

VISOR[®] Product Overview

VISOR® vision sensors for factory automation



Optical sensors

VISOR[®] vision sensors for factory automation

Image processing can be so easy.



sales@electromate.com

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 camera 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:

• Select your VISOR® to suit to your own requirements.

Connectivity:

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



2

www.sensopart.com





sales@electromate.com

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, to increase plant efficiency through the results gained, to increase availability and thus also to reduce costs. Depending on the task, SensoPart offers the VISOR[®] with suitable ranges of integrated detectors and functions. We distinguish between:

Standard: To solve simple image processing tasks

Advanced: An extended scope of functions for more challenging applications

Professional: The complete detector package suited to even very complex tasks



VISOR[®] vision sensors

One camera, one software, any application

Detection & inspection



Reliable detection in any situation

Most production lines require assembly and quality control checks. The VISOR[®] Object provides the answer to the most important questions that arise:

- 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 Color models
 - Color inspection
 - Higher robustness through use of color information and color filters



Toll Free Phone (877) SERV098 www.electromate.com sales@electromate.com

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

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

Sold & Serviced By:

Toll Free Phone (877) SERV098 www.electromate.com sales@electromate.com



Setup requires just a few simple steps

Complex tasks made easy - with VISOR® software packages

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.



Sold & Serviced By:

C ELECTROMATE

Toll Free Phone (877) SERV098 www.electromate.com

sales@electromate.com





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.



Toll Free Phone (877) SERV098 www.electromate.com sales@electromate.com

VISOR[®] Object Standard

The standard for reliable object detection



sales@electromate.com







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





Toll Free Phone (877) SERV098 www.electromate.com sales@electromate.com

9

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

Sold & Serviced By: **ELECTROMATE** Toll Free Phone (877) SERV098

Toll Free Phone (877) SERV098 www.electromate.com sales@electromate.com



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.

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

- Compact and lightweight housing for moving or stationary applications
- Calibration methods tailored to the application
- 2D or 3D localisation in robot coordinates
- Simplified setup through 3D gripper point transformation
- Less robot programming when images are captured in diverse positions



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



Toll Free Phone (877) SERV098 www.electromate.com sales@electromate.com



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[®] 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

- Evaluation of quality parameters according to ISO/IEC 15415 and AIM DPM 2006
- Supplementary object detection for characteristics other than codes (pattern matching, brightness, grey threshold and contrast)
- Flexible definition of output data (header, trailer, net data)
- String comparison with message via the digital switching output
- Support of EtherNet/IP, PROFINET (Conformance Class B) and EtherNet (TCP/IP)
- Comprehensive options for archiving images and data
- Reading of optical characters with OCR





Toll Free Phone (877) SERV09 www.electromate.com sales@electromate.com

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
- Reading OCR fonts

VISOR[®] Allround

Advanced allround vision sensor for complex inspection tasks





VISOR® Allround – Object detection in color plus identification united in one device In the allround version, the device combines the functions of the object sensor (i.a. calibration, pattern matching, contour, calliper, BLOB) with the powerful tools of the code reader (barcode, datamatrix and optical character recognition).



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.

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



The right package for your individual application:

VISOR® Allround Advanced: Color object detection and identification combined in one device



- All evaluations ("Detectors") of object sensor and code reader united in one device
- Real-world engineering units at a mouse click
- Precise determination of X/Y position, orientation and tracking
- Can be used for all common 2D codes (ECC 200-Datamatrix) and common 1D barcodes
- Detection of differences in height in the pseudo height image with Multishot technology

VISOR® Allround Professional: Additionally solving of robotics applications



- Real-world engineering units and robot coordinates at a mouse click
- Unified, easy-to-use configuration and viewer software with staggered user rights and context help

Thoroughly equipped

Sophisticated design and extensive features







- sFTP/SMB archiving
- SensoWeb

VISOR[®] vision sensor

Detectors and application examples

Identification

12	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.		_
ABC	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.	PZN 6 822 9	_
	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.	Arzneimittel für Kinder unzugängle Verschreibungspflichtig. • Zul-Nr.: PZN -6882219	_
Posi	tioning			
0	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.		
30	3D Contour	3D localisation of individual or multiple objects. Inclination of up to \pm 15° and height offset are precisely detected. No CAD models are required.	C SCHECPART	
•••• •30	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 camera. The smallest deviations in the working position and even large angular deviations are precisely detected.	© (3 5275/2004)	
₽	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.		-Cup
ধ	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 analysis in search zone. Definition of result output via switching threshold.







Contrast

Analysis of grey threshold in search zone. Definition of result output via switching threshold.





 \mathbf{O}

Contrast analysis in search zone. Definition of result output via switching threshold.

Measurement



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.

Comparison of character strings; formatting, adding and cutting





Result processing

H

Result processing: Text

Result processing:

Color detection

Math

Color

value

Color

list

Offset of numerical results; calculation of distances and angles; comparison of results. Output of a digital (good/bad) result.

of character strings; sorting, simple calculations.

Output of a digital (good/bad) result.

space: RGB, HSV, LAB.





_

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.

Output of color values via interfaces, setting options for color



VISOR[®] vision sensor

Detectors and application examples

Color detection (continued)

	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.		ए ए ए ए ए ए ए	好好好好
Positi	on tracking			
↓ ♥	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.	a-Cup ^{nuter}	-Cup er
•	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.		
Funct	ions & prepro	cessing filters		
Free	form 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.		E
Col	lor 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)	12345678 12345678 12345678	12345678 12345678 12345678

VISOR[®] vision sensor

Interfaces and tools



Interfaces	
C C SensoWeb	Visualisation of images and results. Easy connection to system visualisation by web browser.
profu [®] Net	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.
Ethernet TCP/IP	Ethernet interface with user-configurable protocol.VISOR $^{\ensuremath{\$}}$ control options via TCP/IP commands.
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.

Product overview VISOR® vision sensors

Software

VISOR[®] Object







Presence, completeness, measurement, position check, color

Advanced

Robotics, presence, completeness, measurement, positioning

Professional

Advanced

Calibration				
Scaling Perspective	✓ -	✓ ✓	✓	↓
Point-pair list Calibration plate (robot)	_	- -	✓	√
Hand-eye Base-eye calibration (robot)	-	_	-	✓

Standard

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	-	-		/

Identification			
Barcodes Datacode	_	-	✓ ✓
Barcode Advanced Datacode Advanced	_	_	✓ ✓
Clear text (OCR)	_	-	✓ ✓

Robotics functions			
Result offset image 2D 3D	- - -	- - -	$\checkmark \mid \checkmark \mid \checkmark$
Checking space around gripper	-	_	✓

Color detectors V10C / V20C / V50C			
Color field Color value Color list	✓ - -	$\checkmark \mid \checkmark \mid \checkmark$	$\checkmark \mid \checkmark \mid \checkmark$
Color distance Binarisation	- -	✓ ✓	✓ ✓

Result processing				
Result processing - Text Math	- -	- 🗸	- 🗸	✓ ✓



VISOR[®] Code Reader



VISOR® Allround



Reading of barcodes, 2D codes, text

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

	Standard	Advanced	Professional	Advanced	Professional
Calibration					
Scaling Perspective	_		\checkmark	✓	
Point-pair list Calibration plate (robot)	_		-	✓	
Hand-eye Base-eye calibration (robot)		_		_	✓
Preprocessing					
Preprocessing filter	_	✓	✓	Ŷ	/
Multiple image capture Shutter variation	_	✓	✓	Ŷ	/
Freeform search area	_	_	✓	Ŷ	/
			· · · · · ·		
Position tracking					
Contour comparison (translation, rotation 360°)	-	_	✓	Ŷ	/
Pattern matching (translation, rotation 360°)	-	_	✓	Ŷ	/
Edge detection (translation, rotation)	-	_	✓	Ŷ	/
,					
Object detection					
Contour Multiple detection		- -		✓	
Pattern comparison Multiple detection	_	-	✓ ✓	✓	
Grey level Contrast Brightness	-	_	✓	✓	
Calliper		_		✓	
BLOB		_		Ŷ	/
3D contour		_		-	✓
Target Mark 3D		_		\checkmark	√
,					
Identification					
Barcodes Datacode		\checkmark		Ŷ	/
Barcode Advanced Datacode Advanced	_		✓	✓	
Clear text (OCR)	-	_	✓	`	/
· · · · · · · · · · · · · · · · · · ·			· · ·		
Robotics functions					
Result offset image 2D 3D	- - -			_	✓
Checking space around gripper				_	√
			· · ·		
Color detectors V10C / V20C / V50C					
Color field Color value Color list	- - -			✓ ✓ ✓	
Color distance Binarisation		- -		\checkmark	√
			I		
Result processing					

✓ | -

- | -

Result processing - Text | Math

✓ | ✓

Product overview VISOR® vision sensors

Hardware

VISOR[®] Object







Presence, completeness, measurement, position check, color

Robotics, presence, completeness, measurement, positioning

	Standard	Advanced	Advanced	Professional
	P	· · · · · · · · · · · · · · · · · · ·		0
Resolution				
V10 (800 × 600): Mono Color	,	/	\checkmark	-
Images per second: Mono Color	75 50		75	-
V20 (1440 x 1080): Mono Color	-	√	Ŷ	1
Number of images per second: Mono Color	-	40 20	40	20
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	-	✓	✓	

Lenses				
V10 wide medium narrow C-Mount	✓ ✓ ✓ −	$\checkmark \checkmark \checkmark \checkmark$	$\checkmark \checkmark \checkmark \checkmark$	-
V20 wide medium narrow C-Mount	- - - -	$\checkmark \checkmark \checkmark \checkmark \checkmark$	✓ ✓	✓ ✓
V50 wide medium narrow C-Mount	- - - -	$\checkmark \checkmark - \checkmark$	-	$\checkmark \checkmark - \checkmark$

Interfaces	Ethernet/EtherNet/IP/PROFINET			
Inputs outputs selectable	2 2 4	2 2 6	2 2 6	
Encoder input	-	√	\checkmark	
Ethernet EtherNet/IP PROFINET SensoWeb	$\checkmark \checkmark \checkmark \checkmark$		$\checkmark \checkmark \checkmark \checkmark$	
Service Port	_	✓	✓	

Job / Detectors			
Number of jobs (max.) Detectors per job (max.)	32 32	255 255	255 255
Job checksum	-	✓	✓



VISOR[®] Code Reader



VISOR[®] Allround



Reading of barcodes, 2D codes, text

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

Standard	Advanced	Professional	Advanced	Professional

Resolution				
V10 (800 × 600): Mono Color		✓ -	✓	_
Images per second: Mono Color	75 -		75 50	_
V20 (1440 × 1080): Mono Color	✓ -		\checkmark	
Number of images per second: Mono Color	40 -		40	20
V50 (2560 × 1936): Mono Color	-	✓ -	-	✓
Images per second: Mono Color	-	22 -	-	22 8

Lighting	white, red ¹ , infrared ¹			
Multishot		_	\checkmark	
Target laser	only V20	\checkmark	\checkmark	

Lenses				
V10 wide medium narrow C-Mount	✓ ✓ ✓ −	$\checkmark \checkmark \checkmark \checkmark $	$\checkmark \checkmark \checkmark \checkmark$	-
V20 wide medium narrow C-Mount	✓ ✓ ✓ −	$\checkmark \checkmark \checkmark \checkmark$	✓ ✓	✓ ✓
V50 wide medium narrow C-Mount	-	$\checkmark \checkmark - \checkmark$	_	$\checkmark \checkmark - \checkmark$

Interfaces	Ethernet/EtherNet/IP/PROFINET			
Inputs outputs selectable	2 2 4 2 2 6		2 2 6	
Encoder input	-	\checkmark	\checkmark	
Ethernet EtherNet/IP PROFINET SensoWeb	$\checkmark \checkmark \checkmark \checkmark$		$\checkmark \checkmark \checkmark \checkmark$	
Service Port	_	✓	✓	

Job / Detectors			
Number of jobs (max.) Detectors per job (max.)	8 2	255 255	255 255
Job checksum	_	\checkmark	\checkmark

Technical data

Optical data

Number of pixels, chip size	VISOR®-V10: 800 (H) × 600 (V) VISOR®-V20: 1440 (H) × 1080 (V) VISOR®- V50:2560 (H) × 1936 (V)
Technology	CMOS (mono / color)
Lighting (integrated)	8 LEDs (except C-Mount) (white, red, infrared)
Fields of view	wide, medium, narrow, motorised focus

Electrical data

Mec	hanical	data
1100	nuncu	aucu

Operating voltage +U _B	18 30V DC ¹	
Power consumption (without	≤ 300 mA	
I/O)	Reverse-polarity protection, U _B / short-circuit protection of all outputs	
Protection circuits		
	Approx. 13 s after Power on	
Rise-time delay	PNP/NPN (switchable)	
Outputs	50 mA, 100 mA (pin 12)	
Max. output current (per output)	PNP/NPN High > U_{p} -1 V, Low < 3 V	
Inputs	> 20 kΩ	
Input resistance	40 kHz	
Encoder input	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb	
Interfaces		
	2 inputs, / 2 outputs, 6 selectable inputs/outputs ³	
Inputs / Outputs		

Dimensions	71 x 45 x 45 mm (without connector)
Enclosure rating	IP 67
Material housing	Aluminium, die-cast, RoHS compliant
Material, front screen	Plastic
Ambient temperature: operating	0 +50° C ²
Ambient temperature: Storage	-20 +60° C ²
Weight	Approx. 200 g
Plug Connections	Supply and I/O M12, 12-pin, Ethernet M12, 4-pin
Vibration / shock resistance	EN 60947-5-2



 1 Max. ripple $< 5\,V_{_{\rm SS}}$ - 2 80 % air humidity, non-condensing

sing ³ dependent on model





Fields of view and depths of field





Field of view V10 medium

Field of view V10 narrow







Field of view V20 medium

200 300 400 500 600



700

nce [mm]

ing d

800 900

1000 1100

155-03100





Field of view V50 wide



Field of view V50 medium



Increased depth of field
 Normal depth of field

Senso Calc

Wizard for optical calculations

Senso**Calc** is an assistant for performing basic calculations for camera applications. The calculations are especially designed for the components of SensoPart.

The following modules are available:









RESOLUTION



Link to Senso**Calc**



Accessories

Brackets, display, cables, lenses, illumination, robotics





Optical accessories: C-Mount protective casing, protective casing and polarizer glasses



C-Mount protective casing: LPTVxx-G37.5 / 651-01006

Protective tube extension: LPT Vxx-25.0 / 651-01007



Removable protective casing: LPCVxx / 651-01001
 Polarising filter panels:

 LPC Vxx S1-5 /

 651-01002

 LPF Vxx S1 /

 651-01003

 LPF Vxx S2 /

 651-01004



QR-Code for more information

Part number / Article number

Illumination: Ring light, spot illumination, connection adapter for illumination



LFR 115 WK-24-2L12 / 525-51153 LFR 115 RK-24-2L12 / 525-51154 LFR 115 IK-24-2L12 / 525-51155



Spot illumination: LS 55 × 46 WK-24-A13 2L12 / 532-51101 LS 55 × 46 RK-24-A13 2L12 / 532-51102 LS 55 × 46 iRK-24-A13 2L12 / 532-51103



Connection adapter: LA 45 V-24-2L12 / 525-01001 LA 45 VT-24-2L12 / 525-01002



QR-Code for more information

Part number / Article number

Part number /

Ring light:

525-51150

525-51151

525-51152

LFR 115 WD-24-2L12 /

LFR 115 RD-24-2L12 /

LFR 115 ID-24-2L12 /

Robotics: Calibration plates and target marks



 Standard:

 ZCP 50-13x15 /

 533-11030

 ZCP 100-13x15 /

 533-11031

 ZCP 200-13x15 /

 533-11032

 PD

 ZCP 500-13x15 /

 533-11033



X01 ZCP 50-13x15-X01 / 533-11037 ZCP 100-13x15-X01 / 533-11038 ZCP 200-13x15-X01 / 533-11039 ZCP 500-13x15-X01 / 533-11040 Others: ZCP 100-13x15-X02 / 533-11035 ZCP 50-13x15-X03 / 533-11042 ZCP 100-13x15-X03 / 533-11041 ZCP 100-ECC200 / 533-11036



Target Mark: ZTM 100-D2-RF-4x3.3 / 533-11045 ZTM 38-D2-RF-2x3.3 / 533-11044 ZTM 58.5-G1-RF-2x4.3 / 533-11043



QR-Code for more information

www.sensopart.com 31

www.sensopart.com

We are SensoPart

SensoPart is one of the leading manufacturers of photoelectric sensors and image processing vision sensors for factory automation. We also offer inductive and ultrasonic sensors, thereby covering a wide spectrum of industrial automation tasks. Our products are used in countless applications and sectors today – from automotive construction and mechanical engineering to electronics manufacturing and the solar industry, as well as the food sector and pharmaceutical industry.



SensoPart worldwide

Germany

SensoPart Industriesensorik GmbH Nägelseestraße 16 79288 Gottenheim Phone +49 7665 94769-0 info@sensopart.de

USA

SensoPart Inc. 30600Telegraph Rd. Suite 2345, Bingham Farms, MI, 48025 Phone +1 866 2827610 info.usa@sensopart.com

France

SensoPart France Sarl 662, rue des Jonchères – Bât. A F-69730 GENAY Phone +33 164 730061 info@sensopart.fr

China

SensoPart China 202, No. 35, Lane 1555 West Jinshajiang Road, Jiading District 201803 Shanghai Phone +86 21 69017660 china@sensopart.cn

United Kingdom

SensoPart UK Limited Pera Business Park, Nottingham Road Melton Mowbray, Leicestershire LE13 0PB Phone +44 1664 561539 info@sensopart.co.uk

Find your local supplier at: www.sensopart.com/en/contact/

