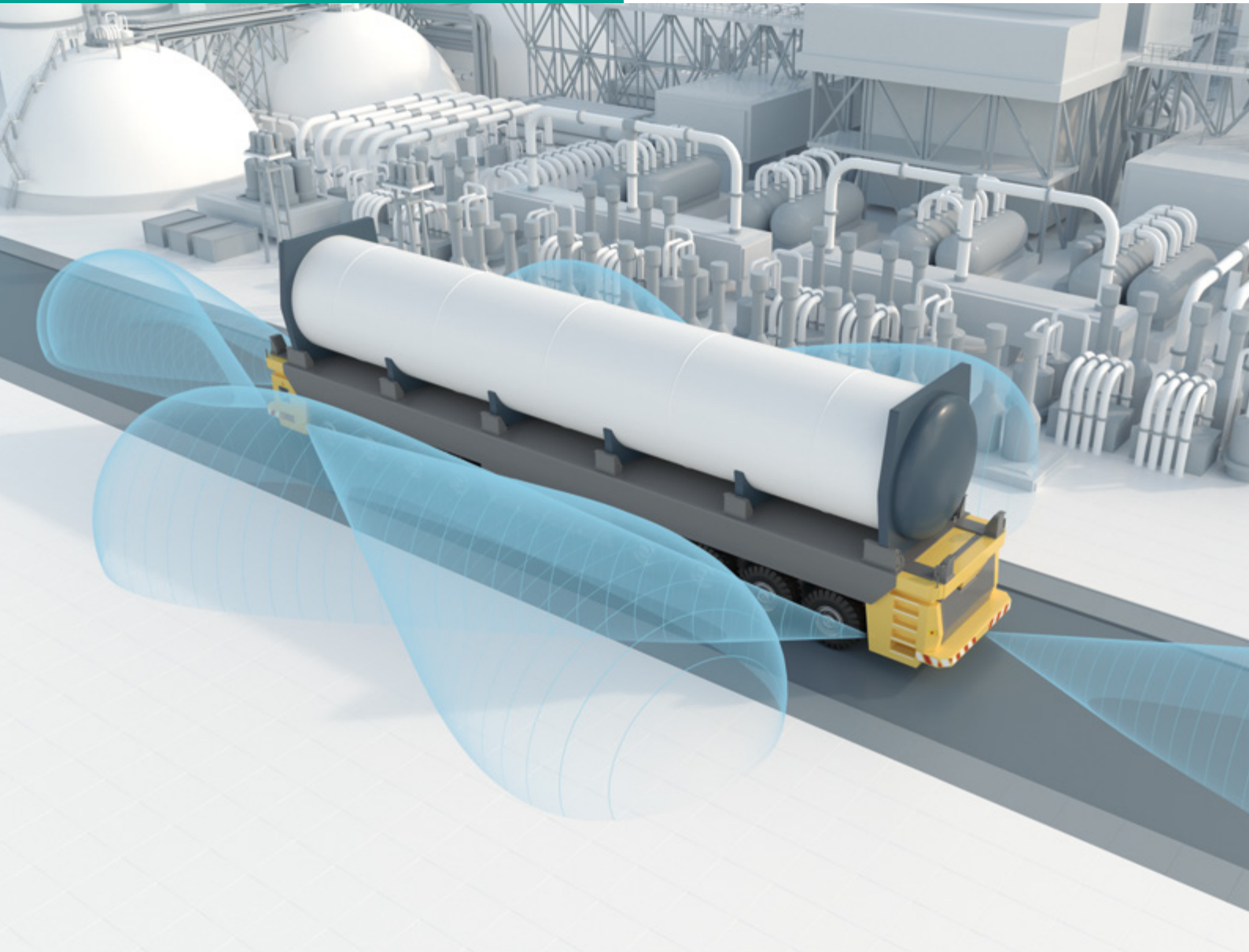


Defying Elements.

Interference-free distance and
velocity measurement.
Even in rain, fog, wind, or dust.

Industrial Radar Sensors
with CAN Interface



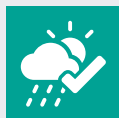
Your automation, our passion.

 **PEPPERL+FUCHS**

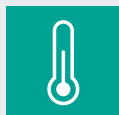
Unique—in Many Respects



Independent of ambient light



Irrespective of rain/snow, wind, fog, dust



Temperature range
-40 °C ... +70 °C



Degree of protection



Interference-free measurement even in rain, fog, wind, or dust. The industrial radar sensors defy the elements and are perfect for outdoor applications where fast distance and velocity measurement over long distances is required.

Long Ranges for High-Speed Applications

Advanced frequency-modulated continuous-wave (FMCW) radar technology enables distance and velocity measurement as well as the detection of the direction of motion in a single device. With sampling rates of up to 200 Hz, radar sensors from Pepperl+Fuchs detect motion speeds in the range of -80 ... +80 m/s at distances of over 25 meters.

Reliable under All Conditions

Even under the most adverse conditions, industrial radar sensors deliver reliable measurement results. This is ensured by the combination of the low-interference operating principle, robust CAN technology, a high degree of protection, and an extended temperature range. Outdoor applications and those under extreme environmental conditions can therefore be implemented without any problems.

Seamless Integration into Mobile Machines

Whether in automated guided vehicles or wheel loaders: optimized for use in mobile machines, the sensors can be quickly and easily integrated into vehicles. With E1-comparable EMC values, an integrated CANopen interface, and vehicle-typical connectors, they are ideal for these special applications.

| Sensor variant | MWC25M-L2M-B16-0,3M-DT6P | MWC25M-L2M-B16-0,3M-APS5P | MWC25M-L2M-B16-2M | MWC25M-L2M-B16-V15 |
|--------------------------|---------------------------------|-----------------------------|-------------------|----------------------|
| Measuring range distance | 0.5 ... 25 m | | | |
| Measuring range velocity | 0.1 ... 80 m/s | | | |
| Sampling rate | 1 ... 200 Hz, parameterizable | | | |
| Repeat accuracy | 1 mm | | | |
| Ambient temperature | -40 °C ... +70 °C | | | |
| Connection type | Fixed cable with plug (DEUTSCH) | Fixed cable with plug (AMP) | Cable | Connector plug (M12) |



For more information, visit

pepperl-fuchs.com/pf-industrial-radar

CANopen®



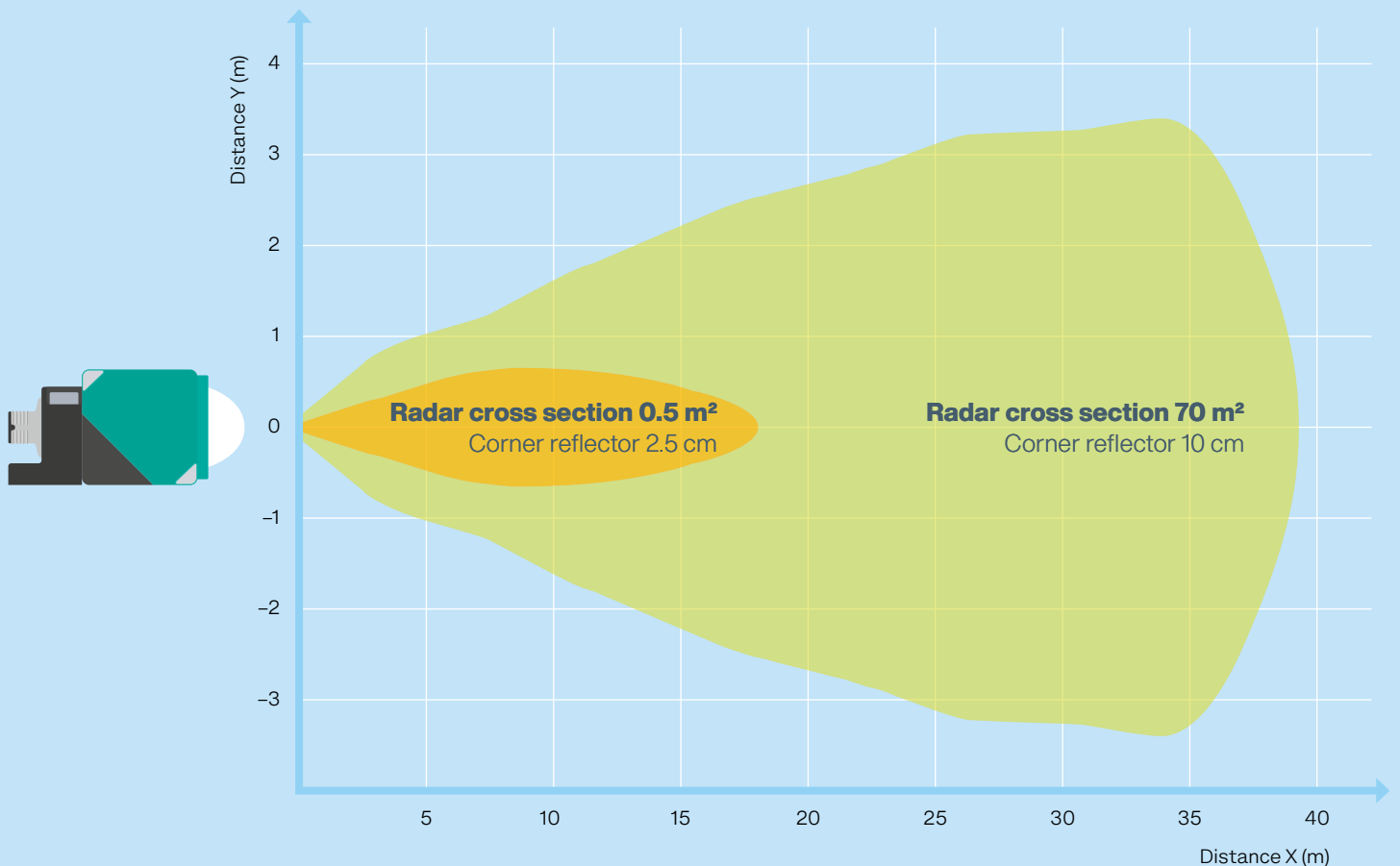
Universal Sensing Principle

Advanced FMCW radar technology for reliable, interference-free measurement—regardless of the environment and on virtually any material.

Measurement on Natural Objects

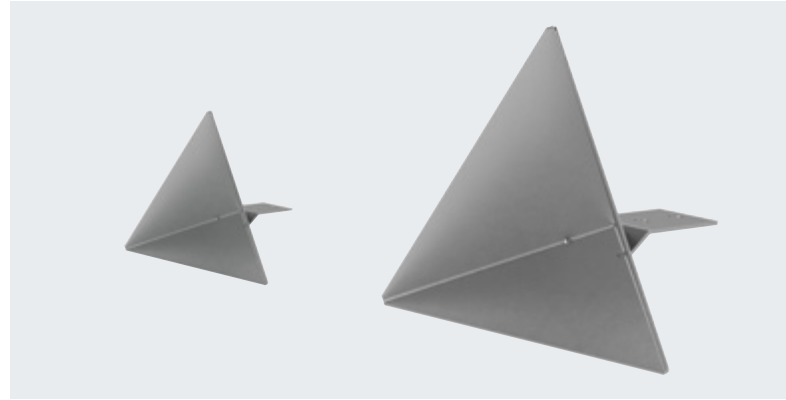
A key advantage of this physical sensing principle is that radar technology enables the detection of nearly all materials and is therefore not limited to specific objects. However, the possible detection range and the measuring range depend on the reflective properties of the target object, the so-called radar cross section (RCS). The larger the RCS, the better the electromagnetic waves are reflected back to the sensor.

Depending on the material, the radar waves are reflected back to the radar sensor to different degrees and are therefore detected to a greater or lesser extent. This degree of reflection is also influenced by the thickness, size, and shape of the target object. A flat metal surface offers perfect reflection and is therefore very suitable as a target object.



Corner Reflectors Stabilize the Measurement

Multiple corner reflectors are available as accessories. These consist of three orthogonal metal plates and create a highly effective reflective surface. If a corner reflector made of metal is attached to a weakly reflective object or an object that is not ideally aligned with the radar sensor, its effective reflection area increases considerably. This makes it easy to stabilize measurements on the intended target object and therefore optimize the application.

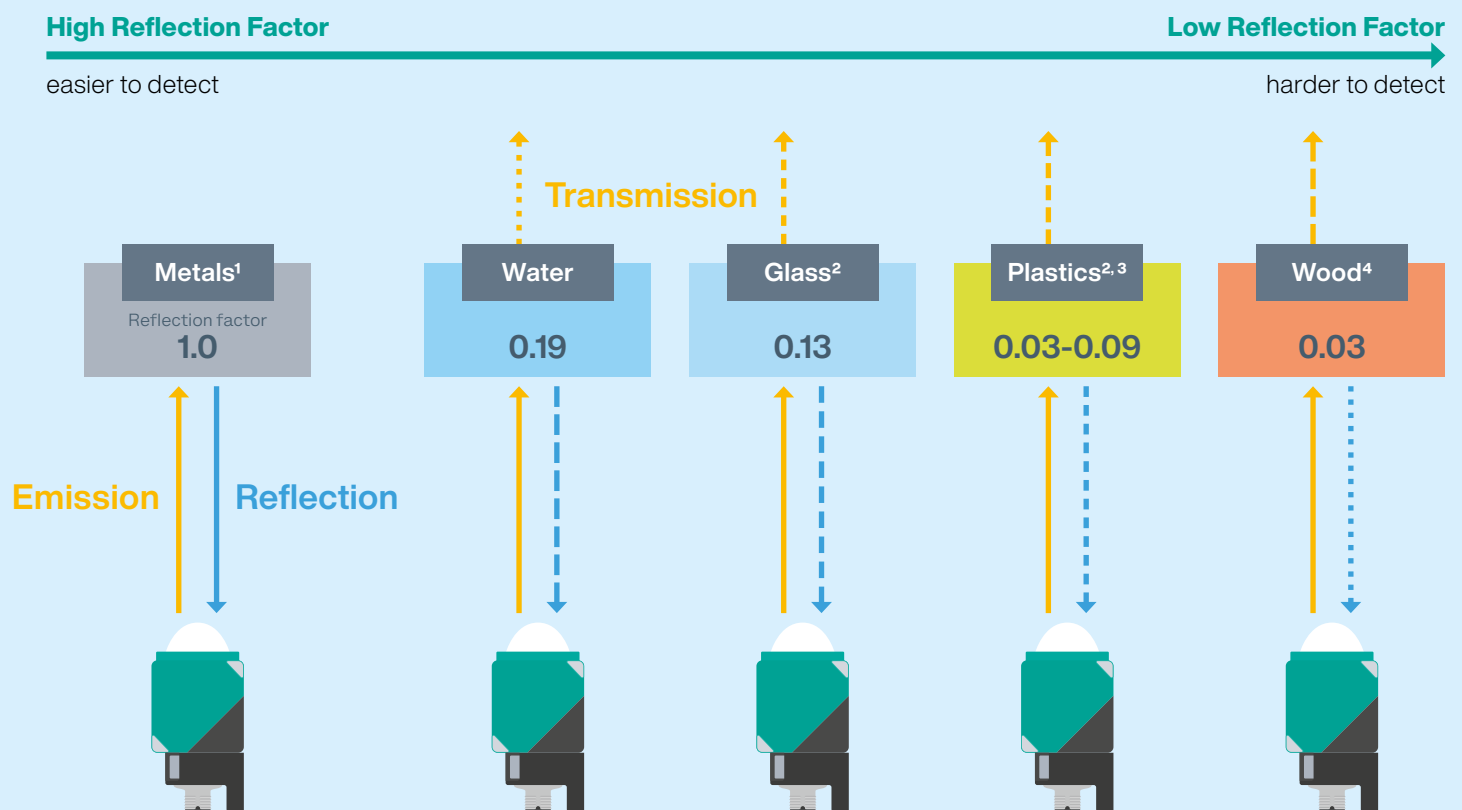


Easily Ignore Interference Targets

At close to the speed of light, radar waves are almost impossible to stop. Up to a certain degree, they can penetrate most materials. If the target object offers a higher reflection amplitude than the other objects in the detection range, these can simply be suppressed. This means that the measurement is not affected even if there are interfering objects directly between the sensor and the target object.



For more information, visit pepperl-fuchs.com/pf-radar-technology



¹Depending on direction, ²depending on thickness, ³depending on material, ⁴depending on contained humidity

Maximum Functionality Guaranteed

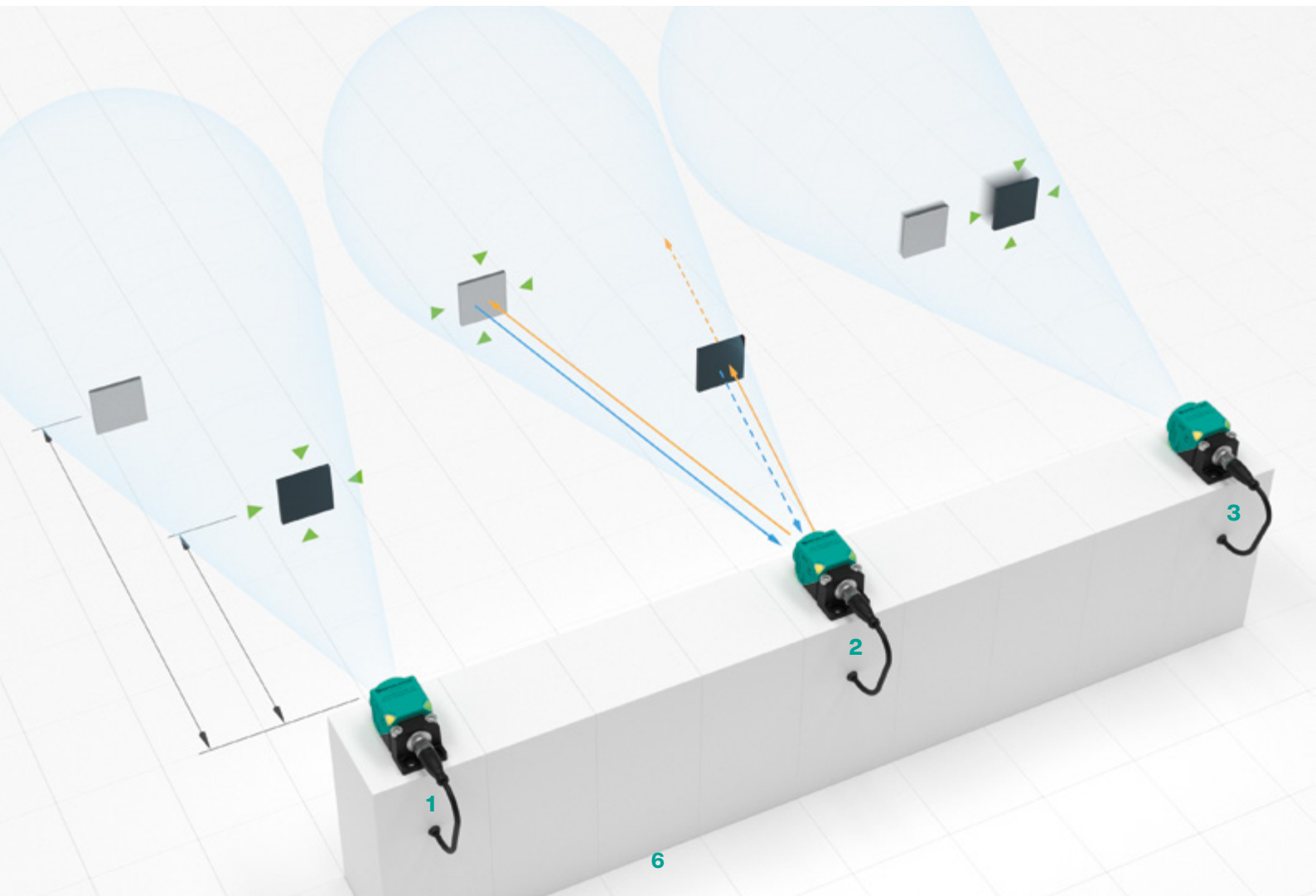
One sensor, three measurement modes, five measuring directions: With the proven L2 design and convenient switching of the measurement modes via PACTware or directly on the CAN bus, the industrial radar sensors can be quickly and easily adapted to your application.

Collision Avoidance with “Closest Distance” (1)

In “closest distance” mode, the object closest to the sensor is detected, regardless of its material. This mode is ideal for collision avoidance, i. e., with mobile construction machinery. Any objects that are within the extension range or action radius of the vehicle and boom are reliably detected.

Interference Target Suppression with “Best Reflection” (2)

When “best reflection” mode is activated, the sensor detects the object with the best reflective properties. This means that interfering objects can simply be ignored, even if they are directly between the sensor and the actual target object. For example, it is possible to “see through” the outer layer of a tank to detect the fill level inside.

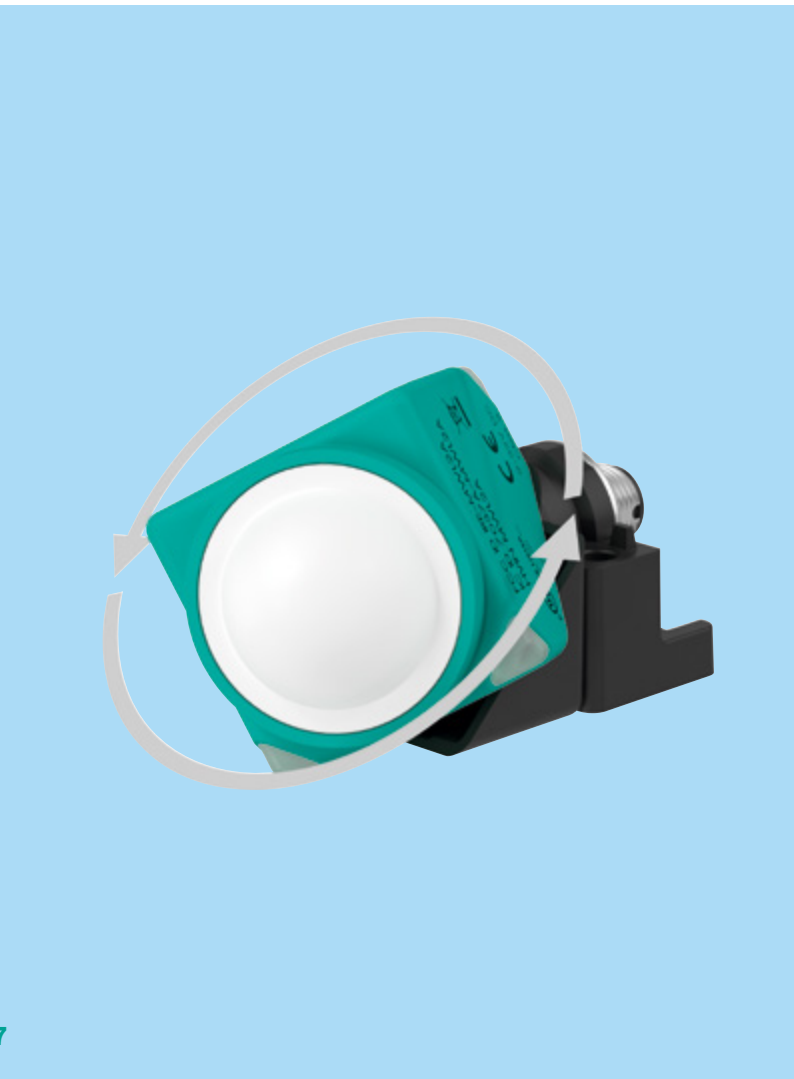
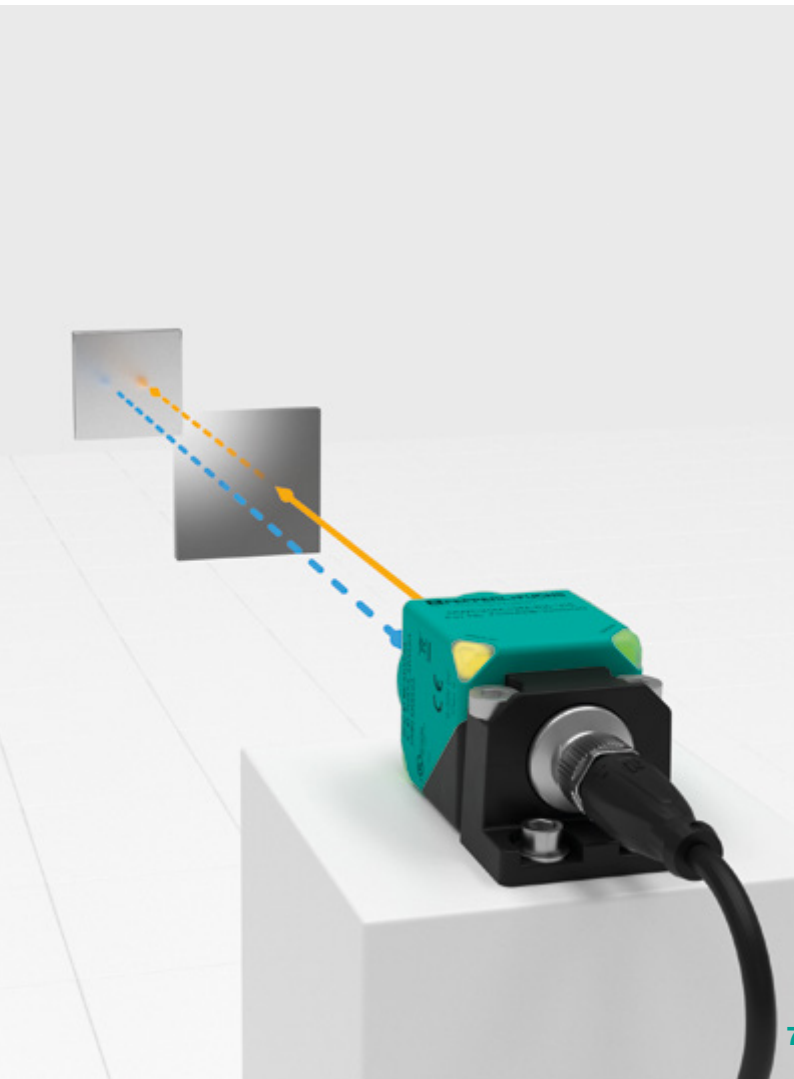


Track Monitoring with “Fastest Velocity” (3)

In “fastest velocity” mode, the radar sensor detects the object that is moving the fastest towards or away from the sensor. This measurement mode effectively supports monitoring an automated guided vehicles (AGVs) track, for example.

Proven Housing Design for Maximum Flexibility

Implemented in the proven and extracompact VariKont-L2 design, the radar sensors create additional freedom. A rotatable and swiveling sensor head enables the sensor head to be optimally aligned in the respective installation. A robust metal mounting with two screw connections serves as a receptacle for the sensor head and prevents problems caused by harsh ambient conditions and machine vibrations.



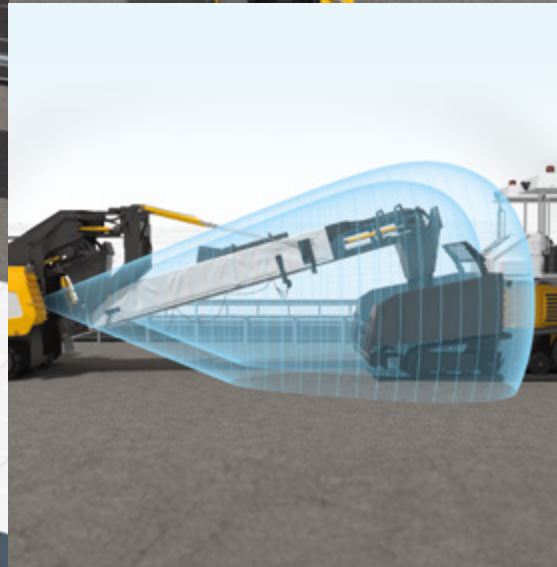
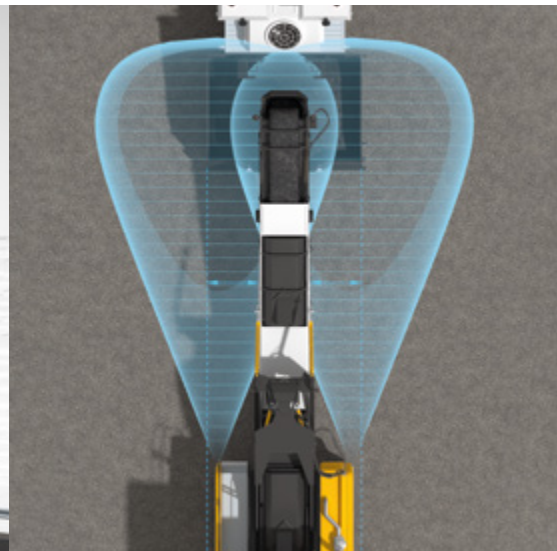
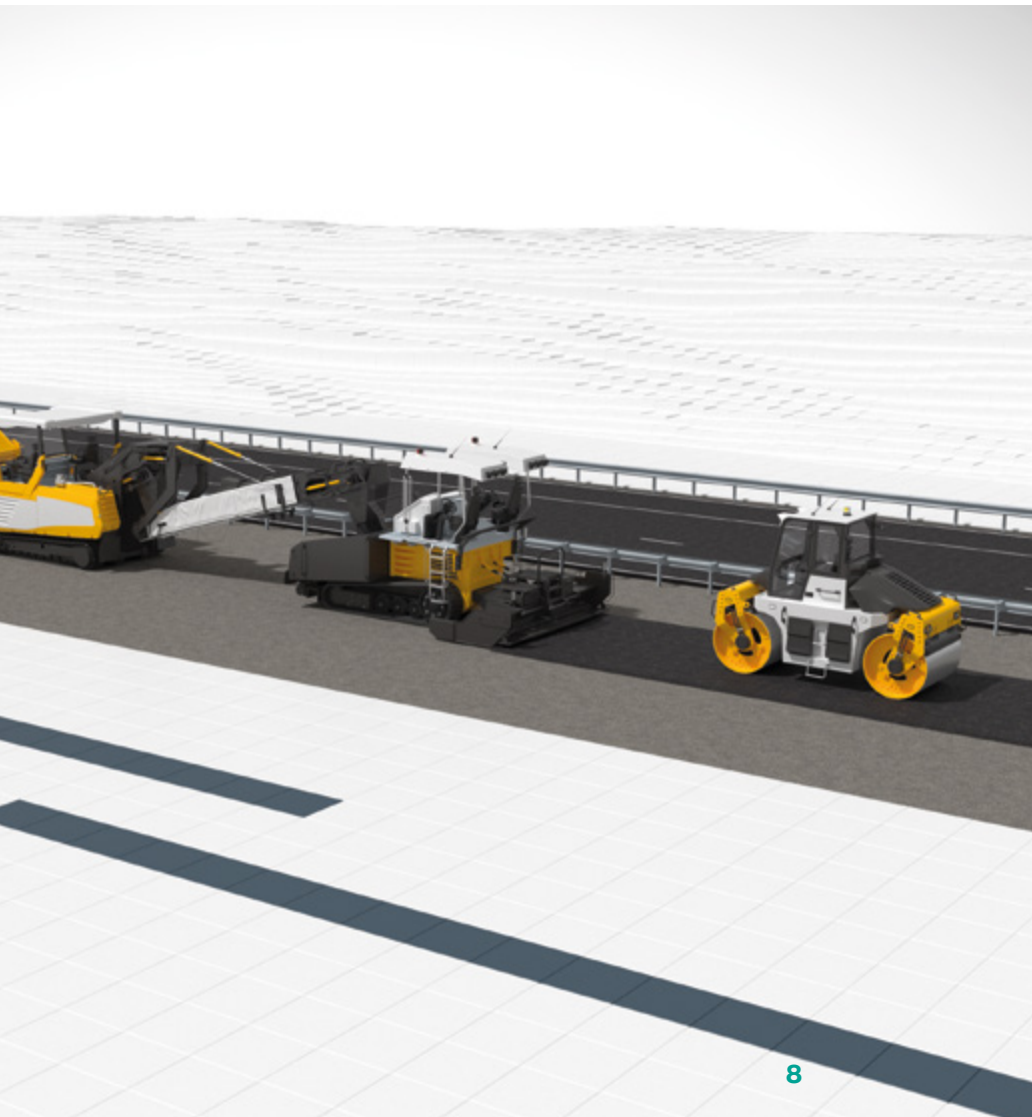
Optimized for Mobile Machines

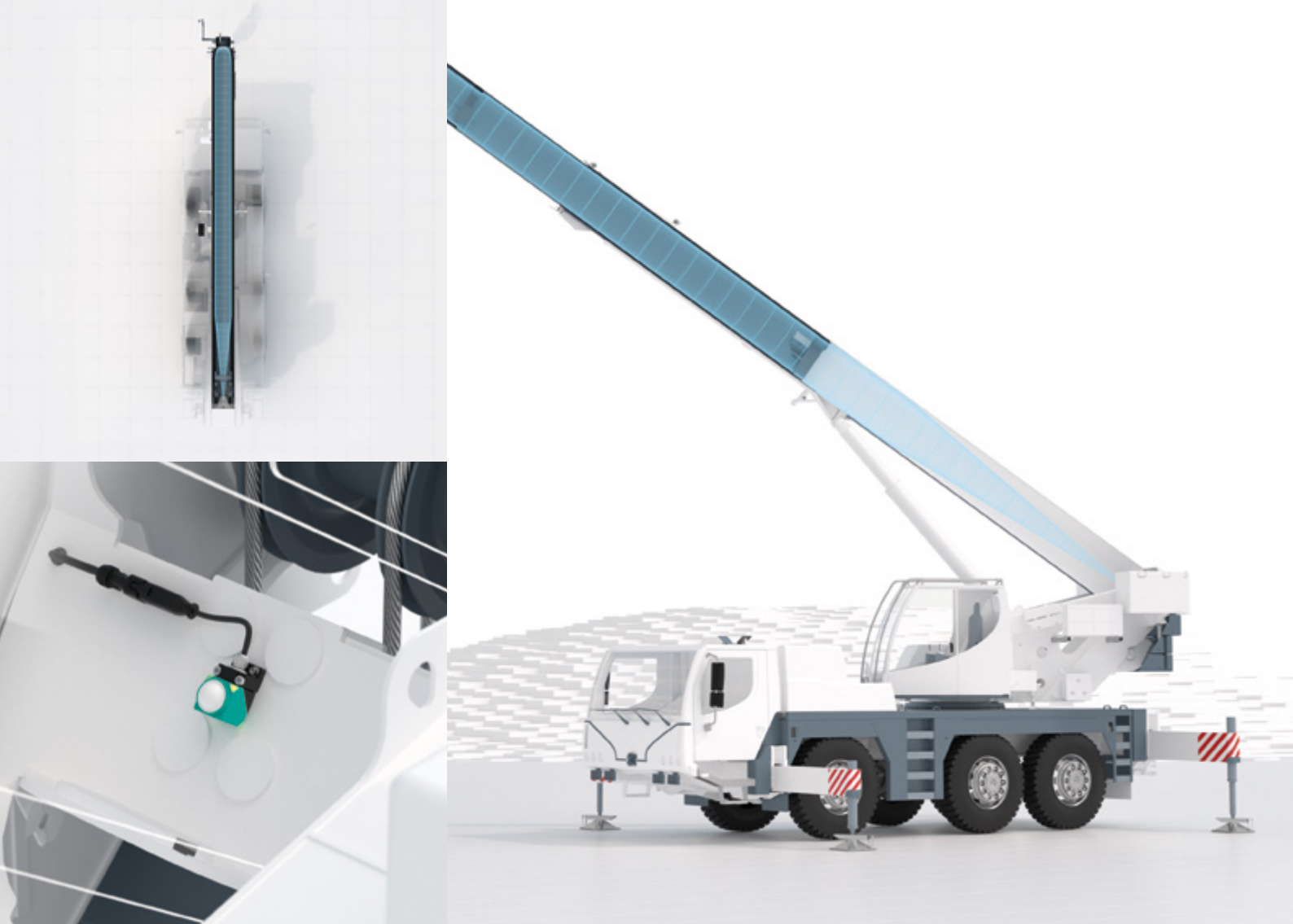
Maximum robustness, vehicle-specific connectors, and an integrated CANopen interface—the industrial radar sensors open up new possibilities in the automation of construction machinery.

Process Optimization in Road Construction

In road construction, a tandem of paver and feeder is often used for placing the pavement. The feeder continuously feeds the paver with material, such as asphalt, while the paver is on the move. It must be ensured that the distance and alignment to each other are correctly maintained at all times.

The use of two robust radar sensors increases precision. Mounted on the feeder, they measure on two corner reflectors attached to the paver. Even minimal distance or track deviations can therefore be registered and corrected immediately. Even harsh ambient conditions, as are common in road construction, have no influence on the measuring operation.





Distance Measurement in Mobile Crane Booms

Radar sensors from Pepperl+Fuchs effectively support the precise control of mobile crane booms. The radar lobe of a radar sensor mounted in the main boom is directed at a corner reflector positioned in the tip of the hydraulic telescopic element. If this telescopic element moves forward or backward when the boom is extended or retracted, the sensor registers this change in distance and transmits these values to the crane control system as the basis for further positioning operations.

Through vehicle-typical connectors such as AMP Superseal or DEUTSCH and the CANopen interface, the sensors can be easily integrated into the on-board network. Even contaminants such as hydraulic oil residues inside the crane arm do not impair the performance of the radar sensors.

A New Chapter for Intralogistics

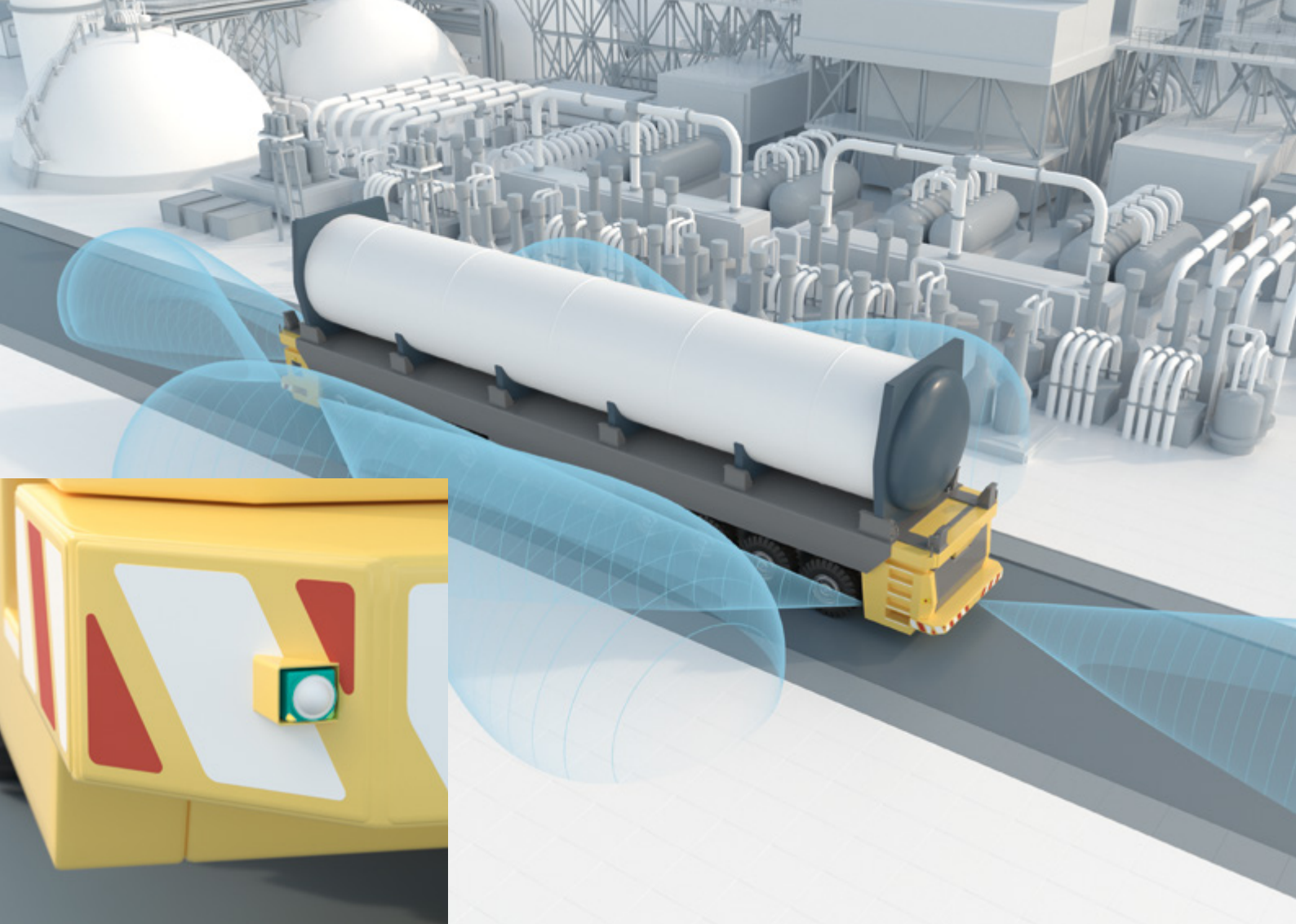
Reliable collision avoidance in outdoor applications, simple detection of natural objects, and exceptionally long ranges. Industrial radar sensors enable new applications in warehousing and material handling.

Maximum Speed Reduction on Forklifts

Speed is a decisive factor in material handling. This also applies to the use of forklifts on company premises. While a high speed is still an advantage outdoors, where surroundings are generally easy to see, certain restrictions are necessary in plants and warehouses for safety reasons.

To relieve personnel of this responsibility, a vertically aligned radar sensor that detects the hall ceiling or metallic cross bracing below it can immediately determine whether the forklift has reached an indoor area. If this is the case, the maximum possible speed is automatically limited to a tolerable level and only released again when the forklift leaves the hall. Due to the strong reflectivity of the metal crossbars, the installation of a corner reflector is not necessary here. Moreover, because of the high range of the sensors, this application can also be realized with correspondingly high hall ceilings.





Collision Avoidance for Heavy-Duty AGVs

The safe use of heavy-duty AGVs for liquid or gaseous media places special demands on sensor technology. The dimensions of the vehicles and the associated large monitoring area must be taken into account, as well as the weather influences in outdoor areas. Due to their long measuring range, radar sensors from Pepperl+Fuchs offer an efficient solution here that enables the reliable protection of driving movements. It is also possible to easily monitor the flanks of long vehicles due to the long range of the sensors.

Outdoor weather conditions do not affect the measurement accuracy, as the radar technology is less susceptible to interference. Mutual interference between radar sensors mounted in close proximity to each other is also ruled out by the frequency modulation used.

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
- Radar Sensors
- Rotary Encoders
- Positioning Systems
- Inclination and Acceleration Sensors
- Vibration Monitoring
- Industrial Ethernet
- AS-Interface
- IO-Link
- Identification Systems
- Displays and Signal Processing
- Connectivity

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