

iVu Barcode Reader (BCR) Image Sensor for use with a Remote Display



Datasheet

The iVu Series Barcode Reader (BCR) sensor package consists of lighting, sensor, and lens. This version of the iVu BCR 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
- 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
- A RS-232 serial communications port that is used to output barcode data to other applications
- High speed processing

The iVu BCR reads the following barcode types:

- DataMatrix (ECC 200) barcodes
- QR Code (QR and Micro QR)
- Linear barcodes: Code128, Code39, CODABAR, Interleaved 2 of 5, EAN13, EAN8, UPCE, Postnet, IMB, and Pharmacode



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 | IVURBNX04 | IVURBNX08 | IVURBNX12 | IVURBNX16 | IVURBNX25 | IVURBNXC |
| Red | IVURBNR04 | IVURBNR08 | IVURBNR12 | IVURBNR16 | IVURBNR25 | N/A |
| Blue | IVURBNB04 | IVURBNB08 | IVURBNB12 | IVURBNB16 | IVURBNB25 | N/A |
| Green | IVURBNG04 | IVURBNG08 | IVURBNG12 | IVURBNG16 | IVURBNG25 | N/A |
| IR | IVURBNI04 | IVURBNI08 | IVURBNI12 | IVURBNI16 | IVURBNI25 | N/A |
| White | IVURBNW04 | IVURBNW08 | IVURBNW12 | IVURBNW16 | IVURBNW25 | N/A |
| UV 365 ¹ | IVURBN604 | IVURBN608 | IVURBN612 | IVURBN616 | IVURBN625 | N/A |
| UV 395 ¹ | IVURBN904 | IVURBN908 | IVURBN912 | IVURBN916 | IVURBN925 | N/A |

¹ Blue Filter Kit (FLTMB) 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 | IVURBPX04 | IVURBPX08 | IVURBPX12 | IVURBPX16 | IVURBPX25 | IVURBPXC |
| Red | IVURBPR04 | IVURBPR08 | IVURBPR08 | IVURBPR16 | IVURBPR25 | N/A |
| Blue | IVURBPB04 | IVURBPB08 | IVURBPB08 | IVURBPB16 | IVURBPB25 | N/A |
| Green | IVURBPG04 | IVURBPG08 | IVURBPG08 | IVURBPG16 | IVURBPG25 | N/A |
| IR | IVURBPI04 | IVURBPI08 | IVURBPI12 | IVURBPI16 | IVURBPI25 | N/A |
| White | IVURBPW04 | IVURBPW08 | IVURBPW12 | IVURBPW16 | IVURBPW25 | N/A |
| UV 365 ¹ | IVURBP604 | IVURBP608 | IVURBP612 | IVURBP616 | IVURBP625 | N/A |
| UV 395 ¹ | IVURBP904 | IVURBP908 | IVURBP912 | IVURBP916 | IVURBP925 | 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

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

60 fps (frames per second)²

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 PBT sensor housing; acrylic window
Weight: 0.20 kg (0.45 lbs)

Environmental Rating

IEC 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

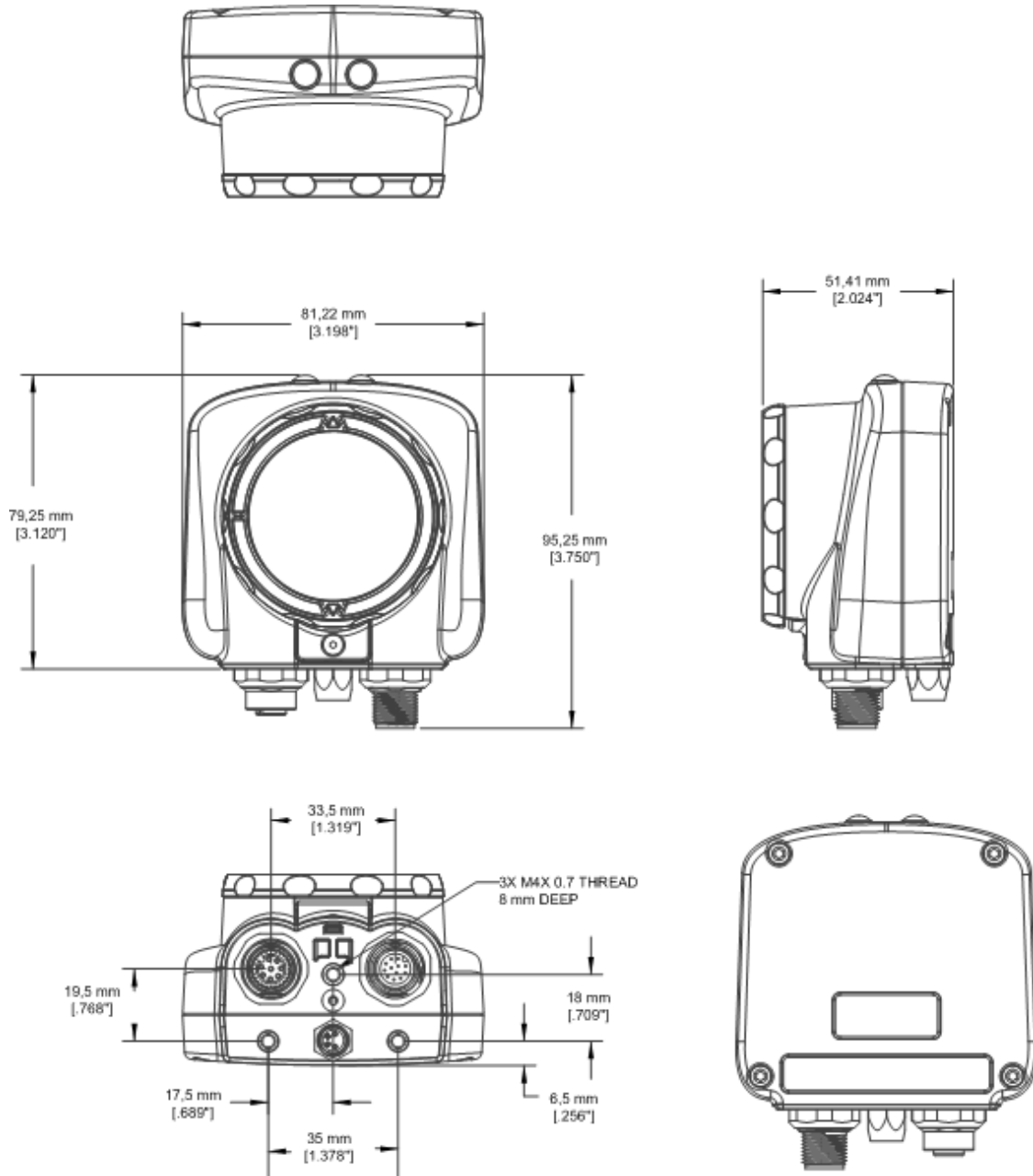


² This value can vary based on inspection settings.

Dimensions

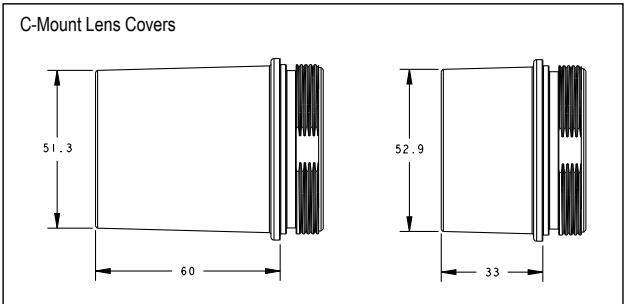
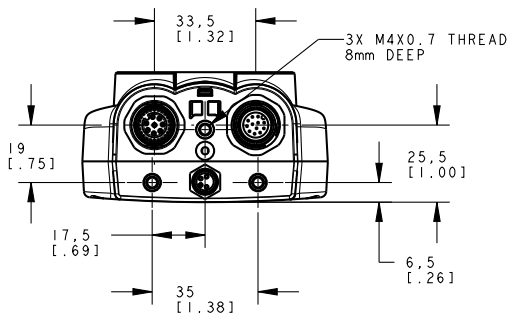
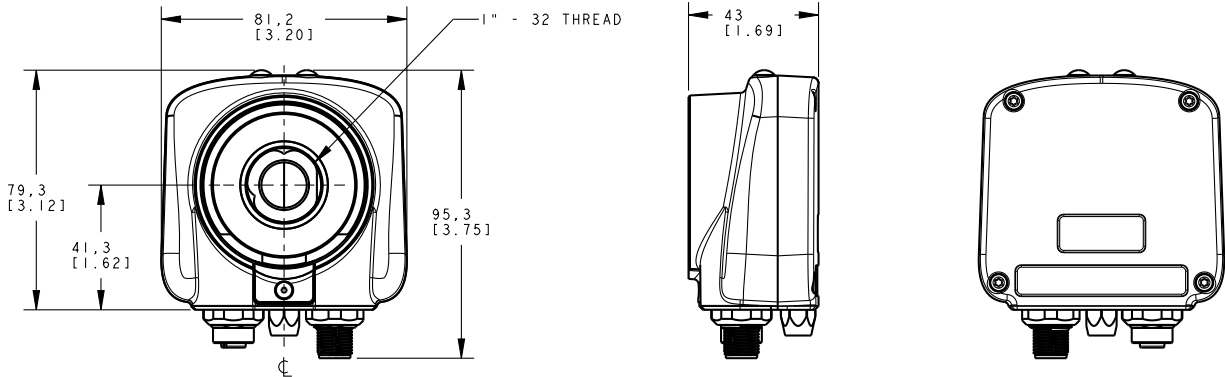
Micro Video Lens Dimensions

All measurements are listed in millimeters [inches], unless noted otherwise.



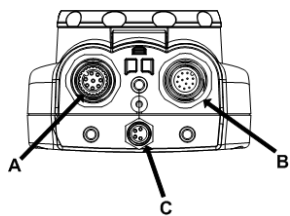
C-Mount Lens Dimensions

All measurements are listed in millimeters [inches], unless noted otherwise.



Cable **Connections** for the iVu BCR with a Remote Display

The cable connections on the iVu BCR sensor are shown below, and power I/O connections (B) are defined in [Table 1](#) on page 4.



- 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

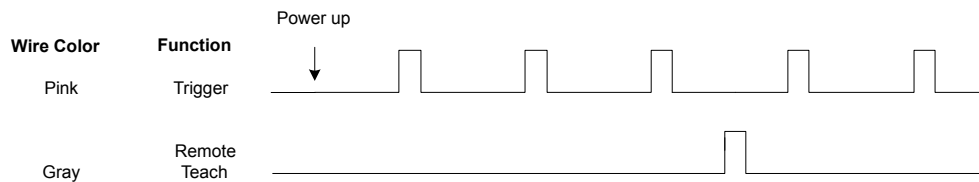
| Pin # | Wire Color | Description | Direction |
|-------|------------|-------------------------|-----------|
| 1 | White | Output 1 | Output |
| 2 | Brown | 10-30V dc | Input |
| 3 | Green | Output 2 | Output |
| 4 | Yellow | Strobe Out (5V dc only) | Output |
| 5 | Gray | Remote Teach | Input |
| 6 | Pink | External Trigger | Input |

| Pin # | Wire Color | Description | Direction |
|-------|------------|------------------------|-----------|
| 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

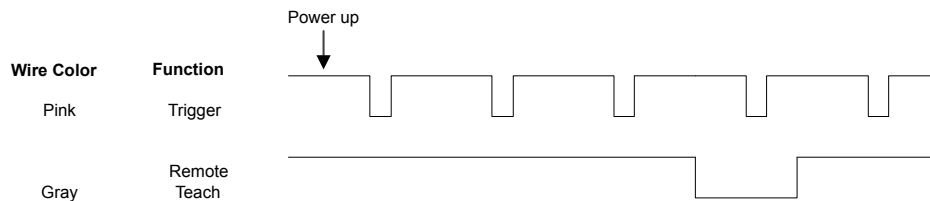
The iVu has two input signals—Trigger and Remote Teach. The default setting is to detect the low to high transition. This setting can be changed in the Main Menu > System > Discrete I/O > Input Polarity screen on the sensor.

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

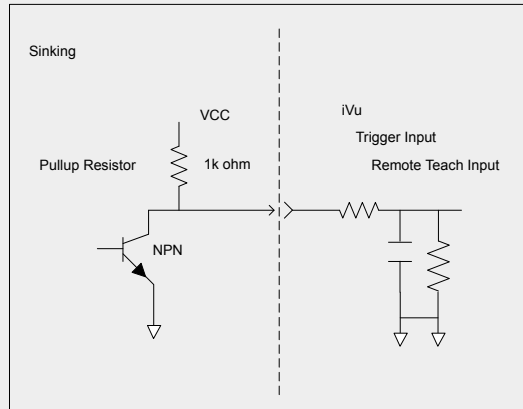


The sensor triggers from high to low, and Remote Teach behaves electrically like trigger.



Note: If the device used to trigger or remote teach the iVu BCR 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

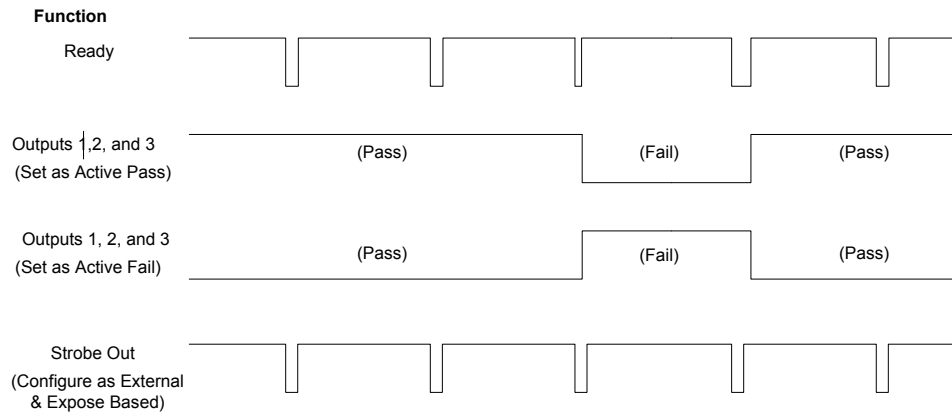


Figure 1. PNP Outputs

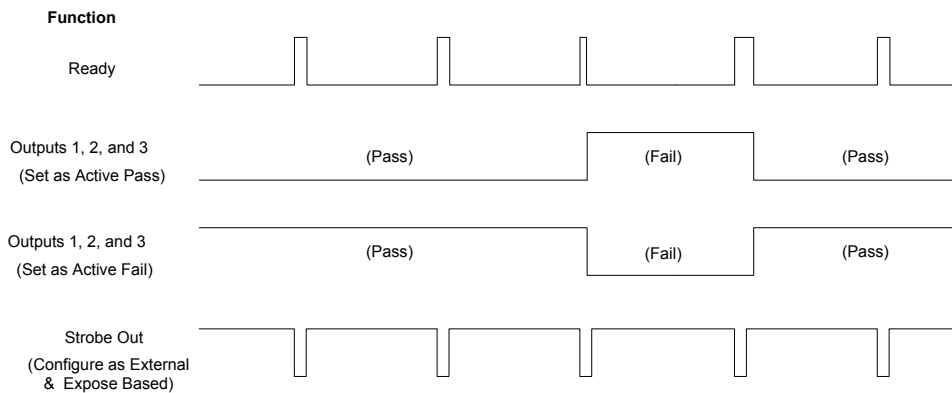
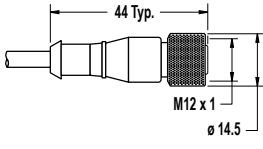
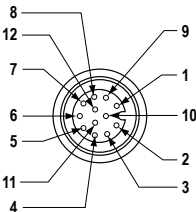



Figure 2. NPN Outputs

Accessories

Power Cable — Required

| 12-Pin M12/Euro-Style Cordsets with Open Shield | | | | | |
|---|----------------|----------|---|---|--|
| Model | Length | Style | Dimensions | Pinout (Female) | |
| MQDC2S-1206 | 1.83 m (6 ft) | Straight |  |  | |
| MQDC2S-1215 | 4.57 m (15 ft) | | | | 1 = White 2 = Brown 3 = Green 4 = Yellow 5 = Gray 6 = Pink 7 = Blue 8 = Red 9 = Orange 10 = Light Blue 11 = Black 12 = Violet |
| MQDC2S-1230 | 9.14 m (30 ft) | | | | |
| MQDC2S-1250 | 15.2 m (50 ft) | | | | |
| MQDC2S-1275 | 22.9 m (75 ft) | | | | |



Note: The cables listed above must be used to meet .

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

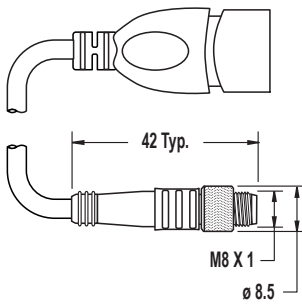
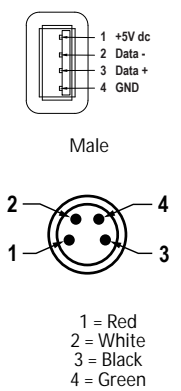
| Model | Length | Description |
|----------------|----------------|-------------------------------------|
| IVURD-MX-803 | 0.91 m (3 ft) | 8-pin cable, straight, M12-Molex |
| IVURD-MX-806 | 1.83 m (6 ft) | |
| IVURD-MX-815 | 4.57 m (15 ft) | |
| IVURD-MX-830 | 9.14 m (30 ft) | |
| IVURD-MX-850 | 15.2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

| Model | Length | Description |
|-----------------|----------------|---|
| IVURD-MXK-803RA | 0.91 m (3 ft) | 8-pin cable, right-angle, M12-Molex Mounting Bracket (SMBRD35) Stylus |
| 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) | |

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/ USB |  |  |
| PSG-4M-401-USB | 0.31 m (1 ft) | | | |
| PSG-4M-403-USB | 0.91 m (3 ft) | | | |
| PSG-4M-410-USB | 3 m (10 ft) | | | |

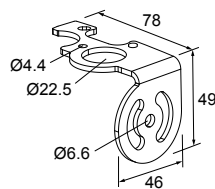
USB Flash Drive — **Optional**

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

Brackets

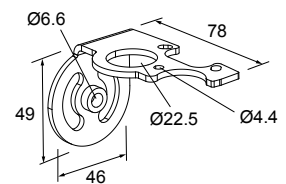
SMBIVURAL

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



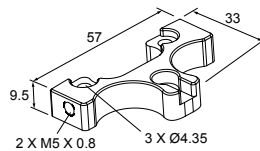
SMBIVURAR

- 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 |
|--------------------|-------------------------|
| LMF04 ³ | 4.3 mm lens |
| LMF06 | 6 mm lens |
| LMF08 | 8 mm lens |
| LMF12 | 12 mm lens |
| LMF16 | 16 mm lens |
| LMF25 | 25 mm lens |

Micro Video Lens Filters — **Optional**

| Model | Description |
|--------|-----------------------------|
| FLTMR2 | Red and dark red filter kit |
| FLTMI | Infrared filter kit |
| FLTMB | Blue filter kit |
| FLTMG | Green filter kit |

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 | |

³ 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 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

Banner Engineering Corp. warrants its products to be free from defects in material and workmanship for one year following the date of shipment. Banner Engineering Corp. will repair or replace, free of charge, any product of its manufacture which, at the time it is returned to the factory, is found to have been defective during the warranty period. This warranty does not cover damage or liability for misuse, abuse, or the improper application or installation of the Banner product.

THIS LIMITED WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES WHETHER EXPRESS OR IMPLIED (INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE), AND WHETHER ARISING UNDER COURSE OF PERFORMANCE, COURSE OF DEALING OR TRADE USAGE.

This Warranty is exclusive and limited to repair or, at the discretion of Banner Engineering Corp., replacement. IN NO EVENT SHALL BANNER ENGINEERING CORP. BE LIABLE TO BUYER OR ANY OTHER PERSON OR ENTITY FOR ANY EXTRA COSTS, EXPENSES, LOSSES, LOSS OF PROFITS, OR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES RESULTING FROM ANY PRODUCT DEFECT OR FROM THE USE OR INABILITY TO USE THE PRODUCT, WHETHER ARISING IN CONTRACT OR WARRANTY, STATUTE, TORT, STRICT LIABILITY, NEGLIGENCE, OR OTHERWISE.

Banner Engineering Corp. reserves the right to change, modify or improve the design of the product without assuming any obligations or liabilities relating to any product previously manufactured by Banner Engineering Corp. Any misuse, abuse, or improper application or installation of this product or use of the product for personal protection applications when the product is identified as not intended for such purposes will void the product warranty. Any modifications to this product without prior express approval by Banner Engineering Corp will void the product warranties. All specifications published in this document are subject to change. Banner reserves the right to modify product specifications or update documentation at any time. Specifications and product information in English supersede that which is provided in any other language. For the most recent version of any documentation, refer to:

www.bannerengineering.com.