

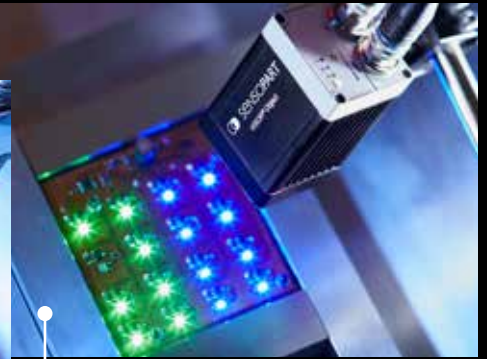
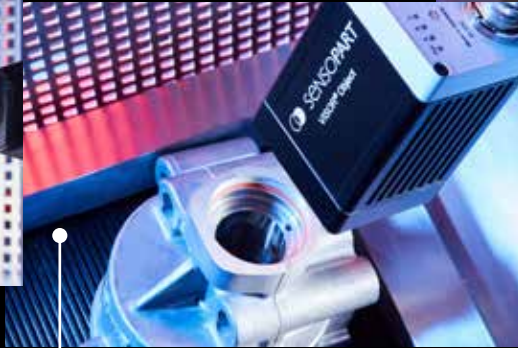
VISOR® vision sensors

Image processing can be so easy.

VISOR® Allround



VISOR® Object



VISOR® Allround

Object detection and identification
in one device

from page 42

- All evaluations ("Detectors") of VISOR® Object and VISOR® Code Reader united in one device
- Highly accurate evaluation via 1.5 megapixel chip
- Powerful color detection of version with color chip
- Ethernet, Profinet and EtherNet/IP are available for data communication

VISOR® Object

Reliable detection and classification
of objects

from page 68

- Detectors for presence and completeness checks as well as for simple measurement tasks
- Precise determination of X/Y position, orientation and tracking
- High evaluation accuracy through 1.5 megapixel chip
- Comprehensive logic functions for the digital switching outputs
- Flexible definition of output data (header; trailer; net data)
- Correction of warps and distortions, conversion into millimetres thanks to easy calibration

VISOR® Object Color

Improved object detection through
supplementary color information

from page 68

- Powerful color detection, even with small color nuances or fluorescent components
- Powerful part-finding and tracking
- High evaluation accuracy through 1.5 megapixel color chip
- Up to 8 digital switching outputs

VISOR® Robotic

VISOR® Code Reader



VISOR® Robotic

The expert for robotics applications
from page 92

- Different detectors for locating up to components
- Check of space available around gripper
- Offset in VISOR® software for simple adjustment of gripper point
- Two calibration methods for robotics applications
- Offset of work plane through Z-offset function

Camera + software = vision!

With its portfolio of vision solutions, SensoPart covers the entire spectrum of industrial image processing. Our VISOR® vision sensors are based on a powerful smart camera in a compact sealed sensor housing with a standardised dovetail mount. They also feature integrated signal processing, LED lighting (white, red, infrared), data interfaces and digital I/Os, integrated lens or C-mount as well as user-friendly configuration software.

VISOR® Code Reader standard

Reading of barcodes and data matrix codes
from page 244

- Flexible definition of output data (header; trailer; net data)
- String comparison with signalling via the digital switching output

VISOR® Code Reader Adv. / Prof.

Reading of barcodes and data matrix codes, as well as detection of optical characters (OCR)
from page 226

- Reads bar codes as well as printed and directly marked data matrix codes reliably; can also read several codes simultaneously and combinations of 1D/2D codes
- Evaluation of quality parameters according to ISO/IEC 15415 and AIM DPM 2006
- Supplementary object detection for features outside the code with "Professional" version

VISOR® Allround

System description

VISOR® Allround – Object detection in color plus identification combined in one device

The VISOR® Allround leaves nothing to be desired.

The VISOR® Allround 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). When feeding parts in correct alignment or positioning components, additional data matrix codes for example can now also be read. With a resolution of up to 1.5 megapixel even the smallest details are reliably detected and evaluated.

Special image filters for image pre-processing can be used, e.g. to highlight edges or to suppress distracting details.

Communication interfaces

In addition to EtherNet/IP and TCP/IP, the VISOR® vision sensors also support the fieldbus standard Profinet IO and thus "understand" the most common communication standards of Industrial Ethernet. Thanks to freely available PLC function blocks for Siemens S7, Codesys and Allen Bradley, the VISOR® can also be easily and flexibly connected to PLC environments. The new VISOR® Allround is thus one of the most powerful vision sensors in the market.

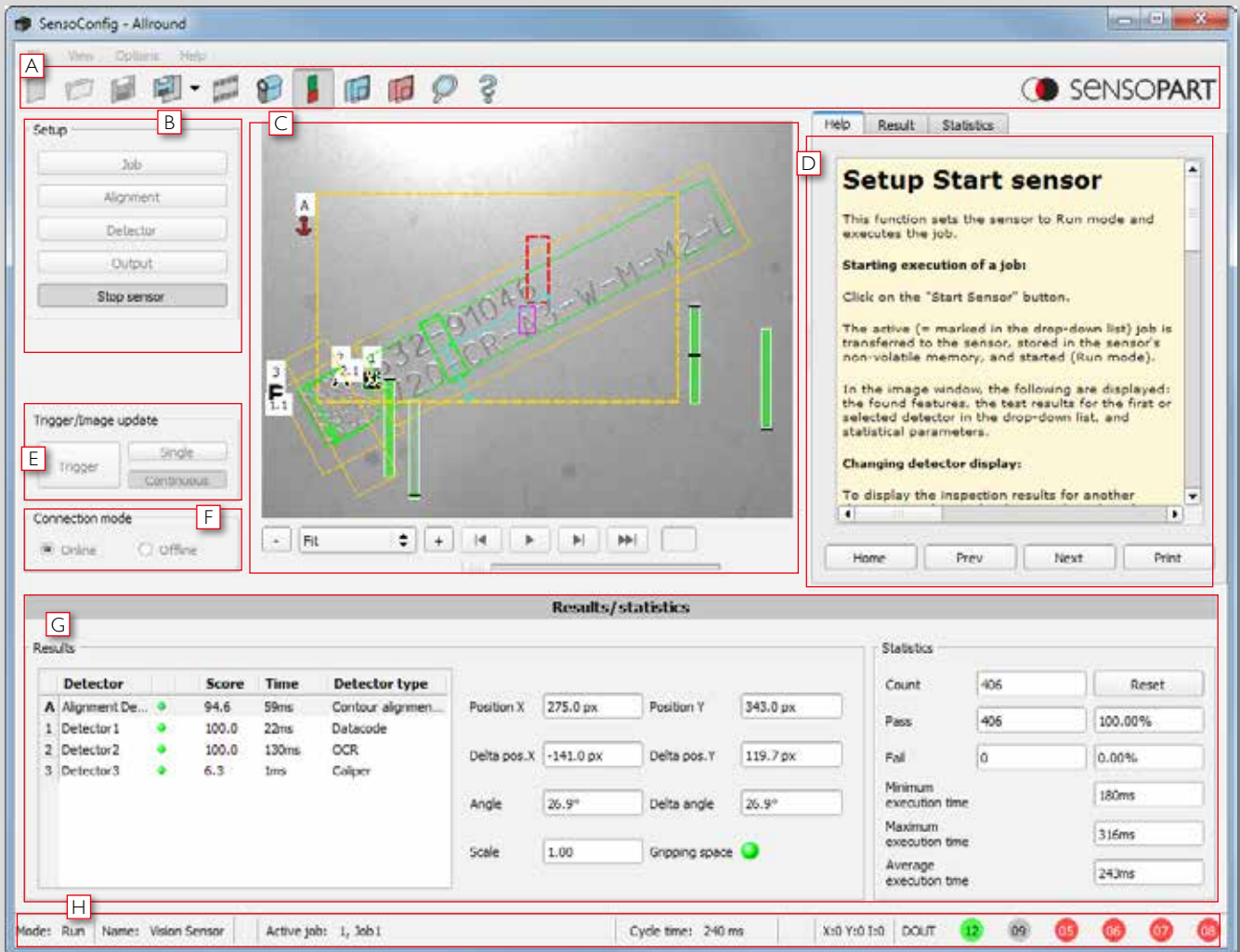
Raised or recessed object details – such as embossed digits and characters on a credit card – are difficult to detect with standard image processing methods. Even use of lateral lighting generally results in poorly identifiable contours due to overexposure and shadows. The solution comes in the shape of SensoPart's VISOR® vision sensor series with the new Multishot function. Contours now stand out clearly so that raised or recessed letters and digits can be easily read, e.g. using the vision sensor's OCR function. Other application examples for VISOR® Multishot include the reading of data matrix codes moulded directly into plastic surfaces, detection of damage such as dents or scratches, or the recognition of raised adhesive beads on the same colored background.

Product variants VISOR® Allround

	VISOR® Allround	
	Presence, completeness, measurement, color, reading of barcodes, 2D codes	
	Advanced	Professional
Resolution	Monochrome, Color	
V10 V10C 800 × 600	75 50	– –
Number of images per second V10 V10 C	Monochrome Color	
V20 V20C 1440 × 1080	40 20	
Number of images per second V20 V20 C	white, red ¹ , infrared ¹	
Lighting		
Multishot	✓	
Target laser	✓	
Lenses		
V10 wide medium narrow c-mount	✓ ✓ ✓ ✓	
V20 wide medium narrow c-mount	✓ ✓ ✓ ✓	
Interfaces		
Inputs outputs selectable	2 2 6	
Encoder input	✓	
Ethernet EtherNet/IP Profinet SensoWeb	✓ ✓ ✓ ✓	
Service port	✓	
Job/Detectors		
Number of jobs (max.)	255	
Number of detectors per job (max.)	255	
Calibration		
Calibration (scaling, perspective)	✓	
Robot calibration	–	✓
Preprocessing		
Preprocessing filter	✓	
Multiple image capture/Shutter variation	✓	
Free-form search area	✓	
Position tracking		
Contour comparison (translation, rotation 360°)	✓	
Pattern matching (translation, rotation 360°)	✓	
Edge detection (translation, rotation)	✓	
Object detection		
Contour comparison (translation, rotation 360°)	✓	
Multiple contour detection	✓	
Pattern matching (translation, rotation 360°)	✓	
Grey level Contrast Brightness	✓	
Calliper	✓	
BLOB	✓	
Identification		
Datacode	✓	
Datacode advanced	✓	
Barcode	✓	
Barcode advanced	✓	
Clear text (OCR)	✓	
Robotics functions		
Result offset	–	✓
Checking space around gripper	–	✓
Color detectors²		
Color field	✓	
Color value	✓	
Color list	✓	
Color distance Binarisation	✓	

¹ not with color hardware V10C/V20C

² only color hardware



3

Overview of the user interface

- A** **Menu bar:** rapid access to the most important functions.
- B** **Setup navigation:** dependable user guidance through the configuration process.
- C** **Image window:** live picture of the object with graphic display of inspection area and results.
- D** **Context help:** precise information on every work step.
- E** **Trigger function:** triggered operation or free-running, single picture or serial switching.
- F** **Online/offline operation:** operating with sensor connected or simulation with stored pictures.
- G** **Result window:** Overview of all results.
- H** **Status line:** current information on active job and on state of outputs.

VISOR® Object

System description

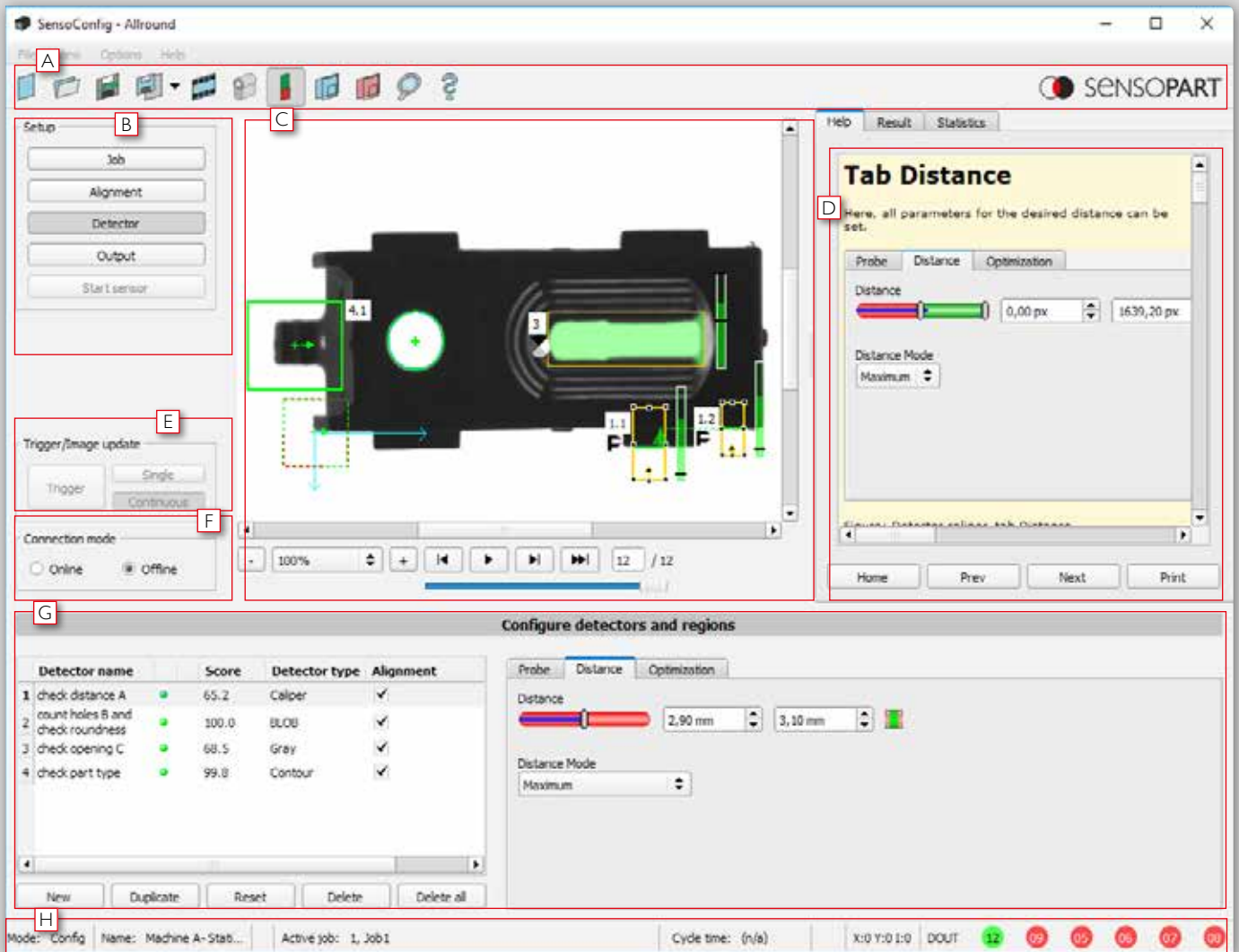
The VISOR® Object from SensoPart not only impresses with its excellent performance data, but also with its sophisticated operating concept: even the definition of complex inspection tasks is achieved rapidly and without complication thanks to its comfortable and easily understood user interface – even without detailed image-processing knowledge. You define and test your inspection tasks (“job”) and desired evaluations (“detectors”) in a few intuitive setup steps.

The effect of every setting is immediately visible in the image. Comprehensive logic functions allow the direct assignment of more complex inspection results to one of six digital result outputs. Time-based control of signal output is also possible via the integrated encoder function. The integrated image recorder, with which you can carry out fault analyses and simulations, is also very helpful.

Everything in view with the Viewer: after completing configuration, the vision sensor works in your production plant autonomously, i.e. without a PC connection. Of course, data can be called up at any time during running operation: our own Viewer software “SensoView” with hierarchical user rights (reliably preventing unintentional changes to the configuration) is available for this. “SensoWeb” enables a simple integration into the plant visualisation via web browser. Professional image processing can be this simple and comfortable!

Product variants VISOR® Object

	VISOR® Object	
	Presence, completeness, measurement, color	
	Standard	Advanced
Resolution		
V10 V10C 800 × 600	Monochrome Color	
Number of images per second V10 V10 C	75 50	
V20 V20C 1440 × 1080	–	Monochrome Color
Number of images per second V20 V20 C	– –	40 20
Lighting	white, red ¹ , infrared ¹	
Multishot	–	
Target laser	–	✓
Lenses		
V10 wide medium narrow c-mount	✓ ✓ ✓ –	✓ ✓ ✓ ✓
V20 wide medium narrow c-mount	– – – –	✓ ✓ ✓ ✓
Interfaces		
Inputs outputs selectable	2 2 4	2 2 6
Encoder input	–	✓
Ethernet EtherNet/IP Profinet SensoWeb	✓ ✓ ✓ ✓	
Service port	–	✓
Job/Detectors		
Number of jobs (max.)	8	255
Number of detectors per job (max.)	32	255
Calibration		
Calibration (scaling, perspective)	–	✓
Robot calibration	–	
Preprocessing		
Preprocessing filter	–	✓
Multiple image capture/Shutter variation	–	✓
Free-form search area	✓	
Position tracking		
Contour comparison (translation, rotation 360°)	✓	
Pattern matching (translation, rotation 360°)	–	✓
Edge detection (translation, rotation)	–	✓
Object detection		
Contour comparison (translation, rotation 360°)	✓	
Multiple contour detection	–	✓
Pattern matching (translation, rotation 360°)	✓	
Grey level Contrast Brightness	✓	
Calliper	–	✓
BLOB	–	✓
Identification		
Datacode	–	
Datacode advanced	–	
Barcode	–	
Barcode advanced	–	
Clear text (OCR)	–	
Robotics functions		
Result offset	–	
Checking space around gripper	–	
Color detectors²		
Color field	✓	
Color value	–	✓
Color list	–	✓
Color distance Binarisation	–	✓



Overview of the user interface

- A **Menu bar:** rapid access to the most important functions.
- B **Setup navigation:** dependable user guidance through the configuration process.
- C **Image window:** live picture of the object with graphic display of inspection area and results.
- D **Context help:** precise information on every work step.
- E **Trigger function:** triggered operation or free-running, single picture or serial switching.
- F **Online/offline operation:** operating with sensor connected or simulation with stored pictures.
- G **Configuration window:** input of parameters for every navigation step.
- H **Status line:** current information on active job and on state of outputs.

VISOR® Robotic

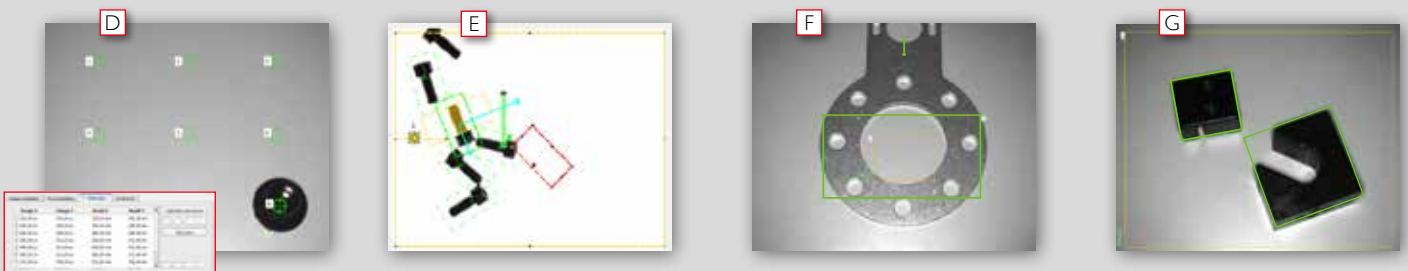
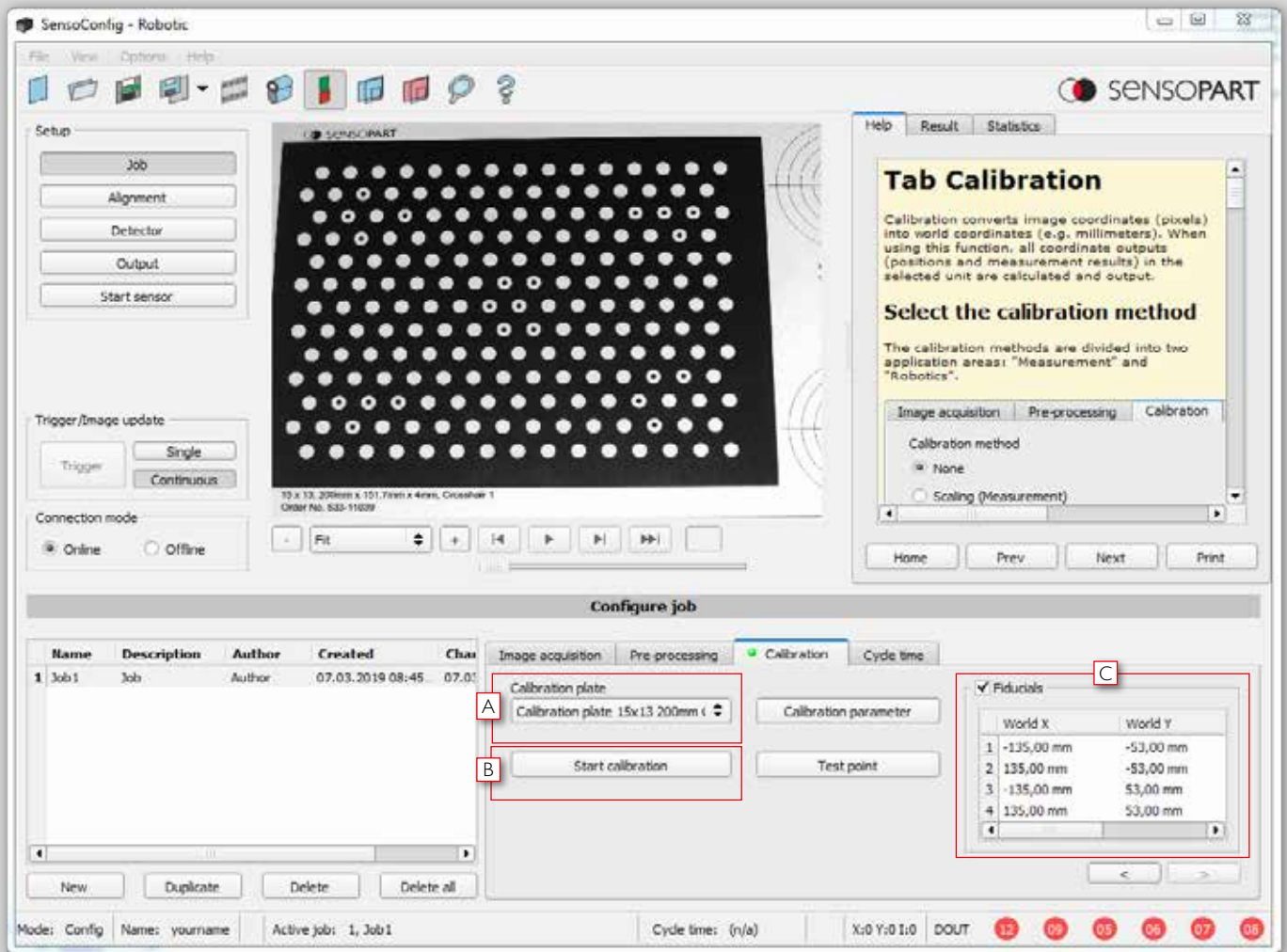
System description

A diverse specialist

Expectations of today's robotics solutions are steadily rising in the context of Industry 4.0, paired with a simultaneous desire for greater ease-of-use. And this is precisely where the VISOR® Robotic demonstrates its outstanding ability. Available in several versions, it offers the perfect solution for a variety of automation tasks. Designed with integrated and standardised interfaces, VISOR® Robotic can be easily incorporated in existing installations and systems, and thanks to different calibration methods and flexible data structures, it is also suited to a diverse range of procedures.

Product variants VISOR® Robotic

	VISOR® Robotic	
	Robotics, presence, completeness, measurement, positioning	
	Advanced	Professional
Resolution		
V10 V10C 800 × 600	Monochrome	–
Number of images per second V10 V10 C	75	– –
V20 V20C 1440 × 1080	Monochrome Color	
Number of images per second V20 V20 C	40 20	
Lighting	white, red ¹ , infrared ¹	
Multishot	–	
Target laser	✓	
Lenses		
V10 wide medium narrow c-mount	✓ ✓ ✓ ✓	
V20 wide medium narrow c-mount	✓ ✓ ✓ ✓	
Interfaces		
Inputs outputs selectable	2 2 6	
Encoder input	✓	
Ethernet EtherNet/IP Profinet SensoWeb	✓ ✓ ✓ ✓	
Service port	✓	
Job/Detectors		
Number of jobs (max.)	255	
Number of detectors per job (max.)	255	
Calibration		
Calibration (scaling, perspective)	✓	
Robot calibration	✓	
Preprocessing		
Preprocessing filter	✓	
Multiple image capture/Shutter variation	✓	
Free-form search area	✓	
Position tracking		
Contour comparison (translation, rotation 360°)	✓	
Pattern matching (translation, rotation 360°)	✓	
Edge detection (translation, rotation)	✓	
Object detection		
Contour comparison (translation, rotation 360°)	✓	
Multiple contour detection	✓	
Pattern matching (translation, rotation 360°)	✓	
Grey level Contrast Brightness	✓	
Calliper	✓	
BLOB	✓	
Identification		
Datacode	–	✓
Datacode advanced	–	✓
Barcode	–	✓
Barcode advanced	–	✓
Clear text (OCR)	–	✓
Robotics functions		
Result offset	✓	
Checking space around gripper	✓	
Color detectors²		
Color field	–	
Color value	–	–
Color list	–	–
Color distance Binarisation	✓	✓



Guide to user interface

- A** **Select calibration plate:** choice of four different sizes.
- B** **Start calibration:** VISOR® is calibrated in just one click.
- C** **Fiducials:** image coordinates mapped to robot coordinates at four points.
- D** **Calibration method point pair list:** calibration with point pair list (robot) for automatic calibration on object.
- E** **Gripping space check:** a freely accessible object is always output if available.
- F** **Result offset:** define the result point and therefore the position that the robot moves to on the component.
- G** **Blob detector:** localise components regardless of their shape and size. No need to teach a reference.

The VISOR® Code Reader

System description

With its integrated object detection, the VISOR® Code Reader is unique in its price segment. The compact sensor reads conventional 1D barcodes, 2D data matrix codes and now also optical characters (OCR). It also has four detectors for object detection (pattern comparison, brightness, grey level and contrast), with which other object features – for example, stamps or logos – can be evaluated in a single reading pass. Codes and object features are even reliably detected with deviations from the taught-in position – using position tracking (optionally activated).

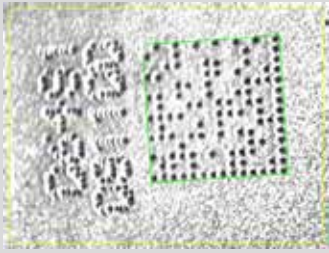
A special image filter with expanded setting options guarantees excellent reading performance even under difficult reading conditions. The test results can largely be evaluated within the sensor itself – with the option of string comparison or regular printouts – so, in many cases it eliminates the connection requirement to PLC or PC. If, however, this proves necessary, it can be easily and flexibly connected using freely available PLC function blocks for Siemens S7, Codesys and Allen Bradley.

With integrated quality parameters complying with ISO and AIM standards, the VISOR® Code Reader also permits the informative evaluation of printed and direct marked 1D and 2D codes. Integrated red, infrared or white light variants provide maximum functional reliability through optimum code illumination.

In addition, the robust, compact and industry-oriented housings guarantee reliability even where space is restricted. Integrated 6 mm or 12 mm optics or C-mount devices also save effort and costs through their optimum adaptation to the most varied of code sizes and operating distances. The V20 variants also offer a resolution of 1.5 megapixels for particularly small codes or large search areas.

Product variants VISOR® Code Reader

	VISOR® Code Reader		
	Reading of barcodes, 2D codes, text		
	Standard	Advanced	Professional
Resolution			
V10 V10C 800 x 600	Monochrome		
Number of images per second V10 V10 C	75 –		
V20 V20C 1440 x 1080	–	Monochrome	
Number of images per second V20 V20 C	– –	40 –	
Lighting	white, red ¹ , infrared ¹		
Multishot	–		
Target laser	–	✓	
Lenses			
V10 wide medium narrow c-mount	✓ ✓ ✓ –	✓ ✓ ✓ ✓	
V20 wide medium narrow c-mount	– – – –	✓ ✓ ✓ ✓	
Interfaces			
Inputs outputs selectable	2 2 4	2 2 6	
Encoder input	–	✓	
Ethernet EtherNet/IP Profinet SensoWeb	✓ ✓ ✓ ✓		
Service port	–	✓	
Job/Detectors			
Number of jobs (max.)	8	255	
Number of detectors per job (max.)	2	255	
Calibration			
Calibration (scaling, perspective)	–		
Robot calibration	–		
Preprocessing			
Preprocessing filter	–	–	✓
Multiple image capture/Shutter variation	–	–	✓
Free-form search area	–	–	✓
Position tracking			
Contour comparison (translation, rotation 360°)	–	✓	
Pattern matching (translation, rotation 360°)	–	✓	
Edge detection (translation, rotation)	–	✓	
Object detection			
Contour comparison (translation, rotation 360°)	–		
Multiple contour detection	–		
Pattern matching (translation, rotation 360°)	–	✓	
Grey level Contrast Brightness	–	✓	
Calliper	–		
BLOB	–		
Identification			
Datacode	✓	✓	
Datacode advanced	–	✓	
Barcode	✓	✓	
Barcode advanced	–	✓	
Clear text (OCR)	–	✓	
Robotics functions			
Result offset	–		
Checking space around gripper	–		
Color detectors²			
Color field	–		
Color value	–		
Color list	–		
Color distance Binarisation	–		



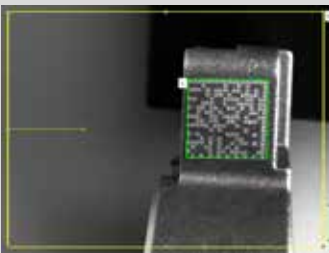
Dot-peened code on rough substrate
Code is made legible by powerful reading algorithm. Presence of the nailed imprint in plain text can be checked using object detection.



Low-contrast code
Code is made legible through high tolerance – also towards weakly contrasting codes.



Optical character reading
Dot matrix printing can also be read with OCR.



Code with small "quiet zone"
Even codes with a small quiet zone or damaged finder pattern can be read.



Code reading on solar cells
Even extremely small codes (e.g. on silicon solar cells) or highly reflective codes (e.g. on thin-layer solar cells) can be read.



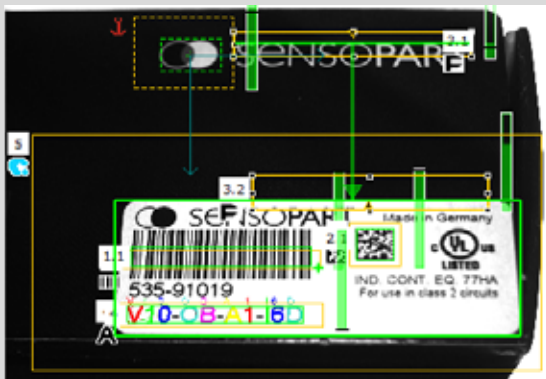
Printed codes on pharmaceutical packaging
ECC200 or bar codes (e.g. EAN 13) can be searched for simultaneously. In addition to code reading, the presence of optical characters can also be checked using object detection.

Special features of the VISOR® Code Reader

- Can be used for all common 2D codes (e.g. ECC 200 data matrix) and common 1D bar codes
- Optimum cost-effectiveness through combination of two functions in one device: code reading and object detection
- High operating dependability through reliable detection of even poorly readable codes under difficult ambient conditions
- Flexible and simple connection to PC and PLC environments due to comprehensive possibilities for archiving pictures and read results, as well as freely available PLC function blocks for Siemens S7, Codesys and Allen Bradley
- Very high flexibility, e.g. also due to reading several similar or different codes in one reading pass
- Reading of optical characters with OCR based on neural networks, particularly suitable for point printing

VISOR® Allround

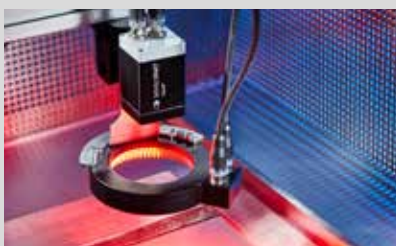
Advanced allround vision sensor for complex inspection tasks.



VISOR® Allround – Object detection in colour plus identification united in one device.
The VISOR® Allround is the latest member in the VISOR family and a real multi-talent among vision sensors. In the new allround version, the device unites the functions of the object sensor (i.e. calibration, pattern matching, contour, calliper, BLOB) with the powerful tools of the code reader (bar code, datamatrix and optical character recognition).

HIGHLIGHTS OF VISOR® ALLROUND

- All evaluations ("Detectors") of VISOR® Object and VISOR® Code Reader united in one device
- Highly accurate evaluation via 1.5 megapixel chip
- Powerful color detection of version with color chip
- EtherNet/IP PROFINET (conformance class B), EtherNet (TCP/IP) supported
- Multishot function reveals minimal height differences and suppresses printed markings
- Calibration function for measurement tasks and robotics applications



The one with a BLOB:
With the new 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.

VISOR® Allround – Object detection in colour plus identification united in one device.

The VISOR® Allround is the latest member in the VISOR® family and a real multi-talent among vision sensors. In the new allround version, the device unites the functions of the object sensor (i.a. calibration, pattern matching, contour, calliper, BLOB) with the powerful tools of the code reader (bar code, datamatrix and optical character recognition). When feeding parts in correct alignment or positioning components, additional data matrix codes for example can now also be read. With a resolution of up to 1,5 megapixel even the smallest details are reliably detected and evaluated.

In addition to the monochrome version, the VISOR® Allround is also available as a colour version with up to 1,5 megapixel. Thus additional “Detectors” are available for colour evaluation. Even the subtlest nuances in shade can be reliably detected. The relevant object colours, for example, can be taught-in quite simply by push of a button or - thanks to the intuitive colour histogram - set graphically for each channel in the colour space. The authorised colour tolerances can be defined by the user.

VISOR® Allround – Product Overview					
	Product variant	Resolution	Focal Length	Integrated illumination	Page
V20x-ALL-A3-xxx	Advanced	1440 x 1080 mono/color	Wide	White, red ¹ or infrared ¹ LEDs	44
V20x-ALL-A3-xxx			Medium	White, red ¹ or infrared ¹ LEDs	46
V20x-ALL-A3-xxx			Narrow	White, red ¹ or infrared ¹ LEDs	48
V20x-ALL-A3-C-2			C-Mount	None	50
V20x-ALL-P3-xxx	Professional	1440 x 1080 mono/color	Wide	White, red ¹ or infrared ¹ LEDs	52
V20x-ALL-P3-xxx			Medium	White, red ¹ or infrared ¹ LEDs	54
V20x-ALL-P3-xxx			Narrow	White, red ¹ or infrared ¹ LEDs	56
V20x-ALL-P3-C-2			C-Mount	None	58
V10x-ALL-A3-xxx	Advanced	800 x 600 mono/color	Wide	White, red ¹ or infrared ¹ LEDs	60
V10x-ALL-A3-xxx			Medium	White, red ¹ or infrared ¹ LEDs	62
V10x-ALL-A3-xxx			Narrow	White, red ¹ or infrared ¹ LEDs	64
V10x-ALL-A3-C-2			C-Mount	None	66

¹ only with monochrome version


VISOR® V20 Allround Advanced, wide field of view

Combines VISOR® Object Color, Code Reader

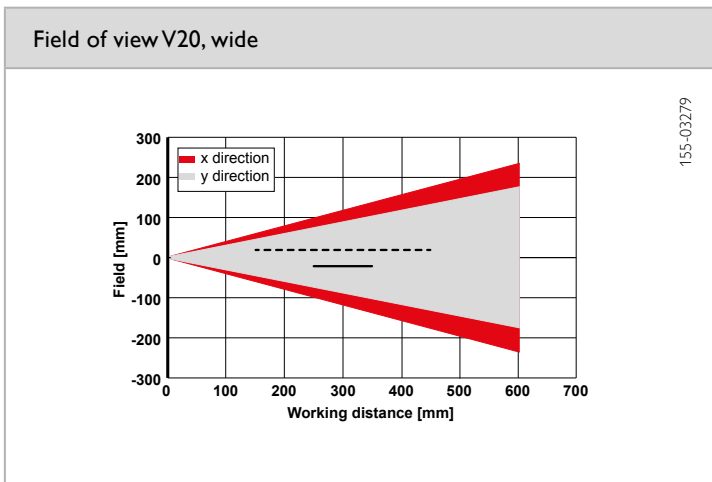
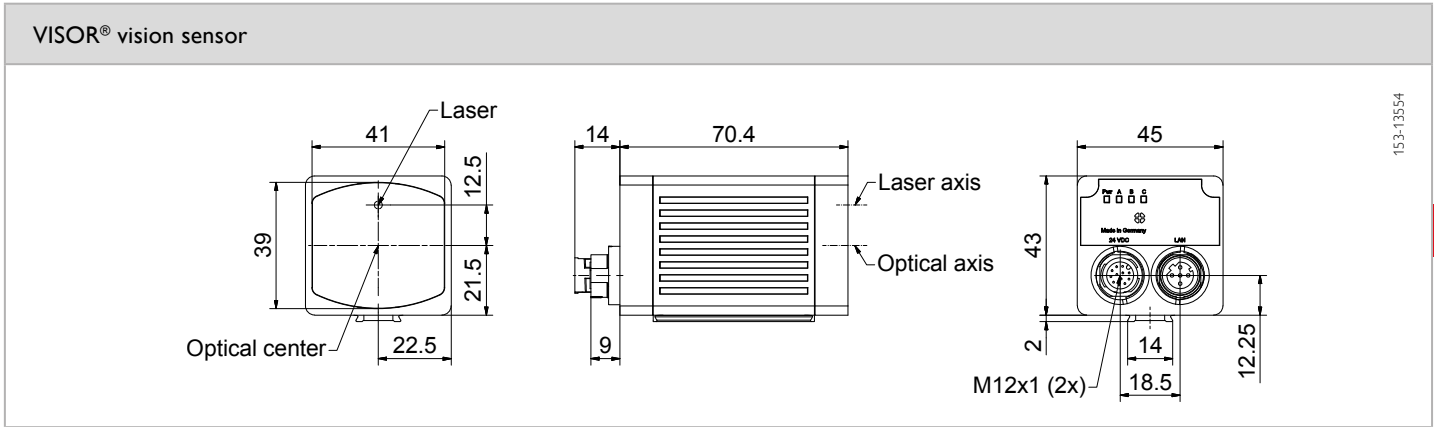


PRODUCT HIGHLIGHTS

- All evaluations ("Detectors") of object sensor and code reader united in one device
- Highly accurate evaluation via 1,5 mega- pixel chip
- 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-Data-matrix) and common 1D-bar codes
- Detection of differences in height in the pseudo height image with multishot technology

Optical data		Functions	
Resolution	1440 x 1080 pixels	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/2.9", monochrome / color	Detectors	Position tracking; X/Y and orientation; Pattern matching / Contour: teach-in and detection of patterns and contours; Calliper: distance between edges;
Integrated lens, focal length [mm]	6.5 (wide)		BLOB, Grey threshold, Brightness: evaluation of brightness;
Pixel size	3.45 µm x 3.45 µm		Contrast: evaluation of contrast; Color value²: output of color values; Color area²: area inspection of colors, with selectable tolerance; Color list²: finding the most similar colors
Focus	Motorized		Barcode: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; Datacode: reading 2D codes: ECC200, QR code, GS1, PDF 417; OCR: reading of fonts
Adjustment range	10 mm to infinity		
Integrated illumination	White (5000 K), red (635 nm) ¹ , infrared (850 nm) ¹ LEDs		
Minimum field of view, X x Y	6 x 4 mm		
Target laser	Laser: red (635 nm) class 1  (IEC 60825-1)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30V DC ³	Dimensions	70.4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Ca. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN	Weight	Approx. 200 g
Input resistance	High > U _B -1V / Low < 3V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	> 20 kΩ	Vibration resistance	EN 60068-2-6
Inputs/outputs	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Shock resistance	EN 60068-2-27
Encoder	2 inputs, 2 outputs, 6 selectable inputs/outputs		
	✓		

¹ Not Color hardware ² Color hardware ³ Max. ripple < 5V_{SS} ⁴ 80 % air humidity, noncondensing



----- Increased depth of field
 ——— Normal depth of field



Illumination	Part number	Article number
White	LM 100 WWK-24Q4-2L12	532-51096
Red	LM 100 RWK-24Q4-2L12	532-51097
—	LM 100 W DF	532-51098

Illumination	Part number	Article number	Accessories
White	V20-ALL-A3-W-W-M2-L	632-91026	Connection cables
Red	V20-ALL-A3-R-W-M2-L	632-91023	Illumination
Infrared	V20-ALL-A3-I-W-M2-L	632-91020	Brackets
White	V20C-ALL-A3-W-W-M2-L	632-91030	Interface accessories
			From Page A-46
			From Page A-33
			From Page A-4
			From Page A-53


VISOR® V20 Allround Advanced, medium field of view

Combines VISOR® Object Color, Code Reader

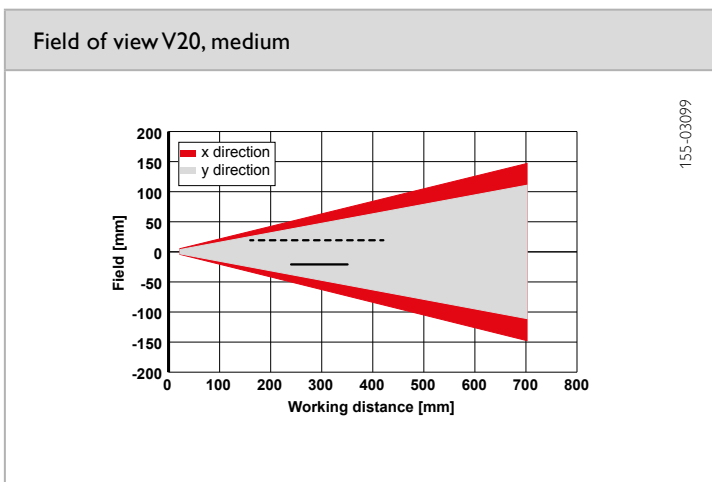
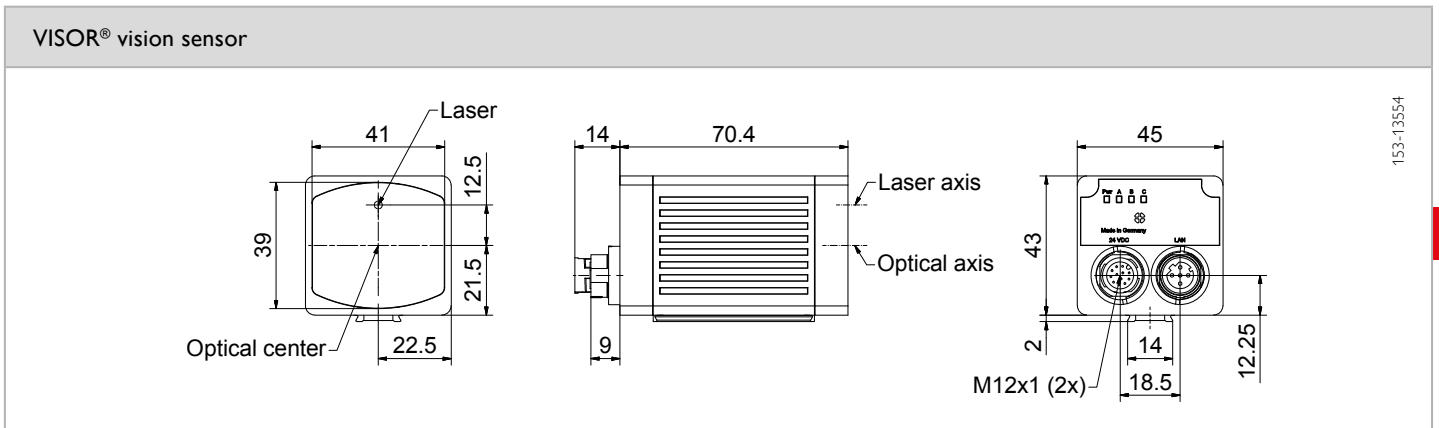


PRODUCT HIGHLIGHTS

- All evaluations ("Detectors") of object sensor and code reader united in one device
- Highly accurate evaluation via 1,5 mega-pixel chip
- 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-Data-matrix) and common 1D-bar codes
- Detection of differences in height in the pseudo height image with multishot technology

Optical data		Functions	
Resolution	1440 × 1080 Pixel	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/2.9", monochrome / color	Detectors	Position tracking: X/Y and orientation; Pattern matching / Contour: teach-in and detection of patterns and contours; Calliper: distance between edges;
Integrated lens, focal length [mm]	12 (medium)		BLOB, Grey threshold, Brightness: evaluation of brightness;
Pixel size	3.45 µm × 3.45 µm		contrast: evaluation of contrast; Color value ² : output of color values; Color field ² : area inspection of colors, with selectable tolerance; Color list ² : finding the most similar colors
Focus	Motorized		Barcode: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; Datacode: reading 2D codes: ECC200, QR code, GS1, PDF 417; OCR: reading of fonts
Adjustment range	25 mm to infinity		
Integrated illumination	White (5000 K), red (635 nm) ¹ , infrared (850 nm) ¹ LEDs		
Minimum field of view, X × Y	10 × 8 mm		
Target laser	Laser: red (635 nm) class 1  (IEC 60825-1)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ³	Dimensions	70.4 × 45 × 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Ca. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1V / Low < 3V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	✓		

¹ Not Color hardware ² Color hardware ³ Max. ripple < 5V_{SS} ⁴ 80 % air humidity, noncondensing



----- Increased depth of field
 ——— Normal depth of field



Illumination	Part number	Article number
White	LM 100 WWK-24Q4-2L12	532-51096
Red	LM 100 RWK-24Q4-2L12	532-51097
—	LM 100 W DF	532-51098

Illumination	Part number	Article number	Accessories
White	V20-ALL-A3-W-M-M2-L	632-91024	Connection cables
Red	V20-ALL-A3-R-M-M2-L	632-91021	Illumination
Infrared	V20-ALL-A3-I-M-M2-L	632-91018	Brackets
White	V20C-ALL-A3-W-M-M2-L	632-91028	Interface accessories


VISOR® V20 Allround Advanced, narrow field of view

Combines VISOR® Object Color, Code Reader

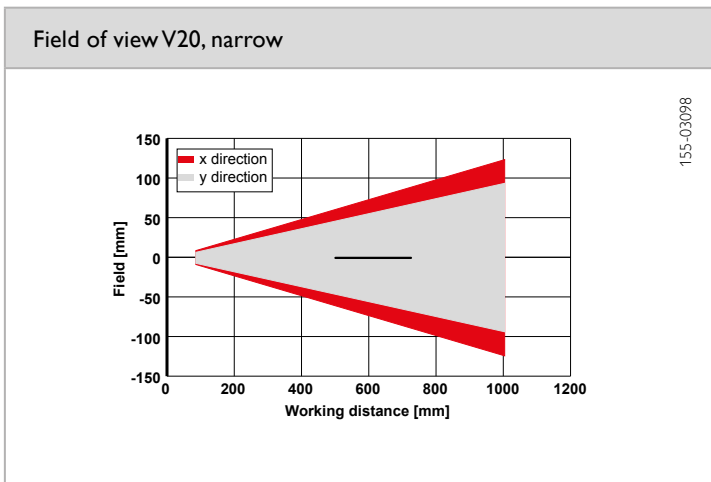
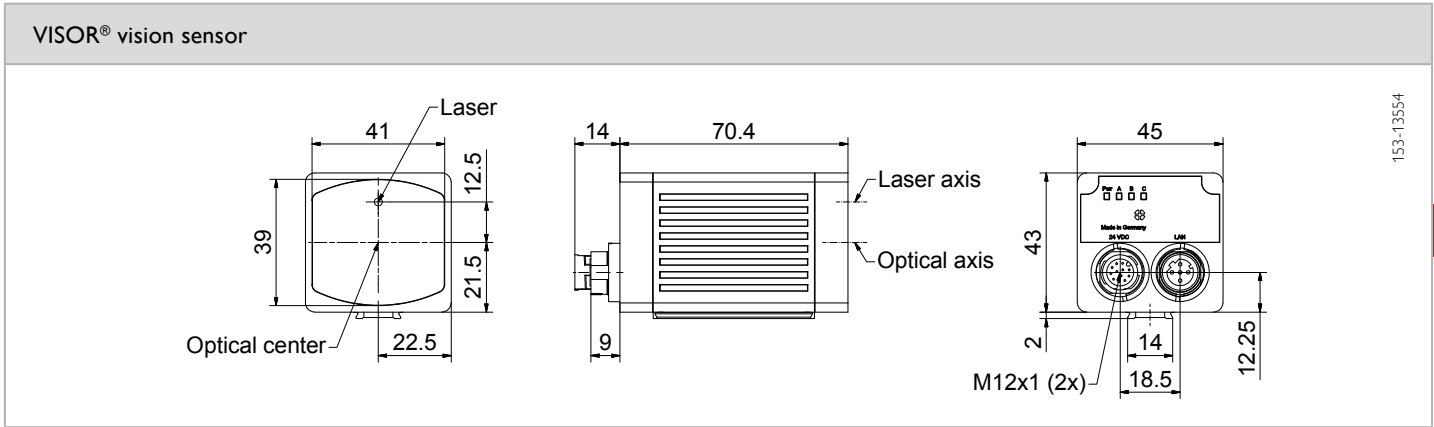


PRODUCT HIGHLIGHTS

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- Detection of differences in height in the pseudo height image with multishot technology

Optical data		Functions	
Resolution	1440 × 1080 Pixel	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/2.9", monochrome / color	Detectors	Position tracking: X/Y and orientation; Pattern matching / Contour: teach-in and detection of patterns and contours; Calliper: distance between edges; BLOB, Grey threshold, Brightness: evaluation of brightness; Contrast: evaluation of contrast; Color value²: output of color values; Color field²: area inspection of colors, with selectable tolerance; Color list²: finding the most similar colors Barcode: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; Datacode: reading 2D codes: ECC200, QR code, GS1, PDF 417; OCR: reading of fonts
Integrated lens, focal length [mm]	20 (narrow)		
Pixel size	3.45 µm × 3.45 µm		
Focus	Motorized		
Adjustment range	100 mm to infinity		
Integrated illumination	White (5000 K), red (635 nm) ¹ , infrared (850 nm) ¹ LEDs		
Minimum field of view, X × Y	18 × 14 mm		
Target laser	Laser: red (635 nm) class 1  (IEC 60825-1)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ³	Dimensions	70,4 × 45 × 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Ca. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1V / Low < 3V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	✓		

¹ Not Color hardware ² Color hardware ³ Max. ripple < 5V_{SS} ⁴ 80 % air humidity, noncondensing



— Normal depth of field



Illumination	Part number	Article number
White	LM 100 WWK-24Q4-2L12	532-51096
Red	LM 100 RWK-24Q4-2L12	532-51097
—	LM 100 W DF	532-51098

Illumination	Part number	Article number	Accessories
White	V20-ALL-A3-W-N-M2-L	632-91025	Connection cables
Red	V20-ALL-A3-R-N-M2-L	632-91022	Illumination
Infrared	V20-ALL-A3-I-N-M2-L	632-91019	Brackets
White	V20C-ALL-A3-W-N-M2-L	632-91029	Interface accessories
			From Page A-46
			From Page A-33
			From Page A-4
			From Page A-53

VISOR® V20 Allround Advanced, C-Mount

Combines VISOR® Object Color, Code Reader



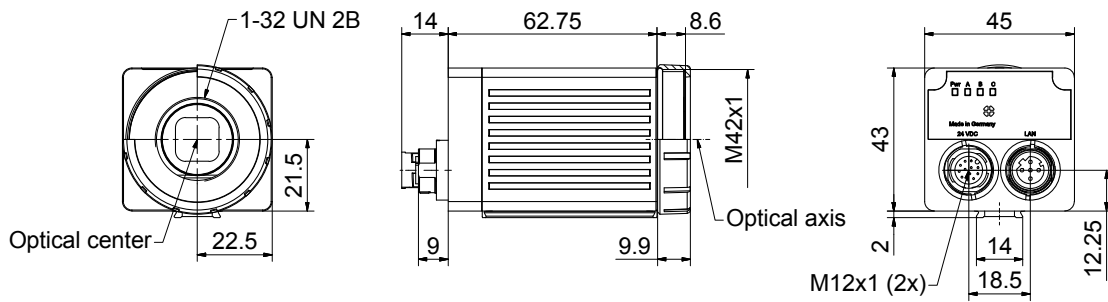
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Optical data		Functions	
Resolution	1440 x 1080 pixels	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/2.9", monochrome / color	Detectors	Position tracking: X/Y and orientation; Pattern matching / Contour: teach-in and detection of patterns and contours; Calliper: distance between edges; BLOB, Grey threshold, Brightness: evaluation of brightness; Contrast: evaluation of contrast; Color value¹: output of color values; Color area¹: area inspection of colors, with selectable tolerance; Color list¹: finding the most similar colors Barcode: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; Datacode: reading 2D codes: ECC200, QR code, GS1, PDF 417; OCR: reading of fonts
Integrated lens, focal length [mm]	C-mount		
Pixel size	3,45 µm x 3,45 µm		
Focus	Manual		
Adjustment range	Dependent on lens		
Integrated illumination	None		
Minimum field of view, X x Y	Dependent on lens		
Target laser	No		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30V DC ²	Dimensions	70,4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65 ³
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Ca. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1V / Low < 3V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Versorgung und I/O M12, 12-polig, Ethernet M12, 4-polig,
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibrationsfestigkeit	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Schockfestigkeit	EN 60068-2-27
Encoder	✓		

¹ Color hardware ² Max. ripple < 5V_{SS} ³ only with protective casing ⁴ 80 % air humidity, noncondensing

Vision-Sensor VISOR® C-mount



153-13555

3

Lens	Illumination
	

155-02565

Illumination	Part number	Article number
White	LM 100 WWK-24Q4-2L12	532-51096
Red	LM 100 RWK-24Q4-2L12	532-51097
-	LM 100 W DF	532-51098

Lens	LO C 8	LO C 12	LO C 16	LO C 25	LO C 35	LO C 50	LO C 75
Focal length	8 mm	12 mm	16 mm	25 mm	35 mm	50 mm	75 mm
Article number	526-51513	526-51514	526-51515	526-51516	526-51525	526-51113	526-51116

Part number	Article number	Accessories
V20-ALL-A3-C-2	632-91017	Connection cables
V20C-ALL-A3-C-2	632-91027	Illumination
		Lenses
		Brackets
		Interface accessories


VISOR® V20 Allround Professional, wide field of view

Combines VISOR® Object Color, Code Reader and Robotic

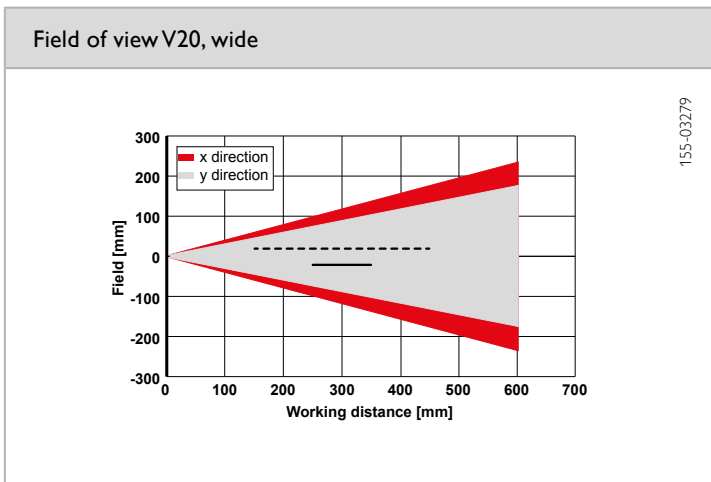
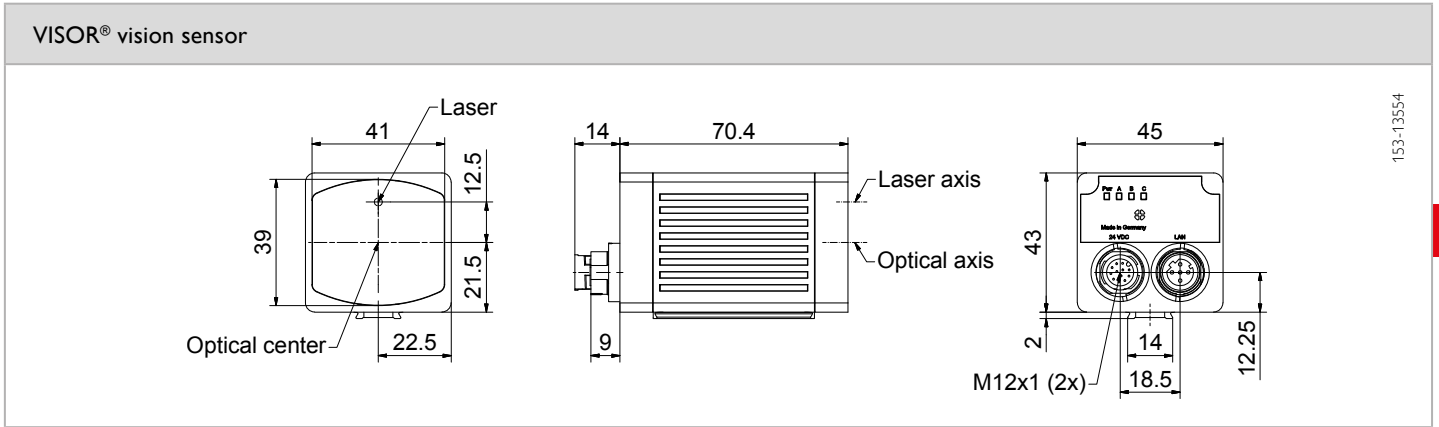


PRODUCT HIGHLIGHTS

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- Precise position determination: X/Y-position and orientation
- Detection of differences in height in the pseudo height image with multishot technology
- User-friendly configuration and viewer software with graded user rights and online help

Optical data		Functions	
Resolution	1440 x 1080 Pixel	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/2.9", monochrome / color	Detectors	Position tracking: X/Y and orientation; Pattern matching / Contour: teach-in and detection of patterns and contours; Calliper: distance between edges; BLOB, Grey threshold, Brightness: evaluation of brightness; Contrast: evaluation of contrast; Color value²: output of color values; Color field²: area inspection of colors, with selectable tolerance; Color list²: finding the most similar colors Barcode: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; Datacode: reading 2D codes: ECC200, QR code, GS1, PDF 417; OCR: reading of fonts
Integrated lens, focal length [mm]	6.5 (wide)		
Pixel size	3.45 µm x 3.45 µm		
Focus	Motorized		
Adjustment range	10 mm to infinity		
Integrated illumination	White (5000 K), red (635 nm) ¹ , infrared (850 nm) ¹ LEDs		
Minimum field of view, X x Y	6 x 4 mm		
Target laser	Laser: red (635 nm) class 1  (IEC 60825-1)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ³	Dimensions	70.4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Ca. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1 V, Low < 3 V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	✓		

¹ Not Color hardware ² Color hardware ³ Max. ripple < 5V_{SS} ⁴ 80 % air humidity, noncondensing



----- Increased depth of field
 ——— Normal depth of field



Illumination	Part number	Article number
White	LM 100 WWK-24Q4-2L12	532-51096
Red	LM 100 RWK-24Q4-2L12	532-51097
—	LM 100 W DF	532-51098

Illumination	Part number	Article number	Accessories
White	V20-ALL-P3-W-W-M2-L	632-91012	Connection cables
Red	V20-ALL-P3-R-W-M2-L	632-91010	Illumination
Infrared	V20-ALL-P3-I-W-M2-L	632-91007	Brackets
White	V20C-ALL-P3-W-W-M2-L	632-91016	Interface accessories
			From Page A-46
			From Page A-33
			From Page A-4
			From Page A-53


VISOR® V20 Allround Professional, medium field of view

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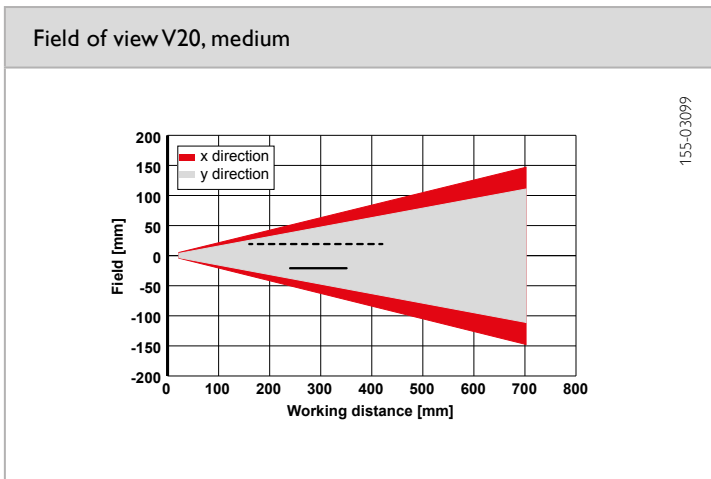
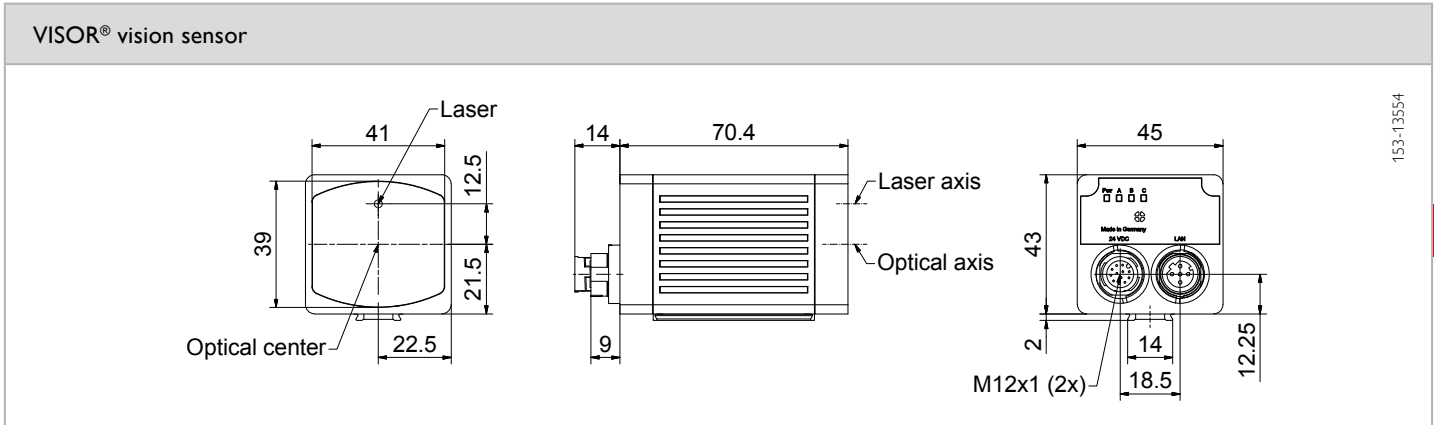


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Resolution	1440 x 1080 Pixel	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/2.9", monochrome / color	Detectors	Position tracking: X/Y and orientation; Pattern matching / Contour: teach-in and detection of patterns and contours; Calliper: distance between edges; BLOB, Grey threshold, Brightness: evaluation of brightness; Contrast: evaluation of contrast; Color value²: output of color values; Color field²: area inspection of colors, with selectable tolerance; Color list²: finding the most similar colors Barcode: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; Datacode: reading 2D codes: ECC200, QR code, GS1, PDF 417; OCR: reading of fonts
Integrated lens, focal length [mm]	12 (medium)		
Pixel size	3,45 µm x 3,45 µm		
Focus	Motorized		
Adjustment range	25 mm to infinity		
Integrated illumination	White (5000 K), red (635 nm) ¹ , infrared (850 nm) ¹ LEDs		
Minimum field of view, X x Y	10 x 8 mm		
Target laser	Laser: red (635 nm) class 1  (IEC 60825-1)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ³	Dimensions	70,4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Ca. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP / NPN	Weight	Approx. 200 g
Input resistance	High > U _B -1 V / Low < 3V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	> 20 kΩ	Vibration resistance	EN 60068-2-6
Inputs/outputs	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Shock resistance	EN 60068-2-27
Encoder	2 inputs, 2 outputs, 6 selectable inputs/outputs		
	✓		

¹ Not Color hardware ² Color hardware ³ Max. ripple < 5V_{SS} ⁴ 80 % air humidity, noncondensing



----- Increased depth of field
 ——— Normal depth of field

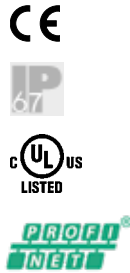


Illumination	Part number	Article number
White	LM 100 WWK-24Q4-2L12	532-51096
Red	LM 100 RWK-24Q4-2L12	532-51097
—	LM 100 W DF	532-51098

Illumination	Part number	Article number	Accessories
White	V20-ALL-P3-W-M-M2-L	632-91000	Connection cables
Red	V20-ALL-P3-R-M-M2-L	632-91008	Illumination
Infrared	V20-ALL-P3-I-M-M2-L	632-91005	Brackets
White	V20C-ALL-P3-W-M-M2-L	632-91014	Interface accessories


VISOR® V20 Allround Professional, narrow field of view

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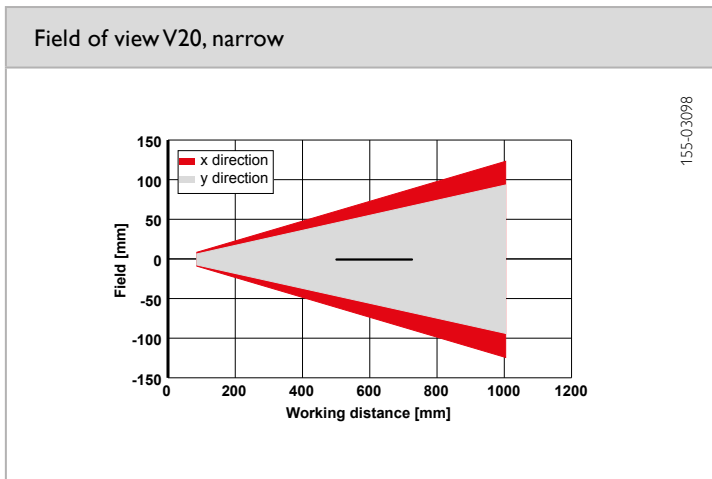
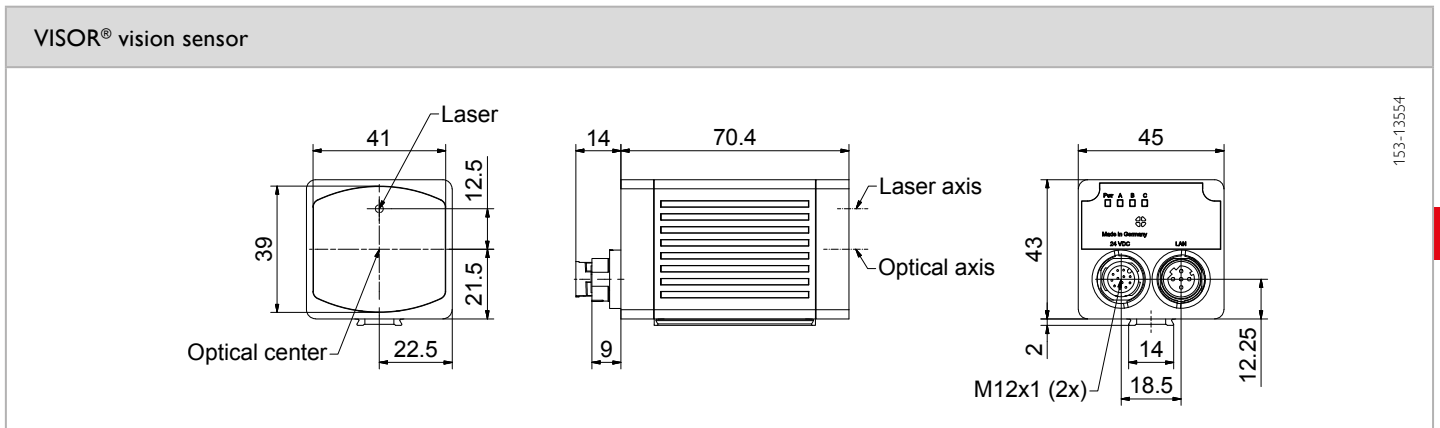


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Adjustment range	100 mm to infinity		
Integrated illumination	White (5000 K), red (635 nm) ¹ , infrared (850 nm) ¹ LEDs		
Minimum field of view, X x Y	18 x 14 mm		
Target laser	Laser: red (635 nm) class 1  (IEC 60825-1)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30V DC ³	Dimensions	70,4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Ca. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
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— Normal depth of field



Illumination	Part number	Article number
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Red	LM 100 RWK-24Q4-2L12	532-51097
—	LM 100 W DF	532-51098

Illumination	Part number	Article number	Accessories
White	V20-ALL-P3-W-N-M2-L	632-91011	Connection cables
Red	V20-ALL-P3-R-N-M2-L	632-91009	Illumination
Infrared	V20-ALL-P3-I-N-M2-L	632-91006	Brackets
White	V20C-ALL-P3-W-N-M2-L	632-91015	Interface accessories
			From Page A-46
			From Page A-33
			From Page A-4
			From Page A-53

VISOR® V20 Allround Professional, C-Mount

Combines VISOR® Object Color, Code Reader and Robotic

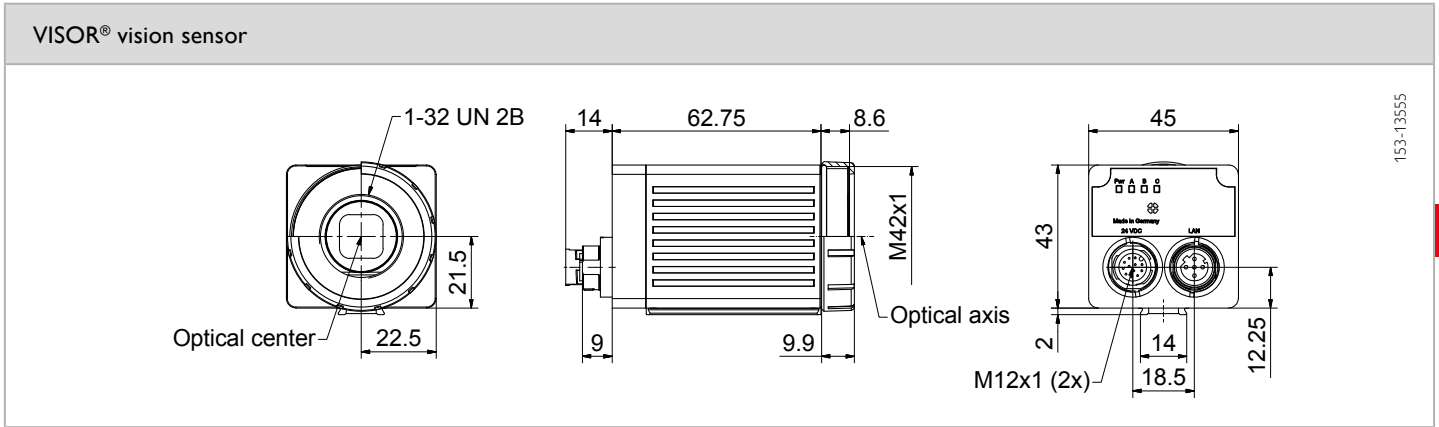


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Integrated lens, focal length [mm]	C-mount		
Pixel size	3,45 µm x 3,45 µm		
Focus	Manual		
Adjustment range	Dependent on lens		
Integrated illumination	None		
Minimum field of view, X x Y	Dependent on lens		
Target laser	No		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30V DC ²	Dimensions	70,4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65 ³
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Ca. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1V / Low < 3V	Weight	Approx. 200 g
Input resistance	> en fonction de l'objectif	Plug connections	Versorgung und I/O M12, 12-polig, Ethernet M12, 4-polig,
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibrationsfestigkeit	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Schockfestigkeit	EN 60068-2-27
Encoder	✓		

¹ Color hardware ² Max. ripple < 5V_{SS} ³ only with protective casing ⁴ 80 % air humidity, noncondensing



Illumination	Part number	Article number
White	LM 100 WWK-24Q4-2L12	532-51096
Red	LM 100 RWK-24Q4-2L12	532-51097
-	LM 100 W DF	532-51098

	LO C 8	LO C 12	LO C 16	LO C 25	LO C 35	LO C 50	LO C 75
Focal length	8 mm	12 mm	16 mm	25 mm	35 mm	50 mm	75 mm
Article number	526-51513	526-51514	526-51515	526-51516	526-51525	526-51113	526-51116

Part number	Article number	Accessories
V20-ALL-P3-C-2	632-91004	Connection cables
V20C-ALL-P3-C-2	632-91013	Illumination
		Lenses
		Brackets
		Interface accessories
		From Page A-46
		From Page A-33
		From Page A-28
		From Page A-4
		From Page A-53


VISOR® V10 Allround Advanced, wide field of view

Combines VISOR® Object Color, Code Reader

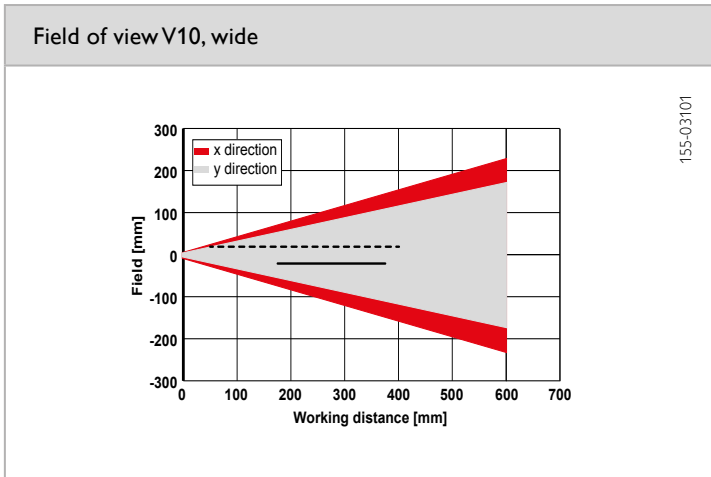
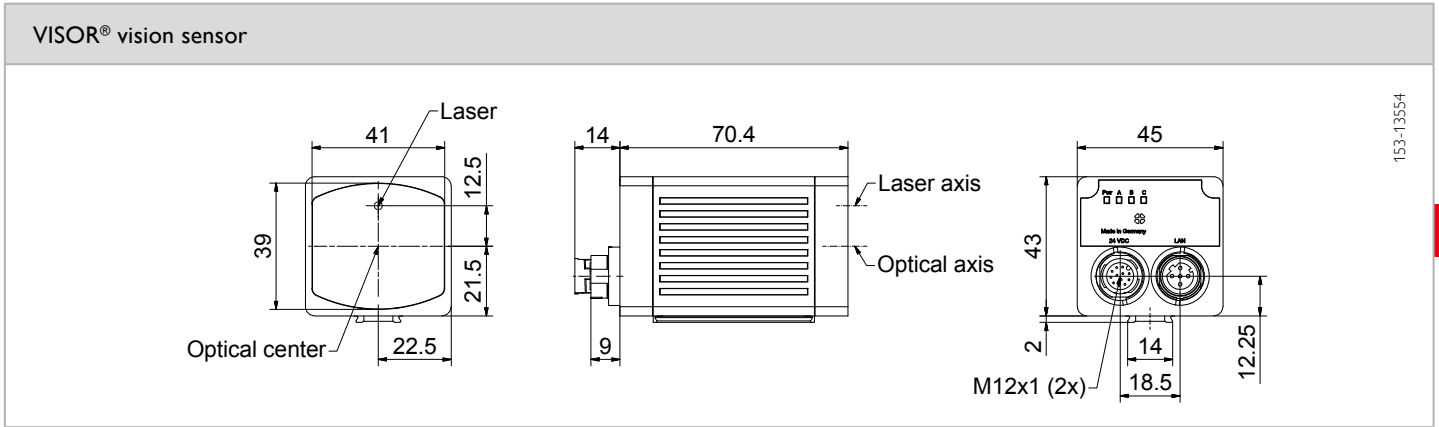


PRODUCT HIGHLIGHTS

- All evaluations ("Detectors") of object sensor and code reader united in one device
- Efficient part detection and tracking
- Real-world engineering units at a mouse click
- Can be used for all common 2D-Codes (ECC 200-Data-matrix) and common 1D-bar codes
- User-friendly configuration and viewer software with graded user rights and online help

Optical data		Functions	
Resolution	800 × 600 Pixel	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/3.6", monochrome / color	Detectors	Position tracking: X/Y and orientation; Pattern matching / Contour: teach-in and detection of patterns and contours; Calliper: distance between edges; BLOB, Grey threshold, Brightness: evaluation of brightness; Contrast: evaluation of contrast; Color value ² : output of color values; Color area ² : area inspection of colors, with selectable tolerance; Color list ² : finding the most similar colors Barcode: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; Datacode: reading 2D codes: ECC200, QR code, GS1, PDF 417; OCR: reading of fonts
Integrated lens, focal length [mm]	5.2 (wide)		
Pixel size	4.8 μm × 4.8 μm		
Focus	Motorized		
Adjustment range	0 mm to infinity		
Integrated illumination	White (5000 K), red (635 nm) ¹ , infrared (850 nm) ¹ LEDs		
Minimum field of view, X × Y	2 × 1 mm		
Target laser	Laser: red (635 nm) class 1  (IEC 60825-1)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ³	Dimensions	70.4 × 45 × 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Ca. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1V / Low < 3V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	✓		

¹ Not Color hardware ² Color hardware ³ Max. ripple < 5V_{SS} ⁴ 80 % air humidity, noncondensing



----- Increased depth of field
 ——— Normal depth of field

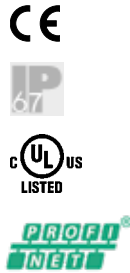


Illumination	Part number	Article number
White	LM 100 WWK-24Q4-2L12	532-51096
Red	LM 100 RWK-24Q4-2L12	532-51097
—	LM 100 W DF	532-51098

Illumination	Part number	Article number	Accessories
White	V10-ALL-A3-W-W-M2-L	631-91004	Connection cables
Red	V10-ALL-A3-R-W-M2-L	631-91007	Illumination
Infrared	V10-ALL-A3-I-W-M2-L	631-91010	Brackets
White	V10C-ALL-A3-W-W-M2-L	631-91041	Interface accessories


VISOR® V10 Allround Advanced, medium field of view

Combines VISOR® Object Color, Code Reader

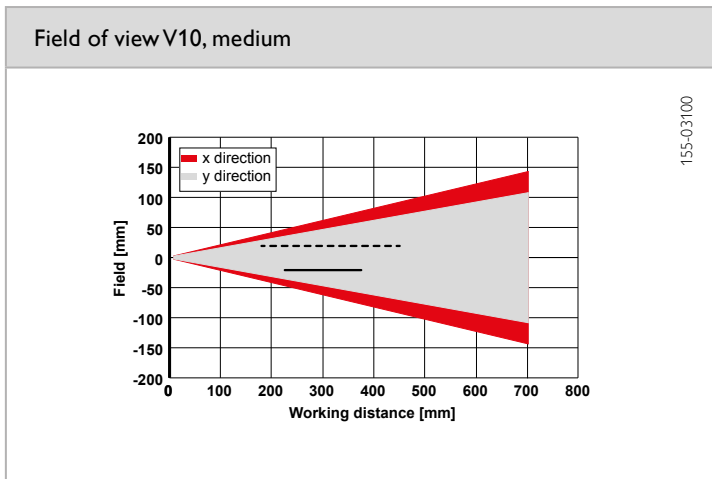
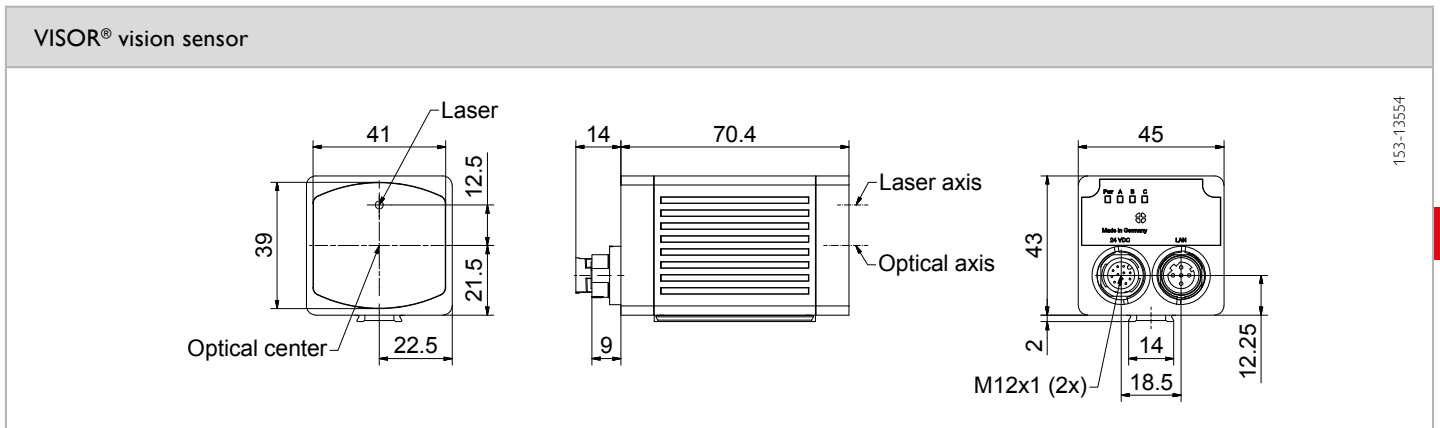


PRODUCT HIGHLIGHTS

- All evaluations ("Detectors") of object sensor and code reader united in one device
- Efficient part detection and tracking
- Real-world engineering units at a mouse click
- Can be used for all common 2D-Codes (ECC 200-Data-matrix) and common 1D-bar codes
- User-friendly configuration and viewer software with graded user rights and online help

Optical data		Functions	
Resolution	800 x 600 Pixel	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/3.6", monochrome / color	Detectors	Position tracking; X/Y and orientation; Pattern matching / Contour: evaluation of brightness; evaluation of contrast; Calliper: distance between edges; BLOB, Grey threshold, Brightness: evaluation of brightness; Contrast: evaluation of contrast; Color value²: output of color values; Color area²: area inspection of colors, with selectable tolerance; Color list²: finding the most similar colors Barcode: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; Datacode: reading 2D codes: ECC200, QR code, GS1, PDF 417; OCR: reading of fonts
Integrated lens, focal length [mm]	9.6 (medium)		
Pixel size	4.8 µm x 4.8 µm		
Focus	Motorized		
Adjustment range	12 mm to infinity		
Integrated illumination	White (5000 K), red (635 nm) ¹ , infrared (850 nm) ¹ LEDs		
Minimum field of view, X x Y	7 x 3 mm		
Target laser	Laser: red (635 nm) class 1 		
	(IEC 60825-1)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ³	Dimensions	70.4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Ca. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1 V / Low < 3V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	✓		

¹ Not Color hardware ² Color hardware ³ Max. ripple < 5V_{SS} ⁴ 80 % air humidity, noncondensing



----- Increased depth of field
 ——— Normal depth of field



Illumination	Part number	Article number
White	LM 100 WWK-24Q4-2L12	532-51096
Red	LM 100 RWK-24Q4-2L12	532-51097
—	LM 100 W DF	532-51098

Illumination	Part number	Article number	Accessories
White	V10-ALL-A3-W-M-M2-L	631-91005	Connection cables
Red	V10-ALL-A3-R-M-M2-L	631-91008	Illumination
Infrared	V10-ALL-A3-I-M-M2-L	631-91029	Brackets
White	V10C-ALL-A3-W-M-M2-L	631-91038	Interface accessories

From Page A-46
 From Page A-33
 From Page A-4
 From Page A-53


VISOR® V10 Allround Advanced, narrow field of view

Combines VISOR® Object Color, Code Reader

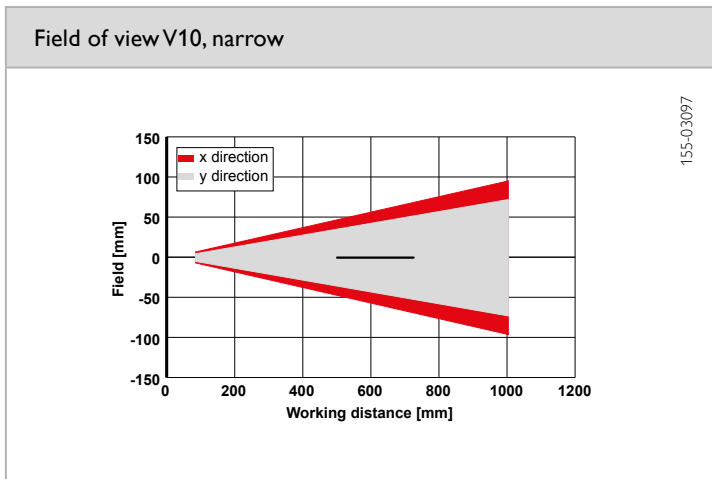
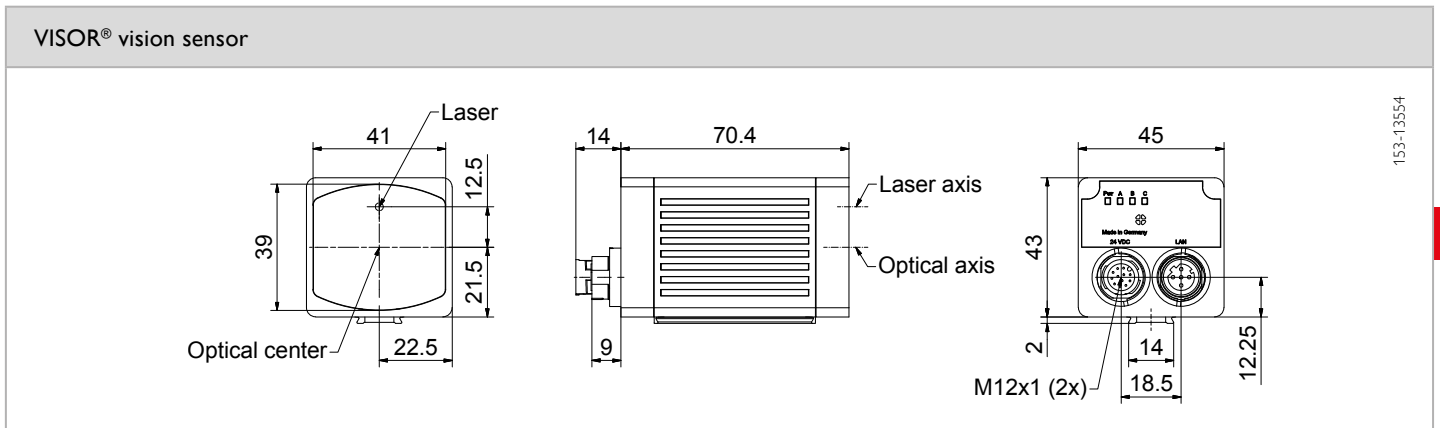


PRODUCT HIGHLIGHTS

- All evaluations ("Detectors") of object sensor and code reader united in one device
- Efficient part detection and tracking
- Real-world engineering units at a mouse click
- Can be used for all common 2D-Codes (ECC 200-Data-matrix) and common 1D-bar codes
- User-friendly configuration and viewer software with graded user rights and online help

Optical data		Functions	
Resolution	800 x 600 Pixel	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/3.6", monochrome / color	Detectors	Position tracking: X/Y and orientation; Pattern matching / Contour: teach-in and detection of patterns and contours; Calliper: distance between edges; BLOB, Grey threshold, Brightness: evaluation of brightness; Contrast: evaluation of contrast; Color value²: output of color values; Color area²: area inspection of colors, with selectable tolerance; Color list²: finding the most similar colors Barcode: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; Datacode: reading 2D codes: ECC200, QR code, GS1, PDF 417; OCR: reading of fonts
Integrated lens, focal length [mm]	20 (narrow)		
Pixel size	4.8 µm x 4.8 µm		
Focus	Motorized		
Adjustment range	100 mm to infinity		
Integrated illumination	White (5000 K), red (635 nm) ¹ , infrared (850 nm) ¹ LEDs		
Minimum field of view, X x Y	14 x 10 mm		
Target laser	Laser: red (635 nm) class 1 		
	(IEC 60825-1)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ³	Dimensions	70.4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Ca. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN	Weight	Approx. 200 g
Input resistance	High > U _B -1 V / Low < 3V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	> 20 kΩ	Vibration resistance	EN 60068-2-6
Inputs/outputs	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Shock resistance	EN 60068-2-27
Encoder	2 inputs, 2 outputs, 6 selectable inputs/outputs		
	✓		

¹ Not Color hardware ² Color hardware ³ Max. ripple < 5V_{SS} ⁴ 80 % air humidity, noncondensing



— Normal depth of field



Illumination	Part number	Article number
White	LM 100 WWK-24Q4-2L12	532-51096
Red	LM 100 RWK-24Q4-2L12	532-51097
—	LM 100 W DF	532-51098

Illumination	Part number	Article number	Accessories
White	V10-ALL-A3-W-N-M2-L	631-91006	Connection cables
Red	V10-ALL-A3-R-N-M2-L	631-91009	Illumination
Infrared	V10-ALL-A3-I-N-M2-L	631-91030	Brackets
White	V10C-ALL-A3-W-N-M2-L	631-91039	Interface accessories

From Page A-46
From Page A-33
From Page A-4
From Page A-53


VISOR® V10 Allround Advanced, C-Mount

Combines VISOR® Object Color, Code Reader

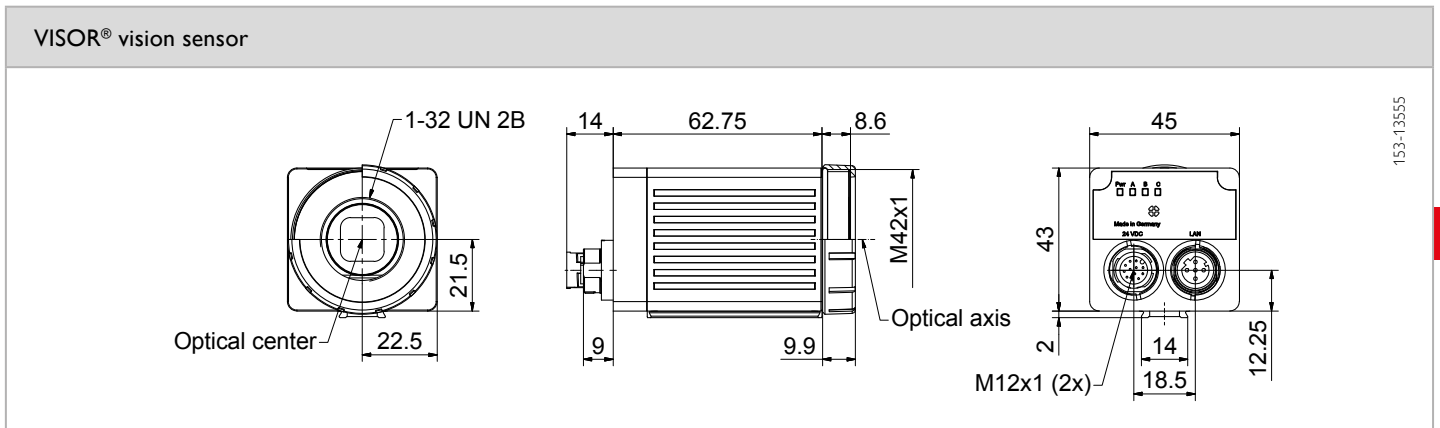


PRODUCT HIGHLIGHTS

- All evaluations ("Detectors") of object sensor and code reader united in one device
- Efficient part detection and tracking
- Real-world engineering units at a mouse click
- Can be used for all common 2D-Codes (ECC 200-Data-matrix) and common 1D-bar codes
- User-friendly configuration and viewer software with graded user rights and online help

Optical data		Functions	
Resolution	800 x 600 Pixel	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/3.6", monochrome / color	Detectors	Position tracking: X/Y and orientation; Pattern matching / Contour: teach-in and detection of patterns and contours; Calliper: distance between edges; BLOB, Grey threshold, Brightness: evaluation of brightness; Contrast: evaluation of contrast; Color value¹: output of color values; Color area¹: area inspection of colors, with selectable tolerance; Color list¹: finding the most similar colors Barcode: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; Datacode: reading 2D codes: ECC200, QR code, GS1, PDF 417; OCR: reading of fonts
Integrated lens, focal length [mm]	C-mount		
Pixel size	4.8 µm x 4.8 µm		
Focus	Manual		
Adjustment range	Dependent on lens		
Integrated illumination	None		
Minimum field of view, X x Y	Dependent on lens		
Target laser	Laser: red (635 nm) class 1  (IEC 60825-1)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ²	Dimensions	70.4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65 ³
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Ca. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1V / Low < 3V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	✓		

¹ Color hardware ² Max. ripple < 5V_{SS} ³ only with protective casing ⁴ 80 % air humidity, noncondensing



Illumination	Part number	Article number
White	LM 100 WWK-24Q4-2L12	532-51096
Red	LM 100 RWK-24Q4-2L12	532-51097
—	LM 100 W DF	532-51098


	LO C 8	LO C 12	LO C 16	LO C 25	LO C 35	LO C 50	LO C 75
Focal length	8 mm	12 mm	16 mm	25 mm	35 mm	50 mm	75 mm
Article number	526-51513	526-51514	526-51515	526-51516	526-51525	526-51113	526-51116

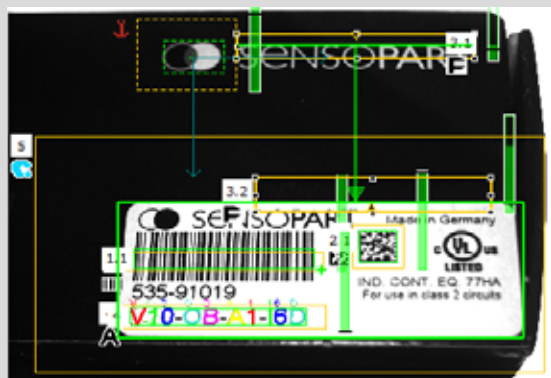
Part number	Article number	Accessories
V10-ALL-A3-C-2	631-91003	Connection cables
V10C-ALL-A3-C-2	631-91036	Illumination
		Lenses
		Brackets
		Interface accessories
		From Page A-46
		From Page A-33
		From Page A-28
		From Page A-4
		From Page A-53

VISOR® Allround

Advanced allround vision sensor for complex inspection tasks.



 made in Germany



VISOR® Allround – Object detection in colour plus identification united in one device.
The VISOR® Allround is the latest member in the VISOR family and a real multi-talent among vision sensors. In the new allround version, the device unites the functions of the object sensor (i.e. calibration, pattern matching, contour, calliper, BLOB) with the powerful tools of the code reader (bar code, datamatrix and optical character recognition).

HIGHLIGHTS OF VISOR® ALLROUND

- All evaluations (“Detectors”) of object sensor and code reader united in one device
- Highly accurate evaluation via 1.3 megapixel chip
- Real-world engineering units and robot coordinates 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-bar codes
- User-friendly configuration and viewer software with graded user rights and online help



The one with a BLOB:

With the new 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.

VISOR® Allround – Object detection in colour plus identification united in one device.

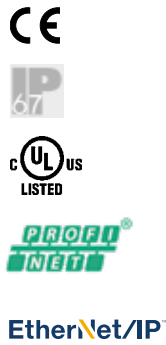
The VISOR® Allround is the latest member in the VISOR® family and a real multi-talent among vision sensors. In the new allround version, the device unites the functions of the object sensor (i.a. calibration, pattern matching, contour, calliper, BLOB) with the powerful tools of the code reader (bar code, datamatrix and optical character recognition). When feeding parts in correct alignment or positioning components, additional data matrix codes for example can now also be read. With a resolution of up to 1.3 megapixel even the smallest details are reliably detected and evaluated.

In addition to the monochrome version, the VISOR® Allround is also available as a colour version with up to 1.3 megapixel. Thus additional “Detectors” are available for colour evaluation. Even the subtlest nuances in shade can be reliably detected. The relevant object colours, for example, can be taught-in quite simply by push of a button or - thanks to the intuitive colour histogram - set graphically for each channel in the colour space. The authorised colour tolerances can be defined by the user.

VISOR® Allround – Product Overview					
	Firmware Option	Resolution	Focal Length	Integrated illumination	Page
V20-ALL-A2-xxx	Advanced	1280 x 1024 pixels	12 mm	White, red or infrared	120
V20-ALL-A2-xxx	Advanced	1280 x 1024 pixels	C-mount	None	122
V20-ALL-P2-xxx	Professional	1280 x 1024 pixels	12 mm	White, red or infrared	124
V20-ALL-P2-xxx	Professional	1280 x 1024 pixels	C-mount	None	126
V20C-ALL-A2-xxx	Advanced	1280 x 1024 pixels	12 mm	White	128
V20C-ALL-A2-xxx	Advanced	1280 x 1024 pixels	C-mount	None	130
V10-ALL-A2-xxx	Advanced	736 x 480 pixels	6 mm	White, red or infrared	132
V10-ALL-A2-xxx	Advanced	736 x 480 pixels	12 mm	White, red or infrared	134
V10-ALL-A2-xxx	Advanced	736 x 480 pixels	25 mm	White, red or infrared	136
V10-ALL-A2-xxx	Advanced	736 x 480 pixels	C-mount	None	138
V10C-ALL-A2-xxx	Advanced	736 x 480 pixels	6 mm	White	140
V10C-ALL-A2-xxx	Advanced	736 x 480 pixels	12 mm	White	142
V10C-ALL-A2-xxx	Advanced	736 x 480 pixels	25 mm	White	144
V10C-ALL-A2-xxx	Advanced	736 x 480 pixels	C-mount	None	146

VISOR® V20 Allround

Advanced vision sensor for complex inspection tasks, 12 mm

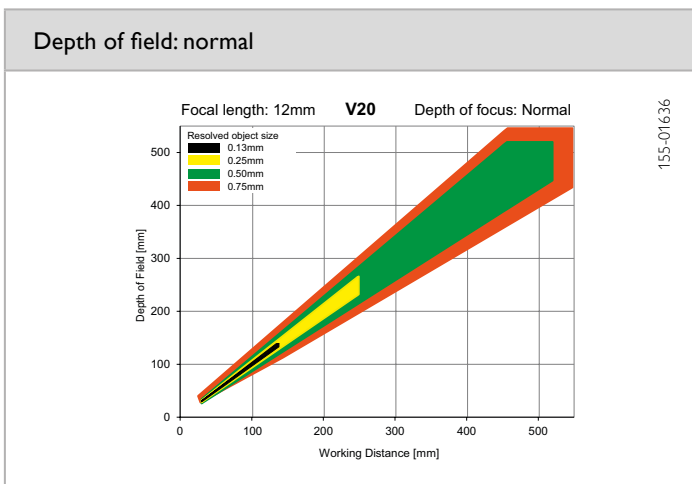
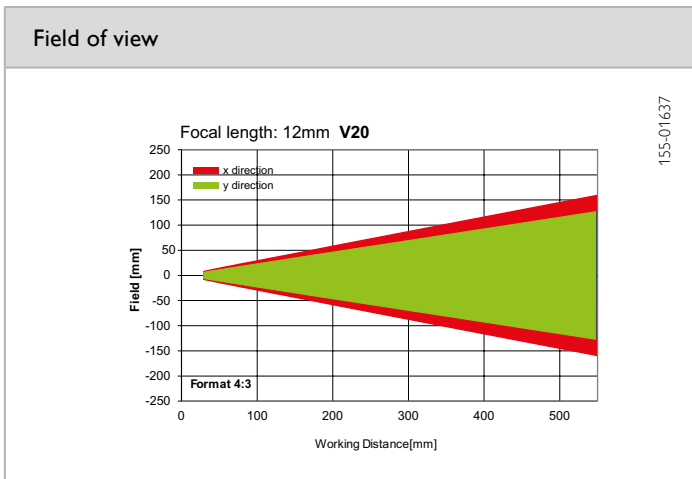
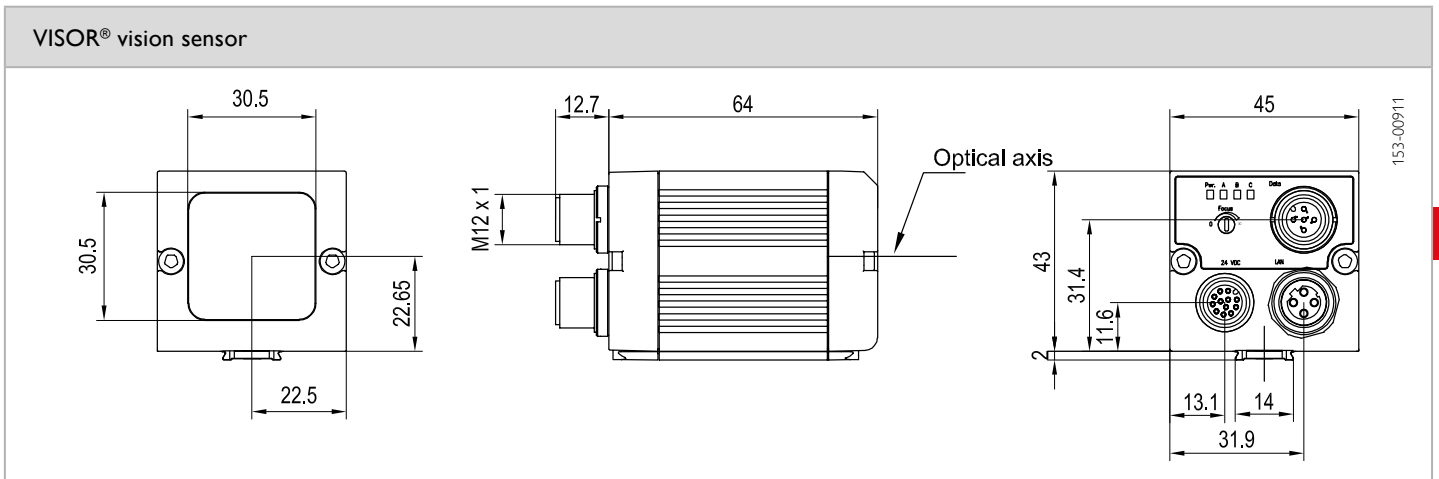


PRODUCT HIGHLIGHTS

- All evaluations ("Detectors") of object sensor and code reader united in one device
- Highly accurate evaluation via 1.3 mega-pixel chip
- Real-world engineering units and robot coordinates at a mouse click
- Precise determination of X/Y position, orientation and tracking
- Can be used for all common 2D-Codes (ECC 200-Data-matrix) and common 1D-bar codes
- User-friendly configuration and viewer software with graded user rights and online help

Optical data		Functions	
Resolution	1280 × 1024 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/1.8", monochrome	Detectors	Contour; pattern comparison, calliper; BLOB, contrast, brightness, grey level, Data code, Bar code, OCR
Integrated lens, focal length	12 mm, adjustable focal position	Properties	Position tracking: X/Y and orientation; pattern comparison / contour: teach-in and detection of patterns and contours; calliper: distance between edges; BLOB, grey threshold, brightness: evaluation of brightness; contrast: evaluation of contrast; bar code: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; data code: reading 2D codes: ECC200, QR code, PDF 417; OCR
Adjustment range	30 mm to infinity	Typical cycle times ²	Typ. 20 ms pattern comparison Typ. 30 ms contour Typ. 8 ms calliper Typ. 30 ms BLOB Typ. 2 ms brightness Typ. 2 ms contrast Typ. 2 ms grey threshold typ. 30 ms bar code typ. 40 ms data code typ. 15 ms per character OCR
Integrated illumination	White, red, infrared LEDs		
Minimum field of view, X × Y	16 × 13 mm ²		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4V DC ¹	Dimensions	65 × 45 × 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 67
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Ca. 13 s after Power on	Ambient temperature: operation	0 ... +50° C ³
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60° C ³
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Ca. 160 g
Inputs	PNP/NPN High > U _B -1V, Low < 3V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

¹ Max. ripple < 5 V_{SS} ² with VGA-resolution (640 × 480 pixels) ³ 80 % air humidity, non-condensing

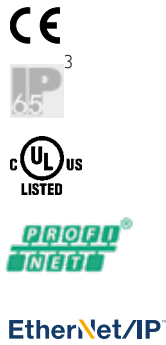


Illumination	Part number	Article number
White	V20-ALL -A2-W12	536-91032
Red	V20-ALL-A2-R12	536-91033
Infrared	V20-ALL-A2-I12	536-91034

Accessories	
Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® V20 Allround

Advanced vision sensor for complex inspection tasks, C-mount

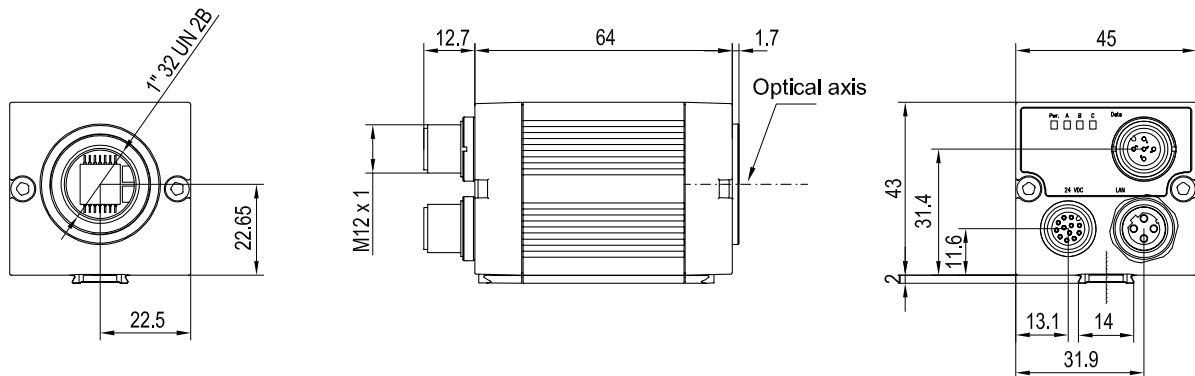


PRODUCT HIGHLIGHTS

- All evaluations ("Detectors") of object sensor and code reader united in one device
- Highly accurate evaluation via 1.3 mega-pixel chip
- Real-world engineering units and robot coordinates at a mouse click
- Precise position determination: X/Y-position and orientation
- Can be used for all common 2D-Codes (ECC 200-Data-matrix) and common 1D-bar codes
- User-friendly configuration and viewer software with graded user rights and online help

Optical data		Functions	
Resolution	1280 × 1024 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/1.8", monochrome	Detectors	Contour; pattern comparison, calliper; BLOB; contrast; brightness; grey level; Data code; Bar code; OCR
Integrated lens, focal length	C-Mount	Properties	Position tracking: X/Y and orientation; pattern comparison / contour: teach-in and detection of patterns and contours; calliper: distance between edges; BLOB; grey threshold, brightness: evaluation of brightness; contrast: evaluation of contrast; bar code: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; data code: reading 2D codes: ECC200, QR code, PDF 417; OCR
Adjustment range	Dependent on lens	Typical cycle times ²	Typ. 20 ms pattern comparison Typ. 30 ms contour Typ. 8 ms calliper Typ. 30 ms BLOB Typ. 2 ms brightness Typ. 2 ms contrast Typ. 2 ms grey threshold typ. 30 ms Bar code typ. 40 ms Data code typ. 15 ms per character OCR
Integrated illumination	None		
Minimum field of view, X × Y	Dependent on lens		
Electrical data		Mechanical data	
Operating voltage, +U _b	18 ... 26.4V DC ¹	Dimensions	65 × 45 × 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 65 ³
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _b / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Ca. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ⁴
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Ca. 160 g
Inputs	PNP/NPN High > U _b -1V, Low < 3V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

¹ Max. ripple < 5V_{ss} ² With VGA-resolution (640 × 480 Pixel) ³ With LPT45 C-mount protective casing ⁴ 80 % air humidity, non-condensing

VISOR® vision sensor


153-00912

3

Lens


	LO C 8	LO C 12	LO C 16	LO C 25	LO C 35	LO C 50	LO C 75
Focal length	8 mm	12 mm	16 mm	25 mm	35 mm	50 mm	75 mm
Article number	526-51513	526-51514	526-51515	526-51516	526-51525	526-51113	526-51116

Part number	Article number
V20-ALL-A2-C	536-91035

Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Lenses	From Page A-28
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® V20 Allround

Advanced vision sensor Professional for complex inspection tasks, 12 mm



EtherNet/IP™

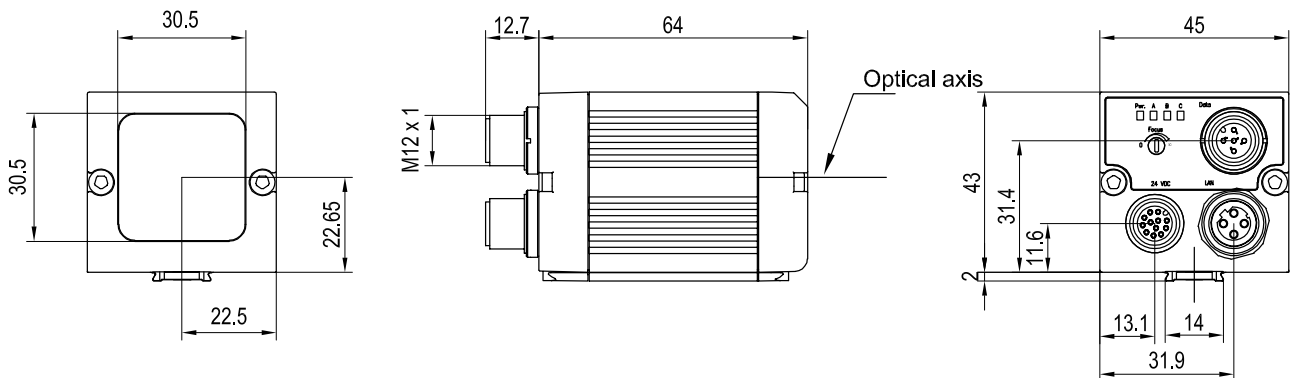
PRODUCT HIGHLIGHTS

- All evaluations ("Detectors") of object sensor and code reader united in one device
- Highly accurate evaluation via 1.3 mega- pixel chip
- Real-world engineering units and robot coordinates at a mouse click
- Precise determination of X/Y position, orientation and tracking
- Detection of differences in height in the pseudo height image with multishot technology
- User-friendly configuration and viewer software with graded user rights and online help

Optical data		Functions	
Resolution	1280 × 1024 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/1.8", monochrome	Detectors	Contour; pattern comparison, calliper; BLOB, contrast, brightness, grey level, Data code, Bar code, OCR
Integrated lens, focal length	12 mm, adjustable focal position	Properties	Position tracking: X/Y and orientation; pattern comparison / contour: teach-in and detection of patterns and contours; calliper: distance between edges; BLOB, grey threshold, brightness: evaluation of brightness; contrast: evaluation of contrast; bar code: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; data code: reading 2D codes: ECC200, QR code, PDF 417; OCR
Adjustment range	30 mm to infinity	Typical cycle times ²	Typ. 20 ms pattern comparison Typ. 30 ms contour Typ. 8 ms calliper Typ. 30 ms BLOB Typ. 2 ms brightness Typ. 2 ms contrast Typ. 2 ms grey threshold typ. 30 ms bar code typ. 40 ms data code typ. 15 ms per character OCR
Integrated illumination	White, red, infrared LEDs		
Minimum field of view, X × Y	16 × 13 mm ²		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4V DC ¹	Dimensions	65 × 45 × 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 67
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Ca. 13 s after Power on	Ambient temperature: operation	0 ... +50° C ³
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60° C ³
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Ca. 160 g
Inputs	PNP/NPN High > U _B -1V, Low < 3V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

¹ Max. ripple < 5V_{SS} ² with VGA-resolution (640 × 480 pixels) ³ 80 % air humidity, non-condensing

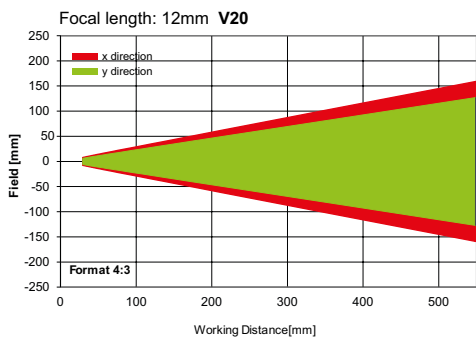
VISOR® vision sensor



153-00911

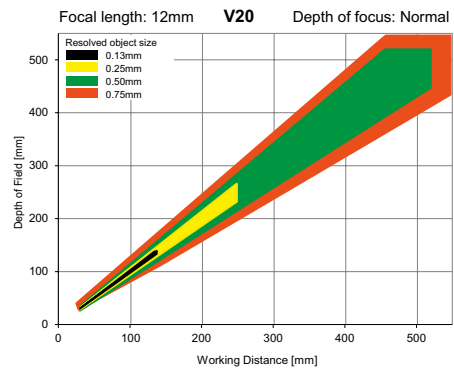
3

Field of view



155-01637

Depth of field: normal



155-01636

Illumination Multishot



156-00025

Illumination	Part number	Article number
White	LM300 WWK-24Q4-2L12	525-51158
Red	LM300 RWK-24Q4-2L12	525-51159
Infrared	LM300 IWK-24Q4-2L12	525-51160

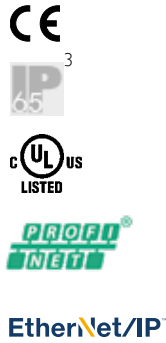
Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53

Part number	Article number
V20-ALL-P2-W12	536-91040
V20-ALL-P2-R12	536-91041
V20-ALL-P2-I12	536-91042

VISOR® V20 Allround

Advanced vision sensor Professional for complex inspection tasks, C-mount

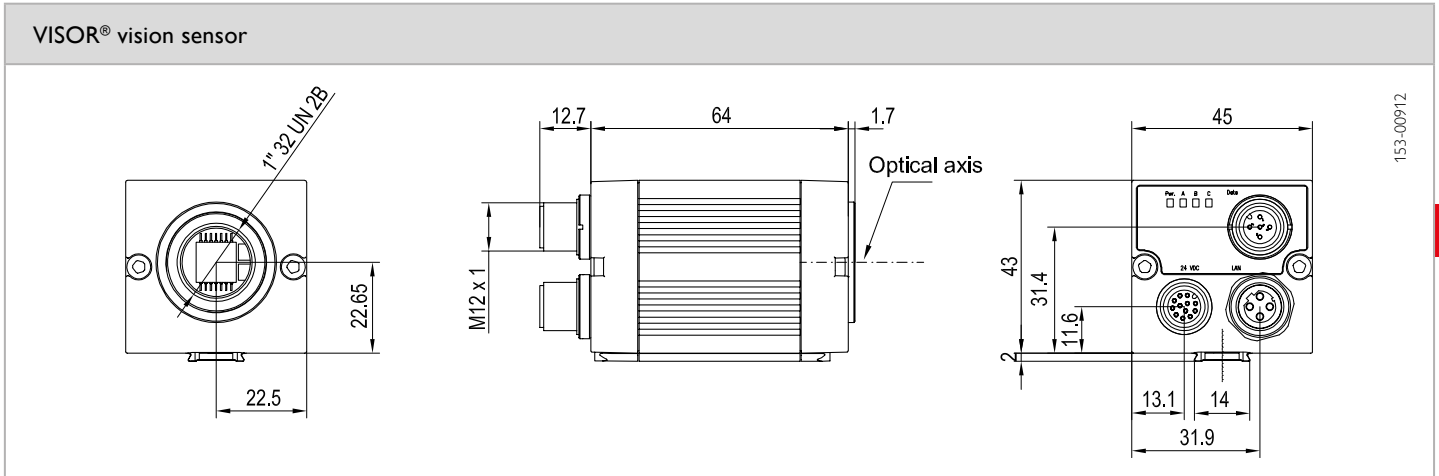


PRODUCT HIGHLIGHTS

- All evaluations ("Detectors") of object sensor and code reader united in one device
- Highly accurate evaluation via 1.3 mega- pixel chip
- Real-world engineering units and robot coordinates at a mouse click
- Precise position determination: X/Y-position and orientation
- Detection of differences in height in the pseudo height image with multishot technology
- User-friendly configuration and viewer software with graded user rights and online help

Optical data		Functions	
Resolution	1280 × 1024 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/1.8", monochrome	Detectors	Contour; pattern comparison, calliper; BLOB; contrast, brightness, grey level, Data code, Bar code, OCR
Integrated lens, focal length	C-Mount	Properties	Position tracking: X/Y and orientation; pattern comparison / contour: teach-in and detection of patterns and contours; calliper: distance between edges; BLOB; grey threshold, brightness: evaluation of brightness; contrast: evaluation of contrast; bar code: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; data code: reading 2D codes: ECC200, QR code, PDF 417; OCR
Adjustment range	Dependent on lens	Typical cycle times ²	Typ. 20 ms pattern comparison Typ. 30 ms contour Typ. 8 ms calliper Typ. 30 ms BLOB Typ. 2 ms brightness Typ. 2 ms contrast Typ. 2 ms grey threshold typ. 30 ms Bar code typ. 40 ms Data code typ. 15 ms per character OCR
Integrated illumination	None		
Minimum field of view, X × Y	Dependent on lens		
Electrical data		Mechanical data	
Operating voltage, +U _b	18 ... 26.4V DC ¹	Dimensions	65 × 45 × 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 65 ³
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _b / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Ca. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ⁴
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Ca. 160 g
Inputs	PNP/NPN High > U _b -1V, Low < 3V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

¹ Max. ripple < 5V_{SS} ² With VGA-resolution (640 × 480 Pixel) ³ With LPT45 C-mount protective casing ⁴ 80 % air humidity, non-condensing



	LO C 8	LO C 12	LO C 16	LO C 25	LO C 35	LO C 50	LO C 75
Focal length	8 mm	12 mm	16 mm	25 mm	35 mm	50 mm	75 mm
Article number	526-51513	526-51514	526-51515	526-51516	526-51525	526-51113	526-51116

Illumination	Part number	Article number
White	LM300 WWK-24Q4-2L12	525-51158
Red	LM300 RWK-24Q4-2L12	525-51159
Infrared	LM300 IWK-24Q4-2L12	525-51160

Accessories	
Connection cables	From Page A-46
Illumination	From Page A-33
Lenses	From Page A-28
Brackets	From Page A-4
Interface accessories	From Page A-53

Part number	Article number
V20-ALL-P2-C	536-91043

VISOR® V20 Allround Color

Advanced vision sensor for complex inspection tasks, 12 mm



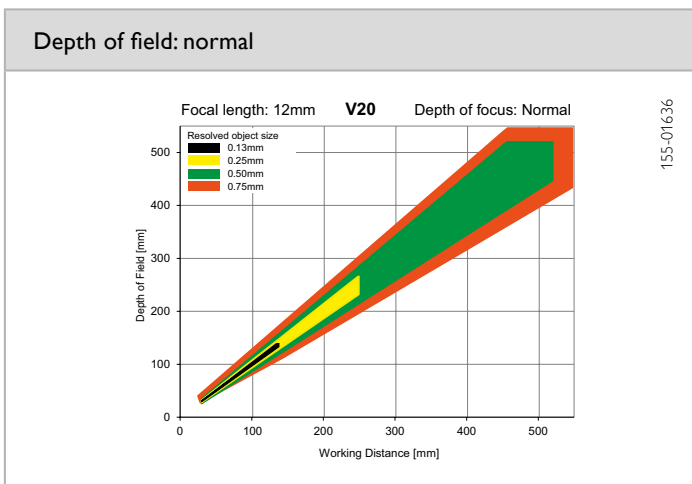
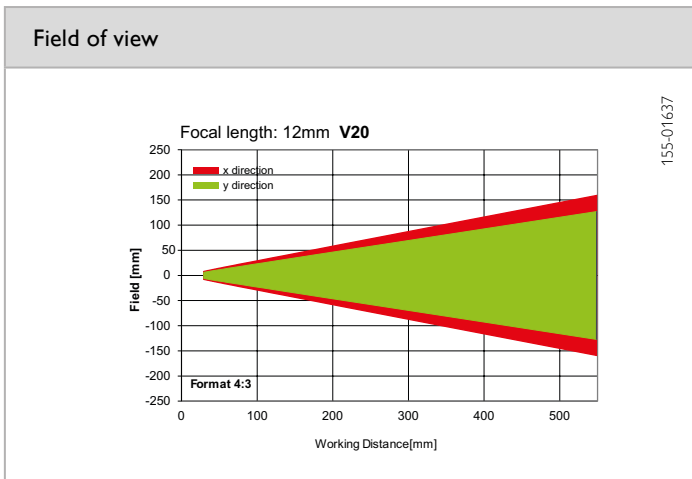
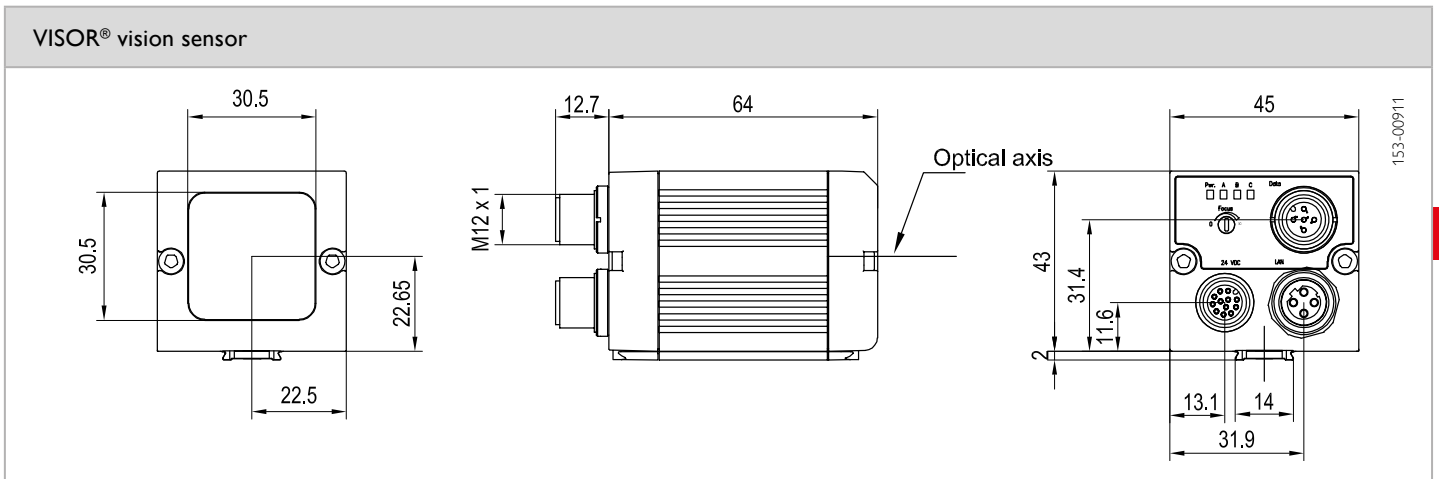
EtherNet/IP®

PRODUCT HIGHLIGHTS

- All evaluations ("Detectors") of object sensor and code reader united in one device
- Highly accurate evaluation via 1.3 mega- pixel colour chip
- Real-world engineering units and robot coordinates at a mouse click
- Precise position determination: X/Y-position and orientation
- Can be used for all common 2D-Codes (ECC 200-Data-matrix) and common 1D-bar codes
- User-friendly configuration and viewer software with graded user rights and online help

Optical data		Functions	
Resolution	1280 x 1024 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/1.8", colour	Detectors	Contour; pattern comparison; calliper; BLOB; contrast; brightness; grey level; data code; bar code; OCR; colour list; colour area; colour value
Integrated lens, focal length	12 mm, adjustable focal position	Properties	Position tracking: X/Y and orientation; pattern comparison / contour: teach-in and detection of patterns and contours; calliper: distance between edges; BLOB; grey threshold; brightness: evaluation of brightness; contrast: evaluation of contrast; colour value: output of colour values; colour area: two-dimensional colour inspection with adjustable tolerance; colour list: detecting the most similar colours; bar code: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; data code: reading 2D codes: ECC200, QR code, PDF 417; OCR
Adjustment range	30 mm to infinity	Typical cycle times ²	Typ. 20 ms pattern comparison; typ. 30 ms contour; typ. 8 ms calliper; typ. 30 ms BLOB; typ. 2 ms brightness; typ. 2 ms contrast; typ. 2 ms grey threshold; typ. 2 ms colour value; typ. 30 ms colour area; typ. 2 ms colour list; typ. 30 ms bar code; typ. 40 ms data code; typ. 15 ms per character OCR
Integrated illumination	White LEDs		
Minimum field of view, X x Y	16 x 13 mm ²		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4V DC ¹	Dimensions	65 x 45 x 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 67
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Ca. 13 s after Power on	Ambient temperature: operation	0 ... +50° C ³
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60° C ³
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Ca. 160 g
Inputs	PNP/NPN High > U _B -1V, Low < 3V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

¹ Max. ripple < 5V_{SS} ² with VGA-resolution (640 x 480 pixels) ³ 80 % air humidity, non-condensing

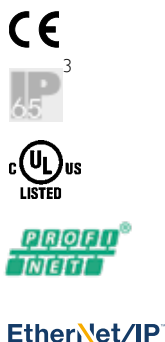


illumination	Part number	Article number
White	V20C-ALL -A2-W12	536-91036

Accessories	
Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® V20 Allround Color

Advanced vision sensor for complex inspection tasks, C-mount

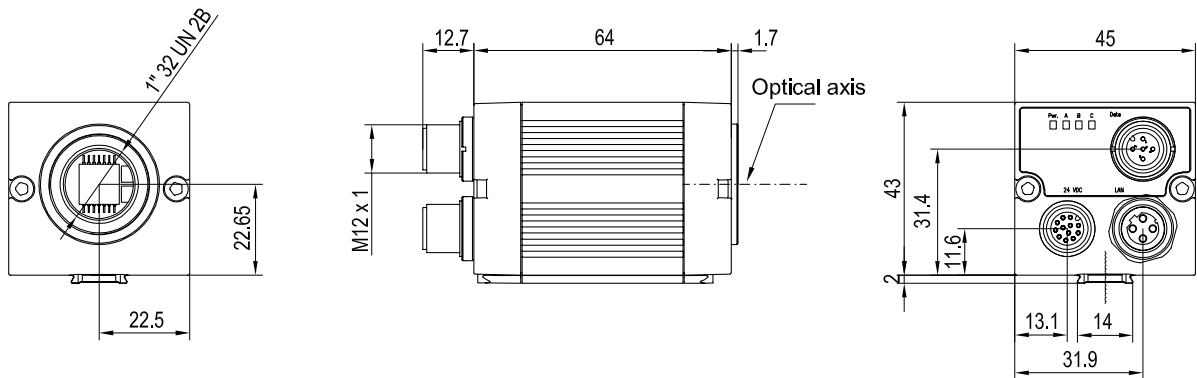


PRODUCT HIGHLIGHTS

- All evaluations ("Detectors") of object sensor and code reader united in one device
- Highly accurate evaluation via 1.3 mega- pixel colour chip
- Real-world engineering units and robot coordinates at a mouse click
- Precise position determination: X/Y-position and orientation
- Can be used for all common 2D-Codes (ECC 200-Data-matrix) and common 1D-bar codes
- User-friendly configuration and viewer software with graded user rights and online help

Optical data		Functions	
Resolution	1280 x 1024 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/1.8", colour	Detectors	Contour; pattern comparison, calliper; BLOB, contrast, brightness, grey level, data code, bar code, OCR, colour list, colour area, colour value
Integrated lens, focal length	C-Mount	Properties	Position tracking: X/Y and orientation; pattern comparison / contour: teach-in and detection of patterns and contours; calliper: distance between edges; BLOB; grey threshold, brightness: evaluation of brightness; contrast: evaluation of contrast; colour value: output of colour values; colour area: two-dimensional colour inspection with adjustable tolerance; colour list: detecting the most similar colours; bar code: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; data code: reading 2D codes: ECC200, QR code, PDF 417; OCR
Adjustment range	Dependent on lens	Typical cycle times ²	Typ. 20 ms pattern comparison; typ. 30 ms contour; typ. 8 ms calliper; typ. 30 ms BLOB; typ. 2 ms brightness; typ. 2 ms contrast; typ. 2 ms grey threshold; typ. 2 ms colour value; typ. 30 ms colour area; typ. 2 ms colour list; typ. 30 ms bar code; typ. 40 ms data code; typ. 15 ms per character OCR
Integrated illumination	None		
Minimum field of view, X x Y	Dependent on lens		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4 V DC ¹	Dimensions	65 x 45 x 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 65 ³
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Ca. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ⁴
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Ca. 160 g
Inputs	PNP/NPN High > U _B -1 V, Low < 3 V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4 V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

¹ Max. ripple < 5 V_{SS} ² With VGA-resolution (640 x 480 Pixel) ³ With LPT45 C-mount protective casing ⁴ 80 % air humidity, non-condensing

VISOR® vision sensor


153-00912

3

Lens

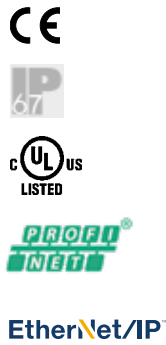

	LO C 8	LO C 12	LO C 16	LO C 25	LO C 35	LO C 50	LO C 75
Focal length	8 mm	12 mm	16 mm	25 mm	35 mm	50 mm	75 mm
Article number	526-51513	526-51514	526-51515	526-51516	526-51525	526-51113	526-51116

Part number	Article number
V20C-ALL -A2-C	536-91037

Accessories	
Connection cables	From Page A-46
Illumination	From Page A-33
Lenses	From Page A-28
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® V10 Allround

Allround vision sensor for complex inspection tasks, 6 mm



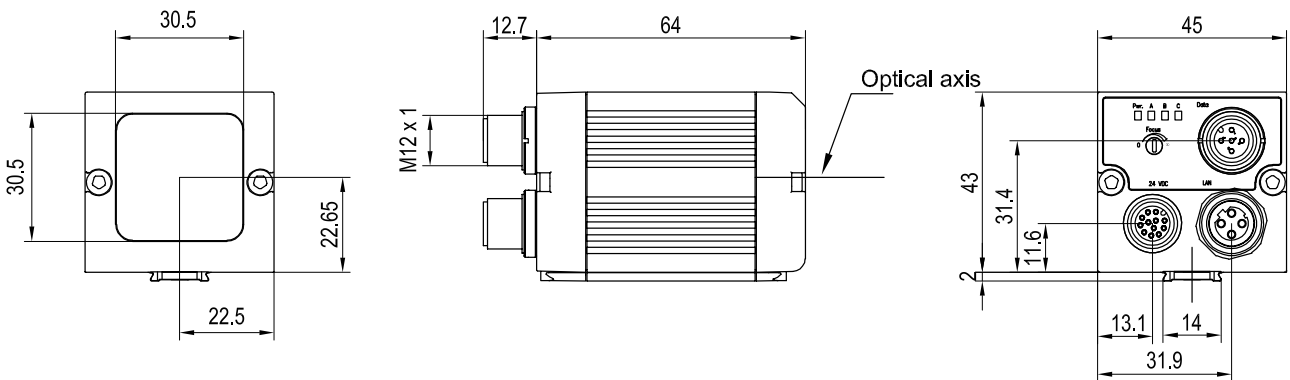
PRODUCT HIGHLIGHTS

- All evaluations ("Detectors") of object sensor and code reader united in one device
- Real-world engineering units and robot coordinates at a mouse click
- Precise position determination: X/Y-position and orientation
- Can be used for all common 2D-Codes (ECC 200-Data-matrix) and common 1D-bar codes
- User-friendly configuration and viewer software with graded user rights and online help

Optical data		Functions	
Resolution	736 x 480 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/3", monochrome	Detectors	Contour, pattern comparison, calliper, BLOB, contrast, brightness, grey level, data code, bar code, OCR
Integrated lens, focal length	6 mm, adjustable focal position	Properties	Position tracking: X/Y and orientation; pattern comparison / contour: teach-in and detection of patterns and contours; calliper: distance between edges; BLOB; grey threshold, brightness: evaluation of brightness; contrast: evaluation of contrast; bar code: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; data code: reading 2D codes: ECC200, QR code, PDF 417; OCR
Adjustment range	6 mm to infinity	Typical cycle times	Typ. 20 ms pattern comparison Typ. 30 ms contour Typ. 8 ms calliper Typ. 30 ms BLOB Typ. 2 ms brightness Typ. 2 ms contrast Typ. 2 ms grey threshold Typ. 30 ms bar code Typ. 40 ms data code Typ. 15 ms per character OCR
Integrated illumination	White, red, infrared LEDs		
Minimum field of view, X x Y	5 x 4 mm ²		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4 V DC ¹	Dimensions	65 x 45 x 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 67
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Ca. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ²
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Ca. 160 g
Inputs	PNP/NPN High > U _B -1 V, Low < 3 V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4 V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

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

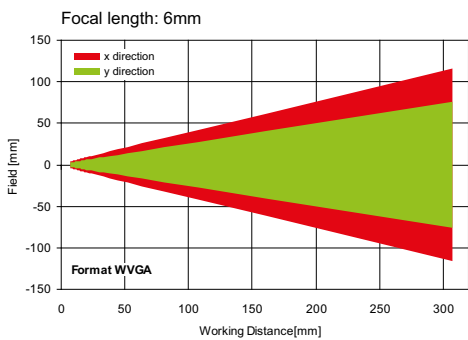
VISOR® vision sensor



153-00911

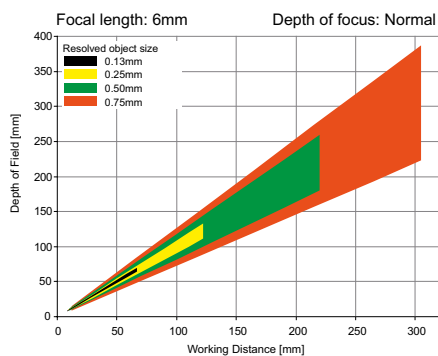
3

Field of view



155-01422

Depth of field: normal



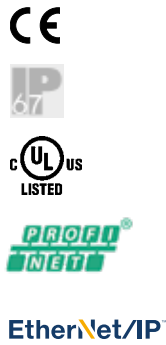
155-01409

Illumination	Part number	Article number
White	V10-ALL-A2-W6	535-91092
Red	V10-ALL-A2-R6	535-91095
Infrared	V10-ALL-A2-I6	535-91098

Accessories	
Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® V10 Allround

Allround vision sensor for complex inspection tasks, 12 mm



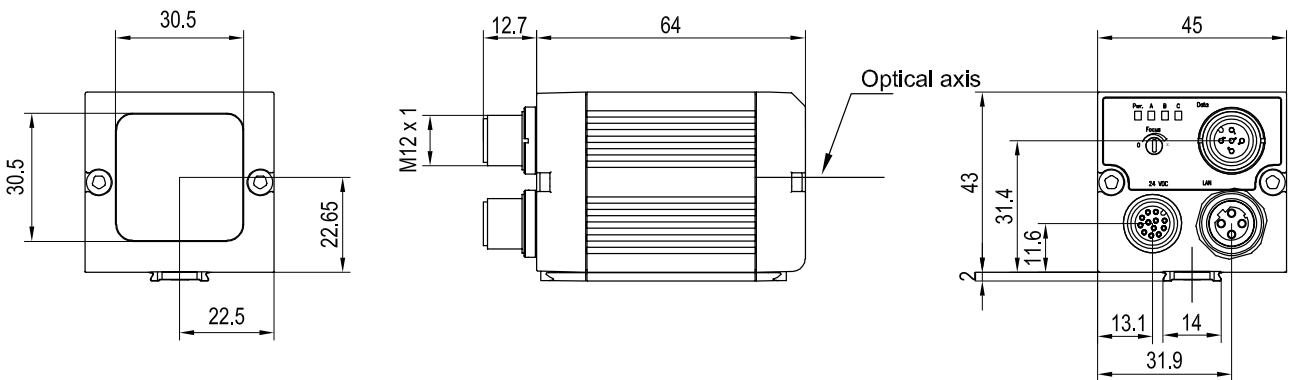
PRODUCT HIGHLIGHTS

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- Real-world engineering units and robot coordinates at a mouse click
- Precise position determination: X/Y-position and orientation
- Can be used for all common 2D-Codes (ECC 200-Data-matrix) and common 1D-bar codes
- User-friendly configuration and viewer software with graded user rights and online help

Optical data		Functions	
Resolution	736 x 480 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/3", monochrome	Detectors	Contour, pattern comparison, calliper, BLOB, contrast, brightness, grey level, data code, bar code, OCR
Integrated lens, focal length	12 mm, adjustable focal position	Properties	Position tracking: X/Y and orientation; pattern comparison / contour: teach-in and detection of patterns and contours; calliper: distance between edges; BLOB; grey threshold, brightness: evaluation of brightness; contrast: evaluation of contrast; bar code: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; data code: reading 2D codes: ECC200, QR code, PDF 417; OCR
Adjustment range	30 mm to infinity	Typical cycle times	Typ. 20 ms pattern comparison Typ. 30 ms contour Typ. 8 ms calliper Typ. 30 ms BLOB Typ. 2 ms brightness Typ. 2 ms contrast Typ. 2 ms grey threshold Typ. 30 ms bar code Typ. 40 ms data code Typ. 15 ms per character OCR
Integrated illumination	White, red, infrared LEDs		
Minimum field of view, X x Y	8 x 6 mm ²		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4 V DC ¹	Dimensions	65 x 45 x 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 67
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Ca. 13 s after Power on	Ambient temperature: operation	0 ... +50° C ²
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60° C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Ca. 160 g
Inputs	PNP/NPN High > U _B -1 V, Low < 3 V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4 V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

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

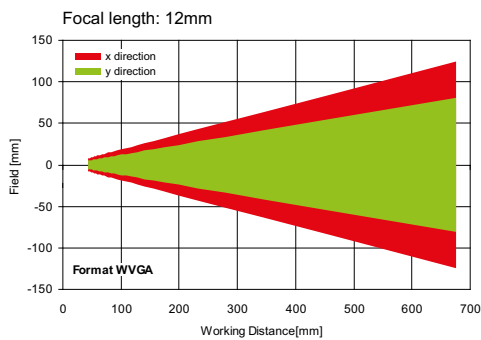
VISOR® vision sensor



153-00911

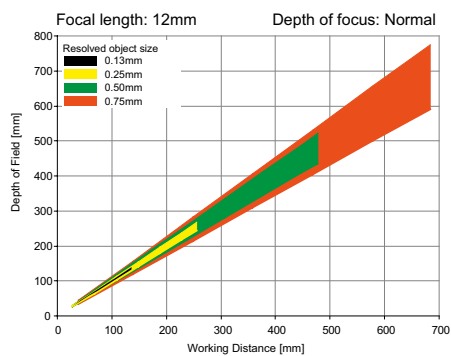
3

Field of view



155-01423

Depth of field: normal



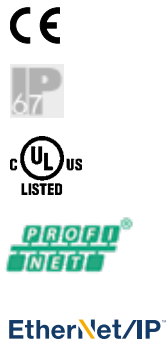
155-01410

Illumination	Part number	Article number
White	V10-ALL-A2-W12	535-91093
Red	V10-ALL-A2-R12	535-91096
Infrared	V10-ALL-A2-I12	535-91099

Accessories	
Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® V10 Allround

Allround vision sensor for complex inspection tasks, 25 mm



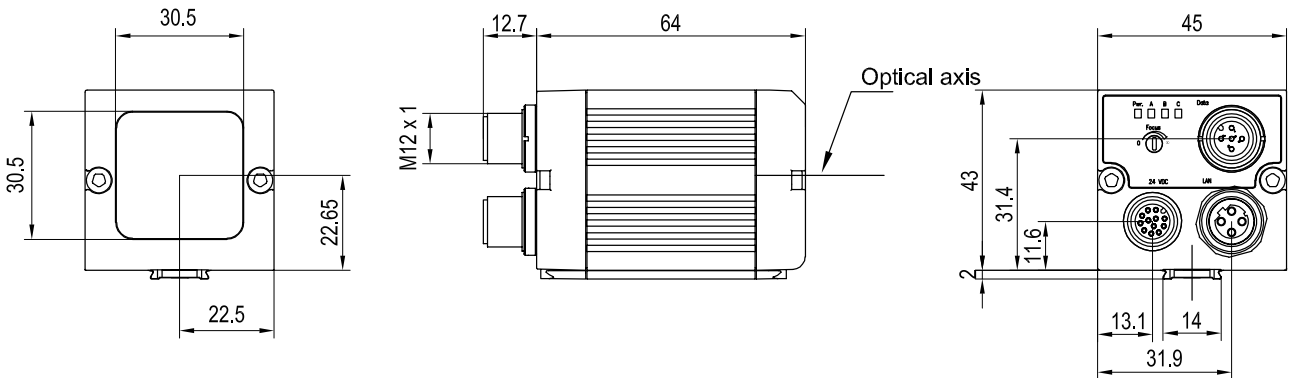
PRODUCT HIGHLIGHTS

- All evaluations ("Detectors") of object sensor and code reader united in one device
- Real-world engineering units and robot coordinates at a mouse click
- Precise position determination: X/Y-position and orientation
- Can be used for all common 2D-Codes (ECC 200-Data-matrix) and common 1D-bar codes
- User-friendly configuration and viewer software with graded user rights and online help

Optical data		Functions	
Resolution	736 x 480 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/3", monochrome	Detectors	Contour, pattern comparison, calliper, BLOB, contrast, brightness, grey level, data code, bar code, OCR
Integrated lens, focal length	25 mm, adjustable focal position	Properties	Position tracking: X/Y and orientation; pattern comparison / contour: teach-in and detection of patterns and contours; calliper: distance between edges; BLOB; grey threshold, brightness: evaluation of brightness; contrast: evaluation of contrast; bar code: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; data code: reading 2D codes: ECC200, QR code, PDF 417; OCR
Adjustment range	140 mm to infinity	Typical cycle times	Typ. 20 ms pattern comparison Typ. 30 ms contour Typ. 8 ms calliper Typ. 30 ms BLOB Typ. 2 ms brightness Typ. 2 ms contrast Typ. 2 ms grey threshold Typ. 30 ms bar code Typ. 40 ms data code Typ. 15 ms per character OCR
Integrated illumination	White, red, infrared LEDs		
Minimum field of view, X x Y	18 x 14 mm ²		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4V DC ¹	Dimensions	65 x 45 x 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 67
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Ca. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ²
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Ca. 160 g
Inputs	PNP/NPN High > U _B -1V, Low < 3V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

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

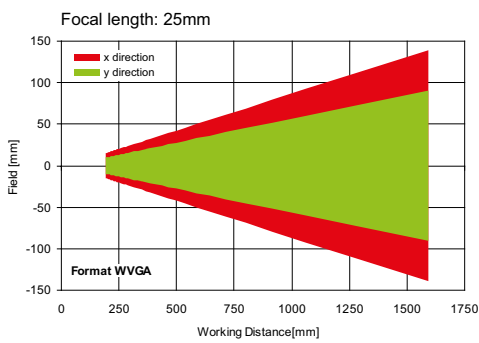
VISOR® vision sensor



153-00911

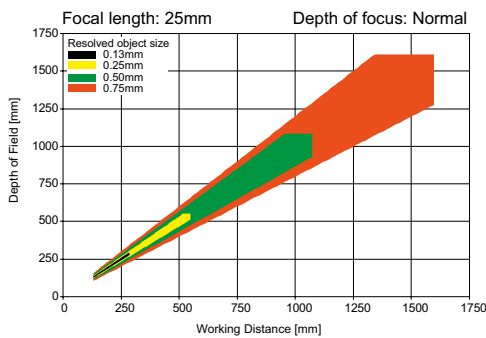
3

Field of view



155-01424

Depth of field: normal



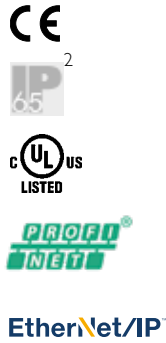
155-01412

illumination	Part number	Article number
White	V10-ALL-A2-W25	535-91094
Red	V10-ALL-A2-R25	535-91097
Infrared	V10-ALL-A2-I25	535-91100

Accessories	
Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® V10 Allround

Allround vision sensor for complex inspection tasks, C-mount

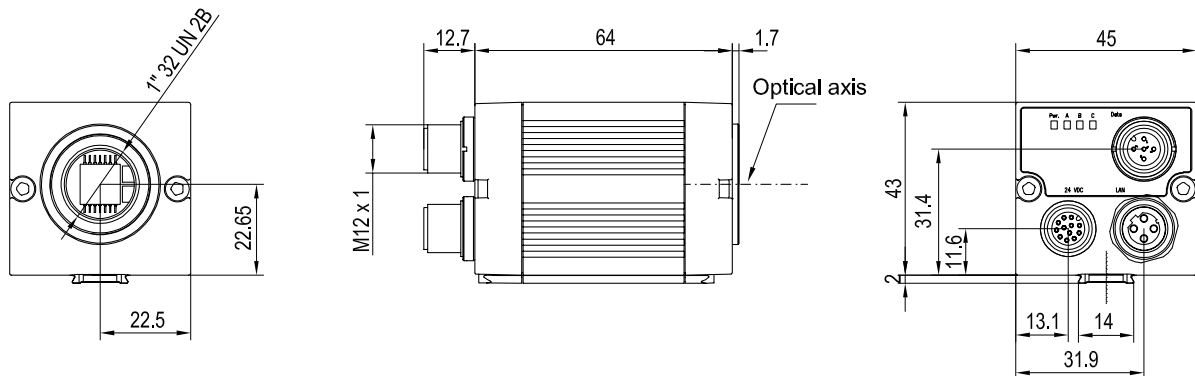


PRODUCT HIGHLIGHTS

- All evaluations ("Detectors") of object sensor and code reader united in one device
- Real-world engineering units and robot coordinates at a mouse click
- Precise position determination: X/Y-position and orientation
- Can be used for all common 2D-Codes (ECC 200-Data-matrix) and common 1D-bar codes
- User-friendly configuration and viewer software with graded user rights and online help

Optical data		Functions	
Resolution	736 x 480 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/3", monochrome	Detectors	Contour, pattern comparison, calliper, BLOB, contrast, brightness, grey level, data code, bar code, OCR
Integrated lens, focal length	C-Mount	Properties	Position tracking: X/Y and orientation; pattern comparison / contour: teach-in and detection of patterns and contours; calliper: distance between edges; BLOB; grey threshold, brightness: evaluation of brightness; contrast: evaluation of contrast; bar code: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; data code: reading 2D codes: ECC200, QR code, PDF 417; OCR
Adjustment range	Dependent on lens	Typical cycle times	Typ. 20 ms pattern comparison Typ. 30 ms contour Typ. 8 ms calliper Typ. 30 ms BLOB Typ. 2 ms brightness Typ. 2 ms contrast Typ. 2 ms grey threshold Typ. 30 ms bar code Typ. 40 ms data code Typ. 15 ms per character OCR
Integrated illumination	None		
Minimum field of view, X x Y	Dependent on lens		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4V DC ¹	Dimensions	65 x 45 x 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 65 ²
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Ca. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ³
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ³
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Ca. 160 g
Inputs	PNP/NPN High > U _B -1V, Low < 3V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

¹ Max. ripple < 5 V_{SS} ² With LPT45 C-mount protective casing ³ 80 % air humidity, non-condensing

VISOR® vision sensor


153-00912

3

Lens

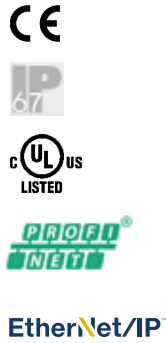

	LO C 8	LO C 12	LO C 16	LO C 25	LO C 35	LO C 50	LO C 75
Focal length	8 mm	12 mm	16 mm	25 mm	35 mm	50 mm	75 mm
Article number	526-51513	526-51514	526-51515	526-51516	526-51525	526-51113	526-51116

Part number	Article number
V10-ALL-A2-C	535-91101

Accessories	
Connection cables	From Page A-46
Illumination	From Page A-33
Lenses	From Page A-28
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® V10 Allround Color

Allround vision sensor for complex inspection tasks, 6 mm

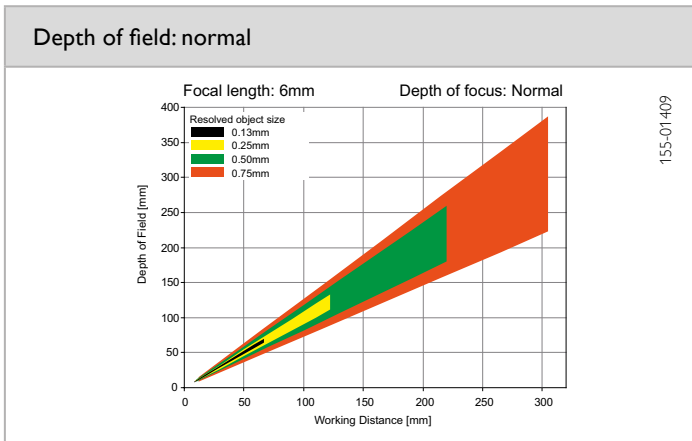
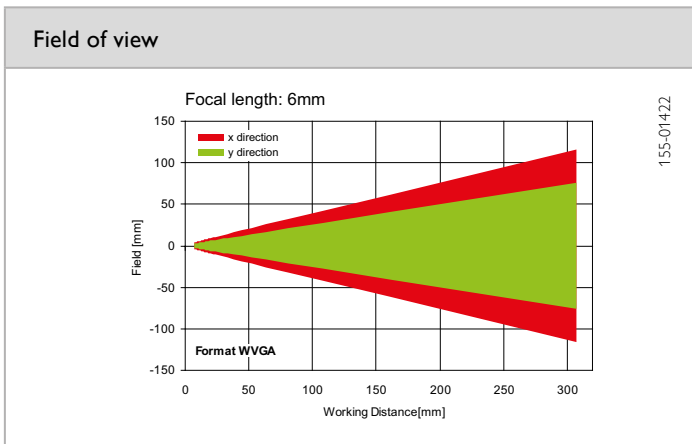
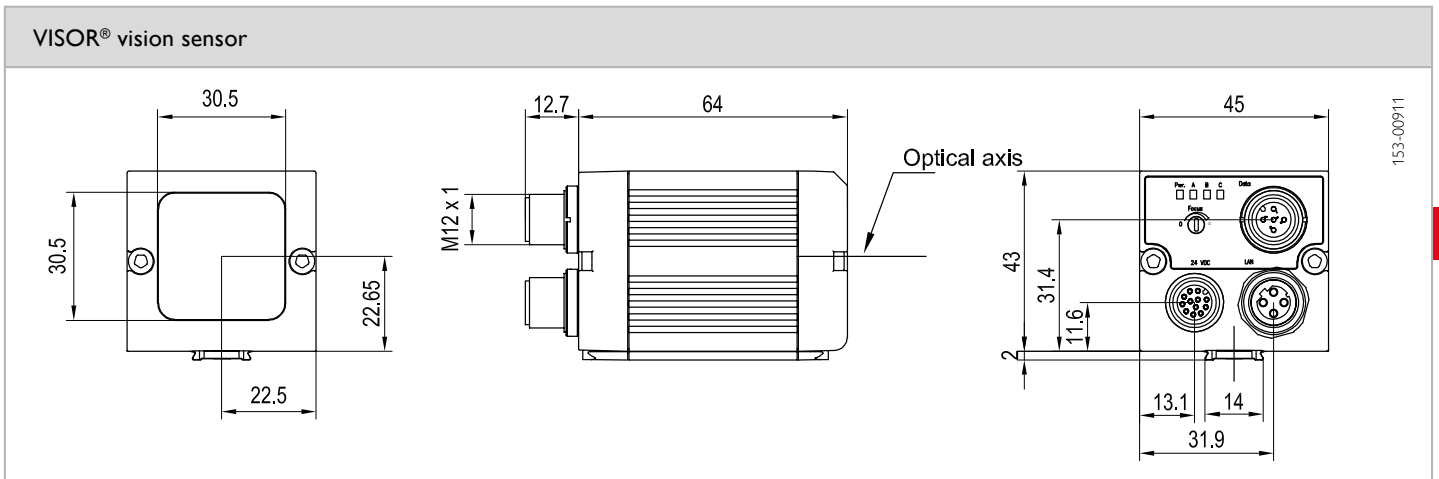


PRODUCT HIGHLIGHTS

- All evaluations ("Detectors") of object sensor and code reader united in one device
- Real-world engineering units and robot coordinates at a mouse click
- Precise position determination: X/Y-position and orientation
- Can be used for all common 2D-Codes (ECC 200-Data-matrix) and common 1D-bar codes
- User-friendly configuration and viewer software with graded user rights and online help

Optical data		Functions	
Resolution	736 x 480 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/3", colour	Detectors'	Contour, pattern comparison, calliper, BLOB, contrast, brightness, grey level, data code, bar code, OCR, colour list, colour area, colour value
Integrated lens, focal length	6 mm, adjustable focal position	Properties	Position tracking: X/Y and orientation; pattern comparison / contour: teach-in and detection of patterns and contours; calliper: distance between edges; BLOB; grey threshold, brightness: evaluation of brightness; contrast: evaluation of contrast; colour value: output of colour values; colour area: two-dimensional colour inspection with adjustable tolerance; colour list: detecting the most similar colours; bar code: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; data code: reading 2D codes: ECC200, QR code, PDF 417; OCR
Adjustment range	6 mm to infinity	Typical cycle times	Typ. 20 ms pattern comparison; typ. 30 ms contour; typ. 8 ms calliper; typ. 30 ms BLOB; typ. 2 ms brightness; typ. 2 ms contrast; typ. 2 ms grey threshold; typ. 2 ms colour value; typ. 30 ms colour area; typ. 2 ms colour list; typ. 30 ms bar code; typ. 40 ms data code; typ. 15 ms per character OCR
Integrated illumination	White LEDs		
Minimum field of view, X x Y	5 x 4 mm ²		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4V DC ¹	Dimensions	65 x 45 x 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 67
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Ca. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ²
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Ca. 160 g
Inputs	PNP/NPN High > U _B -1V, Low < 3V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

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



Illumination	Part number	Article number
White	V10C-ALL-A2-W6	535-91102

Accessories	
Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® V10 Allround Color

Allround vision sensor for complex inspection tasks, 12 mm



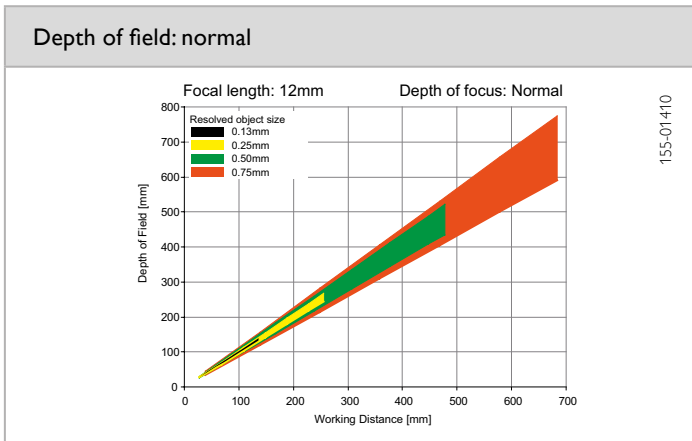
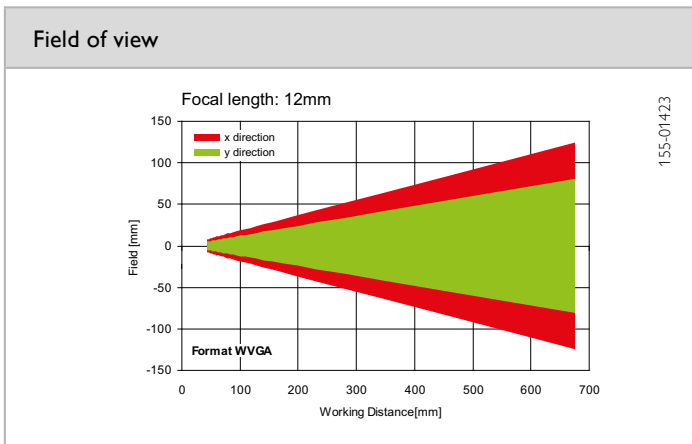
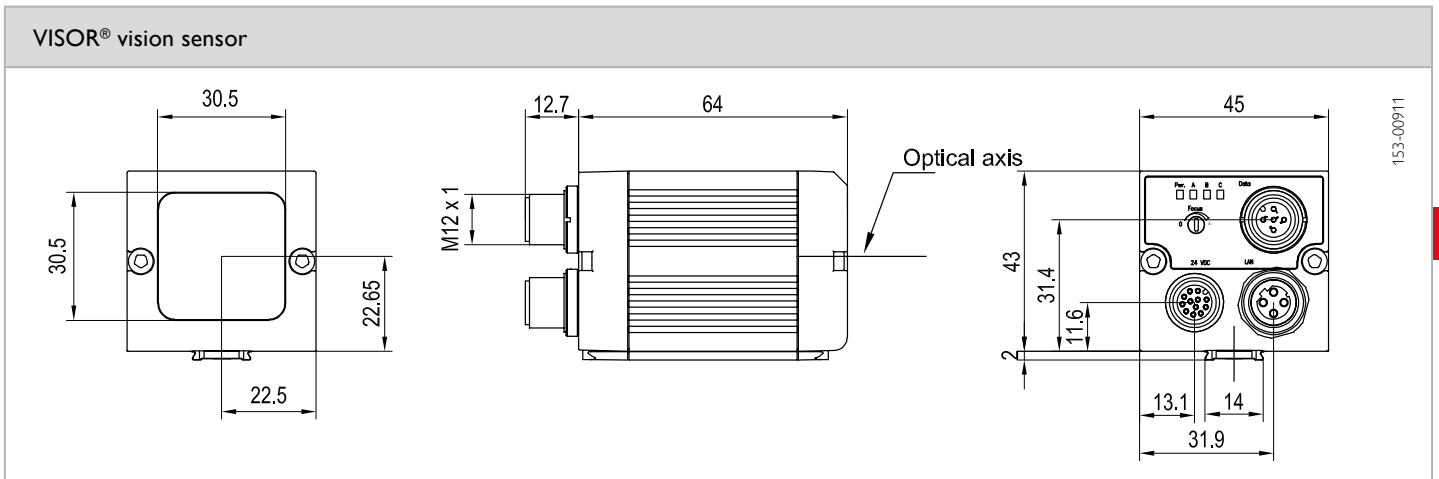
EtherNet/IP™

PRODUCT HIGHLIGHTS

- All evaluations ("Detectors") of object sensor and code reader united in one device
- Real-world engineering units and robot coordinates at a mouse click
- Precise position determination: X/Y-position and orientation
- Can be used for all common 2D-Codes (ECC 200-Data-matrix) and common 1D-bar codes
- User-friendly configuration and viewer software with graded user rights and online help

Optical data		Functions	
Resolution	736 x 480 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/3", colour	Detectors	Contour; pattern comparison; calliper; BLOB; contrast; brightness; grey level-data code; bar code; OCR; colour list; colour area; colour value
Integrated lens, focal length	12 mm, adjustable focal position	Properties	Position tracking: X/Y and orientation; pattern comparison / contour: teach-in and detection of patterns and contours; calliper: distance between edges; BLOB; grey threshold; brightness: evaluation of brightness; contrast: evaluation of contrast; colour value: output of colour values; colour area: two-dimensional colour inspection with adjustable tolerance; colour list: detecting the most similar colours; bar code: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; data code: reading 2D codes: ECC200, QR code, PDF 417; OCR
Adjustment range	30 mm to infinity	Typical cycle times	Typ. 20 ms pattern comparison; typ. 30 ms contour; typ. 8 ms calliper; typ. 30 ms BLOB; typ. 2 ms brightness; typ. 2 ms contrast; typ. 2 ms grey threshold; typ. 2 ms colour value; typ. 30 ms colour area; typ. 2 ms colour list; typ. 30 ms bar code; typ. 40 ms data code; typ. 15 ms per character OCR
Integrated illumination	White LEDs		
Minimum field of view, X x Y	8 x 6 mm ²		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4V DC ¹	Dimensions	65 x 45 x 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 67
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Ca. 13 s after Power on	Ambient temperature: operation	0 ... +50° C ²
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60° C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Ca. 160 g
Inputs	PNP/NPN High > U _B -1V, Low < 3V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

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



Illumination	Part number	Article number
White	V10C-ALL-A2-W12	535-91103

Accessories	
Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® V10 Allround Color

Allround vision sensor for complex inspection tasks, 25 mm



EtherNet/IP™

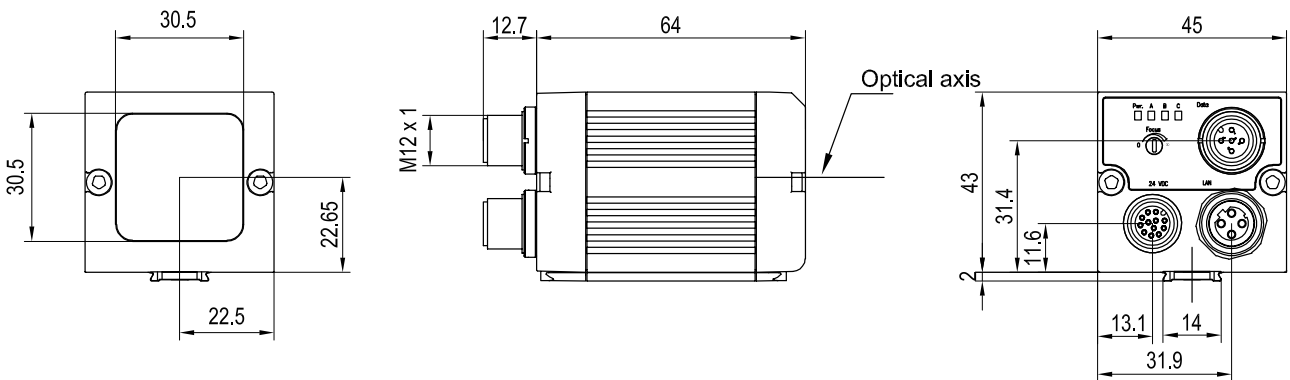
PRODUCT HIGHLIGHTS

- All evaluations ("Detectors") of object sensor and code reader united in one device
- Real-world engineering units and robot coordinates at a mouse click
- Precise position determination: X/Y-position and orientation
- Can be used for all common 2D-Codes (ECC 200-Data-matrix) and common 1D-bar codes
- User-friendly configuration and viewer software with graded user rights and online help

Optical data		Functions	
Resolution	736 x 480 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/3", colour	Detectors	Contour; pattern comparison, calliper, BLOB; contrast, brightness, grey level, data code, bar code, OCR, colour list, colour area, colour value
Integrated lens, focal length	25 mm, adjustable focal position	Properties	Position tracking: X/Y and orientation; pattern comparison / contour: teach-in and detection of patterns and contours; calliper: distance between edges; BLOB; grey threshold, brightness: evaluation of brightness; contrast: evaluation of contrast; colour value: output of colour values; colour area: two-dimensional colour inspection with adjustable tolerance; colour list: detecting the most similar colours; bar code: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; data code: reading 2D codes: ECC200, QR code, PDF 417; OCR
Adjustment range	140 mm to infinity	Typical cycle times	Typ. 20 ms pattern comparison; typ. 30 ms contour; typ. 8 ms calliper; typ. 30 ms BLOB; typ. 2 ms brightness; typ. 2 ms contrast; typ. 2 ms grey threshold; typ. 2 ms colour value; typ. 30 ms colour area; typ. 2 ms colour list; typ. 30 ms bar code; typ. 40 ms data code; typ. 15 ms per character OCR
Integrated illumination	White LEDs		
Minimum field of view, X x Y	18 x 14 mm²		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4V DC ¹	Dimensions	65 x 45 x 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 67
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Ca. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ²
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Ca. 160 g
Inputs	PNP/NPN High > U _B -1V, Low < 3V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

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

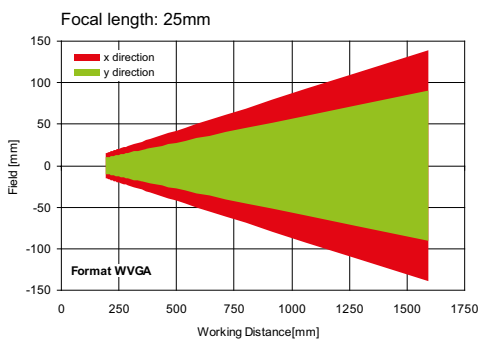
VISOR® vision sensor



153-00911

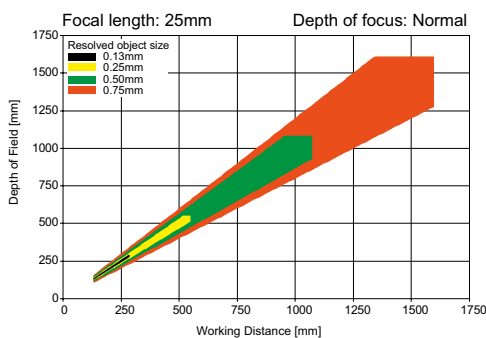
3

Field of view



155-01424

Depth of field: normal



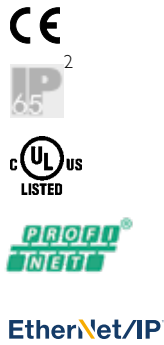
155-01412

Illumination	Part number	Article number
White	V10C-ALL-A2-W25	535-91104

Accessories	
Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® V10 Allround Color

Allround vision sensor for complex inspection tasks, C-mount



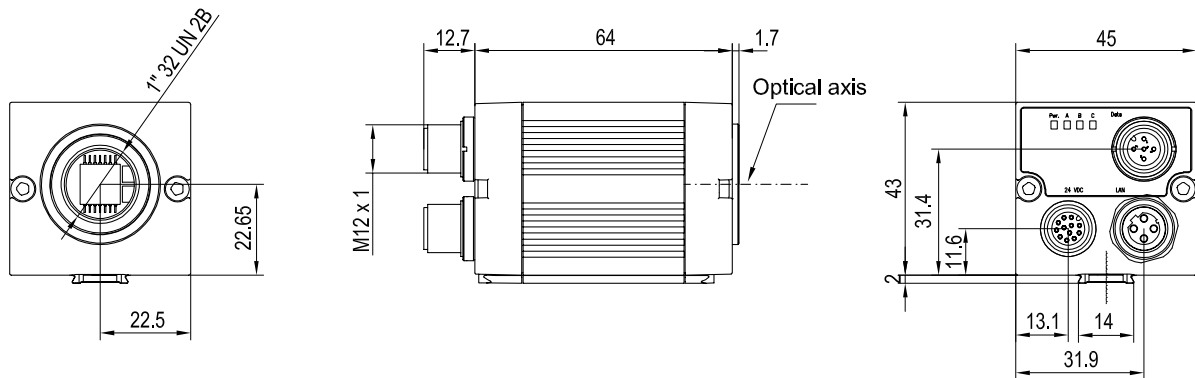
PRODUCT HIGHLIGHTS

- All evaluations ("Detectors") of object sensor and code reader united in one device
- Real-world engineering units and robot coordinates at a mouse click
- Precise position determination: X/Y-position and orientation
- Can be used for all common 2D-Codes (ECC 200-Data-matrix) and common 1D-bar codes
- User-friendly configuration and viewer software with graded user rights and online help

Optical data		Functions	
Resolution	736 x 480 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/3", colour	Detectors	Contour; pattern comparison, calliper; BLOB; contrast; brightness; grey level; data code; bar code, OCR, colour list, colour area, colour value
Integrated lens, focal length	C-Mount	Properties	Position tracking: X/Y and orientation; pattern comparison / contour: teach-in and detection of patterns and contours; calliper: distance between edges; BLOB; grey threshold; brightness: evaluation of brightness; contrast: evaluation of contrast; colour value: output of colour values; colour area: two-dimensional colour inspection with adjustable tolerance; colour list: detecting the most similar colours; bar code: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; data code: reading 2D codes: ECC200, QR code, PDF 417; OCR
Adjustment range	Dependent on lens	Typical cycle times	Typ. 20 ms pattern comparison; typ. 30 ms contour; typ. 8 ms calliper; typ. 30 ms BLOB; typ. 2 ms brightness; typ. 2 ms contrast; typ. 2 ms grey threshold; typ. 2 ms colour value; typ. 30 ms colour area; typ. 2 ms colour list; typ. 30 ms bar code; typ. 40 ms data code; typ. 15 ms per character OCR
Integrated illumination	None		
Minimum field of view, X x Y	Dependent on lens		
Electrical data		Mechanical data	
Operating voltage, +U _b	18 ... 26.4V DC ¹	Dimensions	65 x 45 x 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 65 ²
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _b / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Ca. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ³
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ³
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Ca. 160 g
Inputs	PNP/NPN High > U _b -1 V, Low < 3 V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

¹ Max. ripple < 5V_{SS} ² With LPT45 C-mount protective casing ³ 80 % air humidity, non-condensing

VISOR® vision sensor



153-00912

3

Lens



	LO C 8	LO C 12	LO C 16	LO C 25	LO C 35	LO C 50	LO C 75
Focal length	8 mm	12 mm	16 mm	25 mm	35 mm	50 mm	75 mm
Article number	526-51513	526-51514	526-51515	526-51516	526-51525	526-51113	526-51116

Part number	Article number
V10C-ALL-A2-C	535-91105

Accessories	
Connection cables	From Page A-46
Illumination	From Page A-33
Lenses	From Page A-28
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® Object

Detects the right part in the wrong place and vice versa.



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.



The same or not the same?
The VISOR® detects even the smallest of color nuances more reliably than the human eye. This allows, for example, the detection of color deviations or the sorting of parts by color.

HIGHLIGHTS OF VISOR® OBJECT

- Detectors for presence and completeness checks as well as for simple measurement tasks
- Precise position determination: x/y-position and orientation
- Improved object detection through additional color information
- Comprehensive logic functions for the digital switching outputs
- Flexible definition of output data
- EtherNet/IP PROFINET (conformance class B), EtherNet (TCP/IP) supported
- Comprehensive for archiving images and data
- Simple calibration for measurement tasks. Conversion into mm as well as correction of errors and distortions

Objects that sometimes appear in unexpected positions and have complex shapes and details – classic switching sensors would be completely overwhelmed by such detection tasks. Not the VISOR® Object from SensoPart: it always maintains its overview, detecting defective parts, parts in the wrong position, wrong orientation, wrong sequence or a combination of them all – in an instant. The comprehensive calibration functions range from a simple scaling factor to the correction of image and lens distortions at a mouse click. With its highly precise position and orientation detection, our VISOR® Object is one of the best in its class.

Seven detectors plus position detection

An expansive range of detectors is available for inspection tasks and evaluations: pattern matching, contour detection, calliper, BLOB, brightness, grey threshold and contrast detection. Position tracking offers reliable detection of those features that do not repeatedly appear in the original position taught. All evaluations take place relative to the current part position and orientation, without them having to be defined for every possible position of an individual feature. The color version features detectors for color detection, enabling VISOR® to also distinguish between the finest nuances in shade. This powerful tool allows you to solve even demanding applications confidently!

VISOR® Object – Product overview					
	Product variant	Resolution	Focal Length	Integrated illumination	Page
V20x-OB-A3-xxx	Advanced	1440 x 1080 mono/color	Wide	White, red ¹ or infrared ¹ LEDs	70
V20x-OB-A3-xxx			Medium	White, red ¹ or infrared ¹ LEDs	72
V20x-OB-A3-xxx			Narrow	White, red ¹ or infrared ¹ LEDs	74
V20x-OB-A3-C-2			C-Mount	None	76
V10x-OB-S3-xxx	Standard	800 x 600 mono/color	Wide	White, red ¹ or infrared ¹ LEDs	78
V10x-OB-S3-xxx			Medium	White, red ¹ or infrared ¹ LEDs	80
V10x-OB-S3-xxx			Narrow	White, red ¹ or infrared ¹ LEDs	82
V10x-OB-A3-xxx	Advanced	800 x 600 mono/color	Wide	White, red ¹ or infrared ¹ LEDs	84
V10x-OB-A3-xxx			Medium	White, red ¹ or infrared ¹ LEDs	86
V10x-OB-A3-xxx			Narrow	White, red ¹ or infrared ¹ LEDs	88
V10x-OB-A3-C-2			C-Mount	None	90

¹ Only with monochrome version


VISOR® V20 Object Advanced, wide field of view

Vision sensor for object detection, presence check, completeness check, position inspection and measurement tasks

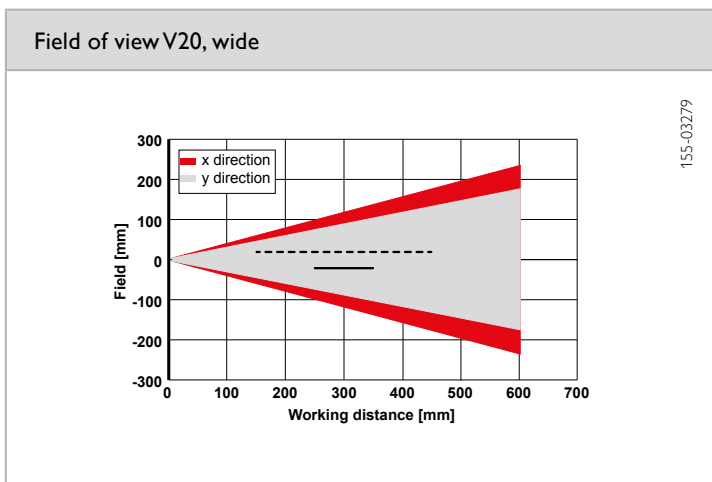
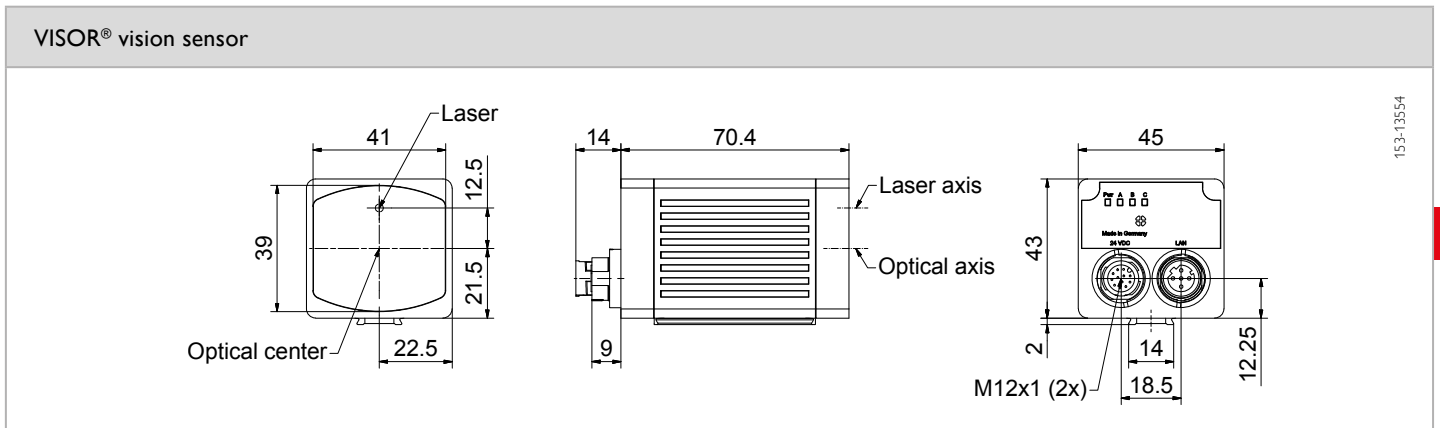


PRODUCT HIGHLIGHTS

- User-friendly configuration and viewer software with hierarchical user rights
- Object detection with 1,5 mega pixel
- Real-world engineering units at a mouse click
- Precise position determination: X/Y-position and orientation
- Comprehensive logic functions for digital switching outputs
- Encoder input

Optical data		Functions	
Resolution	1440 x 1080 pixels	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/2.9", monochrome / color	Detectors	Position tracking: X/Y and orientation; Pattern matching / Contour: teach-in and detection of patterns and contours; Calliper: distance between edges; BLOB, Grey threshold, Brightness: evaluation of brightness; Contrast: evaluation of contrast; Color value²: output of color values; Color area²: area inspection of colors, with selectable tolerance; Color list²: finding the most similar colors
Integrated lens, focal length [mm]	6.5 (wide)		
Pixel size	3.45 µm x 3.45 µm		
Focus	Motorized		
Adjustment range	10 mm to infinity		
Integrated illumination	White (5000 K), red (635 nm) ¹ , infrared (850 nm) ¹ LEDs		
Minimum field of view, X x Y	6 x 4 mm		
Target laser	Laser: red (635 nm) class 1  (IEC 60825-1)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30V DC ³	Dimensions	70.4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Approx. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1V / Low < 3V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	✓		

¹ Not Color hardware ² Color hardware ³ Max. ripple < 5V_{SS} ⁴ 80 % air humidity, noncondensing



- Increased depth of field
- Normal depth of field

Illumination	Part number	Article number	Accessories	
White	V20-OB-A3-W-W-M2-L	632-91031	Connection cables	From Page A-46
Red	V20-OB-A3-R-W-M2-L	632-91034	Illumination	From Page A-33
Infrared	V20-OB-A3-I-W-M2-L	632-91037	Brackets	From Page A-4
White	V20C-OB-A3-W-W-M2-L	632-91041	Interface accessories	From Page A-53


VISOR® V20 Object Advanced, medium field of view

Vision sensor for object detection, presence check, completeness check, position inspection and measurement tasks

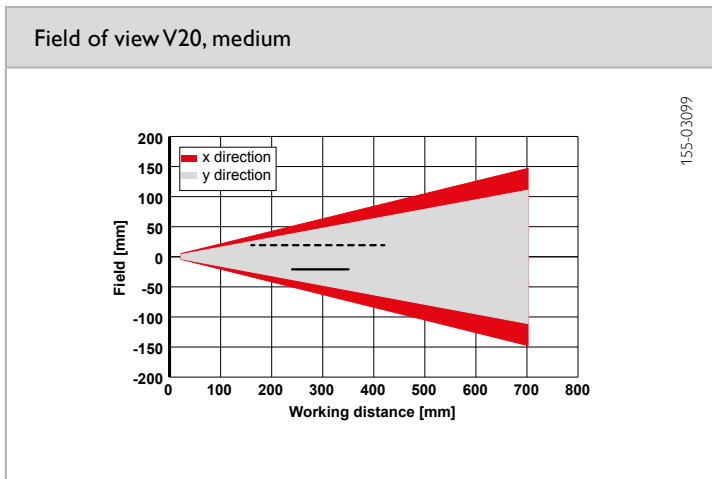
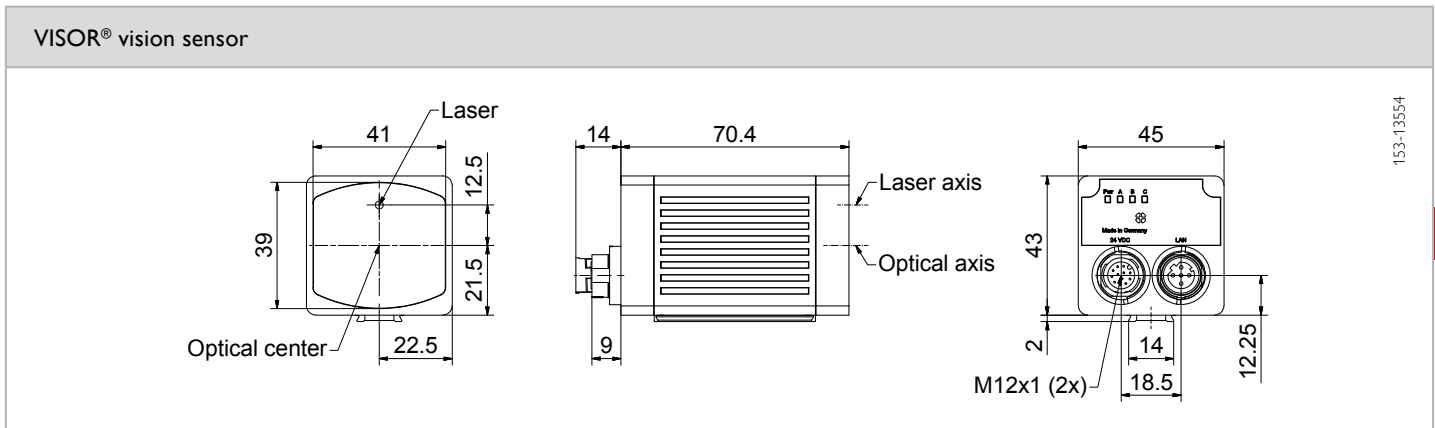


PRODUCT HIGHLIGHTS

- User-friendly configuration and viewer software with hierarchical user rights
- Object detection with 1,5 mega pixel
- Real-world engineering units at a mouse click
- Precise position determination: X/Y-position and orientation
- Comprehensive logic functions for digital switching outputs
- Encoder input

Optical data		Functions	
Resolution	1440 × 1080 Pixel	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/2.9", monochrome / color	Detectors	Position tracking: X/Y and orientation; Pattern matching / Contour: teach-in and detection of patterns and contours; Calliper: distance between edges; BLOB, Grey threshold, Brightness: evaluation of brightness; Contrast: evaluation of contrast; Color value²: output of color values; Color area²: area inspection of colors, with selectable tolerance; Color list²: finding the most similar colors
Integrated lens, focal length [mm]	12 (medium)		
Pixel size	3.45 µm × 3.45 µm		
Focus	Motorized		
Adjustment range	25 mm to infinity		
Integrated illumination	White (5000 K), red (635 nm) ¹ , infrared (850 nm) ¹ LEDs		
Minimum field of view, X × Y	10 × 8 mm		
Target laser	Laser: red (635 nm) class 1 		
	(IEC 60825-1)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ³	Dimensions	70,4 × 45 × 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Approx. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1V / Low < 3V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	✓		

¹ Not Color hardware ² Color hardware ³ Max. ripple < 5V_{SS} ⁴ 80 % air humidity, noncondensing



- Increased depth of field
- Normal depth of field

illumination	Part number	Article number	Accessories	
White	V20-OB-A3-W-M-M2-L	632-91032	Connection cables	From Page A-46
Red	V20-OB-A3-R-M-M2-L	632-91035	Illumination	From Page A-33
Infrared	V20-OB-A3-I-M-M2-L	632-91038	Brackets	From Page A-4
White	V20C-OB-A3-W-M-M2-L	632-91042	Interface accessories	From Page A-53


VISOR® V20 Object Advanced, narrow field of view

Vision sensor for object detection, presence check, completeness check, position inspection and measurement tasks

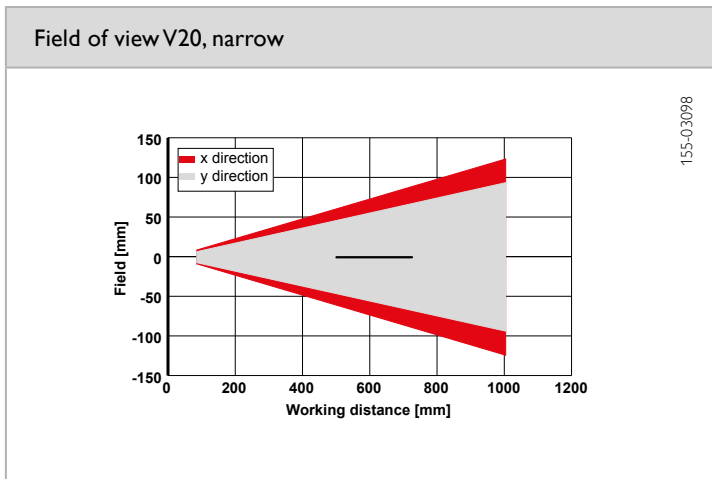
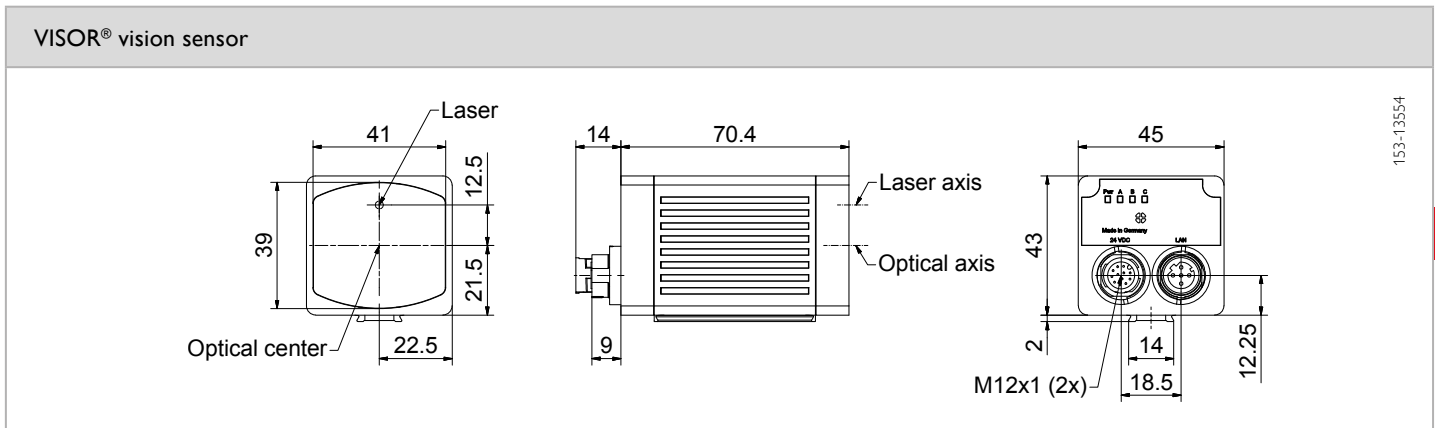


PRODUCT HIGHLIGHTS

- User-friendly configuration and viewer software with hierarchical user rights
- Object detection with 1,5 mega pixel
- Real-world engineering units at a mouse click
- Precise position determination: X/Y-position and orientation
- Comprehensive logic functions for digital switching outputs
- Encoder input

Optical data		Functions	
Resolution	1440 × 1080 Pixel	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/2.9", monochrome / color	Detectors	Position tracking: X/Y and orientation; Pattern matching / Contour: teach-in and detection of patterns and contours; Calliper: distance between edges; BLOB, Grey threshold, Brightness: evaluation of brightness; Contrast: evaluation of contrast; Color value²: output of color values; Color area²: area inspection of colors, with selectable tolerance; Color list²: finding the most similar colors
Integrated lens, focal length [mm]	20 (narrow)		
Pixel size	3.45 µm × 3.45 µm		
Focus	Motorized		
Adjustment range	100 mm to infinity		
Integrated illumination	White (5000 K), red (635 nm) ¹ , infrared (850 nm) ¹ LEDs		
Minimum field of view, X × Y	18 × 14 mm		
Target laser	Laser: red (635 nm) class 1  (IEC 60825-1)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ³	Dimensions	70,4 × 45 × 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Approx. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1 V / Low < 3V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	✓		

¹ Not Color hardware ² Color hardware ³ Max. ripple < 5V_{SS} ⁴ 80 % air humidity, noncondensing



— Normal depth of field

Illumination	Part number	Article number	Accessories	
White	V20-OB-A3-W-N-M2-L	632-91033	Connection cables	From Page A-46
Red	V20-OB-A3-R-N-M2-L	632-91036	Illumination	From Page A-33
Infrared	V20-OB-A3-I-N-M2-L	632-91039	Brackets	From Page A-4
White	V20C-OB-A3-W-N-M2-L	632-91043	Interface accessories	From Page A-53

VISOR® V20 Object Advanced, C-Mount

Vision sensor for object detection, presence check, completeness check, position inspection and measurement tasks

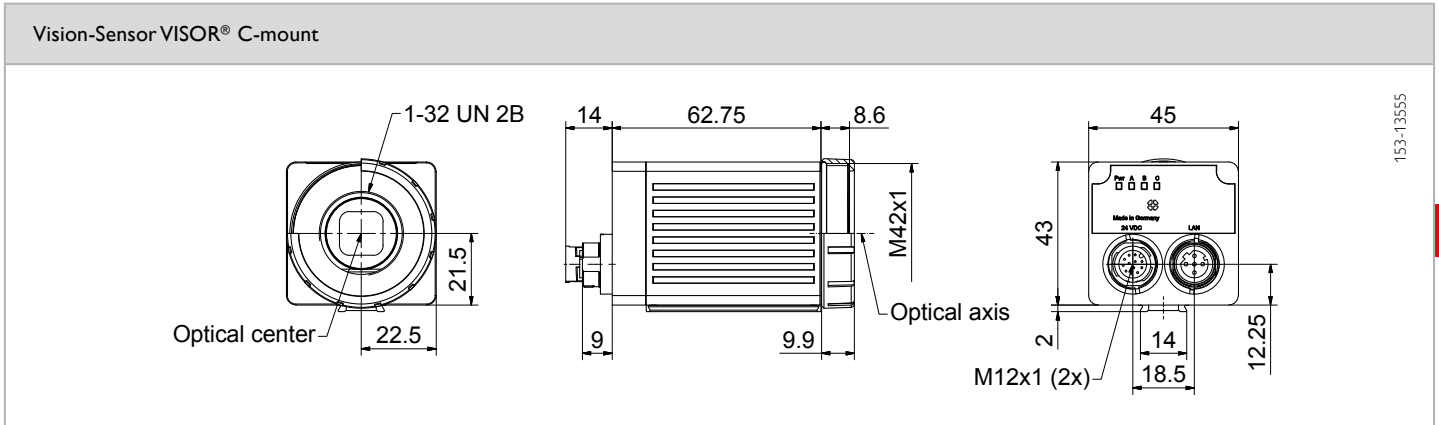


PRODUCT HIGHLIGHTS

- User-friendly configuration and viewer software with hierarchical user rights
- Object detection with 1,5 mega pixel
- Real-world engineering units at a mouse click
- Precise position determination: X/Y-position and orientation
- Comprehensive logic functions for digital switching outputs
- Encoder input

Optical data		Functions	
Resolution	1440 x 1080 pixels	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/2.9", monochrome / color	Detectors	Position tracking; X/Y and orientation; Pattern matching / Contour: teach-in and detection of patterns and contours; Calliper: distance between edges; BLOB, Grey threshold, Brightness: evaluation of brightness; Contrast: evaluation of contrast; Color value¹: output of color values; Color area¹: area inspection of colors, with selectable tolerance; Color list¹: finding the most similar colors
Integrated lens, focal length [mm]	C-mount		
Pixel size	3,45 µm x 3,45 µm		
Focus	Manual		
Adjustment range	Dependent on lens		
Integrated illumination	None		
Minimum field of view, X x Y	Dependent on lens		
Target laser	No		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30V DC ²	Dimensions	70,4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65 ³
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Approx. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1V / Low < 3V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Versorgung und I/O M12, 12-polig, Ethernet M12, 4-polig,
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibrationsfestigkeit	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Schockfestigkeit	EN 60068-2-27
Encoder	✓		

¹ Color hardware ² Max. ripple < 5V_{SS} ³ only with protective casing ⁴ 80 % air humidity, noncondensing



Part number	Article number
LPTVxx-G37.5	651-01006
LPTVxx-25.0	651-01007

	LO C 8	LO C 12	LO C 16	LO C 25	LO C 35	LO C 50	LO C 75
Focal length	8 mm	12 mm	16 mm	25 mm	35 mm	50 mm	75 mm
Article number	526-51513	526-51514	526-51515	526-51516	526-51525	526-51113	526-51116

Part number	Article number	Accessories
V20-OB-A3-C-2	632-91040	Connection cables
V20C-OB-A3-C-2	632-91044	Illumination
		Lenses
		Brackets
		Interface accessories
		From Page A-46
		From Page A-33
		From Page A-28
		From Page A-4
		From Page A-53

VISOR® V10 Object Standard, wide field of view

Vision sensor for object detection, simple presence and completeness checks

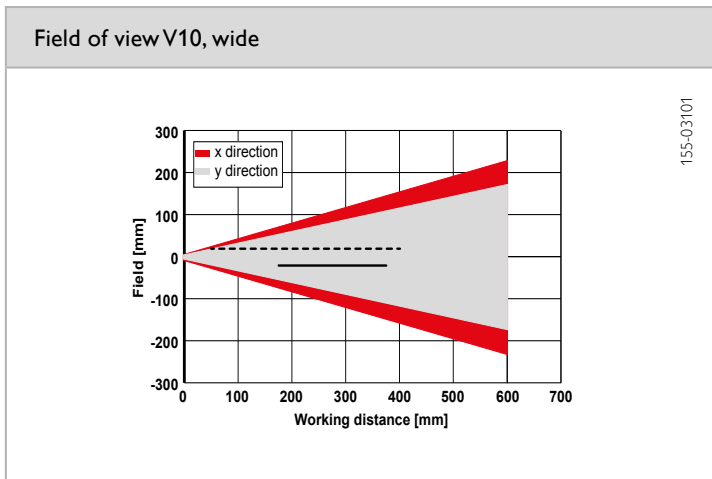
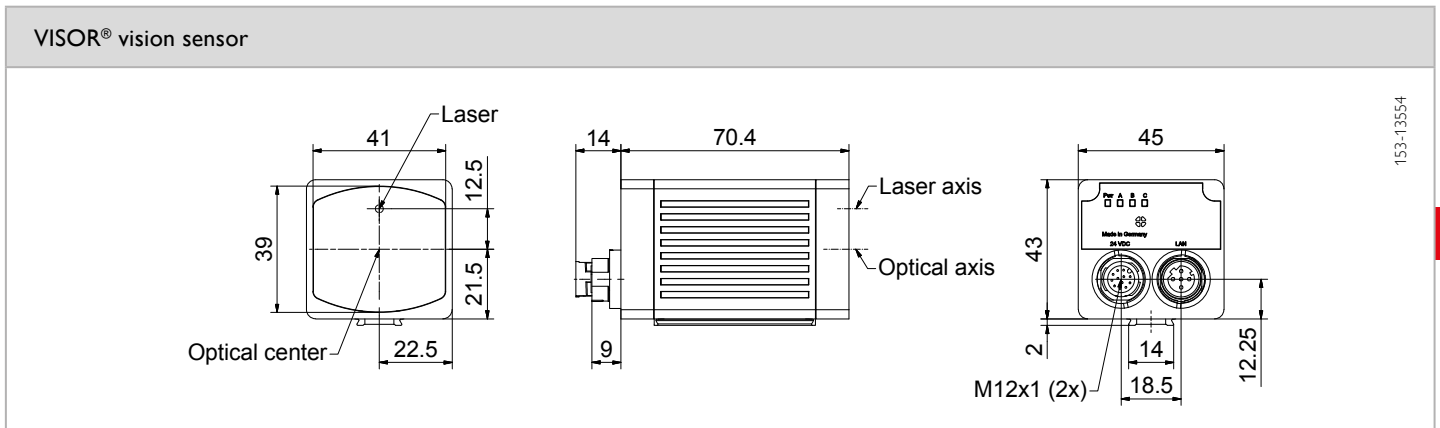


PRODUCT HIGHLIGHTS

- User-friendly configuration and viewer software with hierarchical user rights
- Detectors for object detection
- Efficient part detection and tracking
- Precise position determination: X/Y-position and orientation
- Comprehensive logic functions for digital switching outputs

Optical data		Functions	
Resolution	800 × 600 Pixel	Number of jobs / detectors	8 / 32
Imaging chip CMOS	1/3.6", monochrome / color	Detectors	Position tracking: X/Y and orientation; Pattern matching / Contour: teach-in and detection of patterns and contours; Grey threshold, Brightness: evaluation of brightness; Contrast: evaluation of contrast; Color area²: area inspection of colors, with selectable tolerance;
Integrated lens, focal length [mm]	5.2 (wide)		
Pixel size	4.8 µm × 4.8 µm		
Focus	Motorized		
Adjustment range	0 mm to infinity		
Integrated illumination	White (5000 K), red (635 nm) ¹ , infrared (850 nm) ¹ LEDs		
Minimum field of view, X × Y	2 × 1 mm		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ³	Dimensions	70,4 × 45 × 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Approx. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1V / Low < 3V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 4 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	No		

¹ Not Color hardware ² Color hardware ³ Max. ripple < 5V_{SS} ⁴ 80 % air humidity, noncondensing



- Increased depth of field
- Normal depth of field

Illumination	Part number	Article number	Accessories	
White	V10-OB-S3-W-W-M2	631-91043	Connection cables	From Page A-46
Red	V10-OB-S3-R-W-M2	631-91045	Illumination	From Page A-33
Infrared	V10-OB-S3-I-W-M2	631-91047	Brackets	From Page A-4
White	V10C-OB-S3-W-W-M2	631-91049	Interface accessories	From Page A-53

VISOR® V10 Object Standard, medium field of view

Vision sensor for object detection, simple presence and completeness checks

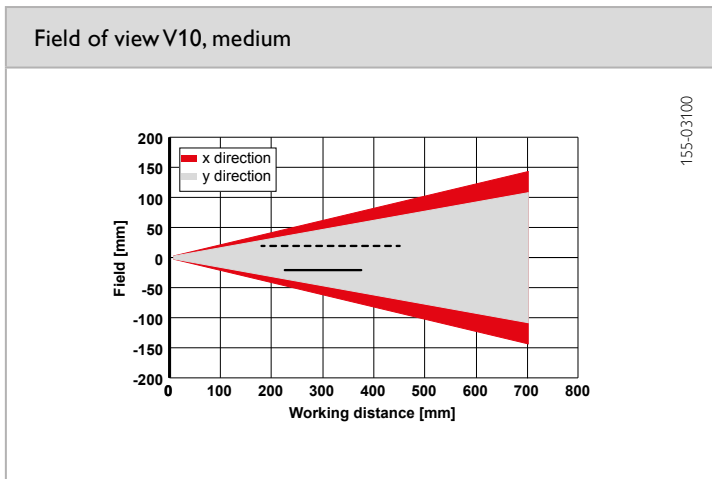
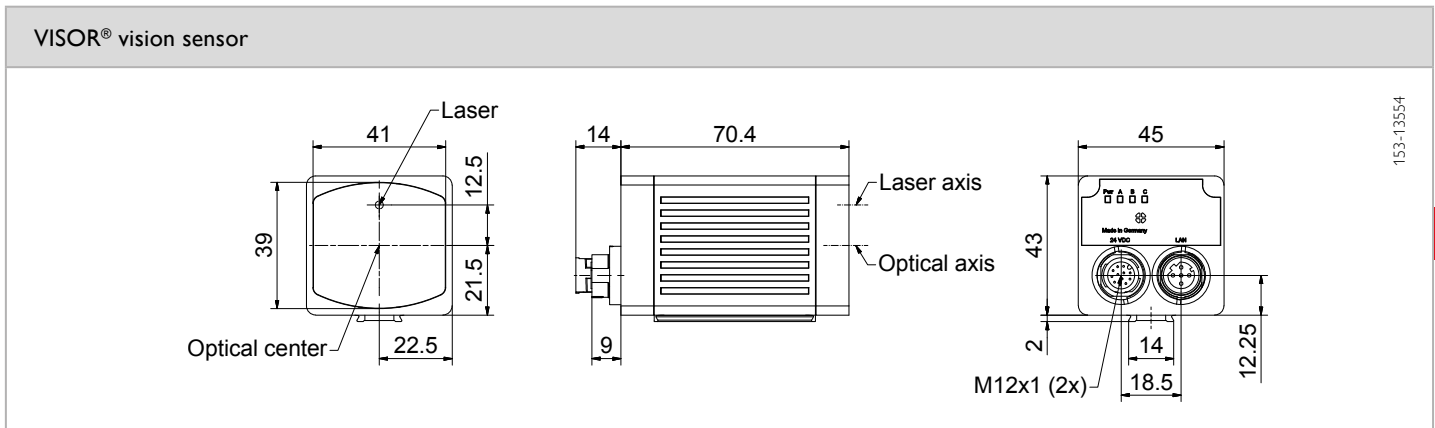


PRODUCT HIGHLIGHTS

- User-friendly configuration and viewer software with hierarchical user rights
- Detectors for object detection
- Efficient part detection and tracking
- Precise position determination: X/Y-position and orientation
- Comprehensive logic functions for digital switching outputs

Optical data		Functions	
Resolution	800 x 600 Pixel	Number of jobs / detectors	8 / 32
Imaging chip CMOS	1/3.6", monochrome / color	Detectors	Position tracking: X/Y and orientation; Pattern matching / Contour: teach-in and detection of patterns and contours;
Integrated lens, focal length [mm]	9.6 (medium)		Grey threshold, Brightness: evaluation of brightness;
Pixel size	4.8 µm x 4.8 µm		Contrast: evaluation of contrast;
Focus	Motorized		Color area²: area inspection of colors, with selectable tolerance;
Adjustment range	12 mm to infinity		
Integrated illumination	White (5000 K), red (635 nm) ¹ , infrared (850 nm) ¹ LEDs		
Minimum field of view, X x Y	7 x 3 mm		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ³	Dimensions	70.4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Approx. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1 V / Low < 3 V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 4 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	No		

¹ Not Color hardware ² Color hardware ³ Max. ripple < 5V_{SS} ⁴ 80 % air humidity, noncondensing



- Increased depth of field
- Normal depth of field

Illumination	Part number	Article number	Accessories	
White	V10-OB-S3-W-M-M2	631-91044	Connection cables	From Page A-46
Red	V10-OB-S3-R-M-M2	631-91046	Illumination	From Page A-33
Infrared	V10-OB-S3-I-M-M2	631-91048	Brackets	From Page A-4
White	V10C-OB-S3-W-M-M2	631-91050	Interface accessories	From Page A-53

VISOR® V10 Object Standard, narrow field of view

Vision sensor for object detection, simple presence and completeness checks

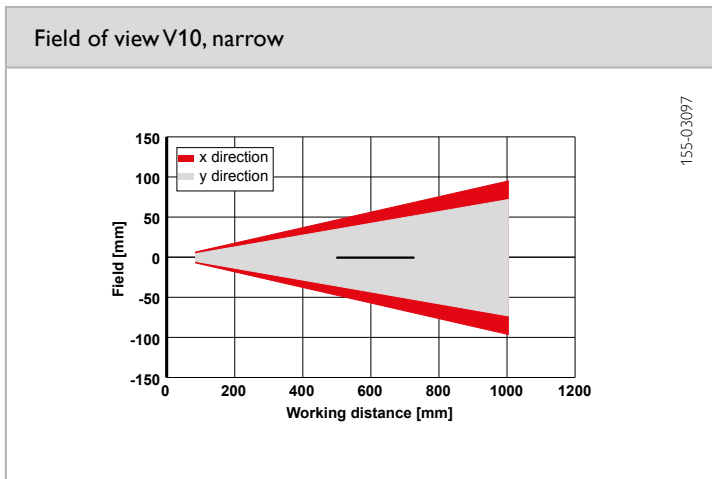
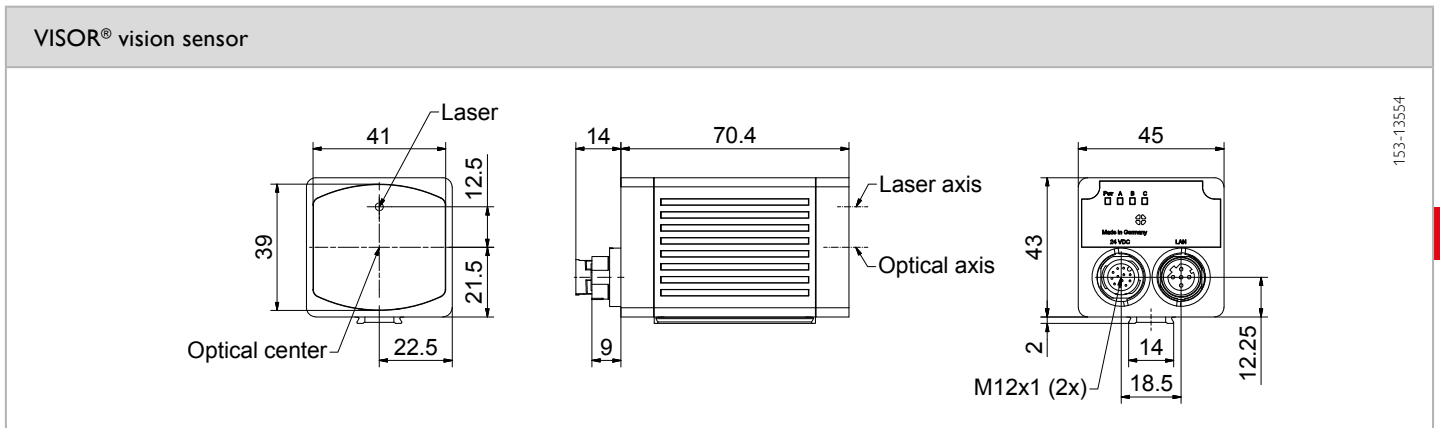


PRODUCT HIGHLIGHTS

- User-friendly configuration and viewer software with hierarchical user rights
- Detectors for object detection
- Efficient part detection and tracking
- Precise position determination: X/Y-position and orientation
- Comprehensive logic functions for digital switching outputs

Optical data		Functions	
Resolution	800 x 600 Pixel	Number of jobs / detectors	8 / 32
Imaging chip CMOS	1/3.6", monochrome / color	Detectors	Position tracking: X/Y and orientation; Pattern matching / Contour: teach-in and detection of patterns and contours;
Integrated lens, focal length [mm]	20 (narrow)		Grey threshold, Brightness: evaluation of brightness;
Pixel size	4.8 µm x 4.8 µm		Contrast: evaluation of contrast;
Focus	Motorized		Color area²: area inspection of colors, with selectable tolerance;
Adjustment range	100 mm to infinity		
Integrated illumination	White (5000 K), red (635 nm) ¹ , infrared (850 nm) ¹ LEDs		
Minimum field of view, X x Y	14 x 10 mm		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ³	Dimensions	70.4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Approx. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1 V / Low < 3 V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 4 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	No		

¹ Not Color hardware ² Color hardware ³ Max. ripple < 5V_{SS} ⁴ 80 % air humidity, noncondensing



— Normal depth of field

Illumination	Part number	Article number	Accessories	
White	V10-OB-S3-W-N-M2	631-91116	Connection cables	From Page A-46
Red	V10-OB-S3-R-N-M2	631-91115	Illumination	From Page A-33
Infrared	V10-OB-S3-I-N-M2	631-91114	Brackets	From Page A-4
White	V10C-OB-S3-W-N-M2	631-91113	Interface accessories	From Page A-53


VISOR® V10 Object Advanced, wide field of view

Vision sensor for object detection, presence check, completeness check, position inspection and measurement tasks

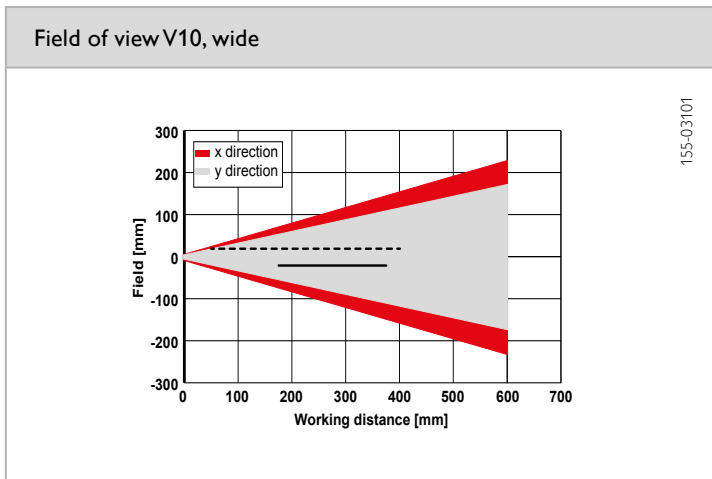
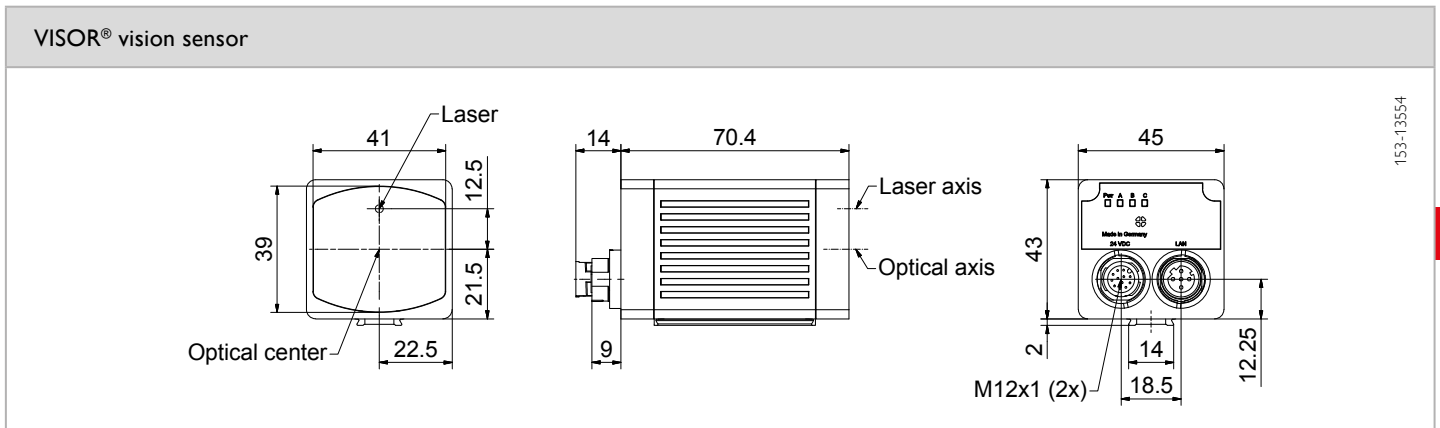


PRODUCT HIGHLIGHTS

- User-friendly configuration and viewer software with hierarchical user rights
- Detectors for object detection
- Real-world engineering units at a mouse click
- Precise position determination: X/Y-position and orientation
- Comprehensive logic functions for digital switching outputs
- Encoder input

Optical data		Functions	
Resolution	800 × 600 Pixel	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/3.6", monochrome / color	Detectors	Position tracking: X/Y and orientation; Pattern matching / Contour: teach-in and detection of patterns and contours; Calliper: distance between edges; BLOB, Grey threshold, Brightness: evaluation of brightness; Contrast: evaluation of contrast; Color value²: output of color values; Color area²: area inspection of colors, with selectable tolerance; Color list²: finding the most similar colors
Integrated lens, focal length [mm]	5.2 (wide)		
Pixel size	4.8 μm × 4.8 μm		
Focus	Motorized		
Adjustment range	0 mm to infinity		
Integrated illumination	White (5000 K), red (635 nm) ¹ , infrared (850 nm) ¹ LEDs		
Minimum field of view, X × Y	2 × 1 mm		
Target laser	Laser: red (635 nm) class 1  (IEC 60825-1)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ³	Dimensions	70,4 × 45 × 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Approx. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1V / Low < 3V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	✓		

¹ Not Color hardware ² Color hardware ³ Max. ripple < 5V_{SS} ⁴ 80 % air humidity, noncondensing



- Increased depth of field
- Normal depth of field

Illumination	Part number	Article number	Accessories	
White	V10-OB-A3-W-W-M2-L	631-91014	Connection cables	From Page A-46
White	V10-OB-A3-W-WD-M2-L	631-91017	Illumination	From Page A-33
Red	V10-OB-A3-R-W-M2-L	631-91019	Brackets	From Page A-4
Red	V10-OB-A3-R-WD-M2-L	631-91022	Interface accessories	From Page A-53
Infrared	V10-OB-A3-I-W-M2-L	631-91024		
Infrared	V10-OB-A3-I-WD-M2-L	631-91027		
White	V10C-OB-A3-W-W-M2-L	631-91013		


VISOR® V10 Object Advanced, medium field of view

Vision sensor for object detection, presence check, completeness check, position inspection and measurement tasks

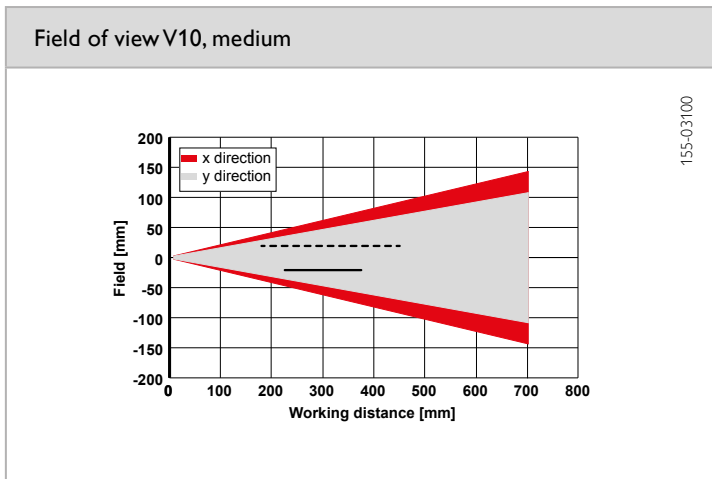
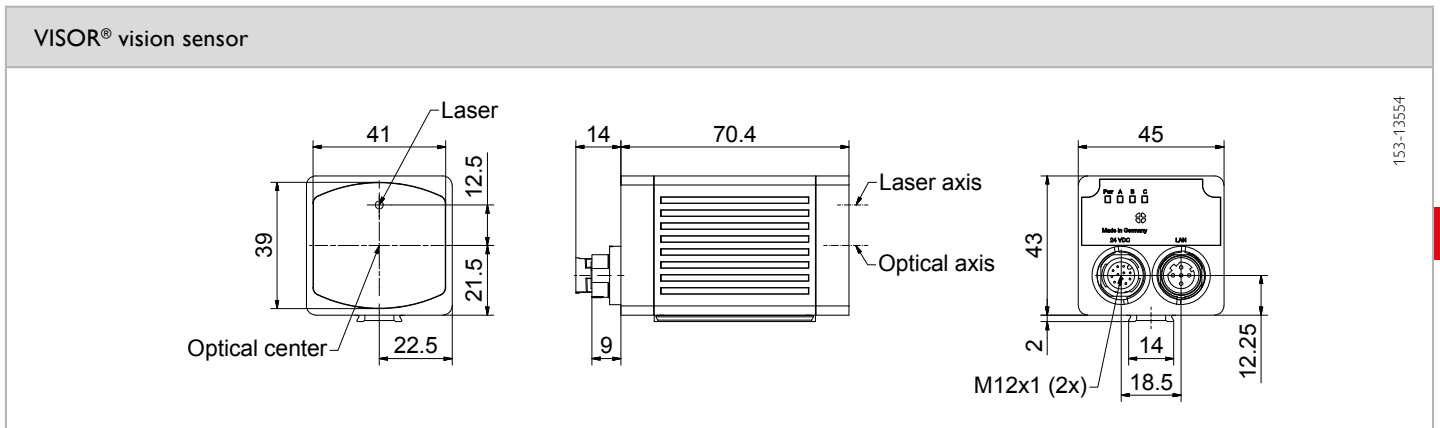


PRODUCT HIGHLIGHTS

- User-friendly configuration and viewer software with hierarchical user rights
- Detectors for object detection
- Real-world engineering units at a mouse click
- Precise position determination: X/Y-position and orientation
- Comprehensive logic functions for digital switching outputs
- Encoder input

Optical data		Functions	
Resolution	800 x 600 Pixel	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/3.6", monochrome / color	Detectors	Position tracking; X/Y and orientation; Pattern matching / Contour: teach-in and detection of patterns and contours; Calliper: distance between edges; BLOB, Grey threshold, Brightness: evaluation of brightness; Contrast: evaluation of contrast; Color value²: output of color values; Color area²: area inspection of colors, with selectable tolerance; Color list²: finding the most similar colors
Integrated lens, focal length [mm]	9.6 (medium)		
Pixel size	4.8 µm x 4.8 µm		
Focus	Motorized		
Adjustment range	12 mm to infinity		
Integrated illumination	White (5000 K), red (635 nm) ¹ , infrared (850 nm) ¹ LEDs		
Minimum field of view, X x Y	7 x 3 mm		
Target laser	Laser: red (635 nm) class 1  (IEC 60825-1)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ³	Dimensions	70.4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Approx. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1 V / Low < 3 V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	✓		

¹ Not Color hardware ² Color hardware ³ Max. ripple < 5V_{SS} ⁴ 80 % air humidity, noncondensing



- Increased depth of field
- Normal depth of field

Illumination	Part number	Article number	Accessories	
White	V10-OB-A3-W-M-M2-L	631-91015	Connection cables	From Page A-46
White	V10-OB-A3-W-MD-M2-L	631-91018	Illumination	From Page A-33
Red	V10-OB-A3-R-M-M2-L	631-91020	Brackets	From Page A-4
Red	V10-OB-A3-R-MD-M2-L	631-91023	Interface accessories	From Page A-53
Infrared	V10-OB-A3-I-M-M2-L	631-91025		
Infrared	V10-OB-A3-I-MD-M2-L	631-91012		
White	V10C-OB-A3-W-M-M2-L	631-91011		


VISOR® V10 Object Advanced, narrow field of view

Vision sensor for object detection, presence check, completeness check, position inspection and measurement tasks

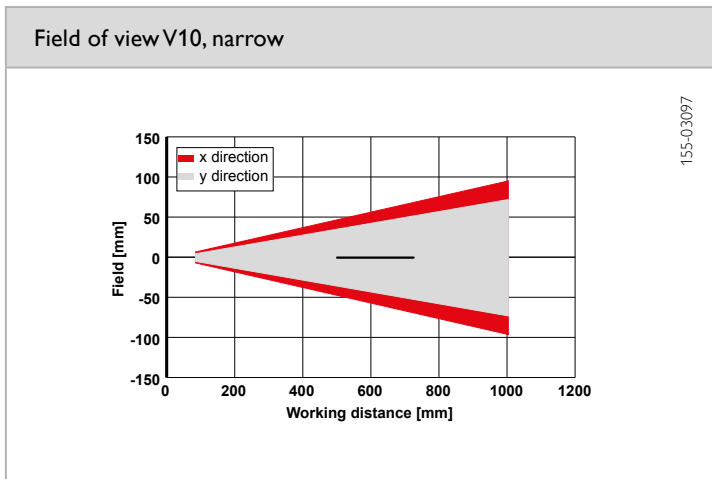
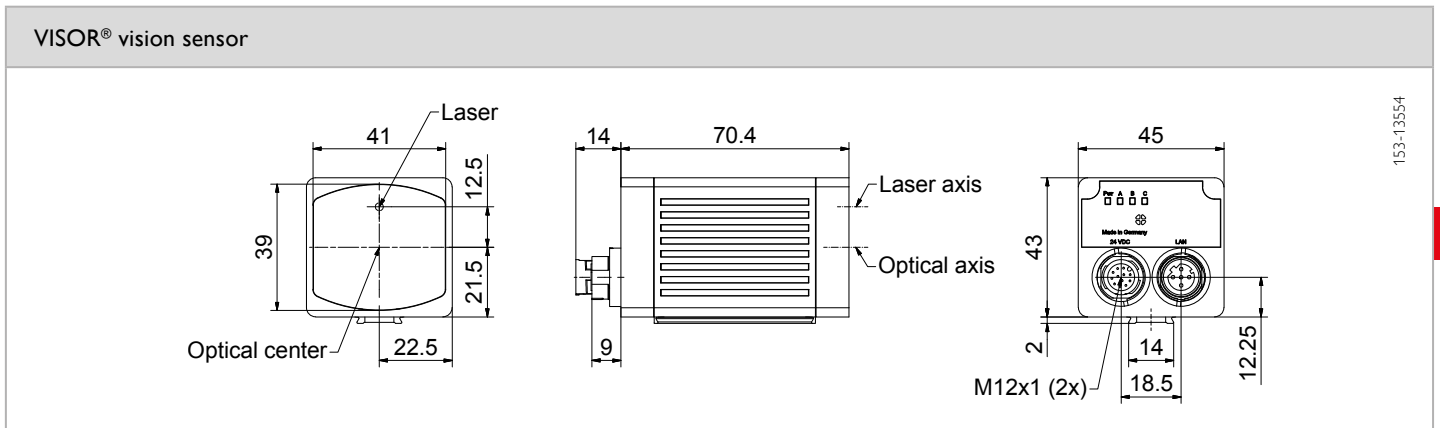


PRODUCT HIGHLIGHTS

- User-friendly configuration and viewer software with hierarchical user rights
- Detectors for object detection
- Real-world engineering units at a mouse click
- Precise position determination: X/Y-position and orientation
- Comprehensive logic functions for digital switching outputs
- Encoder input

Optical data		Functions	
Resolution	800 x 600 Pixel	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/3.6", monochrome / color	Detectors	Position tracking; X/Y and orientation; Pattern matching / Contour: teach-in and detection of patterns and contours; Calliper: distance between edges; BLOB, Grey threshold, Brightness: evaluation of brightness; Contrast: evaluation of contrast; Color value²: output of color values; Color area²: area inspection of colors, with selectable tolerance; Color list²: finding the most similar colors
Integrated lens, focal length [mm]	20 (narrow)		
Pixel size	4.8 µm x 4.8 µm		
Focus	Motorized		
Adjustment range	100 mm to infinity		
Integrated illumination	White (5000 K), red (635 nm) ¹ , infrared (850 nm) ¹ LEDs		
Minimum field of view, X x Y	14 x 10 mm		
Target laser	Laser: red (635 nm) class 1  (IEC 60825-1)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ³	Dimensions	70.4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Approx. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1 V / Low < 3 V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	✓		

¹ Not Color hardware ² Color hardware ³ Max. ripple < 5V_{SS} ⁴ 80 % air humidity, noncondensing



— Normal depth of field

Illumination	Part number	Article number	Accessories	
White	V10-OB-A3-W-N-M2-L	631-91016	Connection cables	From Page A-46
Red	V10-OB-A3-R-N-M2-L	631-91021	Illumination	From Page A-33
Infrared	V10-OB-A3-I-N-M2-L	631-91026	Brackets	From Page A-4
White	V10C-OB-A3-W-N-M2-L	631-91002	Interface accessories	From Page A-53

VISOR® V10 Object Advanced, C-Mount

Vision sensor for object detection, presence check, completeness check, position inspection and measurement tasks

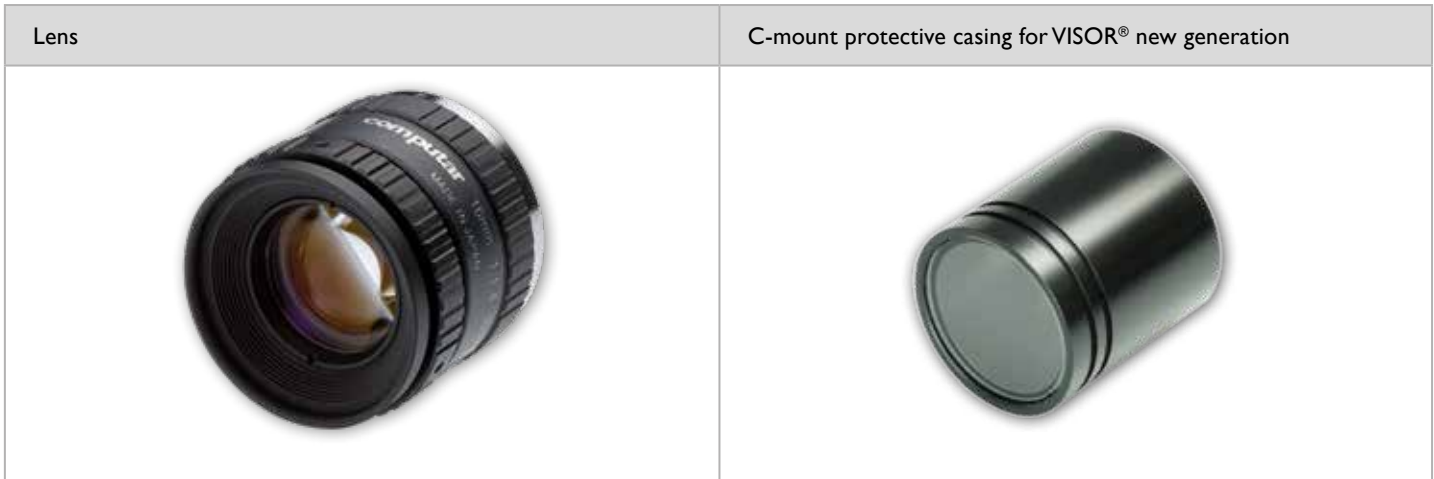
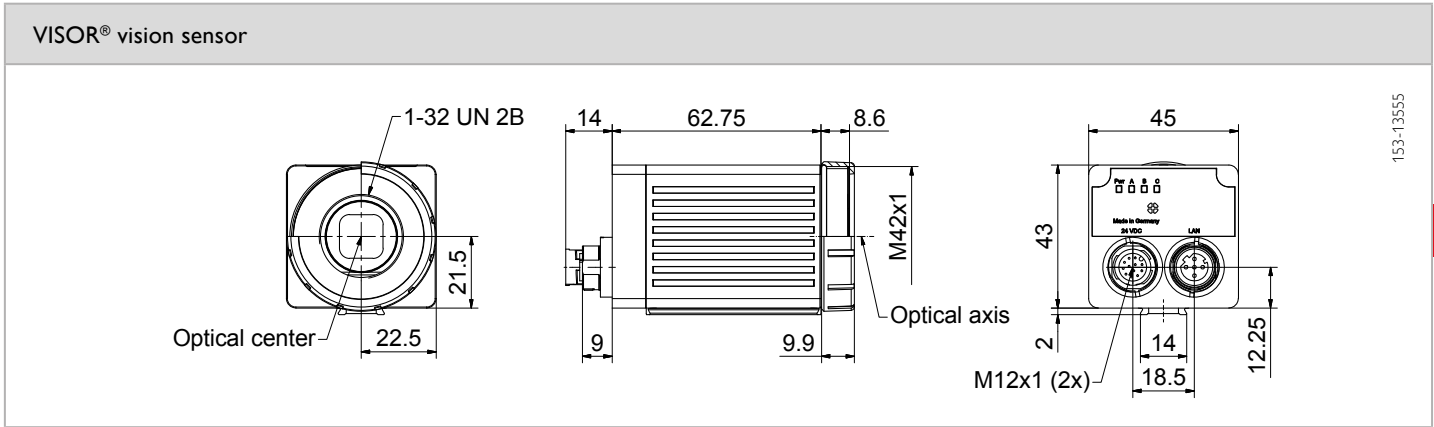


PRODUCT HIGHLIGHTS

- User-friendly configuration and viewer software with hierarchical user rights
- Detectors for object detection
- Real-world engineering units at a mouse click
- Precise position determination: X/Y-position and orientation
- Comprehensive logic functions for digital switching outputs
- Encoder input

Optical data		Functions	
Resolution	800 x 600 Pixel	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/3.6", monochrome / color	Detectors	Position tracking; X/Y and orientation; Pattern matching / Contour: teach-in and detection of patterns and contours; Calliper: distance between edges; BLOB, Grey threshold, Brightness: evaluation of brightness; Contrast: evaluation of contrast; Color value¹: output of color values; Color area¹: area inspection of colors, with selectable tolerance; Color list¹: finding the most similar colors
Integrated lens, focal length [mm]	C-mount		
Pixel size	4.8 µm x 4.8 µm		
Focus	Manual		
Adjustment range	Dependent on lens		
Integrated illumination	None		
Minimum field of view, X x Y	Dependent on lens		
Target laser	none		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ²	Dimensions	70.4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65 ³
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Approx. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1 V / Low < 3 V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	✓		

¹ Color hardware ² Max. ripple < 5V_{SS} ³ only with protective casing ⁴ 80 % air humidity, noncondensing



Part number	Article number
LPTVxx-G37.5	651-01006
LPTVxx-25.0	651-01007


	LO C 8	LO C 12	LO C 16	LO C 25	LO C 35	LO C 50	LO C 75
Focal length	8 mm	12 mm	16 mm	25 mm	35 mm	50 mm	75 mm
Article number	526-51513	526-51514	526-51515	526-51516	526-51525	526-51113	526-51116

Part number	Article number	Accessories
V10-OB-A3-C-2	631-91001	Connection cables
V10C-OB-A3-C-2	631-91042	Illumination
		Lenses
		Brackets
		Interface accessories
		From Page A-46
		From Page A-33
		From Page A-28
		From Page A-4
		From Page A-53

VISOR® object sensor for part detection

Detects the right part in the wrong place and vice versa



 made in Germany



The one with a BLOB: With the new 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.



Calibration function:

With the VISOR®, positions and distances in the sensor image can now be easily converted into relative world coordinates or absolute robot coordinates. Distortions resulting from diagonal view angles and other image errors are simultaneously corrected. Thus robot applications can be easily solved.

HIGHLIGHTS OF VISOR® OBJECT SENSOR

- User-friendly configuration and viewer software with hierarchical user rights and online help
- Real-world engineering units and robot coordinates at a mouse click
- Precise position determination: x/y-position and orientation
- Comprehensive logic functions for the digital switching outputs
- Flexible definition of output data (header, trailer, net data)
- Support of EtherNet/IP and PROFINET
- Comprehensive possibilities for archiving pictures and data

Objects that sometimes appear in unexpected positions and have complex shapes and details – classic switching sensors would be completely overwhelmed by such detection tasks. Not the VISOR® object sensor from SensoPart: it always maintains its overview, detecting defective parts, parts in the wrong position, wrong orientation, wrong sequence or a combination of them all – in an instant. The comprehensive calibration functions range from a simple scaling factor via the correction of image and lens distortions at a mouse click through to a point pair list for robot applications.

With its highly precise position and orientation detection, our VISOR® object sensor is one of the best in its class.

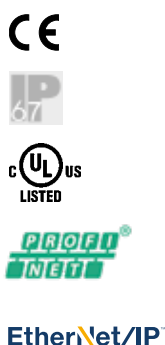
Seven detectors plus position detection

A total of seven detectors are available for inspection tasks and evaluations: pattern comparison, contour detection, calliper, BLOB, brightness, grey threshold and contrast detection. Position tracking offers permits reliable detection of those features that are not always present in precisely the taught-in position. All evaluations take place relative to the current part position and orientation, without them having to be defined for every possible position of an individual feature. This powerful tool allows you to solve even demanding applications confidently!

VISOR® Object Sensors – Product Overview					
	Firmware Option	Resolution	Focal length	Integrated illumination	Page
V20-OB-A2-xxx	Advanced	1280 × 1024 pixels	12 mm	White, red or infrared LEDs	150
V20-OB-A2-xxx	Advanced	1280 × 1024 pixels	C-mount	None	152
V10-OB-S1-xxx	Standard	736 × 480 pixels	6 mm	White, red or infrared LEDs	154
V10-OB-S1-xxx	Standard	736 × 480 pixels	12 mm	White, red or infrared LEDs	156
V10-OB-A1-xxx	Advanced	736 × 480 pixels	6 mm	White, red or infrared LEDs	158
V10-OB-A1-xxx	Advanced	736 × 480 pixels	12 mm	White, red or infrared LEDs	160
V10-OB-A1-xxx	Advanced	736 × 480 pixels	25 mm	White, red or infrared LEDs	162
V10-OB-A1-xxx	Advanced	736 × 480 pixels	C-mount	None	164

VISOR® V20 object sensor

Advanced vision sensor for object detection, 12 mm



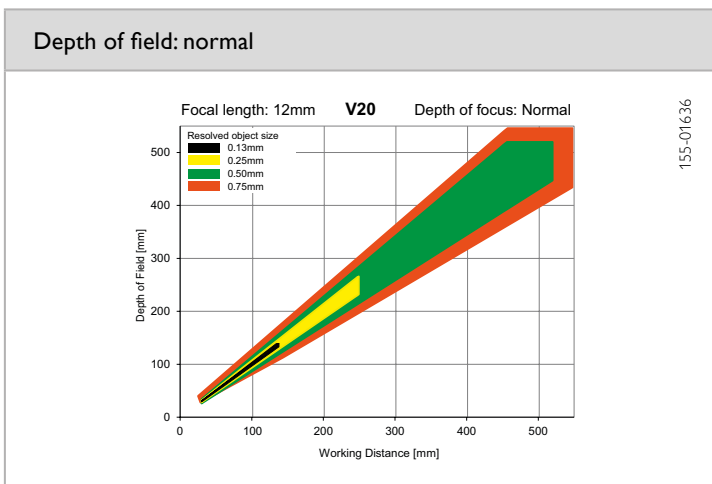
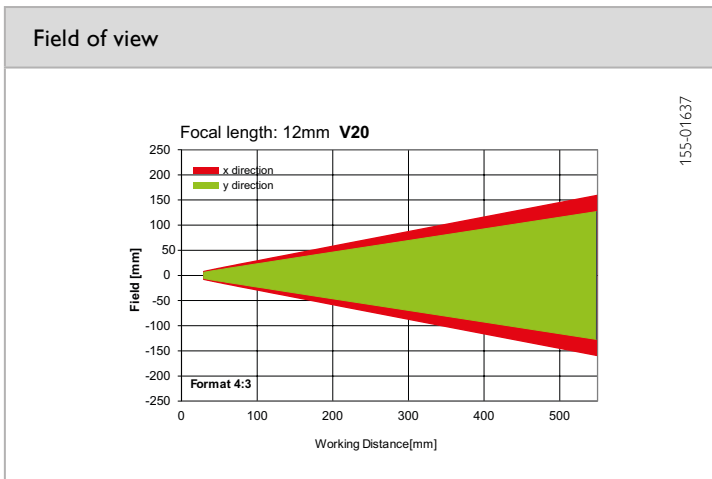
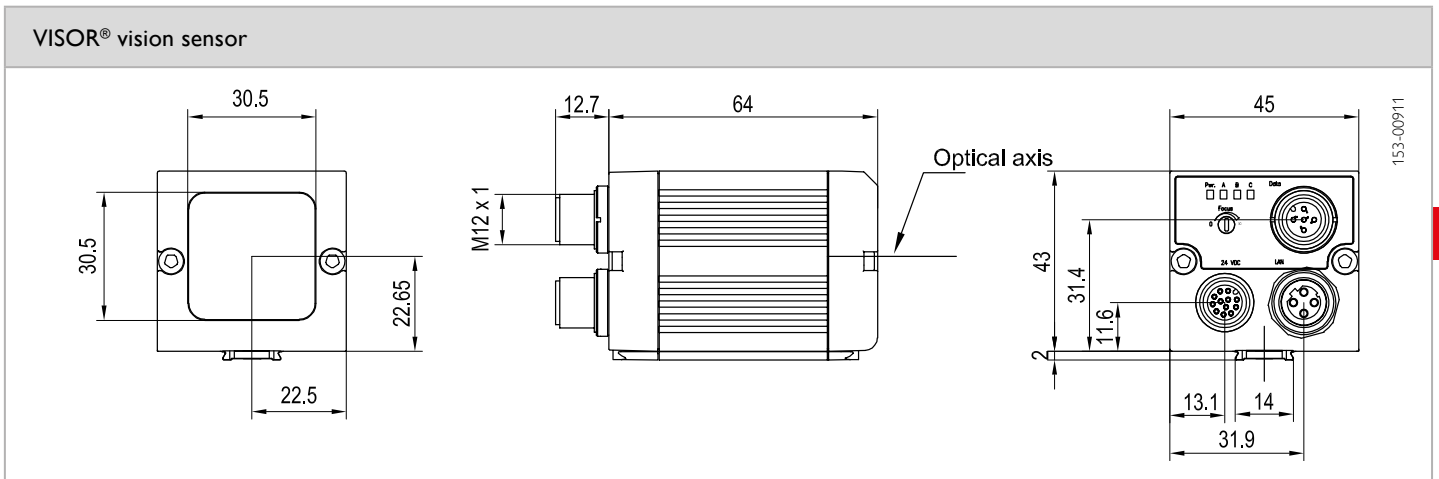
PRODUCT HIGHLIGHTS

- User-friendly configuration and viewer software with hierarchical user rights
- Object detection with 1.3 mega pixel
- Real-world engineering units and robot coordinates at a mouse click
- Precise position determination: X/Y-position and orientation
- Comprehensive logic functions for digital switching outputs
- Encoder input

Optical data		Functions	
Resolution	1280 × 1024 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/1.8", monochrome	Detectors	Contour, pattern comparison, calliper, BLOB, contrast, brightness, grey level
Integrated lens, focal length	12 mm, adjustable focal position	Properties	Position tracking: X/Y and orientation; pattern comparison / contour: teach-in and detection of patterns and contours; calliper: distance between edges; BLOB, grey threshold, brightness: evaluation of brightness; contrast: evaluation of contrast
Adjustment range	30 mm to infinity	Typical cycle times ²	Typ. 20 ms pattern comparison Typ. 30 ms contour Typ. 8 ms calliper Typ. 30 ms BLOB Typ. 2 ms brightness Typ. 2 ms contrast Typ. 2 ms grey threshold
Integrated illumination	White, red, infrared LEDs		
Minimum field of view, X × Y	16 × 13 mm ²		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4 V DC ¹	Dimensions	65 × 45 × 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 67
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Ca. 13 s after Power on	Ambient temperature: operation	0 ... +50° C ³
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60° C ³
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Ca. 160 g
Inputs	PNP/NPN High > U _B -1 V, Low < 3 V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4 V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

¹ Max. ripple < 5 V_{SS} ² with VGA-resolution (640 × 480 pixels) ³ 80 % air humidity, non-condensing

Illumination	Part number	Article number
White	V20-OB-A2-W12	536-91011
Red	V20-OB-A2-R12	536-91012
Infrared	V20-OB-A2-I12	536-91013

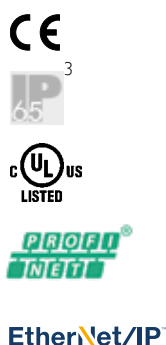


Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® V20 object sensor

Advanced vision sensor for object detection, C-mount



PRODUCT HIGHLIGHTS

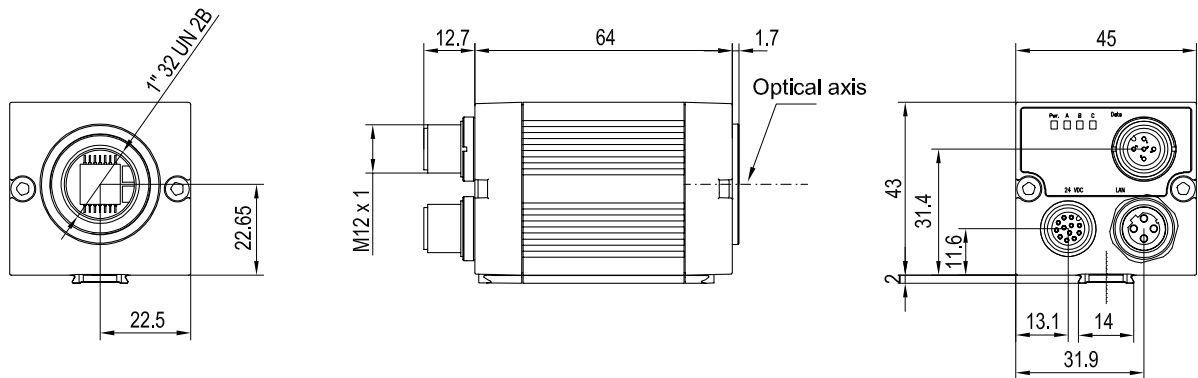
- User-friendly configuration and viewer software with hierarchical user rights
- Object detection with 1.3 mega pixel
- Real-world engineering units and robot coordinates at a mouse click
- Precise position determination: X/Y-position and orientation
- Comprehensive logic functions for digital switching outputs
- Encoder input

Optical data		Functions	
Resolution	1280 × 1024 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/1.8", monochrome	Detectors	Contour, pattern comparison, calliper, BLOB, contrast, brightness, grey level
Integrated lens, focal length	C-Mount	Properties	Position tracking: X/Y and orientation; pattern comparison / contour: teach-in and detection of patterns and contours; calliper: distance between edges; BLOB; grey threshold, brightness: evaluation of brightness; contrast: evaluation of contrast
Adjustment range	Dependent on lens	Typical cycle times ²	Typ. 20 ms pattern comparison Typ. 30 ms contour Typ. 8 ms calliper Typ. 30 ms BLOB Typ. 2 ms brightness Typ. 2 ms contrast Typ. 2 ms grey threshold
Integrated illumination	None		
Minimum field of view, X × Y	Dependent on lens		
Electrical data		Mechanical data	
Operating voltage, +U _b	18 ... 26.4V DC ¹	Dimensions	65 × 45 × 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 65 ³
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _b / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Ca. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ⁴
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Ca. 160 g
Inputs	PNP/NPN High > U _b -1V, Low < 3V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

¹ Max. ripple < 5V_{SS} ² With VGA-resolution (640 × 480 Pixel) ³ With LPT45 C-mount protective casing ⁴ 80 % air humidity, non-condensing

Part number	Article number
V20-OB-A2-C	536-91010

VISOR® vision sensor



153-00912

3

Lens



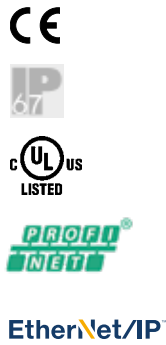
	LO C 8	LO C 12	LO C 16	LO C 25	LO C 35	LO C 50	LO C 75
Focal length	8 mm	12 mm	16 mm	25 mm	35 mm	50 mm	75 mm
Article number	526-51513	526-51514	526-51515	526-51516	526-51525	526-51113	526-51116

Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Lenses	From Page A-28
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® V10 object sensor

Standard vision sensor for object detection, 6 mm



PRODUCT HIGHLIGHTS

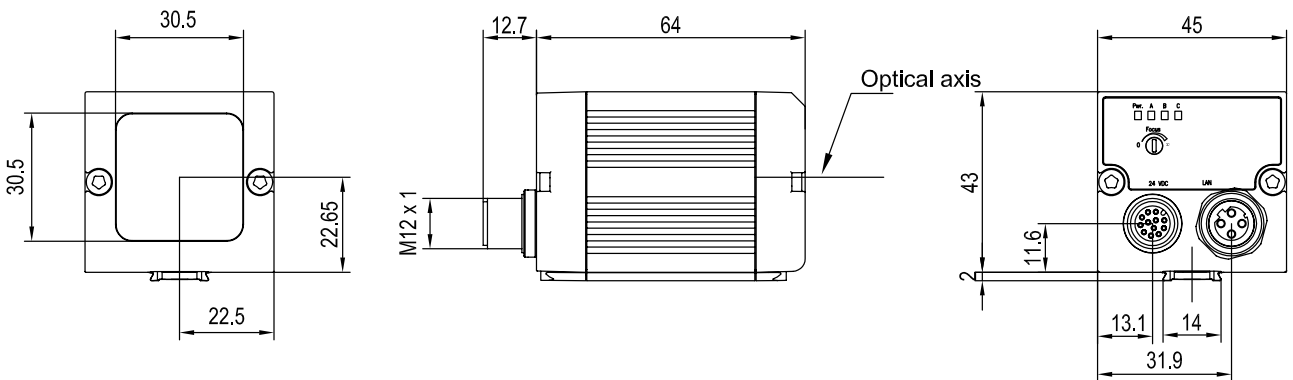
- User-friendly configuration and viewer software with hierarchical user rights
- Detectors for object detection
- Powerful part-finding and tracking
- Precise position determination: X/Y-position and orientation
- Comprehensive logic functions for digital switching outputs

Optical data		Functions	
Resolution	736 x 480 pixels	Number of jobs / detectors	8 / 32
CMOS	1/3", monochrome	Detectors	Contour; pattern comparison, contrast, brightness, grey level
Integrated lens, focal length	6 mm, adjustable focal position	Properties	Position tracking: X/Y and orientation; Pattern comparison / contour: teach-in and detection of patterns and contours; grey threshold, brightness: evaluation of brightness; contrast: evaluation of contrast
Adjustment range	6 mm to infinity	Typical cycle times	Typ. 20 ms pattern comparison Typ. 30 ms contour Typ. 2 ms brightness Typ. 2 ms contrast Typ. 2 ms grey threshold
Integrated illumination	White, red, infrared LEDs		
Minimum field of view, X x Y	5 x 4 mm ²		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4 V DC ¹	Dimensions	65 x 45 x 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 67
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Ca. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ²
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Ca. 160 g
Inputs	PNP/NPN High > U _B -1 V, Low < 3 V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 2 selectable inputs/outputs		

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

Illumination	Depth of field	Part number	Article number
White	Normal	V10-OB-S1-W6	535-91008
Red	Normal	V10-OB-S1-R6	535-91010
Infrared	Normal	V10-OB-S1-I6	535-91046

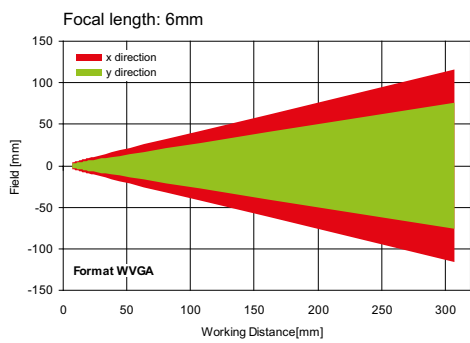
VISOR® vision sensor



153-01030

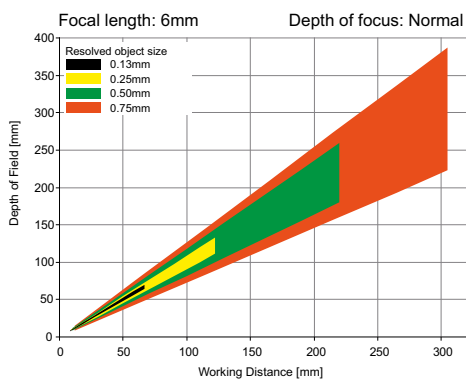
3

Field of view



155-01422

Depth of field: normal



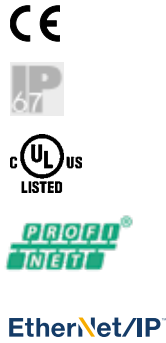
155-01409

Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® V10 object sensor

Standard vision sensor for object detection, 12 mm



PRODUCT HIGHLIGHTS

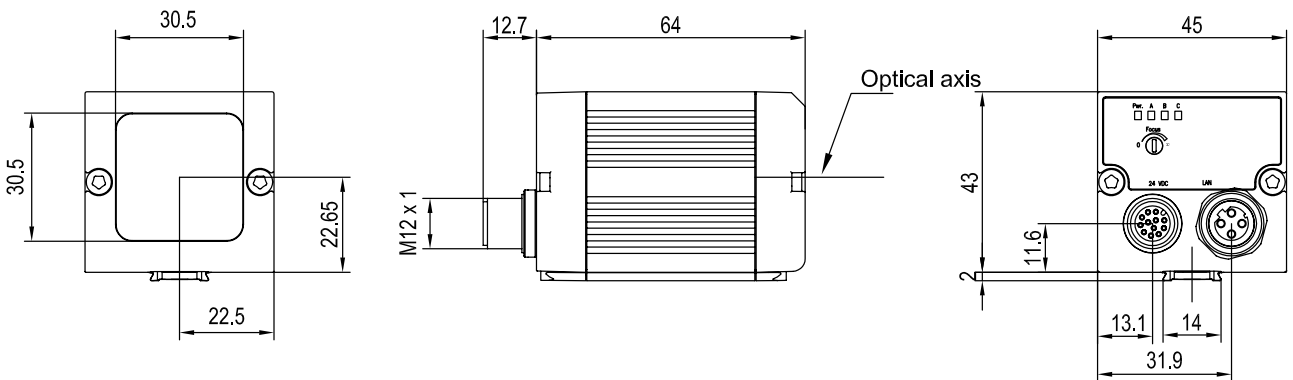
- User-friendly configuration and viewer software with hierarchical user rights
- Detectors for object detection
- Powerful part-finding and tracking
- Precise position determination: X/Y-position and orientation
- Comprehensive logic functions for digital switching outputs

Optical data		Functions	
Resolution	736 x 480 pixels	Number of jobs / detectors	8 / 32
CMOS	1/3", monochrome	Detectors	Contour; pattern comparison, contrast, brightness, grey level
Integrated lens, focal length	12 mm, adjustable focal position	Properties	Position tracking: X/Y and orientation; Pattern comparison / contour: teach-in and detection of patterns and contours; grey threshold, brightness: evaluation of brightness; contrast: evaluation of contrast
Adjustment range	30 mm to infinity	Typical cycle times	Typ. 20 ms pattern comparison Typ. 30 ms contour Typ. 2 ms brightness Typ. 2 ms contrast Typ. 2 ms grey threshold
Integrated illumination	White, red, infrared LEDs		
Minimum field of view, X x Y	8 x 6 mm ²		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4 V DC ¹	Dimensions	65 x 45 x 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 67
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Ca. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ²
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Ca. 160 g
Inputs	PNP/NPN High > U _B -1 V, Low < 3 V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 2 selectable inputs/outputs		

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

Illumination	Depth of field	Part number	Article number
White	Normal	V10-OB-S1-W12	535-91009
Red	Normal	V10-OB-S1-R12	535-91011
Infrared	Normal	V10-OB-S1-I12	535-91047

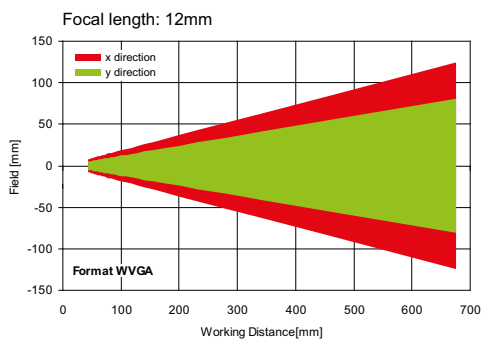
VISOR® vision sensor



153-01030

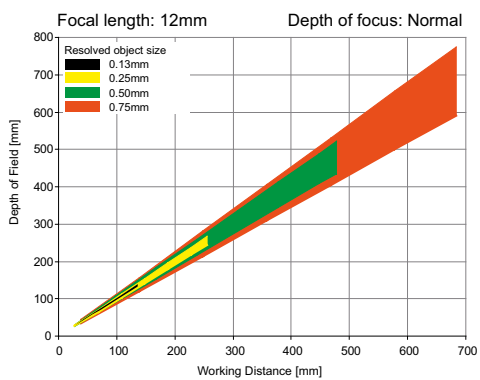
3

Field of view



155-01423

Depth of field: normal



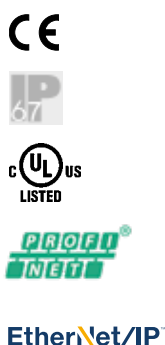
155-01410

Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® V10 object sensor

Advanced vision sensor for object detection, 6 mm



PRODUCT HIGHLIGHTS

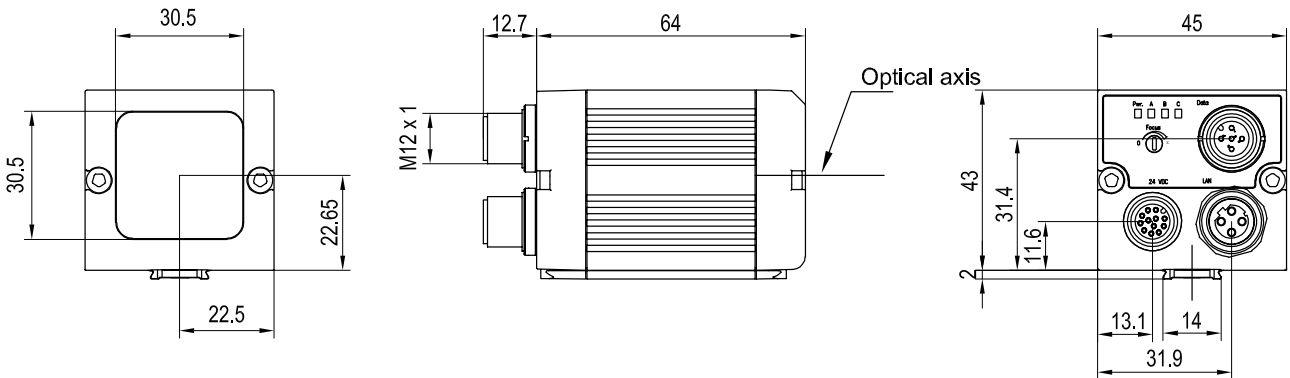
- User-friendly configuration and viewer software with hierarchical user rights
- Detectors for object detection
- Real-world engineering units and robot coordinates at a mouse click
- Precise position determination: X/Y-position and orientation
- Comprehensive logic functions for digital switching outputs
- Encoder input

Optical data		Functions	
Resolution	736 x 480 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/3", monochrome	Detectors	Contour, pattern comparison, calliper, BLOB, contrast, brightness, grey level
Integrated lens, focal length	6 mm, adjustable focal position	Properties	Position tracking: X/Y and orientation; pattern comparison / contour: teach-in and detection of patterns and contours; calliper: distance between edges; BLOB; grey threshold, brightness: evaluation of brightness; contrast: evaluation of contrast
Adjustment range	6 mm to infinity	Typical cycle times	Typ. 20 ms pattern comparison Typ. 30 ms contour Typ. 8 ms calliper Typ. 30 ms BLOB Typ. 2 ms brightness Typ. 2 ms contrast Typ. 2 ms grey threshold
Integrated illumination	White, red, infrared LEDs		
Minimum field of view, X x Y	5 x 4 mm ²		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4V DC ¹	Dimensions	65 x 45 x 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 67
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Ca. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ²
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Ca. 160 g
Inputs	PNP/NPN High > U _B -1V, Low < 3V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

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

Illumination	Depth of field	Part number	Article number
White	Normal	V10-OB-A1-W6	535-91001
White	Enhanced	V10-OB-A1-W6D	535-91013
Red	Normal	V10-OB-A1-R6	535-91003
Red	Enhanced	V10-OB-A1-R6D	535-91016
Infrared	Normal	V10-OB-A1-I6	535-91006
Infrared	Enhanced	V10-OB-A1-I6D	535-91019

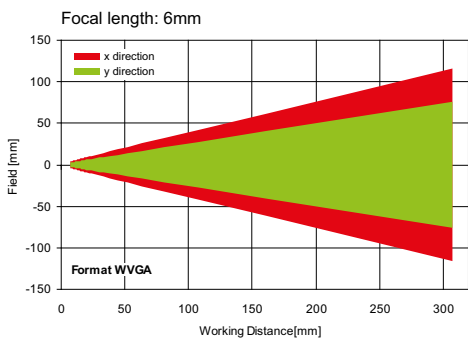
VISOR® vision sensor



153-00911

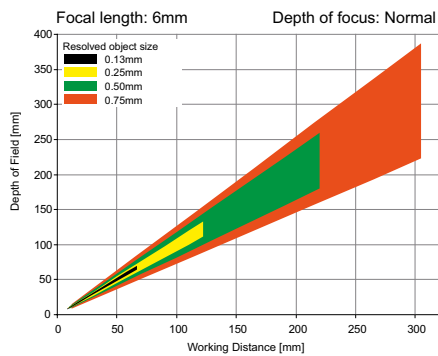
3

Field of view



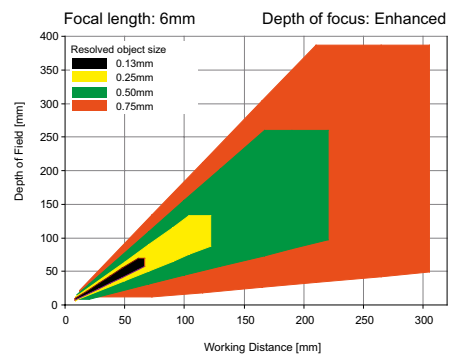
155-01422

Depth of field: normal



155-01409

Depth of field: enhanced



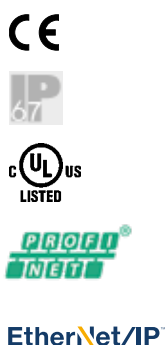
155-01421

Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® V10 object sensor

Advanced vision sensor for object detection, 12 mm



PRODUCT HIGHLIGHTS

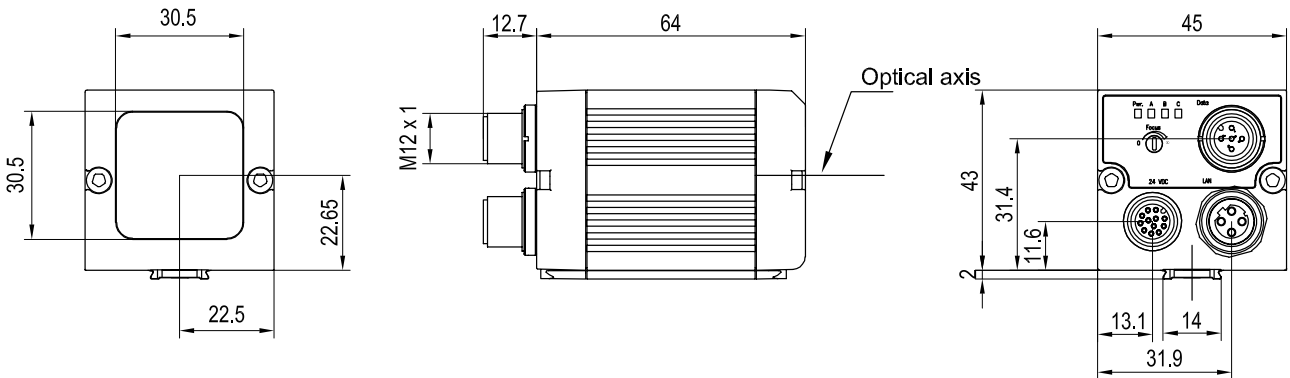
- User-friendly configuration and viewer software with hierarchical user rights
- Detectors for object detection
- Real-world engineering units and robot coordinates at a mouse click
- Precise position determination: X/Y-position and orientation
- Comprehensive logic functions for digital switching outputs
- Encoder input

Optical data		Functions	
Resolution	736 x 480 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/3", monochrome	Detectors	Contour, pattern comparison, calliper, BLOB, contrast, brightness, grey level
Integrated lens, focal length	12 mm, adjustable focal position	Properties	Position tracking: X/Y and orientation; pattern comparison / contour: teach-in and detection of patterns and contours; calliper: distance between edges; BLOB; grey threshold, brightness: evaluation of brightness; contrast: evaluation of contrast
Adjustment range	30 mm to infinity	Typical cycle times	Typ. 20 ms pattern comparison Typ. 30 ms contour Typ. 8 ms calliper Typ. 30 ms BLOB Typ. 2 ms brightness Typ. 2 ms contrast Typ. 2 ms grey threshold
Integrated illumination	White, red, infrared LEDs		
Minimum field of view, X x Y	8 x 6 mm ²		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4V DC ¹	Dimensions	65 x 45 x 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 67
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Ca. 13 s after Power on	Ambient temperature: operation	0 ... +50° C ²
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60° C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Ca. 160 g
Inputs	PNP/NPN High > U _B -1V, Low < 3V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

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

Illumination	Depth of field	Part number	Article number
White	Normal	V10-OB-A1-W12	535-91002
White	Enhanced	V10-OB-A1-W12D	535-91014
Red	Normal	V10-OB-A1-R12	535-91004
Red	Enhanced	V10-OB-A1-R12D	535-91017
Infrared	Normal	V10-OB-A1-I12	535-91007
Infrared	Enhanced	V10-OB-A1-I12D	535-91020

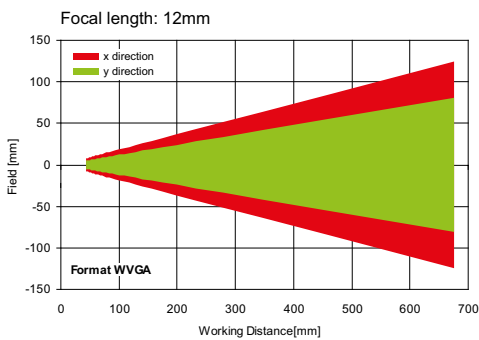
VISOR® vision sensor



153-00911

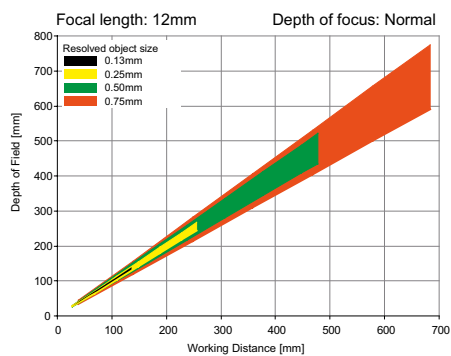
3

Field of view



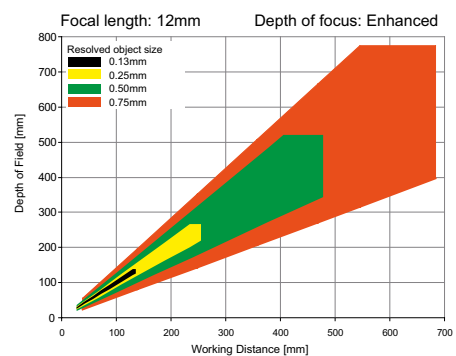
155-01423

Depth of field: normal



155-01410

Depth of field: enhanced



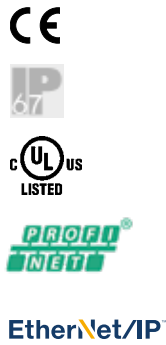
155-01411

Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® V10 object sensor

Advanced vision sensor for object detection, 25 mm



PRODUCT HIGHLIGHTS

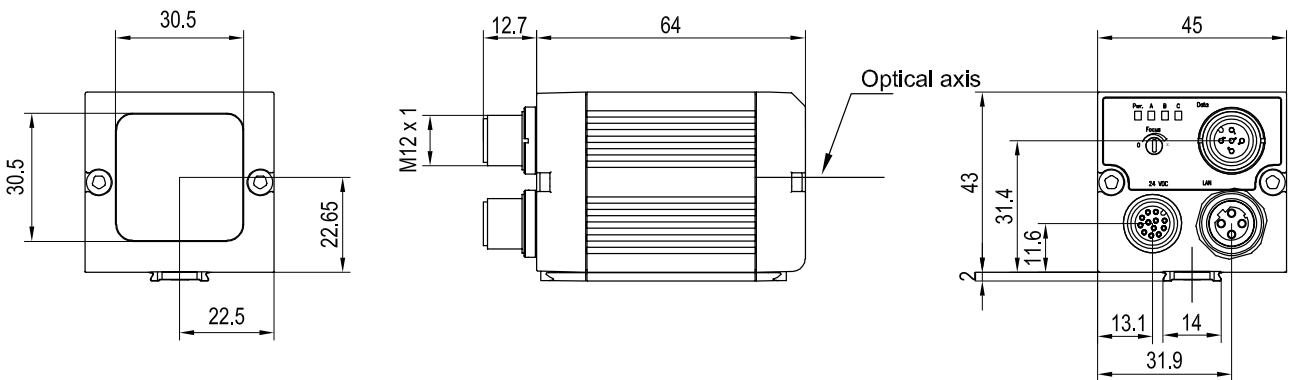
- User-friendly configuration and viewer software with hierarchical user rights
- Detectors for object detection
- Real-world engineering units and robot coordinates at a mouse click
- Precise position determination: X/Y-position and orientation
- Comprehensive logic functions for digital switching outputs
- Encoder input

Optical data		Functions	
Resolution	736 x 480 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/3", monochrome	Detectors	Contour, pattern comparison, calliper, BLOB, contrast, brightness, grey level
Integrated lens, focal length	25 mm, adjustable focal position	Properties	Position tracking: X/Y and orientation; pattern comparison / contour: teach-in and detection of patterns and contours; calliper: distance between edges; BLOB; grey threshold, brightness: evaluation of brightness; contrast: evaluation of contrast
Adjustment range	140 mm to infinity	Typical cycle times	Typ. 20 ms pattern comparison Typ. 30 ms contour Typ. 8 ms calliper Typ. 30 ms BLOB Typ. 2 ms brightness Typ. 2 ms contrast Typ. 2 ms grey threshold
Integrated illumination	White, red, infrared LEDs		
Minimum field of view, X x Y	18 x 14 mm ²		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4 V DC ¹	Dimensions	65 x 45 x 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 67
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Ca. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ²
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Ca. 160 g
Inputs	PNP/NPN High > U _B -1 V, Low < 3 V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoVWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

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

Illumination	Depth of field	Part number	Article number
White	Normal	V10-OB-A1-W25	535-91012
Red	Normal	V10-OB-A1-R25	535-91015
Infrared	Normal	V10-OB-A1-I25	535-91018

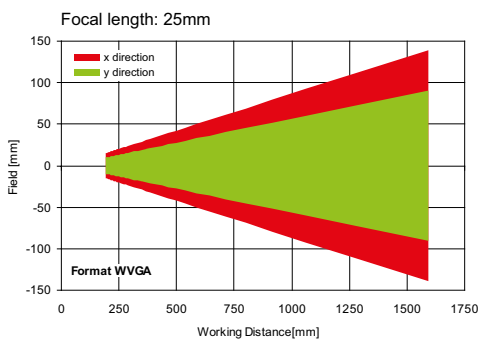
VISOR® vision sensor



153-00911

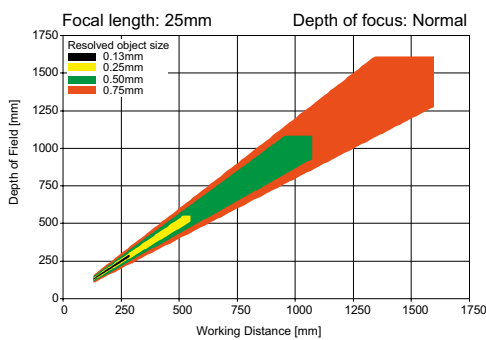
3

Field of view



155-01424

Depth of field: normal



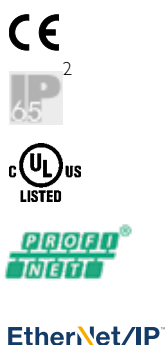
155-01412

Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® V10 object sensor

Advanced vision sensor for object detection, C-mount



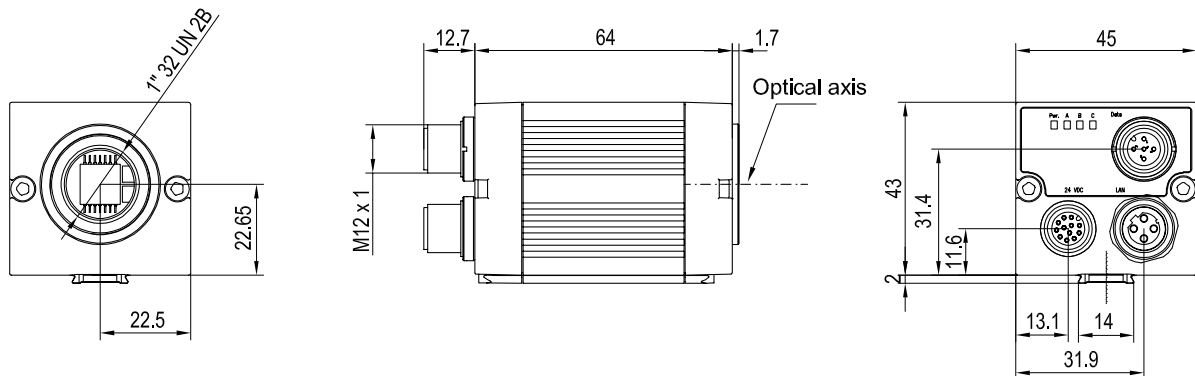
PRODUCT HIGHLIGHTS

- User-friendly configuration and viewer software with hierarchical user rights
- Detectors for object detection
- Real-world engineering units and robot coordinates at a mouse click
- Precise position determination: X/Y-position and orientation
- Comprehensive logic functions for digital switching outputs
- Encoder input

Optical data		Functions	
Resolution	736 x 480 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/3", monochrome	Detectors	Contour, pattern comparison, calliper, BLOB, contrast, brightness, grey level
Integrated lens, focal length	C-Mount	Properties	Position tracking: X/Y and orientation; pattern comparison / contour: teach-in and detection of patterns and contours; calliper: distance between edges; BLOB; grey threshold, brightness: evaluation of brightness; contrast: evaluation of contrast
Adjustment range	Dependent on lens	Typical cycle times	Typ. 20 ms pattern comparison Typ. 30 ms contour Typ. 8 ms calliper Typ. 30 ms BLOB Typ. 2 ms brightness Typ. 2 ms contrast Typ. 2 ms grey threshold
Integrated illumination	None		
Minimum field of view, X x Y	Dependent on lens		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4 V DC ¹	Dimensions	65 x 45 x 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 65 ²
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Ca. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ³
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ³
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Ca. 160 g
Inputs	PNP/NPN High > U _B -1 V, Low < 3 V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

¹ Max. ripple < 5 V_{SS} ² With LPT45 C-mount protective casing ³ 80 % air humidity, non-condensing

Part number	Article number
V10-OB-A1-C	535-91005

VISOR® vision sensor


153-00912

3

Lens


	LO C 8	LO C 12	LO C 16	LO C 25	LO C 35	LO C 50	LO C 75
Focal length	8 mm	12 mm	16 mm	25 mm	35 mm	50 mm	75 mm
Article number	526-51513	526-51514	526-51515	526-51516	526-51525	526-51113	526-51116

Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Lenses	From Page A-28
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® Color

Vision sensor for the most precise object detection



 made in Germany



The same or not the same?

The VISOR® Color detects even the smallest of color nuances more reliably than the human eye. This allows, for example, the detection of color deviations or the sorting of parts by color.



Incorrect occupancy ruled out:

The VISOR® Color combines color and object detection in a single device and can therefore simultaneously inspect occupancy of the blister for completeness and for occupancy with the correct color.



All LEDs in the right place?

A unique performance feature of vision color sensors is the detection of active (self-illuminating) colors. For example, displays in the automotive industry or electronic components can be inspected for correct placement with the VISOR® Color.

HIGHLIGHTS OF THE VISOR® COLOR

- Improved object detection through additional color information
- Powerful color detection, even with the smallest of color nuances or self-illuminating components
- Powerful part finding and tracking
- Highly accurate evaluation via 1.3 megapixel color chip
- Up to 6 digital switching outputs (another 32 with IO box)
- User-friendly configuration and viewer software with graded user rights and online help

Color is an important feature for detecting and differentiating between objects during the production process. Whether colored marks in quality assurance, colored printing or labels, LEDs or display elements, the occupancy of cable harnesses, or the browning level of baked goods – industry is much more colorful than is generally assumed.

Classic color sensors are limited to the detection of passive colors, i.e. of object colors or colored marks – they have to give up when confronted with self-illuminating objects. The VISOR® Color vision color sensor from SensoPart knows no such restrictions – it not only “sees” objects of any shape and color, but also provides additional information on color intensity and the position of the particular object. It can also represent an alternative to conventional contrast sensors for

determining grey values and contrast differences when other object features are to be evaluated simultaneously.

The comprehensive calibration functions range from a simple scaling factor via the correction of image and lens distortions at a mouse click through to a point pair list for robot applications.

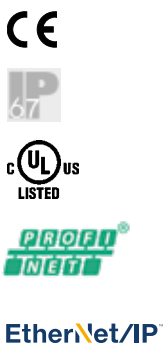
The upgrade to color is easy

The new generation of VISOR® Color vision color sensors not only supports color detection but also all the performance features of the VISOR® object sensor. The operating concept of the two vision sensors is identical – there are just three additional detectors for color detection with corresponding configuration possibilities. The introductory effort for those switching from the VISOR® object sensor is thus minimal – when will you put more colors into your applications?

VISOR® Color – product overview					
	Product variant	Resolution	Focal length	Integrated illumination	Page
V20C-CO-A2-xx	Advanced	1280 x 1024 pixels	12 mm	White	168
V20C-CO-A2-xx	Advanced	1280 x 1024 pixels	C-mount	None	170
V10C-CO-S2-xx	Standard	736 x 480 pixels	6 mm	White	172
V10C-CO-S2-xx	Standard	736 x 480 pixels	12 mm	White	174
V10C-CO-A2-xx	Advanced	736 x 480 pixels	6 mm	White	176
V10C-CO-A2-xx	Advanced	736 x 480 pixels	12 mm	White	178
V10C-CO-A2-xx	Advanced	736 x 480 pixels	25 mm	White	180
V10C-CO-A2-xx	Advanced	736 x 480 pixels	C-mount	None	182

VISOR® V20 Color

Advanced vision sensor for object detection, color, 12 mm



PRODUCT HIGHLIGHTS

- Object detection in color with 1.3 mega pixel resolution
- Reliable detection of very slight color nuances or self-illuminating components
- Powerful part finding and tracking
- User-friendly configuration and viewer software with hierarchical user rights
- Real-world engineering units and robot coordinates at a mouse click
- Encoder input

Optical data		Functions	
Resolution	1280 × 1024 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/1.8", color	Detectors	Contour; pattern comparison; calliper; BLOB; contrast; brightness; grey level; color value; color area; color list
Integrated lens, focal length	12 mm, adjustable focal position	Properties	Position tracking: X/Y and orientation; pattern comparison / contour: teach-in and detection of patterns and contours; calliper: distance between edges; BLOB; grey threshold; brightness: evaluation of brightness; contrast: evaluation of contrast; color area: two-dimensional color inspection with adjustable tolerance; color list: finding the most similar colors
Adjustment range	30 mm to infinity	Typical cycle times ²	Typ. 20 ms pattern comparison; typ. 30 ms contour; Typ. 8 ms calliper; typ. 30 ms BLOB; typ. 2 ms brightness; typ. 2 ms contrast; typ. 2 ms grey threshold; typ. 2 ms color value; typ. 30 ms color area; typ. 2 ms color list
Integrated illumination	White LEDs		
Minimum field of view, X × Y	16 × 13 mm ²		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4V DC ¹	Dimensions	65 × 45 × 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 67
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Approx. 13 s after Power on	Ambient temperature: operation	0 ... +50° C ³
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60° C ³
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Approx. 160 g
Inputs	PNP/NPN High > U _B -1V, Low < 3V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

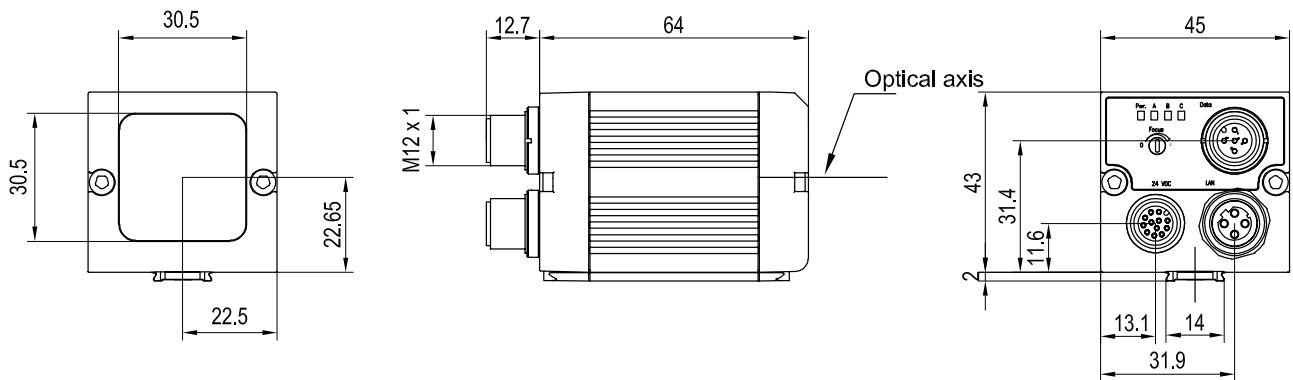
¹ Max. ripple < 5 V_{SS}

² with VGA-resolution (640 × 480 pixels)

³ 80 % air humidity, non-condensing

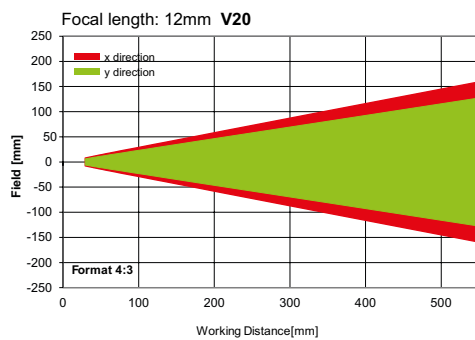
Illumination	Part number	Article number
White	V20C-CO-A2-W12	536-91020

VISOR® vision sensor



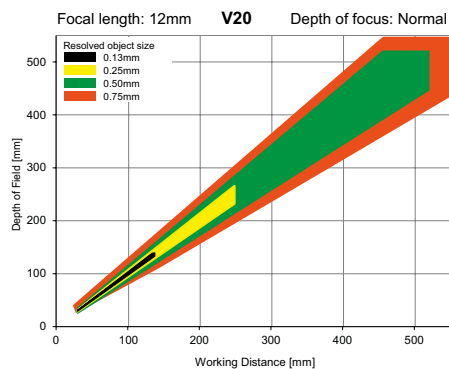
153-00911

Field of view



155-01637

Depth of field: normal



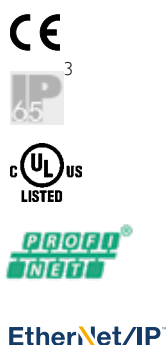
155-01636

Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® V20 Color

Advanced vision sensor for object detection, color, C-mount



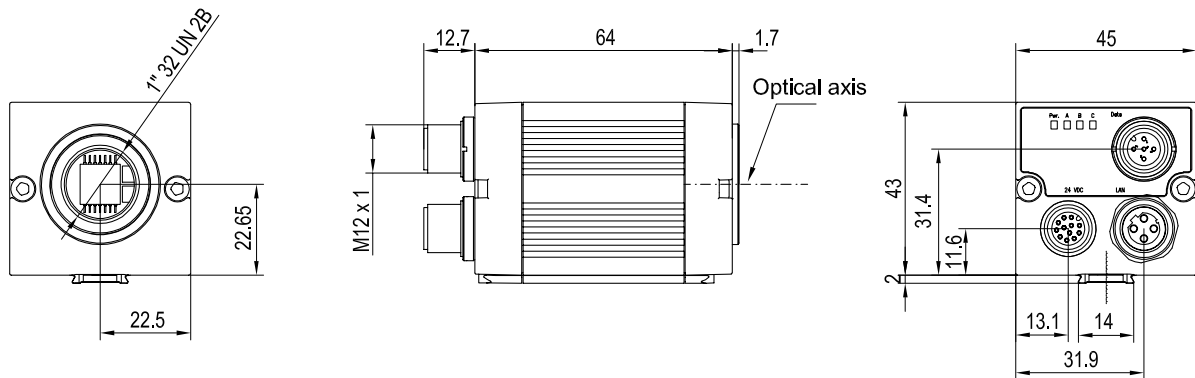
PRODUCT HIGHLIGHTS

- Object detection in color with 1.3 megapixel resolution
- Reliable detection of very slight color nuances or self-illuminating components
- Powerful part finding and tracking
- User-friendly configuration and viewer software with hierarchical user rights
- Real-world engineering units and robot coordinates at a mouse click
- Encoder input

Optical data		Functions	
Resolution	1280 x 1024 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/1.8", color	Detectors	Contour; pattern comparison, calliper; BLOB; contrast, brightness, grey level, color value, color area, color list
Integrated lens, focal length	C-Mount	Properties	Position tracking: X/Y and orientation; pattern comparison / contour: teach-in and detection of patterns and contours; calliper: distance between edges; BLOB; grey threshold, brightness: evaluation of brightness; contrast: evaluation of contrast; color area: two-dimensional color inspection with adjustable tolerance; color list: finding the most similar colors
Adjustment range	Dependent on lens	Typical cycle times ²	Typ. 20 ms pattern comparison; typ. 30 ms contour; Typ. 8 ms calliper; typ. 30 ms BLOB; typ. 2 ms brightness; typ. 2 ms contrast; typ. 2 ms grey threshold; typ. 2 ms color value; typ. 30 ms color area; typ. 2 ms color list
Integrated illumination	None		
Minimum field of view, X x Y	Dependent on lens		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4V DC ¹	Dimensions	65 x 45 x 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 65 ³
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Approx. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ⁴
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Approx. 160 g
Inputs	PNP/NPN High > U _B -1 V, Low < 3 V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

¹ Max. ripple < 5V_{SS} ² With VGA-resolution (640 x 480 Pixel) ³ With LPT45 C-mount protective casing ⁴ 80 % air humidity, non-condensing

Part number	Article number
V20C-CO-A2-C	536-91021

VISOR® vision sensor


153-00912

3

Lens

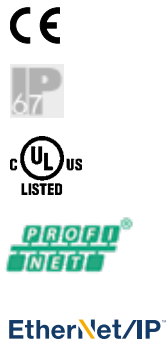

	LO C 8	LO C 12	LO C 16	LO C 25	LO C 35	LO C 50	LO C 75
Focal length	8 mm	12 mm	16 mm	25 mm	35 mm	50 mm	75 mm
Article number	526-51513	526-51514	526-51515	526-51516	526-51525	526-51113	526-51116

Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Lenses	From Page A-28
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® V10 Color

Standard vision sensor for object detection, color, 6 mm



PRODUCT HIGHLIGHTS

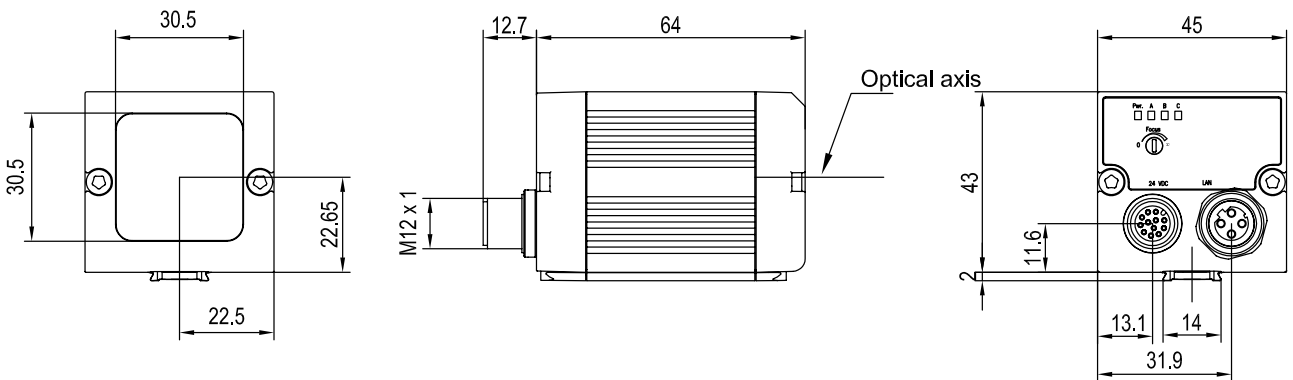
- Object detection in color
- Reliable detection of very slight color nuances or self-illuminating components
- Powerful part finding and tracking
- User-friendly configuration and viewer software with hierarchical user rights

Optical data		Functions	
Resolution	736 x 480 pixels	Number of jobs / detectors	8 / 32
CMOS	1/3", color	Detectors	Position tracking X/Y and orientation via contour inspection; color area
Integrated lens, focal length	6 mm, adjustable focal position	Properties	Position tracking X/Y and orientation; contour: teach-in and detection of contours; color area: two-dimensional color inspection with adjustable tolerance
Adjustment range	6 mm to infinity	Typical cycle times	Typ. 30 ms position tracking Typ. 30 ms color area
Integrated illumination	White LEDs		
Minimum field of view, X x Y	5 x 4 mm ²		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4 V DC ¹	Dimensions	65 x 45 x 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 67
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Approx. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ²
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Approx. 160 g
Inputs	PNP/NPN High > U _B -1 V, Low < 3 V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 2 selectable inputs/outputs		

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

Illumination	Depth of field	Part number	Article number
White	Normal	V10C-CO-S2-W6	535-91071

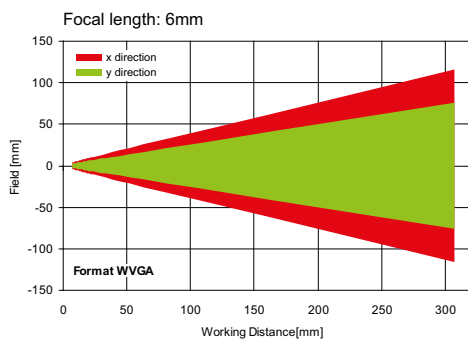
VISOR® vision sensor



153-01030

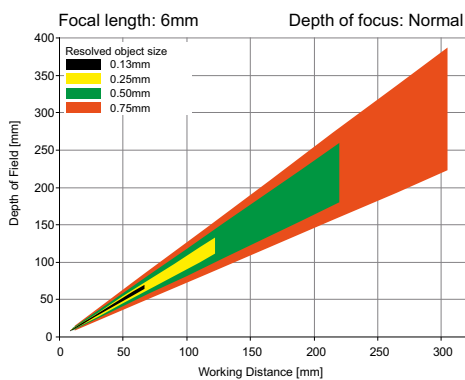
3

Field of view



155-01422

Depth of field: normal



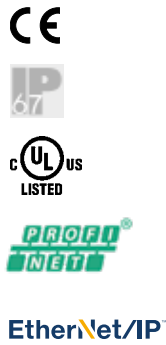
155-01409

Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® V10 Color

Standard vision sensor for object detection, color, 12 mm



PRODUCT HIGHLIGHTS

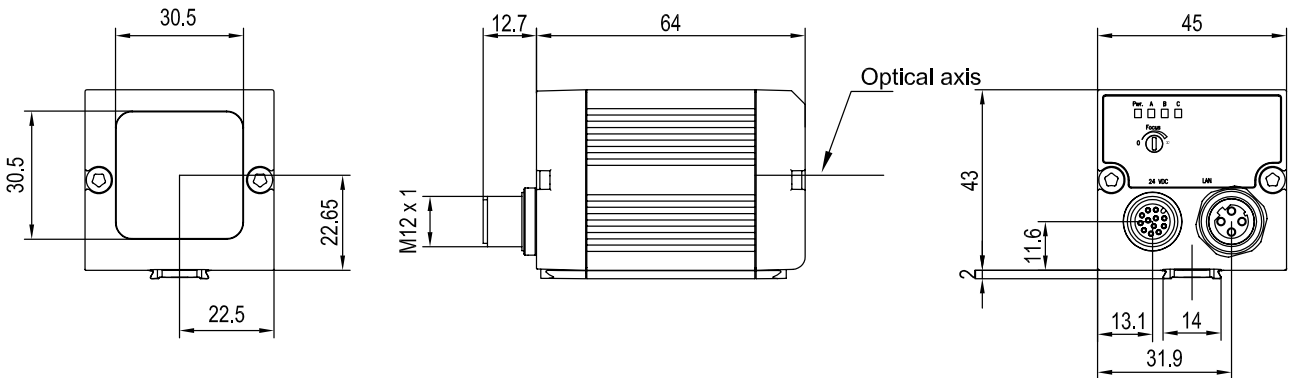
- Object detection in color
- Reliable detection of very slight color nuances or self-illuminating components
- Powerful part finding and tracking
- User-friendly configuration and viewer software with hierarchical user rights

Optical data		Functions	
Resolution	736 x 480 pixels	Number of jobs / detectors	8 / 32
CMOS	1/3", color	Detectors	Position tracking X/Y and orientation via contour inspection; color area
Integrated lens, focal length	12 mm, adjustable focal position	Properties	Position tracking X/Y and orientation; contour: teach-in and detection of contours; color area: two-dimensional color inspection with adjustable tolerance
Adjustment range	30 mm to infinity	Typical cycle times	Typ. 30 ms position tracking Typ. 30 ms color area
Integrated illumination	White LEDs		
Minimum field of view, X x Y	8 x 6 mm ²		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4 V DC ¹	Dimensions	65 x 45 x 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 67
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Approx. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ²
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Approx. 160 g
Inputs	PNP/NPN High > U _B -1 V, Low < 3 V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 2 selectable inputs/outputs		

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

Illumination	Depth of field	Part number	Article number
White	Normal	V10C-CO-S2-W12	535-91072

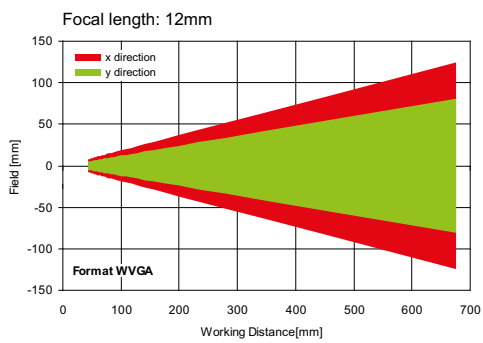
VISOR® vision sensor



153-01030

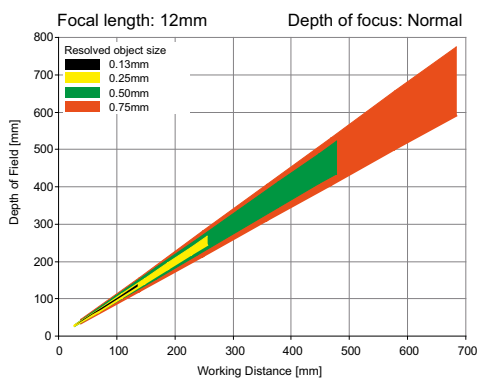
3

Field of view



155-01423

Depth of field: normal



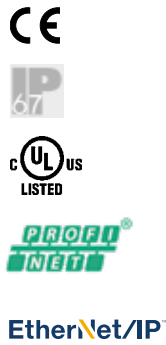
155-01410

Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® V10 Color

Advanced vision sensor for object detection, color, 6 mm



PRODUCT HIGHLIGHTS

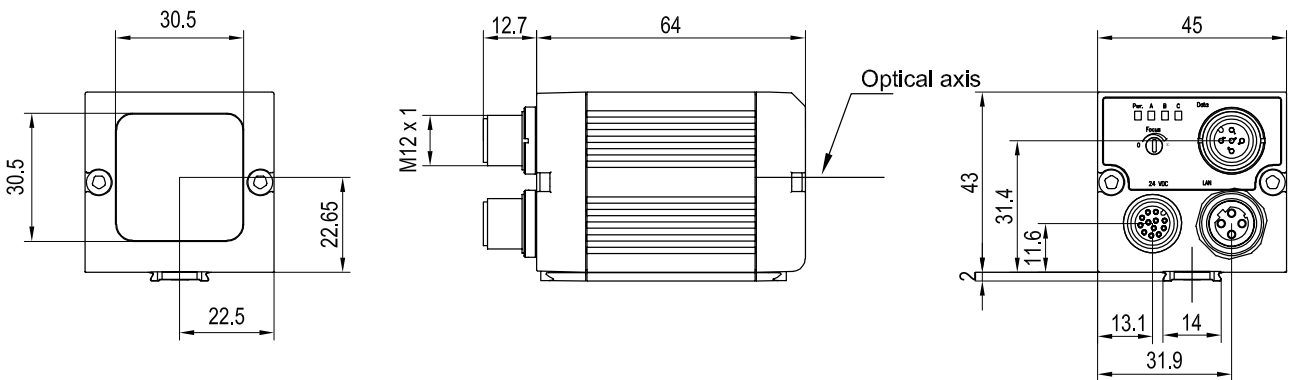
- Object detection in color
- Reliable detection of very slight color nuances or self-illuminating components
- Powerful part finding and tracking
- User-friendly configuration and viewer software with hierarchical user rights
- Real-world engineering units and robot coordinates at a mouse click
- Encoder input

Optical data		Functions	
Resolution	736 x 480 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/3", color	Detectors	Contour; pattern comparison, calliper; BLOB; contrast; brightness; grey level; color value; color area; color list
Integrated lens, focal length	6 mm, adjustable focal position	Properties	Position tracking: X/Y and orientation; pattern comparison / contour: teach-in and detection of patterns and contours; calliper: distance between edges; BLOB; grey threshold; brightness: evaluation of brightness; contrast: evaluation of contrast; color area: two-dimensional color inspection with adjustable tolerance; color list: finding the most similar colors
Adjustment range	6 mm to infinity		
Integrated illumination	White LEDs	Typical cycle times	Typ. 20 ms pattern comparison; typ. 30 ms contour; Typ. 8 ms calliper; typ. 30 ms BLOB; typ. 2 ms brightness; typ. 2 ms contrast; typ. 2 ms grey threshold; typ. 2 ms color value; typ. 30 ms color area; typ. 2 ms color list
Minimum field of view, X x Y	5 x 4 mm ²		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4V DC ¹	Dimensions	65 x 45 x 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 67
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Approx. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ²
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Approx. 160 g
Inputs	PNP/NPN High > U _B -1 V, Low < 3V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

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

Illumination	Depth of field	Part number	Article number
White	Normal	V10C-CO-A2-W6	535-91073

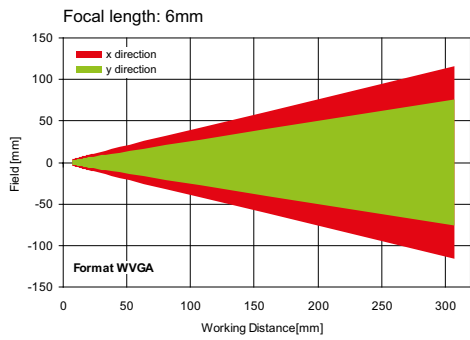
VISOR® vision sensor



153-00911

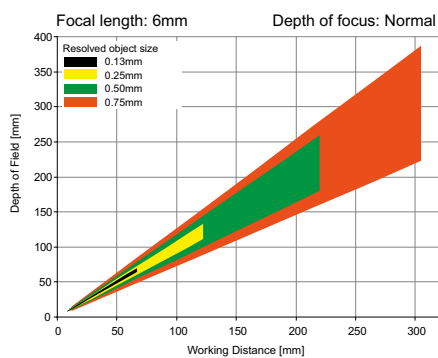
3

Field of view



155-01422

Depth of field: normal



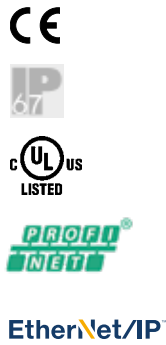
155-01409

Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® V10 Color

Advanced vision sensor for object detection, color, 12 mm



PRODUCT HIGHLIGHTS

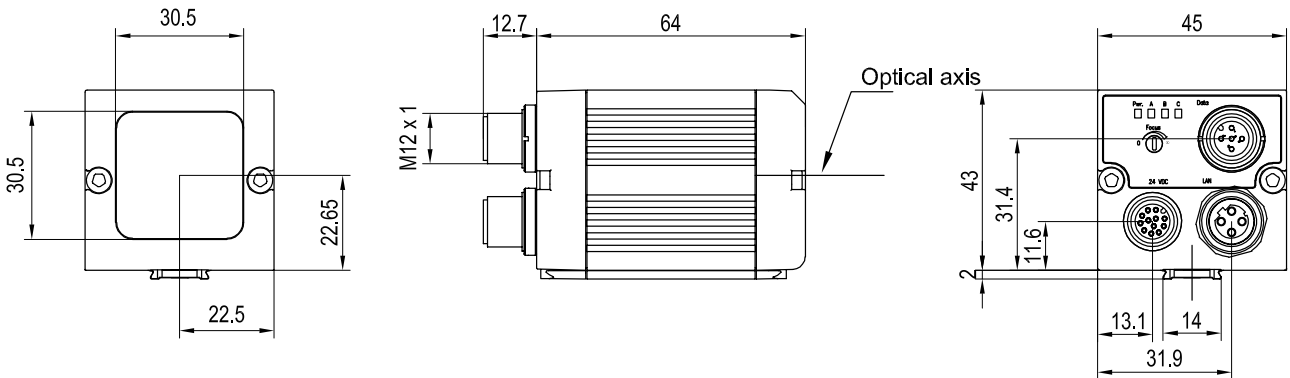
- Object detection in color
- Reliable detection of very slight color nuances or self-illuminating components
- Powerful part finding and tracking
- User-friendly configuration and viewer software with hierarchical user rights
- Real-world engineering units and robot coordinates at a mouse click
- Encoder input

Optical data		Functions	
Resolution	736 x 480 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/3", color	Detectors	Contour, pattern comparison, calliper, BLOB, contrast, brightness, grey level, color value, color area, color list
Integrated lens, focal length	12 mm, adjustable focal position	Properties	Position tracking: X/Y and orientation; pattern comparison / contour: teach-in and detection of patterns and contours; calliper: distance between edges; BLOB; grey threshold, brightness: evaluation of brightness; contrast: evaluation of contrast; color area: two-dimensional color inspection with adjustable tolerance; color list: finding the most similar colors
Adjustment range	30 mm to infinity	Typical cycle times	Typ. 20 ms pattern comparison; typ. 30 ms contour; Typ. 8 ms calliper; typ. 30 ms BLOB; typ. 2 ms brightness; typ. 2 ms contrast; typ. 2 ms grey threshold; typ. 2 ms color value; typ. 30 ms color area; typ. 2 ms color list
Integrated illumination	White LEDs		
Minimum field of view, X x Y	8 x 6 mm ²		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4 V DC ¹	Dimensions	65 x 45 x 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 67
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Approx. 13 s after Power on	Ambient temperature: operation	0 ... +50° C ²
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60° C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Approx. 160 g
Inputs	PNP/NPN High > U _B -1 V, Low < 3 V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

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

Illumination	Depth of field	Part number	Article number
White	Normal	V10C-CO-A2-W12	535-91074

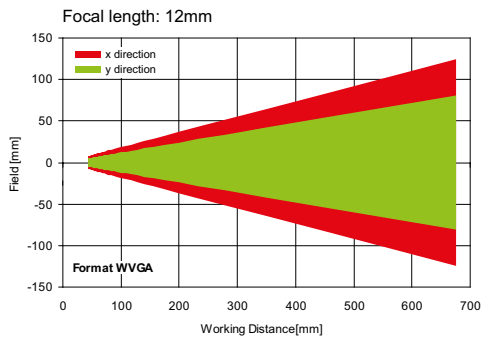
VISOR® vision sensor



153-00911

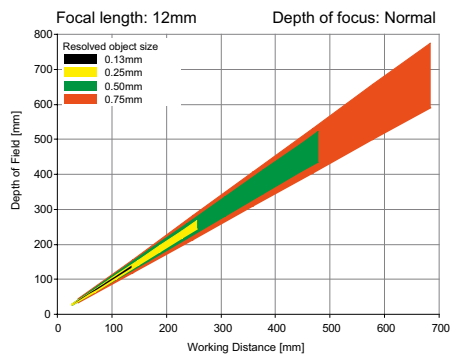
3

Field of view



155-01423

Depth of field: normal



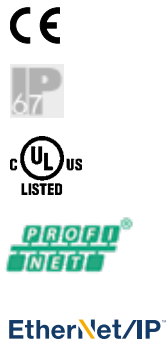
155-01410

Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® V10 Color

Advanced vision sensor for object detection, color, 25 mm



PRODUCT HIGHLIGHTS

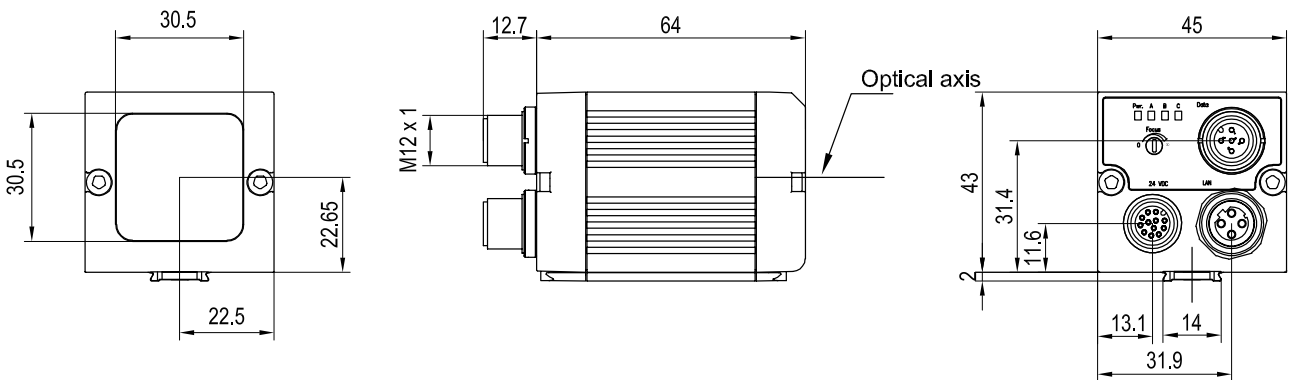
- Object detection in color
- Reliable detection of very slight color nuances or self-illuminating components
- Powerful part finding and tracking
- User-friendly configuration and viewer software with hierarchical user rights
- Real-world engineering units and robot coordinates at a mouse click
- Encoder input

Optical data		Functions	
Resolution	736 x 480 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/3", color	Detectors	Contour, pattern comparison, calliper, BLOB, contrast, brightness, grey level, color value, color area, color list
Integrated lens, focal length	25 mm, adjustable focal position	Properties	Position tracking: X/Y and orientation; pattern comparison / contour: teach-in and detection of patterns and contours; calliper: distance between edges; BLOB; grey threshold, brightness: evaluation of brightness; contrast: evaluation of contrast; color area: two-dimensional color inspection with adjustable tolerance; color list: finding the most similar colors
Adjustment range	140 mm to infinity	Typical cycle times	Typ. 20 ms pattern comparison; typ. 30 ms contour; Typ. 8 ms calliper; typ. 30 ms BLOB; typ. 2 ms brightness; typ. 2 ms contrast; typ. 2 ms grey threshold; typ. 2 ms color value; typ. 30 ms color area; typ. 2 ms color list
Integrated illumination	White LEDs		
Minimum field of view, X x Y	18 x 14 mm ²		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4V DC ¹	Dimensions	65 x 45 x 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 67
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Approx. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ²
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Approx. 160 g
Inputs	PNP/NPN High > U _B -1V, Low < 3V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

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

Illumination	Depth of field	Part number	Article number
White	Normal	V10C-CO-A2-W25	535-91075

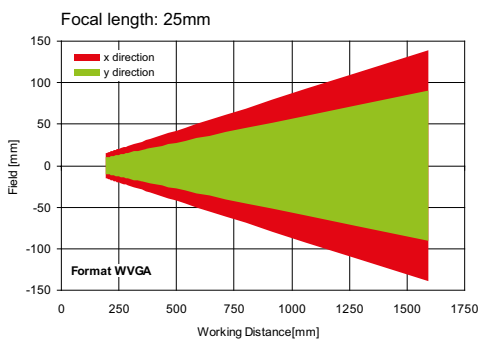
VISOR® vision sensor



153-00911

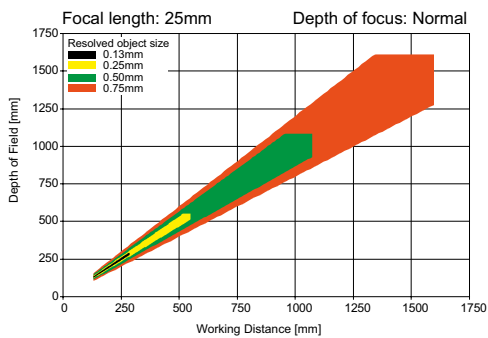
3

Field of view



155-01424

Depth of field: normal



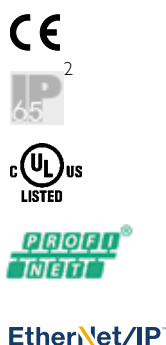
155-01412

Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® V10 Color

Advanced vision sensor for object detection, color, C-mount



PRODUCT HIGHLIGHTS

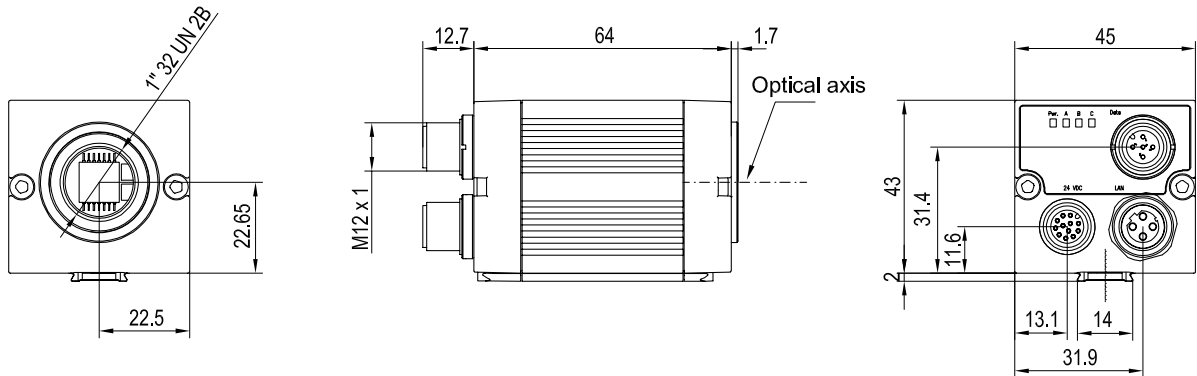
- Object detection in color
- Reliable detection of very slight color nuances or self-illuminating components
- Powerful part finding and tracking
- User-friendly configuration and viewer software with hierarchical user rights
- Real-world engineering units and robot coordinates at a mouse click
- Encoder input

Optical data		Functions	
Resolution	736 x 480 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/3", color	Detectors	Contour; pattern comparison; calliper; BLOB; contrast; brightness; grey level; color value; color area; color list
Integrated lens, focal length	C-Mount	Properties	Position tracking: X/Y and orientation; pattern comparison / contour: teach-in and detection of patterns and contours; calliper: distance between edges; BLOB; grey threshold; brightness: evaluation of brightness; contrast: evaluation of contrast; color area: two-dimensional color inspection with adjustable tolerance; color list: finding the most similar colors
Adjustment range	Dependent on lens	Typical cycle times	Typ. 20 ms pattern comparison; typ. 30 ms contour; Typ. 8 ms calliper; typ. 30 ms BLOB; typ. 2 ms brightness; typ. 2 ms contrast; typ. 2 ms grey threshold; typ. 2 ms color value; typ. 30 ms color area; typ. 2 ms color list
Integrated illumination	None		
Minimum field of view, X x Y	Dependent on lens		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4V DC ¹	Dimensions	65 x 45 x 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 65 ²
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium; plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Approx. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ³
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ³
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Approx. 160 g
Inputs	PNP/NPN High > U _B -1V, Low < 3V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

¹ Max. ripple < 5V_{SS} ² With LPT45 C-mount protective casing ³ 80 % air humidity, non-condensing

Part number	Article number
V10C-CO-A2-C	535-91076

VISOR® vision sensor



153-00912

3

Lens



	LO C 8	LO C 12	LO C 16	LO C 25	LO C 35	LO C 50	LO C 75
Focal length	8 mm	12 mm	16 mm	25 mm	35 mm	50 mm	75 mm
Article number	526-51513	526-51514	526-51515	526-51516	526-51525	526-51113	526-51116

Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Lenses	From Page A-28
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® Robotic

An eye on everything – the vision sensor for robotics applications



The VISOR® Robotic detects the component's position in a universal tray. It can then be reliably removed. Up to 255 configurations enable utmost production flexibility.



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

HIGHLIGHTS OF VISOR® ROBOTIC

- User-friendly configuration and display software
- Different detectors for locating components
- Gripping space check – check for available space around gripper
- Result offset correction in VISOR® software for simple adjustment of gripper point
- Two calibration methods for robotics applications:
 - Calibration plate: simple, fast and precise
 - Point pair list: considerable flexibility when selecting calibration object and field of view
- Offset of work plane through Z-offset function
- EtherNet/IP, PROFINET (Conformances Class B), EtherNet (TCP/IP) supported
- Flexible output protocol
- The right version for every application
 - Different resolutions
 - Focal length of 6 mm to 75 mm
 - Monochrome and color version

Picking up components

Feeding systems in a production line are becoming increasingly versatile – in addition to universal trays, components can be supplied with utmost flexibility using hopper feeders. Thanks to the VISOR® Robotic, components can be reliably located and gripped with both feed options. When loose components are supplied, the sensor not only checks their position but also inspects the free space around the gripper. The VISOR® determines both sets of information and sends them to the robot controller via one of the integrated and standardised process interfaces. The process is managed on the basis of this information – the object is gripped or the feeder is triggered.

The application can also be flexibly adapted to individual goods carriers without the need for a costly centring device. The VISOR® detects the position and the fill level of the tray and transmits this information to the robot. If the camera is mounted in a stationary manner, this is cycle time-neutral.

Placing parts

What happens after components have been reliably collected by the gripper? The VISOR® Robotic also supplies important information for the next work steps, and demonstrates its skills in robot-controlled applications, such as the placing of screws, the mounting of clips or the application of glue. The detection of component positions is carried out effortlessly; this allows the correction of any offset and increases the quality of production. Knowledge of the exact position of a component ensures, for example, the precise insertion of a windscreen. Mechanical effort is reduced, and the production line becomes even more flexible. The VISOR® Robotic concept enables direct communication between the VISOR® and the robot, an additional instance is no longer necessary for many applications.

VISOR® Robotic – product overview					
	Product variants	Resolution	Focal length	Integrated lighting	Page
V20x-RO-A3-xxx	Advanced	1440 x 1080 mono/color	wide	White, red ¹ or infrared ¹ LEDs	94
V20x-RO-A3-xxx			medium	White, red ¹ or infrared ¹ LEDs	96
V20x-RO-A3-xxx			narrow	White, red ¹ or infrared ¹ LEDs	98
V20x-RO-A3-C-2			C-mount	None	100
V20x-RO-P3-xxx	Professional		wide	White, red ¹ or infrared ¹ LEDs	102
V20x-RO-P3-xxx			medium	White, red ¹ or infrared ¹ LEDs	104
V20x-RO-P3-xxx			narrow	White, red ¹ or infrared ¹ LEDs	106
V20x-RO-P3-C-2			C-mount	None	108
V10-RO-A3-xxx	Advanced	800 x 600 mono	wide	White, red ¹ or infrared ¹ LEDs	110
V10-RO-A3-xxx			medium	White, red ¹ or infrared ¹ LEDs	112
V10-RO-A3-xxx			narrow	White, red ¹ or infrared ¹ LEDs	114
V10-RO-A3-C-2			C-mount	None	116

¹ Only with monochrome version


VISOR® V20 Robotic Advanced, wide field of view

Vision sensor for object detection, presence check, completeness check, measurement and positioning tasks

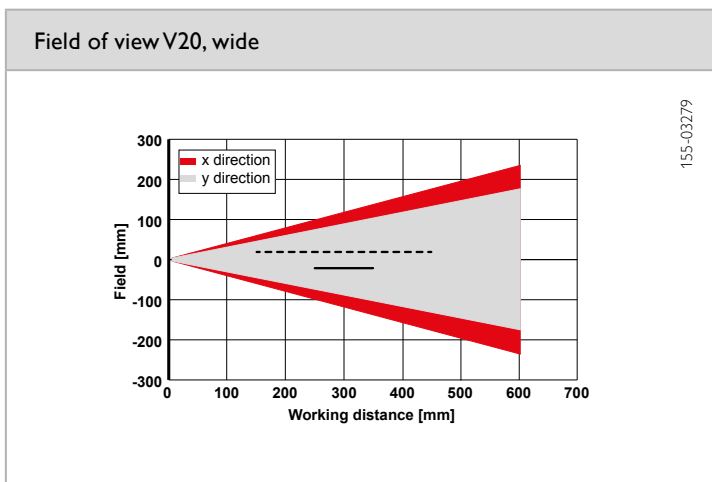
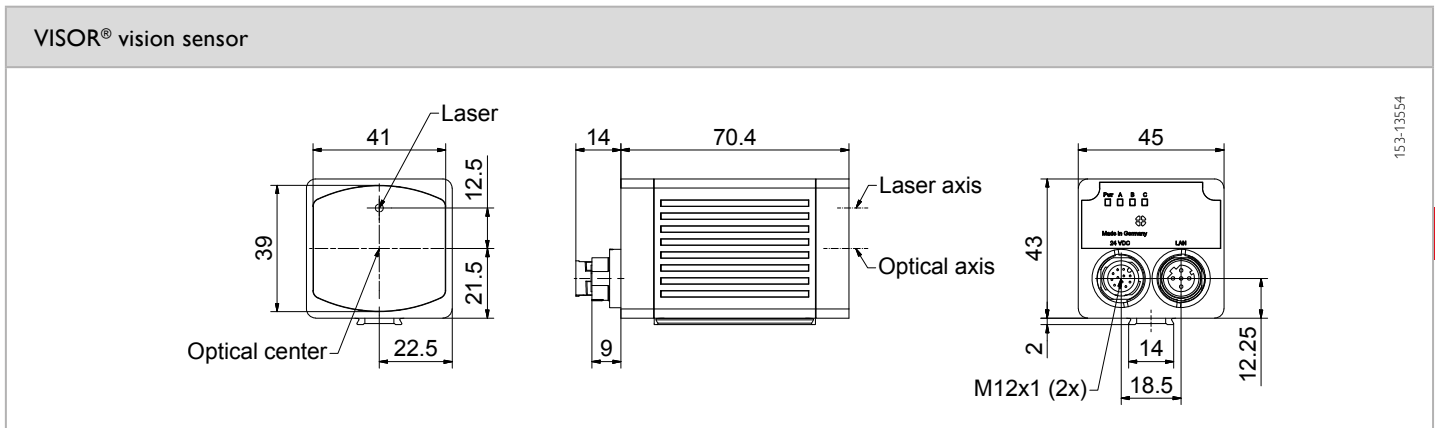


PRODUCT HIGHLIGHTS

- Calibration methods for robotics applications
- Detectors for position determination
- Result offset
- Offset of work plane
- Gripping space check

Optical data		Functions	
Resolution	1440 x 1080 pixels	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/2.9", monochrome / color	Detectors	Position tracking; X/Y and orientation; Pattern matching / Contour: teach-in and detection of patterns and contours; Calliper: distance between edges; BLOB, Grey threshold, Brightness: evaluation of brightness; Contrast: evaluation of contrast
Integrated lens, focal length [mm]	6.5 (wide)		
Pixel size	3.45 µm x 3.45 µm		
Focus	Motorized		
Adjustment range	10 mm to infinity		
Integrated illumination	White (5000 K), red (635 nm) ¹ , infrared (850 nm) ¹ LEDs		
Minimum field of view, X x Y	6 x 4 mm		
Target laser	Laser: red (635 nm) class 1  (IEC 60825-1)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30V DC ³	Dimensions	70.4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Approx. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1V / Low < 3V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	✓		

¹ Not Color hardware ² Color hardware ³ Max. ripple < 5V_s ⁴ 80 % air humidity, noncondensing



- Increased depth of field
- Normal depth of field

illumination	Part number	Article number	Accessories	
White	V20-RO-A3-W-W-M2-L	632-91064	Connection cables	From Page A-46
Red	V20-RO-A3-R-W-M2-L	632-91067	Illumination	From Page A-33
Infrared	V20-RO-A3-I-W-M2-L	632-91070	Brackets	From Page A-4
White	V20C-RO-A3-W-W-M2-L	632-91074	Interface accessories	From Page A-53


VISOR® V20 Robotic Advanced, medium field of view

Vision sensor for object detection, presence check, completeness check, measurement and positioning tasks

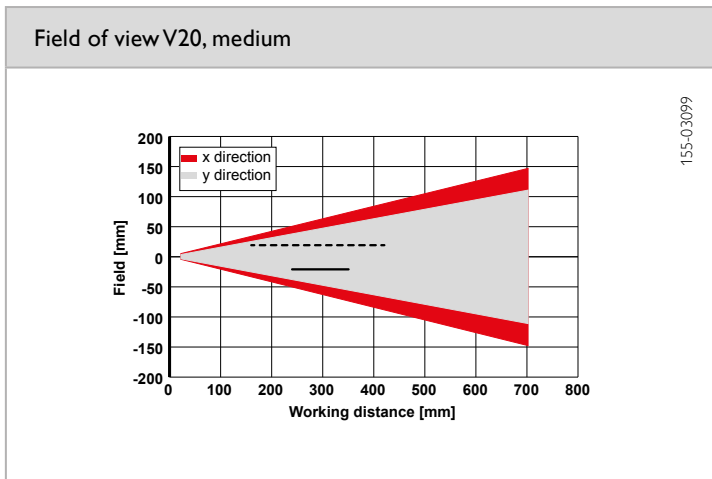
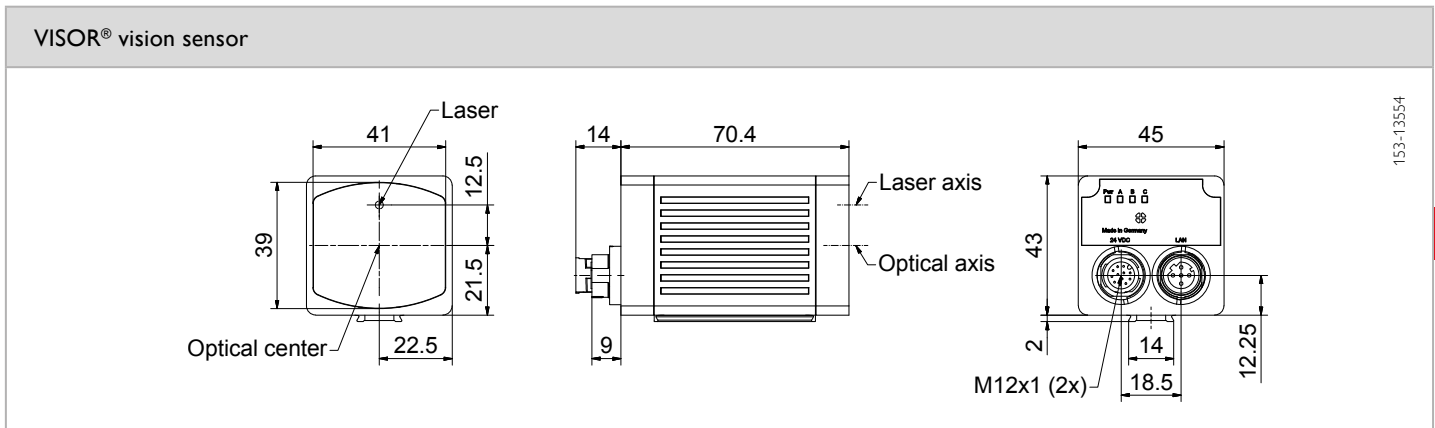


PRODUCT HIGHLIGHTS

- Calibration methods for robotics applications
- Detectors for position determination
- Result offset
- Offset of work plane
- Gripping space check

Optical data		Functions	
Resolution	1440 × 1080 Pixel	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/2.9", monochrome / color	Detectors	Position tracking: X/Y and orientation; Pattern matching / Contour: teach-in and detection of patterns and contours; Calliper: distance between edges; BLOB, Grey threshold, Brightness: evaluation of brightness; Contrast: evaluation of contrast
Integrated lens, focal length [mm]	12 (medium)		
Pixel size	3.45 µm × 3.45 µm		
Focus	Motorized		
Adjustment range	25 mm to infinity		
Integrated illumination	White (5000 K), red (635 nm) ¹ , infrared (850 nm) ¹ LEDs		
Minimum field of view, X × Y	10 × 8 mm		
Target laser	Laser: red (635 nm) class 1  (IEC 60825-1)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ³	Dimensions	70,4 × 45 × 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Approx. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1V / Low < 3V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	✓		

¹ Not Color hardware ² Color hardware ³ Max. ripple < 5V_s ⁴ 80 % air humidity, noncondensing



- Increased depth of field
- Normal depth of field

illumination	Part number	Article number	Accessories	
White	V20-RO-A3-W-M-M2-L	632-91065	Connection cables	From Page A-46
Red	V20-RO-A3-R-M-M2-L	632-91068	Illumination	From Page A-33
Infrared	V20-RO-A3-I-M-M2-L	632-91071	Brackets	From Page A-4
White	V20C-RO-A3-W-M-M2-L	632-91075	Interface accessories	From Page A-53


VISOR® V20 Robotic Advanced, narrow field of view

Vision sensor for object detection, presence check, completeness check, measurement and positioning tasks

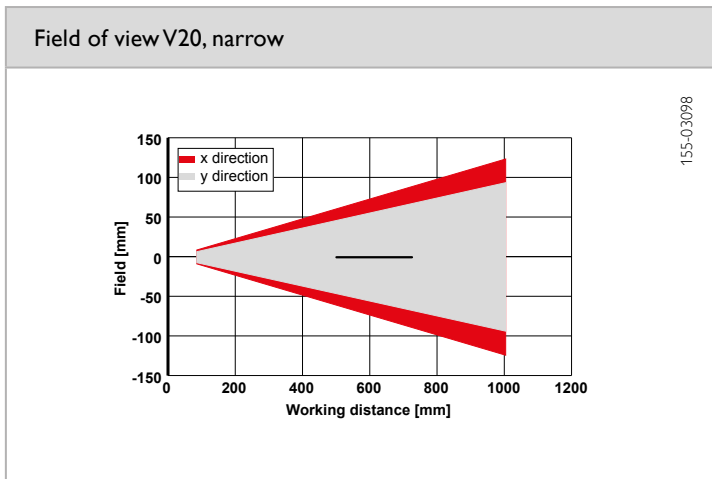
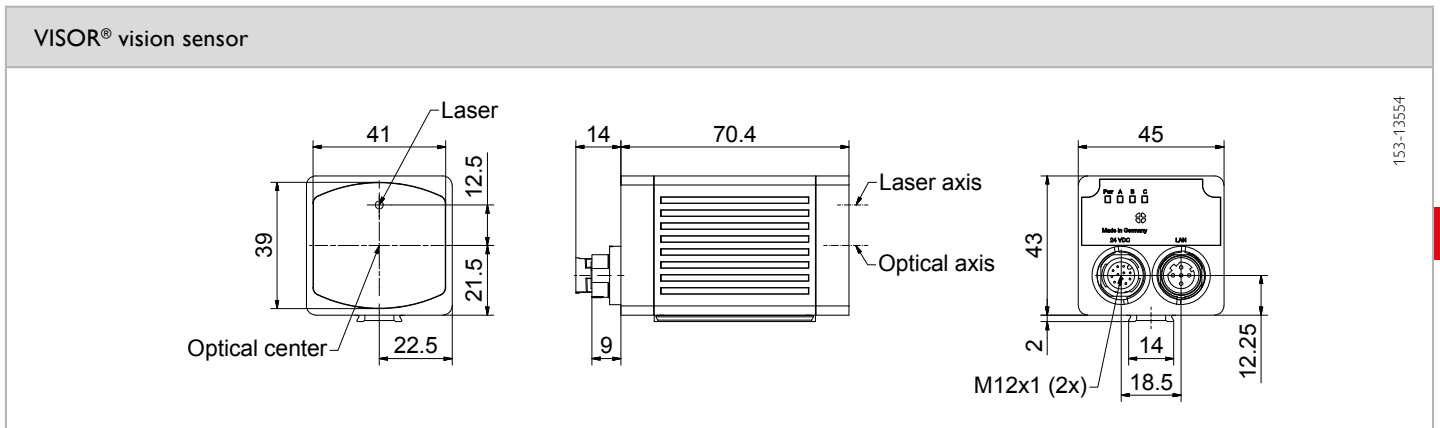


PRODUCT HIGHLIGHTS

- Calibration methods for robotics applications
- Detectors for position determination
- Result offset
- Offset of work plane
- Gripping space check

Optical data		Functions	
Resolution	1440 × 1080 Pixel	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/2.9", monochrome / color	Detectors	Position tracking: X/Y and orientation; Pattern matching / Contour: teach-in and detection of patterns and contours; Calliper: distance between edges; BLOB, Grey threshold, Brightness: evaluation of brightness; Contrast: evaluation of contrast
Integrated lens, focal length [mm]	20 (narrow)		
Pixel size	3.45 μm × 3.45 μm		
Focus	Motorized		
Adjustment range	100 mm to infinity		
Integrated illumination	White (5000 K), red (635 nm) ¹ , infrared (850 nm) ¹ LEDs		
Minimum field of view, X × Y	18 × 14 mm		
Target laser	Laser: red (635 nm) class 1  (IEC 60825-1)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ³	Dimensions	70,4 × 45 × 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Approx. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1V / Low < 3V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces VISOR® V20-CR-Advanced	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	✓		

¹ Not Color hardware ² Color hardware ³ Max. ripple < 5V_s ⁴ 80 % air humidity, noncondensing



— Normal depth of field

illumination	Part number	Article number	Accessories	
White	V20-RO-A3-W-N-M2-L	632-91066	Connection cables	From Page A-46
Red	V20-RO-A3-R-N-M2-L	632-91069	Illumination	From Page A-33
Infrared	V20-RO-A3-I-N-M2-L	632-91072	Brackets	From Page A-4
White	V20C-RO-A3-W-N-M2-L	632-91076	Interface accessories	From Page A-53

VISOR® V20 Robotic Advanced, C-Mount

Vision sensor for object detection, presence check, completeness check, measurement and positioning tasks



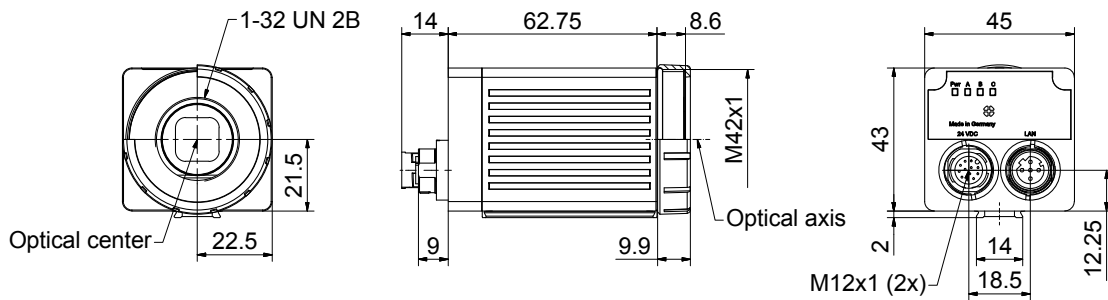
PRODUCT HIGHLIGHTS

- Calibration methods for robotics applications
- Detectors for position determination
- Result offset
- Offset of work plane
- Gripping space check

Optical data		Functions	
Resolution	1440 x 1080 pixels	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/2.9", monochrome / color	Detectors	Position tracking; X/Y and orientation; Pattern matching / Contour: teach-in and detection of patterns and contours; Calliper: distance between edges; BLOB, Grey threshold, Brightness: evaluation of brightness; Contrast: evaluation of contrast
Integrated lens, focal length [mm]	C-mount		
Pixel size	3,45 µm x 3,45 µm		
Focus	Manual		
Adjustment range	Dependent on lens		
Integrated illumination	None		
Minimum field of view, X x Y	Dependent on lens		
Target laser	No		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30V DC ²	Dimensions	70,4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65 ³
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Approx. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1V / Low < 3V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Versorgung und I/O M12, 12-polig, Ethernet M12, 4-polig,
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibrationsfestigkeit	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Schockfestigkeit	EN 60068-2-27
Encoder	✓		

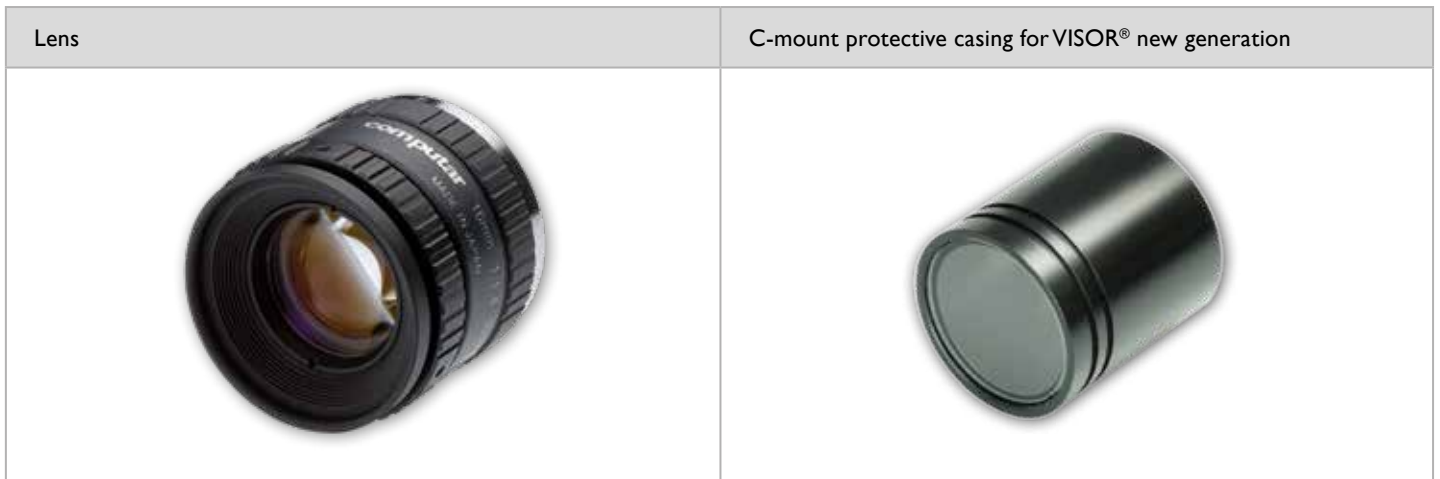
¹ Color hardware ² max. Restwelligkeit < 5V_{SS} ³ only with protective casing ⁴ 80 % air humidity, noncondensing

Vision-Sensor VISOR® C-mount



153-13555

3



Part number	Article number
LPTVxx-G37.5	651-01006
LPTVxx-25.0	651-01007

	LO C 8	LO C 12	LO C 16	LO C 25	LO C 35	LO C 50	LO C 75
Focal length	8 mm	12 mm	16 mm	25 mm	35 mm	50 mm	75 mm
Article number	526-51513	526-51514	526-51515	526-51516	526-51525	526-51113	526-51116

Part number	Article number	Accessories
V20-RO-A3-C-2	632-91073	Connection cables
V20C-RO-A3-C-2	632-91077	Illumination
		Lenses
		Brackets
		Interface accessories
		From Page A-46
		From Page A-33
		From Page A-28
		From Page A-4
		From Page A-53


VISOR® V20 Robotic Professional, wide field of view

Vision sensor for object detection, presence check, completeness check, measurement and positioning tasks

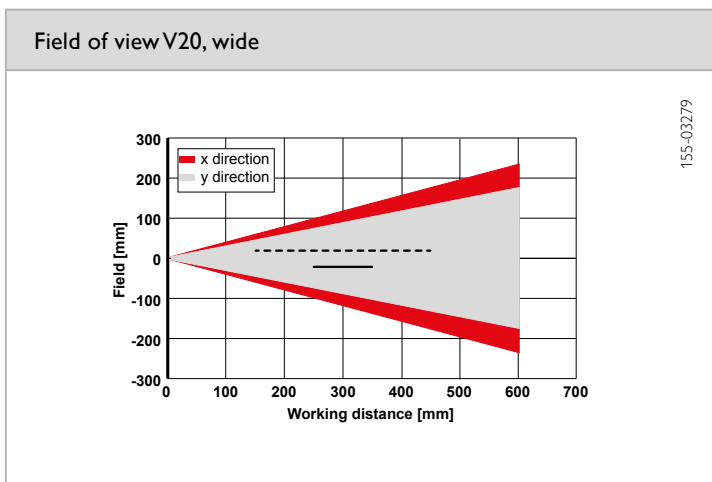
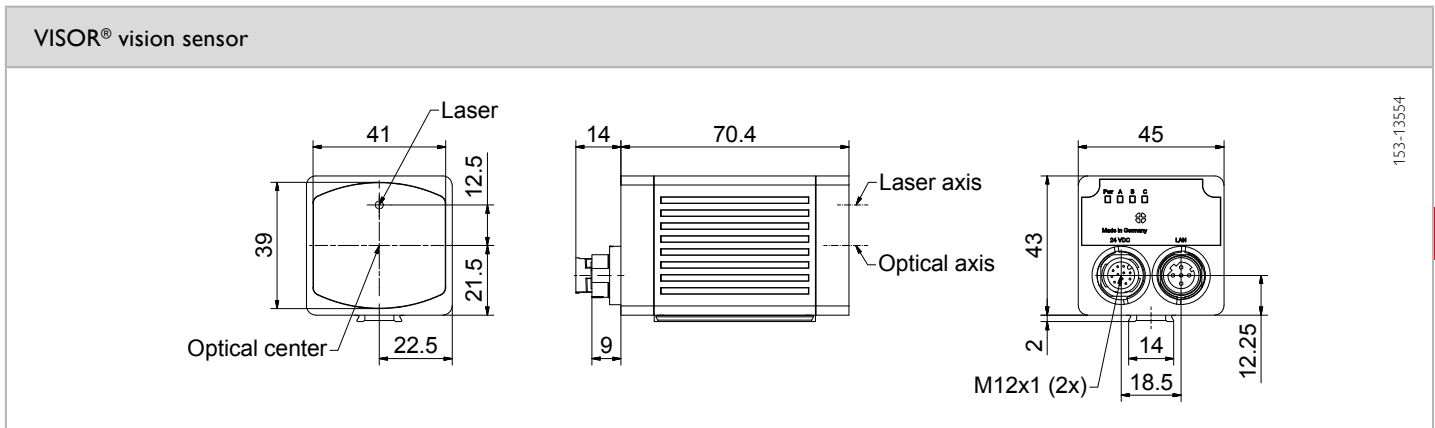


PRODUCT HIGHLIGHTS

- Calibration methods for robotics applications
- Detectors for position determination
- Result offset
- Offset of work plane
- Gripping space check
- Can be used for all common 2D codes (ECC 200 data matrix) , common 1D bar codes and OCR

Optical data		Functions	
Resolution	1440 x 1080 Pixel	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/2.9", monochrome / color	Detectors	Position tracking; X/Y and orientation; Pattern matching / Contour: teach-in and detection of patterns and contours; Calliper: distance between edges; BLOB, Grey threshold, Brightness: evaluation of brightness; Contrast: evaluation of contrast; CBarcode: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; Datacode: reading 2D codes: ECC200, QR code, GS1, PDF 417; OCR reading of fonts
Integrated lens, focal length [mm]	6.5 (wide)		
Pixel size	3.45 µm x 3.45 µm		
Focus	Motorized		
Adjustment range	10 mm to infinity		
Integrated illumination	White (5000 K), red (635 nm) ¹ , infrared (850 nm) ¹ LEDs		
Minimum field of view, X x Y	6 x 4 mm		
Target laser	Laser: red (635 nm) class 1  (IEC 60825-1)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ³	Dimensions	70.4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Approx. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1 V, Low < 3 V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	✓		

¹ Not Color hardware ² Color hardware ³ Max. ripple < 5V_s ⁴ 80 % air humidity, noncondensing



- Increased depth of field
- Normal depth of field

illumination	Part number	Article number	Accessories	
White	V20-RO-P3-W-W-M2-L	632-91120	Connection cables	From Page A-46
Red	V20-RO-P3-R-W-M2-L	632-91123	Illumination	From Page A-33
Infrared	V20-RO-P3-I-W-M2-L	632-91126	Brackets	From Page A-4
White	V20C-RO-P3-W-W-M2-L	632-91130	Interface accessories	From Page A-53


VISOR® V20 Robotic Professional, medium field of view

Vision sensor for object detection, presence check, completeness check, measurement and positioning tasks

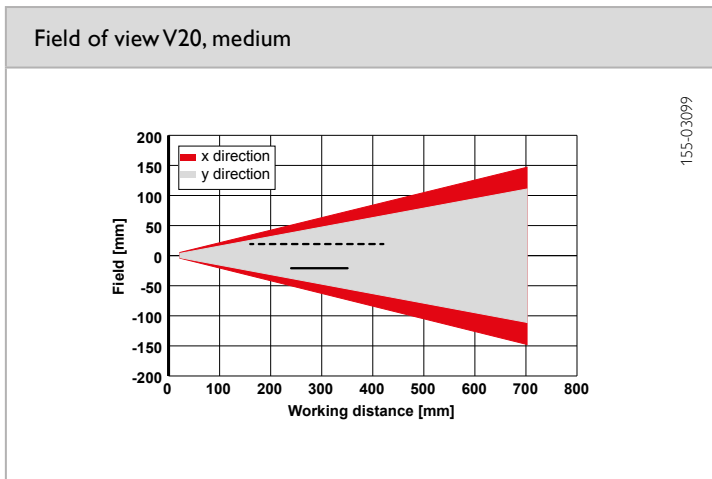
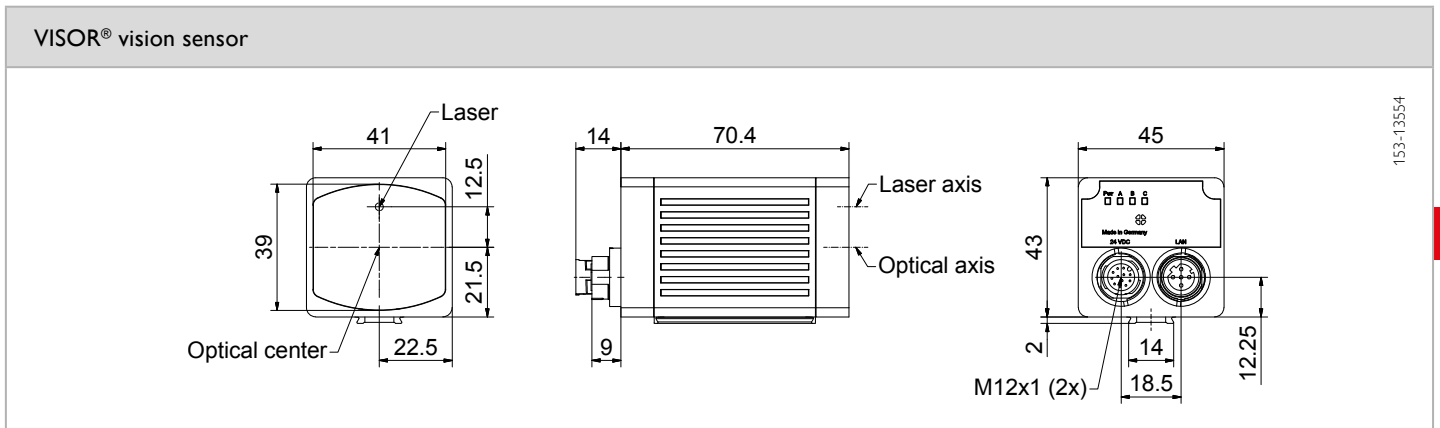


PRODUCT HIGHLIGHTS

- Calibration methods for robotics applications
- Detectors for position determination
- Result offset
- Offset of work plane
- Gripping space check
- Can be used for all common 2D codes (ECC 200 data matrix) , common 1D bar codes and OCR

Optical data		Functions	
Resolution	1440 x 1080 Pixel	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/2.9", monochrome / color	Detectors	Position tracking; X/Y and orientation; Pattern matching / Contour: teach-in and detection of patterns and contours; Calliper: distance between edges; BLOB, Grey threshold, Brightness: evaluation of brightness; Contrast: evaluation of contrast Barcode: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; Datacode: reading 2D codes: ECC200, QR code, GS1, PDF 417; OCR reading of fonts
Integrated lens, focal length [mm]	12 (medium)		
Pixel size	3.45 µm x 3.45 µm		
Focus	Motorized		
Adjustment range	25 mm to infinity		
Integrated illumination	White (5000 K), red (635 nm) ¹ , infrared (850 nm) ¹ LEDs		
Minimum field of view, X x Y	10 x 8 mm		
Target laser	Laser: red (635 nm) class 1  (IEC 60825-1)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ³	Dimensions	70.4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Approx. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP / NPN High > U _B -1V / Low < 3V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	✓		

¹ Not Color hardware ² Color hardware ³ Max. ripple < 5V_s ⁴ 80 % air humidity, noncondensing



- Increased depth of field
- Normal depth of field

Illumination	Part number	Article number	Accessories	
White	V20-RO-P3-W-M-M2-L	632-91121	Connection cables	From Page A-46
Red	V20-RO-P3-R-M-M2-L	632-91124	Illumination	From Page A-33
Infrared	V20-RO-P3-I-M-M2-L	632-91127	Brackets	From Page A-4
White	V20C-RO-P3-W-M-M2-L	632-91131	Interface accessories	From Page A-53


VISOR® V20 Robotic Professional, narrow field of view

Vision sensor for object detection, presence check, completeness check, measurement and positioning tasks

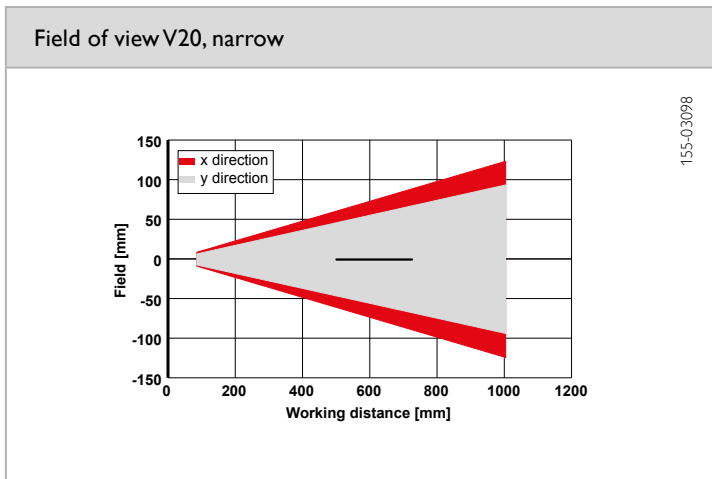
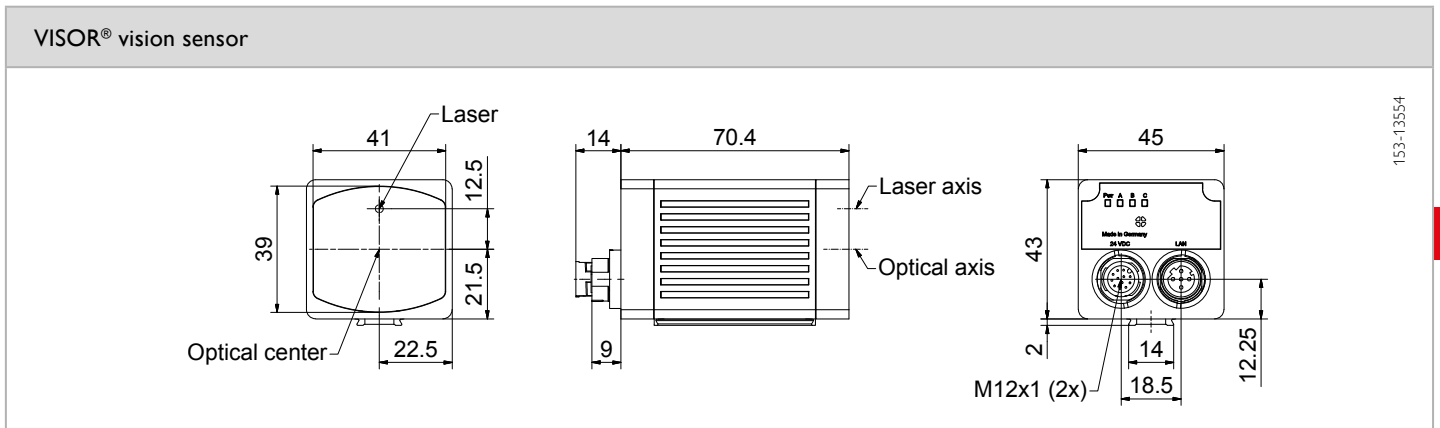


PRODUCT HIGHLIGHTS

- Calibration methods for robotics applications
- Detectors for position determination
- Result offset
- Offset of work plane
- Gripping space check
- Can be used for all common 2D codes (ECC 200 data matrix) , common 1D bar codes and OCR

Optical data		Functions	
Resolution	1440 x 1080 pixels	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/2.9", monochrome / color	Detectors	Position tracking; X/Y and orientation; Pattern matching / Contour: teach-in and detection of patterns and contours; Calliper: distance between edges; BLOB, Grey threshold, Brightness: evaluation of brightness; Contrast: evaluation of contrast Barcode: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; Datacode: reading 2D codes: ECC200, QR code, GS1, PDF 417; OCR reading of fonts
Integrated lens, focal length [mm]	20 (narrow)		
Pixel size	3.45 µm x 3.45 µm		
Focus	Motorized		
Adjustment range	100 mm to infinity		
Integrated illumination	White (5000 K), red (635 nm) ¹ , infrared (850 nm) ¹ LEDs		
Minimum field of view, X x Y	18 x 14 mm		
Target laser	Laser: red (635 nm) class 1  (IEC 60825-1)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30V DC ³	Dimensions	70,4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Approx. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1V / Low < 3V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	✓		

¹ Not Color hardware ² Color hardware ³ Max. ripple < 5V_s ⁴ 80 % air humidity, noncondensing



— Normal depth of field

Illumination	Part number	Article number	Accessories	
White	V20-RO-P3-W-N-M2-L	632-91122	Connection cables	From Page A-46
Red	V20-RO-P3-R-N-M2-L	632-91125	Illumination	From Page A-33
Infrared	V20-RO-P3-I-N-M2-L	632-91128	Brackets	From Page A-4
White	V20C-RO-P3-W-N-M2-L	632-91132	Interface accessories	From Page A-53

VISOR® V20 Robotic Professional, C-Mount

Vision sensor for object detection, presence check, completeness check, measurement and positioning tasks

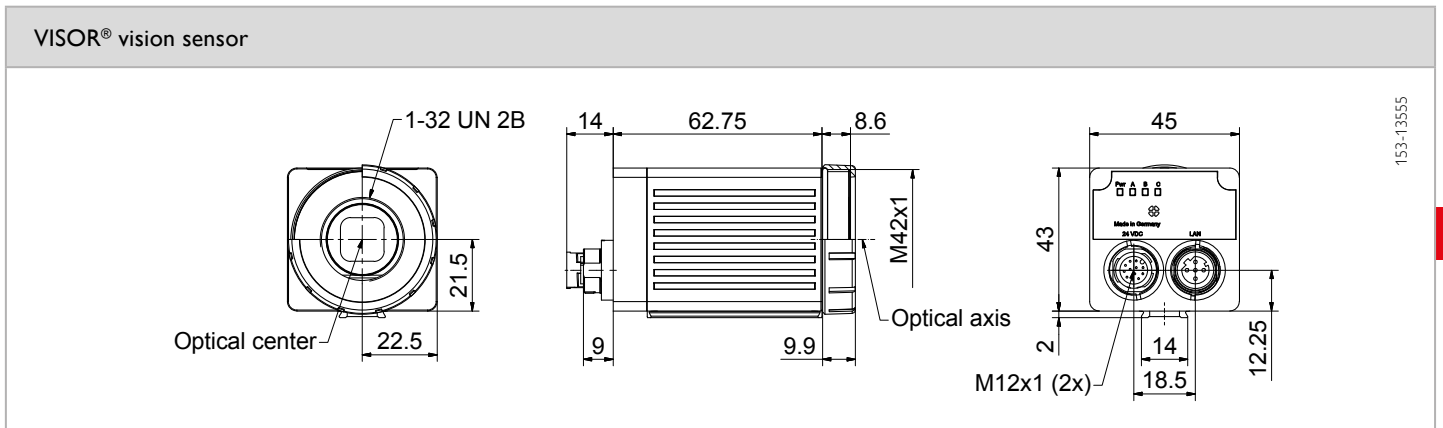


PRODUCT HIGHLIGHTS

- Calibration methods for robotics applications
- Detectors for position determination
- Result offset
- Offset of work plane
- Gripping space check
- Can be used for all common 2D codes (ECC 200 data matrix) , common 1D bar codes and OCR

Optical data		Functions	
Resolution	1440 x 1080 pixels	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/2.9", monochrome / color	Detectors	Position tracking; X/Y and orientation; Pattern matching / Contour: teach-in and detection of patterns and contours; Calliper: distance between edges; BLOB, Grey threshold, Brightness: evaluation of brightness; Contrast: evaluation of contrast Barcode: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; Datacode: reading 2D codes: ECC200, QR code, GS1, PDF 417; OCR reading of fonts
Integrated lens, focal length [mm]	C-mount		
Pixel size	3,45 µm x 3,45 µm		
Focus	Manual		
Adjustment range	Dependent on lens		
Integrated illumination	None		
Minimum field of view, X x Y	Dependent on lens		
Target laser	No		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30V DC ²	Dimensions	70,4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65 ³
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Approx. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1V / Low < 3V	Weight	Approx. 200 g
Input resistance	> en fonction de l'objectif	Plug connections	Versorgung und I/O M12, 12-polig, Ethernet M12, 4-polig,
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibrationsfestigkeit	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Schockfestigkeit	EN 60068-2-27
Encoder	✓		

¹ Color hardware ² Max. ripple < 5V_{SS} ³ only with protective casing ⁴ 80 % air humidity, noncondensing



Part number	Article number
LPTVxx-G37.5	651-01006
LPTVxx-25.0	651-01007

	LO C 8	LO C 12	LO C 16	LO C 25	LO C 35	LO C 50	LO C 75
Focal length	8 mm	12 mm	16 mm	25 mm	35 mm	50 mm	75 mm
Article number	526-51513	526-51514	526-51515	526-51516	526-51525	526-51113	526-51116

Part number	Article number	Accessories
V20-RO-P3-C-2	632-91129	Connection cables
V20C-RO-P3-C-2	632-91133	Illumination
		Lenses
		Brackets
		Interface accessories
		From Page A-46
		From Page A-33
		From Page A-28
		From Page A-4
		From Page A-53


VISOR® V10 Robotic Advanced, wide field of view

Vision sensor for object detection, presence check, completeness check, measurement and positioning tasks

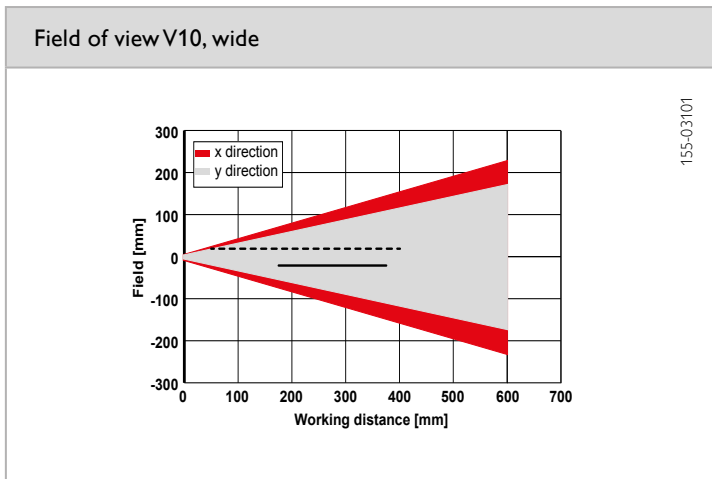
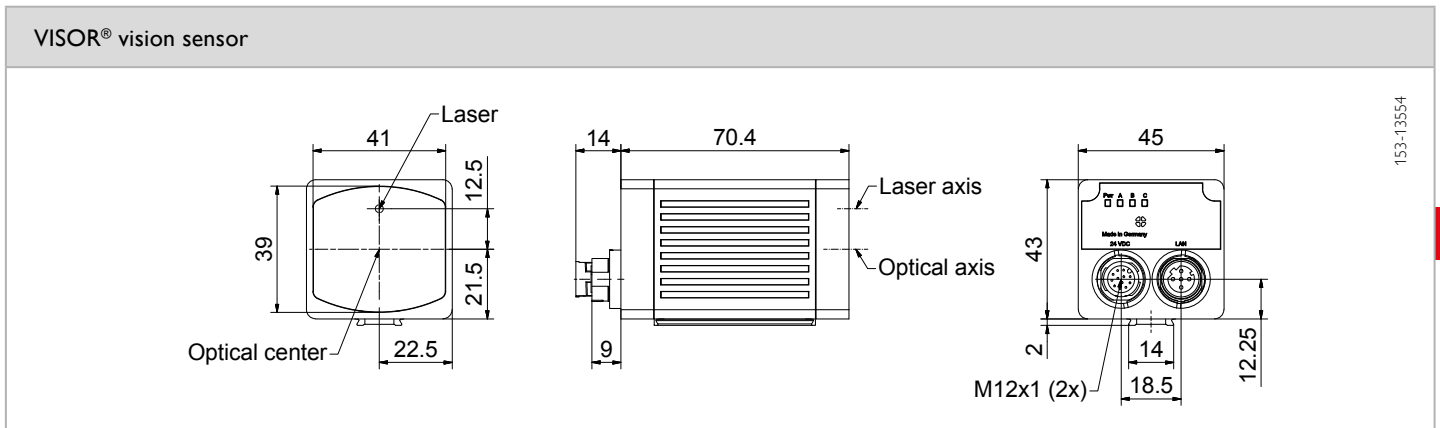


PRODUCT HIGHLIGHTS

- Calibration methods for robotics applications
- Detectors for position determination
- Result offset
- Offset of work plane
- Gripping space check

Optical data		Functions	
Resolution	800 × 600 Pixel	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/3.6", monochrome / color	Detectors	Position tracking: X/Y and orientation; Pattern matching / Contour: teach-in and detection of patterns and contours; Calliper: distance between edges; BLOB, Grey threshold, Brightness: evaluation of brightness; Contrast: evaluation of contrast;
Integrated lens, focal length [mm]	5.2 (wide)		
Pixel size	4.8 µm × 4.8 µm		
Focus	Motorized		
Adjustment range	0 mm to infinity		
Integrated illumination	White (5000 K), red (635 nm) ¹ , infrared (850 nm) ¹ LEDs		
Minimum field of view, X × Y	2 × 1 mm		
Target laser	Laser: red (635 nm) class 1  (IEC 60825-1)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ³	Dimensions	70.4 × 45 × 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Approx. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1 V / Low < 3 V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	✓		

¹ Not Color hardware ² Color hardware ³ Max. ripple < 5 V_s ⁴ 80 % air humidity, noncondensing



- Increased depth of field
- Normal depth of field

Illumination	Part number	Article number	Accessories	
White	V10-RO-A3-W-W-M2-L	631-91073	Connection cables	From Page A-46
Red	V10-RO-A3-R-W-M2-L	631-91076	Illumination	From Page A-33
Infrared	V10-RO-A3-I-W-M2-L	631-91079	Brackets	From Page A-4
			Interface accessories	From Page A-53


VISOR® V10 Robotic Advanced, medium field of view

Vision sensor for object detection, presence check, completeness check, measurement and positioning tasks

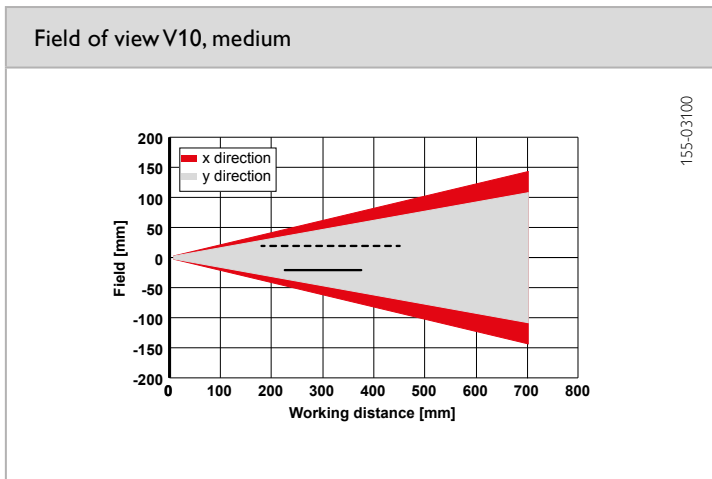
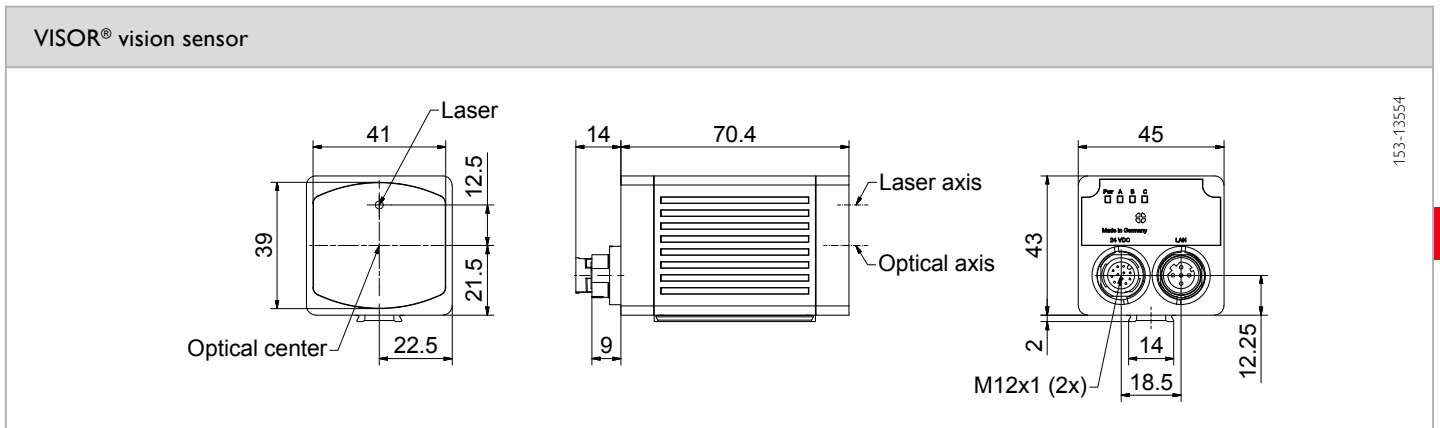


PRODUCT HIGHLIGHTS

- Calibration methods for robotics applications
- Detectors for position determination
- Result offset
- Offset of work plane
- Gripping space check

Optical data		Functions	
Resolution	800 x 600 Pixel	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/3.6", monochrome / color	Detectors	Position tracking; X/Y and orientation; Pattern matching / Contour: teach-in and detection of patterns and contours; Calliper: distance between edges; BLOB, Grey threshold, Brightness: evaluation of brightness; Contrast: evaluation of contrast;
Integrated lens, focal length [mm]	9.6 (medium)		
Pixel size	4.8 µm x 4.8 µm		
Focus	Motorized		
Adjustment range	12 mm to infinity		
Integrated illumination	White (5000 K), red (635 nm) ¹ , infrared (850 nm) ¹ LEDs		
Minimum field of view, X x Y	7 x 3 mm		
Target laser	Laser: red (635 nm) class 1  (IEC 60825-1)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ³	Dimensions	70.4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Approx. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1V / Low < 3V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	✓		

¹ Not Color hardware ² Color hardware ³ Max. ripple < 5 V_s ⁴ 80 % air humidity, noncondensing



- Increased depth of field
- Normal depth of field

Illumination	Part number	Article number	Accessories	
White	V10-RO-A3-W-M-M2-L	631-91074	Connection cables	From Page A-46
Red	V10-RO-A3-R-M-M2-L	631-91077	Illumination	From Page A-33
Infrared	V10-RO-A3-I-M-M2-L	631-91080	Brackets	From Page A-4
			Interface accessories	From Page A-53


VISOR® V10 Robotic Advanced, narrow field of view

Vision sensor for object detection, presence check, completeness check, measurement and positioning tasks

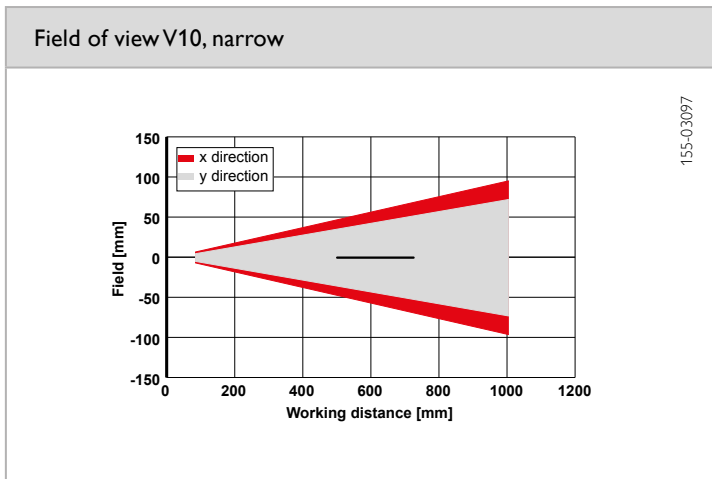
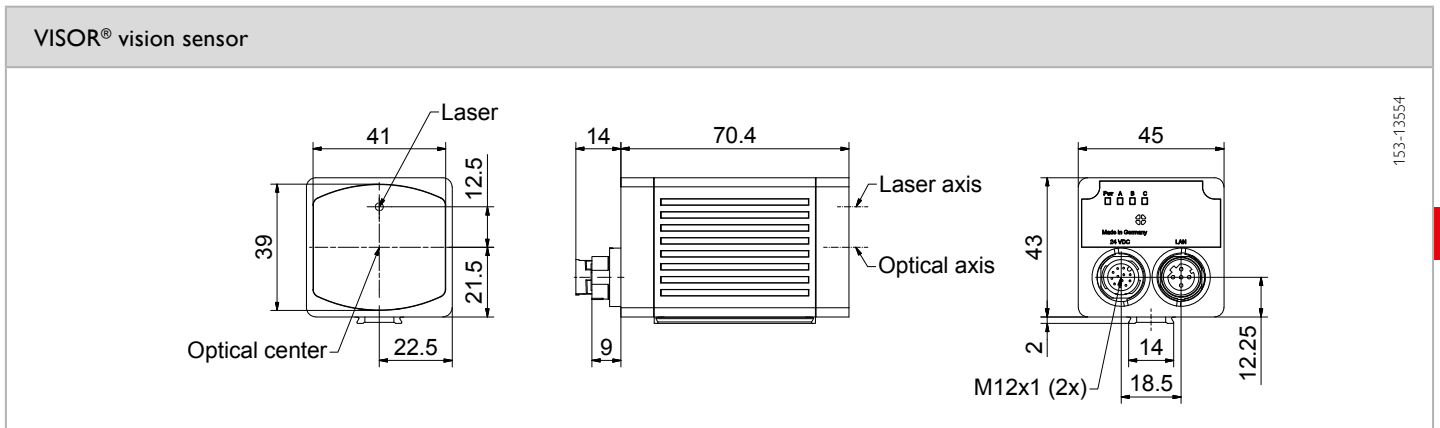


PRODUCT HIGHLIGHTS

- Calibration methods for robotics applications
- Detectors for position determination
- Result offset
- Offset of work plane
- Gripping space check

Optical data		Functions	
Resolution	800 x 600 Pixel	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/3.6", monochrome / color	Detectors	Position tracking; X/Y and orientation; Pattern matching / Contour: teach-in and detection of patterns and contours; Calliper: distance between edges; BLOB, Grey threshold, Brightness: evaluation of brightness; Contrast: evaluation of contrast;
Integrated lens, focal length [mm]	20 (narrow)		
Pixel size	4.8 µm x 4.8 µm		
Focus	Motorized		
Adjustment range	100 mm to infinity		
Integrated illumination	White (5000 K), red (635 nm) ¹ , infrared (850 nm) ¹ LEDs		
Minimum field of view, X x Y	14 x 10 mm		
Target laser	Laser: red (635 nm) class 1  (IEC 60825-1)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ³	Dimensions	70.4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Approx. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1V / Low < 3V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	✓		

¹ Not Color hardware ² Color hardware ³ Max. ripple < 5V_s ⁴ 80 % air humidity, noncondensing



— Normal depth of field

Illumination	Part number	Article number	Accessories	
White	V10-RO-A3-W-N-M2-L	631-91075	Connection cables	From Page A-46
Red	V10-RO-A3-R-N-M2-L	631-91078	Illumination	From Page A-33
Infrared	V10-RO-A3-I-N-M2-L	631-91081	Brackets	From Page A-4
			Interface accessories	From Page A-53


VISOR® V10 Robotic Advanced, C-Mount

Vision sensor for object detection, presence check, completeness check, measurement and positioning tasks

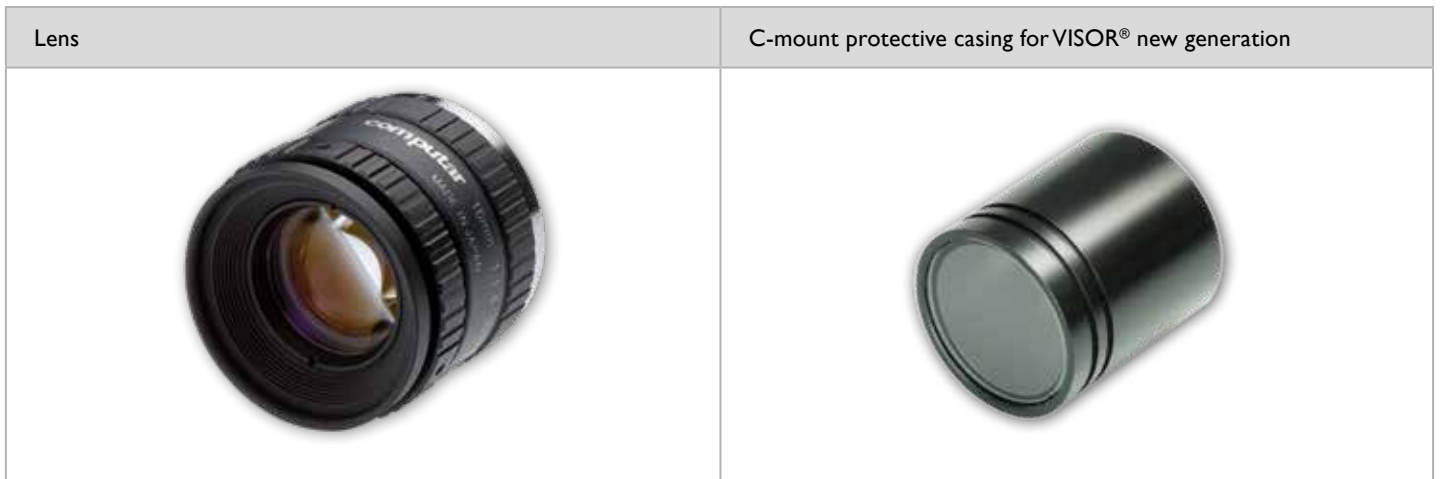
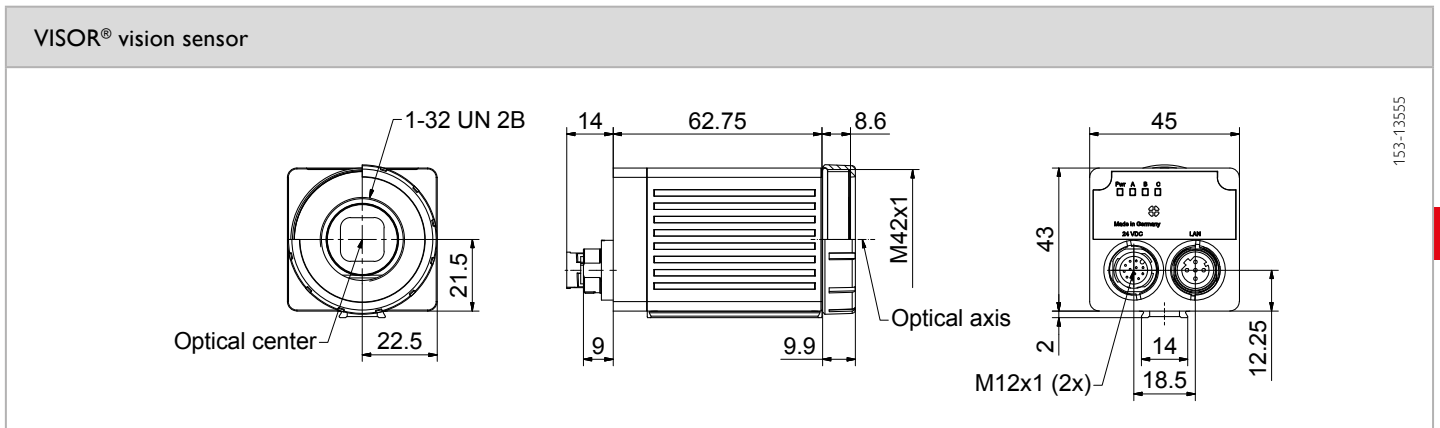


PRODUCT HIGHLIGHTS

- Calibration methods for robotics applications
- Detectors for position determination
- Result offset
- Offset of work plane
- Gripping space check

Optical data		Functions	
Resolution	800 x 600 Pixel	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/3.6", monochrome / color	Detectors	Position tracking; X/Y and orientation; Pattern matching / Contour: teach-in and detection of patterns and contours; Calliper: distance between edges; BLOB, Grey threshold, Brightness: evaluation of brightness; Contrast: evaluation of contrast;
Integrated lens, focal length [mm]	C-mount		
Pixel size	4.8 µm x 4.8 µm		
Focus	Manual		
Adjustment range	Dependent on lens		
Integrated illumination	None		
Minimum field of view, X x Y	Dependent on lens		
Target laser	Laser: red (635 nm) class 1  (IEC 60825-1)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ²	Dimensions	70.4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65 ³
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Approx. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ⁴
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1V / Low < 3V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	✓		

¹ Color hardware ² Max. ripple < 5V_{SS} ³ only with protective casing ⁴ 80 % air humidity, noncondensing



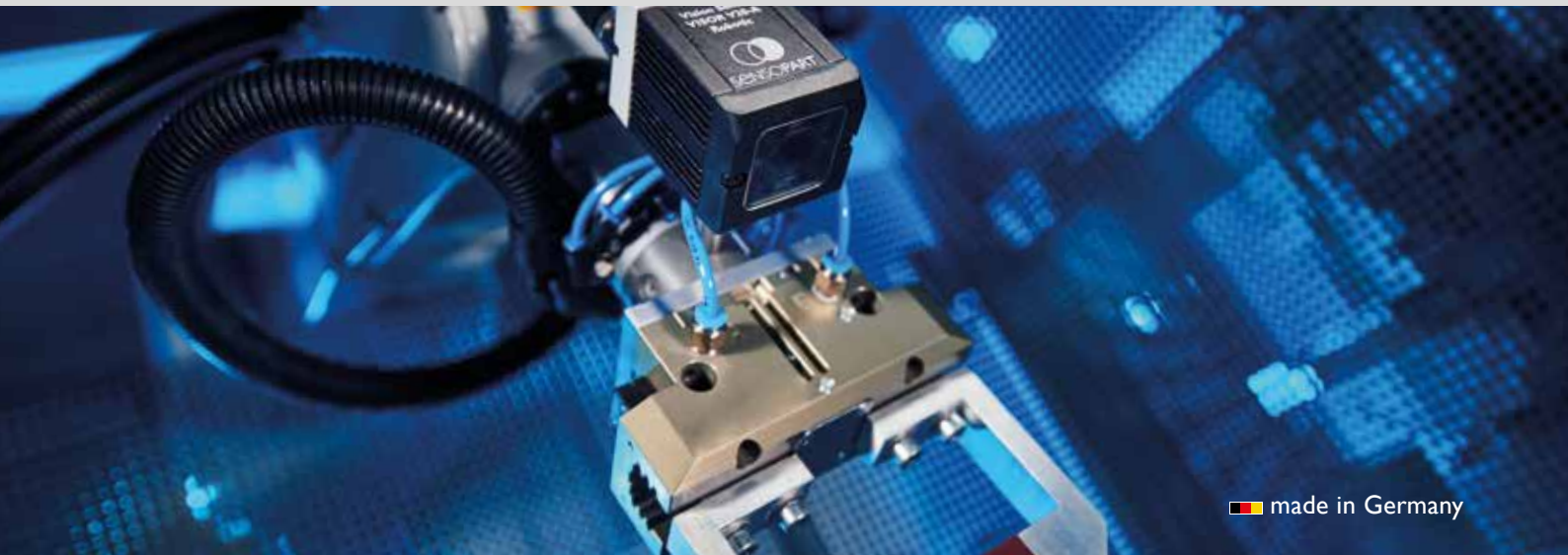
Part number	Article number
LPTVxx-G37.5	651-01006
LPTVxx-25.0	651-01007


	LO C 8	LO C 12	LO C 16	LO C 25	LO C 35	LO C 50	LO C 75
Focal length	8 mm	12 mm	16 mm	25 mm	35 mm	50 mm	75 mm
Article number	526-51513	526-51514	526-51515	526-51516	526-51525	526-51113	526-51116

Part number	Article number	Accessories
V10-RO-A3-C-2	631-91082	<ul style="list-style-type: none"> Connection cables Illumination Lenses Brackets Interface accessories
		<ul style="list-style-type: none"> From Page A-46 From Page A-33 From Page A-28 From Page A-4 From Page A-53

VISOR® Robotic

An eye on everything – the Vision sensor for robotics applications



 made in Germany



The VISOR® Robotic detects the component's position in a universal tray. It can then be reliably removed. Up to 255 configurations enable utmost production flexibility.



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

HIGHLIGHTS OF VISOR® ROBOTIC

- User-friendly configuration and display software
- Different detectors for locating up to 10,000 components
- Gripping space check – check for available space around gripper
- Result offset correction in VISOR® software for simple adjustment of gripper point
- Two calibration methods for robotics applications:
 - Calibration plate: simple, fast and precise
 - Point pair list: considerable flexibility when selecting calibration object and field of view
- Offset of work plane through Z-offset function
- Integrated and standardised interfaces (PROFINET, EtherNet/IP, TCP/IP)
- Flexible output protocol
- The right version for every application
 - Different resolutions
 - Focal length of 6 mm to 75 mm
 - Monochrome and color version

Picking up components

Feeding systems in a production line are becoming increasingly versatile – in addition to universal trays, components can be supplied with utmost flexibility using hopper feeders. Thanks to the VISOR® Robotic, components can be reliably located and gripped with both feed options. When loose components are supplied, the sensor not only checks their position but also inspects the free space around the gripper. The VISOR® determines both sets of information and sends them to the robot controller via one of the integrated and standardised process interfaces. The process is managed on the basis of this information – the object is gripped or the feeder is triggered. The application can also be flexibly adapted to individual goods carriers without the need for a costly centring device. The VISOR® detects the position and the fill level of the tray and transmits this information to the robot. If the camera is mounted in a stationary manner, this is cycle time-neutral.

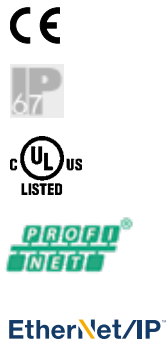
Placing parts

What happens after components have been reliably collected by the gripper? The VISOR® Robotic also supplies important information for the next work steps, and demonstrates its skills in robot-controlled applications, such as the placing of screws, the mounting of clips or the application of glue. The detection of component positions is carried out effortlessly; this allows the correction of any offset and increases the quality of production. Knowledge of the exact position of a component ensures, for example, the precise insertion of a windscreen. Mechanical effort is reduced, and the production line becomes even more flexible. The VISOR® Robotic concept enables direct communication between the VISOR® and the robot, an additional instance is no longer necessary for many applications.

VISOR® Robotic – product overview					
	Product variant	Resolution	Focal length	Integrated illumination	Page
V20-RO-A2-xxx	Advanced	1280 x 1024 pixels	12 mm	White, red or infrared LEDs	186
V20-RO-A2-xxx	Advanced	1280 x 1024 pixels	C-mount	None	188
V10-RO-A2-xxx	Advanced	736 x 480 pixels	6 mm	White, red or infrared LEDs	190
V10-RO-A2-xxx	Advanced	736 x 480 pixels	12 mm	White, red or infrared LEDs	192
V10-RO-A2-xxx	Advanced	736 x 480 pixels	25 mm	White, red, or infrared LEDs	194
V10-RO-A2-xxx	Advanced	736 x 480 pixels	C-Mount	None	196
V20C-RO-A2-xxx	Advanced	1280 x 1024 pixels	12 mm	White LEDs	198
V20C-RO-A2-xxx	Advanced	1280 x 1024 pixels	C-mount	None	200

VISOR® V20 Robotic

Advanced vision sensor for robotics applications, 12 mm



PRODUCT HIGHLIGHTS

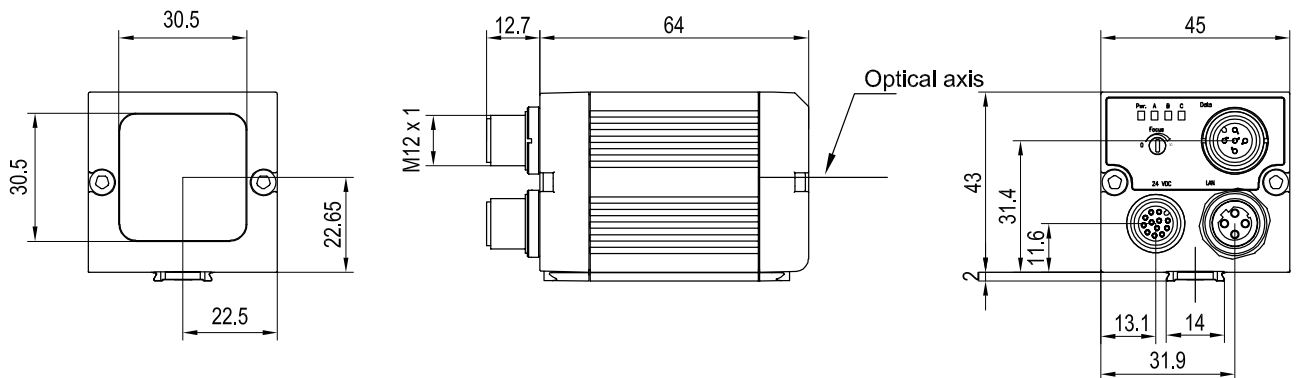
- Different detectors for locating up to 10,000 components
- Gripping space check – check for available space around gripper
- Result offset correction in VISOR® software for simple adjustment of gripper point
- Two calibration methods for robotics applications
- Offset of work plane through Z-offset function
- High-precision analysis due to 1.3 megapixel resolution

Optical data		Functions	
Resolution	1280 × 1024 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/1.8", monochrome	Special functions	Calibration plate (Robot) Point pair list (Robot) Z-Offset Gripping space check Result offset correction
Integrated lens, focal length	12 mm, adjustable focal position	Detectors	Contour; pattern comparison, calliper; BLOB, contrast, brightness, grey level
Adjustment range	30 mm to infinity	Properties	Position tracking: X/Y and orientation; pattern comparison / contour: teach-in and detection of patterns and contours; calliper: distance between edges; BLOB, grey threshold, brightness; evaluation of brightness; contrast: evaluation of contrast
Integrated illumination	White, red, infrared LEDs	Typical cycle times	same as VISOR® V20 Object sensor
Minimum field of view, X × Y	16 × 13 mm ²		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4V DC ¹	Dimensions	65 × 45 × 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 67
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Approx. 13 s after Power on	Ambient temperature: operation	0 ... +50° C ²
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60° C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Approx. 160 g
Inputs	PNP/NPN High > U _B -1V, Low < 3V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

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

Illumination	Part number	Article number
White	V20-RO-A2-W12	536-91047
Red	V20-RO-A2-R12	536-91048
Infrared	V20-RO-A2-I12	536-91049

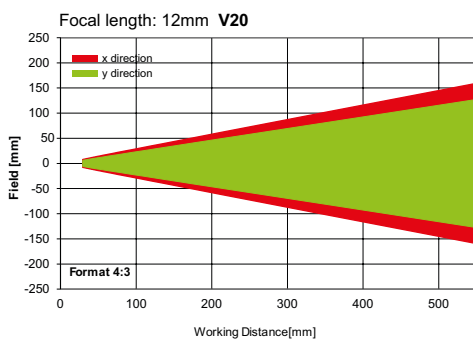
VISOR® vision sensor



153-00911

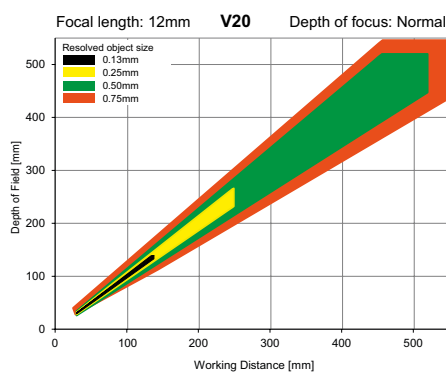
3

Field of view



155-01637

Depth of field: normal



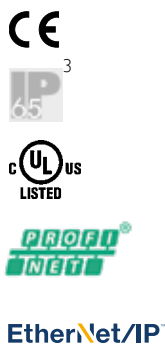
155-01636

Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53
Calibration	From Page A-44

VISOR® V20 Robotic

Advanced vision sensor for robotics applications, C-mount



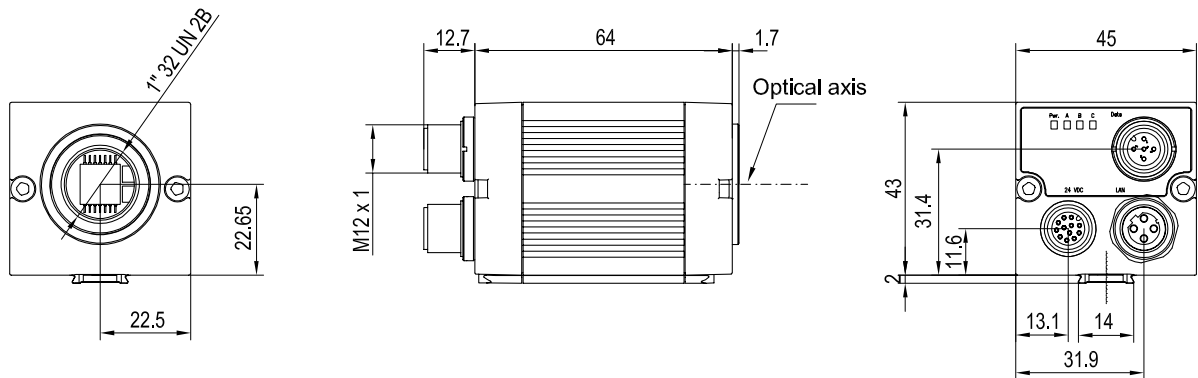
PRODUCT HIGHLIGHTS

- Different detectors for locating up to 10,000 components
- Gripping space check – check for available space around gripper
- Result offset correction in VISOR® software for simple adjustment of gripper point
- Two calibration methods for robotics applications
- Offset of work plane through Z-offset function
- High-precision analysis due to 1.3 megapixel resolution

Optical data		Functions	
Resolution	1280 x 1024 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/1.8", color	Special functions	Calibration plate (Robot) Point pair list (Robot) Z-Offset Gripping space check Result offset correction
Integrated lens, focal length	C-Mount	Detectors	Contour; pattern comparison, calliper; BLOB, contrast, brightness, grey level
Adjustment range	Dependent on lens	Properties	Position tracking: X/Y and orientation; pattern comparison / contour: teach-in and detection of patterns and contours; calliper: distance between edges; BLOB, grey threshold, brightness: evaluation of brightness; contrast: evaluation of contrast
Integrated illumination	None	Typical cycle times	same as VISOR® V20 Object sensor
Minimum field of view, X x Y	Dependent on lens		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4V DC ¹	Dimensions	65 x 45 x 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 65 ³
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Approx. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ²
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Approx. 160 g
Inputs	PNP/NPN High > U _B -1V, Low < 3V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

¹ Max. ripple < 5V_{SS} ² 80 % air humidity, non-condensing ³ With LPT45 C-mount protective casing

Part number	Article number
V20-RO-A2-C	536-91053

VISOR® vision sensor


153-00912

3

Lens

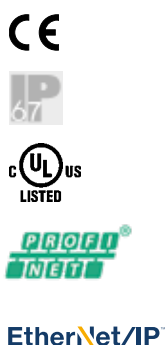

	LO C 8	LO C 12	LO C 16	LO C 25	LO C 35	LO C 50	LO C 75
Focal length	8 mm	12 mm	16 mm	25 mm	35 mm	50 mm	75 mm
Article number	526-51513	526-51514	526-51515	526-51516	526-51525	526-51113	526-51116

Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Lenses	From Page A-28
Brackets	From Page A-4
Interface accessories	From Page A-53
Calibration	From Page A-44

VISOR® V10 Robotic

Advanced vision sensor for robotics applications, 6 mm



PRODUCT HIGHLIGHTS

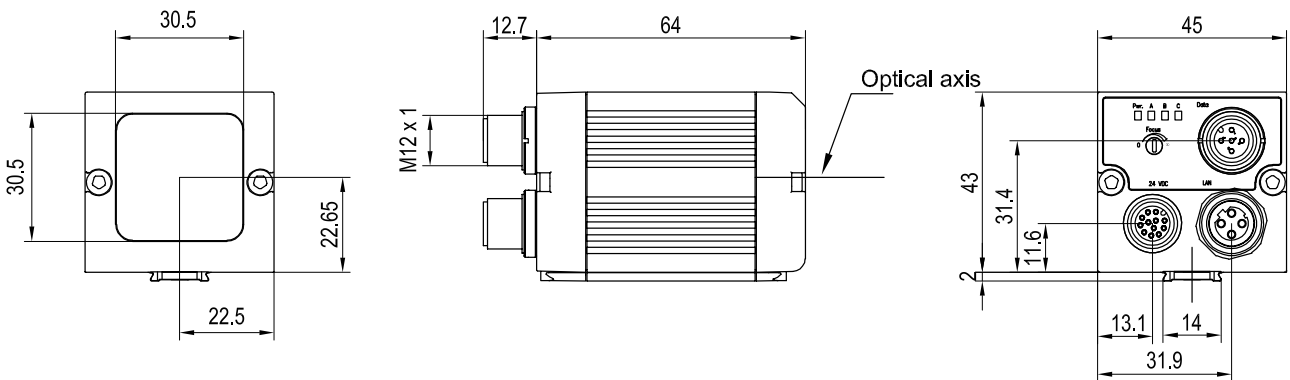
- Different detectors for locating up to 10,000 components
- Gripping space check – check for available space around gripper
- Result offset correction in VISOR® software for simple adjustment of gripper point
- Two calibration methods for robotics applications
- Offset of work plane through Z-offset function
- High-precision analysis due to WVGA resolution

Optical data		Functions	
Resolution	736 x 480 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/3", monochrome	Special functions	Calibration plate (Robot) Point pair list (Robot) Z-Offset Gripping space check Result offset correction
Integrated lens, focal length	6 mm, adjustable focal position	Detectors	Contour, pattern comparison, calliper, BLOB, contrast, brightness, grey level
Adjustment range	6 mm to infinity	Properties	Position tracking: X/Y and orientation; pattern comparison / contour: teach-in and detection of patterns and contours; calliper: distance between edges; BLOB, grey threshold, brightness: evaluation of brightness; contrast: evaluation of contrast
Integrated illumination	White, red, infrared LEDs	Typical cycle times	same as VISOR® V10 Object sensor
Minimum field of view, X x Y	5 x 4 mm ²		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4 V DC ¹	Dimensions	65 x 45 x 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 67
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Approx. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ²
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Approx. 160 g
Inputs	PNP/NPN High > U _B -1 V, Low < 3 V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4 V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoVweb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

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

Illumination	Depth of field	Part number	Article number
White	Normal	V10-RO-A2-W6	535-91123
Red	Normal	V10-RO-A2-R6	535-91124
Infrared	Normal	V10-RO-A2-I6	535-91125

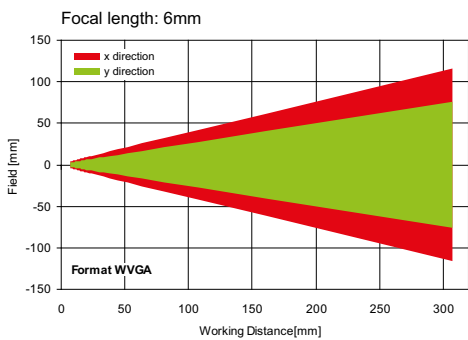
VISOR® vision sensor



153-00911

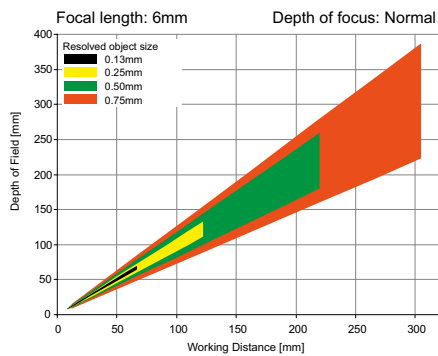
3

Field of view



155-01422

Depth of field: normal



155-01409

Depth of field: enhanced

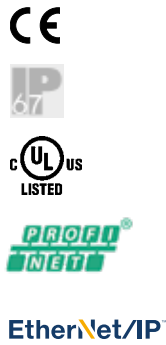
155-01421

Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53
Calibration	From Page A-44

VISOR® V10 Robotic

Advanced vision sensor for robotics applications, 12 mm



PRODUCT HIGHLIGHTS

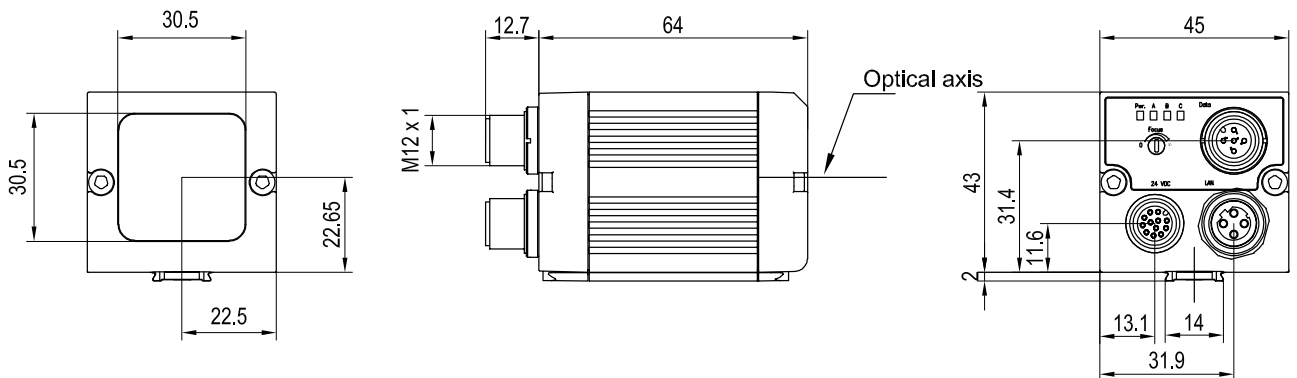
- Different detectors for locating up to 10,000 components
- Gripping space check – check for available space around gripper
- Result offset correction in VISOR® software for simple adjustment of gripper point
- Two calibration methods for robotics applications
- Offset of work plane through Z-offset function
- High-precision analysis due to WVGA resolution

Optical data		Functions	
Resolution	736 x 480 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/3", monochrome	Special functions	Calibration plate (Robot) Point pair list (Robot) Z-Offset Gripping space check Result offset correction
Integrated lens, focal length	12 mm, adjustable focal position	Detectors	Contour, pattern comparison, calliper, BLOB, contrast, brightness, grey level
Adjustment range	30 mm to infinity	Properties	Position tracking: X/Y and orientation; pattern comparison / contour: teach-in and detection of patterns and contours; calliper: distance between edges; BLOB, grey threshold, brightness; evaluation of brightness; contrast: evaluation of contrast
Integrated illumination	White, red, infrared LEDs	Typical cycle times	same as VISOR® V10 Object sensor
Minimum field of view, X x Y	8 x 6 mm ²		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4 V DC ¹	Dimensions	65 x 45 x 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 67
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Approx. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ²
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Approx. 160 g
Inputs	PNP/NPN High > U _B -1V, Low < 3V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 2 selectable inputs/outputs		

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

Illumination	Depth of field	Part number	Article number
White	Normal	V10-RO-A2-W12	535-91116
Red	Normal	V10-RO-A2-R12	535-91117
Infrared	Normal	V10-RO-A2-I12	535-91118

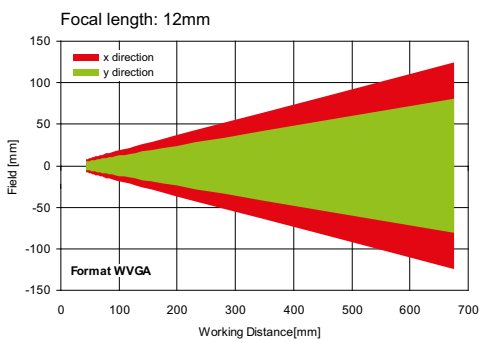
VISOR® vision sensor



153-00911

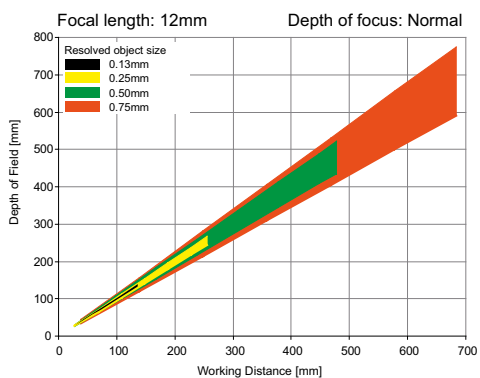
3

Field of view



155-01423

Depth of field: normal



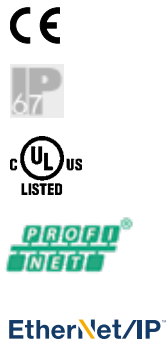
155-01410

Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53
Calibration	From Page A-44

VISOR® V10 Robotic

Advanced vision sensor for robotics applications, 25 mm



PRODUCT HIGHLIGHTS

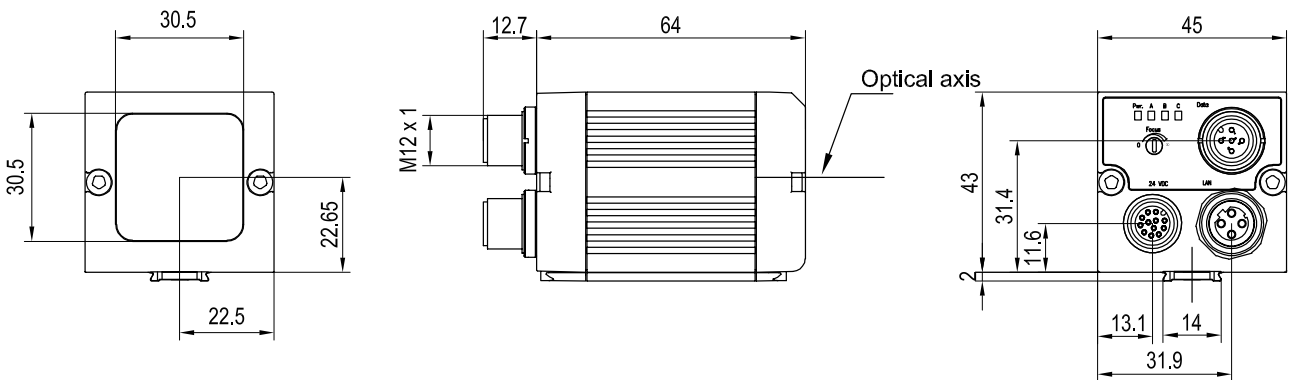
- Different detectors for locating up to 10,000 components
- Gripping space check – check for available space around gripper
- Result offset correction in VISOR® software for simple adjustment of gripper point
- Two calibration methods for robotics applications
- Offset of work plane through Z-offset function
- High-precision analysis due to WVGA resolution

Optical data		Functions	
Resolution	736 x 480 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/3", monochrome	Special functions	Calibration plate (Robot) Point pair list (Robot) Z-Offset Gripping space check Result offset correction
Integrated lens, focal length	25 mm, adjustable focal position	Detectors	Contour; pattern comparison, calliper; BLOB, contrast, brightness, grey level
Adjustment range	140 mm to infinity	Properties	Position tracking; X/Y and orientation; pattern comparison / contour: teach-in and detection of patterns and contours; calliper: distance between edges; BLOB, grey threshold, brightness: evaluation of brightness; contrast: evaluation of contrast
Integrated illumination	White, red, infrared LEDs	Typical cycle times	same as VISOR® V10 Object sensor
Minimum field of view, X x Y	18 x 14 mm ²		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4 V DC ¹	Dimensions	65 x 45 x 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 67
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Approx. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ²
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Approx. 160 g
Inputs	PNP/NPN High > U _B -1 V, Low < 3 V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoVWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

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

Illumination	Depth of field	Part number	Article number
White	Normal	V10-RO-A2-W25	535-91119
Red	Normal	V10-RO-A2-R25	535-91120
Infrared	Normal	V10-RO-A2-I25	535-91121

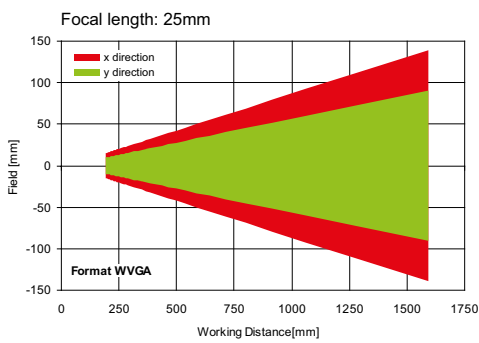
VISOR® vision sensor



153-00911

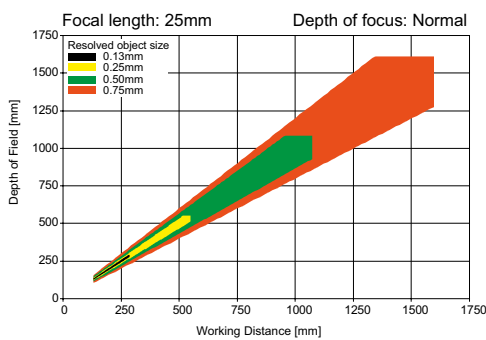
3

Field of view



155-01424

Depth of field: normal



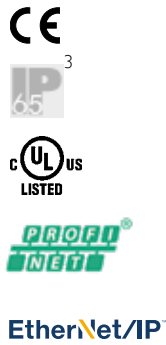
155-01412

Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53
Calibration	From Page A-44

VISOR® V10 Robotic

Advanced vision sensor for robotics applications, C-mount



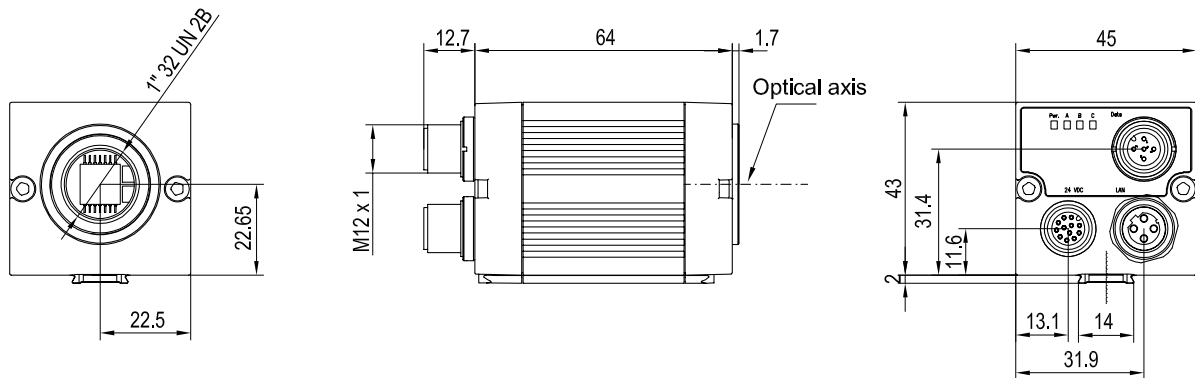
PRODUCT HIGHLIGHTS

- Different detectors for locating up to 10,000 components
- Gripping space check – check for available space around gripper
- Result offset correction in VISOR® software for simple adjustment of gripper point
- Two calibration methods for robotics applications
- Offset of work plane through Z-offset function
- High-precision analysis due to WVGA resolution

Optical data		Functions	
Resolution	736 x 480 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/3", monochrome	Special functions	Calibration plate (Robot) Point pair list (Robot) Z-Offset Gripping space check Result offset correction
Integrated lens, focal length	C-Mount	Detectors	Contour; pattern comparison; calliper; BLOB; contrast; brightness; grey level
Adjustment range	Dependent on lens	Properties	Position tracking; X/Y and orientation; pattern comparison / contour: teach-in and detection of patterns and contours; calliper: distance between edges; BLOB, grey threshold, brightness: evaluation of brightness; contrast: evaluation of contrast
Integrated illumination	None	Typical cycle times	same as VISOR® V10 Object sensor
Minimum field of view, X x Y	Dependent on lens		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4 V DC ¹	Dimensions	65 x 45 x 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 65 ³
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Approx. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ²
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Approx. 160 g
Inputs	PNP/NPN High > U _B -1 V, Low < 3 V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

¹ Max. ripple < 5 V_{SS} ² 80 % air humidity, non-condensing ³ With LPT45 C-mount protective casing

Part number	Article number
V10-RO-A2-C	535-91122

VISOR® vision sensor


153-00912

3

Lens

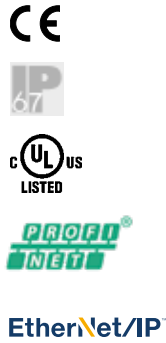

	LO C 8	LO C 12	LO C 16	LO C 25	LO C 35	LO C 50	LO C 75
Focal length	8 mm	12 mm	16 mm	25 mm	35 mm	50 mm	75 mm
Article number	526-51513	526-51514	526-51515	526-51516	526-51525	526-51113	526-51116

Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Lenses	From Page A-28
Brackets	From Page A-4
Interface accessories	From Page A-53
Calibration	From Page A-44

VISOR® V20C Robotic Color

Advanced vision sensor for robotics applications, color, 12 mm



PRODUCT HIGHLIGHTS

- Different detectors for locating up to 10,000 components
- Gripping space check – check for available space around gripper
- Result offset correction in VISOR® software for simple adjustment of gripper point
- Two calibration methods for robotics applications
- Offset of work plane through Z-offset function
- High-precision analysis due to 1.3 megapixel color resolution

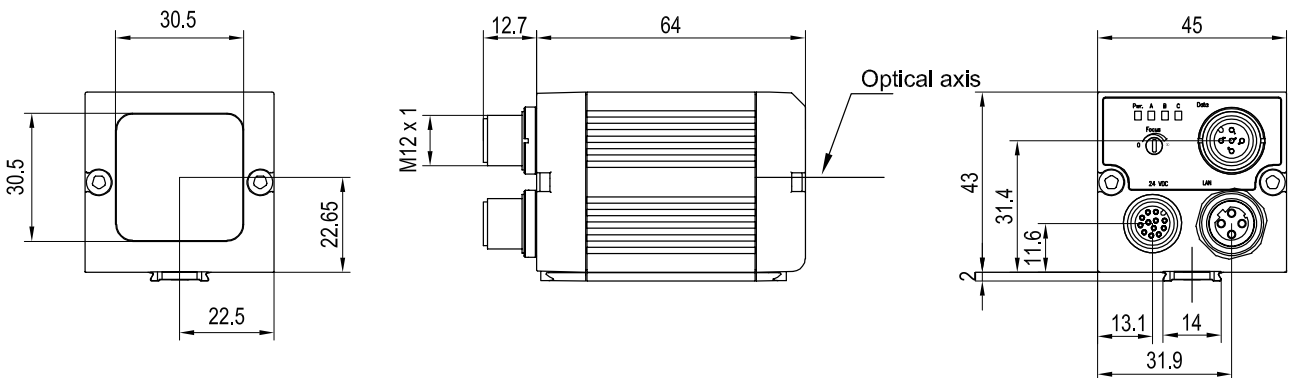
Optical data		Functions	
Resolution	1280 × 1024 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/1.8", color	Special functions	Calibration plate (Robot) Point pair list (Robot) Z-Offset Gripping space check Result offset correction Virtual color filter
Integrated lens, focal length	12 mm, adjustable focal position	Detectors	Contour; pattern comparison, calliper; BLOB, contrast, brightness, grey level
Adjustment range	30 mm to infinity	Properties	Position tracking: X/Y and orientation; pattern comparison / contour: teach-in and detection of patterns and contours; calliper: distance between edges; BLOB, grey threshold, brightness; evaluation of brightness; contrast: evaluation of contrast
Integrated illumination	White LEDs	Typical cycle times	same as VISOR® Color V20C
Minimum field of view, X × Y	16 × 13 mm ²		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4V DC ¹	Dimensions	65 × 45 × 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 67
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Approx. 13 s after Power on	Ambient temperature: operation	0 ... +50° C ²
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60° C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Approx. 160 g
Inputs	PNP/NPN High > U _B -1V, Low < 3V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

¹ Max. ripple < 5V_{SS}

² 80 % air humidity, non-condensing

Illumination	Part number	Article number
White	V20C-RO-A2-W12	536-91051

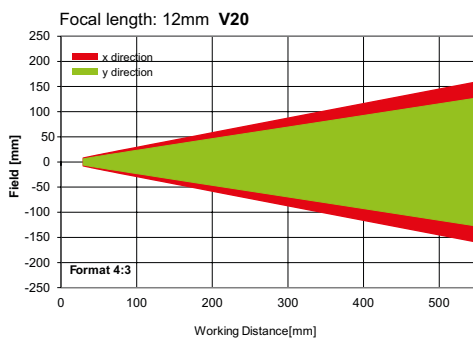
VISOR® vision sensor



153-00911

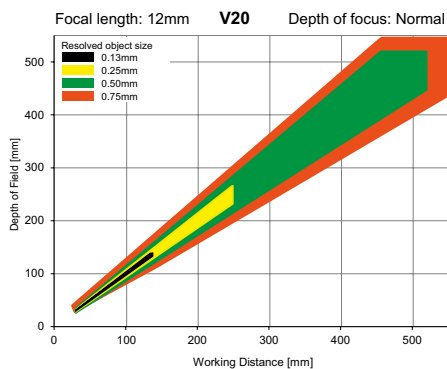
3

Field of view



155-01637

Depth of field: normal



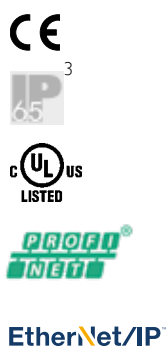
155-01636

Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53
Calibration	From Page A-44

VISOR® V20C Robotic Color

Advanced vision sensor for robotics applications, color, C-mount



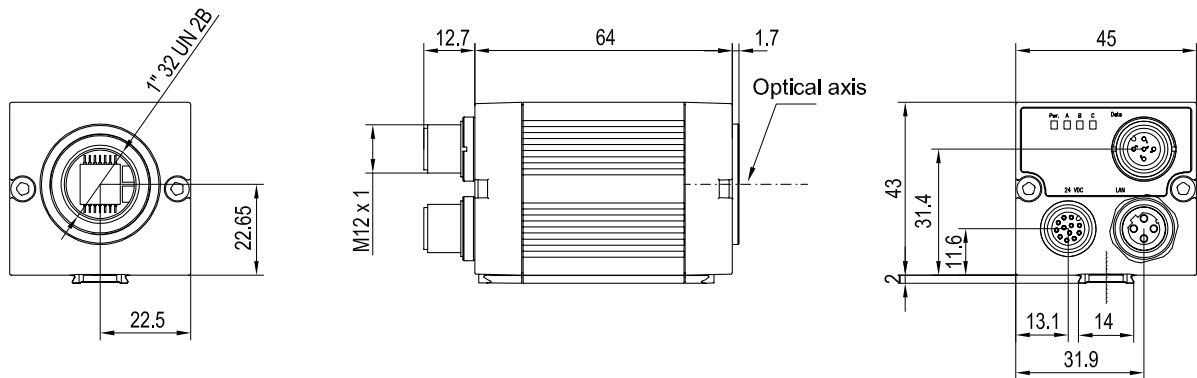
PRODUCT HIGHLIGHTS

- Different detectors for locating up to 10,000 components
- Gripping space check – check for available space around gripper
- Result offset correction in VISOR® software for simple adjustment of gripper point
- Two calibration methods for robotics applications
- Offset of work plane through Z-offset function
- High-precision analysis due to 1.3 megapixel color resolution

Optical data		Functions	
Resolution	1280 x 1024 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/1.8", color	Special functions	Calibration plate (Robot) Point pair list (Robot) Z-Offset Gripping space check Result offset correction Virtual color filter
Integrated lens, focal length	C-Mount	Detectors	Contour; pattern comparison, calliper; BLOB; contrast; brightness; grey level
Adjustment range	Dependent on lens	Properties	Position tracking: X/Y and orientation; pattern comparison / contour: teach-in and detection of patterns and contours; calliper: distance between edges; BLOB; grey threshold; brightness: evaluation of brightness; contrast: evaluation of contrast
Integrated illumination	None	Typical cycle times	same as VISOR® Color V20C
Minimum field of view, X x Y	Dependent on lens		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4V DC ¹	Dimensions	65 x 45 x 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 65 ³
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power-On Delay	Approx. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ²
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Approx. 160 g
Inputs	PNP/NPN High > U _B -1 V, Low < 3 V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4 V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

¹ Max. ripple < 5V_{SS} ² 80 % air humidity, non-condensing ³ With LPT45 C-mount protective casing

Part number	Article number
V20C-RO-A2-C	536-91050

VISOR® vision sensor


153-00912

3

Lens


	LO C 8	LO C 12	LO C 16	LO C 25	LO C 35	LO C 50	LO C 75
Focal length	8 mm	12 mm	16 mm	25 mm	35 mm	50 mm	75 mm
Article number	526-51513	526-51514	526-51515	526-51516	526-51525	526-51113	526-51116

Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Lenses	From Page A-28
Brackets	From Page A-4
Interface accessories	From Page A-53
Calibration	From Page A-44

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 on to 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.

The VISOR® Code Reader Standard offers suitable tools for easily readable barcodes and data matrix codes (e.g. printed). The Advanced or Professional versions provide high-performance reading algorithms for difficult codes (e.g. directly marked).

HIGHLIGHTS OF VISOR® CODE READER

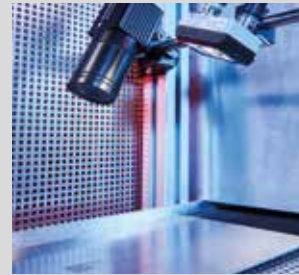
- Reliably reads barcodes as well as printed and directly marked data matrix codes, and even several codes simultaneously and mixed 1D/2D codes
- Supplementary object detection for characteristics other than codes
- Evaluation of quality parameters according to ISO/IEC 15415 and AIM DPM 2006
- Flexible definition of output data (header; trailer; user data)
- String comparison with message via the digital switching output
- EtherNet/IP PROFINET (conformance class B), EtherNet (TCP/IP) supported
- Comprehensive options for archiving images and data
- Optical character recognition



Printed barcodes



Code on shiny metallic surface



Dot-peened code with external lighting



*A lot of information in a small space:
up to 2,334 ASCII symbols (7 bit) or
3,116 digits can be coded with an
ECC-200 data matrix code.*

VISOR® Code Reader – product overview					
	Product variant	Resolution	Focal length	Integrated lighting	Page
V20-CR-A3-xxx	Advanced	1440 × 1080	wide	White, red or infrared LEDs	228
V20-CR-A3-xxx	Advanced		medium	White, red or infrared LEDs	230
V20-CR-A3-xxx	Advanced		narrow	White, red or infrared LEDs	232
V20-CR-A3-C-2	Advanced		C-mount	None	234
V20-CR-P3-xxx	Professional	1440 × 1080	wide	White, red or infrared LEDs	236
V20-CR-P3-xxx	Professional		medium	White, red or infrared LEDs	238
V20-CR-P3-xxx	Professional		narrow	White, red or infrared LEDs	240
V20-CR-P3-C-2	Professional		C-mount	None	242
V10-CR-S3-xxx	Standard	800 × 600	wide	White, red or infrared LEDs	244
V10-CR-S3-xxx	Standard		medium	White, red or infrared LEDs	246
V10-CR-S3-xxx	Standard		narrow	White, red or infrared LEDs	248
V10-CR-A3-xxx	Advanced	800 × 600	wide	White, red or infrared LEDs	250
V10-CR-A3-xxx	Advanced		medium	White, red or infrared LEDs	252
V10-CR-A3-xxx	Advanced		narrow	White, red or infrared LEDs	254
V10-CR-A3-C-2	Advanced		C-mount	None	256
V10-CR-P3-xxx	Professional	800 × 600	wide	White, red or infrared LEDs	258
V10-CR-P3-xxx	Professional		medium	White, red or infrared LEDs	260
V10-CR-P3-xxx	Professional		narrow	White, red or infrared LEDs	262
V10-CR-P3-C-2	Professional		C-mount	None	264


VISOR® V20 Code Reader Advanced, wide field of view

Multi-Code Reader for 1D and 2D codes

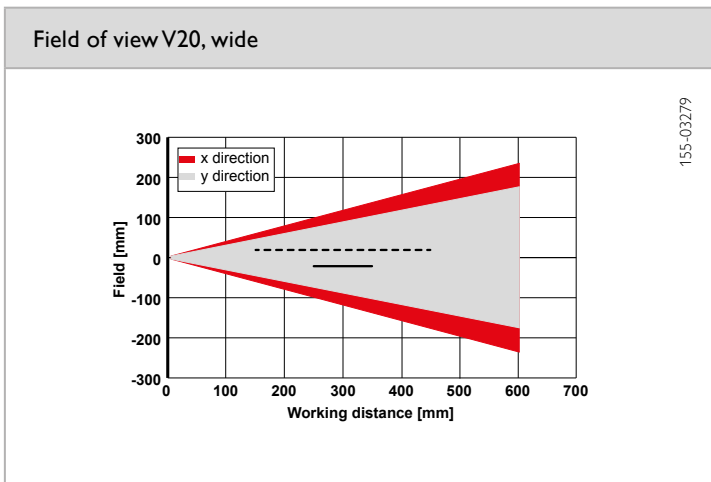
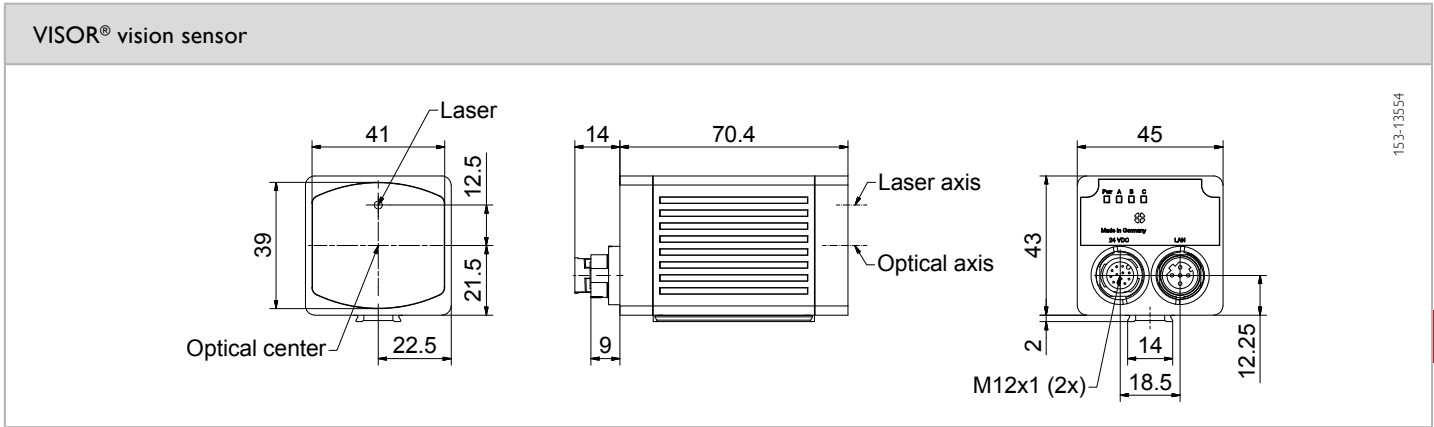


PRODUCT HIGHLIGHTS

- Can be used for all common 2D codes (ECC 200 data matrix) and common 1D bar codes
- Reliable detection of even poorly readable codes under difficult ambient conditions
- Comprehensive tools for flexible and easy connection to PC and PLC environments
- Reading of several similar or differing types of codes in one reading pass

Optical data		Functions	
Resolution	1440 x 1080 pixels	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/2.9", monochrome	Detectors	Barcode: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; Datacode: reading 2D codes: ECC200, QR code, PDF 417, GS1
Integrated lens, focal length [mm]	6.5 (wide)		
Pixel size	3.45 µm x 3.45 µm		
Focus	Motorized		
Adjustment range	10 mm to infinity		
Integrated illumination	White (5000 K), red (635 nm), infrared (850 nm) LEDs		
Minimum field of view, X x Y	6 x 4 mm		
Target laser	Laser: red (635 nm) class 1  (IEC 60825-1)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30V DC ¹	Dimensions	70.4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Ca. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ²
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1V / Low < 3V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces VISOR® V20-CR-Advanced	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	✓		

¹ Max. ripple < 5V_{SS} ² 80 % air humidity, noncondensing



- Increased depth of field
- Normal depth of field

illumination	Part number	Article number	Accessories	
White	V20-CR-A3-W-W-M2-L	632-91045	Connection cables	From Page A-46
White	V20-CR-A3-W-WD-M2-L	632-91094	Illumination	From Page A-33
Red	V20-CR-A3-R-W-M2-L	632-91048	Brackets	From Page A-4
Red	V20-CR-A3-R-WD-M2-L	632-91096	Interface accessories	From Page A-53
Infrared	V20-CR-A3-I-W-M2-L	632-91051		
Infrared	V20-CR-A3-I-WD-M2-L	632-91098		


VISOR® V20 Code Reader Advanced, medium field of view

Multi-Code Reader for 1D and 2D codes

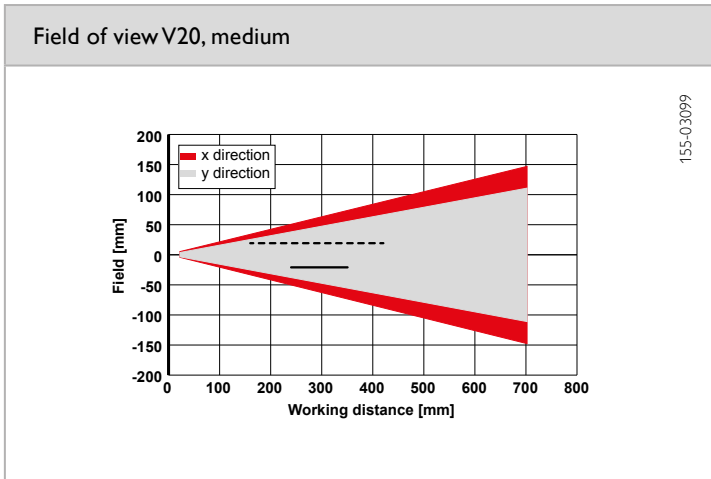
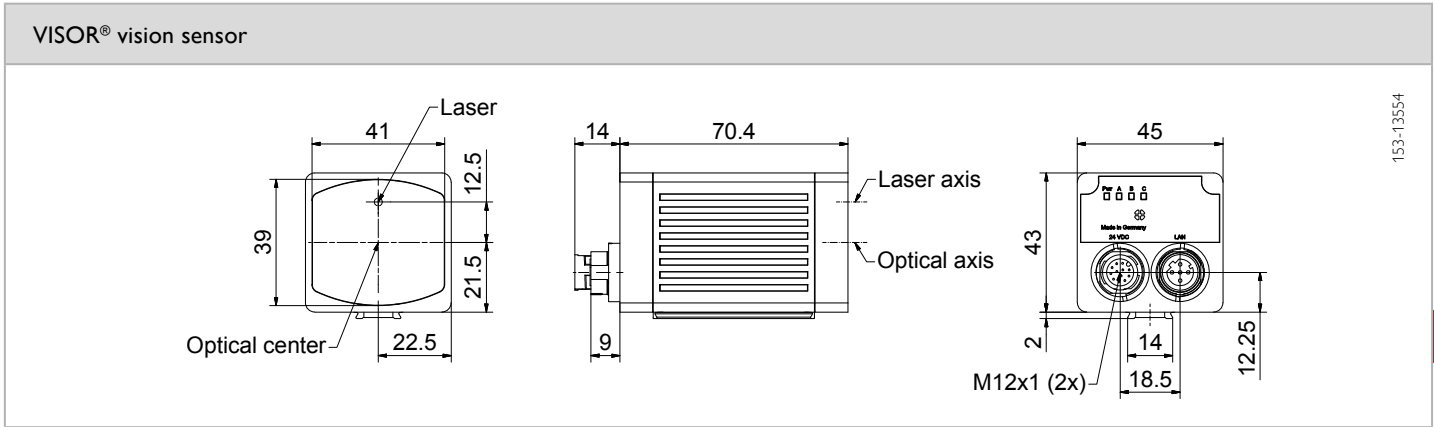


PRODUCT HIGHLIGHTS

- Can be used for all common 2D codes (ECC 200 data matrix) and common 1D bar codes
- Reliable detection of even poorly readable codes under difficult ambient conditions
- Comprehensive tools for flexible and easy connection to PC and PLC environments
- Reading of several similar or differing types of codes in one reading pass

Optical data		Functions	
Resolution	1440 × 1080 Pixel	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/2.9", monochrome	Detectors	Barcode: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; Datacode: reading 2D codes: ECC200, QR code, PDF 417, GS1
Integrated lens, focal length [mm]	12 (medium)		
Pixel size	3.45 µm × 3.45 µm		
Focus	Motorized		
Adjustment range	25 mm to infinity		
Integrated illumination	White (5000 K), red (635 nm), infrared (850 nm) LEDs		
Minimum field of view, X × Y	10 × 8 mm		
Target laser	Laser: red (635 nm) class 1  (IEC 60825-1)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ¹	Dimensions	70.4 × 45 × 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Ca. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ²
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1 V / Low < 3 V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
VISOR® V20-CR-Advanced		Shock resistance	EN 60068-2-27
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs		
Encoder	✓		

¹ Max. ripple < 5V_{SS} ² 80 % air humidity, noncondensing



- Increased depth of field
- Normal depth of field

Illumination	Part number	Article number	Accessories	
White	V20-CR-A3-W-M-M2-L	632-91046	Connection cables	From Page A-46
White	V20-CR-A3-W-MD-M2-L	632-91095	Illumination	From Page A-33
Red	V20-CR-A3-R-M-M2-L	632-91049	Brackets	From Page A-4
Red	V20-CR-A3-R-MD-M2-L	632-91078	Interface accessories	From Page A-53
Infrared	V20-CR-A3-I-M-M2-L	632-91052		
Infrared	V20-CR-A3-I-MD-M2-L	632-91099		


VISOR® V20 Code Reader Advanced, narrow field of view

Multi-Code Reader for 1D and 2D codes

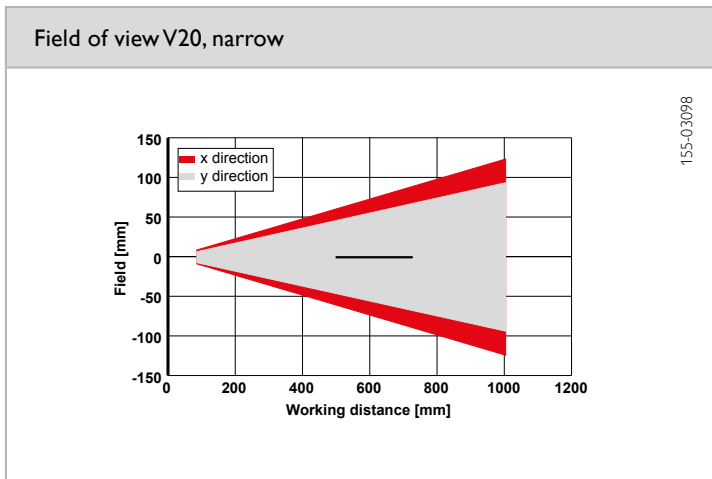
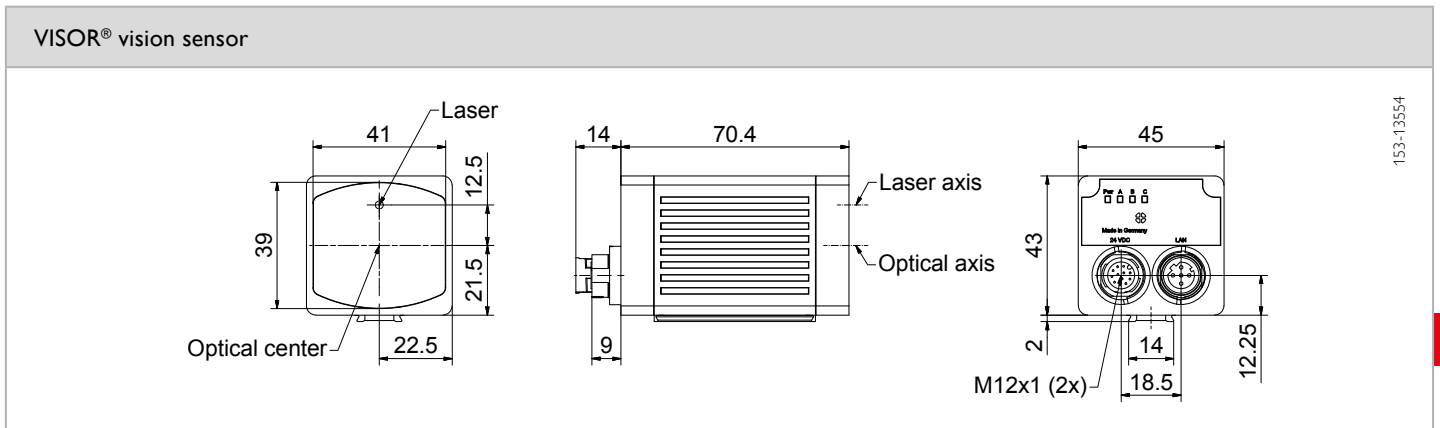


PRODUCT HIGHLIGHTS

- Can be used for all common 2D codes (ECC 200 data matrix) and common 1D bar codes
- Reliable detection of even poorly readable codes under difficult ambient conditions
- Comprehensive tools for flexible and easy connection to PC and PLC environments
- Reading of several similar or differing types of codes in one reading pass

Optical data		Functions	
Resolution	1440 × 1080 Pixel	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/2.9", monochrome	Detectors	Barcode: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; Datacode: reading 2D codes: ECC200, QR code, PDF 417, GS1
Integrated lens, focal length [mm]	20 (narrow)		
Pixel size	3.45 µm × 3.45 µm		
Focus	Motorized		
Adjustment range	100 mm to infinity		
Integrated illumination	White (5000 K), red (635 nm), infrared (850 nm) LEDs		
Minimum field of view, X × Y	18 × 14 mm		
Target laser	Laser: red (635 nm) class 1  (IEC 60825-1)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ¹	Dimensions	70.4 × 45 × 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Ca. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ²
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1 V / Low < 3 V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
VISOR® V20-CR-Advanced		Shock resistance	EN 60068-2-27
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs		
Encoder	✓		

¹ Max. ripple < 5V_{SS} ² 80 % air humidity, noncondensing



— Normal depth of field

Illumination	Part number	Article number	Accessories	
White	V20-CR-A3-W-N-M2-L	632-91047	Connection cables	From Page A-46
Red	V20-CR-A3-R-N-M2-L	632-91050	Illumination	From Page A-33
Infrared	V20-CR-A3-I-N-M2-L	632-91053	Brackets	From Page A-4
			Interface accessories	From Page A-53

VISOR® V20 Code Reader Advanced, C-Mount

Multi-Code Reader for 1D and 2D codes



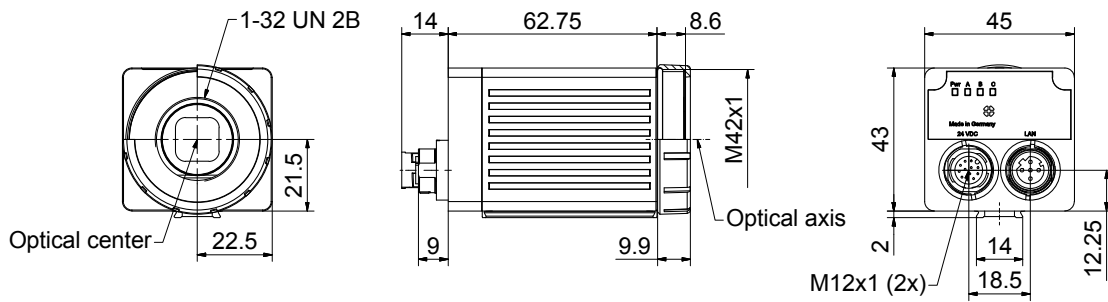
PRODUCT HIGHLIGHTS

- Can be used for all common 2D codes (ECC 200 data matrix) and common 1D bar codes
- Reliable detection of even poorly readable codes under difficult ambient conditions
- Comprehensive tools for flexible and easy connection to PC and PLC environments
- Reading of several similar or differing types of codes in one reading pass

Optical data		Functions	
Resolution	1440 x 1080 pixels	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/2.9", monochrome	Detectors	Barcode: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; Datacode: reading 2D codes: ECC200, QR code, PDF 417, GS1
Integrated lens, focal length [mm]	C-mount		
Pixel size	3,45 µm x 3,45 µm		
Focus	Manual		
Adjustment range	Dependent on lens		
Integrated illumination	None		
Minimum field of view, X x Y	Dependent on lens		
Target laser	No		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30V DC ¹	Dimensions	70,4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65 ²
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Ca. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ³
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ³
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1V / Low < 3V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Versorgung und I/O M12, 12-polig, Ethernet M12, 4-polig,
Interfaces VISOR® V20-CR-Advanced	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibrationsfestigkeit	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Schockfestigkeit	EN 60068-2-27
Encoder	✓		

¹ Max. ripple < 5V_{SS} ² only with protective casing ³ 80 % air humidity, noncondensing

Vision-Sensor VISOR® C-mount



153-13555

4



Part number	Article number
LPTVxx-G37.5	651-01006
LPTVxx-25.0	651-01007

	LO C 8	LO C 12	LO C 16	LO C 25	LO C 35	LO C 50	LO C 75
Focal length	8 mm	12 mm	16 mm	25 mm	35 mm	50 mm	75 mm
Article number	526-51513	526-51514	526-51515	526-51516	526-51525	526-51113	526-51116

Part number	Article number	Accessories										
V20-CR-A3-C-2	632-91054	<table border="1"> <tr> <td>Connection cables</td> <td>From Page A-46</td> </tr> <tr> <td>Illumination</td> <td>From Page A-33</td> </tr> <tr> <td>Lenses</td> <td>From Page A-28</td> </tr> <tr> <td>Brackets</td> <td>From Page A-4</td> </tr> <tr> <td>Interface accessories</td> <td>From Page A-53</td> </tr> </table>	Connection cables	From Page A-46	Illumination	From Page A-33	Lenses	From Page A-28	Brackets	From Page A-4	Interface accessories	From Page A-53
Connection cables	From Page A-46											
Illumination	From Page A-33											
Lenses	From Page A-28											
Brackets	From Page A-4											
Interface accessories	From Page A-53											


VISOR® V20 Code Reader Professional, wide field of view

Multi Code Reader for 1D and 2D codes and OCR

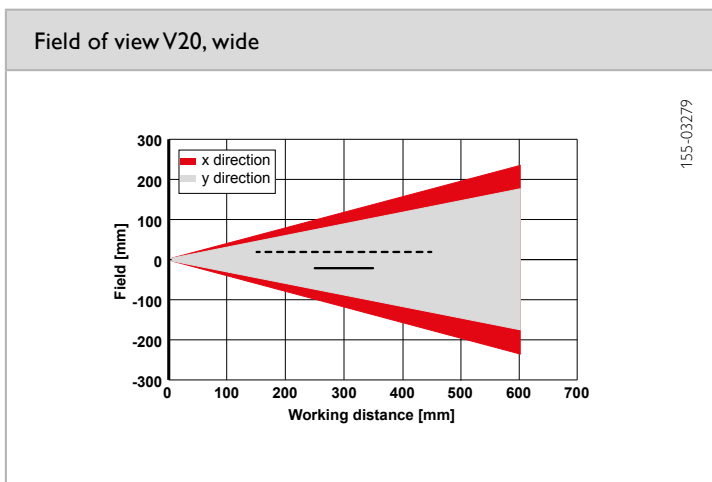
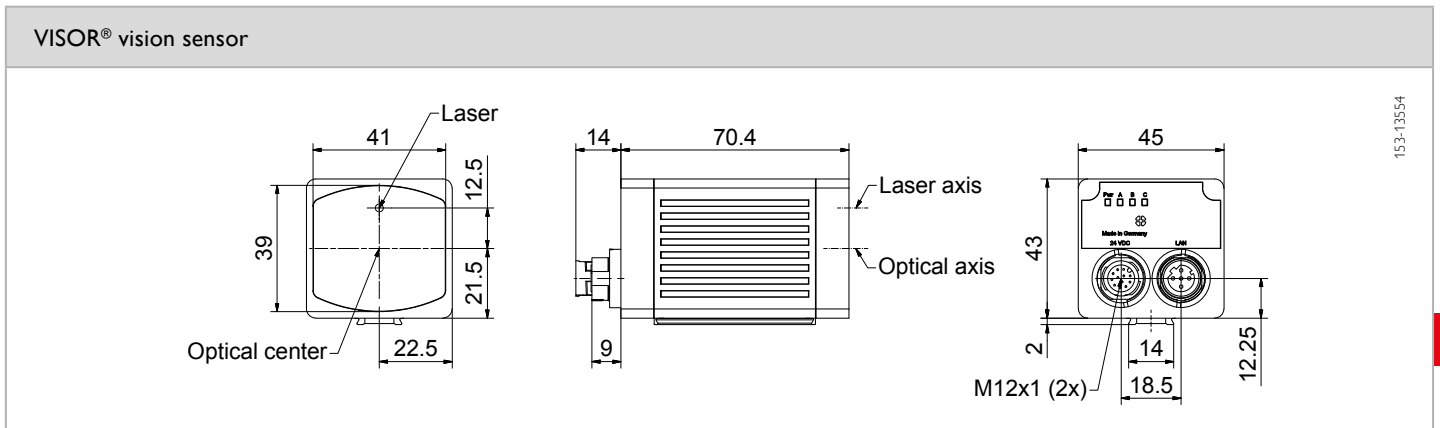


PRODUCT HIGHLIGHTS

- Can be used for all common 2D codes (ECC 200 data matrix) and common 1D bar codes
- Combination of two functions in one device: code reading and object detection
- Reliable detection of even poorly readable codes under difficult ambient conditions
- Comprehensive tools for flexible and easy connection to PC and PLC environments
- Reading of several similar or differing types of codes in one reading pass
- Reading OCR fonts

Optical data		Functions	
Resolution	1440 x 1080 pixels	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/2.9", monochrome	Detectors	Position tracking: X/Y and orientation; Pattern matching / contour: teach-in and detection of patterns and contours;
Integrated lens, focal length [mm]	6.5 (wide)		Grey threshold, Brightness: evaluation of brightness;
Pixel size	3.45 µm x 3.45 µm		Contrast: evaluation of contrast;
Focus	Motorized		Barcode: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; Datacode: reading 2D codes: ECC200, QR code, GS1, PDF 417; OCR: reading of fonts
Adjustment range	10 mm to infinity		
Integrated illumination	White (5000 K), red (635 nm), infrared (850 nm) LEDs		
Minimum field of view, X x Y	6 x 4 mm		
Target laser	Laser: red (635 nm) class 1  (IEC 60825-1)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30V DC ¹	Dimensions	70.4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Ca. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ²
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1V / Low < 3V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	✓		

¹ Max. ripple < 5 V_{SS} ² 80 % air humidity, noncondensing



- Increased depth of field
- Normal depth of field

Illumination	Part number	Article number	Accessories	
White	V20-CR-P3-W-W-M2-L	632-91079	Connection cables	From Page A-46
White	V20-CR-P3-W-WD-M2-L	632-91082	Illumination	From Page A-33
Red	V20-CR-P3-R-W-M2-L	632-91084	Brackets	From Page A-4
Red	V20-CR-P3-R-WD-M2-L	632-91087	Interface accessories	From Page A-53
Infrared	V20-CR-P3-I-W-M2-L	632-91089		
Infrared	V20-CR-P3-I-WD-M2-L	632-91092		


VISOR® V20 Code Reader Professional, medium field of view

Multi Code Reader for 1 D und 2 D Codes and OCR

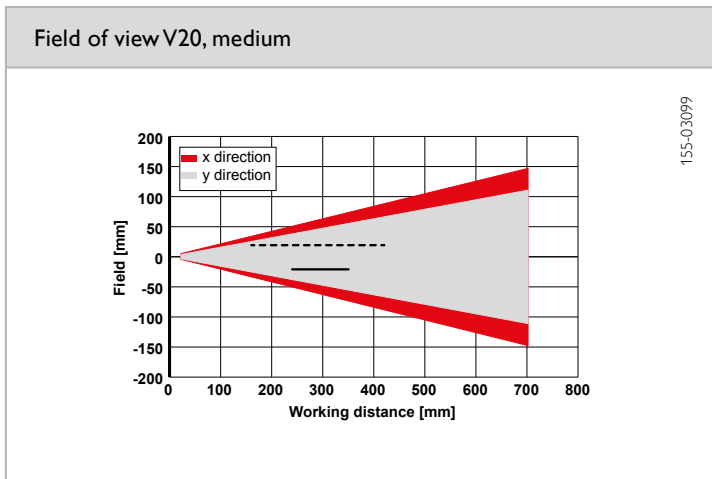
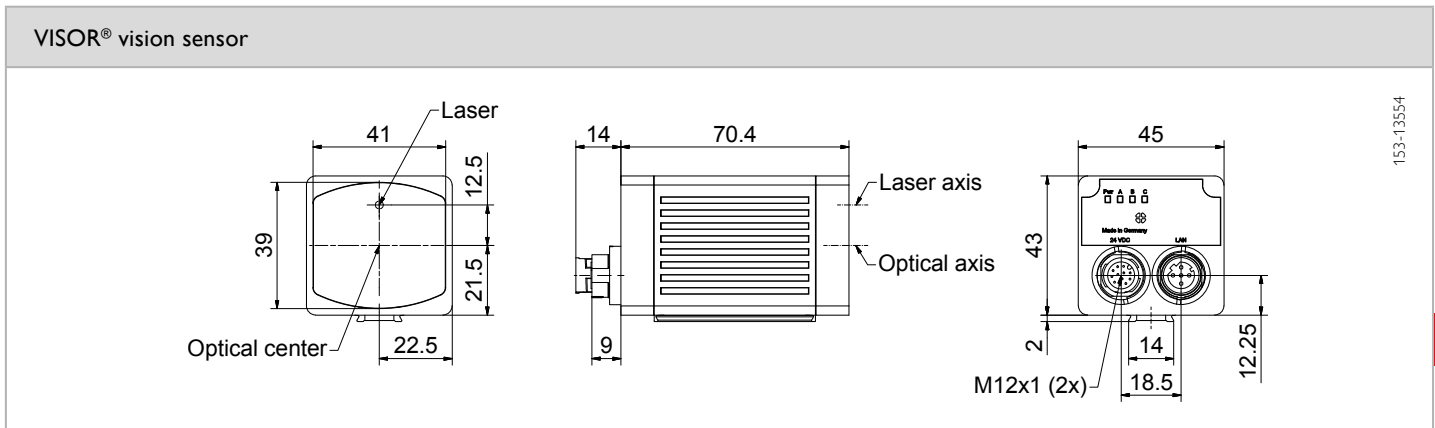


PRODUCT HIGHLIGHTS

- Can be used for all common 2D codes (ECC 200 data matrix) and common 1D bar codes
- Combination of two functions in one device: code reading and object detection
- Reliable detection of even poorly readable codes under difficult ambient conditions
- Comprehensive tools for flexible and easy connection to PC and PLC environments
- Reading of several similar or differing types of codes in one reading pass
- Reading OCR fonts

Optical data		Functions	
Resolution	1440 × 1080 Pixel	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/2.9", monochrome	Detectors	Position tracking: X/Y and orientation; Pattern matching / contour: teach-in and detection of patterns and contours; Grey threshold, Brightness: evaluation of brightness; Contrast: evaluation of contrast; Barcode: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; Datacode: reading 2D codes: ECC200, QR code, GS1, PDF 417; OCR: reading of fonts
Integrated lens, focal length [mm]	12 (medium)		
Pixel size	3.45 µm × 3.45 µm		
Focus	Motorized		
Adjustment range	25 mm to infinity		
Integrated illumination	White (5000 K), red (635 nm), infrared (850 nm) LEDs		
Minimum field of view, X × Y	10 × 8 mm		
Target laser	Laser: red (635 nm) class 1  (IEC 60825-1)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ¹	Dimensions	70.4 × 45 × 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Ca. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ²
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1 V / Low < 3 V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
VISOR® V20-CR-Advanced		Shock resistance	EN 60068-2-27
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs		
Encoder	✓		

¹ Max. ripple < 5 V_{SS} ² 80 % air humidity, noncondensing



- Increased depth of field
- Normal depth of field

illumination	Part number	Article number	Accessories	
White	V20-CR-P3-W-M-M2-L	632-91080	Connection cables	From Page A-46
White	V20-CR-P3-W-MD-M2-L	632-91083	Illumination	From Page A-33
Red	V20-CR-P3-R-M-M2-L	632-91085	Brackets	From Page A-4
Red	V20-CR-P3-R-MD-M2-L	632-91088	Interface accessories	From Page A-53
Infrared	V20-CR-P3-I-M-M2-L	632-91090		
Infrared	V20-CR-P3-I-MD-M2-L	632-91093		


VISOR® V20 Code Reader Professional, narrow field of view

Multi Code Reader for 1 D und 2 D Codes and OCR

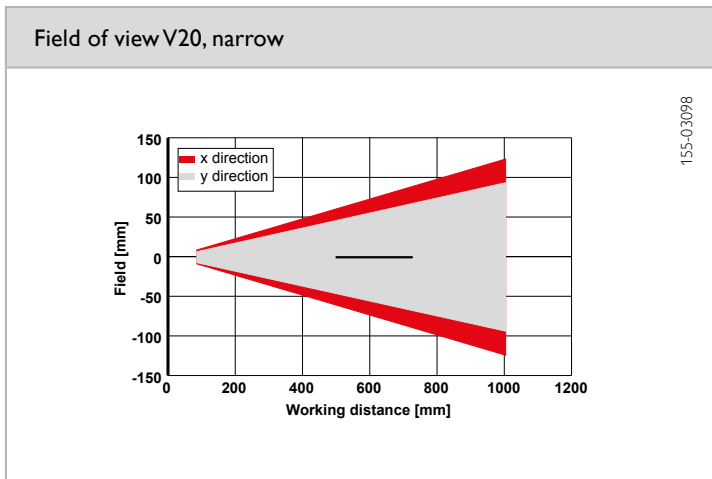
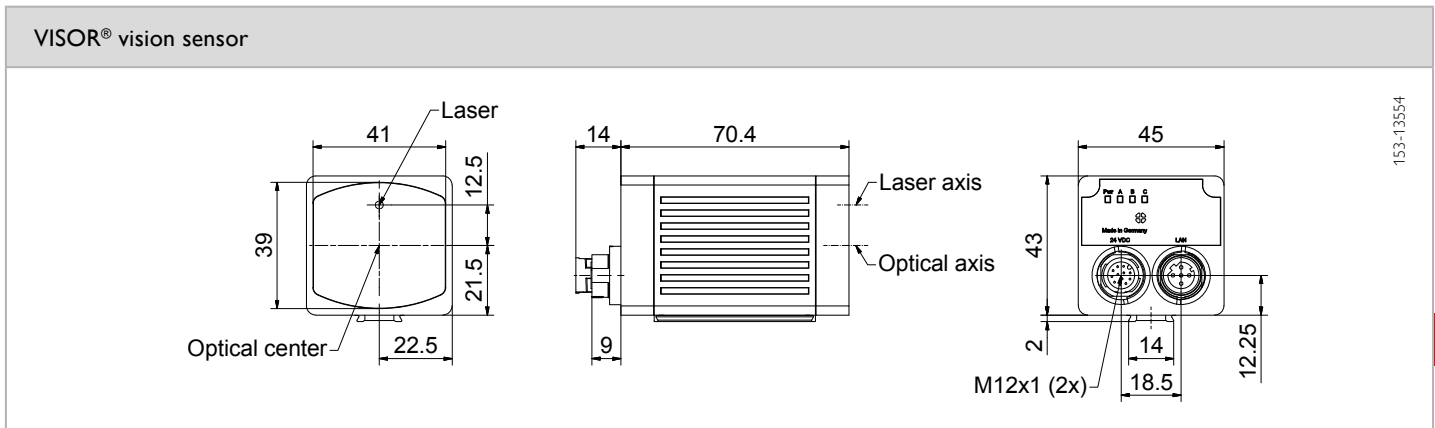


PRODUCT HIGHLIGHTS

- Can be used for all common 2D codes (ECC 200 data matrix) and common 1D bar codes
- Combination of two functions in one device: code reading and object detection
- Reliable detection of even poorly readable codes under difficult ambient conditions
- Comprehensive tools for flexible and easy connection to PC and PLC environments
- Reading of several similar or differing types of codes in one reading pass
- Reading OCR fonts

Optical data		Functions	
Resolution	1440 × 1080 Pixel	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/2.9", monochrome	Detectors	Position tracking: X/Y and orientation; Pattern matching / contour: teach-in and detection of patterns and contours; Grey threshold, Brightness: evaluation of brightness; Contrast: evaluation of contrast; Barcode: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; Datacode: reading 2D codes: ECC200, QR code, GS1, PDF 417; OCR: reading of fonts
Integrated lens, focal length [mm]	20 (narrow)		
Pixel size	3.45 µm × 3.45 µm		
Focus	Motorized		
Adjustment range	100 mm to infinity		
Integrated illumination	White (5000 K), red (635 nm), infrared (850 nm) LEDs		
Minimum field of view, X × Y	18 × 14 mm		
Target laser	Laser: red (635 nm) class 1  (IEC 60825-1)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ¹	Dimensions	70,4 × 45 × 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Ca. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ²
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1 V / Low < 3V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces VISOR® V20-CR-Advanced	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	✓		

¹ Max. ripple < 5V_{SS} ² 80 % air humidity, noncondensing



— Normal depth of field

Illumination	Part number	Article number	Accessories	
White	V20-CR-P3-W-N-M2-L	632-91081	Connection cables	From Page A-46
Red	V20-CR-P3-R-N-M2-L	632-91086	Illumination	From Page A-33
Infrared	V20-CR-P3-I-N-M2-L	632-91091	Brackets	From Page A-4
			Interface accessories	From Page A-53

VISOR® V20 Code Reader Professional, C-Mount

Multi Code Reader for 1 D und 2 D Codes and OCR

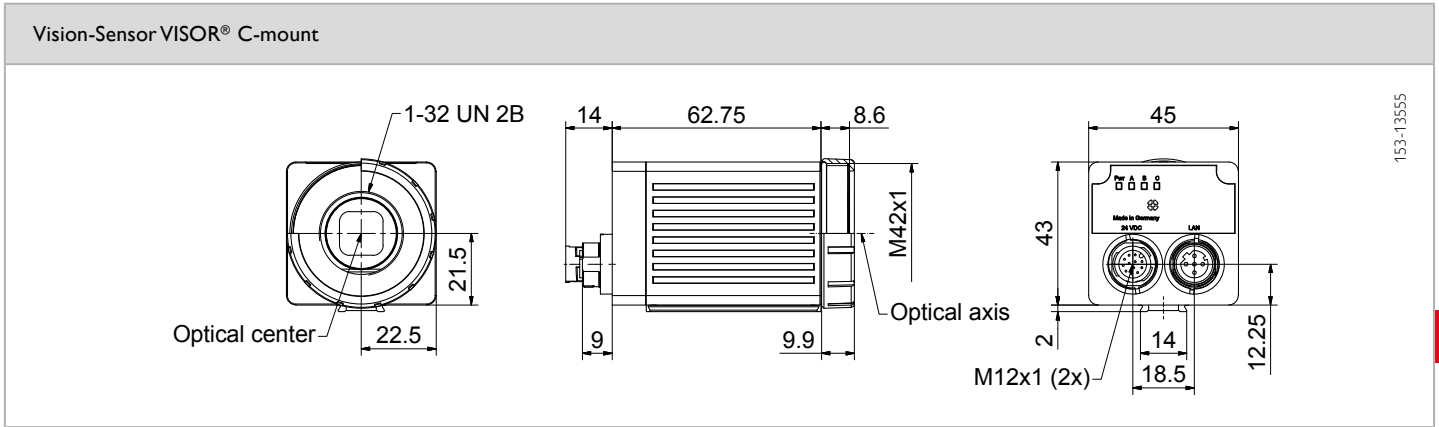


PRODUCT HIGHLIGHTS

- Can be used for all common 2D codes (ECC 200 data matrix) and common 1D bar codes
- Combination of two functions in one device: code reading and object detection
- Reliable detection of even poorly readable codes under difficult ambient conditions
- Comprehensive tools for flexible and easy connection to PC and PLC environments
- Reading of several similar or differing types of codes in one reading pass
- Reading OCR fonts

Optical data		Functions	
Resolution	1440 x 1080 pixels	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/2.9", monochrome	Detectors	Position tracking; X/Y and orientation; Pattern matching / Contour: teach-in and detection of patterns and contours;
Integrated lens, focal length [mm]	C-mount		Grey threshold, Brightness: evaluation of brightness;
Pixel size	3,45 µm x 3,45 µm		Contrast: evaluation of contrast;
Focus	Manual		Barcode: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; Datacode: reading 2D codes: ECC200, QR code, GS1, PDF 417; OCR: reading of fonts
Adjustment range	Dependent on lens		
Integrated illumination	None		
Minimum field of view, X x Y	Dependent on lens		
Target laser	No		
Electrical data		Mechanical data	
Operating voltage, +U _b	18 ... 30V DC ¹	Dimensions	70,4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65 ²
Protective circuits	Reverse-polarity protection, U _b / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Ca. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ³
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ³
Switching threshold inputs incl. encoder	PNP/NPN High > U _b -1V / Low < 3V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Versorgung und I/O M12, 12-polig, Ethernet M12, 4-polig,
Interfaces VISOR® V20-CR-Advanced	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibrationsfestigkeit	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Schockfestigkeit	EN 60068-2-27
Encoder	✓		

¹ Max. ripple < 5V_{SS} ² only with protective casing ³ 80 % air humidity, noncondensing



Part number	Article number
LPTVxx-G37.5	651-01006
LPTVxx-25.0	651-01007

	LO C 8	LO C 12	LO C 16	LO C 25	LO C 35	LO C 50	LO C 75
Focal length	8 mm	12 mm	16 mm	25 mm	35 mm	50 mm	75 mm
Article number	526-51513	526-51514	526-51515	526-51516	526-51525	526-51113	526-51116

Part number	Article number	Accessories
V20-CR-P3-C-2	632-91134	<ul style="list-style-type: none"> Connection cables Illumination Lenses Brackets Interface accessories
		<ul style="list-style-type: none"> From Page A-46 From Page A-33 From Page A-28 From Page A-4 From Page A-53

VISOR® V10 Code Reader Standard, wide field of view

Reading of 1D and 2D codes

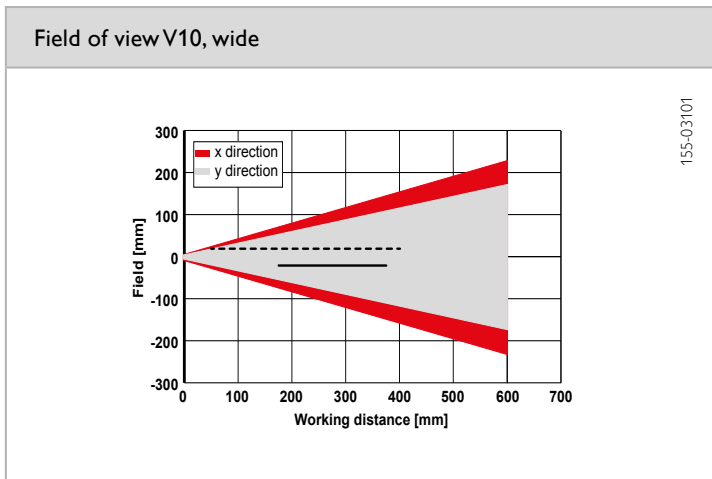
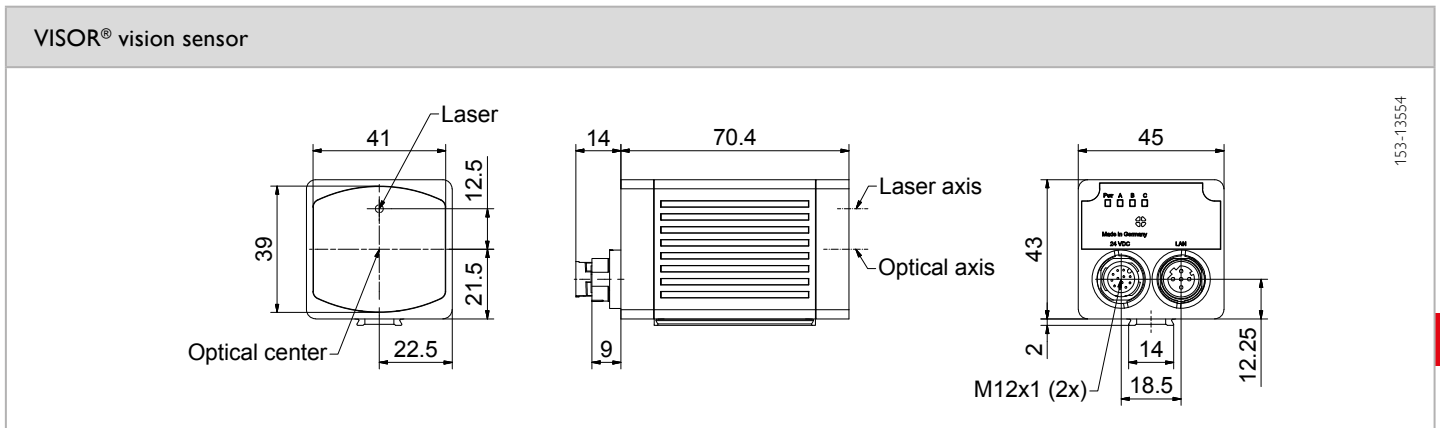


PRODUCT HIGHLIGHTS

- Can be used for all common 2D codes (ECC 200 data matrix) and common 1D bar codes
- Comprehensive tools for flexible and easy connection to PC and PLC environments
- Reading of several similar or differing types of codes in one reading pass

Optical data		Functions	
Resolution	800 x 600 Pixel	Number of jobs / detectors	8 / 32
Imaging chip CMOS	1/3.6", monochrome	Detectors	Barcode: reading of 1D barcodes: EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, Code 32, Code 39, Code 93, Code 128, GS1, Pharmacode, Codabar; Datacode: reading of 2D barcodes: ECC200, QR-Code, PDF 417, ECC200 GS1
Integrated lens, focal length [mm]	5.2 (wide)		
Pixel size	4.8 µm x 4.8 µm		
Focus	Motorized		
Adjustment range	0 mm to infinity		
Integrated illumination	White (5000 K), red (635 nm), infrared (850 nm) LEDs		
Minimum field of view, X x Y	2 x 1 mm		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ¹	Dimensions	70.4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Ca. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ²
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1 V / Low < 3 V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 4 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	No		

¹ Max. ripple < 5 V_{SS} ² 80 % air humidity, noncondensing



- Increased depth of field
- Normal depth of field

Illumination	Part number	Article number	Accessories	
White	V10-CR-S3-W-W-M2	631-91061	Connection cables	From Page A-46
White	V10-CR-S3-W-WD-M2	631-91000	Illumination	From Page A-33
Red	V10-CR-S3-R-W-M2	631-91064	Brackets	From Page A-4
Red	V10-CR-S3-R-WD-M2	631-91066	Interface accessories	From Page A-53
Infrared	V10-CR-S3-I-W-M2	631-91069		
Infrared	V10-CR-S3-I-WD-M2	631-91040		

VISOR® V10 Code Reader Standard, medium field of view

Reading of 1D and 2D codes

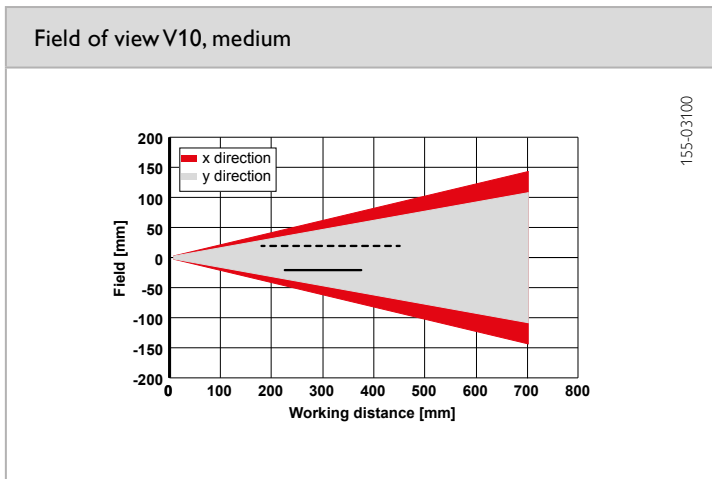
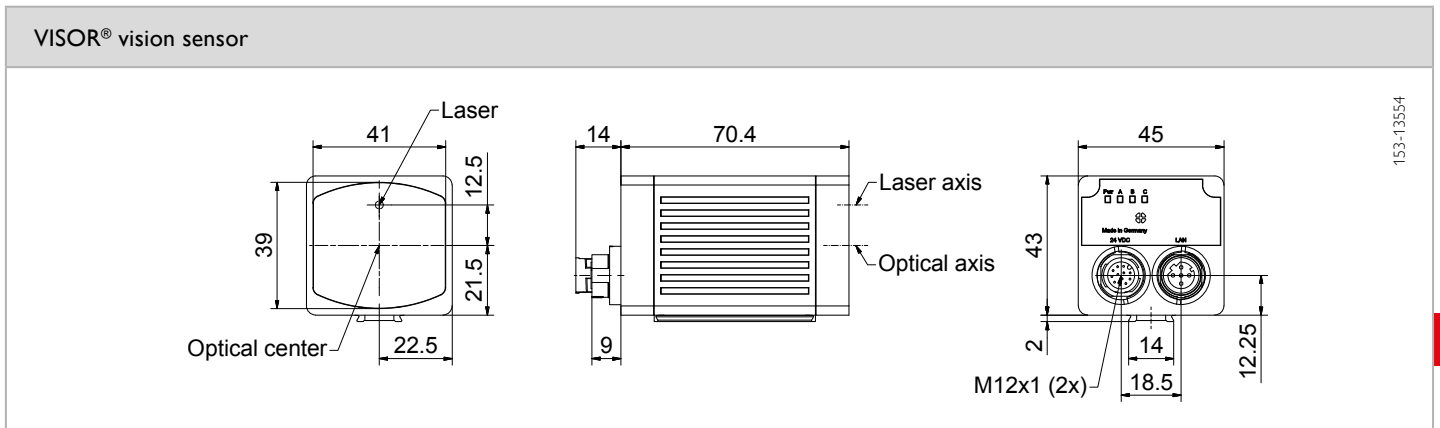


PRODUCT HIGHLIGHTS

- Can be used for all common 2D codes (ECC 200 data matrix) and common 1D bar codes
- Comprehensive tools for flexible and easy connection to PC and PLC environments
- Reading of several similar or differing types of codes in one reading pass

Optical data		Functions	
Resolution	800 x 600 Pixel	Number of jobs / detectors	8 / 32
Imaging chip CMOS	1/3.6", monochrome	Detectors	Barcode: reading of 1D barcodes: EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, Code 32, Code 39, Code 93, Code 128, GS1, Pharmacode, Codabar; Datacode: reading of 2D barcodes: ECC200, QR-Code, PDF 417, ECC200 GS1
Integrated lens, focal length [mm]	9.6 (medium)		
Pixel size	4.8 µm x 4.8 µm		
Focus	Motorized		
Adjustment range	12 mm to infinity		
Integrated illumination	White (5000 K), red (635 nm), infrared (850 nm) LEDs		
Minimum field of view, X x Y	7 x 3 mm		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ¹	Dimensions	70.4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Ca. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ²
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1 V / Low < 3 V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 4 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	No		

¹ Max. ripple < 5 V_{SS} ² 80 % air humidity, noncondensing



- Increased depth of field
- Normal depth of field

Illumination	Part number	Article number	Accessories	
White	V10-CR-S3-W-M-M2	631-91062	Connection cables	From Page A-46
White	V10-CR-S3-W-MD-M2	631-91037	Illumination	From Page A-33
Red	V10-CR-S3-R-M-M2	631-91065	Brackets	From Page A-4
Red	V10-CR-S3-R-MD-M2	631-91067	Interface accessories	From Page A-53
Infrared	V10-CR-S3-I-M-M2	631-91070		
Infrared	V10-CR-S3-I-MD-M2	631-91071		

VISOR® V10 Code Reader Standard, narrow field of view

Reading of 1D and 2D codes

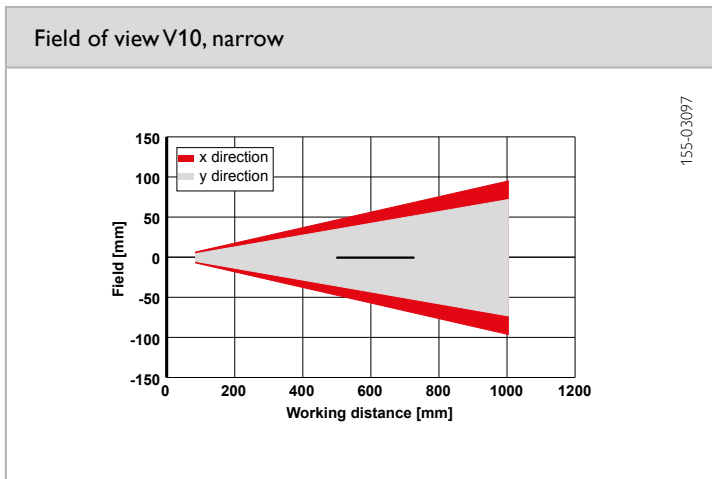
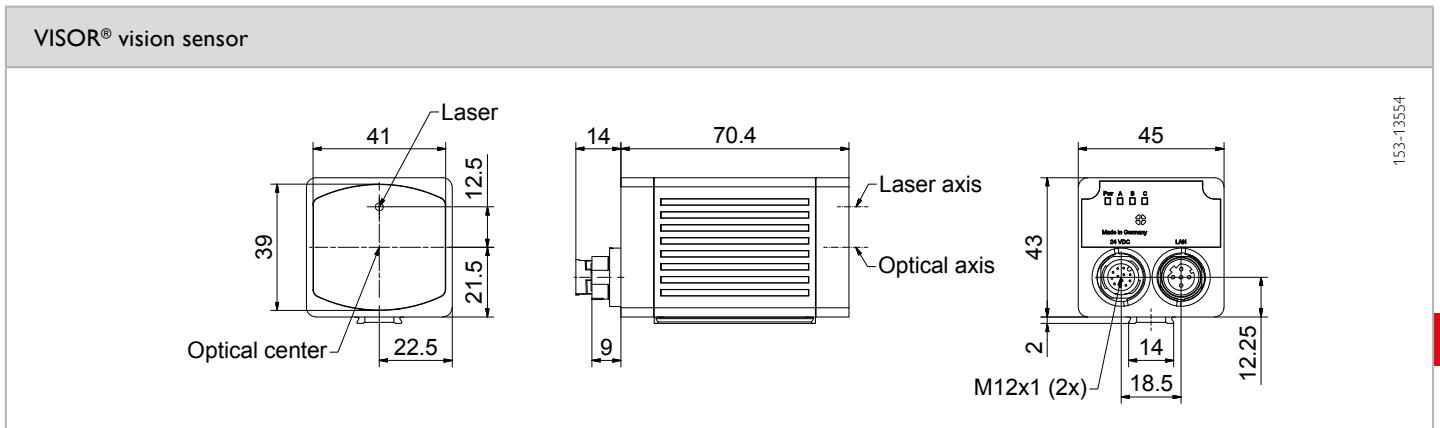


PRODUCT HIGHLIGHTS

- Can be used for all common 2D codes (ECC 200 data matrix) and common 1D bar codes
- Comprehensive tools for flexible and easy connection to PC and PLC environments
- Reading of several similar or differing types of codes in one reading pass

Optical data		Functions	
Resolution	800 x 600 Pixel	Number of jobs / detectors	8 / 32
Imaging chip CMOS	1/3.6", monochrome	Detectors	Barcode: reading of 1D barcodes: EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, Code 32, Code 39, Code 93, Code 128, GS1, Pharmacode, Codabar; Data code: reading of 2D barcodes: ECC200, QR-Code, PDF 417, ECC200 GS1
Integrated lens, focal length [mm]	20 (narrow)		
Pixel size	4.8 µm x 4.8 µm		
Focus	Motorized		
Adjustment range	100 mm to infinity		
Integrated illumination	White (5000 K), red (635 nm), infrared (850 nm) LEDs		
Minimum field of view, X x Y	14 x 10 mm		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ¹	Dimensions	70.4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Ca. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ²
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1 V / Low < 3 V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb	Vibration resistance	EN 60068-2-6
VISOR® V20-CR-Advanced		Shock resistance	EN 60068-2-27
Inputs/outputs	2 inputs, 2 outputs, 4 selectable inputs/outputs		
Encoder	No		

¹ Max. ripple < 5 V_{SS} ² 80 % air humidity, noncondensing



— Normal depth of field

Illumination	Part number	Article number	Accessories	
White	V10-CR-S3-W-N-M2	631-91063	Connection cables	From Page A-46
Red	V10-CR-S3-R-N-M2	631-91068	Illumination	From Page A-33
Infrared	V10-CR-S3-I-N-M2	631-91072	Brackets	From Page A-4
			Interface accessories	From Page A-53


VISOR® V10 Code Reader Advanced, wide field of view

Multi-Code Reader for 1D and 2D codes

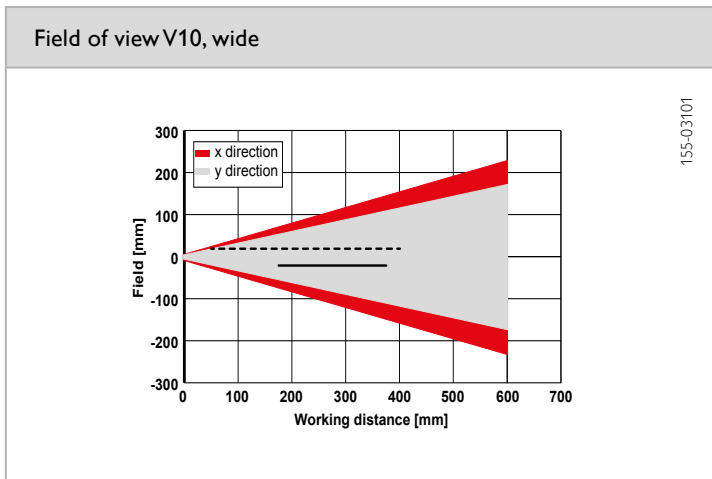
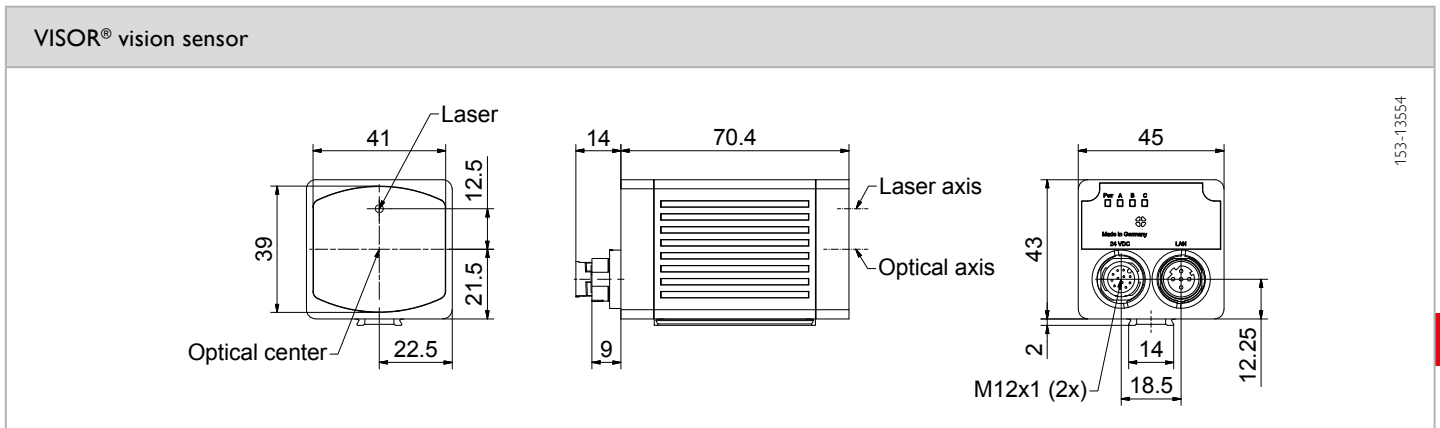


PRODUCT HIGHLIGHTS

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- Reliable detection of even poorly readable codes under difficult ambient conditions
- Comprehensive tools for flexible and easy connection to PC and PLC environments
- Reading of several similar or differing types of codes in one reading pass

Optical data		Functions	
Resolution	800 × 600 Pixel	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/3.6", monochrome	Detectors	Barcode: reading of 1D barcodes: EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, Code 32, Code 39, Code 93, Code 128, GS1, Pharmacode, Codabar; Datacode: reading of 2D barcodes: ECC200, QR-Code, PDF 417, ECC200 GS1
Integrated lens, focal length [mm]	5.2 (wide)		
Pixel size	4.8 μm × 4.8 μm		
Focus	Motorized		
Adjustment range	0 mm to infinity		
Integrated illumination	White (5000 K), red (635 nm), infrared (850 nm) LEDs		
Minimum field of view, X × Y	2 × 1 mm		
Target laser	Laser: red (635 nm) class 1  (IEC 60825-1)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ¹	Dimensions	70.4 × 45 × 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Ca. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ²
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1 V / Low < 3 V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
VISOR® V20-CR-Advanced		Shock resistance	EN 60068-2-27
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs		
Encoder	✓		

¹ Max. ripple < 5V_{SS} ² 80 % air humidity, noncondensing



----- Increased depth of field
 _____ Normal depth of field

Illumination	Part number	Article number	Accessories	
White	V10-CR-A3-W-W-M2-L	631-91051	Connection cables	From Page A-46
White	V10-CR-A3-W-WD-M2-L	631-91035	Illumination	From Page A-33
Red	V10-CR-A3-R-W-M2-L	631-91054	Brackets	From Page A-4
Red	V10-CR-A3-R-WD-M2-L	631-91033	Interface accessories	From Page A-53
Infrared	V10-CR-A3-I-W-M2-L	631-91057		
Infrared	V10-CR-A3-I-WD-M2-L	631-91031		


VISOR® V10 Code Reader Advanced, medium field of view

Multi-Code Reader for 1 D und 2 D Codes

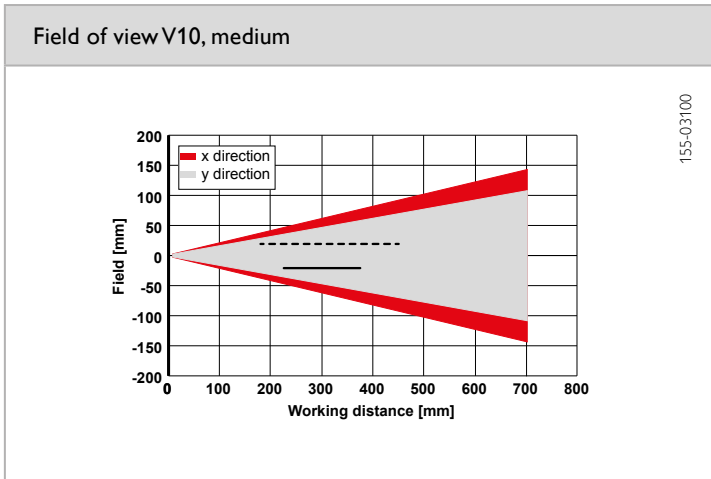
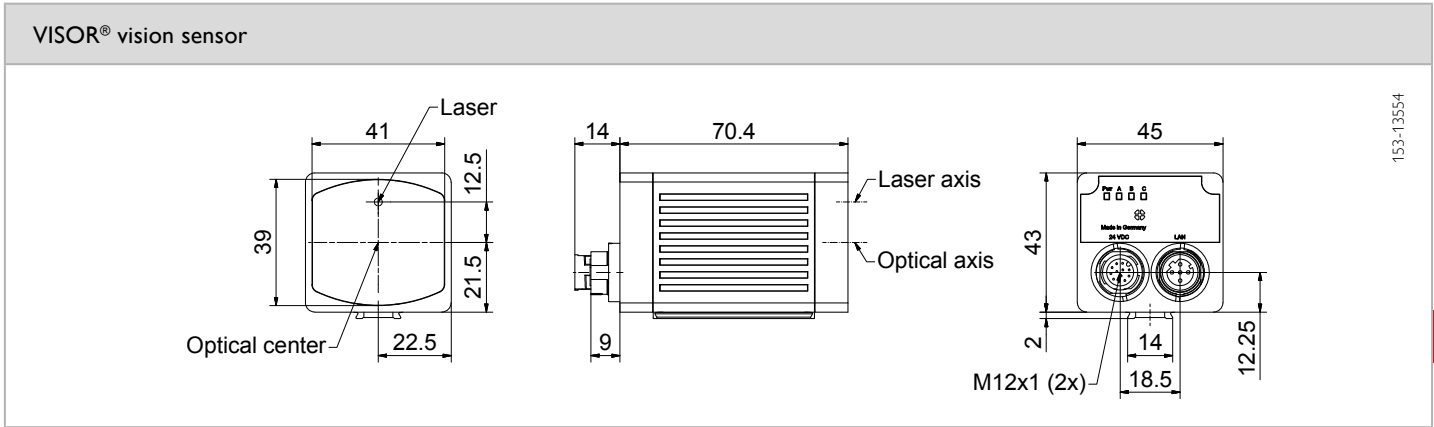


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Optical data		Functions	
Resolution	800 x 600 Pixel	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/3.6", monochrome	Detectors	Barcode: reading of 1D barcodes: EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, Code 32, Code 39, Code 93, Code 128, GS1, Pharmacode, Codabar; Datacode: reading of 2D barcodes: ECC200, QR-Code, PDF 417, ECC200 GS1
Integrated lens, focal length [mm]	9.6 (medium)		
Pixel size	4.8 µm x 4.8 µm		
Focus	Motorized		
Adjustment range	12 mm to infinity		
Integrated illumination	White (5000 K), red (635 nm), infrared (850 nm) LEDs		
Minimum field of view, X x Y	7 x 3 mm		
Target laser	Laser: red (635 nm) class 1  (IEC 60825-1)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ¹	Dimensions	70.4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Ca. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ²
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1V / Low < 3V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces VISOR® V20-CR-Advanced	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	✓		

¹ Max. ripple < 5V_{SS} ² 80 % air humidity, noncondensing



- Increased depth of field
- Normal depth of field

Illumination	Part number	Article number	Accessories	
White	V10-CR-A3-W-M-M2-L	631-91052	Connection cables	From Page A-46
White	V10-CR-A3-W-MD-M2-L	631-91034	Illumination	From Page A-33
Red	V10-CR-A3-R-M-M2-L	631-91055	Brackets	From Page A-4
Red	V10-CR-A3-R-MD-M2-L	631-91032	Interface accessories	From Page A-53
Infrared	V10-CR-A3-I-M-M2-L	631-91058		
Infrared	V10-CR-A3-I-MD-M2-L	631-91028		


VISOR® V10 Code Reader Advanced, narrow field of view

Multi-Code Reader for 1 D und 2 D Codes

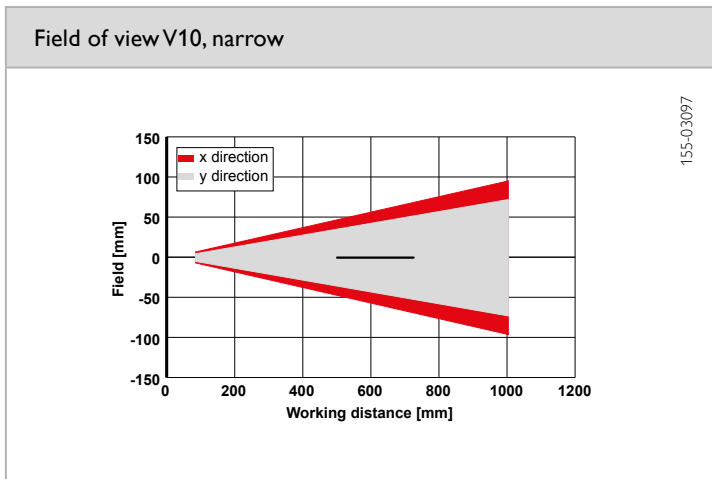
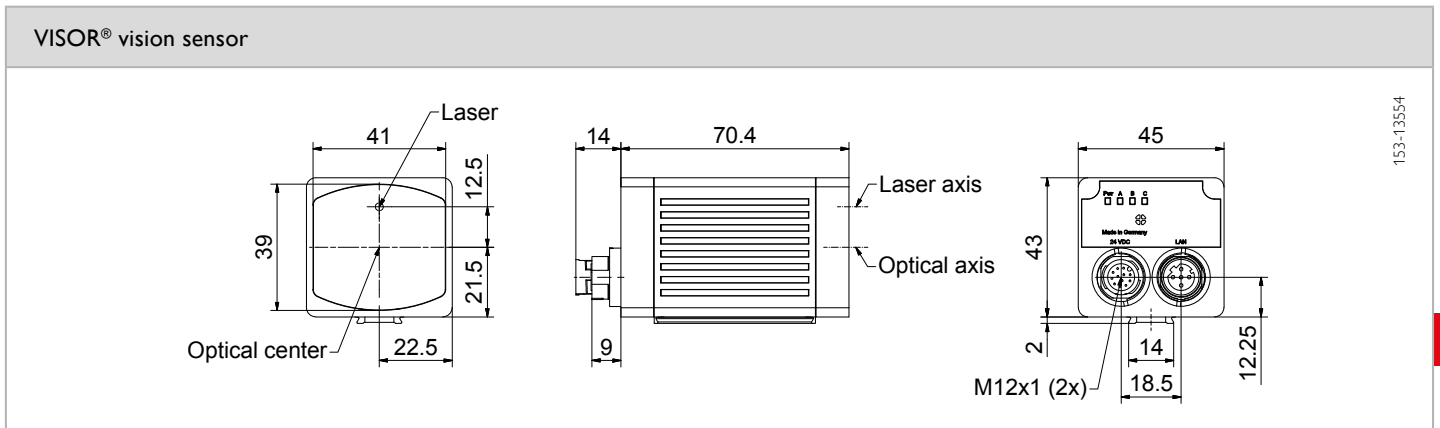


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Optical data		Functions	
Resolution	800 x 600 Pixel	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/3.6", monochrome	Detectors	Barcode: reading of 1D barcodes: EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, Code 32, Code 39, Code 93, Code 128, GS1, Pharmacode, Codabar; Datacode: reading of 2D barcodes: ECC200, QR-Code, PDF 417, ECC200 GS1
Integrated lens, focal length [mm]	20 (narrow)		
Pixel size	4.8 µm x 4.8 µm		
Focus	Motorized		
Adjustment range	100 mm to infinity		
Integrated illumination	White (5000 K), red (635 nm), infrared (850 nm) LEDs		
Minimum field of view, X x Y	14 x 10 mm		
Target laser	Laser: red (635 nm) class 1  (IEC 60825-1)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ¹	Dimensions	70.4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Ca. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ²
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1V / Low < 3V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces VISOR® V20-CR-Advanced	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	✓		

¹ Max. ripple < 5V_{SS} ² 80 % air humidity, noncondensing



— Normal depth of field

Illumination	Part number	Article number	Accessories	
White	V10-CR-A3-W-N-M2-L	631-91053	Connection cables	From Page A-46
Red	V10-CR-A3-R-N-M2-L	631-91056	Illumination	From Page A-33
Infrared	V10-CR-A3-I-N-M2-L	631-91059	Brackets	From Page A-4
			Interface accessories	From Page A-53

VISOR® V10 Code Reader Advanced, C-Mount

Multi-Code Reader for 1D und 2D Codes

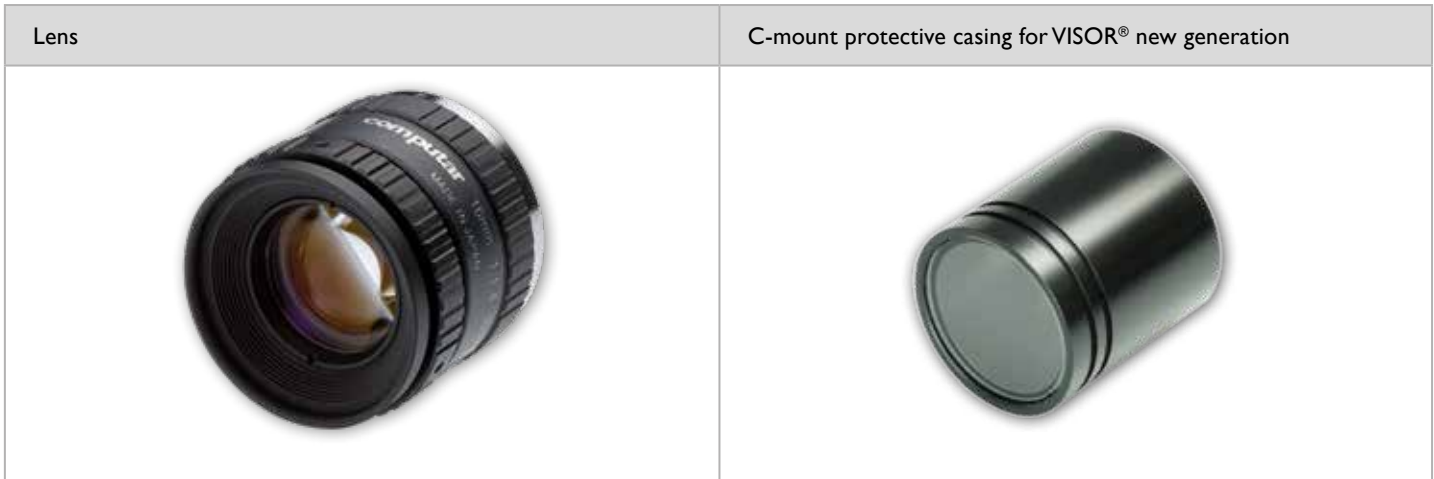
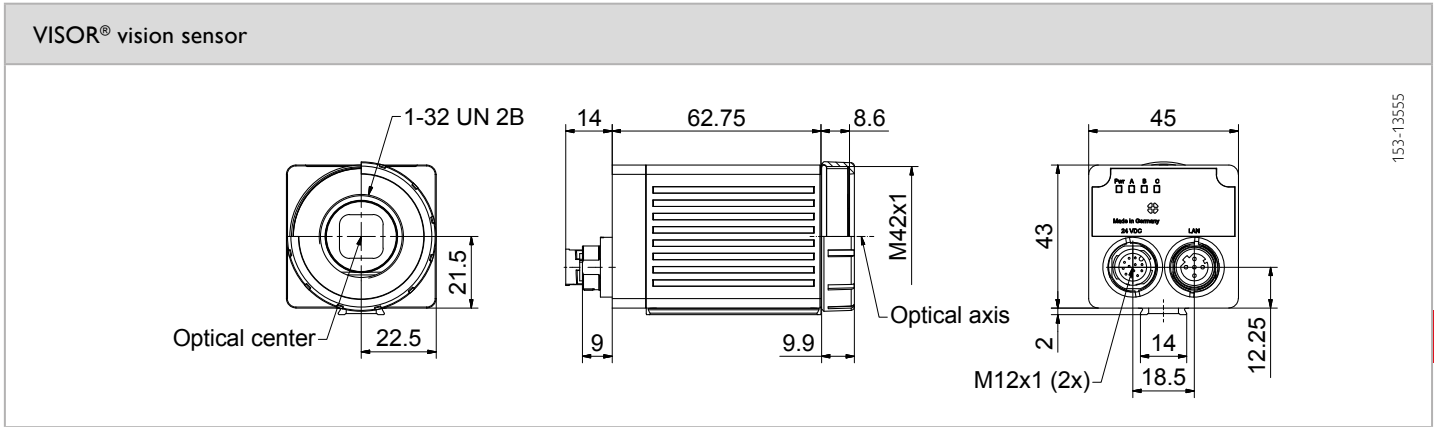


PRODUCT HIGHLIGHTS

- Can be used for all common 2D codes (ECC 200 data matrix) and common 1D bar codes
- Reliable detection of even poorly readable codes under difficult ambient conditions
- Comprehensive tools for flexible and easy connection to PC and PLC environments
- Reading of several similar or differing types of codes in one reading pass

Optical data		Functions	
Resolution	800 x 600 Pixel	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/3.6", monochrome	Detectors	Barcode: reading of 1D barcodes: EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, Code 32, Code 39, Code 93, Code 128, GS1, Pharmacode, Codabar; Datacode: reading of 2D barcodes: ECC200, QR-Code, PDF 417, ECC200 GS1
Integrated lens, focal length [mm]	C-mount		
Pixel size	4.8 µm x 4.8 µm		
Focus	Manual		
Adjustment range	Dependent on lens		
Integrated illumination	None		
Minimum field of view, X x Y	Dependent on lens		
Target laser	None		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ¹	Dimensions	70.4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65 ²
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Ca. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ³
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ³
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1 V / Low < 3 V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	✓		

¹ Max. ripple < 5 V_{SS} ² only with protective casing ³ 80 % air humidity, noncondensing



Part number	Article number
LPTVxx-G37.5	651-01006
LPTVxx-25.0	651-01007

	LO C 8	LO C 12	LO C 16	LO C 25	LO C 35	LO C 50	LO C 75
Focal length	8 mm	12 mm	16 mm	25 mm	35 mm	50 mm	75 mm
Article number	526-51513	526-51514	526-51515	526-51516	526-51525	526-51113	526-51116

Part number	Article number	Accessories
V10-CR-A3-C-2	631-91060	<ul style="list-style-type: none"> Connection cables Illumination Lenses Brackets Interface accessories
		<ul style="list-style-type: none"> From Page A-46 From Page A-33 From Page A-28 From Page A-4 From Page A-53

VISOR® V10 Code Reader Professional, wide field of view

Multi-Code Reader for 1D und 2D Codes und OCR

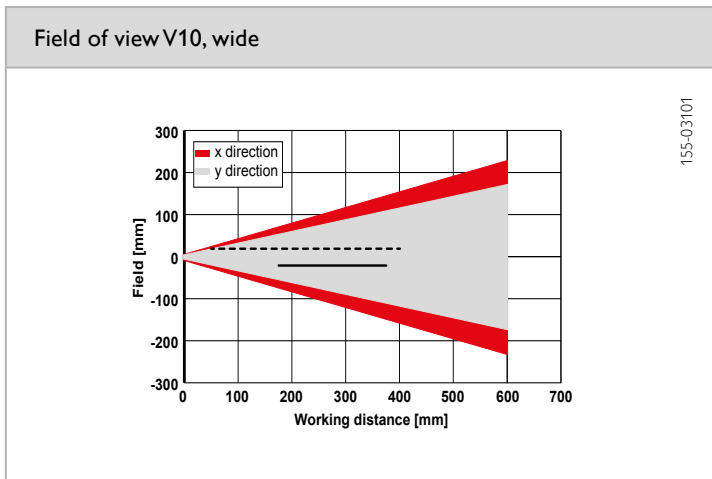
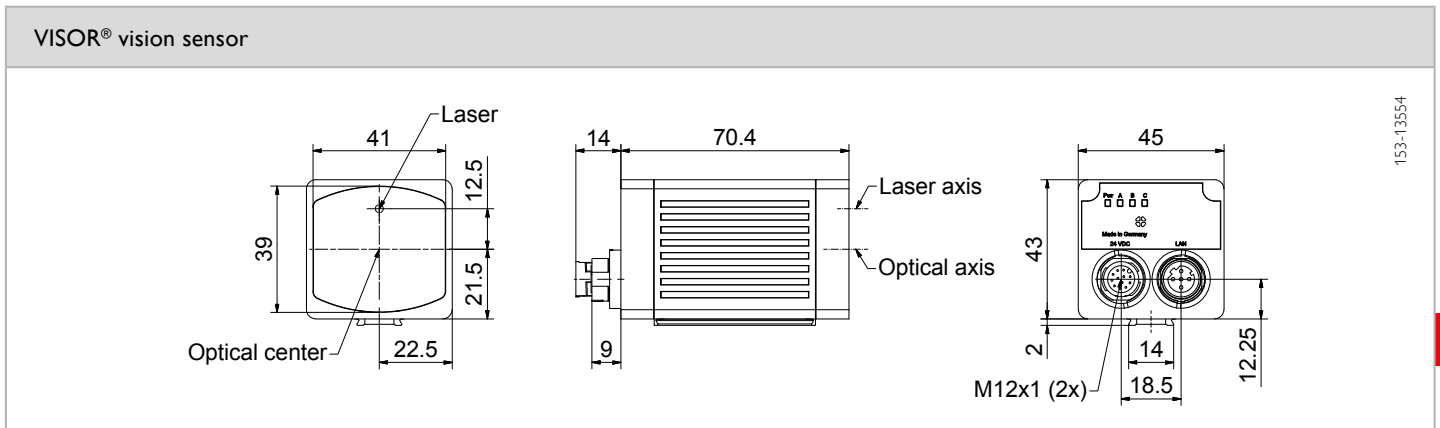


PRODUCT HIGHLIGHTS

- Can be used for all common 2D codes (ECC 200 data matrix) and common 1D bar codes
- Combination of two functions in one device: code reading and object detection
- Reliable detection of even poorly readable codes under difficult ambient conditions
- Comprehensive tools for flexible and easy connection to PC and PLC environments
- Reading of several similar or differing types of codes in one reading pass
- Reading OCR fonts

Optical data		Functions	
Resolution	800 x 600 Pixel	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/3.6", monochrome	Detectors	Position tracking: X/Y and orientation; Pattern matching / contour: teach-in and detection of patterns and contours; Grey threshold, Brightness: evaluation of brightness; Contrast: evaluation of contrast; Barcode: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; Datacode: reading 2D codes: ECC200, QR code, GS1, PDF 417; OCR: reading of fonts
Integrated lens, focal length [mm]	5.2 (wide)		
Pixel size	4.8 µm x 4.8 µm		
Focus	Motorized		
Adjustment range	0 mm to infinity		
Integrated illumination	White (5000 K), red (635 nm), infrared (850 nm) LEDs		
Minimum field of view, X x Y	2 x 1 mm		
Target laser	Laser: red (635 nm) class 1 ⚠ (IEC 60825-1)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ¹	Dimensions	70.4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Ca. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ²
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1V / Low < 3V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
VISOR® V20-CR-Advanced		Shock resistance	EN 60068-2-27
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs		
Encoder	✓		

¹ Max. ripple < 5 V_{SS} ² 80 % air humidity, noncondensing



- Increased depth of field
- Normal depth of field

Illumination	Part number	Article number	Accessories	
White	V10-CR-P3-W-W-M2-L	631-91083	Connection cables	From Page A-46
White	V10-CR-P3-W-WD-M2-L	631-91086	Illumination	From Page A-33
Red	V10-CR-P3-R-W-M2-L	631-91088	Brackets	From Page A-4
Red	V10-CR-P3-R-WD-M2-L	631-91091	Interface accessories	From Page A-53
Infrared	V10-CR-P3-I-W-M2-L	631-91093		
Infrared	V10-CR-P3-I-WD-M2-L	631-91096		


VISOR® V10 Code Reader Professional, medium field of view

Multi-Code Reader for 1D and 2D codes and OCR

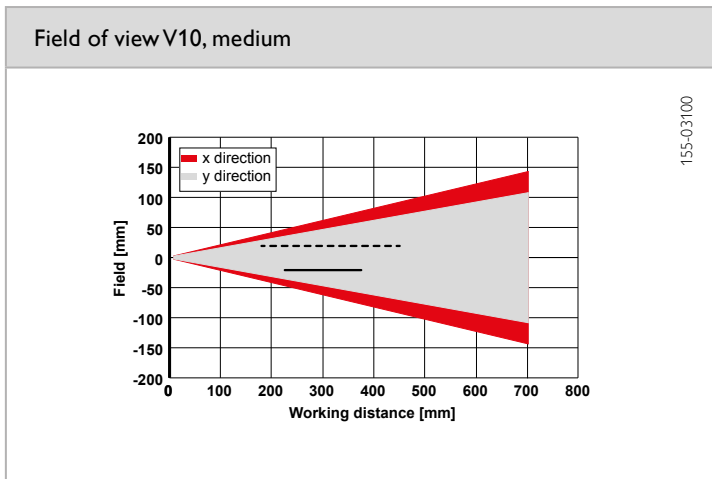
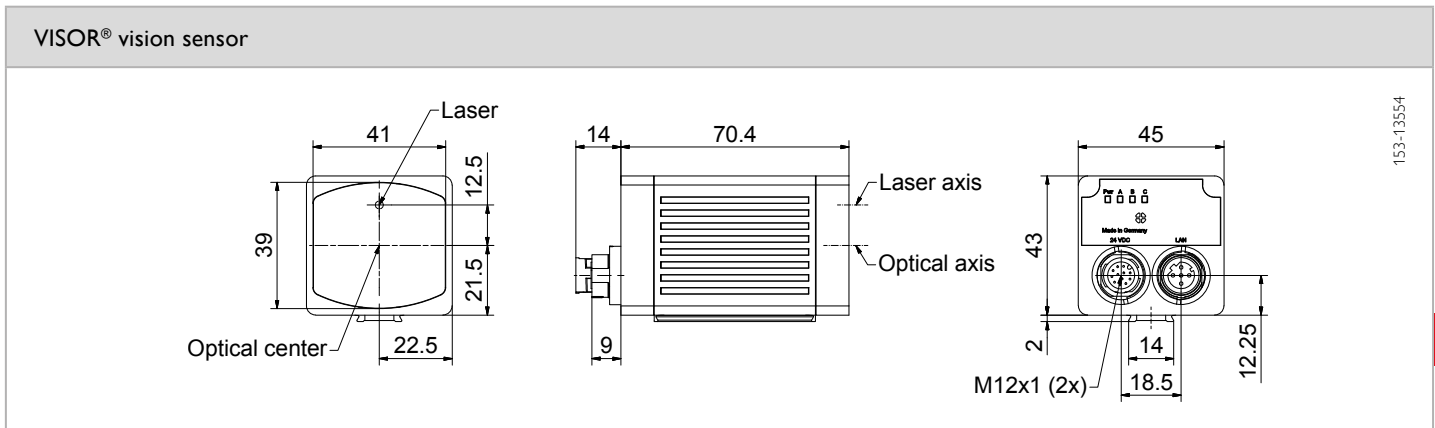


PRODUCT HIGHLIGHTS

- Can be used for all common 2D codes (ECC 200 data matrix) and common 1D bar codes
- Combination of two functions in one device: code reading and object detection
- Reliable detection of even poorly readable codes under difficult ambient conditions
- Comprehensive tools for flexible and easy connection to PC and PLC environments
- Reading of several similar or differing types of codes in one reading pass
- Reading OCR fonts

Optical data		Functions	
Resolution	800 x 600 Pixel	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/3.6", monochrome	Detectors	Position tracking: X/Y and orientation; Pattern matching / contour: teach-in and detection of patterns and contours;
Integrated lens, focal length [mm]	9.6 (medium)		Grey threshold, Brightness: evaluation of brightness;
Pixel size	4.8 µm x 4.8 µm		Contrast: evaluation of contrast;
Focus	Motorized		Barcode: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; Datacode: reading 2D codes: ECC200, QR code, GS1, PDF 417; OCR: reading of fonts
Adjustment range	12 mm to infinity		
Integrated illumination	White (5000 K), red (635 nm), infrared (850 nm) LEDs		
Minimum field of view, X x Y	7 x 3 mm		
Target laser	Laser: red (635 nm) class 1  (IEC 60825-1)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ¹	Dimensions	70.4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Ca. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ²
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1V / Low < 3V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	✓		

¹ Max. ripple < 5 V_{SS} ² 80 % air humidity, noncondensing



- Increased depth of field
- Normal depth of field

Illumination	Part number	Article number	Accessories	
White	V10-CR-P3-W-M-M2-L	631-91084	Connection cables	From Page A-46
White	V10-CR-P3-W-MD-M2-L	631-91087	Illumination	From Page A-33
Red	V10-CR-P3-R-M-M2-L	631-91089	Brackets	From Page A-4
Red	V10-CR-P3-R-MD-M2-L	631-91092	Interface accessories	From Page A-53
Infrared	V10-CR-P3-I-M-M2-L	631-91094		
Infrared	V10-CR-P3-I-MD-M2-L	631-91097		


VISOR® V10 Code Reader Professional, narrow field of view

Multi-Code Reader for 1D and 2D codes and OCR

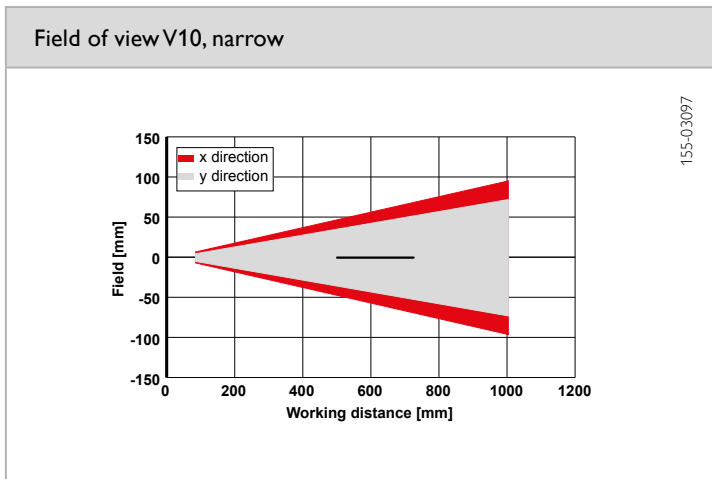
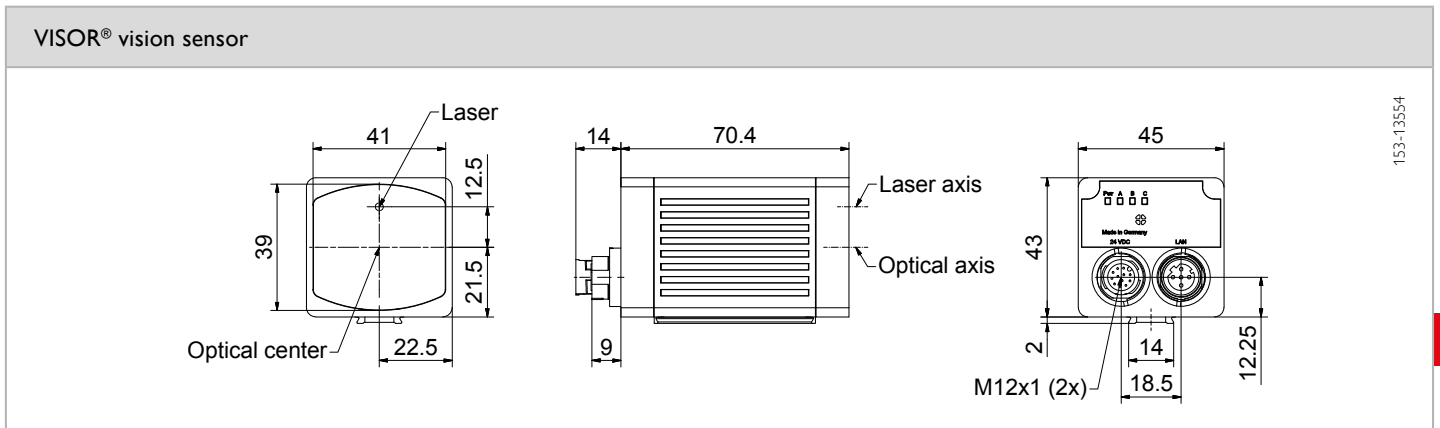


PRODUCT HIGHLIGHTS

- Can be used for all common 2D codes (ECC 200 data matrix) and common 1D bar codes
- Combination of two functions in one device: code reading and object detection
- Reliable detection of even poorly readable codes under difficult ambient conditions
- Comprehensive tools for flexible and easy connection to PC and PLC environments
- Reading of several similar or differing types of codes in one reading pass
- Reading OCR fonts

Optical data		Functions	
Resolution	800 x 600 Pixel	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/3.6", monochrome	Detectors	Position tracking: X/Y and orientation; Pattern matching / contour: teach-in and detection of patterns and contours;
Integrated lens, focal length [mm]	20 (narrow)		Grey threshold, Brightness: evaluation of brightness;
Pixel size	4.8 µm x 4.8 µm		Contrast: evaluation of contrast;
Focus	Motorized		Barcode: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; Datacode: reading 2D codes: ECC200, QR code, GS1, PDF 417; OCR: reading of fonts
Adjustment range	100 mm to infinity		
Integrated illumination	White (5000 K), red (635 nm), infrared (850 nm) LEDs		
Minimum field of view, X x Y	14 x 10 mm		
Target laser	Laser: red (635 nm) class 1  (IEC 60825-1)		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ¹	Dimensions	70.4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Ca. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ²
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1V / Low < 3V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	✓		

¹ Max. ripple < 5 V_{SS} ² 80 % air humidity, noncondensing



— Normal depth of field

Illumination	Part number	Article number	Accessories	
White	V10-CR-P3-W-N-M2-L	631-91085	Connection cables	From Page A-46
Red	V10-CR-P3-R-N-M2-L	631-91090	Illumination	From Page A-33
Infrared	V10-CR-P3-I-N-M2-L	631-91095	Brackets	From Page A-4
			Interface accessories	From Page A-53

VISOR® V10 Code Reader Professional, C-Mount

Multi-Code Reader for 1D and 2D codes and OCR

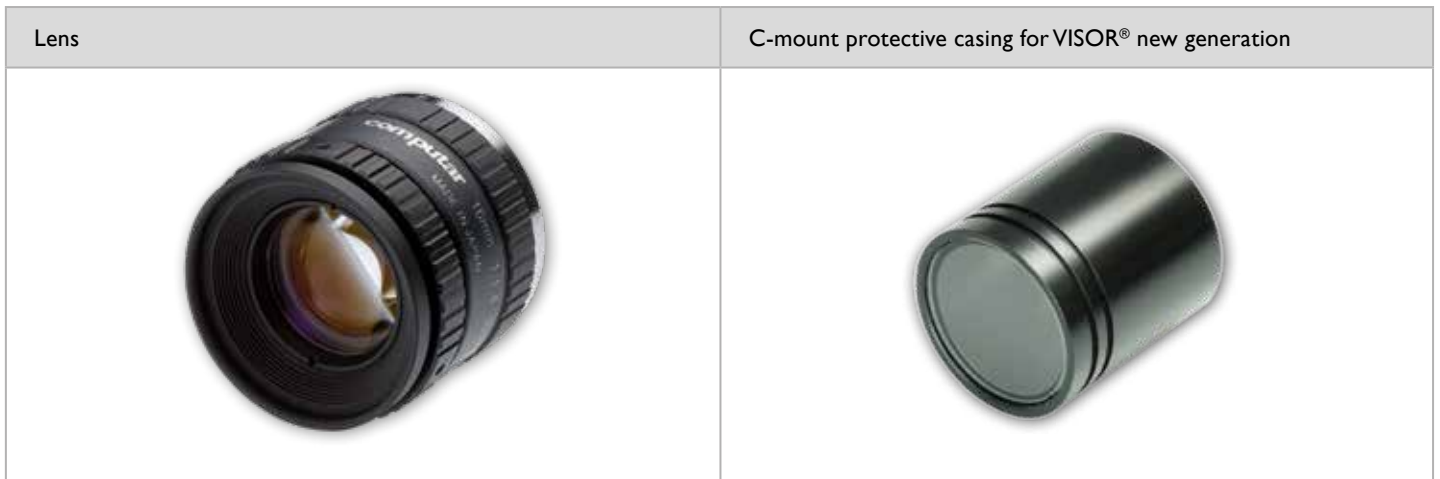
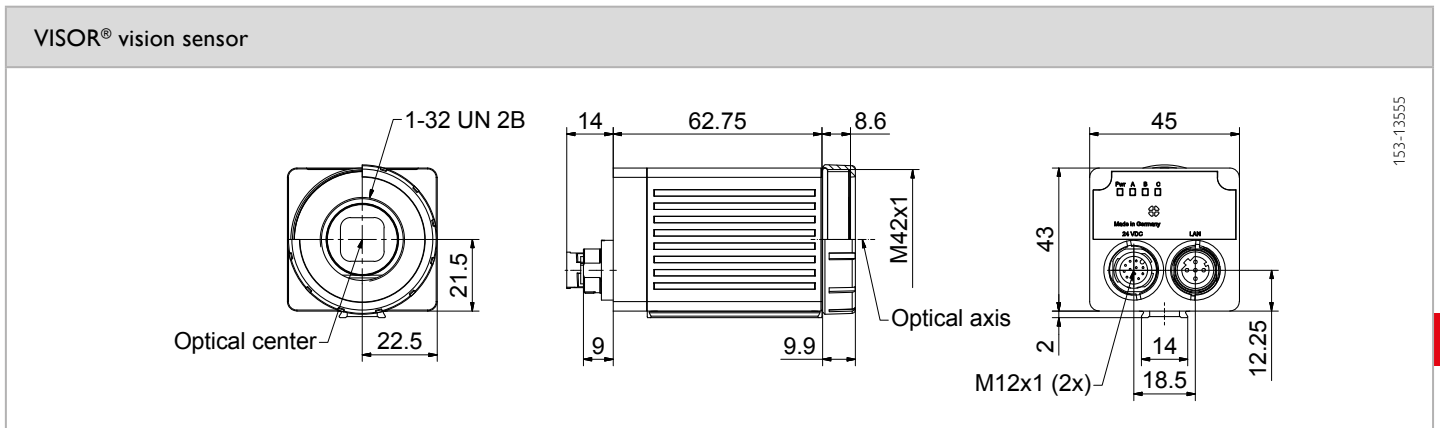


PRODUCT HIGHLIGHTS

- Can be used for all common 2D codes (ECC 200 data matrix) and common 1D bar codes
- Combination of two functions in one device: code reading and object detection
- Reliable detection of even poorly readable codes under difficult ambient conditions
- Comprehensive tools for flexible and easy connection to PC and PLC environments
- Reading of several similar or differing types of codes in one reading pass
- Reading OCR fonts

Optical data		Functions	
Resolution	800 x 600 Pixel	Number of jobs / detectors	max. 255 / max. 255
Imaging chip CMOS	1/3.6", monochrome	Detectors	Position tracking: X/Y and orientation; Pattern matching / contour: teach-in and detection of patterns and contours;
Integrated lens, focal length [mm]	C-mount		Grey threshold, Brightness: evaluation of brightness;
Pixel size	4.8 µm x 4.8 µm		Contrast: evaluation of contrast;
Focus	Manual		Barcode: reading 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, code 32, code 39, code 93, code 128, GS1, pharm code, codabar; Datacode: reading 2D codes: ECC200, QR code, GS1, PDF 417; OCR: reading of fonts
Adjustment range	Dependent on lens		
Integrated illumination	None		
Minimum field of view, X x Y	Dependent on lens		
Target laser	No		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 30 DC ¹	Dimensions	70.4 x 45 x 45 mm (without plug)
Current consumption (without I/O)	≤ 300 mA	Enclosure rating	IP 67 & IP 65 ²
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, housing	Aluminium, die-cast, RoHS compliant
Power On Delay	Ca. 13 s after Power on	Material, front screen	Plastic
Outputs	PNP/NPN (switchable)	Ambient temperature: operation	0 ... +50 °C ³
Max. output current (per output)	50 mA, 100 mA (pin 12)	Ambient temperature: storage	-20 ... +60 °C ³
Switching threshold inputs incl. encoder	PNP/NPN High > U _B -1V / Low < 3V	Weight	Approx. 200 g
Input resistance	> 20 kΩ	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Interfaces	Ethernet (LAN), EtherNet/IP, PROFINET, SensoWeb, Service Port	Vibration resistance	EN 60068-2-6
Inputs/outputs	2 inputs, 2 outputs, 6 selectable inputs/outputs	Shock resistance	EN 60068-2-27
Encoder	✓		

¹ Max. ripple < 5V_{SS} ² only with protective casing ³ 80 % air humidity, noncondensing



Part number	Article number
LPTVxx-G37.5	651-01006
LPTVxx-25.0	651-01007

	LO C 8	LO C 12	LO C 16	LO C 25	LO C 35	LO C 50	LO C 75
Focal length	8 mm	12 mm	16 mm	25 mm	35 mm	50 mm	75 mm
Article number	526-51513	526-51514	526-51515	526-51516	526-51525	526-51113	526-51116

Part number	Article number	Accessories
V10-CR-P3-C-2	631-91098	<ul style="list-style-type: none"> Connection cables Illumination Lenses Brackets Interface accessories
		<ul style="list-style-type: none"> From Page A-46 From Page A-33 From Page A-28 From Page A-4 From Page A-53

The VISOR® Code Reader reads whatever's printed, dot peened and lasered.

System description

With its integrated object detection, the VISOR® Code Reader is unique in its price segment. The compact sensor reads conventional 1D bar codes, 2D data matrix codes and now also optical characters (OCR). It also has four detectors for object detection (pattern comparison, brightness, grey level and contrast), with which other object features – for example, stamps or logos – can be evaluated in a single reading pass. Codes and object features are even reliably detected with deviations from the taught-in position – using position tracking (optionally activated).

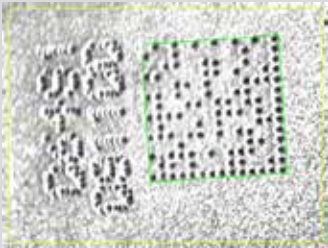
A special image filter with expanded setting options guarantees excellent reading performance even under difficult reading conditions. The test results can largely be evaluated within the sensor itself – with the option of string comparison or regular print-outs – so that there is no need for a PLC or PC connection in many cases. If, however, this proves necessary, it can be easily and flexibly connected using freely available PLC function blocks for Siemens S7, Codesys and Allen Bradley.

With integrated quality parameters complying with ISO and AIM standards, the VISOR® Code Reader also permits the informative evaluation of printed and direct marked 1D and 2D codes. Integrated red, infrared or white light variants provide maximum functional reliability through optimum code illumination.

In addition, the robust, compact and industry-oriented housings guarantee reliability even where space is restricted. Integrated 6 mm or 12 mm optics or C-mount devices also save effort and costs through their optimum adaptation to the most varied of code sizes and operating distances. The new V20 variants also offer a resolution of 1.3 megapixels for particularly small codes or large search areas.

VISOR® Code Reader product variants

Features/sensors	Standard	Advanced
Functions		
V10 resolution in pixels	736 × 480	736 × 480
V20 resolution in pixels	1280 × 1024	1280 × 1024
Image rate per second V10 V20	50 40	50 40
Number of jobs detectors	8 2	max. 255 max. 255
Position tracking	–	✓
Pattern comparison (X-,Y-translation)	–	✓
Grey threshold	–	✓
Contrast	–	✓
Brightness	–	✓
Data code	✓	✓
Bar code	✓	✓
OCR	–	✓
Freeform Tool	–	✓
		<i>(not applicable to 1D & 2D codes)</i>
Interfaces		
Inputs outputs	2 4	2 4
Freely definable switching outputs/inputs, PNP or NPN	2	4
Encoder input	–	✓
I/O expansion	✓	✓
RS422 RS232	✓ ✓	✓ ✓
Ethernet / data transmission	✓	✓
EtherNet / IP	✓	✓
PROFINET	✓	✓
SensoWeb	✓	✓
Lens		
V10: integrated 6 mm 12 mm 25 mm	✓ ✓ ✓	✓ ✓ ✓
V20: integrated 12 mm	✓	✓
C-mount	–	✓
Operation / visualisation		
Viewer software with user guidance	✓	✓
Hierarchised user rights	✓	✓



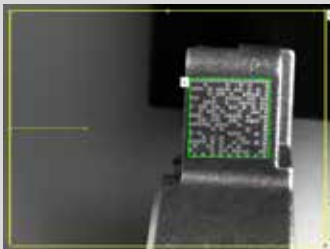
Dot peened code on rough substrate
Code is made legible by powerful reading algorithm. Presence of the nailed imprint in plain text can be checked using object detection.



Low-contrast code
Code is made legible through high tolerance – also towards weakly contrasting codes.



Optical character reading
Dot matrix printing can also be read with OCR.



Code with small "quiet zone"
Even codes with a small quiet zone or damaged finder pattern can be read.



Code reading on solar cells
Even extremely small codes (e.g. on silicon solar cells) or highly reflective codes (e.g. on thin-layer solar cells) can be read.



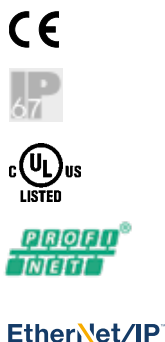
Printed codes on pharmaceutical packaging
ECC200 or bar codes (e.g. EAN 13) can be searched for simultaneously. In addition to code reading, the presence of optical characters can also be checked using object detection.

Special features of the VISOR[®] Code Reader

- Can be used for all common 2D codes (e.g. ECC 200 data matrix) and common 1D bar codes
- Optimum cost-effectiveness through combination of two functions in one device: code reading and object detection
- High operating dependability through reliable detection of even poorly readable codes under difficult ambient conditions
- Flexible and simple connection to PC and PLC environments due to comprehensive possibilities for archiving pictures and read results, as well as freely available PLC function blocks for Siemens S7, Codesys and Allen Bradley
- Very high flexibility, e.g. also due to reading several similar or different codes in one reading pass
- Reading of optical characters with OCR based on neuronal networks, particularly suitable for point printing

VISOR® V20 Code Reader

Standard vision sensor for code reading, 12 mm



PRODUCT HIGHLIGHTS

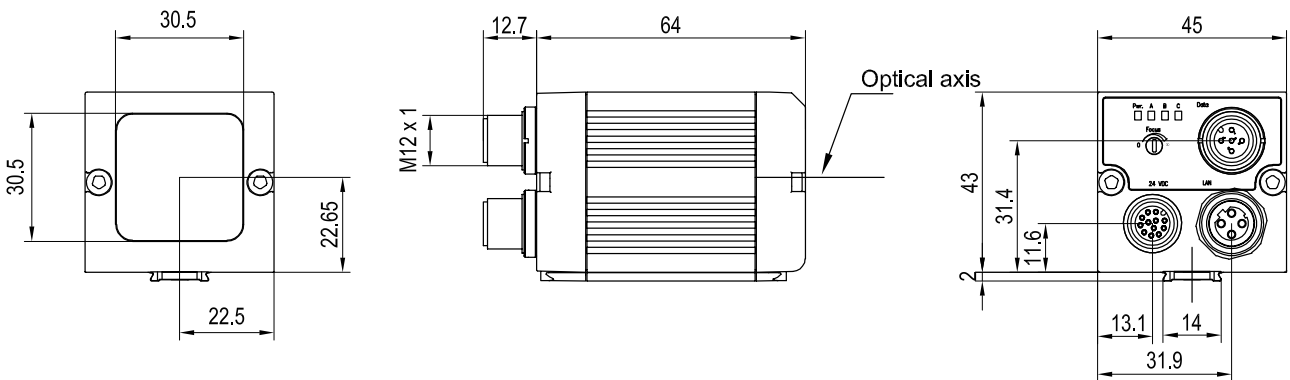
- Can be used for all common 2D codes (ECC 200 data matrix) and common 1D bar codes
- Reliable detection of even poorly readable codes under difficult ambient conditions
- Comprehensive tools for flexible and easy connection to PC and PLC environments

Optical data		Functions	
Resolution	1280 × 1024 pixels	Number of jobs / detectors	8 / 2
CMOS	1/1.8", monochrome	Detectors	Bar code / data code
Integrated lens, focal length	12 mm, adjustable focal position	Properties	Bar code: reading of 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, Code 32, Code 39, Code 93, Code 128, GS1, Pharmacode, Codabar; data code: reading of 2D codes, ECC200, QR code, PDF 417, ECC200 GS1
Adjustment range	30 mm to infinity	Typical cycle time ²	Typ. 30 ms bar code Typ. 40 ms data code
Integrated illumination	White, red, infrared LEDs		
Minimum field of view, X × Y	16 × 13 mm ²		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4 V DC ¹	Dimensions	65 × 45 × 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 67
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Ca. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ³
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ³
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Ca. 160 g
Inputs	PNP/NPN High > U _B -1 V, Low < 3 V	Plug connection	Power and I/O M12 12-pin Ethernet M12 4-pin Data M12 5-pin
Input resistance	> 20 kΩ	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4 V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 2 selectable inputs/outputs		

¹ Max. ripple < 5 V_{SS} ² with VGA-resolution (640 × 480 pixels) ³ 80 % air humidity, non-condensing

Illumination	Part number	Article number
White	V20-CR-S2-W12	536-91044
Red	V20-CR-S2-R12	536-91045
Infrared	V20-CR-S2-I12	536-91046

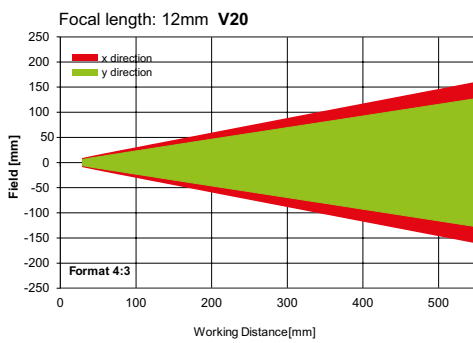
VISOR® vision sensor



153-00911

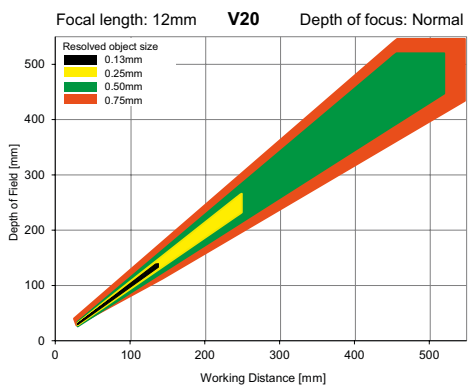
4

Field of view



155-01637

Depth of field: normal



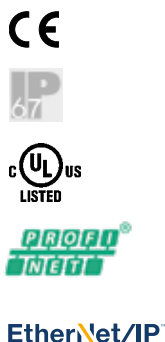
155-01636

Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® V20 Code Reader

Advanced vision sensor for code reading with object detection, 12 mm



PRODUCT HIGHLIGHTS

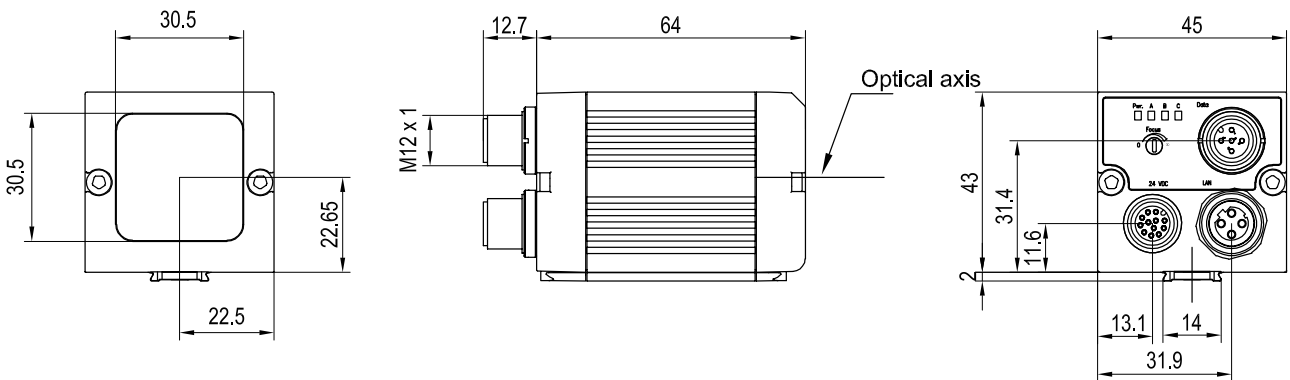
- Can be used for all common 2D codes (ECC 200 data matrix) and common 1D bar codes
- Combination of two functions in one device: code reading and object detection
- Reliable detection of even poorly readable codes under difficult ambient conditions
- Comprehensive tools for flexible and easy connection to PC and PLC environments
- Reading of several similar or differing types of codes in one reading pass

Optical data		Functions	
Resolution	1280 × 1024 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/1.8", monochrome	Detectors	Pattern comparison, contrast, brightness, grey level, bar code, data code, OCR
Integrated lens, focal length	12 mm, adjustable focal position	Properties	X/Y position tracking; pattern comparison: teach-in and pattern detection; grey level, brightness: evaluation of brightness; contrast: evaluation of contrast; bar code: reading of 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, Code 32, Code 39, Code 93, Code 128, GS1, Pharmacode, Codabar; data code: reading of 2D codes: ECC200, QR code, PDF 417, ECC200 GS1
Adjustment range	30 mm to infinity	Typical cycle time ²	Typ. 20 ms pattern comparison; typ. 2 ms brightness; typ. 2 ms contrast; typ. 2 ms grey level; typ. 30 ms bar code; typ. 40 ms data code
Integrated illumination	White, red, infrared, UV (400 nm) LEDs		
Minimum field of view, X × Y	16 × 13 mm ²		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4 V DC ¹	Dimensions	65 × 45 × 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 67
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Ca. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ³
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ³
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Ca. 160 g
Inputs	PNP/NPN High > U _B -1 V, Low < 3 V	Plug connection	Power and I/O M12 12-pin Ethernet M12 4-pin Data M12 5-pin
Input resistance	> 20 kΩ	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4 V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

¹ Max. ripple < 5V_{SS} ² with VGA-resolution (640 × 480 pixels) ³ 80 % air humidity, non-condensing

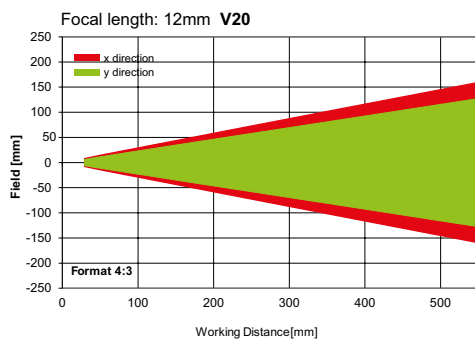
Illumination	Part number	Article number
White	V20-CR-A2-W12	536-91001
Red	V20-CR-A2-R12	536-91002
Infrared	V20-CR-A2-I12	536-91003
UV (400 nm)	V20-CR-A2-U12	536-91019

VISOR® vision sensor



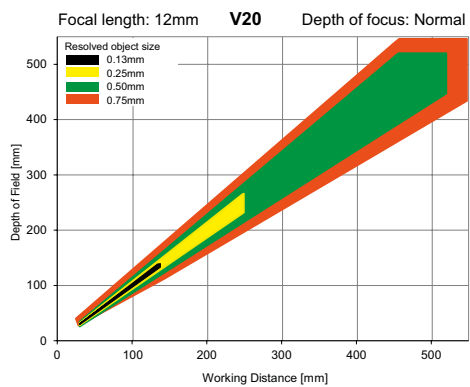
153-00911

Field of view



155-01637

Depth of field: normal



155-01636

Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® V20 Code Reader Color

Advanced vision sensor for code reading with object detection, 12 mm



EtherNet/IP™

PRODUCT HIGHLIGHTS

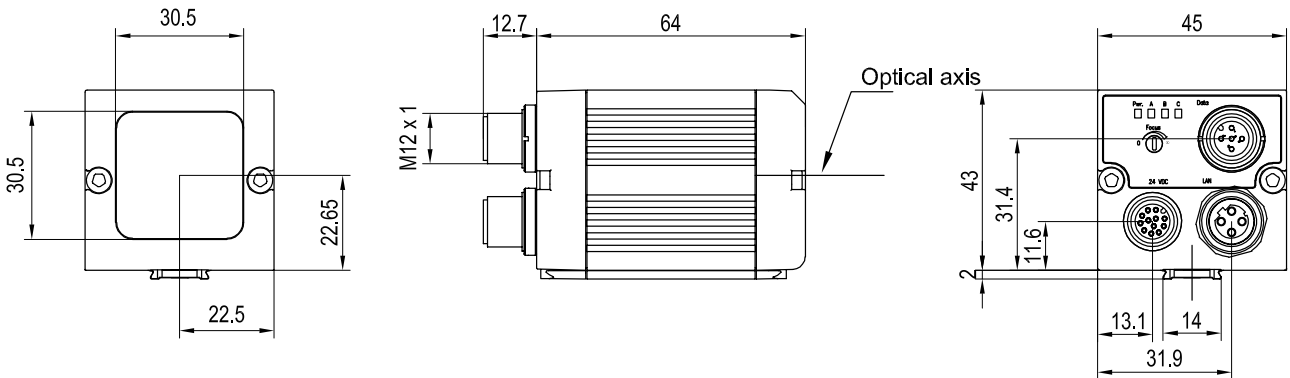
- Can be used for all common 2D codes (ECC 200 data matrix) and common 1D bar codes
- Code reading of color image
- Reliable detection of even poorly readable codes under difficult ambient conditions
- Comprehensive tools for flexible and easy connection to PC and PLC environments
- Reading of several similar or differing types of codes in one reading pass

Optical data		Functions	
Resolution	1280 × 1024 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/1.8", color	Detectors	Pattern comparison, contrast, brightness, grey level, bar code, data code, OCR
Integrated lens, focal length	12 mm, adjustable focal position	Properties	X/Y position tracking; pattern comparison: teach-in and pattern detection; grey level, brightness: evaluation of brightness; contrast: evaluation of contrast; bar code: reading of 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, Code 32, Code 39, Code 93, Code 128, GS1, Pharmacode, Codabar; data code: reading of 2D codes: ECC200, QR code, PDF 417, ECC200 GS1
Adjustment range	30 mm to infinity	Typical cycle time ²	Typ. 20 ms pattern comparison; typ. 2 ms brightness; typ. 2 ms contrast; typ. 2 ms grey level; typ. 30 ms bar code; typ. 40 ms data code
Integrated illumination	White LEDs		
Minimum field of view, X × Y	16 × 13 mm ²		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4V DC ¹	Dimensions	65 × 45 × 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 67
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Ca. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ³
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ³
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Ca. 160 g
Inputs	PNP/NPN High > U _B -1 V, Low < 3 V	Plug connection	Power and I/O M12 12-pin Ethernet M12 4-pin Data M12 5-pin
Input resistance	> 20 kΩ	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

¹ Max. ripple < 5V_{SS} ² with VGA-resolution (640 × 480 pixels) ³ 80 % air humidity, non-condensing

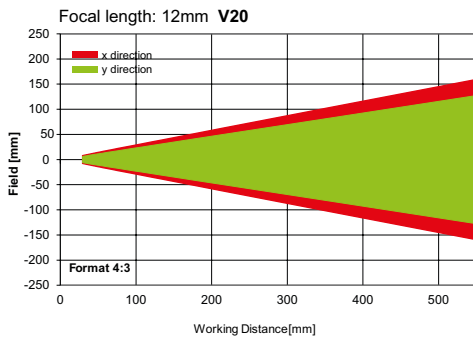
Illumination	Part number	Article number
White	V20C-CR-A2-W12	536-91026

VISOR® vision sensor



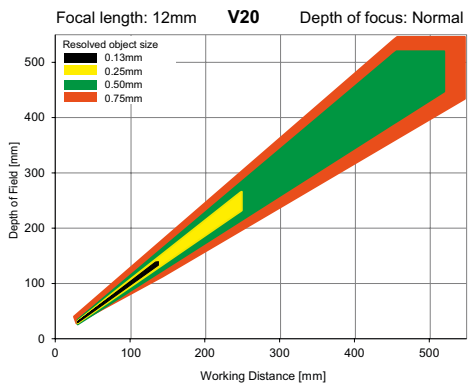
153-00911

Field of view



155-01637

Depth of field: normal



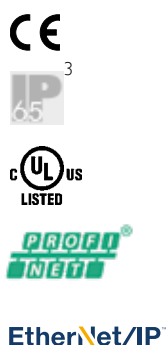
155-01636

Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® V20 Code Reader

Advanced vision sensor for code reading with object detection, C-mount



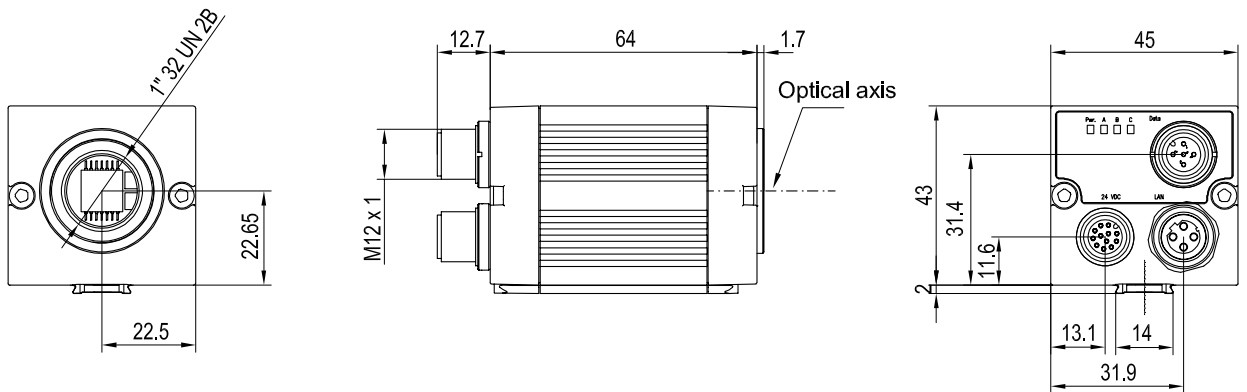
PRODUCT HIGHLIGHTS

- Can be used for all common 2D codes (ECC 200 data matrix) and common 1D bar codes
- Combination of two functions in one device: code reading and object detection
- Reliable detection of even poorly readable codes under difficult ambient conditions
- Comprehensive tools for flexible and easy connection to PC and PLC environments
- Reading of several similar or differing types of codes in one reading pass

Optical data		Functions	
Resolution	1280 × 1024 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/1.8", monochrome	Detectors	Pattern comparison, contrast, brightness, grey level, bar code, data code, OCR
Integrated lens, focal length	C-mount	Properties	X/Y position tracking; pattern comparison: teach-in and pattern detection; grey level, brightness: evaluation of brightness; contrast: evaluation of contrast; bar code: reading of 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, Code 32, Code 39, Code 93, Code 128, GS1, Pharmacode, Codabar; data code: reading of 2D codes: ECC200, QR code, PDF 417, ECC200 GS1
Adjustment range	Dependent on lens	Typical cycle time ²	Typ. 20 ms pattern comparison; typ. 2 ms brightness; typ. 2 ms contrast; typ. 2 ms grey level; typ. 30 ms bar code; typ. 40 ms data code
Integrated illumination	None		
Minimum field of view, X × Y	Dependent on lens		
Electrical data		Mechanical data	
Operating voltage, +U _b	18 ... 26.4 V DC ¹	Dimensions	65 × 45 × 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 65 ³
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _b / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Ca. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ⁴
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ⁴
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Ca. 160 g
Inputs	PNP/NPN High > U _b -1 V, Low < 3 V	Plug connection	Power and I/O M12 12-pin Ethernet M12 4-pin Data M12 5-pin
Input resistance	> 20 kΩ	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4 V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

¹ Max. ripple < 5V_{SS} ² With VGA-resolution (640 × 480 Pixel) ³ With LPT45 C-mount protective casing ⁴ 80 % air humidity, non-condensing

Part number	Article number
V20-CR-A2-C	536-91000

VISOR® vision sensor


153-00912

4

Lens

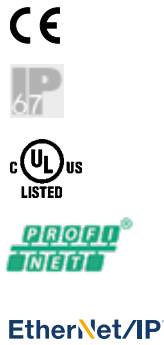

	LO C 8	LO C 12	LO C 16	LO C 25	LO C 35	LO C 50	LO C 75
Focal length	8 mm	12 mm	16 mm	25 mm	35 mm	50 mm	75 mm
Article number	526-51513	526-51514	526-51515	526-51516	526-51525	526-51113	526-51116

Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Lenses	From Page A-28
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® V10 Code Reader

Standard vision sensor for code reading, 6 mm



PRODUCT HIGHLIGHTS

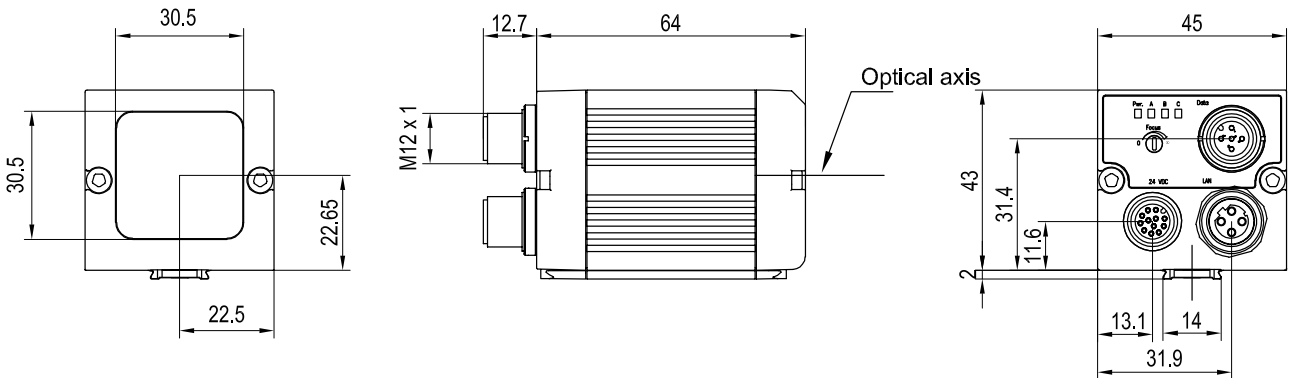
- Can be used for all common 2D codes (ECC 200 data matrix) and common 1D bar codes
- Reliable detection of even poorly readable codes under difficult ambient conditions
- Comprehensive tools for flexible and easy connection to PC and PLC environments

Optical data		Functions	
Resolution	736 x 480 pixels	Number of jobs / detectors	8 / 2
CMOS	1/3", monochrome	Detectors	Bar code / data code
Integrated lens, focal length	6 mm, adjustable focal position	Properties	UPC, RSS, 2/5 Interleaved, 2/5 Industrial, Code 32, Code 39, Code 93, Code 128, GS1, Pharmacode, Codabar; data code: reading of 2D codes, ECC200, QR code, PDF 417, ECC200 GS1
Adjustment range	6 mm to infinity	Typical cycle time	Typ. 30 ms bar code Typ. 40 ms data code
Integrated illumination	White, red, infrared LEDs		
Minimum field of view, X x Y	5 x 4 mm ²		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4V DC ¹	Dimensions	65 x 45 x 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 67
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Ca. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ²
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Ca. 160 g
Inputs	PNP/NPN High > U _B -1V, Low < 3V	Plug connection	Power and I/O M12, 12pin Ethernet M12, 4pin Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 2 selectable inputs/outputs		

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

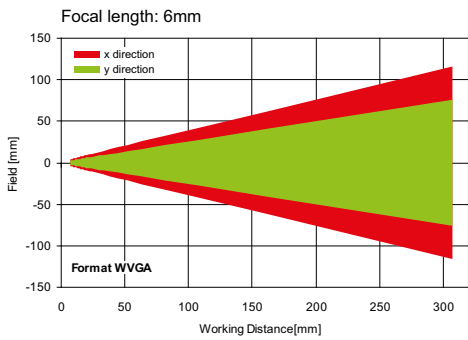
Illumination	Depth of field	Part number	Article number
White	Normal	V10-CR-S1-W6	535-91034
White	Enhanced	V10-CR-S1-W6D	535-91036
Red	Normal	V10-CR-S1-R6	535-91038
Red	Enhanced	V10-CR-S1-R6D	535-91040
Infrared	Normal	V10-CR-S1-I6	535-91042
Infrared	Enhanced	V10-CR-S1-I6D	535-91044

VISOR® vision sensor



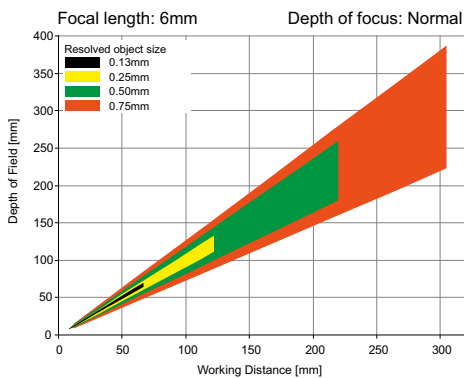
153-00911

Field of view



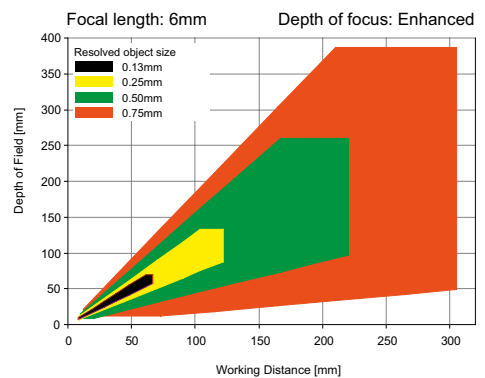
155-01422

Depth of field: normal



155-01409

Depth of field: enhanced



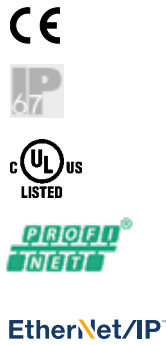
155-01421

Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® V10 Code Reader

Standard vision sensor for code reading, 12 mm



PRODUCT HIGHLIGHTS

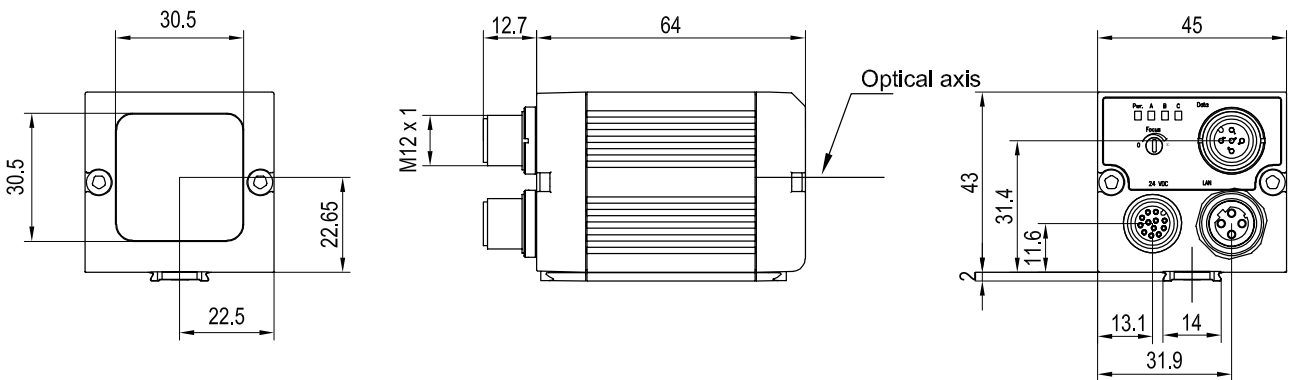
- Can be used for all common 2D codes (ECC 200 data matrix) and common 1D bar codes
- Reliable detection of even poorly readable codes under difficult ambient conditions
- Comprehensive tools for flexible and easy connection to PC and PLC environments

Optical data		Functions	
Resolution	736 x 480 pixels	Number of jobs / detectors	8 / 2
CMOS	1/3", monochrome	Detectors	Bar code / data code
Integrated lens, focal length	12 mm, adjustable focal position	Properties	Bar code: reading of 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, Code 32, Code 39, Code 93, Code 128, GS1, Pharmacode, Codabar; data code: reading of 2D codes, ECC200, QR code, PDF 417, ECC200 GS1
Adjustment range	30 mm to infinity	Typical cycle time	Typ. 30 ms bar code Typ. 40 ms data code
Integrated illumination	White, red, infrared LEDs		
Minimum field of view, X x Y	8 x 6 mm ²		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4 V DC ¹	Dimensions	65 x 45 x 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 67
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Ca. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ²
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Ca. 160 g
Inputs	PNP/NPN High > U _B -1V, Low < 3V	Plug connection	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 2 selectable inputs/outputs		

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

Illumination	Depth of field	Part number	Article number
White	Normal	V10-CR-S1-W12	535-91035
White	Enhanced	V10-CR-S1-W12D	535-91037
Red	Normal	V10-CR-S1-R12	535-91039
Red	Enhanced	V10-CR-S1-R12D	535-91041
Infrared	Normal	V10-CR-S1-I12	535-91043
Infrared	Enhanced	V10-CR-S1-I12D	535-91045

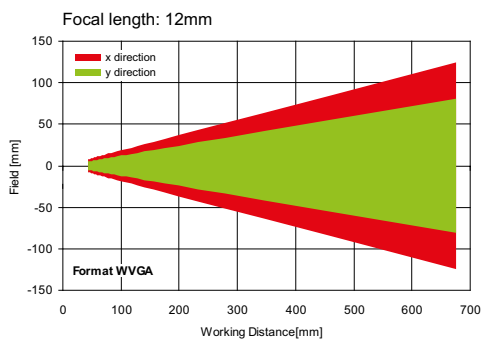
VISOR® vision sensor



153-00911

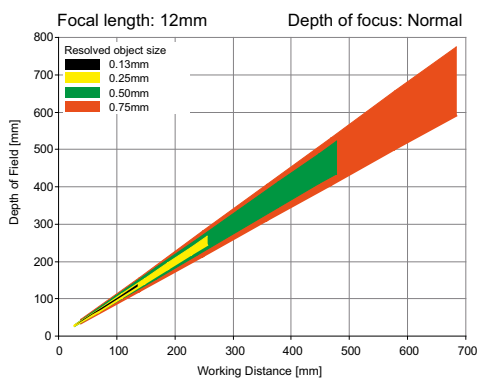
4

Field of view



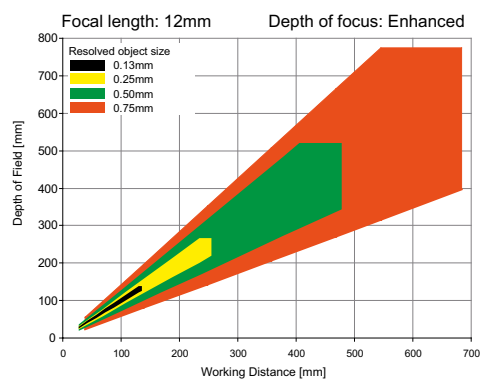
155-01423

Depth of field: normal



155-01410

Depth of field: enhanced



155-01411

Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® V10 Code Reader

Standard vision sensor for code reading, 25 mm



PRODUCT HIGHLIGHTS

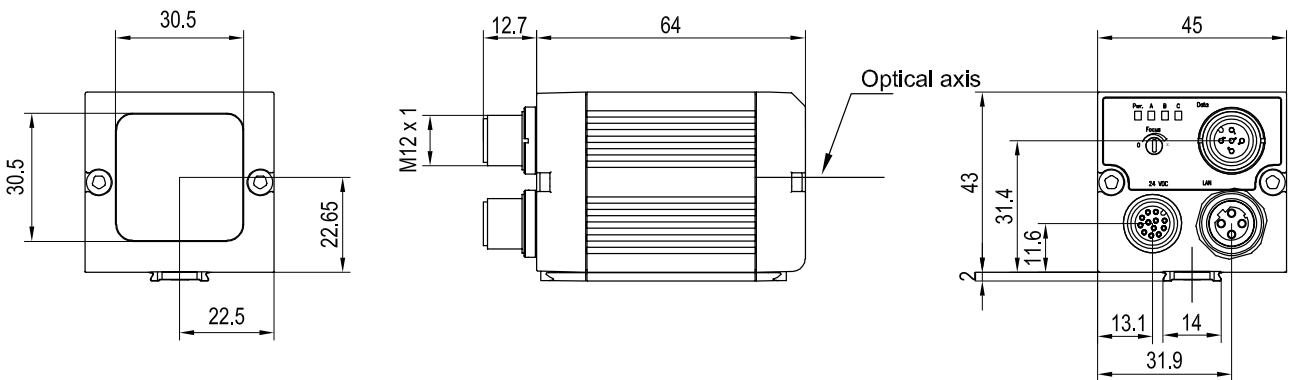
- Can be used for all common 2D codes (ECC 200 data matrix) and common 1D bar codes
- Reliable detection of even poorly readable codes under difficult ambient conditions
- Comprehensive tools for flexible and easy connection to PC and PLC environments

Optical data		Functions	
Resolution	736 x 480 pixels	Number of jobs / detectors	8 / 2
CMOS	1/3", monochrome	Detectors	Bar code / data code
Integrated lens, focal length	25 mm, adjustable focal position	Properties	Bar code: reading of 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, Code 32, Code 39, Code 93, Code 128, GS1, Pharmacode, Codabar; data code: reading of 2D codes, ECC200, QR code, PDF 417, ECC200 GS1
Adjustment range	140 mm to infinity	Typical cycle times	Typ. 30 ms bar code Typ. 40 ms data code
Integrated illumination	White, red, infrared LEDs		
Minimum field of view, X x Y	18 x 14 mm ²		
Electrical data		Mechanical data	
Operating voltage, +U _b	18 ... 26.4V DC ¹	Dimensions	65 x 45 x 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 67
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _b / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Ca. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ²
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Ca. 160 g
Inputs	PNP/NPN High > U _b -1V, Low < 3V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

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

Illumination	Depth of field	Part number	Article number
White	Normal	V10-CR-S2-W25	535-91088
Red	Normal	V10-CR-S2-R25	535-91089
Infrared	Normal	V10-CR-S2-I25	535-91090

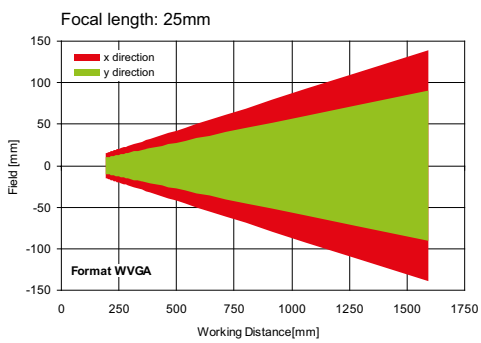
VISOR® vision sensor



153-00911

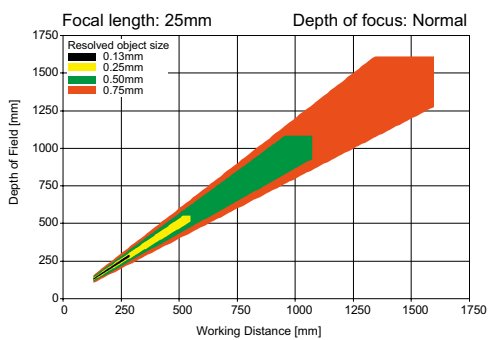
4

Field of view



155-01424

Depth of field: normal



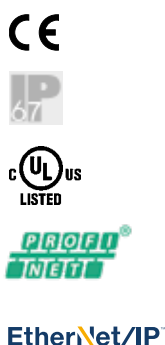
155-01412

Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® V10 Code Reader

Advanced vision sensor for code reading with object detection, 6 mm



PRODUCT HIGHLIGHTS

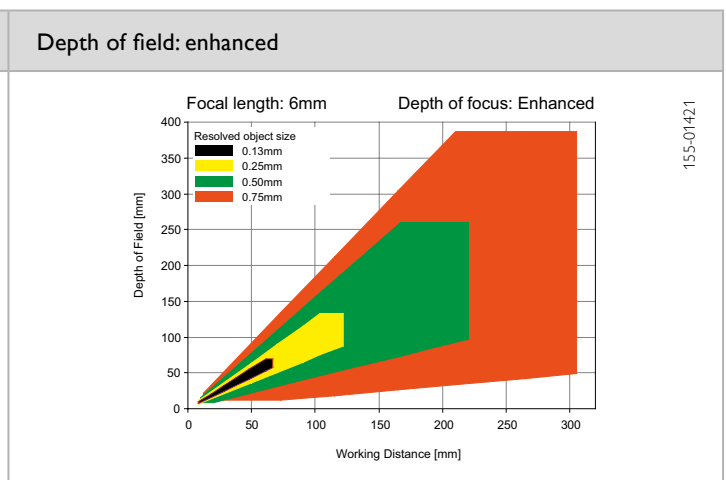
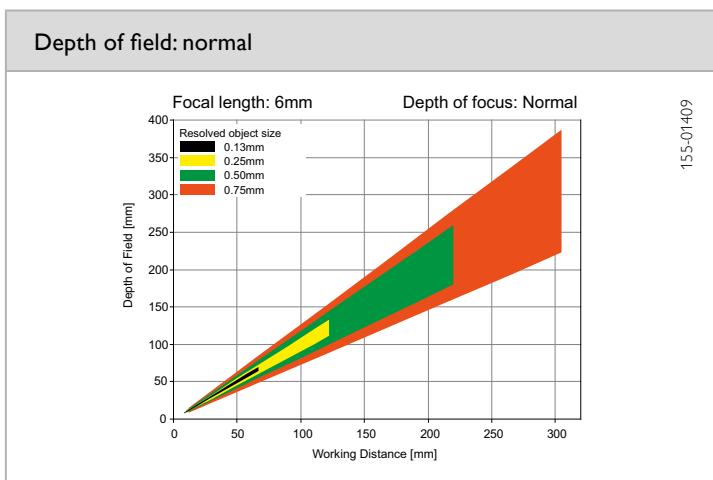
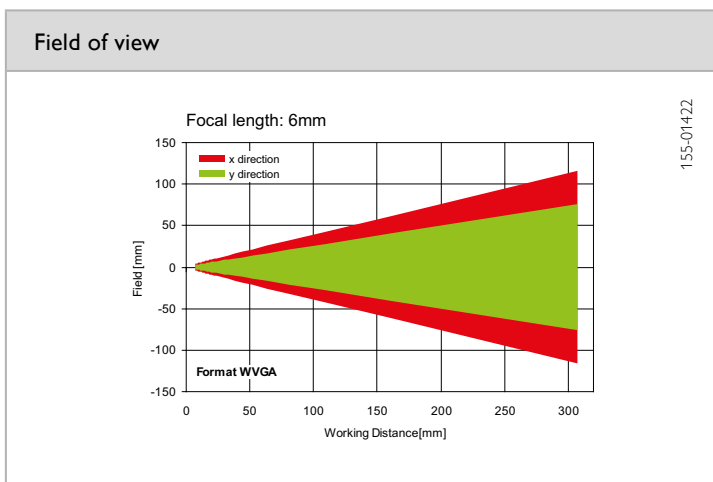
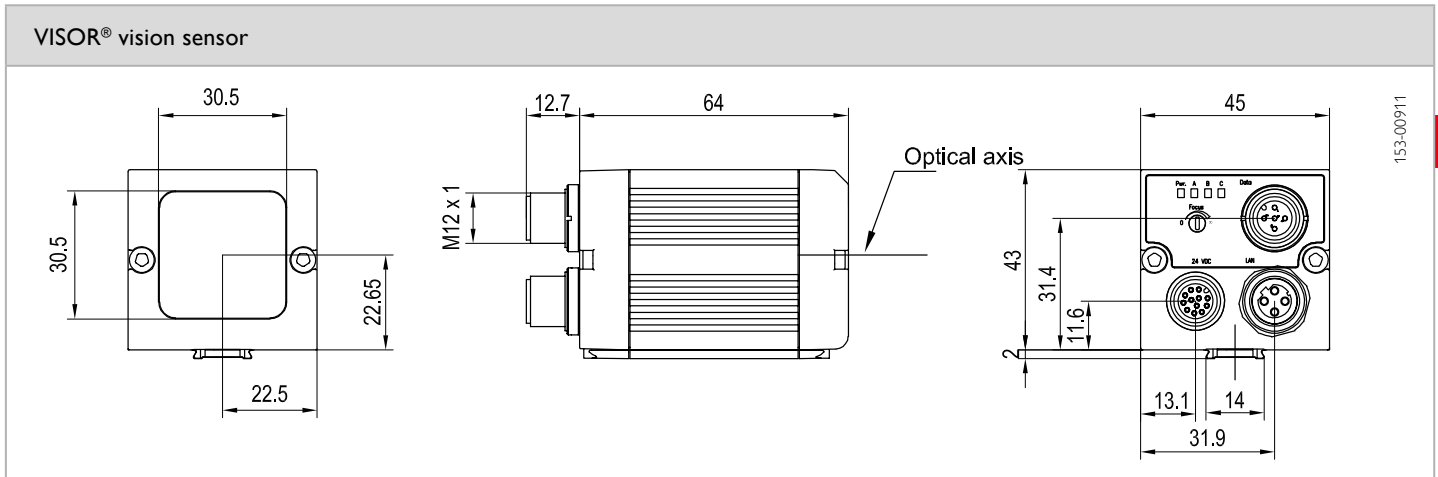
- Can be used for all common 2D codes (ECC 200 data matrix) and common 1D bar codes
- Combination of two functions in one device: code reading and object detection
- Reliable detection of even poorly readable codes under difficult ambient conditions
- Comprehensive tools for flexible and easy connection to PC and PLC environments
- Reading of several similar or differing types of codes in one reading pass

Optical data		Functions	
Resolution	736 x 480 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/3", monochrome	Detectors	Pattern comparison, contrast, brightness, grey level, bar code, data code, OCR
Integrated lens, focal length	6 mm, adjustable focal position	Properties	X/Y position tracking; pattern comparison: teach-in and pattern detection; grey level, brightness: evaluation of brightness; contrast: evaluation of contrasts; bar code: reading of 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, Code 32, Code 39, Code 93, Code 128, GS1, Pharmacode, Codabar; data code: reading of 2D codes, ECC200, QR code, PDF 417, ECC200 GS1
Adjustment range	6 mm to infinity	Typical cycle time	Typ. 20 ms pattern comparison; typ. 2 ms brightness; typ. 2 ms contrast; typ. 2 ms grey level; typ. 30 ms bar code; typ. 40 ms data code
Integrated illumination	White, red, infrared LEDs		
Minimum field of view, X x Y	5 x 4 mm ²		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4 V DC ¹	Dimensions	65 x 45 x 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 67
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Ca. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ²
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Ca. 160 g
Inputs	PNP/NPN High > U _B -1 V, Low < 3 V	Plug connection	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4 V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

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

Illumination	Depth of field	Part number	Article number
White	Normal	V10-CR-A1-W6	535-91021
White	Enhanced	V10-CR-A1-W6D	535-91023
Red	Normal	V10-CR-A1-R6	535-91025
Red	Enhanced	V10-CR-A1-R6D	535-91027

Illumination	Depth of field	Part number	Article number
Infrared	Normal	V10-CR-A1-I6	535-91029
Infrared	Enhanced	V10-CR-A1-I6D	535-91031

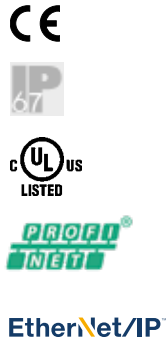


Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® V10 Code Reader

Advanced vision sensor for code reading with object detection, 12 mm



PRODUCT HIGHLIGHTS

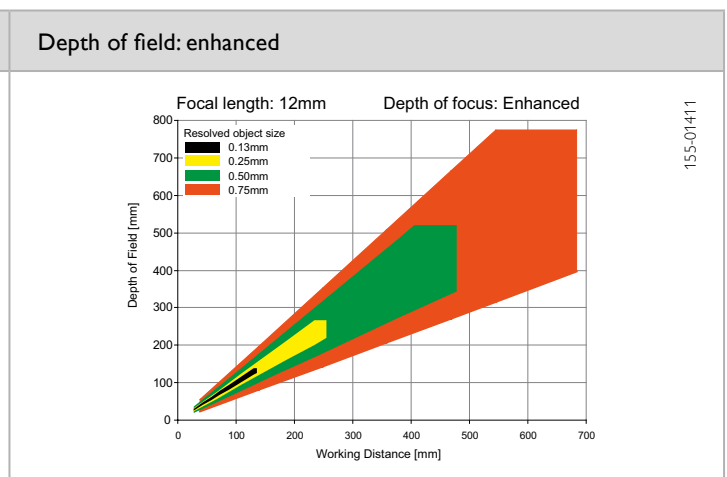
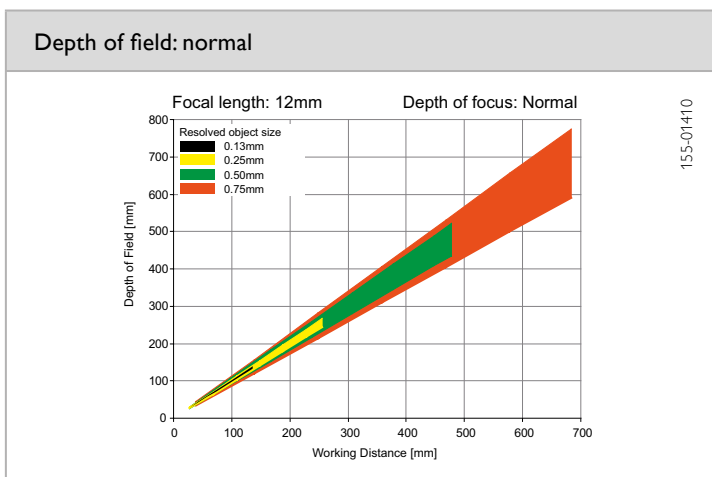
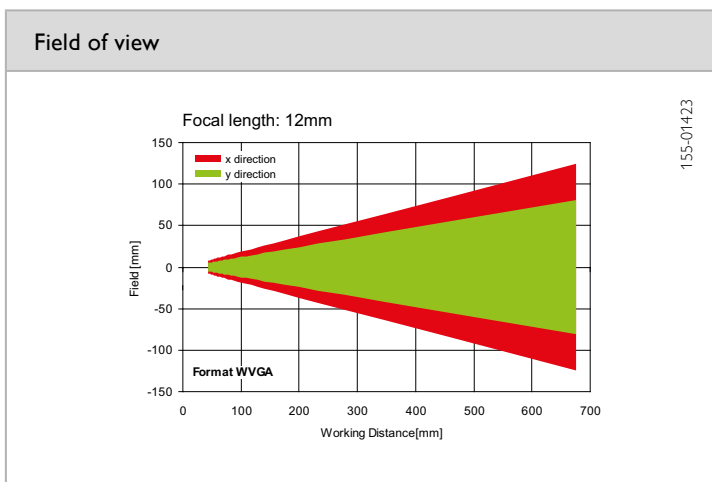
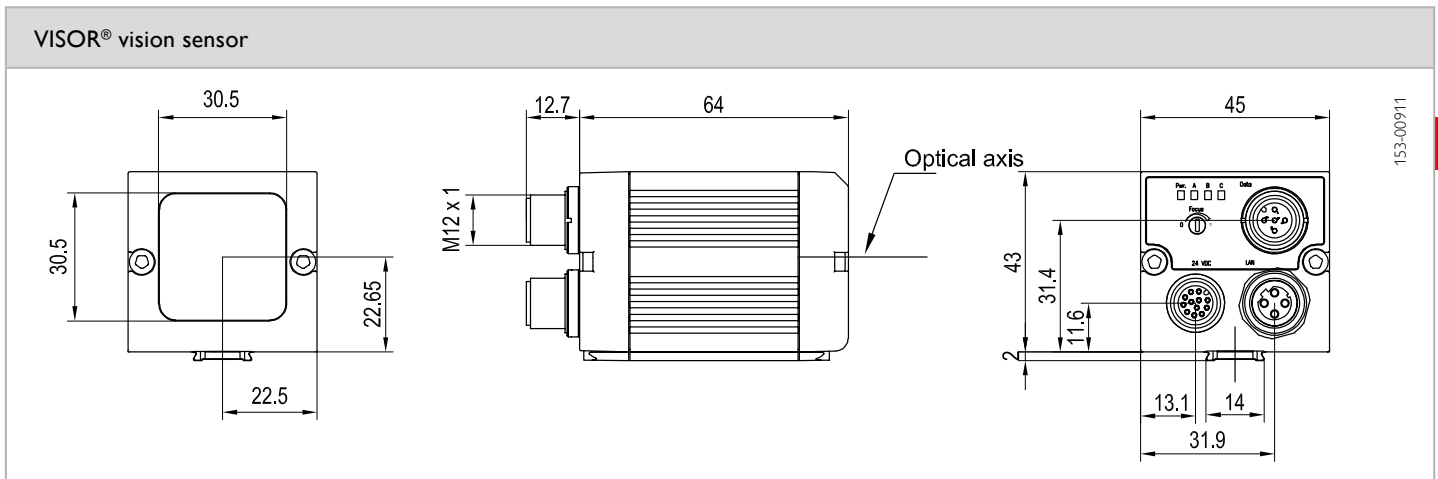
- Can be used for all common 2D codes (ECC 200 data matrix) and common 1D bar codes
- Combination of two functions in one device: code reading and object detection
- Reliable detection of even poorly readable codes under difficult ambient conditions
- Comprehensive tools for flexible and easy connection to PC and PLC environments
- Reading of several similar or differing types of codes in one reading pass

Optical data		Functions	
Resolution	736 x 480 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/3", monochrome	Detectors	Pattern comparison, contrast, brightness, grey level, bar code, data code, OCR
Integrated lens, focal length	12 mm, adjustable focal position	Properties	X/Y position tracking; pattern comparison: teach-in and pattern detection; grey level, brightness: evaluation of brightness; contrast: evaluation of contrast; bar code: reading of 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, Code 32, Code 39, Code 93, Code 128, GS1, Pharmacode, Codabar; data code: reading of 2D codes: ECC200, QR code, PDF 417, ECC200 GS1
Adjustment range	30 mm to infinity	Typical cycle time	Typ. 20 ms pattern comparison; typ. 2 ms brightness; typ. 2 ms contrast; typ. 2 ms grey level; typ. 30 ms bar code; typ. 40 ms data code
Integrated illumination	White, red, infrared LEDs		
Minimum field of view, X x Y	8 x 6 mm ²		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4 V DC ¹	Dimensions	65 x 45 x 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 67
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Ca. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ²
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Ca. 160 g
Inputs	PNP/NPN High > U _B -1 V, Low < 3 V	Plug connection	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4 V		
Interfaces	Ethernet (LAN), RS422, RS232 EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

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

Illumination	Depth of field	Part number	Article number
White	Normal	V10-CR-A1-W12	535-91022
White	Enhanced	V10-CR-A1-W12D	535-91024
Red	Normal	V10-CR-A1-R12	535-91026
Red	Enhanced	V10-CR-A1-R12D	535-91028

Illumination	Depth of field	Part number	Article number
Infrared	Normal	V10-CR-A1-I12	535-91030
Infrared	Enhanced	V10-CR-A1-I12D	535-91032

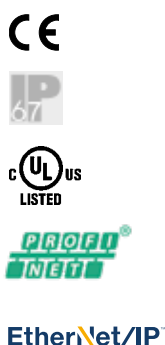


Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Brackets	From Page A-4
Interface accessories	From Page A-53

VISOR® V10 Code Reader

Advanced vision sensor code reading with object detection, 25 mm



PRODUCT HIGHLIGHTS

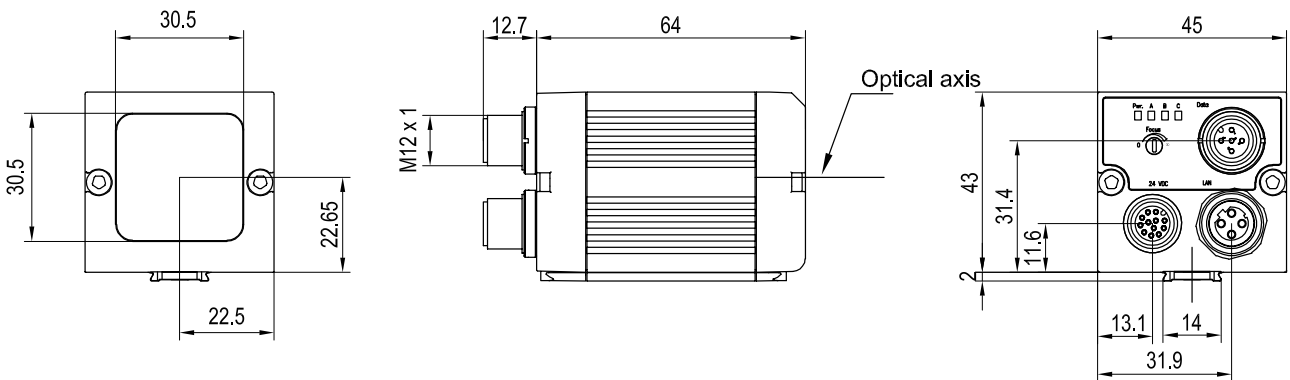
- Can be used for all common 2D codes (ECC 200 data matrix) and common 1D bar codes
- Combination of two functions in one device: code reading and object detection
- Reliable detection of even poorly readable codes under difficult ambient conditions
- Comprehensive tools for flexible and easy connection to PC and PLC environments
- Reading of several similar or differing types of codes in one reading pass

Optical data		Functions	
Resolution	736 × 480 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/3", monochrome	Detectors	Pattern comparison, contrast, brightness, grey level, bar code, data code, OCR
Integrated lens, focal length	25 mm, adjustable focal position	Properties	X/Y position tracking; pattern comparison: teach-in and pattern detection; grey level, brightness: evaluation of brightness; contrast: evaluation of contrast; bar code: reading of 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, Code 32, Code 39, Code 93, Code 128, GS1, Pharmacode, Codabar; data code: reading of 2D codes: ECC200, QR code, PDF 417, ECC200 GS1
Adjustment range	140 mm to infinity	Typical cycle times	Typ. 20 ms pattern comparison; typ. 2 ms brightness; typ. 2 ms contrast; typ. 2 ms grey level; typ. 30 ms bar code; typ. 40 ms data code
Integrated illumination	White, red, infrared LEDs		
Minimum field of view, X × Y	18 × 14 mm ²		
Electrical data		Mechanical data	
Operating voltage, +U _B	18 ... 26.4 V DC ¹	Dimensions	65 × 45 × 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 67
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Ca. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ²
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ²
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Ca. 160 g
Inputs	PNP/NPN High > U _B -1 V, Low < 3 V	Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4 V		
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

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

Illumination	Depth of field	Part number	Article number
White	Normal	V10-CR-A2-W25	535-91084
Red	Normal	V10-CR-A2-R25	535-91085
Infrared	Normal	V10-CR-A2-I25	535-91086

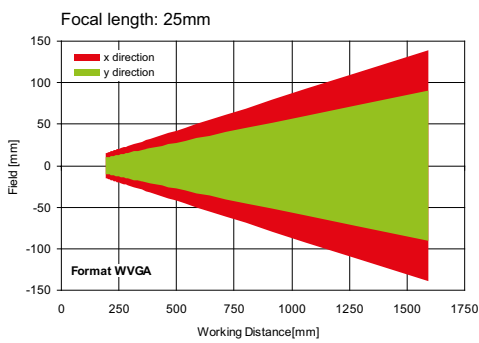
VISOR® vision sensor



153-00911

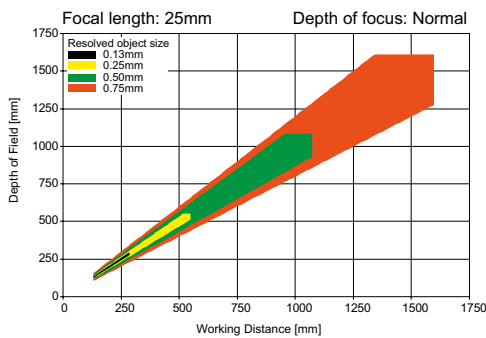
4

Field of view



155-01424

Depth of field: normal



155-01412

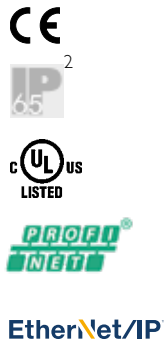
Accessories

- Connection cables
- Illumination
- Brackets
- Interface accessories

- From Page A-46
- From Page A-33
- From Page A-4
- From Page A-53

VISOR® V10 Code Reader

Advanced vision sensor for code reading with object detection, C-mount



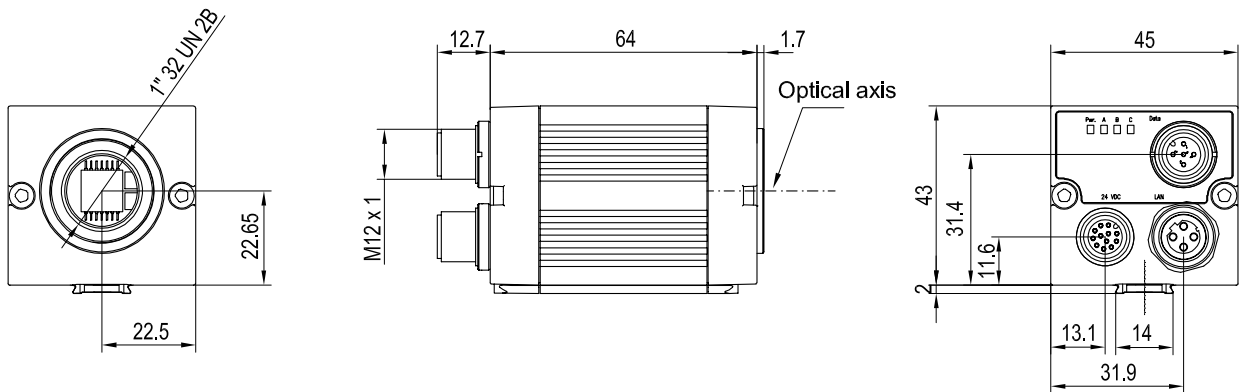
PRODUCT HIGHLIGHTS

- Can be used for all common 2D codes (ECC 200 data matrix) and common 1D bar codes
- Combination of two functions in one device: code reading and object detection
- Reliable detection of even poorly readable codes under difficult ambient conditions
- Comprehensive tools for flexible and easy connection to PC and PLC environments
- Reading of several similar or differing types of codes in one reading pass

Optical data		Functions	
Resolution	736 x 480 pixels	Number of jobs / detectors	max. 255 / max. 255
CMOS	1/3", monochrome	Detectors	Pattern comparison, contrast, brightness, grey level, bar code, data code, OCR
Integrated lens, focal length	C-mount	Properties	X/Y position tracking; pattern comparison: teach-in and pattern detection; grey level, brightness: evaluation of brightness; contrast: evaluation of contrast; bar code: reading of 1D bar codes, EAN, UPC, RSS, 2/5 Interleaved, 2/5 Industrial, Code 32, Code 39, Code 93, Code 128, GS1, Pharmacode, Codabar; data code: reading of 2D codes: ECC200, QR code, PDF 417, ECC200 GS1
Adjustment range	Dependent on lens	Typical cycle time	Typ. 20 ms pattern comparison; typ. 2 ms brightness; typ. 2 ms contrast; typ. 2 ms grey level; typ. 30 ms bar code; typ. 40 ms data code
Integrated illumination	None		
Minimum field of view, X x Y	Dependent on lens		
Electrical data		Mechanical data	
Operating voltage, +U _b	18 ... 26.4V DC ¹	Dimensions	65 x 45 x 45 mm (without plug)
Current consumption (without illumination and I/O)	≤ 120 mA	Enclosure rating	IP 65 ²
Current consumption (without I/O)	≤ 200 mA	Material, housing	Aluminium, plastic
Protective circuits	Reverse-polarity protection, U _b / short-circuit protection of all outputs	Material, front screen	Plastic
Power On Delay	Ca. 13 s after Power on	Ambient temperature: operation	0 ... +50 °C ³
Outputs	PNP / NPN (switchable)	Ambient temperature: storage	-20 ... +60 °C ³
Max. output current (per output)	50 mA, 100 mA (pin 12)	Weight	Ca. 160 g
Inputs	PNP/NPN High > U _b -1 V, Low < 3 V	Plug connection	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Input resistance	> 20 kOhm	Vibration and impact resistance	EN 60947-5-2
Encoder input	High > 4V		
Interfaces	Ethernet (LAN), RS422, RS232 EtherNet/IP, PROFINET, SensoWeb		
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs		

¹ Max. ripple < 5V_{SS} ² With LPT45 C-mount protective casing ³ 80 % air humidity, non-condensing

Part number	Article number
V10-CR-A1-C	535-91033

VISOR® vision sensor


153-00912

4

Lens


	LO C 8	LO C 12	LO C 16	LO C 25	LO C 35	LO C 50	LO C 75
Focal length	8 mm	12 mm	16 mm	25 mm	35 mm	50 mm	75 mm
Article number	526-51513	526-51514	526-51515	526-51516	526-51525	526-51113	526-51116

Accessories

Connection cables	From Page A-46
Illumination	From Page A-33
Lenses	From Page A-28
Brackets	From Page A-4
Interface accessories	From Page A-53