SENSOPART

VISOR® Product Overview

VISOR® vision sensors for factory automation

VISOR® vision sensors for factory automation

Image processing can be so easy.

In the global automation of industrial processes, a vast number of decisions have to be made every second. Here, however, more complex links of detector results are necessary to achieve a safe and reliable good/bad decision. With our portfolio of vision solutions, we cover a wide spectrum of industrial image processing. Now even more complex applications can be evaluated with an easy-to-use vision sensor and without the need for a PC during operation. Whether detection & inspection, identification, measurement, positioning, or color detection – the VISOR® vision sensor family offers the right product for every application.

The foundation for this is a powerful smart vision sensor in a compact and lightweight sensor housing.

Perfectly in tune:
- A combination of sophisticated hardware and easily configurable software

Flexibility:
- One of the most extensive vision sensor families on the market to solve your applications

Scalability:
- With the VISOR® **XE**, SensoPart offers a high-performance variant with full compatibility with the existing VISOR® series

Connectivity:
- Comprehensive protocols (e.g. PROFINET, Ethernet/IP) for seamless integration into your environment

Ease-of-Use:
- Modern AI-based solutions solve applications more easily than ever

In many industries and applications the VISOR® can help to achieve the requirements of the automation task:

Automotive industry

Assembly & Handling

Robotics

Electronics

Food & Beverages

Plastics technology

Lab automation

Pharmaceuticals & Cosmetics

Solar industry

Packaging technology

The VISOR® helps to ensure quality, increase plant efficiency, reduce scrap, and reduce costs. The VISOR offers multiple ranges of integrated detectors and functionalities depending on the task:

Standard: Solves simple image processing tasks

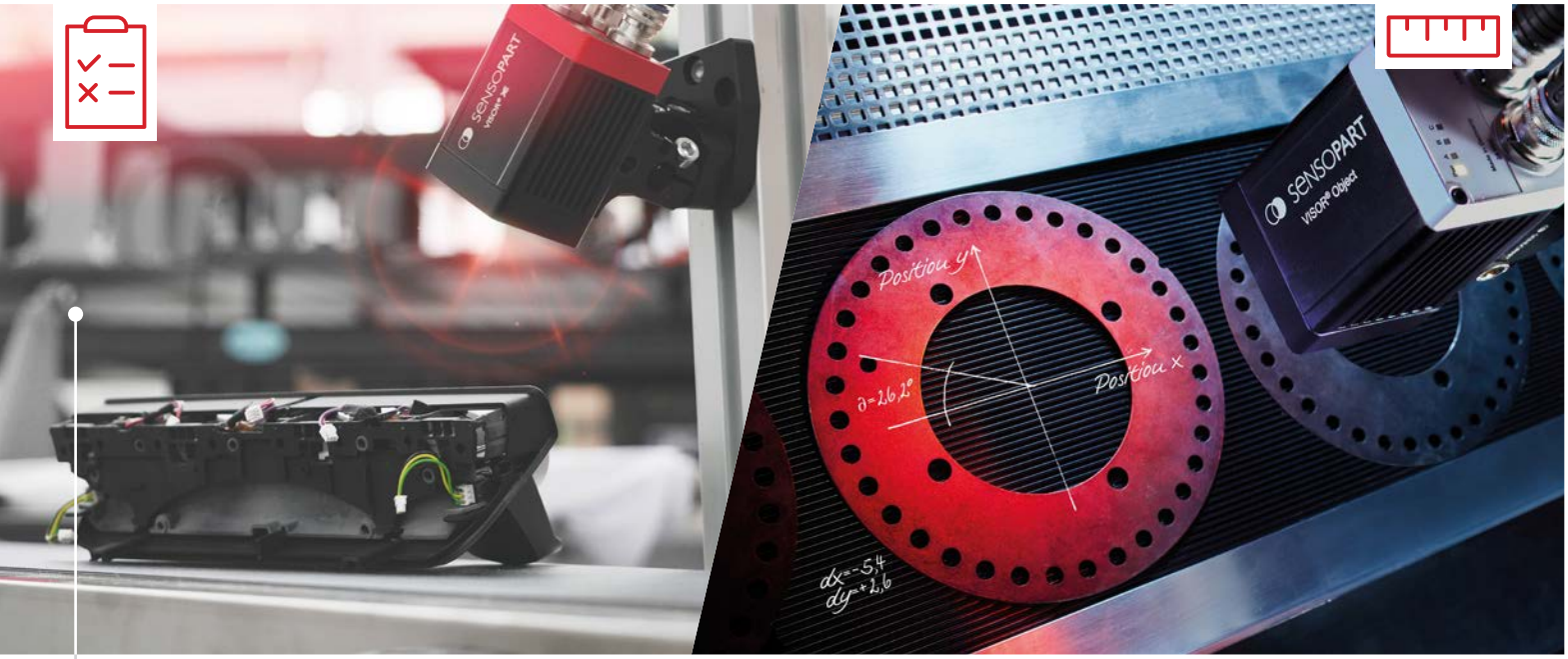
Advanced: An extended scope of functions for more challenging applications

Professional: The complete detector package suited to the most complex tasks

VISOR® vision sensors

Unified hardware and software for any application, anytime

Detection, Inspection & Measurement



Reliable detection in any situation

Most production lines require assembly and quality control checks. The VISOR® Object AI, available in both monochrome and color models, delivers solutions to the most critical production questions:

- Is the object present and correct?
- Is it the correct type / object?
- Is the object in the right place?
- Is the number of objects correct?
- Is the object dimensionally accurate?
- Is it free of errors?
- Does it have the right color?

- **VISOR® Object Standard**
  - The standard for reliable object detection
  - 7 detectors for presence check, completeness check or simple position check
  - Simple compensation of position variations even with components that are not precisely guided

- **VISOR® Object Advanced**
  - Challenging inspection tasks simply solved
  - Variants with resolutions up to 5 megapixels
  - All software functions of the standard variant
  - Further alignment and detectors for counting and evaluating objects
  - Easy integration into the system by calculating results directly in the VISOR®
  - Accurate measurement results in the entire field of view through calibration with just a few mouse clicks
- **VISOR® Object AI Advanced**
  - Classification of objects made even easier with artificial intelligence
  - All functions of VISOR® Object Advanced

Identification

Reliable differentiation and tracking of objects

Parts are generally labelled with one-dimensional barcodes or two-dimensional data matrix codes, which are either printed or applied using dot-peen or laser marking technology (direct marking). Our VISOR® Code Readers reliably read all industry standard code types.

- VISOR® Code Reader
  - Accurately reads all industry standard code types
  - Reliable interpretation of extremely small printed codes or codes marked on difficult surfaces thanks to various optics and illumination variants
- VISOR® Allround
  - Reading of engraved or raised lettering
  - Multishot technology to make height changes visible

Positioning

Reliable detection of any position

The precise positioning of parts is a key process in industrial production. Our vision sensors always have an eye on the exact position, and supply the values in robot coordinates in a few simple steps.

- VISOR® Robotic
  - Using special functions, such as gripper space check and point offset, enable a precise gripping of parts
  - Sensor data is directly transfered into the robot coordinates, avoiding the need for additional complex programming work in the robot's control system
  - Function blocks available for many robot types make integration particularly easy
- VISOR® Object
  - Fine positioning without calibration in real-world coordinates

VISOR® vision sensors

Sophisticated design and extensive features

VISOR® ready-to-use:

- VISOR® Allround
- VISOR® Object
- VISOR® Robotic
- VISOR® Code Reader

VISOR® C-Mount ready-to-use:

High-resolution monochrome or color imaging chip

- 800 x 600 pixels
- 1440 x 1080 pixels
- 2560 x 1936 pixels

- User-friendly configuration software (also available offline)
- SensoView and SensoWeb

- Integrated lens (wide, medium, narrow)
- Motorized focus adjustment

- Target Laser

- High-performance, integrated LED lighting (white, red, infrared, ultraviolet)
- Can be combined with external illumination

- C-Mount lens (various focal lengths)

- Integrated processing unit with high-performance processor
- Robust and vibration-resistant metal housing, IP 65 / IP 67
- Compact dimensions: 71 x 45 x 45 mm

- Status LEDs

- Simple and flexible installation using dovetail mount
- Extensive range of mounting accessories and holders

Power supply and I/O, M12, 12-pin

- Power supply
- I/Os
- Encoder
- External lighting

Configuration and data output, Ethernet, M12, 4-pin

- Ethernet
- EtherNet/IP
- PROFINET
- sFTP/SMB archiving
- SensoWeb

VISOR® **XE** vision sensors

XE-tra fast. **XE**-tra easy. **XE**-tra smart.

VISOR® ready-to-use:

- VISOR® **XE** Allround
- VISOR® **XE** Object
- VISOR® **XE** Robotic
- VISOR® **XE** Code Reader

VISOR® C-Mount ready-to-use:

- User-friendly configuration software (also available offline)
- SensoView and SensoWeb

High-resolution monochrome or color imaging chip

- 1600 x 1200 pixels
- 2560 x 1936 pixels

- Integrated lens (wide, medium, narrow)
- Motorized focus adjustment
- Target Laser
- High-performance, integrated LED lighting (white, red, infrared, ultraviolet)
- Can be combined with external illumination
- C-Mount lens (various focal lengths)

- Integrated processing unit with high-performance processor and additional AI optimization
- Robust and vibration-resistant metal housing, IP 65 / IP 67
- Compact dimensions: 71 x 45 x 45 mm

- Status LEDs

Power supply and I/O, M12, 12-pin

- Power supply
- I/Os
- External lighting

Configuration and data output, Ethernet, M12, 4-pin

- 2x Ethernet
- EtherNet/IP
- PROFINET
- sFTP/SMB archiving
- SensoWeb

- Simple and flexible installation using dovetail mount
- Extensive range of mounting accessories and holders

Setup requires just a few simple steps

Complex tasks made easy - with VISOR® software packages

The VISOR® **XE** delivers XE-tra power

With VISOR® **XE**, SensoPart provides a high-performance sensor that is fully compatible with our existing product line. All VISOR® models and variants utilize the same software, allowing for seamless transfer of existing application solutions between them.

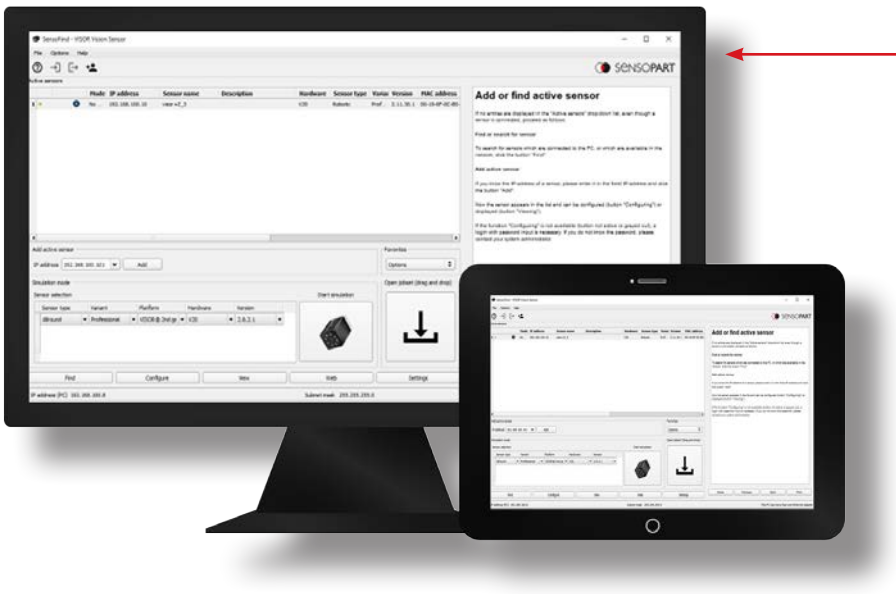
Unpack, set up, go

Vision sensors have never been as easy and intuitive to use despite unprecedented levels of performance. Our VISOR® vision sensors are the perfect solution for both beginners and experts. The VISOR® is ready in just a few mouse clicks. Thanks to VISOR® technology from SensoPart, there is now a simple and effective solution for even the most challenging vision tasks. Whether these involve complex object shapes, color detection, data matrix codes, fluorescent display elements – our application-specific vision sensors reliably detect all relevant object characteristics

Step by step towards the goal

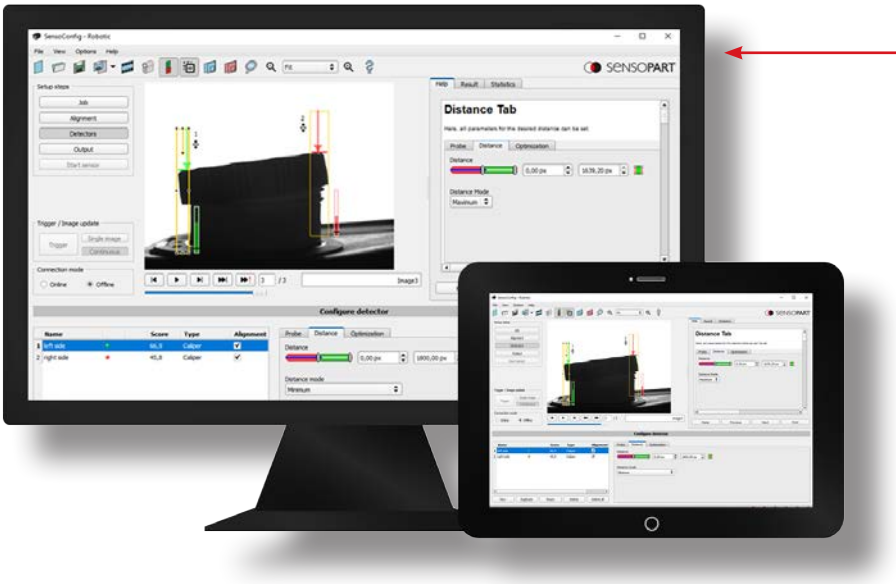
1. Set up job and image
2. Set up image tracking and detectors
3. Activate result output/communication

Once the sensor has been started, a PC is no longer necessary.



SensoFind

Lists all the VISOR® vision sensors available in the network. Configuration or Viewer mode can be accessed directly from here and offline simulation can also be started.



SensoConfig

Complex inspection tasks can be easily set up in a step by step process. The effect of each setting is immediately visible on the screen. Comprehensive logic functions enable the direct assignment of complex inspection results to one of six digital result outputs. The integrated image recorder, which enables error analysis and simulations, is also very useful.

SensoView & SensoWeb

Once configuration has been completed, the vision sensor operates as a free-standing unit – i.e. without a PC connection. Data can of course be called up at any time while the sensor is running: a unique viewer software "SensoView" with restricted user rights is available for this purpose – inadvertent changes to configuration settings are thus reliably avoided. SensoWeb enables easy connection to system visualisation by web browser.

VISOR® Object Standard

The standard for reliable object detection

The right color in the right place?
The Color variant detects different colors faster and more reliably than the human eye.
This makes it possible, for example, to sort parts based on their color, check the correct wiring of a connector or verify the correct function of LED components.

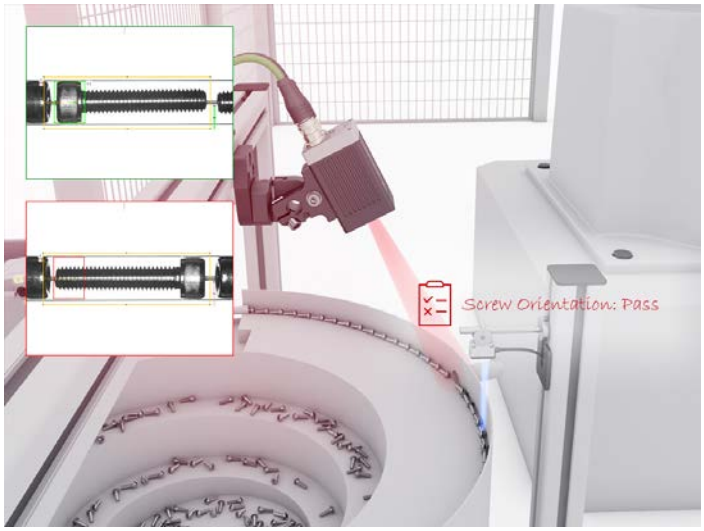
HIGHLIGHTS VISOR® OBJECT STANDARD

- Seven detectors for solving presence inspection, completeness inspection or part differentiation tasks
- Robust contour alignment for the compensation of position deviations even with non-precisely guided components
- Extensive logic functions, flexible result delay of the switching outputs for easy integration into the system
- All models available as color variants for reliable color inspection

The right package for your individual application:

VISOR® Object Standard: Presence and completeness check, sorting of parts

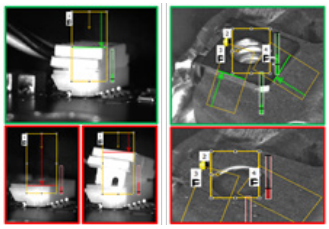
- Easy-to-use configuration and viewer software
- Easy integration with three field-of-view options and an electrical focus
- Trigger signal input delay, output signal delay, and 300mA output control can eliminate the need for a PLC in conveyor and vibratory bowl feeder applications
- Reduces setup and maintenance requirements



VISOR® Object Advanced

Challenging inspection tasks simply solved

The one with a BLOB:
With the BLOB detector (Binary Large Object), the VISOR® detects even small differences between objects, counts parts or detects whether a part is face up or face down.



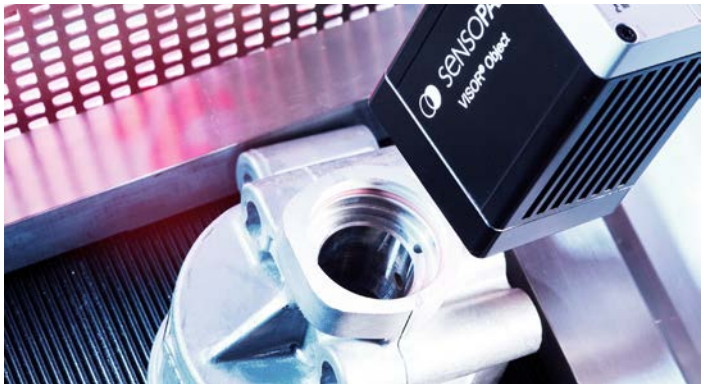
Fits, wiggles and has air
Not only the presence, but also the correct fit of the connector or mounting clip can be easily checked with the VISOR® Object.

HIGHLIGHTS VISOR® OBJECT ADVANCED

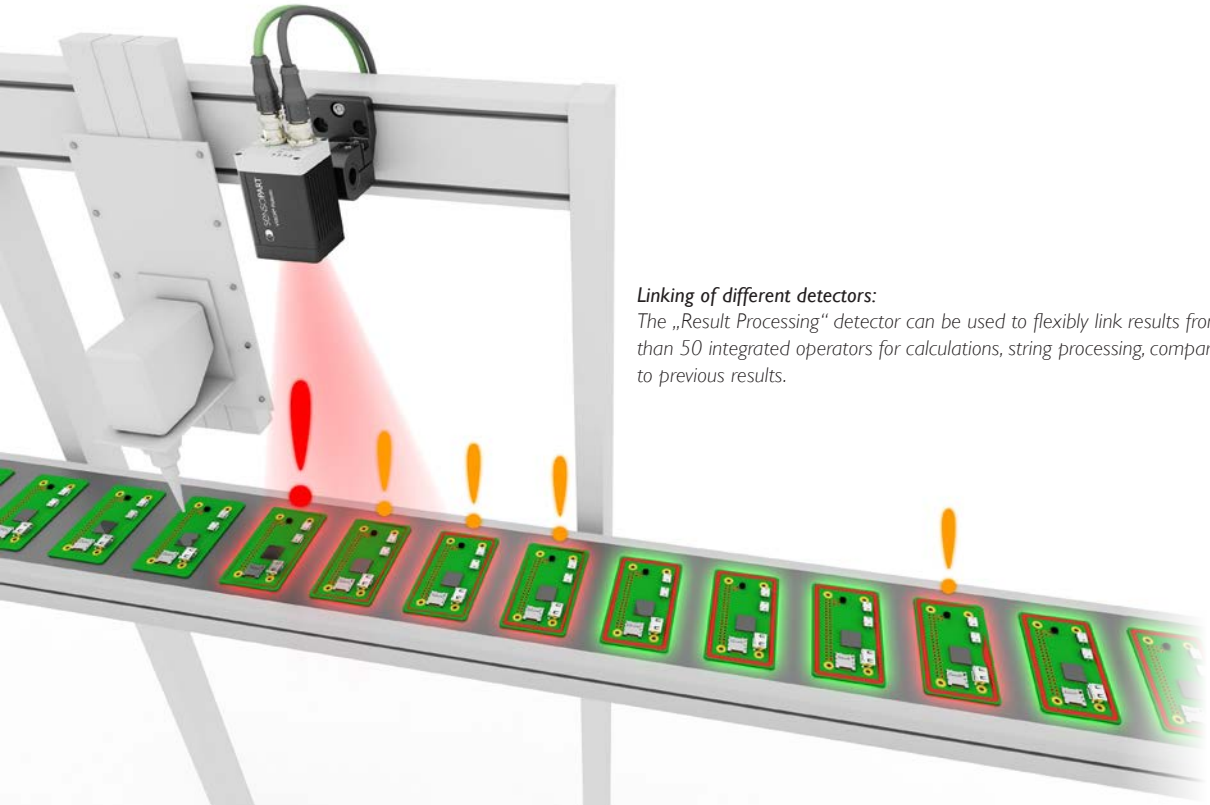
- All functions of the VISOR® Object Standard
- Hardware variants up to 5 megapixels for highest accuracy or largest fields of view
- Additional detectors for counting and evaluating objects, as well as for solving measuring and positioning tasks
- Three position alignment systems for compensation of position variations even with non-precisely guided components
- Correction of distortion, conversion to millimeters thanks to easy calibration
- Extensive logic and calculation functions for maximum flexibility, memory for access to previous results
- Flexible definition of output data for easy communication with PLC or PC

The right package for your individual application:

VISOR® Object Advanced: Presence and completeness check, position control, counting of objects, sorting of parts, part recognition and differentiation, simple measuring and quality control tasks.

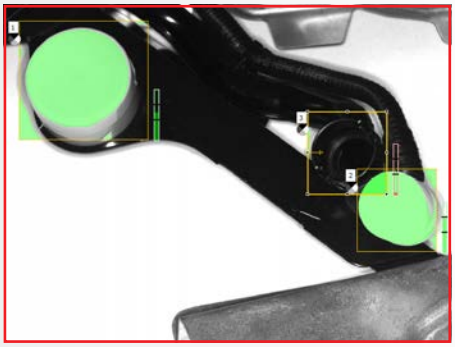


- Reliable detection and evaluation via 12 flexible detectors
- Simple compensation of position variations even with components that are not precisely guided
- Differentiation of color nuances and compensation of variances via image pre-processing
- Trouble-free integration in any installation situation thanks to various resolution levels from 0.5 to 5 megapixels, internal optics with three field-of-view variants and electrical focus, as well as a C-Mount variant and a large portfolio of illumination and accessories
- 255 jobs with up to 255 detectors, so that even diverse tasks can easily be solved



Linking of different detectors:
The „Result Processing" detector can be used to flexibly link results from different detectors. It offers more than 50 integrated operators for calculations, string processing, comparisons and decisions, as well as access to previous results.

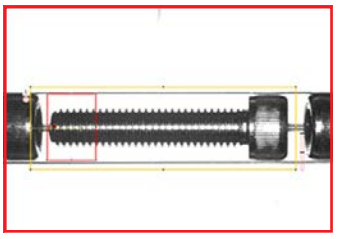
Presence check of protective caps

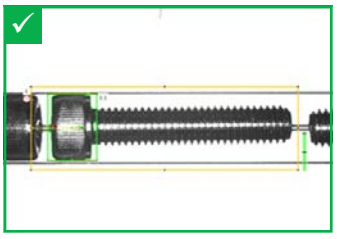


The VISOR® Object in combination with a robot provides the necessary flexibility for inspecting hard-to-see protective caps. Thus, the desired image acquisition for a reliable inspection succeeds. The software provides the function to determine the presence of the caps based on a unique grey value and, if necessary, to check their position. To check different types of caps with the same hardware, the vision sensor offers the possibility to change jobs. The duration of the image evaluation is only a few milliseconds, so that a protective cap inspection is possible in passing.

Check of the correct feeding of screws in the right position

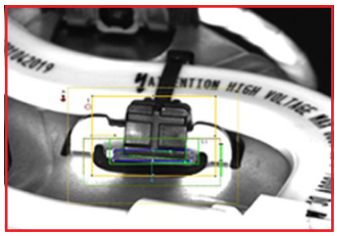
The VISOR® Object can be configured in terms of time so that it starts evaluating the fed screws at the right time, even if the trigger is staggered. Likewise, a specially designed output, which can be loaded with up to 100mA, can also be parameterized as an ejector. Thus the signal comes at the right time as well as in the right interval. Due to the integrated autofocus and the integrated illumination, the image acquisition can be easily set in the VISOR® software. To check the alignment of the screws, a simple contour detector can be parameterized in just a few steps.

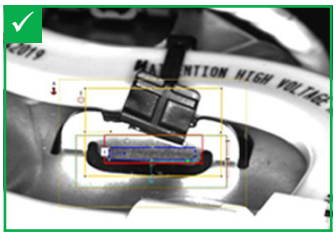


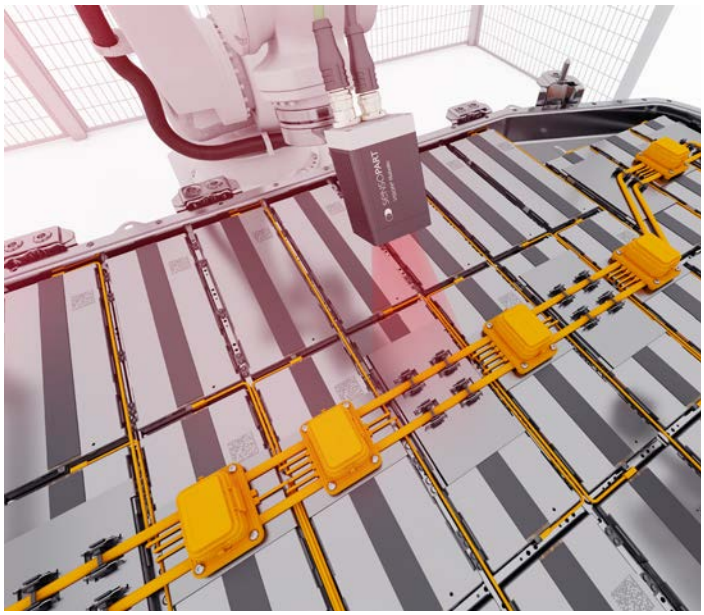


Position control of the fastening clips of cable harnesses

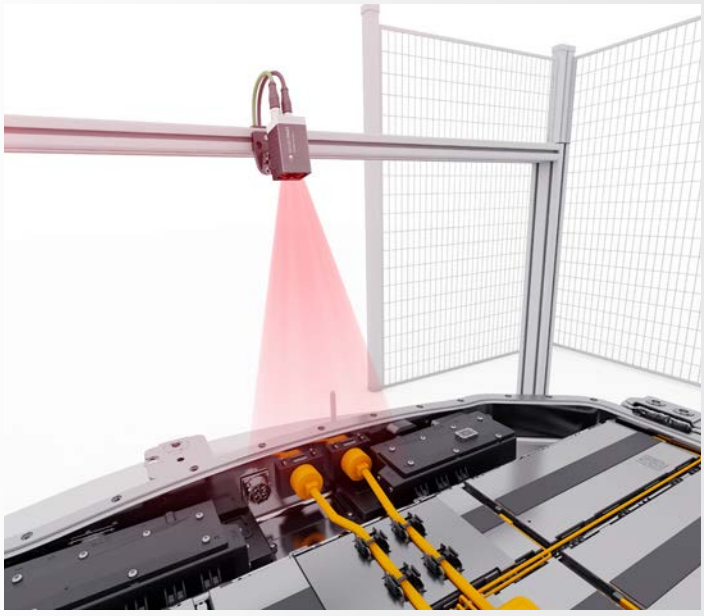
The VISOR® Object in combination with a robot provides the necessary flexibility for inspecting fastening clips that are difficult to see. Thus, the desired image acquisition for a reliable inspection succeeds. The software offers the function to teach a unique contour, which can then be searched and checked in its position. In addition, different clamp types can be stored as identification jobs in the software and checked with the same hardware. The duration of the image evaluation is only a few milliseconds, so that clamp inspection is possible on the fly, which significantly reduces the time required.



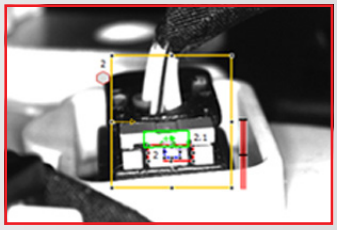


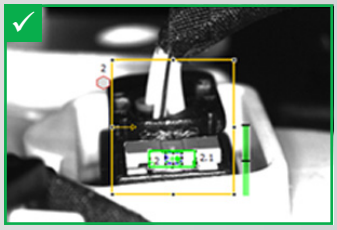


Locking check of the connections



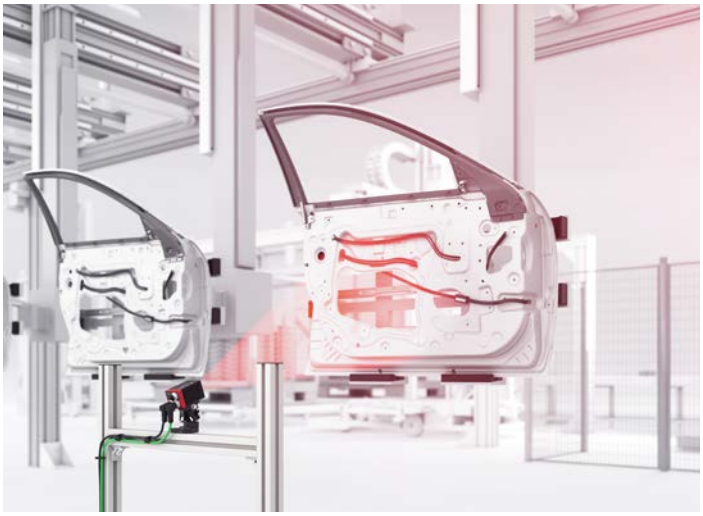
The VISOR® Object, mounted stationary or in combination with a robot as required, provides the necessary flexibility for inspecting connectors that are difficult to see. Thus, the desired image acquisition for a reliable inspection is achieved. The VISOR® software offers the function to teach a unique contour, which can then be searched and inspected in its position. Job changes are available to check different fasteners with the same hardware. The duration of the image evaluation is only a few milliseconds, so that a connector inspection is possible in passing, which significantly reduces the time required.





VISOR® Object AI

Artificial intelligence. Real results.



Presence check of additional parts on car doors:
*The VISOR® **XE** V50 Object AI, equipped with advanced artificial intelligence, performs a reliable presence check of numerous small components during the assembly of car doors.*

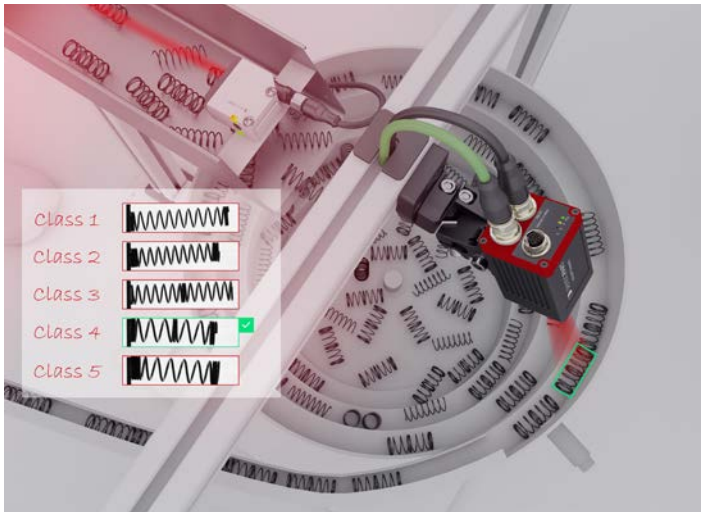
HIGHLIGHTS VISOR® OBJECT AI

- Easy setup without image processing knowledge
- AI technology in a robust vision sensor, made for industrial automation
- Train the detector with a few images on your PC
- Reliable results with strong varying processes and products
- The VISOR® **XE** Object AI features AI-optimized hardware for superior results

The right solution package for your individual application:

VISOR® Object AI: Powerful functions for presence and completeness checks, position control, counting of objects, part recognition and simple measuring and quality control tasks

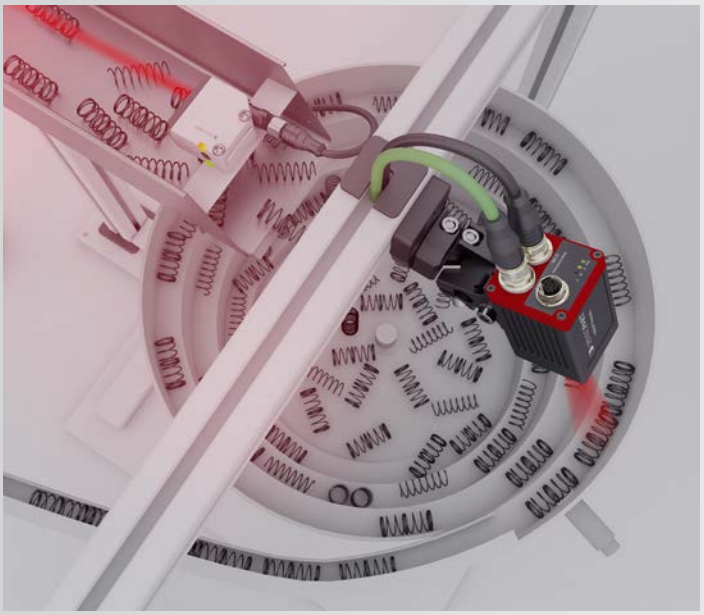
- The "Classification (AI)" detector facilitates object classification and ensures reliable assignment of up to 200 classes
- Automatic evaluation of objects as "good" or "bad" for the presence check
- Artificial intelligence (AI) enables learning of distinguishing features based on a few sample images; no expert knowledge required
- Easy adaptation to process variations such as lot variations, stains or strong reflections with just a few mouse clicks
- Thanks to the AI-optimized hardware of the VISOR® **XE** Object AI, up to 40 rapid inspections are possible for every image.



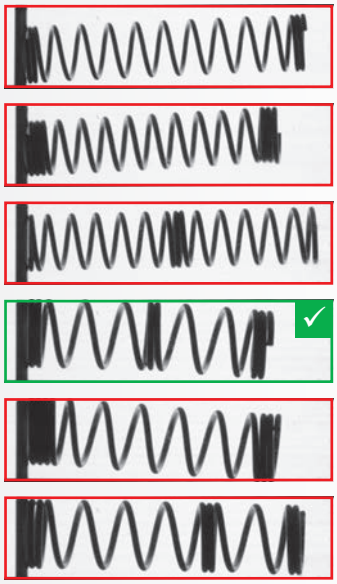
Checking the right spring type:
With the classification detector, even very similar looking springs are reliably distinguished and correctly fed to the machine.

Check the right type of fuel hoses and clips:
The VISOR® Object AI detects the different fuel hoses and respective clips in different cars and reliably checks whether the correct ones have been installed.

Classification of springs

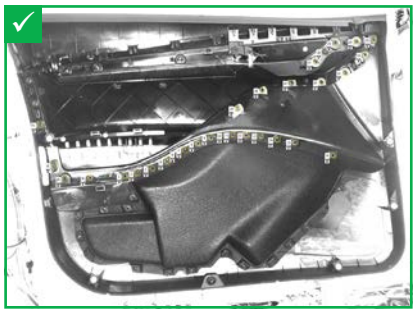


With the classification detector of the VISOR® **XE** Object AI, even very similar looking springs are reliably distinguished and correctly fed to the machine.
By assigning only a few examples of each class, the classifier automatically learns to distinguish the different types.



Precise Presence Detection of Car Door Components

The VISOR® **XE** V50 Object AI, equipped with advanced artificial intelligence, performs a reliable presence check of the numerous small components during the assembly of car doors.
The "Classification (AI)" detector enables the vision sensor to perform over 40 AI-based checks in the shortest possible time. The detector impresses with its ease of use by eliminating the need for time-consuming selection of the optimum image processing method. Users only need to teach in sample images of components with and without the desired element, which considerably simplifies and speeds up the process.



Check the right type of fuel filler necks

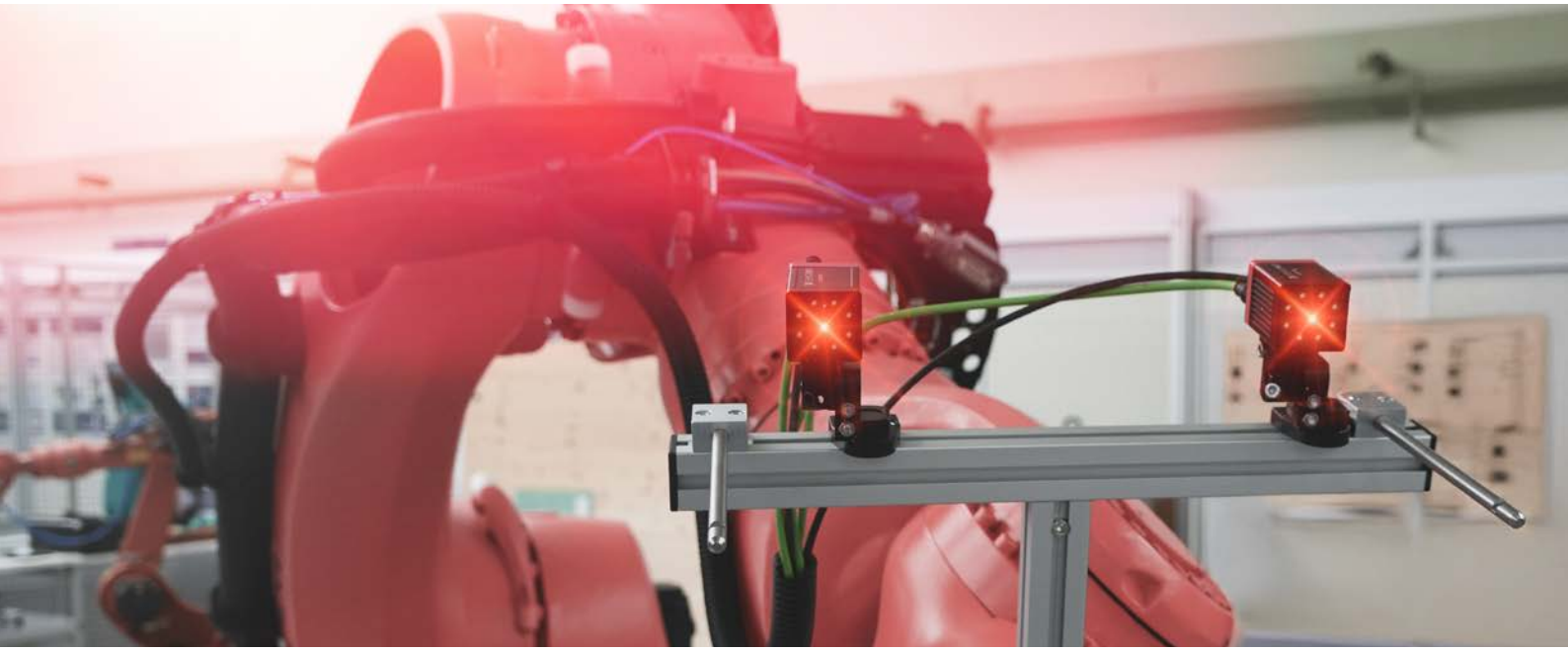
The VISOR® Object AI easily and reliably checks whether the correct type of fuel filler necks has been installed in the different cars on a production line. By assigning only a few examples of each class, the classifier automatically learns to distinguish the different types. Variations in position and reflections can be shown to the detector and it learns the necessary features.

Check the right type of fuel hoses and clips

The VISOR® Object AI detects the different fuel hoses and respective clips in different cars and reliably checks whether the correct ones have been installed. By assigning only a few examples of each class, the classifier automatically learns to distinguish the different types. Variations in position can be shown to the detector and it learns the necessary features.

VISOR® Robotic

An eye on everything – the vision sensor for Robot guidance



The VISOR® Robotic detects the position of the component in a load carrier and transmits the gripping position directly to the robot.

HIGHLIGHTS OF VISOR® ROBOTIC

- Reliable 2D or 3D localization in robot coordinates
- Accurate picking of parts made possible by special functions such as gripper clearance check and gripper offset
- Compact and lightweight housing for mobile or stationary use
- Simplified commissioning enabled by application-specific calibration methods
- Simple integration thanks to multiple robot function modules and apps

The VISOR® Robotic determines the exact position of the sensor housing. Offset data is used to correct the robot's trajectory.

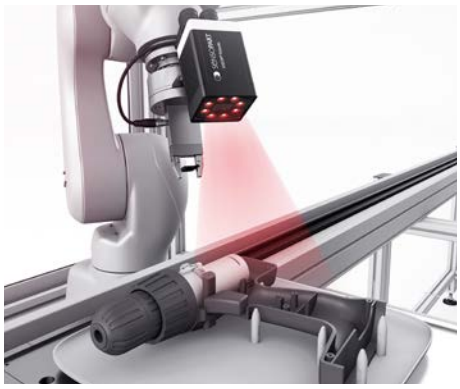
*With the additional LAN connection on the VISOR® **XE** Robotic, cabling on the robot arm is simplified, reducing cable runs.*

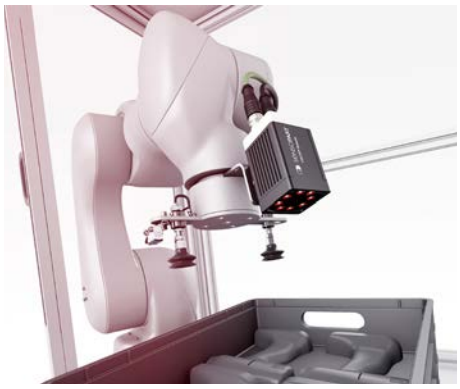
The right package for your individual application:

VISOR® Robotic Advanced: For solving common image-based robotics applications

- Simple calibration methods for robotics applications
- Result offset 3D for direct gripper point transmission to robot
- Easy adjustment of the work plane
- Target Mark 3D technology provides 3D object poses in no time

VISOR® Robotic Professional: Extended functionality for identification, extended calibration methods and localization in 3D

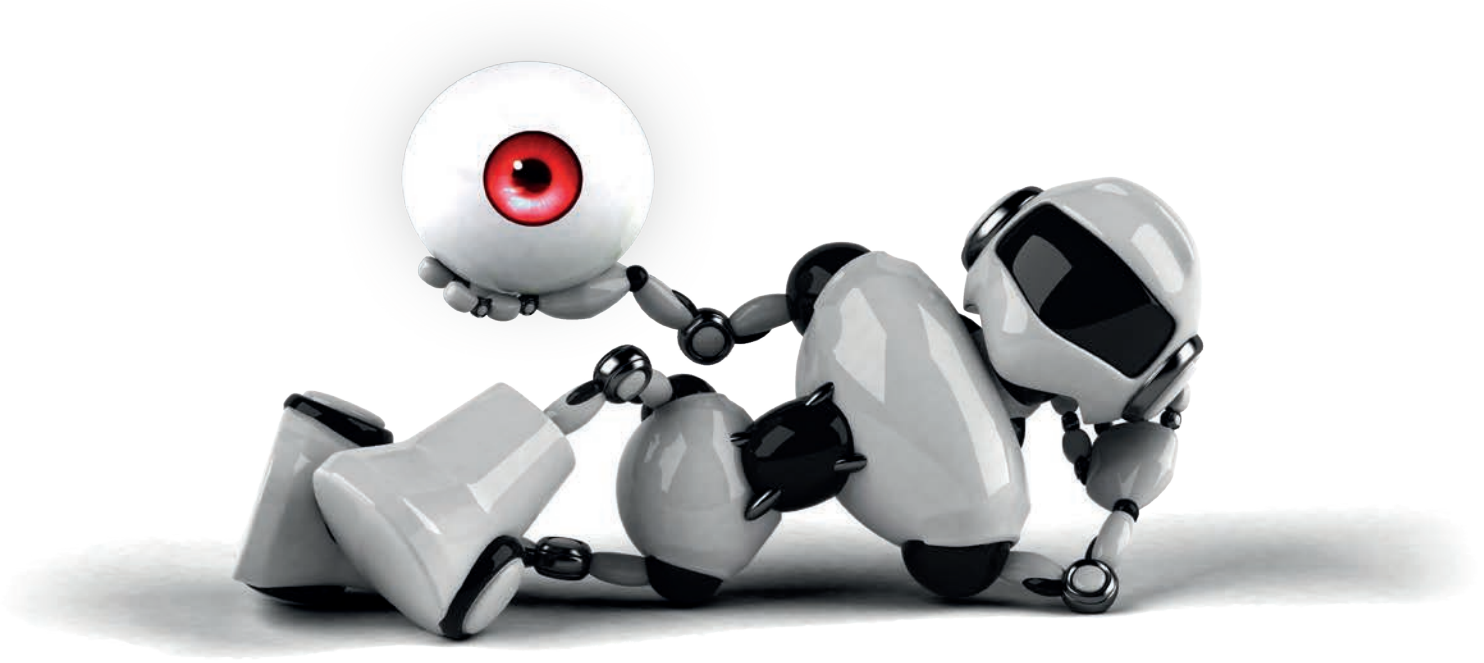




- Calibration methods tailored to the application
- Can be used for all common 2D codes, common 1D barcodes and OCR

VISOR® Robotic

Easy.Robot.Vision.



Simple connection to robot systems from leading manufacturers

The VISOR® Robotic vision sensor was specially developed for the challenges in robotics applications. With its integrated, standardised interfaces, it can be easily incorporated in existing installations and robot systems from leading manufacturers. Specially developed apps and function modules allow seamless communication between the vision sensor and robot, and considerably facilitate setup, operation and data exchange. This enables fast integration of the sensor in numerous applications.

Easy connection to solutions of leading manufacturers

In addition to the apps and function modules developed by us, the setup of robotics applications is also simplified by the offerings of other solution providers.
Of course, the cooperation of these programs with our VISOR® Robotic works without problems. Their additional tools make the communication with robots and their setup and operation even more comfortable and expand your possibilities considerably.

ABB · KUKA · UNIVERSAL ROBOTS · ARTIMINDS · wandelbots · DENSO · MITSUBISHI ELECTRIC · YASKAWA · drag&bot · FANUC · DOOSAN · STÄUBLI · READY ROBOTICS

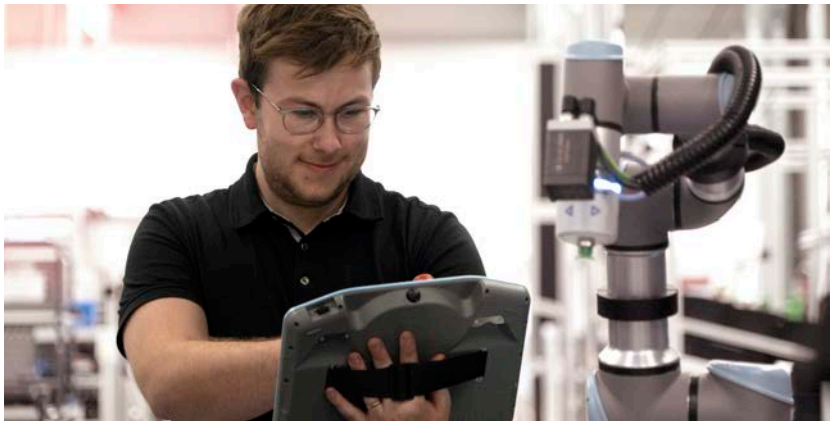
VISOR® Robotic Starter Kits

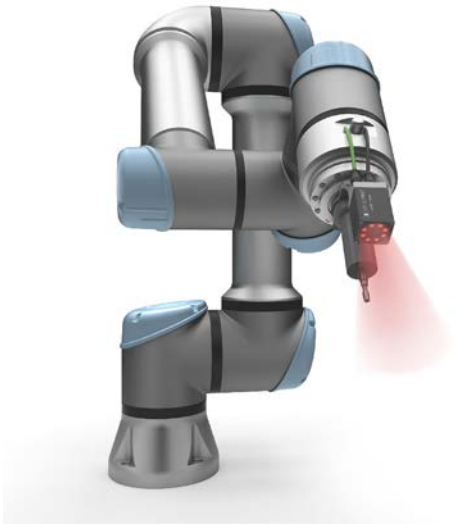
- Everything you need to get started with one single part number
- 3 different hardware levels ranging from basic to advanced
- Kits suited for stationary or end-of-arm configurations
- Compatible with different robot manufacturers
- For more information, visit **www.EasyRobotVision.com**

VISOR® Robotic URCap

One with the robot. Easy. Quick. Flexible. VISOR®.

The VISOR® Robotic URCap guides you through all the necessary steps to set up your vision-guided robotics applications and provides prepared program routines for pick-and-place tasks.

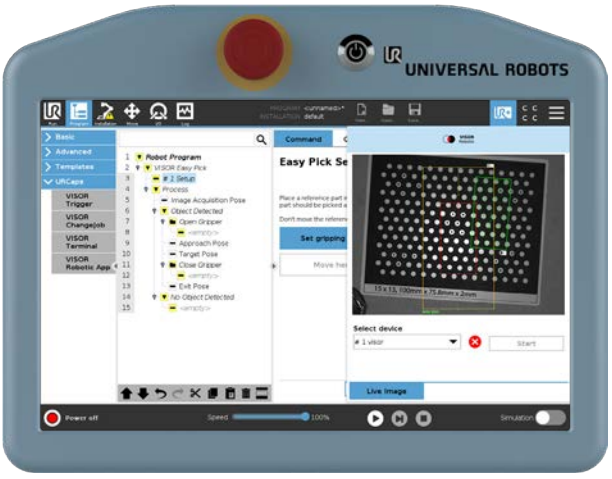




How does it work?

The VISOR® Robotic in combination with the URCap offers a flexible, fast and robust solution for 2D vision guided robotics. A new program is set up in **less than 15 minutes**, thanks to:

- Simple VISOR® configuration
- Step-by-step guide to vision sensor calibration in the URCap software package
- Guided commissioning when setting up Pick and Place applications
- QR codes that link to tutorial videos for each step

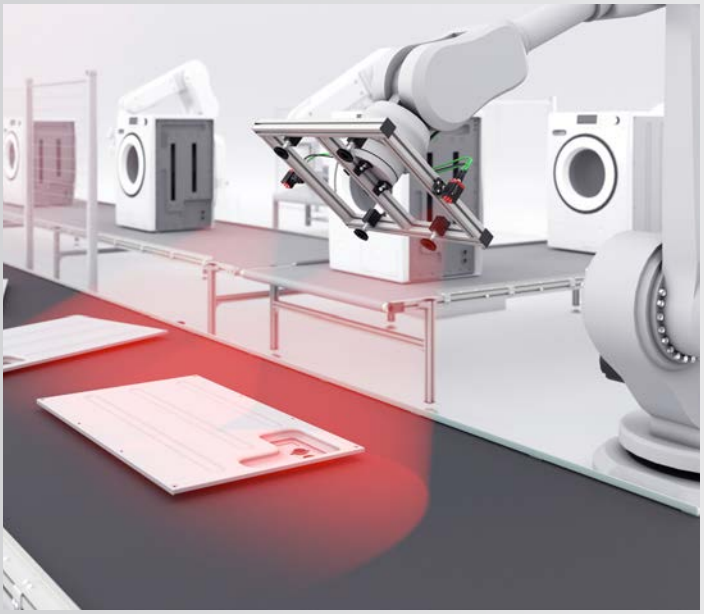


VISOR® Robotic URCap highlights

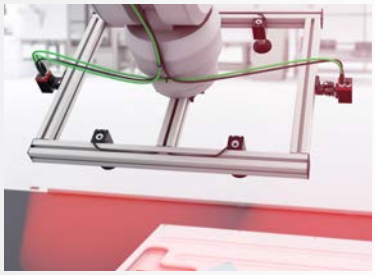
- Find all sensors in the network with one click
- Operate up to 8 VISOR® Robotics in parallel
- Live image from the vision sensor showing the part position
- Support from SensoPart's „assisted calibration process" (ACP)
- Backup functions and QuickStart jobsets

UNIVERSAL ROBOTS+ Certified

Precise robotic handling for large components

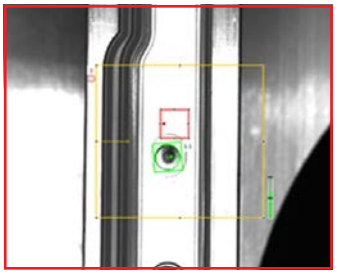


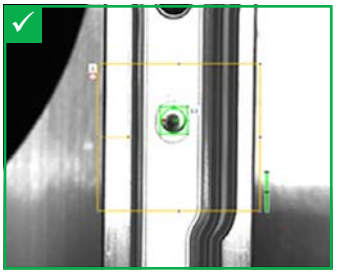
With the VISOR® **XE** Robotic, the exact position of the large components is determined and transferred to the controller in robot coordinates.
The VISOR® **XE** series enables fast, cost-effective installation and connection of multiple vision sensors thanks to the additional LAN connector, which reduces cabling and installation time. This solution facilitates the reliable detection of large components and simplifies their integration into existing systems.

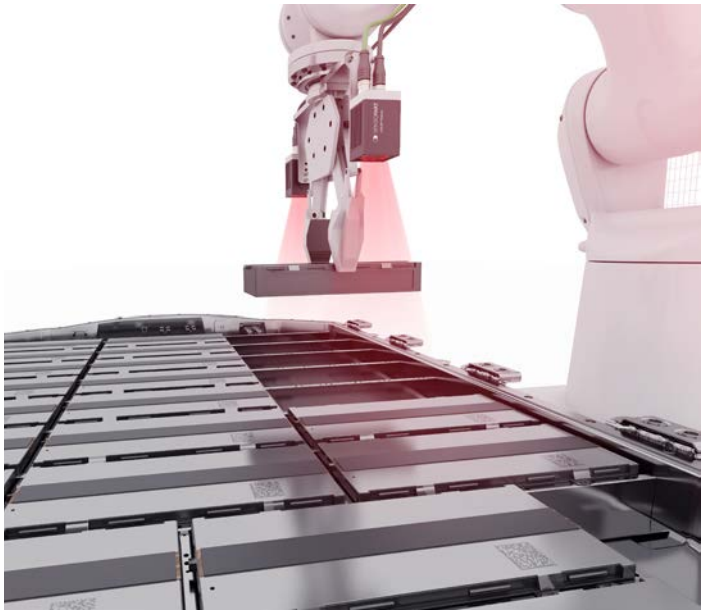


Inserting battery modules into the housing bottom part

With the VISOR® Robotic, the exact position of the housing bottom part is determined and transferred to the controller in robot coordinates. Due to its compact and robust design, the vision sensor can be easily integrated directly into the robot gripper. With the help of standardized calibration plates, the image coordinates can be converted into world coordinates.

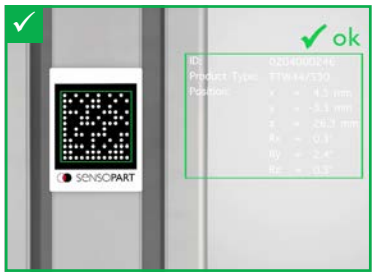




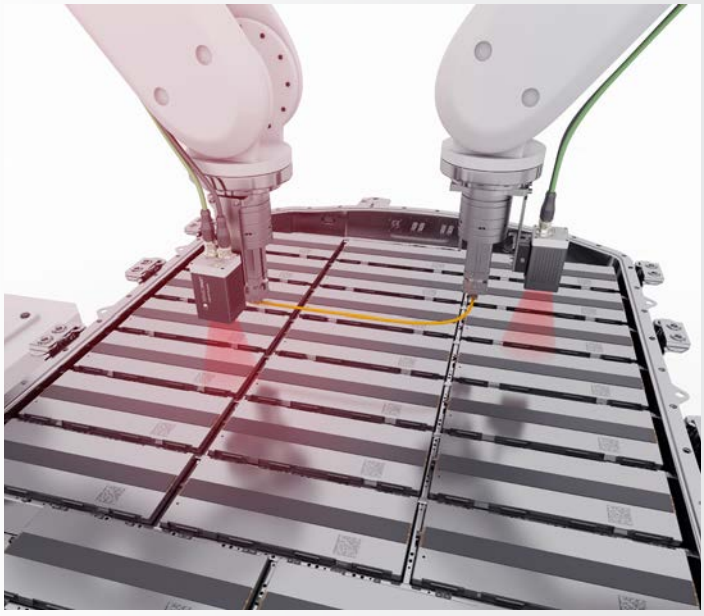


Transfer to test station

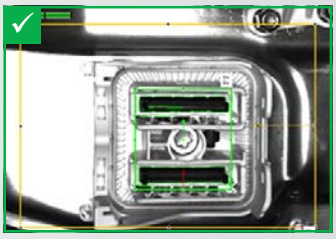
Target Mark 3D technology solves this challenge by placing a coded mark on the machine. The robot program is then written and references the mark. If the user repositions the robot, such as onto a mobile platform, Target Mark technology identifies the machine that needs attention and measures the offset from the machine, automatically adjusting the robot program as needed.

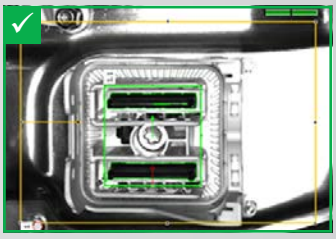


Automated assembly of electrical plug connections



Robot automation makes it possible to avoid assembly errors with serious consequences. Cooperating robots each grip one end of the cable and carry out the plugging process synchronously with movements coordinated in terms of time and geometry. With one VISOR® Robotic each, the corresponding robot detects the real position of the plug-in slots. The compact and robust design of the vision sensor allows it to be integrated into the robot gripper. The VISOR® in the variant with narrow field of view provides sufficient distance between the gripper and the object.





VISOR® Code Reader

Reads whatever is printed, dot-peened and lasered

The VISOR® Code Reader from SensoPart easily reads barcodes of numerous types as well as printed and directly marked data matrix codes according to the ECC200 standard, regardless of the carrier materials (metal, plastic, paper, glass). The sensor even easily deciphers skewed or distorted codes, or those onto convex, reflective or transparent surfaces.

Built-in early warning system: the VISOR® Code Reader evaluates the quality of your printed and directly marked data matrix codes on the basis of standardised quality parameters according to ISO and AIM standards.

HIGHLIGHTS OF VISOR® CODE READER

- With the most powerful processor in the VISOR® product family, the VISOR® **XE** Code Reader enables high-speed code reading, even at high resolutions
- Reading of Barcodes / Datamatrix codes and plain text recognition (OCR - robust reading of difficult codes including low-contrast, dirty, and damaged)
- Reading of directly marked codes
- Support for all marking methods including printed, needled, and lasered
- Reading on a wide range of surfaces (including metal, plastic, and paper)
- Evaluation of quality parameters according to ISO/IEC 15415, ISO 15416, ISO/IEC 29158 and SEMI-T10

The right package for your individual application:

VISOR® Code Reader Standard: Reliable reading of printed codes and labels

- Can be used for all common 2D codes and common 1D barcodes
- Comprehensive tools for flexible and easy connection to PC and PLC environments

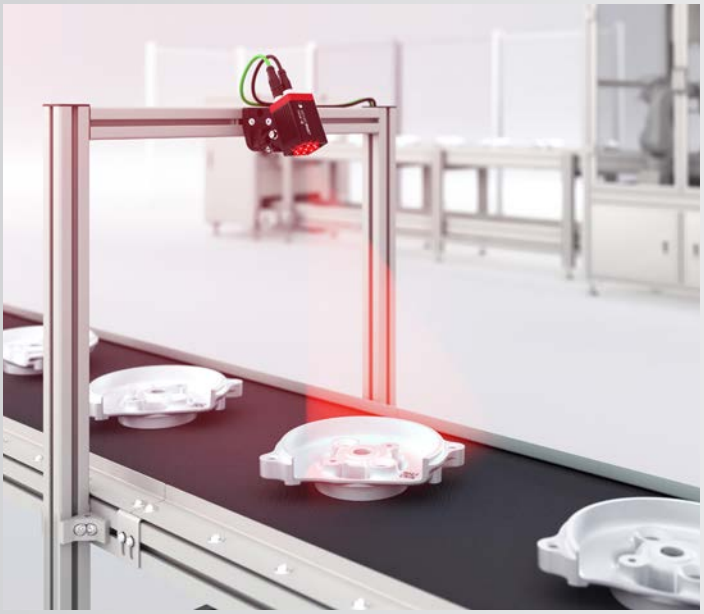
VISOR® Code Reader Advanced: Reading of printed and directly marked codes on all surfaces

- Reliable detection of even poorly readable codes under difficult ambient conditions
- Reading of several similar or differing types of codes in one reading pass
- Combination of two functions in one device: code reading and object detection (only VISOR® V10 Code Reader Advanced, C-Mount)

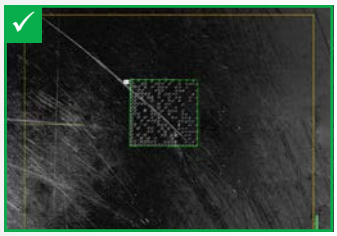
VISOR® Code Reader Professional: The comprehensive package of detectors (incl. optical character reading with OCR) even for very complex tasks

- Combination of two functions in one device: code reading and some features of object detection
- Plain text recognition with OCR

High-Speed, High-Resolution Code Reading

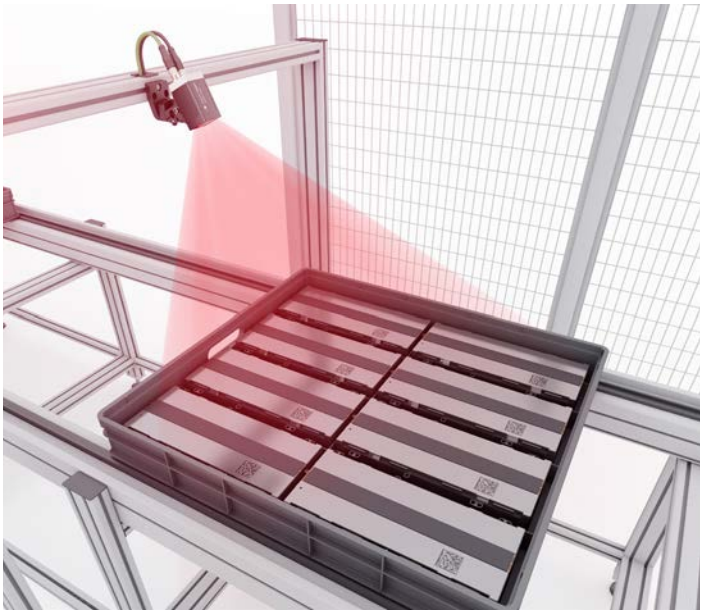


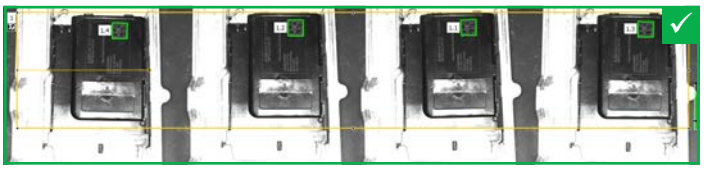
The VISOR® **XE** Code Reader easily reads barcodes along with printed and directly marked data matrix codes – even when scanning multiple 1D and 2D codes simultaneously. Reliable code detection is ensured, even in challenging conditions like long distances, moving objects, low contrast, or damaged codes.
The VISOR® **XE** series Code Reader combines high resolution with fast processing speeds. It is available with a range of optics and illumiation options. The V50 (5 megapixel) variant reads codes in large fields of view in under 40 milliseconds and eliminates the need for multiple devices.



Identification by means of directly marked codes

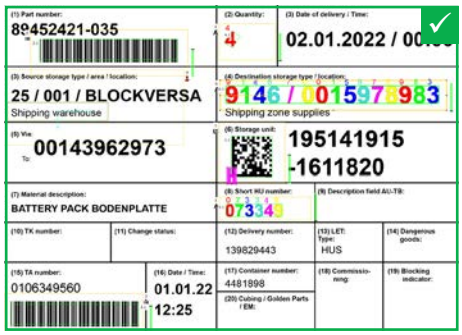
Directly marked codes are no problem for the VISOR® Code Reader, which reliably reads codes even from long distances, on moving objects, and in low-contrast conditions. The distance between the vision sensor and the target can be adjusted to meet specific application needs.





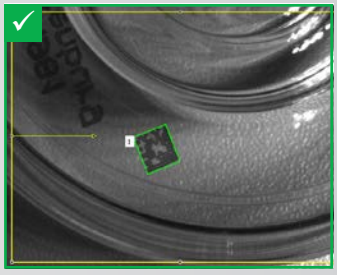
Reading the delivery note

With optional accessories, e.g. spotlights, the delivery notes can be well illuminated even from a great distance, so that the contents can be read reliably even in changing ambient light. With the associated software, it is very easy to store different label types as identification jobs. In addition, it is possible to flexibly select between barcode, datacode and OCR in each of these jobs. The 5-megapixel VISOR® Code Reader reliably reads delivery notes even in motion.



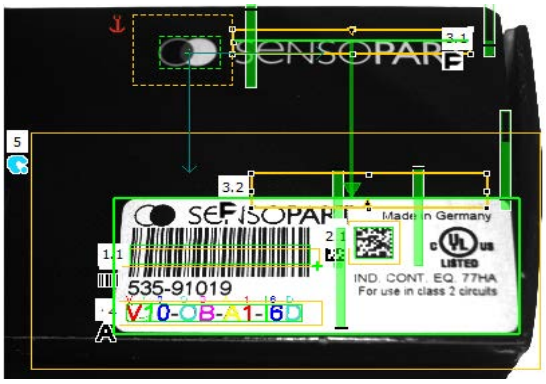
Reading difficult codes

The VISOR® Code Reader reliably reads the lasered code on the rough background of a die-cast part. The code is reliably deciphered even if it is skewed, distorted or applied to convex, reflective or transparent surfaces.
Even codes printed on transparent materials with varying backgrounds are reliably captured.



VISOR® Allround

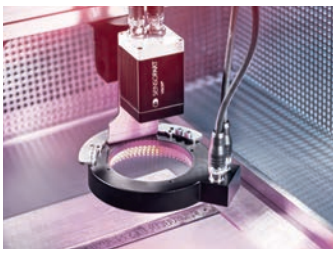
Advanced allround vision sensor for complex inspection tasks



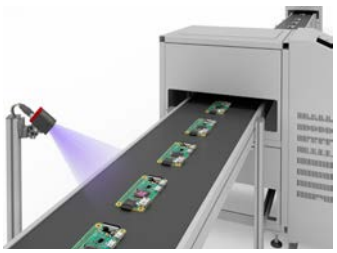
VISOR® Allround – Object AI, Code Reader and Robotic united in one device
The VISOR® Allround offers functions for object detection in color (including calibration, pattern matching, contour, caliper, BLOB), identification (barcode, data matrix and plain text reading) and positioning (including 3D target mark) in one single device.

HIGHLIGHTS OF VISOR® ALLROUND

- **Highly accurate evaluation via 5 megapixel chip**
- All evaluations („Detectors") of VISOR® Object and VISOR® Code Reader united in one device
- Powerful color detection of version with color chip
- EtherNet/IP PROFINET (Conformance Class B) and TCP/IP is supported
- Multishot function reveals minimal height differences and suppresses printed markings
- Calibration function for measurement tasks and robotics applications
- Only vision sensor with integrated UV lighting on the market



VISOR® Mulitshot:
Raised or recessed object details – such as embossed digits and characters on a credit card – are difficult to detect with standard image processing methods. A remedy for this problem was found in the new Multishot function of the VISOR® vision sensor range from SensoPart.



UV illumination:
The VISOR® Allround, equipped with integrated UV illumination, can detect markings, inscriptions, and codes invisible to the human eye. Its extensive functionality makes it unique in the market, enabling a wide range of new applications.

The right package for your individual application:

VISOR® Allround Advanced: Multishot and integrated UV lighting

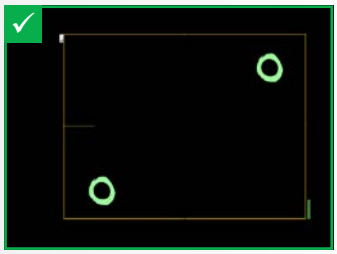
- Combines all analysis tools (detectors) from the VISOR® Object and VISOR® Code Reader into a single device
- Integrated UV lighting to easily identify invisible markings
- Detection of height differences with multishot technology

VISOR® Allround Professional: All VISOR® features and capabilities in a single device

- Includes all functions of the VISOR® Allround Advanced.
- Additionally, incorporates all evaluations from the VISOR® Object AI and VISOR® Robotic.

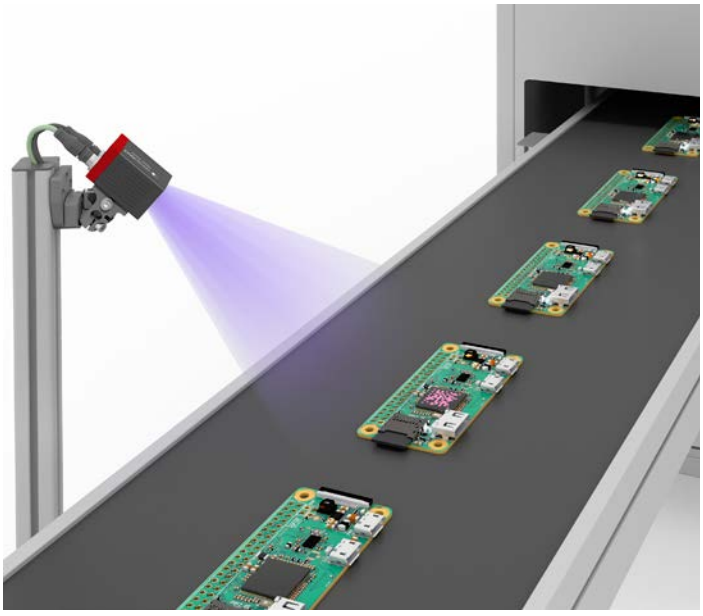
Presence of invisible product safety characteristics

Often screws are sealed by a fluorescent ink to be able to check whether they have been opened or if the product is still sealed. It's done with invisible ink so that the end customer does not see the marking. The presence of this fluorescent ink can be checked by the VISOR® Allround UV. For the evaluation of the luminescent markings, the user has the same extensive detection tools at his disposal as the classic illumination variants (white, red, infrared) of the VISOR® Allround series.



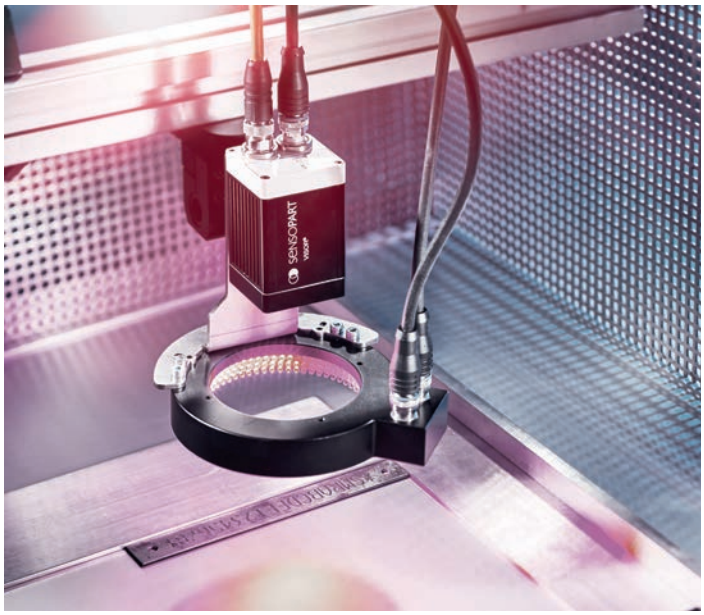
Invisible ink code identification

PCB boards are often marked with a data matrix code with invisible ink to be able to identify the board without allowing the end customer to see the marking. Thus the product can be tracked during production process by the VISOR® Allround with integrated UV illumination. It can reliably check the presence of the luminescent ink. For the evaluation of the luminescent markings, the user has the same extensive detection tools at his disposal as the classic illumination variants (white, red, infrared) of the VISOR® Allround series.



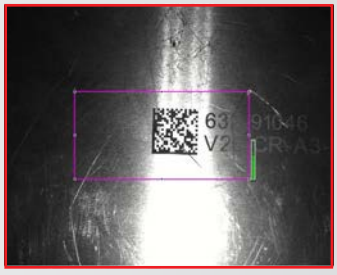
Detecting characters on shiny metal

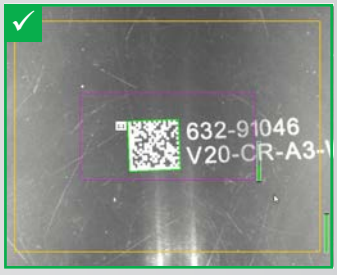
Rough and shiny metal surfaces make it very difficult to detect markings with standard algorithms. By using the multishot feature of the VISOR® Allround the characters are clearly visible and it's very easy to solve these kind of applications.



Identification of a code on a shiny surface

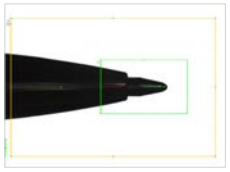
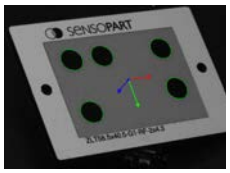
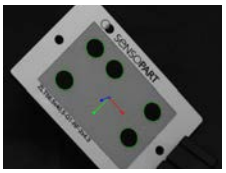
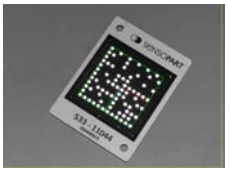
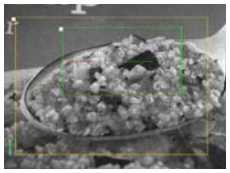
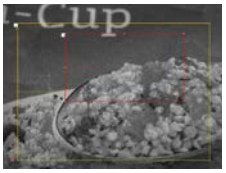
Trouble with shiny surfaces? No problem! This is where a polarizing filter kicks in. With this helpful accessory, details can be detected regardless of the reflectivity of the surface. The switchable version with 50% coverage of the LEDs can reliably detect the object even if the texture of the surface varies without changing the filter. Installation is very easy by simply „clicking" it onto the VISOR®.



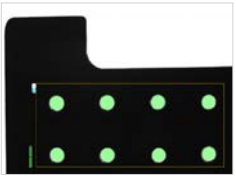
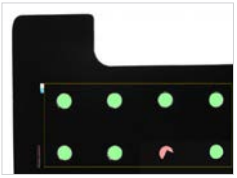


VISOR® vision sensor

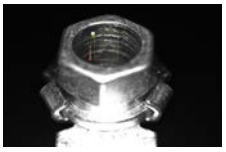
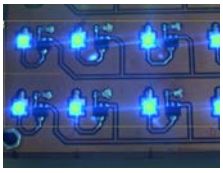
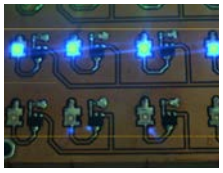
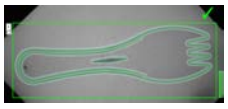
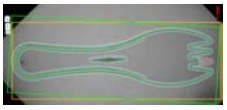
Detectors and application examples

Identification				
	Data code	Reading and quality assessment of 2D codes, such as ECC200, QR code, ECC200 (GS1), QR code (GS1), PDF 417. High-performance decoder algorithm for directly marked, low-contrast and damaged codes.		–
	Barcode	Reading and quality assessment of most barcode types, such as EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, Code 32, Code 39, Code 93, Code 128, GS1, Pharmacode, Codabar.		–
	OCR	Optical character reading of printed, laser-etched or dotpeened characters. High reading rate with difficult characters or fluctuating marking quality through use of neural networks. Easy to use. Fast segmentation mode for high reading rates.		–
Positioning / Inspection				
	Contour	Object search based on contour comparison: once a contour has been taught, images are then scanned for the same contour. The degree of similarity can be defined by switching thresholds. Function for teaching random shapes. Orientation and scaling variations are configurable.		
	Contour 3D	3D localisation of individual or multiple objects. Inclination of up to ± 15° and height offset are precisely detected. No CAD models are required.		
	Target Mark 3D	Reading highly specific 3D information and position data and transmitting it to the robot. The position of the target mark is referenced only once during the initial setup of the smart vision sensor. The smallest deviations in the working position and even large angular deviations are precisely detected.		
	Pattern matching	Object search based on pattern matching: once a pattern has been taught, consecutive images are then scanned for the same pattern. The degree of similarity can be defined by switching thresholds. Free form function for teaching random shapes with random orientation.		

Positioning / Inspection (continued)

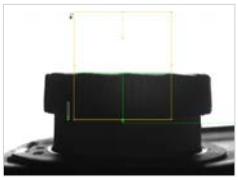
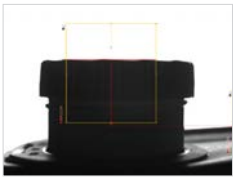
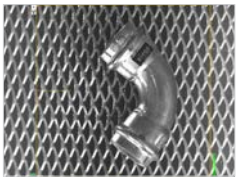
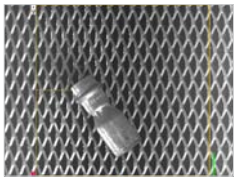
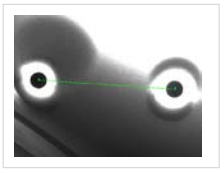
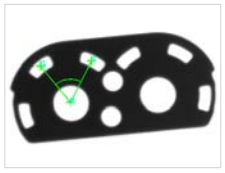
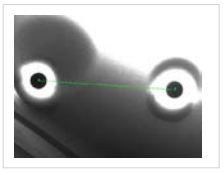
BLOB	Counting and evaluation of objects: Analysis and sorting of objects based on user-defined criteria (area, height, width, circumference, position face up/face down and more).		

Inspection

Brightness	Brightness analysis in search zone. Definition of result output via switching threshold.		
Contrast	Contrast analysis in search zone. Definition of result output via switching threshold.		
Gray	Analysis of grey threshold in search zone. Definition of result output via switching threshold.		
Color value	Output of color values via interfaces, setting options for color space: RGB, HSV, LAB.		–
Color area	Color evaluation via area: evaluation of interrelated color area according to size and color. Innovative configuration via histogram for color spaces RGB, HSV and LAB.		
Contour check	Detection of deviations from a reference contour. The number of permitted deviations determines the result.		

VISOR® vision sensor

Detectors and application examples

Measurement				
	Caliper	Measurement of the distance between edges. Diverse detection options. Measurement of minimum, maximum or averaged distance values. Innovative visualisation of detected edges. Definition of measurement sensitivity by dividing the measurement field into search beams.		
Classification				
	Classification (AI)	Assign objects into different classes. This detector assigns a class to an object or feature within the region of interest. These classes are defined using sample images. Pass/Fail judgments can be made or up to 200 different classes can be defined.		
	Color list	Color evaluation via list: find a color from a list of taught colors, evaluation of colors according to color deviation (delta e) in the color spaces RGB, HSV and LAB.		
Result processing				
	Result processing: Text	Comparison of character strings; formatting, adding and cutting of character strings; sorting, simple calculations. Output of a digital (good/bad) result.		–
	Result processing: Math	Offset of numerical results; calculation of distances and angles; comparison of results. Output of a digital (good/bad) result.		
	Result processing: Robotic	Processing of results for the type Pose 3D (X, Y, Z, Angle X, Y, Z).		–

Position alignment

Edge detection

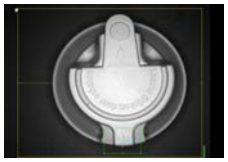
High-performance edge finder for position tracking. Combination of different search strategies possible. Innovative visualisation of edges found. Definition of measurement sensitivity by dividing the measurement field into search beams.

Pattern matching

Object search based on pattern matching: once a pattern has been taught, consecutive images are then scanned for the same pattern. The degree of similarity can be defined by switching thresholds. Free form function for teaching random shapes. Detection of rotated patterns.

Contour

Object search based on contour comparison: once a contour has been taught, images are scanned for the same contour. The degree of similarity can be defined by switching thresholds. Free form function for teaching random shapes. Orientation and scaling variations are configurable.



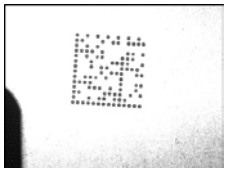
Functions & preprocessing filters

Freeform tool

Innovative freeform tool for creating user-defined teach-in areas for pattern matching and contour, as well as for creating user-defined search areas for contrast, grey threshold, brightness and BLOB.

Filter

Large number of preprocessing filters to improve the picture before actual image processing.



Color filters

Definition of any color as software color filter to enable OCR on multi-colored backgrounds or the highlighting of edges during object detection tasks (e.g. for parts on colored conveyor belts).

Individual overlays

Display of detector results and text elements in the image. Automatic positioning in the image, in the search area or at the result position. Automatic or fixed coloring of the text.

VISOR® vision sensor

Interfaces

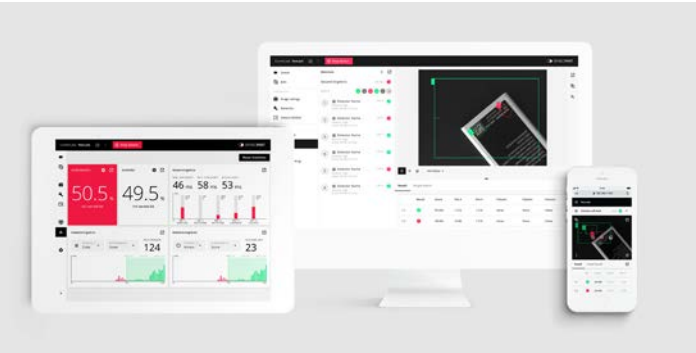
Interfaces	
Ethernet TCP/IP	Ethernet interface with user-configurable protocol. VISOR® control options via TCP/IP commands.
PROFINET®	Industrial Ethernet in compliance with PROFINET standard (Conformance Class B) through integrated Ethernet interface. VISOR® control options via PROFINET commands.
EtherNet/IP™	Industrial Ethernet in compliance with EtherNet/IP standard through integrated Ethernet interface. VISOR® control options via EtherNet/IP commands.

SensoWeb

Versatile monitoring for the VISOR®

New design, additional functions:
SensoPart vision sensors of the VISOR® series are equipped with the pre-installed monitoring software SensoWeb, which enables convenient monitoring of the sensors during operation with common web browsers. In addition to the current status, differentiated statistical evaluations can now also be displayed. In combination with an external WLAN router, the results can also be output on mobile devices such as smartphones or tablets as well as on common machine operating panels.

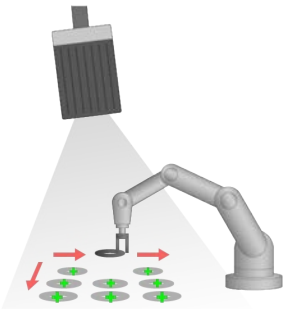
- New, modern design
- Easier user guidance
- More efficient process monitoring
- Statistics function
- Personalized display possible
- Platform-independent visualization solution



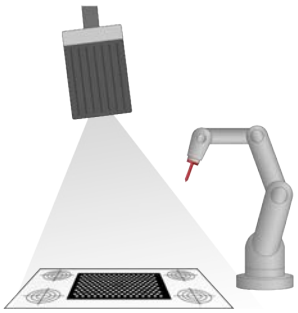
Calibration	
Calibration (scaling/ perspective) 	Output of results in customised units (mm, cm, m, inch). Effects of perspective corrected according to the calibration method.
Robotic calibration 	Output of results in customised units (mm, cm, m, inch) in a world coordinates system. A number of different methods are available for high flexibility.

Calibration methods

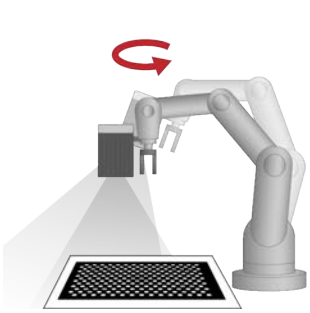
For a wide range of applications



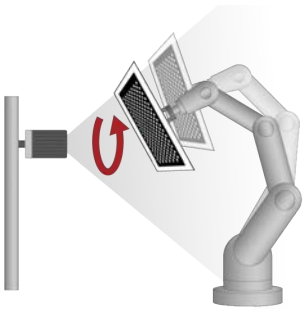
Point pair list



Calibration plate



Hand-Eye



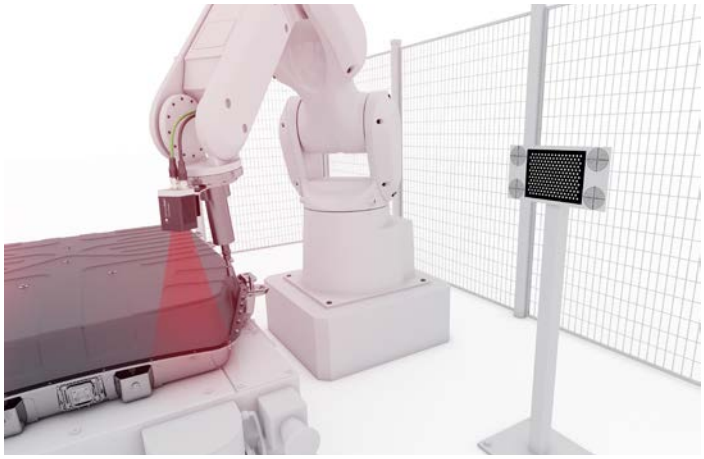
Base-Eye

Hand-Eye-Calibration

Reduce downtime to a minimum

True non-contact calibration that gets a system back up and running in minutes and reduces downtime to a minimum:

- No worker in workspace area required
- Fully automated
- Independent from mechanical TCP
- Calibration area can be anywhere
- Workspace can be anywhere



Product overview - Software

VISOR® & VISOR® **XE** Vision Sensors

	VISOR® Object		VISOR® Object AI
			
	Presence, completeness, measurement, position check, color		Presence, completeness, measurement, position check, color, artificial intelligence
	Standard	Advanced	Advanced
	–	–	XE
Calibration			
Scaling | Perspective	✓ | –	✓ | ✓	✓ | ✓
Point-pair list | Calibration plate (robot)	–	– | –	– | –
Hand-eye | Base-eye calibration (robot)	–		–
Preprocessing			
Preprocessing filter	–	✓	✓
Multiple image capture | Shutter variation	–	✓	✓
Freeform search area	✓		✓
Position tracking			
Contour comparison (translation, rotation 360°)	✓		✓
Pattern matching (translation, rotation 360°)	–	✓	✓
Edge detection (translation, rotation)	–	✓	✓
Object detection			
Contour | Multiple detection	✓ | –	✓ | ✓	✓ | ✓
Pattern comparison | Multiple detection	✓ | –	✓ | ✓	✓ | ✓
Grey level | Contrast | Brightness	✓		✓
Calliper	✓		✓
BLOB	–	✓	✓
3D contour	–	–	–
Target Mark 3D	–	–	–
Classification (AI)	–	–	✓
Contour check	–	✓	✓
Identification			
Barcodes | Datacode	–		–
Clear text (OCR)	–		–
Robotics functions			
Result offset image | 2D | 3D	– | – | –	– | – | –	– | – | –
Checking space around gripper	–		–
Color detectors for Color variants			
Color field | Color value | Color list	✓ | – | –	✓ | ✓ | ✓	✓ | ✓ | ✓
Color distance | Binarisation	– | –	✓ | ✓	✓ | ✓
Result processing / Output			
Result processing - Text | Math	– | –	– | ✓	– | ✓
Result processing - Robotics	–	–	–
Individual Overlays	–	✓	✓

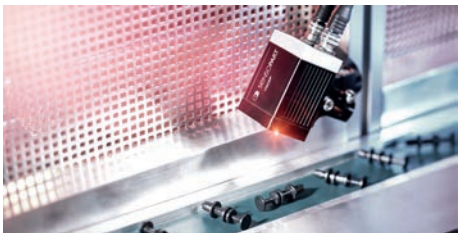
VISOR® Robotic

Robotics, presence, completeness, measurement, positioning

VISOR® Code Reader

Reading of barcodes, 2D codes, text

VISOR® Allround



Presence, completeness, measurement, position check, color, reading of barcodes, data codes, text, Multishot

Advanced	Professional	Standard	Advanced	Professional	Advanced	Professional
–	XE	–	XE	XE	–	XE
✓ | ✓		–			✓ | ✓	
✓ | ✓		–			–	✓
–	✓	–			–	✓
✓		–	✓	✓	✓	
✓		–	✓	✓	✓	
✓		–	–	✓	✓	
✓		–		✓	✓	
✓		–		✓	✓	
✓		–		✓	✓	
✓ | ✓		– | –			✓	
✓ | ✓		– | –		✓ | ✓	✓	
✓		–		✓	✓	
✓		–			✓	
✓		–			✓	
–	✓	–			–	✓
✓		–			✓	
–		–			–	✓
–		–			✓	
–	✓ | ✓	✓			✓	
–	✓ | ✓	–		✓	✓	
✓ | ✓ | ✓		– | – | –			–	✓
✓		–			–	✓
✓ | ✓ | ✓		– | – | –			✓ | ✓ | ✓	
✓ | ✓		– | –			✓ | ✓	
– | ✓	✓| ✓	– | –	✓ | –		✓ | ✓	
✓	✓	–	–		–	✓
✓	✓	–	✓	✓	✓	✓

Product overview - Hardware

VISOR® Vision Sensors

	VISOR® Object		VISOR® Object AI
			
	Presence, completeness, measurement, position check, color		Presence, completeness, measurement, position check, color, artificial intelligence
	Standard	Advanced	Advanced
Resolution			
VISOR® V10 (800 x 600): Mono | Color	✓		✓
Images per second: Mono | Color	75 | 50		75 | 50
VISOR® V20 (1440 x 1080): Mono | Color	–	✓	✓
Images per second: Mono | Color	–	40 | 20	40 | 20
VISOR® V50 (2560 x 1936): Mono | Color	–	✓	✓
Images per second: Mono | Color	–	22 | 8	22 | 8
Lighting	white, red[1], infrared[1]		
Multishot (Mono)	–		–
Target laser	–	✓	✓
Integrated UV lighting	–		–
Lenses			
V10 wide | medium | narrow | C-Mount	✓| ✓| ✓| –	✓| ✓| ✓| ✓	✓| ✓| ✓| ✓
V20 wide | medium | narrow | C-Mount	– | – | – | –	✓| ✓| ✓| ✓	✓| ✓| ✓| ✓
V50 wide | medium | narrow | C-Mount	– | – | – | –	✓| ✓| – | ✓	✓| ✓| – | ✓
Interfaces			
Inputs | outputs | selectable	2 | 2 | 4	2 | 2 | 6	2 | 2 | 6
Encoder input	–	✓	✓
Ethernet | EtherNet/IP | PROFINET | SensoWeb	✓ | ✓| ✓| ✓		✓ | ✓| ✓| ✓
Service Port	–	✓	✓
Job / Detectors			
Number of jobs (max.) | Detectors per job (max.)	32 | 32	255 | 255	255 | 255
Number of classification (AI) detectors per job (max.)	–		10
Job checksum	–	✓	✓

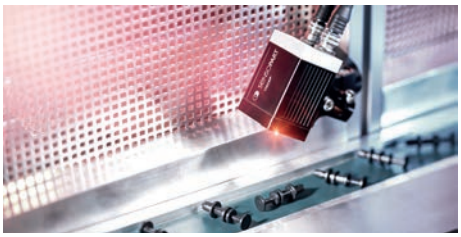
VISOR® Robotic

Robotics, presence, completeness, measurement, positioning

VISOR® Code Reader

Reading of barcodes, 2D codes, text

VISOR® Allround



Presence, completeness, measurement, position check, color, reading of barcodes, data codes, text, multi-shot

Advanced	Professional	Standard	Advanced	Professional	Advanced	Professional
✓	–	✓ | –			✓	–
75	–	75 | –			75 | 50	–
✓		✓ | –			✓	
40 | 20		40 | –			40 | 20	
–	✓	–	✓ | –		–	✓
–	22 | 8	–	22 | –		–	22 | 8
white, red[1], infrared[1]						
–		–			✓	
✓		only V20	✓		✓	
–		–			only V20	only V50
✓ | ✓| ✓| ✓	–	✓| ✓| ✓| –	✓| ✓| ✓| ✓		✓ | ✓| ✓| ✓	–
✓ | ✓| ✓| ✓		✓| ✓| ✓| –	✓| ✓| ✓| ✓		✓ | ✓| ✓| ✓	
–	✓| ✓| – | ✓	–	✓| ✓| – | ✓		–	✓| ✓| – | ✓
2 | 2 | 6		2 | 2 | 4	2 | 2 | 6		2 | 2 | 6	
✓		–	✓		✓	
✓ | ✓| ✓| ✓		✓| ✓| ✓| ✓			✓ | ✓| ✓| ✓	
✓		–	✓		✓	
255 | 255		8 | 2	255 | 255		255 | 255	
–		–			–	
✓		–	✓		✓	

[1] not with color hardware

Product overview - Hardware

VISOR® **XE** Vision Sensors

	VISOR® Object		VISOR® Object AI
			
	Presence, completeness, measurement, position check, color		Presence, completeness, measurement, position check, color, artificial intelligence
	Standard	Advanced	Advanced
	–	–	XE
Resolution	–		
VISOR® **XE** V20 (1600 x 1200): Mono | Color	–		✓
Images per second: Mono | Color	–		80 | 40
VISOR® **XE** V50 (2560 x 1936): Mono | Color	–		✓
Images per second: Mono | Color	–		44 | 16
Lighting	–		white, red[1], infrared[1]
Multishot (Mono)	–		–
Target laser	–		✓
Integrated UV lighting	–		–
Lenses	–		
V20 wide | medium | narrow | C-Mount	–		✓| ✓| ✓| ✓
V50 wide | medium | narrow | C-Mount	–		✓| ✓| – | ✓
Interfaces	–		
Inputs | outputs | selectable	–		2 | 2 | 6
Ethernet | EtherNet/IP | PROFINET | SensoWeb	–		✓ | ✓| ✓| ✓
Service Port	–		✓
Job / Detectors	–		
Number of jobs (max.) | Detectors per job (max.)	–		255 | 255
Number of classification (AI) detectors per job (max.)	–		40
Job checksum	–		✓

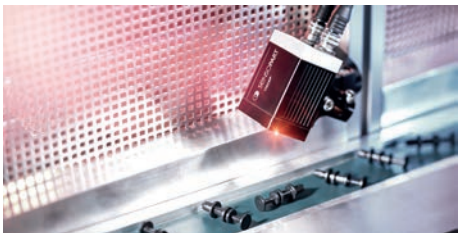
VISOR® Robotic

Robotics, presence, completeness, measurement, positioning

VISOR® Code Reader

Reading of barcodes, 2D codes, text

VISOR® Allround



Presence, completeness, measurement, position check, color, reading of barcodes, data codes, text, multi-shot

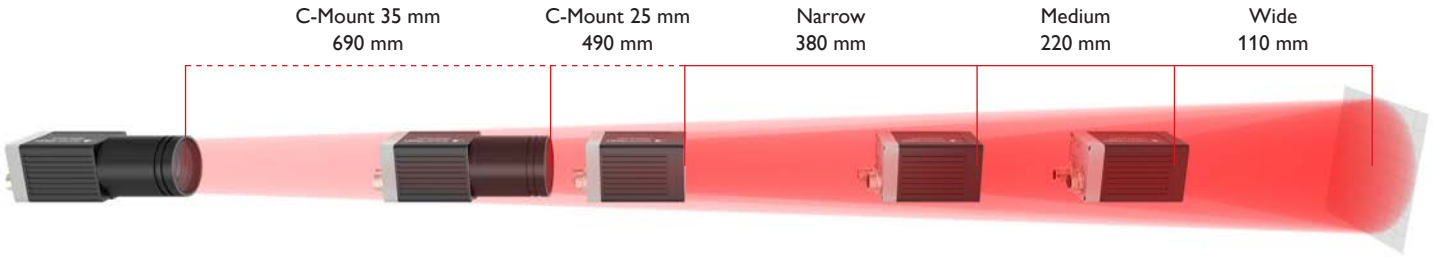
Advanced	Professional	Standard	Advanced	Professional	Advanced	Professional
–	XE	–	XE	XE	–	XE
–		–			–	
–	✓	–	✓ | –		–	✓
–	80 | 40	–	80 | –		–	80 | 40
–	✓	–	✓ | –		–	✓
–	44 | 16	–	44 | –		–	44 | 16
	white, red[1], infrared[1]	–	white, red[1], infrared[1]		–	white, red[1], infrared[1]
–	–	–	–		–	✓
–	✓	–	✓		–	✓
–	–	–	–		–	only V50
–		–			–	
–	✓ | ✓ | ✓ | ✓	–	✓ | ✓ | ✓ | ✓		–	✓ | ✓ | ✓ | ✓
–	✓ | ✓ | – | ✓	–	✓ | ✓ | – | ✓		–	✓ | ✓ | – | ✓
–		–			–	
–	2 | 2 | 6	–	2 | 2 | 6		–	2 | 2 | 6
–	✓ | ✓ | ✓ | ✓	–	✓ | ✓ | ✓ | ✓		–	✓ | ✓ | ✓ | ✓
–	✓	–	✓		–	✓
–		–			–	
–	255 | 255	–	255 | 255		–	255 | 255
–		–			–	
–	✓	–	✓		–	255 | 255

[1] not with color hardware

C-mount

Full flexibility in distance and field of view

With the VISOR® c-mount variants, the optics of the VISOR® can be flexibly adapted to the needs of the user. Depending on the desired working distance, different c-mount lenses can be attached to the VISOR® in order to ideally match the vision sensor to the application. A narrow field of view allows the smallest details to be detected at a great distance, while a wide field of view allows several features of a component or different components to be detected at the same time. If the application changes and the working distance is different, only the lens needs to be changed in the c-mount variant. Lenses are available in 8, 12, 16, 25, 35, 50 and 75 mm.



Fields of view and depths of field

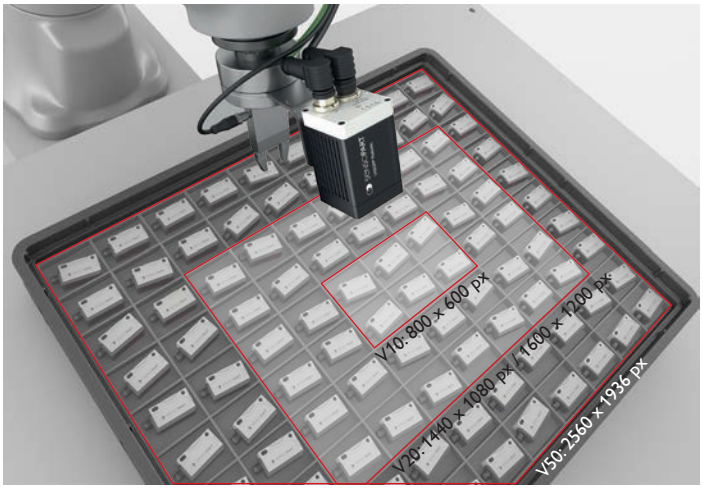
The right VISOR® for every application

VISOR® vision sensors are available in 3 resolution variants:
- V10: 800 x 600 pixels
- V20: 1440 x 1080 pixels
- V50: 2560 x 1936 pixels

VISOR® **XE** vision sensors are available in 2 resolution variants:
- V20: 1600 x 1200 pixels
- V50: 2560 x 1936 pixels

Depending on the resolution variant, up to 3 different fields of view are available::
- wide
- medium
- narrow

This means that the suitable VISOR® variant can be chosen for each application, precisely tailored to the requirements.



SensoCalc

Wizard for optical calculations

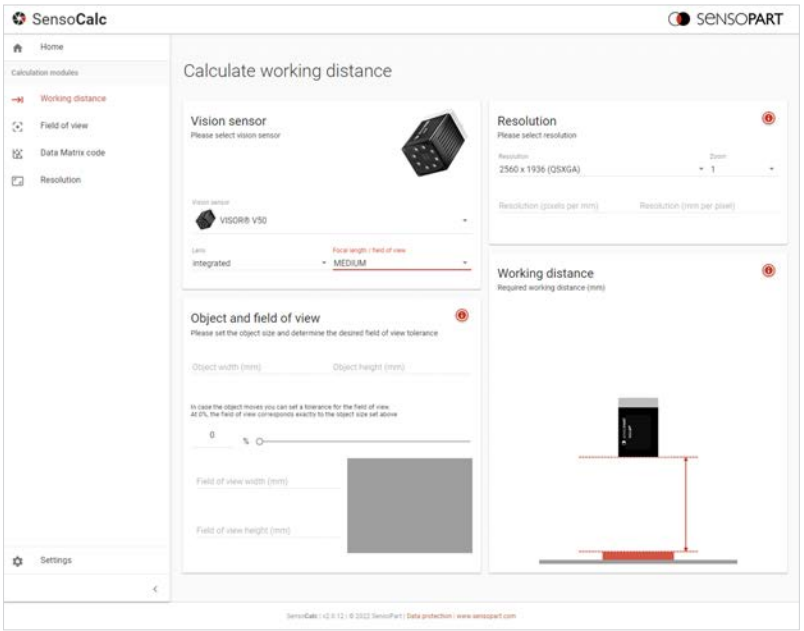
Senso**Calc** is an assistant for performing basic calculations for vision sensor applications. The calculations are especially designed for the components of SensoPart. This means that the appropriate VISOR® can be determined via the working distance, the required field of view, the type of code to be read or the desired resolution.

WORKING DISTANCE

FIELD OF VIEW

DATA MATRIX CODE

RESOLUTION



Go to SensoCalc

Accessories

VISOR®-Types, Power I/O cables

1:VISOR®:

VISOR® Object

VISOR® Object AI

VISOR® Robotic

VISOR® Code Reader

VISOR® Allround

QR-Code for more information

2. Power I/O cables:

M12 socket, 3-pin (24V, GND, Trigger), Straight Connector:

Part number / Length / Article number
C L12/3FG-S-2M-PUR / 2m (6'6") / 902-51833
C L12/3FG-S-5M-PUR / 5m (16'4") / 902-51834
C L12/3FG-S-10M-PUR / 10m (32'9") / 902-51835
C L12/3FG-S-20M-PUR / 20m (65'7") / 902-51839

M12 socket, 3-pin (24V, GND, Trigger), Angled Connector:

Part number / Length / Article number
C L12/3FW-S-2M-PUR / 2m (6'6") / 902-51833
C L12/3FW-S-5M-PUR / 5m (16'4") / 902-51834
C L12/3FW-S-10M-PUR / 10m (32'9") / 902-51835
C L12/3FW-S-20M-PUR / 20m (65'7") / 902-51839

M12 socket, 12-pin (24V, GND, Trigger, Ready, 8 additional I/O), Straight Connector:

Part number / Length / Article number
C L12FG-S-2M-PUR / 2m (6'6") / 902-51801
C L12FG-S-5M-PUR / 5m (16'4") / 902-51796
C L12FG-S-10M-PUR / 10m (32'9") / 902-51797
C L12FG-S-20M-PUR / 20m (65'7") / 902-51805

M12 socket, 12-pin (24V, GND, Trigger, Ready, 8 additional I/O), Angled Connector:

Part number / Length / Article number
C L12FW-S-2M-PUR / 2m (6'6") / 902-51798
C L12FW-S-5M-PUR / 5m (16'4") / 902-51799
C L12FW-S-10M-PUR / 10m (32'9") / 902-51800
C L12FW-S-20M-PUR / 20m (65'7") / 902-51821

QR-Code for more information

3. Ethernet cables:

Part number / Length / Article number

Straight Connector:		Angled Connector:	
CI L4MG/RJ45G-GS-1.5M-PUR / 1.5m (4'11") / 902-51887	CI L4MG/RJ45G-GS-10M-PUR / 10m (32'9") / 902-51784	CI L4MW/RJ45G-GS-1.5M-PUR / 1.5m (4'11") / 902-51888	CI L4MW/RJ45G-GS-10M-PUR / 10m (32'9") / 902-51790
CI L4MG/RJ45G-GS-3M-PUR / 3m (9'10") / 902-51754	CI L4MG/RJ45G-GS-20M-PUR / 20m (65'7") / 902-51820	CI L4MW/RJ45G-GS-3M-PUR / 3m (9'10") / 902-51786	CI L4MW/RJ45G-GS-20M-PUR / 20m (65'7") / 902-51822
CI L4MG/RJ45G-GS-5M-PUR / 5m (16'4") / 902-51782	CI L4MG/RJ45G-GS-30M-PUR / 30m (98'5") / 902-51843	CI L4MW/RJ45G-GS-5M-PUR / 5m (16'4") / 902-51788	CI L4MW/RJ45G-GS-30M-PUR / 30m (98'5") / 902-51844

QR-Code for more information

4. Brackets for V10, V20, V50:

Part number / Description / Article number

Mounting hinge with 3 axes:
MG 3A / Standard type / 543-11024
MG 3A-MST12 / For fixing to 12mm rod / 543-11034

QR-Code for more information

5. Optical accessories:

Part number / Description / Article number

Removable protective casing:	Polarising filter panels:
LPC Vxx / Standard type / 651-01001	LPF Vxx S1 / 100% coverage / 651-01003
LPC Vxx-ESD / Anti-static coating / 651-01010	LPF Vxx S2 / 50% coverage / 651-01004

QR-Code for more information

Accessories

Illumination, cables for illumination, robotics

6. Illumination:

Part number / Light color - Description / Article number

Ring light:		Spot illumination:
LFR 115 WD-24-2L12 / white diffuse light / 525-51150	LFR 115 WK-24-2L12 / white clear light / 525-51153	LS 55 x 46 WK-24-A13 2L12 / white light / 532-51101
LFR 115 RD-24-2L12 / red diffuse light / 525-51151	LFR 115 RK-24-2L12 / red clear light / 525-51154	LS 55 x 46 RK-24-A13 2L12 / red light / 532-51102
LFR 115 ID-24-2L12 / infrared diffuse light / 525-51152	LFR 115 IK-24-2L12 / infrared clear light / 525-51155	LS 55 x 46 IRK-24-A13 2L12 / infrared light / 532-51103

QR-Code for more information

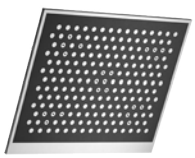
7. Illumination:

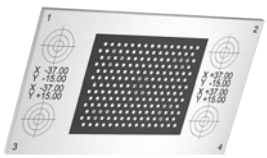
Part number / Length / Article number

Straight Connector:		Angled Connector:
CB L12FS/L12FS-0.35M-GG-PUR / 0.35m (1'15") / 902-51841	CB L12FS/L12FS-10M-GG-PUR / 10m (32'8") / 902-51854	CB L12FS/L12FS-0.35M-WW-PUR / 0.35m (16'4") / 902-51842
CB L12FS/L12FS-0.5M-GG-PUR / 0.5m (1'64") / 902-51806	CB L12FS/L12FS-15M-GG-PUR / 15m (49'21") / 902-51855	CB L12FS/L12FS-0.5M-WW-PUR / 0.5m (1'64") / 902-51808
CB L12FS/L12FS-2M-GG-PUR / 2m (6'56") / 902-51807	CB L4MG-10M-PUR / 10m (32'8") / 902-51756	CB L12FS/L12FS-2M-WW-PUR / 2m (6'56") / 902-51809

QR-Code for more information

8. Robotics:





Part number / Article number

Standard calibration plates:	Calibration plates with reference marks:	Calibration plates with reflective marks:	TargetMark:
ZCP 50-13x15 / 533-11030	ZCP 50-13x15-X01 / 533-11037	ZCP 100-13x15-X02 / 533-11035	ZTM 50-D2-2x3.3 / 533-11046
ZCP 100-13x15 / 533-11031	ZCP 100-13x15-X01 / 533-11038		ZTM 100-D2-4x3.3 / 533-11047
ZCP 200-13x15 / 533-11032	ZCP 200-13x15-X01 / 533-11039		
ZCP 500-13x15 / 533-11033	ZCP 500-13x15-X01 / 533-11040		

QR-Code for more information

9. Optical accessories:

Part number / Description / Article number

C-Mount lenses:

- LOC-08-HD-30.5x0,5 / 8 mm lens / 526-51535
- LOC-12-HD-27x0,5 / 12 mm lens / 526-51536
- LOC-16-HD-27x0,5 / 16 mm lens / 526-51537
- LOC-25-HD-27x0,5 / 25 mm lens / 526-51538
- LOC-35-HD-27x0,5 / 35 mm lens / 526-51539
- LOC-50-HD-27x0,5 / 50 mm lens / 526-51540
- LOC-75-HD-34x0,5 / 75 mm lens / 526-51541

Intermediate ring:

- LR 5 / 5mm ring / 543-11011
- ETS / Ring set / 527-51143

Filter:

- LOF-PF-30,5 x 0,5 / Polarizing filter / 526-51531

QR-Code for more information

10. Optical accessories:

Part number / Description / Article number

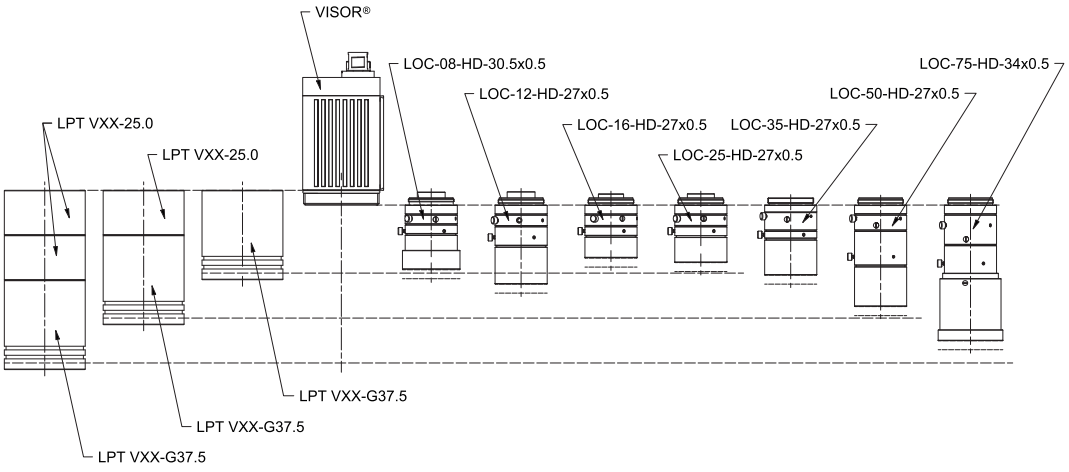
C-Mount protective casing:

- LPT Vxx-G37.5 / Clear / 651-01006
- LPT Vxx-G37.5-BP-R630 / Cover with Red BP filter / 651-01008
- LPT Vxx-G37.5-BP-I860 / Cover with Infrared BP filter / 651-01009

Protective tube extension:

- LPT Vxx-25.0 / 651-01007

QR-Code for more information



Technical data

Optical data	VISOR®	VISOR® **XE**
Number of pixels, chip size	VISOR® V10 ...: 800 (H) x 600 (V) VISOR® V20 ...: 1440 (H) x 1080 (V) VISOR® V50...:2560 (H) x 1936 (V)	VISOR® **XE** V20...: 1600 (H) x 1200 (V) VISOR® **XE** V50...:2560 (H) x 1936 (V)
Technology	CMOS (mono / color)	CMOS (mono / color)
Lighting (integrated)	8 LEDs (except C-Mount) (white, red, infrared, ultraviolet)	8 LEDs (except C-Mount) (white, red, infrared, ultraviolet)
Fields of view	wide, medium, narrow	wide, medium, narrow

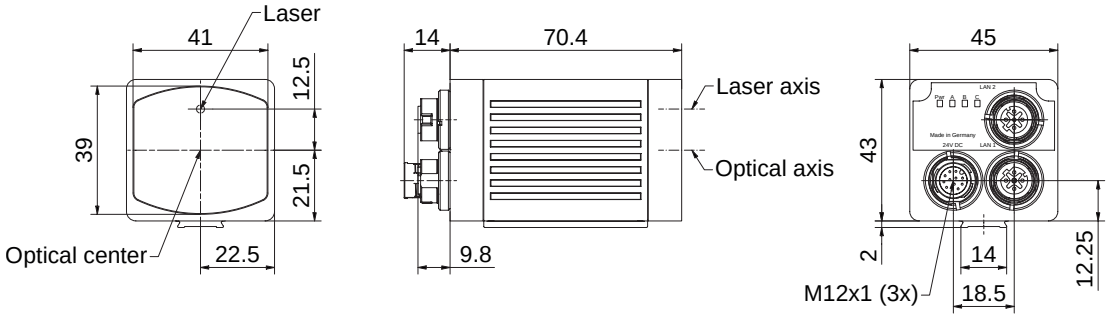
Electrical data	VISOR®	VISOR® **XE**
Operating voltage $+U_B$	18 … 30 V DC[1]	18 … 30 V DC[1]
Power consumption (without I/O)	≤ 350 mA	≤ 350 mA
Protection circuits	Reverse-polarity protection, U_B / short-circuit protection of all outputs	Reverse-polarity protection, U_B / short-circuit protection of all outputs
Rise-time delay	Approx. 16 s after Power on	Approx. 16 s after Power on
Outputs	PNP/NPN (switchable)	PNP/NPN (switchable)
Max. output current (per output)	50 mA, 100 mA (pin 12)	50 mA, 100 mA (pin 12)
Inputs	PNP/NPN High > U_B-1 V, Low < 3 V	PNP/NPN High > U_B-1 V, Low < 3 V
Input resistance	> 20 kΩ	> 20 kΩ
Encoder input	40 kHz	
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb
Inputs / Outputs	2 inputs / 2 outputs, Selectable inputs/outputs: Standard variant 4; Advanced/ Professional variant 6	2 inputs / 2 outputs, Selectable inputs/outputs: Standard variant 4; Advanced/ Professional variant 6

[1] Max. ripple < 5 V_{SS} [3] dependent on model

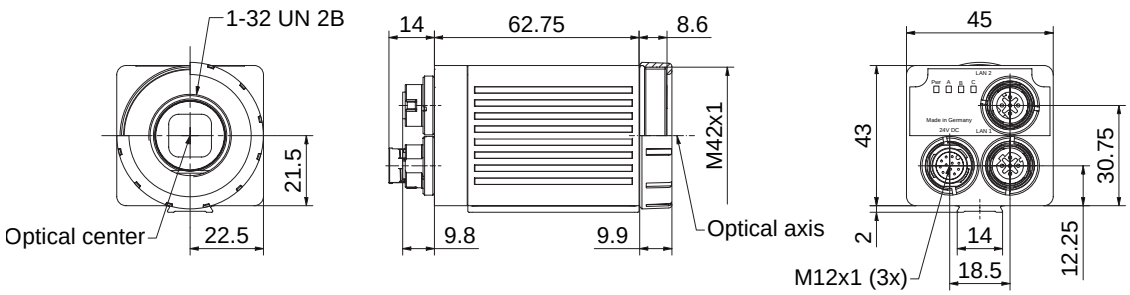
Mechanical data	VISOR®	VISOR® **XE**
Dimensions	71 x 45 x 45 mm (without connector)	71 x 45 x 45 mm (without connector)
Enclosure rating	IP65/IP67	IP65/IP67
Material housing	Aluminium, die-cast, RoHS compliant	Aluminium, die-cast, RoHS compliant
Material, front screen	Plastic	Plastic
Ambient temperature: operating	0 … +50° C[2]	0 … +50° C[2]
Ambient temperature: Storage	-20 … +60° C[2]	-20 … +60° C[2]
Weight	ca. 220 g	ca. 220 g
Plug Connections	Supply and I/O M12, 12-pin, Ethernet M12, 4-pin	Supply and I/O M12, 12-pin, 2x Ethernet M12, 4-pin
Vibration / shock resistance	EN 60947-5-2	EN 60947-5-2
c UL us LISTED CE		

[2] 95 % air humidity, non-condensing

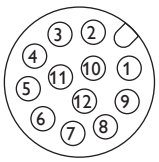
Vision sensor VISOR® with integrated optics & lighting



Vision sensor VISOR® c-mount



I/O Mapping 24 V DC connection



PIN	Color [3]	Signal
1	BN	+ U_B (24VD C)
2	BU	GND
3	WH	IN (external trigger)
4	GN	READY (ready for next external trigger)
5 [1]	PK	IN/OUT (encoder B+)
6	YE	IN/OUT, (external illumination south) [4]
7	BK	IN/OUT, (external illumination west) [4], LED B [2]
8	GY	IN/OUT, (external illumination north) [4], LED C [2]
9	RD	IN/OUT, (external illumination, external illumination east) [4]
10 [1]	VT	IN (encoder A+)
11	GY/PK	VALID (indicator for valid results)
12	RD/BU	IN/OUT (ejector), LED A [2]

[1] Not available on all Standard models
[2] All indicator LEDs are set without consideration of any delay times used
[3] Colors match the SensoPart power cables. If other cables are used, there might be differences.
[4] Only if Multishot is active

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SensoPart is a leading manufacturer of photoelectric sensors and machine vision sensors for factory automation. We also offer inductive and ultrasonic sensors, covering a wide spectrum of industrial automation tasks. Our products are used in countless applications and industries – from automotive assembly and mechanical engineering to electronics manufacturing and solar, as well as in the food and pharmaceutical industries. We take great pride in our renowned, German-made quality products, developed and manufactured at our two facilities in Germany and shipped worldwide.

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