PROTON CAMERA INNOVATIONS

Operational Manual

PROTON ZOOM

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2 Welcome

Dear content creator,

thank you for choosing our PROTON ZOOM for your next project.

PROTON ZOOM is the smallest broadcast zoom camera in the market with full image control, amazing 12 bit dynamic and ultra wide-angle shots.

This will give you spectacular new perspectives without compromising on quality.

The only limit is your imagination.

This **Operational Manual** gives you a short overview of how to operate the camera. Detailed information about the control interface can be found in the **Reference Manual**.

In case you are missing a feature in on our product, feel free to share your thoughts with us. We love to get your feedback to bring even more innovation into our products.

Your PROTON CAMERA INNOVATIONS Team.

FUTURE. MINI. CAMERA.

3 Technical data

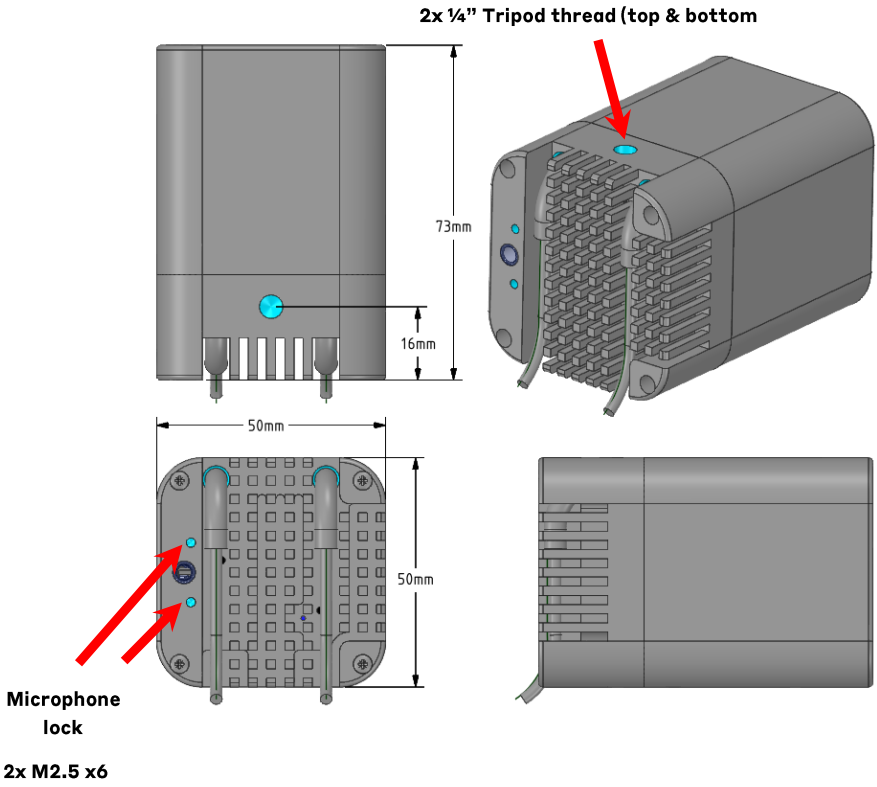
3.1 Overview

Size	50x50x73 mm
Weight	234 grams
Operation voltage	5 V – 25 V (Camera has reverse polarity protection)
Power	3.8 W (P60, cold camera)
Operational temperature	-30 ... 60 °C
Lens / FOV	Integrated motor lens with zoom (2.2x), focus and iris control. 55-115 degree horizontal viewing angle. F1.5 @115 degree wide angle F2.4 @55 degree narrow angle.
Sensor	1/1.8" 1920x1080 4 µm pixel 7.68mm x 4.32mm – 8.8 mm diagonal. 12 bit dynamic (72 dB)
ISO Base sensitivity	75 – 2400 200 – 6400 (low light mode)
Shutter	6 µs ... 1/FPS
Video modes	1920x1080 SDI 1.5G / 3G P23, P24, P25, P29, P30, P50, P59, P60, I50, I59, I60

Audio	3.5 mm stereo microphone audio socket. 48 Khz sampling rate 24 bit. 80 dBA Signal-to-Noise-Ration.

3.2 Dimensions

The camera has a size of 50x50x73 mm, refer to the technical drawing below for details.



3.3 Camera Mount

At the top and bottom of the camera is a ¼" tripod thread for easy mounting.

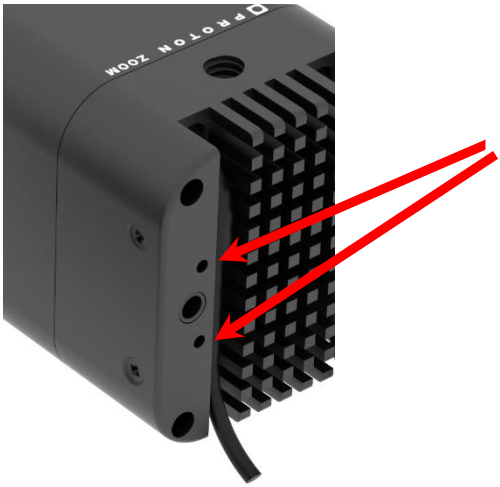
The camera can be mounted overhead, since the image can easily be flipped.

3.3.1 Audio Connector Lock

Next to the audio connector you find two M2.5x6mm threads.

These can be used to secure your audio connector.

We suggest designing a custom 3D printed holder depending on your connector type.

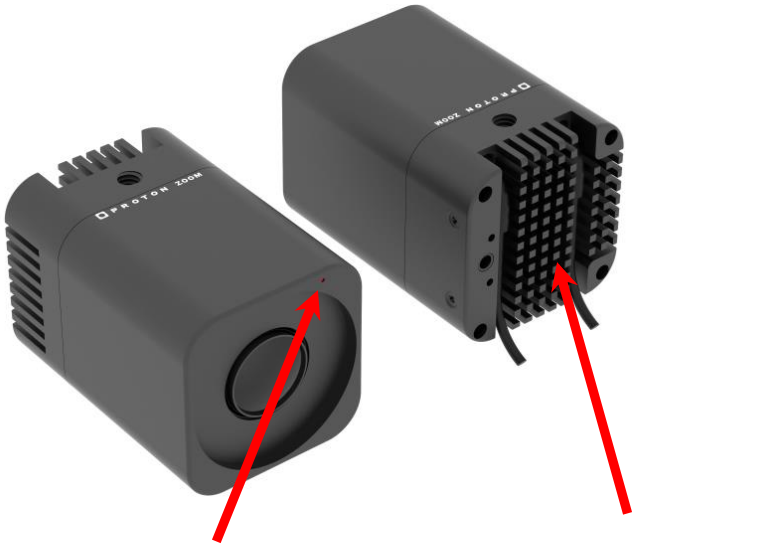


3.4 LEDs

The camera has two status lights:

- RGB LED for operational status on the backside:
  - Green / Cyan blinking: Boot
  - Blue blinking: Operation
  - Yellow blinking: Busy
  - Red blinking: Error
- Red Tally LED on the front: Can be controlled via software (**system tally** command)

Please Refer to the Reference Manual for more details.



3.5 Power and Heat Management

PROTON ZOOM has the lowest power consumption on the mini camera market (~3.5 W). The housing offers sufficient cooling.

You can optimize power on demand by the following factors.

Factor	Action
Temperature	The hotter the camera gets, the more power it will use: +20 °C (e.g. 50 → 70 °C) = +200 mW. Better mounting → Better cooling → Lower power consumption A cool camera consumes ~3.0 W at p60. In a hot environment it can go up to 3.8 W
Operational voltage	The efficiency of the power supply depends on the operating voltage. Best efficiency is achieved around 8 V, worst at 25 V (+/- 100 mW).
Video mode	p60 and i60 video modes have the highest power consumption. In case high frame rates are not needed, switching to p30 will save ~200 mW.
Scale factor	A bigger scale factor results in less power consumption. Switching from

	the lowest to the highest scale factor saves ~300 mW.

3.5.1 Overtemperature Protection

The camera has internal temperature monitoring and will shut down when over temperature is detected (90 °C). When the temperature drops sufficiently, the camera resumes operation.

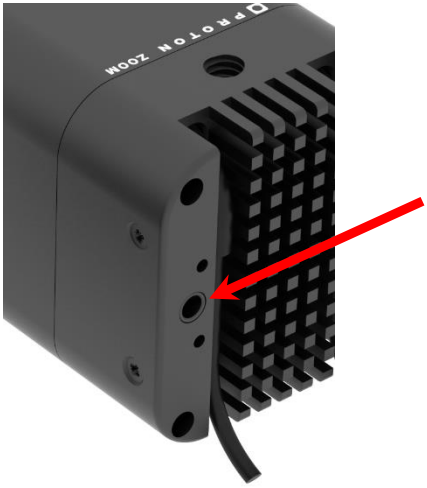
Over temperature events are logged and can be checked using the **system error** and **system temp count** commands (see Reference Manual for details). Note that the error log is not persistent and must be read before the camera gets powered off. The over temperature event counter is stored persistently.

Usually this only happens in very hot environment (e.g. desert, direct sun light).

4 Connection

The camera has two connection cables and a socket:

- **Power / Control Cable:** Hirose HR10A-7P-6P(73)
  - Power
  - RS485 (120 Termination in camera)
- **Coax Cable:** Belden 179DT with BNC Plug
- **3.5 mm audio socket** on the backside for microphone or line-in.



3.5mm audio socket

Power can be supplied in 4 ways:

- Connect to a CyanView CIO: https://support.cyanview.com/docs/Manuals/CI0/CI0Manual

- Connect to a power supply (sold separately: PCI-ACC-PSU) or a PC with a PROTON PIO box (sold separately: PCI-ACC-PIO).
- Use a breakout cable (sold separately, ref: PCI-ACC-FOUT).
- Cut the power cable and use a custom power supply.

4.1 Power / Control Cable

Signal	Cable color	Breakout Cable	HR10A-7P-6P pin
RS485 A+	white	white	1
RS485 B+	black	green	2
GND	blue	black	5
Power	brown	red	6

The Hirose HR10A-7P-6P(73) connector is directly compatible with a **Cyanview CIO** (www.cyanview.com) for simple integration.

4.2 Coax Cable

The coax cable transports the 3 Gbit SDI video signal. Bad extension cables or unprofessional shortening may cause signal loss. This work should only be done by trained experts and checked with an SDI analyzer to confirm the required performance is achieved.

The following components and tools from www.coax-connectors.com are used in the camera:

- Cable: Belden 179DT
- BNC Straight Jack: 75R 12GHz - 10-500-W126

- Stripper: 96-312D
- Crimping Tool: 96-336J
- BNC Plug 75R: 10-005-B36-ABl

4.3 Coax Cable Extension

3G signals are very sensitive to bad cables or wrong way of cable extension. This leads to no or instable image (drop out).

The camera has a 1.8m (6 feet) cable but can be extended with **ONE HIGH QUALITY barrel connector** or SDI extension cable.

For extension the following cables have been tested as a reference. SDI defines 40dB loss for maximum cable length.

This table is based on conservative 35dB for additional headroom.

Cable type	Length 3G SDI
RG179	5m
RG-59	5m
Vector 08/3.7	10m
Belden 1694A	40m
Belden 4694A	50m

4.4 Cable Handling

The cables are directly mounted into the camera and are clamped internally, so they will not slip out.

The design of the housing is done in a way that enables the cables to be routed in different directions. This simplifies integration in tight spaces.

The cables are sensitive to breaking. Therefore, do not bend the cables many times around tight corners.

In case the camera is mounted permanently, this is not an issue. For rental cameras, hard bending is not recommended since the cable can develop an internal break. Please advise the rental partner.

Damage to the cable is not covered by the warranty but can be repaired at our service center for a fee.

The camera is very tough but be nice to it 😉.

4.5 Audio Connector

The 3.5mm audio socket supports microphone or line input.

Pin	Signal
1	Left
2	Right
3	GND

The ADC includes an analogue amplifier with 40 dB gain to adapt to any application.

The audio connector supports 3 types of input signals.

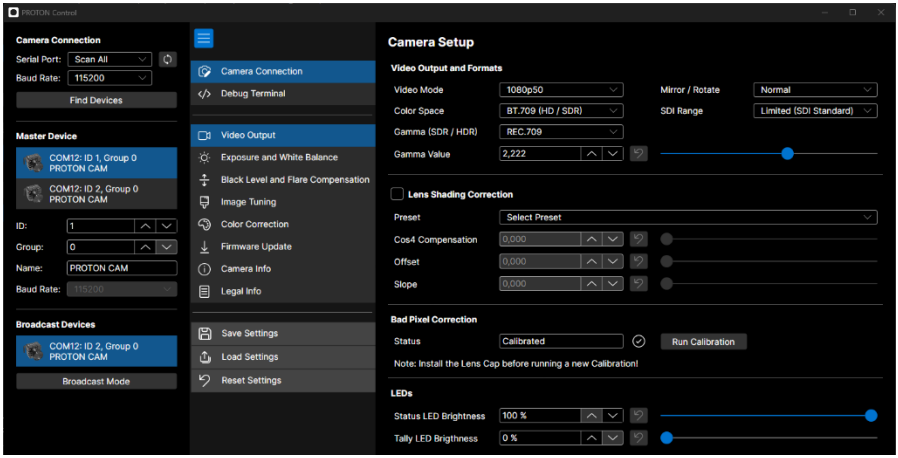
- **Electret microphone**
  - 2.5 V bias can be enabled in PROTON Control
- **Dynamic microphone**
- **Any line in signal**
  - Wireless receiver
  - Amplifier with line out
  - Computer (isolation transformer recommended)

6 Control

The camera is controlled via an RS485 interface. Details about the PROTON OS protocol can be found in the Reference Manual.

The camera is supported by Cyan View RCPs with CIO. Just plug and play to operate the camera:
www.cyanview.com

The camera can also be controlled by our easy-to-use PROTON Control software which is available for PC and MAC and can be downloaded here:
www.proton-camera.com/downloads

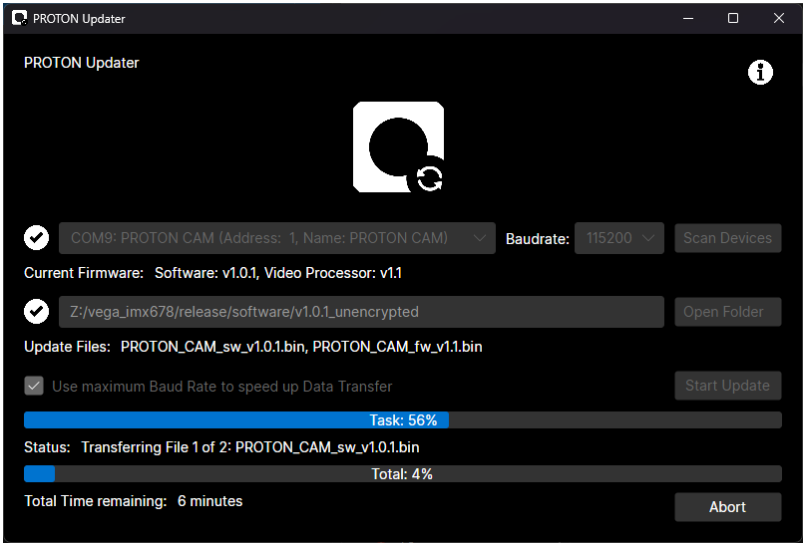


7 Firmware Update

The camera's firmware can be updated by the customer. For this a PROTON PIO (ref: PCI-ACC-PIO) and a PC or MAC are required.

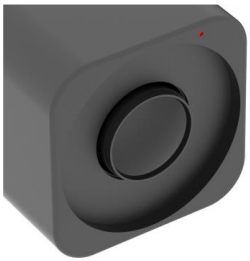
The PROTON Updater software can be found on: www.proton-camera.com/downloads.

Refer to the Reference Manual for details on the firmware update process.



8 Lens Care

For transport it is recommended to cover the lens with the provided lens cover:



Important: Make sure that the lens is not in wide angle position as in this position the cover may touch the lens.

In case the lens touches the cover, it can get scratched during transportation.

If the camera is started with the cover attached, the motor calibration fails. This will lead to bad focus.

In this case just restart the camera without the cover to recalibrate it.

9 Safety

The camera gets warm during operation. This is normal on a passively cooled device.

Especially in a hot temperature environment, the temperature can reach above 60 °C.

Touching may be harmful or cause burns on longer contacts.

In case you operate the camera in those scenarios, take precautions when handling the camera.

The product is tested safe according to EN 62368-1 (2025-01).

It is recommended to use a solid camera mount to improve cooling, see chapter 3.5 for details on power and heat management.

The internal temperature is monitored to get an indicator of current operating condition. The camera is protected from over temperature. It will shut down in this case. When the temperature drops, the camera will resume operation. See chapter 3.5.1 for details on the over temperature protection.

10 Warranty

PROTON Camera Innovations GmbH warrants that this product will be free from defects in materials and workmanship for a period of **6 months** from the date of purchase. If a product proves to be defective during this warranty period, PROTON Camera Innovations GmbH, at its option, either will repair the defective product without charge for parts and labor or will provide a replacement in exchange for the defective product.

To obtain service under this warranty, you the Customer, must notify PROTON Camera Innovations GmbH of the defect before the expiration of the warranty period and make suitable arrangements for the performance of service. The Customer shall be responsible for packaging and shipping the defective product to a designated service center nominated by PROTON Camera Innovations GmbH, with shipping charges pre-paid. Customer shall be responsible for paying all shipping changes, insurance, duties, taxes, and any other charges for products returned to us for any reason.

This warranty shall not apply to any defect, failure or damage caused by improper use or improper or inadequate maintenance and care. PROTON Camera Innovations GmbH shall not be obligated to furnish service under this warranty: a) to repair damage resulting from attempts by personal other than PROTON Camera Innovations GmbH representatives to install, repair or service the product, b) to repair damage resulting from improper use or connection to incompatible equipment, c) to repair any damage or malfunction caused by

the use of non PROTON Camera Innovations GmbH parts or supplies, or d) to service a product that has been modified or integrated with other products when the effect of such a modification or integration increases the time or difficulty of servicing the product.

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11 Certifications

This equipment has been tested and found to comply with the limits for a Class B digital device in a residential environment according to the following rules:

- European Council Directive- EMC Directive 2014/30/EU.
- General Product Safety Directive (GPSD)
- RoHS Directive 2011/65/EU + 2015/863
- FCC rules part 15.

12 Recycling

You can return an old or damaged PROTON Camera Innovations product for recycling. The recycling is free of charge.

For recycling, please request an RMA form for your device via email from

weee@proton-camera.com

We need the following information:

- Subject: Recycling
- Product name
- Product serial number
    - Can be found on bottom of product

Please ship the product at your expense to our office, including the RMA form.

PROTON Camera Innovations GmbH
Fockestraße 10
30827 Garbsen
Germany

By sending in the product, it will be owned by Proton Camera Innovations GmbH and will be recycled according to German law.