YOSENSI.IO

YO Analog

User guide v3.3

Release notes

Date	Version	Changes
11.06.2021	1.0	Initial release.
13.12.2021	2.0	Change of power supply from 100~240 V AC, 50/60 Hz to 6 - 30 V DC, 5 - 21 V AC.
26.08.2022	3.0	Added specifications of the device, Installation instruction, upgraded device configuration and operation of the device, updated payloads description, added compliance statement
20.07.2023	3.1	Added configuration node with Yosensi Management Platform. Changed description of connecting nodes with Yosensi Management Platform.
26.10.2023	3.2	Added configuration with Yosensi Mobile App.
19.12.2023	4.2	Added outlier detection mechanism with description

Content

Product description

Overview

The YO Analog measures AC flowing through devices connected to the electricity grid. With one YO Analog it is possible to measure the current simultaneously (e.g., in two three-phase, six single-phase, one three-phase and three single-phase devices, etc.). It is possible to install current clamps without knowing the direction through which the current flows. Wireless communication eliminates the need for additional wiring or conversion of existing installations. By means of the application algorithm developed by the Yosensi Team, and despite the limitations of data transfer in the LoRaWAN network, it is possible to establish accurate mapping of current and power consumption.
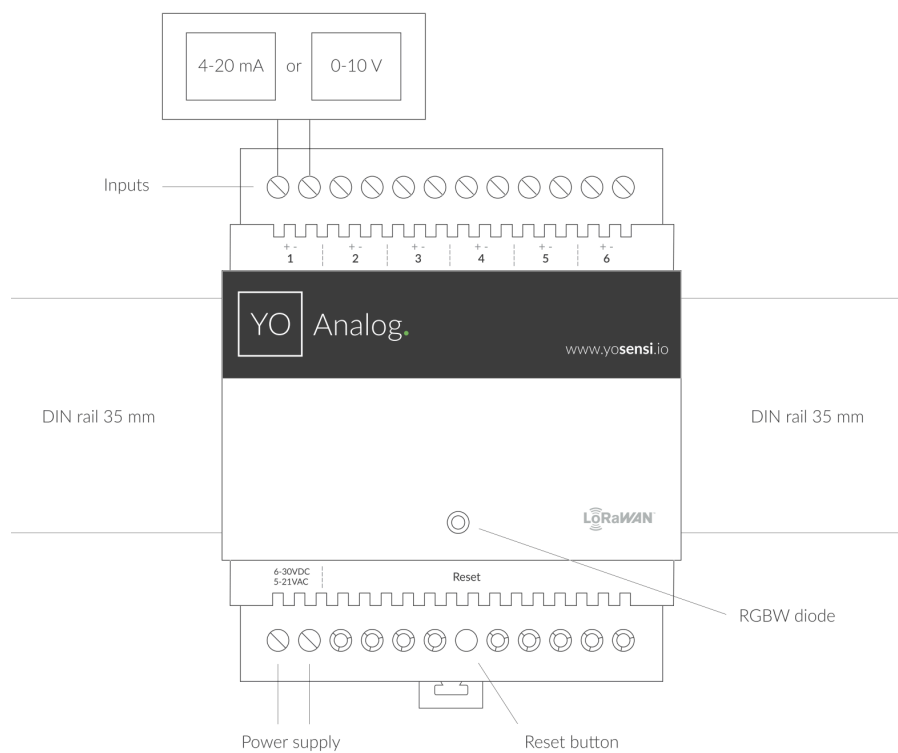

Figure 1 Device top view.

Device sticker placed on the right side of the device enclosure contains information about model, version, LoRaWAN region and 3 parameters important in case of device identification and configuration:

- **DEV EUI:** 64-bit unique device identifier in a LoRaWAN network,
- **DEV ADDR:** address required to connect via ABP activation type to LoRaWAN,
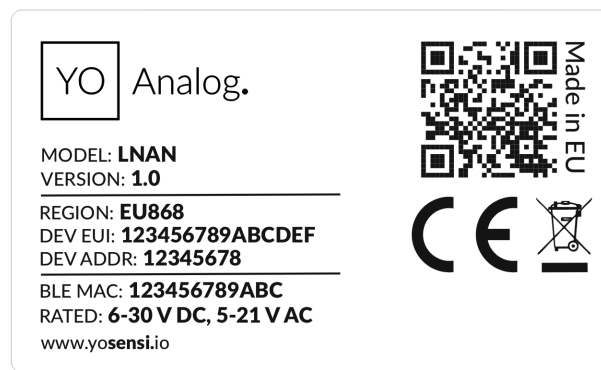- **BLE MAC:** bluetooth physical address.

Figure 2 Device label.

Physical interfaces

LEDs

YO Analog communicates its current behavior to the user by RGBW LED placed on the top of the device shown on figure one.

DIODE STATUES INTERPRETATION

BEHAVIOUR	COLOUR	DEVICE STATUS
Single flash	Green	**General:** device is working correctly (power and memory).
Single flash	Red	**General:** device is working incorrectly (power and memory). **LoRaWAN communication:** failed to receive an acknowledgement from LoRaWAN Server within specified timeout.
Single flash	White	**LoRaWAN communication:** LoRaWAN frame sent \ confirmation from LoRaWAN Server after receiving the frame.
Slow flashing	Blue	**BLE communication:** connection to the device via BLE (configuration).
Rapid flashing	Blue	**LoRaWAN communication:** connecting to LoRaWAN network.

Buttons

YO Analogis equipped with one reset button inside the device on the PCB board under the inscription "reset" shown on the device. It is possible to press it with a thin stick.
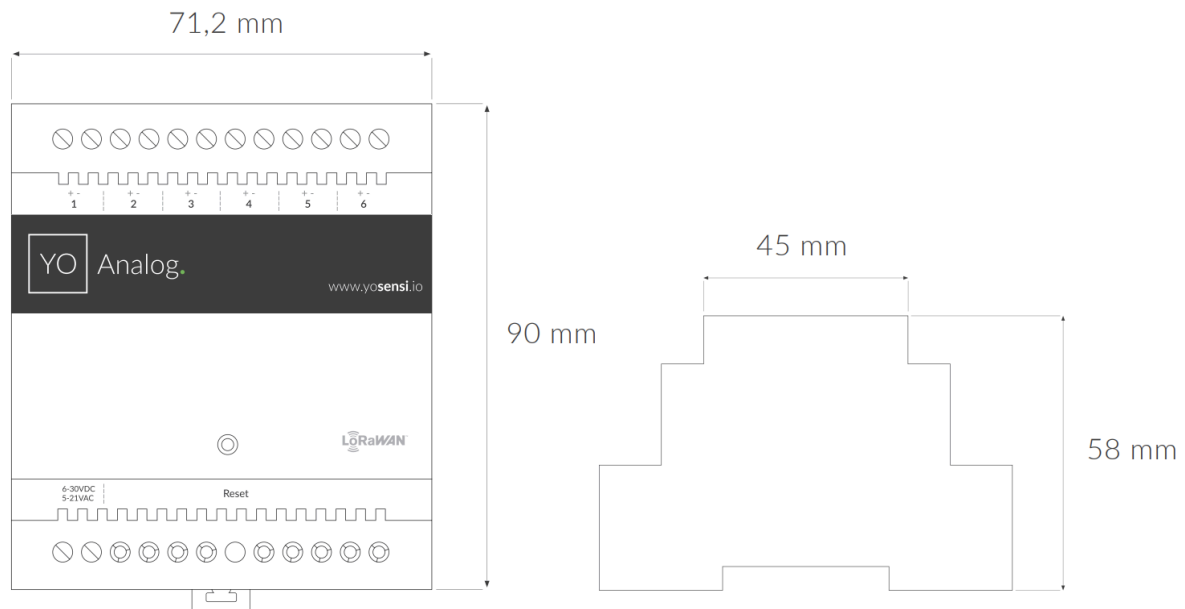
Specifications

Physical

Figure 3 Dimensions of the device.

PHYSICAL SPECIFICATION

Dimensions	Height: 90 mm Width: 71,2 (4 pole) mm Depth: 58 mm
Colour	Light grey
Mounting method	35 mm DIN rail Vertical (can be screwed to the wall)
Enclosure material	Polycarbonate
Fire resistance class	UL94-VO
Level of protection	IP20
Weight	127 g

Operating conditions

OPERATING CONDITIONS

Temperature	0° to 70°C
Humidity	0 to 90%
Placement	Indoor use
Power supply	6 - 30 V DC 5 - 21 V AC
Power consumption	Typical: 80 mA DC (12 V DC) Maximum: 180 mA DC (12 V DC)

Measured values

MEASUREMENT RANGES

Parameter	Measuring range	Accuracy
Current	4-20 mA	-
Voltage	0-10 V	-

Current

YO Pulse provides measuring of current flow in the network between 4 - 20 mA which is used as a standard in many industries. This helps customers to monitor signals in the industry network connected to the IoT devices. YO Analog can monitor up to 6 signals depending on the configuration.
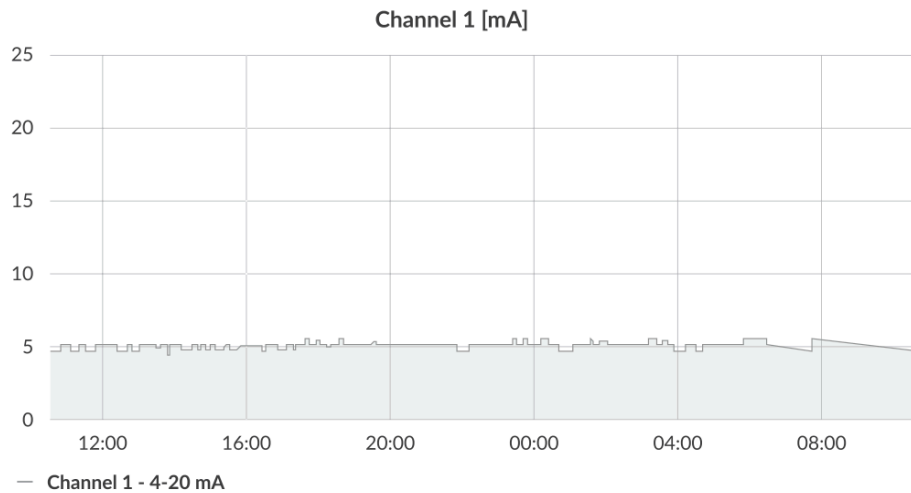

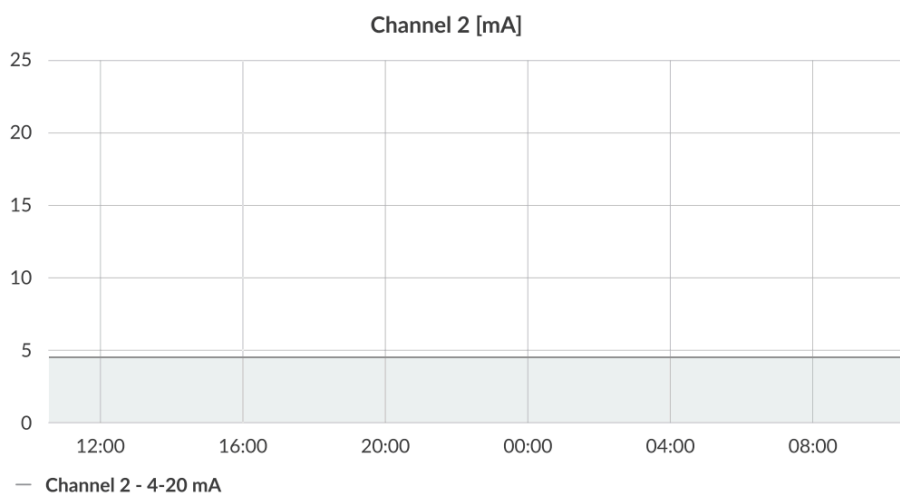Figure 4 Current flow on first channel of the device exemplary chart.

Figure 5 Current flow on the second channel of the device exemplary chart.
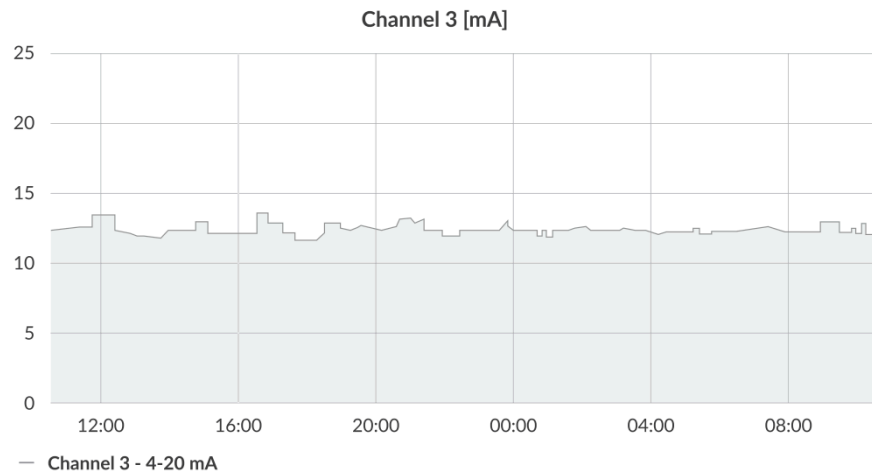
Channel 3 [mA]

— Channel 3 - 4-20 mA

Figure 6 Current flow on the third channel of the device exemplary chart.

Voltage

YO Pulse provides measuring of voltage in the network between 0- 10 V which is used as a standard in many industries. This helps customers to monitor control signals in the industry network connected to the IoT devices. YO Analog can monitor up to 6 signals depending on the configuration.

Channel 4 [V]

— Channel 4 - 0-10 V
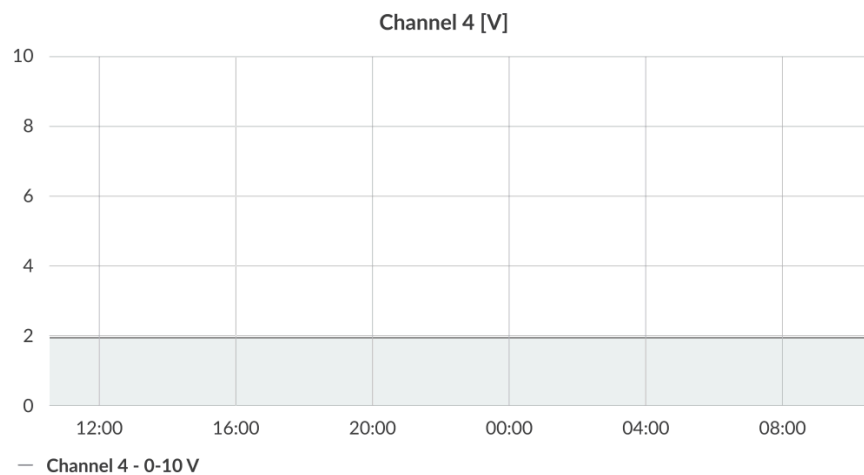
Figure 7 Voltage on the fourth channel of the device exemplary chart.

Channel 5 [V]

Channel 5 - 0-10 V
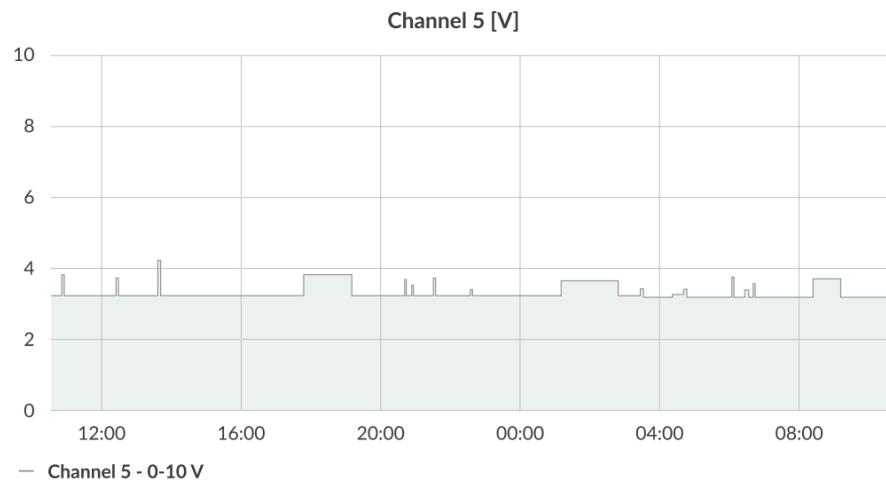
Figure 8 Voltage on the fifth channel of the device exemplary chart.
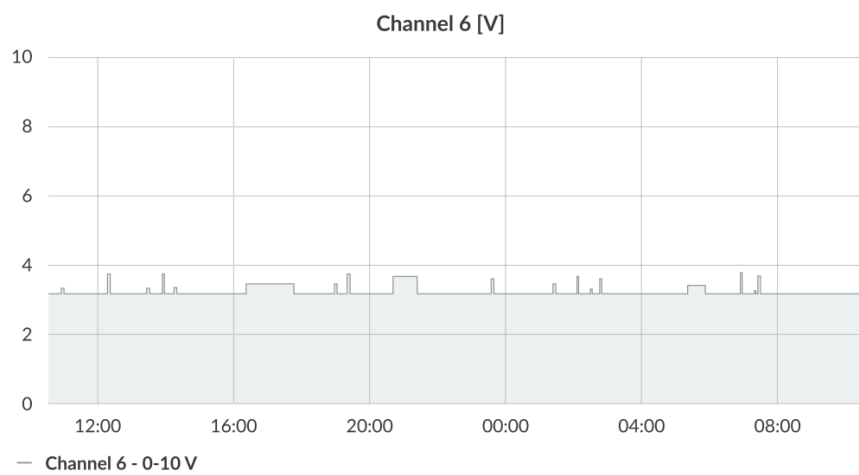
Channel 6 [V]

Channel 6 - 0-10 V

Figure 9 Voltage on the sixth channel of the device exemplary chart.

Installation

Package contents

1. Device.
2. Warranty card.

Safety precautions

SAFETY PRECAUTIONS

SYMBOL	DESCRIPTION
	Device is marked with a symbol saying that electrical and electronic products may not be mixed with unsorted household waste. Remember that batteries used to power the device must be treated at a specialized treatment facility.
	Remember about possible electrostatic discharge when replacing battery, connecting input or doing some other operations near inside electronics.
	Be careful while handling the device – dropping it may cause damage that will affect the sensors and other electronics inside.
	When installing the device on the wall remember to wear adequate protective equipment.
	To maintain the level of protection device cover screws must be properly tightened. Device shouldn't be used without cover.
	Any actions inside the device's enclosure (excluding replacing batteries) must be performed by trained personnel only.
	Clean the device only with damp cloth.
	Device is intended for indoor use. Make sure that device is not exposed for long term UV rays and in an environment in the immediate vicinity of water which may flood the device.

Installation guide

1. Mount the device on a 35 mm DIN rail.
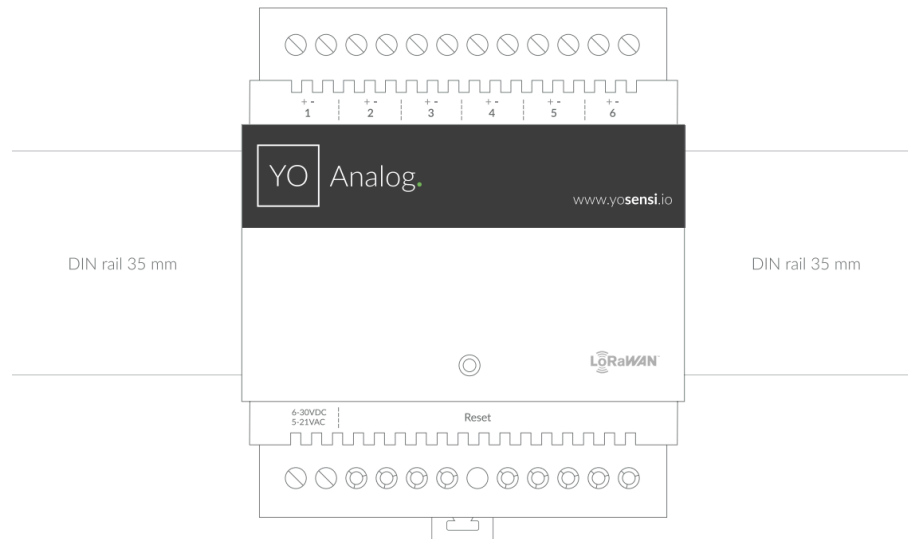
Figure 10 Device mounting instructions.

Important! By default each input is configured as current. If you want to configure one or more inputs as voltage you have to do it before connecting sensors. The configuration is possible via BLE.

2. Connect a 4-20 mA signal source and/or a 0-10 V voltage measuring cable to the individual inputs of the device according to the polarity shown on the enclosure label.
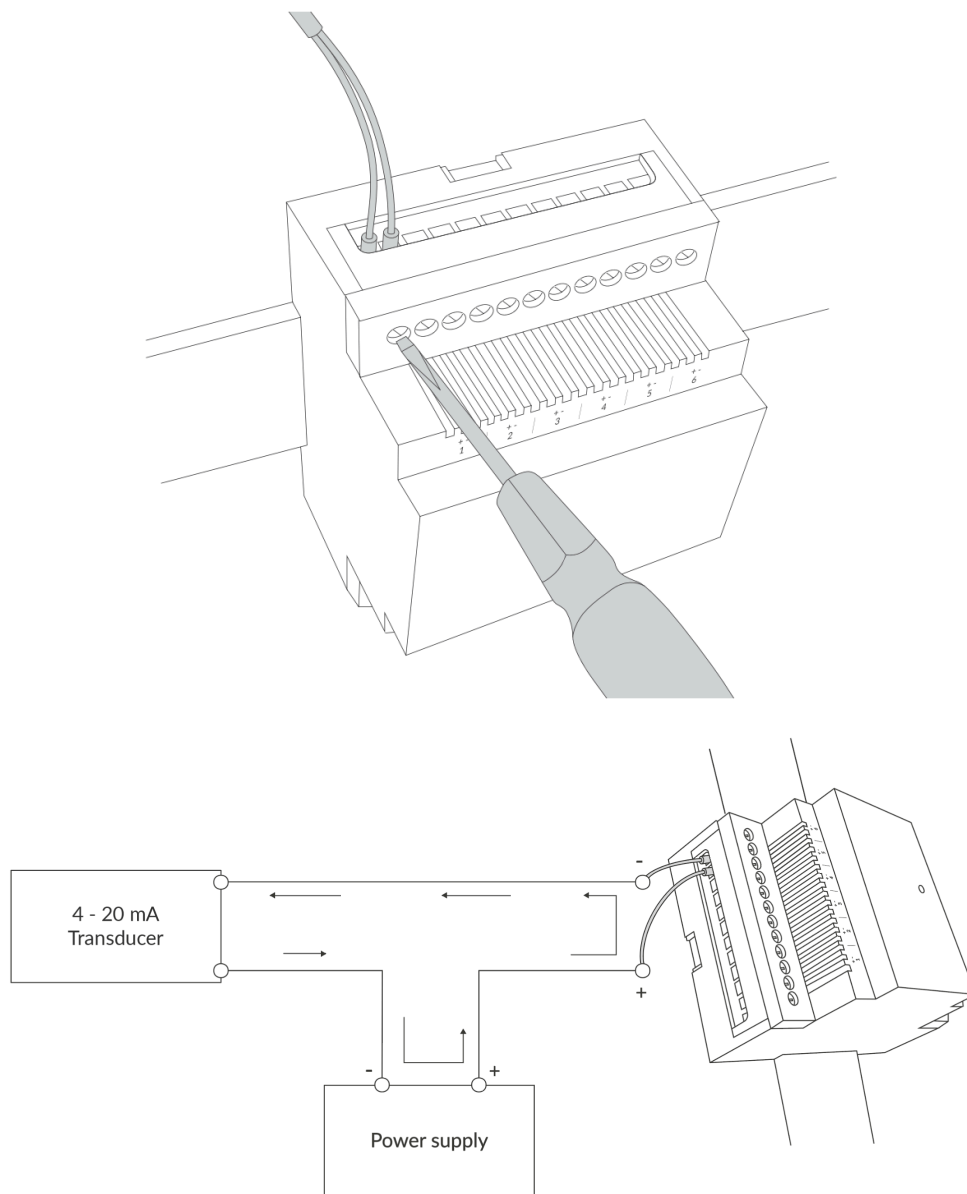
Figure 11 Connect the inputs to the individual channels of the device.

3. Screw the power supply wires to the device regardless of polarity (6 - 30 V DC, 5 - 21 V AC).
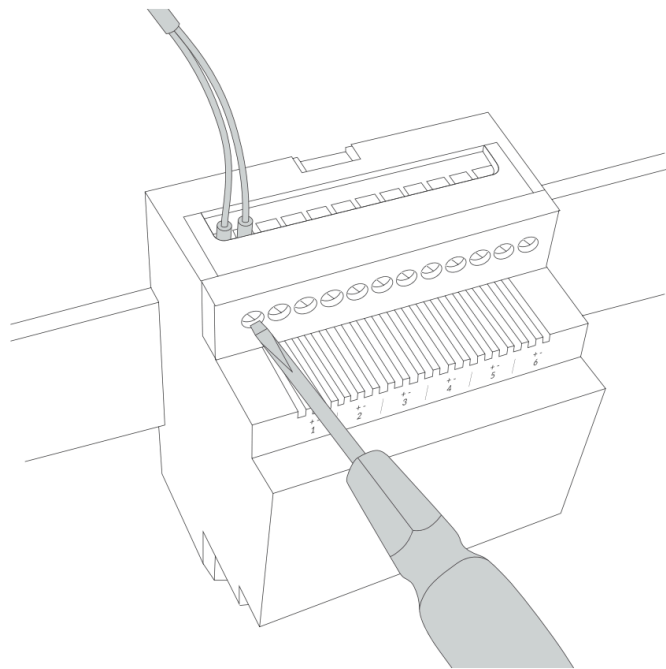
Figure 12 Instruction on how to fasten the current clamps around the wires.
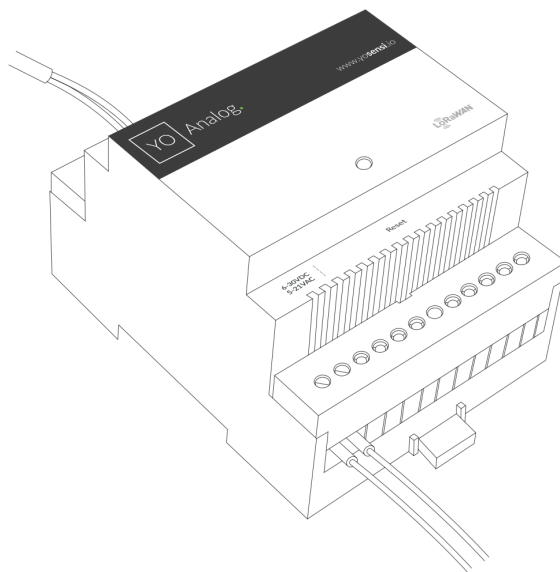
Figure 13 Final look of the device.

Operation

IoT system components

Typical IoT systems consist of 3 main elements *(Figure 14)*, brief described below. In order to set communication, each element must be properly configured.

1. **Node** – device with sensors and a wireless communication module that gathers data, forms the payload and sends it to the gateway.
2. **Gateway** – device similar to routers, equipped with a LoRa concentrator, that receives LoRa packets and send them to the Internet-connected server.
3. **Server** – in most cases, a cloud-based service where data is processed, stored, analysed, and presented in user-friendly ways (via a user interface); Yosensi default and recommended tools are Yosensi Management Platform (for IoT structure management) and Grafana (for data presentation).

Node   →   Gateway   →   Server
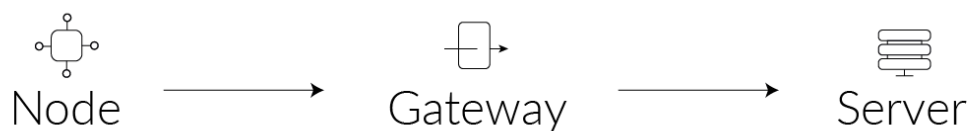
Figure 14 IoT system components.

Line of sight

Obstacle
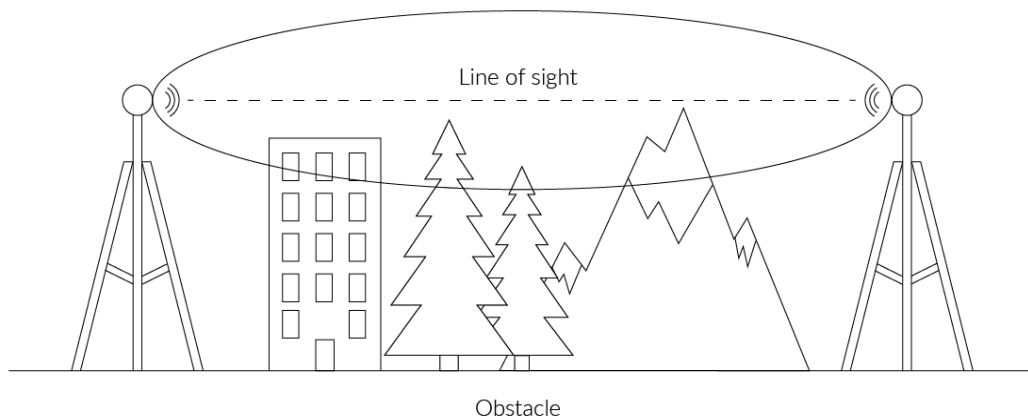
Figure 15 Fresnel zone where communication between two antennas can occur.

Device configuration

Configurable parameters

A few parameters must be set before sending data to the gateway. The default firmware is configured in OTAA mode with predefined *deveui*, *appkey* (OTAA) and *appskey*, *nwkskey* (ABP).

Configuration of the device is stored in a JSON file divided into the following sections:
- **info** (generic, read only): information about the device,
- **lorawan** (generic): configuration data for LoRaWAN connection,
- **ble** (generic): bluetooth settings,
- **device** (dynamic): individual configuration for a specific device (this section's structure differs for each device),

Sample configuration file for the YO Analog device.

```json
{
        "info": {
                "devmodel": "LNAN",
                "fwver": "3.5.0",
                "loraradio": "SX1261",
                "lorawanver": "1.0.2",
                "loraregion": "EU868",
                "blemacaddr": "0123456789ab"
        },
        "lorawan": {
                "subband": 1,
                "nwktype": "public",
                "acttype": "otaa",
                "otaa": {
                        "deveui": "0123456789abcdef",
                        "appeui": "fedcba9876543210",
                        "appkey": "000102030405060708090a0b0c0d0e0f",
                        "trials": 3
                },
                "abp": {
                        "devaddr": "01234567",
                        "nwkskey": "0123456789abcdef0123456789abcdef",
                        "appskey": "000102030405060708090a0b0c0d0e0f"
                }
        },
        "ble": {
                "power": 0,
                "interval": 1600
        },
        "device": {
                "measinterval": 300,
                "measthreshold": 20,
                "ch1func": "0-20mA",
                "ch2func": "0-20mA",
                "ch3func": "0-20mA",
                "ch4func": "0-10V",
                "ch5func": "0-10V",
                "ch6func": "0-10V"
        }
}
```

GENERICS PARAMETERS

SECTION	NAME	DESCRIPTION	POSSIBLE VALUES	DEFAULT VALUE	READ/ WRITE
info	devmodel	Device name	-	LNAN	R
	fwver	Firmware version	-	3.5.0	R
	loraradio	Radio chipset model	-	SX1261[1]	R
	lorawanver	LoRaWAN stack version	-	1.0.2	R
	loraregion	LoRaWAN region	-	EU868[1]	R
	blemacaddr	Bluetooth LE address	-	predefined	R
lorawan	subband	Uplink subband number	Table[2]	predefined	R/W
	nwktype	Network type	public, private	public	R/W
	acttype	Activation type	otaa, abp	otaa	R/W
lorawan -otaa	deveui	Device EUI (Extended Unique Identifier)	8 B (HEX)	predefined	R/W
	appeui	Application EUI	8 B (HEX)	predefined	R/W
	appkey	Application Key	16 B (HEX)	predefined	R/W
	trials	Join request trials	1-9	3	R/W
lorawan -abp	devaddr	Device Address	4 B (HEX)	predefined	R/W
	nwkskey	Network Session Key	16 B (HEX)	predefined	R/W
	appskey	Application Session Key	16 B (HEX)	predefined	R/W
ble	power	Bluetooth LE transmit power [dBm]	0[4]	0	R/W
	interval	Bluetooth LE advertising interval [ms]	MS_INPUT[3]	1600	R/W

[1] LoRa radio chipset used defines the LoRaWAN region: SX1261 - EU868; SX1262 - AU915, US915, AS923

[2] Uplink subband list for specific LoRaWAN regions - UPLINK SUBBAND Table.

[3] Calculation formula: $MS\_INPUT = INTERVAL\_MS \times 1.6$.

[4] Change currently not supported.

DEVICE PARAMETERS

NAME	DESCRIPTION	POSSIBLE VALUES	DEFAULT VALUE	READ/ WRITE
measinterval	Measuring and sending interval LoRa [s]	60[1]–999999	300	R/W
measthreshold	Measuring and sending threshold accuracy	1-9999	20	R/W
chxfunc	Number of channels with function of measurement current or voltage	0-20 mA 0-10 V	0-20 mA	R/W

Parameters description

- **nwktype:** used for setting the device in public or private network type.

- **acttype:** used for setting the device in ABP or OTAA mode.

- **deveui, ... , appskey:** predefined addresses and keys, these parameters are generated using multiple IDs specific to the particular MCU and are unique for each device.; they can be changed if needed.

- **interval:** determines the interval of sending broadcast packets, used to connect to every BLE receiver around the device.

- **subband:** used for setting the communication frequency sub-band in LoRaWAN.

- **measinterval:** measurement interval [s] between sending LoRa packets.

- **measthreshold:** measurement threshold for each channel. If current or voltage value between previous measurement and the next differs by a value of 'meastreshold', it queues this data for sending. Measurement difference is reported in subsequent LoRa packets along with measurement time.

- **ch1func...ch6func:** numbers of channels with measurement of current or voltage flow in the network connected to the device.

Outlier detection mechanism

The **measthreshold** configuration parameter defines the sensitivity range for each data point used to determine if the subsequent measurement should be placed in the payload and sent to the server. If all values are within range, then only the first and last values remain (see the left side of *Figure 25*). If measurements are out of range, then the payload includes more than two points (see the right side of *Figure 13*). The scenario where too many data points exist such that they do not fit in one payload is

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[1] Activation type OTAA: min. 60
  Activation type ABP: min. 120

possible, so they are sent in subsequent payloads with a reduced sending time despite the value configured in **_measinterval_**
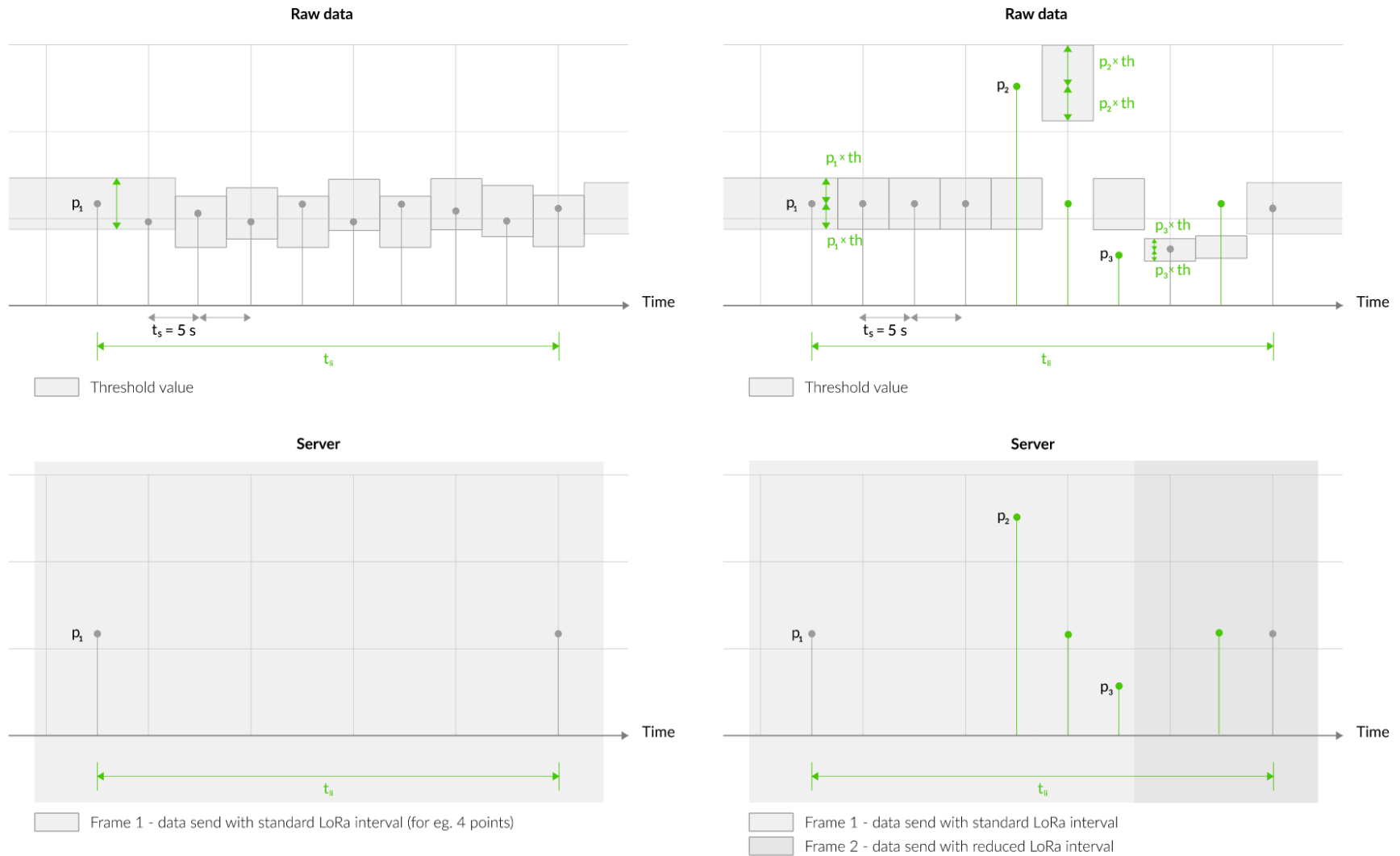
Figure 16 The outlier detection mechanism using a configurable threshold value.

UPLINK SUBBAND

REGION	DESCRIPTION	POSSIBLE VALUES	DEFAULT VALUE	READ/ WRITE
EU868	Sub-band 1; 867.1 - 868.5 MHz; channels 0-7	1	1	R
US915	Sub-band 1; 902.3 - 903.7 MHz; channels 0-7	1	2	R/W
	Sub-band 2; 903.9 - 905.3 MHz; channels 8-15	2		
	Sub-band 3; 905.5 - 906.9 MHz; channels 16-23	3		
	Sub-band 4; 907.1 - 908.5 MHz; channels 24-31	4		
	Sub-band 5; 908.7 - 910.1 MHz; channels 32-39	5		
	Sub-band 6; 910.3 - 911.7 MHz; channels 40-47	6		
	Sub-band 7; 911.9 - 913.3 MHz; channels 48-55	7		
	Sub-band 8; 915.5 - 914.9 MHz; channels 56-63	8		
AU915	Sub-band 1; 915.2 -916.6 MHz; channels 0-7	1	2	R/W
	Sub-band 2; 916.8 - 918.2 MHz; channels 8-15	2		
	Sub-band 3; 918.4 - 919.8 MHz; channels 16-23	3		
	Sub-band 4; 920.0 - 921.4 MHz; channels 24-31	4		
	Sub-band 5; 921.6 - 923.0 MHz; channels 32-39	5		
	Sub-band 6; 923.2 - 924.6MHz; channels 40-47	6		
	Sub-band 7; 924.8 - 926.2 MHz; channels 48-55	7		
	Sub-band 8; 926.4 - 927.8 MHz; channels 56-63	8		
AS923	Sub-band 1; 922.0 -923.2 MHz; channels 0-8	1	1	R/W
	Sub-band 2; 923.2 - 924.5 MHz; channels 9-17	2*		

2 change is not supported*

Configuration node with Yosensi Management Platform

Connect to the device as follows:
1. Log in at app.yosensi.io
2. You'll see the dashboard organization view. Go to the Application section in the sidebar.
3. Select application, locate and select the device by looking for the DEV EUI on the device label
4. Select the Firmware section. For the configuration of the device, you can see three different buttons:
   - Configure – here, you can change and upload the device parameters.
   - Update firmware – here, you can update the firmware to version 3.4.0 and newer.
   - Recover device – this section restores the firmware of the device. This button helps if you lose the connection while uploading firmware.
5. Once the "Configure" button has been selected and the node has been paired with the computer, the next step is configuring parameters. You will see 2 different display options for the configuration. The first recommended is "Form-based-editor" and the second is "Text editor". Possible values with the description of each parameter can be found in the device configuration.

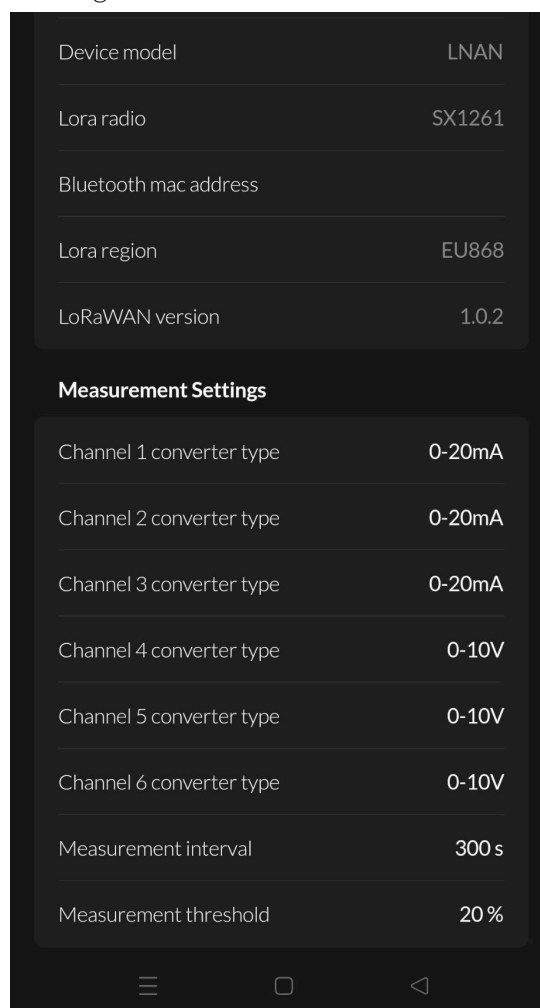*Figure 17 Update configuration section view.*

6. Press the Upload button and wait.

> **NOTE**   Additional information including device configuration can be found in **Yosensi configuration web tool**.

Configuration node with Yosensi mobile app

Connect to the device using Yosensi app as follows:

1. Login to Yosensi App using your credentials.
2. Go to the Devices section and choose the device you want to configure. If you can not see the device ensure that you are in the correct organization. Alternatively you can also scan the QR code placed on the node. It will redirect you right to the device details.
3. After selecting the device go to the "configuration" option in device details. Now wait, your mobile will pair with the node.
4. You will see 2 different display options of the configuration, first recommended is "Form-based-editor" second "Text editor". Possible values with description of each parameter can be found in the device configuration.

Device model	LNAN
Lora radio	SX1261
Bluetooth mac address	
Lora region	EU868
LoRaWAN version	1.0.2

Measurement Settings

Channel 1 converter type	0-20mA
Channel 2 converter type	0-20mA
Channel 3 converter type	0-20mA
Channel 4 converter type	0-10V
Channel 5 converter type	0-10V
Channel 6 converter type	0-10V
Measurement interval	300 s
Measurement threshold	20 %

Figure 18Configuration view in mobile app.

5. After changing parameters, press the "Save" button.

Connecting node with network

The LoRaWAN architecture requires a configured Gateway and Network Server. We'll go through an example in our recommended Yosensi Management Platform software.

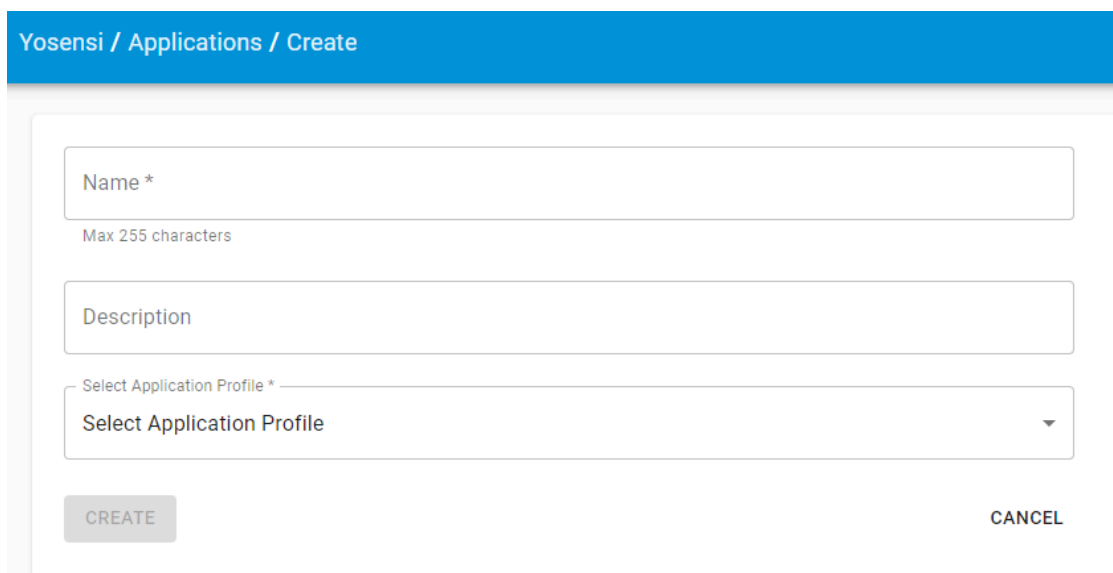### Yosensi Management Platform configuration

Before you can make the node visible, you'll need an **organization** and an **application**. The organization is your own space, at the highest level of IoT systems management (like the root directory in operating systems). It can be created only by Yosensi staff, and all clients using Yosensi Management Platform have one created for them by default. In case of any questions, you can find us at support@yosensi.io. The application is a representation of each system and, together with the node definitions, is created by customers. The basic integration of a node into the Yosensi Management Platform is described below. Nodes can be added manually or via Bluetooth.

> **NOTE**   **A subscription is needed to use Yosensi Management Platform. Contact us on contact@yosensi.io for more information and pricing.**

Adding a node manually

Yosensi Management Platform integration instructions:

1. Log in to app.yosensi.io.
2. You'll see the default organization view. To switch to another organization, click on the user avatar in the right top corner and select 'Switch Organization'.
3. To create a new application, press the bottom right '+' button. Fill in the 'Name' and 'Description' fields and select an 'Application Profile', which is the region definition.

Figure 19 Application creation form.

4. Proceed to the application by clicking its name on the list, then press the '☰' button to add a node. Click '**Add manually**'. Set the node's 'Name' and 'Description' fields, and fill in 'DEV EU' and 'OTAA Key' (otaa section – *appkey*). **All device identifiers are provided by Yosensi Support when you order the nodes.**

Select a model that is compatible with your device — this choice affects the number of charts and data source (YO Analog). You can also set the node's 'Location', if locations have been pre-defined. If you haven't defined a suitable location, leave this field set at <None>.

NODES LIST	NODES TREE	GATEWAYS	DETAILS	LOCATIONS	EXTERNAL API	>
Node Name ↑	Node ID	Model	Last Seen	Network	Disabled	Dashboard

No records found

Select devices ☰

Add device via Ble ✳

Add device manually ☰+

✕
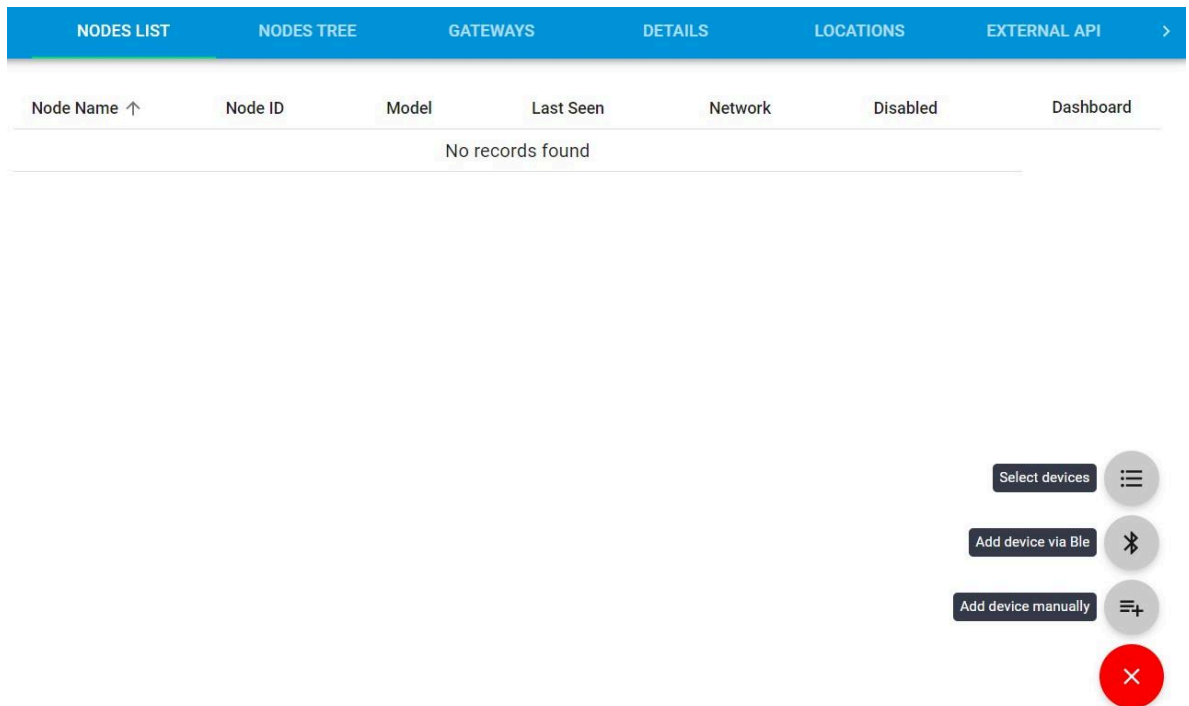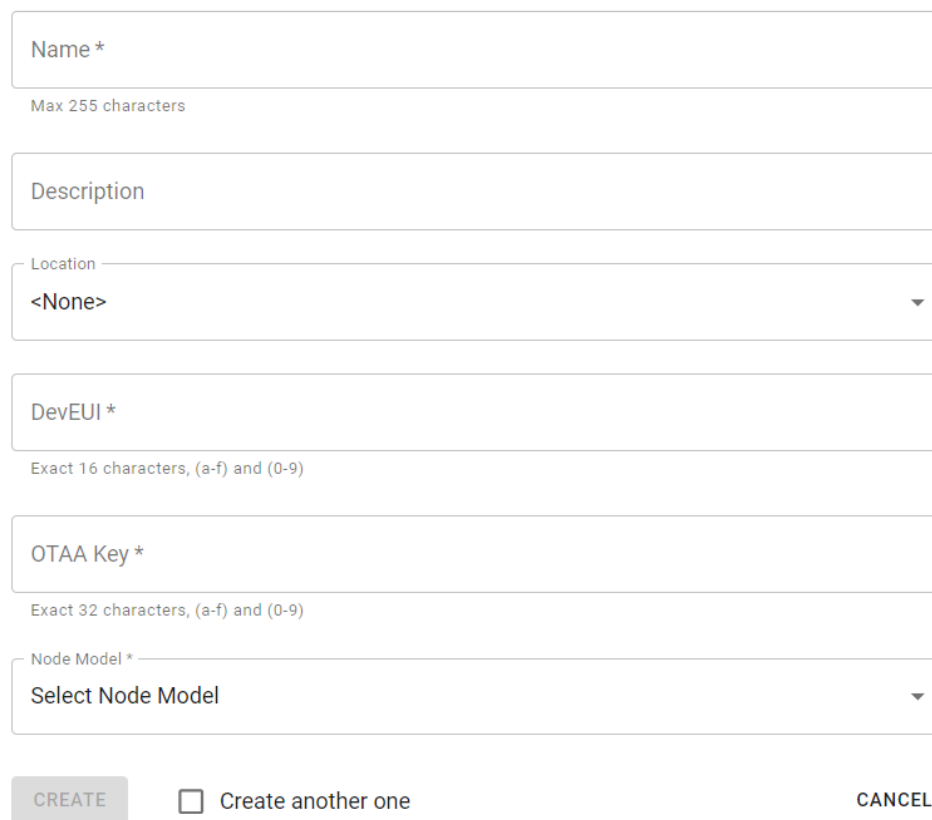
Figure 20 Adding node to the Yosensi Management Platform section view.

Figure 21 Node creation form.

5. **New nodes must be added in OTAA mode**. Nodes can be switched to ABP mode after activation in the Yosensi Management Platform by changing the Node configuration.

   Click on the link in the 'Node Name' column. Go to the 'KEYS' tab and switch 'LoRa Type' from OTAA to ABP and fill in the blank spaces, then press update. The identifiers 'Device Address' (*devaddr*), 'Application Session Key' (*appskey*) and 'Network Session Key' (*nwkskey*) are provided by Support, or can be found in the device's configuration pane while connected to the node in the firmware section.

Figure 22 Node LoRa type configuration form.

6. When the server receives data from the device, you'll notice that the 'Last Seen' column ('NODES LIST' tab) status changes from 'never' to a few 'seconds ago'.

7. Open charts by clicking on the 'OPEN' button in Dashboard columns or by entering the node's 'DETAILS' tab ('Node Name' column link) and clicking 'CHARTS'.

Adding node via Bluetooth

1. Log in at app.yosensi.io.
2. You'll see the default organization view. To switch to another organization, click on the user avatar in the right top corner and select 'Switch Organization'.
3. To create an application, click the bottom right '+' button. Fill in the 'Name' and 'Description' fields and select the 'Application Profile', which is the region definition.
4. Proceed to the application by clicking its name on the list, and press the '≡'' button to add a node. Click '**Add via Ble**'. Select the device to add. Then, the list with devices available to connect to the application will appear. The name of the node will be generated automatically from the device model and DEV EUI, with OTAA key and DEV EUI filled in, press create.
5. When the server receives data, you'll notice that the 'Last Seen' column (NODES LIST' tab) status changes from 'never' to a few 'seconds ago'.
6. Open charts by clicking on the 'OPEN' button in Dashboard columns or by entering the node's 'DETAILS' tab ('Node Name' column link) and clicking 'CHARTS'.

Payload description

If you want to connect to your own server you have to decode the payload specific to each device. To do this you need a payload decoder which can be downloaded from Payload decoder. Extended documentation of the protocol can be found at Payload description. An exemplary payload produced by YO Analog is presented below with division into each measurement marked together with decoded values whose interpretation is described in the Payload description document.

Example of YO Analog payload with description:

02:00:00:36:2e:00:11:01:02:5d:2e:00:11:02:02:5b:2e:00:11:03:02:58:32:00:11:04:01:e1:32:00:11:05:01:e3:32:00:11:06:01:e2

Payload header				First measurement (CH1-current)					
0x02	0x00	0x00	0x36	0x2E	0x00	0x11	0x01	0x02	0x5D
ver = 2	cnt =	pct [s] = 254		type = 11 prec = 2	md [s] = 0	addr_len = 1 meas_len = 2	addr = 1	val = 605 (6,05 [mA])	

Second measurement (CH2-current)					
0x2E	0x00	0x11	0x02	0x02	0x5B
type = 11 prec = 2	md [s] = 0	addr_len = 1 meas_len = 2	addr = 2	val = 603 (6,03 [mA])	

Third measurement (CH3-current)

0x2E	0x00	0x11	0x03	0x02	0x58
type = 11 prec = 2	md [s] = 0	addr_len = 1 meas_len = 2	addr = 3	val = 600 (6,00 [mA])	

Fourth measurement (CH4- voltage)

0x32	0x00	0x11	0x04	0x01	0xE1
type = 12 prec = 2	md [s] = 0	addr_len = 1 meas_len = 2	addr = 4	val = 481 (4,81 [V])	

Fifth measurement (CH5 - voltage)

0x32	0x00	0x11	0x05	0x01	0xE3
type = 12 prec = 2	md [s] = 0	addr_len = 1 meas_len = 2	addr = 5	val = 483 (4,83 [V])	

Sixth measurement (CH6 - voltage)

0x32	0x00	0x11	0x06	0x01	0xE2
type = 12 prec = 2	md [s] = 0	addr_len = 1 meas_len = 2	addr = 6	val = 482 (4,82 [V])	

Compliance statements

CE

UNITED KINGDOM CONFORMITY ASSESSED
No. 07/2021/UKCA

with the European Directives: EMC 2014/30/UE; RED 2014/53/UE; RoHS 2011/65/UE

Yosensi Sp. z o.o. ul. Żurawia 71A, lok. 1.50, 15-540 Białystok

On our sole responsibility, we hereby declare that the product:

Name	**YO Analog**
Technical data	**Voltage 6÷30 V DC/5÷21V AC; current mx 180 mA (12 V DC); IP20**

to which this declaration of conformity applies is consistent with legal acts:

The Directive EMC 2014/30/UE	Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility (Official Journal of the European Union L 96/79 of 29.3.2014)
The Directive RED 2014/53/UE	Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC(Official Journal of the European Union L 153/62of 22.5.2014)
The Directive RoHS 2011/65/EU and 2015/863/EU	Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (Official Journal of the European Union L 174/88 of 1.7.2011) and Commission Delegated Directive (EU) 2015/863 of 31 March 2015 amending Annex II to Directive 2011/65/EU

Harmonized standards applied to the product to which this Declaration of Conformity relates:

BS EN 50401:2017	Product standard to demonstrate the compliance of base station equipment with radiofrequency electromagnetic field exposure limits (110 MHz - 100 GHz), when put into service
BS EN IEC 61326-1:2021	Electrical equipment for measurement, control and laboratory use -- EMC requirements -- Part 1: General requirements (IEC 61326-1:2020)
BS EN IEC 61000-6-2: 2019	Electromagnetic compatibility (EMC) -- Part 6-2: Generic standards -- Immunity standard for industrial environments (IEC 61000-6-2:2016)
BS EN IEC 61000-6-4: 2019	Electromagnetic compatibility (EMC) -- Part 6-4: Generic standards -- Emission standard for industrial environments (IEC 61000-6-4:2018)
ETSI EN 301 489-3 V2.1.1:2019	ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 3: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 246 GHz; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU
ETSI EN 300 220-2 V3.2.1:2018	Short Range Devices (SRD) operating in the frequency range 25 MHz to 1 000 MHz; Part 2: Harmonised Standard for access to radio spectrum for non specific radio equipment
ETSI EN 300 328 V2.2.2:2019	Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz band; Harmonised Standard for access to radio spectrum
BS EN IEC 63000:2018	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

The last two digits of the year in which the CE marking was affixed to the product: 21

Founder/R&D Director
Paweł Popławski

Białystok, 2021-11-18

....
Place and date of issue

....
Name, surname and signature of the authorized person

YOSENSI.IO

CE

EC DECLARATION OF CONFORMITY
No. 07/2021/EN

with the European Directives: EMC 2014/30/UE; RED 2014/53/UE; RoHS 2011/65/UE

Yosensi Sp. z o.o. ul. Żurawia 71A, lok. 1.50,   15-540 Białystok

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Founder/R&D Director
Paweł Popławski

Białystok, 2021-11-18

Place and date of issue   Name, surname and signature of the authorized person

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