iVu Bar Code Reader (BCR) Image Sensor

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Datasheet

iVu BCR Image Sensor for use with a Remote Display

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 (FLTB) 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 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)
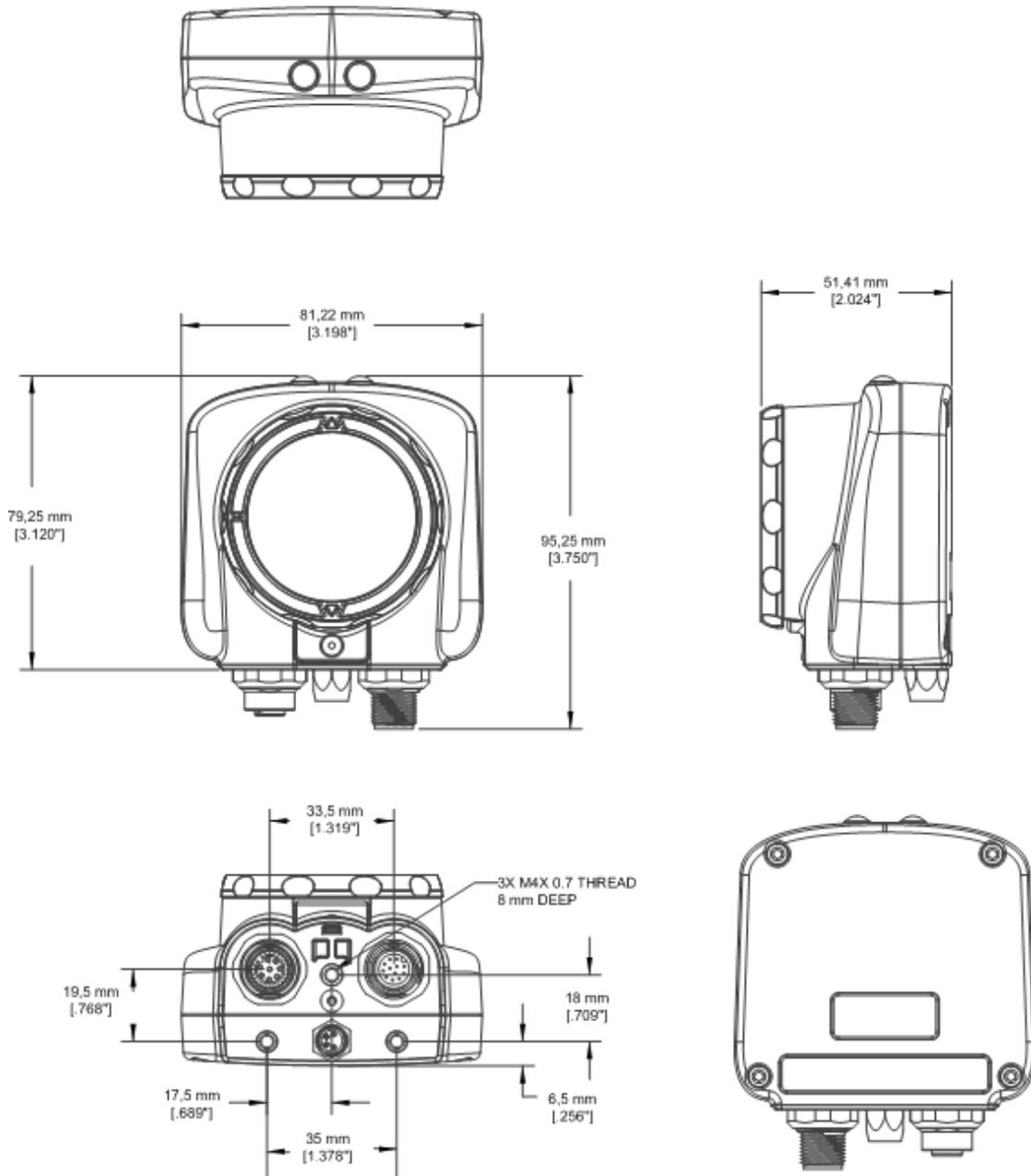Maximum relative humidity: 95% maximum relative humidity (non-condensing)

Certifications
C E
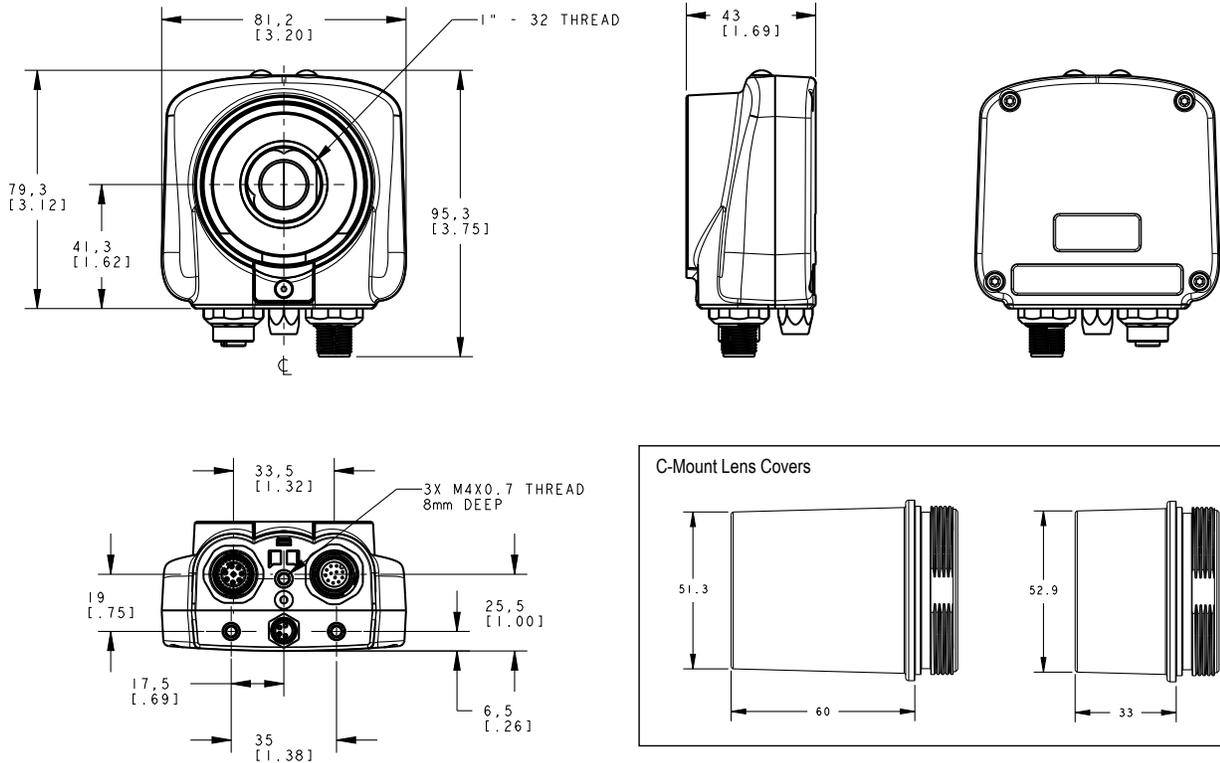
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[2] This value can vary based on inspection settings.

Dimensions

Micro Video Lens Dimensions

81,22 mm
[3.198"]

51,41 mm
[2.024"]

79,25 mm
[3.120"]

95,25 mm
[3.750"]

33,5 mm
[1.319"]

3X M4X 0.7 THREAD
6 mm DEEP

19,5 mm
[.768"]

18 mm
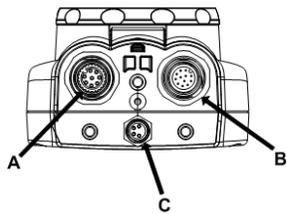[.709"]

17,5 mm
[.689"]

6,5 mm
[.256"]

35 mm
[1.378"]

C-Mount Lens Dimensions

Cable Connections for the iVu BCR with a Remote Display

The cable connections on the iVu sensor are shown below, and power I/O connections (B) are defined in the Power I/O Connections table below.

A   Remote Display Connector

B   Power I/O Connector

C   USB Connector

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

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

Power I/O Connections			
Pin #	Wire Color	Description	Direction
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
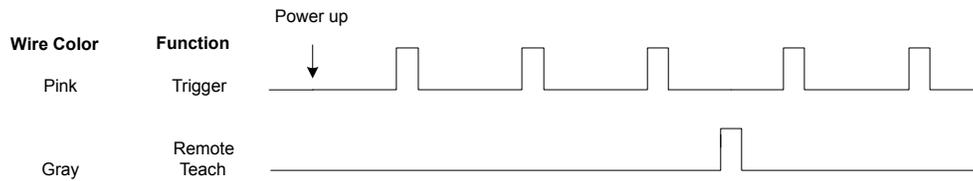
The sensor triggers from low to high, and Remote Teach behaves electrically like trigger.

## NPN (High-to-Low) Trigger and Remote Teach Input Waveforms
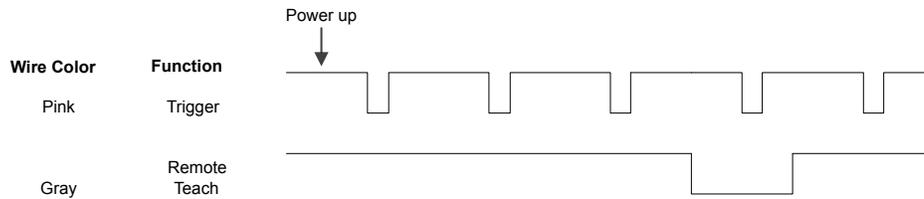
The sensor triggers from high to low, and Remote Teach behaves electrically like trigger.

NOTE: If the device used to trigger or remote teach the iVu 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.
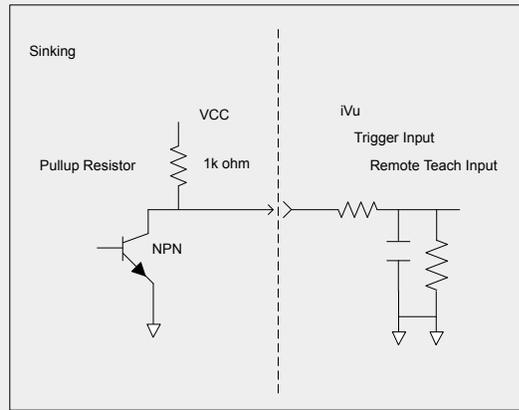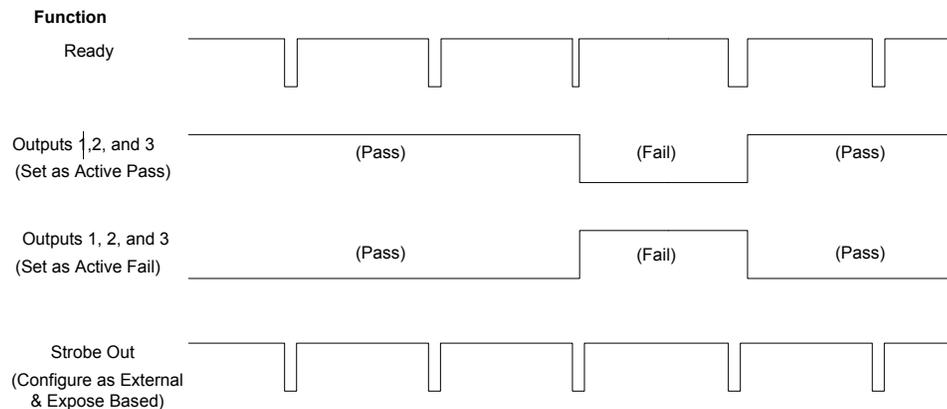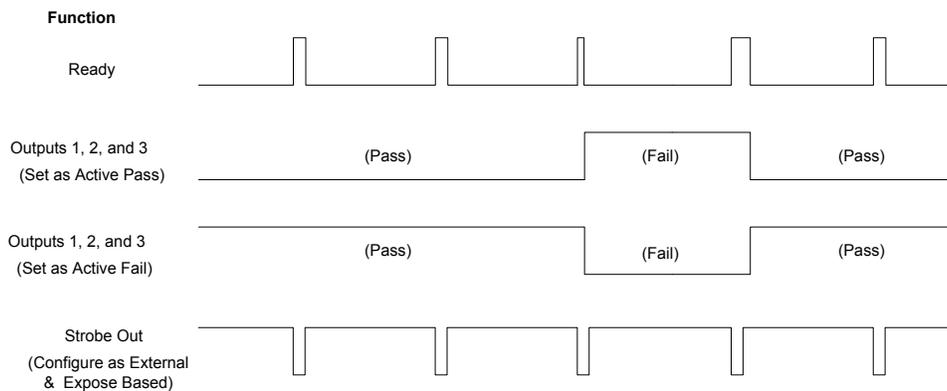

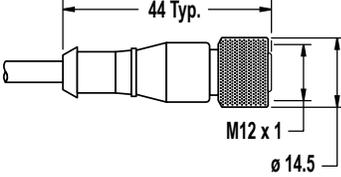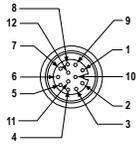## iVu Output Waveforms

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
MQDC2S-1206	1.83 m (6 ft)	Straight		
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)			

Dimensions: 44 Typ., M12 x 1, ø 14.5

Pinout:
1 = White
2 = Brown
3 = Green
4 = Yellow
5 = Gray
6 = Pink
7 = Blue
8 = Red
9 = Orange
10 = Lt. Blue
11 = Black
12 = Violet

NOTE: The cables listed above must be used to meet C E.

Remote Display — Required for Setup

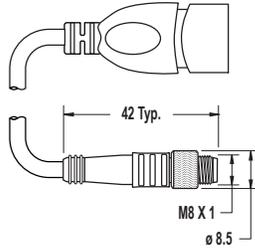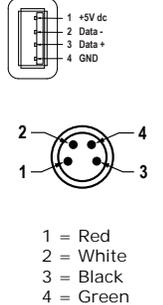| Model	Description	Data Sheet
RD35	89 mm (3.5 in) Diagonal Remote Touch Screen	p/n 149171
RDM35	89 mm (3.5 in) Diagonal Machine-Mountable Remote Touch Screen	p/n 166096

Cordsets

Table 1: Cordsets

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

Table 2: 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)	
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		1 +5V dc 2 Data - 3 Data + 4 GND 1 = Red 2 = White 3 = Black 4 = Green
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
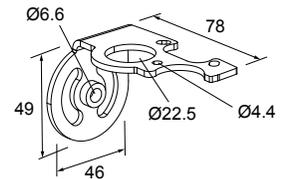
SMBIVURAL
- Right-angle bracket for mounting sensor from the left
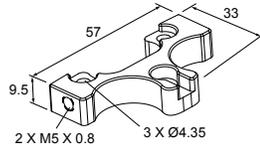- 12-ga. stainless steel
- Hardware included
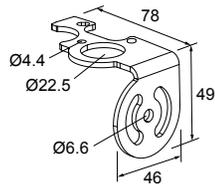
SMBIVURAR
- Right-angle bracket for mounting sensor from right
- 12-ga. stainless steel
- Hardware included

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

57
33
9.5
2 X M5 X 0.8   3 X Ø4.35

> 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
FLTMR	Red filter kit
FLTMB	Blue filter kit
FLTMG	Green filter kit
FLTMI	IR 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)

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[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 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

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