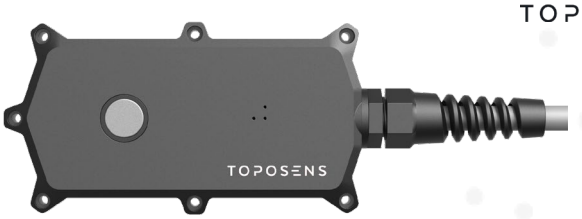
ECHO ONE DK

3D Collision Avoidance Sensor Development Kit



The Toposens ECHO ONE DK enables you to fully evaluate and integrate our ECHO ONE 3D Collision Avoidance Sensor into your application (AGV, robot or other autonomous applications). Using our ECHO ONE DK, your AGV will avoid collisions in an industrial environment for increased safety and reliability far more efficiently than conventional sensors are capable of doing. Based on our proprietary 3D ultrasonic technology, the new sensor uses time-of-flight echolocation data for a precise multi-object detection.

Our ECHO ONE DK provides you with great flexibility in evaluating our ECHO ONE sensor for use in your product. For easy integration, our DK includes the industry standard CAN bus communication interface (other interfaces are available upon request).

The ECHO ONE DK Set includes: A 3D Ultrasonic Sensor plus three software packages:

- Toposens sensor Library (C++-Library)
- ROS support
- Cross-Platform Toposens 3D Visualizer.

Additionally, there is a separate interface adapter for firmware updates.

The ECHO ONE DK enables you to fully demonstrate and validate the functionality and performance of our ECHO ONE 3D Collision Avoidance Sensor including its high accuracy, extended opening angle, and enlarged detection range.

3D Multi-Object Detection

Detection of complex and transparent objects

Ultra-wide Field-of-View

Key Features

- **3D Multi-Object Detection –** Generate 3D echolocations (X/Y/Z) of the sensors surroundings
- **Ultra Short-Range Detection –** 3D data from 20cm
- **Ultrawide Field-of-View –** At Ultra short-range up to 180° and at 3 m up to 110° (horizontal)
- **Best-in-Class Detection Capability –** Detect dark, transparent, complex and small objects
- **High Robustness –** Immunity to lighting conditions and IP67 protection class
- **Compact Design and Flexible Mounting –** Flat housing design and seven screw holes
- **Easy Software Integration –** CAN and ROS driver delivering X,Y,Z data output
- **Low Power Consumption –** 2.2 W average for longer robot uptime

ECHO ONE DK

Specifications

Technical Characteristics	*Reference Object: Norm Pole, Ø 75 mm, height 1000 mm
Ultrasonic Frequency	~40 kHz
Frame Rate	Up to ~20 Hz (adjustable)
3D Operating Range*	200 - 3000 mm
Horizontal Field of View*	200 - 600 mm up to ±90° 600 - 3000 mm up to ±55°
Vertical Field of View*	200 - 600 mm up to ±90° 600 - 3000 mm up to ±25°
Communication Interface	CAN 2.0A, default data rate 1 Mbit/s (other data rates/ interfaces on request)

Physical Characteristics	
Dimensions	122 x 68 x 23 mm
Weight	253 g (incl. cable)
Protection Class	IP67 (sensor unit)
Fixed sensor cable	D-SUB 15 female (others on request) 850 mm length (flexible part)

Electrical Characteristics	
Supply Voltage (nominal)	12 V
Supply Voltage Range	6 - 28 V
Power consumption (average)	2.2 W (at 12 V)

All data are averaged results of laboratory prepared samples. Data is subject to change.

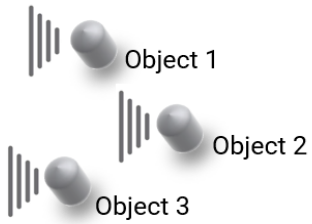
ECHO ONE DK

Functional Overview

1. Ultrasonic Pulse

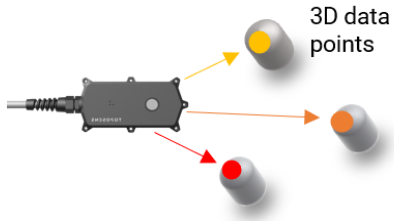
3D echolocation sensor sends out an ultrasonic pulse

2. Reflected Echo



Pulse is reflected by surrounding objects and received by the sensors microphones

3. 3D Echo Point Cloud



Based on echo ToF data, the origins of the echoes are calculated as 3D coordinates

ECHO ONE // Development-Kit

Sketch