Toposens 3D COLLISION AVOIDANCE SYSTEM

The Toposens 3D Collision Avoidance System is a **Plug & Play solution** which equips your robot with **best-in-class 3D collision avoidance** to detect all kinds of obstacles reliably. The Toposens technology can detect objects other sensors are unable to detect and therefore help you build and use **the safest and most reliable** mobile robots in the market. The system consists of the next-generation **3D Ultrasonic Echolocation Sensor ECHO ONE®** and the **Toposens Processing Unit (TPU)** providing reliable data filtering and 3D collision avoidance funtionality.

Plug & Play Solution.

ECHO ONE® + **Toposens Processing Unit** → **Plug & Play 3D Collision Avoidance Solution**

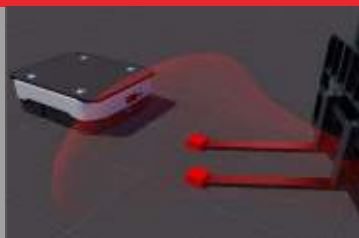**ECHO ONE® - 3D Ultrasonic Echolocation Sensor**
- Reliable detection of complex objects, such as forklift forks, floor-based objects, glass or mirrored surfaces
- Ultra-wide FIeld-of-View with minimal blind zone
- Detection of multiple objects in 3D space

TOPOSENS PROCESSING UNIT - 3D Collision Avoidance Processing
Featuring preconfigured:
- 3D warning and stopping zones (dynamic & adjustable)
- Advanced noise filters for highest reliability and noise immunity
- Graphical User Interface (GUI) to adjust sensor parameters, warning and stopping zones and to view real-time 3D data
- Digital I/Os and ethernet as hardware interfaces

N e x t L e v e l R o b o t i c S a f e t y

Industrial Mobile Robotics Collision Avoidance

Outdoor Robotics

Autonomous Parking

Toposens ECHO ONE®
3D Ultrasonic Collision Avoidance Sensor

Detecting the Undetectable

The **3D Echolocation Sensor ECHO ONE®** enables your mobile robot to reliably detect even the most complex objects in three-dimensional space, such as forklift forks, floor-based objects, and even glass. With a small blind zone, ultra-wide opening angle, and detection range of up to 3 m, you can **reduce costly accidents** whilst ensuring **highest safety** in any environment.

Based on our **proprietary 3D ultrasonic technology**, Toposens ultrasonic sensors use Time-of-Flight echolocation data for detection in three-dimensional space, filtered by the **Toposens Processing Unit** for 3D collision avoidance, offering you **Next-Level Robotic Safety**.

Key Features and Specifications.

| SPECIFICATIONS	
Detection Range	10 mm - 3000 mm
Weight	160 g (excl. cable)
Dimensions [LWH]	125 mm x 56 mm x 42 mm (excl. cable)
Field-of-View	Up to 160° Horizontal
	Up to 80° Vertical
ELECTRICAL	
Power Consumption avg. (12V)	2.0W
INTERFACE	
CAN	ISO 11898-2:2016 / CAN 2.0A

Additional supplies available upon request.

Toposens PROCESSING UNIT
Advanced 3D Collision Avoidance Software

The **Toposens Processing Unit** serves the need of easy integration of the Toposens 3D ultrasonic sensing technology into your application. It enables you to use **pre-filtered point clouds** displayable in a Graphical User Interface (GUI) to make use of the **3D collision avoidance functionality** by setting dynamical three-dimensional, adjustable **warning- and stopping-zones**.

Technology.

ECHO ONE®

TOPOSENS PROCESSING UNIT
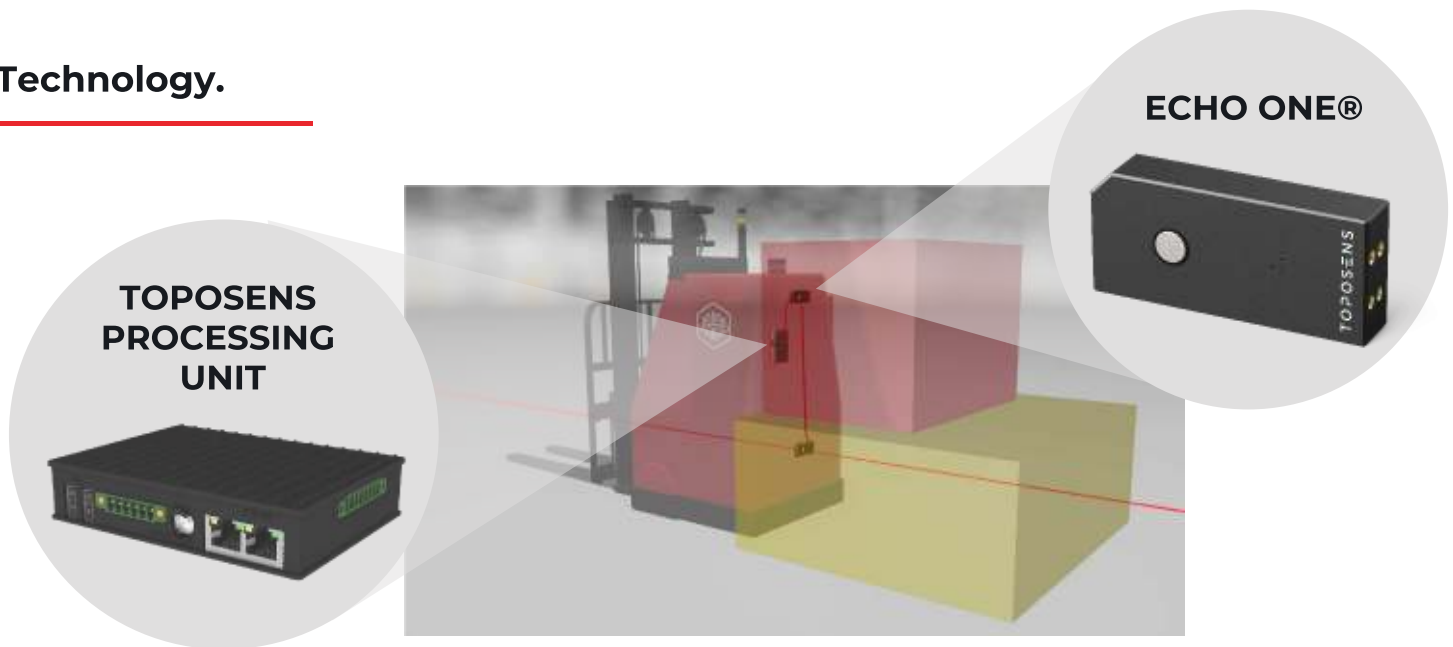
GATEWAY
The TPU acts as a gateway between ECHO ONE® and control units of your robot.

FILTERS
The TPU features a set of sophisticated filters to pre-filter the point cloud obtained by the ECHO ONE®.
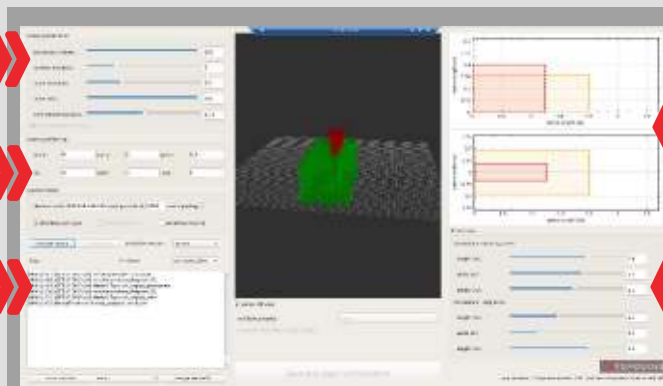
3D COLLISION AVOIDANCE
3D collision avoidance is adjustable via configurable warning zones and stop zones via easy-to-use graphical interface (GUI).

GUI Interface.

Parameter Adjustments

Sensor Vehicle Positioning

IP Configuration

3D Collision Zone Visualization

3D Collision Zone Configuration

Step-by-step operating instructions are available online.

Toposens PROCESSING UNIT
Advanced 3D Collision Avoidance Software

Specifications.

MECHANICAL	
Dimensions	112 mm x 84 mm x 25 mm
Weight	450 g
Enclosure Material	Aluminium housing
MTTF	> 200.000 hrs
ENVIRONMENTAL	
Ambient temperature range	-40 - 80° C (industrial)
ELECTRICAL	
Nominal Supply Voltage	12 V
Operating Voltage	8 V to 36 V
Current Consumption typ. (12V)	300 mA with TS Point Cloud Processing running and Ethernet up
CONNECTIVITY	
Ethernet	1x 1000 Mbps Ethernet port, RJ45 connector 1x 100 Mbps Ethernet port, RJ45 connector
CAN Bus	1x CAN BUS, 1 Mbps (In use for Sensor Bus)
Digital Inputs (EN 61131-2)	4x Voltage Input, 6-24 V, 3 mA, isolated, Phoenix connector
Digital Outputs (EN 61131-2)	4x Voltage Source, max. 0.5 A, isolated, Phoenix connector
OPERATING MODES	
3D Collision Avoidance	Via I/O ports or ethernet
Sensor Fusion	3D point cloud via ethernet