# WE MAKE MACHINE VISION ACCESSIBLE

## CUSTOMIZABLE AND EASILY CONFIGURED 2D AND 3D MACHINE VISION SOLUTIONS – DRIVEN BY SICK AppSpace

SICK
Sensor Intelligence.

## WE MAKE MACHINE VISION ACCESSIBLE

# CUSTOMIZABLE AND EASILY CONFIGURED 2D AND 3D MACHINE VISION SOLUTIONS – DRIVEN BY SICK AppSpace

Machine vision solutions make your manufacturing processes more efficient and competitive. But do they always meet your precise specifications? Now you can have customizable 2D and 3D vision sensors, tailored to your business. These are either ready-to-use solutions that can be easily configured without a vision or programming expert or they can be modified to solve your particular application – by SICK or its partners.

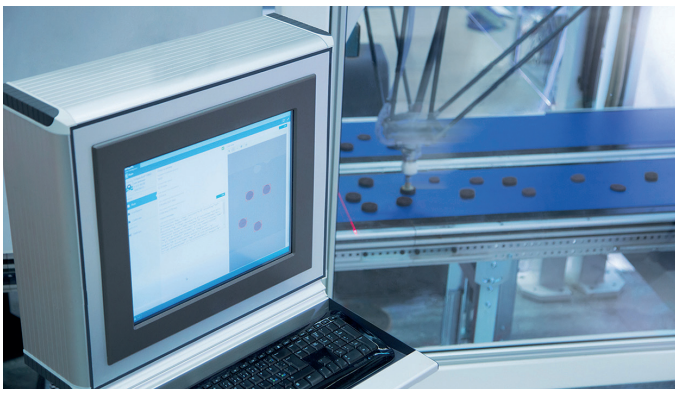
Solutions, driven by SICK AppSpace, help you take a significant step towards the future and Industry 4.0. How? SICK AppSpace enables you to create completely new and adaptive solutions for automation applications for quality control, positioning, robot guidance, or track and trace.


8025277/2020-03-06

# ROBOT GUIDANCE

### 3D Belt Pick
For locating products on a coveyor belt with the TriSpectorP1000 3D vision camera

### PLOC2D
Vision system for 2D parts localization



# QUALITY CONTROL

### Pinspector 2D
2D quality control system for contactless pin inspection, verifying the presence and position of pins

### Color Inspection and Sorting
Inspection and sorting of primary or secondary packaged objects by color and size

### Presence Inspection
Automated presence inspection using 2D vision sensors

### Label Checker
2D quality control system designed for various label inspections, with primary focus on optical character recognition

# POSITIONING

### Dolly Positioning
Precise detection of dollies for the fine positioning of AGVs during the pick up process with a 3D snapshot camera

### Pallet Pocket Detection
Precise detection of pallet pockets with a 3D snapshot camera

### InspectorP Rack Fine Positioning
Fine positioning solution for single- and double-deep racking of stacker cranes or other automated storage and retrieval systems

# ENGINEERING FRAMEWORK FOR YOUR INDIVIDUALIZED SENSOR APPLICATIONS

An eco-system in which you develop individualized SensorApps for your sensors either alone or together with SICK experts. For all applications and all technologies – undertaken by a dynamic community of developers. Your individualized SensorApps are created on the basis of our intelligent software tools and algorithms. Our existing solutions for track and trace, positioning tasks, robot guidance systems, or quality control can be adapted to your individual needs. Or completely new SensorApps can be created in line with your requirements and absolutely tailored to your systems. SICK AppSpace provides assistance with a range of devices and technologies, such as 2D vision, 3D vision, LiDAR, RFID, or integration products.



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# 8 THINGS TO KNOW ABOUT SICK AppSpace

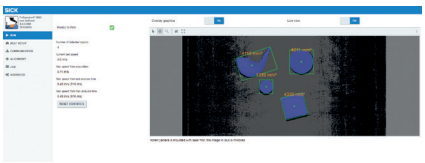
1. One eco-system for all sensor technologies – including, but not limited to, machine vision
2. Enables anyone to easily enhance existing solutions or create new ones tailored to specific needs
3. Engineering framework to design and operate sensor applications
4. Accessible for non-programming users through SensorApp UIs and graphical application modeling
5. Allows focus on solving applications while SICK maintains hardware and API lifecycle
6. Open eco-system with best-in-class software stack (e.g. HALCON, OpenCV, SICK Algorithm library)
7. Reduced amount of development work required thanks to option of reusing SensorApps on various programmable devices
8. Risk-free introduction thanks to free 90-day trial license

→ www.sick.com/appspace

# ROBOT GUIDANCE

## 3D BELT PICK

Step up your belt picking applications



### Industries

- Consumer goods
- Food and beverage
- Packaging
- Health care manufacturing
- Robotics
- Handling and assembly

### Product description

The 3D Belt Pick SensorApp from SICK is specialized for locating products on a conveyor belt. With this software installed, the TriSpectorP1000 programmable 3D camera turns into a stand-alone, belt-picking sensor. Working with 3D vision in your robot guidance projects increases both the reliability of your picking process and the quality of the handled products. For each detected product, the camera reports location, height and orientation to the robot controller. On request, the SensorApp script can be opened and customized, e.g. to combine robot guidance with inspection.

### At a glance

- Provides 3D coordinates of products on belt
- Intuitive web GUI
- Easy integration with several robot brands
- Simple hand-eye alignment
- Customization on request, adding e.g. inspection or sorting
- Running on TriSpectorP1000 stand-alone, IP67 rated, 3D camera

### Your benefits

- Collisions and product damage are prevented – 3D technology enables reliable detection and gentle handling based on the true shape of each product
- Step-by-step, easy installation in web GUI
- Easy to integrate with selectable interfaces for ABB
- PickMaster™, Stäubli and URCap Quick change-over to new product batch – works without teach-in, height-based detection allows shifting product design
- Handles varying and poor contrast scenarios, e.g. when belt and product have the same color

### Fields of application

- Robot belt picking in secondary packaging: 3D localization of food, as well as pharma and cosmetics products on packaging line conveyor belts
- Robot belt picking in secondary packaging: 3D localization of fish, meat, and poultry products on production line conveyor belts



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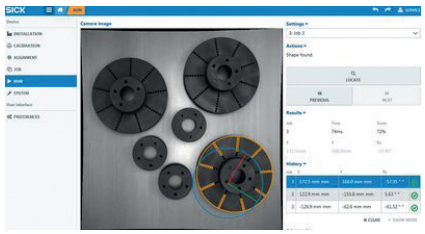
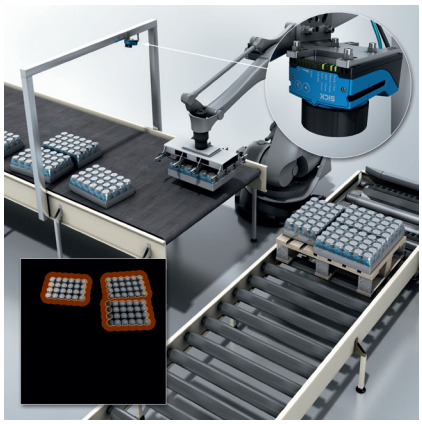
# PLOC2D

## Easy to use and flexible part localization sensor system



### Industries

- Automotive and parts suppliers
- Consumer goods
- Courier, express, parcel, and postal
- Electronics
- Food and beverage
- Handling and assembly
- Packaging
- Robotics

### Product description

The PLOC2D is a vision system for 2D parts localization. The easy-to-operate sensor system is fitted with a high-quality image processing hardware which is used in combination with a powerful localization algorithm. It can therefore localize parts quickly and reliably. The housing of the sensor system has an enclosure rating of IP65. The PLOC2D is connected directly to the robot control or the PLC and is ready to use immediately. The intuitive human machine interface is designed to ensure that the PLOC2D is easy to set up and maintain in production environments.

### At a glance

- 2D position determination of parts
- Comparison of coordinate systems of robots and sensor systems
- Tools and functions for easy calibration of the FLEX variants
- Intuitive human machine interface for set-up and maintenance of system components
- Stand-alone sensor system – no external PC required

### Your benefits

- The sensor system is ready for measurement when unpacked
- Easy setup and operation does not require the expertise of a machine vision specialist
- Fast and simple calibration of the FLEX versions, alongside a wide range of lens and illumination accessories, ensures easy adaptation to specific requirements
- Powerful teach-in and high accuracy ensures reliable operation
- Simple integration with most robot brands and PLCs

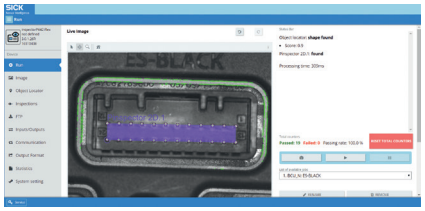
### Fields of application

- Robot belt picking: localization of goods on conveyor belts, press-shop tending, end-of line applications
- Robot packaging: localization of goods on conveyor belts for end-of line applications
- Robot picking from anyfeeders: localization and sorting in anyfeeders
- Robot picking of kitted parts: identification of parts in kitting applications
- Robot automated riveting and screwing: hole position localization in any riveting task

# QUALITY CONTROL

## PINSPECTOR 2D

Pin inspection – verifying the presence of pins and their position



### Industries

- Automotive and parts suppliers
- Electronics

### Product description

Pinspector 2D is an easy-to-set compact quality control system designed for contactless pin inspection - verifying the presence of pins and their position. Thanks to its advanced inspections, the system also detects and sorts blobs according to pre-set parameters, reads and verifies 1D and 2D codes, provides OCR, OCV functions and measures dimensions. The specialization in the 2D pin inspection with the combination of additional inspections, makes it great match for the demanding applications.

### At a glance

- Pin presence and position inspection
- Additional inspections: pattern matching, edge-to-edge measurement, pixel counter, blob inspection, shape locator, reading and verification of 1D and 2D codes
- Easy teach-in of connector pin patterns
- Web-based user interface
- Inspection statistics

### Your benefits

- Compact all-in-one system
- Multi-functional by combining various inspections
- High reliability thanks to reliable algorithms
- Easy set-up and configuration via web interface
- Flexible optical design
- Rugged housing, ideal for harsh ambient conditions
- Multiple programs and job switching

### Fields of application

- Inspection of connector pins: inspection of pin quality in connectors for car electronic control units or inspection of pin quality during manufacturing process of sensors
- Press-fit process quality control: quality inspection of pins before and after the press-fit process during PCB manufacturing



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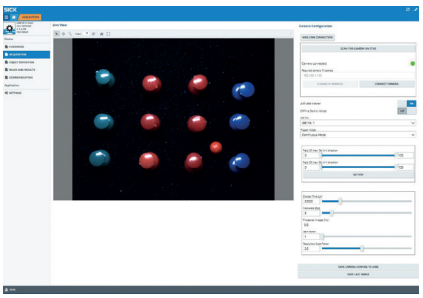
# COLOR INSPECTION AND SORTING

## Inspection and sorting by size and color



### Industries

- Automotive and parts suppliers
- Food and beverage
- Metal and steel
- Health care manufacturing

### Product description

Color Inspection and Sorting inspects unpackaged, primary, or secondary packaged objects regarding size and color. The SensorApp is used to count objects with different sizes and colors as well as to detect the color or color gradations of objects and therefore categorize them as “good/developed” or “bad/burned”. In addition, objects with anomalies (such as wrong size or color) can be sorted out or the integrity and completeness of secondary packaging can be detected. Different application configurations can be saved as jobs, which can be loaded manually or decentrally. The SensorApp requires a hardware environment, consisting of an SIM4000 or SIM1012, a pico- or midiCam with LED illumination and a photoelectric sensor.

### At a glance

- Inspection by size and color
- Flexible camera, lens and illumination concept
- Cameras for tight spaces or critical environments
- Intuitive GUI for set-up and output of results Flexible camera triggering
- Results from the GUI and output via digital output and TCP/IP
- Jobs can be loaded decentrally

### Your benefits

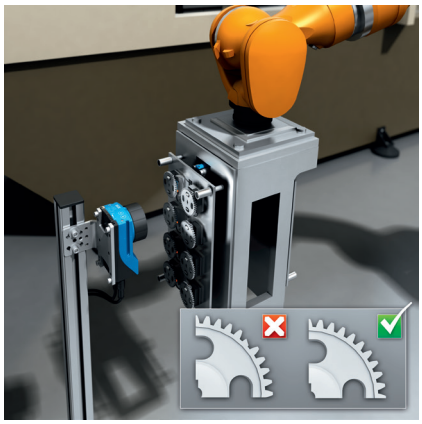
- The demo mode with example images shows the principle of operation in simple terms
- Step-by-step instructions for defining objects makes it easy to set up a task
- The flexible hardware and SensorApp concept enables customized adaptations and extensions when it comes to functionality and performance
- Very well-suited to industrial use thanks to rugged devices with long service life and availability

### Fields of application

- Color/color-grading inspection: detection of color or color grading of goods to decide between „good“ and „bad“
- Inspection of parts in packaged units: counting of parts of different colors and sizes in packaged units and sort out wrong units
- Inspection of copper refinery process: flame color monitoring during refining process in copper production

# PRESENCE INSPECTION

## Easy presence inspection



### Industries

- Automotive and parts suppliers
- Consumer goods
- Electronics
- Food and beverage
- Packaging
- Handling and assembly
- Health care manufacturing
- Rubber and plastics

### Product description

The Presence Inspection SensorApp for the InspectorP6xx family of 2D cameras is used to ensure that desired qualities are present and undesired elements are not present. Inspection is solved by configuring a selection of tools for image analysis using a graphical user interface in a web browser. Tool Plugin support offers exceptional customization possibilities.

### At a glance

- 2D vision inspection
- Solving presence inspection applications
- Object Locator, Pixel and Edge Pixel Counter, Blob Finder
- Easy-to-use user interface in web browser
- Various field of views, resolution, performance, optics, and lighting depending on selected InspectorP6xx
- Tool Plugin support
- Fieldbus and TCP/IP

### Your benefits

- Automated inspection to improve production yield and rate
- Reliable inspection to reduce waste and avoid production downtime
- Customer satisfaction by delivering quality products
- Free up staff for more satisfying assignments by elimination of dull, dangerous or dirty work tasks
- Small investment and quick commissioning to improve profitability
- InspectorP6xx family of 2D cameras that fits various price and performance needs
- Easy-to-use user interface makes it convenient and quick to learn
- The Tool Plugin support with source code access offers any AppSpace developer exceptional customization possibilities

### Fields of application

- Assembly verification: inspect assembly for correct manufacturing and presence of components
- Box content verification: inspection of boxes or other containers to verify that the expected items, and only those, are present
- Inline quality control: presence inspection of manufactured details to ensure that desired qualities are given and/or undesired elements are not present
- Print inspection: inspection to verify successful product printing or labelling



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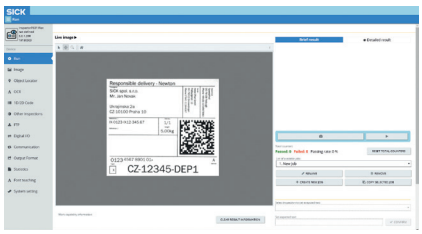
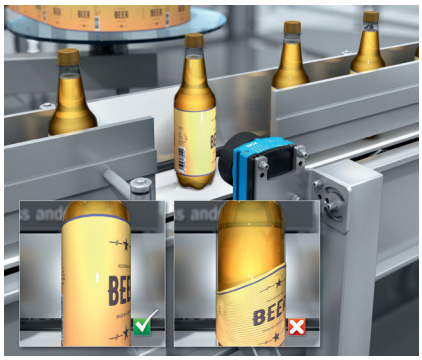
# LABEL CHECKER

## Complex label inspections with high performance OCR



## Industries

- Automotive and parts suppliers
- Consumer goods
- Electronics
- Food and beverage
- Packaging
- Handling and assembly
- Health care manufacturing
- Semiconductor

## Product description

Label Checker is a multifunctional and easy-to-set compact quality control system designed for various label inspections, with primary focus on optical character recognition. The system improves productivity by performing multiple inspections simultaneously and ensures high quality output. Thanks to the advanced tools, it is not limited to reading and verifying printed texts, barcodes and 2D codes, but it also checks the correct label position, presence of pictograms, and print quality. Moreover, Label Checker offers image filters and other features such as overlapping characters segmentation and-, image calibration that ensure reliable operation, even in challenging applications.

## At a glance

- OCR, 1D, and 2D codes: reading, recognition, validation, verification
- Additional inspections: pattern matching, edge-to-edge measurement, pixel counter, blob inspection, shape locator, print quality check
- Easy teach-in of custom font
- Flexible range of C-mount lens and integrated illumination
- Web-based user interface

## Your benefits

- Compact all-in-one system
- Multifunctional by combining various label inspections
- High reliability thanks to robust deep-learning-based algorithms
- Easy set-up and configuration via web interface
- Flexible optical design and high-power illumination, able to fit almost any application
- Rugged housing, ideal for harsh ambient conditions
- Multiple programs and job switching

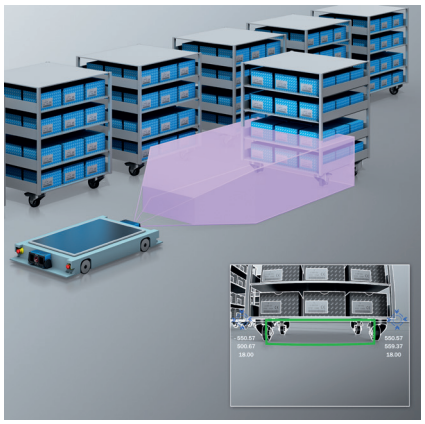
## Fields of application

- Label inspection on car lights: complex control of thermally printed label, after printing and sticking to car lights
- Car part identification: identification or secondary verification of car parts based on the printed VIN code on the label
- Product marking check: checking the quality of the laser-printed product markings on car lights
- Skid identification: reading the skid (carrier) number for the tracking of vehicles during chassis construction
- Quality inspection of labels on bottles: comprehensive inspection of labels applied to bottles, including expiration date reading and label position check
- Checking labels on boxes: reading and verification of the expiration date on boxes containing various types of food
- Inspection of pharmaceutical packaging: reading of the LOT number, Data Matrix, and pharma code printed on boxes containing pharmaceuticals
- Identification of boxes with furniture: reading of numbers directly printed on boxes

# POSITIONING

## DOLLY POSITIONING

### 3D snapshot – position determination for picking up dollies



### Industries

- Automotive and parts suppliers
- Consumer goods
- Packaging
- Retail and warehousing
- Industrial vehicles

### Product description

Precision is key when it comes to the automated pick-up of dollies with an automated guided vehicle system (AGV system). The fine positioning of the AGV system requires the exact identification of the relative place and position of the dolly. The Dolly Positioning SensorApp provides the data needed for this purpose. It runs directly on the Visionary-T AP 3D vision sensor from SICK. The measured values required to automatically pick up the dolly are pre-processed and evaluated on the sensor, then transmitted to the control of the automated guided vehicle system. The Dolly Positioning SensorApp is based on the SICK AppSpace concept and can be loaded on the sensor as a complete, application-specific Key App.

### At a glance

- Automated position determination of a wide range of dollies
- Processing of distance values with 144 x 176 pixels per recording
- Working range: 1 m to 1.5 m
- < 800 ms processing time for the detection of coordinates

### Your benefits

- Short process times for dolly pick-up
- Increases efficiency of automated guided vehicle systems in logistics
- Low maintenance effort due to stable app hardware combination
- Easy integration on automated guided vehicle systems
- Automated and reliable position determination for nearly any dolly
- Based on SICK AppSpace and makes it possible to load application-specific Key Apps to the sensor using SICK AppManager.

### Field of application

- Picking of dollies and containers to be transported by an AGV



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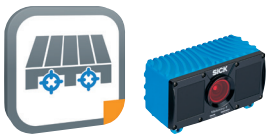
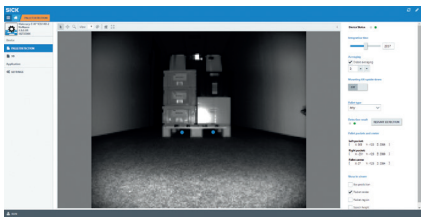
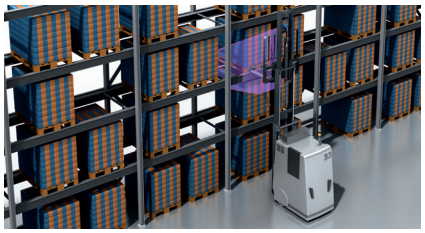
Subject to change without notice

# PALLET POCKET DETECTION

## 3D snapshot – for the detection and position determination of pallet pockets







### Industries

- Automotive and parts suppliers
- Consumer goods
- Packaging
- Retail and warehousing
- Industrial vehicles

### Product description

The storage and removal of loads using industrial trucks requires the precise detection of storage spaces and pallet, especially at great heights. For an automated manned forklift truck to correctly pick up and transport a pallet, for example, it must precisely detect the pallet pockets. The Pallet Pocket Detection SensorApp provides the data required to do this. It runs directly on the Visionary-T AP 3D vision sensor from SICK. The measured values required to pick up the pallet are pre-processed and evaluated on the sensor, then transmitted to the control of the automated manned forklift truck. The Pallet Pocket Detection SensorApp is based on SICK AppSpace and can be loaded on the sensor as a complete, application-specific Key App.

### At a glance

- SensorApp for automated position determination of pallets
- Processing of distance values with 144 x 176 pixels per recording
- Working range: 1.5 m to 3 m
- < 800 ms processing time for the detection of coordinates

### Your benefits

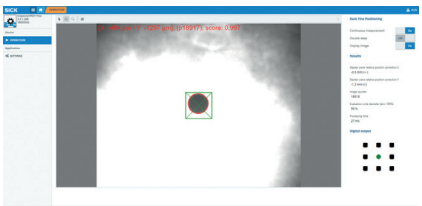
- Automated detection of the pallet pockets of nearly any pallet type
- Reliable position determination of pallets
- Short process times for pallet pick-up
- Increases efficiency of industrial trucks in logistics
- Low maintenance effort due to stable app hardware combination
- Easy integration on industrial trucks
- Apps to the sensor using SICK AppManager.

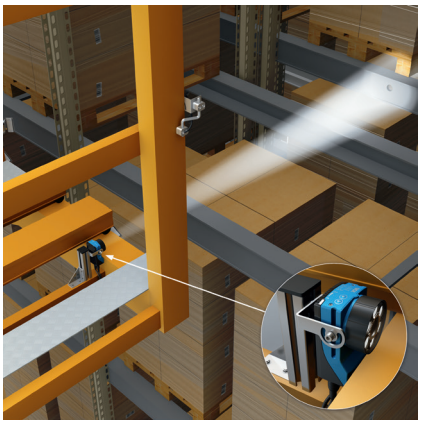
### Field of application

- Picking up and transporting of loaded pallets by an autonomous forklift

# InspectorP RACK FINE POSITIONING

## Fine positioning solution for single- and double-deep racking





### Industries

- Retail and warehousing
- Storage and conveyor

### Product description

The InspectorP Rack Fine Positioning is an easy-to-use yet flexible vision sensor that guides fine positioning of stacker cranes, or other automated storage and retrieval systems, in X and Y. The large measurement range allows for double-deep racking using the same sensor for both near and far range. Racks are reliably located using drilled holes only or reflectors, even with challenges such as stains or reflections. InspectorP Rack Fine Positioning offers plug-and-play simplicity out of the box by including pre-assembled illumination, pre-focused optics and pre-installed software.

### At a glance

- Single- and double-deep racking with only one device
- Easy-to-use web interface
- PROFINET and digital output
- Rugged housing with included IP67 protective hood
- LEDs, aiming laser, on-device buttons and optional microSD memory card
- Pre-assembled, pre-focused and pre-configured
- Image data access

### Your benefits

- Save rack space to maximize storage capacity with high-precision positioning
- Handle near and far range in double-deep racking with only one sensor
- Compact, pre-configured, stand-alone device for easy mechanical integration without hardware adjustments
- Flexible system integration through multiple connectivity options
- Little to no training needed thanks to smart hardware features and simple web GUI
- Allows using only holes for positioning, even with challenges such as stains or reflections
- Image monitoring and logging of hard-to-reach places

### Field of application

- Stacker crane fine positioning: fine positioning of the driving and lifting unit on stacker cranes (or other ASRS) in high-bay warehouses



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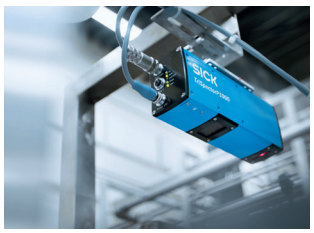
# A NEW DIMENSION IN MACHINE VISION

Machine vision solutions are ideal for automated inspection and measurement tasks. SICK's robot guidance solutions and a broad 2D and pioneering 3D vision portfolio are used worldwide to solve a wide range of applications where there is a need to measure, locate, inspect, and identify.


**2D machine vision**
Optimize your productivity with 2D machine vision solutions for quality inspection, fine positioning, precise measurements, and identification. Our wide portfolio is designed to manage challenges in all industries still easily configured to best fit your specific needs.



**3D machine vision**
Bring your automation solutions to a new dimension with increased flexibility and reliability. Our pioneering 3D vision portfolio enables reliable object detection, true shape control, accurate dimensioning, and precise item positioning – whether items are still or conveyed at high speed.

**Robot guidance**
Take the next step in factory automation and unleash the full power of Robot Vision with our easy-to-use 2D and 3D robot guidance systems. We make your robots smart by equipping them with sharp eyes and clever brains, ready to tackle today's and tomorrow's challenges in robot automation.

**Scalable machine vision systems**
Our Sensor Integration Machines (SIMs) are opening up new possibilities for solving applications. Data from SICK sensors and cameras can be merged, evaluated, archived, and transmitted. Furthermore, SICK offers machine vision project consulting, solution engineering, and trainings.

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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 9,700 employees and over 50 subsidiaries and equity investments as well as numerous agencies worldwide, SICK is always close to its 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.

SICK has extensive experience in various industries and understands their processes and requirements. With intelligent sensors, SICK delivers exactly what the 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 SICK a reliable supplier and development partner.

Comprehensive services round out the offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

**That is "Sensor Intelligence."**

**Worldwide presence:**

Australia, Austria, Belgium, Brazil, Canada, Chile, China, Czech Republic, Denmark, Finland, France, Germany, Great Britain, Hungary, Hong Kong, India, Israel, Italy, Japan, Malaysia, Mexico, Netherlands, New Zealand, Norway, Poland, Romania, Russia, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Thailand, Turkey, United Arab Emirates, USA, Vietnam.

Detailed addresses and further locations → www.sick.com



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Sensor Intelligence.