

# MV-SC2023XC

## 2.4 MP Color Vision Sensor



### Introduction

With built-in positioning and measurement algorithms, MV-SC2023XC vision sensor can realize counting, existence, measurement detection, and recognition. It can be monitored and operated via the SCMVS client. It can output results via RS-232 and Ethernet, and cooperate with other processes via IO. The vision sensor supports multiple result output methods and customized result text output.

### Available Model

- 5 mm focal length: MV-SC2023XC-05M-WBN
- 12 mm focal length: MV-SC2023XC-12M-WBN
- 16 mm focal length: MV-SC2023XC-16M-WBN

### Applicable Industry

Consumer electronics, food and pharmaceuticals, and automotive industries.

### Key Features

- Adopts embedded hardware platform for high-speed image processing.
- Adopts built-in positioning and measurement algorithms to for counting, existence, measurement detection, and recognition.
- Provides multiple I/O interfaces for input and output signals.
- Provides multiple indicators for displaying device status.
- Adopts light source to ensure uniform brightness in the illuminated area.
- Supports multiple communication protocols, including RS-232, TCP, UDP, FTP, PROFINET, Modbus, Ethernet/IP, etc.

## Specification

| Model                  | MV-SC2023XC-05M-WBN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | MV-SC2023XC-12M-WBN | MV-SC2023XC-16M-WBN |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|---------------------|
| Tool                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                     |                     |
| Vision tool            | <ul style="list-style-type: none"><li>● Measurement: P2P measurement, P2L measurement, contrast measurement, grayscale size, edge width measurement, width measurement, brightness analysis, L2L angle, color measurement, color size, diameter measurement, line angle</li><li>● Existence: Existence detection, anomaly judge, spot existence, edge existence, contour existence, pattern existence, circle existence, line existence</li><li>● Count: Learning-based count, spot count, edge count, contour count, pattern count, color count</li><li>● Recognition: Multi-object count, category recognition, code recognition, OCR, color contrast, color recognition</li><li>● Logic: Calculator, if module, logic judge, condition judge, string comparison, combination judge, format output</li><li>● Defect detection: Anomaly detection</li><li>● Location: Calibration convert, single point alignment, point rectify, point grasp, scale transformation, fixture</li></ul> |                     |                     |
| Solution capacity      | Supports solution importing and exporting, up to 16 solutions and 40 modules can be stored.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                     |                     |
| Communication protocol | RS-232, TCP, UDP, FTP, PROFINET, Modbus, EtherNet/IP, MELSEC/SLMP, FINS, Keyence KV                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                     |                     |
| Performance            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                     |                     |
| Sensor type            | CMOS, global shutter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                     |                     |
| Pixel size             | 2.2 μm × 2.2 μm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                     |                     |
| Sensor size            | 1/3.52"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                     |                     |
| Resolution             | 1920 × 1280                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                     |                     |
| Max. frame rate        | 75 fps                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                     |                     |
| Gain                   | 0 dB to 48 dB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                     |                     |
| Exposure time          | 36 μs to 100 ms                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                     |                     |
| Pixel format           | Mono 8, RGB 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                     |                     |
| Mono/color             | Color                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                     |                     |
| Electrical feature     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                     |                     |
| Data interface         | Fast Ethernet (100 Mbit/s)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                     |                     |
| Digital I/O            | 17-pin M12 connector provides power and I/O, including isolated input (Line 0/1) × 2, isolated output (Line 2/3) × 2, RS-232 × 1<br>Supports device triggering via pressing side button                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                     |                     |
| Power supply           | 24 VDC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                     |                     |
| Power consumption      | Avg.: 5 W @ 24 VDC (light source enabled)<br>Max.: 12 W @ 24 VDC (light source enabled)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                     |                     |
| Mechanical             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                     |                     |
| Lens mount             | M12-mount, mechanical autofocus supported                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                     |                     |
| Focal length           | 5 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 12 mm               | 16 mm               |
| Lens cap               | Transparent lens cap by default. Half-polarized and fully-polarized caps are optional.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                     |                     |
| Light source           | White light by default. Red, blue, IR, UV, and two-color (red/blue) lights are optional.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                     |                     |
| Aiming system          | 2 green LED lights                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                     |                     |
| Indicator              | Power indicator (PWR), network indicator (LNK), result indicator (OK/NG), and user-defined indicator (U1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                     |                     |
| Dimension              | Straight angle: 72.7 mm × 31.5 mm × 41 mm (2.9" × 1.2" × 1.6")<br>Right angle: 51.5 mm × 31.5 mm × 61 mm (2.0" × 1.2" × 2.4")                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                     |                     |

|                             |                                                                                                                              |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------|
| <b>Weight</b>               | 118 g (0.3 lb.)                                                                                                              |
| <b>Ingress protection</b>   | IP65                                                                                                                         |
| <b>Temperature</b>          | Working temperature: 0 °C to 50 °C (32 °F to 122 °F)<br>Storage temperature: -30 °C to 70 °C (-22 °F to 158 °F)              |
| <b>Humidity</b>             | 20% RH to 95% RH (no condensation)                                                                                           |
| <b>Vibration resistance</b> | Meets standard IEC 60068-2-6:2007.<br>Device only: 10 Hz to 55 Hz, 1.5 mm peak-to-peak amplitude, 2 hours per axis (X, Y, Z) |
| <b>Shock resistance</b>     | Meets standard IEC 60068-2-27:2008.<br>Device only: 30 g / 11 ms, half-sine wave, 500 shocks per axis (6 directions)         |
| <b>General</b>              |                                                                                                                              |
| <b>Client software</b>      | SCMVS                                                                                                                        |
| <b>Certification</b>        | CE, KC                                                                                                                       |

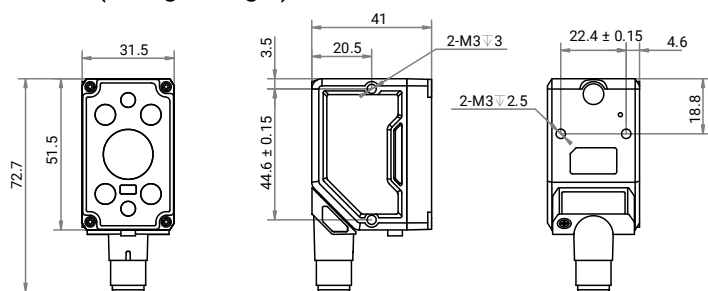
## Detection Range

| MV-SC2023XC (Unit: mm) |                  |               |     |                       |                          |
|------------------------|------------------|---------------|-----|-----------------------|--------------------------|
| Lens Focal Length      | Working Distance | Field of View |     | Single Pixel Accuracy | Diagram of Field of View |
|                        |                  | H             | V   |                       |                          |
| 5                      | 25               | 21            | 14  | 0.01                  |                          |
|                        | 100              | 84            | 56  | 0.04                  |                          |
|                        | 200              | 169           | 113 | 0.09                  |                          |
|                        | 300              | 253           | 169 | 0.13                  |                          |
|                        | 500              | 422           | 282 | 0.22                  |                          |
|                        | 800              | 676           | 451 | 0.35                  |                          |
|                        | 1000             | 845           | 563 | 0.44                  |                          |
| 12                     | 60               | 21            | 14  | 0.01                  |                          |
|                        | 100              | 35            | 23  | 0.02                  |                          |
|                        | 200              | 70            | 47  | 0.04                  |                          |
|                        | 300              | 106           | 70  | 0.06                  |                          |
|                        | 500              | 176           | 117 | 0.09                  |                          |
|                        | 800              | 282           | 188 | 0.15                  |                          |
|                        | 1000             | 352           | 235 | 0.18                  |                          |
| 16                     | 125              | 33            | 22  | 0.02                  |                          |
|                        | 200              | 53            | 35  | 0.03                  |                          |
|                        | 300              | 79            | 53  | 0.04                  |                          |
|                        | 500              | 132           | 88  | 0.07                  |                          |
|                        | 800              | 211           | 141 | 0.11                  |                          |
|                        | 1000             | 264           | 176 | 0.14                  |                          |

# Dimension

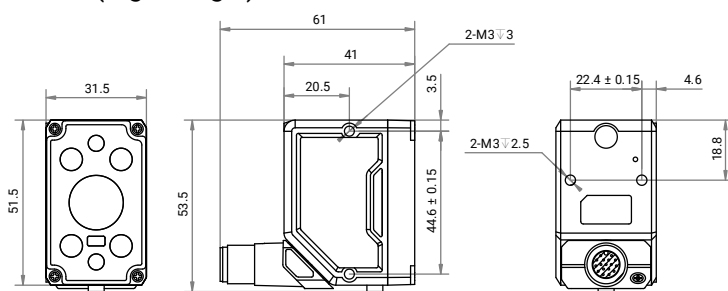
**HIKROBOT**

Device (Straight Angle)



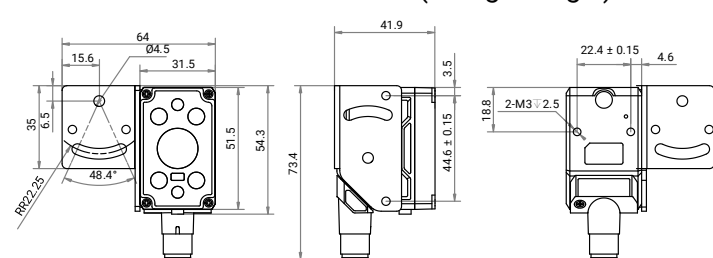
Unit: mm

Device (Right Angle)



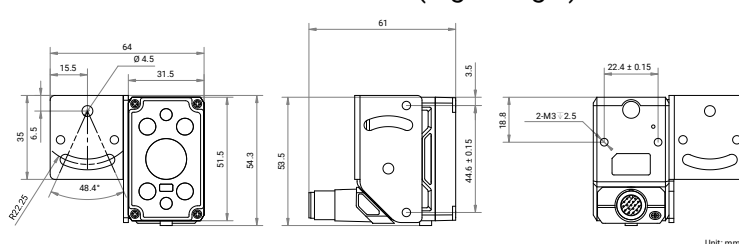
Unit: mm

Device and Installation Bracket 1 (Straight Angle)



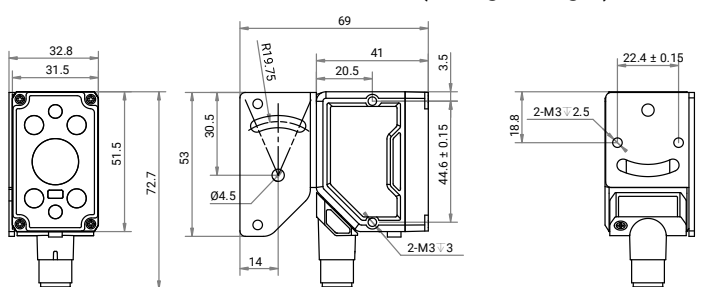
Unit: mm

Device and Installation Bracket 1 (Right Angle)



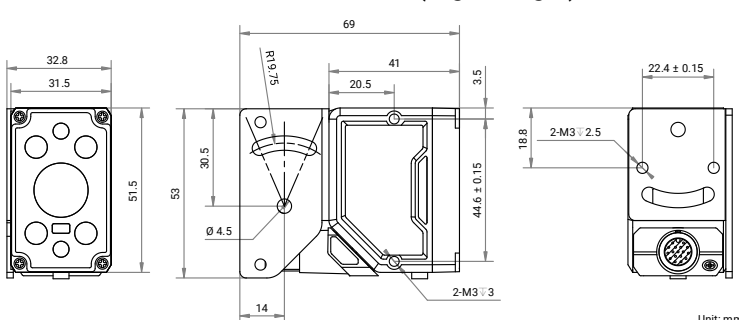
Unit: mm

Device and Installation Bracket 2 (Straight Angle)



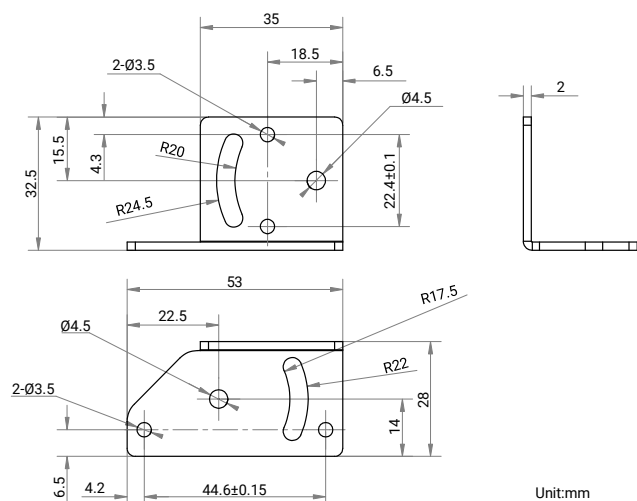
Unit: mm

Device and Installation Bracket 2 (Right Angle)



Unit: mm

## Bracket



Unit: mm