

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, 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
- 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	IVU2RGX04	IVU2RGX06	IVU2RGX08	IVU2RGX12	IVU2RGX16	IVU2RGX25	IVU2RGXC
Red	IVU2RGR04	IVU2RGR06	IVU2RGR08	IVU2RGR12	IVU2RGR16	IVU2RGR25	N/A
Blue	IVU2RGB04	IVU2RGB06	IVU2RGB08	IVU2RGB12	IVU2RGB16	IVU2RGB25	N/A
Green	IVU2RGG04	IVU2RGG06	IVU2RGG08	IVU2RGG12	IVU2RGG16	IVU2RGG25	N/A
IR	IVU2RGI04	IVU2RGI06	IVU2RGI08	IVU2RGI12	IVU2RGI16	IVU2RGI25	N/A
White	IVU2RGW04	IVU2RGW06	IVU2RGW08	IVU2RGW12	IVU2RGW16	IVU2RGW25	N/A
UV 365 ¹ ²	IVU2RG604	IVU2RG606	IVU2RG608	IVU2RG612	IVU2RG616	IVU2RG625	N/A
UV 395 ¹ ²	IVU2RG904	IVU2RG906	IVU2RG908	IVU2RG912	IVU2RG916	IVU2RG925	N/A

¹ Blue Filter Kit (FLTMB) included with UV models.



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).



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, 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

Remote Display Connection

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

Acquisition

98 fps (frames per second)³

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: 0.41 kg (0.90 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

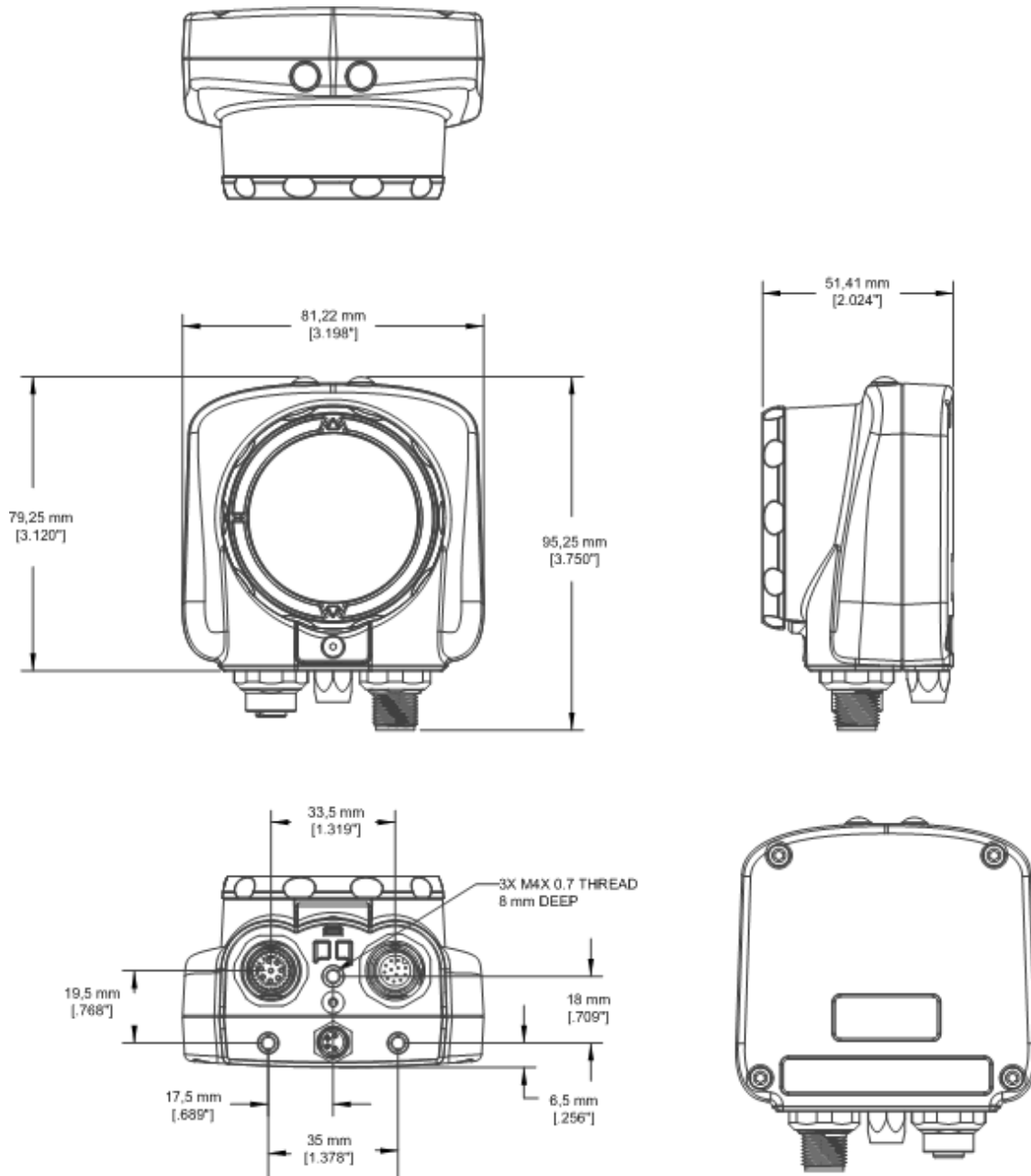


³ This value can vary based on inspection settings.

Dimensions

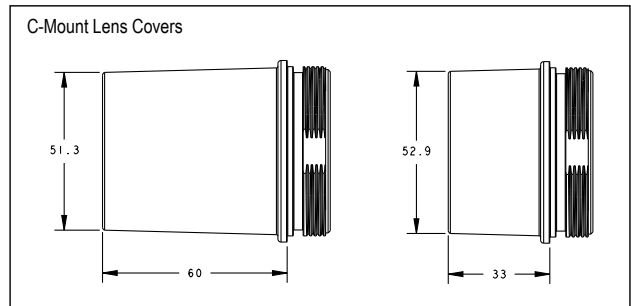
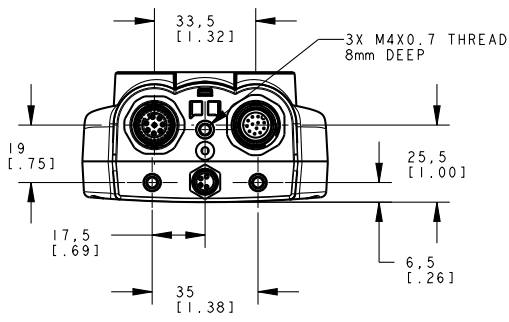
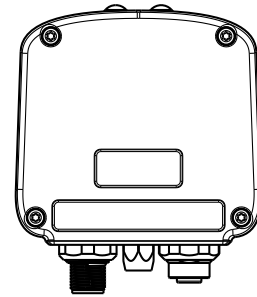
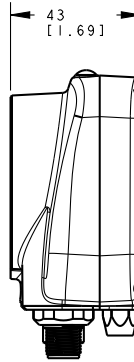
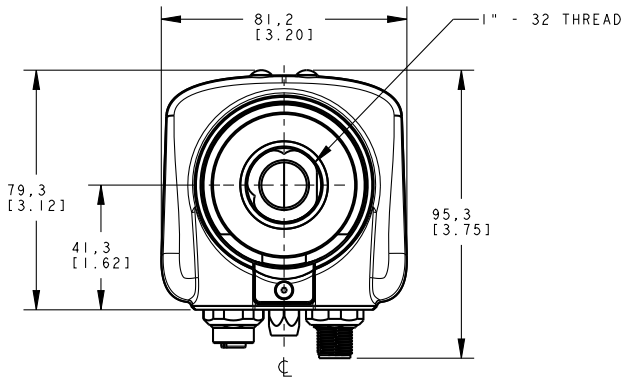
Micro Video Lens Dimensions

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



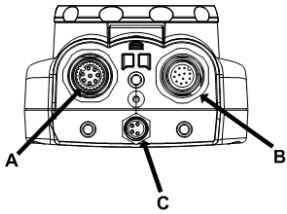
C-Mount Lens Dimensions

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



Cable **Connections** for the iVu 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.

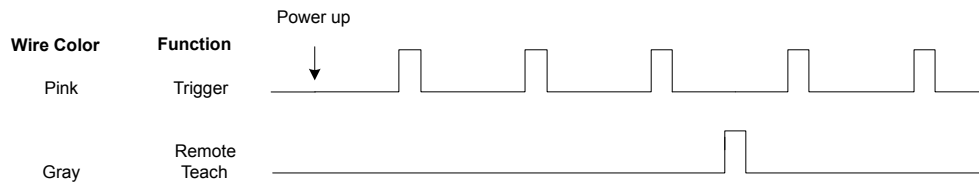
Table 1: Power I/O Connections

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 – 12	multiple	Not used	N/A

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.

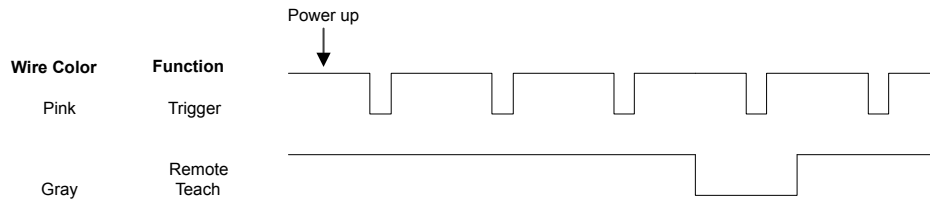


Note:

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:

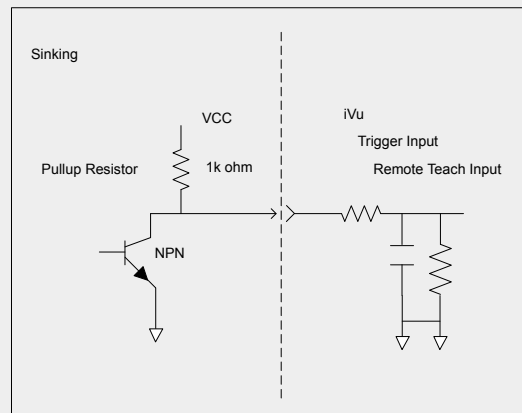
Table 3: Required iVu Input Signal Voltage

	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

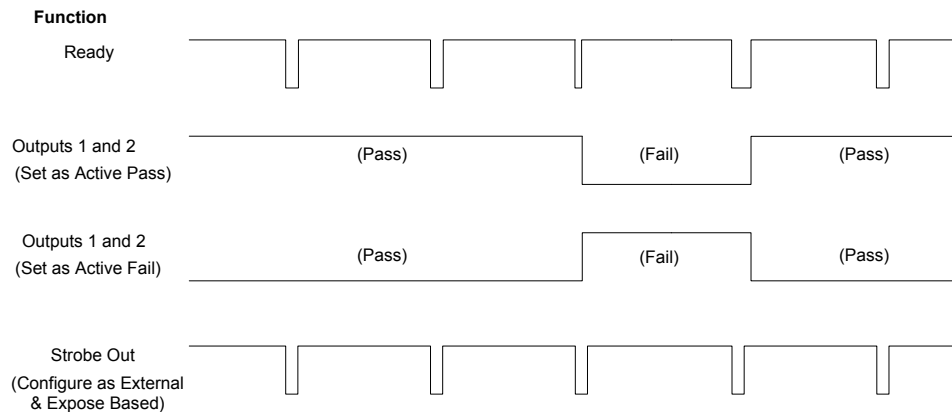


Figure 1. PNP Outputs

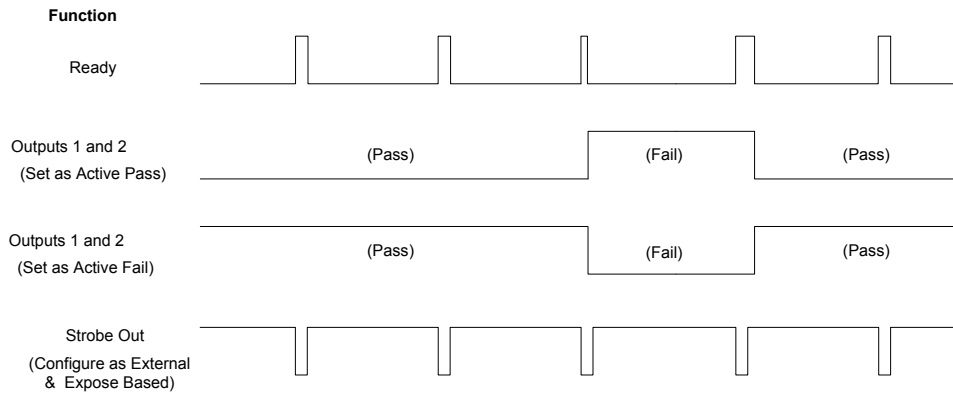


Figure 2. NPN Outputs

Note:

Table 4: Expected iVu Output Signal Voltage

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

Accessories

Power Cable — Required

12-Pin M12/Euro-Style Cordsets with Open Shield				
Model	Length	Style	Dimensions	Pinout (Female)
MQDC2S-1206	1.83 m (6 ft)	Straight		<ul style="list-style-type: none"> 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-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

RD35 Remote Display Accessory Kit

Table 5: 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)	Mounting Bracket (SMBRD35) Stylus

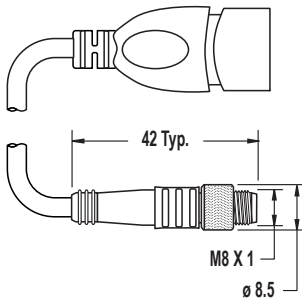
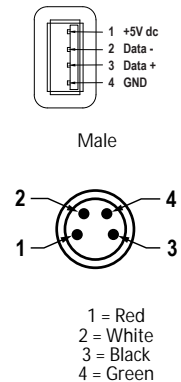
Model	Length	Description
IVURD-MXK-815	4.57 m (15 ft)	8-pin cable, right-angle, M12-Molex Mounting Bracket (SMBRD35) Stylus
IVURD-MXK-830	9.14 m (30 ft)	
IVURD-MXK-850	15.2 m (50 ft)	
IVURD-MXK-803RA	0.91 m (3 ft)	
IVURD-MXK-806RA	1.83 m (6 ft)	
IVURD-MXK-815RA	4.57 m (15 ft)	
IVURD-MXK-830RA	9.14 m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

RDM35 Remote Display Accessory Kit

Table 6: Cordset Kits

Model	Length	Description
IVURDM-QDK-803	0.91 m (3 ft)	8-pin cable, straight, M12-M12 Mounting bracket (SMBRDM35) Stylus
IVURDM-QDK-806	1.83 m (6 ft)	
IVURDM-QDK-815	4.57 m (15 ft)	
IVURDM-QDK-830	9.14 m (30 ft)	
IVURDM-QDK-850	15.2 m (50 ft)	8-pin cable, right-angle, M12-M12 Mounting bracket (SMBRDM35) Stylus
IVURDM-QDK-803RA	0.91 m (3 ft)	
IVURDM-QDK-806RA	1.83 m (6 ft)	
IVURDM-QDK-815RA	4.57 m (15 ft)	
IVURDM-QDK-830RA	9.14 m (30 ft)	
IVURDM-QDK-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)			

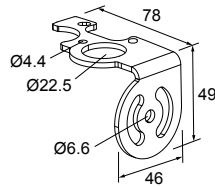
USB Flash Drive — Optional

Model	Description
IVU-USBFD2	USB Flash Drive 2 GB

Brackets

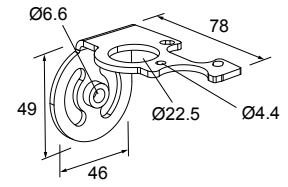
SMBIVURAL

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



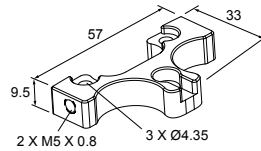
SMBIVURAR

- 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 ⁴	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

⁴ 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

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