

Wireless Multi-Channel Soil Moisture Sensor Model: WH51

Contents

1. Introduction.....	2
2. Get Started	2
2.1 Parts List	2
3. Overview	3
4. Setup Guide	4
4.1 Install batteries	4
5. Wi-Fi Configure with gateway	4
5.1 Pair with Gateway	5
5.2 Wi-Fi Connection for the Gateway.....	5
6. View Online Data on WS View.....	6
7. Custom mode	8
8. Specification	13
9. Warranty Information.....	14

1. Introduction

Thanks for purchasing this Multi-Channel WH51 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 done.

To ensure the best product performance, please read this manual and retain it for future reference.

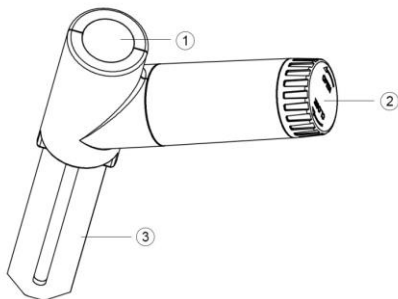
2. Get Started

2.1 Parts List

One Soil Moisture Sensor

One User Manual

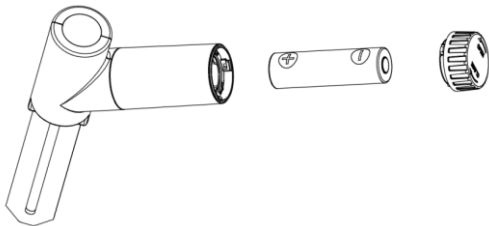
3. Overview



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

4. Setup Guide

4.1 Install batteries



1. Open the battery cap of the soil moisture sensor

2. Insert one AA battery.

3. After inserting the battery, the remote sensor LED indicator will light for 4 seconds, and then flash once per 70 second thereafter. Each time it flashes, the sensor is transmitting data.

4. Close the battery cap.

5. Insert the sensor totally into the soil of your desired location (after the WIFI configuration done).

5. Wi-Fi Configure with gateway

This soil moisture sensor doesn't have a display function and you need to use our WS View App to view the data on your mobile application after

pairing this device with our GW1000 Wi-Fi Gateway(sold separately).

5.1 Pair with Gateway

If GW1000 has been in operation, and you have never had any WH51 soil moisture sensor setup before, just power up the sensor and GW1000 will pick soil moisture data automatically.

If a WH51 sensor has been hooked on GW1000 before, and you have a new WH51 sensor to replace the old one, unplug GW1000 from USB socket and power up again, then the new sensor will be learned and old sensor will be erased.

Note: The gateway can support up to 8 soil moisture sensors(with GW100 Firmware V1.4.6 or above). 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 ecowitt.net(will not sync).

5.2 Wi-Fi Connection for the Gateway

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

Any question, please contact the customer service.

6. 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.

GW1000-WIFI885C	
Indoor Temperature	Indoor Humidity
28.3 °C	60 %
Outdoor Temperature	Outdoor Humidity
26.0 °C	65 %
Absolute Pressure	Relative Pressure
1012.6 hpa	1012.6 hpa
CH1 Soil	22 %
GW1000_V1.2.7	

Note:

1. The soil moisture data can be only viewed on the Live Data interface since it doesn't support uploads to weather underground.

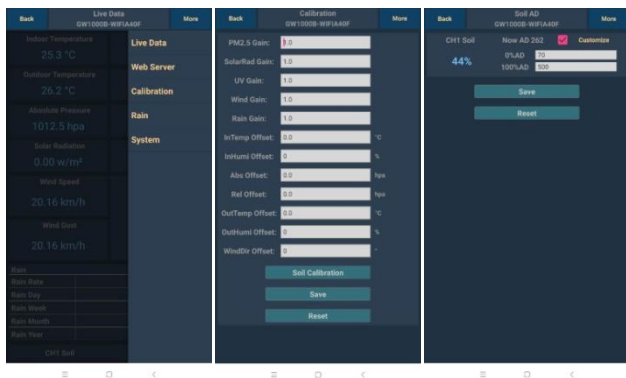
If you choose to upload the data to our weather server: <https://www.ecowitt.net>, you can view the

live data/history graph and download the records on the website. You can add a shortcut of the website on the home screen of your phone for quick access.

2. This soil moisture sensor works with WH0291 Soil Moisture Monitor display console(sold separately). The sensor and display console should be at the same frequency. One console only receives one channel sensor.

7. Custom mode

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



Custom OFF:

Moisture level is calculated based on default dry and wet definition:

Dry (0%AD) AD: 70

Wet (100% AD) AD: 500

$$\text{Soil Moisture} = \frac{(\text{moisture AD} - 0\%AD) * 100\%}{(100\% AD - 0\%AD)}$$

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 at dry or wet condition 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 type that gives very different output value at 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 at dry soil condition, 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 condition, you could

decrease the 100%AD value to fix it.

Please refer to the below example for better understanding.

For example:

When you use this product at the first time, please turn off the custom mode and test the product at the following two situations:

Situation One:

You watered your potted plant with enough water and the soil should be extremely wet, however the displayed moisture readings is 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:

$$\text{Soil Moisture} = (\text{moisture AD} - 0\%AD) * 100\% / (\text{100\% AD} - 0\%AD)$$

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 for once to update the data. When you get your expected moisture reading, click Save to save the setting.

Situation Two:

Your potted plant hasn't been watered for very long time and soil is extremely dry. When at this dry condition, 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:

$$\text{Soil Moisture} = (\text{moisture AD} - 0\%AD) * 100\% / (500 - 0\%AD)$$

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 for 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 result.

Record the $0\%AD$ and $100\%AD$ value for future use (when WIFI network changed).

8. Specification

Moisture Range:0~100%; Resolution: 1%
0%AD setting range:70~200; Initial value:70
100%AD setting range:0%AD+10~1000; Initial
value:500

Frequency: 433/915/868 MHz(optional)

Sensor reporting interval: 70 seconds

Transmission distance in open field: 100m(300
feet)

IP66 waterproof

Power consumption

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

9. 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, 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.