



YO Distance

User guide v1.2

Release notes

Released	Version	Key changes
05.09.2022	1.0	Initial release.
20.06.2023	1.1	Added node configuration with Yosensi Management Platform. Changed description of connecting nodes with Yosensi Management Platform.
26.10.2023	1.2	Added configuration with Yosensi Mobile App.

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Product description

Overview

YO Distance is a LoRaWAN device for ultrasonic distance measurement. One use case example is monitoring the water level in a remote tank. Additionally, the device contains sensors that measure temperature, relative humidity.

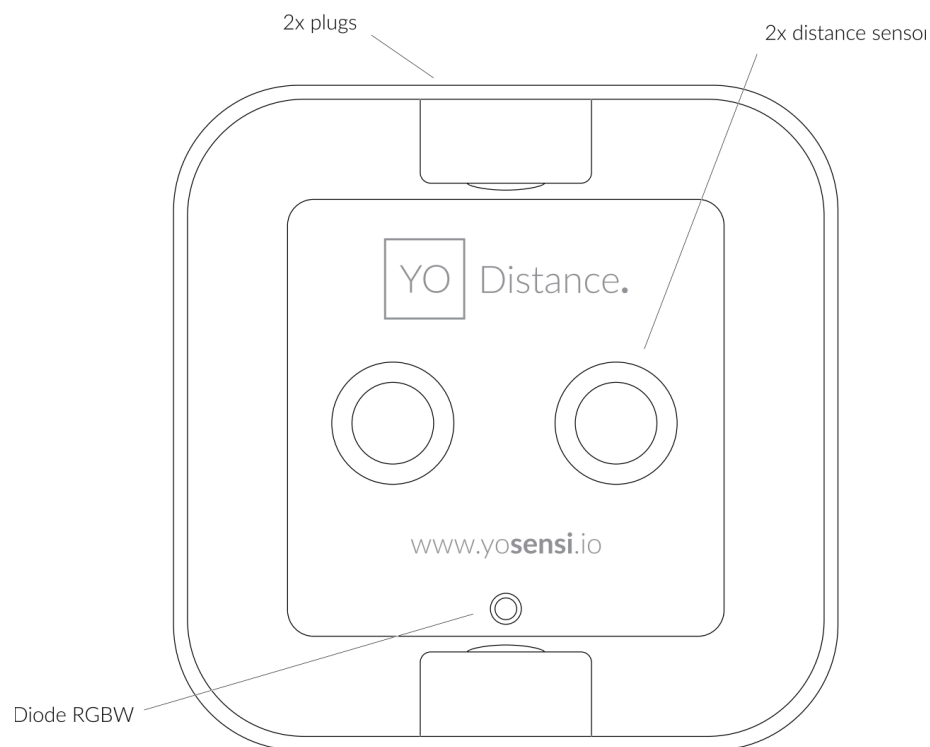


Figure 1 Device top view.

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 sticker.

Physical interfaces

LEDs

YO Distance is equipped with a RGBW LED to indicate the operating status on the top of the device.

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 Distance is equipped with one reset button inside the device. Reset button is placed on the PCB board opposite the electrical socket sensor.

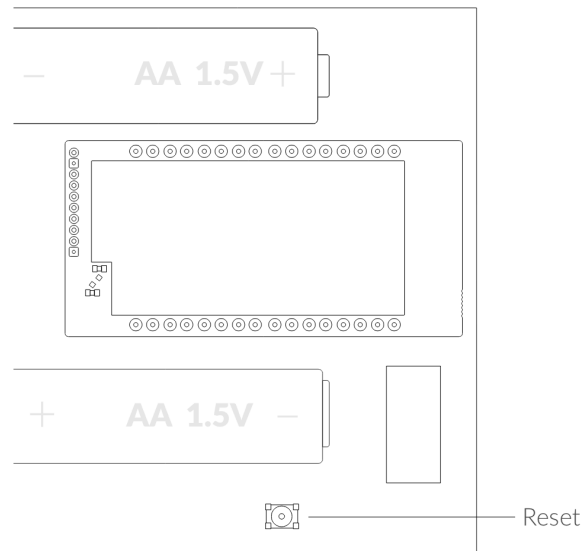
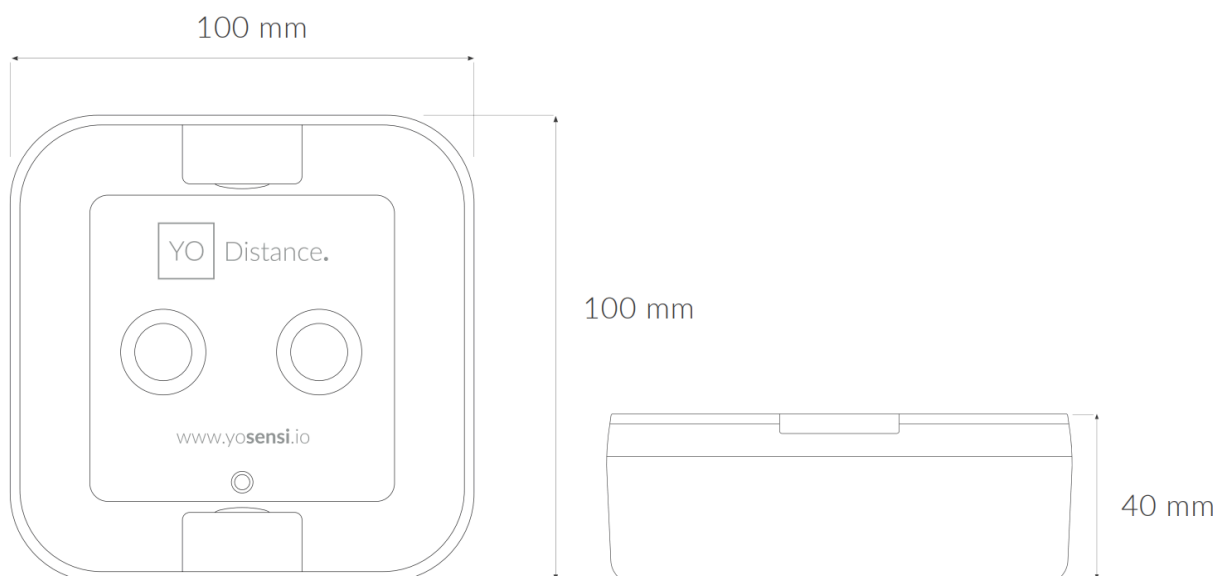


Figure 3 Reset button.

Specifications

Physical



*Figure 4 Dimensions of the device.***PHYSICAL SPECIFICATION**

Dimensions	Height: 40 mm Width: 100 mm Depth: 100 mm
Colour	Light grey
Mounting method	Horizontal Vertical (can be screwed to the wall)
Enclosure material	ASA
Level of protection	IP67
Weight	176 g

Operating conditions

OPERATING CONDITIONS

Temperature	0° to 70°C
Humidity	0 to 90%
Placement	Indoor/outdoor use
Power supply	3 x LR6 (AA) battery (3 x 1,5 V)
Power consumption	Maximum 120 mA DC (4,5 V DC)

Measured values

MEASUREMENT RANGES

Parameter	Measurement range	Accuracy
Distance	Measuring range from flat surfaces (cardboard surface measuring 50 cm x 60 cm): From 3 cm to 420 cm	Blind distance: From 0 cm to 3 cm
Temperature	-40° to 125°C	±0.2°C (5° to 60°C)
Relative humidity	0% to 100%	±2% (20% to 80%)

Distance

The ultrasonic sensor sends out high frequency sound waves in the environment of the detection, meanwhile receives the reflection of the ultrasonic echo from nearby objects and directly outputs distance reading through processing the echo time . Due to waterproof ultrasonic transducers it can be used i.e. water tanks to verify water level or gasoline tanks.

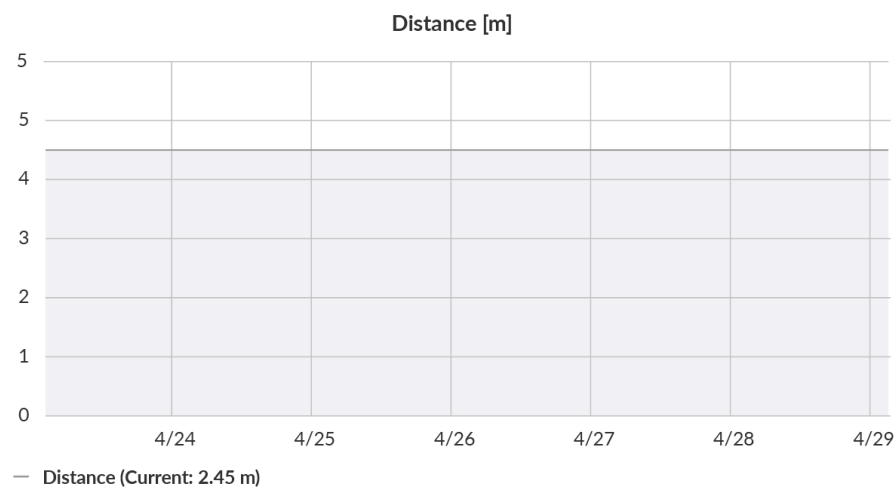


Figure 5 Distance measurement exemplary chart.

Temperature and relative humidity

Temperature and relative humidity are measured by sensors placed inside the device enclosure. These measurements can be used to monitor if the device is working in recommended conditions.

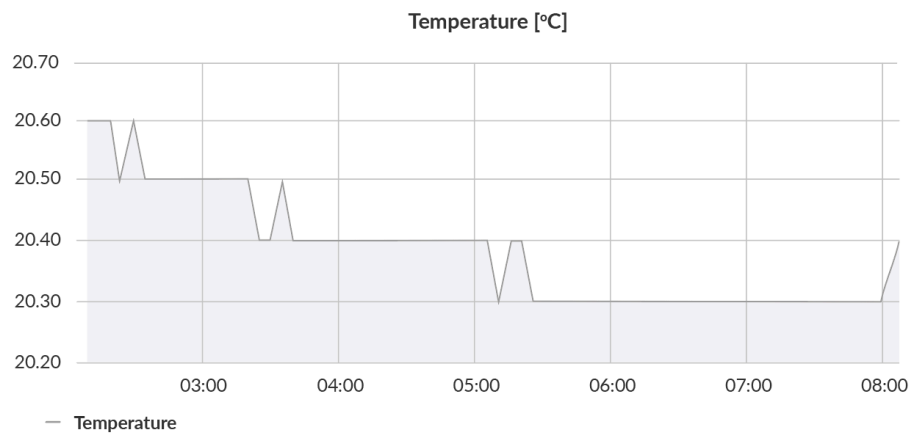


Figure 6 Internal temperature exemplary chart.

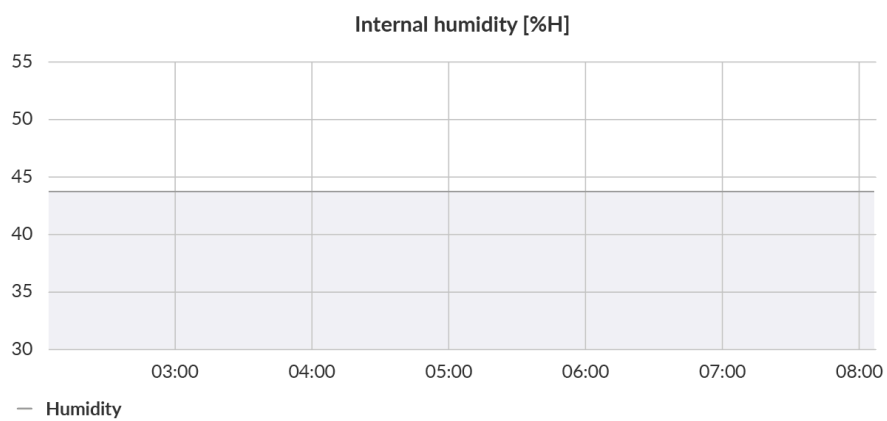


Figure 7 Internal humidity exemplary chart.

Battery condition

Battery voltage is used to monitor its condition – to spot anomalies (like sudden drop) or its current condition based on voltage drop over time in comparison to initial voltage rating.

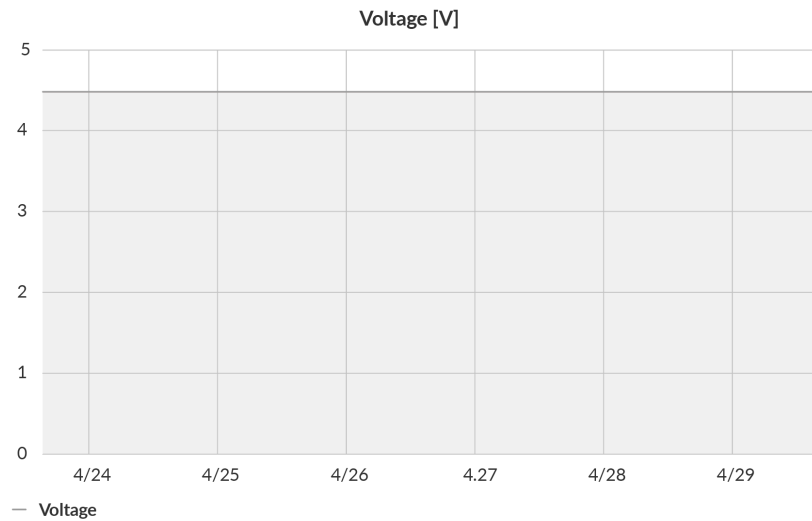


Figure 8 Battery voltage exemplary chart.









Installation

Package contents

1. Device (without batteries).
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 outdoor and 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. Unscrew the device: remove 4 screws from the enclosure. Gently disassemble the device (the cover and bottom of the device are connected via cable).

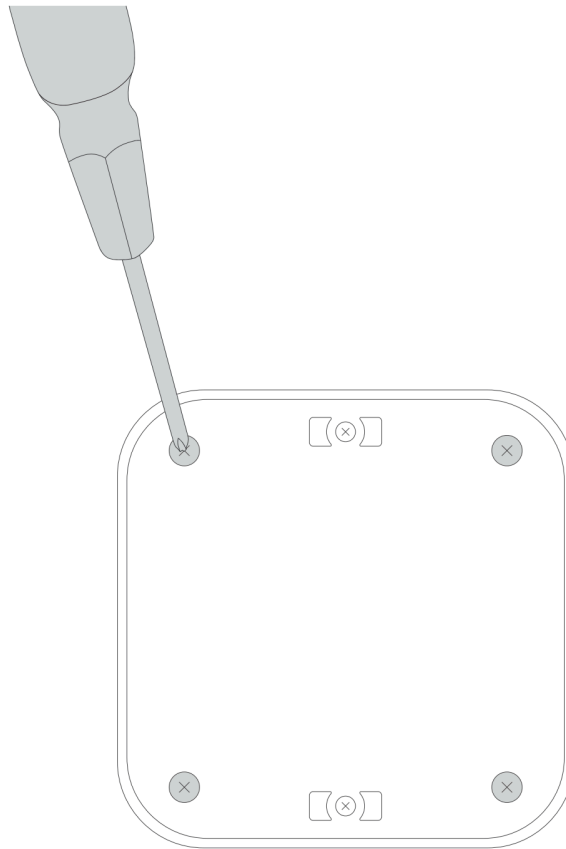


Figure 9 Device opening instructions.

2. Place 3 AA batteries in the device according to the polarity marked on the PCB..

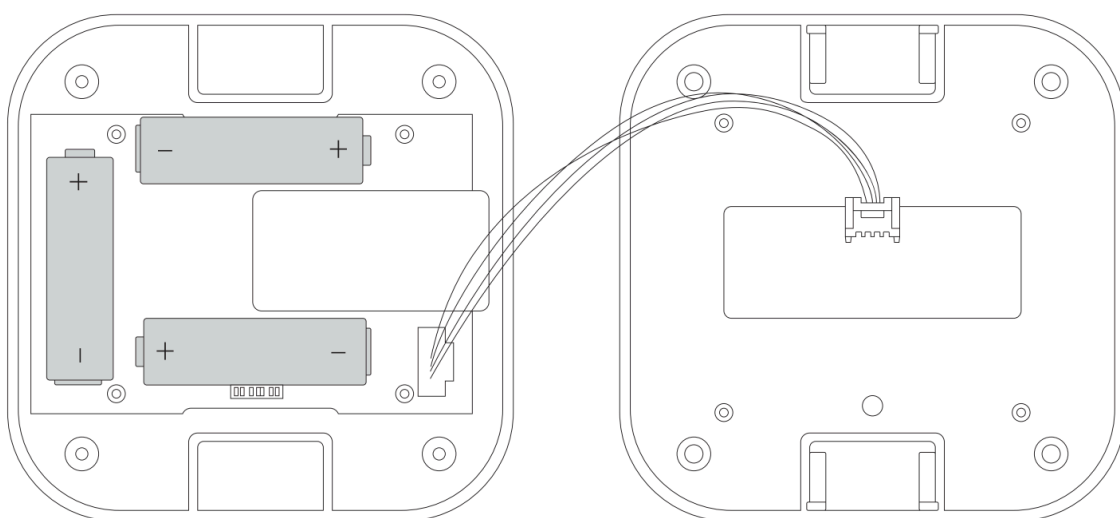


Figure 10 Instruction of placing 3AA batteries in the device.

3. The device is on. Screw it back together.

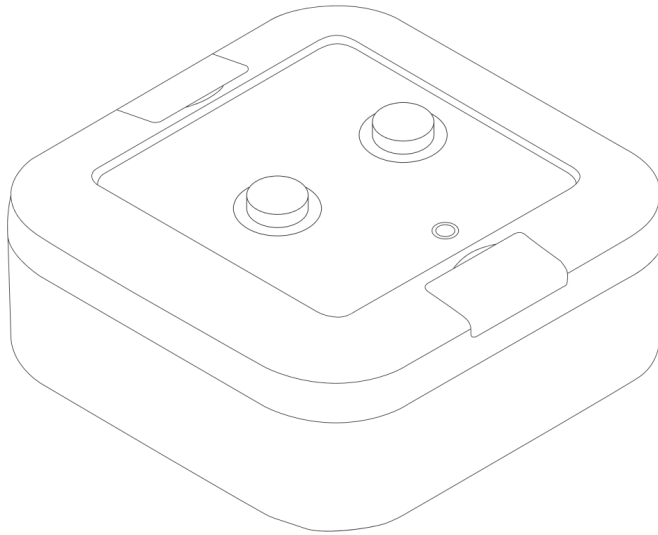


Figure 11 Top view of YO Distance after assembling it.

4. Press the spring contact in the DI connector and insert the pulse counting cable. Tighten the cable gland nut to immobilize the sensor cable and maintain tightness.

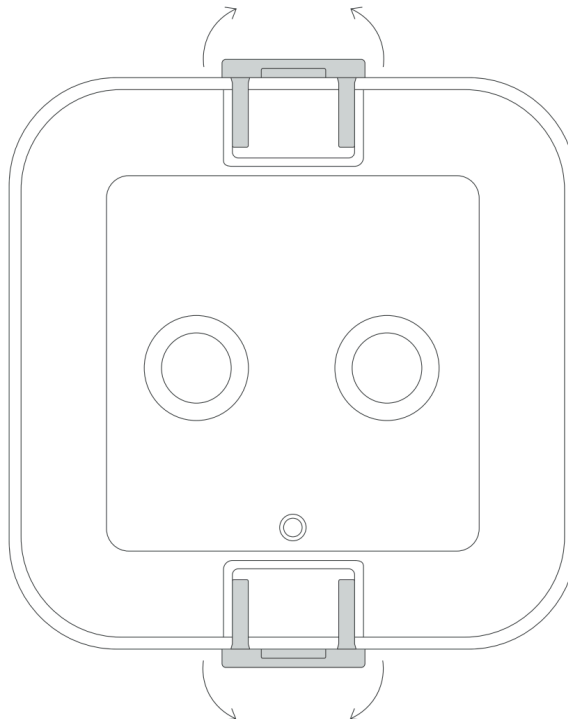


Figure 12 Tightening the cable gland instructions.

5. The device is suitable for horizontal mounting. It is recommended that it be placed in the center of the cover (ceiling) of the water tank, so that the distance from the tank walls is the same on each side.

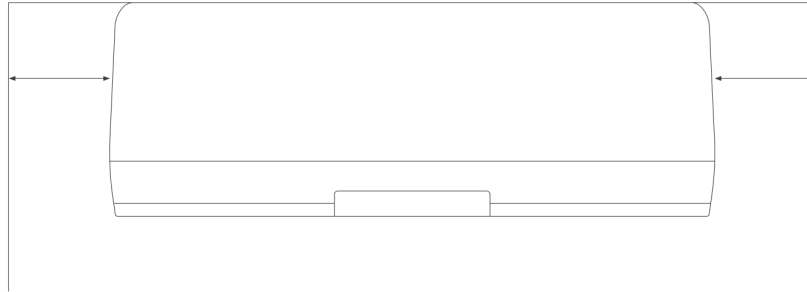


Figure 13 Instruction for horizontal mounting of the device.

Operation

IoT system components

Typical IoT systems consist of 3 main elements (*Figure 13*), 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).

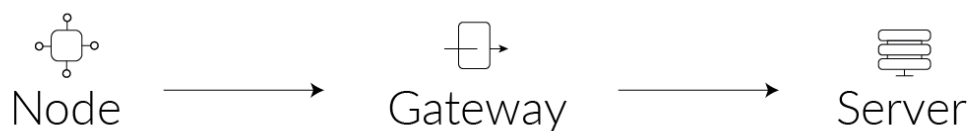


Figure 14 IoT system components.

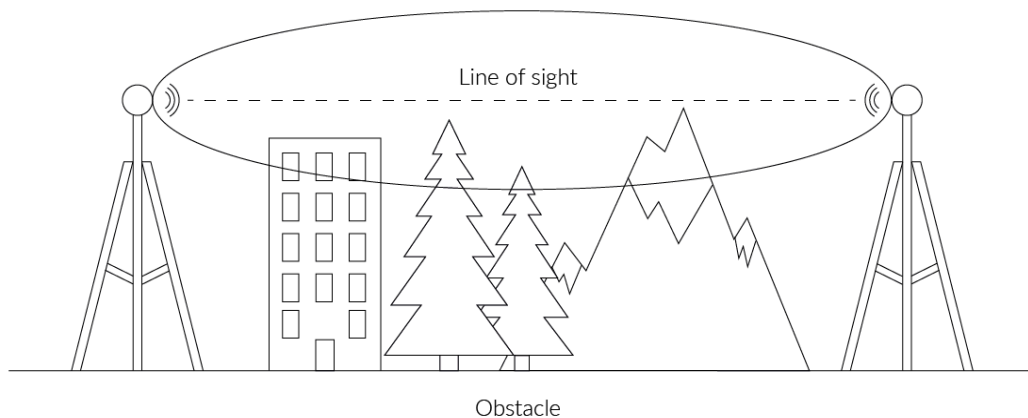


Figure 15 Fresnel zone where communication between two antennas can occur.

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 Distance device.

```
{
  "info": {
    "devmodel": "LNDN",
    "fwver": "3.6.1",
    "loraradio": "SX1261",
    "lorawanver": "1.0.2",
    "loraregion": "EU868",
    "blemacaddr": "0123456789ab"
  },
  "lorawan": {
    "subband": 1,
    "nwkttype": "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
  }
}
```


GENERIC PARAMETERS

SECTION	NAME	DESCRIPTION	POSSIBLE VALUES	DEFAULT VALUE	READ/ WRITE
info	devmodel	Device name	-	LNDN	R
	fwver	Firmware version	-	3.6.1	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 × 1.6.

⁴ Change currently not supported.

DEVICE PARAMETERS

NAME	DESCRIPTION	POSSIBLE VALUES	DEFAULT VALUE	READ/ WRITE
measinterval	Measuring and sending interval LoRa [s]	120-999999	3600	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.

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
	Sub-band 1; 902.3 - 903.7 MHz; channels 0-7	1		
	Sub-band 2; 903.9 - 905.3 MHz; channels 8-15	2		
	Sub-band 3; 905.5 - 906.9 MHz; channels 16-23	3		
US915	Sub-band 4; 907.1 - 908.5 MHz; channels 24-31	4	2	R/W
	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 16 Update configuration section view.

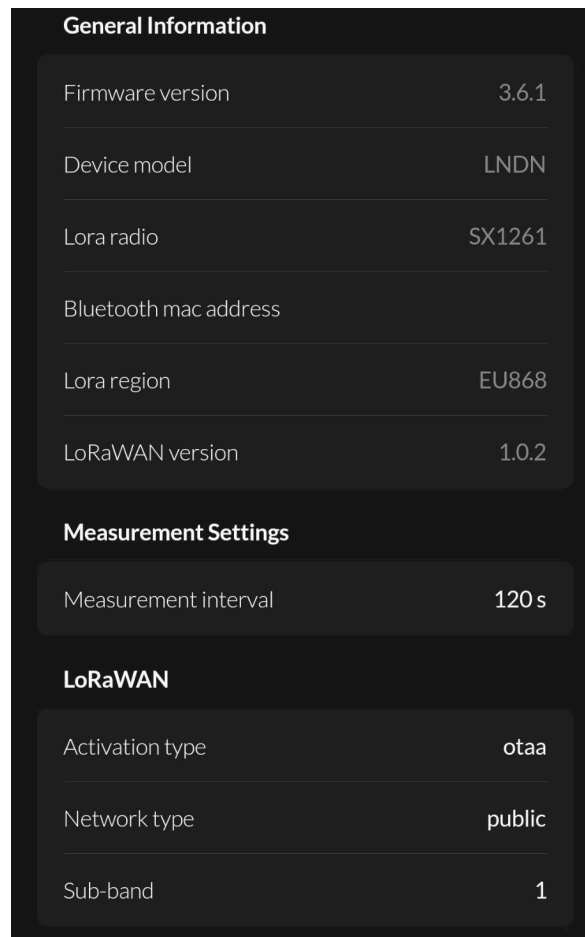
6. Press the Upload button and wait.

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.



The screenshot displays the configuration interface of the Yosensi mobile app, organized into three main sections: General Information, Measurement Settings, and LoRaWAN. Each section contains a list of parameters and their current values.

General Information	
Firmware version	3.6.1
Device model	LNDN
Lora radio	SX1261
Bluetooth mac address	
Lora region	EU868
LoRaWAN version	1.0.2

Measurement Settings	
Measurement interval	120 s

LoRaWAN	
Activation type	otaa
Network type	public
Sub-band	1

Figure 17 Configuration 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

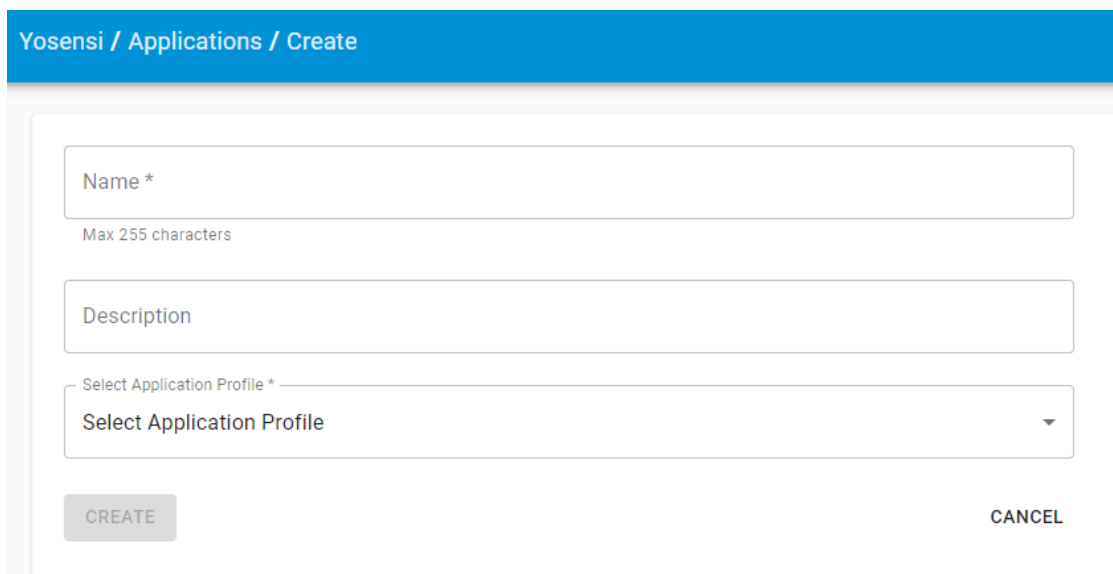
Before you can make the node visible, you'll need an **organization** and an **application**. The organization is your own space, at the highest level of IoT systems management (like the root directory in operating systems). It can be created only by Yosensi staff, and all clients using Yosensi Management 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.



The screenshot shows the 'Yosensi / Applications / Create' form. It features a blue header bar with the text 'Yosensi / Applications / Create'. Below the header, there are three input fields: 'Name *' with a 'Max 255 characters' hint, 'Description', and 'Select Application Profile *' which is a dropdown menu. At the bottom left is a 'CREATE' button and at the bottom right is a 'CANCEL' button.

Figure 18 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 EUI' 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 Distance). 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						

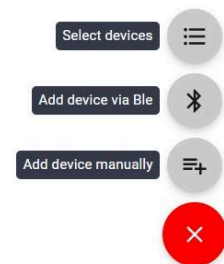
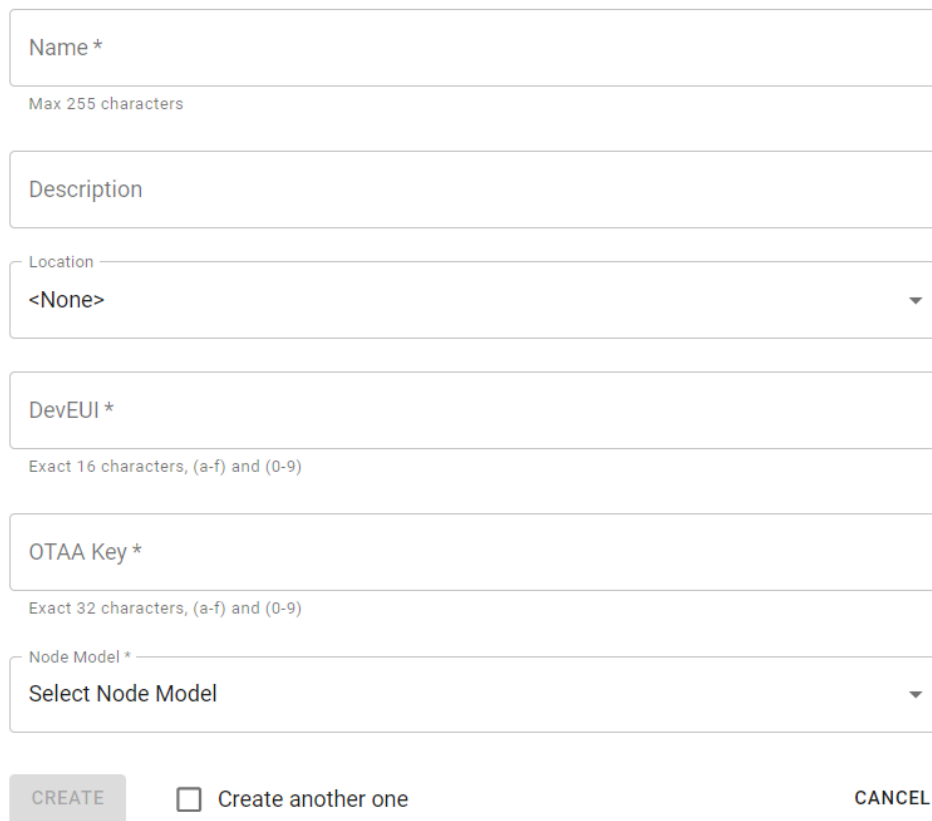


Figure 19 Adding node to the Yosensi Management Platform section view.



The form consists of several input fields and a submit button. The first field is 'Name *' with a 'Max 255 characters' hint. The second is 'Description'. The third is a dropdown menu for 'Location' with '<None>' selected. The fourth is 'DevEUI *' with a hint 'Exact 16 characters, (a-f) and (0-9)'. The fifth is 'OTAA Key *' with a hint 'Exact 32 characters, (a-f) and (0-9)'. The sixth is a dropdown menu for 'Node Model *' with 'Select Node Model' selected. At the bottom, there is a 'CREATE' button, a checkbox labeled 'Create another one', and a 'CANCEL' button.

Name *

Max 255 characters

Description

Location

<None>

DevEUI *

Exact 16 characters, (a-f) and (0-9)

OTAA Key *

Exact 32 characters, (a-f) and (0-9)

Node Model *

Select Node Model

CREATE

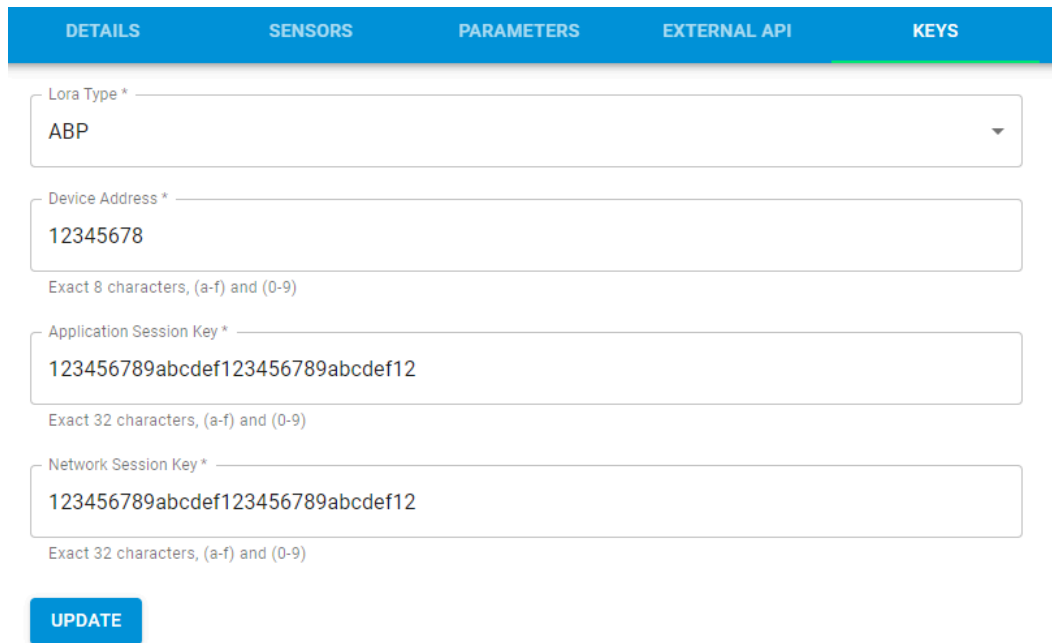
☐ Create another one

CANCEL

Figure 20 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.



The image shows a web form for configuring a Node LoRa type. At the top, there is a navigation bar with five tabs: DETAILS, SENSORS, PARAMETERS, EXTERNAL API, and KEYS. The DETAILS tab is currently selected. Below the tabs, there are four input fields, each with a label and an asterisk indicating it is required. The first field is 'Lora Type' with a dropdown menu showing 'ABP'. The second field is 'Device Address' with the value '12345678' and a note below it: 'Exact 8 characters, (a-f) and (0-9)'. The third field is 'Application Session Key' with the value '123456789abcdef123456789abcdef12' and a note below it: 'Exact 32 characters, (a-f) and (0-9)'. The fourth field is 'Network Session Key' with the same value '123456789abcdef123456789abcdef12' and a note below it: 'Exact 32 characters, (a-f) and (0-9)'. At the bottom of the form is a blue button labeled 'UPDATE'.

Figure 21 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, it is necessary to decode the specific payload for each device. To accomplish this, a payload decoder is required, which can be downloaded using the following link: [Payload decoder](#). Extended documentation of the protocol can be found in the [Payload description](#) on our website. An example payload produced by YO Distance is presented below with divisions for each measurement and marked with decoded values, whose interpretation is described in the [Payload description](#).

Example of YO Distance payload with description:

02:00:00:00:08:00:01:12:88:0d:00:01:00:cd:10:00:00:63:28:00:01:01:2e:41:00:05:00:12:ff:e8:05:fc

Payload header				First measurement (battery voltage)				
0x02	0x00	0x00	0x00	0x08	0x00	0x01	0x12	0x88
ver = 2	cnt = 0	pct [s] = 0		type = 2 prec = 0	md [s] = 0	addr_len = 0 meas_len = 2	val = 4744 (4744 [mV])	

Second measurement (temperature)				
0x0D	0x00	0x01	0x00	0xCD
type = 3 prec = 1	md [s] = 0	addr_len = 0 meas_len = 2	val = 205 (20,5 [°C])	

Third measurement (relative humidity)			
0x10	0x00	0x01	0x37
type = 4 prec = 0	md [s] = 0	addr_len = 0 meas_len = 2	val = 99 (99[%])

Fourth measurement(distance)				
0x28	0x00	0x01	0x01	0x2E
type = 10 prec = 0	md [s] = 0	addr_len = 0 meas_len = 2	val = 302 (30,2[mm])	

Compliance statements

		UNITED KINGDOM CONFORMITY ASSESSED No. 10/2021/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 Technical data	YO Distance Voltage 4,5 V DC; current max 120mA; IP67	
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 153/62 of 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		
Białystok, 2021-11-18 Place and date of issue	Founder/R&D Director Paweł Popławski  Name, surname and signature of the authorized person	
<div style="text-align: center;">  </div>		

	
EC DECLARATION OF CONFORMITY No. 10/2021/EN	
with the European Directives: EMC 2014/30/UE; RED 2014/53/UE; RoHS 2011/65/UE	
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Białystok, 2021-11-18 Place and date of issue	Founder/R&D Director Paweł Popławski  Name, surname and signature of the authorized person
YOSSENSI.IO	