

## APPLICATION NOTE

## Handling of Cameras with TCG and RCG Sensor Options

V2.0.0  
2018-10-04

## 1. Terms used in this document

Term	Description
Circular protection foil	Adhesive tape to protect the lens mount against dirt
Cover glass	Glass layer on top of the sensor surface, removed for RCG and TCG cameras
lbf-in	Inch-Pounds, unit for maximum torque, based on the British imperial units system. (1 lbf-in = 0.113 Nm)
Nm	Newton meter, unit for maximum torque; based on the metrical system. (1 Nm = 8.85 lbf-in)
PCB	Printed circuit board
PCBA	Printed circuit board assembly as a set of multiple PCBs
Extended Format housing	Extended-sized housing, such as for Prosilica GT1910, GT1660, and GT2300
Large Format housing	Large-sized housing, such as for Prosilica GT4905, GT4907, and GT6600
Protection glass	Clear “filter” in the camera mount assembly
RCG	Removed Cover Glass
TCG	Taped Cover Glass

## 2. Scope

RCG and TCG cameras must be handled with utmost care to avoid damage to the image sensor. Follow the instructions in this document to properly prepare RCG or TCG cameras for operation.

## 3. Safety notes

### 3.1. Electrostatic discharge (ESD)

Electrostatic charge builds up in the body when walking on carpeted floor. This can discharge when touching metal objects like a door handle. Such ESD can damage electronic devices, especially when tools or hands get in contact with connectors. We recommend measures to avoid damage by ESD:

- Unpacking: Remove the camera from its anti-static packaging only when your body is grounded.
- Workplace: Use a static-safe workplace with static-dissipative mat and air ionization.
- Wrist strap: Wear a static-dissipative wrist strap to ground your body.
- Clothing: Wear ESD-protective clothing. Keep components away from your body and clothing. Even if you are wearing a wrist strap, your body is grounded but your clothes are not.

### 3.2. Sensor damage

Follow the instructions thoroughly to avoid damage to sensor and camera. Work in a dust-free environment ( $\leq$  class 100,000) with low humidity.

## 4. Warranty precautions

Allied Vision warranty does not cover any damage to the sensor as soon as the cover glass or the circular protection foil is removed. TCG and RCG cameras have the standard 3 year warranty on the electronics, but excluding sensor.

## 5. Instructions

### 5.1. Unpacking cameras



#### Keep camera packaging

We recommend to keep the camera packaging:

- To store the camera.
- To ship the camera back in case of damage.

1. Open the shipping box.
2. Take out the ESD bag with the camera.
3. Take the camera out of the ESD bag.

### 5.2. Checking the camera function

With this simple test you can check that the sensor of your new Allied Vision camera is working properly. No lens is required.

1. Connect the camera to a PC.
2. Start **Vimba Viewer** to acquire an image.
3. Remove the lens cap from the lens mount.
4. Wave your hand in front of the sensor.

The Vimba Viewer shows a camera image of a moving shadow. This proves proper camera function.

5. For RCG cameras, continue with: [5.3. Preparing RCG cameras](#) on page 2.
- For TCG cameras, continue with: [5.4. Preparing TCG cameras](#) on page 3.

### 5.3. Preparing RCG cameras

1. With your finger tips, starting from the edge, slowly pull the circular protection foil from the lens mount until removed completely.

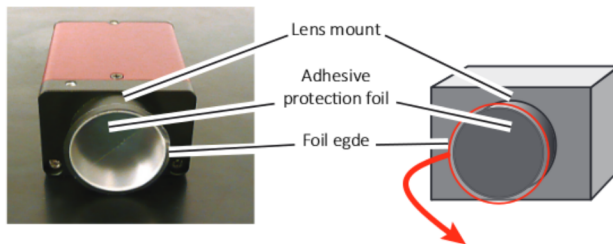


Figure 1: Pulling the circular protection foil off the lens mount

2. Continue with: [5.5. Mounting the lens](#) on page 14.

## 5.4. Preparing TCG cameras



### About the following instructions

The instructions consist of multiple steps. We recommend you read the instructions first to get an orientation on camera preparation.

Front housing assemblies for Prosilica GT cameras differ between Extended Format housing and Large Format housing. For Prosilica GT cameras, continue with

[5.4.1. Disassembling Prosilica GT Extended Format housing cameras](#) on page 3 or with

[5.4.2. Disassembling Prosilica GT Large Format housing cameras](#) on page 5.

For other cameras, continue with [5.4.3. Removing the taped cover glass](#) on page 8.

### 5.4.1. Disassembling Prosilica GT Extended Format housing cameras

1. Power off and unplug the camera.
2. With a water resistant ink pen, draw a line (1) across the joint between front assembly and body assembly. This will serve as an index to reassemble the camera in correct orientation.
3. Loosen and remove the four M2 x 8 socket head cap screws of the front assembly.

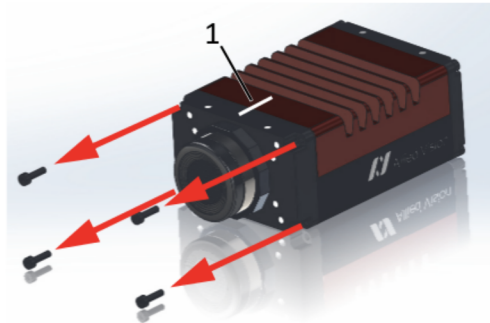


Figure 2: Removing the four M2 x 8 socket head cap screws of the front assembly

4. Detach the front assembly (2) from the body assembly (3).

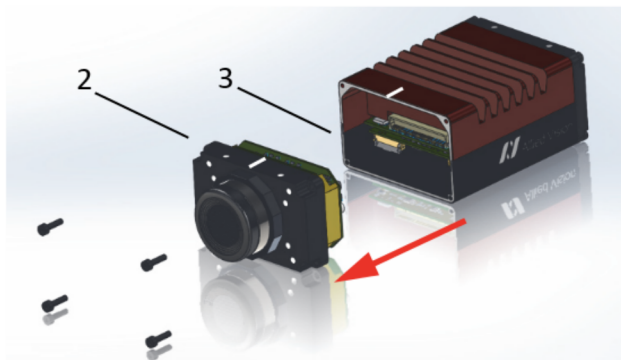


Figure 3: Detaching the front assembly

The front assembly consists of the sensor unit (1) and the lens mount (2). The sensor unit must be kept in one piece to avoid damage to the sensor.

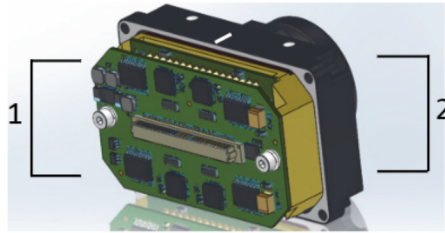


Figure 4: Front assembly overview: sensor unit and lens mount



#### NOTICE

##### Damage to the sensor

If you must reassemble the sensor unit, do not put the sensor surface down facing the PCB, as it can damage the sensor.

- Keep the sensor unit in one piece.
- If PCBs have been separated, place the sensor PCB on top with the sensor surface facing the lens mount.

8. With a water resistant ink pen, draw a line (3) across the joint between sensor unit and front assembly.
9. Loosen the two M2 x 16 socket head cap screws (4) of the sensor unit, keeping screws in place.

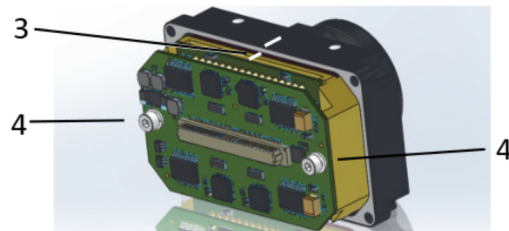


Figure 5: Loosening the two M2 x 16 socket head cap screws

9. Keeping screws (4) in place, remove the sensor unit (1) from the lens mount (2).

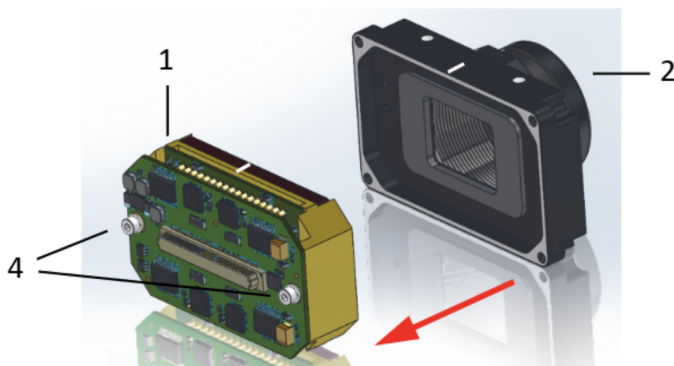


Figure 6: Removing the sensor unit from the lens mount

10. Continue with 5.4.3. [Removing the taped cover glass](#) on page 8.

### 5.4.2. Disassembling Prosilica GT Large Format housing cameras

1. Power off and unplug the camera.
2. Loosen and remove the four M2 x 10 socket head cap screws of the front assembly.

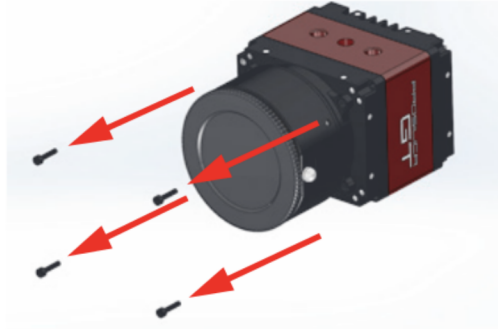


Figure 7: Removing the four M2 x 10 socket head cap screws of the front assembly

3. Flip the front assembly (3) by approximately 45° to the right side of the body assembly (4). For the next steps, avoid mechanical stress to the ribbon cable (1). The ribbon cable is included only for cameras with certain mount options.
4. Disengage the flexible contact bar (2).

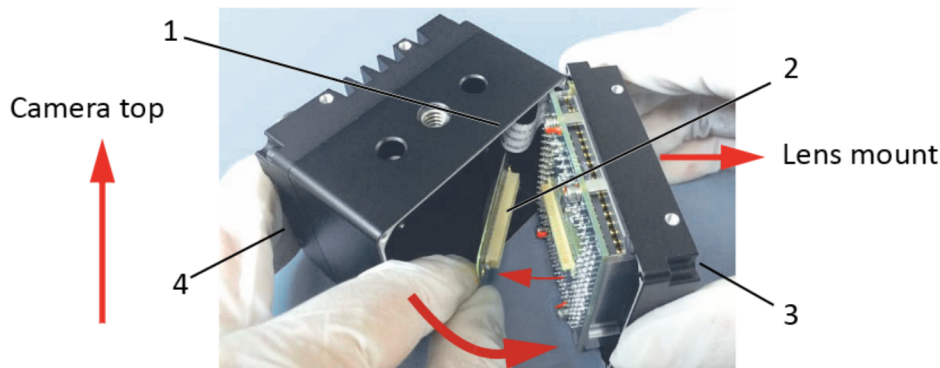


Figure 8: Flipping front assembly away from the body assembly

5. Continue to flip open the front assembly to an angle of 180° and position the sections next to each other on the workbench



#### Continuing the disassembly

Keep the camera flipped open as described in step 5.  
 The illustrations of the next action steps are schematics.


**Continuing the disassembly**

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The illustrations of the next action steps are schematics.

The front assembly consists of the sensor unit (1) and the lens mount (2).



Figure 9: Front assembly overview: sensor unit and lens mount

- Remove the two M2 x 10 socket head cap screws (3) and spacers from the sensor unit.

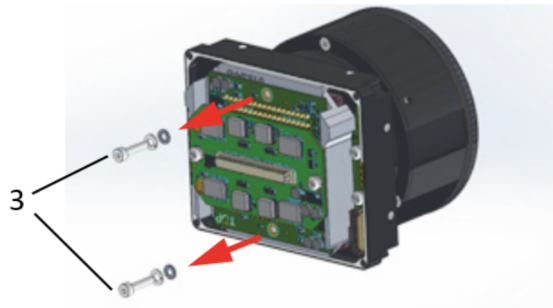


Figure 10: Loosening the two M2 x 10 socket head cap screws and spacers

- With a water resistant ink pen, draw a line (4) across the center top of sensor unit and front assembly.
- Remove the sensor unit (1) from the lens mount (2).

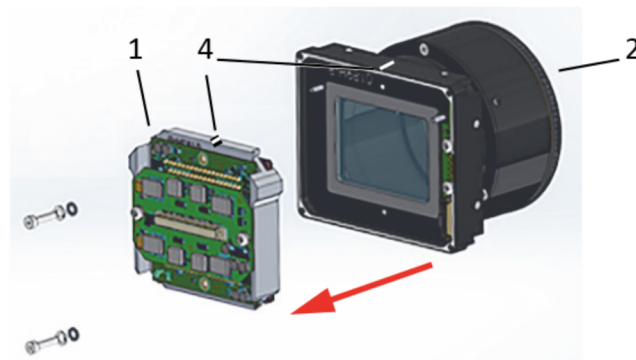


Figure 11: Removing the sensor unit from the lens mount

You have access to the sensor.

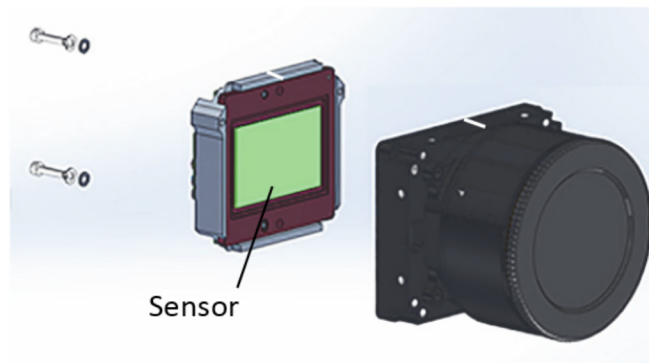


Figure 12: sensor unit and sensor

9. Continue with [5.4.3. Removing the taped cover glass](#) on page 8.

### 5.4.3. Removing the taped cover glass

At delivery, sensors of TCG cameras are protected by the cover glass fixed by adhesive tapes. This section instructs on removing these tapes and the cover glass.



#### Sensor access for cameras with filter or protection glass

For some cameras, filter or protection glass must be removed, see [5.6.5.6. Handling cameras with filter or protection glass](#) on page 14.



#### Ease handling

- Use a magnifying glass for better view.
- Read the instructions thoroughly and keep tools at hand for camera preparation.



#### Use of the term "camera" in this section

In this section, the term "camera" includes sensor units of Prosilica GT cameras.

Required tools	Tools short names	Purpose
Base magnifier or microscope	Magnifying glass	For better view
Wooden spatula	Spatula	To keep the cover glass in position until removed
Precision screwdriver	Screwdriver	To lift up the adhesive tapes
Pinch nose pliers	Pliers	To pull off the adhesive tapes
Circular protection foil (optional)	Circular protection foil	To protect the sensor during camera storage before final hardware installation

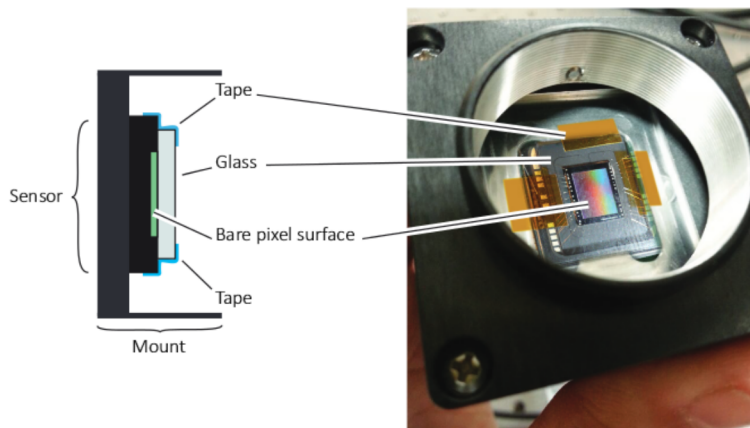


Figure 13: Sensor with TCG

1. Place the camera facing sensor side up on your work bench.
2. Place the magnifying glass above the camera, with sufficient space to access the TCG and the adhesive tapes with tools.



3. Take the spatula with your left hand.
4. With the spatula, push the cover glass down to keep the sensor protected.  
**Keep pushing down with the spatula until step 15.**

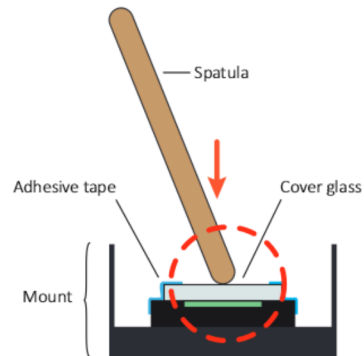


Figure 14: Spatula pushing down the cover glass

5. Take the screwdriver with your right hand.
6. On the left side of the sensor, carefully push the tool tip of the screwdriver against the corner of the adhesive tape until it starts to come off. Continue lifting up the corner, until pliers can get a grip.

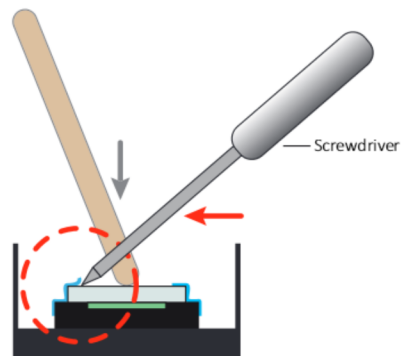


Figure 15: Screwdriver lifting up the adhesive tape

7. Put the screwdriver aside and take the pliers.
8. **Keep pushing down with the spatula until step 15.**

9. With the pliers, grip the detached corner of tape and slowly pull it off the cover glass and off the sensor baseplate.

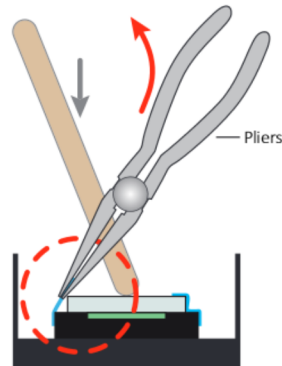


Figure 16: Pliers pulling the adhesive tape off the sensor

10. Strip off the tape from the pliers.
11. Put the pliers aside.
12. Repeat steps 5. to 11., until all adhesive tapes have been removed from the sensor.
13. With one hand pushing the spatula pushing against the cover glass, take the camera into the other hand.
14. Rotate the camera with the lens mount facing down.
15. Slowly release the spatula from the cover glass until it drops out of the lens mount.

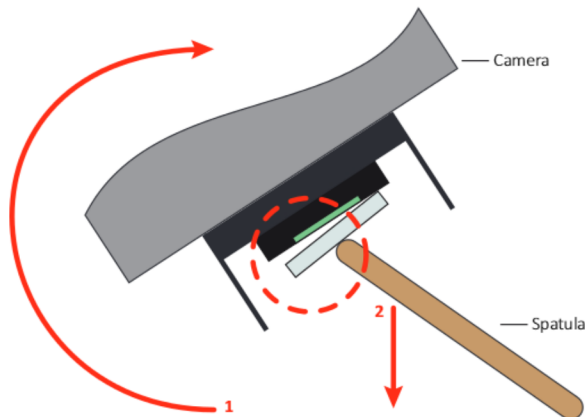


Figure 17: Rotating the camera to drop the cover glass



#### Storing cameras after the cover glass has been removed

If you want to store the camera at this stage, fix a circular protection foil to the lens mount to protect the sensor.

16. For Prosilica GT cameras, continue with [5.4.4. Reassembling Prosilica GT Extended Format housing cameras](#) on page 11 or with [5.4.5. Reassembling Prosilica GT Large Format housing cameras](#) on page 13. For other cameras, continue with [5.5. Mounting the lens](#) on page 14.

#### 5.4.4. Reassembling Prosilica GT Extended Format housing cameras

1. Position sensor unit and lens mount, so that markers (3) align.
2. Keeping screws (1) and spacers in place, fit the sensor unit (2) as a unit into the lens mount (4)

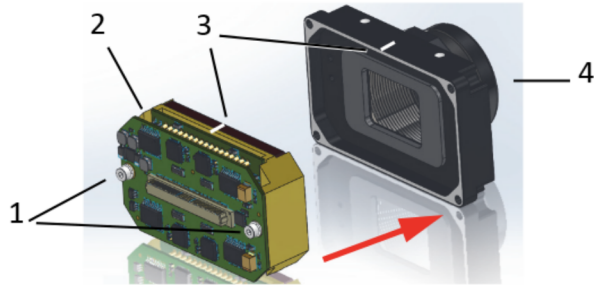


Figure 18: Fitting the sensor unit from into the lens mount

3. Tighten the two M2 x 16 socket head cap screws (1) at a maximum torque of 4 lbf-in (0.45 Nm).

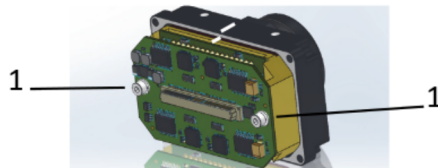


Figure 19: Tightening the two M2 x 16 socket head cap screws (4)

4. Position front assembly and body assembly, so that markers (5) align.
5. Mount the front assembly (4) to the body assembly (6).

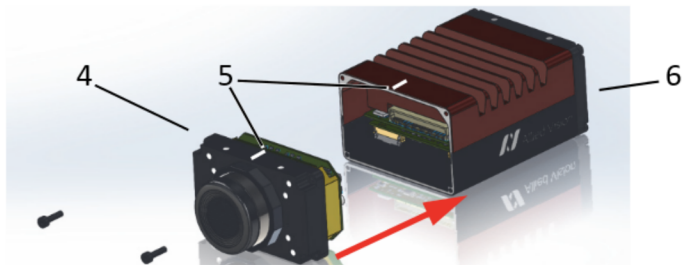
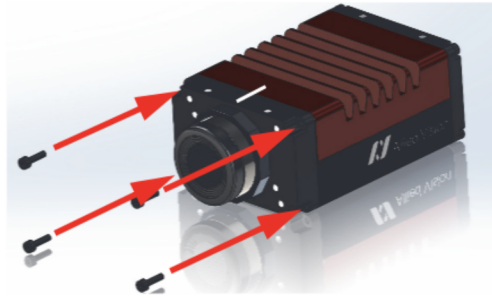


Figure 20: Mounting the front assembly to the body assembly

6. Insert and tighten the four M2 x 8 socket head cap screws at a maximum torque of 4.5 lbf-in (0.51 Nm).



*Figure 21: Inserting and tightening the four M2 x 8 socket head cap screws of the front assembly*

#### 5.4.5. Reassembling Prosilica GT Large Format housing cameras

1. Position sensor unit (1) and lens mount (3), so that markers (2) align.
2. Fit the sensor unit (1) into the lens mount (3).

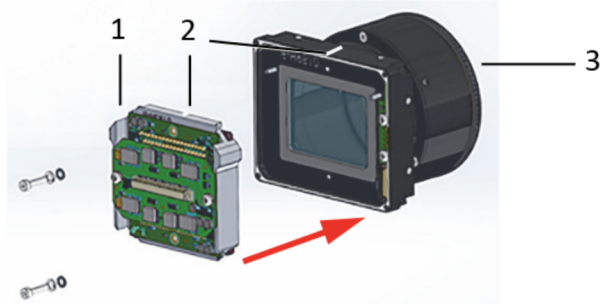


Figure 22: Fitting the sensor unit into the lens mount

3. Put one drop of Loctite 290 threadlocker on the threads of the two M2 x 10 socket head cap screws (4). Insert screws and spacers (4) and tighten screws at a maximum torque of 3.5 lbf-in (0.4 Nm).

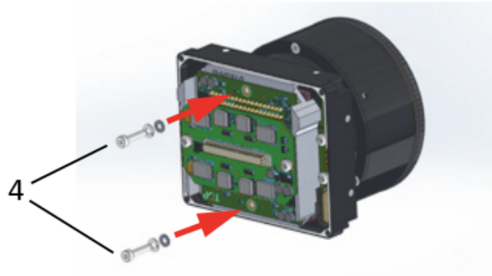


Figure 23: Inserting the two M2 x 10 socket head cap screws

4. Flip the front assembly (7) back to the body assembly (8) to approximately 45°.
5. Engage the flexible contact bar (6) to the mating contact bar.
6. Avoid bending or squeezing the ribbon cable (5):  
Flip the front assembly (7) back to the body assembly (8) and close the camera.

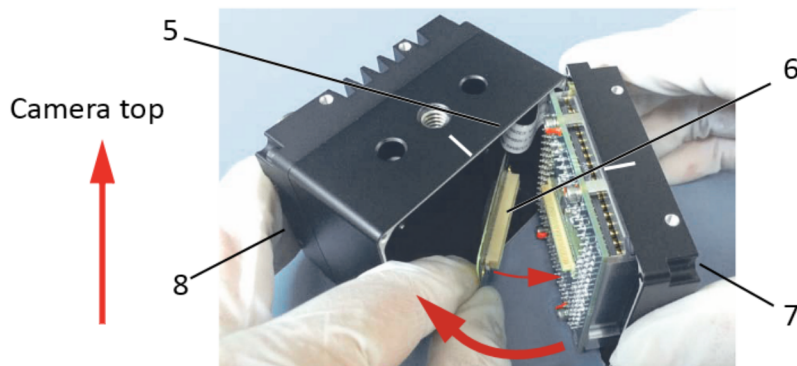


Figure 24: Rejoining the front assembly with the body assembly

7. Insert and tighten the four M2 x 10 socket head cap screws at a maximum torque of 4 lbf-in (0.45 Nm).

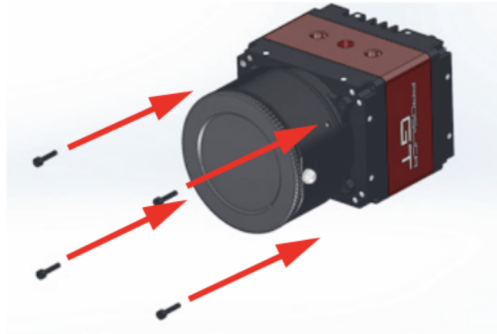


Figure 25: Inserting the four M2 x 10 socket head cap screws of the front assembly

## 5.5. Mounting the lens



### NOTICE

#### Damage to the sensor

If you want to use your camera without lens, observe [Safety notes](#) on page 1.



### NOTICE

#### Damage to sensor and lens

If the lens exceeds maximum protrusion, camera or lens may be damaged.

To avoid damaging the sensor or the back lens, use lenses with a maximum protrusion within camera specifications. For details, see your camera's technical manual.

1. Mount the lens according to the manual of the lens or of the camera.

## 5.6. Handling cameras with filter or protection glass

For cameras delivered with filter or protection glass, filter mount with IR-cut filter or protection glass must be removed.

Required tool	Tool short name	Purpose
E9020001 Filter removal tool (pin spanner wrench)	Wrench	To remove the filter mount

### 5.6.1. Removing filter or protection glass

1. Insert the wrench into the lens mount, cautiously engage the pins of the wrench into the holes of the filter mount.
2. Rotate the wrench counter-clockwise to unscrew the filter mount.

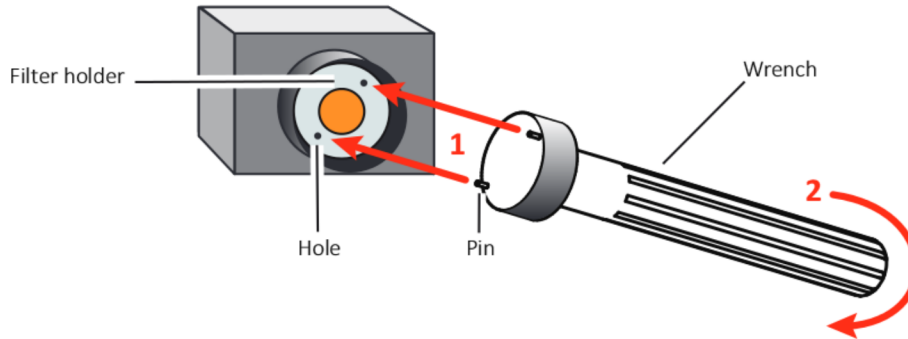


Figure 26: Removing the filter mount

3. With the filter mount unscrewed, slowly move the wrench out of the lens mount, so that the filter mount lies on top of the tool.
4. Take the filter mount from the wrench and store it in a clean and dry place.

### 5.6.2. Remounting filter or protection glass

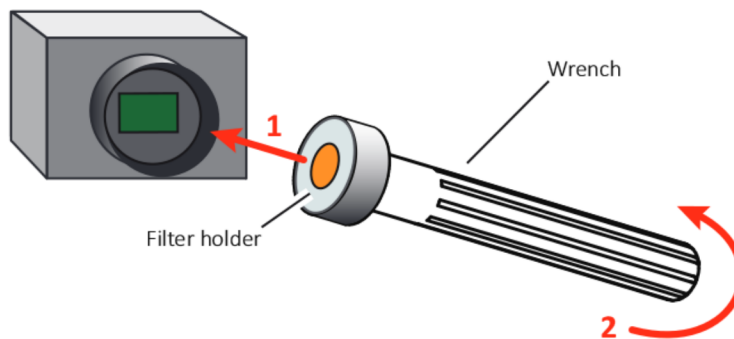


Figure 27: Remounting the filter mount

1. Place the filter mount on the wrench.
2. Insert the wrench into the lens mount, until the filter mount touches the thread.
3. Rotate the wrench counter-clockwise, until you feel the filter mount engage into the thread.
4. Screw in the wrench clockwise at a maximum torque of 8 lbf-in.
5. Move the wrench out of the lens mount.
6. Immediately mount a lens to the camera or close the lens mount with a circular protection foil for storage.

## 5.7. Focus recalibration

When the sensor cover glass has been removed, lenses would not focus to infinity anymore. To compensate for this, Manta G-145B cameras with RCG options are calibrated for use without sensor cover glass. You do not have to recalibrate these cameras.

Should lens mounts have to be recalibrated for Prosilica GT cameras, follow the instructions in the technical manual.



### **Prosilica GT Technical Manual**

Download the *Prosilica GT Technical Manual* from “Product documentation” at <https://www.alliedvision.com/en/support/technical-documentation.html>.

## 6. Contact

For technical support, please contact [support@alliedvision.com](mailto:support@alliedvision.com).

For comments or suggestions regarding this document, please contact [info@alliedvision.com](mailto:info@alliedvision.com).

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