



MACHINE VISION

PROFILE AND VISION
SENSORS

INDUSTRY 4.0 – MACHINE VISION IS A BASIC BUILDING BLOCK OF SMART PRODUCTION

FLEXIBLE PRODUCTION SYSTEMS

The efficient manufacture of small lot sizes up to individual production is made possible through flexible production systems that can be easily adapted to changing requirements or those that ideally are able to adapt themselves.

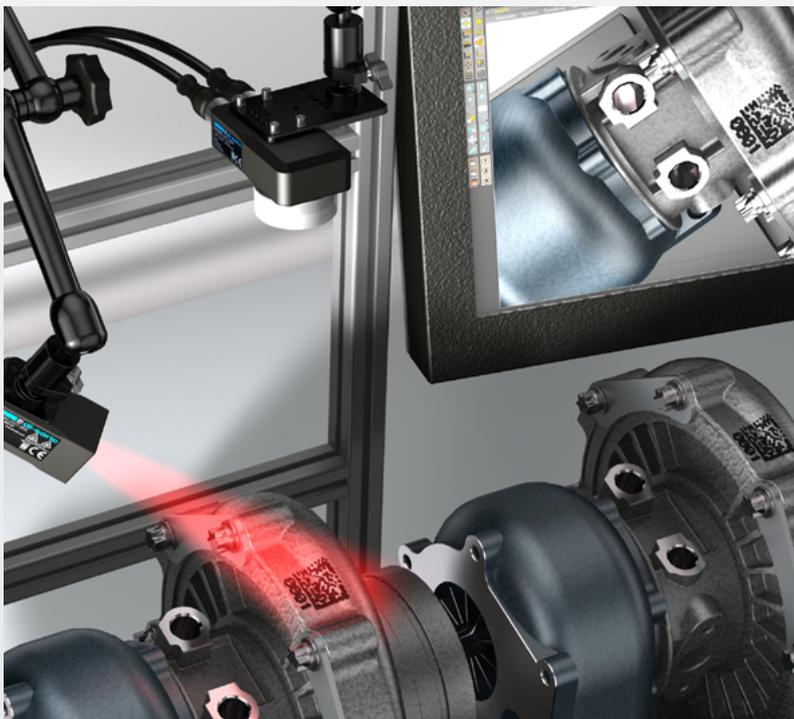
This flexibility is achieved through the automated exchange of information between the individual production components, which make data for the optimization of the entire process available to the process control. This includes, for example, sensors networked via IO-Link or Vision and Profile sensors or ID Readers integrated via Profinet.

Through individual marking (coding), the product itself becomes an information carrier and is thus part of the production – in a quality-inspected and traceable manner.

OPTIMAL APPLICATION SOLUTIONS WITH THE DI-SORIC MACHINE VISION SENSORS

Working distance, depth of field on the inspection object, resolution of the inspection object and the size of the field of view play a decisive role in a successful solution. Our Machine Vision Sensors offer you the necessary flexibility to meet these requirements.

Additionally, di-soric offers you an extensive portfolio of lighting for diverse lighting scenarios which contribute to the feasibility and stability of your solutions.



APPLICATION REQUIREMENTS FOR THE SELECTION OF THE OPTIMAL SENSOR

- Component size
- Working distance
- Resolution
- Ambient light
- Type of inspection
- Cycle time
- Communication interface

VISION AND PROFILE SENSORS FROM THE QUALITY INSPECTION TO TRACK AND TRACE

A flexible, automated quality inspection contributes decisively to the overall efficiency of a production process: It directly indicates quality fluctuations and ensures that only products manufactured within the defined parameters are further processed or packaged.



CS-60 VISION SENSOR

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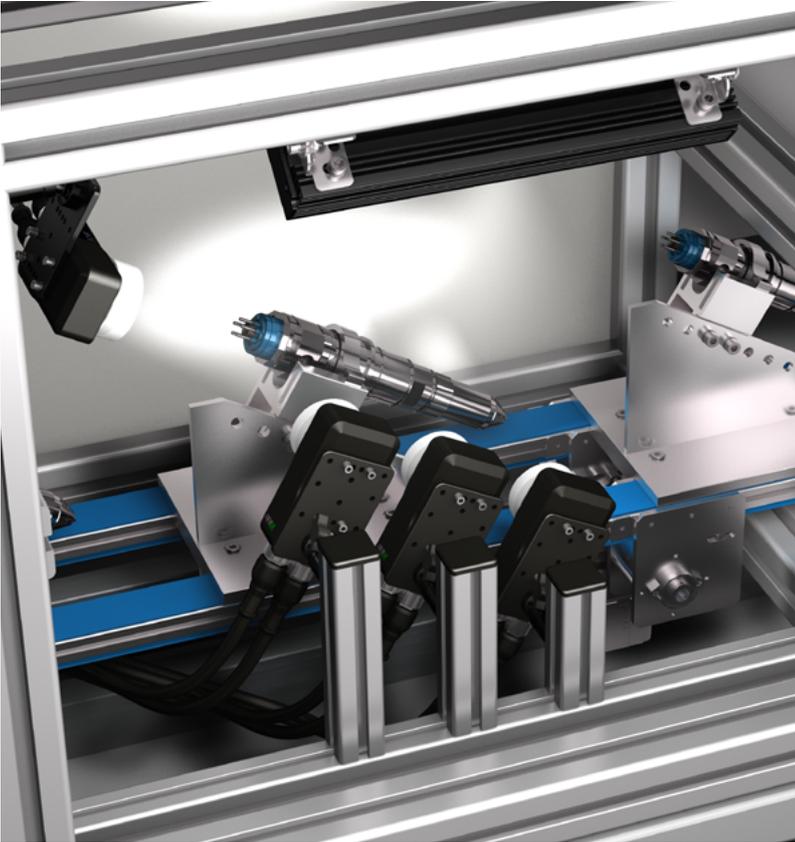
- High-quality, precise 2D image of the field of view
- Simple localization, detection, counting and measuring of structures in the image
- High-performance reading of ID codes (printed, directly marked (DPM))
- Transfer of results and image via various interfaces



PS-30 PROFILE SENSOR

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- Secure comparison of the taught reference profile with the live profile of the inspection object
- Accurate position transfer in mm through calibration of the sensor
- Distinction accuracy of 0.5 mm
- Data and status reporting via IO-Link



Quality inspection of components

A product is checked for the required quality before packaging. Different product characteristics and image field sizes make the highest demands on the flexibility of the Vision Sensor and on illumination.

For an optimal inspection image, the direct bright field illumination, integrated in the CS-60, with various filter attachments and indirect through-light with the BE-B barlight come into use.

Completeness inspection with the transfer of position to parts handling

The product quality and position is checked by the CS-60 at the interface to the next process step. Through its adaptation options relating to working distance and image field (changing lenses), as well as the internal high power illumination, the CS-60 delivers the depth of field required for the representation of the entire product characteristics in the inspection image. The robot is thus enabled to grasp safely.



CS-60 VISION SENSOR – NVISION-I SOFTWARE

SAVE TIME

Not just because of the interface which is clear, intuitive and simple to operate, but also because of the high-performance tools, which are consistently optimized at the highest quality and with the highest level of performance.

The visualization of the pipeline and linking of individual tasks in the Logic tool make the greatest degree of flexibility and high speed in the realization of the application possible.

Pipeline & status checks

- Inspection tools can be inserted here and moved via drag & drop
- Measured values and inspection results/status are shown here

Navigation bar & inspection tools

- Intuitive and user-friendly navigation menu
- Contextual help can be displayed as needed
- Menu guidance available in 4 languages (German, English, French, Chinese)

The screenshot displays the Nvision-I software interface. On the left, a pipeline configuration panel shows several tools: Acquisition, Locate Area, Locate Area1, Locate Shape, Measure Circle, and Logic. The 'Measure Circle' tool is selected and highlighted. The main workspace shows a grayscale image of a mechanical part with a green dashed circle overlaid on a circular feature. The text 'Measure Circle' and 'Diameter : 49px' are visible on the image. On the right, a help window for the 'Measure Circle' tool is open, providing detailed instructions and parameters. The interface includes a top navigation bar with various tool icons and a status bar at the bottom.

Configuration

- Parameters for search criteria can be set simply and directly
- Threshold values for the evaluation criteria can be entered easily

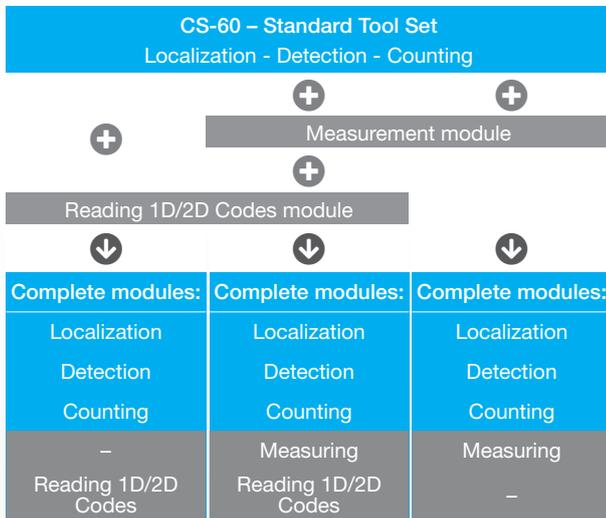
Display & drawing tools

- Image viewing for the control and analysis during operation
- Context-sensitive description of the tools on the right side to ensure optimal tool use with their complete functionality

YOU ONLY PAY FOR WHAT YOU NEED

With the option of adding additional tools at anytime - but not until you need them. The second option is a customization to the software for tailored solutions:

Desired functionality and operation with a look & feel in your own design.



The standard model of the CS-60 with the tool set Localization, Detection and Counting can be expanded with additional functions such as Measuring and Reading of 1D & 2D Codes after purchasing the device via simple licensing.

Sending in the device serial number is all that it takes to purchase an upgrade license.

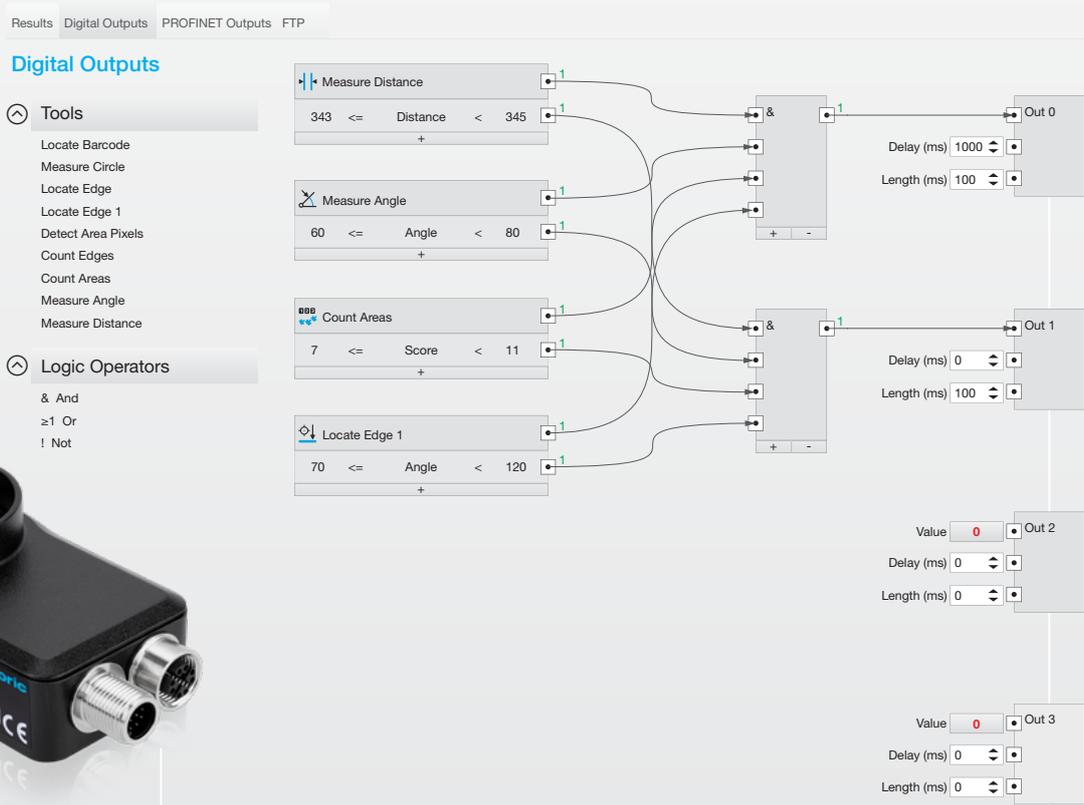
This license is entered via the user interface and the expanded functionality of the software is enabled and available immediately.

It is therefore no longer necessary to replace the vision sensor due to changing application requirements.

THE LOGIC TOOL THE LINKING OF RESULTS TO OUTPUTS

Through the free linking of the results of several tools into an overall result directly in the Vision Sensor you get a high-performance – without PLC load.

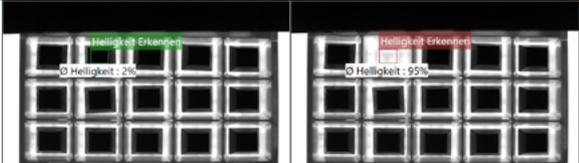
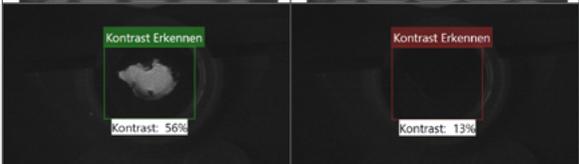
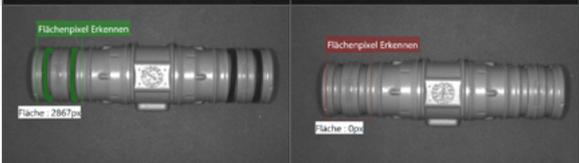
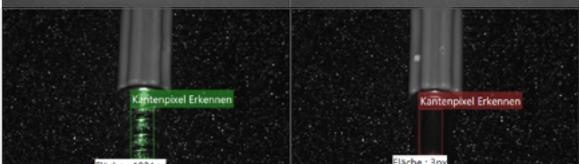
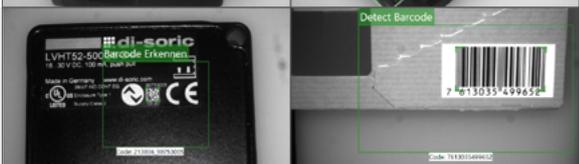
Another advantage is the high degree of flexibility: the measured values or results can be addressed at any point on the Profinet field bus.



FAST AND SIMPLE THE IMAGE PROCESSING TOOLS

Via comprehensive image processing tools, both the verification of the quality and completeness of parts is possible as well as their localization and the transmission of determined positions by way of various communication interfaces. Demanding tasks, such as quality inspections of highly reflective objects and applications in changing ambient lighting situations or at high speeds are reliably performed.

COUNTING of areas, edges and shapes		✓
AREAS	Determines the number of contiguous dark or bright regions	

LOCALIZATION of areas, edges and shapes		✓
AREA	The tool "Localize area" is used in order to localize a part in a scene using Blob analysis	
EDGE	Finds an edge within the defined search field and serves as a guide for subsequent tools	
SHAPE	Compares learned patterns within the defined working area and also serves as position correction for subsequent tools	
DETECTION OF THE presence/absence of a feature based on pixel values and contrast		✓
BRIGHTNESS	Detects the average brightness as a function of the threshold range within a defined area in the image	
CONTRAST	Detects the contrast as a function of the threshold range within a defined area in the image	
AREA PIXELS	Detects the number of pixels as a function of the threshold range within a defined area in the image	
EDGE PIXELS	Detects the number of edge pixels as a function of the threshold range within a defined area in the image	
LOCALIZE AND READ 1D and 2D codes		+
LOCALIZATION	Finds a code within the defined search field and serves as a guide for subsequent tools. Efficient for label fit check	
READ	Decodes all codes and can evaluate the content using different criteria (regular expressions)	
COUNTING	Enables multiple recognition of different codes	

TECHNICAL DATA

CS-60

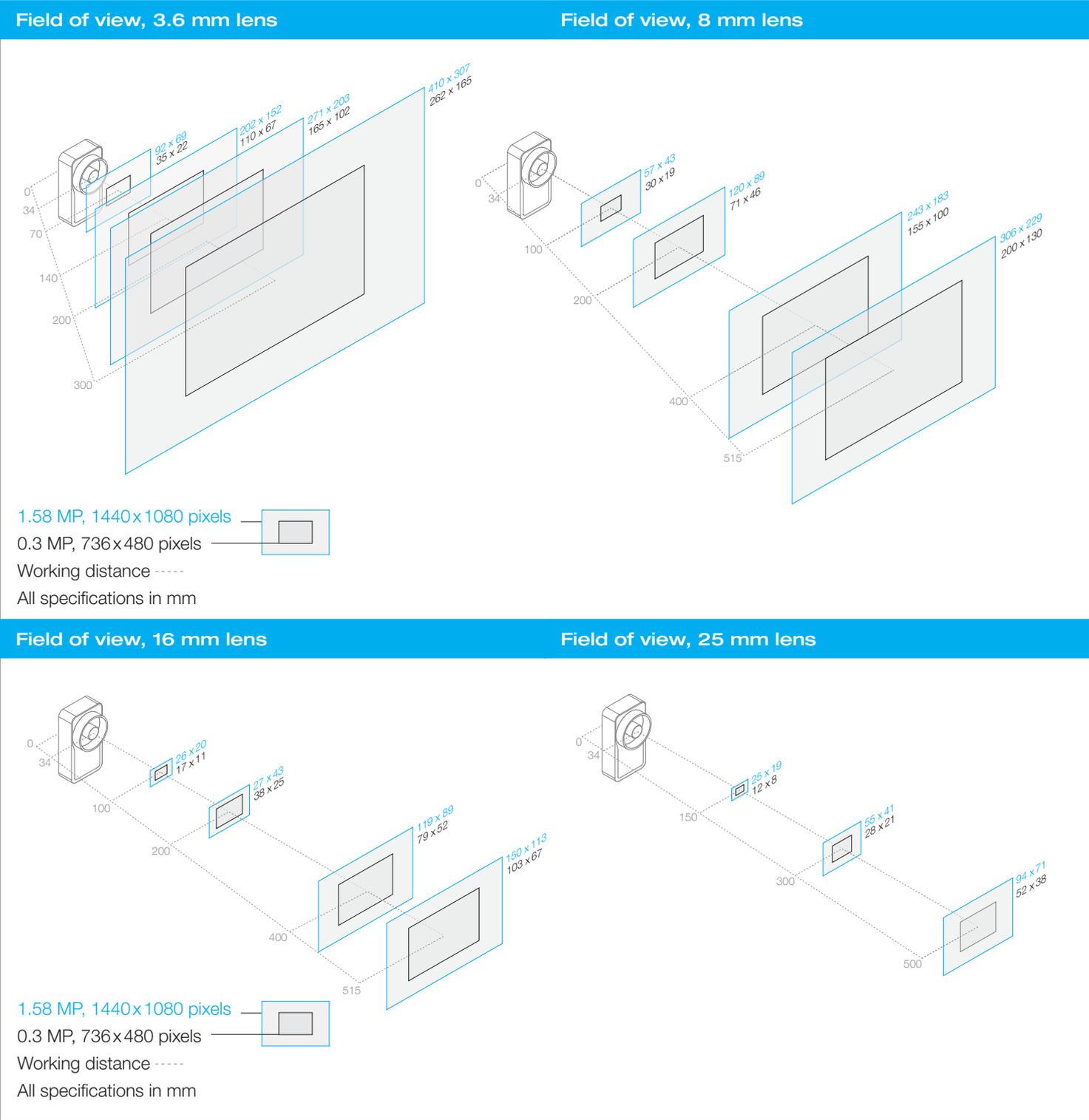


	CS60- BM28-EP15/300	CS60- BM28-EP15/300ID	CS60- BM28-EP15/400	CS60- BM28-EP15/400ID	CS60- BM38-EP15/300	CS60- BM38-EP15/300ID	CS60- BM38-EP15/400	CS60- BM38-EP15/400ID
Standard Tools								
▪ Localization	■	■	■	■	■	■	■	■
▪ Part recognition	■	■	■	■	■	■	■	■
▪ Counting	■	■	■	■	■	■	■	■
▪ Measuring			■	■			■	■
▪ Read code		■		■		■		■
Upgrade options:								
▪ Measurement module	■	■			■	■		
▪ Reading 1D& 2D Codes module	■		■		■		■	
▪ Customization module	■	■	■	■	■	■	■	■
CMOS type	EV76C541				IMX 273			
Optical format	1/4"				1/2.9"			
Resolution	736 (H) x 480(V)				1440 (H) x 1080 (V)			
Pixel size (µm)	4.5 x 4.5				3.45 x 3.45			
Shutter	global				global			
Max. image frequency (fps)	30				30			
Scope of delivery	CS-60 Vision Sensor, lens O-S1-S-080-40, lens cover CS60-Window							
Housing dimensions H/W/D	85 / 45 / 34 mm							
Service voltage	18 to 30VDC							
Working distance	1 Vision Sensor with S-mount - 4 lenses: 50 – 1500 mm							
Focal length	Variable - S-mount: 3.6, 8, 16, 25 mm							
Internal lighting	Switchable integrated illumination: High Power red, High Power white							
Storage / number of jobs	16 GB / to 255							
Focusing	Variable focus with aperture 4 and 8							
Interfaces & protocols	Digital I/O, TCP/IP, Profinet							
Digital inputs / outputs	2 + 1 external trigger / 4 + 1 ready signal							
Image storage	Via FTP / manually in the software							
Protection class	IP67							

FIELDS OF VIEW

CS-60

The following table shows the representation of fields of view with the available lenses at various working distances for the CS-60 with 736 x 480 pixels (0.3 MP) and 1440 x 1080 pixels (1.58 MP). Working distance: Back edge sensor to worktop.
 Depth of sensor: 34 mm.



PS-30 PROFILE SENSOR

PS-30 PROFILE SENSOR - UNCOMPLICATED AND FLEXIBLE FOR PRECISE MEASUREMENTS AND INSPECTION TASKS

The optoelectronic PS-30 Profile Sensor is ready to use in just a few steps and captures profiles of various objects per laser line scan. Up to 10 target profiles simplify the inspection and measurement of changing objects on the same production line.

The PS-30 checks not only for the presence of an object, it also determines whether the actually intended component is used and correctly attached. Improve your product quality and increase your production efficiency with the PS-30 Profile Sensor.



Minimize costs and installation effort



Can be used out-of-the-box:
Quick start-up with teach buttons
and a display on the sensor



Ambient light immunity:
no shielding or external
illumination necessary



Distance- and color-independent
measurement:
High tolerance with object positioning

Higher production efficiency

Up to 10 target profiles for simplified inspection of
changing objects on the same production line can be
stored

Sustained decrease in the rejection rate

Simplified error analysis via IO-Link

Improvement of your product quality

Ensuring correct and complete
assembly and processing



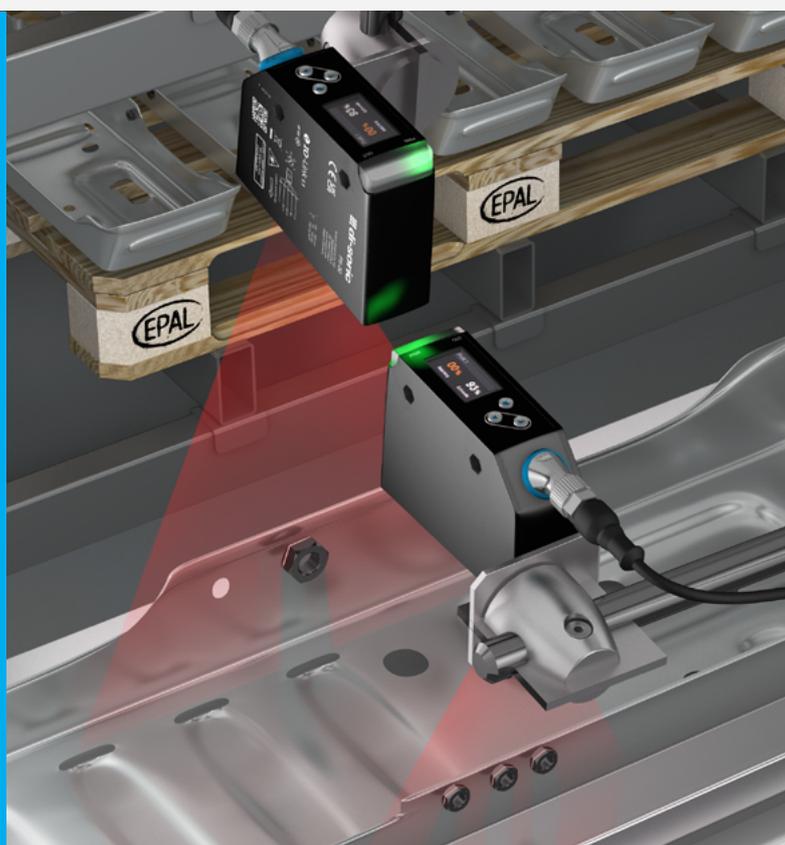


Inspect reference distance and position between bearing and shaft

A journal and a bearing ring must be subjected to a type verification and position determination prior to final assembly. With simple learning of the desired journal profile, both can be determined with the PS-30.

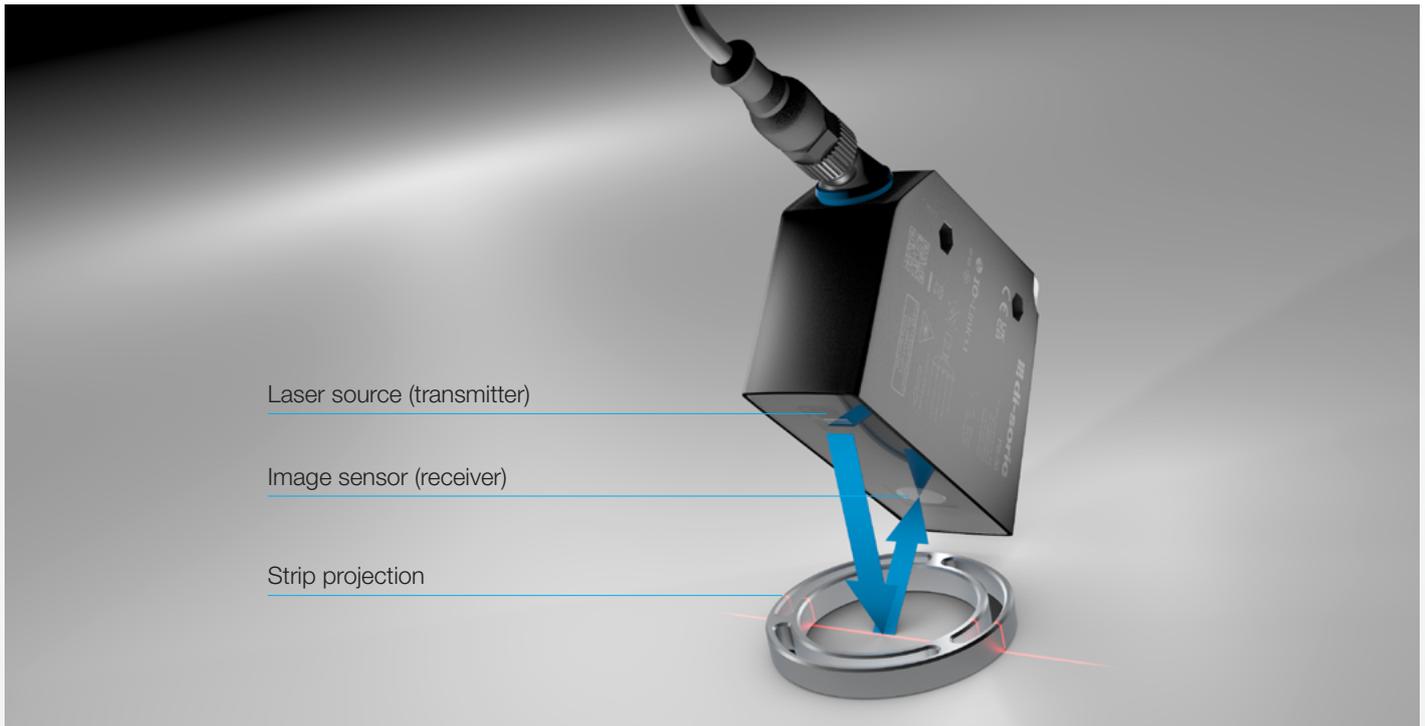
Welding nuts inspection

The nuts welded on to the profile carrier need to be checked for presence and position. The PS-30 detects not only the presence of nuts, but also compares the position in the x and z directions with a previously learned pattern. The results are transmitted numerically via IO-Link or the digital IO interface as an OK/not-OK result.

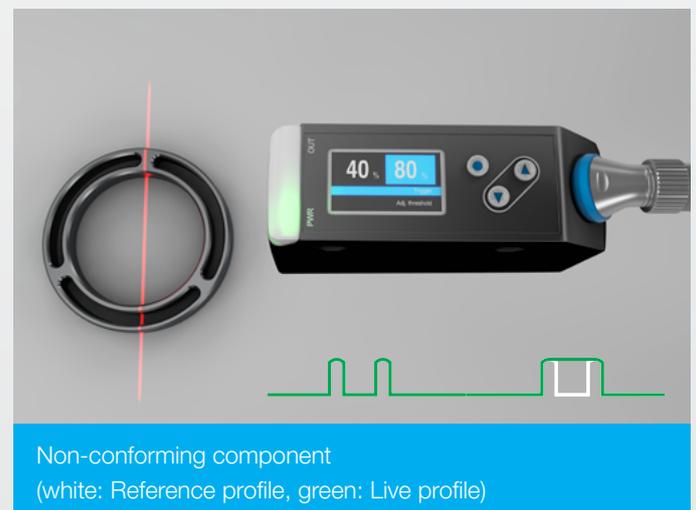


INLINE QUALITY INSPECTION WITH THE PS-30

The PS-30 will meet your difficult challenges. By means of the light section method, it reliably detects the profile of objects and determines differences from 0.5 mm. Through the comparison of the actual height profile with the predefined height profile, a correct assembly, use, orientation and processing of the component can be checked.



The inspection region can be delimited to relevant sections thanks to the region-of-interest function (ROI). Two green markers visualize the selected ROI on the laser line. By means of the ROI function, minimal gap deviations (e.g. in the case of unplugged plug connection) are also detected in addition to the presence or absence of the smallest components.

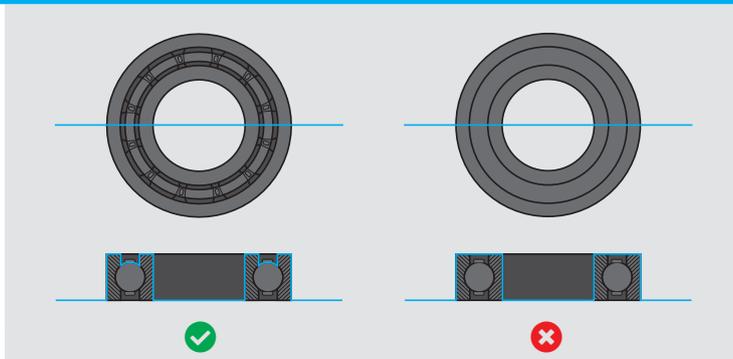


SORTING AND ORIENTATION

The PS-30 differentiates parts which can barely be distinguished from one another. The correct position of the objects is checked in the continuous process. Bad parts can thus be safely detected and sorted out.

Your advantages

- Detect error sources early on and eliminate them
- Minimize rejection rate in the long term
- Prevent consequential damage due to installed bad parts

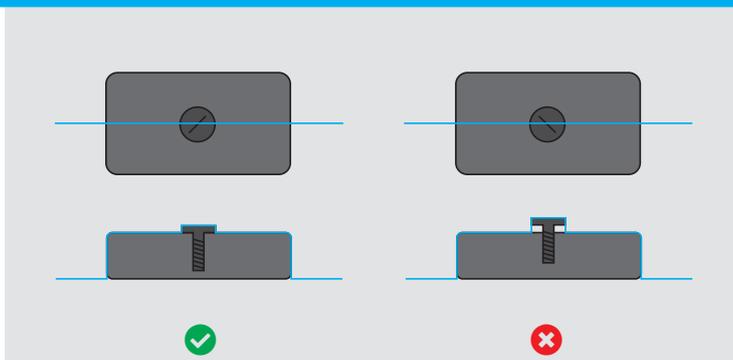


COMPLETE AND CORRECT ASSEMBLY

The correct and complete assembly of, for example, seal rings or screw-in depth of screws is reliably checked by the PS-30 Profile Sensor.

Your advantages

- Detect incomplete components and add on if necessary
- Readjust or sort out incorrectly assembled components
- Prevent leaks or instabilities

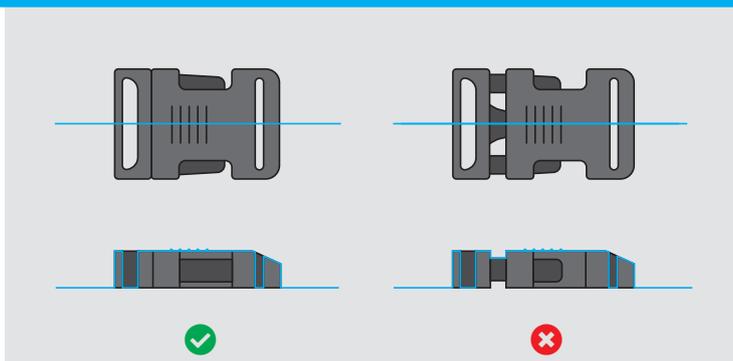


GAP CHECKING

The PS-30 checks whether seals are fastened through a focused contour comparison for the relevant profile section.

Your advantages

- Detect and rework incorrectly assembled components

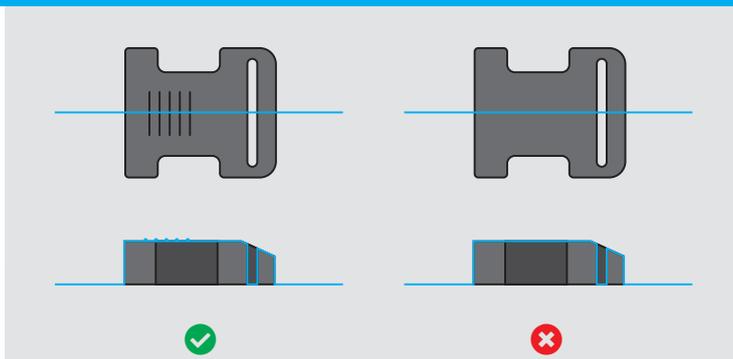


PROCESSING CHECKING

Using the contour, the PS-30 distinguishes processed and unprocessed parts.

Your advantages

- Surface structure makes possible conclusions concerning possible errors in the system (e.g. unprocessed workpieces due to a machine error)



TECHNICAL DATA

PS-30



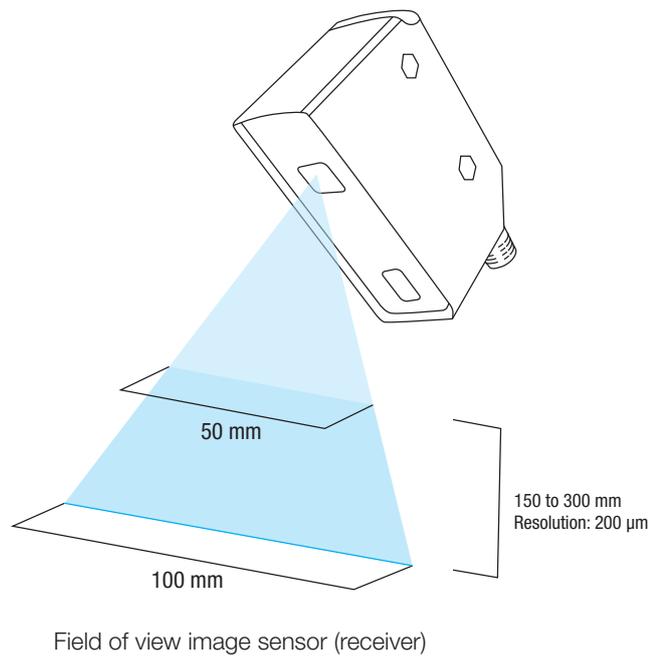
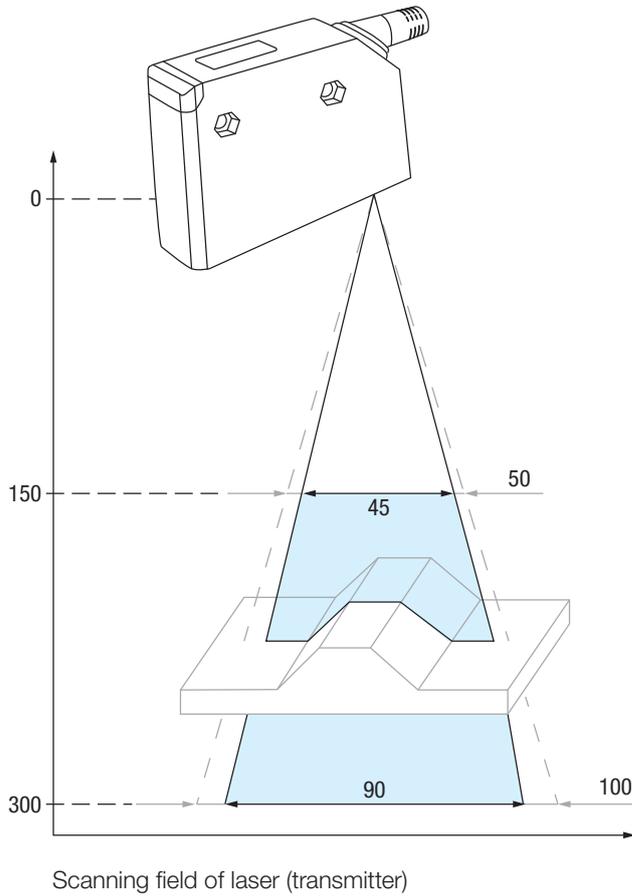
PS-30

Reference parameters	+20°C, 24 VDC
Power consumption	< 200 mA
Housing dimensions H/W/D	88 / 65 / 28.5 mm
Housing material	Die-cast zinc (black)
Weight	535 g
Protection class	III, operation on protective low voltage
Storable profiles	10
Number of inputs/outputs	1 (digital) / 2 (digital)
Switching output	pnp/npn, 100 mA, NO/NC parameterizable
Interface	IO-Link V1.1, COM3
Profiles	Smart Sensor: Process Data Variable, Device Identification, Device Diagnosis
Light source	Laser
Light color	Red
Wavelength	650 nm
Laser class	1 (IEC 60825-1)
Ambient light immunity	20 kLx
Measuring range	150 to 300 mm
Measured value resolution	X-axis 0.25 mm, Z-axis 0.2 mm
Measuring frequency	5 Hz
Protection type	IP65
Connection	Connector, M12, 5-pin

MEASURING RANGE

PS-30

Working and lateral detection region



ACCESSORIES MACHINE VISION

CUSTOMIZED ACCESSORIES

It is not only the quality of the sensors that plays a major role in the process-reliable detection of parts and objects. The accessories are also very important. They can ensure flexible, stable mounting, secure signal transmission and much more.



LIGHTS FOR VISION SENSORS

There are applications that require the illumination of objects. di-soric has an extensive portfolio of lights for industrial image processing and identification that satisfy these requirements. Further information can be found in the brochure "Vision ID Lights" or on our website www.di-soric.com.

ID READER FIXED-MOUNTED AND HANDHELD

IDENTIFICATION SOLUTIONS

In a smart factory, production logistics is another important factor. Identification solutions are required for the detection and localization of parts, product carriers, products, packaging, etc. from incoming goods to final shipping. di-soric offers fixed-mounted or mobile code readers for reading 1D and 2D codes in its portfolio.



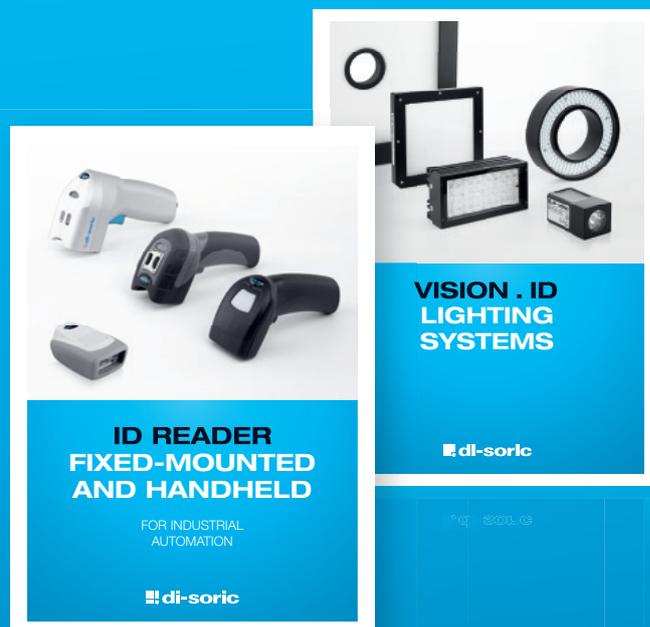
YOU WANT MORE?

Further information can be found in our brochure "Vision.ID Lighting Systems" and "ID Reader Fixed mounted and Handheld" and on our website: www.di-soric.com

Would like to speak directly with one of our employees?

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SOLUTIONS. CLEVER. PRACTICAL.

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