VISOR® Code Reader

In a class of its own.

VISOR® Code Reader

V20-CR-P2-R12

- *Professional version for detecting 1D/2D codes, objects and for optical character reading with OCR*
- *Megapixel resolution*
- *Rapidly detects as many jobs and detectors as desired*
- *Has position tracking*
- *Reads several different types of codes in one reading pass*

V10-CR-S1-R12

- *Standard version for detecting 1D/2D codes*
- *Maximum of 8 inspection tasks with one evaluation each (maximum of 5 identical types of code per reading)*

The VISOR® Code Reader from SensoPart easily reads bar codes 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 attached 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.

HIGHLIGHTS OF VISOR® CODE READER

- Reliably reads bar codes as well as printed and directly marked data matrix codes, and even several codes simultaneously and mixed 1D/2D codes

- Supplementary object detection for features other than codes

- Evaluation of quality parameters according to ISO/IEC 15415 and AIM DPM 2006

- Flexible definition of output data (header, trailer, net data)

- String comparision with message via the digital switching output

- Support of EtherNet/IP and DHCP, PROFINET

- Comprehensive possibilities for archiving pictures and data

- Reading of optical characters with OCR

Applications

- Product labelling and identification
- Automated product tracking
- Product picking, quality assurance

Sectors

- Automotive and supplier industries
- Food and beverages industries
- Pharmaceutical and cosmetics industries
- Packaging industry and logistics
- Laboratory automation
- Solar industry

made in Germany

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.

Printed bar codes   *Laser-printed codes on plastic*   *Codes on glass*

VISOR® Code Reader – Product Overview					
	Product variants	Resolution	Focal length	Integrated illumination	Page
V20-CR-S2-xxx	Standard	1280 x 1024 pixels	12 mm	White, red, infrared LEDs	162
V20-CR-A2-xxx	Advanced	1280 x 1024 pixels	12 mm	White, red, infrared LEDs or UV	164
V20C-CR-A2-xxx	Advanced	1280 x 1024 pixels	12 mm	White LEDs	166
V20-CR-A2-xxx	Advanced	1280 x 1024 pixels	C-mount	None	168
V20-CR-P2-xxx	Professional	1280 x 1024 pixels	12 mm	White, red or infrared LEDs	170
V20C-CR-P2-xxx	Professional	1280 x 1024 pixels	12 mm	White LEDs	172
V20-CR-P2-xxx	Professional	1280 x 1024 pixels	C-mount	None	174
V10-CR-S1-xxx	Standard	736 x 480 pixels	6 mm	White, red or infrared LEDs	176
V10-CR-S1-xxx	Standard	736 x 480 pixels	12 mm	White, red or infrared LEDs	178
V10-CR-S2-xxx	Standard	736 x 480 pixels	25 mm	White, red or infrared LEDs	180
V10-CR-A1-xxx	Advanced	736 x 480 pixels	6 mm	White, red or infrared LEDs	182
V10-CR-A1-xxx	Advanced	736 x 480 pixels	12 mm	White, red or infrared LEDs	184
V10-CR-A2-xxx	Advanced	736 x 480 pixels	25 mm	White, red or infrared LEDs	186
V10-CR-A1-xxx	Advanced	736 x 480 pixels	C-mount	None	188

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	Professional
Functions			
V10 resolution in pixels	736 × 480	736 × 480	–
V20 resolution in pixels	1280 × 1024	1280 × 1024	1280 × 1024
Image rate per second V10 | V20	50 | 40	50 | 40	– | 40
Number of jobs | detectors	8 | 2	max. 255 | max. 255	max. 255 | max. 255
Position tracking	–	✓	✓
Pattern comparison (X-, Y-translation)	–	✓	✓
Grey threshold	–	✓	✓
Contrast	–	✓	✓
Brightness	–	✓	✓
Data code	✓	✓	✓
Bar code	✓	✓	✓
OCR	–	–	✓
Freeform Tool	–	✓ *(not applicable to 1D & 2 D codes)*	✓ *(not applicable to 1D & 2 D codes)*
Interfaces			
Inputs | outputs	2 | 4	2 | 4	2 | 4
Freely definable switching outputs/inputs, PNP or NPN	2	4	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	✓	✓	✓
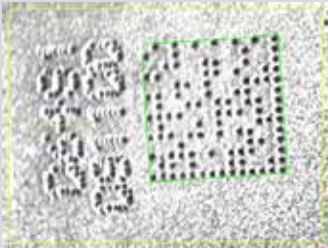
Dot peened code on rough substrate
Code is made legible by powerful reading algorithm. Presence of the nailed imprint in plain text can be checked using object detection.

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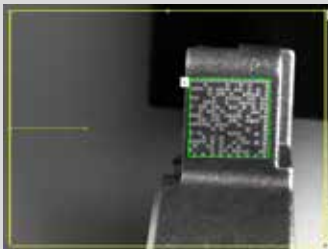
Code with small "quiet zone"
Even codes with a small quiet zone or damaged finder pattern can be read.

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

CE

IP 67
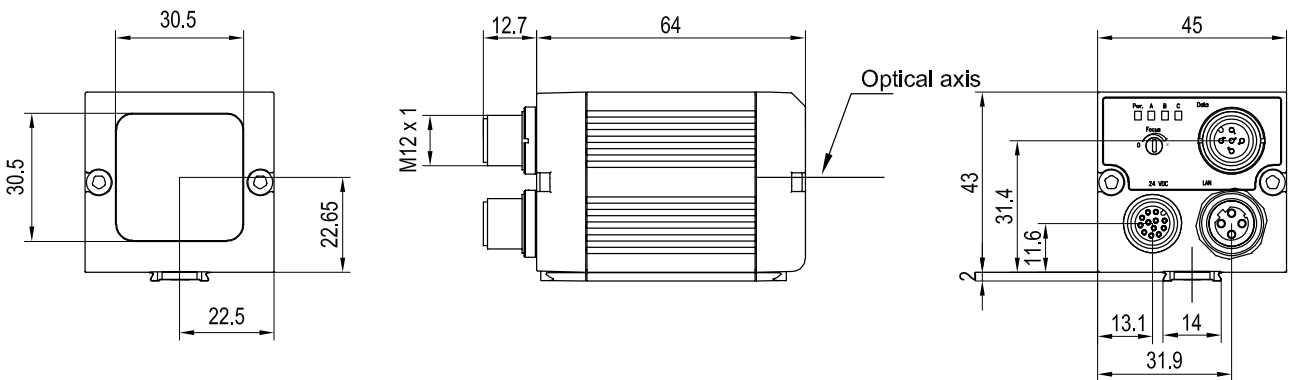
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PROFINET®

EtherNet/IP™

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	
Resolution	1280 × 1024 pixels
CMOS	1/1.8'', monochrome
Integrated lens, focal length	12 mm, adjustable focal position
Adjustment range	30 mm to infinity
Integrated illumination	White, red, infrared LEDs
Minimum field of view, X × Y	16 × 13 mm²

Functions	
Number of jobs / detectors	8 / 2
Detectors	Bar code / data code
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
Typical cycle time[2]	Typ. 30 ms bar code Typ. 40 ms data code

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
Power On Delay	Ca. 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 kΩ
Encoder input	High > 4 V
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb
Inputs/outputs	2 inputs, 4 outputs, 2 selectable inputs/outputs

Mechanical data	
Dimensions	65 × 45 × 45 mm (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	Ca. 160 g
Plug connection	Power and I/O M12 12-pin Ethernet M12 4-pin Data M12 5-pin
Vibration and impact resistance	EN 60947-5-2

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

30.5

30.5

22.65

22.5

12.7   64

M12 x 1

Optical axis

45

43

31.4

11.6

2

13.1   14

31.9

Par. A   B   C   Data

Focus

24 VDC   LAN

153-00911

5

Field of view

Focal length: 12mm V20

Field [mm]

| x direction |
| y direction |

250
200
150
100
50
0
-50
-100
-150
-200
-250

Format 4:3

0   100   200   300   400   500

Working Distance[mm]

155-01637

Depth of field: normal

Focal length: 12mm   V20   Depth of focus: Normal

Resolved object size
- 0.13mm
- 0.25mm
- 0.50mm
- 0.75mm

Depth of Field [mm]

500

400

300

200

100

0

0   100   200   300   400   500

Working Distance [mm]

155-01636

Accessories

Connection cables	From Page A-38
Illumination	From Page A-30
Brackets	From Page A-14
Interface accessories	From Page A-42

VISOR® V20 Code Reader

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

CE
IP 67
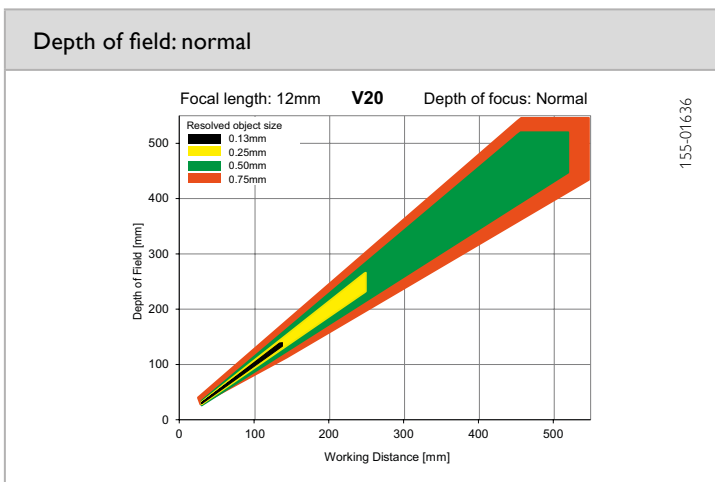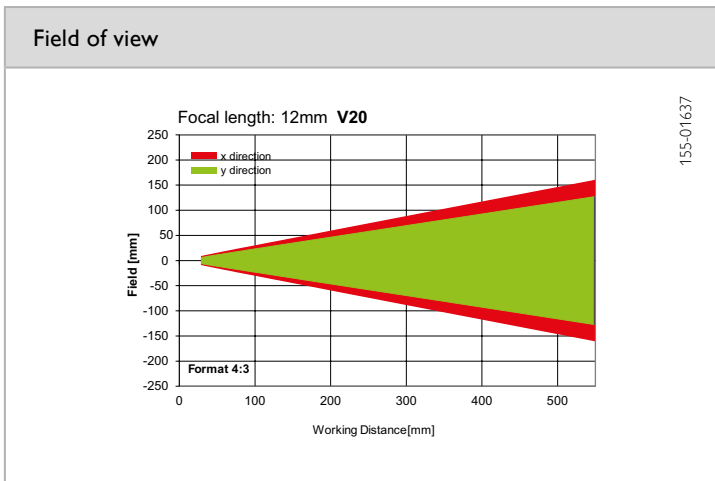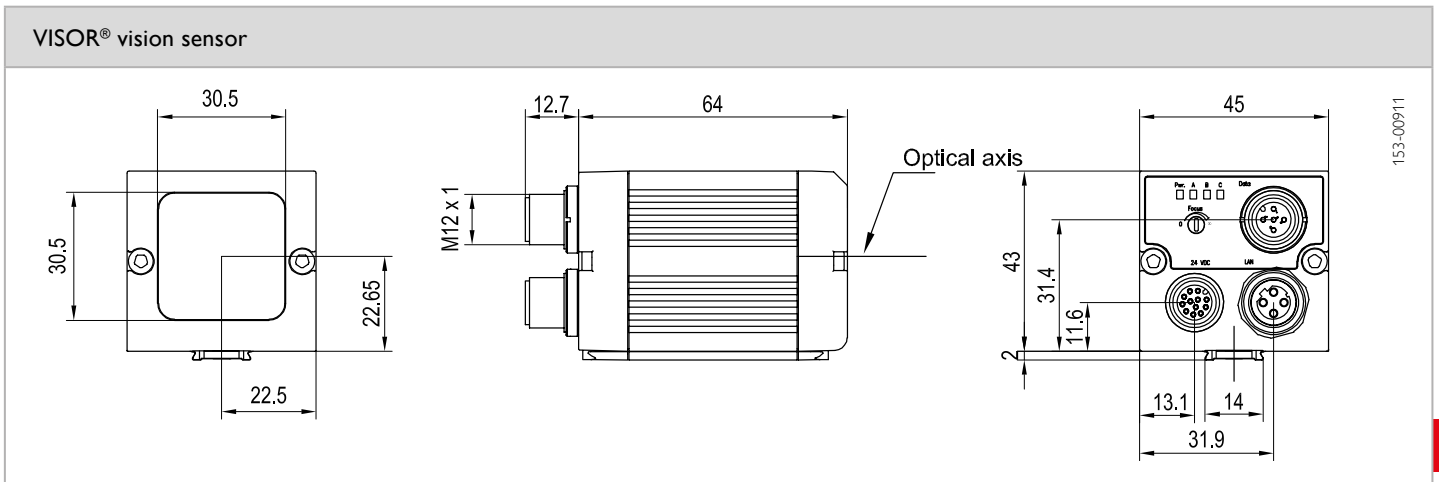c(UL)us LISTED
PROFI NET®
EtherNet/IP™

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

Resolution	1280 × 1024 pixels
CMOS	1/1.8'', monochrome
Integrated lens, focal length	12 mm, adjustable focal position
Adjustment range	30 mm to infinity
Integrated illumination	White, red, infrared LEDs
Minimum field of view, X × Y	16 × 13 mm²

Functions

Number of jobs / detectors	max. 255 / max. 255
Detectors	Pattern comparison, contrast, brightness, grey level, bar code, data code
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
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

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
Power On Delay	Ca. 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 kΩ
Encoder input	High > 4 V
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs

Mechanical data

Dimensions	65 × 45 × 45 mm (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	Ca. 160 g
Plug connection	Power 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 × 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

Version: 02/2017. Subject to changes; diagrams similar

VISOR® vision sensor

153-00911

30.5

30.5

22.65

22.5

12.7

64

M12 x 1

Optical axis

45

43

31.4

11.6

2

13.1

14

31.9

Par. A B C Data

Focus

24 VDC LAN

5

Field of view

155-01637

Focal length: 12mm V20

x direction
y direction

Field [mm]

250
200
150
100
50
0
-50
-100
-150
-200
-250

Format 4:3

0   100   200   300   400   500

Working Distance [mm]

Depth of field: normal

155-01636

Focal length: 12mm V20   Depth of focus: Normal

Resolved object size
■ 0.13mm
■ 0.25mm
■ 0.50mm
■ 0.75mm

Depth of Field [mm]

500

400

300

200

100

0

0   100   200   300   400   500

Working Distance [mm]

Accessories

Connection cables	From Page A-38
Illumination	From Page A-30
Brackets	From Page A-14
Interface accessories	From Page A-42

VISOR® V20 Code Reader Color

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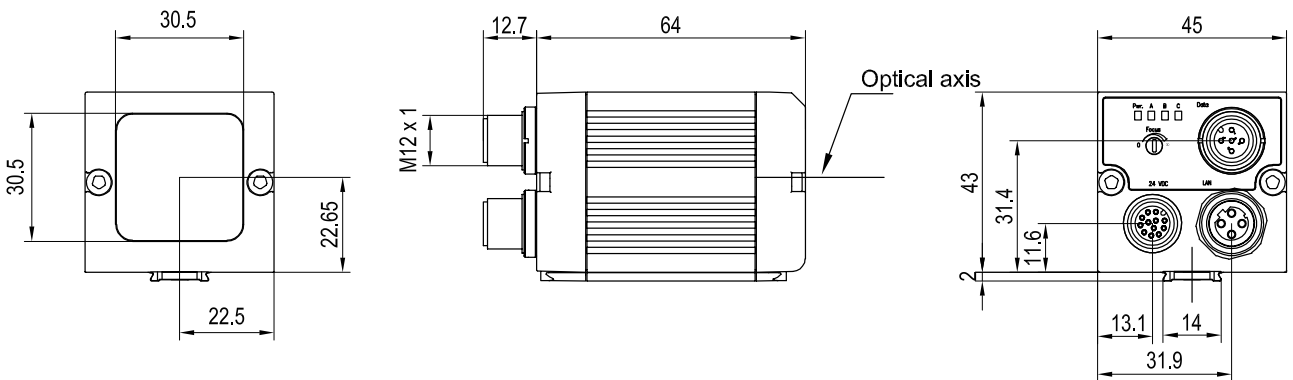
PRODUCT HIGHLIGHTS

- Can be used for all common 2D codes (ECC 200 data matrix) and common 1D bar codes
- Code reading of colour 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	
Resolution	1280 × 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 × Y	16 × 13 mm²

Functions	
Number of jobs / detectors	max. 255 / max. 255
Detectors	Pattern comparison, contrast, brightness, grey level, bar code, data code
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
Typical cycle time²	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

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
Power On Delay	Ca. 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 kΩ
Encoder input	High > 4 V
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs

Mechanical data	
Dimensions	65 × 45 × 45 mm (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	Ca. 160 g
Plug connection	Power 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 × 480 pixels)   [3] 80 % air humidity, non-condensing

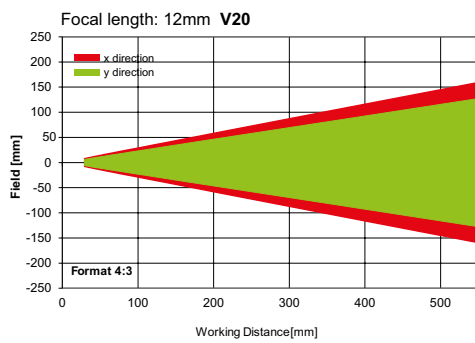| Illumination	Part number	Article number
White	V20C-CR-A2-W12	536-91026

VISOR® vision sensor

30.5

30.5

22.65

22.5

12.7   64

M12 x 1

Optical axis

45

43

31.4

11.6

2

13.1   14

31.9

153-00911

Field of view

Focal length: 12mm **V20**

155-01637

x direction
y direction

Field [mm]

250
200
150
100
50
0
-50
-100
-150
-200
-250

Format 4:3

0   100   200   300   400   500

Working Distance[mm]

Depth of field: normal

Focal length: 12mm **V20**   Depth of focus: Normal

155-01636

Resolved object size
0.13mm
0.25mm
0.50mm
0.75mm

Depth of Field [mm]

500

400

300

200

100

0

0   100   200   300   400   500

Working Distance [mm]

Accessories

Connection cables	From Page A-38
Illumination	From Page A-30
Brackets	From Page A-14
Interface accessories	From Page A-42

VISOR® V20 Code Reader

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

CE

IP 65 [3]
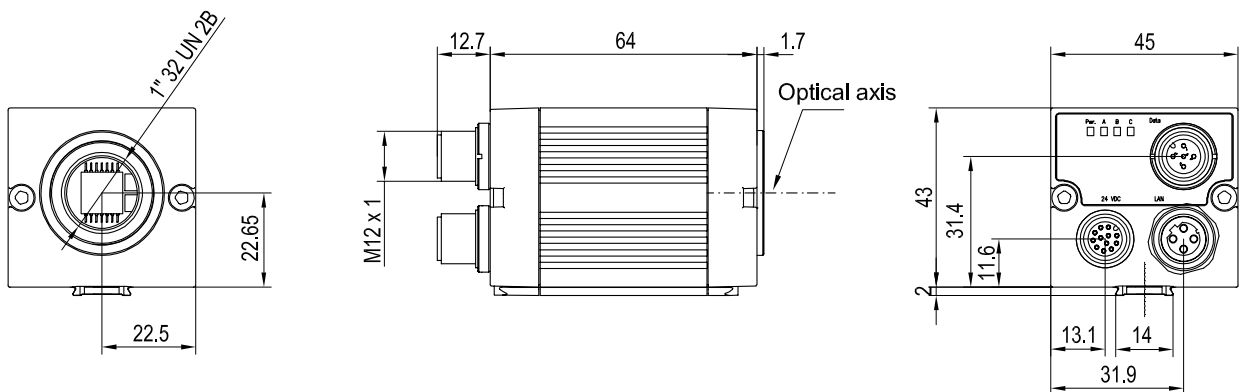
c(UL)us LISTED

PROFI NET®

EtherNet/IP™

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

Resolution	1280 × 1024 pixels
CMOS	1/1.8'', monochrome
Integrated lens, focal length	C-mount
Adjustment range	Dependent on lens
Integrated illumination	None
Minimum field of view, X × Y	Dependent on lens

Functions

Number of jobs / detectors	max. 255 / max. 255
Detectors	Pattern comparison, contrast, brightness, grey level, bar code, data code
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
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

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
Power On Delay	Ca. 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 kΩ
Encoder input	High > 4 V
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs

Mechanical data

Dimensions	65 × 45 × 45 mm (without plug)
Enclosure rating	IP 65[3]
Material, housing	Aluminium, plastic
Material, front screen	Plastic
Ambient temperature: operation	0 … +50 °C[4]
Ambient temperature: storage	-20 … +60 °C[4]
Weight	Ca. 160 g
Plug connection	Power 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 × 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

1" 32 UN 2B

12.7 · 64 · 1.7

Optical axis

M12 x 1

22.65

22.5

45

43 · 31.4 · 11.6 · 2

13.1 · 14

31.9

Par. A B C Data

24 VDC LAN

153-00912

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-38
Illumination	From Page A-30
Lenses	From Page A-27
Brackets	From Page A-14
Interface accessories	From Page A-42

VISOR® V20 Code Reader

Professional vision sensor for code reading, object detection and OCR, 12 mm
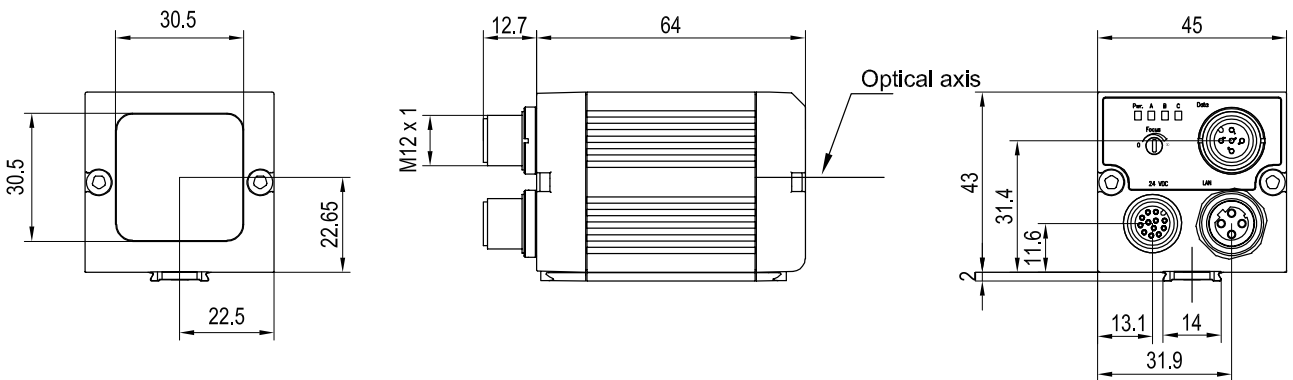
PRODUCT HIGHLIGHTS

- 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
- Reading of optical characters with OCR

Optical data	
Resolution	1280 × 1024 pixels
CMOS	1/1.8'', monochrome
Integrated lens, focal length	12 mm, adjustable focal position
Adjustment range	30 mm to infinity
Integrated illumination	White, red, infrared LEDs
Minimum field of view, X × Y	16 × 13 mm^2

Functions	
Number of jobs / detectors	max. 255 / max. 255
Detectors	Pattern comparison, contrast, brightness, grey level, bar code, data code, OCR
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; OCR: optical character reading, ECC200 GS1
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; typ. 15 ms per character OCR

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
Power On Delay	Ca. 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 kΩ
Encoder input	High > 4 V
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs

Mechanical data	
Dimensions	65 × 45 × 45 mm (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	Ca. 160 g
Plug connection	Power 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 × 480 Pixel) ^{3} 80 % air humidity, non-condensing

Illumination	Part number	Article number
White	V20-CR-P2-W12	536-91005
Red	V20-CR-P2-R12	536-91006
Infrared	V20-CR-P2-I12	536-91007
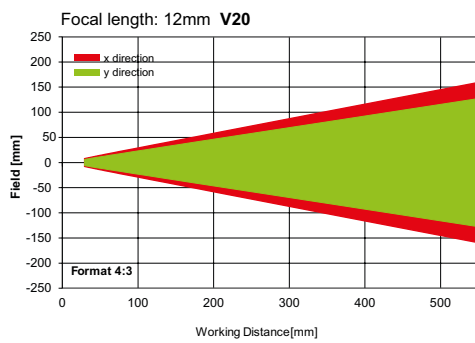
Version: 02/2017. Subject to changes; diagrams similar
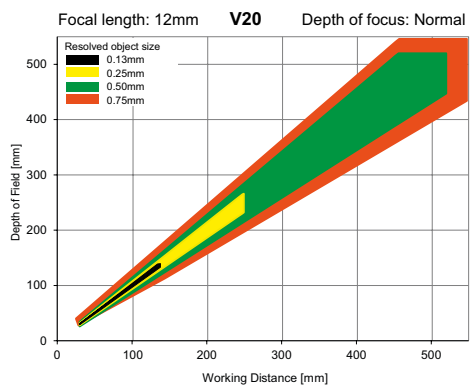
VISOR® vision sensor

153-00911

30.5
30.5
22.65
22.5

M12 x 1
12.7
64
Optical axis

45
43
31.4
11.6
2
13.1
14
31.9

Par. A B C Data
Focus
24 VDC LAN

Field of view

155-01637

Focal length: 12mm **V20**

x direction
y direction

Field [mm]
250
200
150
100
50
0
-50
-100
-150
-200
-250

Format 4:3

0 100 200 300 400 500
Working Distance [mm]

Depth of field: normal

155-01636

Focal length: 12mm **V20**   Depth of focus: Normal

Resolved object size
0.13mm
0.25mm
0.50mm
0.75mm

Depth of Field [mm]
500
400
300
200
100
0

0 100 200 300 400 500
Working Distance [mm]

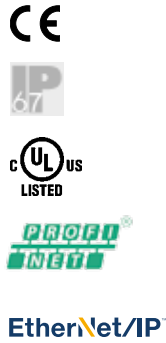## Accessories

Connection cables	From Page A-38
Illumination	From Page A-30
Brackets	From Page A-14
Interface accessories	From Page A-42

VISOR® V20 Code Reader Color

Professional vision sensor for code reading, object detection and OCR, 12 mm
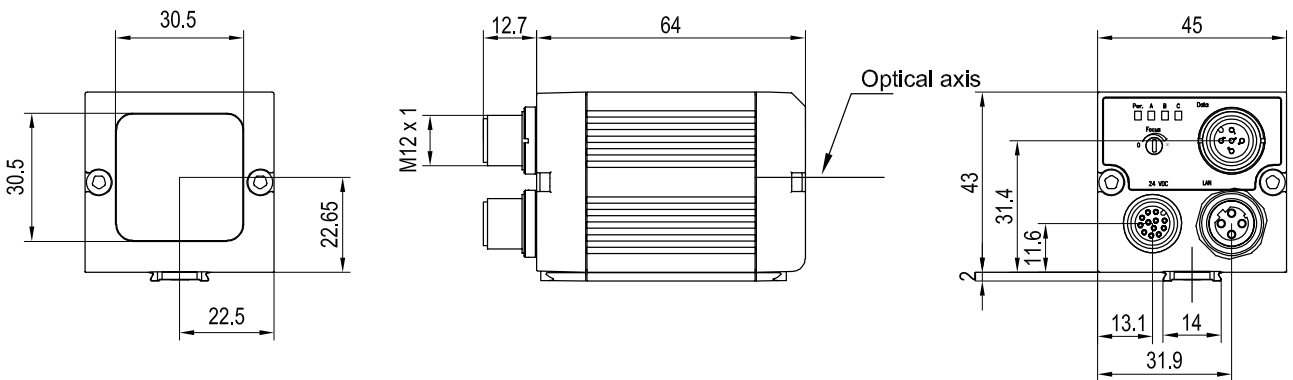
PRODUCT HIGHLIGHTS

- Can be used for all common 2D codes (ECC 200 data matrix) and common 1D bar codes
- Code reading of colour 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
- Reading of optical characters with OCR

Optical data	
Resolution	1280 × 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 ×Y	16 × 13 mm²

Functions	
Number of jobs / detectors	max. 255 / max. 255
Detectors	Pattern comparison, contrast, brightness, grey level, bar code, data code, OCR
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, Pharma-code, Codabar; data code: reading of 2D codes: ECC200, QR code, PDF 417; ECC200 GS1, OCR: optical character reading; colour area: two-dimensional colour inspection with adustable tolerance; colour list: finding the most similar colours
Typical cycle time²	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; colour list typ. 15 ms per character OCR; colour value; typ. 30 ms colour area; typ. 2 ms

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
Power On Delay	Ca. 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 kΩ
Encoder input	High > 4 V
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs

Mechanical data	
Dimensions	65 × 45 × 45 mm (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	Ca. 160 g
Plug connection	Power 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 × 480 Pixel)   [3] 80 % air humidity, non-condensing

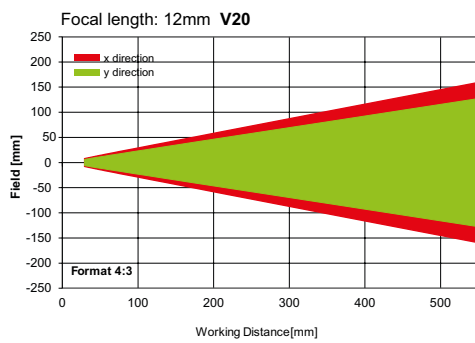| Illumination	Part number	Article number
White	V20C-CR-P2-W12	536-91027

Version: 02/2017. Subject to changes; diagrams similar

VISOR® vision sensor

30.5

30.5

22.65

22.5

12.7

64

M12 x 1

Optical axis

45

43

31.4

11.6

2

13.1

14

31.9

Par. A B C Data

Focus

24 VDC LAN

153-00911

Field of view

Focal length: 12mm **V20**

x direction

y direction

Field [mm]

250
200
150
100
50
0
-50
-100
-150
-200
-250

Format 4:3

0   100   200   300   400   500

Working Distance[mm]

155-01637

Depth of field: normal

Focal length: 12mm **V20**   Depth of focus: Normal

Resolved object size

0.13mm
0.25mm
0.50mm
0.75mm

Depth of Field [mm]

500

400

300

200

100

0

0   100   200   300   400   500

Working Distance [mm]

155-01636

Accessories

Connection cables	From Page A-38
Illumination	From Page A-30
Brackets	From Page A-14
Interface accessories	From Page A-42

5
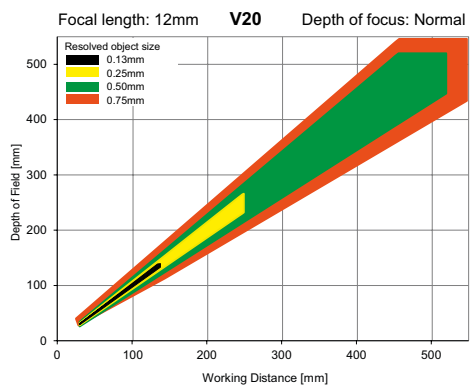
VISOR® V20 Code Reader

Professional vision sensor for code reading, object detection and OCR, C-mount

CE

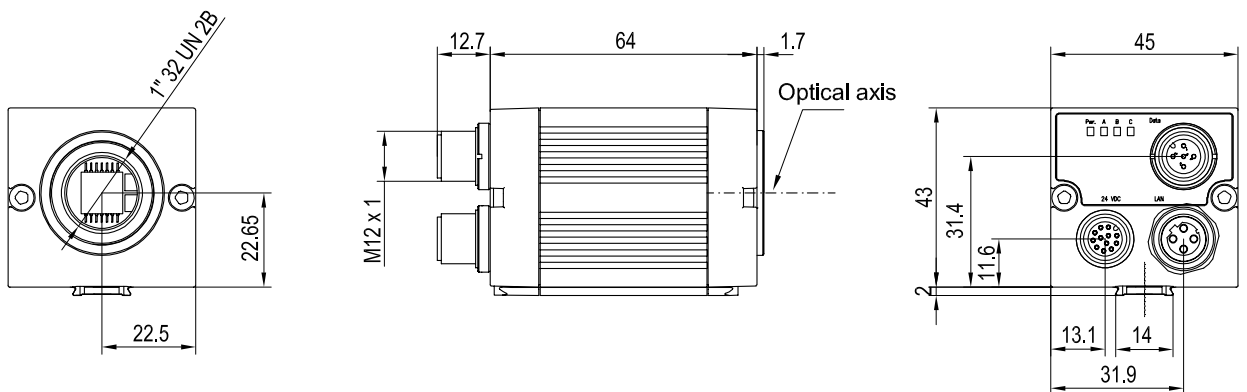IP 65[3]

c UL us
LISTED

PROFI NET®

EtherNet/IP™

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 of optical characters with OCR

Optical data

Resolution	1280 × 1024 pixels
CMOS	1/1.8'', monochrome
Integrated lens, focal length	C-mount
Adjustment range	Dependent on lens
Integrated illumination	None
Minimum field of view, X × Y	Dependent on lens

Functions

Number of jobs / detectors	max. 255 / max. 255
Detectors	Pattern comparison, contrast, brightness, grey level, bar code, data code, OCR
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; OCR: optical character reading, ECC200 GS1
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; typ. 15 ms per character OCR

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
Power On Delay	Ca. 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 kΩ
Encoder input	High > 4 V
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs

Mechanical data

Dimensions	65 × 45 × 45 mm (without plug)
Enclosure rating	IP 65[3]
Material, housing	Aluminium, plastic
Material, front screen	Plastic
Ambient temperature: operation	0 … +50 °C[4]
Ambient temperature: storage	-20 … +60 °C[4]
Weight	Ca. 160 g
Plug connection	Power 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 × 480 Pixel)   [3] With LPT45 C-mount protective casing   [4] 80 % air humidity, non-condensing

Part number	Article number
V20-CR-P2-C	536-91004

Version: 02/2017. Subject to changes; diagrams similar

VISOR® vision sensor

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-38
Illumination	From Page A-30
Lenses	From Page A-27
Brackets	From Page A-14
Interface accessories	From Page A-42

VISOR® V10 Code Reader

Standard vision sensor for code reading, 6 mm
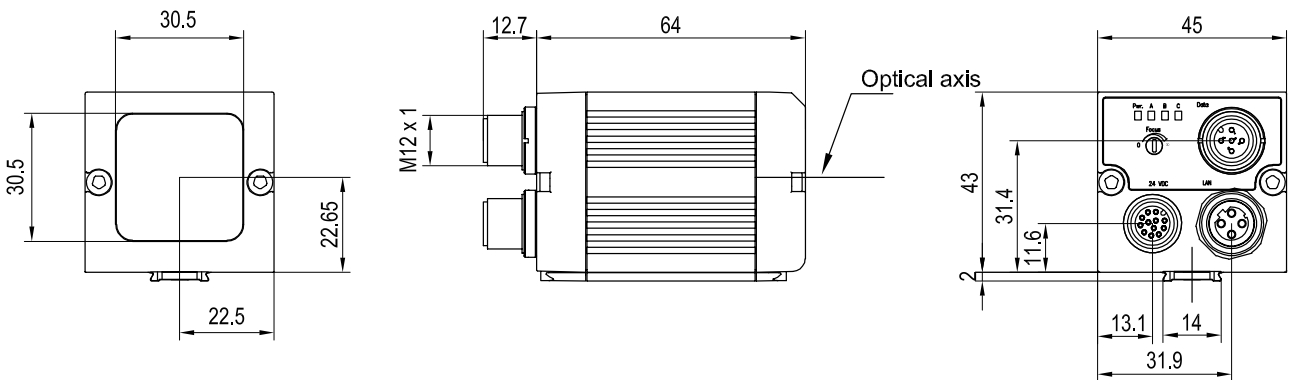
PRODUCT HIGHLIGHTS

- 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	
Resolution	736 × 480 pixels
CMOS	1/3'', monochrome
Integrated lens, focal length	6 mm, adjustable focal position
Adjustment range	6 mm to infinity
Integrated illumination	White, red, infrared LEDs
Minimum field of view, X × Y	5 × 4 mm²

Functions	
Number of jobs / detectors	8 / 2
Detectors	Bar code / data code
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
Typical cycle time	Typ. 30 ms bar code Typ. 40 ms data code

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
Power On Delay	Ca. 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-1V, Low < 3V
Input resistance	> 20 kOhm
Interfaces	Ethernet (LAN), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb
Inputs/outputs	2 inputs, 4 outputs, 2 selectable inputs/outputs

Mechanical data	
Dimensions	65 × 45 × 45 mm (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	Ca. 160 g
Plug connection	Power and I/O M12, 12pin Ethernet M12, 4pin 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	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

Version: 02/2017. Subject to changes; diagrams similar
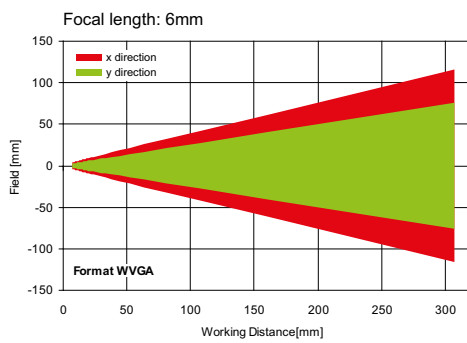
VISOR® vision sensor

30.5

30.5

22.65

22.5

12.7

64

M12 x 1

Optical axis

45

43

31.4

11.6

2

13.1

14

31.9

Par. A B C Data
Focus
24 VDC LAN

153-00911

5

Field of view

Focal length: 6mm

155-01422

| | x direction |
| | y direction |

Field [mm]

150
100
50
0
-50
-100
-150

Format WVGA

0   50   100   150   200   250   300

Working Distance[mm]

Depth of field: normal

Focal length: 6mm   **Depth of focus: Normal**

155-01409

Resolved object size
0.13mm
0.25mm
0.50mm
0.75mm

Depth of Field [mm]

400
350
300
250
200
150
100
50
0

0   50   100   150   200   250   300

Working Distance [mm]

Depth of field: enhanced

Focal length: 6mm   **Depth of focus: Enhanced**

155-01421

Resolved object size
0.13mm
0.25mm
0.50mm
0.75mm

Depth of Field [mm]

400
350
300
250
200
150
100
50
0

0   50   100   150   200   250   300
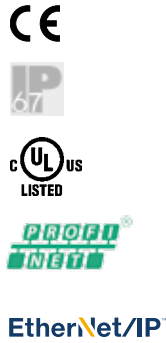
Working Distance [mm]
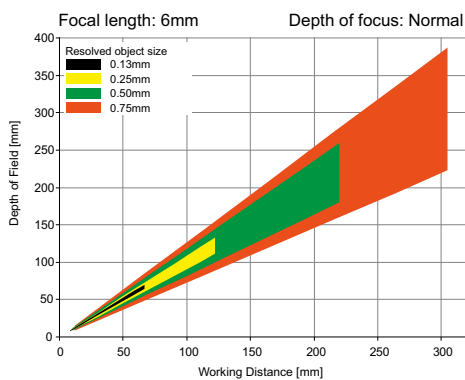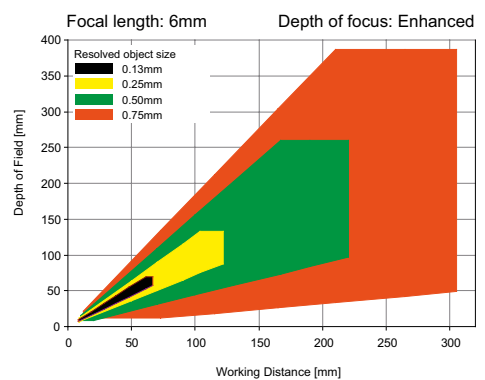
Accessories

Connection cables	From Page A-38
Illumination	From Page A-30
Brackets	From Page A-14
Interface accessories	From Page A-42

VISOR® V10 Code Reader

Standard vision sensor for code reading, 12 mm
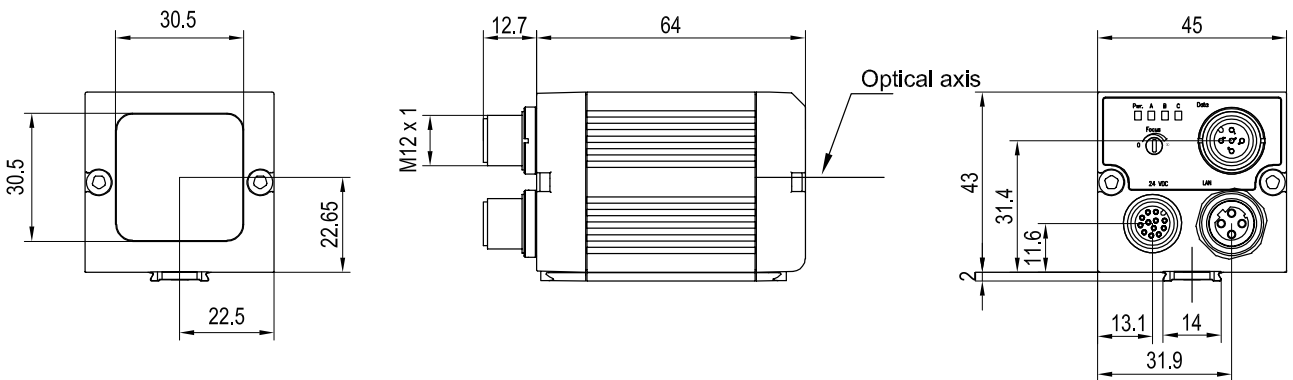
PRODUCT HIGHLIGHTS

- 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

Resolution	736 x 480 pixels
CMOS	1/3'', monochrome
Integrated lens, focal length	12 mm, adjustable focal position
Adjustment range	30 mm to infinity
Integrated illumination	White, red, infrared LEDs
Minimum field of view, X x Y	$8 \times 6\ mm^2$

Functions

Number of jobs / detectors	8 / 2
Detectors	Bar code / data code
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
Typical cycle time	Typ. 30 ms bar code Typ. 40 ms data code

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
Power On Delay	Ca. 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), RS422, RS232, EtherNet/IP, PROFINET, SensoWeb
Inputs/outputs	2 inputs, 4 outputs, 2 selectable inputs/outputs

Mechanical data

Dimensions	65 x 45 x 45 mm (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	Ca. 160 g
Plug connection	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	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

Version: 02/2017. Subject to changes; diagrams similar

VISOR® vision sensor

Optical axis

30.5
30.5
22.65
22.5

12.7
64
M12 x 1

45
43
31.4
11.6
2
13.1
14
31.9

Par. A B C Data
Focus
24 VDC LAN

153-00911

Field of view

Focal length: 12mm

- x direction
- y direction

Format WVGA

Field [mm] vs Working Distance[mm]

155-01423

Depth of field: normal

Focal length: 12mm   Depth of focus: Normal

Resolved object size
- 0.13mm
- 0.25mm
- 0.50mm
- 0.75mm

Depth of Field [mm] vs Working Distance [mm]

155-01410

Depth of field: enhanced

Focal length: 12mm   Depth of focus: Enhanced

Resolved object size
- 0.13mm
- 0.25mm
- 0.50mm
- 0.75mm

Depth of Field [mm] vs Working Distance [mm]

155-01411

Accessories

Connection cables	From Page A-38
Illumination	From Page A-30
Brackets	From Page A-14
Interface accessories	From Page A-42

VISOR® V10 Code Reader

Standard vision sensor for code reading, 25 mm

CE
IP 67
c UL us LISTED
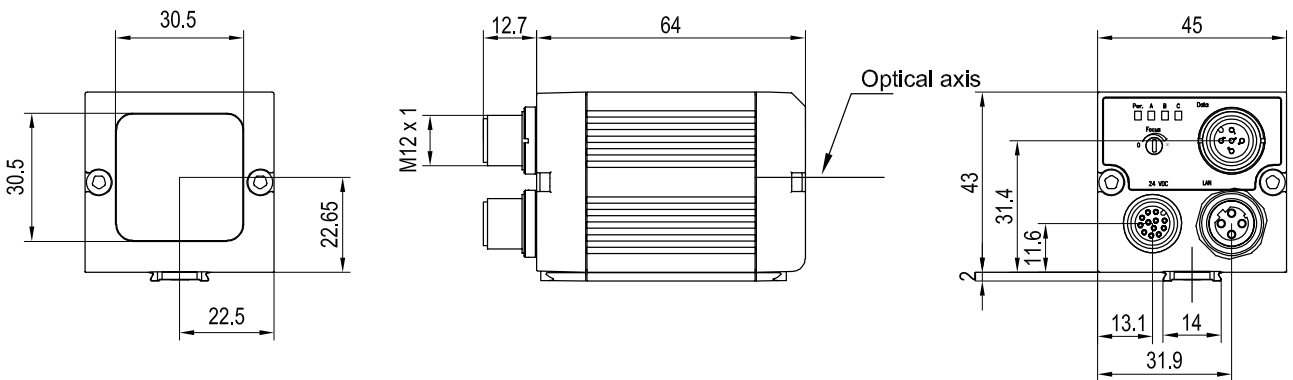PROFI NET®
EtherNet/IP™

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

Resolution	736 × 480 pixels
CMOS	1/3'', monochrome
Integrated lens, focal length	25 mm, adjustable focal position
Adjustment range	140 mm to infinity
Integrated illumination	White, red, infrared LEDs
Minimum field of view, X × Y	18×14 mm^2

Functions

Number of jobs / detectors	8 / 2
Detectors	Bar code / data code
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
Typical cycle times	Typ. 30 ms bar code Typ. 40 ms data code

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
Power On Delay	Ca. 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, PROFINET, SensoWeb
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs

Mechanical data

Dimensions	65 × 45 × 45 mm (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	Ca. 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	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

Field of view

Focal length: 25mm

- x direction
- y direction

Format WVGA

Field [mm] / Working Distance[mm]

Depth of field: normal

Focal length: 25mm   Depth of focus: Normal

Resolved object size
- 0.13mm
- 0.25mm
- 0.50mm
- 0.75mm

Depth of Field [mm] / Working Distance [mm]

Accessories

Connection cables	From Page A-38
Illumination	From Page A-30
Brackets	From Page A-14
Interface accessories	From Page A-42

VISOR® V10 Code Reader

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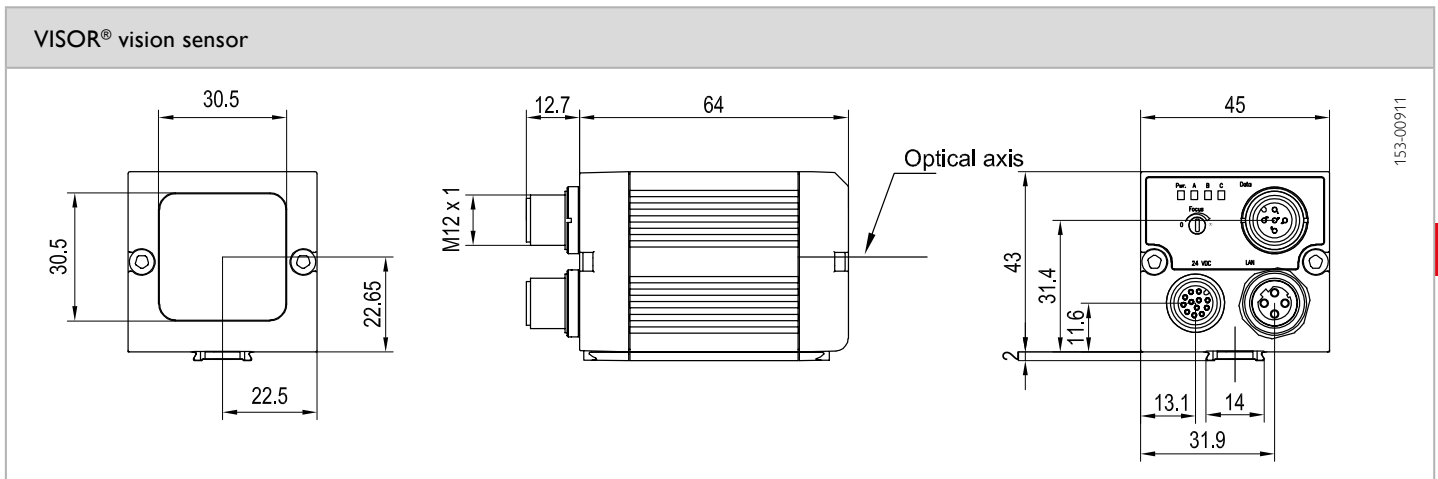

PRODUCT HIGHLIGHTS

- 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

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

Functions

Number of jobs / detectors	max. 255 / max. 255
Detectors	Pattern comparison, contrast, brightness, grey level, bar code, data code
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
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

Electrical data

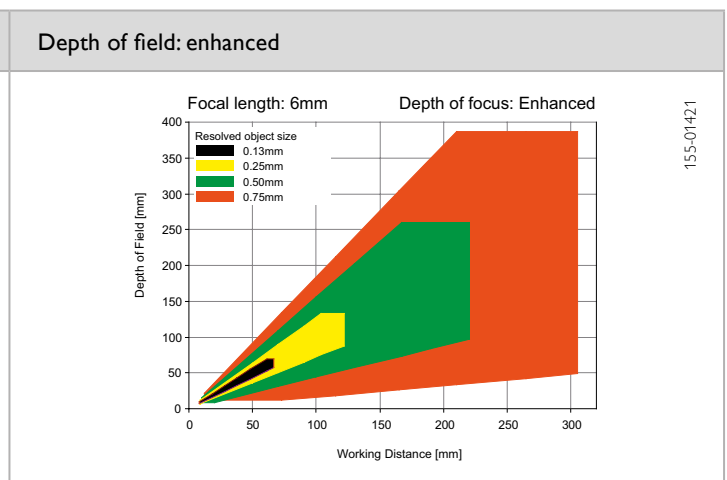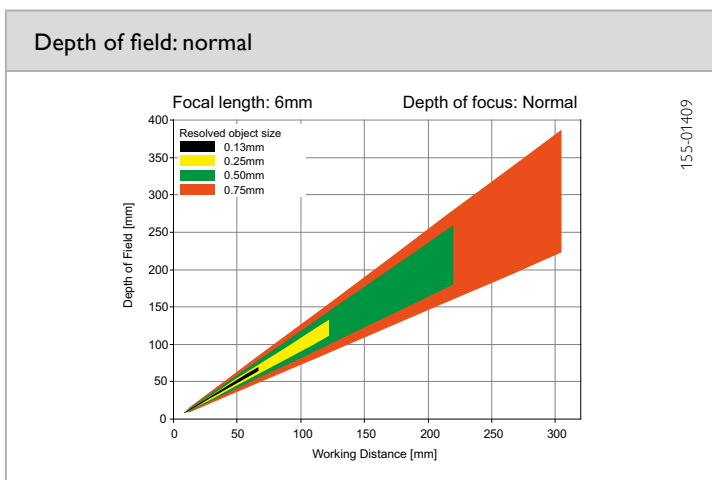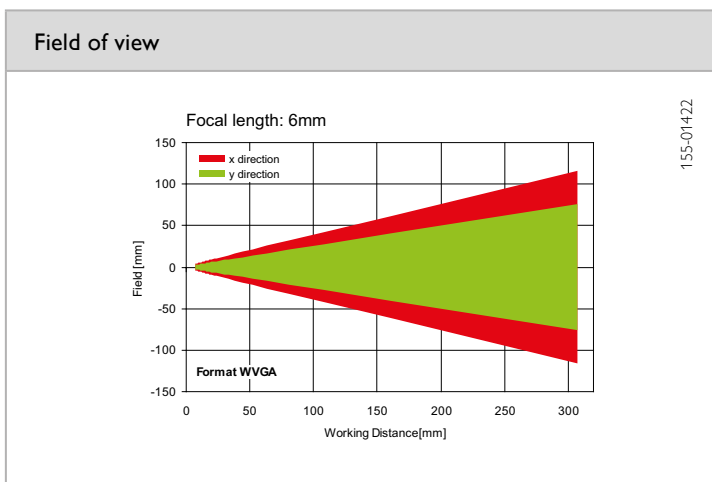|	
Operating voltage, $+U_B$	18 … 26.4 V DC[1]
Current consumption (without illumination and I/O)	≤ 120 mA
Current consumption (without I/O)	≤ 200 mA
Protective circuits	Reverse-polarity protection, U_B / short-circuit protection of all outputs
Power On Delay	Ca. 13 s after Power on
Outputs	PNP / NPN (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, PROFINET, SensoWeb
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs

Mechanical data

Dimensions	65 × 45 × 45 mm (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	Ca. 160 g
Plug connection	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	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

Version: 02/2017. Subject to changes; diagrams similar

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

VISOR® vision sensor

153-00911

Optical axis

Field of view

155-01422

Focal length: 6mm

x direction
y direction

Format WVGA

Depth of field: normal

155-01409

Focal length: 6mm   Depth of focus: Normal

Resolved object size
0.13mm
0.25mm
0.50mm
0.75mm

Depth of field: enhanced

155-01421

Focal length: 6mm   Depth of focus: Enhanced

Resolved object size
0.13mm
0.25mm
0.50mm
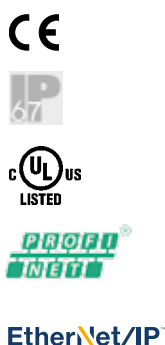0.75mm

Accessories

Connection cables	From Page A-38
Illumination	From Page A-30
Brackets	From Page A-14
Interface accessories	From Page A-42

VISOR® V10 Code Reader

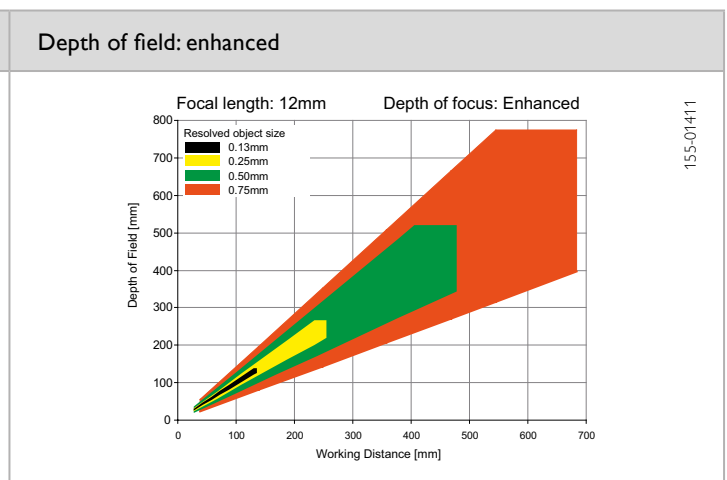Advanced vision sensor for code reading with object detection, 12 mm
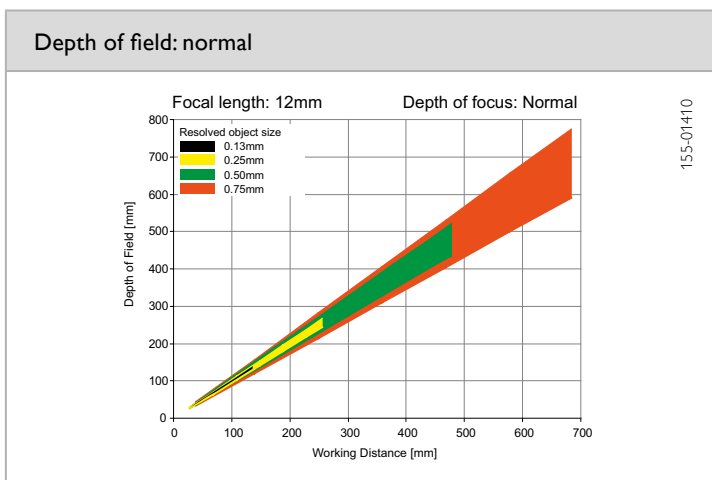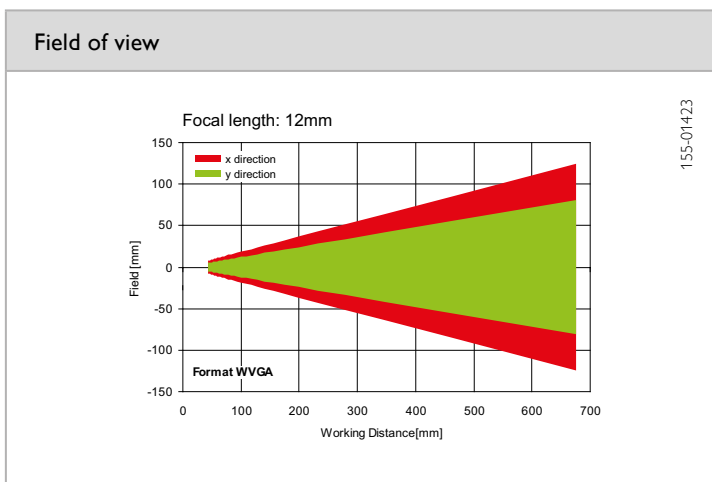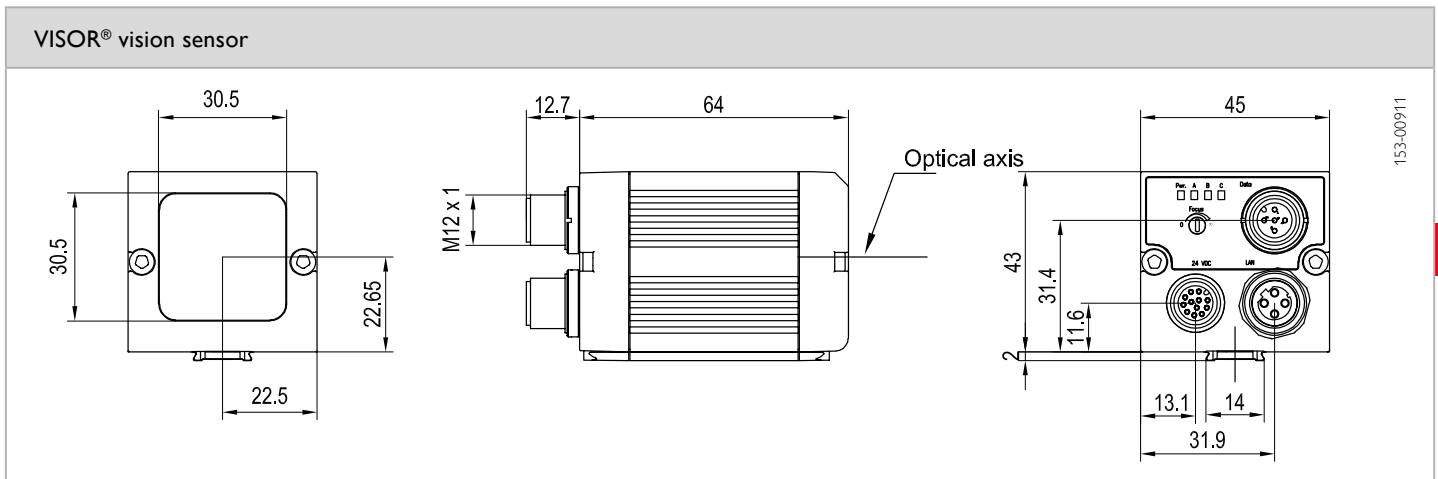
PRODUCT HIGHLIGHTS

- 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	
Resolution	736 × 480 pixels
CMOS	1/3", monochrome
Integrated lens, focal length	12 mm, adjustable focal position
Adjustment range	30 mm to infinity
Integrated illumination	White, red, infrared LEDs
Minimum field of view, X × Y	8 × 6 mm^2

Functions	
Number of jobs / detectors	max. 255 / max. 255
Detectors	Pattern comparison, contrast, brightness, grey level, bar code, data code
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
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

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
Power On Delay	Ca. 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, PROFINET, SensoWeb
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs

Mechanical data	
Dimensions	65 × 45 × 45 mm (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	Ca. 160 g
Plug connection	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	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

Version: 02/2017. Subject to changes; diagrams similar

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

VISOR® vision sensor

30.5 · 30.5 · 22.65 · 22.5 · 12.7 · 64 · M12 x 1 · Optical axis · 45 · 43 · 31.4 · 11.6 · 2 · 13.1 · 14 · 31.9

Pwr. A B C · Data · Focus · 24 VDC · LAN

153-00911

Field of view

Focal length: 12mm

- x direction
- y direction

Format WVGA

Field [mm] / Working Distance[mm]

155-01423

Depth of field: normal

Focal length: 12mm   Depth of focus: Normal

Resolved object size
- 0.13mm
- 0.25mm
- 0.50mm
- 0.75mm

Depth of Field [mm] / Working Distance [mm]

155-01410

Depth of field: enhanced

Focal length: 12mm   Depth of focus: Enhanced

Resolved object size
- 0.13mm
- 0.25mm
- 0.50mm
- 0.75mm

Depth of Field [mm] / Working Distance [mm]

155-01411

Accessories

Connection cables	From Page A-38
Illumination	From Page A-30
Brackets	From Page A-14
Interface accessories	From Page A-42

VISOR® V10 Code Reader

Advanced vision sensor code reading with object detection, 25 mm
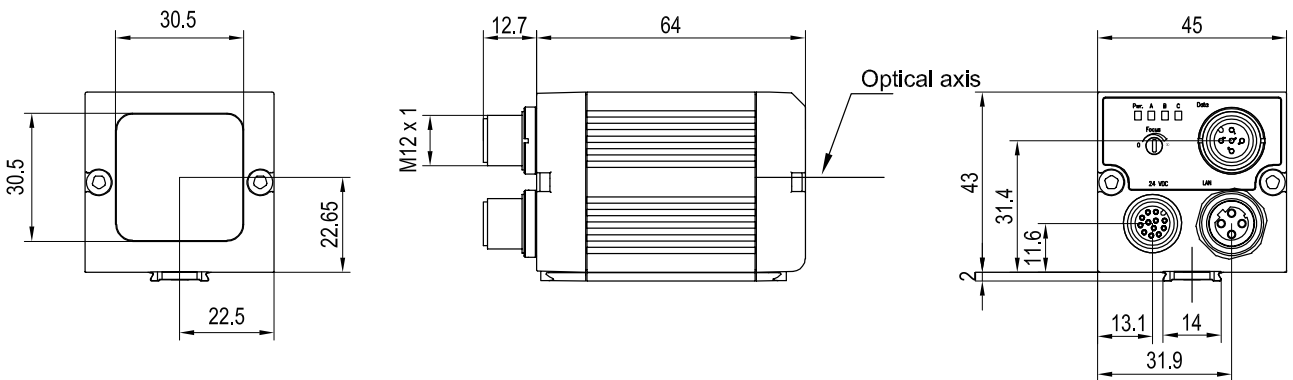
PRODUCT HIGHLIGHTS

- 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

Resolution	736 × 480 pixels
CMOS	1/3'', monochrome
Integrated lens, focal length	25 mm, adjustable focal position
Adjustment range	140 mm to infinity
Integrated illumination	White, red, infrared LEDs
Minimum field of view, X × Y	18 × 14 mm^2

Functions

Number of jobs / detectors	max. 255 / max. 255
Detectors	Pattern comparison, contrast, brightness, grey level, bar code, data code
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
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

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
Power On Delay	Ca. 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, PROFINET, SensoWeb
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs

Mechanical data

Dimensions	65 × 45 × 45 mm (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	Ca. 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	V10-CR-A2-W25	535-91084
Red	Normal	V10-CR-A2-R25	535-91085
Infrared	Normal	V10-CR-A2-I25	535-91086

Version: 02/2017. Subject to changes; diagrams similar

VISOR® vision sensor

Optical axis

30.5 · 30.5 · 22.65 · 22.5

12.7 · 64 · M12 x 1

45 · 43 · 31.4 · 11.6 · 2 · 13.1 · 14 · 31.9

153-00911

Field of view

Focal length: 25mm

Format WVGA

- x direction
- y direction

Field [mm]

Working Distance[mm]
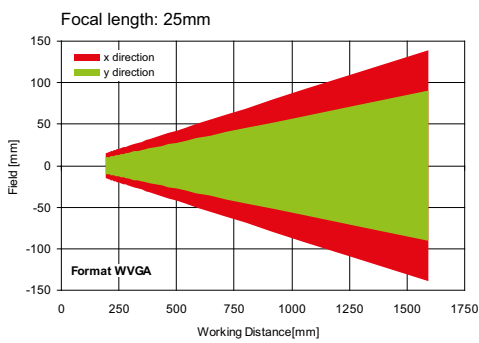
155-01424

Depth of field: normal

Focal length: 25mm   Depth of focus: Normal

Resolved object size
- 0.13mm
- 0.25mm
- 0.50mm
- 0.75mm

Depth of Field [mm]

Working Distance [mm]
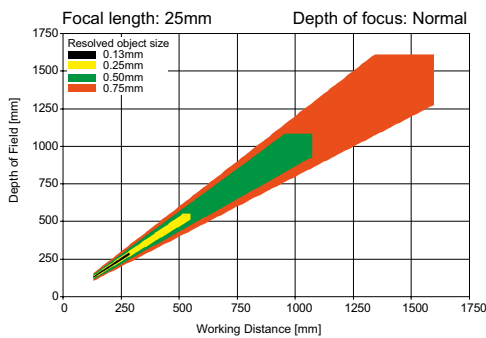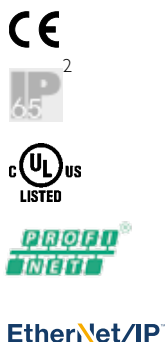
155-01412

Accessories

Connection cables	From Page A-38
Illumination	From Page A-30
Brackets	From Page A-14
Interface accessories	From Page A-42

VISOR® V10 Code Reader

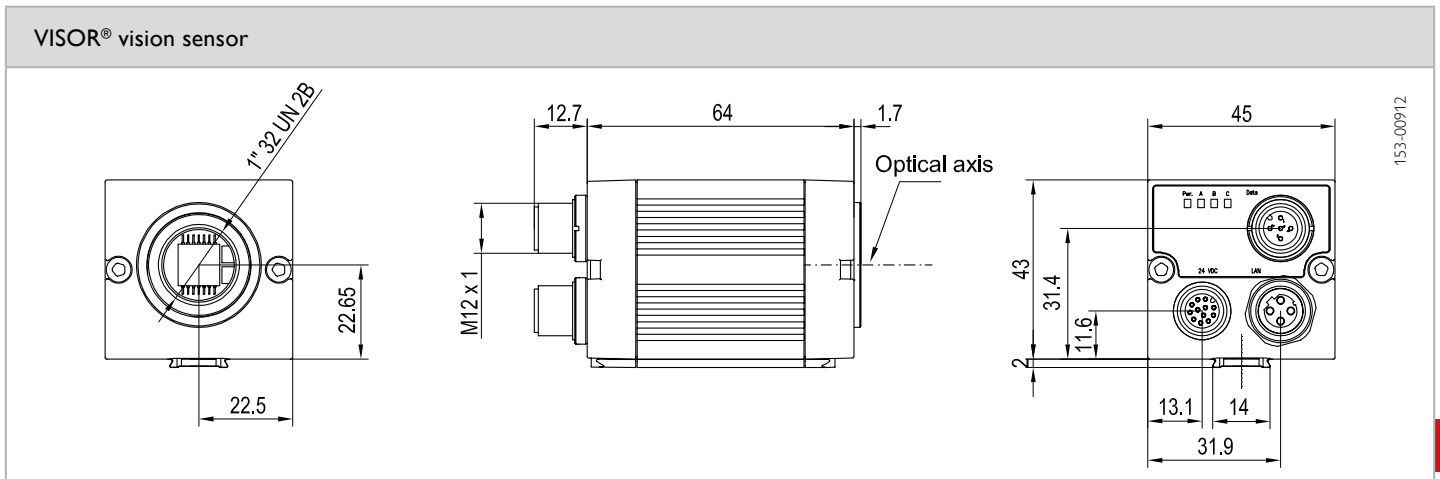Advanced vision sensor for code reading with object detection, C-mount

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

Resolution	736 x 480 pixels
CMOS	1/3'', monochrome
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	Pattern comparison, contrast, brightness, grey level, bar code, data code
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
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

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
Power On Delay	Ca. 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, PROFINET, SensoWeb
Inputs/outputs	2 inputs, 4 outputs, 4 selectable inputs/outputs

Mechanical data

Dimensions	65 x 45 x 45 mm (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	Ca. 160 g
Plug connection	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
V10-CR-A1-C	535-91033

VISOR® vision sensor

1" 32 UN 2B

12.7 64 1.7

Optical axis

M12 x 1

22.65

22.5

45

43 31.4

11.6

2

13.1 14

31.9

Par. A B C Data

24 VDC LAN

153-00912

5

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-38
Illumination	From Page A-30
Lenses	From Page A-27
Brackets	From Page A-14
Interface accessories	From Page A-42