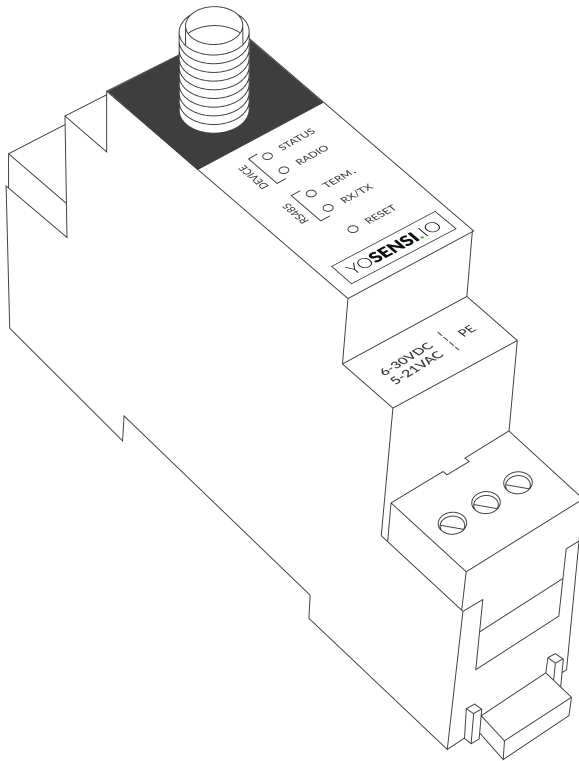




# Modbus.

Datasheet





## Application

- YO Modbus is the bridge between the Modbus network and LoRaWAN. It allows to read data via Modbus RTU from Slave devices and send it via LoRaWAN.
- With one YO Modbus device, it is possible to create up to 150 Modbus queries and send via LoRaWAN collected in up to 30 different LoRa frames. There is no limit to the number of devices to which your Modbus can send queries. The limit is only based on the number of queries.

## Components

- The device consists of a microcontroller (with Bluetooth Low Energy), communication modules (LoRa), power supply systems, and a galvanically isolated RS485 interface.
- The enclosure of the device is adapted for installation in electrical switchboards or automation cabinets on standard 35 mm DIN rails.
- On special request, the YO Modbus device can be prepared in an IP67-rated protective enclosure without DIN rail mounting.
- The device is equipped with 4 diodes that indicate the operating status of the device.

# Operation of the device

- A LoRaWAN network is required for data transmission.
- The device must be powered from the power supply.
- Device parameters can be configured or reconfigured at any time via BLE.
- Yosensi provides access to a Command Line Interface application as a part of a comprehensive solution, allowing the device to be configured.
- It is recommended that the device be added to the Yosensi Suite system, which allows for the easy management 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

Measuring interval  
Serial baudrate  
Serial bits  
Serial parity  
Serial stop bits  
Serial Tx/Rx delay  
RS485 termination

### Modbus settings

Modbus query section  
Modbus out section

# Advantages

- Production quality – made in the European Union by qualified engineers.
- The RS485 input on which the Modbus RTU protocol works is galvanically isolated from the rest of the device modules for maximum protection.
- Additionally, the device can be connected to protective earth (PE) cable so that the charges coming from the RS485 cable shielding will be slowly dissipated to the earth cable. It will lead to equipotential bonding in the Modbus network on the device side.
- The device is designed for mounting on standard 35 mm DIN rails in electrical switchboards. It occupies only one pole width like a standard single-phase overcurrent circuit breaker.
- The device has a built-in configurable termination resistor.
- YO Modbus is a LoRaWAN end-device and so far it operates in Class A allowing it to send data according to a configured schedule.
- Configuration is via JSON data exchange format.
- It can be powered by direct or alternating current over a wide voltage range of 6-30 VDC or 5-21 VAC respectively.
- Wireless communication eliminates the need for additional wiring or conversion of existing installations.
- Low energy consumption.
- Depending on the version, the LoRa radio can operate in different regions (e.g., EU868, US915, AU915, AS923) 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 connection over ABP or OTAA.
- Command Line Interface application for convenient device configuration.
- Access to the Yosensi Suite system for configuring devices and managing infrastructure.

# Technical details

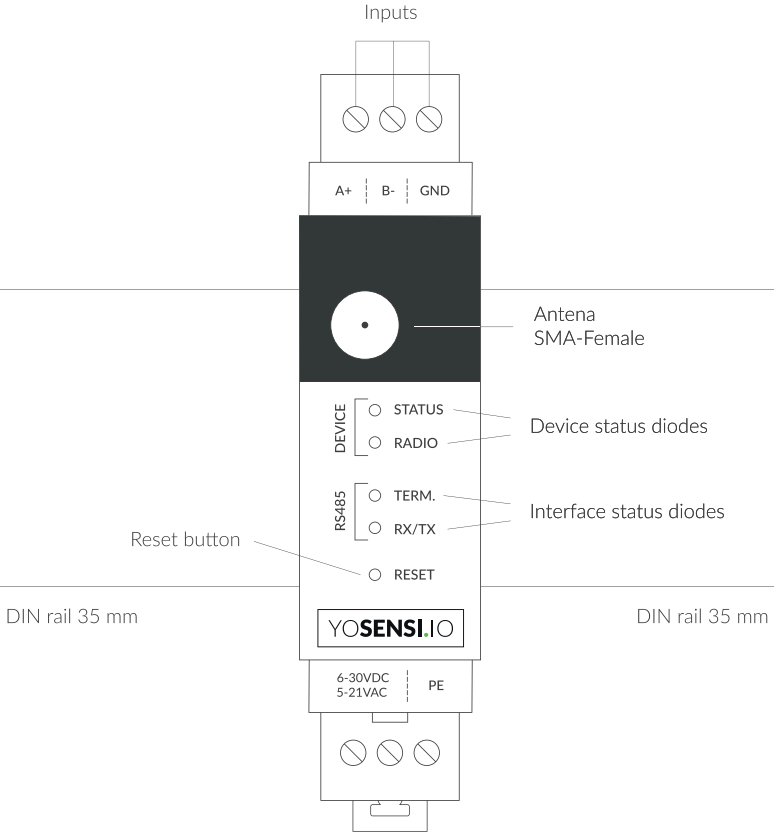


Figure 1. Top view of the device.

# Enclosure of the device

Dimensions	Height: 90 mm Depth: 58 mm	Width: 17,5 mm (1 pole)
Colour	Light grey (RAL 7035)	
Installation	35 mm DIN rail standard	
Enclosure material	Polycarbonate	
Fire resistance class	UL94-VO	
Level of protection	IP20	

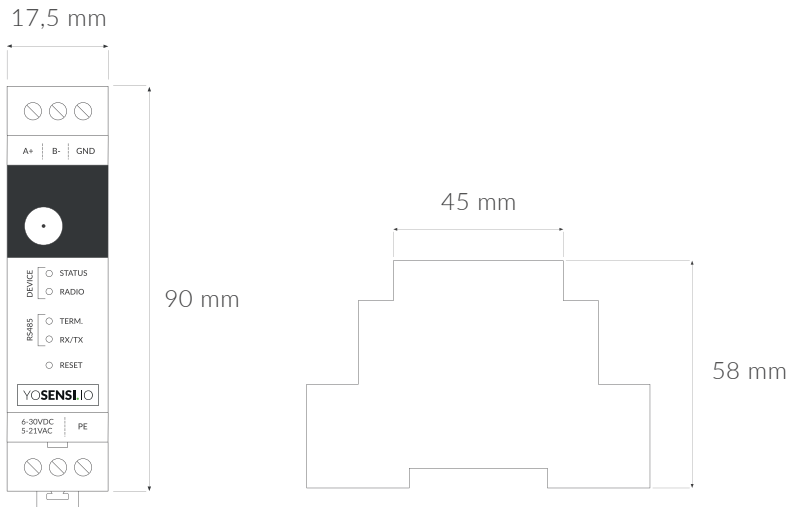


Figure 2. Dimensions of the device.

# Parameters

<b>Tx Power</b>	LoRa EU868: to +14 [dBm] LoRa US915, AU915, AS923: to +22 [dBm] Bluetooth Low Energy (BLE): -20 to +6 [dBm]
<b>Power consumption</b>	Typical: 12 mA DC (12 V DC) Maximum: 120 mA DC (12 V DC)
<b>Input signal</b>	Digital RS485
<b>Weight</b>	90 g
<b>Certificates</b>	CE

# Revision history

Date	Version	Page(s)	Changes
January 2022	1	All	Initial version







The logo for YOSSENSI.IO is enclosed in a thin black rectangular border. The text 'YOSENSI' is in a bold, uppercase, sans-serif font, followed by '.IO' in a smaller, regular, uppercase, sans-serif font. The background of the entire page is a stylized world map where the continents are filled with intricate white and grey circuit board patterns.

YOSENSI.IO

LoRa Alliance Member

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