



# People Counter.

DATASHEET

## BI-DIRECTIONAL DEVICE THAT USES A NOVEL 24 GHZ RADAR TRANSCEIVER

The device detects both directions independently when a certain distance exists between people.



Telemetry experts



LoRaWAN-based  
communication



BLE 5.0 support



Efficient device  
deployment & management



Support for multiple  
LoRaWAN regions



High-quality  
products made in EU

# Release notes

Released	Version	Key changes
28.02.2023	1.0	Initial release.

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## Application

- YO People Counter is a **bi-directional device** that uses a novel **24 GHz radar** transceiver to detect motion from both directions simultaneously.
- The device detects a person moving independently when a certain distance exists between people.
- The device can count people flow in buildings, exhibitions, and airports.



## Components

- The device consists of a **microcontroller** (with Bluetooth Low Energy), communication modules (LoRa), and a radar **sensor working on 24 GHz**.
- YO People Counter includes an **ABS enclosure**, ideal for a wall or ceiling mount and smart applications.



## Operation of the device

- A LoRaWAN network is required for data transmission.
- It is possible to configure or reconfigure device parameters, **at any time**, via BLE.
- The device receives power from a **USB-C connector** or an auxiliary power supply socket.
- Place the device near the entrance of the building. When mounted on the wall, remember that it will count persons walking side-by-side as one person.
- When mounted on the ceiling, it cannot distinguish persons passing by walking side by side and will count them as one person.
- 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

<b>LoRaWAN settings</b>	Network type (private or public) operating mode selection (OTAA or ABP)
	<div><div><b>OTAA</b><ul style="list-style-type: none"><li>• Device EUI</li><li>• Application EUI</li><li>• Application Key</li><li>• Number of trails</li></ul></div><div><b>ABP</b><ul style="list-style-type: none"><li>• Device address</li><li>• Network session key</li><li>• Application key</li></ul></div></div>
<b>Bluetooth Low Energy (BLE) settings</b>	Transmission power Advertising frame interval
<b>Device settings</b>	Measuring interval Clear sum time
<b>Detection area</b>	Radar freq Hold time Sensitivity Beam angle minimum Beam angle maximum Beam angle threshold Distance range Distance minimum Distance maximum Distance threshold Speed range Speed minimum Speed maximum Speed threshold Direction Track filter Default settings



## Advantages



- **Production quality** - made in the **European Union** by **qualified engineers**.
- Buying **YO People Counter** provides a camera-less solution that is less expensive for security systems that monitor buildings and maintains customer privacy.
- With **bi-directional counting**, you can register people entering or exiting the building. Depending on the version, the **LoRa radio** can operate in different regions (e.g., EU868, US915, AU915, AS923) adapted to several 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 OTTA
  - 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

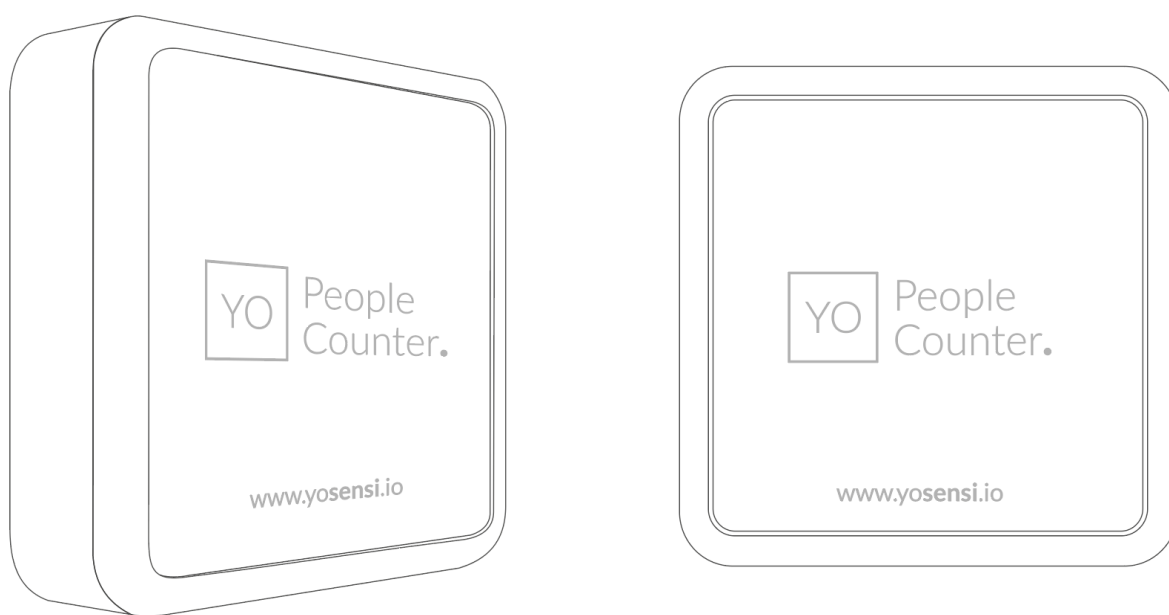


Figure 1 Top view of the device.

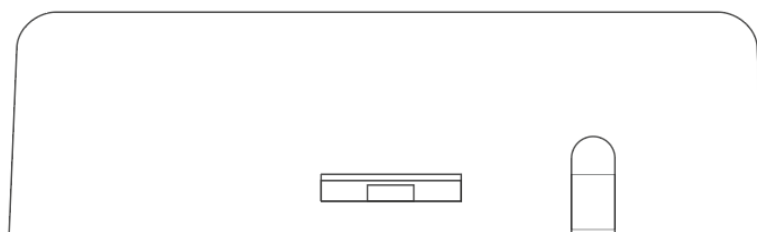


Figure 2 Side view of the device.



## Enclosure of the device

<b>Dimensions</b>	Height: 25.5 mm Width: 86 mm Depth: 86 mm
<b>Colour</b>	White
<b>Installation</b>	Horizontal Vertical (can be screwed to the wall or ceiling)
<b>Enclosure material</b>	ABS (FR)
<b>Level of protection</b>	IP40, UL94-V0

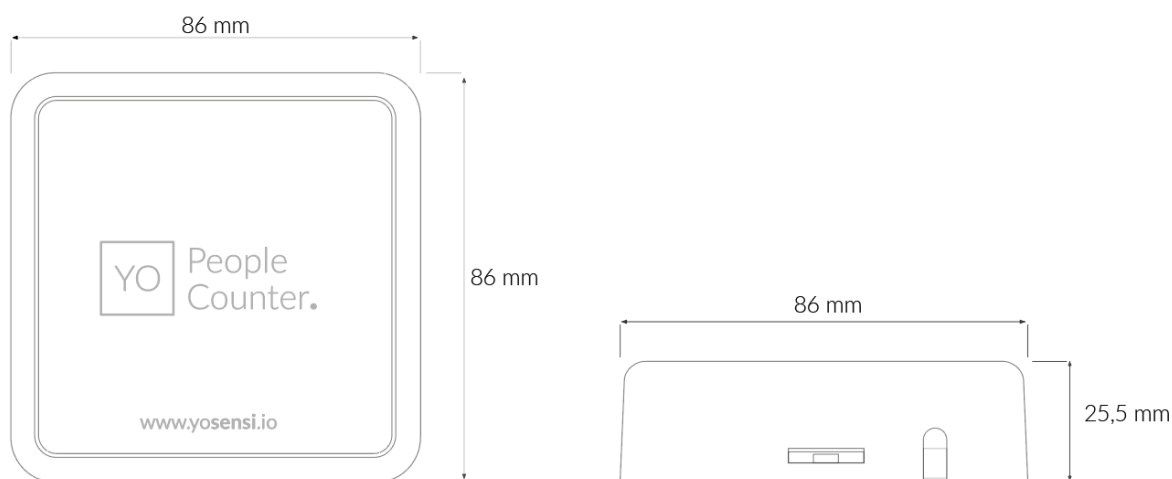


Figure 3 Dimension of the device.





## 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 supply</b>	USB-C 5V DC, 6 - 30 V DC, 5 - 21 V AC
<b>Power consumption</b>	Maximum: 1,1 A (12 VDC)
<b>Measuring range</b>	<b>Temperature:</b> Measuring range: -40°C to 125°C (-40°F to 257°F) Accuracy: $\pm 0,2^{\circ}\text{C}$ (at temperatures between 5°C and 60°C (41°F to 140°F))  <b>Humidity:</b> Measuring range: 0% to 100% Accuracy: $\pm 2\%$ (relative humidity from 20% to 80%)  <b>Radar motion detector:</b> Frequency: 24GHz Beam Aperture: 80° / 34° Range: 10-500cm
<b>Weight</b>	91 g
<b>Certificates</b>	CE



## People counter parameters

<b>Left to right</b>	measure the number of people who entered from the <b>left side to the right</b>
<b>Right to left</b>	measure the number of people who entered from the <b>right side to the left</b>
<b>The sum of left-to-right</b>	counts is the sum of people who moved from the left to the <b>right side</b> . The measurements begin when the device turns on.
<b>The sum of right-to-left</b>	counts is the sum of people who moved from the left to the <b>right side</b> . The measurements begin when the device turns on.
<b>The difference between the sum of people</b>	the difference is <i>the difference between the sum of people</i> counted who come from the left side and those who come from the right side. The measurements begin when the device turns on



## Sample charts

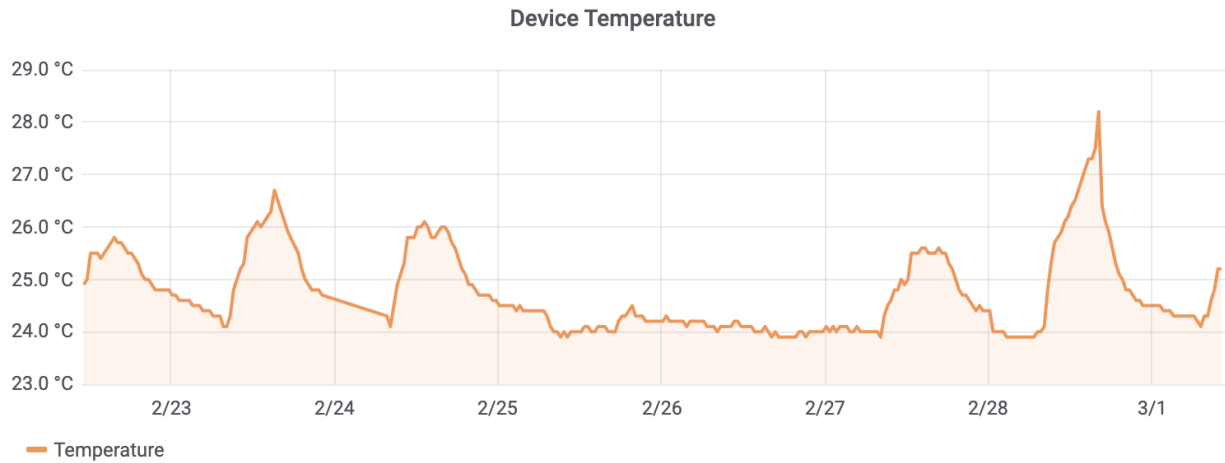


Figure 4 Example chart of temperature.

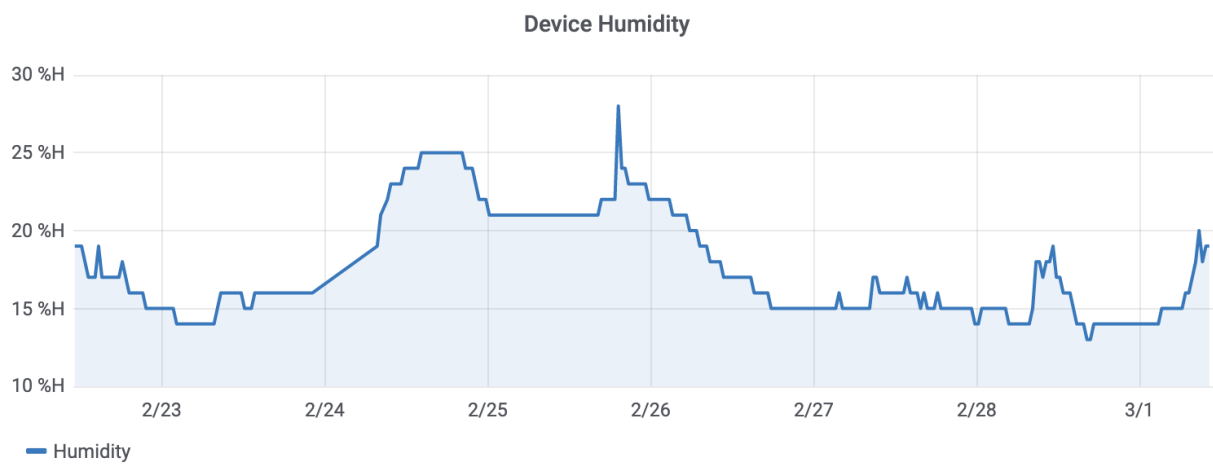


Figure 5 Example chart of internal humidity.

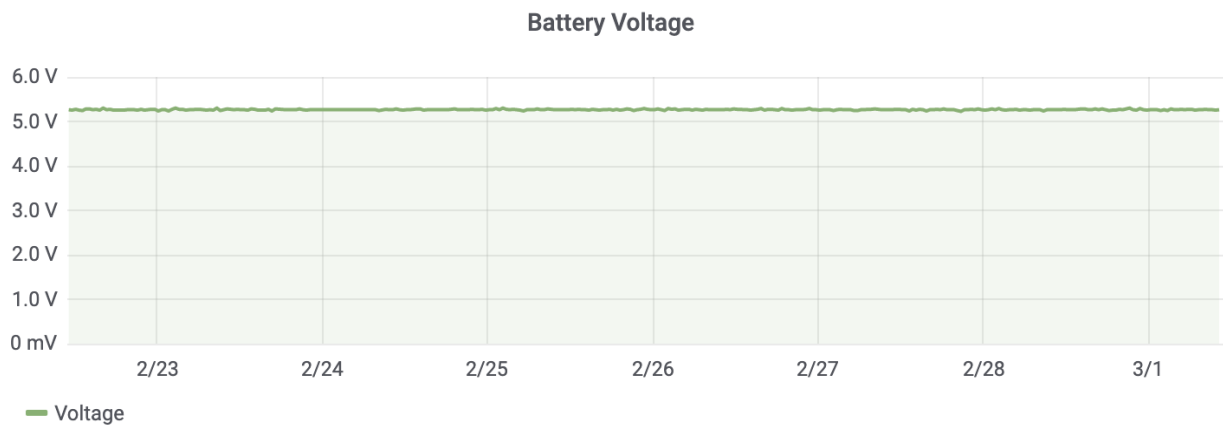


Figure 6 Example chart of power supply voltage.

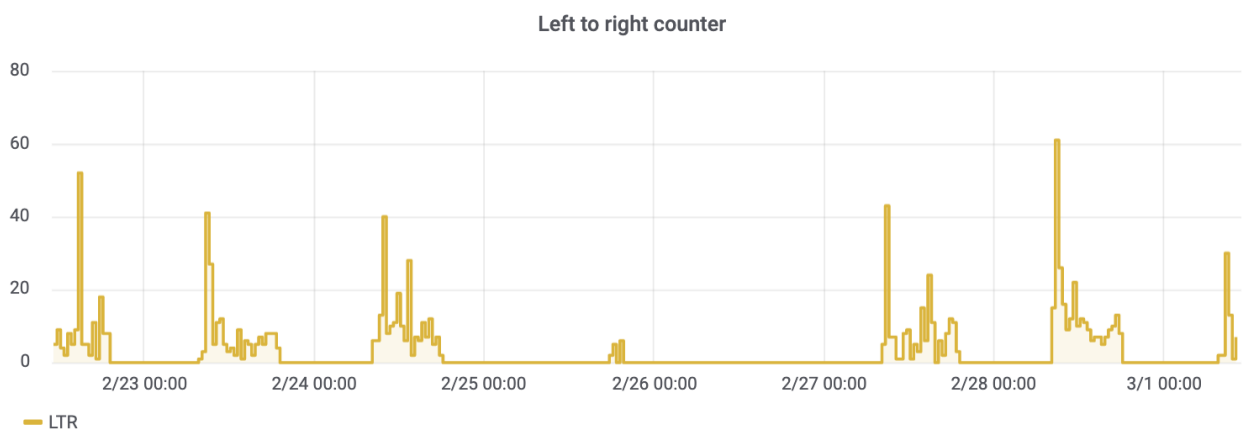


Figure 7 Example chart of people counter flow from left to right side.

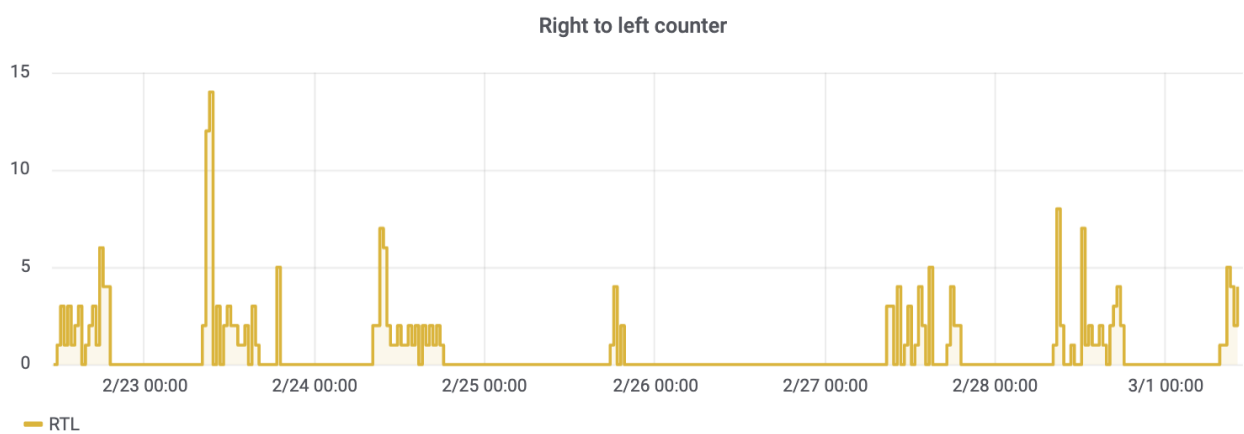


Figure 8 Example chart of people counter flow from right to left side.

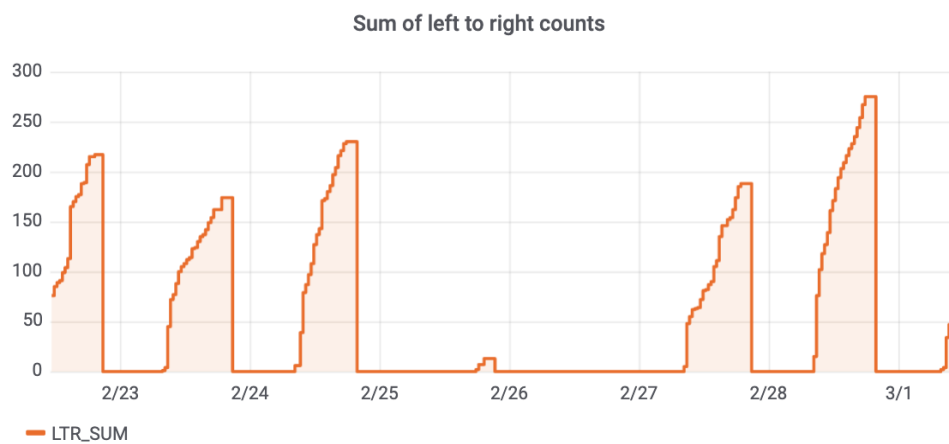


Figure 9 Example chart of summary people counter flow from left side to right.

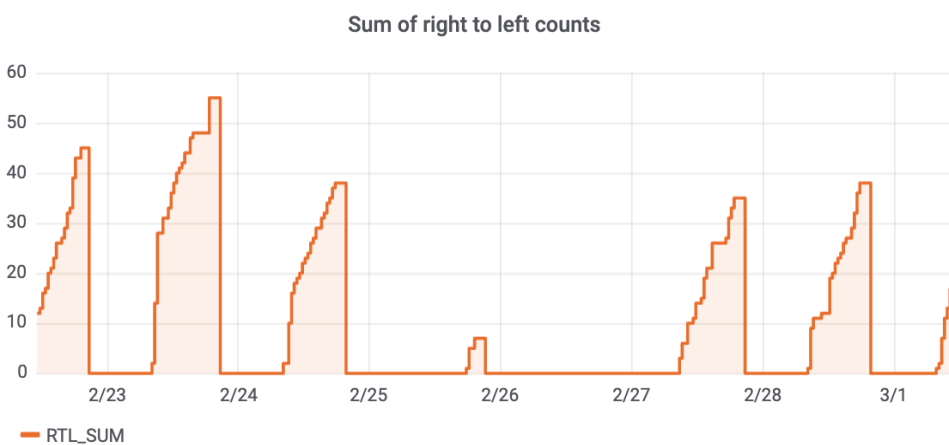


Figure 10 Example chart of summary people counter flow from left side to right.

Difference between LTR\_SUM and RTL\_SUM

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Figure 11 Example chart of difference between summary people counter flow from left side to right






## Revision history

Date	Version	Page(s)	Changes
February 2023	1	All	Initial version

# YOSENSI.IO



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