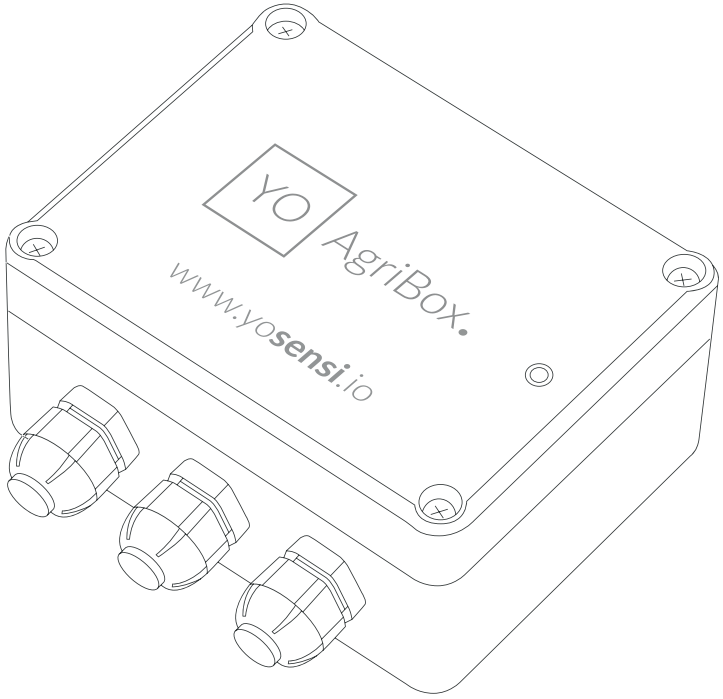
YO

AgriBox.

Datasheet



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LoRa Alliance™ Member CE

YO AgriBox.

Application

- YO AgriBox is a LoRaWAN device for measuring soil moisture at 3 points.
- Additionally, the device contains sensors that measure temperature and relative humidity inside the device.
- YO AgriBox makes it easy to plan and maintain optimum growing conditions for plants.

Components

- The device consists of a microcontroller (with Bluetooth Low Energy), communication modules (LoRa), sensors and batteries.
- YO AgriBox is equipped with an enclosure made of ABS with IP67 protection class.
- The enclosure of the device has IP67 buffers for which measurement probes can be installed.
- No soil moisture probes are attached to the device. Our offer includes soil moisture sensors with 2 m wire lengths. It is possible to connect up to 3 soil moisture probes.
- The enclosure is designed to be easily mounted on the wall or pole.
- YO AgriBox is equipped with a diode that indicates the operating status.

Operation of the device

- A LoRaWAN network is required for data transmission.
- The device does not require an external power supply.
- Place the device at the location for soil moisture measurement and configure/reconfigure the device via BLE.
- The device takes measurements at the interval specified in the configuration parameters.
- Yosensi provides access to the Yosensi Configuration Web Tool as part of the Yosensi Management Platform comprehensive solution, allowing device configuration and firmware updates.
- It is recommended to add the device to the Yosensi Management Platform, which allows detailed and easy monitoring of the data transmitted by the devices.

Device configuration

LoRaWAN settings	Network type (private or public) Operating mode selection (OTAA or ABP) **OTAA** • Device EUI • Application EUI • Application key • Number of trials **ABP** • Device address • Network session key • Application session key
Bluetooth Low Energy (BLE) settings	Transmission power Advertising frame interval
Device settings	Measurement interval (of soil moisture) Calibration is required before connecting the sensor

Advantages

- Production quality – made in the European Union by qualified engineers.
- As a complementary solution, Yosensi offers the purchase of soil moisture sensors. These sensors have a Polyurethane (PUR) wire and a waterproof sensor enclosure.
- The measuring probes can be completely buried and placed at different depths of soil.
- YO AgriBox is a wireless device that uses LoRaWAN technology.
- The device works based on the radio, so there is no need for additional wires.
- Very low power consumption.
- Depending on the version, the LoRa radio can operate in different regions (e.g., EU868, US915, AU915, AS923 etc.) adapted to different ISM frequency bands.
- Using Bluetooth Low Energy (BLE) provides:
  – configuration convenience (in a user-friendly way via a JSON data exchange format),
  – possibility of firmware update via OTA,
  – very low energy consumption.
- Supported LoRaWAN network type: private or public and connection over ABP or OTAA.
- Access to the Yosensi Management Platform for device configuration, firmware updates and infrastructure management.

Technical details

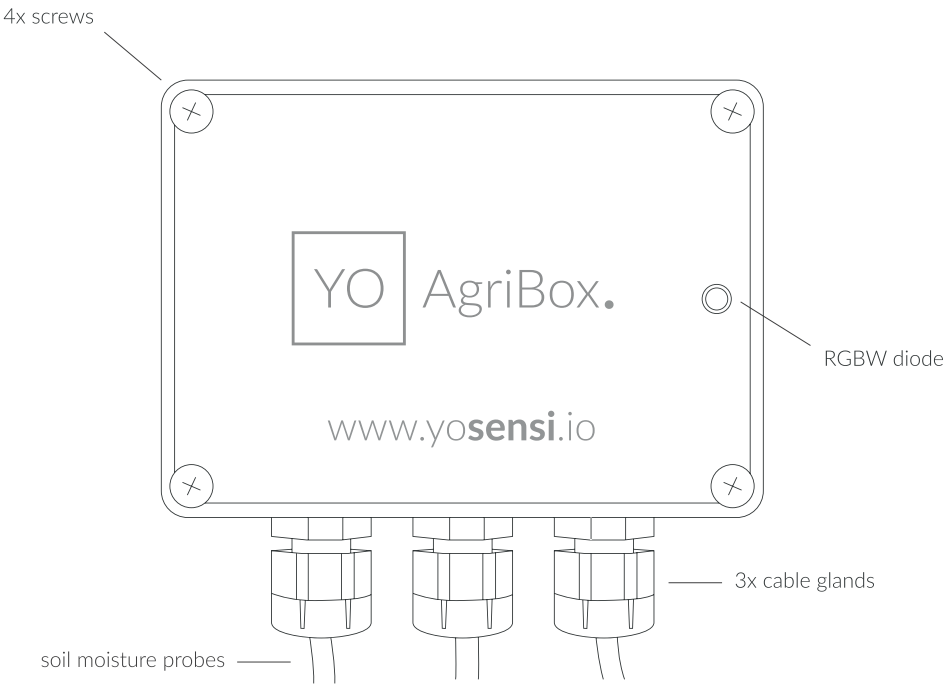


Figure 1. Top view of the device.

Enclosure of the device

Dimensions	Height: 42 mm Width: 88 mm Depth: 64 mm
Colour	Light grey
Installation Choose from	Horizontal Vertical (can be screwed to the wall)
Enclosure material	ABS
Level of protection	IP67

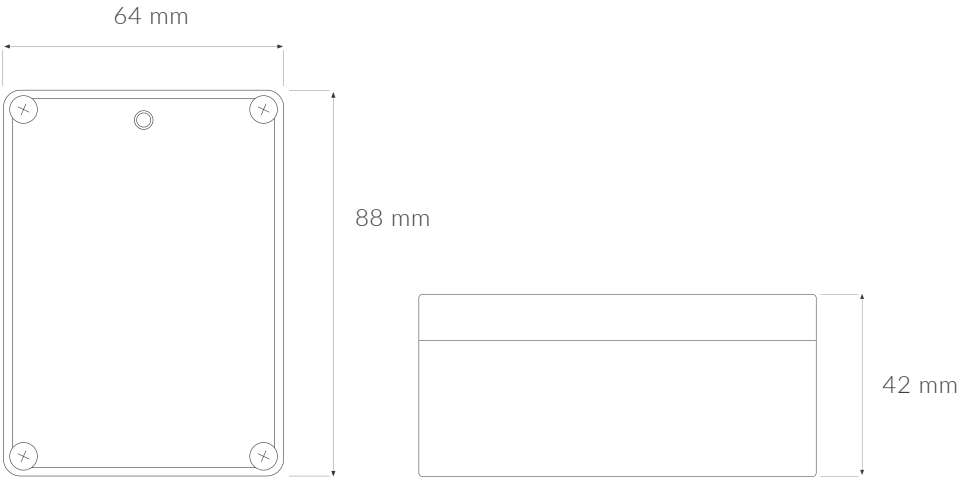
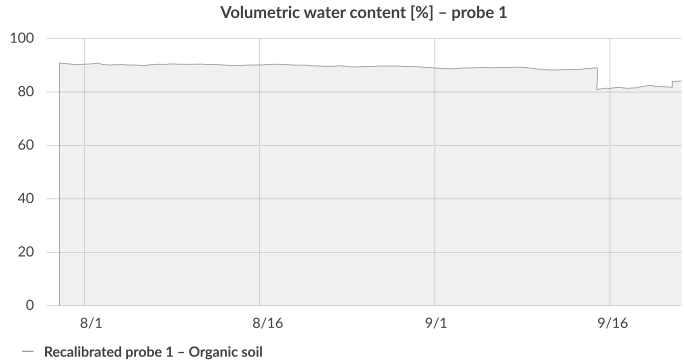


Figure 2. Dimensions of the device.

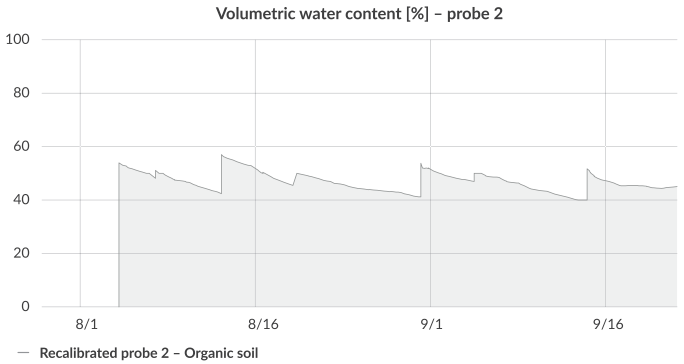
Parameters

Tx Power	LoRa EU868: to +14 [dBm] LoRa US915, AU915, AS923: to +22 [dBm] Bluetooth Low Energy (BLE): -20 to +6 [dBm]
Power supply	3 × AA battery (3 x 1,5 V)
Power consumption	Maximum: 120 mA DC (4,5 V DC)
Measuring range	**Volumetric water content:** Measurement range: from 0% to 100% **Temperature:** Measurement range: from -40°C to 125°C (-40°F to 257°F) Accuracy: ±0,2°C (32.36°F) (in temperatures from 5°C to 60°C (41°F to 140°F)) **Relative humidity:** Measurement range: from 0% to 100% Accuracy: ±2% (relative humidity from 20% to 80%)
Weight	134 g (without batteries)
Certificates	CE

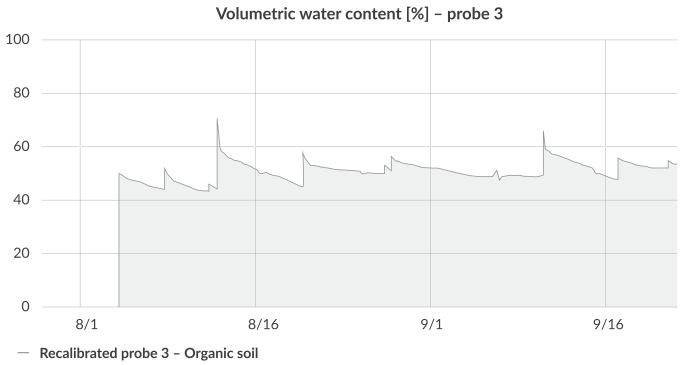
Sample charts



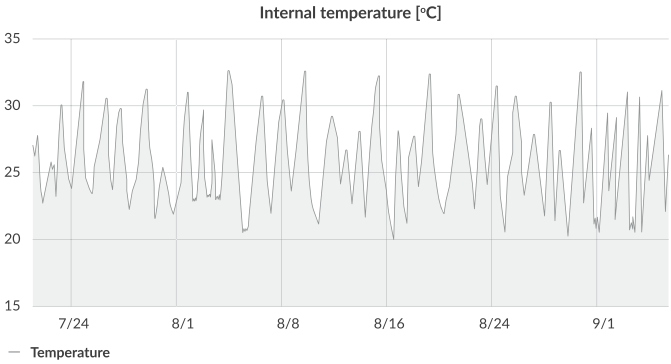
Example of an **volumetric water content** measurement chart for channel one.



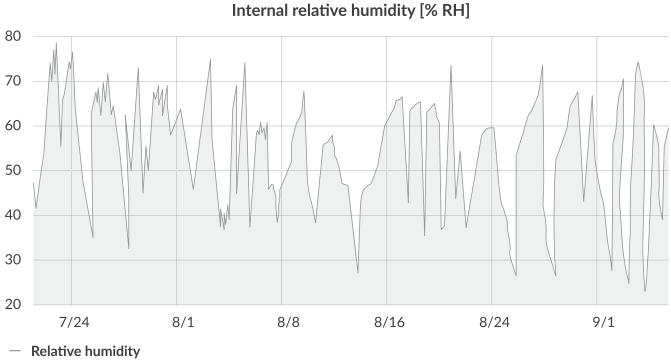
Example of an **volumetric water content** measurement chart for channel two.



Example of an **volumetric water content** measurement chart for channel three.



Example of an **internal temperature** measurement chart.



Example of an **internal relative humidity** measurement chart.

Revision history

Date	Version	Page(s)	Changes
September 2021	1	All	Initial version
February 2022	1.1	3, 4	Changes are related to the firmware and apply to devices working with firmware version 2.0.0 and above.

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