

Gocator 2D Smart Camera

Quick Start Guide



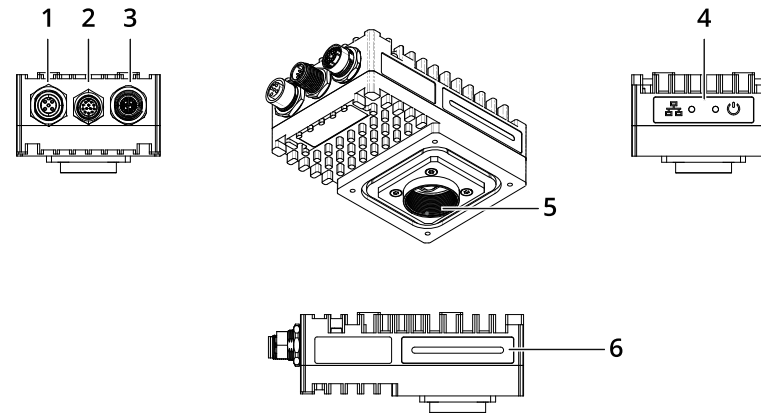
Installation

Before installing the Gocator 2D Smart Camera, please note the following:

- The camera is powered using the provided 24 VDC power supply. This power supply can output 10 amps, which is sufficient to power the optional RMX140 ring light (which requires 7 amps).
- The camera cannot be connected to a Master.
- The camera does not accept an encoder signal but can be triggered using a hardware signal from another Gocator 3D sensor (digital output part detection) or an inductive, capacitive, or proximity sensor typically used to detect parts on a production line

For complete specifications, see the *Gocator 2D Smart Camera* user manual.

Gocator 2D Smart Camera - Hardware Overview

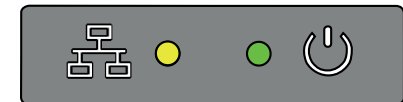


Gocator 2D Smart Camera

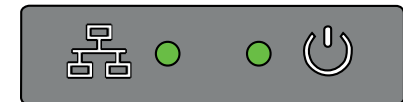
Item	Description
1	Camera light Powers an RMX140 Smart Vision Lights ring light. Do not use this connector for powering anything else.

Item	Description
2	Power and I/O Provides power to the smart camera and accepts input and output signals. Optionally, you can use this to power a camera light other than the RMX140 ring light.
3	Network Accepts power and connects to 1000 Mbit/s Ethernet network.
4	Indicators Two LEDs indicate whether the camera is powered up (green indicator on right) and the network speed (left).

Yellow indicator = 100 Mbps



Green indicator = 1 Gbps



5	Lens mount	The lens mount threads. For information on mounting a lens, see <i>Mounting the Lens</i> in the <i>Gocator 2D Smart Camera</i> user manual.
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6	Status light	While the camera is powering up, the status light strip is blue. After powering up, the status light turns off.
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You can configure the status light to show green or red based on various digital triggers, such as measurement pass/fail, system state (running or not), and so on. For information, see *Digital Output* in the *Gocator 2D Smart Camera* user manual.



For the user manual, CAD drawings, firmware release notes, SDK, and more, go to lmi3d.com/product-downloads.

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Mounting the Lens

CAUTION



Injury by a falling lens

Especially if you are going to operate Gocator 2D Smart Camera without a lens tube: Screw lenses into the lens mount until you feel resistance.

CAUTION



Risk of cuts by sharp edges of lens mounts

The threads of the lens mount can have sharp edges. Be careful when mounting or unmounting lenses.

NOTICE



Damage to cameras by unsuitable lenses

The lens and the camera's sensor, filter or electronics can be damaged if a lens exceeding maximum protrusion is mounted to the camera.

- Use lenses with less than 13.6 mm maximum protrusion.

NOTICE

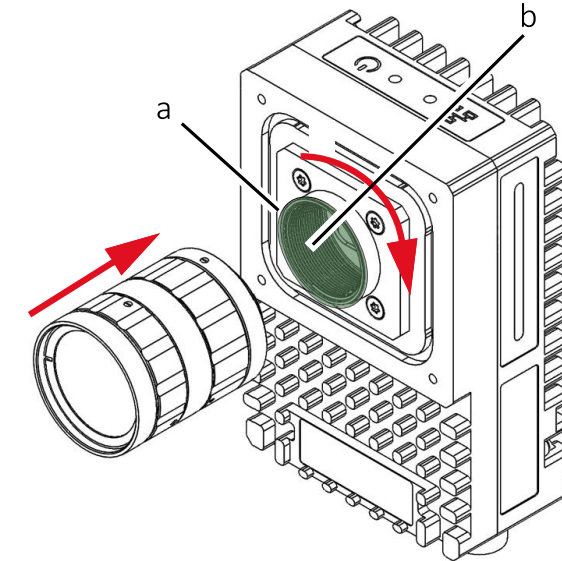


Damage to lenses or lens tubes

Lenses or the lens tube's front glass can be damaged if lenses are used that exceed the dimensions of the lens tube.

- Use only lenses within the dimensions of the lens tube.
- Observe that some lenses change in length when focus or zoom are used.

1. Remove the rear lens dust cap from the lens.
2. Put the lens face down on your work surface and place the dust cap on the rear of the lens.
3. Remove the plastic film (a) covering the camera's C mount with your fingers.
Keep the plastic film in case you need to remove the lens in the future.
4. Remove the rear lens dust cap.
5. Fit the lens thread into the camera's C-mount thread (b) and screw the lens clockwise until tight.
Be careful not to cross-thread the lens.



Connecting Power and I/O Cordset

For full pinout information of the cordset's connector, see *Gocator Power / IO Connector* in the GoPxL for Gocator 2D Smart Cameras user manual.

NOTICE



Damage by reverse polarity

If powered with reverse polarity, Gocator 2D Smart Camera can be damaged.

Power the smart camera according to the specifications described in *Gocator 2D Smart Camera Power / IO Connector* in the user manual.

NOTICE



Damage by unsuitable signal levels

If unsuitable signal levels are used, Gocator 2D Smart Camera can be damaged.

Observe the specifications in *Gocator 2D Smart Camera Power / I/O Connector* in the user manual.

NOTICE



Damage by unsuitable cables

If cable plugs do not fit tightly, Gocator 2D Smart Camera can be damaged.

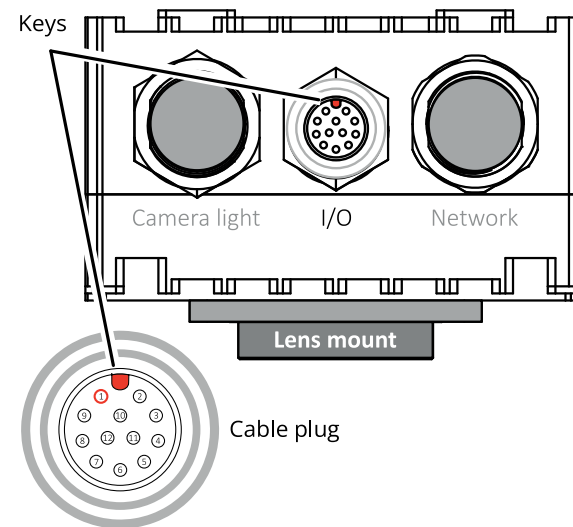
- For IP67 compliance, use only cables by LMI.
- Before using other cables, apply tests for IP67 compliance.



I/O cables maximum length

The maximum length for I/O cables must not exceed 30 m.

2. Rotate the cordset's connector until its key aligns with the key of the camera's connector, and push the cordset connector onto the camera connector.



3. Rotate the locking sleeve clockwise to tighten the connectors.
Tighten to a maximum torque of 1.2 to 1.5 N m.

Connecting Open Wire Leads to the Power Supply

To power the camera, you must wire the 18-gauge red and black leads of the Power and I/O cordset to the power supply.

CAUTION



Shock hazard

Make sure the AC cord is not plugged in when wiring the power supply to the AC cord.

NOTICE



Damage to Device

Be careful not to reverse polarity when wiring the AC cord and the Power and I/O cordset to the power supply. This can damage the camera.

Camera power and ground

Function	Pin	Lead	Description
DC_24V	7	Red (#18)	24 VDC (±10%)
GND_24V	8	Black (#18)	0 VDC

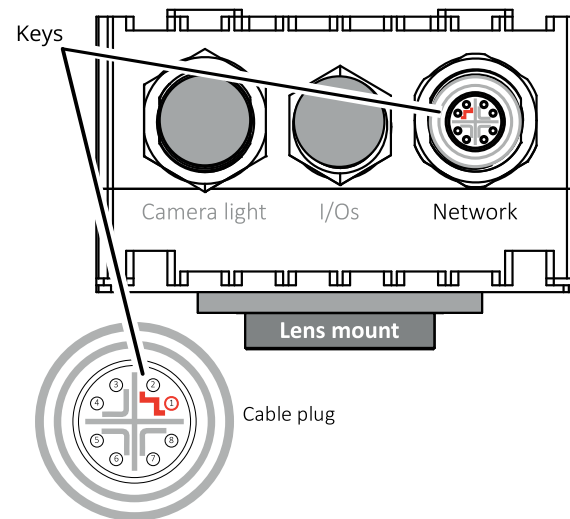
Connecting the Cordset to the Device

1. Remove the IP67 protective cap from the device's connector and store it for future use.



Connecting Network Cordset

1. Remove the IP67 protective cap from the device's LAN (POE) connector and store it for future use.
2. Align the keys of the device and cordset connectors, and push the cordset connector onto the device connector.



3. Rotate the locking sleeve clockwise to tighten the connectors. Tighten to a maximum torque of 1.2 to 1.5 N m.
4. Connect the RJ45 plug to a client computer or switch.

Preparing Power Supply

Gocator 2D Smart Camera is supplied with a DIN-rail mountable power supply from Mean Well. The supply outputs 24V @ 10A and supports the RMX140 ring light.

1. Wire the 18-gauge black lead to a v- terminal on the power supply.
2. Wire the 18-gauge red lead to a v+ terminal on the power supply.

Connecting Open Wires to Peripherals

Depending on your application, you may need to wire other Power and IO cordset leads:

- Digital triggering of the camera: see *Wiring Digital Trigger Input* below.
- Software triggering of the camera using the REST API or a PLC (done via Ethernet over a switch or direct connection).
- Triggering external devices or an externally powered light source: see *Wiring Digital and Light Trigger Outputs* below.

CAUTION



Shock hazard

Make sure the AC cord is not plugged in when wiring the power supply to the AC cord.










NOTICE



Damage to Device

Be careful not to reverse polarity when wiring the AC cord and the Power and I/O cordset to the power supply. This can damage the camera.

A three-prong AC cord is sold separately; you must wire the AC cord to the power supply. Use the color coding in the following table to identify Line, Neutral, and Ground for your region.

Conductor Color Coding								
Conductors	International			North American			Japanese	
	3 Conductors			3 Conductors			3 Conductors	
Line	Brown		Black		or	Brown		Black
Neutral	Blue		White		or	Blue		White
Ground	Green/Yellow		Green		or	Green/Yellow		Green



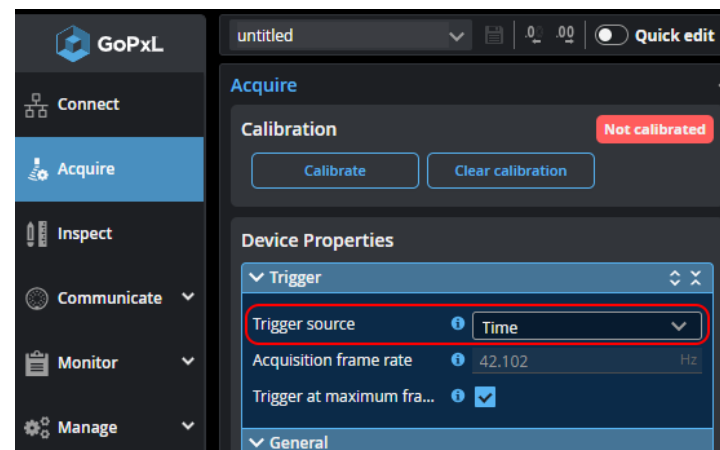
1. Wire the AC cord's ground lead to the power supply's ground (\perp) terminal.
2. Wire the AC cord's neutral lead to the power supply's neutral (N) terminal.
3. Wire the AC cord's neutral lead to the power supply's line (L) terminal.

Adjusting Focus and Aperture

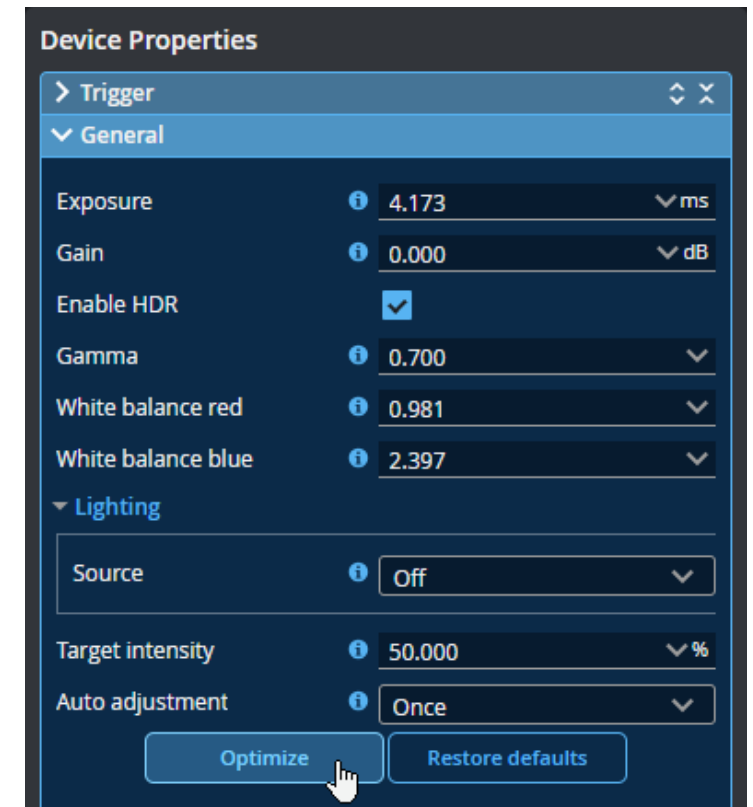
Before attaching the lens cover and ring light, you acquire a series of images so that you can adjust the lens focus and aperture.

1. Make sure the camera's network cordset is connected to a switch or directly to the client computer.
2. Apply power to the camera.

3. On the client PC, change the IP address of the network adapter to which the camera is connected as follows:
IPv4 address: 192.168.x.x (except 192.168.1.10 or the IP address of any other devices on that network)
IPv4 mask: 255.255.x.x
4. In web browser such as Google Chrome, go to 192.168.1.10.
The camera's default IP address is 192.168.1.10.
5. Go to the **Acquire** page and make sure **Trigger source** is set to Time.



6. Remove the lens cap.
7. With a white sheet of paper under the camera, in the **General** section, click the **Optimize** button.



8. Place a target under the camera.
9. At the upper right of the user interface, click the Start button to start capturing images.



- Adjust the aperture and focus on the lens until the image is sharp and depth of field (if appropriate) is adequate.

Mounting Lens Cover

CAUTION



Injury by falling lens covers

Tighten screws at 1.0 Nm maximum torque.
Follow the instructions below.

NOTICE



Damage to lenses or lens covers

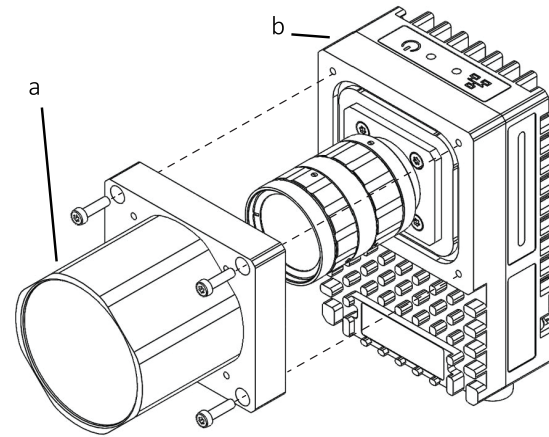
Lenses or the lens cover's front glass can be damaged if lenses are used that exceed the dimensions of the lens tube.

- Use only lenses within the dimensions of the lens cover.
- Observe that some lenses change in length when focus or zoom are used.

The optional lens cover protects the camera lens, and helps prevent accidental adjustment of focus and aperture.

- Align the lens tube (a) and camera housing (b) mounting holes.
- Using the provided M3-12↓ screws, attach the tube lens to the housing.
Tighten the screws to a maximum torque of 1.0 Nm.

For final assembly, LMI recommends using screw locking varnish to prevent the screws from coming loose.



Mounting Ring Light Adapter Plate

CAUTION



Injury by a falling camera ring lights

- Tighten screws at 1.0 Nm maximum torque.
- Follow the instructions below.

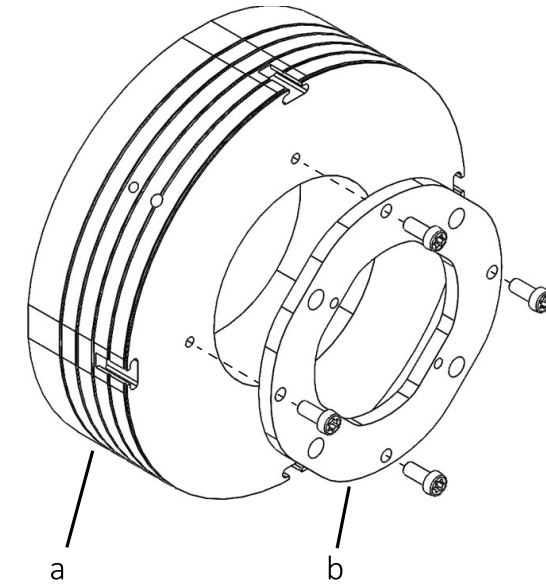
If you are using the RMX140 ring light, you must first install an adapter plate.

If you are using the lens cover, use the mounting plate with part number 301355. Follow these steps:

- Align the ring light (a) and adapter (b) mounting holes.
- Using the provided M4-10↓ screws, attach the adapter to the ring light.

Tighten the screws to a maximum torque of 1.0 Nm.

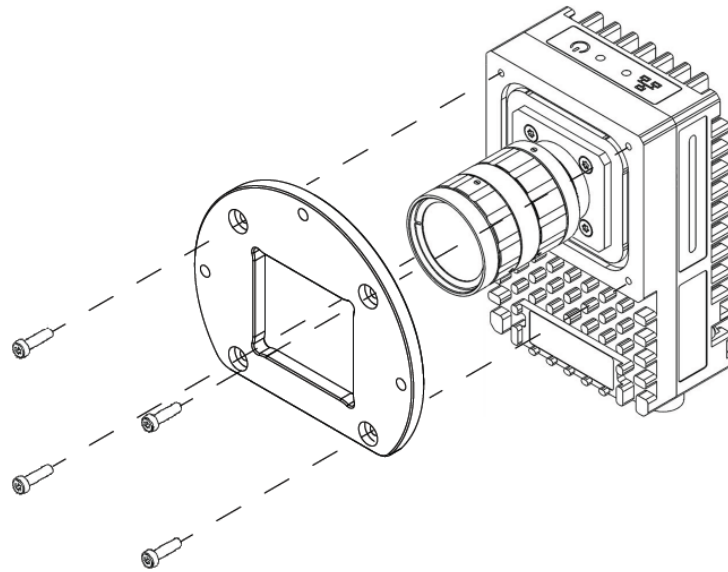
For final assembly, LMI recommends using screw locking varnish to prevent the screws from coming loose.



If you are *not* using the lens cover, use the mounting plate with part number 301419. Follow these steps:

- Align the camera and adapter mounting holes.
- Using the provided M3-12↓ screws, attach the adapter to the ring light.
Tighten the screws to a maximum torque of 1.0 Nm.

For final assembly, LMI recommends using screw locking varnish to prevent the screws from coming loose.



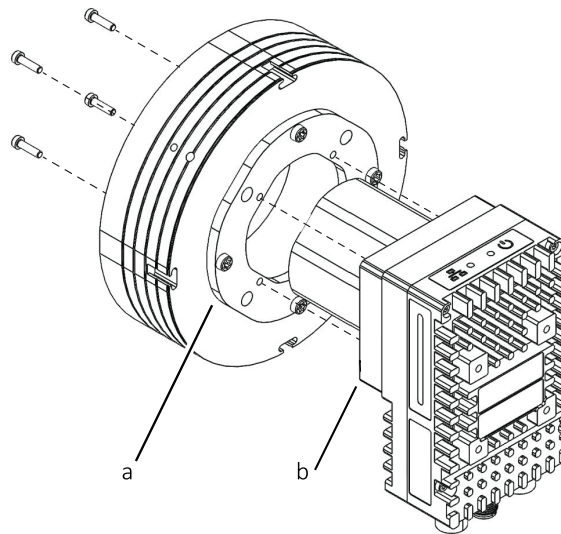
If You Are Using the Lens Cover...

After installing the adapter to the ring light, install the assembly to the camera.

1. Align the adapter plate (a) and lens tube (b) mounting holes.
2. Using the provided M3-12↓ screws, attach the ring light to the lens tube.

Tighten the screws to a maximum torque of 1.0 Nm.

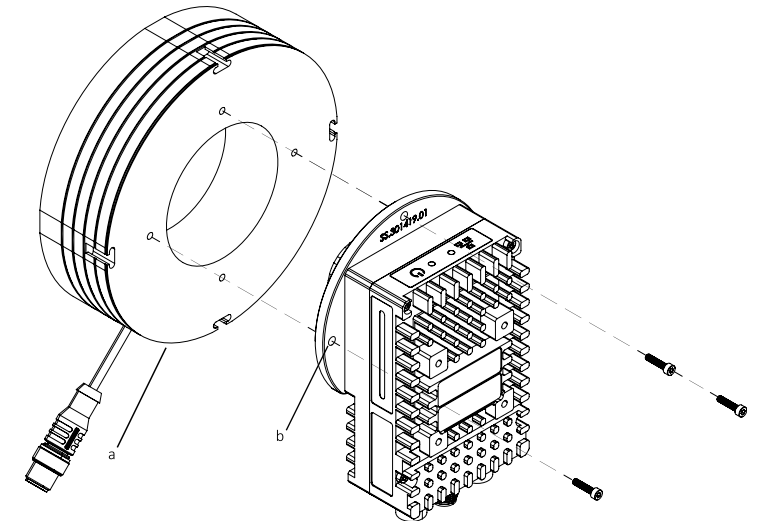
For final assembly, LMI recommends using screw locking varnish to prevent the screws from coming loose.



1. Rotate the ring light (a) until the holes on the back of the light align with the holes on the adapter plate (b).
2. Using the provided screws, attach the ring light to the adapter plate.

Tighten the screws to a maximum torque of 1.0 Nm.

For final assembly, LMI recommends using screw locking varnish to prevent the screws from coming loose.



Mounting Ring Light to the Camera

⚠ CAUTION



Injury by a falling camera ring lights

- Tighten screws at 1.0 Nm maximum torque.
- Follow the instructions below.

If You Are Not Using the Lens Cover...

Install the ring light to the adapter plate (301419) you mounted on the camera.

Connecting Ring Light to the Camera

NOTICE



Damage to Gocator 2D Smart Camera electronics and connected peripherals

If the power output is used beyond the specified limits, Gocator 2D Smart Camera can be damaged.

- Keep the maximum output for VCC-Light below 5.9 A.
- Observe that above 700 mA, Strobe-PNP is limited to 50 ms and 10% duty cycle.
- Observe the specifications in *Gocator 2D Smart Camera Light Connector* in the user manual.



Connections for external lighting

LMI offers compatible Y-cables at different lengths to separate electrical lines for lighting control by Gocator 2D Smart Camera from lighting power by external power supplies; contact LMI for more information.

NOTICE



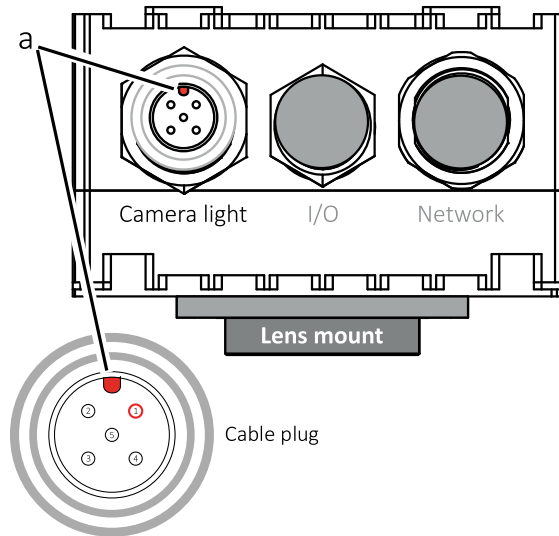
Damage by unsuitable cables

If cable plugs do not fit tightly, the Gocator 2D Smart Camera can be damaged.

- For IP67 compliance, use only cables by LMI Technologies.
- Before using other cables, apply tests for IP67 compliance.

After mounting the ring light to the camera, you must connect the ring light to the camera using the 5-pin cordset.

1. Remove the IP67 protective cap from the camera's connector. Store the cap safely for future use.
2. Rotate the cordset's connector until its key aligns with the key of the camera's connector, and push the cordset connector onto the camera connector.

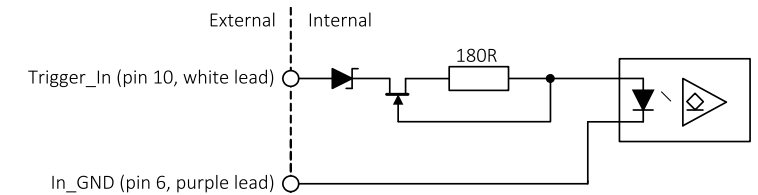


3. Rotate the locking sleeve clockwise to tighten the connectors. Tighten to a maximum torque of 1.2 to 1.5 N m.

Wiring Trigger Input

When triggering the camera externally with voltages up to 24 VDC, you can connect the input directly to the camera: an external resistor is not

necessary.

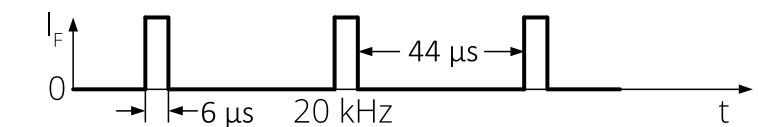


Camera trigger input pinout

Function	Pin	Lead	Description
In_GND	6	Purple	Optically-isolated input ground. 0 VDC
Trigger_In	10	White	Optically-isolated trigger input. $V_{in (low)} = 0$ to 1.0 VDC $V_{in (high)} = 3$ to 24 VDC Current (constant-current source) = 3 to 4 mA

For > 24.0 VDC to 36 VDC, connect a 3.3 k Ω external resistor in series.

The minimum pulse width is as follows:



For full pinout information on this connector, see *Gocator Power / IO Connector* in the user manual for this device.

Wiring Digital and Light Trigger Outputs

To trigger digital outputs (pin 4 or 11) or trigger an externally powered light source (pin 12), you must provide and connect an external power supply to drive these outputs, on pin 9.

NOTICE



Damage to Gocator 2D Smart Camera electronics and connected peripherals

To prevent damage to the camera, add a resistor in series to ensure the following conditions for the output pins:

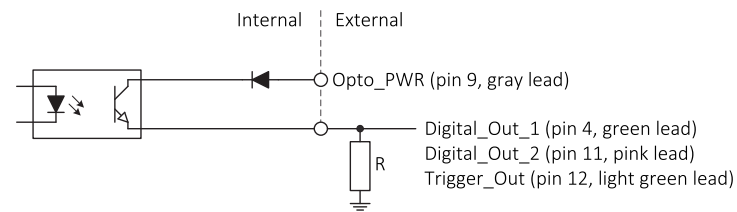
- Maximum output voltage is below 24 VDC
- Maximum output current is below 10 mA

For recommended resistor values, see [Opto_PWR voltage and external resistor values below](#).

If digital outputs (pins 4 or 11) or light trigger output (pin 12) are connected to devices with a high impedance (< 5 mA draw), you must add an external resistor in series.

Opto_PWR voltage and external resistor values

Opto_PWR voltage	Resistor value	
5 VDC	1.0 kΩ	minimum 5 mA current draw required
12 VDC	2.4 kΩ	
24 VDC	4.7 kΩ	



Digital outputs and light trigger pinout

Function	Pin	Lead	Description
Digital_Out_1	4	Green	Optically-isolated output. Open emitter, maximum 10 mA.
Opto_PWR	9	Gray	Power for optically-isolated output. (User-supplied power for driving digital and trigger outputs.) Max. 30 VDC
Digital_Out_2	11	Pink	Optically-isolated output.
Trigger_Out (strobe)	12	Light Green	Optically-isolated output. Open emitter, maximum 10 mA.

For full pinout information on this connector, see *Gocator Power / IO Connector* in the user manual for this device.

Mounting Camera

CAUTION



Injury by a falling Gocator 2D Smart Camera embedded camera systems

Ensure proper mounting of Gocator 2D Smart Camera, especially for dynamic applications.

- Mount the smart camera as described in the instructions.
- Always make sure the mounting threads are intact.
- Fasten screws with maximum torque, using the specified thread engagement.
- For less thread engagement, calculate torque values correspondingly.

You should mount the Gocator 2D Smart Camera at an appropriate distance from your target. Determine the appropriate distance by looking at the camera's specifications, that is, its minimum object distance and its different working distances, taking into account the size of your target.

The camera should be mounted using the provided mounting hardware (part number 301409) to a stable surface, using M4 screws. You can optionally use a 1/4" tripod mount with the mounting plate. For complete information on mounting points, see the specifications in the *Gocator 2D Smart Camera* user manual.

NOTICE



Damage to mounting holes

The maximum torque of the M4 screws is 1.2 Nm for a minimum thread engagement of 3.0 mm between screws and mounting threads.

Be careful not to damage the internal threads by cross-threading or improper insertion of screws.