PRODUCT INFORMATION

PLR

3D LOCALIZATION OF PARTS IN CARRIERS

Robot guidance systems

SICK
Sensor Intelligence.

COST-EFFECTIVE, PRECISE ROBOT GUIDANCE

Part handling is one of the most important applications for factory automation. The use of flexible robots for this task represents a cost-effective alternative to traditional manual and semiautomatic handling systems.

Implementation of part localization for robot guidance demands a solution that is reliable and delivers reproducible results while at the same time being easy to use.

Part localization using a 3D-vision sensor delivers the flexibility needed when dealing with discrepancies such as:

- Inaccurately positioned part carriers
- Damaged part carriers
- Tilted stacks on the pallet
- Part positions shifting during transport
- Natural part manufacturing tolerances

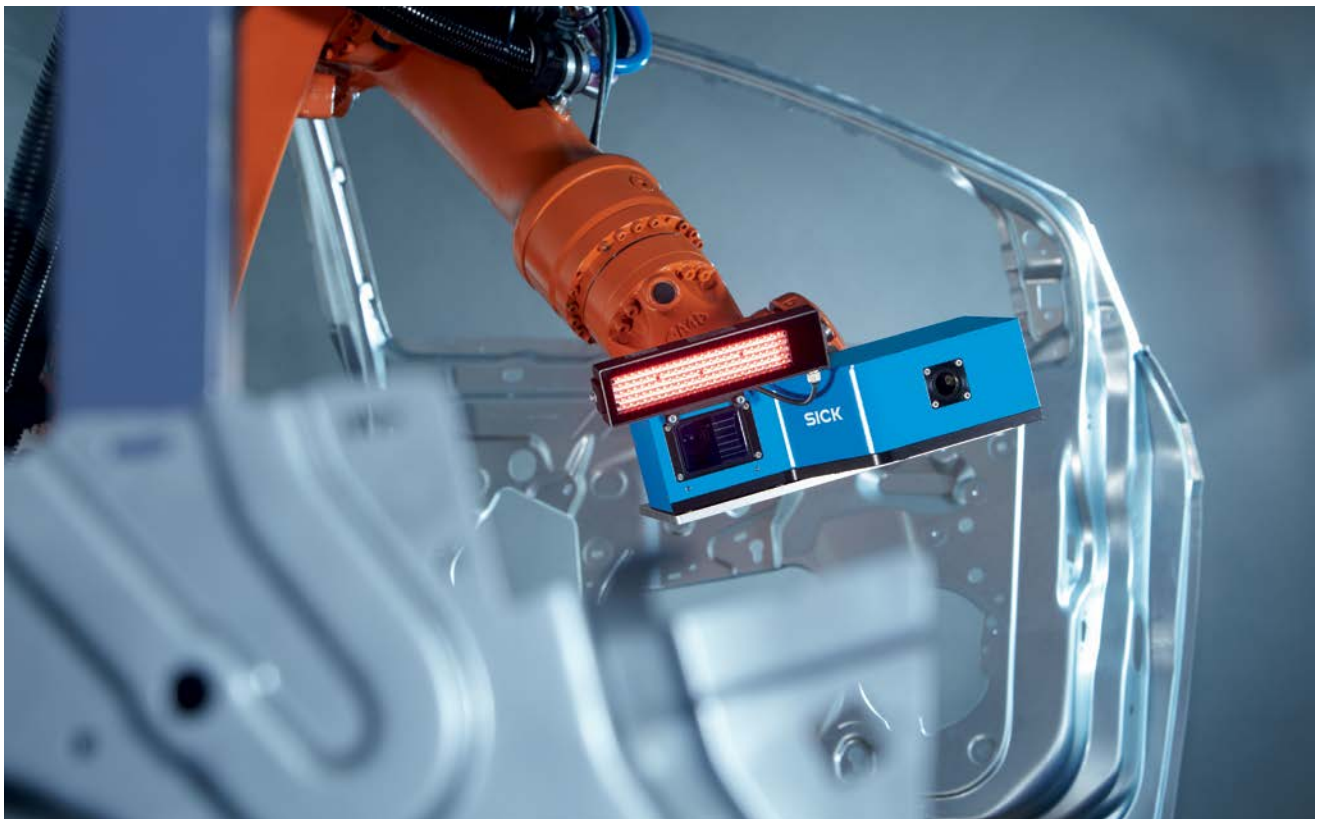
The PLR sensor from SICK combines a number of key features that are crucial for efficient, precise robot guidance:

- Reliability
- Short cycle times
- Ease of operation
- Low cost

One of the outstanding characteristics of the PLR sensor is its high level of long-term reliability, which is necessary to ensure trouble-free material handling and thus guarantee maximum production uptime.

Because all the functions needed for installation, configuration and verification are integrated in the sensor itself, the effort involved in setting it up and maintaining it in production is kept to a minimum.

The PLR sensor from SICK is a cost-effective, easy-to-use sensor for robot guidance in part handling applications.



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EXAMPLE OF USE

Among the greatest challenges to be overcome when handling large, bulky stamped sheet metal parts are the mechanical inaccuracies that frequently arise in real life. The parts that are to be manipulated or transported might move. The carriers in which the parts are stored can be damaged during transportation. Furthermore, it is difficult to position the carriers precisely at the specified location. Introducing PLR-based guidance of the robot provides the flexibility needed to overcome these problems by ensuring reliable and speedy robot parts handling.

Reliability

The rugged design of the PLR, its integrated illumination and combined 2D/3D vision technology ensure that measurement results are not impacted by varying ambient conditions or light reflections from the parts.

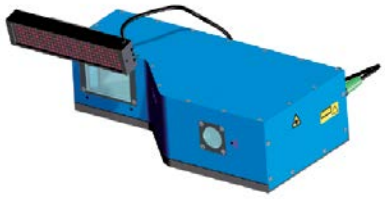
Ease of operation

Very little effort is involved in installing and maintaining the PLR sensor. The sensor can be set up and completely configured in a matter of minutes. The integrated web server means that you can operate the sensor using any standard browser. Maintenance is simple and the PLR offers a quick device replacement concept.

Cost-effectiveness

The PLR sensor is an integrated, pre-calibrated standalone sensor that is inexpensive and quick to install and requires no investment in ancillary equipment (such as PCs or controllers).

LOCALIZATION OF MAINLY ORIENTED PARTS IN CARRIERS



Additional information

Product description

The PLR has been developed for robot-automated part handling. It is a standalone device that includes all the localization functions, an easy-to-use robot interface, as well as all the functions necessary for rapid integration with the robot. The sensor combines state-of-the-art 2D and 3D machine vision techniques to provide a unique solution that can be used reliably in environments where ambient conditions vary.

The user interface, which is operated via the integrated web server, and the field-proven tools ensure problem-free integration of the sensor. The short setup time is a hallmark of the sensor.

It can be smoothly retrofitted into existing robot cells and handling stations without any need for vision specialists or additional computer systems.

The PLR is supplied factory-calibrated with software preloaded to enable any new solution to go live without further preparations by the user. Simply install the device, connect it to the robot controller, load an existing job configuration or create a new one in a just couple of minutes, and PLR is ready for operation.

The PLR sensor from SICK is the ideal solution for cost-effective automated part handling.

At a glance

- Sensor for flexible automated part handling
- Standalone sensor factory-calibrated at SICK
- Precise part localization and rapid measurements
- Combined 2D/3D part localization
- Calculation of correction values for the coordinate system of the gripper
- Reliable part localization, even under varying ambient conditions
- Web server user interface
- Tools for alignment and communication with the robot

Your benefits

- The PLR gives you the flexibility you need for reliable automated part handling.
- The standalone sensor is very cost-effective. Additional hardware such as PCs and cabinets are not required.
- Factory calibration and tools for integration with the robot make it easy to configure new applications.
- The design, together with the functions for alignment of the robot and position correction, makes it easy for robot integrators to work with the sensor.
- The functionality of the PLR makes it easy to use without knowledge of machine vision.
- The innovative combination of 2D and 3D image processing techniques provides the reliability and flexibility needed for problem-free material handling operation.
- The integrated web server allows the PLR to be operated through a standard web browser without installing any PLR-specific software on factory PC's or laptops.

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Detailed technical data

Features

System type:	Robot guidance
Applications:	Part localization for robot guidance
System features:	Standalone sensor for localization of parts using combined 2D and 3D measurements
Example field of view:	200 mm x 260 mm at 365 mm distance (typical)
Measurement range:	360 mm through 370 mm (high-accuracy measurement range) 350 through 1500 mm (coarse measurement range)
Image resolution (X, Y, Z):	0.26 mm
Light source:	Laser (660 nm), LED (630 nm)
Laser class:	2M
LED class:	Risk group 1 (low risk, IEC 62471:2006)

Performance data

Part localization time:	< 500 ms
Localization accuracy[1]:	± 0.5 mm and ± 0.1°
Output data:	x, y, z (mm), roll, pitch, yaw (degrees)

[1] Depending on part characteristics such as material reflectivity, edge features etc.

Interfaces

Communication:	Ethernet
Data transmission rate:	100 Mbit/s
Protocol:	TCP/IP XML and CSV (robot), TCP/IP (operator)
Operator interface:	Web server

PLR sensor

Mechanical/electrical

Connections:	Power supply: Connector M12, 8-pin, male; Ethernet: M12, 4-pin, D-coded
Supply voltage:	24 V DC ± 20 %
Power consumption:	1.2 A
Housing material:	Aluminum (anodized)
Weight:	3 kg
Enclosure rating:	IP 65

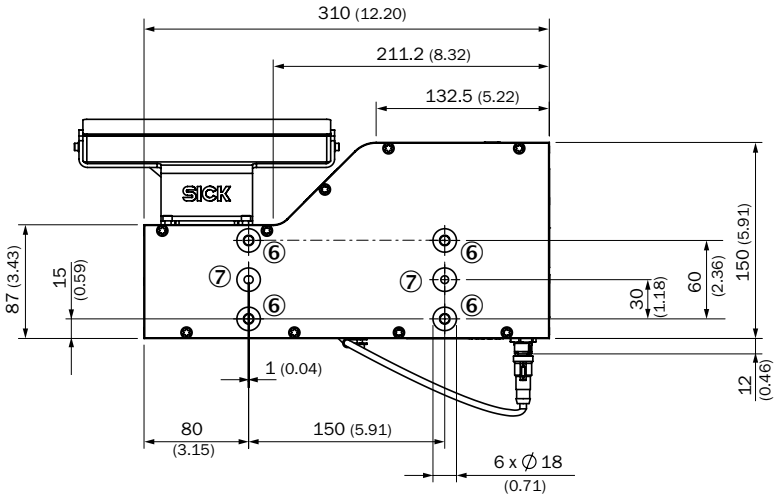
Ambient data

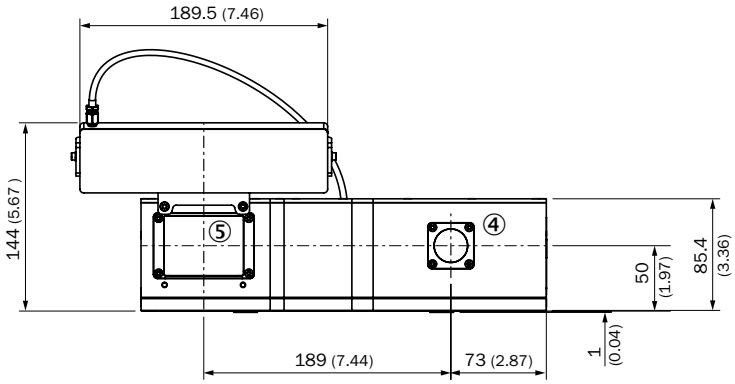
Ambient temperature, operation:	0 °C through 45 °C
Ambient temperature, storage:	-30 °C through 70 °C
Impact load:	15 g, 3 x 6 directions
Vibration load:	5 g, 58 Hz through 150 Hz

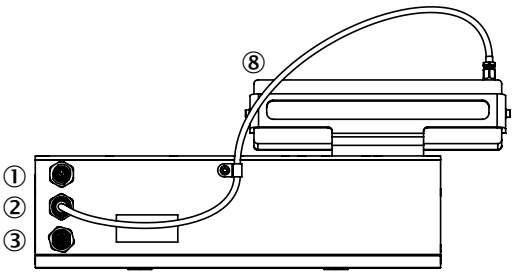
Ordering information

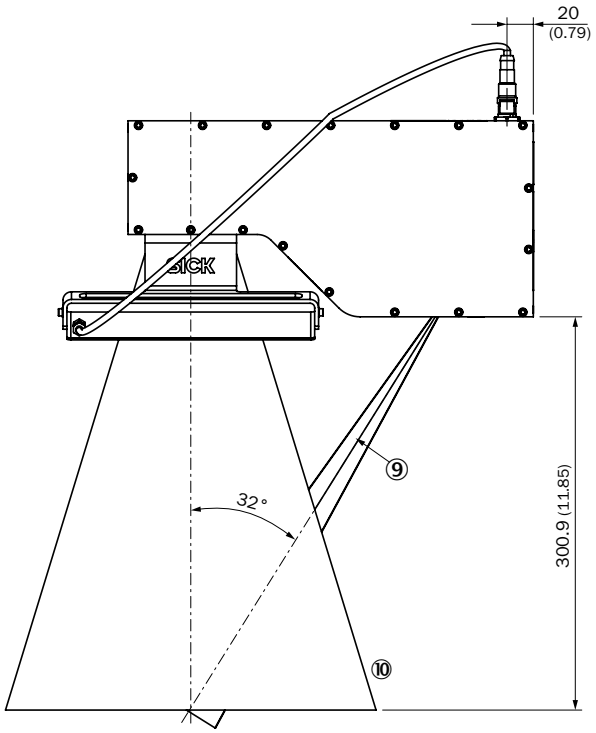
System type	System characteristics	Type	Part number
Robot guidance	Standalone sensor for localization of parts using combined 2D and 3D measurements	PLR3000	1058779

Dimensional drawings









① Power supply connector (M12, male)

② LED illumination connector (M12, female)

③ Ethernet connector (M12, female)

④ Laser aperture

⑤ Camera aperture

⑥ Mounting hole pattern, M8 x 8 mm deep

⑦ Fitting hole pattern, Ø 6H7 x 8 mm deep

⑧ Top-mounted LED illumination; it is also possible to fit the illumination in 4 positions around the camera aperture

⑨ Emitted laser light

⑩ Camera field of view

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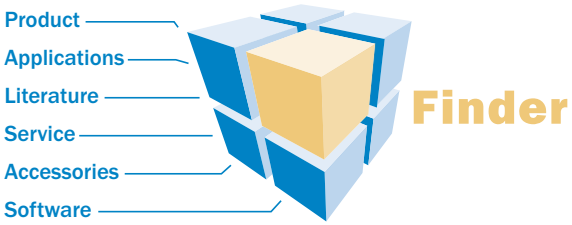

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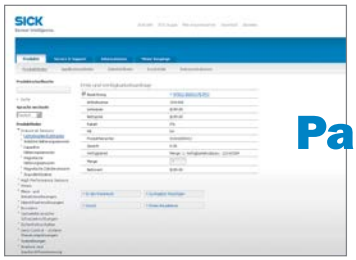

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SICK AT A GLANCE

SICK is a leading manufacturer of intelligent sensors and sensor solutions for industrial applications. With more than 6,500 employees and over 50 subsidiaries and equity investments as well as numerous representative offices worldwide, we are always close to our customers. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents and preventing damage to the environment.

We have extensive experience in various industries and understand their processes and requirements. With intelligent sensors, we can deliver exactly what our customers need. In application centers in Europe, Asia and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes us a reliable supplier and development partner.

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Detailed addresses and additional representatives → www.sick.com

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