

APPLICATION NOTE

Preparing Cameras without Sensor Cover Glass

Alvium, Manta, Prosilica GT

V3.0.1
2022-Sep-27

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 sensor option
TCG	Taped Cover Glass sensor option

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 (class 100 or better) with humidity according to ESD requirements.

4. Warranty conditions

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 **warranty on the electronics, but excluding sensor**:

Camera series	Alvium housed cameras	Alvium bare board cameras	Manta	Prosilica
Electronics warranty	3 years	2 years	3 years	3 years

Table 1: Warranty duration by camera series



Warranty conditions

For the warranty of cameras and sensors, see www.alliedvision.com/en/support/warranty.

5. Common instructions



NOTICE

Damage to the camera electronics and sensor

- Work in a dust-free environment (class 100 or better) with humidity according to ESD requirements.
- Observe notes for 3.1. [Electrostatic discharge \(ESD\)](#) on page 1.
- Follow the instructions thoroughly.

5.1. Unpacking cameras



Keep 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** or another Viewer application to acquire an image.
3. Wave your hand in front of the sensor.
The viewer shows a camera image of a moving shadow. This proves proper camera function.
4. Continue with the corresponding instructions:
 - [6. Instructions for housed Alvium cameras – RCG](#) on page 3
 - [7. Instructions for Alvium bare board cameras – TCG](#) on page 4
 - [8. Instructions for Manta cameras – RCG](#) on page 7
 - [9. Instructions for Prosilica GT cameras – TCG](#) on page 8.

6. Instructions for housed Alvium cameras – RCG

At delivery, sensors of RCG cameras are protected by the circular protection foil placed on the lens mount. This section instructs on removing the circular protection foil and mounting the lens.



NOTICE

Damage to the camera electronics and sensor

- Work in a dust-free environment (class 100 or better) with humidity according to ESD requirements.
- Observe notes for [3.1. Electrostatic discharge \(ESD\)](#) on page 1.
- Follow the instructions thoroughly.

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

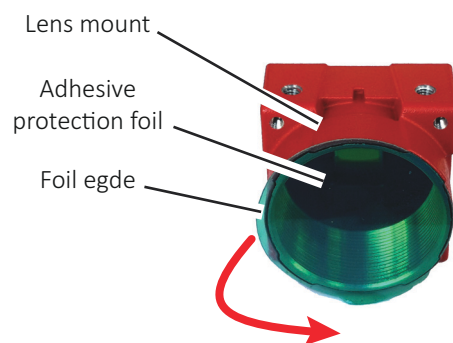


Figure 1: Pulling the circular protection foil off the lens mount



NOTICE

Damage to the sensor

If you want to use your camera without lens, observe [3. 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 user guide.

2. Mount your optics according to the manual of the lens manufacturer and the Alvium user guide.

Without compensation, cameras could be focused to infinity after the sensor cover glass has been removed. Therefore, Alvium RCG cameras are calibrated for proper focus before shipping.

7. Instructions for Alvium bare board cameras – TCG

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. Note that you must mount bare board cameras into housings immediately after the TCG has been removed.



NOTICE

Damage to the camera electronics and sensor

- Work in a dust-free environment (class 100 or better) with humidity according to ESD requirements.
- Observe notes for [3.1. Electrostatic discharge \(ESD\)](#) on page 1.
- To protect the sensor from dirt, mount the camera into a housing immediately.
- Follow the instructions thoroughly.



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 user guide.



About the following instructions

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



Ease handling

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



Required tools

Before you can remove the TCG, please obtain the required tools shown below.

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

Table 2: Required tools to remove a TCG

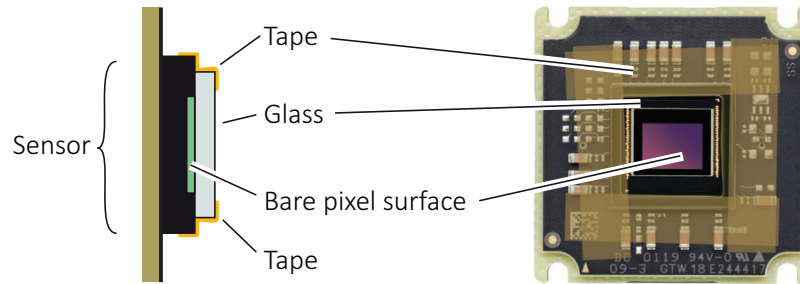


Figure 2: Sensor with TCG (schematic view)

1. Place the camera on your work bench, with the sensor side facing up.
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 one hand.
4. With the spatula, push the cover glass down to keep the sensor protected.
Keep pushing down with the spatula until step 15.

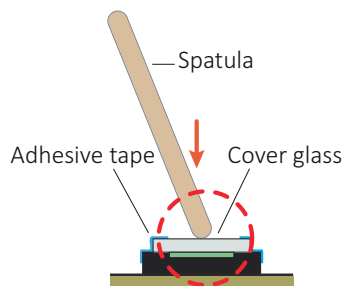


Figure 3: Spatula pushing down the cover glass (schematic view)

5. Take the screwdriver with the other 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.

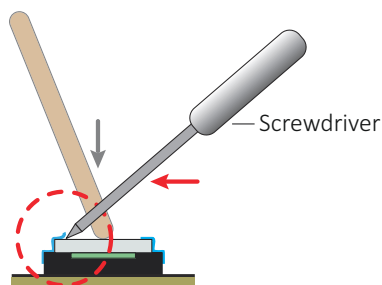


Figure 4: Screwdriver lifting up the adhesive tape (schematic view)

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.

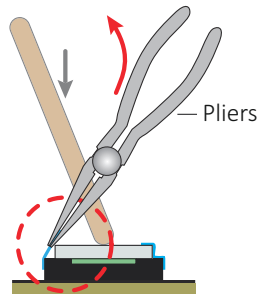


Figure 5: Pliers pulling the adhesive tape off the sensor (schematic view)

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 against the cover glass, take the camera into the other hand.
14. Rotate the camera with the sensor facing down.
15. Slowly release the spatula from the cover glass until it disengages from the camera.

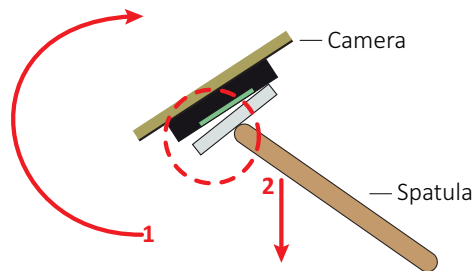


Figure 6: Rotating the camera to drop the cover glass (schematic view)



NOTICE

Damage to the sensor

If dirt penetrates the sensor surface, the sensor can be damaged.

- To protect the sensor from dirt, mount the camera into a housing immediately.

8. Instructions for Manta cameras – RCG

At delivery, sensors of RCG cameras are protected by the circular protection foil placed on the lens mount. This section instructs on removing the circular protection foil and mounting the lens.



NOTICE

Damage to the camera electronics and sensor

- Work in a dust-free environment (class 100 or better) with humidity according to ESD requirements.
- Observe notes for [3.1. Electrostatic discharge \(ESD\)](#) on page 1.
- Follow the instructions thoroughly.

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

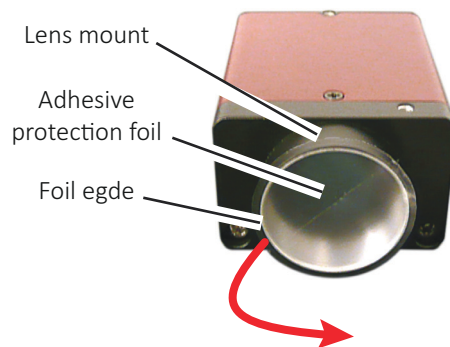


Figure 7: Pulling the circular protection foil off the lens mount



NOTICE

Damage to the sensor

If you want to use your camera without lens, observe [3. 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 user guide.

2. Mount your optics according to the manual of the lens manufacturer and the Manta User Guide.

Without compensation, cameras could be focused to infinity after the sensor cover glass has been removed. Therefore, Manta RCG cameras are calibrated for proper focus before shipping.

9. Instructions for Prosilica GT cameras – TCG

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, starting to disassemble the camera in order to get access to the sensor.



NOTICE

Damage to the camera electronics and sensor

- Work in a dust-free environment (class 100 or better) with humidity according to ESD requirements.
- Observe notes for [3.1. Electrostatic discharge \(ESD\)](#) on page 1.
- Follow the instructions thoroughly.



About the following instructions

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

For Prosilica GT **Extended Format housing** cameras, start with [9.1. Disassembling Prosilica GT Extended Format housing cameras](#) on page 8.

For Prosilica **GT Large Format housing** cameras, start with [9.2. Disassembling Prosilica GT Large Format housing cameras](#) on page 10.

9.1. Disassembling Prosilica GT Extended Format housing cameras

1. Power off and unplug the camera.
2. With a water resistant ink pen, draw a line (a) 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.

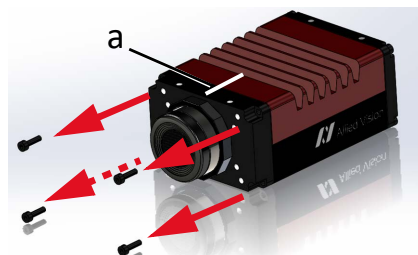


Figure 8: Removing the four M2 x 8 socket head cap screws of the front assembly

4. Detach the front assembly (b) from the body assembly (c).

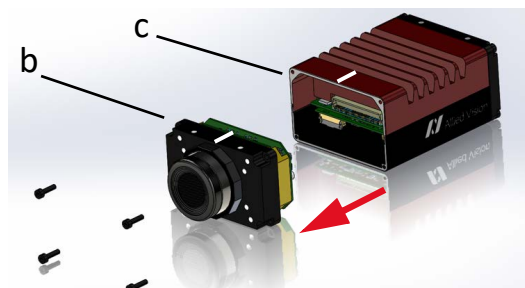


Figure 9: Detaching the front assembly

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

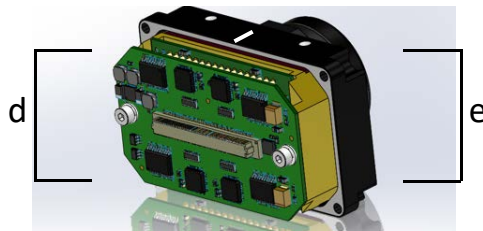


Figure 10: Front assembly overview: sensor unit and lens mount



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.

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

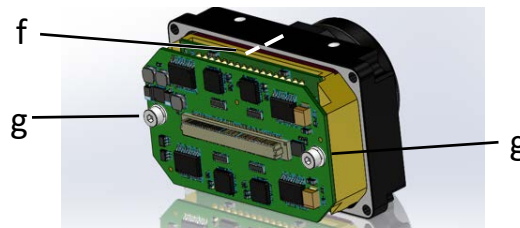


Figure 11: Loosening the two M2 x 16 socket head cap screws

7. Keeping screws (h) in place, remove the sensor unit (i) from the lens mount (k).

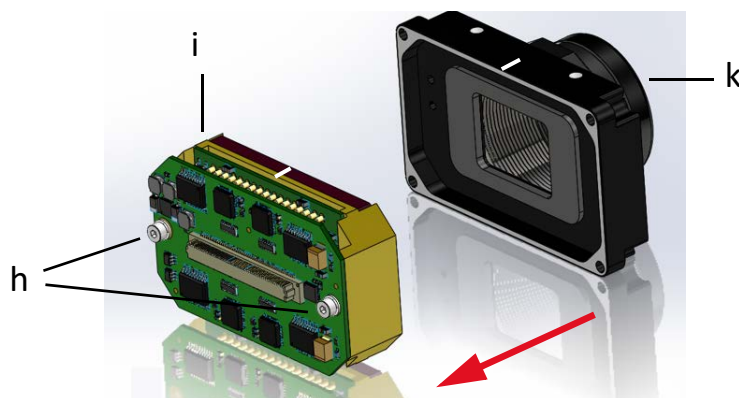


Figure 12: Removing the sensor unit from the lens mount

- Continue with [9.3. Removing the taped cover glass](#) on page 12.

9.2. 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.

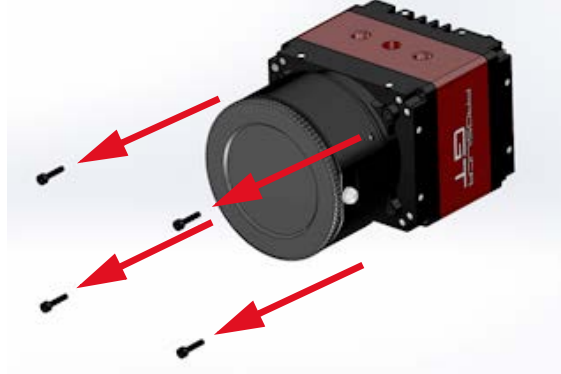


Figure 13: Removing the four M2 x 10 socket head cap screws of the front assembly

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

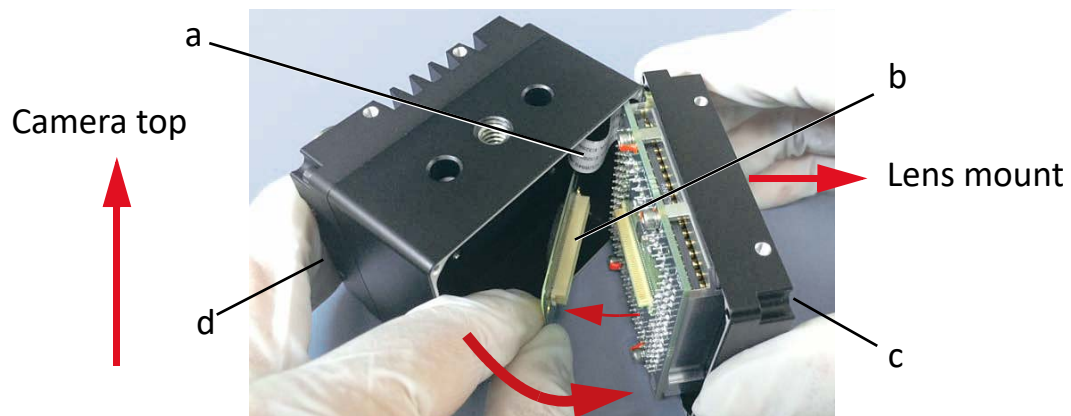


Figure 14: Flipping front assembly away from the body assembly

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

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

The front assembly consists of the sensor unit (e) and the lens mount (f).



Figure 15: Front assembly overview: sensor unit and lens mount

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

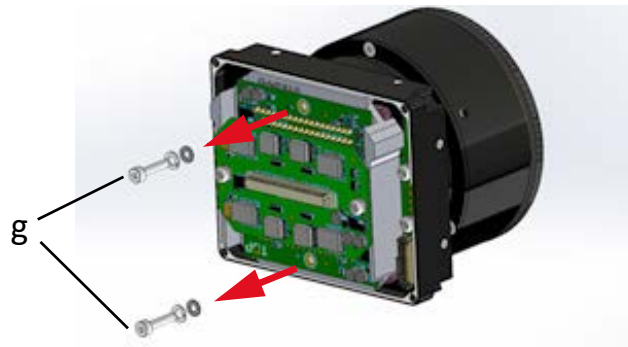


Figure 16: Loosening the two M2 x 10 socket head cap screws and spacers

7. With a water resistant ink pen, draw a line (i) across the center top of sensor unit and front assembly.
8. Remove the sensor unit (h) from the lens mount (k).

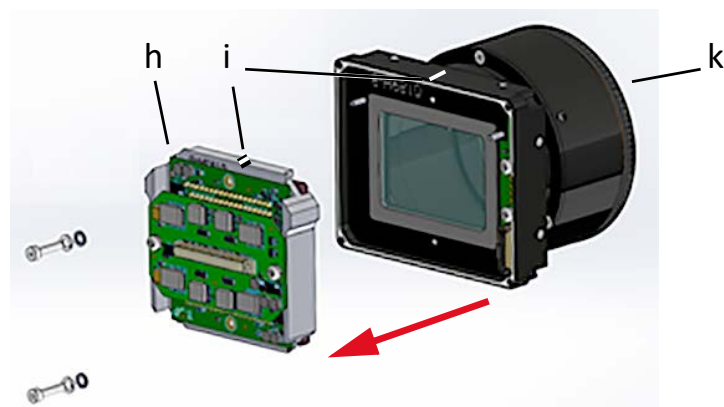


Figure 17: Removing the sensor unit from the lens mount

You have access to the sensor now.

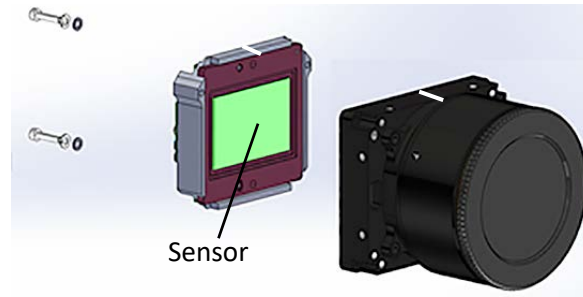


Figure 18: sensor unit and sensor

9. Continue with [9.3. Removing the taped cover glass](#) on page 12.

9.3. Removing the taped cover glass



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

Before you can remove the TCG, please obtain the required tools shown below.

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

Table 3: Required tools to remove a TCG

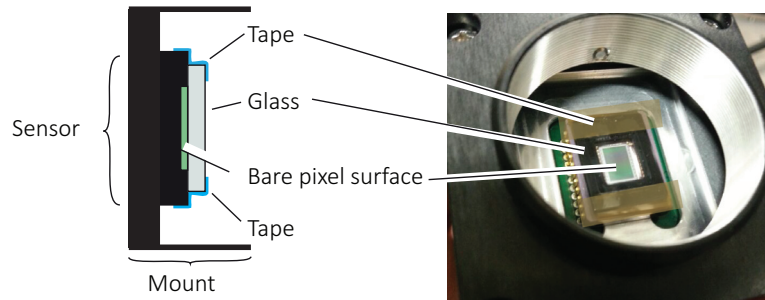


Figure 19: Sensor with TCG (schematic view)

1. Place the camera on your work bench, with the sensor side facing up.
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 one hand.
4. With the spatula, push the cover glass down to keep the sensor protected.
Keep pushing down with the spatula until step 15.

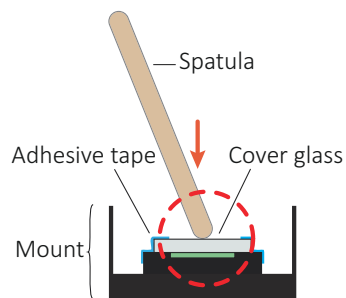


Figure 20: Spatula pushing down the cover glass (schematic view)

5. Take the screwdriver with the other 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.

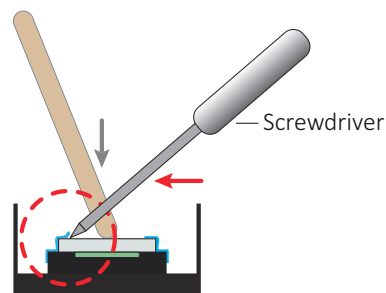


Figure 21: Screwdriver lifting up the adhesive tape (schematic view)

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 the tape and slowly pull it off the cover glass and off the sensor baseplate.

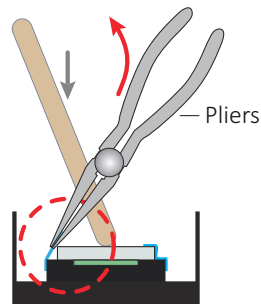


Figure 22: Pliers pulling the adhesive tape off the sensor (schematic view)

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 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.

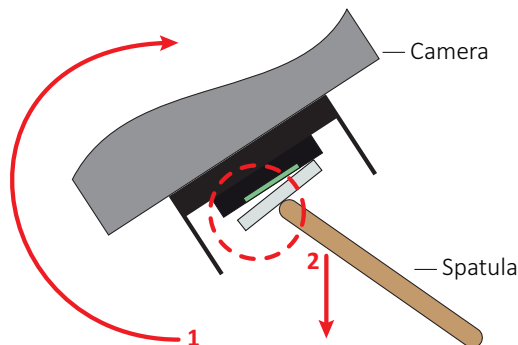


Figure 23: Rotating the camera to drop the cover glass (schematic view)



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 in order to protect the sensor.

16. Continue with
 - [9.4. Reassembling Prosilica GT Extended Format housing cameras](#) on page 15 for Prosilica GT **Extended Format housing** cameras
 - [9.5. Reassembling Prosilica GT Large Format housing cameras](#) on page 16 for Prosilica **GT Large Format housing** cameras.

9.4. Reassembling Prosilica GT Extended Format housing cameras

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

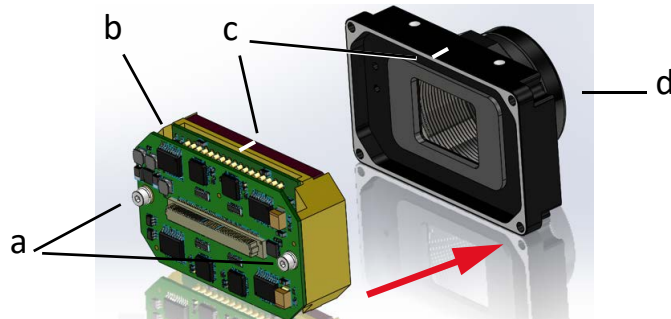


Figure 24: Fitting the sensor unit into the lens mount

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

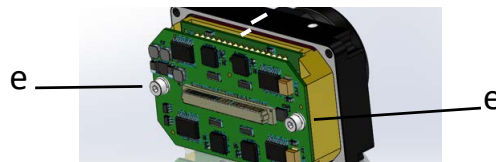


Figure 25: Tightening the two M2 x 16 socket head cap screws

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

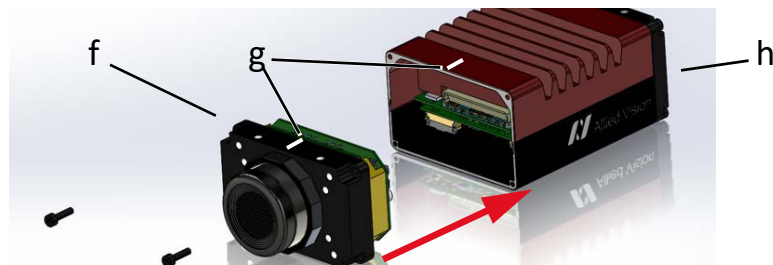


Figure 26: Mounting the front assembly to the body assembly

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).

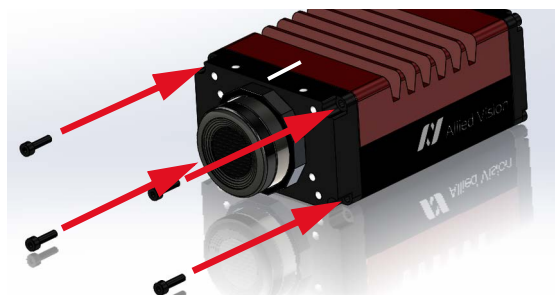


Figure 27: Inserting and tightening the four M2 x 8 socket head cap screws of the front assembly

9.5. Reassembling Prosilica GT Large Format housing cameras

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

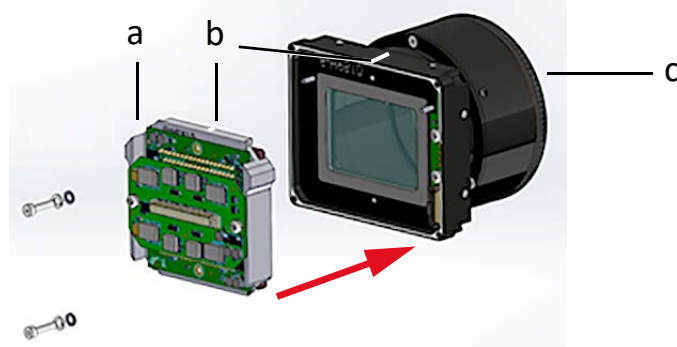


Figure 28: Fitting the sensor unit into the lens mount

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

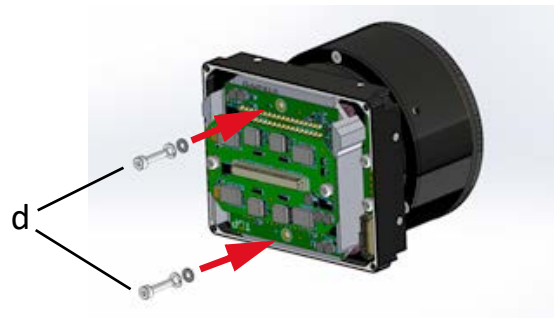


Figure 29: Inserting the two M2 x 10 socket head cap screws

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

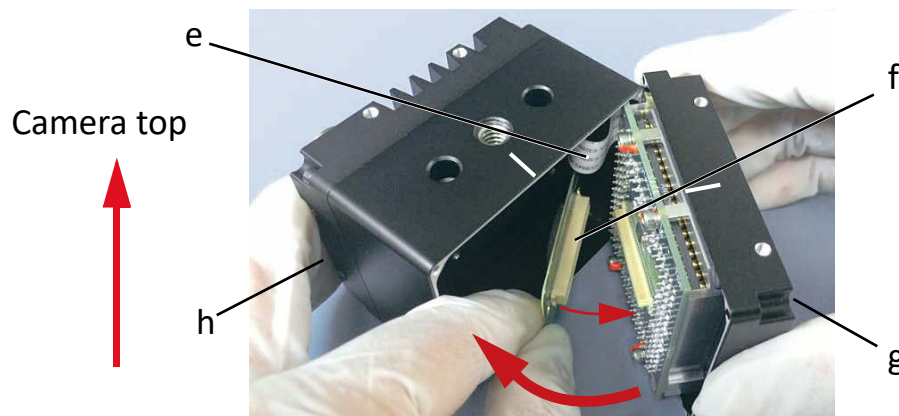


Figure 30: Rejoining the front assembly with the body assembly

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

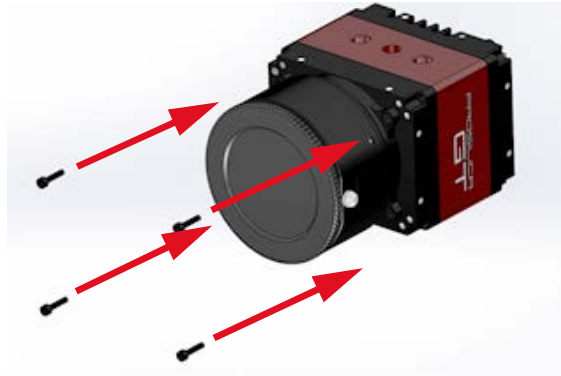


Figure 31: Inserting the four M2 x 10 socket head cap screws of the front assembly

9.6. Mounting the lens



NOTICE

Damage to the sensor

If you want to use your camera without lens, observe 3. [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 user guide.

- Mount your optics according to the manual of the lens manufacturer and the Prosilica GT User Guide.

9.7. Focus recalibration

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



Prosilica GT User Guide

Download the Prosilica GT User Guide from www.alliedvision.com/en/support/technical-documentation/prosilica-gt-documentation.

10. Contact us

Website, email

General

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info@alliedvision.com

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Offices

**Europe, Middle East, and Africa
(Headquarters)**

Allied Vision Technologies GmbH
Taschenweg 2a
07646 Stadtroda, Germany
T// +49 36428 677-0 (Reception)
T// +49 36428 677-230 (Sales)
F// +49 36428 677-28

Asia-Pacific**China**

Allied Vision Technologies
(Shanghai) Co., Ltd.
2-2109 Hongwell Int. Plaza
1602# ZhongShanXi Road
Shanghai 200235, China
T// +86 21 64861133

Singapore

Allied Vision Technologies Asia Pte. Ltd
82 Playfair Rd, #07-01 D'Lithium
Singapore 368001
T// +65 6634 9027

North, Central, and South America**Canada**

Allied Vision Technologies Canada Inc.
300 – 4621 Canada Way
Burnaby, BC V5G 4X8, Canada
T// +1 604 875 8855

USA

Allied Vision Technologies, Inc.
102 Pickering Way- Suite 502
Exton, PA 19341, USA
Toll-free// +1-877-USA-1394
T// +1 978 225 2030

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