

# Avoid Collisions Reliably and Safely

Ultrasonic Sensor with Integrated CAN Interface for Mobile Machines

## At a Glance

- Quick and completely reliable detection of objects in the monitoring area
- CAN interface for optimal integration in the field of mobile equipment
- Resistant to dust, dirt, and severe temperature fluctuations
- High EMC resistance
- Safe collision avoidance up to PL c/SIL 1, redundant up to PL d/SIL 2



## The Application

When moving high volumes of earth on large construction sites or in surface mining applications, excavators are required for tasks such as digging out pits and filling them again. The devices are also used to transport bulk materials and other goods that are needed on-site. These mobile machines must be able to operate safely at all times and in all directions, including on uncertain terrain.

## The Goal

Mobile machines such as excavators often have an extremely restricted field of view at the rear and to the sides. It is important that dangerous collisions with people, objects, or other vehicles are avoided when maneuvering or in the swivel range of these machines. Depending on the situation, the safety system must meet a specific performance level (PL) or safety integrity level (SIL). This requires completely reliable detection or distance measurement in the area concerned. The sensors for this must furthermore be able to withstand challenging ambient conditions such as dust, dirt, moisture, and severe temperature fluctuations. In addition, high EMC resistance is required to prevent other devices from interfering with the reliability of the measurements or with the sensors themselves.



## The Solution

Ultrasonic sensors from the UC\*-L2M-B16 series are fitted on the sides and rear of the mobile machines to ensure optimal monitoring of these areas with a restricted field of view. The number and detection range of the sensors are selected based on the size of the respective vehicle to ensure that the sound beams optimally cover the monitoring area. The ultrasonic sensors of the UC\*-L2M-B16 series have an integrated CAN interface, which allows the sensors to be directly integrated into the vehicle's CAN bus system. The degree of protection (IP68) ensures that the devices are not only dirt-repellent, but also resistant to dust and water. In addition, the sensors are designed to withstand temperatures as low as -40 °C, have high EMC resistance, and can be used on public roads due to E1 approval.

Depending on the required performance or safety integrity level, the ultrasonic sensors of the UC\*-L2M-B16 series can be used individually or redundantly. A customized safety concept confirms the suitability of the sensors for safety-relevant applications and facilitates the corresponding verification for the user.

## The Benefits

The ultrasonic sensors from the UC\*-L2M-B16 series are the first to offer an integrated CAN interface, allowing the sensors to be directly integrated into the CAN bus system of the mobile machine. The extensive selection of different specialized connectors (M12, DEUTSCH, and AMP) enables the sensors to be used in existing configurations without any problems. A wide range of additional functions also provides the user with maximum flexibility for their applications. This means that interfering machine parts can be blocked out to ensure consistent measurements. The adjustable sound beams allow the sensors to be quickly adapted to the respective application without reducing the range of detection. The automatic sensor synchronization ensures convenient operation when using several sensors in a confined space. Moreover, the customized safety concept allows cost-efficient collision protection in safety applications up to PL c/SIL 1 or PL d/SIL 2, even for retrofits.

### Technical Features

- Detection range: Up to 4,000 millimeters
- Approval: E1
- Extended temperature range: -40 °C to 85 °C
- Degree of protection: IP68
- Interface: CANopen
- Connectors: M12, DEUTSCH, AMP

