



# DATASHEET

## EYES

v3.2

# 1. Datasheet

## 1.1. Hardware Version

| Components        | Version |
|-------------------|---------|
| Eyes (camera)     | v2.0    |
| Eye Box           | v1.4    |
| Eyes Lighting Kit | v1.0    |

## 1.2. Eyes

### Eyes

| Camera Characteristics         |          |                                 | Unit                 |
|--------------------------------|----------|---------------------------------|----------------------|
| Interface                      |          | USB-C 3.x                       |                      |
| Image Sensor Technology        |          | Rolling Shutter. Size 1.4 x 1.4 | [ $\mu\text{m px}$ ] |
| RGB Camera Field of View (FOV) |          | 69.4 x 42.5 x 77 (+/- 3)        | [°]                  |
| RGB Camera Resolution          | Standard | 1280x720                        | [px]                 |
|                                | Close-up | 1920x1080                       | [px]                 |
| Depth Technology               |          | Active IR Stereo                |                      |
| Depth FOV                      |          | 65±2 x 40±1 x 72±2              | [°]                  |
| Depth Output Resolution        |          | 1280 x 720                      | [px]                 |
| Working Distance               |          | 400-1000                        | [mm]                 |
|                                |          | 15.75 - 39.37                   | [inch]               |
| Operating Temperature          |          | 0 – 35                          | [°C]                 |
|                                |          | 32 – 95                         | [°F]                 |
| IP Rating                      |          | IP 54                           |                      |
| Weight                         |          | 0.260                           | [kg]                 |
|                                |          | 0.57                            | [lb]                 |
| Calculated operation life      |          | 30 000                          | [h]                  |

| Eyes Features          |                            |  | Unit   |
|------------------------|----------------------------|--|--------|
| Type of vision system  | 2.5 D                      |  |        |
| Minimum workpiece size | 10x10 or 15 diameter       |  | [mm]   |
|                        | 0.39x0.39 or 0.59 diameter |  | [inch] |

| Eyes Features                                   |  |               |                   |               | Unit      |
|---|--|---------------|-------------------|---------------|-----------|
| Applications Supported                          | Detection, Sorting, Inspection, Landmark |               |                   |               |           |
| Mounting options supported                      | Robot and External                       |               |                   |               |           |
| Reconfigurability when Robot mounted            | 12 configurations (4 x 3)                |               |                   |               |           |
|   | Around robot's flange                    |               | Tilt orientations |               |           |
|   | 0 - 90 - 180 - 270                       |               | 0 - 45 - 90       |               | [degrees] |
|   | Processing time                          |               | Typical: 0.5 s    |               |           |
| Detection Repeatability                         | < 2                                      |               |                   |               | [mm]      |
|   | < 0.078                                  |               |                   |               | [inch]    |
| Detection Accuracy (typical) measured at 500 mm | External Mount                           |               | Robot Mount       |               |           |
|   | 2  |               | 2                 |               | [mm]      |
|   | 0.078                                    |               | 0.078             |               | [inch]    |
| Minimum Inspection Defect Size                  | Standard                                 |               | Close-up          |               |           |
|   | 5  |               | 3                 |               | [mm]      |
|   | 0.197                                    |               | 0.118             |               | [inch]    |
| Landmark accuracy**                             | Waypoint distance from Landmark          | Minimum error | Typical error     | Maximum error |           |
|   | 200                                      | 0.2635        | 0.6596            | 0.9500        | [mm]      |
|   | 7.874                                    | 0.0104        | 0.0260            | 0.0374        | [inch]    |
|   | 500                                      | 0.6586        | 1.6490            | 2.3750        | [mm]      |
|   | 19.68                                    | 0.0259        | 0.0649            | 0.0935        | [inch]    |
|   | 1000                                     | 1.3173        | 3.2981            | 4.7500        | [mm]      |
|   | 39.37                                    | 0.0519        | 0.1298            | 0.1870        | [inch]    |

\*\* Depending on the distance from the waypoint (picking point) to Landmark. Obtained using dual capture approach with the camera being 300 mm (11.81 in) above the Landmark.

| Application and set-up recommendations |                             |
|--|-----------------------------|
| Lighting conditions                    | No drastic, instant changes |
| Reflections and focused light spots    | Keep minimal                |
| Characteristics of objects             | Different from background   |
| Camera with respect to workspace table | Looking straight to it      |

## Eyes Lighting Kit

| Eyes Lighting Kit Features |                    | Unit |
|----------------------------|--------------------|------|
| Input voltage              | 24                 | [V]  |
| Maximum current            | 1                  | [A]  |
| Connection                 | 3-pin M8 connector |      |
| Operating temperature      | 0–50               | [°C] |
|                            | 32–122             | [°F] |
| IP rating                  | IP54               |      |
| Weight                     | 0.131              | [kg] |
|                            | 0.288              | [lb] |
| Calculated operation life  | 30 000             | [h]  |

## Eye Box

| Eye Box                   |                    |
|---------------------------|--------------------|
| Weight                    | 1.01 kg<br>2.23 lb |
| Required power supply     | 24V (6.25A)        |
| Calculated operation life | 30 000 h           |

| Power Supply (6.25A/150W) | Min | Typical | Max | Units |
|---------------------------|-----|---------|-----|-------|
| Input voltage (AC)        | 100 | -       | 240 | [V]   |
| Input current             | -   | -       | 2.1 | [A]   |
| Output voltage            | -   | 24      | -   | [V]   |
| Output current            | -   | 6.25    | -   | [A]   |

| Power input (24V connector) | Min | Typical | Max | Units |
|-----------------------------|-----|---------|-----|-------|
| Supply voltage              | -   | 24      | 25  | [V]   |
| Supply current              | -   | 6.25    | -   | [A]   |

| Power output (Device connector) | Min | Typical | Max  | Units |
|---------------------------------|-----|---------|------|-------|
| Output voltage                  | -   | 24      | 25   | [V]   |
| Output current (EB HW v1.2)     | -   | 4.5     | 4.5* | [A]   |

\*Peak currents

## Eye Box I/O interface:

| Power Reference (24V, GND) | Min | Typical | Max | Units |
|----------------------------|-----|---------|-----|-------|
| Reference output voltage   | -   | 24      | 25  | [V]   |

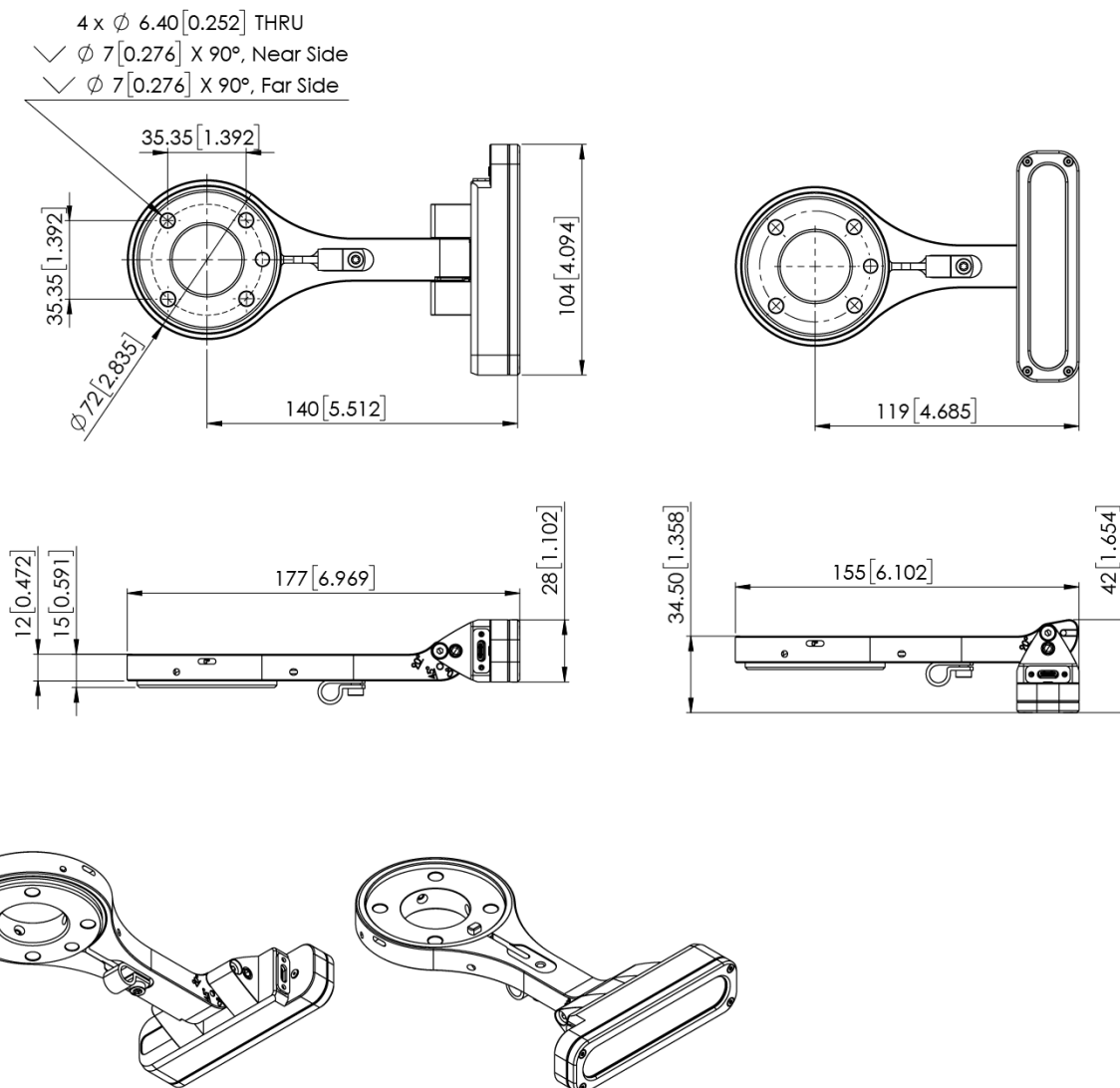
| Power Reference (24V, GND) | Min | Typical | Max | Units |
|----------------------------|-----|---------|-----|-------|
| Reference output current   | -   | -       | 100 | [mA]  |

| Digital Output (DO1-DO8)         | Min | Typical | Max | Units |
|----------------------------------|-----|---------|-----|-------|
| Output current - altogether      | -   | -       | 100 | [mA]  |
| Output resistance (active state) | -   | 24      | -   | [Ω]   |

| Digital Input (DI1-DI8) as PNP | Min  | Typical | Max | Units |
|--------------------------------|------|---------|-----|-------|
| Voltage level - TRUE           | 18   | 24      | 30  | [V]   |
| Voltage level - FALSE          | -0.5 | 0       | 2.5 | [V]   |
| Input current                  | -    | -       | 6   | [mA]  |
| Input resistance               | -    | 5       | -   | [kΩ]  |

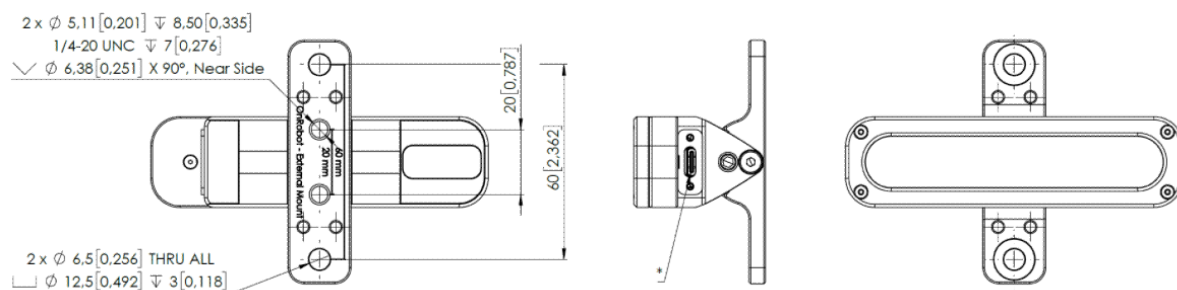
| Digital Input (DI1-DI8) as NPN | Min  | Typical | Max | Units |
|--------------------------------|------|---------|-----|-------|
| Voltage level - TRUE           | -0.5 | 0       | 5   | [V]   |
| Voltage level - FALSE          | 18   | 24      | 30  | [V]   |
| Input current                  | -    | -       | 6   | [mA]  |
| Input resistance               | -    | 5       | -   | [kΩ]  |

### 1.3. Eyes - Robot Mount



All dimensions are in mm and [inches].

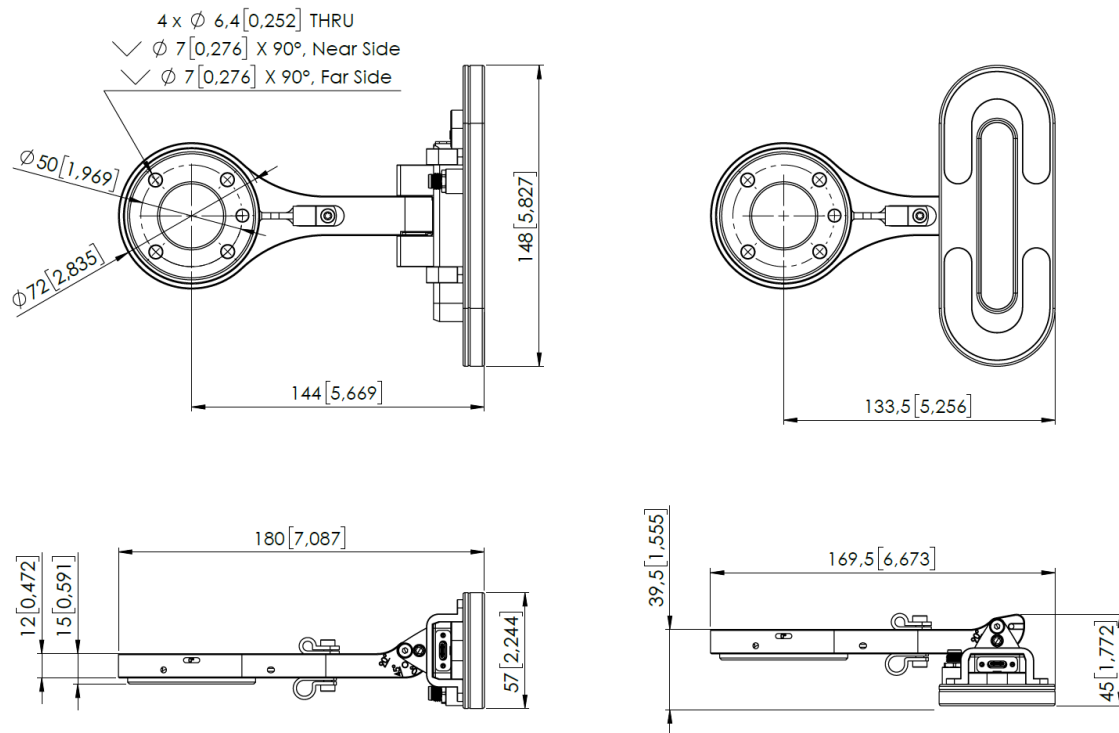
### 1.4. Eyes - External Mount



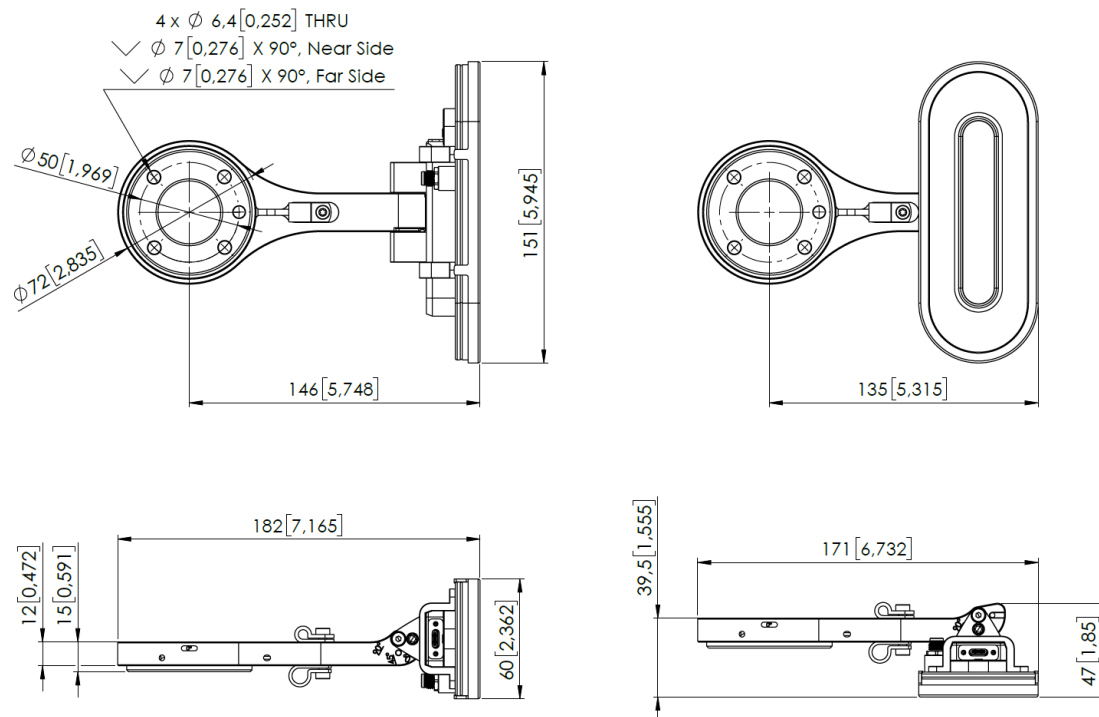
All dimensions are in mm and [inches].

## 1.5. Eyes Lighting Kit Mount

### Eyes with Light

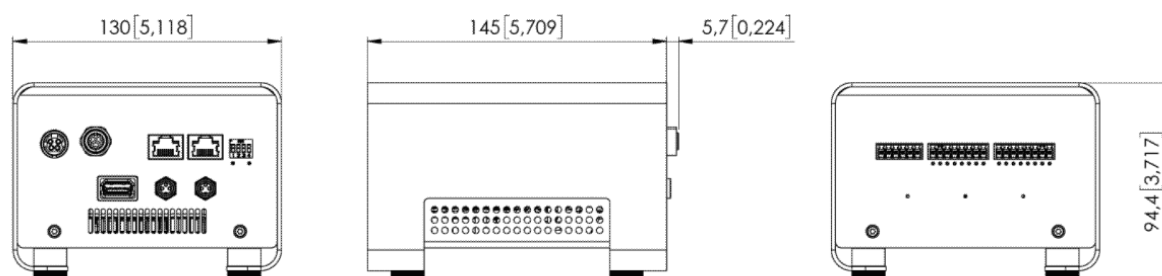


### Eyes with Light and Diffuser



All dimensions are in mm and [inches].

## 1.6. Eye Box



All dimensions are in mm and [inches].