VISION SENSORS

FOR INDUSTRIAL AUTOMATION

di-soric

VISION SENSORS
FOR THE MOST DIVERSE REQUIREMENTS

CS-50 VISION SENSORS – SIMPLE OPERATION AND RELIABLE DETECTION TOOLS

CS-50 Vision Sensors – the world's smallest vision sensors offer powerful performance with easy handling for numerous verification tasks in industrial applications.

With their Liquid Lens, autofocus and outstanding click-zoom function, you can realize multiple fields of view without a loss of resolution.

- Smallest vision sensor for narrow environments
- Extensive verification tools
- 3 variants for working distances from 40 - 1200 mm
- Liquid Lens, autofocus & click-zoom

CS-60 VISION SENSORS – THE BEST POSSIBLE FLEXIBILITY FOR DEMANDING INSPECTION TASKS WITH UP TO 1.6 MEGAPIXEL RESOLUTION

Our CS-60 Vision Sensor off ers outstanding fl exibility for the highest degree of productivity. Due to easy lens changing and integrated high-performance illumination, the CS-60 creates excellent images with respect to distance, fi eld of vision and resolution.

The extensive tools can be easily expanded through software upgrades and may be individually customized as needed. Comfortable, logical linking of tools and the versatile Profi net connection to the existing PLC component complete its fl exibility.

- Flash with high power LED illumination in red and white
- Changeable lenses for flexibility in terms of distance, field of vision and resolution
- Upgrade options: Measuring module and Detection module and reading of 1D/2D codes
- Flexible Profinet component configuration

OUR ALL-AROUND SOLUTION.
THE CS-50.

CS-50 VISION SENSORS – SIMPLE OPERATION AND RELIABLE DETECTION TOOLS

The compact and robust CS-50 is easily integrated into machines and systems that only have limited space. The intuitive operation of the Vision Sensor offers top performance for completeness checking, rotation verification, presence checking, counting objects and much more.

Up to 300% faster performance

The CS-50 offers a significant increase in speed compared to existing vision sensors. A process speed with up to 2,500 component inspections per minute is possible.

The world's smallest industrial Vision Sensor

The CS-50 is the world's smallest vision sensor – this also means it can be integrated easily into machines and systems that have limited space.

Easy to operate

Our new Autovision software can be operated by every sensor user – for everyone who wants to run their applications intuitively with a robust and powerful product.

Click-zoom & Liquid Lens Autofocus

Digitally adjusting both focal lengths and the Liquid Lens Autofocus option when changing a lens does not require the use of hardware and prevents misalignment.

Common interfaces on board

In addition to our PROFINET and RS232 standard protocols, the CS 50 is also able to communicate with your industrial environment via Ethernet/IP and TCP/IP.

1.4 GB of memory

With approximately 1.4 GB of RAM, there is enough memory for practically an unlimited amount of jobs.

PLC-compliant data types

We supply PLC-compliant data formats for a fast, convenient connection to your PLC. This makes it possible to control the parameters in a job via external systems using a direct connection to your machine control system.

SOFTWARE THE CS-50 IS BASED ON. AUTOVISION.

THE INTERFACE

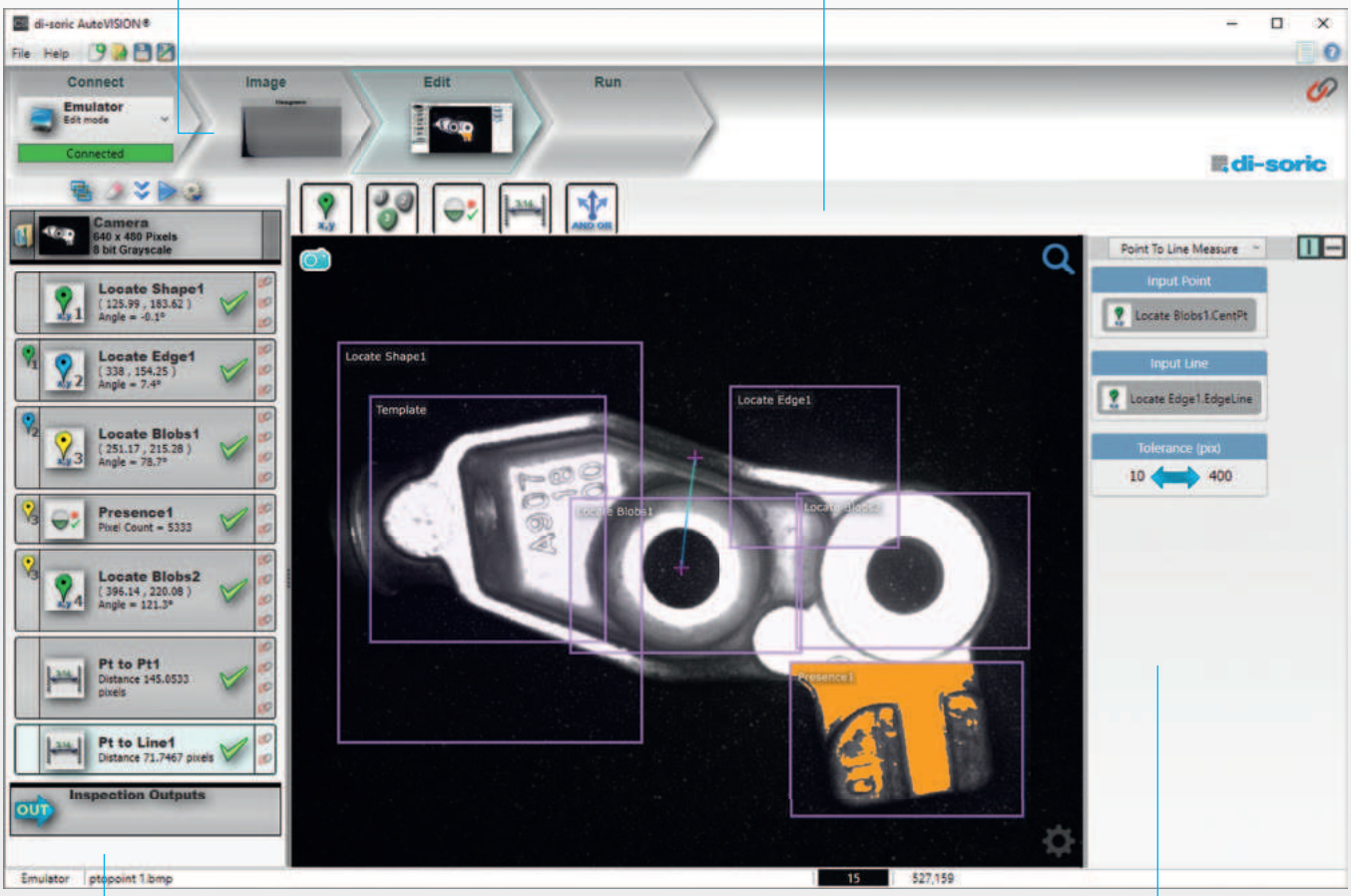
Autovision is a proven, user-friendly piece of Vision software which can be configured step-by-step and has an intuitive and clearly structured menu interface.
With tools in the five areas, localization, counting, detection, measurement and logic, many applications can be realized quickly and easily.

Navigation bar & verification tools

- Simple step-by-step programming
- Menu guidance available in 5 languages

Display & Drawing tools

Image viewing for checking and analysis during operation



Status tools

Measured values and test results/status are shown here

Configuration

Parameters for search criteria can be adjusted simply and directly.
Limit values for the evaluation criteria can be entered easily

OUR FLEXIBLE ONE.
THE CS-60 VISION SENSOR.

ALSO FOR MORE DEMANDING APPLICATIONS WITH UP TO 1.6 MEGAPIXEL RESOLUTION

The CS-60 Vision Sensor impresses with its powerful, upgradeable software, clever and robust illumination concept, its M12 interchangeable lens system, and extensive optics accessories. Thanks to high-performance image processing tools and the quickly configurable nVision-i software, optimal performance and smooth startup is guaranteed.

Comprehensive focal lengths through M12 interchangeable lenses

for satisfying all common application requirements in the industrial vision sensor area

High-performance image-processing tools and a user-friendly, intuitive software interface

ensure simple and seamless integration

Integrated high power LED illumination in red and white

Illumination can be switched in the software for optimal startup at high speed and at a large working distance

Upgrade function

The modules “Measurement” and “1D and 2D code Reading” can be acquired separately or together as a software expansion to the standard module (Localization, Detection, Counting) with a simple license model.

More on page 8

Reliable and fast: The ID Read tools for all common 1D and 2D code types

(Optional upgrade)

Supports industry protocols

Digital I/O, TCP/IP, Profinet, HTTP, FTP/SFTP and ReST-API are supported

Robust, compact casing with protection class IP67

For use in working environments with active washing without the application of additional protective equipment

CS-60 VISION SENSOR – nVISION-i SOFTWARE

SAVE TIME

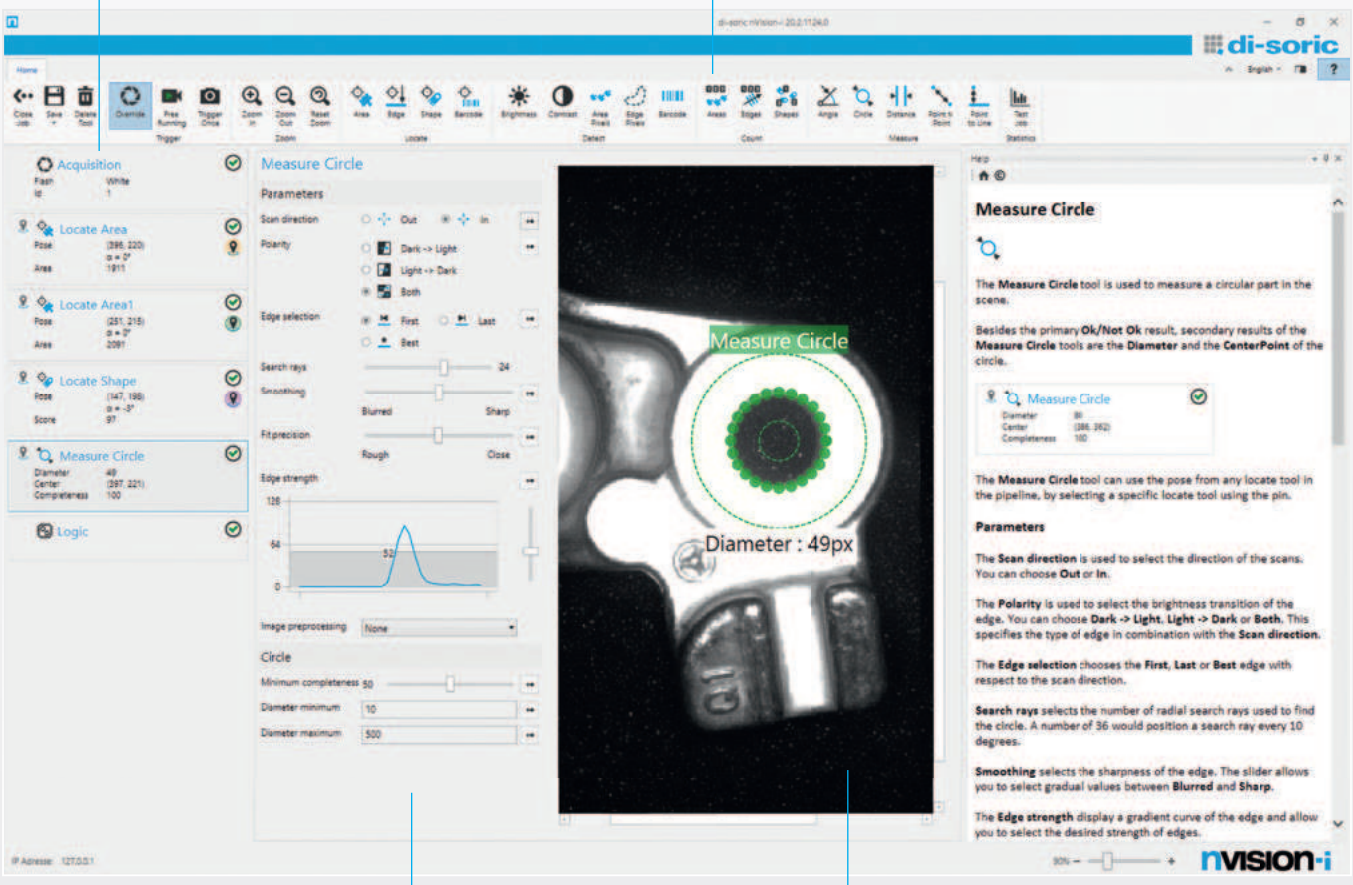
Not just because of the interface, which is clear, intuitive and simple to operate, but also because of the high-performance tools, which can be optimized at the highest level of quality and with the highest level of performance.
The visualization of the pipeline and linking of individual tasks in the Logic tool make the greatest degree of flexibility and high speed in the realization of the application possible.

Pipeline & status checks

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

Navigation bar & verification tools

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



Configuration

- Parameters for search criteria can be adjusted simply and directly
- Limit values for the evaluation criteria can be entered easily

Display & Drawing tools

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

CS-60 VISION SENSOR
nVISION-i SOFTWARE

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 an adjustment to the software for tailored solutions:
Desired functionality and operation with a look & feel in your own design.

UPGRADES

From the standard tool set (Localization, Detection, Counting) to the modules “Measurement” and/or “Reading 1D & 2D codes”

CS 60 – Standard Tool Set Localization - Detection - Counting		
	+ Measurement module	
+ Reading 1D/2D Codes module		
Complete modules:	Complete modules:	Complete modules:
Localization Detection Counting	Localization Detection Counting	Localization Detection Counting
– Reading 1D/2D Codes	Measuring Reading 1D/2D Codes	Measuring –

The standard model of the CS-60 with the tool set Localization, Detection and Counting can be expanded with additional functions such as Measurement and Reading 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.

CUSTOMIZATION

In addition to upgrades, we also offer the expansion or modification of the nVision-i software for tailored solutions – including startup support for maximum productivity and quality gains.

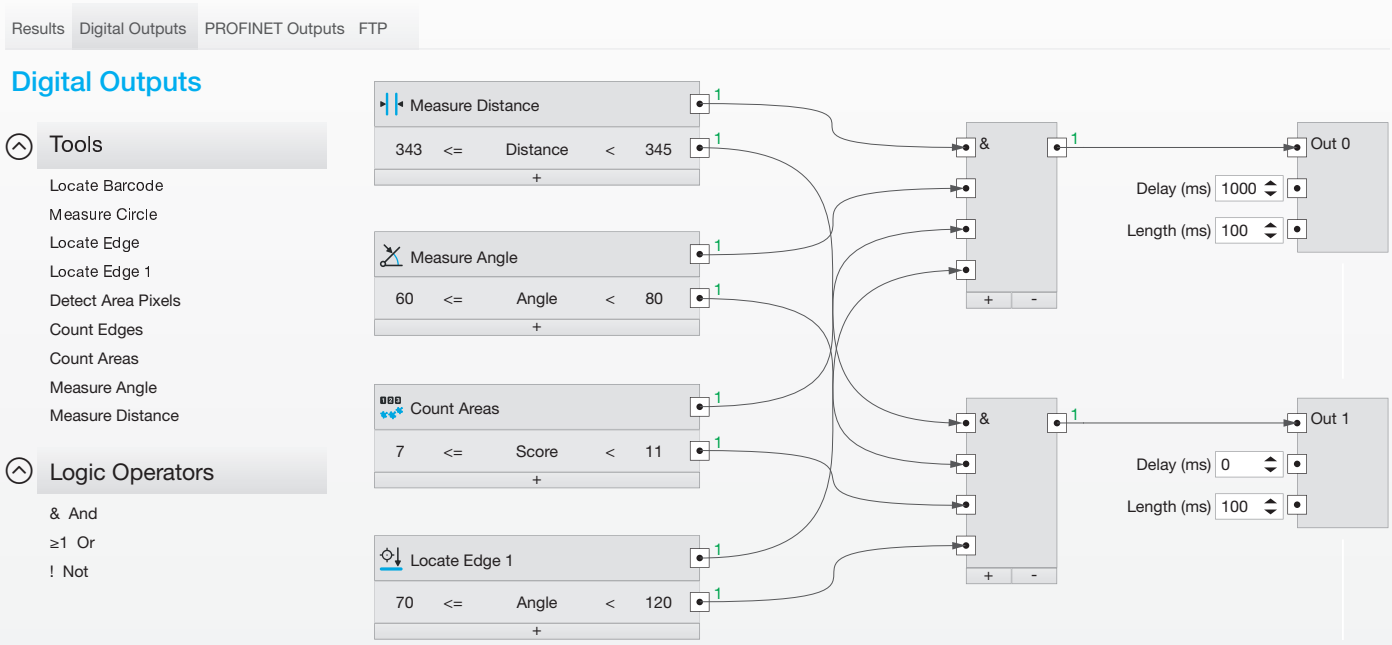
For example, you need a variety of tools in an application which, taken together, reduce the performance of the sensor. We will place them together in one module for you and thereby increase productivity and performance of the CS-60 in the application.

In addition to precise, high-performance functionality, your Vision applications also get their own look & feel in the interface.

THE LOGIC TOOL
nVISION-i SOFTWARE

THE LINKING OF RESULTS WITH OUTPUTS

The free linking of the results of several tools into an overall result directly in the vision sensor provides you with high-performance - without utilizing the PLC.
Another advantage is the high degree of flexibility: the measured values can be addressed at any point on the Profinet fieldbus.



The graphically oriented Logic tool is based on a function plan (FUP), whereby a clear display is possible, even in more complex functions. This, in turn, ensures that the implementation of the behavior of inputs and outputs is simple and highly transparent.

SIMPLE AND FAST

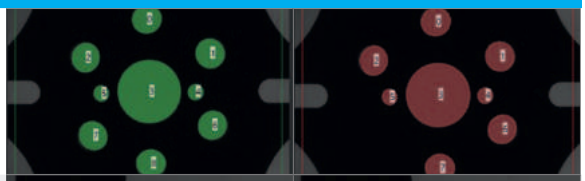
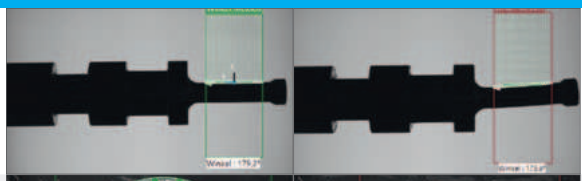
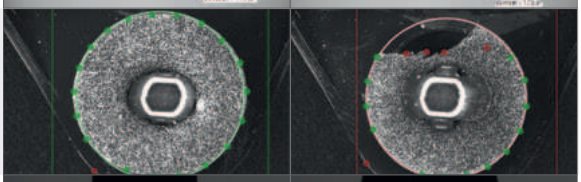
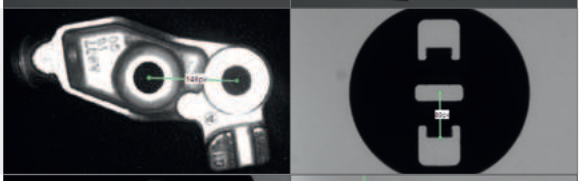
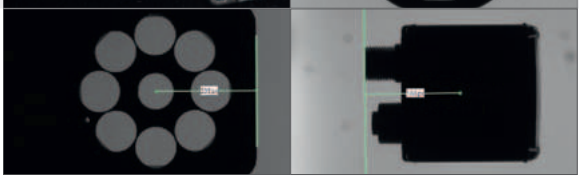
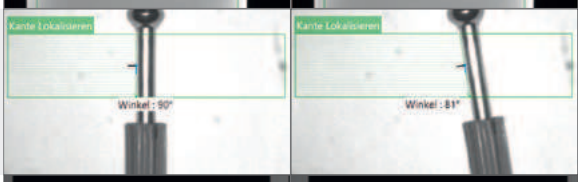
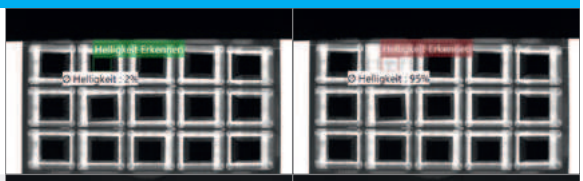
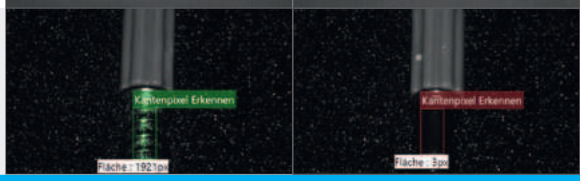
COUNTING of areas, edges and shapes			CS 50	CS 60
AREAS	Determines the number of contiguous dark or bright regions		✓	✓
EDGES	Determines the number of edges along a line/search beam		✗	✓
SHAPES	Identifies and counts objects whose contour matches the learned contour		✓	✓
MEASUREMENT of angles, diameters, distances			CS 50	CS 60
ANGLE	Determines the angle of an edge		✓	+
CIRCLE	Determines the diameter and circularity		✓	+
DISTANCE	The slider determines the distance between 2 edges		✓	+
POINT-TO-POINT	Measures the distance between 2 contour patterns, 2 circles or mixed points		✓	+
POINT-TO-LINE	Measures the distance between a point (from blob, contour pattern, circle or edge) and a line/edge		✓	+

IMAGE PROCESSING TOOLS:		
✓ available		
+ available after upgrade		
✗ not available		

THE IMAGE PROCESSING TOOLS

LOCALIZATION of areas, edges and shapes			CS 50	CS 60
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			CS 50	CS 60
BRIGHTNESS	Determines average brightness within the defined working area		✓	✓
CONTRAST	Determines the contrast within the defined working area		✓	✓
AREA PIXELS	Determines the number of pixels of a part of the scene		✓	✓
EDGE PIXELS	Determines the edge texture within the defined working area		✓	✓
LOCALIZE AND READ 1D and 2D codes				CS 60
LOCALIZATION	Finds a code within the defined search field and serves as a guide for subsequent tools. Efficient in checking labels			+
READ	Decodes all codes and can evaluate the content using different criteria (regular expressions)			+
COUNTING	Enables multiple recognition of different codes			+

APPLICATIONS
VISION SENSORS

Our vision sensors rise to the challenge of ambitious verification tasks and thus can be used in a variety of industries.
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.

Quality checks in automobile assembly

CS-50 / CS-60

Position checks and presence checks of rivets, bores and nuts

CS-50 / CS-60

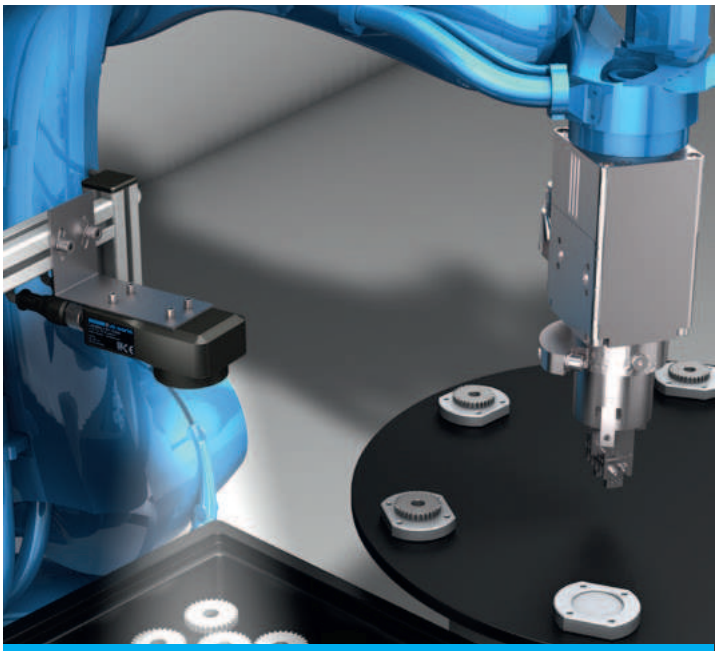
Positioning checks in consumer goods production

CS-50 / CS-60

Quality control prior to packaging

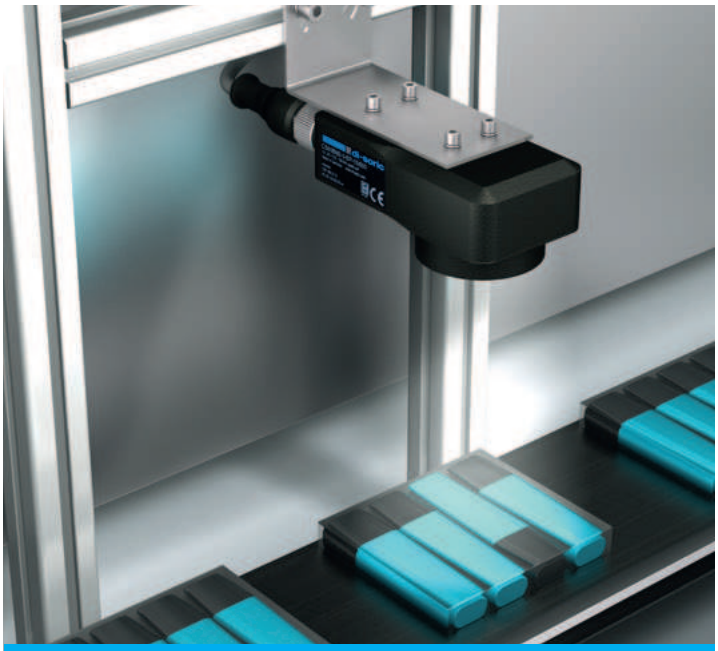
CS-50 / CS-60

Demanding tasks, such as quality checks of highly reflective objects and applications in changing ambient lighting situations or at high speeds are reliably performed. Integration in existing systems, even when space is limited, is easily possible. Thanks to the robust IP67 casing, our Vision Sensors can also be used in production environments where active washing takes place.



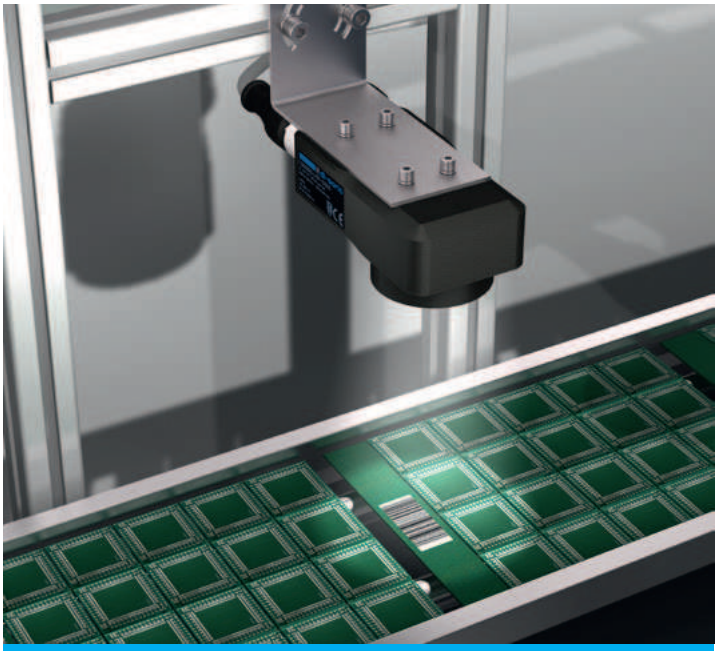
Inspection of parts and robotic pick & place

CS-50 / CS-60



Position checks in the packaging industry

CS-50 / CS-60



Alignment of electronic components using barcode

Only CS-60

Quality control via barcode determination for packaging machines

Only CS-60

TECHNICAL DATA
CS-50 VISION SENSORS

	CS 50 BM2-2-ES-G1 BM2-2-ES-G5	**CS 50** BM2-4-ES-G1 BM2-4-ES-G5	**CS 50** BM2-4L-ES-G1 BM2-4L-ES-G5
T			
▪ Finding	■	■	■
▪ Presence	■	■	■
▪ Counting	■	■	■
▪ Measuring	■	■	■
▪ Logic	■	■	■
Wo	50 – 300 mm	40 – 150 mm	75 – 1200 mm
Se	5 mm / 10 mm	16 mm / 32 mm	16 mm / 32 mm
I	G1: High power, red G5: High power, white	G1: High power, red G5: High power, white	G1: High power, red G5: High power, white

Sc	CS-50 Vision Sensor
Ho	25.4 / 44.5 / 44.5 mm
Se	5 to 30VDC
I	Monochrome / VGA
St	1.4 GB / virtually unlimited
F	Electronic Autofocus
I & p	RS232, Ethernet/IP, TCP/ IP, ProfiNet
Di	1 (trigger) / 3
I	Via FTP

TECHNICAL DATA
CS-60 VISION SENSORS

	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	**300**	**300ID**	**400**	**400ID**	**300**	**300ID**	**400**	**400ID**
▪ Localization	■	■	■	■	■	■	■	■
▪ Detect	■	■	■	■	■	■	■	■
▪ Counting	■	■	■	■	■	■	■	■
▪ Measuring			■	■			■	■
▪ Read ID-Code		■		■		■		■
Upgrade options:								
▪ Measurement module	■	■			■	■		
▪ Reading 1D& 2D Codes module	■		■		■		■	
▪ Customization module	■	■	■	■	■	■	■	■

	BM28-EP15/	BM38-EP15/
Type	EV76C541	IMX 273
Optical format	1/4"	1/2.9"
Resolution (H x V)	736 (H) x 480 (V) px	1456 (H) x 1088 (V) px
Pixel size (µm)	4.5 x 4.5	3.45 x 3.45
Shutter	global	global
Max. image frequency (fps)	30	30

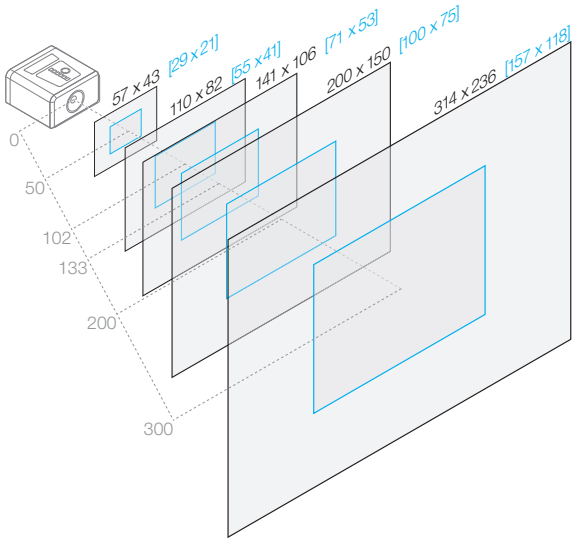
	CS60-
Scope of delivery	CS-60 Vision Sensor, lens O-S1-S-080-40, lens cover CS60-Window
Housing dimensions H / W / D	85 / 45 / 34 mm
Service voltage	18 to 30VDC
Working distance	1 Vision Sensor with S-mount - 4 lenses: 50 – 1500 mm
Focal length	Variable - S-mount: 3.6, 8, 16, 25 mm
Internal lights	Switchable 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

FIELDS OF VIEW
CS-50

THE MODELS WITH LIQUID LENS 5/10 MM AND 16/32 MM

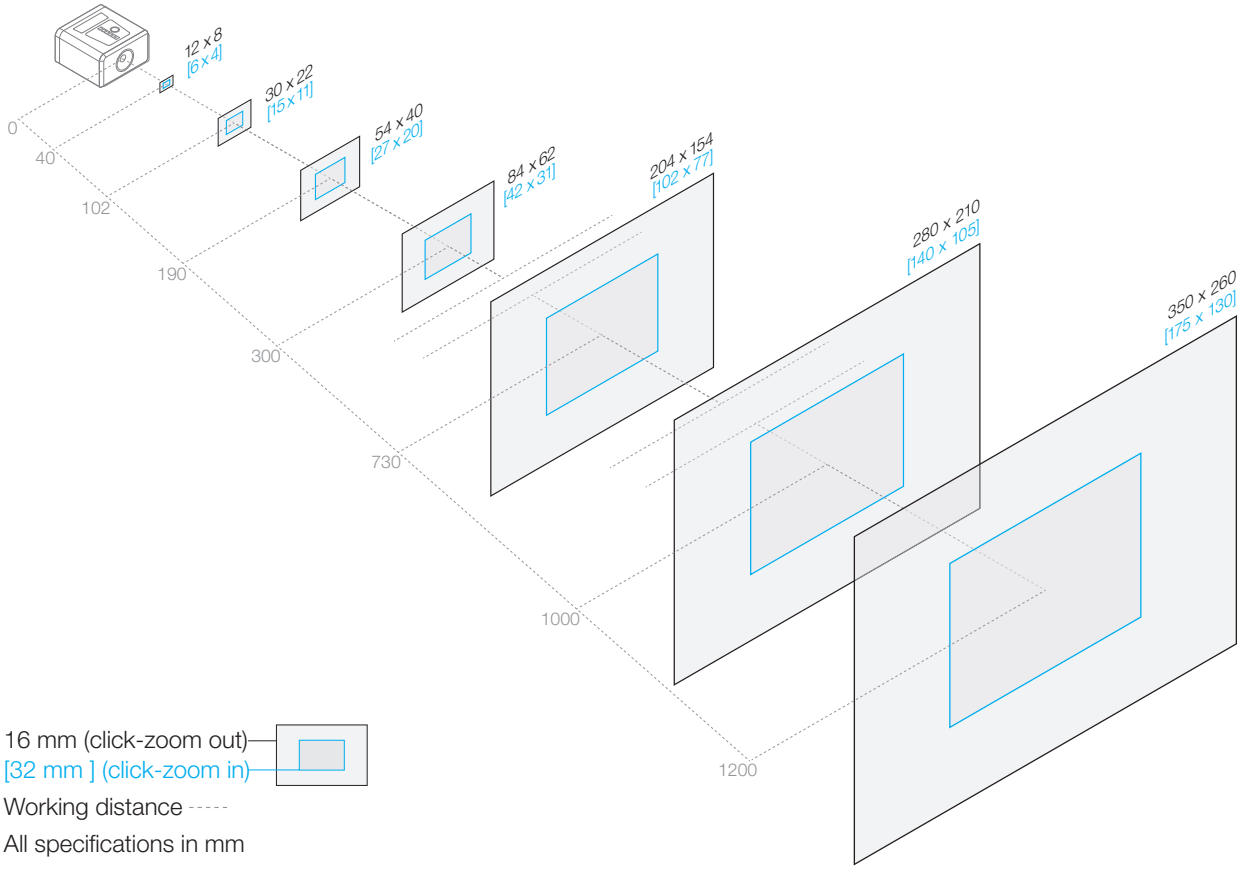
The following representation shows the fields of view of the CS-50 with Liquid Lens lenses at various working distances.

Field of view, focal length 5/10 mm



16 mm (click-zoom out)
[32 mm] (click-zoom in)
Working distance -----
All specifications in mm

Field of view, focal length 16/32 mm



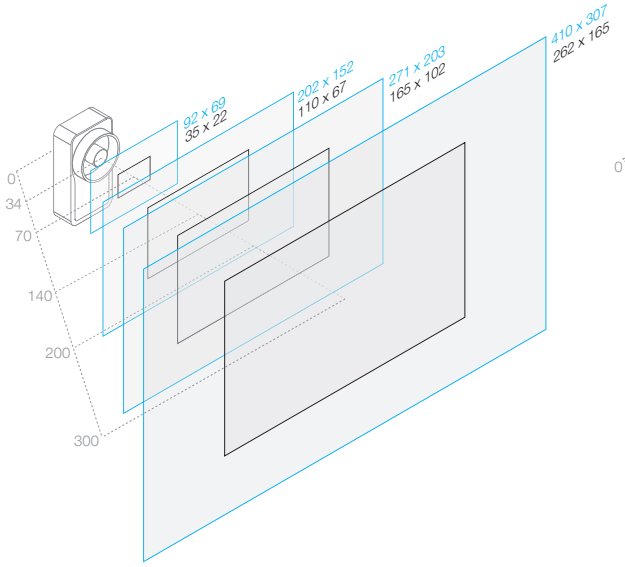
16 mm (click-zoom out)
[32 mm] (click-zoom in)
Working distance -----
All specifications in mm

FIELDS OF VIEW
CS-60

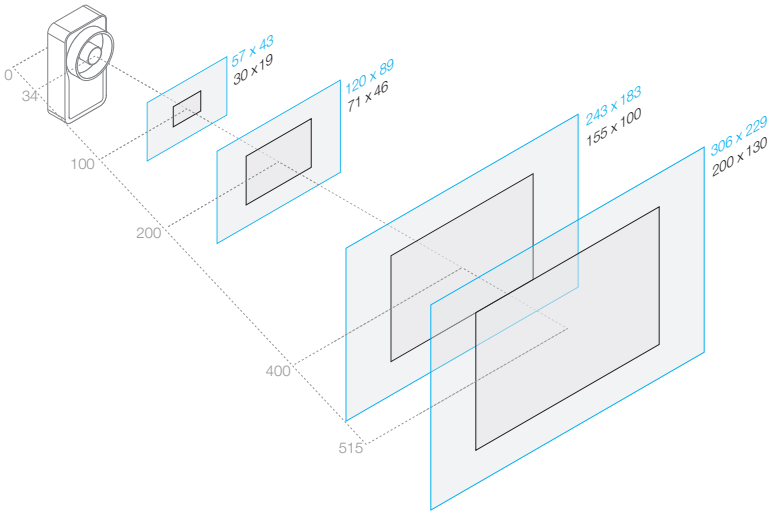
FOR THE VARIANTS CS60-BM2X AND CS60-BM3X WITH 4 DIFFERENT FOCAL LENGTHS.

The following table shows the 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.

Field of view, 3.6 mm lens

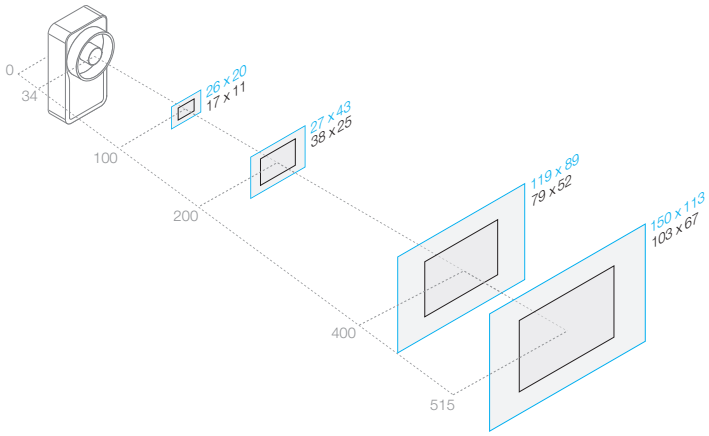


Field of view, 8 mm lens

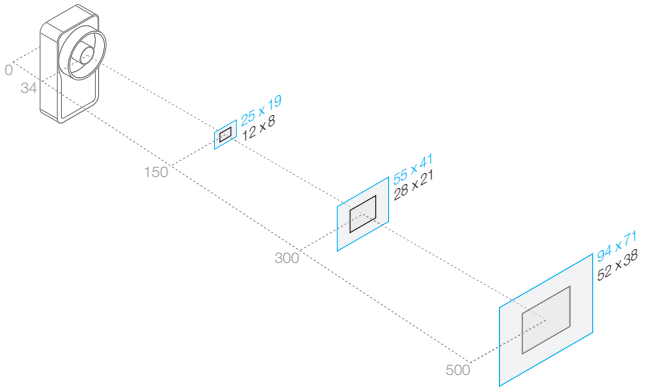


1.58 MP, 1440 x 1080 pixels
0.3 MP, 736 x 480 pixels
Working distance -----
All specifications in mm

Field of view, 16 mm lens



Field of view, 25 mm lens



1.58 MP, 1440 x 1080 pixels
0.3 MP, 736 x 480 pixels
Working distance -----
All specifications in mm

LIGHTS
FOR VISION SENSORS

VISION ID LIGHTS

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.

ACCESSORIES
FOR VISION SENSORS

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.

CS-50 HMI

CS-60 LENSES

CONNECTING LINES AND BRACKETS

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