# Product overview - Software
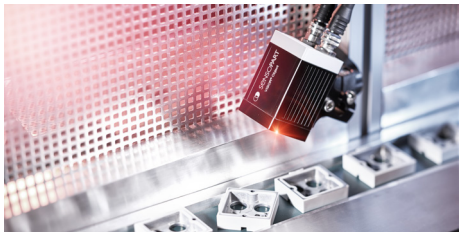## VISOR® & VISOR® **XE** Vision Sensors



**VISOR® Object** — Presence, completeness, measurement, position check, color



**VISOR® Object AI** — Presence, completeness, measurement, position check, color, artificial intelligence
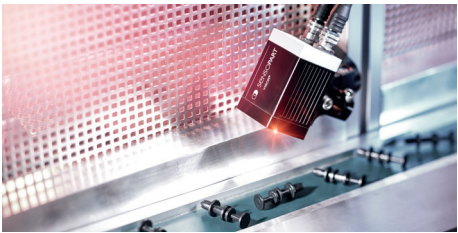


**VISOR® Robotic** — Robotics, presence, completeness, measurement, positioning



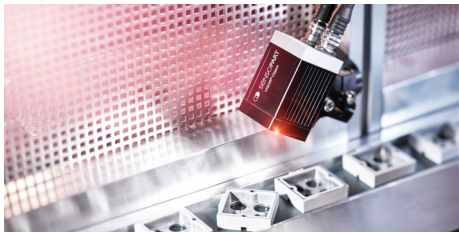**VISOR® Code Reader** — Reading of barcodes, 2D codes, text



**VISOR® Allround** — Presence, completeness, measurement, position check, color, reading of barcodes, data codes, text, Multishot

| Feature | VISOR® Object | | VISOR® Object AI | VISOR® Robotic | | VISOR® Code Reader | | | VISOR® Allround | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Standard | Advanced | Advanced | Advanced | Professional | Standard | Advanced | Professional | Advanced | Professional |
| (XE) | – | – | XE | – | XE | – | XE | XE | – | XE |
| **Calibration** | | | | | | | | | | |
| Scaling \| Perspective | ✓ \| – | ✓ \| ✓ | ✓ \| ✓ | ✓ \| ✓ | ✓ \| ✓ | – | – | – | ✓ \| ✓ | ✓ \| ✓ |
| Point-pair list \| Calibration plate (robot) | – | – \| – | – \| – | ✓ \| ✓ | ✓ \| ✓ | – | – | – | – | ✓ |
| Hand-eye \| Base-eye calibration (robot) | – | – | – | – | ✓ | – | – | – | – | ✓ |
| **Preprocessing** | | | | | | | | | | |
| Preprocessing filter | – | ✓ | ✓ | ✓ | ✓ | – | ✓ | ✓ | ✓ | ✓ |
| Multiple image capture \| Shutter variation | – | ✓ | ✓ | ✓ | ✓ | – | ✓ | ✓ | ✓ | ✓ |
| Freeform search area | ✓ | – | ✓ | ✓ | ✓ | – | – | ✓ | ✓ | ✓ |
| **Position tracking** | | | | | | | | | | |
| Contour comparison (translation, rotation 360°) | ✓ | – | ✓ | ✓ | ✓ | – | – | ✓ | ✓ | ✓ |
| Pattern matching (translation, rotation 360°) | – | ✓ | ✓ | ✓ | ✓ | – | – | ✓ | ✓ | ✓ |
| Edge detection (translation, rotation) | – | ✓ | ✓ | ✓ | ✓ | – | – | ✓ | ✓ | ✓ |
| **Object detection** | | | | | | | | | | |
| Contour \| Multiple detection | ✓ \| – | ✓ \| ✓ | ✓ \| ✓ | ✓ \| ✓ | ✓ \| ✓ | – | – \| – | – | ✓ | ✓ |
| Pattern comparison \| Multiple detection | ✓ \| – | ✓ \| ✓ | ✓ \| ✓ | ✓ \| ✓ | ✓ \| ✓ | – | – \| – | ✓ \| ✓ | ✓ | ✓ |
| Grey level \| Contrast \| Brightness | ✓ | – | ✓ | ✓ | ✓ | – | – | – | ✓ | ✓ |
| Calliper | ✓ | – | ✓ | ✓ | ✓ | – | – | – | ✓ | ✓ |
| BLOB | – | ✓ | ✓ | ✓ | ✓ | – | – | – | ✓ | ✓ |
| 3D contour | – | – | – | – | ✓ | – | – | – | – | ✓ |
| Target Mark 3D | – | – | – | ✓ | ✓ | – | – | – | ✓ | ✓ |
| Classification (AI) | – | – | ✓ | – | – | – | – | – | – | ✓ |
| Contour check | – | ✓ | ✓ | – | – | – | – | – | ✓ | ✓ |
| **Identification** | | | | | | | | | | |
| Barcodes \| Datacode | – | – | – | – | ✓ \| ✓ | – | ✓ | – | ✓ | ✓ |
| Clear text (OCR) | – | – | – | – | ✓ \| ✓ | – | – | ✓ | ✓ | ✓ |
| **Robotics functions** | | | | | | | | | | |
| Result offset image \| 2D \| 3D | – \| – \| – | – \| – \| – | – \| – \| – | ✓ \| ✓ \| ✓ | ✓ \| ✓ \| ✓ | – \| – \| – | – \| – \| – | – | – | ✓ |
| Checking space around gripper | – | – | – | ✓ | ✓ | – | – | – | – | ✓ |
| **Color detectors for Color variants** | | | | | | | | | | |
| Color field \| Color value \| Color list | ✓ \| – \| – | ✓ \| ✓ \| ✓ | ✓ \| ✓ \| ✓ | ✓ \| ✓ \| ✓ | ✓ \| ✓ \| ✓ | – \| – \| – | – \| – \| – | – | ✓ \| ✓ \| ✓ | ✓ \| ✓ \| ✓ |
| Color distance \| Binarisation | – \| – | ✓ \| ✓ | ✓ \| ✓ | ✓ \| ✓ | ✓ \| ✓ | – \| – | – \| – | – | ✓ \| ✓ | ✓ \| ✓ |
| **Result processing / Output** | | | | | | | | | | |
| Result processing - Text \| Math | – \| – | – \| ✓ | – \| ✓ | – \| ✓ | ✓ \| ✓ | – \| – | – \| – | ✓ \| – | ✓ \| ✓ | ✓ \| ✓ |
| Result processing - Robotics | – | – | – | ✓ | ✓ | – | – | – | – | ✓ |
| Individual Overlays | – | ✓ | ✓ | ✓ | ✓ | – | ✓ | ✓ | ✓ | ✓ |

SensoPart

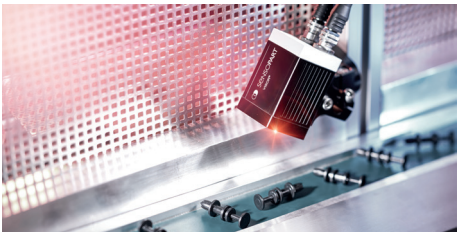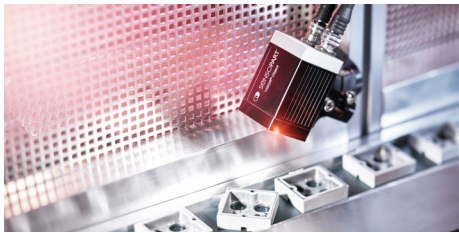| | VISOR® Object | | VISOR® Object AI | VISOR® Robotic | | VISOR® Code Reader | | | VISOR® Allround | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Presence, completeness, measurement, position check, color | | Presence, completeness, measurement, position check, color, artificial intelligence | Robotics, presence, completeness, measurement, positioning | | Reading of barcodes, 2D codes, text | | | Presence, completeness, measurement, position check, color, reading of barcodes, data codes, text, multi-shot | |
| | Standard | Advanced | Advanced | Advanced | Professional | Standard | Advanced | Professional | Advanced | Professional |
| **Resolution** | | | | | | | | | | |
| VISOR® V10 (800 × 600): Mono \| Color | ✓ | ✓ | ✓ | ✓ | – | ✓\|– | ✓\|– | – | ✓ | – |
| Images per second: Mono \| Color | 75 \| 50 | 75 \| 50 | 75 \| 50 | 75 | – | 75 \|– | 75 \|– | – | 75 \| 50 | – |
| VISOR® V20 (1440 × 1080): Mono \| Color | – | ✓ | ✓ | ✓ | – | ✓\|– | ✓\|– | – | ✓ | ✓ |
| Images per second: Mono \| Color | – | 40 \| 20 | 40 \| 20 | 40 \| 20 | – | 40 \|– | 40 \|– | – | 40 \| 20 | 40 \| 20 |
| VISOR® V50 (2560 × 1936): Mono \| Color | – | ✓ | ✓ | – | ✓ | – | ✓\|– | ✓\|– | – | ✓ |
| Images per second: Mono \| Color | – | 22 \| 8 | 22 \| 8 | – | 22 \| 8 | – | 22 \|– | 22 \|– | – | 22 \| 8 |
| **Lighting** | white, red¹, infrared¹ | | | | | white, red¹, infrared¹ | | | | |
| Multishot (Mono) | – | – | – | – | – | – | – | – | ✓ | ✓ |
| Target laser | – | ✓ | ✓ | ✓ | ✓ | only V20 | ✓ | ✓ | ✓ | ✓ |
| Integrated UV lighting | – | – | – | – | – | – | – | – | only V20 | only V50 |
| **Lenses** | | | | | | | | | | |
| V10 wide \| medium \| narrow \| C-Mount | ✓\|✓\|✓\|– | ✓\|✓\|✓\|✓ | ✓\|✓\|✓\|✓ | ✓\|✓\|✓\|✓ | – | ✓\|✓\|✓\|– | ✓\|✓\|✓\|✓ | | ✓\|✓\|✓\|✓ | – |
| V20 wide \| medium \| narrow \| C-Mount | –\|–\|–\|– | ✓\|✓\|✓\|✓ | ✓\|✓\|✓\|✓ | ✓\|✓\|✓\|✓ | | ✓\|✓\|✓\|– | ✓\|✓\|✓\|✓ | | ✓\|✓\|✓\|✓ | |
| V50 wide \| medium \| narrow \| C-Mount | –\|–\|–\|– | ✓\|✓\|–\|✓ | ✓\|✓\|–\|✓ | – | ✓\|✓\|–\|✓ | – | ✓\|✓\|–\|✓ | | – | ✓\|✓\|–\|✓ |
| **Interfaces** | | | | | | | | | | |
| Inputs \| outputs \| selectable | 2 \| 2 \| 4 | 2 \| 2 \| 6 | 2 \| 2 \| 6 | 2 \| 2 \| 6 | | 2 \| 2 \| 4 | 2 \| 2 \| 6 | | 2 \| 2 \| 6 | |
| Encoder input | – | ✓ | ✓ | ✓ | | – | ✓ | | ✓ | |
| Ethernet \| EtherNet/IP \| PROFINET \| SensoWeb | ✓ \| ✓\| ✓\| ✓ | | ✓ \| ✓\| ✓\| ✓ | ✓ \| ✓\| ✓\| ✓ | | ✓\| ✓\| ✓\| ✓ | | | ✓ \| ✓\| ✓\| ✓ | |
| Service Port | – | ✓ | ✓ | ✓ | | – | ✓ | | ✓ | |
| **Job / Detectors** | | | | | | | | | | |
| Number of jobs (max.) \| Detectors per job (max.) | 32 \| 32 | 255 \| 255 | 255 \| 255 | 255 \| 255 | | 8 \| 2 | 255 \| 255 | | 255 \| 255 | |
| Number of classification (AI) detectors per job (max.) | – | | 10 | – | | – | | | – | |
| Job checksum | – | ✓ | ✓ | ✓ | | – | ✓ | | ✓ | |

¹ not with color hardware

## VISOR® XE Vision Sensors



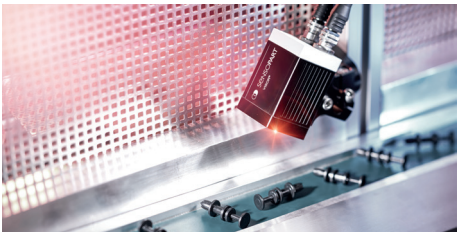| | VISOR® Object | | VISOR® Object AI | VISOR® Robotic | | VISOR® Code Reader | | | VISOR® Allround | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Presence, completeness, measurement, position check, color | | Presence, completeness, measurement, position check, color, artificial intelligence | Robotics, presence, completeness, measurement, positioning | | Reading of barcodes, 2D codes, text | | | Presence, completeness, measurement, position check, color, reading of barcodes, data codes, text, multi-shot | |
| | Standard | Advanced | Advanced | Advanced | Professional | Standard | Advanced | Professional | Advanced | Professional |
| | – | – | XE | – | XE | – | XE | XE | – | XE |
| **Resolution** | – | – | | – | | – | | | – | |
| VISOR® XE V20 (1600 × 1200): Mono \| Color | – | – | ✓ | – | ✓ | – | ✓ \| – | | – | ✓ |
| Images per second: Mono \| Color | – | – | 80 \| 40 | – | 80 \| 40 | – | 80 \| – | | – | 80 \| 40 |
| VISOR® XE V50 (2560 × 1936): Mono \| Color | – | – | ✓ | – | ✓ | – | ✓ \| – | | – | ✓ |
| Images per second: Mono \| Color | – | – | 44 \| 16 | – | 44 \| 16 | – | 44 \| – | | – | 44 \| 16 |
| **Lighting** | – | – | white, red[1], infrared[1] | – | white, red[1], infrared[1] | – | white, red[1], infrared[1] | | – | white, red[1], infrared[1] |
| Multishot (Mono) | – | – | – | – | – | – | – | | – | ✓ |
| Target laser | – | – | ✓ | – | ✓ | – | ✓ | | – | ✓ |
| Integrated UV lighting | – | – | – | – | – | – | – | | – | only V50 |
| **Lenses** | – | – | | – | | – | | | – | |
| V20 wide \| medium \| narrow \| C-Mount | – | – | ✓ \| ✓ \| ✓ \| ✓ | – | ✓ \| ✓ \| ✓ \| ✓ | – | ✓ \| ✓ \| ✓ \| ✓ | | – | ✓ \| ✓ \| ✓ \| ✓ |
| V50 wide \| medium \| narrow \| C-Mount | – | – | ✓ \| ✓ \| – \| ✓ | – | ✓ \| ✓ \| – \| ✓ | – | ✓ \| ✓ \| – \| ✓ | | – | ✓ \| ✓ \| – \| ✓ |
| **Interfaces** | – | – | | – | | – | | | – | |
| Inputs \| outputs \| selectable | – | – | 2 \| 2 \| 6 | – | 2 \| 2 \| 6 | – | 2 \| 2 \| 6 | | – | 2 \| 2 \| 6 |
| Ethernet \| EtherNet/IP \| PROFINET \| SensoWeb | – | – | ✓ \| ✓ \| ✓ \| ✓ | – | ✓ \| ✓ \| ✓ \| ✓ | – | ✓ \| ✓ \| ✓ \| ✓ | | – | ✓ \| ✓ \| ✓ \| ✓ |
| Service Port | – | – | ✓ | – | ✓ | – | ✓ | | – | ✓ |
| **Job / Detectors** | – | – | | – | | – | | | – | |
| Number of jobs (max.) \| Detectors per job (max.) | – | – | 255 \| 255 | – | 255 \| 255 | – | 255 \| 255 | | – | 255 \| 255 |
| Number of classification (AI) detectors per job (max.) | – | – | 40 | – | – | – | – | | – | – |
| Job checksum | – | – | ✓ | – | ✓ | – | ✓ | | – | 255 \| 255 |

[1] not with color hardware