


# Eyesight vision systems – everything is possible

At last. You can do what you want!



 made in Germany



#### **Taking measures:**

The dimensional accuracy of an object (e.g. a turned or pressed part) is an important quality feature, and can indirectly provide information on its consistency, stresses or wear, preventing rejects in downstream processes.



#### **Providing direction:**

The correct alignment of an object is an important prerequisite for downstream processes, e.g. for positioning and tracking a gripper. Colours, shapes and contours are suitable for monitoring correct orientation.



#### **Preventing faults:**

Very different features can be checked at a glance with the Eyesight – here, for example, the position and colour of the cap, filling level and presence of the use-by date. This pays, because each unnoticed fault may be expensive later.

## EYESIGHT HIGHLIGHTS

- Complete image-processing package with robust and flexible smart camera
- Programming via drag & drop of function blocks
- Complex iterative linkage of individual inspections
- Image and result visualisation in inspection mode
- Interpreter for programming one's own functions
- Image processing simulated on PC without camera
- Freely programmable data protocol for Ethernet and serial interface

Most image-processing applications can be rapidly and easily solved with pre-configured VISOR® vision sensors. However, their range of functions is not always sufficient for particularly demanding or specific tasks – but here, too, SensoPart has the right solution: the freely programmable Eyesight vision systems offer comprehensive configuration possibilities so that you can also implement very complex automation applications with the smart camera. Whereby complex is not synonymous with complicated: graphic programming by means of drag & drop makes it easy for you to “construct” your own applications.

Eyesight has numerous of routines for object measurement, position determination and tracking, data communication, warpage point determination, contour inspection/tracking, colour selection/monitoring, brightness correction as well as a variety of filter functions. What can otherwise only be achieved by fully-fledged image-processing systems, you can implement with Eyesight with considerably less effort – and at a relatively reasonable price.

| Eyesight Vision Systems – Product Overview |                    |                    |              |                             |      |
|--|--------------------|--------------------|--------------|-----------------------------|------|
|  | Firmware Option    | Resolution         | Focal length | Integrated illumination     | Page |
| V20-EYE-A2-xxx                             | Monochrome, colour | 1280 x 1024 pixels | 12           | White, red or infrared LEDs | 148  |
| V20-EYE-A2-xxx                             | Monochrome, colour | 1280 x 1024 pixels | C-Mount      | None                        | 150  |
| V10-EYE-A1-xxx                             | Monochrome, colour | 736 x 480 pixels   | 6            | White, red or infrared LEDs | 152  |
| V10-EYE-A1-xxx                             | Monochrome, colour | 736 x 480 pixels   | 12           | White, red or infrared LEDs | 154  |
| V10-EYE-A1-xxx                             | Monochrome, colour | 736 x 480 pixels   | C-Mount      | None                        | 156  |

# V20 Eyesight

Vision system for complex image-processing applications, 12 mm



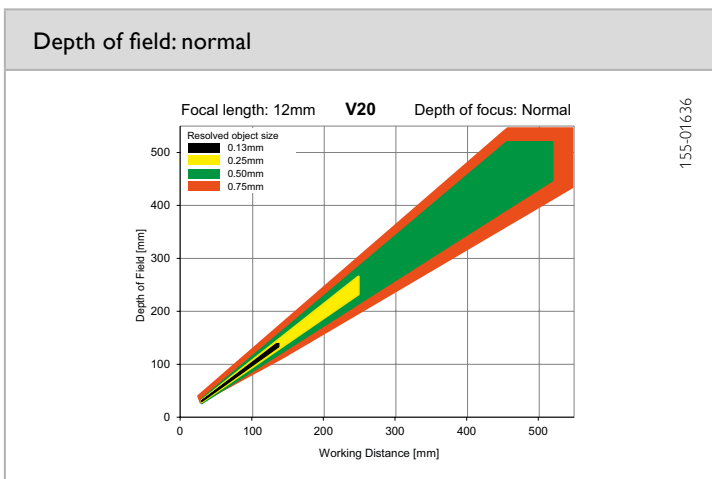
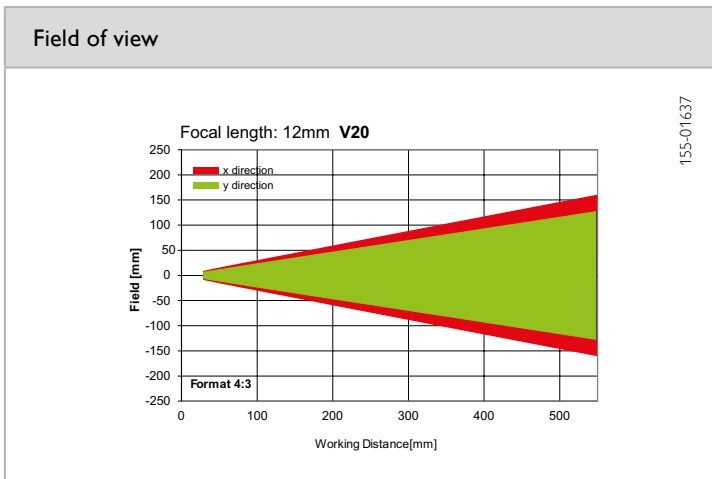
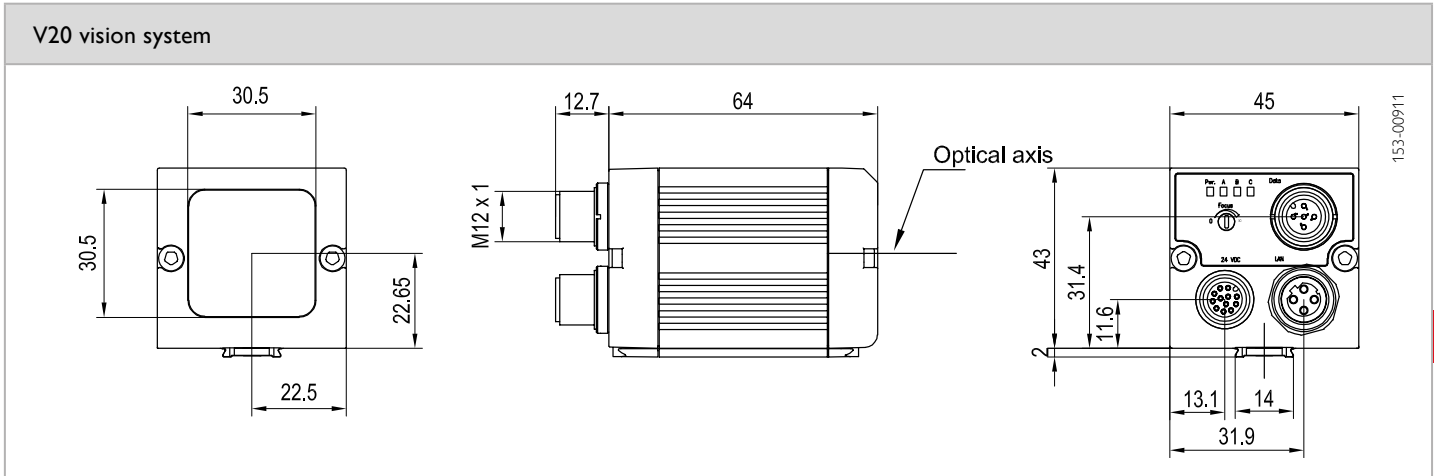
## PRODUCT HIGHLIGHTS

- Complete image-processing package with robust and flexible hardware, 1.3 mega pixel
- Programming via drag & drop of function blocks
- Complex, iterative linkage of individual inspections
- Image processing can be simulated on the PC without camera
- Image and result visualisation in inspection mode
- Script interpreter for advanced user functions

| Optical data                                       |   | Functions                       |  |
|--|---|---------------------------------|--|
| Resolution   | 1280 x 1024 pixels  | Number of inspection programmes | No limitation (max. ca. 40 MB)   |
| CMOS   | 1/1.8", monochrome or colour  | Functions                       | All function blocks for object measurement, position determination/tracking, sequence control, data and image transfer, contour inspection, subprogrammes, script interpreter. |
| Integrated lens, focal length                      | 12 mm, adjustable focal position  | Properties                      | See overview of commands   |
| Adjustment range                                   | 30 mm to infinity   | Typical cycle times             | Dependent on inspection programme  |
| Integrated illumination                            | White, red, infrared LEDs   |                                 |  |
| Minimum field of view, X x Y                       | 16 x 13 mm <sup>2</sup>   |                                 |  |
| Electrical data                                    |   | Mechanical data                 |  |
| Operating voltage, +U <sub>B</sub>                 | 18 ... 26.4V DC <sup>1</sup>  | Dimensions                      | 65 x 45 x 45 mm (without plug)   |
| Current consumption (without illumination and I/O) | ≤ 120 mA  | Enclosure rating                | IP 67  |
| Current consumption (without I/O)                  | ≤ 200 mA  | Material, housing               | Aluminium, plastic   |
| Protective circuits                                | Reverse-polarity protection, U <sub>B</sub> / short-circuit protection of all outputs | Material, front screen          | Plastic  |
| Power On Delay                                     | Ca. 13 s after Power on   | Ambient temperature: operation  | 0 ... +50 °C <sup>2</sup>  |
| Outputs  | PNP   | Ambient temperature: storage    | -20 ... +60 °C <sup>2</sup>  |
| Max. output current (per output)                   | 50 mA, 100 mA (pin 12)  | Weight                          | Ca. 160 g  |
| Inputs   | PNP High > U <sub>B</sub> -1 V, Low < 3 V   | Plug connections                | Supply and I/O M12, 12-pin<br>Ethernet M12, 4-pin<br>Data M12, 5-pin   |
| Input resistance                                   | > 20 kΩ   | Vibration and impact resistance | EN 60947-5-2   |
| Interfaces   | Ethernet (LAN), RS422, RS232  |                                 |  |
| Inputs/outputs                                     | 2 inputs, 4 outputs,<br>4 selectable inputs/outputs                                   |                                 |  |

<sup>1</sup> Max. ripple < 5V<sub>SS</sub>    <sup>2</sup> 80 % air humidity, non-condensing

| Illumination | Product variant | Part number     | Article number |
|--------------|-----------------|-----------------|----------------|
| White        | Monochrome      | V20-EYE-A2-W12  | 537-91008      |
| Red          | Monochrome      | V20-EYE-A2-R12  | 537-91009      |
| Infrared     | Monochrome      | V20-EYE-A2-I12  | 537-91010      |
| White        | Colour          | V20C-EYE-A2-W12 | 537-91014      |



**Accessories**

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

# V20 Eyesight

Vision system for complex image-processing applications, C-mount



## PRODUCT HIGHLIGHTS

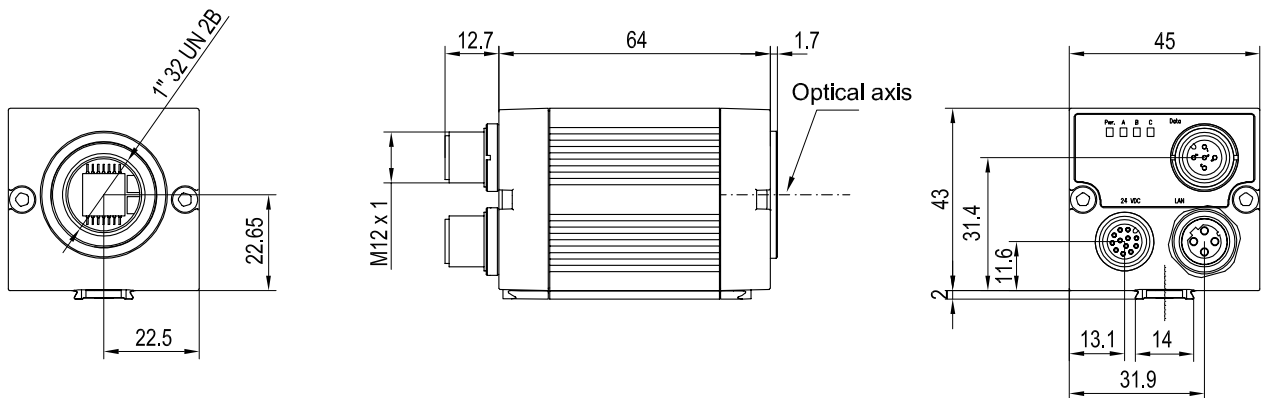
- Complete image-processing package with robust and flexible hardware, 1.3 mega pixel
- Programming via drag & drop of function blocks
- Complex, iterative linkage of individual inspections
- Image processing can be simulated on the PC without camera
- Image and result visualisation in inspection mode
- Script interpreter for advanced user functions

| Optical data                                       |   | Functions                       |  |
|--|---|---------------------------------|--|
| Resolution   | 1280 x 1024 pixels  | Number of inspection programmes | No limitation (max. ca. 40 MB)   |
| CMOS   | 1/1.8", monochrome or colour  | Functions                       | All function blocks for object measurement, position determination/tracking, sequence control, data and image transfer, contour inspection, subprogrammes, script interpreter. |
| Integrated lens, focal length                      | C-mount   | Properties                      | See overview of commands   |
| Adjustment range                                   | Dependent on lens   | Typical cycle times             | Dependent on inspection programme  |
| Integrated illumination                            | None  |                                 |  |
| Minimum field of view, X x Y                       | Dependent on lens   |                                 |  |
| Electrical data                                    |   | Mechanical data                 |  |
| Operating voltage, +U <sub>B</sub>                 | 18 ... 26.4V DC <sup>1</sup>  | Dimensions                      | 65 x 45 x 45 mm (without plug)   |
| Current consumption (without illumination and I/O) | ≤ 120 mA  | Enclosure rating                | IP 65 <sup>2</sup>   |
| Current consumption (without I/O)                  | ≤ 200 mA  | Material, housing               | Aluminium, plastic   |
| Protective circuits                                | Reverse-polarity protection, U <sub>B</sub> / short-circuit protection of all outputs | Material, front screen          | Plastic  |
| Power On Delay                                     | Ca. 13 s after Power on   | Ambient temperature: operation  | 0 ... +50 °C <sup>3</sup>  |
| Outputs  | PNP   | Ambient temperature: storage    | -20 ... +60 °C <sup>3</sup>  |
| Max. output current (per output)                   | 50 mA, 100 mA (pin 12)  | Weight                          | Ca. 160 g  |
| Inputs   | PNP High > U <sub>B</sub> -1 V, Low < 3 V   | Plug connections                | Supply and I/O M12, 12-pin<br>Ethernet M12, 4-pin<br>Data M12, 5-pin   |
| Input resistance                                   | > 20 kΩ   | Vibration and impact resistance | EN 60947-5-2   |
| Interfaces   | Ethernet (LAN), RS422, RS232  |                                 |  |
| Inputs/outputs                                     | 2 inputs, 4 outputs,<br>4 selectable inputs/outputs                                   |                                 |  |

<sup>1</sup> Max. ripple < 5V<sub>SS</sub>    <sup>2</sup> With LPT45 C-mount protective casing    <sup>3</sup> 80 % air humidity, non-condensing

| Product variant | Part number   | Article number |
|-----------------|---------------|----------------|
| Monochrome      | V20-EYE-A2-C  | 537-91007      |
| Colour          | V20C-EYE-A2-C | 537-91015      |

### V20 vision system



153-00912

4

### Lens



|                       | LO C 8    | LO C 12   | LO C 16   | LO C 25   | LO C 35   | LO C 50   | LO C 75   |
|-----------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| <b>Focal length</b>   | 8 mm      | 12 mm     | 16 mm     | 25 mm     | 35 mm     | 50 mm     | 75 mm     |
| <b>Article number</b> | 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 |

# V10 Eyesight

Vision system for complex image-processing applications, 6 mm



## PRODUCT HIGHLIGHTS

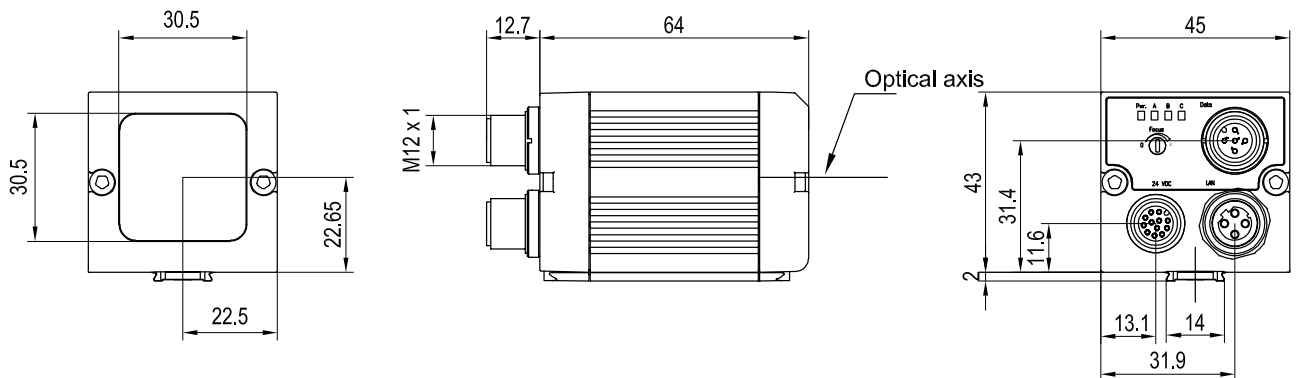
- Complete image-processing package with robust and flexible hardware
- Programming via drag & drop of function blocks
- Complex, iterative linkage of individual inspections
- Image processing can be simulated on the PC without camera
- Image and result visualisation in inspection mode
- Script interpreter for advanced user functions

| Optical data                                       |   | Functions                       |  |
|--|---|---------------------------------|--|
| Resolution   | 736 x 480 pixels  | Number of inspection programs   | No limitation (max. ca. 40 MB)   |
| CMOS   | 1/3", monochrome or colour  | Functions                       | All function blocks for object measurement, position determination / tracking, sequence control, data and image transfer, contour inspection, subprogrammes, script interpreter. |
| 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 x Y                       | 5 x 4 mm <sup>2</sup>   | Properties                      | See overview of commands   |
|  |   | Typical cycle times             | Dependent on inspection programme  |
| Electrical data                                    |   | Mechanical data                 |  |
| Operating voltage, +U <sub>B</sub>                 | 18 ... 26.4V DC <sup>1</sup>  | Dimensions                      | 65 x 45 x 45 mm (without plug)   |
| Current consumption (without illumination and I/O) | ≤ 120 mA  | Enclosure rating                | IP 67  |
| Current consumption (without I/O)                  | ≤ 200 mA  | Material, housing               | Aluminium, plastic   |
| Protective circuits                                | Reverse-polarity protection, U <sub>B</sub> / short-circuit protection of all outputs | Material, front screen          | Plastic  |
| Power On Delay                                     | Ca. 13 s after Power on   | Ambient temperature: operation  | 0 ... +50 °C <sup>2</sup>  |
| Outputs  | PNP   | Ambient temperature: storage    | -20 ... +60 °C <sup>2</sup>  |
| Max. output current (per output)                   | 50 mA, 100 mA (pin 12)  | Weight                          | Ca. 160 g  |
| Inputs   | PNP High > U <sub>B</sub> -1 V, Low < 3 V   | Plug connections                | Supply and I/O M12, 12-pin<br>Ethernet M12, 4-pin<br>Data M12, 5-pin   |
| Input resistance                                   | > 20 kΩ   | Vibration and impact resistance | EN 60947-5-2   |
| Interfaces   | Ethernet (LAN), RS422, RS232  |                                 |  |
| Inputs/outputs                                     | 2 inputs, 4 outputs,<br>4 selectable inputs/outputs                                   |                                 |  |

<sup>1</sup> Max. ripple < 5V<sub>SS</sub>    <sup>2</sup> 80 % air humidity, non-condensing

| Illumination | Product variant | Part number    | Article number |
|--------------|-----------------|----------------|----------------|
| White        | Monochrome      | V10-EYE-A1-W6  | 537-91000      |
| Red          | Monochrome      | V10-EYE-A1-R6  | 537-91002      |
| Infrared     | Monochrome      | V10-EYE-A1-I6  | 537-91005      |
| White        | Colour          | V10C-EYE-A2-W6 | 537-91011      |

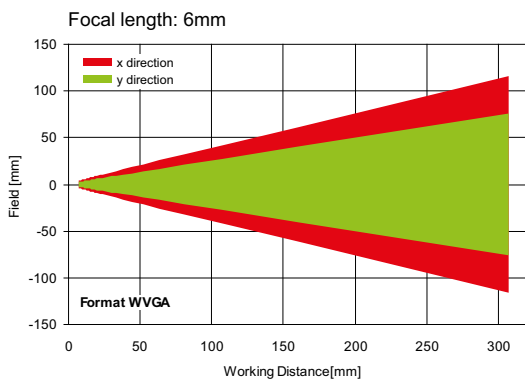
V10 vision system



153-00911

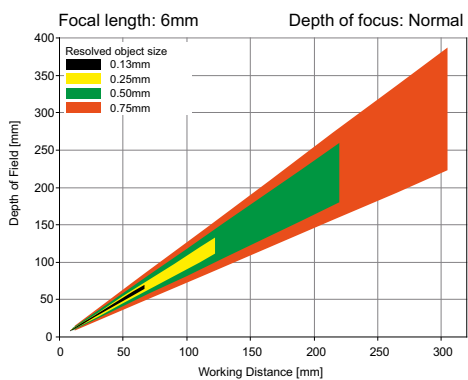
4

Field of view



155-01422

Depth of field: normal



155-01409

Accessories

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



# V10 Eyesight

Vision system for complex image-processing applications, 12 mm



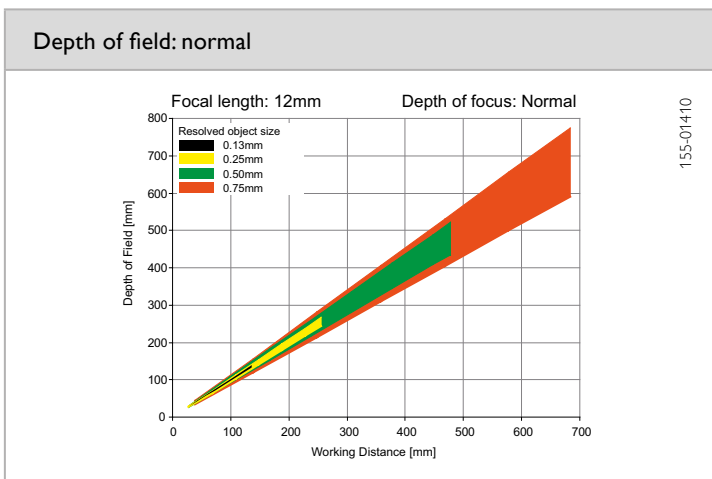
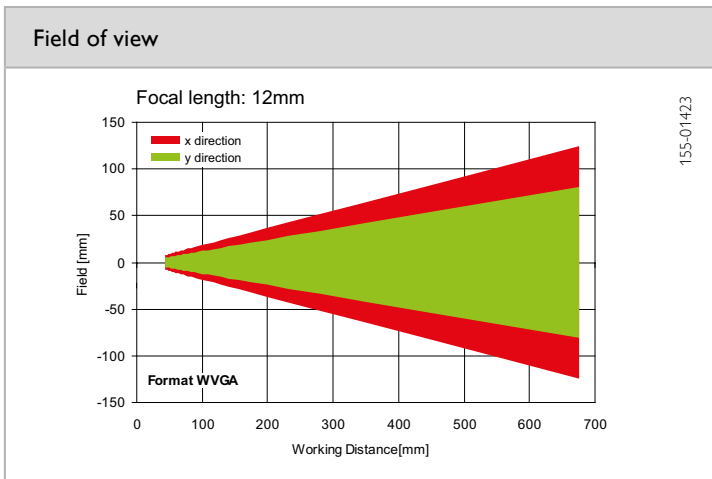
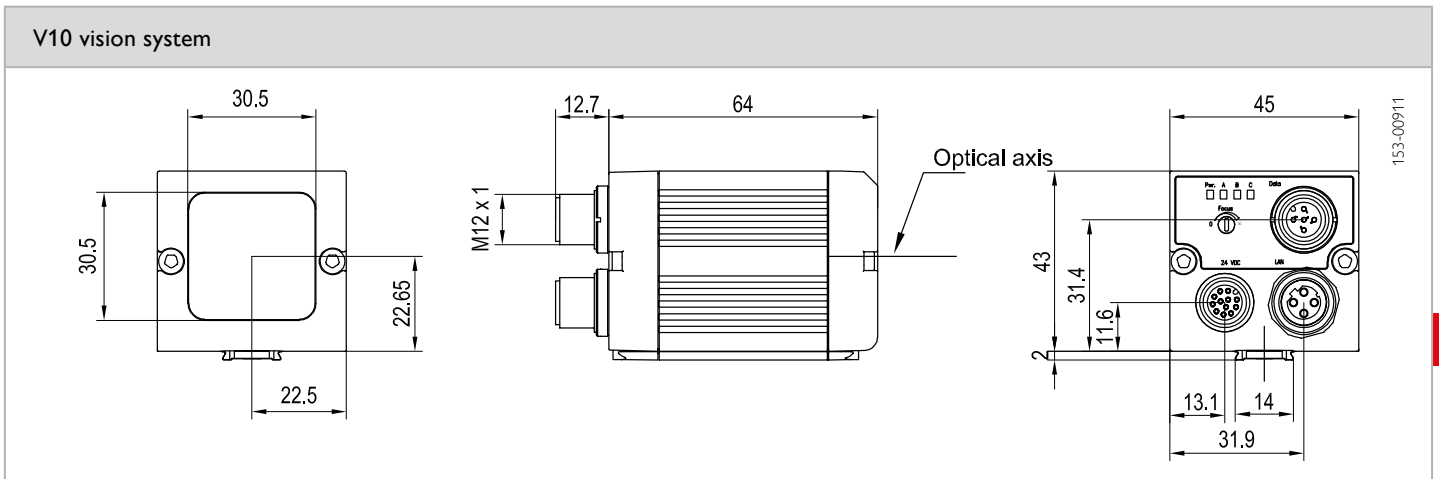
## PRODUCT HIGHLIGHTS

- Complete image-processing package with robust and flexible hardware
- Programming via drag & drop of function blocks
- Complex, iterative linkage of individual inspections
- Image processing can be simulated on the PC without camera
- Image and result visualisation in inspection mode
- Script interpreter for advanced user functions

| Optical data                                       |   | Functions                       |  |
|--|---|---------------------------------|--|
| Resolution   | 736 x 480 pixels  | Number of inspection programmes | No limitation (max. ca. 40 MB)   |
| CMOS   | 1/3", monochrome or colour  | Functions                       | All function blocks for object measurement, position determination/tracking, sequence control, data and image transfer, contour inspection, subprogrammes, script interpreter. |
| Integrated lens, focal length                      | 12 mm, adjustable focal position  | Properties                      | See overview of commands   |
| Adjustment range                                   | 30 mm to infinity   | Typical cycle times             | Dependent on inspection programme  |
| Integrated illumination                            | White, red, infrared LEDs   |                                 |  |
| Minimum field of view, X x Y                       | 8 x 6 mm <sup>2</sup>   |                                 |  |
| Electrical data                                    |   | Mechanical data                 |  |
| Operating voltage, +U <sub>B</sub>                 | 18 ... 26.4V DC <sup>1</sup>  | Dimensions                      | 65 x 45 x 45 mm (without plug)   |
| Current consumption (without illumination and I/O) | ≤ 120 mA  | Enclosure rating                | IP 67  |
| Current consumption (without I/O)                  | ≤ 200 mA  | Material, housing               | Aluminium, plastic   |
| Protective circuits                                | Reverse-polarity protection, U <sub>B</sub> / short-circuit protection of all outputs | Material, front screen          | Plastic  |
| Power On Delay                                     | Ca. 13 s after Power on   | Ambient temperature: operation  | 0 ... +50 °C <sup>2</sup>  |
| Outputs  | PNP   | Ambient temperature: storage    | -20 ... +60 °C <sup>2</sup>  |
| Max. output current (per output)                   | 50 mA, 100 mA (pin 12)  | Weight                          | Ca. 160 g  |
| Inputs   | PNP High > U <sub>B</sub> -1V, Low < 3V   | Plug connections                | Supply and I/O M12, 12-pin<br>Ethernet M12, 4-pin<br>Data M12, 5-pin   |
| Input resistance                                   | > 20 kΩ   | Vibration and impact resistance | EN 60947-5-2   |
| Interfaces   | Ethernet (LAN), RS422, RS232  |                                 |  |
| Inputs/outputs                                     | 2 inputs, 4 outputs,<br>4 selectable inputs/outputs                                   |                                 |  |

<sup>1</sup> Max. ripple < 5V<sub>SS</sub>    <sup>2</sup> 80 % air humidity, non-condensing

| Illumination | Product variant | Part number     | Article number |
|--------------|-----------------|-----------------|----------------|
| White        | Monochrome      | V10-EYE-A1-W12  | 537-91001      |
| Red          | Monochrome      | V10-EYE-A1-R12  | 537-91003      |
| Infrared     | Monochrome      | V10-EYE-A1-I12  | 537-91006      |
| White        | Colour          | V10C-EYE-A2-W12 | 537-91012      |



**Accessories**

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

# V10 Eyesight

Vision system for complex image-processing applications, C-mount



## PRODUCT HIGHLIGHTS

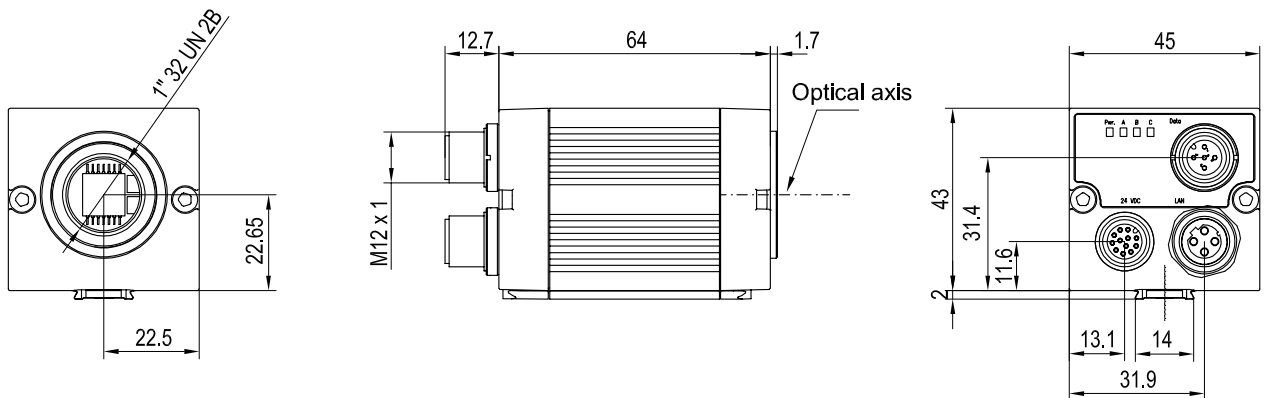
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- Programming via drag & drop of function blocks
- Complex, iterative linkage of individual inspections
- Image processing can be simulated on the PC without camera
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- Script interpreter for advanced user functions

| Optical data                                       |   | Functions                       |  |
|--|---|---------------------------------|--|
| Resolution   | 736 x 480 pixels  | Number of inspection programmes | No limitation (max. ca. 40 MB)   |
| CMOS   | 1/3", monochrome or colour  | Functions                       | All function blocks for object measurement, position determination/tracking, sequence control, data and image transfer, contour inspection, subprogrammes, script interpreter. |
| Integrated lens, focal length                      | C-mount   | Properties                      | See overview of commands   |
| Adjustment range                                   | Dependent on lens   | Typical cycle times             | Dependent on inspection programme  |
| Integrated illumination                            | None  |                                 |  |
| Minimum field of view, X x Y                       | Dependent on lens   |                                 |  |
| Electrical data                                    |   | Mechanical data                 |  |
| Operating voltage, +U <sub>B</sub>                 | 18 ... 26.4V DC <sup>1</sup>  | Dimensions                      | 65 x 45 x 45 mm (without plug)   |
| Current consumption (without illumination and I/O) | ≤ 120 mA  | Enclosure rating                | IP 65 <sup>2</sup>   |
| Current consumption (without I/O)                  | ≤ 200 mA  | Material, housing               | Aluminium, plastic   |
| Protective circuits                                | Reverse-polarity protection, U <sub>B</sub> / short-circuit protection of all outputs | Material, front screen          | Plastic  |
| Power On Delay                                     | Ca. 13 s after Power on   | Ambient temperature: operation  | 0 ... +50 °C <sup>3</sup>  |
| Outputs  | PNP   | Ambient temperature: storage    | -20 ... +60 °C <sup>3</sup>  |
| Max. output current (per output)                   | 50 mA, 100 mA (pin 12)  | Weight                          | Ca. 160 g  |
| Inputs   | PNP High > U <sub>B</sub> -1V, Low < 3V   | Plug connections                | Supply and I/O M12, 12-pin<br>Ethernet M12, 4-pin<br>Data M12, 5-pin   |
| Input resistance                                   | > 20 kΩ   | Vibration and impact resistance | EN 60947-5-2   |
| Interfaces   | Ethernet (LAN), RS422, RS232  |                                 |  |
| Inputs/outputs                                     | 2 inputs, 4 outputs,<br>4 selectable inputs/outputs                                   |                                 |  |

<sup>1</sup> Max. ripple < 5V<sub>SS</sub>    <sup>2</sup> With LPT45 C-mount protective casing    <sup>3</sup> 80 % air humidity, non-condensing

| Product variant | Part number   | Article number |
|-----------------|---------------|----------------|
| Monochrome      | V10-EYE-A1-C  | 537-91004      |
| Colour          | V10C-EYE-A2-C | 537-91013      |

### V10 vision system



### Lens



|                       | LO C 8    | LO C 12   | LO C 16   | LO C 25   | LO C 35   | LO C 50   | LO C 75   |
|-----------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| <b>Focal length</b>   | 8 mm      | 12 mm     | 16 mm     | 25 mm     | 35 mm     | 50 mm     | 75 mm     |
| <b>Article number</b> | 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 |