

# iVu TG<sup>Gen2</sup> 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 Gen2 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
- Adjustable image resolution up to 752×480 pixels



### 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

Ring Light Options	Micro Video Lens Options						C-Mount Lens Options
	4.3 mm	6 mm	8 mm	12 mm	16 mm	25 mm	
None	IVU2TGX04	IVU2TGX06	IVU2TGX08	IVU2TGX12	IVU2TGX16	IVU2TGX25	IVU2TGXC
Red	IVU2TGR04	IVU2TGR06	IVU2TGR08	IVU2TGR12	IVU2TGR16	IVU2TGR25	N/A
Blue	IVU2TGB04	IVU2TGB06	IVU2TGB08	IVU2TGB12	IVU2TGB16	IVU2TGB25	N/A
Green	IVU2TGG04	IVU2TGG06	IVU2TGG08	IVU2TGG12	IVU2TGG16	IVU2TGG25	N/A
IR	IVU2TGI04	IVU2TGI06	IVU2TGI08	IVU2TGI12	IVU2TGI16	IVU2TGI25	N/A
White	IVU2TGW04	IVU2TGW06	IVU2TGW08	IVU2TGW12	IVU2TGW16	IVU2TGW25	N/A
UV 365 <sup>1</sup> <sup>2</sup>	IVU2TG604	IVU2TG606	IVU2TG608	IVU2TG612	IVU2TG616	IVU2TG625	N/A
UV 395 <sup>1</sup> <sup>2</sup>	IVU2TG904	IVU2TG906	IVU2TG908	IVU2TG912	IVU2TG916	IVU2TG925	N/A

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

<sup>2</sup>



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

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### Power Connection

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

### 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 8)

### Power Requirements

Voltage: 10 to 30 V dc

Current: 800 mA maximum (exclusive of I/O load)

### Output Configuration

NPN or PNP, software selectable

### 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)<sup>3</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 PBT sensor housing; die cast zinc back cover; acrylic window

Weight: 0.38 kg (0.85 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



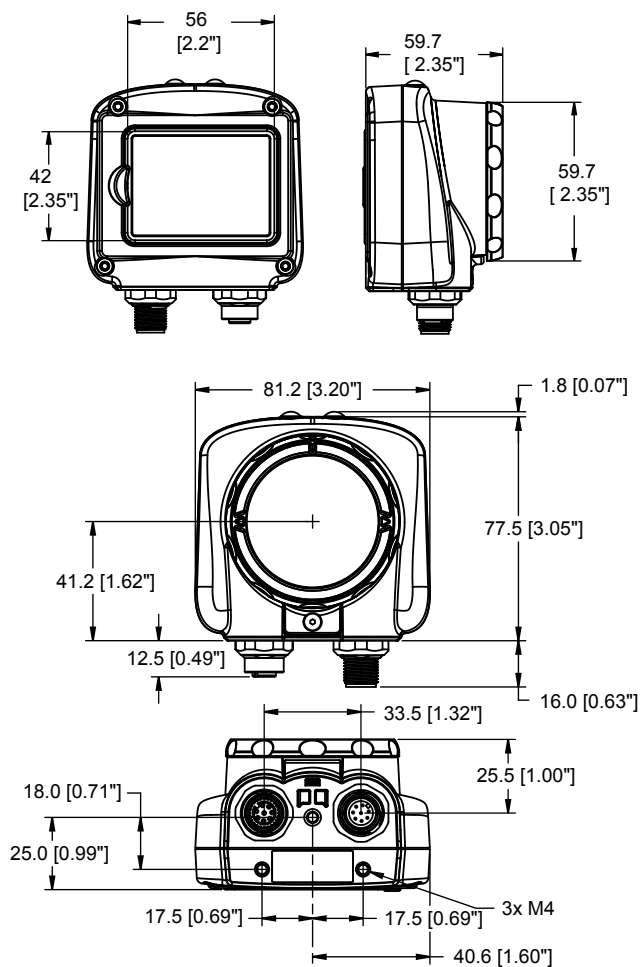

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<sup>3</sup> This value can vary based on inspection settings.

## Dimensions

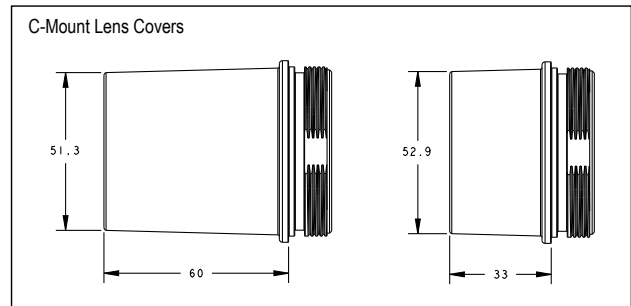
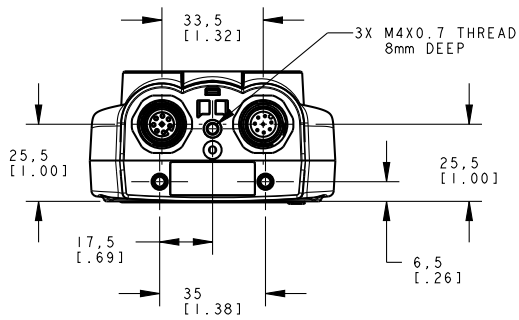
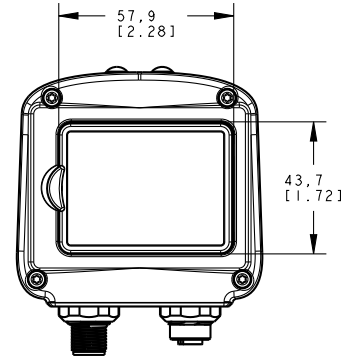
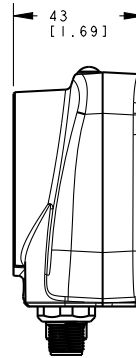
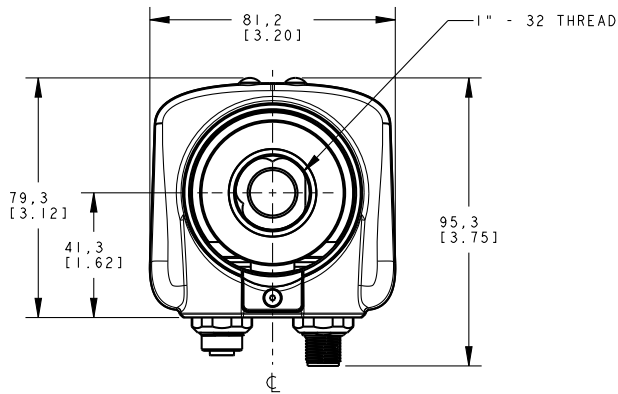
### Micro Video Lens Dimensions

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 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.

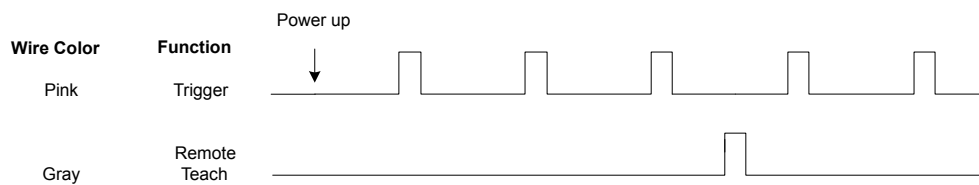
Table 1: Power I/O Connections

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.

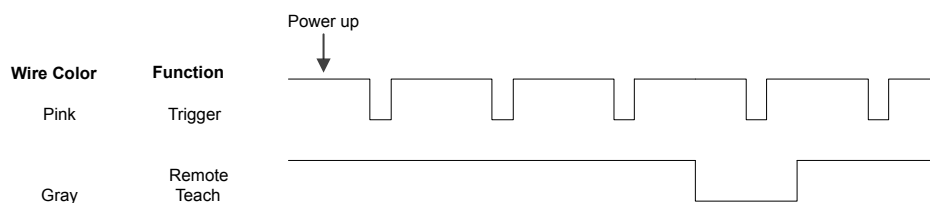


NOTE:

Table 2: Required iVu Input Signal Voltage

	ON	OFF
PNP	+10 to 30 V dc	< 2 V dc

## 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:

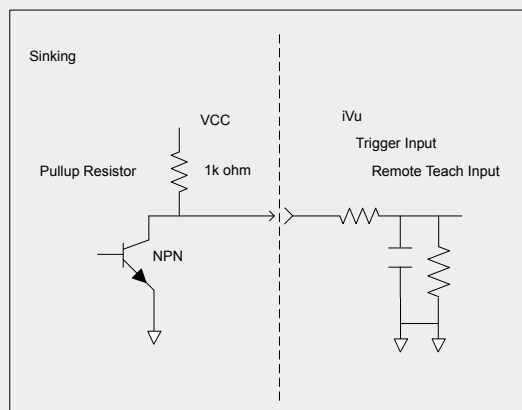
Table 3: Required iVu Input Signal Voltage

	ON	OFF
NPN	< 2 V dc	+ 10 to 30 V dc



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.



Option 2: Enable the Input Pullup in the iVu TG software (Main Menu > System > Discrete I/O > Input Pullup).

## iVu Output Waveforms

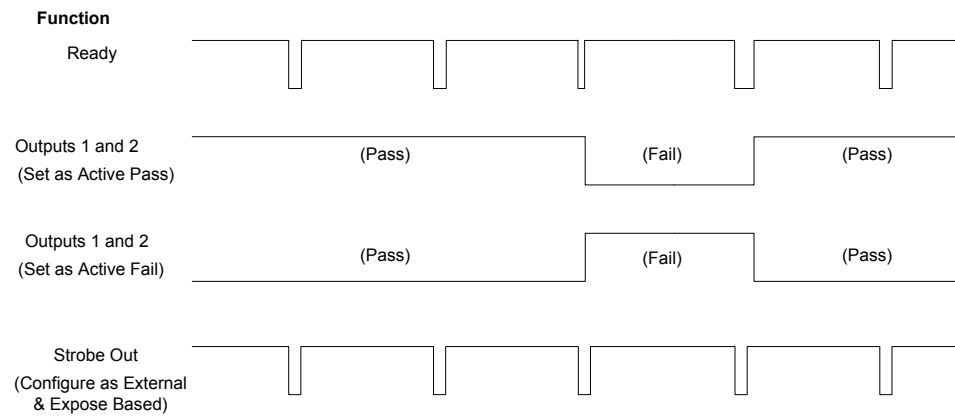


Figure 1. PNP Outputs

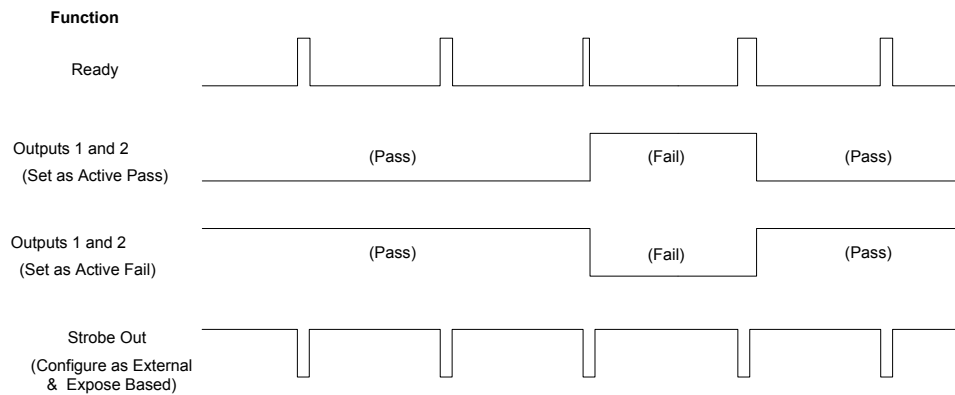


Figure 2. NPN Outputs



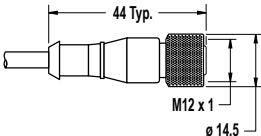
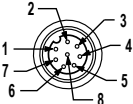
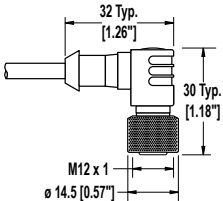
NOTE:

Table 4: Expected iVu Output Signal Voltage

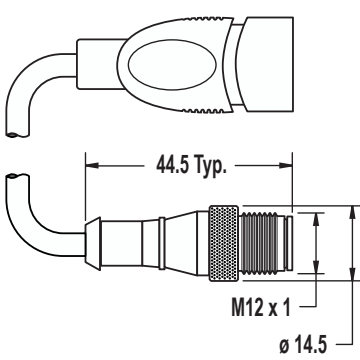
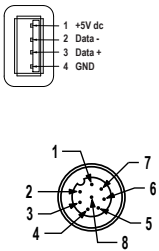
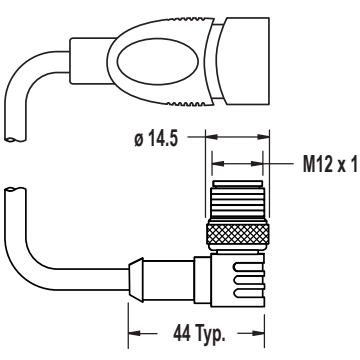
	ON	OFF
PNP	+V	< 2 V dc
NPN	< 2 V dc	+V

## Accessories

### Power Cable — Required

8-Pin Threaded M12/Euro-Style Cordsets with Open-Shield				
Model	Length	Style	Dimensions	Pinout
MQDC2S-806	1.83 m (6 ft)	Straight		  1 = White 2 = Brown 3 = Green 4 = Yellow 5 = Gray 6 = Pink 7 = Blue 8 = Red
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

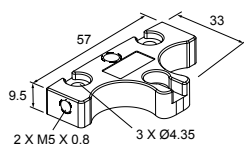
8-Pin Threaded M12/Euro-Style to USB Cordsets—Double Ended					
Model	Length	Style	Dimensions	Pinout	
MQDEC-8005-USB	0.15 m (6 ft)	Straight Euro QD/USB			
MQDEC-801-USB	0.31 m (1 ft)				
MQDEC-803-USB	0.91 m (3 ft)				
MQDEC-810-USB	3.0 m (10 ft)				
MQDEC-8005RA-USB	0.15 m (6 ft)	Right-Angle Euro QD/USB			
MQDEC-801RA-USB	0.31 m (1 ft)				
MQDEC-803RA-USB	0.91 m (3 ft)				
MQDEC-810RA-USB	3.0 m (10 ft)				



## Brackets

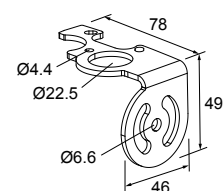
### SMBI VUB

- Bottom mounting bracket
- Black anodized aluminum
- Hardware included



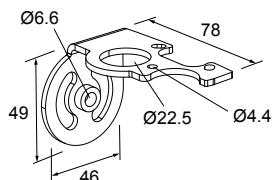
### SMBI VURAL

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



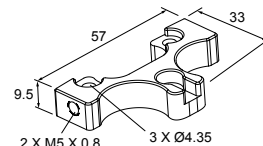
### SMBI VURAR

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



### SMBI VUU

- 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>4</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>4</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

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