, or claims based on misrepresentation by the seller, or performance variations resulting from installation-related circumstances.

FCC Statement

Statement according to FCC part 15.19:

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

Statement according to FCC part 15.21:

Modifications not expressly approved by this company could void the user's authority to operate the equipment.

Statement according to FCC part 15.105:

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

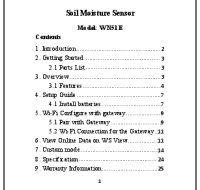
However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC ID: WA5WN51E

SHENZHEN

Documents / Resources

 Soil Moisture Sensor Model: WN51E Contents 1. Introduction ..... 2 2. Getting Started ..... 3 2.1 Parts List ..... 3 3. Overview ..... 5 3.1 Features ..... 6 4. Setup Guide ..... 7 4.1 Install batteries ..... 7 5. Wi-Fi Configure with gateway ..... 9 5.1 Pair with Gateway ..... 9 5.2 Wi-Fi Connection for the Gateway ..... 11 6. View Online Data on WS View ..... 13 7. Custom mode ..... 24 8. Specification ..... 24 9. Warranty Information 25 1	**Shenzhen Fine Offset Electronics WN51E Soil Moisture Sensor** [pdf] User Manual WN51E, WA5WN51E, Soil Moisture Sensor

References

- **Ecowitt Weather**