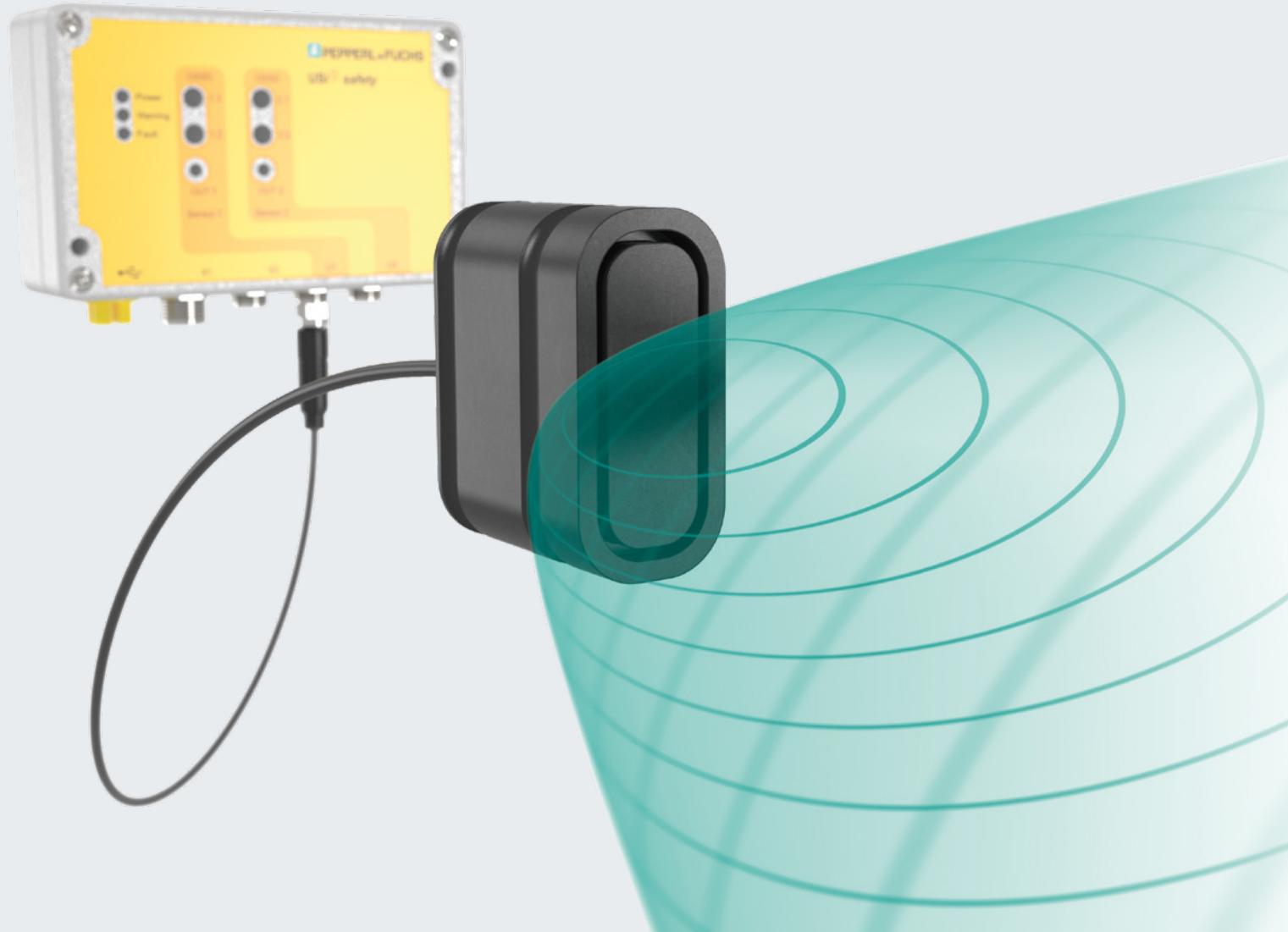


Safety without exception.

The USi®-safety sensor system in accordance with category 3 PL d

Conquering the elements with unique ultrasonic technology for maximum safety.



Your automation, our passion.

 **PEPPERL+FUCHS**

USi®-safety: Safety without Exception

The ultrasonic sensor system brings safety to applications where it was not possible before. Whether in very tight installation spaces, in dusty environments or outdoors—with the USi-safety, safe protection can now be achieved anywhere.



Ultrasonic Technology for Safety in All Areas

The USi-safety ultrasonic sensor system is breaking new ground for safety applications—whether in challenging, dusty environments or in outdoor areas. Due to state-of-the-art ultrasonic technology and all its proven advantages, machines and vehicles are reliably protected. Whether wood, metal, or

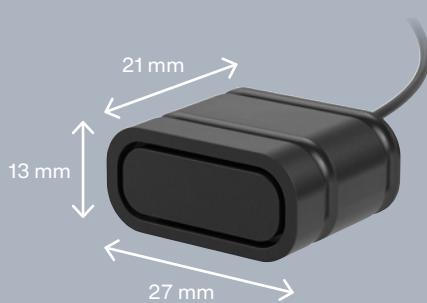
plastic, colored, reflective, or transparent, objects, or people—the possibilities of ultrasonic technology are almost limitless. Regardless of material, surface structure and colors, reliable detection is always ensured.

Two Safe Systems on a Single Evaluation Unit

Up to two ultrasonic sensor units can be connected to the evaluation unit of the USi-safety ultrasonic sensor system. They each have a single-fault tolerance, two-channel structure. Reliable protection is therefore possible via each of the two independent sensor channels. A safe sensor system is provided even when only one sensor unit is connected. One signal output and safe OSSD outputs in accordance with category 3 PL d are available for signal output to a safety controller for each connected sensor unit.

Highlights

- Unique ultrasonic technology meets safety standards in accordance with category 3 PL d even in harsh environments
- Detached sensor system provides installation flexibility—the miniature sensing units fit in tight spaces
- Reliable safety operation regardless of target material, surface structure, and surface color
- Optimal safety protection is assured by the unique “wide and shallow” elliptical 3-D detection field
- Easy teach-in of reference target for high tamper protection



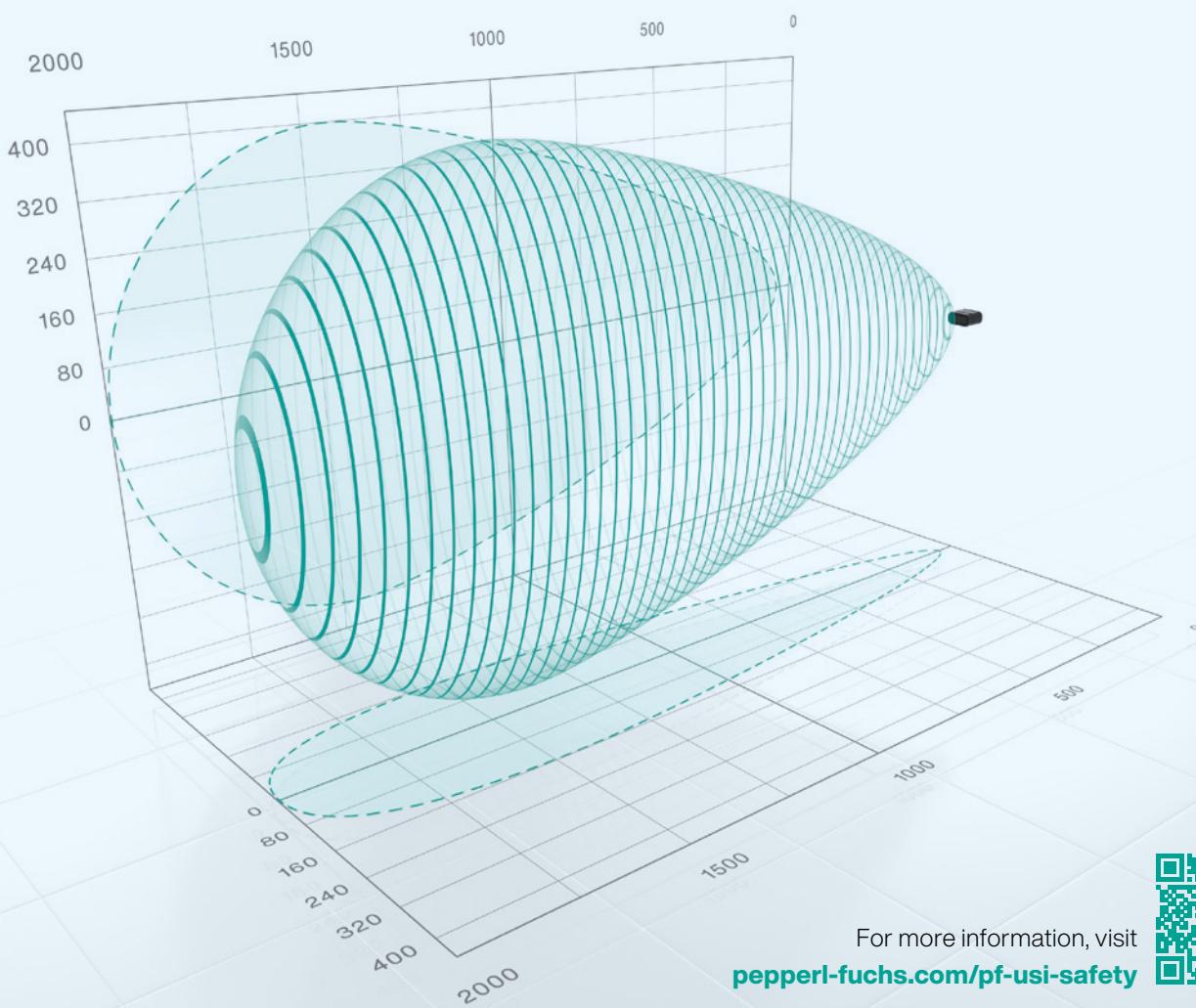
Flexible and Robust: Sensor Unit in Miniature Housing Design

The sensor units are detached from the evaluation unit and, with cable lengths of up to 3 m, can be placed wherever protection is required. Due to their miniature housing, they are well suited for narrow or tight installation spaces. The high IP69K protection rating also makes them very robust against dust and moisture.

Elliptical Ultrasonic Field for Extra-Wide Detection Range

Due to the special “wide and shallow” shape of the detection field, the system can be successfully used just above the floor or close to a wall. Perfected for monitoring in three-dimensional space, the optimal protection of machines, vehicles and persons is therefore ensured.

This is made possible by the special shape of the sound beam: while conventional ultrasonic sensors emit acoustic signals in the form of a radially symmetrical sound beam, the USI-safety does so in an elliptical sound field. Due to the opening angle of $\pm 17^\circ \pm 5^\circ$, a particularly wide detection range is generated in one plane and a narrow detection range in the other plane.

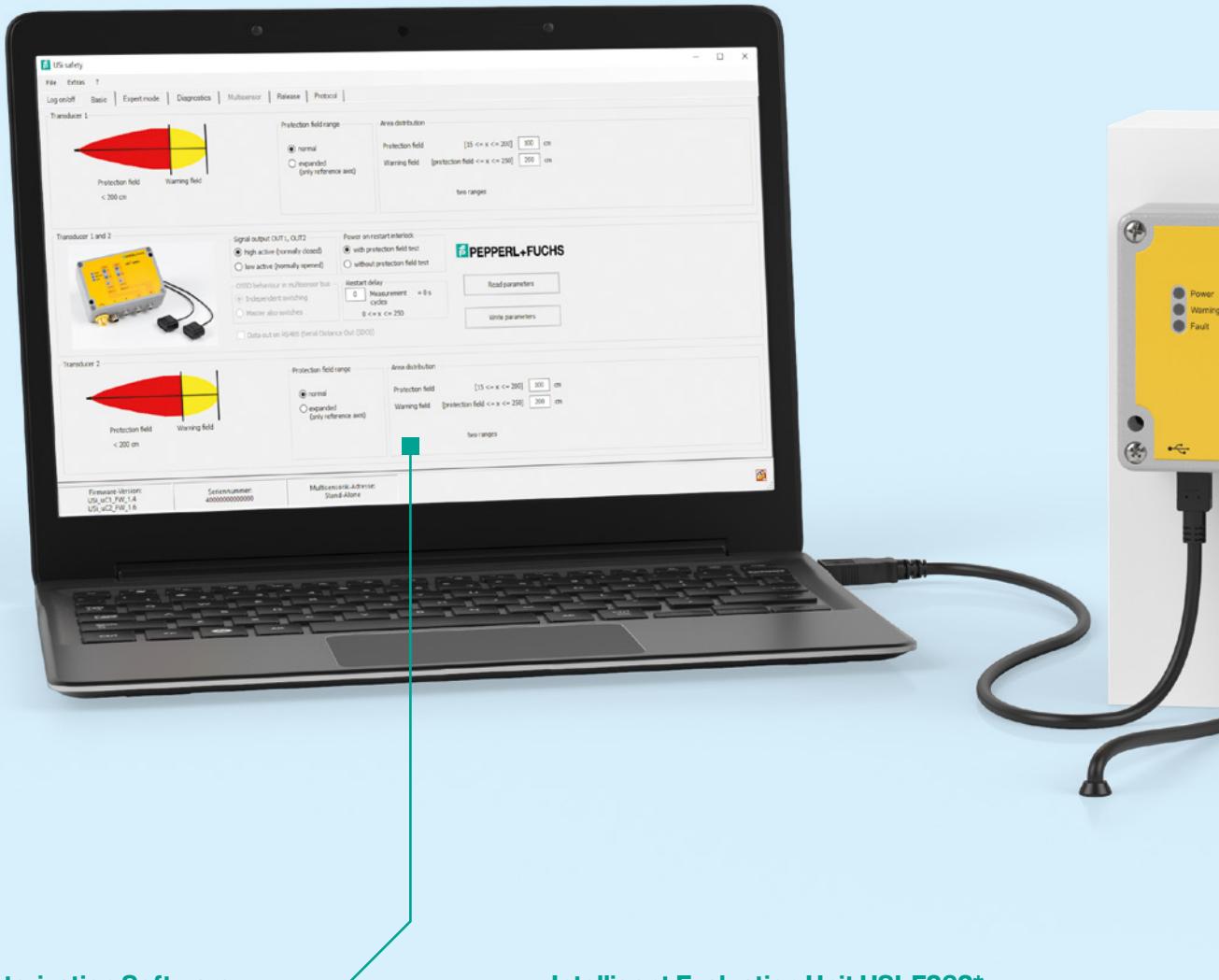


For more information, visit
pepperl-fuchs.com/pf-usi-safety



Flexibility and Safety in One System

An intelligent evaluation unit, up to two detached sensor units, an optional temperature sensor for automatic temperature compensation, and parameterization software that automatically generates safety protocols for plant documentation. This is the USi-safety system.



Intuitive Parameterization Software

- Intuitive settings of, e. g., switching points, output logic as well as safety- and ultrasonic-specific parameters
- Easy initialization of periodic tests
- Automatically generated safety protocols for plant documentation

Intelligent Evaluation Unit USI-F262*

- Two microcontrollers monitor the connected sensors and their own hardware to ensure that the components are functioning correctly
- Single-fault tolerance of the system according to EN ISO 13849-1
- Two safe, short-circuit- and cross-circuit-monitored OSSD outputs
- One additional non-safe signal output per sensor channel



Sensor Unit USI2500-27X13E*

- Up to two independently operating sensor units per evaluation unit
- Very small housing with IP69K protection
- Flexible positioning due to detached design with up to 3 m cable length
- Optional: mounting sets for different mounting situations

Optional Temperature Sensor USI-TEMP*

- Temperature sensor with mounting flexibility
- Automatic temperature compensation for wide temperature fluctuations, e. g., in outdoor applications

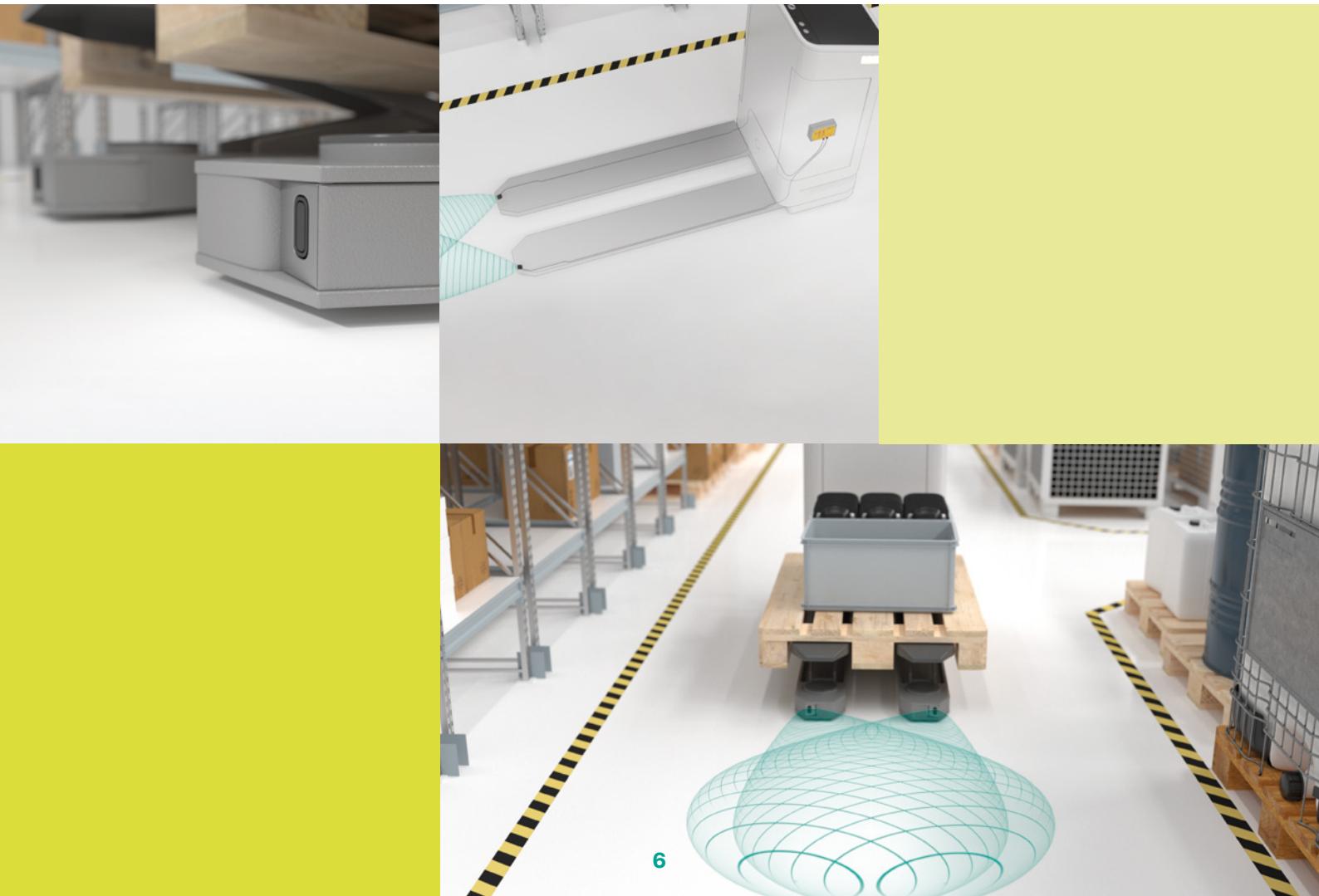
Reliable Protection in Any Environment

Tight installation spaces, dusty environments—the unique ultrasonic technology guarantees maximum reliability in vehicle and machine protection. Whether for collision avoidance in the tips of forklifts or machine safeguarding in the timber industry, there are no limits to the USi-safety.

Collision Avoidance in the Fork Tip

When safeguarding automated guided vehicles (AGVs), not only the main direction of travel but also the secondary direction as well as side protection are relevant. Due to structural characteristics, these are often very difficult or impossible to implement with conventional safety sensor technology. This is where USi-safety sets new standards.

To protect the reverse travel of automated forklifts, the area in front of the fork is particularly critical. Due to their miniature housing, the sensor units of the USi-safety can be integrated directly into the fork tips. With a cable length of up to 3 m, the detached evaluation unit finds its place in the chassis of the AGV.



Robust Protection with Optimized Sound Beam

Mounted directly above the floor, the three-dimensional, elliptical “wide and shallow” sound beam optimally safeguards the blind zone between the AGV and the pallet up to PL d. Even whirled-up dust or other environmental influences do not affect the ultrasonic sensor system. With its unique features, USi-safety is the perfect complement to conventional safety equipment in the AGV.



Personal Safety in Lane-Guided AGVs

Lane-guided AGVs follow a lane applied to the ground and transport goods from one station to the next. If this is an area where people cross the specified paths of the vehicles, collisions must be reliably avoided and therefore personal protection must be ensured. At the same time, the transport should not be interrupted unnecessarily.

The detection range of the ultrasonic sensor units can be quickly and easily adapted to the conditions via the parameterization software. In addition to safe OSSD outputs for the safety field, one signal output is available per channel, which can be used, e.g., to slow down the AGV or to issue a warning signal.



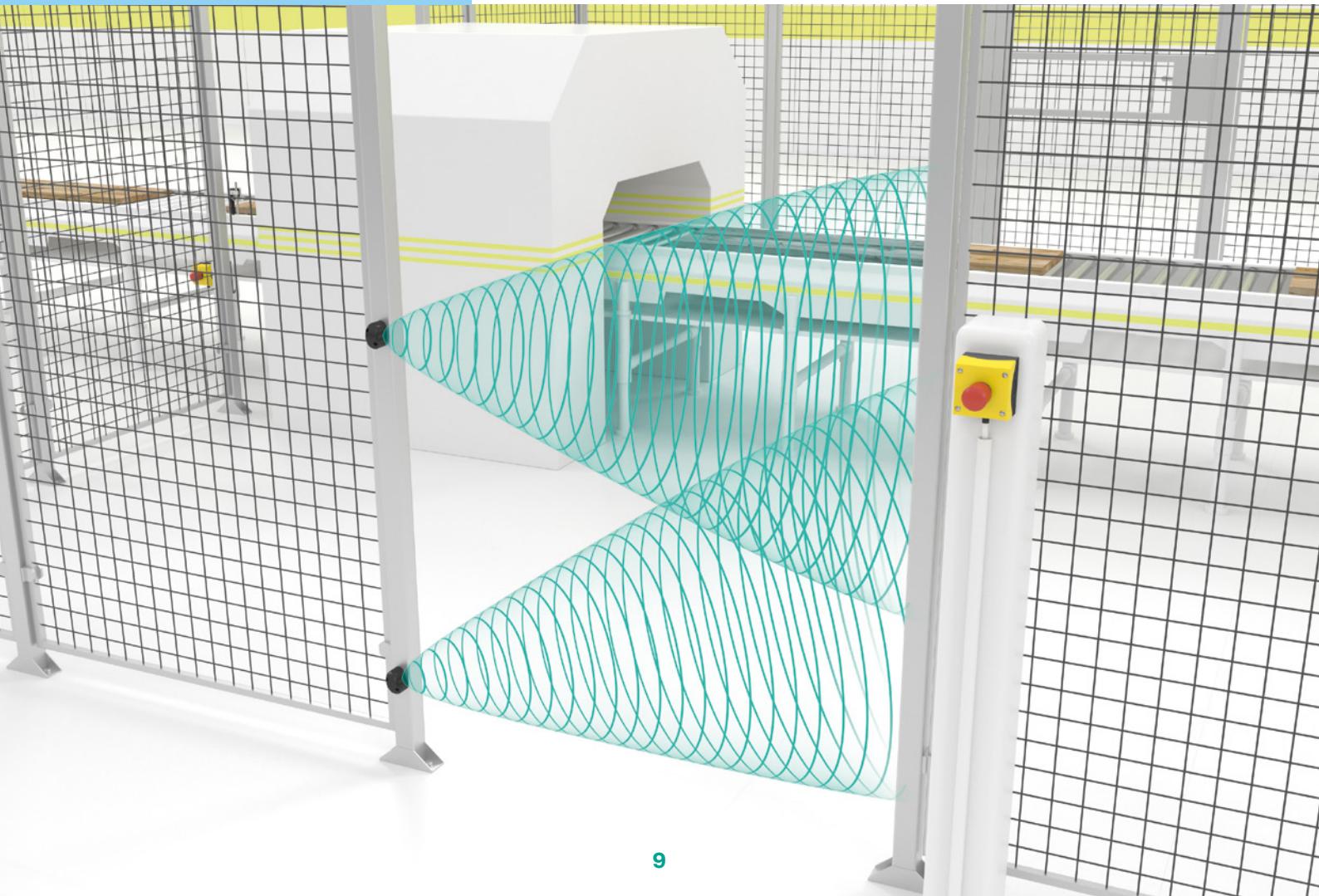


Machine Safeguarding in the Wood Industry

Usually, machines are safeguarded by photoelectric light curtains. However, in demanding environments, such as in the wood industry, these have a major disadvantage: wood dust or other particles flying around can lead to false alarms and the machine switches into the safe state. The light grid must be cleaned and the machine restarted manually in order to continue with the process.

Used as a “sound curtain”, the USi-safety is insensitive to wood dust or other particles due to the ultrasonic technology. Unlike optical sensors, the USi-safety does not need to be kept clean, nor is the production process interrupted unnecessarily and the machine is still reliably safeguarded.

In addition, the system offers a further advantage: fixed machine parts can be taught-in via the Teach-In function and used for manipulation protection. If this reference target is no longer recognized due to manipulation, the system switches to the safe state.



Innovation and Expertise Right from the Start

With our unique expertise in developing and manufacturing ultrasonic sensors, Pepperl+Fuchs is working on the application solutions of the future. Our ultrasonic portfolio combines decades of in-house expertise in ultrasonic transducers, an ultrasonic technology center, and comprehensive expert knowledge—for future-proof, application-oriented sensor solutions.

Top Quality and Performance

Ultrasonic sensors from Pepperl+Fuchs are built in our own technology center, where transducer development and manufacturing take place. For more than 30 years, our forward-thinking team of experts has been working continually to advance ultrasonic technology for the solutions of tomorrow. That means our customers always receive the highest-performance products on the market.

This approach has led to the broadest portfolio in the industry—supported by numerous patents and innovations—for the highest level of flexibility in product selection and optimal application solutions. In addition to our standard portfolio, Pepperl+Fuchs has the knowledge and infrastructure to respond to customer requirements with speed and flexibility.

Ultrasonic Sensors for Any Industrial Application

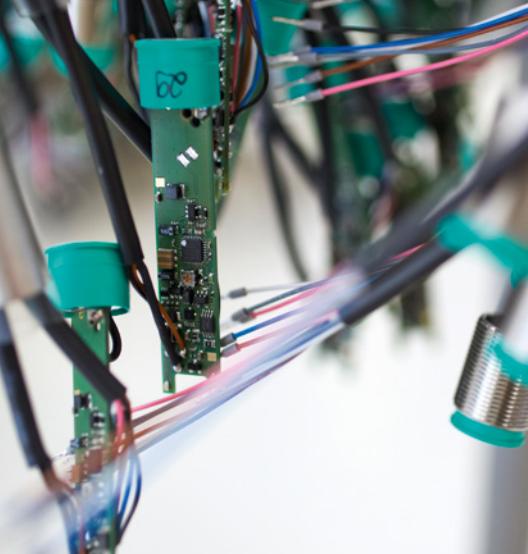
Ultrasonic sensors are used to detect objects and measure distance in industrial applications where versatility and reliability are key. Pepperl+Fuchs offers a wide variety of ultrasonic sensors that feature benefits like minimal dead bands, large measuring ranges of up to 10 m, adjustable sound beams, and much more—and all in a variety of housing designs, so we can always offer reliable and efficient solutions.



Deepen your knowledge of ultrasonic sensors with Pepperl+Fuchs' Ultrasonic Technology Guide:
pepperl-fuchs.com/technology-guide

Sensorik4.0®— Paving the Way for the Smart Factory

In the “Industry 4.0” future of fully networked production systems, communication-ready sensors play a vital role because they send and receive sensor data within production processes and to higher-level, local, or cloud-based information systems. To pave the way for Industry 4.0, Pepperl+Fuchs is providing innovative sensor technologies with Sensorik4.0®. They use the standard IO-Link interface to support the digitization of industrial applications.



Your automation, our passion.

Explosion Protection

- Intrinsic Safety Barriers
- Signal Conditioners
- FieldConnex® Fieldbus Infrastructure
- Remote I/O Systems
- Electrical Explosion Protection Equipment
- Purge and Pressurization Systems
- HMI Systems
- Mobile Computing and Communications
- HART Interface Solutions
- Surge Protection
- Wireless Solutions
- Level Measurement

Industrial Sensors

- Proximity Sensors
- Photoelectric Sensors
- Industrial Vision
- Ultrasonic Sensors
- Rotary Encoders
- Positioning Systems
- Inclination and Acceleration Sensors
- Vibration Sensors
- Industrial Ethernet
- AS-Interface
- IO-Link
- Identification Systems
- Displays and Signal Processing
- Connectivity

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