



MACHINE VISION

OVERVIEW OF THE PRODUCTS

2D machine vision, 3D machine vision, Sensor Integration Machine

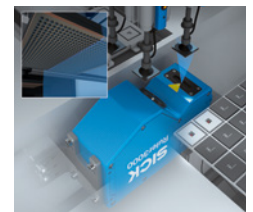
SICK
Sensor Intelligence.

WE GIVE YOU THE VISION TO PERFORM



Production and logistics teams need high-performing and easy-to-use machine vision solutions to drive ever-more dynamic automated operations. Being able to achieve the right vision configuration and progress rapidly to completely reliable operation is vital. Grounded in a history of pioneering technology, the wide-ranging 2D and 3D portfolio from SICK remains at the cutting edge of machine vision development. Supported by our global experts and benefiting from extensive customer application experience, SICK gives you the vision to perform.

Alongside world-class streaming cameras and easy-to-use vision sensors, the unique machine vision foundation software and digital services from SICK are focused on simplicity for our customers. Positioning, inspection, measuring and code-reading, whatever the combination, you are empowered to adapt and fast-track your application to optimum operating performance.



SICK offers the right solution for every requirement: 2D and 3D using different technologies

Our commitment to a common user experience gives you the confidence to grow, and the agility to adapt quickly to your product and process changes.

From tiny, intelligent sensors to high-performance 3D streaming cameras and Sensor Integration Machines, the broad portfolio of state-of-the-art hardware from SICK is supported by two unique software offers. Thanks to the SICK Nova foundation software, you get solution-oriented toolsets, ready to run directly onboard our vision sensors - solving your application in just minutes. You don't even need programming skills. Just access the toolset you need, including options for AI Deep Learning or develop your own application-specific solutions. When you need to stream high quality data, the easy-to-use but yet powerful Stream configuration software offers rapid integration into your own software ecosystem.

→ www.sick.com/machine_vision



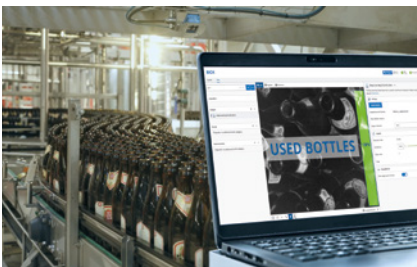
2D machine vision

SICK offers a powerful vision sensor portfolio designed to manage challenges in all industries where a standard sensor would not work. These vision sensors provide a full toolset for positioning, inspection, measurement and reading, depending on the variant. A flexible optical design fulfills the needs of almost all applications. Simplicity is ensured by automatic setup, intelligent algorithms and a intuitive web based user interface.



3D machine vision

SICK's 3D vision series offers a wide range of powerful and flexible products designed for reliable operation in harsh industrial environments. They range from versatile high-speed cameras that deliver high quality 3D and contrast images to smart and configurable stand-alone sensors that facilitate rapid development and easy integration. Their scalability ensures a perfect fit with your 3D vision application.



Machine vision software

With simplicity for our customers in mind, SICK offers machine vision software solutions that seamlessly integrates with all vision sensors in our portfolio. Thanks to scalability in terms of functionality and integration into ecosystems, there is a solution for every requirement. When combined with the power of AI Deep Learning, allowing teaching by examples instead of setting up rules manually, machine vision truly becomes easy to use.



SICK NOVA – MACHINE VISION MADE EASY

→ www.sick.com/SICK_Nova

SICK Nova is the foundation software for configurable machine vision solutions in a broad array of industries and quality control applications. Featuring a user-friendly web interface and AI capabilities, SICK Nova supports experts and non-experts alike so they can quickly and easily handle even the most challenging applications. SICK Nova runs on a multitude of 2D and 3D vision sensors, leveraging different imaging technologies. Moreover, users can conveniently extend the software's functionality with both user-developed and ready-made SICK Nova plug-ins. With this kind of scalability, SICK Nova is a safe choice that ensures cost-effective ownership.

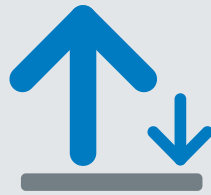
” SCALABLE,
ON-DEVICE AND
EASY-TO-USE





Ease of use

SICK Nova offers a user-friendly web interface with point-and-click configuration and embedded assistance, making the software quick and convenient to use.



Scalability

SICK Nova runs seamlessly on SICK 2D and 3D vision sensors and has the same familiar user experience. With three toolset levels for users to choose from, including tools powered by AI deep learning, SICK Nova delivers a suitable solution for every need.



Plug-ins

Users can expand the software's functionality using standard or custom SICK Nova plug-in tools available in the SICK AppPool. Users with a SICK AppSpace license can also develop customized plug-ins if needed.



AI capabilities

Powered by AI deep-learning technology, SICK Nova offers both on-device and cloud-based tools for complex defect detection and sorting.



Presence Inspection

The Presence Inspection toolset provides solutions to a wide range of applications such as presence and absence detection, completeness checks, counting, sorting and fill level monitoring tasks. It comes with a fundamental, yet comprehensive, set of image analysis and communication tools that are easily configured using an intuitive graphical user interface in a web browser.



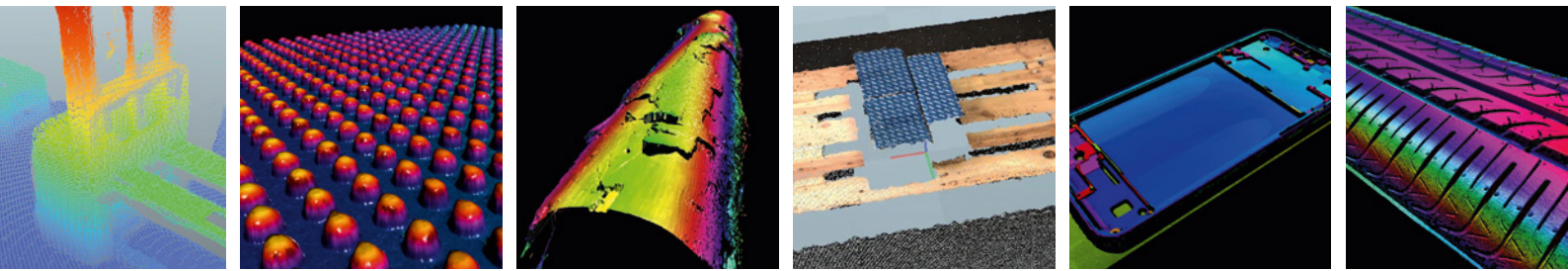
Quality Inspection

The Quality Inspection toolset enables solutions for detailed quality control, object localization and measuring in manufacturing and assembly verification applications. It can be used to ensure that produced items have the exact qualities required regarding presence, location and dimensions. In addition to all tools available in Presence Inspection toolset, the Quality Inspection toolset also include a vast range of tools for quality assurance, positioning, dimensioning, calibration and identification.



Intelligent Inspection

The deep learning-powered Intelligent Inspection toolset enables powerful anomaly detection and object classification solutions that is not possible with rule-based machine vision. The combination of an example-based approach with on-device training and user-friendly interface paves the way for simplified and rapid solution development. By teaching the vision sensor examples of good or bad, the configuration is done with ease. In addition, all traditional rule-based machine vision software tools from Quality Inspection toolset are included making it possible to use the benefits of the existing tools in tandem with deep learning capabilities.



SICK STREAM SOFTWARE SOLUTIONS – TAKE CONTROL OF YOUR 3D STREAMING DATA

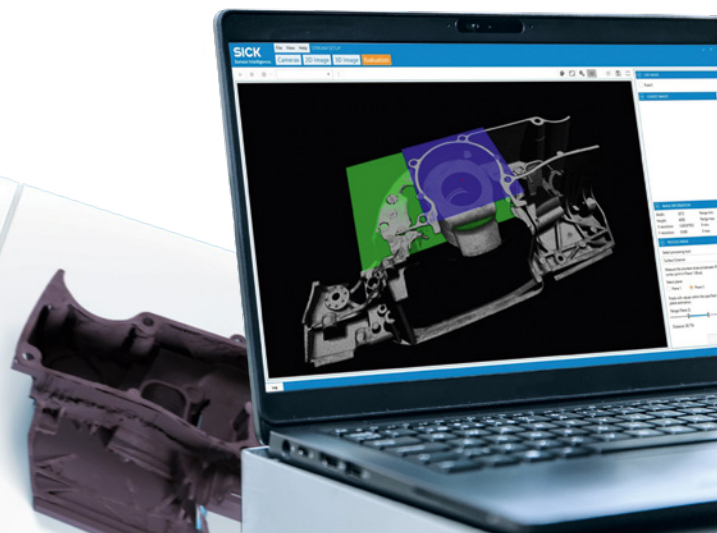
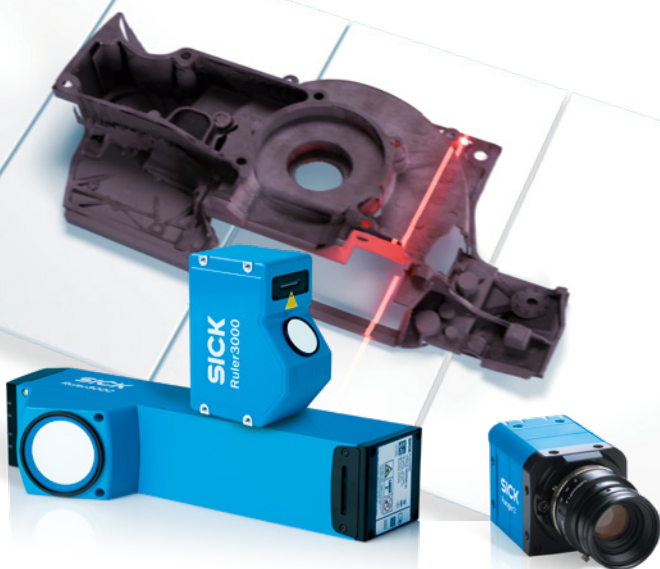
To easily handle streaming high-quality data, SICK offer configuration softwares that enables easy parameterization and rapid integration into your own software ecosystem.



The [Stream Setup](#) configuration software comes included with the Ranger3 and Ruler3000 3D cameras and provides quick and easy configuration, collection, optimization and evaluation with the user-friendly processing tools for e.g., noise reduction and false data removal. With Stream SDK (software Development Kit), rapid camera integration is enabled by GigE vision and supportive C#/C++ APIs into your PC application.



The [SOPAS Engineering Tool](#) allows for easy configuration of the streaming products Visionary-T Mini CX and Visionary-S CX. It provides a quick and easy way to visualize and record data. Along with the SOPAS Engineering Tool, a comprehensive SDK enables a fast camera integration into your application by providing e.g. C++ and Python samples as well as ROS driver.





AI DEEP LEARNING

TAKES MACHINE VISION BEYOND TRADITIONAL LIMITS

WHY CHOOSE AI DEEP LEARNING FROM SICK?

→ www.sick.com/Ai

Deep Learning made accessible

Configure your Deep Learning application with easy-to-use software tools. By teaching with examples instead of manually setting up rules, applications can be solved rapidly also by non-experts. In addition, the deep-learning-powered Intelligent Inspection toolset provides solutions to more complex defect detection and object classification applications where traditional rule-based tools may be insufficient on their own.

On-device or SICK dStudio based training

Fast and easy on-device application buildup with the Intelligent Inspection toolset as well as optimized accuracy and execution speed with training in SICK dStudio.

Easy to expand and customize

Our flexible product portfolio can easily be tailored to specific requirements, by yourself or with our experienced support teams. With SICK Nova Plug-in support it's easy to add-on functionality.

Deep Learning dedicated support and service

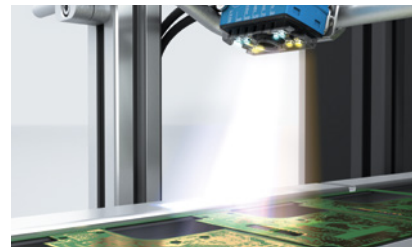
Deep Learning experts specialized in your industry. Located where you are.



Classification of new and used bottles

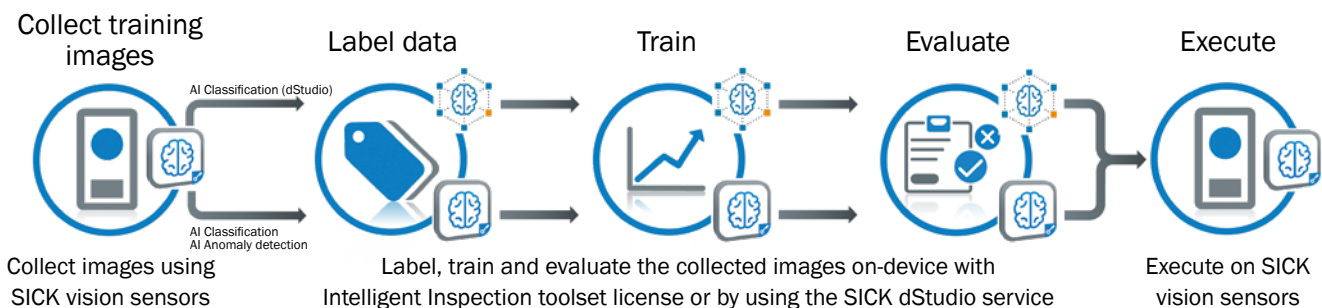


Classification of annual rings up or down















Anomaly defect detection of PCB

FAST AND EASY ON-DEVICE APPLICATION BUILDUP, FOR OPTIMIZED ACCURACY AND EXECUTION SPEED, THE LABELLING, TRAINING AND EVALUATION CAN BE DONE WITH SICK DSTUDIO



OVERVIEW OF MACHINE VISION SENSORS

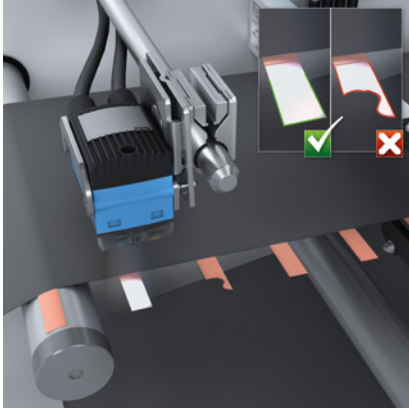

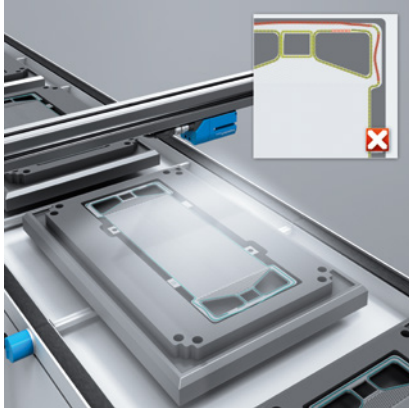

Product		Method of data providing				Main tasks						
		Embedded image processing	Streaming	SICK AppSpace	SICK Nova	Classification	Identification	Collision warning/ Navigation	Positioning	Presence detection	Quality Control	Measuring
2D machine vision												
	InspectorP61x	■		■	■	■	■		■	■	■	■
	InspectorP62x	■		■	■	■	■		■	■	■	■
	InspectorP63x	■		■	■	■	■		■	■	■	■
	Inspector83x	■		■	■	■	■		■	■	■	■
	Inspector85x	■		■	■	■	■		■	■	■	■
	picoCam2		■	■ ¹⁾	■ ¹⁾	■ ¹⁾	■ ¹⁾			■ ¹⁾	■ ¹⁾	■ ¹⁾
	midiCam2		■	■ ¹⁾	■ ¹⁾	■ ¹⁾	■ ¹⁾			■ ¹⁾	■ ¹⁾	■ ¹⁾
3D machine vision												
	TriSpector1000	■		■					■	■	■	■
	Ranger3		■						■ ²⁾	■ ²⁾	■ ²⁾	■ ²⁾
	Ruler3000		■		■ ¹⁾		■ ¹⁾		■ ¹⁾	■ ¹⁾	■ ¹⁾	■ ¹⁾
	Visionary-S	■	■ ³⁾	■ ⁴⁾	■ ⁴⁾			■ ⁴⁾	■ ⁴⁾	■ ⁴⁾	■ ⁴⁾	■ ⁴⁾
	Visionary-T Mini	■	■ ³⁾	■ ⁴⁾	■ ⁴⁾			■ ⁴⁾	■ ⁴⁾	■ ⁴⁾	■ ⁴⁾	■ ⁴⁾
	Visionary-B Two	■	■	■		■		■	■	■		■
Sensor Integration Machine												
	SIM2x00	■		■	■	■	■			■	■	■

¹⁾ In combination with a Sensor Integration Machine unit (e.g. SIM2500 Nova)
²⁾ Requires integration-software
³⁾ CX-hardware versions using SOPAS ET software
⁴⁾ AP-hardware versions
⁵⁾ Depends on the infrared emission properties of the target object
⁶⁾ With internal illumination, can be extended to longer distances when using external illumination
⁷⁾ Currently not supported by SICK Nova

Color inspection	Technology		Communication interfaces				Sensor resolution	Working distance	Page
	Snapshot (2D/3D)	3D laser triangulation	Serial	Ethernet TCP/IP	Fieldbuses	GigE Vision			
	2D		7)	■	■		1.2 Mpixel	50 mm ... 300 mm ⁶⁾	→ 10
	2D		7)	■	■		1.3 Mpixel	70 mm ... 1,500 mm	→ 10
	2D		7)	■	■		1.3 Mpixel ... 1.9 Mpixel	Depending on optics	→ 11
■	2D		7)	■	■		1.3 Mpixel ... 5.1 Mpixel	Depending on optics	→ 11
	2D		7)	■	■		5 Mpixel ... 12 Mpixel	Depending on optics	→ 11
■	2D			■		■	1.58 Mpixel ... 5.01 Mpixel	Depending on optics	→ 12
■	2D			■		■	1.58 Mpixel ... 12.29 Mpixel	Depending on optics	→ 12
		■	■	■			1536 datapoint/profile	141 mm ... 1091 mm	→ 14
		■		■		■	2,560 x 832 px 3200 datapoint/profile	Depending on optics	→ 14
		■		■		■	2,560 x 832 px 3200 datapoint/profile	46,7 mm ... 1445 mm	→ 13
■	3D			■			640 px x 512 px	0.5 m ... 6.5 m 0.5 m ... 65 m	→ 15
	3D			■			512 px x 424 px	≤ 16 m ⁵⁾	→ 15
■	3D			■		■	1024 x 576 px	0.3 m ... 37m	→ 15
■			7)	■	■	■			→ 13

	 <p>InspectorP61x</p>	 <p>InspectorP62x</p>
	<p>Powerful 2D vision sensor for tight spaces</p>	<p>All-in-one vision sensor with electric focus and rugged housing</p>

<p>Possible fields of application</p>		
	<ul style="list-style-type: none"> • Inline quality control for electronics, packaging, and automotive industries • Manufacturing and assembly verification • Part localization and measurement • Detail inspection, counting, and measurement • Perfect for robot end-of-arm mounting • Print and label inspection with code reading and OCV • Track and trace by code reading and OCR 	<ul style="list-style-type: none"> • Inline quality control in the production of parts, assemblies or products • Inspection and measurement of details • Print and label inspection with code reading and OCV • Track and trace by code reading and OCR • Other SensorApps, systems or custom development for additional tasks, e.g.: • Fine positioning of stacker cranes

<p>Example application</p>		
	<p style="text-align: center;">Battery</p>  <p style="text-align: center;">Quality control of electrode tabs</p> 	<p style="text-align: center;">Electronics</p>  <p style="text-align: center;">Verifying the seal</p> 

<p>Detailed information</p>	<p>→ www.sick.com/InspectorP61x</p>	<p>→ www.sick.com/InspectorP62x</p>
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InspectorP63x

All-in-one vision sensor with flexible optics and rugged housing



Inspector83x

AI-powered quality control made stress-free



Inspector85x

Focusing on the big picture

- Robot picking
- Precise part positioning
- Quality inspection of shapes and dimensions
- Defect and part presence detection
- Calibrated, high-accuracy measurements
- Track and trace by code reading and OCR
- Print and label inspection with code reading and OCV
- Object sorting

- Complex and unpredictable defect detection
- Sorting of parts, products or packages
- Inline, high-speed quality control in the production of parts, assembly, or finalized products
- Manufacturing and assembly verification
- Track and trace by OCR and code reading
- OCR/OCV and quality inspection in packaging lines

- In-line quality inspection in automotive and white goods production lines that require large field of view
- OCR/OCV and quality inspection in packaging lines for consumer goods
- Solder inspection of electronics and automotive components
- Complex and unpredictable defect detection

Rubber and plastics

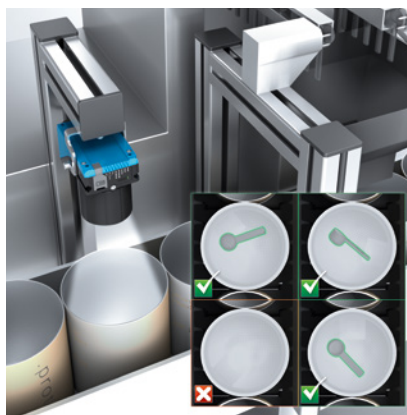


Monitoring of the injection mold



→ www.sick.com/InspectorP63x

Consumer goods

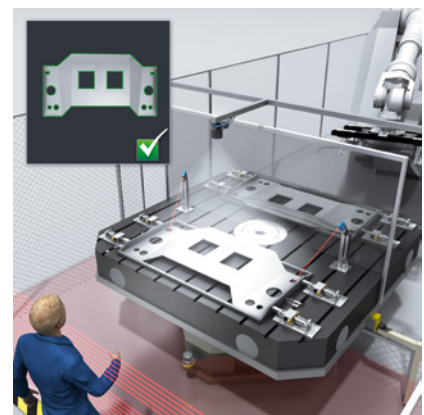


Completeness verification



→ www.sick.com/Inspector83x

Automotive






Type check for bodyparts



→ www.sick.com/Inspector85x

	 <p>picoCam2</p>	 <p>midicam2</p>
	<p>Ultra compact industrial streaming cameras in accordance with GigE vision standard</p>	<p>Rugged and high-resolution streaming camera in accordance with GigE vision standard</p>

<p>Possible fields of application</p> <ul style="list-style-type: none"> • Fast in-line quality control for consumer goods, automotive and electronics industries • Manufacturing and assembly verification • Part localization and measurement • Detail inspection, counting and measurement • Color verification and sorting • Challenging classification and anomaly applications 	<ul style="list-style-type: none"> • Fast in-line quality control for consumer goods, automotive and electronics industries • Manufacturing and assembly verification • Part localization and measurement • Detail inspection, counting and measurement • Color verification and sorting • Challenging classification and anomaly applications 	
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<p>Example application</p>	<p>Automotive</p>	<p>Consumer goods</p>
	 <p>Inline quality control</p> 	 <p>Inline quality control</p> 

Detailed information

→ www.sick.com/picocam2

→ www.sick.com/midicam2



SIM2x00 Nova

High-performance, customizable 2D machine vision in tight spaces

- Fast in-line quality control for consumer goods, automotive and electronics industries
- Manufacturing and assembly verification
- Part localization and measurement
- Detail inspection, counting and measurement
- Color verification and sorting
- Challenging classification and anomaly applications

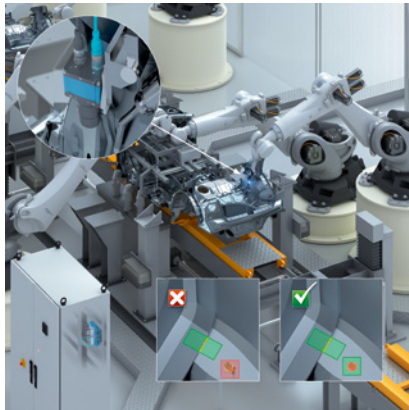


Ruler3000

The fast way to high-performance 3D

- Assembly inspection of tablets and cell phones in the electronics industry
- Quality control of tires
- Weld seam inspection of batteries
- Packaging and in-line food quality control
- Inspection of boards and 3D log measurement in the timber industry
- Article identification in logistics
- Robot guided inspection

Automotive

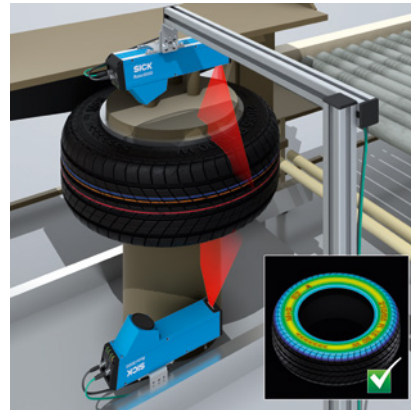


Measuring the welding edge and spot welding inspection



→ www.sick.com/SIM2x00_Nova

Automotive



Lettering inspection/side walls of tires



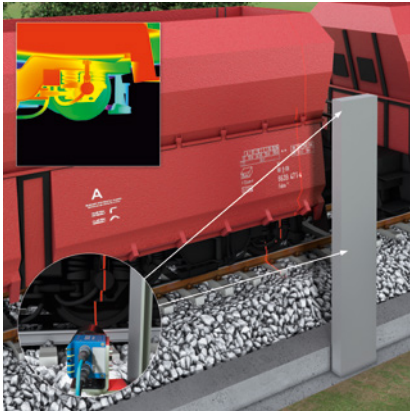

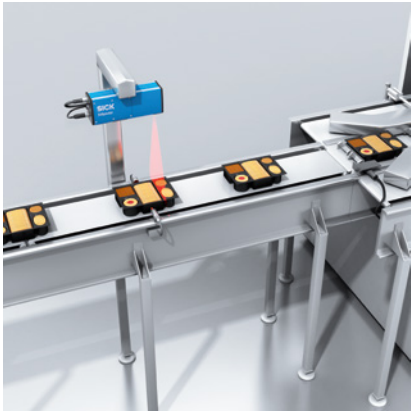

→ www.sick.com/Ruler3000

	 <p>Ranger3</p>	 <p>TriSpector1000</p>	
<p>Superior 3D performance in a small package powered by ROCC technology</p>		<p>Configurable, intuitive, and reliable 3D inspection of moving parts</p>	

Possible fields of application

- Electronic component and PCB inspection
- Quality control of tires
- High-speed railway and road surface inspection
- Dimensioning of tubes in the metal industry
- Packaging and in-line food quality control
- Quality inspection and classification in the wood and furniture industry
- Quality control in consumer goods; volume and thickness measuring, counting and positioning of objects
- Box integrity including content verification, completeness and emptiness check
- Product dimensioning in food processing

Example application

	Rail	Food and Beverage	
	 <p>Inspection of train components</p> 	 <p>Box content verification</p> 	

Detailed information	→ www.sick.com/Ranger3	→ www.sick.com/TriSpector1000	
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Visionary-S

3D snapshot – colorful perspectives for precise factory automation



Visionary-T Mini

3D machine vision has never been easier



Visionary-B Two

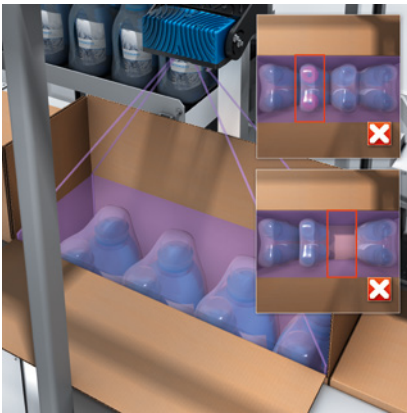
Rugged and smart - 3D snapshot solution for harsh outdoor environment

- Bin picking
- Navigation and positioning in robotics
- Quality control, e.g. of secondary packaging
- Palletizing and depalletizing
- Dimensioning of goods
- Verification, e.g. empty container detection at airports
- Checking the packaging content
- Checking the manufacturing and assembly
- Completeness or empty checking

- Object detection
- Navigation
- Palletizing and depalletizing
- Measurement and volume detection
- Positioning
- Gesture control
- Area monitoring
- Checking the packaging content
- Checking the manufacturing and assembly
- Completeness or empty checking
- Fill level monitoring

- Object detection
- Navigation
- Positioning
- Area surveillance
- Fill level monitoring

Consumer goods



Presence detection



→ www.sick.com/Visionary-S

Logistics



Fill level monitoring



→ www.sick.com/Visionary-T_Mini

Mining



People Detection



→ www.sick.com/Visionary-B_Two

ACCESSORIES FOR THE MACHINE VISION PORTFOLIO

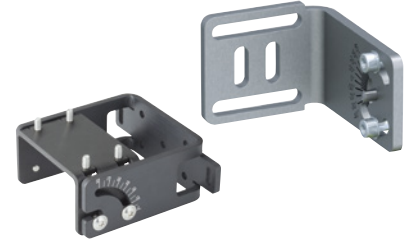
Different needs require different solutions. Fitting the respective customer requirements on site and exactly matched to the products, these accessories enable quick and easy sensor integration into existing systems. This makes applications efficient and reliable.



Plug connectors and cables



Connection devices



Mounting concept



Illuminations



Optics

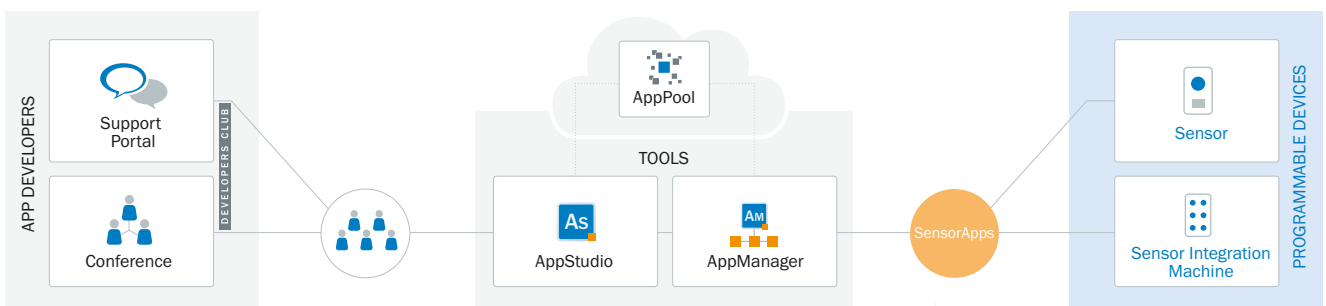


Encoders



SICK APPSPACE – 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.





EXAMPLES OF APPLICATION SPECIFIC SICK SENSORAPPS

Find more solutions → www.sick.com/SICK_sensorapps



PLOC2D

Easy to use and flexible part localization sensor system

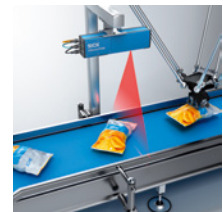
- 2D part localization
- Stand-alone sensor with web-based user interface
- Easy integration with robots



3D Belt Pick

Conveyor belt picking made simple in all dimensions

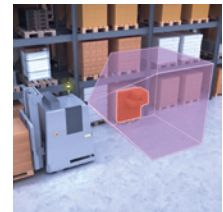
- Provides 3D coordinates and measurements of products on belt
- Easy integration with several robot brands
- Running stand-alone on TrispectorP1000 and on Ruler3000 bundle



3D Object Detection

For collision avoidance applications

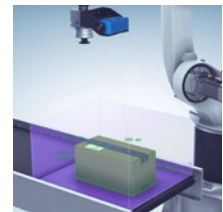
- Flexible collision avoidance with up to 16 switchable detection fields and freely configurable object sizes
- Prime Version with ground filter for e.g. forklift fork detection when left on the ground
- Easy to integrate via I/O interface or via Ethernet with REST API



Static Package Dimensioning

SensorApp to estimate dimension (length, width, height) of the smallest enclosing cube around one or a group of objects

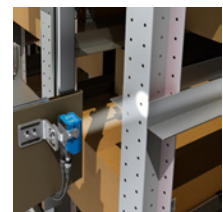
- Stand-alone solution - no additional computer needed
- Access to dimensioning result (L,W,H) via REST API
- SensorApp can be loaded to Visionary-S AP devices



InspectorP Rack Fine Positioning

Fine positioning solution for single- and double-deep racking

- Single- and double-depth rack storage using one device
- User-friendly web interface
- Pre-assembled, pre-focused and pre-configured



Label Checker

Complex label inspections with high performance OCR

- OCR, 1D, and 2D codes: reading, recognition, validation, verification
- Easy teach-in of custom font
- Web-based user interface



SYSTEM SOLUTIONS

Our system solutions meet special customer requirements and the needs of diverse industrial sectors. They are particularly well suited to demanding indoor and outdoor applications. Extensive measuring tasks are solved through the targeted combination of different principles of operation. Their properties, such as self-diagnosis, alarm detection or logging functions, ensure an especially high reliability and error tolerance. The compatibility of our solutions with higher-level systems allows for vertical integration into existing environments. In combination with services, holistic solutions can be designed that increase productivity, safety and availability. [Find more solutions → www.sick.com/c/g568259](http://www.sick.com/c/g568259)

EXAMPLES OF ROBOT GUIDANCE SYSTEMS

PLB

Flexible part localization for bin picking and depalletizing.

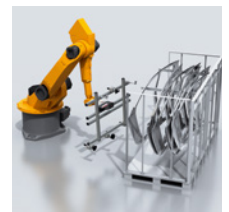
- Several localization algorithms based on CAD, geometric part features, and AI
- Selection of various pre-calibrated 3D cameras for immediate use
- Easy integration with any robot model



PLR

Accurate part localization for reliable robot handling

- Precise and rapid part localization
- Combined 2D and 3D measurement
- Tools for easy integration with the robot

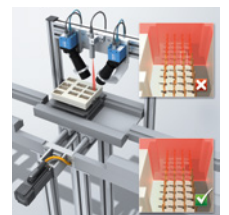


EXAMPLES OF QUALITY CONTROL SYSTEMS

Pinspector 3D

Pin and press-fit inspection – verifying the presence and position of pins

- Full-scale solution for the inspection of PCBs and pin connectors
- Ranger3 cameras from SICK for high-precision 3D imaging
- Four variants – high value, fast inspection, and double-camera to prevent occlusion



Foreign Object Detection System

Foreign object detection for simple and challenging surfaces

- Optical testing system for foreign object detection based on Ranger3 3D vision cameras and the laser triangulation method
- SICK AppSpace environment for customer-specific applications
- Scalable system for inspecting surfaces for foreign objects of various shapes and sizes



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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 11,900 employees and over 50 subsidiaries and equity investments, as well as numerous international agencies, SICK is always close to its customers. An extensive range of products and services creates the ideal 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.

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