



TOPOSENS

ECHO ONE[®]

Quick Start Guide



Toposens ECHO ONE®

3D Collision Avoidance System ECHO

English Version | Q2 2024



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Toposens ECHO ONE® 3D Ultrasonic Collision Avoidance System.
For Firmware version 3.0.0

Manufacturer

MEYSENS GmbH
Wilhelm-Wagenfeld-Straße 24
80807 Munich
Germany
+49 89 2375 1540
info@toposens.com

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Compliance Notice

Compliance with local occupational health and safety regulations and general safety regulations for equipment applications is crucial. The Toposens ECHO ONE® system must be operated in strict adherence to health, safety, and legal regulations to ensure both the safety of the operator and the efficient functionality of the system. Always refer to the latest regulations and guidelines in your jurisdiction before operation.

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Original Document

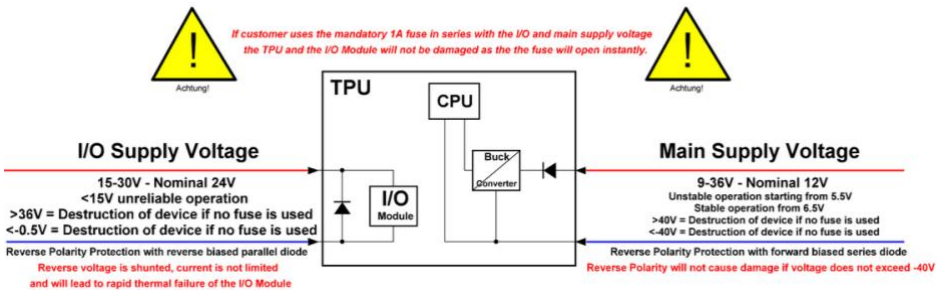
This document is an original document of MEYSENS GmbH.

**Scope of validity**

This document applies only to the Toposens ECHO ONE® 3D Ultrasonic Collision Avoidance System, Hardware Version 1.0. For information on non-included accessories and the machine or system in which this product has been integrated into, refer to the corresponding documentation.



Electrical Voltage Warning: Shut down power supply before installing or maintaining the sensor, TPU or wiring. Use the recommended fuses or other safety measures to avoid dangerous situations. **Qualified personnel only.**



Ultrasonic Emission Warning: Keep at least **0.15 m / 6 inches distance** to an active sensor. Do not touch the front of an active sensor. Don't hold an active sensor up to ears or point at people or animals from close range. Do not operate the product in the vicinity of non-compatible ultrasonic devices.

Automatic Startup Warning: When working on a product or machine, **consult its documentation** to avoid unexpected movement and to ensure a safe working environment.

Comprehensive Information: Read the **Toposens ECHO ONE® 3D Collision Avoidance System Manual** before installation, setup, use and maintenance of the product for more comprehensive information.

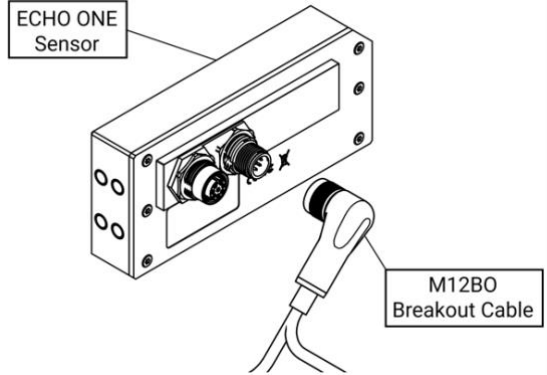
Personal and occupational Safety: Adhere to local and national regulations. Don't use the product as a safety component as it **does not offer a personal safety level**

1. SETUP

1.1

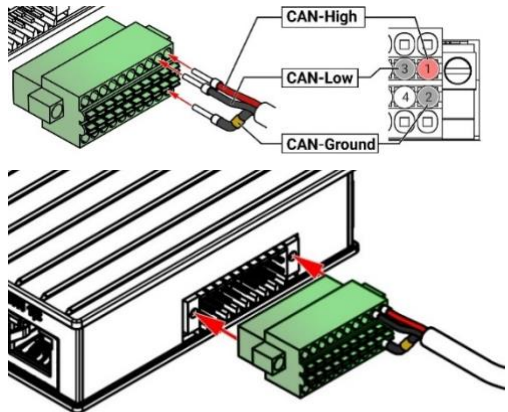
CONNECT SENSOR TO TPU

Connect one end of the provided Breakout Cable to a sensor.



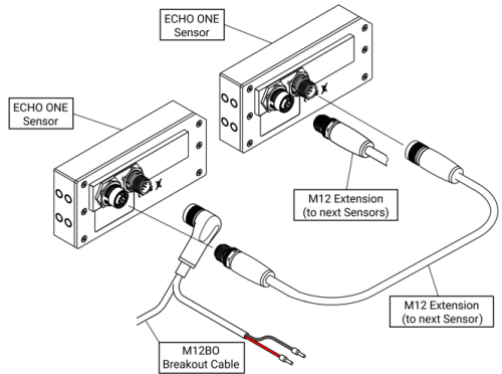
Connect the cable from the sensor to the corresponding terminals "CAN High", "CAN Ground" and "CAN Low" on the included terminal block.

Plug and secure the terminal block in the matching socket on the TPU.

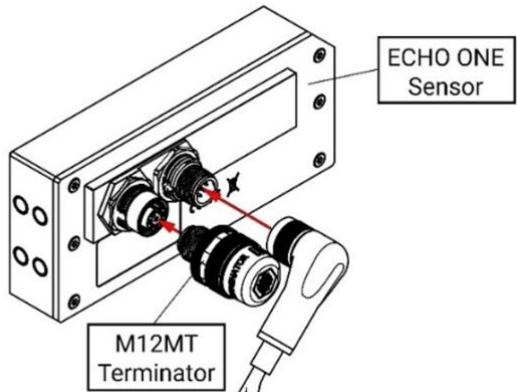


1.2
CONNECT SENSORS

If you have a multisensor setup, connect the first sensor to the next one using the M12 Extension Cable. Repeat to all the sensors in your setup (max. 4).

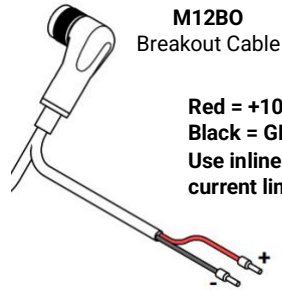


Connect the provided terminator on the open terminal of the last sensor in the chain.

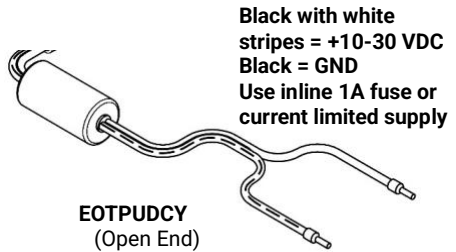


1.3
CONNECT POWER TO SENSOR(S)

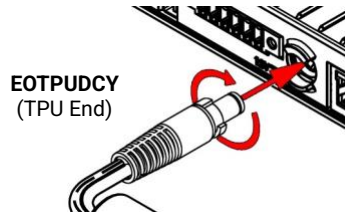
Connect the power conductors of the M12BO cable to an *unpowered* power source through a 1A slow blow DC-rated fuse or use a current-limited power supply. The permissible voltage range is 10-30 VDC.


1.4
CONNECT POWER TO TPU

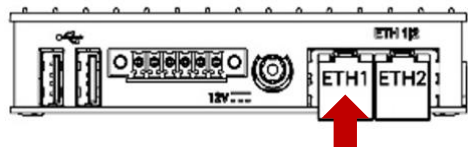
Connect an *unpowered* power source through a 1A slow blow DC-rated fuse or use a current limited power supply to the open-ended conductors of the cable. The permissible voltage range is 10-30 VDC.



Plug and lock the included EOTPUDCY cable to the TPU's power input.


1.5
CONNECT COMPUTER TO TPU

Use an Ethernet cable (CAT5e RJ45) to connect your computer to the ETH1 Port of the TPU. Power-on your ECHO ONE system.

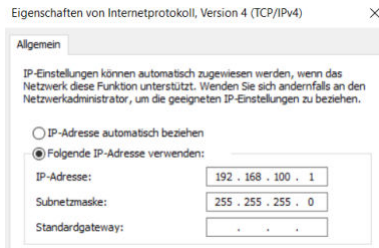


1.6
NETWORK CONFIGURATION

The TPU's ETH1 interface is configured with the fixed IP address 192.168.100.100.

On your computer, disconnect any other network connections and set the network adapter's IPv4 settings to an IP address in the same subnet, for example:

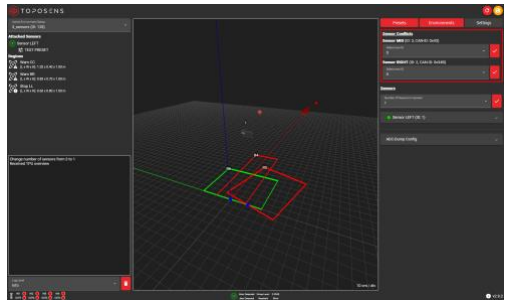
- IP-Adress: 192.168.100.101
- Netmask: 255.255.255.0



Start a new browser session, type in the IP address of the TPU's ETH1 port in the address-field and press enter:

<http://192.168.100.100>

The graphical user interface will automatically launch. You can use the browser functionality to adjust the size of the windows and fonts.

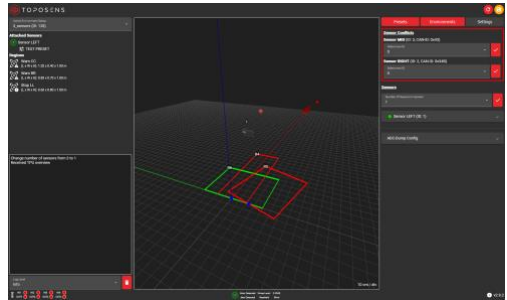


2. TPU GRAPHICAL USER INTERFACE

2.1

CONNECT TO THE GRAPHICAL USER INTERFACE

Once you type-in the IP-address on your browser's address field, the graphical user interface will automatically launch.



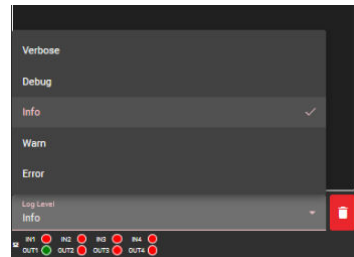
2.2

THE LOG WINDOW

On the lower, left corner of the GUI there is a log window. Select the level of information you would like to have from the options in the drop-down menu:

- VERBOSE: all messages
- DEBUG: only debug messages
- INFO: only general information messages
- WARN: only warnings
- ERROR: only errors

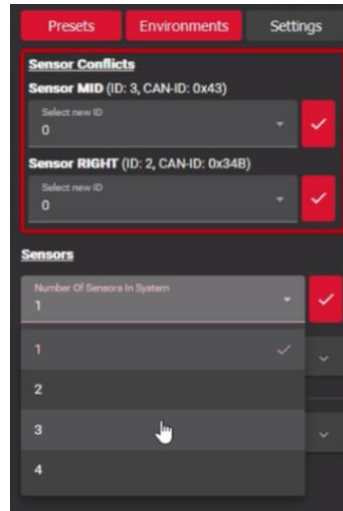
PIC IS OUT OF DATE



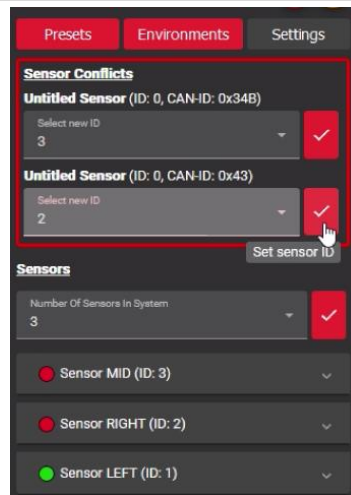
2.3
SENSORS CONFIGURATION

Navigate to the tab “Settings/Sensor” on the upper right-side of the GUI. The system will automatically detect connected sensors and show a “Sensor conflict” if the number of sensors *configured* in the GUI (default: 1) does not correspond to the number of sensors *connected* to the TPU.

Configure the number of sensors connected to your system under “Number Of Sensors in System” (maximum: 4 sensors) and press the check mark.

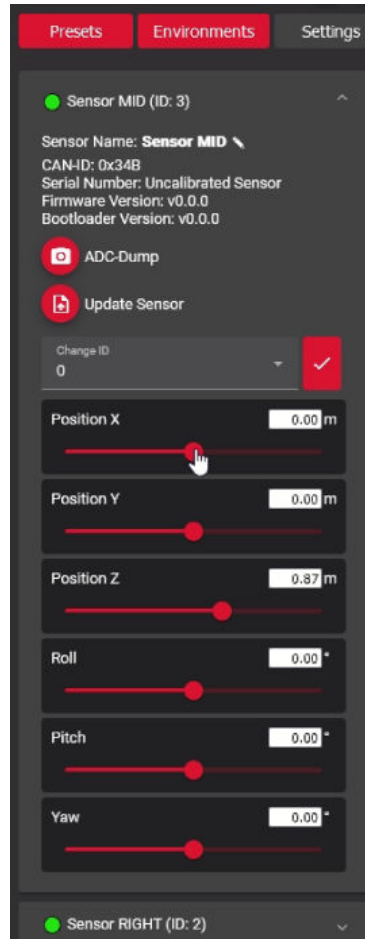


Each sensor is assigned a virtual ID upon production (default virtual ID = 0). Assign a new virtual ID to each of the conflicting sensors by selecting a virtual ID (different from all others) and pressing the check mark.



For each of the connected sensors, click on the drop-down arrow next to their name to see their individual settings. Each sensor has coordinates for its position (x, y, z) and orientation (roll, pitch, yaw) in 3D space. The values are in reference to the (0,0,0)-position in the GUI (blue point at the axis origin). Configure these values according to your setup.

You can also set a new sensor name by rewriting the default name and pressing ENTER.



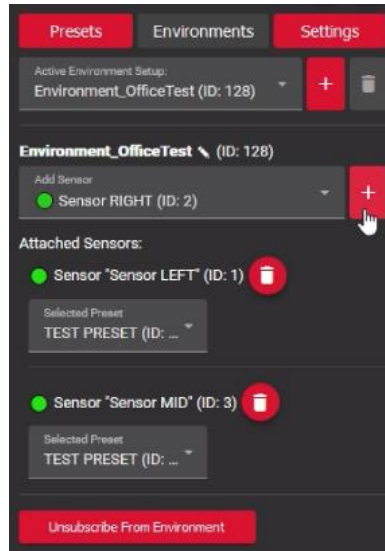
2.4

ENVIRONMENT CONFIGURATION

An Environment contains a set of sensors with their sensor configuration.

The TPU comes with the default environment “Initial setup” – select this environment (or create a new one by pressing the “+” button) and add to the Environment the connected sensors by pressing the “+” button in the dropdown menu “Add Sensor”.

To change the name of the Environment, select the current name, type-in the new name and press enter.



2.5

REGION CONFIGURATION

Navigate to the tab “Environments/Region Monitor”. To visualise the regions in 3D, check the box “show 3D Region”. To visualise the field-of-view of the configured sensors, select the box “Show Detection Range”.



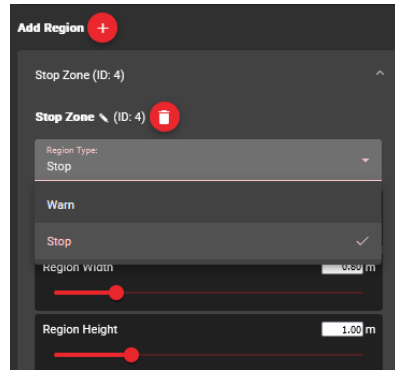
2.5

REGION CONFIGURATION

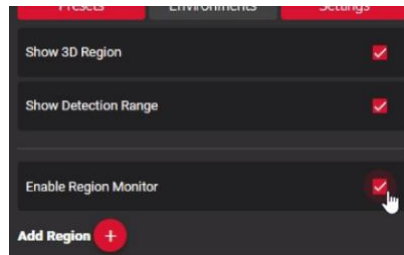
The TPU comes with the default regions “Stop Zone (ID:4)” of type “Stop” and “Warn Zone (ID:5)” of type “Warn”. To add additional regions, press the “Add Region +” button.

To change the dimensions and orientation of regions, type-in the values in the text boxes or use the sliders.

To change the name of a region, select the name, type-in the new name and press enter.



Enabling the “Region Monitor” functionality allows your computer or robot to receive information about the status of the configured zones (zone free or zone violated) via the IO and the UDP interfaces.



2.6

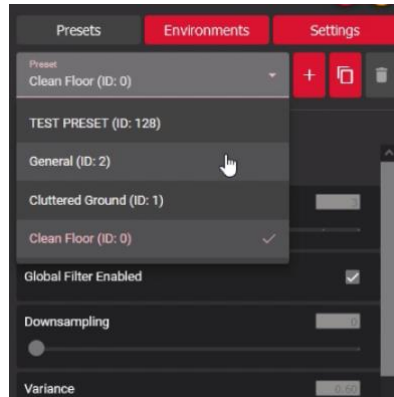
FILTERS CONFIGURATION

Filters are post-processing algorithms for improving the quality of the point cloud.

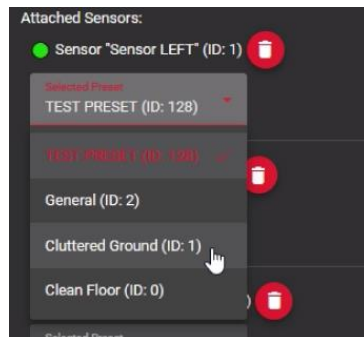
Navigate to the tab "Presets/Filter/" and select the Preset better suited for your application from the dropdown menu. The TPU comes with three pre-defined presets:

- Clean Floor: for floors without imperfections or features
- Cluttered Ground: for floors cluttered with small objects and/or features (e.g. seams)
- General: for other environments

You can also create your own custom Preset by clicking the "+" button.



Navigate to the tab "Environments/Setup/" and for each of the sensors configured in the Environment, select a Preset. *Select the same Preset for all configured sensors.*



And that's it! – your system is ready to go. If you have further questions, please refer to the Toposens ECHO ONE® Manual.

Also available for download in the member's area on the Toposens website:
<https://toposens.com/members/>.

If you face any difficulties, please contact us at support@toposens.com