Wireless Soil Moisture Sensor

User manual

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1. Statement

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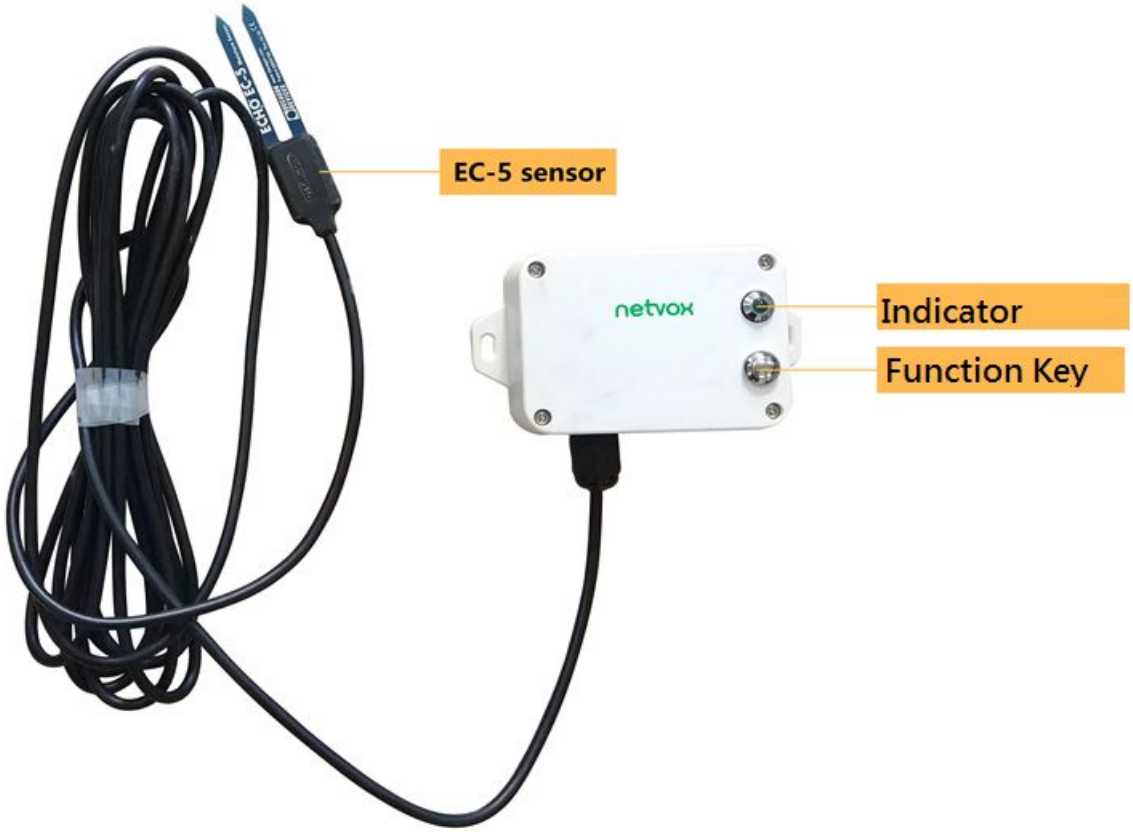
2. Appearance



3. Introduction

The R718PB13 is a ClassA type device based on the LoRaWAN protocol.
The R718PB13 can be connected to the EC-5 soil sensor, and the soil moisture collected by the sensor is reported to the corresponding gateway.

LoRa Wireless Technology:
LoRa is a wireless communication technology dedicated to long distance and low power consumption. Compared with other communication methods, LoRa spread spectrum modulation method greatly increases to expand the communication distance. Widely used in long-distance, low-data wireless communications. For example, automatic meter reading, building automation equipment, wireless security systems, industrial monitoring. Main features include small size, low power consumption, transmission distance, anti-interference ability and so on.

LoRaWAN:
LoRaWAN uses LoRa technology to define end-to-end standard specifications to ensure interoperability between devices and gateways from different manufacturers.

4. Main Characteristics

- Compatible with LoRaWAN
- 2 sections of 3.6V power supply
- Simple operation and setting

5. Operation

5.1 Power on and Turn on / off

(1) **Turn on:** It is powered by 2 sections of 3.6V battery. Press and hold the function key for 3 seconds and release it. The LED flashes once and the device is turned on successfully.
(2) **Turn off:** Press and hold function key for 5 seconds till the green indicator flashes quickly and release. The green indicator will flash 20 times to show that the device is turned off.

Note:
1. The interval between off/on is suggested to be about 10 seconds to avoid the interference of capacitor inductance and other energy storage components.

5.2 Join Into LoRa Network

To join the device into LoRa network to communicate with LoRa gateway.

The network operation is as following:
(1) If the device had never joined any network, turn on the device; it will search an available LoRa network to join. The green indicator will stay on for 5 seconds to show it joins into the network, otherwise, the green indicator will be off.
(2) If R718PB13 had been joined into a LoRa network, turn on the device; it will repeat step (1).

5.3 Function of Keys

(1) Press and hold function key for 5 seconds to reset to factory setting. After restoring to factory setting successfully, the green indicator will flashes quickly 20 times.
(2) Press function key to turn on the device which is in the network and the green indicator will flash once and the device will send a data report. Otherwise, the indicator does not work.

5.4 Data Report

A version package and an attribute report data are sent immediately after the device is powered on.
The default report configuration of the device is as follows:
ReportMaxTime: 900s;
ReportChange: 0;
Note: The default value of the factory ReportMaxTime (default factory setting is: 5min = 900s).
The R718PB13 device does not support the ReportChange function. That is, the configuration is invalid. The sent report data string is always sent according to the ReportMaxTime cycle.
R718PB13Report data type:
R718PB13: the data of the device report: soil moisture (EC-5).

5.5 Soil Acquisition Data Calibration

The R718PB13 calibrates the acquired soil data by setting soil calibration values. When the soil calibration value in the issued command is 0, the collected data is the data actually collected by the soil sensor. If the soil calibration value in the command is not 0, the collected data is the original collected data plus the calibration value.

5.6 Select Soil Type

R718PB13 selects the soil type by instruction. The soil types include mineral soil, potting soil and rock wool. See the documentation (LoRaWAN Payload) for details.

5.7 Low Voltage Warning

The low voltage threshold of the device is 3.2V. When the battery voltage is lower than this threshold, the device will not work properly. At the same time, the report will also show the voltage alarm.

5.8 Restore to Factory Setting

Operation method:

1. Press and hold the binding button for 5 seconds to release (the binding button is released when the LED flashes), and the LED flashes 20 times.
2. After the device is restored to factory settings, it needs to be restarted before it can be added.

6. Installation

METHOD 1. HORIZONTAL INSTALLATION

1. Excavate a hole or trench a few centimeters deeper than the depth at which the sensor is to be installed.
2. At the installation depth, shave off some soil from the vertical soil face exposing undisturbed soil.
3. Insert the sensor into the undisturbed soil face until the entire sensor is inserted. The tip of each prong has been sharpened to make it easier to push the sensor into the soil. Be careful with the sharp tips!
4. Backfill the trench taking care to pack the soil back to natural bulk density around the sensor body of the EC-5 .

METHOD 2. VERTICAL INSTALLATION

1. Auger a 3-in hole to the depth at which the sensor is to be installed.
2. Insert the sensor into the undisturbed soil at the bottom of the auger hole using a hand or any other implement that will guide the sensor into the soil at the bottom of the hole. Many people have used a simple piece of PVC pipe with a notch cut in the end for the sensor to sit in, with the sensor cable routed inside the pipe.
3. After inserting the sensor, backfill the hole, taking care to pack the soil back to natural bulk density while not damaging the black overmolding of the sensor and the sensor cable in the process.

Make sure that the sensor prongs and sensor body are buried completely. Carefully backfill the hole to match the bulk density of the surrounding soil. Be careful not to bend the black overmolding connecting the sensor to the cable.

View a visual demonstration on proper installation of the sensor in How to install soil moisture sensors.

The sensor can be oriented in any direction. However, orienting the flat side perpendicular to the surface of the soil will minimize effects on downward water movement.

7. Important Maintenance Instruction

Your device is a product of superior design and craftsmanship and should be used with care. The following suggestions will help you use the warranty service effectively.

• Keep the equipment dry. Rain, moisture, and various liquids or moisture may contain minerals that can corrode electronic circuits. In case the device is wet, please dry it completely.

• Do not use or store in dusty or dirty areas. This can damage its detachable parts and electronic components.

• Do not store in excessive heat. High temperatures can shorten the life of electronic devices, destroy batteries, and deform or melt some plastic parts.

• Do not store in a cold place. Otherwise, when the temperature rises to normal temperature, moisture will form inside, which will destroy the board.

• Do not throw, knock or shake the device. Rough handling of equipment can destroy internal circuit boards and delicate structures.

• Do not wash with strong chemicals, detergents or strong detergents.

• Do not apply with paint. Smudges can block debris in detachable parts and affect normal operation.

• Do not throw the battery into a fire to prevent the battery from exploding. Damaged batteries may also explode.

All of the above suggestions apply equally to your device, battery and accessories. If any device is not working properly.

Please take it to the nearest authorized service facility for repair.