

**Analyzing needs.  
Reinventing technology.  
Simplifying solutions.**

Light Section Sensors  
with SmartRunner Technology



Your automation, our passion.

 **PEPPERL+FUCHS**

# SmartRunner Technology: Unique Engineering—Unique Opportunities

Based on an innovative combination of light section technology and 2-D vision, SmartRunner from Pepperl+Fuchs is a family of high-precision sensors tailored to the needs of specific applications. These innovative sensors transform complex profile data into easy-to-process digital signals, making integration into the overall process incredibly simple.

## Light Section Technology—Precise and Reliable

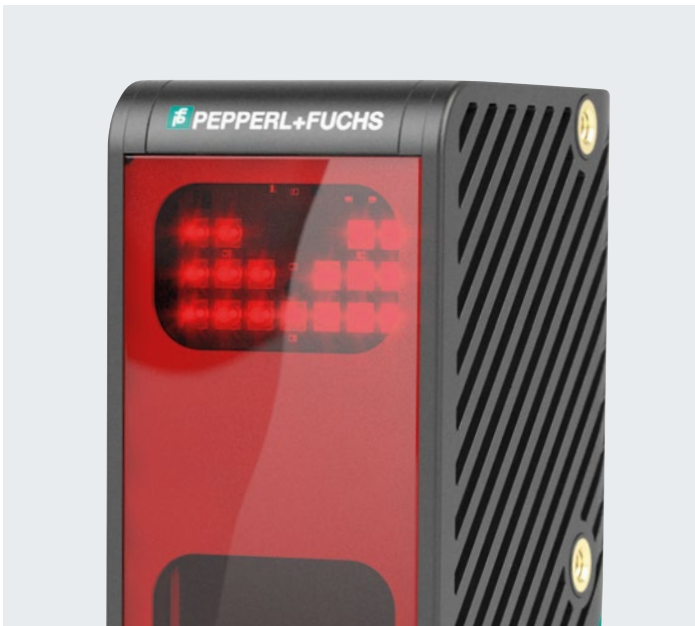
Reliable, high-precision measurement independent of surface texture and color is the hallmark of light section sensors. As an integral part of the SmartRunner sensor family, laser light technology is ideally suited to detecting, monitoring, and protecting even the smallest of objects. Using triangulation, the height profile of a contour is recorded and supplied for evaluation.

## Application-Specific Sensors—Preconfigured and Ready to Use

SmartRunner sensors are optimized and preconfigured to handle specific applications. The optics, camera, and evaluation logic are integrated into a compact housing and transform complex data into easy-to-process digital signals. Regardless of the task at hand, the user always receives a simple “good” or “bad” signal that can be taken directly to the control system.

The compact housing and a swiveling connection simplify integration, even in the tightest spaces. Using a deflection mirror to extend the base length allowed us to create an extremely compact housing without compromising performance.





### Advanced Diagnostics of 2-D Vision Sensors

The integrated camera also makes it possible to record images in order to document the complete process and assure top quality control. The recorded error images can be uploaded remotely, preventing trips to the factory floor and allowing easy monitoring of difficult-to-access machine areas. The high-performance LEDs supply consistent, brightly-lit images. Parameterization through Data Matrix control codes is also possible.



### Easy Commissioning with Teach-In and Data Matrix Control Codes

Easy setup is a key feature when commissioning SmartRunner sensors. With teach-in, you can customize specific application requirements in a few seconds—without a PC or special expertise. A revolutionary method for initial or reparameterization is available through the use of control codes: All sensor parameters can be given in a Data Matrix code. Simply placed in front of the vision camera, it will be instantly detected and decoded, and the sensor will automatically save the parameters contained within. This allows a large number of sensors to be put into operation easily and quickly.

#### Highlights

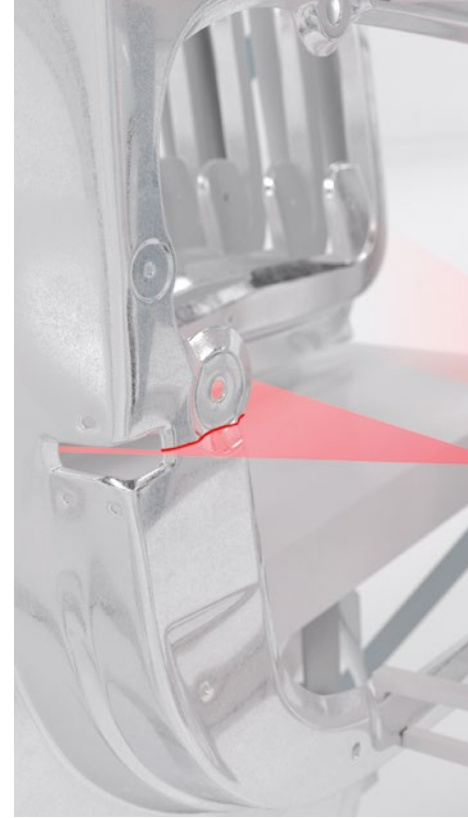
- Unique combination of light section technology and 2-D vision sensor with integrated LEDs opens up a variety of new applications
- Application-specific sensors—preconfigured and calibrated based on the application
- Transformation of complex measuring data into simple digital signals for fast and easy integration
- Easy installation due to parameterization via Data Matrix control codes or teach-in
- Light section technology provides reliable measuring on any material regardless of surface contour or color

Additional information is available at:  
[www.pepperl-fuchs.com/smartrunner](http://www.pepperl-fuchs.com/smartrunner)



# SmartRunner Matcher— The Specialist for Profile Comparisons

Optimized and preconfigured for the comparison of height profiles, the SmartRunner Matcher helps prevent damage and defective production. By comparing with the stored reference profiles, the correct positioning of an object is identified and recognized. This ensures accuracy in robotic gripping systems.



## Preventing Mistakes and Collisions

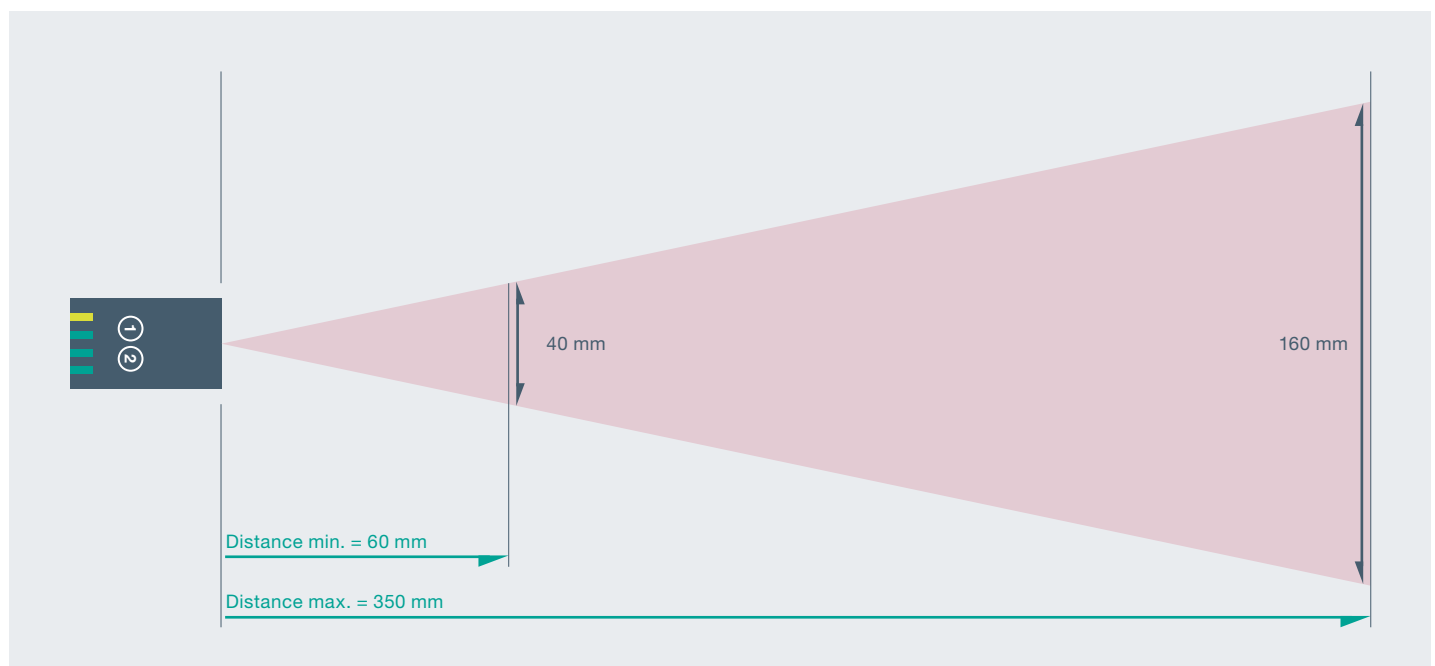
The integrated processor of the SmartRunner Matcher has been programmed at the factory to report deviations from the taught contour. Via the profile comparison, the sensor verifies the recorded contour of an object, its correct location, and spacing. In the event of a fault, collisions and damage are avoided and lengthy machine downtime is reduced.

To do this, a specific height profile is programmed and a trigger executes a comparison between the reference and recorded contours. If these are identical or “close enough,” a “good” signal is produced. If the two profiles differ, a “bad” signal is produced.

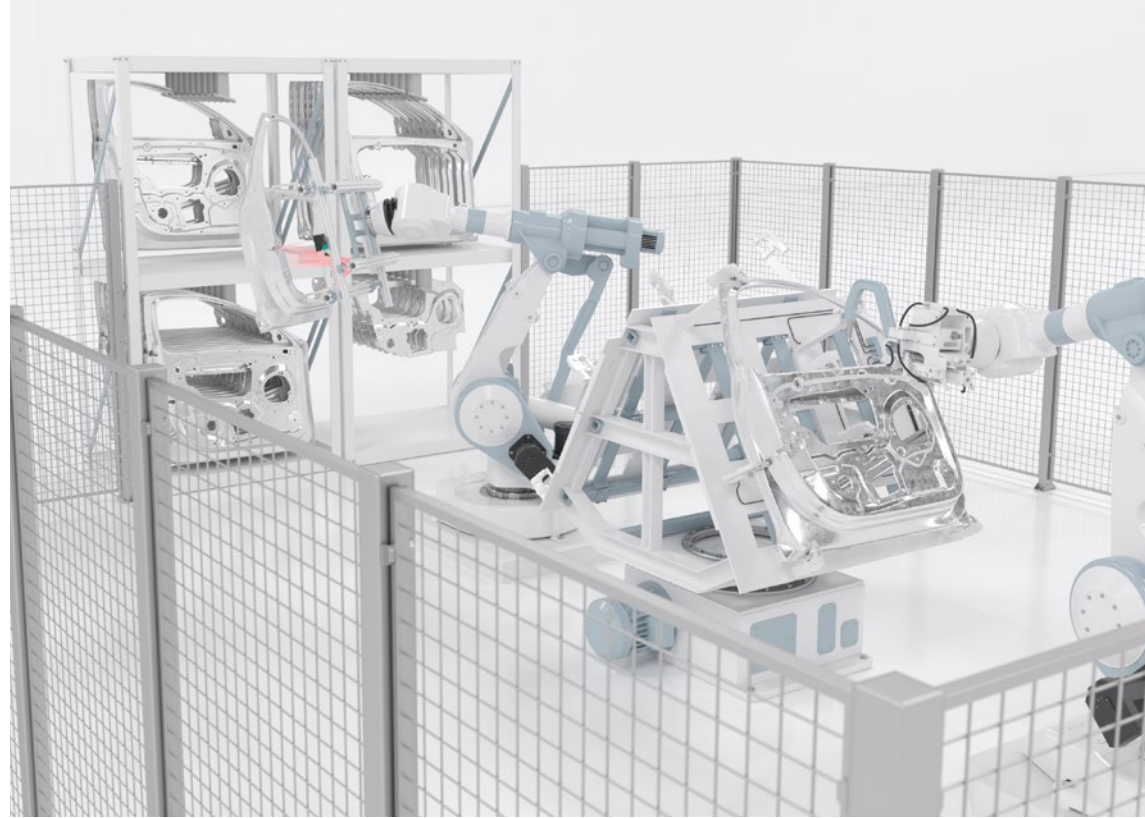
## Ready for Operation in Minutes

Commissioning the SmartRunner Matcher is simple: the sensor just has to be mounted and aligned to the desired profile and then programmed using teach-in—the reference contour is programmed and the machine process can begin.

Since the application-specific evaluation is integrated directly into the sensor, easy-to-process digital signals are produced instead of raw data. Thus, the sensor can be directly connected to the control system without much effort.



Detection zone of SmartRunner Matcher (example)

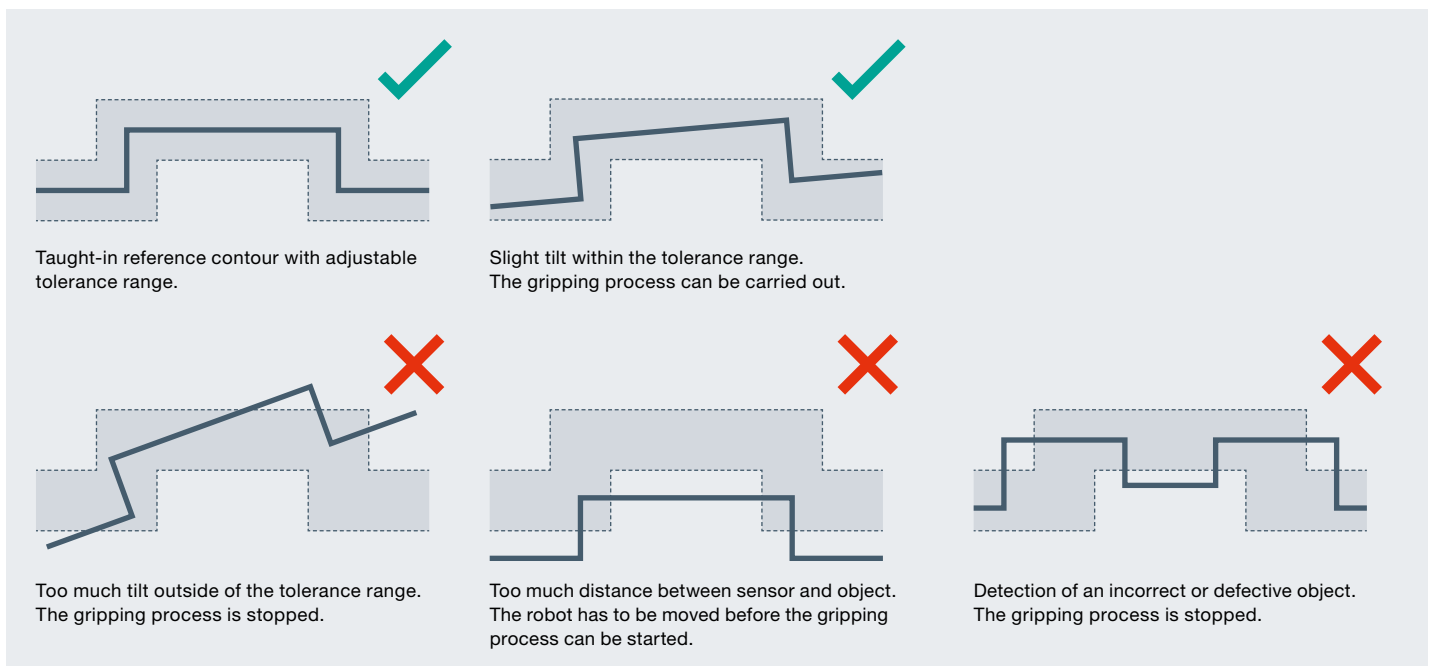


### System Changeover—Quicker and Easier Than Ever

Being able to adapt quickly to changing application conditions is becoming more and more important. As a result, processes must be flexible to accommodate modified vehicle types or adjustments in packaging quantities. This normally requires repositioning and reparameterization of sensors—not difficult with the SmartRunner Matcher. Via teach-in or Data Matrix control codes, the sensor can be quickly adapted to new applications.



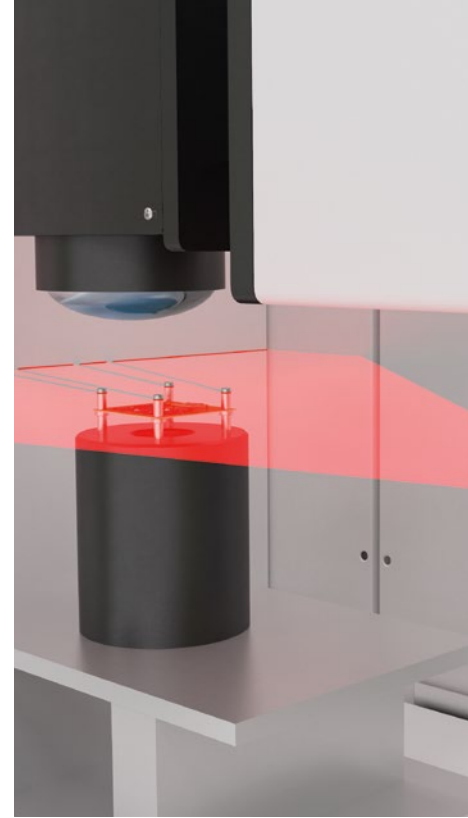
Additional information and technical data are available at: [www.pepperl-fuchs.com/matcher](http://www.pepperl-fuchs.com/matcher)



Reliable detection of object contour, positioning, and distance in robotic gripping system

# SmartRunner Detector— The Specialist for High-Precision Monitoring

When it comes to protecting sensitive machine parts such as expensive optics or precision tools, the SmartRunner Detector is the product of choice. Optimized for high-precision monitoring, it detects even the smallest fault.

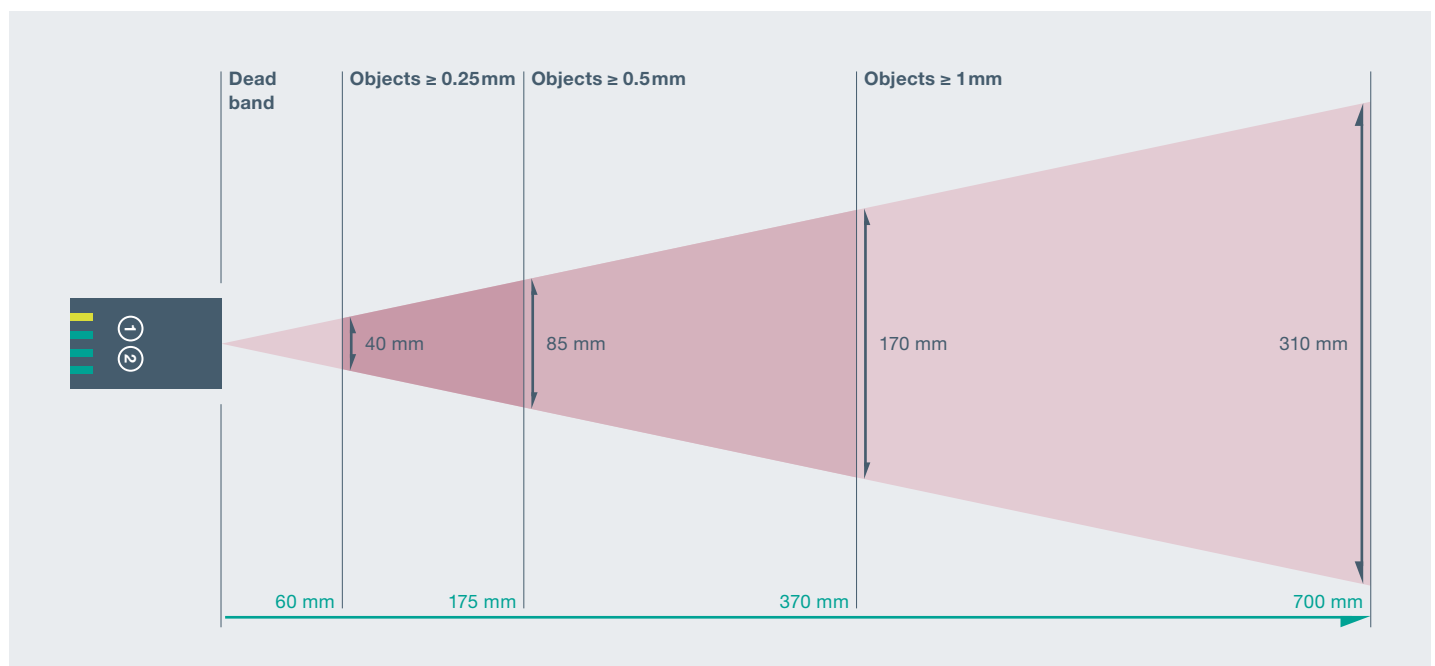


## Machine Monitoring with Light Section Technology

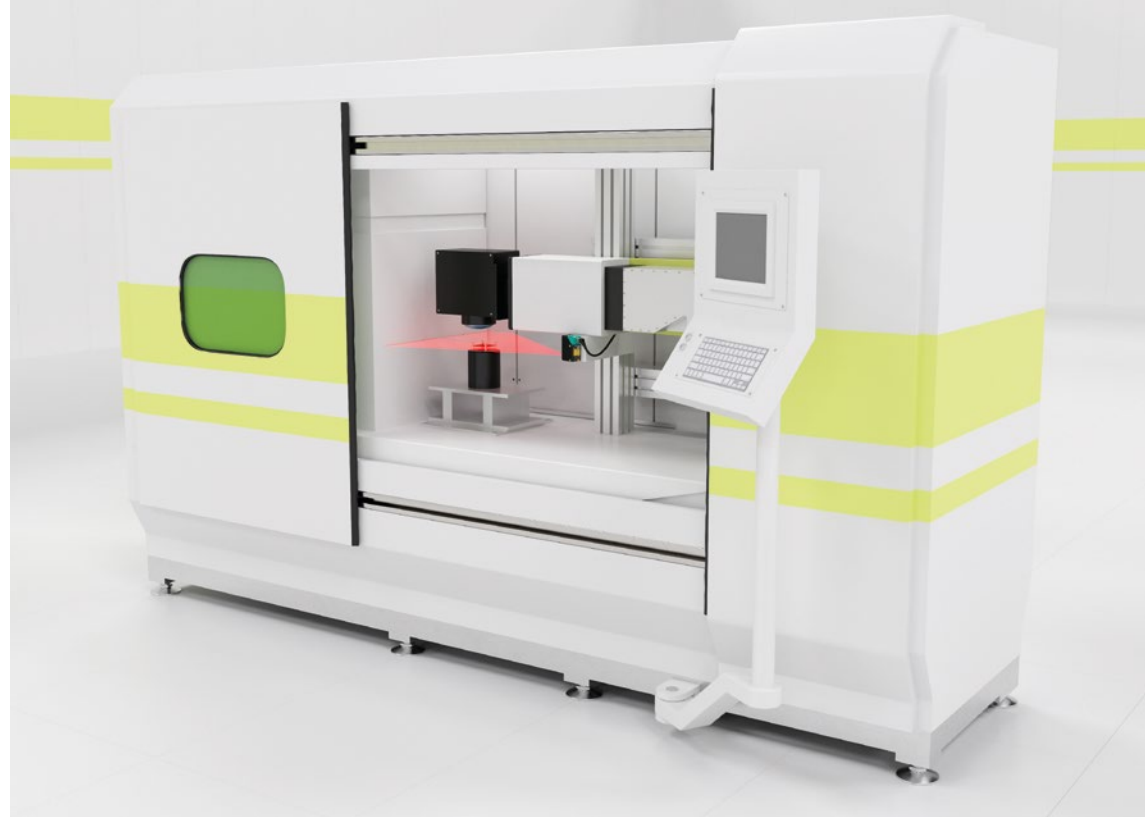
The SmartRunner Detector monitors sensitive machine areas by detecting product overhang and shutting down the machine if necessary. It increases machine uptime and helps avoid expensive repairs and replacement parts. With high-precision light section technology, the sensor detects any deviation from the previously taught background. In a trapezoidal detection range the sensor detects objects as small as 1 mm. A “bad” signal on the digital output clearly indicates a bad part or obstruction.

## Freely Definable Detection Areas for Maximum Flexibility

If only specific application-related areas need to be monitored, the SmartRunner Detector offers the ability to freely define regions of interest (ROI). Objects that enter the detection zone outside of the ROI are detected, but they do not trigger a digital signal. The definition of minimum or maximum sizes of the objects also gives the user the opportunity to avoid false alarms caused by targets outside the taught tolerance.



Detection zone of SmartRunner Detector (example)



### Easy Commissioning via Plug-and-Play

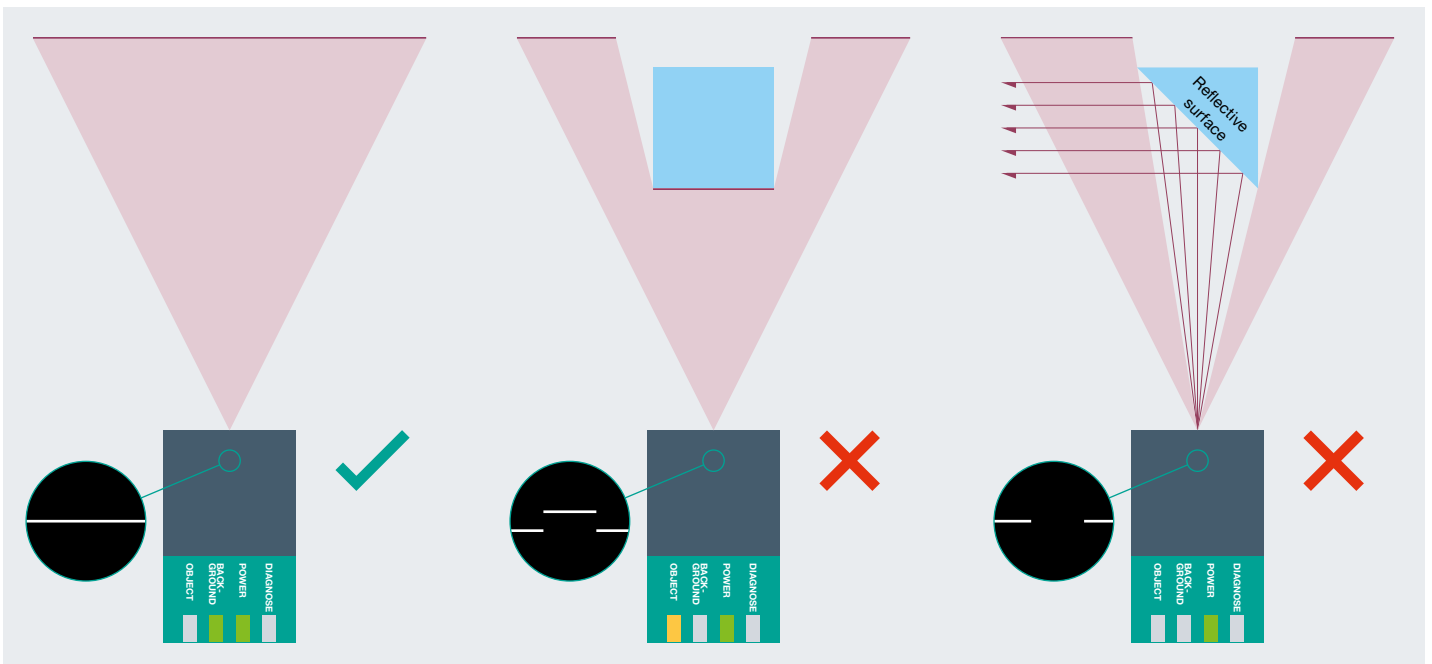
Factory optimization of the SmartRunner Detector makes commissioning extremely easy: The user projects the laser line onto a fixed background and teaches it in. No PC is required, and exposure times do not have to be adjusted manually. If an object enters the monitoring field, the sensor sends a digital signal and a stop is triggered, protecting sensitive machine parts.

### Reliable Protection with Simultaneous Evaluation

The sensor also detects objects that are not visible to the camera—for instance, the surface of an object could be reflecting away the light such that the camera cannot see the object. Because the SmartRunner Detector evaluates both the laser line on the object as well as on the background, the sensor results are always reliable. Either a broken background line or an object in the detection zone will cause the target to be detected.



Additional information and technical data are available at: [www.pepperl-fuchs.com/detector](http://www.pepperl-fuchs.com/detector)



Simultaneous evaluation of the laser line: object and background

# Your automation, our passion.

## Explosion Protection

- Intrinsically Safe Barriers
- Signal Conditioners
- Fieldbus Infrastructure
- Remote I/O Systems
- HART Interface Solutions
- Wireless Solutions
- Level Measurement
- Purge and Pressurization Systems
- Industrial Monitors and HMI Solutions
- Electrical Explosion Protection Equipment
- Solutions for Explosion Protection

## Industrial Sensors

- Proximity Sensors
- Photoelectric Sensors
- Industrial Vision
- Ultrasonic Sensors
- Rotary Encoders
- Positioning Systems
- Inclination and Acceleration Sensors
- Fieldbus Modules
- AS-Interface
- Identification Systems
- Displays and Signal Processing
- Connectivity