

# iVu TG Image Sensor for use with a Remote Display



## Datasheet

The iVu image sensor is used to monitor parts for type, size, orientation, shape, and location. The iVu TG Image Sensor package consists of lighting, sensor, and lens. This version of the iVu TG requires a separately available Remote Display touch screen to set up and monitor inspections. Appropriate cables and mounting brackets can be ordered for each application. Additionally, other lenses, brackets, filters and external lights are available. Installation, setup, and configuration can be done quickly without requiring a PC to configure the sensor.

### Features



- No PC required to configure the sensor
- Image processing expertise is not required
- Three sensors in one package—a match sensor that determines whether a pattern on a label or part matches some reference pattern; an area sensor that detects whether a particular feature (or features) is present or not; and a blemish sensor that detects flaws on parts
- USB port for uploading and downloading of inspections and log files for easy updating and diagnostics
- Separate touch screen display mounts remotely from the sensor to allow easy access to the user interface and to view inspection images
- High speed processing



### WARNING: Not To Be Used for Personnel Protection

Never use this device as a sensing device for personnel protection. Doing so could lead to serious injury or death. This device does not include the self-checking redundant circuitry necessary to allow its use in personnel safety applications. A sensor failure or malfunction can cause either an energized or de-energized sensor output condition.

## Models

| NPN Models          |                          |           |           |           |           |                      |
|---------------------|--------------------------|-----------|-----------|-----------|-----------|----------------------|
| Ring Light Options  | Micro Video Lens Options |           |           |           |           | C-Mount Lens Options |
|                     | 4.3 mm                   | 8 mm      | 12 mm     | 16 mm     | 25 mm     |                      |
| None                | IVURGNX04                | IVURGNX08 | IVURGNX12 | IVURGNX16 | IVURGNX25 | IVURGNXC             |
| Red                 | IVURGNR04                | IVURGNR08 | IVURGNR12 | IVURGNR16 | IVURGNR25 | N/A                  |
| Blue                | IVURGNB04                | IVURGNB08 | IVURGNB12 | IVURGNB16 | IVURGNB25 | N/A                  |
| Green               | IVURGNG04                | IVURGNG08 | IVURGNG12 | IVURGNG16 | IVURGNG25 | N/A                  |
| IR                  | IVURGNI04                | IVURGNI08 | IVURGNI12 | IVURGNI16 | IVURGNI25 | N/A                  |
| White               | IVURGNW04                | IVURGNW08 | IVURGNW12 | IVURGNW16 | IVURGNW25 | N/A                  |
| UV 365 <sup>1</sup> | IVURGN604                | IVURGN608 | IVURGN612 | IVURGN616 | IVURGN625 | N/A                  |
| UV 395 <sup>1</sup> | IVURGN904                | IVURGN908 | IVURGN912 | IVURGN916 | IVURGN925 | N/A                  |

<sup>1</sup> Blue Filter Kit (FLT B) included with UV models.



| PNP Models          |                          |           |           |           |           |                      |
|---------------------|--------------------------|-----------|-----------|-----------|-----------|----------------------|
| Ring Light Options  | Micro Video Lens Options |           |           |           |           | C-Mount Lens Options |
|                     | 4.3 mm                   | 8 mm      | 12 mm     | 16 mm     | 25 mm     |                      |
| None                | IVURGPX04                | IVURGPX08 | IVURGPX12 | IVURGPX16 | IVURGPX25 | IVURGPXC             |
| Red                 | IVURGPR04                | IVURGPR08 | IVURGPR12 | IVURGPR16 | IVURGPR25 | N/A                  |
| Blue                | IVURGPB04                | IVURGPB08 | IVURGPB12 | IVURGPB16 | IVURGPB25 | N/A                  |
| Green               | IVURGPG04                | IVURGPG08 | IVURGPG12 | IVURGPG16 | IVURGPG25 | N/A                  |
| IR                  | IVURGPI04                | IVURGPI08 | IVURGPI12 | IVURGPI16 | IVURGPI25 | N/A                  |
| White               | IVURGPW04                | IVURGPW08 | IVURGPW12 | IVURGPW16 | IVURGPW25 | N/A                  |
| UV 365 <sup>1</sup> | IVURGP604                | IVURGP608 | IVURGP612 | IVURGP616 | IVURGP625 | N/A                  |
| UV 395 <sup>1</sup> | IVURGP904                | IVURGP908 | IVURGP912 | IVURGP916 | IVURGP925 | N/A                  |



NOTE: This product emits UV light. Exempt Risk Group (RG 0) product. No optical hazard is considered reasonably foreseeable, even for continuous, unrestricted use (IEC 62471).

## Sensor Specifications

### Power Connection

12-pin Euro-style (M12) male connector; accessory cable required for operation (see [Power Cable — Required](#) on page 7)

### USB 2.0 Host

4-pin Pico (M8) female connector; optional USB cable required for operation of USB flash drive (see [USB Cable — Optional](#) on page 8)

### Power Requirements

Voltage: 10 to 30 V dc  
Current: 800 mA maximum (exclusive of I/O load)

### Output Configuration

NPN or PNP determined by model

### Tools

Match, Area, Area with Motion

### Demo Mode

Full tool functionality on canned images

### Sensor Lock

Optional password protection

### External Strobe Output

+ 5 V dc

### Integrated Ring Light

Red, IR, Green, Blue, White

### Output Rating

150 mA

### Remote Display Connection

8-pin Euro-style (M12) female connector; accessory cable required for remote display

### Acquisition

98 fps (frames per second)<sup>2</sup>

### Exposure Time

0.1 ms to 1.049 s

### Imager

1/3 inch CMOS 752 × 480 pixels; adjustable Field of View (FOV)

### Lens Mount

Micro Video Lens models: M12 × 1 mm thread; micro video lens 4.3, 6, 8, 12, 16, 25 mm  
C-Mount models: Standard C-mount (1 inch-32 UN)

### Construction

Black Valox™ sensor housing; acrylic window  
Weight: 0.20 kg (0.45 lbs)

### Environmental Rating

IP67

### Operating Conditions

Stable Ambient Temperature: 0 °C to +50 °C (+32 °F to +122 °F)  
Maximum relative humidity: 95% maximum relative humidity (non-condensing)

### Certifications

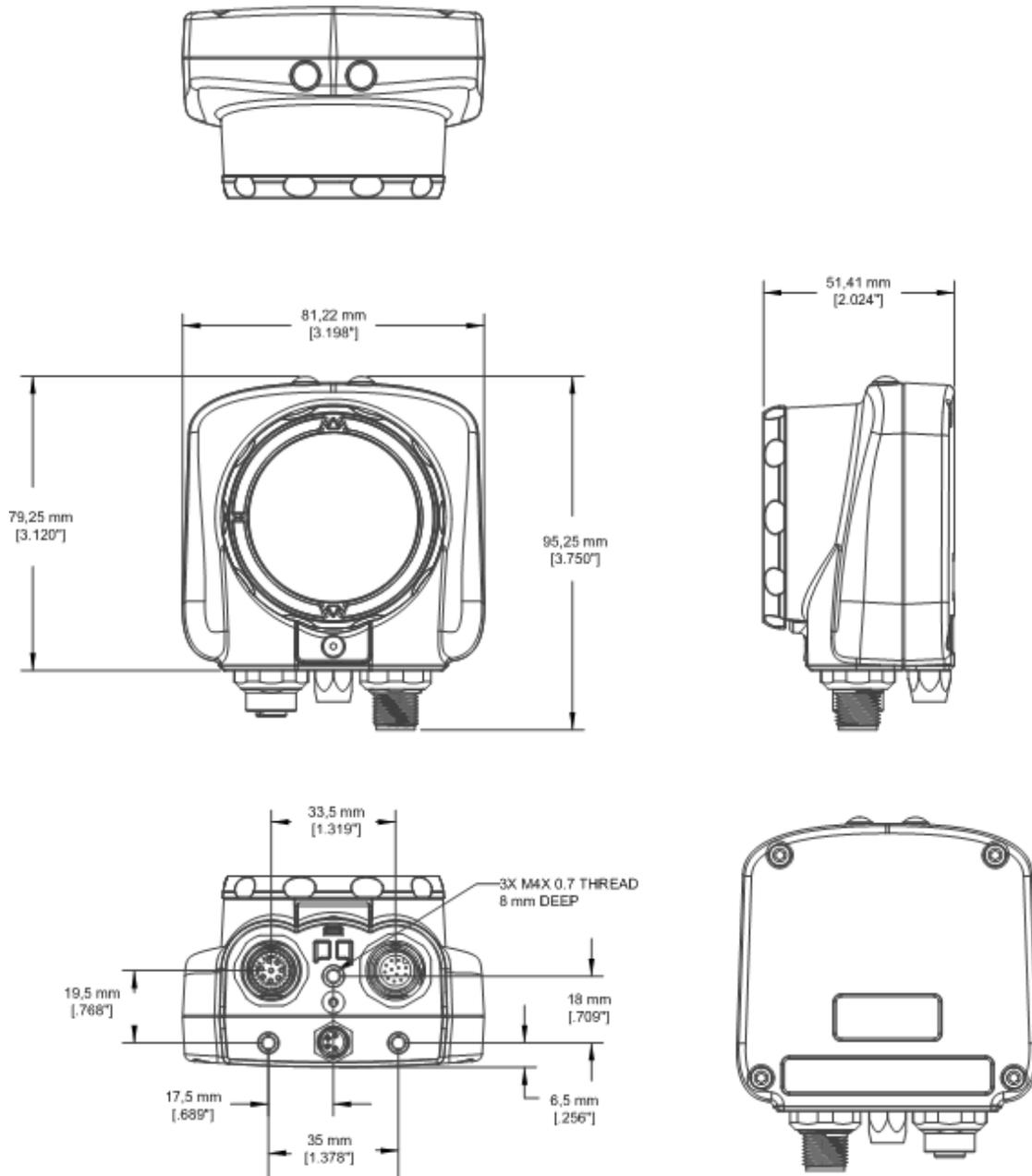


<sup>2</sup> This value can vary based on inspection settings.

## Dimensions

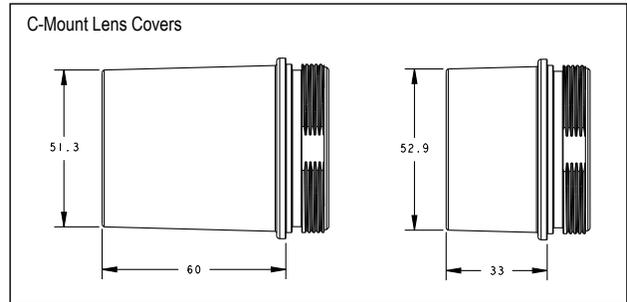
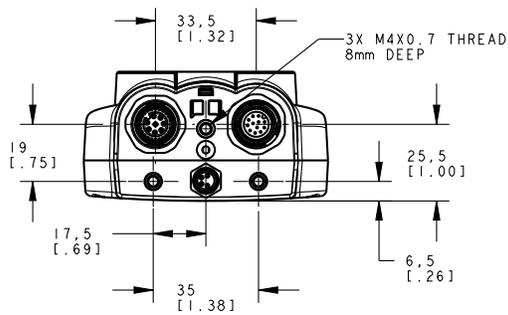
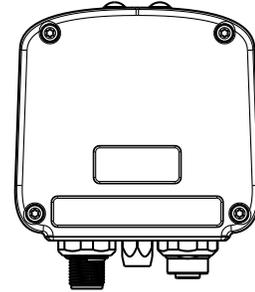
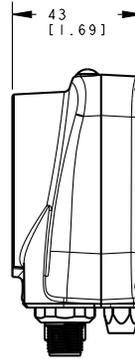
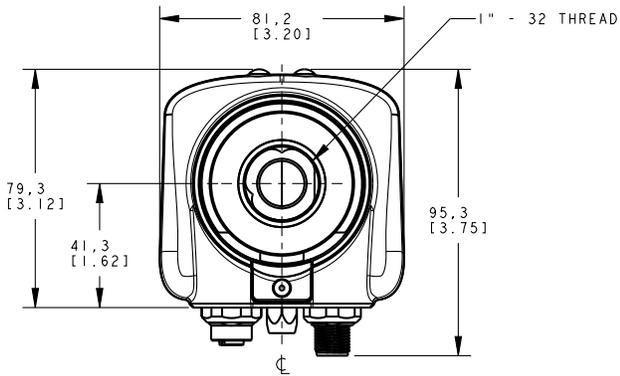
### Micro Video Lens Dimensions

All measurements are listed in millimeters (inches).



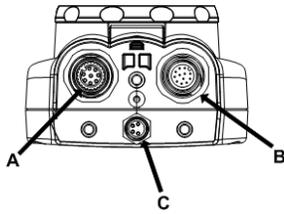
### C-Mount Lens Dimensions

All measurements are listed in millimeters (inches).



## Cable Connections for the iVu TG with a Remote Display

The cable connections on the iVu TG sensor are shown below, and power I/O connections (B) are defined in [Table 1](#) on page 5.



- A Remote Display Connector
- B Power I/O Connector
- C USB Connector



NOTE: Micro video lens model shown. C-Mount model connections are identical.

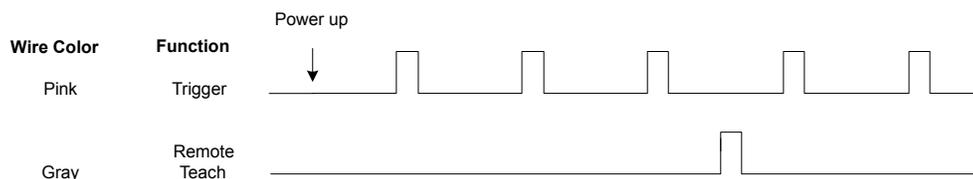
Table 1: Power I/O Connections

| Pin # | Wire Color | Description             | Direction |
|-------|------------|-------------------------|-----------|
| 1     | White      | Output 1                | Output    |
| 2     | Brown      | 10-30V dc               | Input     |
| 3     | Green      | Output 2                | Output    |
| 4     | Yellow     | Strobe Out (5V dc only) | Output    |
| 5     | Gray       | Remote Teach            | Input     |
| 6     | Pink       | External Trigger        | Input     |
| 7     | Blue       | Common (Signal Ground)  | Input     |
| 8     | Red        | Ready                   | Output    |
| 9     | Orange     | Not used                | N/A       |
| 10    | Light Blue | RS-232 TX               | Output    |
| 11    | Black      | RS-232 Signal Ground    | Output    |
| 12    | Violet     | RS-232 Rx               | Input     |

## iVu Trigger, Remote Teach, and I/O Waveforms

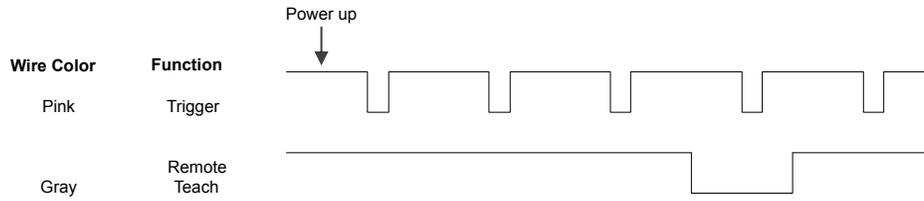
The iVu has two input signals—Trigger and Remote Teach. The default setting is to detect the low to high transition. This setting can be changed in the Main Menu > System > Discrete I/O > Input Polarity screen on the sensor.

### PNP (Low-to-High) Trigger and Remote Teach Input Waveforms



The sensor triggers from low to high, and Remote Teach behaves electrically like trigger.

## NPN (High-to-Low) Trigger and Remote Teach Input Waveforms

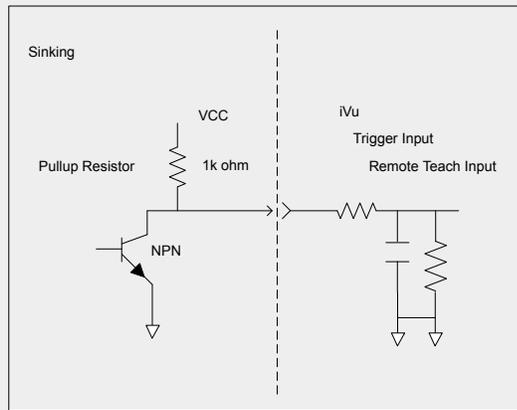


The sensor triggers from high to low, and Remote Teach behaves electrically like trigger.



**NOTE:** If the device used to trigger or remote teach the iVu TG is a sinking device, these are the options regarding the use of a pull-up resistor:

Option 1: Put a pull-up resistor, rated approximately 1k ohm, between the sensor's positive (+) voltage and the sensor's input as shown below.



## iVu Output Waveforms

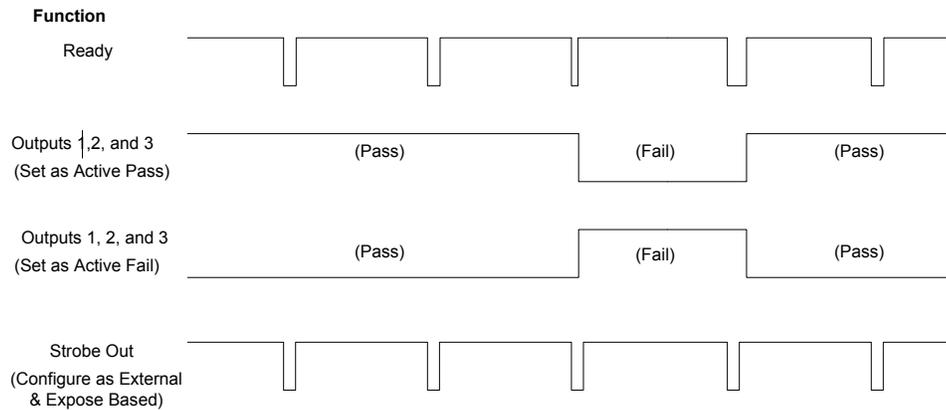


Figure 1. PNP Outputs

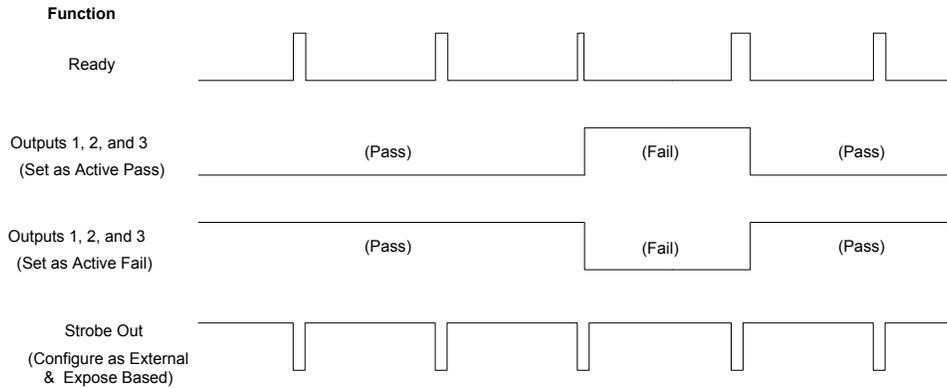


Figure 2. NPN Outputs

## Accessories

### Power Cable — Required

| 12-Pin M12/Euro-Style Cordsets with Open Shield |                |          |            |  |
|---|----------------|----------|------------|--|
| Model   | Length         | Style    | Dimensions | Pinout   |
| MQDC2S-1206                                     | 1.83 m (6 ft)  | Straight |            | <ul style="list-style-type: none"> <li>1 = White</li> <li>2 = Brown</li> <li>3 = Green</li> <li>4 = Yellow</li> <li>5 = Gray</li> <li>6 = Pink</li> <li>7 = Blue</li> <li>8 = Red</li> <li>9 = Orange</li> <li>10 = Lt. Blue</li> <li>11 = Black</li> <li>12 = Violet</li> </ul> |
| MQDC2S-1215                                     | 4.57 m (15 ft) |          |            |  |
| MQDC2S-1230                                     | 9.14 m (30 ft) |          |            |  |
| MQDC2S-1250                                     | 15.2 m (50 ft) |          |            |  |
| MQDC2S-1275                                     | 22.9 m (75 ft) |          |            |  |

### Remote Display — Required for Setup

| Model | Description   | Data Sheet |
|-------|---|------------|
| RD35  | 89 mm (3.5 in) Diagonal Remote Touch Screen                   | p/n 149171 |
| RDM35 | 89 mm (3.5 in) Diagonal Machine-Mountable Remote Touch Screen | p/n 166096 |

## Cordsets

Table 2: Cordsets

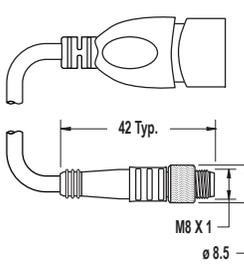
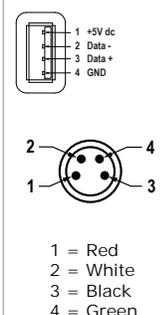
| Model        | Length         | Description                      |
|--------------|----------------|----------------------------------|
| IVURD-MX-803 | 0.91 m (3 ft)  | 8-pin cable, straight, M12-Molex |
| IVURD-MX-806 | 1.83 m (6 ft)  |                                  |
| IVURD-MX-815 | 4.57 m (15 ft) |                                  |
| IVURD-MX-830 | 9.14 m (30 ft) |                                  |
| IVURD-MX-850 | 15.2 m (50 ft) |                                  |

| Model          | Length        | Description                         |
|----------------|---------------|-------------------------------------|
| IVURD-MX-803RA | 0.91m (3 ft)  | 8-pin cable, right-angle, M12-Molex |
| IVURD-MX-806RA | 1.83m (6 ft)  |                                     |
| IVURD-MX-815RA | 4.57m (15 ft) |                                     |
| IVURD-MX-830RA | 9.14m (30 ft) |                                     |
| IVURD-MX-850RA | 15.2m (50 ft) |                                     |

Table 3: Cordset Kits

| Model           | Length         | Description                         |
|-----------------|----------------|-------------------------------------|
| IVURD-MXK-803   | 0.91 m (3 ft)  | 8-pin cable, straight, M12-Molex    |
| IVURD-MXK-806   | 1.83 m (6 ft)  |                                     |
| IVURD-MXK-815   | 4.57 m (15 ft) |                                     |
| IVURD-MXK-830   | 9.14 m (30 ft) |                                     |
| IVURD-MXK-850   | 15.2 m (50 ft) |                                     |
| IVURD-MXK-803RA | 0.91 m (3 ft)  | 8-pin cable, right-angle, M12-Molex |
| IVURD-MXK-806RA | 1.83 m (6 ft)  |                                     |
| IVURD-MXK-815RA | 4.57 m (15 ft) |                                     |
| IVURD-MXK-830RA | 9.14 m (30 ft) |                                     |
| IVURD-MXK-850RA | 15.2 m (50 ft) |                                     |
|                 |                | Mounting Bracket (SMBRD35)          |
|                 |                | Stylus                              |

### USB Cable — Optional

| 4-Pin Threaded M8/Pico-Style to USB Cordsets with Shield—Double Ended |               |                          |  |   |
|---|---------------|--------------------------|--|---|
| Model   | Length        | Style                    | Dimensions   | Pinout  |
| PSG-4M-4005-USB   | 0.15 m (6 in) | Straight Pico QD/<br>USB |  |  |
| PSG-4M-401-USB  | 0.31 m (1 ft) |                          |  |   |
| PSG-4M-403-USB  | 0.91 m (3 ft) |                          |  |   |
| PSG-4M-410-USB  | 3.0 m (10 ft) |                          |  |   |
| PSG-4M-416-USB  | 4.9 m (16 ft) |                          |  |   |

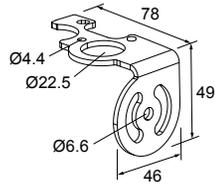
### USB Flash Drive — Optional

| Model      | Description          |
|------------|----------------------|
| IVU-USBFD2 | USB Flash Drive 2 GB |

## Brackets

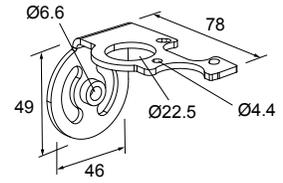
### SMBIVURAL

- Right-angle bracket for mounting sensor from the left
- 12-ga. stainless steel
- Hardware included



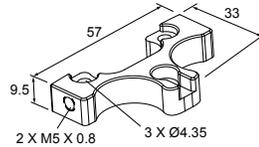
### SMBIVURAR

- Right-angle bracket for mounting sensor from right
- 12-ga. stainless steel
- Hardware included



### SMBIVUU

- U-shaped swivel bracket kit
- 14-ga. stainless steel
- Hardware included



NOTE: Use cables with right-angle connectors with this bracket kit.

## Micro Video Lens Accessories

### Micro Video Lens Models

| Model              | Lens Description |
|--------------------|------------------|
| LMFO4 <sup>3</sup> | 4.3 mm lens      |
| LMFO6              | 6 mm lens        |
| LMFO8              | 8 mm lens        |
| LMF12              | 12 mm lens       |
| LMF16              | 16 mm lens       |
| LMF25              | 25 mm lens       |

### Micro Video Lens Filters — Optional

| Model | Description      |
|-------|------------------|
| FLTMR | Red filter kit   |
| FLTMB | Blue filter kit  |
| FLTMG | Green filter kit |
| FLTMI | IR filter kit    |

<sup>3</sup> Due to the flexibility of the replaceable lenses, focus mechanism, and imager field-of-view settings, it is possible with the 4.3 mm lens to experience reflections from the internal strobe on the inspection image. To eliminate this effect, the field-of-view can be limited to the system default of 320×240 (or 640×480 for fine), the working distance to the object should be no more than about 8 inches, or an external strobe should be used instead of the internal ring light.

## C-Mount Lens Accessories

### C-Mount Lens Models

| Model    | Lens Description  |
|----------|---|
| LCF04    | 4 mm Lens - no threads for filter                       |
| LCF08    | 8 mm Lens - no threads for filter                       |
| LCF12    | 12 mm Lens - no threads for filter                      |
| LCF16    | 16 mm Lens, aperture lock - no threads for filter       |
| LCF25R   | 25mm lens   |
| LCF25LR  | 25mm lens with focus locking                            |
| LCF50L1R | 50mm lens with focus locking, plastic                   |
| LCF50L2R | 50mm lens with focus locking, metal (will not fit ring) |
| LCF75LR  | 75mm lens with focus locking, metal (will not fit ring) |

### C-Mount Lens Enclosure Choices

| Model      | Description                   |
|------------|-------------------------------|
| IVUSLC50-P | Sealed C-mount lens enclosure |
| IVUSLC75-P |                               |

### C-Mount Lens Filters — Optional

| Model | Description      |
|-------|------------------|
| FLTR  | Red filter kit   |
| FLTB  | Blue filter kit  |
| FLTG  | Green filter kit |
| FLTI  | IR Filter kit    |

## Banner Engineering Corp Limited Warranty

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