Wireless Soil Moisture\ Temperature\ Electrical Conductivity

Wireless Network Based on LoRa Technology

Overview

The device is a wireless communication device that detects soil temperature and soil moisture and soil electrical conductivity, and transmits the detected data to other devices through a wireless network. The SX1276 wireless communication method is adopted.

Main Characteristics

● Adopt SX1276 wireless communication module

● 2 ER14505 batteries AA Size (3.6V / section) parallel power supply

● Main unit protection level IP65

● The base is equipped with a magnet that can be attached to a ferrous object

● Soil moisture, temperature, electrical conductivity detection

● Compatible with LoRaWAN™ Class A

● Frequency hopping spread spectrum technology

● Configuration parameters can be configured through a third-party software platform, data can be read and alerts can be set via SMS text and email (optional)

● Applicable to third-party platforms: Actility / ThingPark, TTN, MyDevices / Cayenn

● Low power consumption, longer battery life support

*Battery life is determined by sensor reporting frequency and other variables, please refer to http://www.netvox.com.tw/electric/electric_calc.html

On this website, users can find battery life of various models in different configurations.

Application Scenario

● Soil moisture detection

● Soil temperature detection

● Soil electrical conductivity

● Other

Dimensions
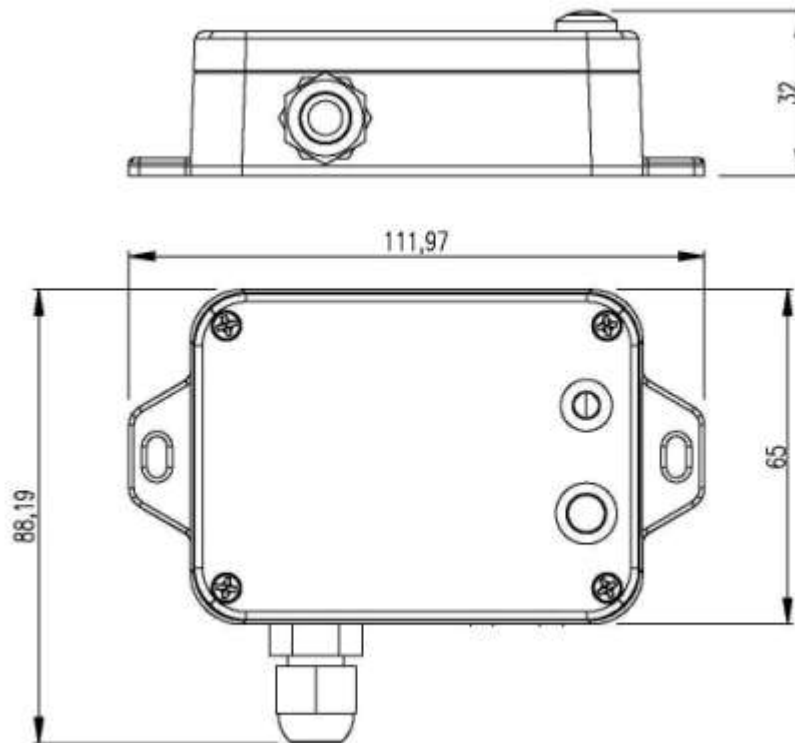
Electrical Characteristics

Power Supply	2 ER14505 lithium batteries (3.6 V, 2400mAh / section) in parallel
Battery Life	2.7 years (condition: ambient temperature 25 ° C, 60 min report once, txpower = 20 dBm , LoRa spreading factor SF = 10)
Sleep Current	20 uA
Awakening Current	6.3mA/ 3.3V
RF Emission Current	120mA/ 3 .3 V
RF Receiving Current	11 mA/ 3.3V
Battery Measurement Accuracy	± 0.1V

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

Frequency

Frequency Range	863MHz-928MHz 470MHz-510MHz
Power Output	US915 20dbm; AS923 16dbm; AU915 20dbm; CN470 19.15dbm; EU868 16dbm; KR920 14dbm; IN865 20dbm;
Receiving Sensitivity	-136 dBm (LoRa, Spreading Factor=12, Bit Rate = 293bps) -121 dBm (FSK, Frequency deviation=5kHz, Bit Rate=1.2kbps)
Antenna Type	Built-in antenna
Communication Distance	Up to 10 km (visible linear obstacle-free transmission distance, actual transmission distance depends on the environment.)
Data Transfer Rate	0.3kbps ~ 50kbps (LoRa) 1.2kbps ~ 300kbps (FSK)
Modulation System Mode	LoRa/FSK (Note: You can choose one of them)
Supportable LoRaWAN Band	EU863-870,US902-928,AU915-928,KR920-923,AS923-1, AS923-2,AS923-3,IN865-867,CN470-510 (Note: optional, to be done in the factory configuration)

Sensor - Soil moisture/Temperature/Electrical Conductivity

Operating Current	6mA/ 5VDC
Soil Temperature Resolution	0.1 ° C
Soil Temperature Range	-40~80℃
Soil Moisture Resolution	0.03% within 0-50%, 1% within 50-100%
Soil Moisture Accuracy	±2% within 0-50%, ±3% within 50-100%;
Soil Moisture Range	0-100%
Sensor Detection Range	The detecting radius of the sensor is about 7 cm, meaning the soil moisture percentage will vary significantly when there is water permeability within a radius of 7 cm.
Electrical Conductivity Resolution	0.1 ds/m
Electrical Conductivity Accuracy	In the range of 0-10 ds/m: ±0.3 ds/m In the range of 10-20 ds/m: ±1 ds/m
Electrical Conductivity Range	0-20 ds/m

Physical

Size	L: 112 mm*W: 88.19 mm*H: 32 mm,
Sensor Cable Length	2 m
Ambient Temperature Range	-20℃ to 55 ℃
Body Weight	About 160g
Ambient Humidity Range	<90% RH (no condense)
Storage Temperature Range	-40 ℃ ~ 85 ℃