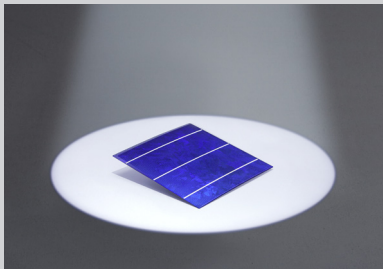
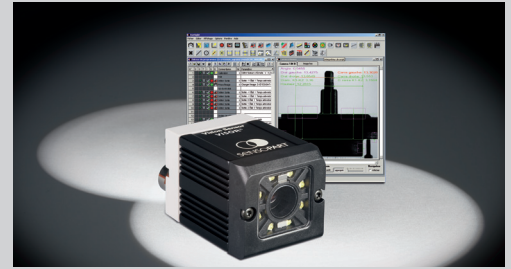
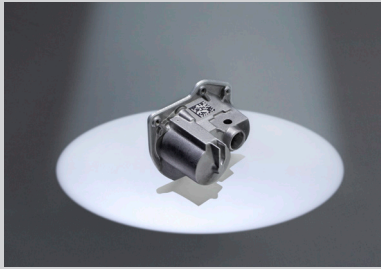


Product overview – vision sensors and systems



| Features/sensors | VISOR® object sensor | | VISOR® Color | | VISOR® solar sensor | |
|---|-------------------------------------|---------------------|---|--|--|--|
| | V10 Standard | V10 /V20 Advanced | V10C Standard | V10C /V20C Advanced | V10 Standard | V10 Advanced |
| Highlights | Object detection and classification | | Improved object detection through additional colour information | | Positioning and inspecting solar cells | |
| | | | Colour area – – | Colour area Colour list Colour value | Wafer position and breakouts – | Wafer position and breakouts Busbar position and number |
| Functions | | | | | | |
| Resolution in pixels V10 | 736 x 480 Mono | 736 x 480 Mono | 736 x 480 Colour | 736 x 480 Colour | 736 x 480 Mono | 736 x 480 Mono |
| Resolution in pixels V20 | – | 1280 x 1024 Mono | – | 1280 x 1024 Colour | – | – |
| Image rate per second V10 V20 | 50 – | 50 40 | 40 – | 40 20 | 50 – | 50 – |
| Number of jobs detectors | 2 32 | max. 255 max. 255 | 8 32 | max. 255 max. 255 | 2 32 | max. 255 max. 255 |
| Position tracking | – | ✓ | ✓ | ✓ | – | ✓ |
| Contour matching (X-,Y-translation, orientation) | ✓ | ✓ | ✓ | ✓ | – | – |
| Pattern comparison (X-,Y-translation) | ✓ | ✓ | – | ✓ | – | ✓ |
| Grey threshold | ✓ | ✓ | – | ✓ | ✓ | ✓ |
| Contrast | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Brightness | ✓ | ✓ | – | ✓ | ✓ | ✓ |
| Freeform tool | Contour only | ✓ | ✓ | ✓ | – | – |
| Interfaces | | | | | | |
| Inputs outputs | 2 4 | 2 4 | 2 4 | 2 4 | 2 4 | 2 4 |
| Freely definable switching outputs/inputs, PNP or NPN | 2 | 4 | 2 | 4 | 2 | 4 |
| Encoder input | – | ✓ | – | ✓ | – | ✓ |
| I/O expansion | – | ✓ | – | ✓ | – | ✓ |
| RS 422 RS 232 | – – | ✓ ✓ | – – | ✓ ✓ | – – | ✓ ✓ |
| Ethernet | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| EtherNet/IP | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Lens | | | | | | |
| V10 integrated, 6 mm 12 mm 25 mm | ✓ ✓ – | ✓ ✓ ✓ | ✓ ✓ – | ✓ ✓ ✓ | ✓ ✓ – | ✓ ✓ ✓ |
| V20 integrated, 12 mm | – | ✓ | – | ✓ | – | – |
| C-mount | – | ✓ | – | ✓ | – | ✓ |

| | | | |
|----------------------------|----|----|----|
| More Information from page | 62 | 80 | 98 |
|----------------------------|----|----|----|



1

| VISOR® Code Reader | | |
|---------------------|---------------------------------------|--|
| V10 Standard | V10/V20 Advanced | V20 Professional (OCR) |
| Code reading | | |
| Data code | Data code | Data code |
| Bar code | Bar code | Bar code |
| – | – | Optical character recognition (OCR) |
| 736 x 480 Mono | 736 x 480 Mono | – |
| – | 1280 x 1024 Mono | 1280 x 1024 Mono |
| 50 – | 50 40 | – 40 |
| 8 1 | max. 255 max. 255 | max. 255 max. 255 |
| – | ✓ | ✓ |
| – | – | – |
| – | ✓ | ✓ |
| – | ✓ | ✓ |
| – | ✓ | ✓ |
| – | ✓ (not with data codes and bar codes) | ✓ (not with data codes, bar codes and OCR) |
| 2 4 | 2 4 | 2 4 |
| 2 | 4 | 4 |
| – | ✓ | ✓ |
| ✓ | ✓ | ✓ |
| ✓ ✓ | ✓ ✓ | ✓ ✓ |
| ✓ | ✓ | ✓ |
| ✓ | ✓ | ✓ |
| ✓ ✓ – | ✓ ✓ ✓ | – |
| – | ✓ | ✓ |
| – | ✓ | ✓ |

| Features/sensors | Eyesight Vision-System | |
|---|--|--------------------|
| | V10/V20 | V10C/V20C (Colour) |
| Functions | | |
| Resolution in pixels V10 | 736 x 480 Mono | 736 x 480 Colour |
| Resolution in pixels V20 | 1280 x 1024 Mono | 1280 x 1024 Colour |
| Image rate per second V10 V20 | 50 40 | 40 20 |
| Number of jobs detectors | max. 40 Mbyte | max. 40 Mbyte |
| Position tracking | ✓ | ✓ |
| Commands | | |
| Image/camera | Image capture, camera settings | |
| Colours | Select colour channel, colour inspection, colour filter (only for V10C/V20C) | |
| Pre-processing | Calibration and position tracking, correct brightness, remove background, filter functions | |
| Inputs/outputs | Test input, set output, access INI file, text, data transfer – serial, data transfer – LAN (text line) | |
| Visualisation | Image transfer | |
| Measurement | Image information, area test, list of points, determine points, determine lines, calculate circle, calculate distance, line distance, calculate cross-section, measure gap width, calipers (hor./vert./free), calculate angle, determine warpage point | |
| Program control | Stop watch, control of sequence and loop options, run subprogram, access variable, evaluation | |
| Pattern/contour comparison | Count objects, inspect contour, track contour, correlation, Smart Match (optional) | |
| Scanning | Scan points, scan points (circular scanner), edge counter (straight), find edges (projected), search ring for counting | |
| Access to libraries | Script interpreter | |
| Interfaces | | |
| Inputs outputs | 2 4 | 2 4 |
| Freely definable switching outputs/inputs | 4 | 4 |
| I/O expansion | ✓ | ✓ |
| RS422 RS232 | ✓ ✓ | ✓ ✓ |
| Ethernet | ✓ | ✓ |
| Lens | | |
| V10 integrated, 6 mm 12 mm | ✓ ✓ | ✓ ✓ |
| V20 integrated, 12 mm | ✓ | ✓ |
| C-mount | ✓ | ✓ |