

iVu TG Image Sensor with Integrated 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, lens, and display. 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
- Integrated color touch screen display
- 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	IVUTGNX04	IVUTGNX08	IVUTGNX12	IVUTGNX16	IVUTGNX25	IVUTGNXC
Red	IVUTGNR04	IVUTGNR08	IVUTGNR12	IVUTGNR16	IVUTGNR25	N/A
Blue	IVUTGNB04	IVUTGNB08	IVUTGNB12	IVUTGNB16	IVUTGNB25	N/A
Green	IVUTGNG04	IVUTGNG08	IVUTGNG12	IVUTGNG16	IVUTGNG25	N/A
IR	IVUTGNI04	IVUTGNI08	IVUTGNI12	IVUTGNI16	IVUTGNI25	N/A
White	IVUTGNW04	IVUTGNW08	IVUTGNW12	IVUTGNW16	IVUTGNW25	N/A
UV 365 [¶]	IVUTGN604	IVUTGN608	IVUTGN612	IVUTGN616	IVUTGN625	N/A
UV 395 [¶]	IVUTGN904	IVUTGN908	IVUTGN912	IVUTGN916	IVUTGN925	N/A

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	IVUTGPX04	IVUTGPX08	IVUTGPX12	IVUTGPX16	IVUTGPX25	IVUTGPXC

[¶] 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	
Red	IVUTGPR04	IVUTGPR08	IVUTGPR12	IVUTGPR16	IVUTGPR25	N/A
Blue	IVUTGPB04	IVUTGPB08	IVUTGPB12	IVUTGPB16	IVUTGPB25	N/A
Green	IVUTGPG04	IVUTGPG08	IVUTGPG12	IVUTGPG16	IVUTGPG25	N/A
IR	IVUTGPI04	IVUTGPI08	IVUTGPI12	IVUTGPI16	IVUTGPI25	N/A
White	IVUTGPW04	IVUTGPW08	IVUTGPW12	IVUTGPW16	IVUTGPW25	N/A
UV 365 ¹	IVUTGP604	IVUTGP608	IVUTGP612	IVUTGP616	IVUTGP625	N/A
UV 3950 ¹	IVUTGP904	IVUTGP908	IVUTGP912	IVUTGP916	IVUTGP925	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

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

USB 2.0 Host

8-pin Euro-style (M12) female connector; optional USB cable required for operation of USB flash drive (see [USB Cable — Optional](#) on page 7)

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

Display

68.5 mm (2.7 in) LCD Color Integrated Display 320 × 240 pixels

Acquisition

98 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: 0.28 kg (0.61 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)

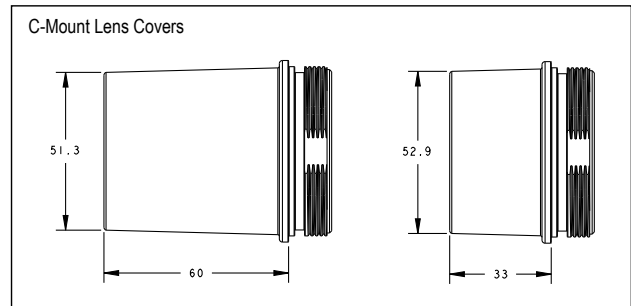
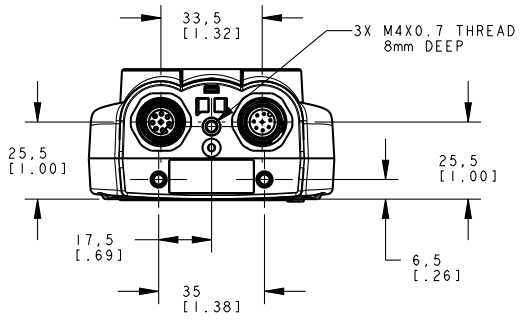
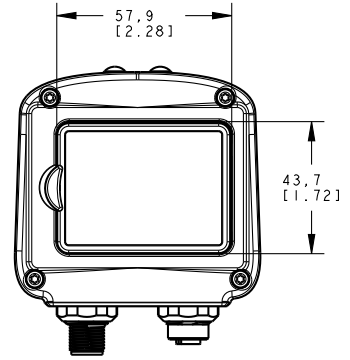
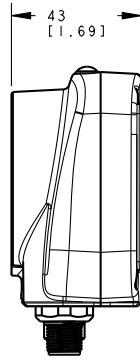
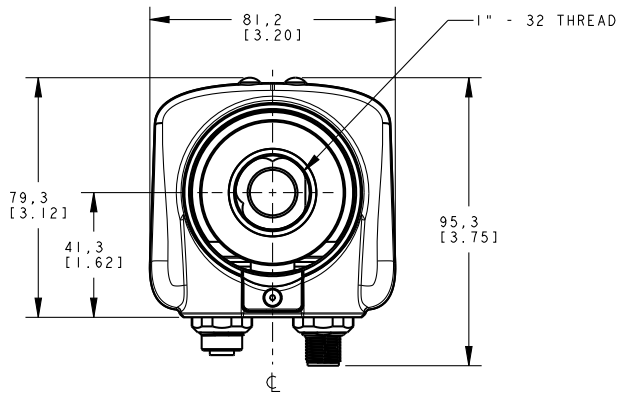
Certifications



² This value can vary based on inspection settings.

C-Mount Lens Dimensions

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



Cable **Connections** for iVu TG with Integrated Display

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



- A USB Connector
- B Power I/O Connector



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

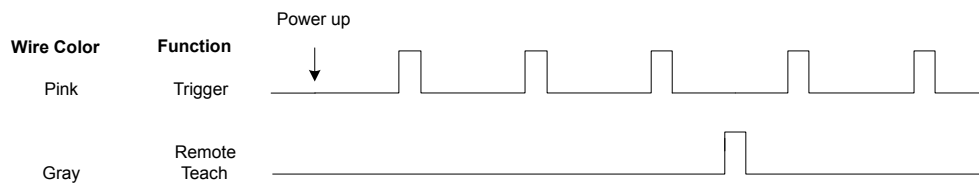
Table 1: Power I/O Connections

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

iVu Trigger, Remote Teach, and I/O Waveforms

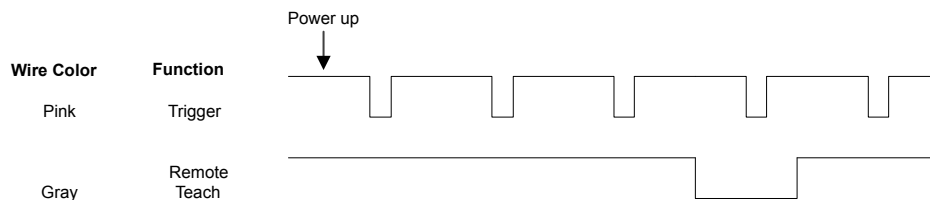
The iVu has two input signals—Trigger and Remote Teach. The default setting is to detect the low to high transition. This setting can be changed in the Main Menu > System > Discrete I/O > Input Polarity screen on the sensor.

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

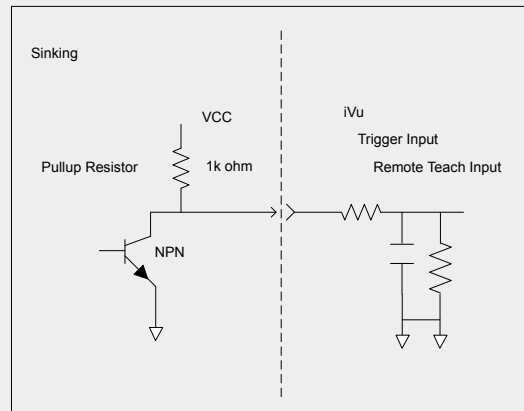


The sensor triggers from high to low, and Remote Teach behaves electrically like trigger.

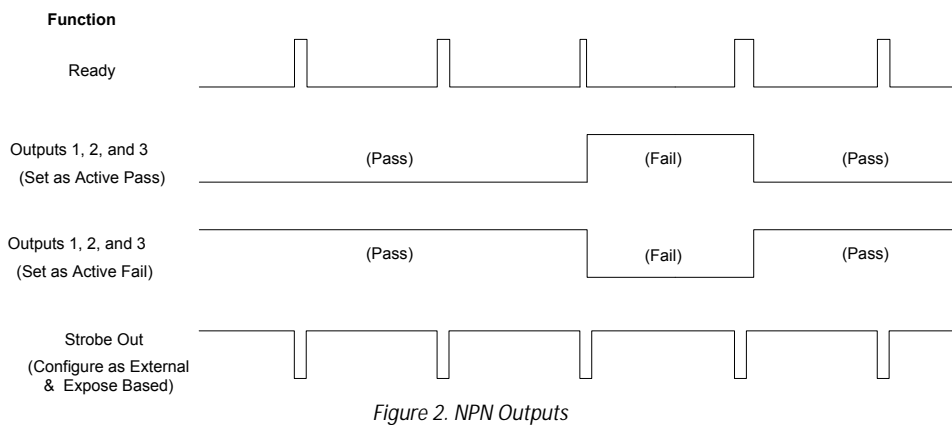
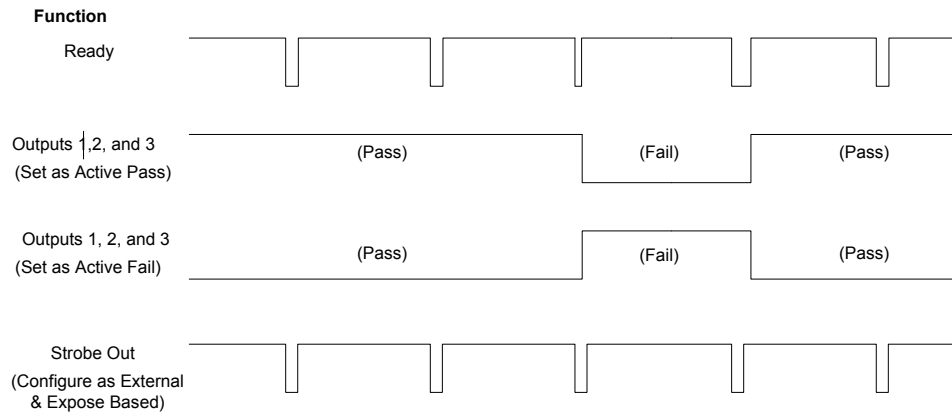


Note: If the device used to trigger or remote teach the iVu TG is a sinking device, these are the options regarding the use of a pull-up resistor:

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.

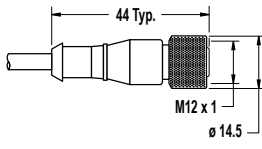
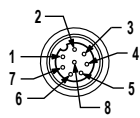
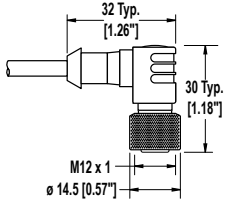


iVu Output Waveforms

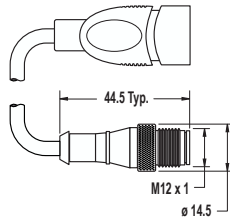
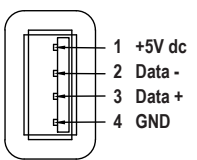
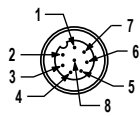
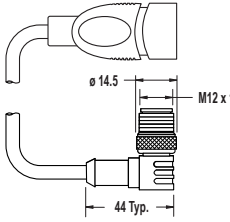


Accessories

Power Cable — Required

8-Pin Threaded M12/Euro-Style Cordsets with Open-Shield				
Model	Length	Style	Dimensions	Pinout (Female)
MQDC2S-806	1.83 m (6 ft)	Straight		 <p>1 = White 2 = Brown 3 = Green 4 = Yellow 5 = Gray 6 = Pink 7 = Blue 8 = Red</p>
MQDC2S-815	4.57 m (15 ft)			
MQDC2S-830	9.14 m (30 ft)			
MQDC2S-850	15.2 m (50 ft)			
MQDC2S-806RA	1.83 m (6 ft)	Right-Angle		
MQDC2S-815RA	4.57 m (15 ft)			
MQDC2S-830RA	9.14 m (30 ft)			
MQDC2S-850RA	15.2 m (50 ft)			

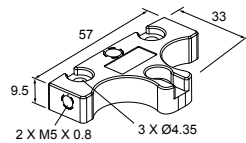
USB Cable — Optional

8-Pin Threaded M12/Euro-Style to USB Cordsets—Double Ended				
Model	Length	Style	Dimensions	Pinout
MQDEC-8005-USB	0.15 m (6 6)	Straight Euro QD/USB		 <p>Male</p> 
MQDEC-801-USB	0.31 m (1 ft)			
MQDEC-803-USB	0.91 m (3 ft)			
MQDEC-810-USB	3 m (10 ft)			
MQDEC-8005RA-USB	0.15 m (6 6)	Right-Angle Euro QD/USB		
MQDEC-801RA-USB	0.31 m (1 ft)			
MQDEC-803RA-USB	0.91 m (3 ft)			
MQDEC-810RA-USB	3 m (10 ft)			

Brackets

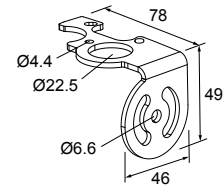
SMBIVUB

- Bottom mounting bracket
- Black anodized aluminum
- Hardware included



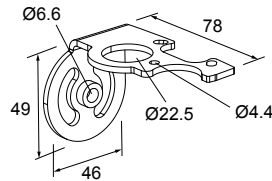
SMBIVURAL

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



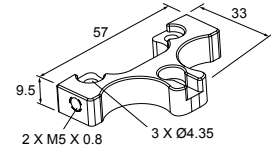
SMBIVURAR

- 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

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.

Model	Lens Description
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

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.