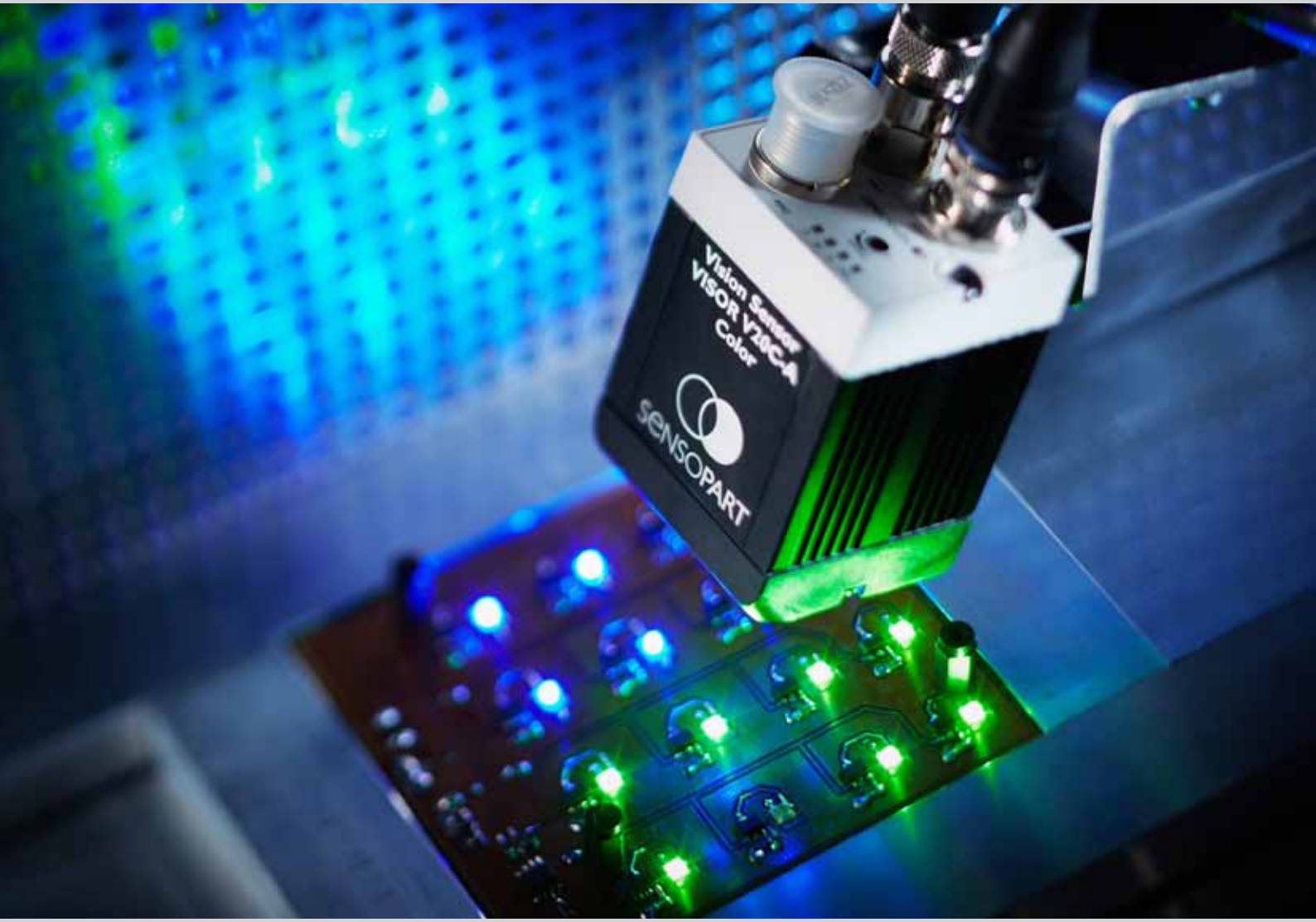
SENSOPART

VISOR® Color.

Vision colour sensors for optimum object detection.

Detect colours!

See the world as it is – with VISOR® Color from SensoPart.



Blue above, green below:
Classic colour sensors cannot detect active (self-illuminating) colours – no problem for the VISOR® Color. The vision colour sensor finds out whether the green and blue LEDs are in the right place and whether the colour intensities lie within the defined tolerance ranges. The combination of object and colour detection expands the range of uses of vision sensors with a new dimension.

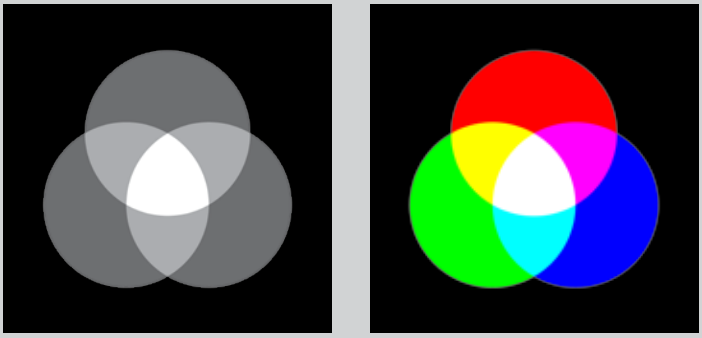
High-resolution image processing, sophisticated algorithms, user-friendly design – the vision sensors of the VISOR® series from SensoPart are among the best available on the market. The latest member of the series, the VISOR® Color, can now do even more: it sees the world exactly like the human eye in red, green, blue and all the other colours of the visible spectrum.

As the first vision colour sensor with a high-resolution colour chip (up to 1.3 megapixels), the VISOR® Color offers colour detection in a quality that has hitherto only been possible with an image processing system costing many times more. The VISOR® Color reliably and unfailingly detects even the finest of colour nuances, overlooked by the human eye at first glance. It also detects so-called active colours, e. g. those of illuminated LEDs.

Object detection included

With the VISOR® Color you can exploit the colour feature economically and thus open up numerous new application potentials. It is now just as possible to automate inspections previously carried out visually as it is to add the evaluation of the colour feature to an existing process – because the VISOR® Color is not just a colour sensor, but also offers a wide range of additional functions for object detection.

Do the colour test now: where most vision sensors only see grey on grey, you can be really colourful with the VISOR® Color from SensoPart!



Green or blue?

Decisive information is lost in a monochrome image: the colour. As the comparison between the green and blue circular areas shows, even clearly differing colours can hardly or no longer be differentiated on the basis of their grey values. The VISOR® Color analyses the individual colour channels separately and thus detects even the slightest colour differences.

Applications

- Checking presence and position
- Checking completeness of assemblies and packaging
- Sorting parts according to shape and colour
- Checking cable occupation
- Checking the function and placement of LEDs and displays

Sectors

- Automotive and supplier industries
- Machine construction, e. g. plastic injection molding machines
- Electronics production
- Packaging industry and logistics

It's set up!

VISOR®. The vision sensor for fast implementation.

Now in colour!

Unpack, set up and get going – never before have vision sensors been so powerful and so easily and intuitively operated. The VISOR® is ready for operation in just ten minutes with a few mouse clicks. With VISOR® technology from SensoPart there is now a simple and effective solution for even the most difficult of automation tasks. Whether objects with a complex shape, data matrix codes, self-lighting display elements or edge defects on solar cells – our application-specific vision sensors reliably detect all relevant object features.

Housings
Integrated evaluation unit with powerful signal processor, IP 67 enclosure rating, vibration-proof

Mounting
Simple and flexible mounting thanks to dovetail

Illustration 1:1

Illumination
Integrated LED illumination (white, red, infrared)

Interfaces
Integrated communication interfaces (Ethernet, serial interfaces, digital I/O)

Lens
Integrated lens or C-mount variants for long distances

VISOR® Color

System description

The vision colour sensors of the VISOR® Color series offer comprehensive functions for detecting coloured objects. Instead of the usual monochrome imaging chip they are equipped with a colour chip with a resolution of up to 1.3 megapixels (V20).

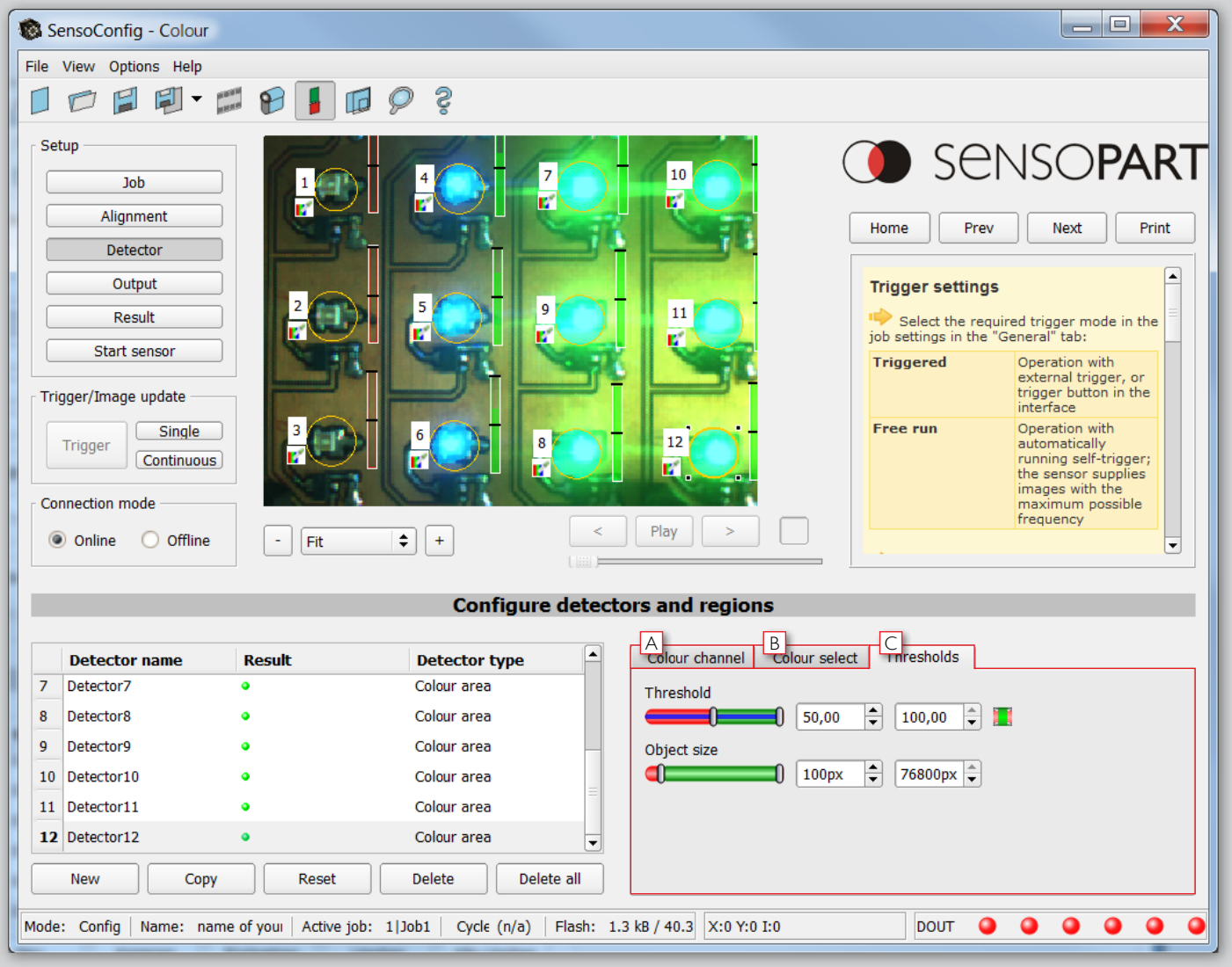
The comprehensive selection of detectors for object detection corresponds to the functional range of VISOR® object sensors. In addition to the detectors for sample comparison, contour, contrast, grey level, brightness and position tracking (selectable via sample comparison, contour or edge scanning), the VISOR® Color is also equipped with three detectors for colour detection. Three colour spaces (RGB, HSV, Lab) and several colour channels are available.

With the new colour detectors, the VISOR® Color is capable of differentiating between the finest of colour nuances. Any desired number of colours, colour gradients or colour patterns can be stored in the sensor memory and called up on demand. Moreover, objects with similar colours can be searched for.

Uniform operation for all VISOR® sensors
Setup of the VISOR® Color takes place via the proven intuitive user interface of the VISOR® series, with which even complex inspection tasks can be configured without detailed knowledge of image processing. Inspection tasks (jobs), position tracking (alignment) and the desired evaluations (detector) can be configured and tested in a few intuitively understandable setup steps. The effect of every setting is immediately visible in the image. Comprehensive logic functions allow the direct assignment of complex inspection results to one of six digital results outputs. With the help of the I/O expansion, available as an accessory, it is even possible to trigger up to 32 switching outputs.

Product variants: VISOR® Color

Features/sensors	Standard	Advanced
Functions		
Resolution, V10	736 x 480 Color	736 x 480 Color
Resolution, V20	–	1280 x 1024 Color
Image rate per second	50	50
Number of jobs | detectors	8 | 32	max. 255 / max. 255
Position tracking	✓	✓
Contour (X-, Y-rotation)	✓	✓
Sample comparison (X-, Y-translation)	–	✓
Grey level	–	✓
Contrast	✓	✓
Brightness	–	✓
Colour value	–	✓
Colour area	✓	✓
Colour list	–	✓
Free-form tool	✓	✓
Interfaces		
Inputs | outputs	2 | 4	2 | 4
Freely definable switching inputs / outputs, PNP or NPN	2	4
Encoder input	–	✓
Interface for IO box	–	✓
RS232 | RS422	– | –	✓
Ethernet / Data transfer	✓	✓ | ✓
EtherNet / IP	✓	✓
Profibus interface	–	✓
Lens		
V10 integrated, 6 mm | 12 mm | 25 mm	✓ | ✓ | –	✓ | ✓ | ✓
V20 integrated, 12 mm	–	✓
C-mount	–	✓
Operation / visualization		
Viewer software with user guidance	✓	✓
Graded user rights	✓	✓



Overview of the user interface

A **Colour channel:** selection of the colour space and the colour channels in which the detector is to operate.

B **Colour selection:** setting of the colour to be searched for.
A good/bad result is generated depending on the proportion of the area.

C **Thresholds:** setting of the threshold for the good/bad signal.

VISOR® Color

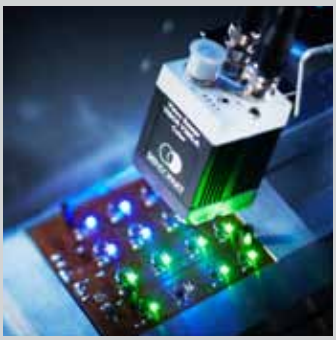
Vision sensor for the most precise object detection

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

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

HIGHLIGHTS OF THE VISOR® COLOR

- Improved object detection through additional colour information
- Powerful colour detection, even with the smallest of colour nuances or self-illuminating components
- Powerful part finding and tracking
- Highly accurate evaluation via 1.3 megapixel colour 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



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

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

Classic colour sensors are limited to the detection of passive colours, i. e. of object colours or coloured marks – they have to give up when confronted with self-illuminating objects. The VISOR® Color vision colour sensor from SensoPart knows no such restrictions – it not only "sees" objects of any shape and colour, but also provides additional information on colour 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 upgrade to colour is easy

The new generation of VISOR® Color vision colour sensors not only supports colour 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 colour detection with corresponding configuration possibilities. The introductory effort for those switching from the VISOR® object sensor is thus minimal – when will you put more colours into your applications?

VISOR® Color – product overview				
	Product variant	**Focal length**	**Integrated illumination**	**Page**
V20C-CO-A2-xx	Advanced	12	White	10
V20C-CO-A2-xx	Advanced	C-mount	None	12
V10C-CO-S2-xx	Standard	6	White	14
V10C-CO-S2-xx	Standard	12	White	16
V10C-CO-A2-xx	Advanced	6	White	18
V10C-CO-A2-xx	Advanced	12	White	20
V10C-CO-A2-xx	Advanced	25	White	22
V10C-CO-A2-xx	Advanced	C-mount	None	24

VISOR® V20 Color

Advanced vision sensor for object detection, colour, 12 mm

PRODUCT HIGHLIGHTS

- Object detection in colour with 1.3 mega-pixel resolution
- Reliable detection of very slight colour nuances or self-illuminating components
- Powerful part finding and tracking
- User-friendly configuration and viewer software with hierarchical user rights
- Unlimited number of jobs and detectors
- Encoder input

Optical data	
Resolution	1280 x 1024 pixels
CMOS	1/1.8", colour
Integrated lens, focal length	12 mm, adjustable focal position
Adjustment range	30 mm to infinity
Integrated illumination	White LEDs
Minimum field of view, X x Y	16 x 13 mm[2]

Functions	
Number of jobs / detectors	max. 255 / max. 255
Detectors	Contour, pattern comparison, contrast, brightness, grey level, colour value, colour area, colour list
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; colour area: two-dimensional colour inspection with adustable tolerance; colour list: finding the most similar colours
Typical cycle times[2]	Typ. 30 ms pattern comparison; typ. 60 ms contour; 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

Electrical data	
Operating voltage, $+U_B$	18 … 26.4 V DC[1]
Current consumption (without illumination and I/O)	≤ 120 mA
Current consumption (without I/O)	≤ 200 mA
Protective circuits	Reverse-polarity protection, U_B / short-circuit protection of all outputs
Readiness delay	Approx. 13 s after Power on
Outputs	PNP / NPN (switchable)
Max. output current (per output)	50 mA, 100 mA (pin 12)
Inputs	PNP/NPN High > U_B-1 V, Low < 3 V
Input resistance	> 20 kOhm
Encoder input	High > 4 V
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs

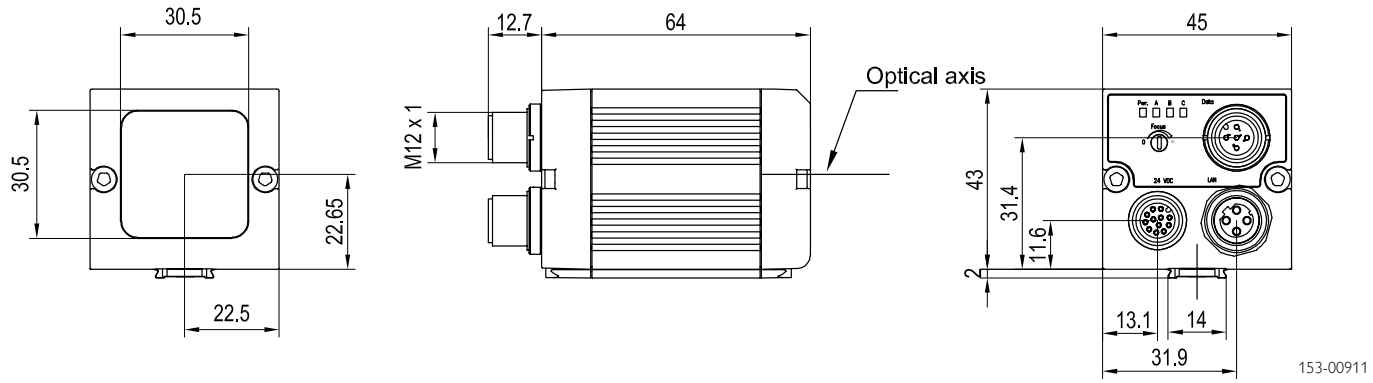
Mechanical data	
Dimensions	65 x 45 x 45 mm[3] (without plug)
Enclosure rating	IP 67
Material, housing	Aluminium, plastic
Material, front screen	Plastic
Ambient temperature: operation	0 … +50° C[3]
Ambient temperature: storage	-20 … +60° C[3]
Weight	Approx. 160 g
Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Vibration and impact resistance	EN 60947-5-2

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

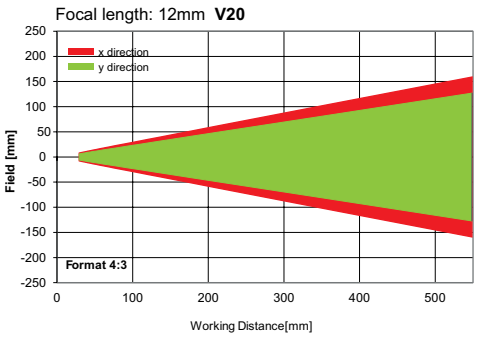
Illumination	Part number	Article number
White	V20C-CO-A2-W12	536-91020

Version: 06/2013. Subject to changes; diagrams similar

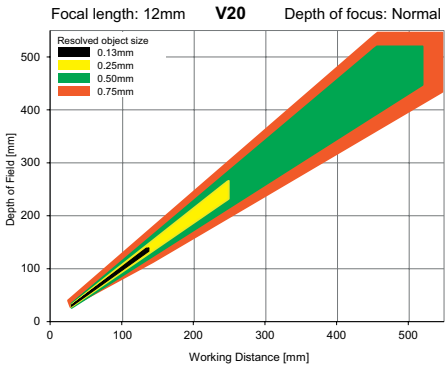
VISOR® vision sensor



Field of view



Depth of field: normal



Accessories

Connection cables	See product catalogue/accessories
Illumination	
Brackets	
Interface accessories	

VISOR® V20 Color

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

CE

IP 65[3]

PRODUCT HIGHLIGHTS

- Object detection in colour with 1.3 megapixel resolution
- Reliable detection of very slight colour nuances or self-illuminating components
- Powerful part finding and tracking
- User-friendly configuration and viewer software with hierarchical user rights
- Unlimited number of jobs and detectors
- Encoder input

Optical data	
Resolution	1280 x 1024 pixels
CMOS	1/1.8", colour
Integrated lens, focal length	C-Mount
Adjustment range	Dependent on lens
Integrated illumination	None
Minimum field of view, X x Y	Dependent on lens

Functions	
Number of jobs / detectors	max. 255 / max. 255
Detectors	Contour, pattern comparison, contrast, brightness, grey level, colour value, colour area, colour list
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; colour area: two-dimensional colour inspection with adustable tolerance; colour list: finding the most similar colours
Typical cycle times[2]	Typ. 30 ms pattern comparison; typ. 60 ms contour; 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

Electrical data	
Operating voltage, $+U_B$	18 … 26.4 V DC[1]
Current consumption (without illumination and I/O)	≤ 120 mA
Current consumption (without I/O)	≤ 200 mA
Protective circuits	Reverse-polarity protection, U_B / short-circuit protection of all outputs
Readiness delay	Approx. 13 s after Power on
Outputs	PNP / NPN (switchable)
Max. output current (per output)	50 mA, 100 mA (pin 12)
Inputs	PNP/NPN High > U_B-1 V, Low < 3 V
Input resistance	> 20 kOhm
Encoder input	High > 4 V
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs

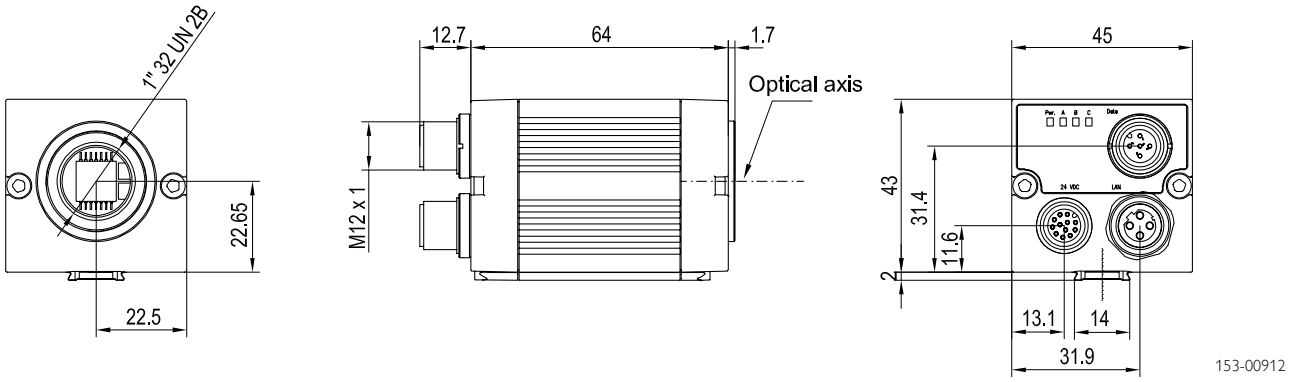
Mechanical data	
Dimensions	65 x 45 x 45 mm[3] (without plug)
Enclosure rating	IP 65[2]
Material, housing	Aluminium, plastic
Material, front screen	Plastic
Ambient temperature: operation	0 … +50 °C[4]
Ambient temperature: storage	-20 … +60 °C[4]
Weight	Approx. 160 g
Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Vibration and impact resistance	EN 60947-5-2

[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

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

Version: 06/2013. Subject to changes; diagrams similar

VISOR® vision sensor



Lens

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

Accessories

Connection cables	See product catalogue/accessories
Illumination	
Lenses	
Brackets	
Interface accessories	

VISOR® V10 Color

Standard vision sensor for object detection, colour, 6 mm

PRODUCT HIGHLIGHTS

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

Optical data	
Resolution	736 x 480 pixels
CMOS	1/3", colour
Integrated lens, focal length	6 mm, adjustable focal position
Adjustment range	6 mm to infinity
Integrated illumination	White LEDs
Minimum field of view, X x Y	5 x 4 mm²

Functions	
Number of jobs / detectors	8 / 32
Detectors	Position tracking X/Y and orientation via contour inspection; colour area
Properties	Position tracking X/Y and orientation; contour: teach-in and detection of contours; colour area: two-dimensional colour inspection with adustable tolerance
Typical cycle times	Typ. 60 ms position tracking Typ. 30 ms colour area

Electrical data	
Operating voltage, $+U_B$	18 … 26.4 V DC[1]
Current consumption (without illumination and I/O)	≤ 120 mA
Current consumption (without I/O)	≤ 200 mA
Protective circuits	Reverse-polarity protection, U_B / short-circuit protection of all outputs
Readiness delay	Approx. 13 s after Power on
Outputs	PNP / NPN (switchable)
Max. output current (per output)	50 mA, 100 mA (pin 12)
Inputs	PNP/NPN High > U_B-1 V, Low < 3 V
Input resistance	> 20 kOhm
Interfaces	Ethernet (LAN), EtherNet/IP
Inputs/outputs	2 inputs, 4 outputs, 2 selectable inputs/outputs

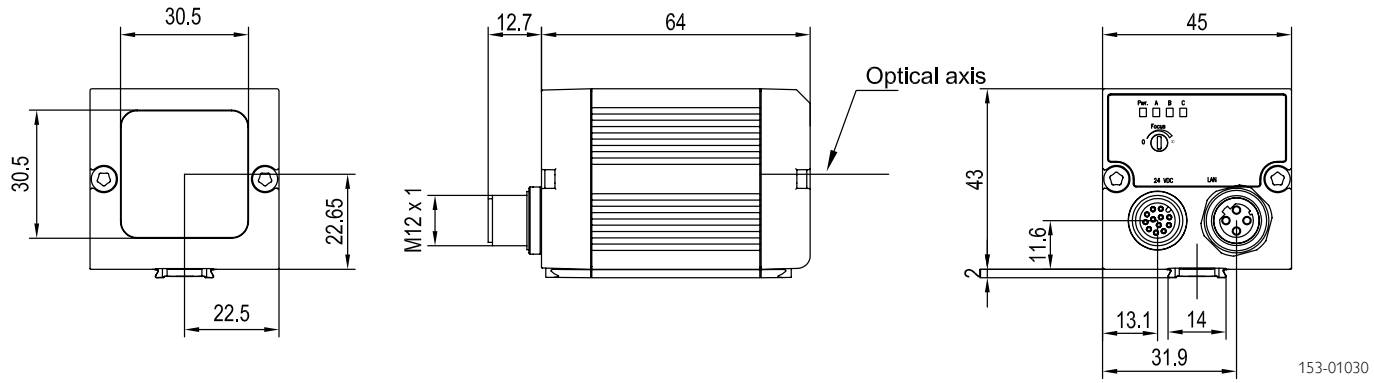
Mechanical data	
Dimensions	65 x 45 x 45 mm³ (without plug)
Enclosure rating	IP 67
Material, housing	Aluminium, plastic
Material, front screen	Plastic
Ambient temperature: operation	0 … +50 °C[2]
Ambient temperature: storage	-20 … +60 °C[2]
Weight	Approx. 160 g
Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Vibration and impact resistance	EN 60947-5-2

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

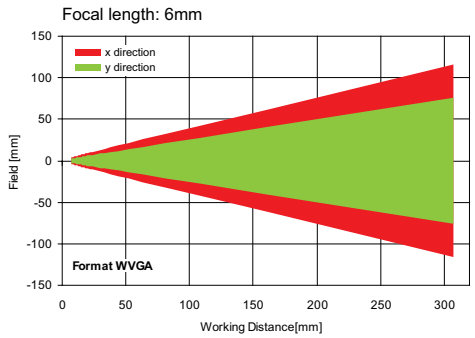
Illumination	Depth of field	Part number	Article number
White	Normal	V10C-CO-S2-W6	535-91071

Version: 06/2013. Subject to changes; diagrams similar

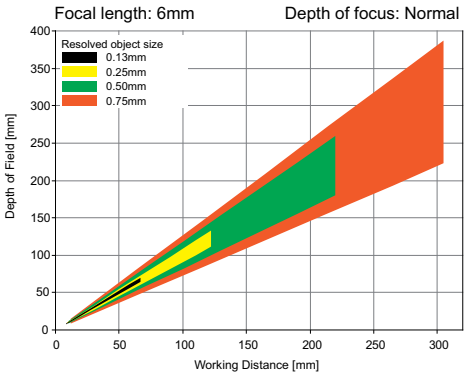
VISOR® vision sensor



Field of view



Depth of field: normal



Accessories

Connection cables	See product catalogue/accessories
Illumination	
Brackets	
Interface accessories	

VISOR® V10 Color

Standard vision sensor for object detection, colour, 12 mm

PRODUCT HIGHLIGHTS

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

Optical data	
Resolution	736 x 480 pixels
CMOS	1/3", colour
Integrated lens, focal length	12 mm, adjustable focal position
Adjustment range	30 mm to infinity
Integrated illumination	White LEDs
Minimum field of view, X x Y	8 x 6 mm²

Functions	
Number of jobs / detectors	8 / 32
Detectors	Position tracking X/Y and orientation via contour inspection; colour area
Properties	Position tracking X/Y and orientation; contour: teach-in and detection of contours; colour area: two-dimensional colour inspection with adustable tolerance
Typical cycle times	Typ. 60 ms position tracking Typ. 30 ms colour area

Electrical data	
Operating voltage, $+U_B$	18 … 26.4 V DC[1]
Current consumption (without illumination and I/O)	≤ 120 mA
Current consumption (without I/O)	≤ 200 mA
Protective circuits	Reverse-polarity protection, U_B / short-circuit protection of all outputs
Readiness delay	Approx. 13 s after Power on
Outputs	PNP / NPN (switchable)
Max. output current (per output)	50 mA, 100 mA (pin 12)
Inputs	PNP/NPN High > U_B-1 V, Low < 3 V
Input resistance	> 20 kOhm
Interfaces	Ethernet (LAN), EtherNet/IP
Inputs/outputs	2 inputs, 4 outputs, 2 selectable inputs/outputs

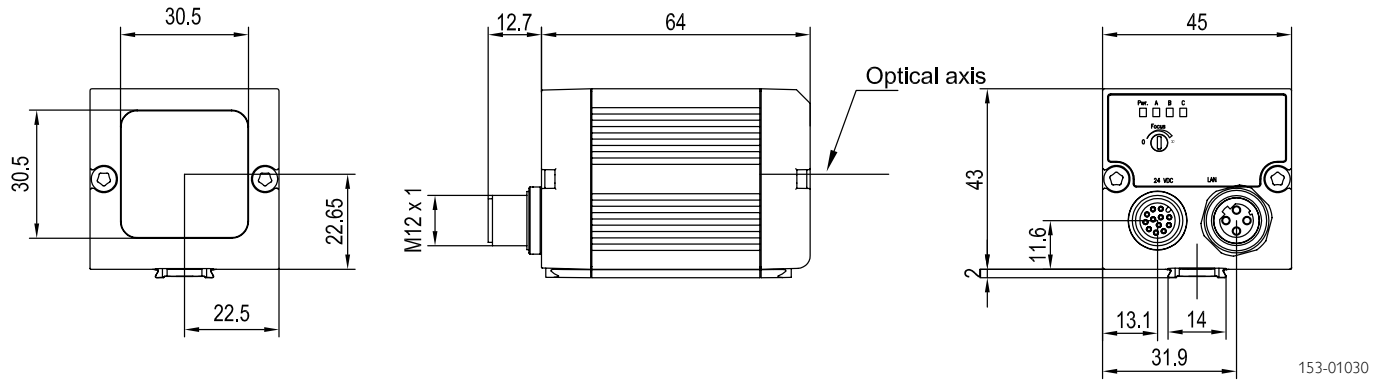
Mechanical data	
Dimensions	65 x 45 x 45 mm³ (without plug)
Enclosure rating	IP 67
Material, housing	Aluminium, plastic
Material, front screen	Plastic
Ambient temperature: operation	0 … +50 °C[2]
Ambient temperature: storage	-20 … +60 °C[2]
Weight	Approx. 160 g
Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin
Vibration and impact resistance	EN 60947-5-2

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

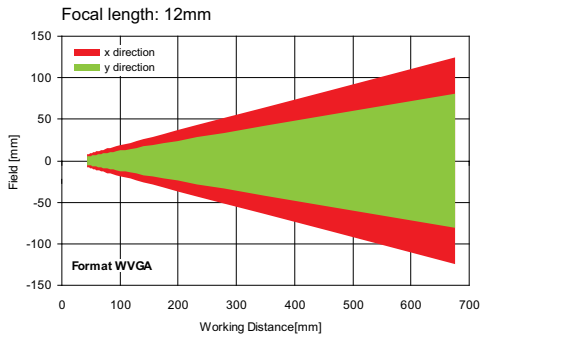
Illumination	Depth of field	Part number	Article number
White	Normal	V10C-CO-S2-W12	535-91072

Version: 06/2013. Subject to changes; diagrams similar

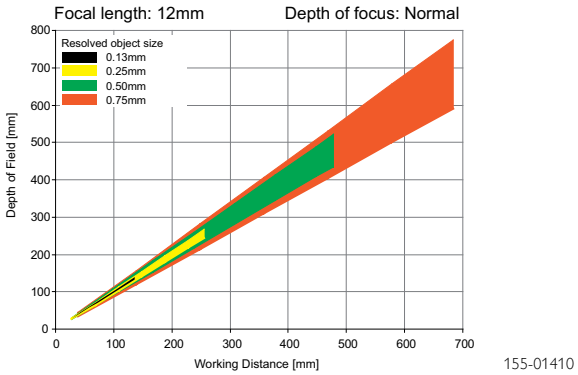
VISOR® vision sensor



Field of view



Depth of field: normal



Accessories

Connection cables	See product catalogue/accessories
Illumination	
Brackets	
Interface accessories	

VISOR® V10 Color

Advanced vision sensor for object detection, colour, 6 mm

PRODUCT HIGHLIGHTS

- Object detection in colour
- Reliable detection of very slight colour nuances or self-illuminating components
- Powerful part finding and tracking
- User-friendly configuration and viewer software with hierarchical user rights
- Unlimited number of jobs and detectors
- Encoder input

Optical data	
Resolution	736 x 480 pixels
CMOS	1/3", colour
Integrated lens, focal length	6 mm, adjustable focal position
Adjustment range	6 mm to infinity
Integrated illumination	White LEDs
Minimum field of view, X x Y	5 x 4 mm²

Functions	
Number of jobs / detectors	max. 255 / max. 255
Detectors	Contour, pattern comparison, contrast, brightness, grey level, colour value, colour area, colour list
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; colour area: two-dimensional colour inspection with adustable tolerance; colour list: finding the most similar colours
Typical cycle times	Typ. 30 ms pattern comparison; typ. 60 ms contour; typ. 2 ms brightness; typ. 2 ms contrast; typ. 2 ms grey threshold; typ. 2 ms colour value; typ. 30 ms colour area;

Electrical data	
Operating voltage, $+U_B$	18 … 26.4 V DC[1]
Current consumption (without illumination and I/O)	≤ 120 mA
Current consumption (without I/O)	≤ 200 mA
Protective circuits	Reverse-polarity protection, U_B / short-circuit protection of all outputs
Readiness delay	Approx. 13 s after Power on
Outputs	PNP / NPN (switchable)
Max. output current (per output)	50 mA, 100 mA (pin 12)
Inputs	PNP/NPN High > U_B-1 V, Low < 3 V
Input resistance	> 20 kOhm
Encoder input	High > 4 V
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs

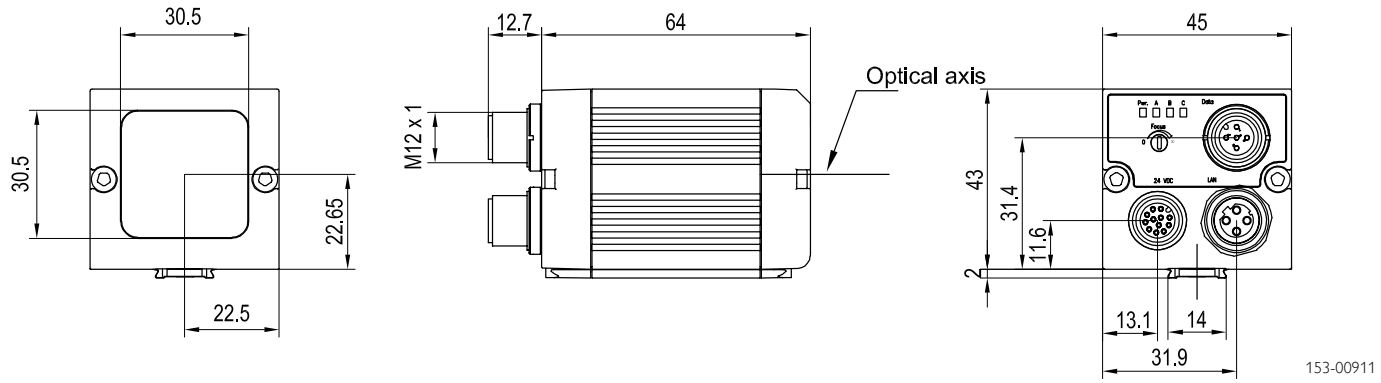
Mechanical data	
Dimensions	65 x 45 x 45 mm³ (without plug)
Enclosure rating	IP 67
Material, housing	Aluminium, plastic
Material, front screen	Plastic
Ambient temperature: operation	0 … +50 °C[2]
Ambient temperature: storage	-20 … +60 °C[2]
Weight	Approx. 160 g
Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Vibration and impact resistance	EN 60947-5-2

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

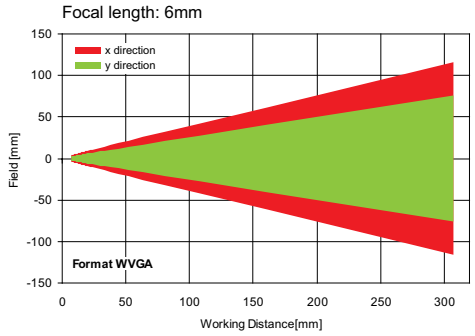
Illumination	Depth of field	Part number	Article number
White	Normal	V10C-CO-A2-W6	535-91073

Version: 06/2013. Subject to changes; diagrams similar

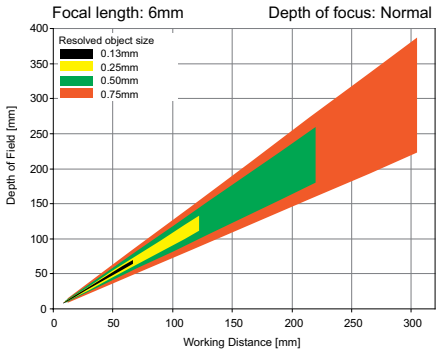
VISOR® vision sensor



Field of view



Depth of field: normal



Accessories

Connection cables	See product catalogue/accessories
Illumination	
Brackets	
Interface accessories	

VISOR® V10 Color

Advanced vision sensor for object detection, colour, 12 mm

PRODUCT HIGHLIGHTS

- Object detection in colour
- Reliable detection of very slight colour nuances or self-illuminating components
- Powerful part finding and tracking
- User-friendly configuration and viewer software with hierarchical user rights
- Unlimited number of jobs and detectors
- Encoder input

Optical data	
Resolution	736 x 480 pixels
CMOS	1/3", colour
Integrated lens, focal length	12 mm, adjustable focal position
Adjustment range	30 mm to infinity
Integrated illumination	White LEDs
Minimum field of view, X x Y	8 x 6 mm[2]

Functions	
Number of jobs / detectors	max. 255 / max. 255
Detectors	Contour, pattern comparison, contrast, brightness, grey level, colour value, colour area, colour list
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; colour area: two-dimensional colour inspection with adustable tolerance; colour list: finding the most similar colours
Typical cycle times	Typ. 30 ms pattern comparison; typ. 60 ms contour; 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

Electrical data	
Operating voltage, $+U_B$	18 … 26.4 V DC[1]
Current consumption (without illumination and I/O)	≤ 120 mA
Current consumption (without I/O)	≤ 200 mA
Protective circuits	Reverse-polarity protection, U_B / short-circuit protection of all outputs
Readiness delay	Approx. 13 s after Power on
Outputs	PNP / NPN (switchable)
Max. output current (per output)	50 mA, 100 mA (pin 12)
Inputs	PNP/NPN High > U_B-1 V, Low < 3 V
Input resistance	> 20 kOhm
Encoder input	High > 4 V
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs

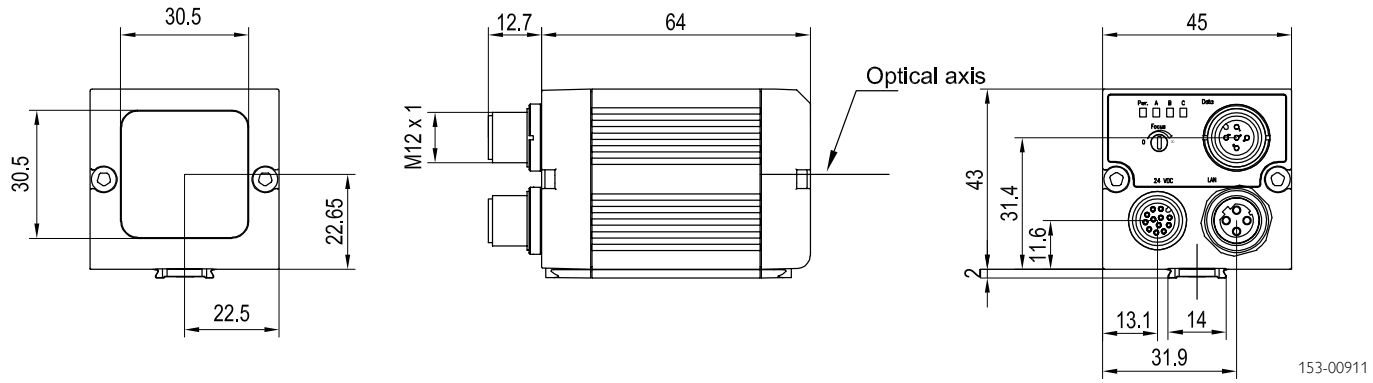
Mechanical data	
Dimensions	65 x 45 x 45 mm[3] (without plug)
Enclosure rating	IP 67
Material, housing	Aluminium, plastic
Material, front screen	Plastic
Ambient temperature: operation	0 … +50° C[2]
Ambient temperature: storage	-20 … +60° C[2]
Weight	Approx. 160 g
Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Vibration and impact resistance	EN 60947-5-2

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

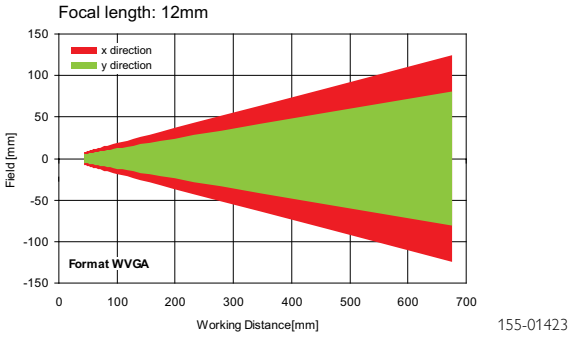
Illumination	Depth of field	Part number	Article number
White	Normal	V10C-CO-A2-W12	535-91074

Version: 06/2013. Subject to changes; diagrams similar

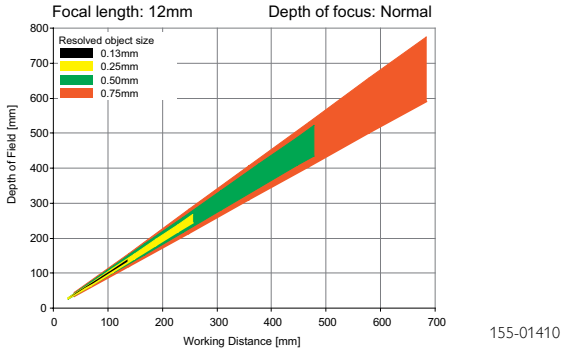
VISOR® vision sensor



Field of view



Depth of field: normal



Accessories

Connection cables	See product catalgue/ accessories
Illumination	
Brackets	
Interface accessories	

VISOR® V10 Color

Advanced vision sensor for object detection, colour, 25 mm

PRODUCT HIGHLIGHTS

- Object detection in colour
- Reliable detection of very slight colour nuances or self-illuminating components
- Powerful part finding and tracking
- User-friendly configuration and viewer software with hierarchical user rights
- Unlimited number of jobs and detectors
- Encoder input

Optical data	
Resolution	736 x 480 pixels
CMOS	1/3", colour
Integrated lens, focal length	25 mm, adjustable focal position
Adjustment range	140 mm to infinity
Integrated illumination	White LEDs
Minimum field of view, X x Y	18 x 14 mm[2]

Functions	
Number of jobs / detectors	max. 255 / max. 255
Detectors	Contour, pattern comparison, contrast, brightness, grey level, colour value, colour area, colour list
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; colour area: two-dimensional colour inspection with adustable tolerance; colour list: finding the most similar colours
Typical cycle times	Typ. 30 ms pattern comparison; typ. 60 ms contour; 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

Electrical data	
Operating voltage, $+U_B$	18 … 26.4 V DC[1]
Current consumption (without illumination and I/O)	≤ 120 mA
Current consumption (without I/O)	≤ 200 mA
Protective circuits	Reverse-polarity protection, U_B / short-circuit protection of all outputs
Readiness delay	Approx. 13 s after Power on
Outputs	PNP / NPN (switchable)
Max. output current (per output)	50 mA, 100 mA (pin 12)
Inputs	PNP/NPN High > U_B-1 V, Low < 3 V
Input resistance	> 20 kOhm
Encoder input	High > 4 V
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs

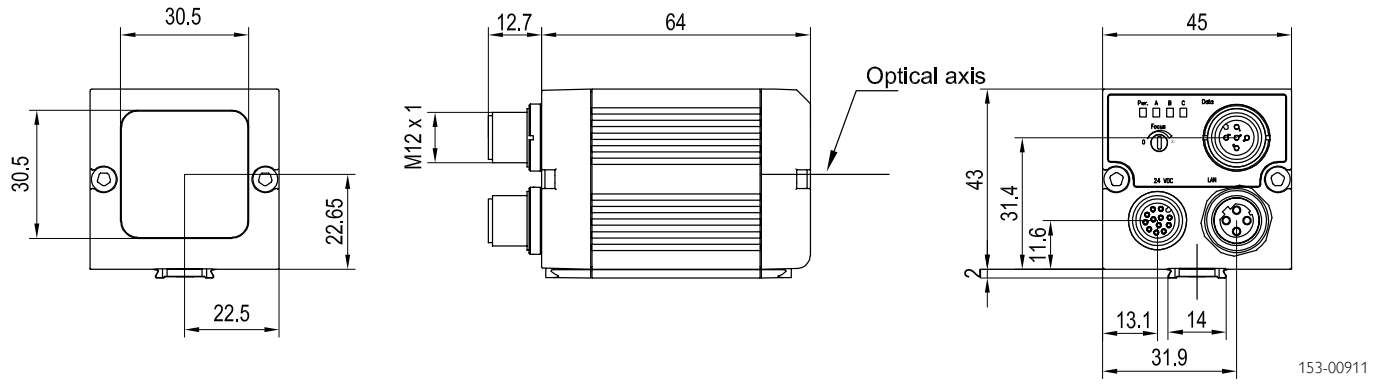
Mechanical data	
Dimensions	65 x 45 x 45 mm[3] (without plug)
Enclosure rating	IP 67
Material, housing	Aluminium, plastic
Material, front screen	Plastic
Ambient temperature: operation	0 … +50 °C[2]
Ambient temperature: storage	-20 … +60 °C[2]
Weight	Approx. 160 g
Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Vibration and impact resistance	EN 60947-5-2

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

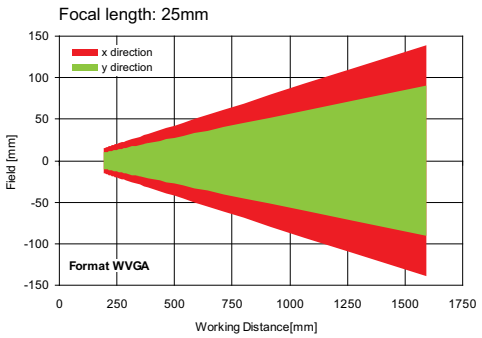
Illumination	Depth of field	Part number	Article number
White	Normal	V10C-CO-A2-W25	535-91075

Version: 06/2013. Subject to changes; diagrams similar

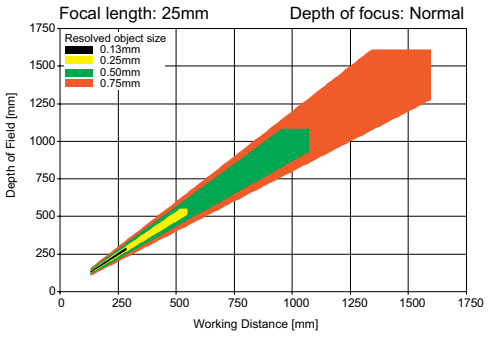
VISOR® vision sensor



Field of view



Depth of field: normal



Accessories

Connection cables	See product catalogue/accessories
Illumination	
Brackets	
Interface accessories	

VISOR® V10 Color

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

CE

IP 65[3]

PRODUCT HIGHLIGHTS

- Object detection in colour
- Reliable detection of very slight colour nuances or self-illuminating components
- Powerful part finding and tracking
- User-friendly configuration and viewer software with hierarchical user rights
- Unlimited number of jobs and detectors
- Encoder input

Optical data	
Resolution	736 x 480 pixels
CMOS	1/3", colour
Integrated lens, focal length	C-Mount
Adjustment range	Dependent on lens
Integrated illumination	None
Minimum field of view, X x Y	Dependent on lens

Functions	
Number of jobs / detectors	max. 255 / max. 255
Detectors	Contour, pattern comparison, contrast, brightness, grey level, colour value, colour area, colour list
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; colour area: two-dimensional colour inspection with adustable tolerance; colour list: finding the most similar colours
Typical cycle times	Typ. 30 ms pattern comparison; typ. 60 ms contour; 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

Electrical data	
Operating voltage, $+U_B$	18 … 26.4 V DC[1]
Current consumption (without illumination and I/O)	≤ 120 mA
Current consumption (without I/O)	≤ 200 mA
Protective circuits	Reverse-polarity protection, U_B / short-circuit protection of all outputs
Readiness delay	Approx. 13 s after Power on
Outputs	PNP / NPN (switchable)
Max. output current (per output)	50 mA, 100 mA (pin 12)
Inputs	PNP/NPN High > U_B-1 V, Low < 3 V
Input resistance	> 20 kOhm
Encoder input	High > 4 V
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs

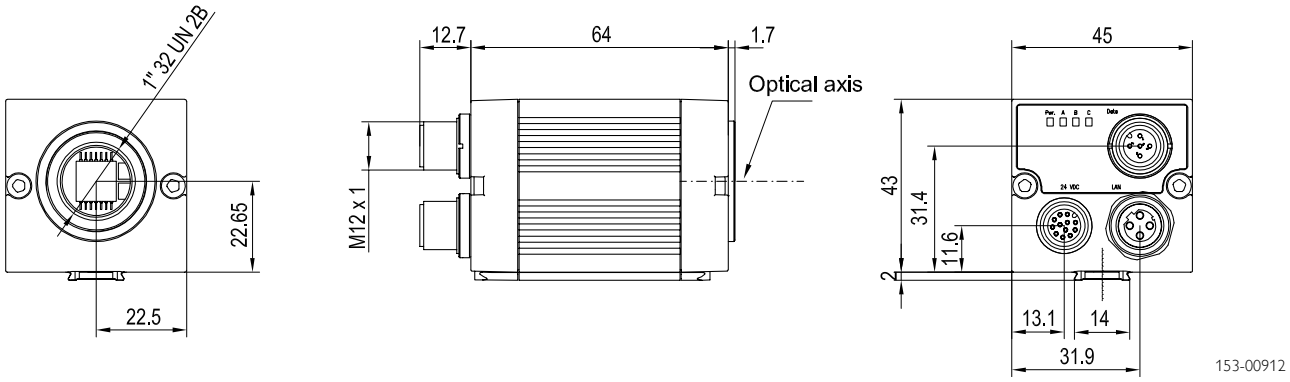
Mechanical data	
Dimensions	65 x 45 x 45 mm[3] (without plug)
Enclosure rating	IP 65[2]
Material, housing	Aluminium, plastic
Material, front screen	Plastic
Ambient temperature: operation	0 … +50 °C[3]
Ambient temperature: storage	-20 … +60 °C[3]
Weight	Approx. 160 g
Plug connections	Supply and I/O M12, 12-pin Ethernet M12, 4-pin Data M12, 5-pin
Vibration and impact resistance	EN 60947-5-2

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

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

Version: 06/2013. Subject to changes; diagrams similar

VISOR® vision sensor



Lens

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

Accessories

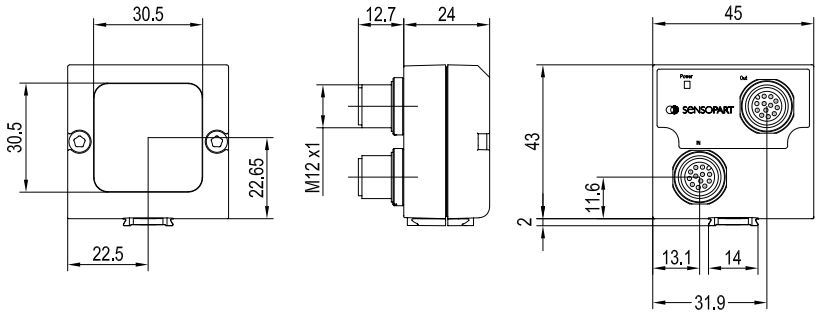
Connection cables	See product catalogue/accessories
Illumination	
Lenses	
Brackets	
Interface accessories	

Accessories

Illumination

Surface light for VISOR®

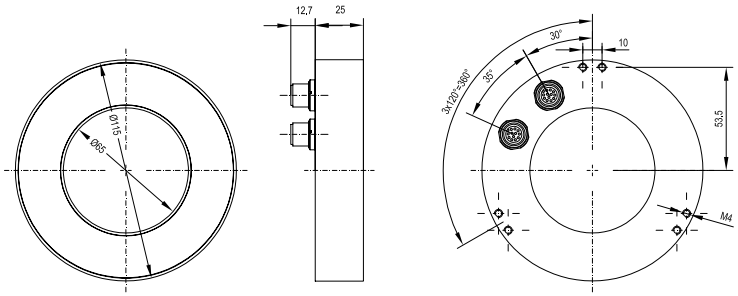
Part number	Article number	Description
LF45 W-24-2L12	525-51147	Surface light, VISOR®, white, 12-pin



153-00924

Ring light for VISOR®

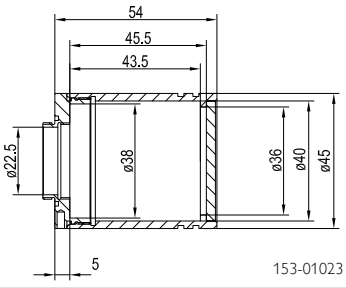
Part number	Article number	Description	Angle bracket
LFR 115 WD-24-2L12	525-51150	Ring light, VISOR®, white, 12-pin	543-11015



153-00926

Lenses and mountings

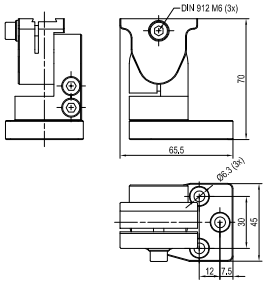
Protective casings



153-01023

Part number / Article number	LPT 45 CML 5 / 527-51132
Description	C-mount IP 65 protective casing Flange 5 mm Maximum lens dimensions: diameter: 38 mm length: 42 mm

Mountings



153-00913

Part number / Article number	MG 2A / 543-11023
Description	Mounting angle with 2 axes Material: anodised aluminium

Connection, interface and illumination cables


Power supply and I/O cable, straight


Power supply and I/O cable, 90°


Ethernet cable, straight


Ethernet cable, 90°


Data cable, straight


Data cable, 90°


Illumination cable, straight


Illumination cable, 90°

Part number	Article number	Description
C L12FG-2m-PUR	902-51801	Power supply and I/O cable, M12/12-pin, 2 m, straight connector, shielded
C L12FG-5m-PUR	902-51796	Power supply and I/O cable, M12/12-pin, 5 m, straight connector, shielded
C L12FG-10m-PUR	902-51797	Power supply and I/O cable, M12/12-pin, 10 m, straight connector, shielded
C L12FW-2m-PUR	902-51798	Power supply and I/O cable, M12/12-pin, 2 m, 90° connector, shielded
C L12FW-5m-PUR	902-51799	Power supply and I/O cable, M12/12-pin, 5 m, 90° connector, shielded
C L12FW-10m-PUR	902-51800	Power supply and I/O cable, M12/12-pin, 10 m, 90° connector, shielded
CI L5FS-2m-G-PUR	902-51813	Data cable, 2 m, straight connector
CI L5FS-5m-G-PUR	902-51814	Data cable, 5 m, straight connector
CI L5FS-10m-G-PUR	902-51815	Data cable, 10 m, straight connector
CI L5FS-2m-W-PUR	902-51816	Data cable, 2 m, 90° connector
CI L5FS-5m-W-PUR	902-51817	Data cable, 5 m, 90° connector
CI L5FS-10m-W-PUR	902-51818	Data cable, 10 m, 90° connector
CI L4MG / RJ45G-GS-3m-PUR	902-51754	Ethernet cable, 3 m, M12, straight, 4-pin / RJ45, shielded, cross-over
CI L4MG / RJ45G-GS-5m-PUR	902-51782	Ethernet cable, 5 m, M12, straight, 4-pin / RJ45, shielded, cross-over
CI L4MG / RJ45G-GS-10m-PUR	902-51784	Ethernet cable, 10 m, M12, straight, 4-pin / RJ45, shielded, cross-over
CI L4MW / RJ45G-SG-3m-PUR	902-51786	Ethernet cable, 3 m, M12, 90°, 4-pin / RJ45, shielded, cross-over
CI L4MW / RJ45G-SG-5m-PUR	902-51788	Ethernet cable, 5 m, M12, 90°, 4-pin / RJ45, shielded, cross-over
CI L4MW / RJ45G-SG-10m-PUR	902-51790	Ethernet cable, 10 m, M12, 90°, 4-pin / RJ45, shielded, cross-over
CB L12FS / L12FS-0,5m-GG-PUR	902-51806	Illumination cable 2 x M12/12-pin, 0.5 m, straight connector, shielded
CB L12FS / L12FS-2m-GG-PUR	902-51807	Illumination cable 2 x M12/12-pin, 2 m, straight connector, shielded
CB L12FS / L12FS-0,5m-WW-PUR	902-51808	Illumination cable 2 x M12/12-pin, 0.5 m, 90° connector, shielded
CB L12FS / L12FS-2m-WW-PUR	902-51809	Illumination cable 2 x M12/12-pin, 2 m, 90° connector, shielded
ST M12-12	994-51135	Mains power supply with M12 12-pin connector, Euro-plug
ST M12-12-M	994-51138	Mains power supply with M12 12-pin connector, multi-plug
ST V 10	543-11022	Test box V 10

For further accessories see SensoPart's Complete Catalogue, chapter Accessories or www. sensopart.com

We look ahead.

Yesterday, today and in the future.

SENSOPART

„We gauge ourselves not by what is possible today, but by our vision of what can be achieved" – this has been our motto since the foundation of SensoPart in 1994. Our goal is to always be a step ahead and to be able to offer our customers the most innovative sensor for industrial automation.

With our easy to integrate VISOR® vision sensors and our compact laser sensors with an amazing background suppression made in Germany, we stick up to this motto.

Get ready – we still have a lot of ideas for the future.

SENSOR TECHNOLOGY

- Light barriers
- Proximity switches
- Laser sensors
- Miniature sensors
- Distance sensors
- Colour sensors
- Contrast sensors
- Anti-collision sensors
- Slot sensors
- Fibre-optic amplifiers
- Inductive sensors
- Capacitive sensors
- Ultrasonic sensors

VISION

- Vision sensors
- Smart cameras
- Vision systems
- Object detection
- Object measurement
- Colour detection
- Code reading OCR
- Lighting
- Lenses

Germany
SensoPart
Industriesensorik GmbH
79288 Gottenheim
Tel. +49 7665 94769-0
info@sensopart.de

France
SensoPart France SARL
77420 Champs – Marne la Vallée
Tél. +33 164 73 00 61
info@sensopart.fr

United Kingdom
SensoPart UK Limited
Burton on Trent, DE14 2WQ
Tel. +44 1283 567470
uk@sensopart.com

USA
SensoPart Inc.
Perrysburg OH 43551
Tel. +1 866 282-7610
usa@sensopart.com

China
SensoPart China
201803 Shanghai
Tel. +86 21 69017660
china@sensopart.com

Find your local contact at: www.sensopart.com/international

www.sensopart.com

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