



Player One



Professional Cooled Camera Manual V1.1

V1.1



Player One

Professional Cooled Camera Features

Cooled camera series is our most advanced product line

Rear/Front Sensor Tilt Plate

To obtain a flatter image field

When do solar imaging with prominence telescope, the Newton ring is annoying. Smoother solar image without Newton ring could be taken by adjusting the sensor tilt plate. Besides, when you use a planetary camera for DSO lucky imaging, if you found the stars in corner are not perfect, you can adjust the sensor tilt plate to obtain a flatter image field. get a much smaller field curvature of the telescope.

Deep cooling

High quality 2-stage TEC cooling system

Cooling system is the core of cooled camera, we did an innovation on it, can give deeper cooling than a lot of competitors.

DDR buffer

512MB DDR3 Buffer

It helps stabilize and secure data transmission, it effectively avoids frame dropping and greatly reduces readout noise. Buffer size is according to the total pixels of camera, we has 3 different buffer size for cooled camera line!

BFL Solution

Complete imaging train solution

Player One provide a lot of accessories for cooled cameras, such like filter wheel, filter drawer, OAG, adapters, can make sure the imaging system working on right BFL (back focal length).



Player One



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Player One

» 01

Camera line introduction

Over view of cooled camera line

One Map to understand cooled camera line



1. Camera line introduction



Cooled Camera Specification

| Model | Sensor | Format | Resolution | Total Pixel | Pixel Size | Noise | QE | FW | Delta-T | ADC | FPS | Exposure Range | Window | Bayer Pattern | Shutter | Weight | BFL |
|------------------|--------------|---------------------|------------|-------------|------------|-----------|------|--------|----------------|-------|--------|----------------|--------|---------------|---------|--------|--------|
| Poseidon-M PRO | IMX571 mono | 23.5×15.7mm (APS-C) | 6252×4176 | 26MP | 3.76μm | 3.9-1.0e | ≈91% | 71.7ke | -40°C±2°C | 16bit | 15FPS | 32μs-2000s | AR | - | Rolling | 650g | 17.5mm |
| Poseidon-C PRO | IMX571 color | 23.5×15.7mm (APS-C) | 6252×4176 | 26MP | 3.76μm | 3.9-1.0e | ≈80% | 71.7ke | -40°C±2°C | 16bit | 15FPS | 32μs-2000s | AR | RGGB | Rolling | 650g | 17.5mm |
| Artemis-M PRO | IMX492 mono | 19.2×13mm (4/3") | 8288×5648 | 47MP | 2.3μm | 7.7-1.46e | ≈90% | 18.6ke | -40°C±2°C | 12bit | 8FPS | 32μs-2000s | AR | - | Rolling | 650g | 17.5mm |
| Artemis-C PRO | IMX294 color | 19.2×13mm (4/3") | 4144×2824 | 11.7MP | 4.63μm | 7.8-1.2e | ≈75% | 65.8ke | -40°C±2°C | 14bit | 33FPS | 32μs-2000s | AR | RGGB | Rolling | 650g | 17.5mm |
| Ares-M PRO | IMX533 mono | 11.31×11.31mm (1") | 3008×3008 | 9MP | 3.76μm | 4.46-1e | ≈91% | 73ke | -35 °C ~ -40°C | 14bit | 43FPS | 32μs-2000s | AR | - | Rolling | 420g | 17.5mm |
| Ares-C PRO | IMX533 color | 11.31×11.31mm (1") | 3008×3008 | 9MP | 3.76μm | 4.46-1e | ≈80% | 73ke | -35°C ~ -40°C | 4bit | 43FPS | 32μs-2000s | AR | RGGB | Rolling | 420g | 17.5mm |
| Uranus-C PRO | IMX585 color | 11.2×6.3mm (1/1.2") | 3856×2180 | 8.3MP | 2.9μm | 6.5-0.7e | ≈91% | 47ke | -35°C ~ -40°C | 12bit | 47FPS | 32μs-2000s | AR | RGGB | Rolling | 420g | 17.5mm |
| Apollo-M MAX PRO | IMX432 mono | 14.5×9.9mm (1.1") | 1608×1104 | 1.7MP | 9μm | 22.9-2.6e | ≈79% | 100ke | -35°C ~ -40°C | 12bit | 126FPS | 32μs-2000s | AR | - | Global | 420g | 17.5mm |



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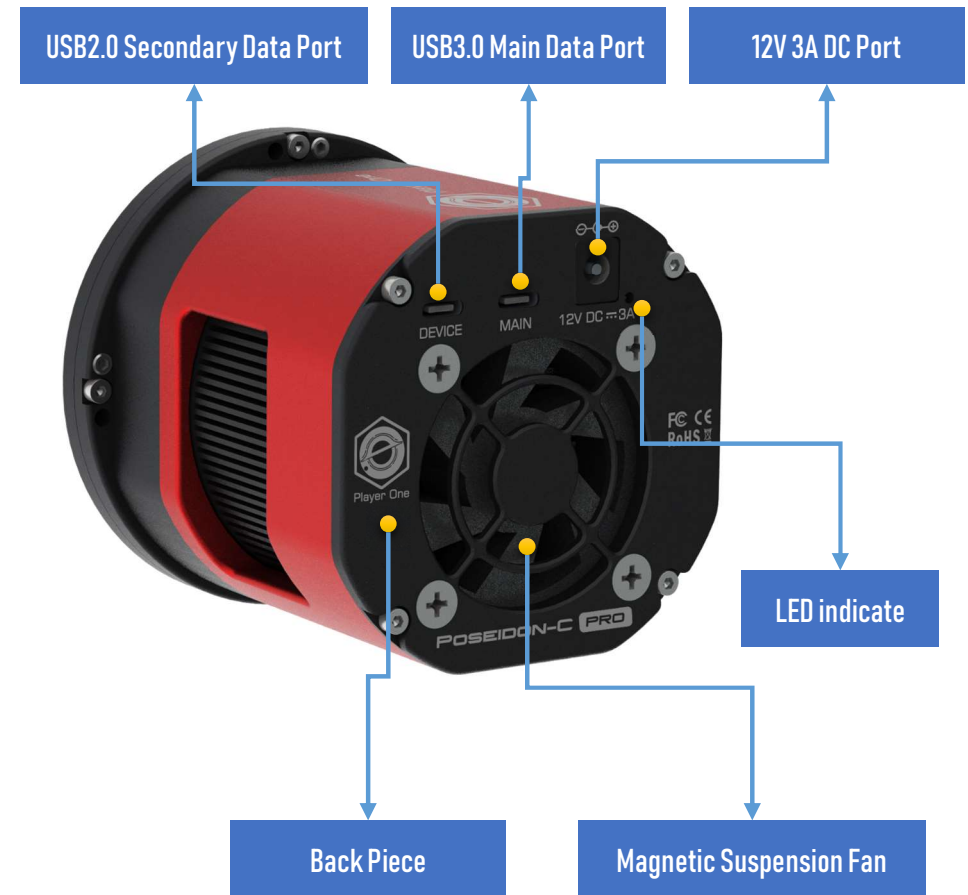
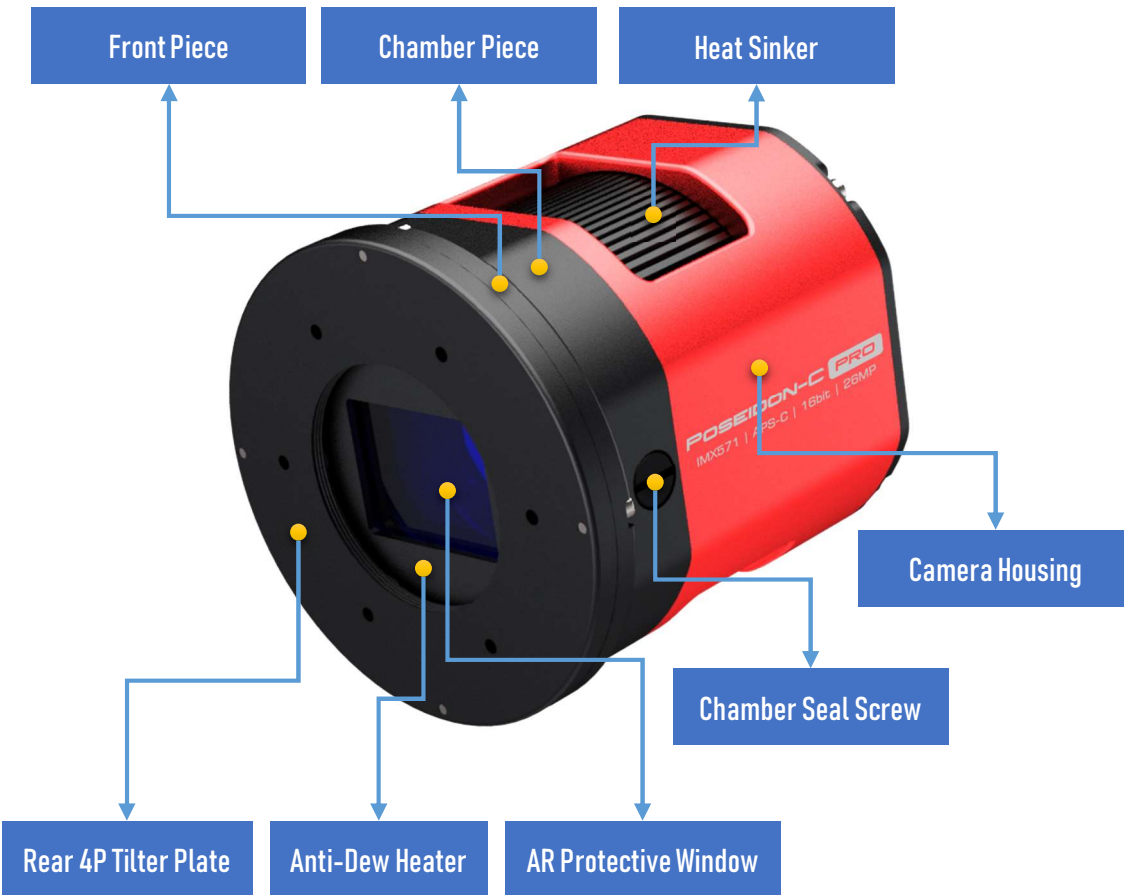
»

02

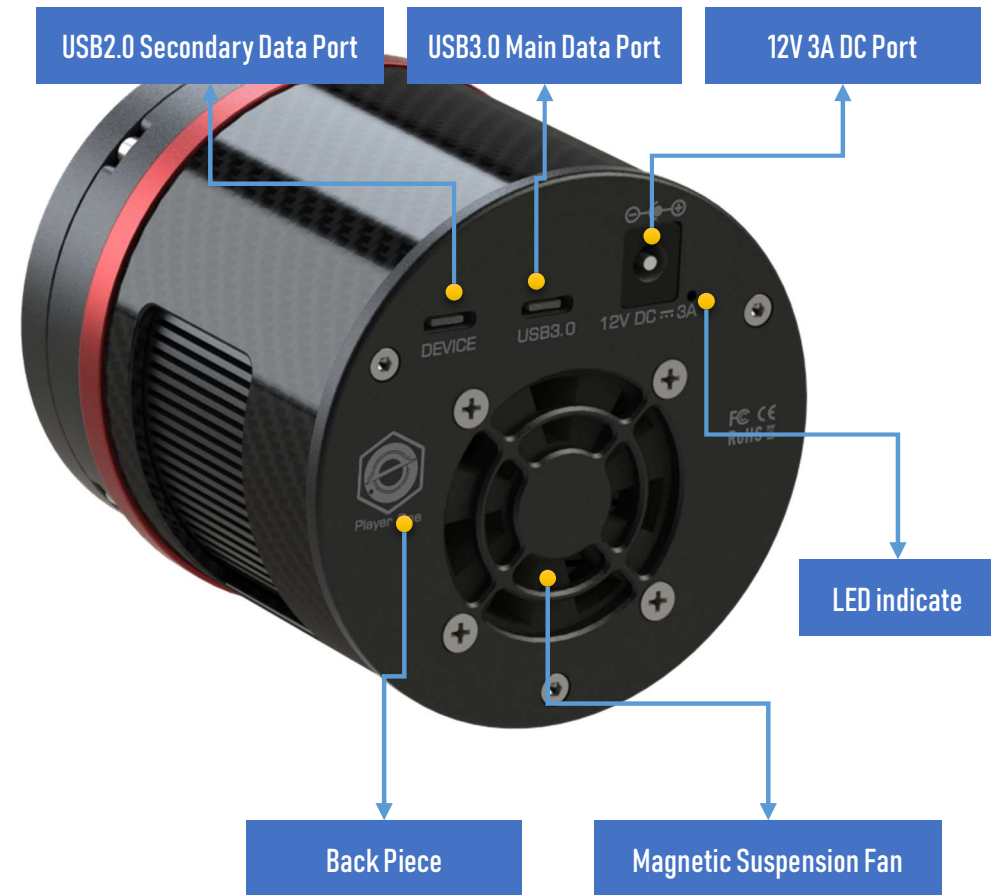
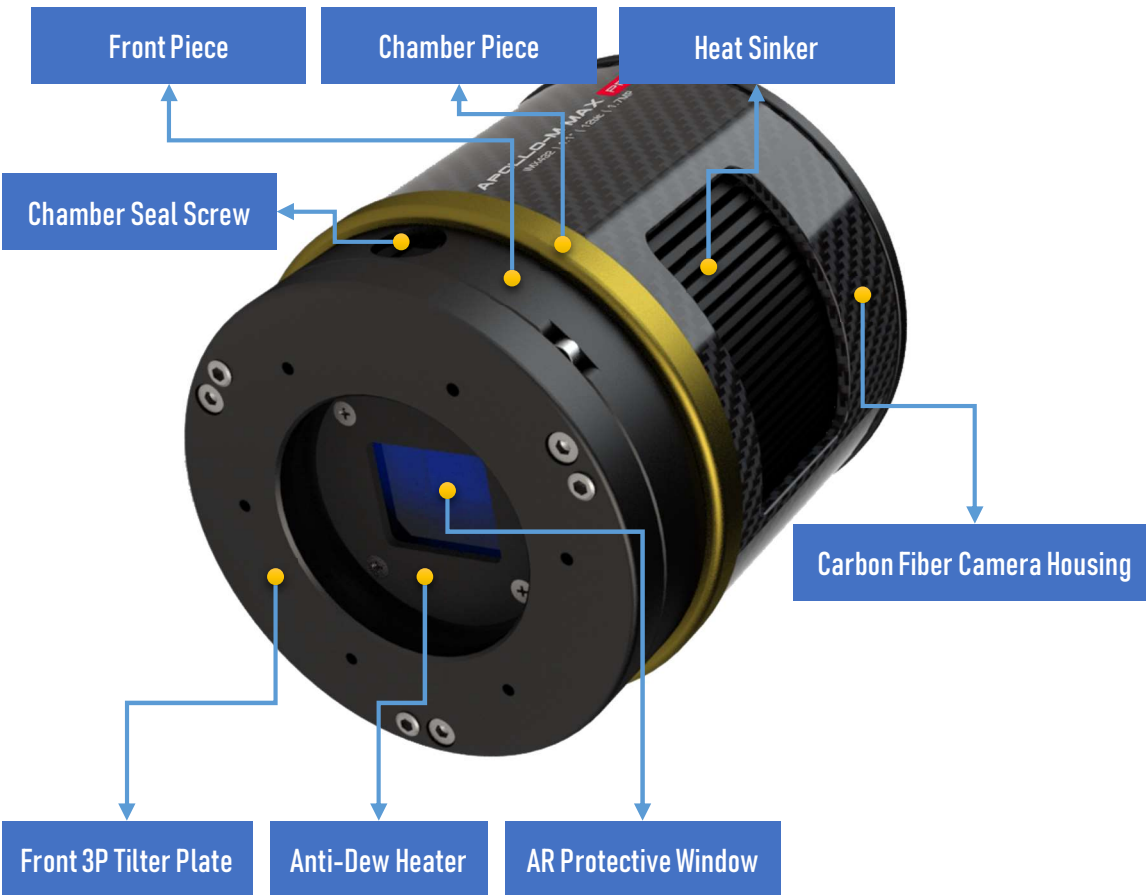
Camera external view

Familiar with cooled camera

2. Camera external view



2. Camera external view





Player One

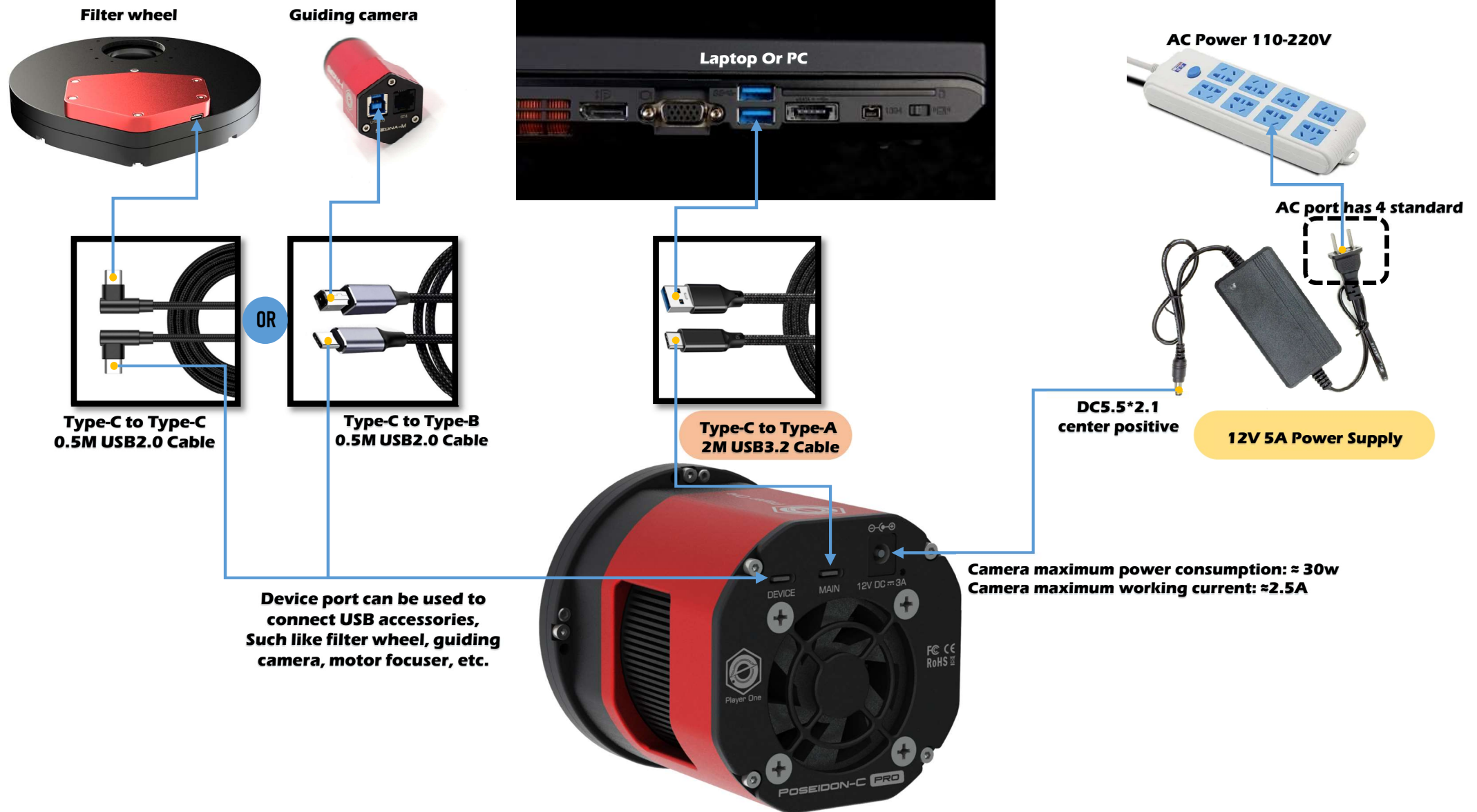


03

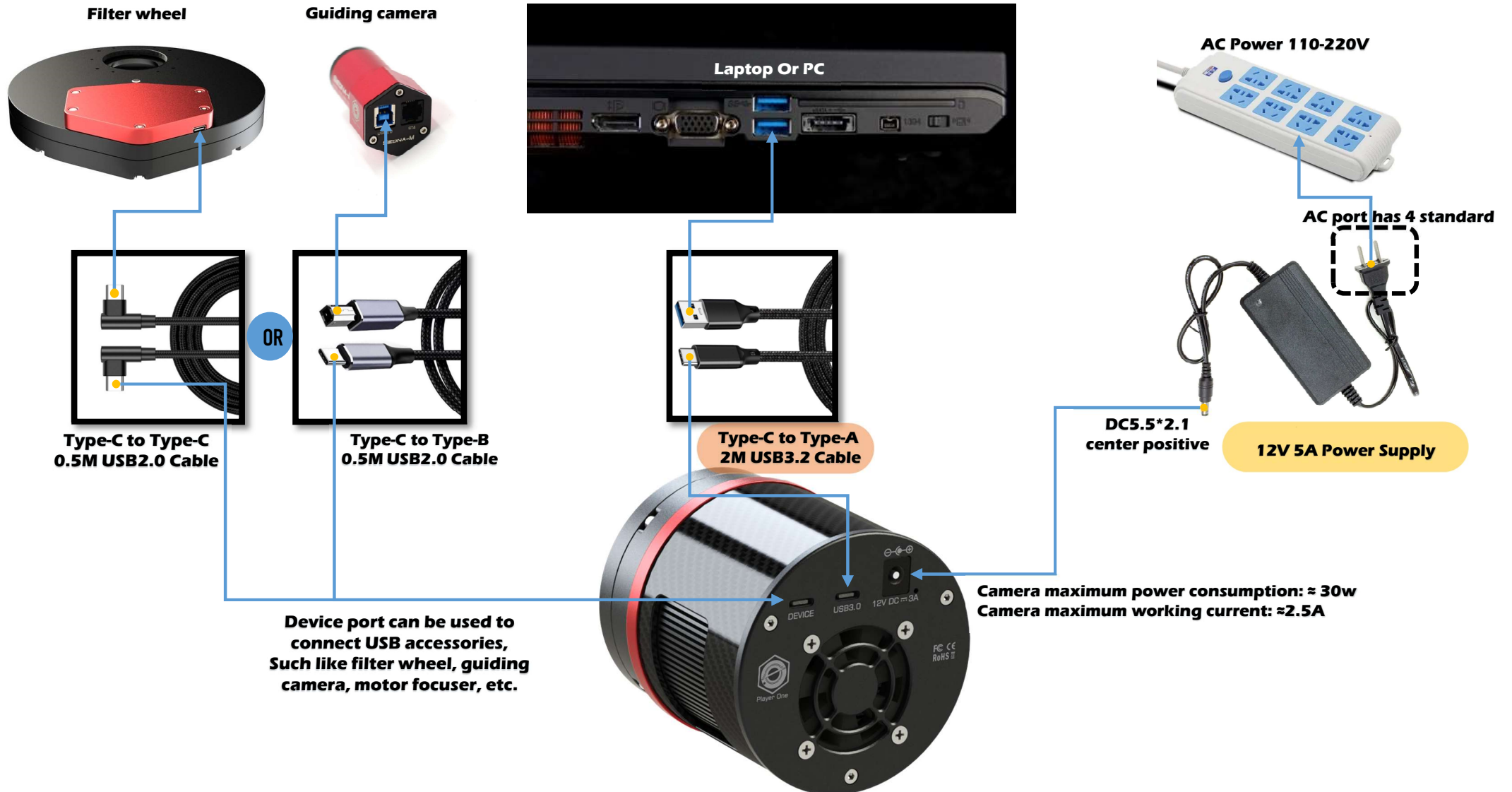
Cable connections

Familiar with all cables

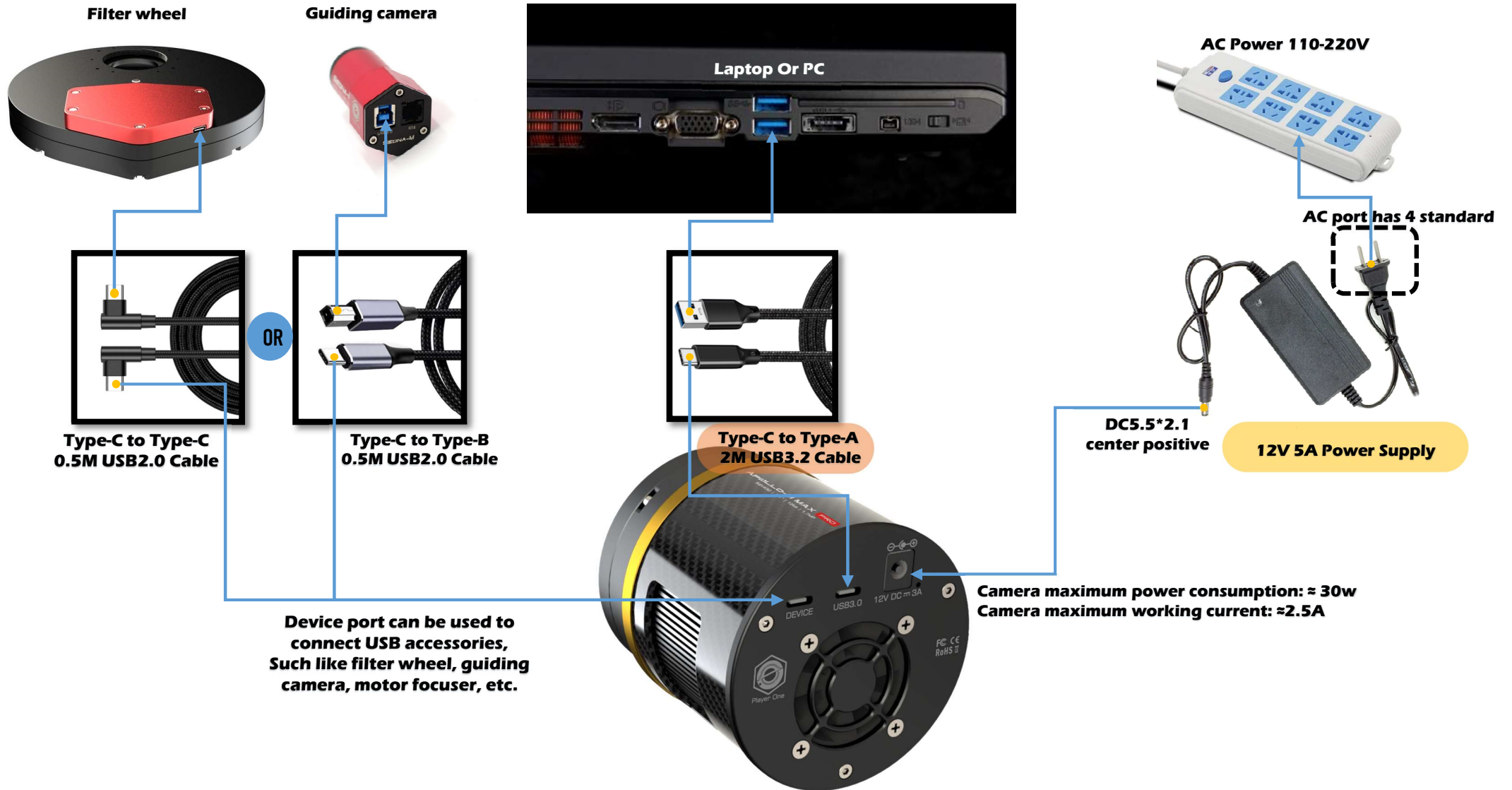
3. Cable connections



3. Cable connections



3. Cable connections

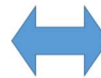


3. Cable connections

Optional accessory:

Power supply is necessary if you want to open cooling system of cooled camera. It has different adapter so we can't put it into camera standard package list.
Purchase link:

12V 5A AC to DC Power Supply



AC cable Length : 1.4 meter



UK Standard

For UK, UAE, Hong Kong, Singapore, Malaysia, Vietnam, Indonesia, etc.



EU Standard

For France, Italy, Sweden, Finland, Spain, Netherlands, Denmark, Norway, Poland, Austria, Portugal, Belgium, Hungary, Russia, South Korea, etc.



US Standard

For US, Japan, Canada, Brazil, Taiwan, etc.



CN Standard

For China, New Zealand, Australia, Argentina, etc.



Player One



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Driver and software installation

First time to run your camera

4.Driver and Software installation

1. Open Player One website to download:

<https://player-one-astronomy.com/service/software/>

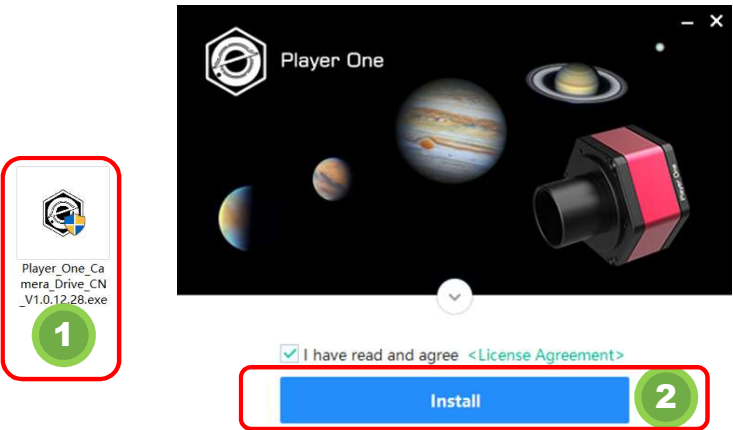
For planetary imaging, Sharpcap 4 and upper is supported.
 For DSO imaging, ASCOM 6.5 is supported.
 Windows 7/8/10/11 is supported.
 Linux and Mac OS is supported.

Home » Service » Software

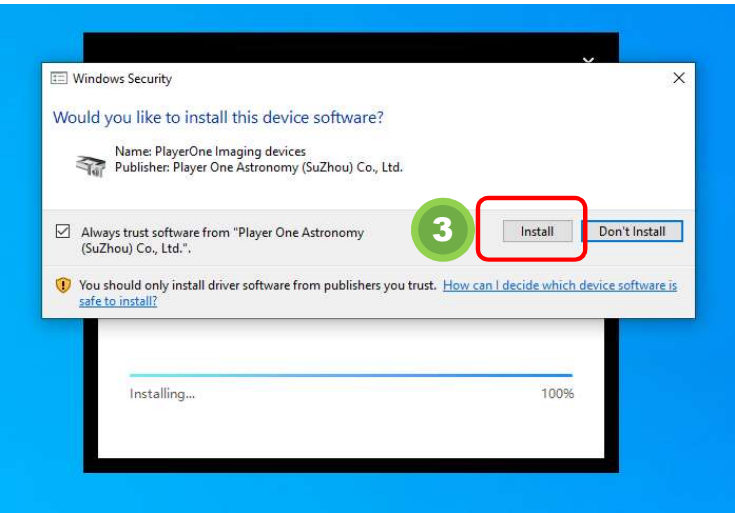
| Native Driver | | | | |
|---------------|--|-----------|----------------------|--------------------------|
| Camera Driver | Windows users must install the native driver to use the camera. | V1.1.2.4 | Released: 2021/02/04 | Download |
| Camera SDK | SDK is provided for developers to do secondary development based on Player One cameras | V1.1.2.25 | Released: 2021/02/25 | Download |

2. Driver installation (Don't connect the camera before installation)

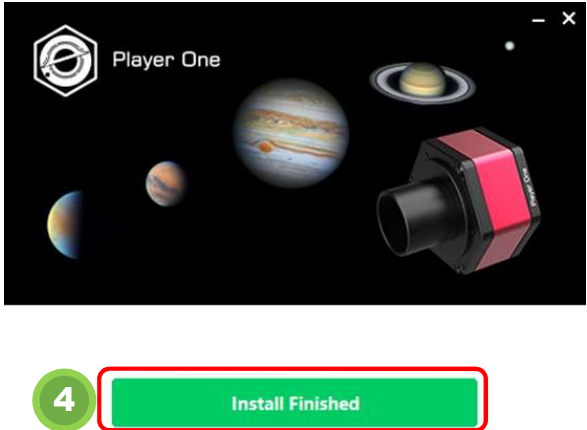
- 1) Double-click the driver installation package to enter the installation page
- 2) Click "Install" and wait for completion



- 3) In first installation, your computer will show up Windows Security window, please click "Install".



- 4) Click "Install Finished" to finish installation.

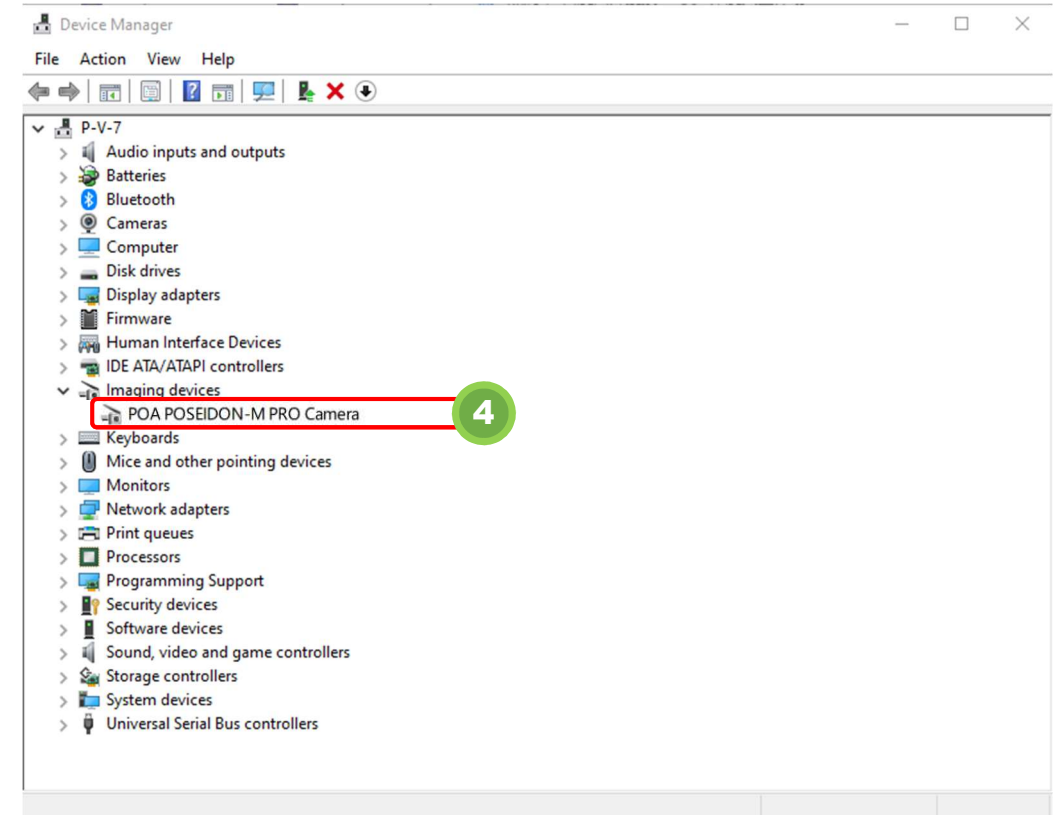


4.Driver and Software installation

5) After installation, connect the camera to the computer USB3.0 port through USB cable, and the camera will be automatically recognized.



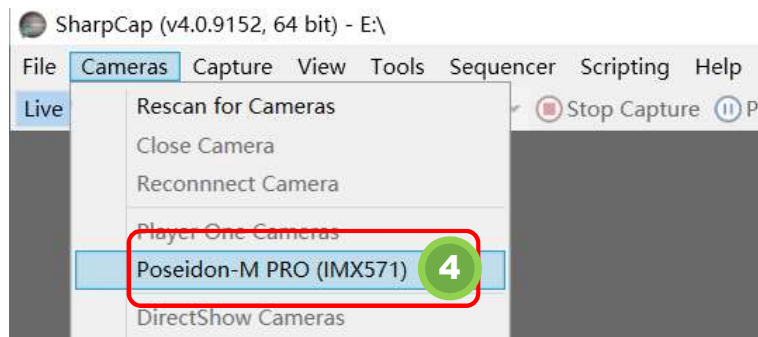
6) View the camera status in Device Manager



4.Driver and Software installation

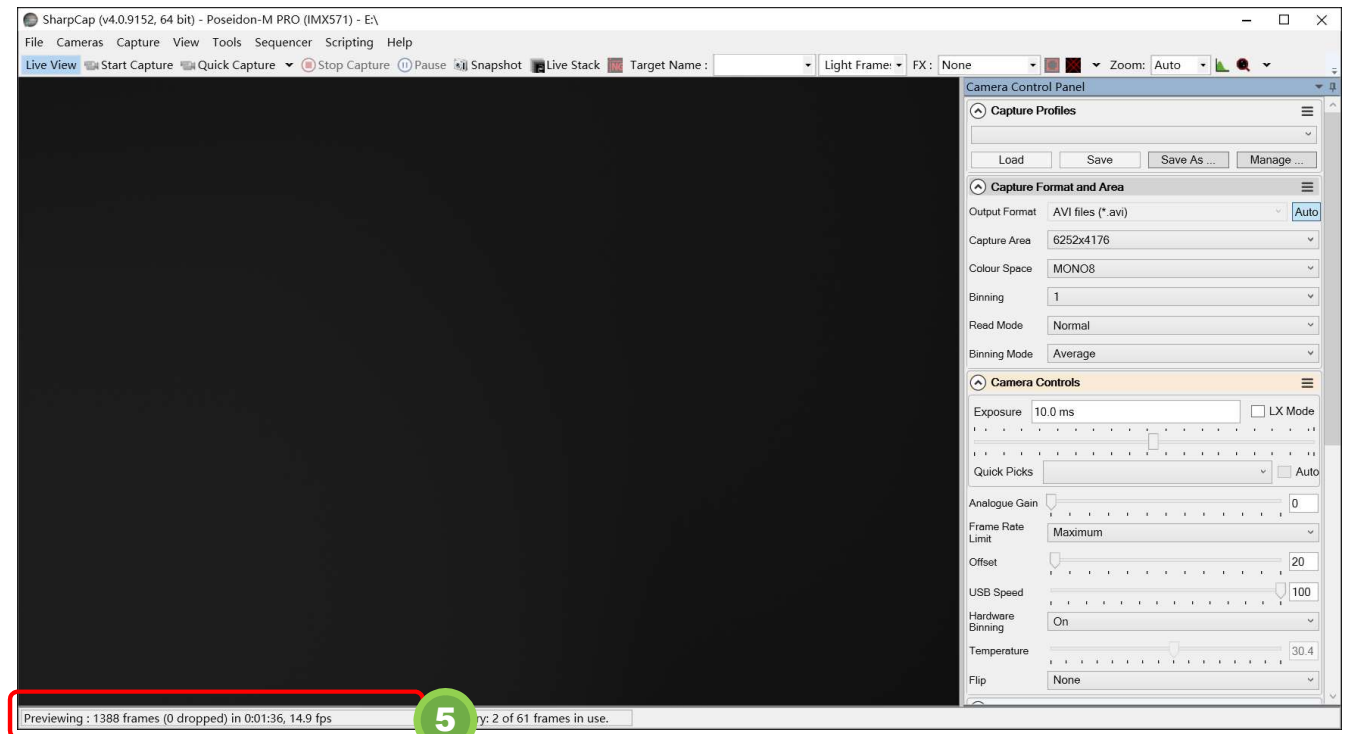
3. Install capture software

- 1) After the installation of the driver, you will need to install a capture software such as SharpCap.
- 2) Select the installation path (the default path is generally recommended).
- 3) After the installation is completed, open the software.
- 4) Open Camera: under the Cameras menu, go to Player One Cameras and select the available camera models.



5) Check FPS

FPS is a very important parameter, if FPS show a normal value such like the fps in camera specification, means the camera can transmit data to your computer normally.

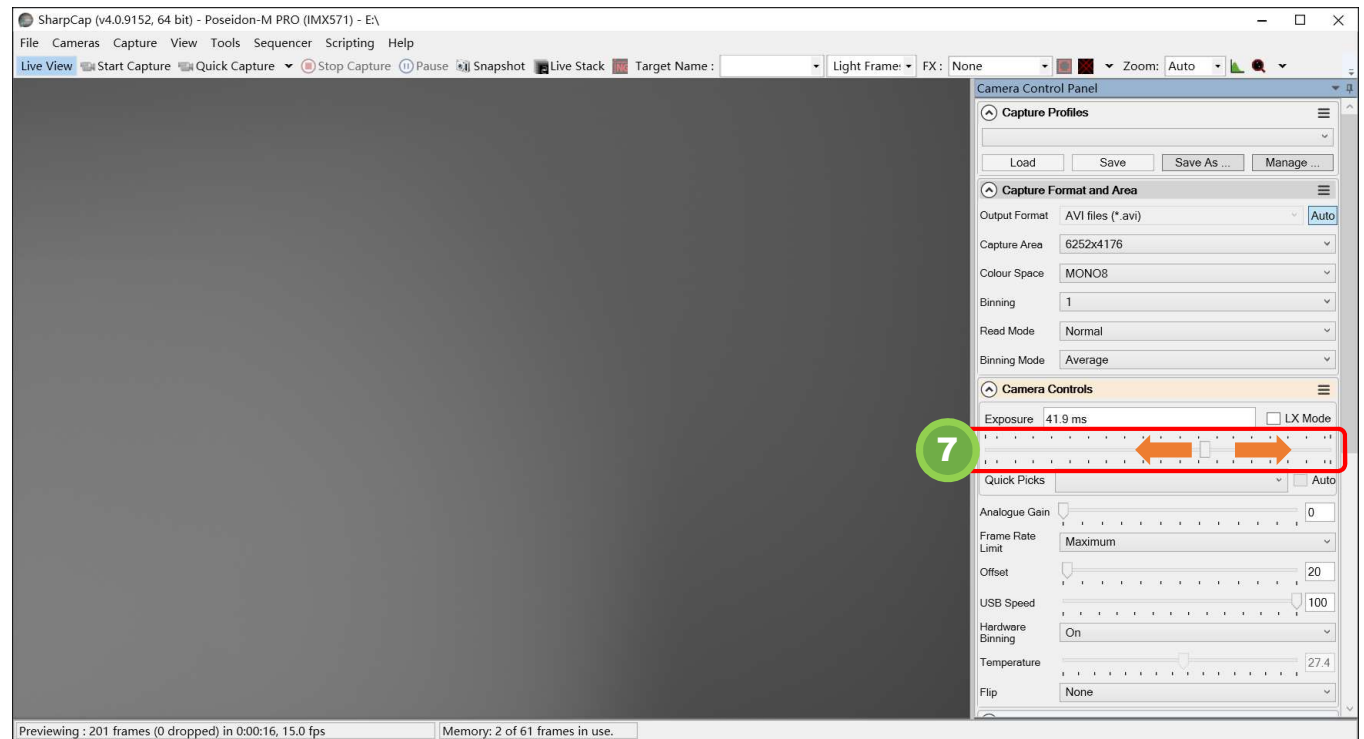


4.Driver and Software installation

6) Remove the camera cover



7) Check the preview. Adjust the exposure, you will see the change of brightness **from the preview**. That means the camera is working normally.

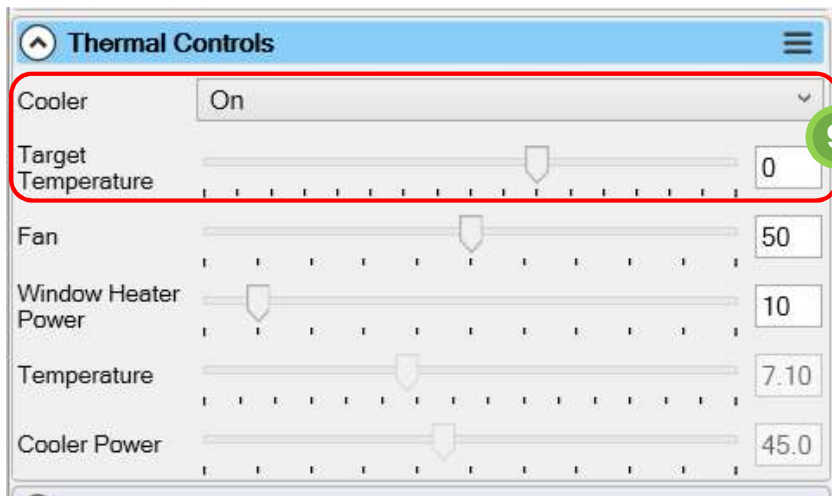


4.Driver and Software installation

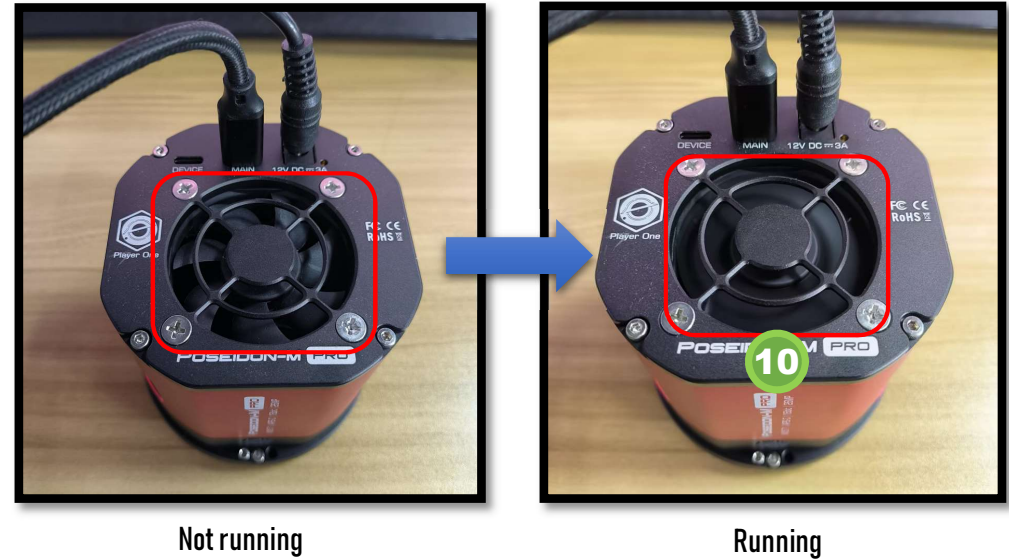
8) Plugin the 12V power supply



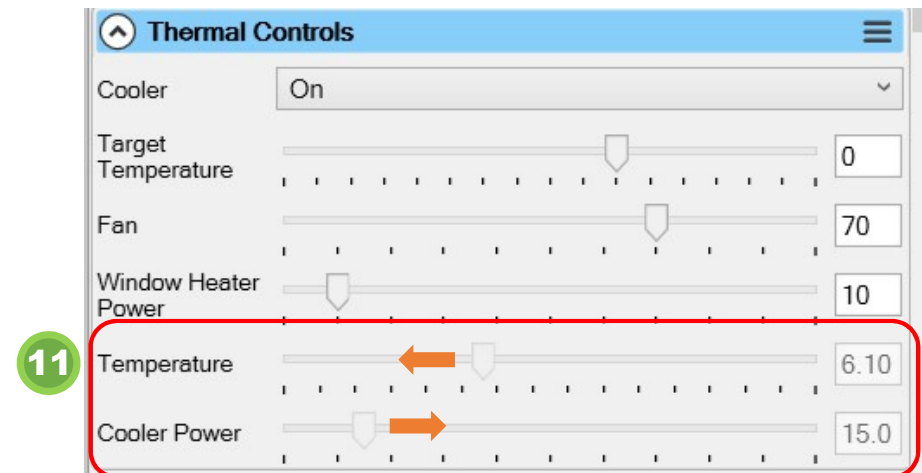
9) Cooler set "On", and set target temperature to 0 degree.



10) Check the Fan is running or not.



11) Check the Temperature drop down from ambient temperature and Cooler Power rising up from 0.



If all functions are normal as the manual said, it means the camera works very well!



Player One

» 05

Imaging train

How to setup entire imaging train

5. Imaging Train

In deep sky imaging, telescope and camera is not enough, we also need some necessary accessories, like filter drawer, filter wheel, OAG and etc.

And some telescope required flattener or coma corrector, when use those optical accessories, we must considering back focal length (BFL). Most flattener or coma corrector was designed 55mm BFL.

Our accessories system already considered almost all combinations.



Color Cooled Camera + Filter Drawer + DSLR Lens



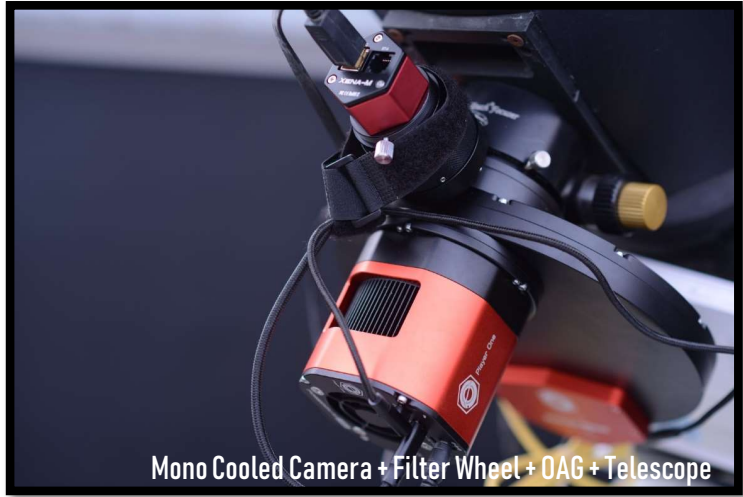
Mono Cooled Camera + Filter Wheel + Telescope

Reference on the right show up 4 different common imaging train.

Drawing in next page, is our entire BFL solution for two kind of cooled cameras.

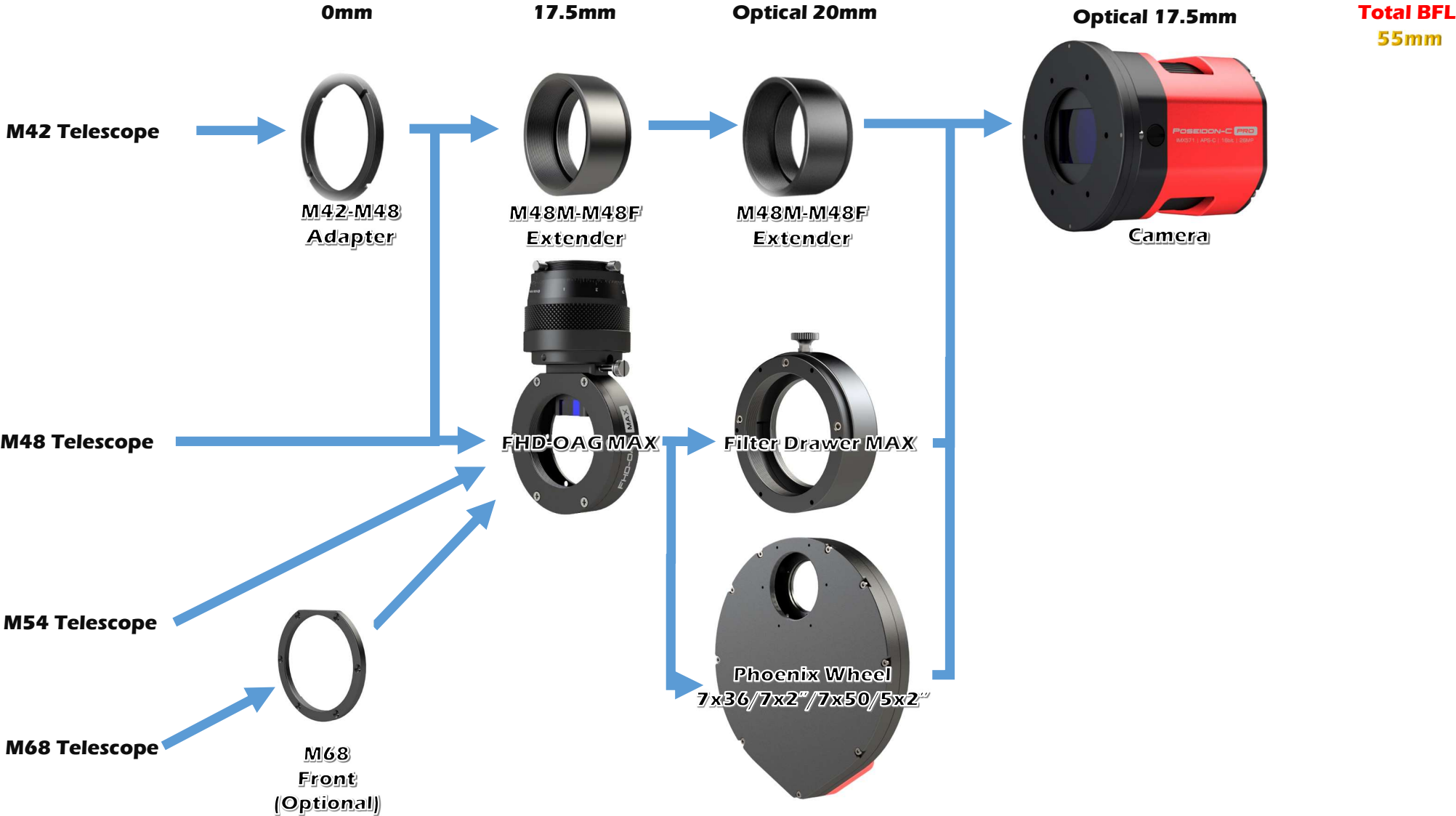


Color Cooled Camera + Filter Drawer + OAG + Telescope

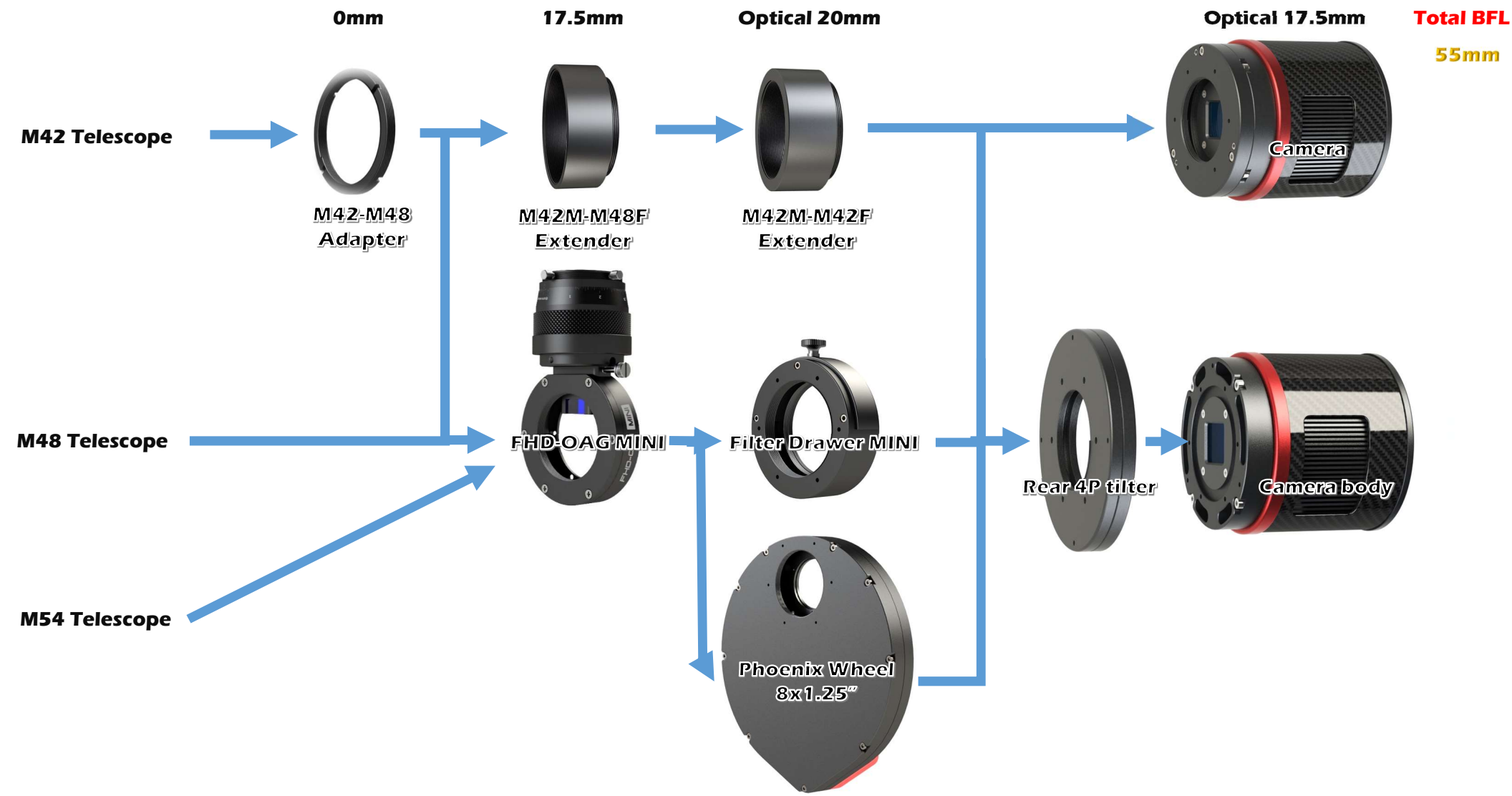


Mono Cooled Camera + Filter Wheel + OAG + Telescope

Poseidon/Artemis PRO camera adapter system



Ares PRO/Uranus PRO/Apollo PRO Camera adapter system



Accessory Compatible list

| Model | Sensor | Format | Support Filter Wheel | Support Filter Drawer | Support OAG | Recommend filter size |
|------------------|--------------|----------------------|---------------------------------------|--------------------------|----------------|-----------------------|
| Zeus-M PRO | IMX455 mono | 36×24mm (Full-Frame) | Phoenix Wheel 7x36mm/7x2"/7x50mm/5x2" | Filter Drawer MAX | FHD-OAG MAX | 2"/50mm |
| Zeus-C PRO | IMX455 color | 36×24mm (Full-Frame) | Phoenix Wheel 7x36mm/7x2"/7x50mm/5x2" | Filter Drawer MAX | FHD-OAG MAX | 2"/50mm |
| Poseidon-M PRO | IMX571 mono | 23.5×15.7mm (APS-C) | Phoenix Wheel 7x36mm/7x2"/7x50mm/5x2" | Filter Drawer MAX | FHD-OAG MAX | 36mm/2" |
| Poseidon-C PRO | IMX571 color | 23.5×15.7mm (APS-C) | Phoenix Wheel 7x36mm/7x2"/7x50mm/5x2" | Filter Drawer MAX | FHD-OAG MAX | 36mm/2" |
| Artemis-M PRO | IMX492 mono | 19.2×13mm (4/3") | Phoenix Wheel 7x36mm/7x2"/7x50mm/5x2" | Filter Drawer MAX | FHD-OAG MAX | 36mm |
| Artemis-C PRO | IMX294 color | 19.2×13mm (4/3") | Phoenix Wheel 7x36mm/7x2"/7x50mm/5x2" | Filter Drawer MAX | FHD-OAG MAX | 36mm |
| Ares-M PRO | IMX533 mono | 11.31×11.31mm (1") | Phoenix Wheel 8x1.25" | Filter Drawer MINI | FHD-OAG MINI | 1.25" |
| Ares-C PRO | IMX533 color | 11.31×11.31mm (1") | Phoenix Wheel 8x1.25" | Filter Drawer MINI | FHD-OAG MINI | 1.25" |
| Uranus-C PRO | IMX585 color | 11.2×6.3mm (1/1.2") | Phoenix Wheel 8x1.25" | Filter Drawer MINI | FHD-OAG MINI | 1.25" |
| Apollo-M MAX PRO | IMX432 mono | 14.5×9.9mm (1.1") | Phoenix Wheel 8x1.25" | Filter Drawer MINI | FHD-OAG MINI | 1.25" |



» 06

ASCOM and Native Settings in DSO imaging

How to set Gain/offset and other settings in ASCOM and Native mode

6. Camera ASCOM driver installation

Many DSO imaging software (such as SGP and Maxim dl) require ASCOM platform and camera ASCOM driver to control the camera for DSO imaging.

The ASCOM driver of Player One camera is developed based on ASCOM 6.5, so you need to download the latest ASCOM6.5 platform and camera ASCOM driver from the official website to control the camera normally.

<https://player-one-astronomy.com/service/software/>

6-1. Download ASCOM platform and camera driver

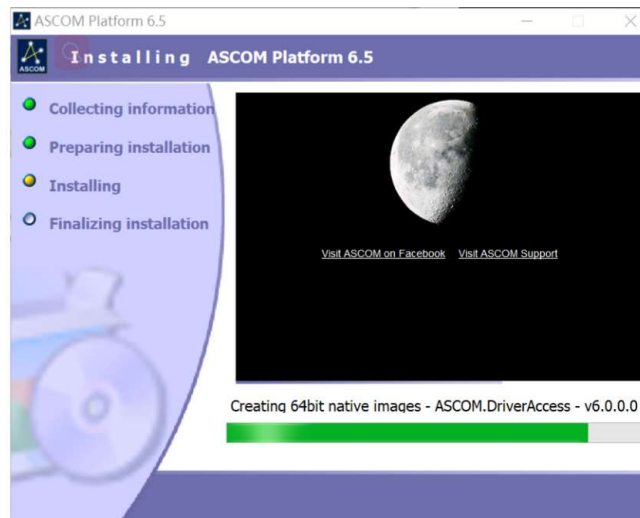
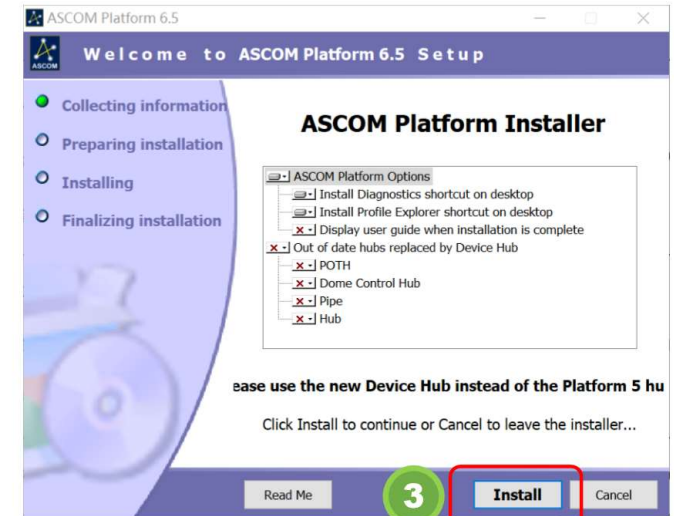
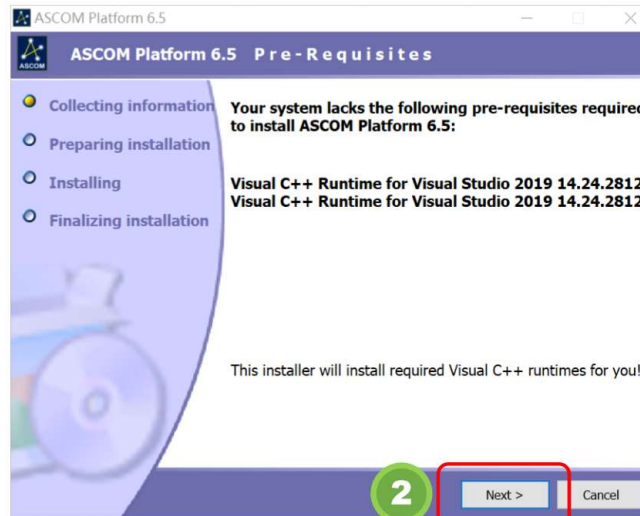
Click the download button to download the driver.
And wait for the download to complete.

| ASCOM Driver | | | | |
|--|---|-------------|---------------------------------|--|
| ASCOM platform | The ASCOM platform is an astronomical standard protocol set running on the windows system. Many astronomy software need to be installed after the ASCOM platform can be used. You can log on to the ASCOM platform official website for more information. | V6.5 | Released: 2020/5/20 1 | Official Download ASCOM6.5 Download |
| Camera ASCOM Driver (base on ASCOM6.5) | Software using ASCOM interface, need to be installed to control the camera. ASCOM6.5 platform is required. | V6.5.1.0225 | Released: 2021 2 | Download |

6. Camera ASCOM driver installation

6-2. install ASCOM platform

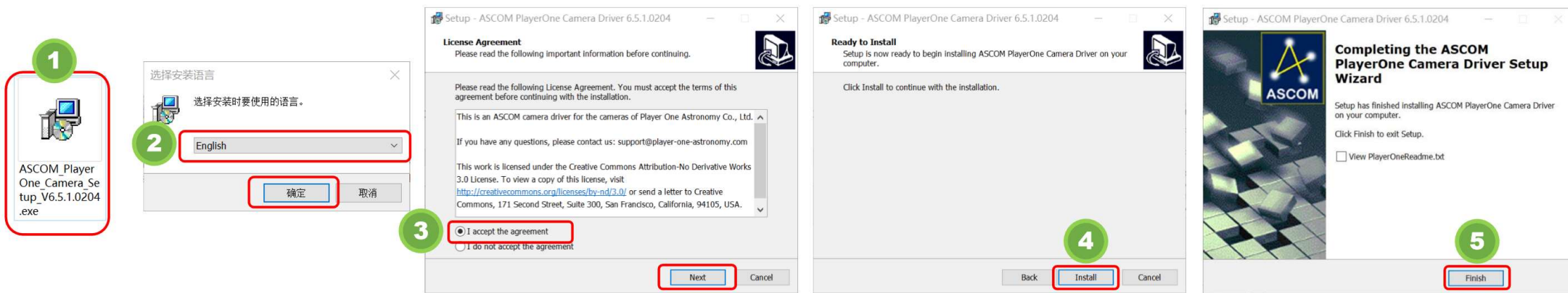
- 1) Double-click the driver installation package to enter the installation page
- 2) Automatically detect necessary files and click "Next" to continue.
- 3) Click "Install" to Install the platform
- 4) Installation completed



6. Camera ASCOM driver installation

6-3. install camera ASCOM driver

- 1) Double-click the driver installation package to enter the installation page.
- 2) Select the language, it is recommended to choose Chinese, and then click "OK" button.
- 3) Select "I Accept the Agreement" and click the "Next" button.
- 4) Click the "Install" button to Install and wait for completion.
- 5) Click "Finish" to complete the installation.



6-4. Download and install capture and guiding software

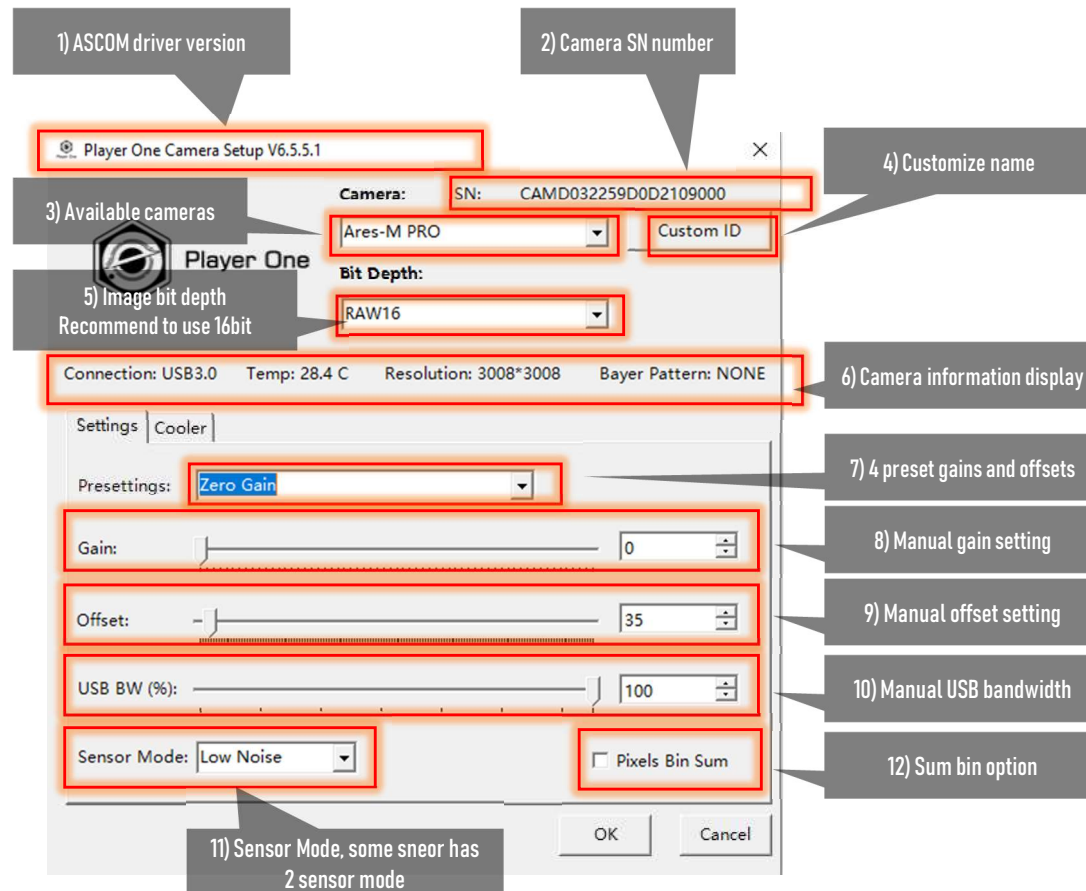
There are many software that support ASCOM platform, you can choose the software you are familiar with to shoot and guide the star, all the commonly used software download links are as follows:

<https://player-one-astronomy.com/service/software/>

6. Camera ASCOM driver installation

6-5. ASCOM setup window

1. ASCOM window introduction



1) **ASCOM driver version:** Shows the current version you used, recommend to use newest version.

2) **Camera SN number:** Camera SN is the identity of the camera, it is unique. It is important for warranty and after-sale service.

3) **Available cameras:** Cameras which already connected to your PC.

4) **Customize name:** Users can set names of your camera, especially when 2 same model connected.

5) **Image bit depth:** RAW8/RAW16, Recommend to use RAW16 for imaging.

6) **Camera information display:** Basic info of the camera.

a. Sometimes when you found image download speed is too slow, check if connection is USB3.0 here.

b. Check the current temperature of sensor.

c. Check Resolution of the camera

d. Check bayer Pattern of the camera, only color camera has bayer pattern info.

7) **4 preset gains and offsets:** We provide 4 default gain and offset preset settings.

8) **Manual gain setting:** Control the gain value manually. (For experienced photographers)

9) **Manual offset setting:** Control the offset value manually. (For experienced photographers)

10) **Manual USB bandwidth:** Bandwidth can control the download speed of image, if has image download failure, reduce the bandwidth to 40%.

11) **Sensor Mode:** Cameras which using IMX533/IMX571 sensor has 2 sensor mode. Normal mode has faster FPS, Low Noise mode has lower readout noise.

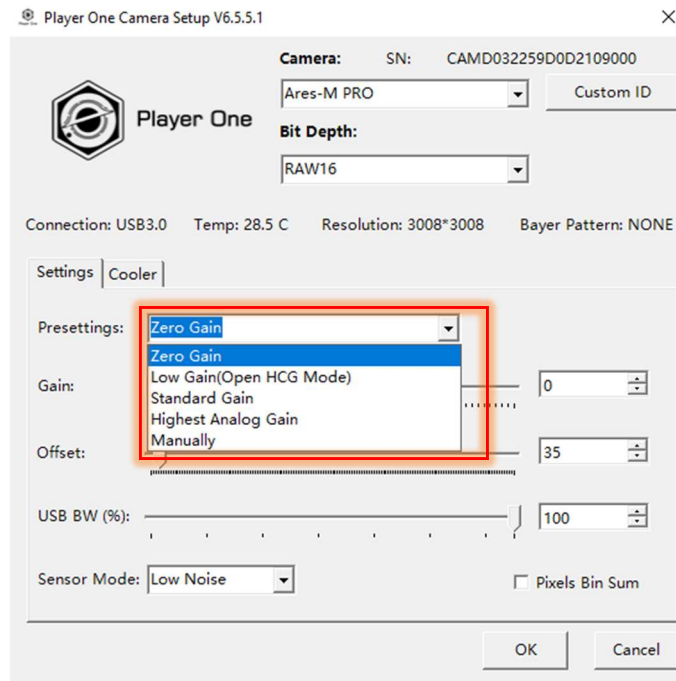
12) **Sum bin option:** Sum bin means when do binning, brightness value of pixels will sum up, it will make the image brighter. Most used in plate solve.

6. Camera ASCOM driver installation

2. Detailed explanation of Gain preset values

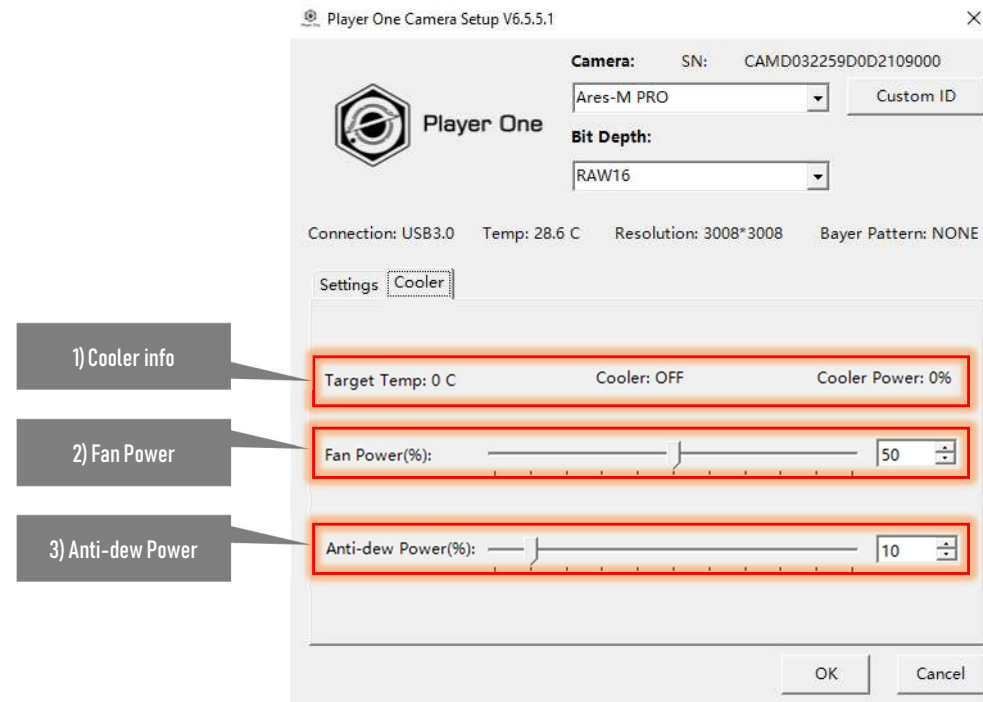
- 1) **Zero Gain**: Maximum dynamic range can be obtained, suitable for long exposures.
- 2) **Low Gain (Open HCG Mode)**: it is the lowest trigger gain to start the HCG mode of camera, and can obtain high dynamic and low readout noise.
- 3) **Standard Gain**: 1e /ADU can be obtained and minimize quantization error.
- 4) **Highest Analog Gain**: obtain the lowest readout noise, suitable for short exposures.
- 5) **Manually**: Manual setting of gain and offset.

*Notice: Preset values including offset and gain, no need to set offset manually.



3. Cooler control panel

- 1) **Cooler info**: Show up current info of cooling system.
 - a) Target Temp: Target temperature you set in capture software, it only could be set in capture software.
 - b) Cooler: ON means cooler is active, TEC unit and Fan is running. OFF means cooler is inactive, TEC and Fan is not running.
 - c) Cooler Power: Show up the power of cooling system.
- 2) **Fan Power**: Carbon fiber camera default power is 50%, Aluminum camera default power is 70%. If need maximum delta-T, set 100% power.
- 3) **Anti-Dew Power**: All our cooled cameras has Anti-Dew heater, anti-dew can protect window against dew problem. Default power is 10%, minimum power is 1%, maximum power is 100%.



6. Camera ASCOM driver installation

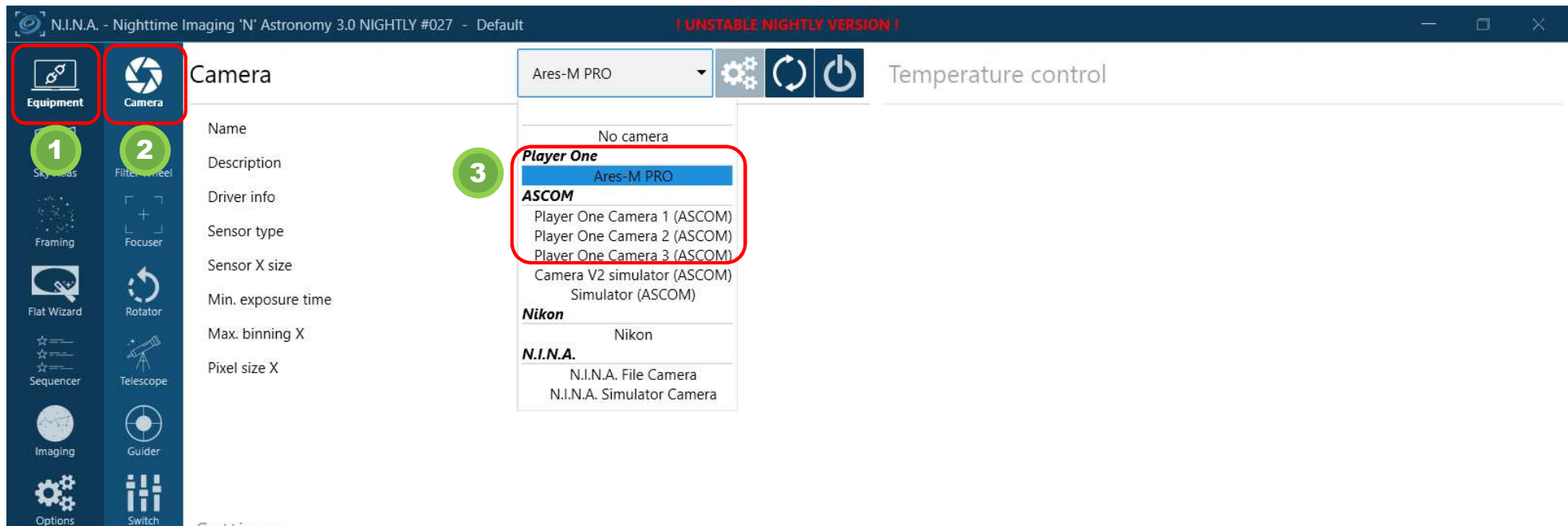
4. Preset value and option table

| Model | Sensor | Zero Gain | | HCG Gain | | Standard Gain | | High Gain mode | | Dual Sensor Mode |
|------------------|--------------|-----------|--------|----------|--------|---------------|--------|----------------|--------|------------------|
| | | Gain | Offset | Gain | Offset | Gain | Offset | Gain | Offset | |
| Zeus-M PRO | IMX455 mono | 0 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | Support |
| Zeus-C PRO | IMX455 color | 0 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | Support |
| Poseidon-M PRO | IMX571 mono | 0 | 20 | 125 | 25 | 8 | 20 | 550 | 1200 | Support |
| Poseidon-C PRO | IMX571 color | 0 | 20 | 125 | 25 | 8 | 20 | 550 | 1200 | Support |
| Artemis-M PRO | IMX492 mono | 0 | 5 | 120 | 5 | 229 | 5 | 400 | 70 | NO |
| Artemis-C PRO | IMX294 color | 0 | 5 | 120 | 5 | 120 | 5 | 400 | 70 | NO |
| Ares-M PRO | IMX533 mono | 0 | 35 | 125 | 50 | 130 | 50 | 600 | 1000 | Support |
| Ares-C PRO | IMX533 color | 0 | 35 | 125 | 50 | 130 | 50 | 600 | 1000 | Support |
| Uranus-C PRO | IMX585 color | 0 | 3 | 210 | 6 | 210 | 6 | 498 | 120 | NO |
| Apollo-M MAX PRO | IMX432 mono | 0 | 12 | 145 | 13 | 280 | 45 | 385 | 130 | NO |

6. Camera Settings in NINA


6-6 Setup in NINA

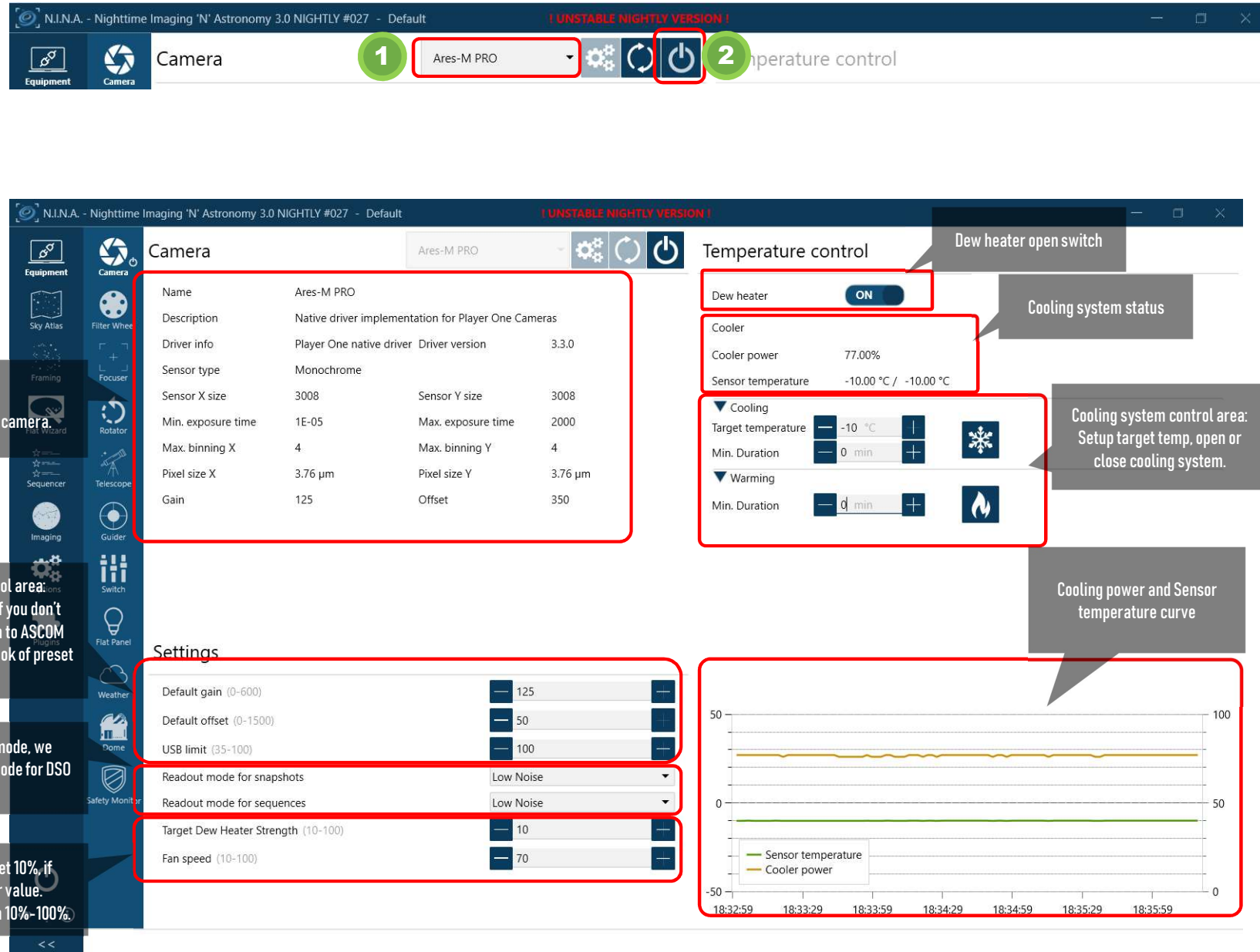
- 1) Open the Equipment Bar
- 2) Open the Camera bar
- 3) Select Camera from combo box.
 - a) Select camera below “Player One”, means control the camera via native driver.
 - b) Select camera below “ASCOM”, means control camera via ASCOM driver. We provide 3 ASCOM camera option, users could setup at most 3 cameras for imaging and guiding.



6. Camera Settings in NINA

6-6-1 Native mode in NINA

- 1) Choose the Camera you want connected as main camera.
- 2) Press  to connect the camera. Then you will see following picture, all functions are active.



Camera

Name: Ares-M PRO

Description: Native driver implementation for Player One Cameras

Driver info: Player One native driver Driver version: 3.3.0

Sensor type: Monochrome

Sensor X size: 3008 Sensor Y size: 3008

Min. exposure time: 1E-05 Max. exposure time: 2000

Max. binning X: 4 Max. binning Y: 4

Pixel size X: 3.76 μm Pixel size Y: 3.76 μm

Gain: 125 Offset: 350

Temperature control

Dew heater: **ON**

Cooler power: 77.00%

Sensor temperature: -10.00 $^{\circ}\text{C}$ / -10.00 $^{\circ}\text{C}$

Cooling system control area: Setup target temp, open or close cooling system.

Target temperature: -10 $^{\circ}\text{C}$

Min. Duration: 0 min

Cooling power and Sensor temperature curve

Sensor temperature (green line)

Cooler power (yellow line)

Settings

Default gain (0-600): 125

Default offset (0-1500): 50

USB limit (35-100): 100

Readout mode for snapshots: Low Noise

Readout mode for sequences: Low Noise

Target Dew Heater Strength (10-100): 10

Fan speed (10-100): 70

Gain/offset/ USB limit control area: Setup Gain/offset/ USB limit, if you don't which value is the best, switch to ASCOM connection in NINA and take a look of preset settings.

Dew heater recommend to set 10%, if humidity is high, set higher value. Fan speed can be adjusted from 10%-100%.

6. Camera ASCOM Settings for DSO imaging

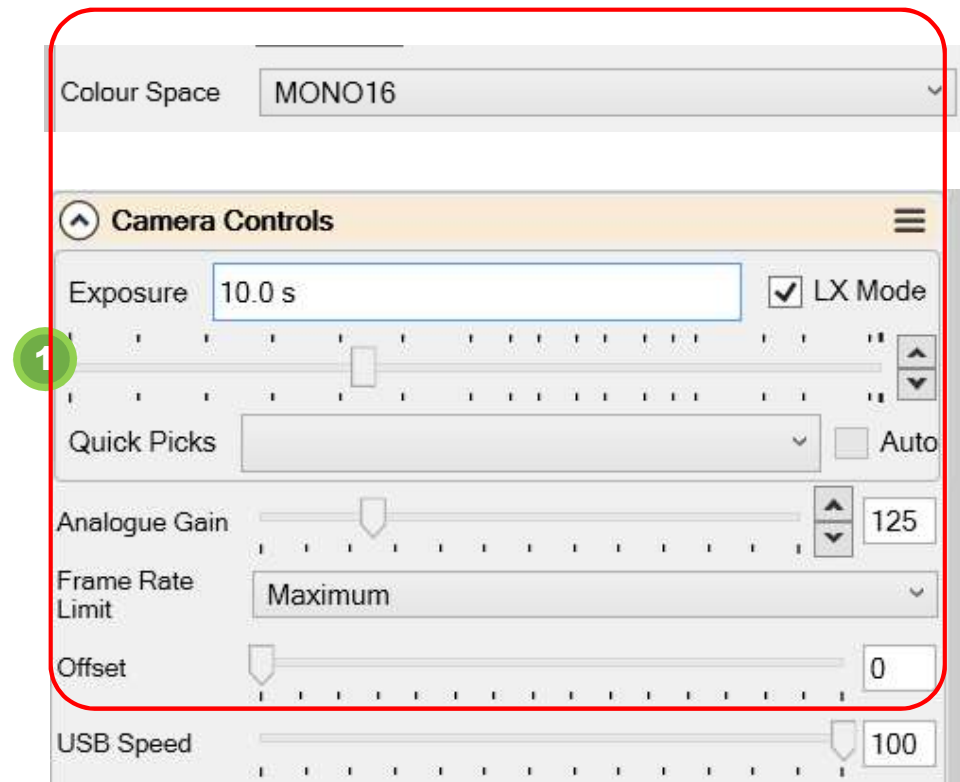
6.6.2 How adjust offset to suitable value?

The effect of offset is to add a constant value to the brightness value of all pixels in the image, ensuring that all pixel brightness values are greater than 0.

In different software, offset value might not same, because they may use different algorithm to calculate.

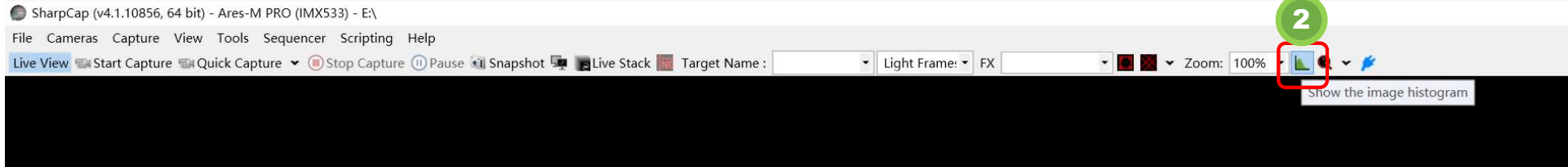
There is a simple way to find out best offset value, take Sharpcap as an example:

1) We use Ares-M PRO (IMX533) camera (camera was covered, we need to take dark frame). After connected, choose RAW16 mode and we set gain=125 and offset=0 in Sharpcap, take 10s exposure to capture dark frame.

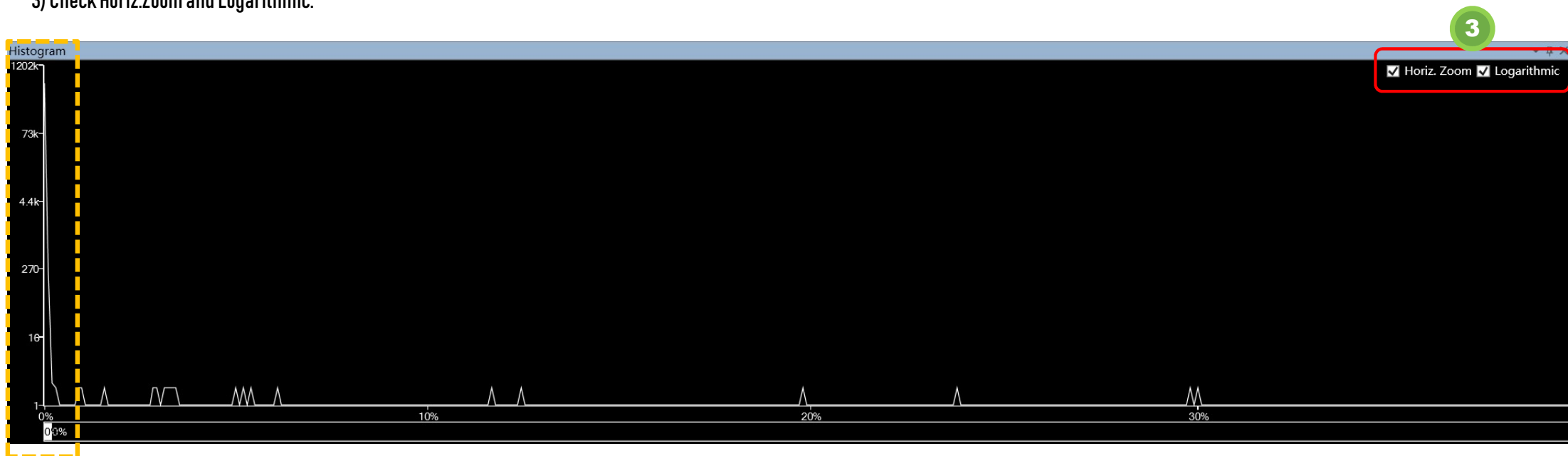


6. Camera ASCOM Settings for DSO imaging

2) Click  to show up histogram 3) Set 10s exposure



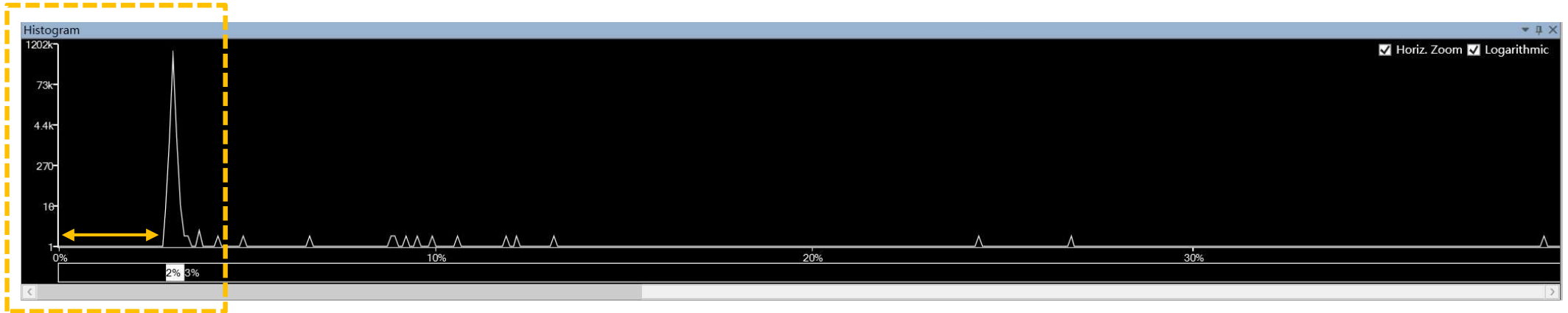
3) Check Horiz.Zoom and Logarithmic.



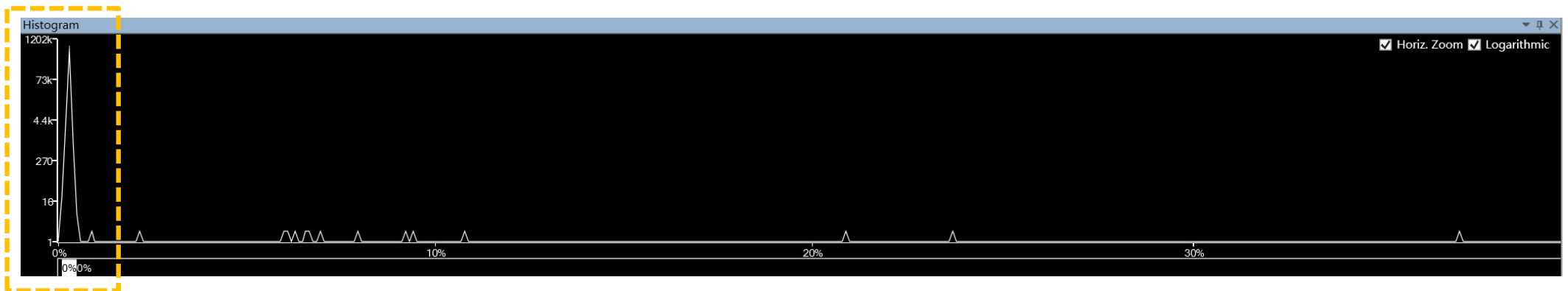
We can see the left part of curve cut off, which means offset was too low.

6. Camera ASCOM Settings for DSO imaging

4) Set offset value to 500, and take a shot again. We can see the whole curve can be seen, which means offset is high enough. But it left too much space on the left.



5) So we reduce the offset value, and take 10s dark frame again. After a few times attempts, we found 50 is the best value.

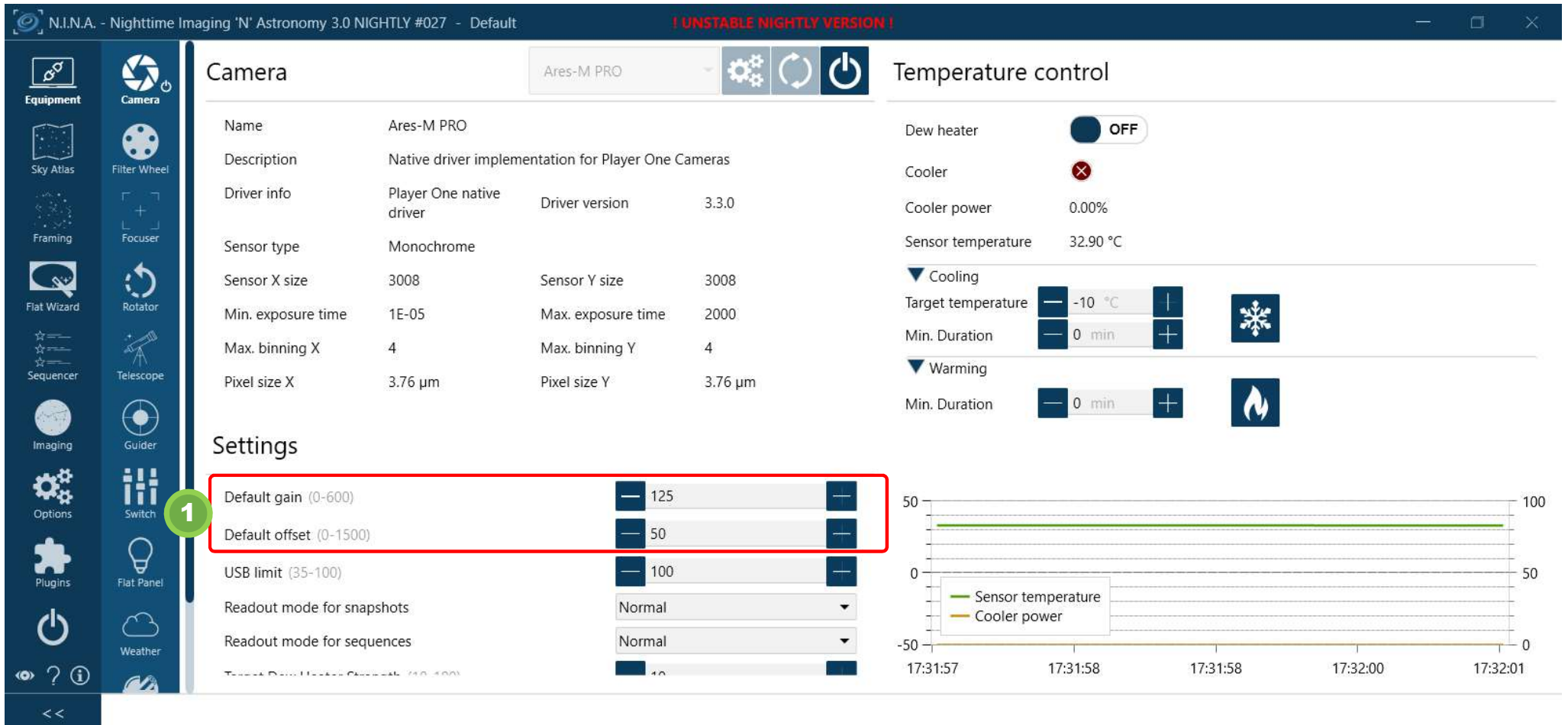


6. Camera ASCOM Settings for DSO imaging

6.6.3 Offset in NINA

In NINA, offset looks different, histogram is not as same as Sharpcap.

1) We use Ares-M PRO (IMX533) camera (camera was covered, we need to take dark frame). After connected, camera run under RAW16 mode and we set gain=125 and offset=50 in NINA, take 10s exposure to capture dark frame.



N.I.N.A. - Nighttime Imaging 'N' Astronomy 3.0 NIGHTLY #027 - Default

UNSTABLE NIGHTLY VERSION!

Camera

Ares-M PRO

Name: Ares-M PRO

Description: Native driver implementation for Player One Cameras

Driver info: Player One native driver | Driver version: 3.3.0

Sensor type: Monochrome

Sensor X size: 3008 | Sensor Y size: 3008


Min. exposure time: 1E-05 | Max. exposure time: 2000

Max. binning X: 4 | Max. binning Y: 4

Pixel size X: 3.76 μm | Pixel size Y: 3.76 μm

Temperature control

Dew heater: OFF

Cooler: 

Cooler power: 0.00%

Sensor temperature: 32.90 $^{\circ}\text{C}$

▼ Cooling

Target temperature: -10 $^{\circ}\text{C}$

Min. Duration: 0 min

▼ Warming

Min. Duration: 0 min

Settings

1

Default gain (0-600): 125

Default offset (0-1500): 50

USB limit (35-100): 100

Readout mode for snapshots: Normal

Readout mode for sequences: Normal

Test Readout Mode Strength (10-100): 10

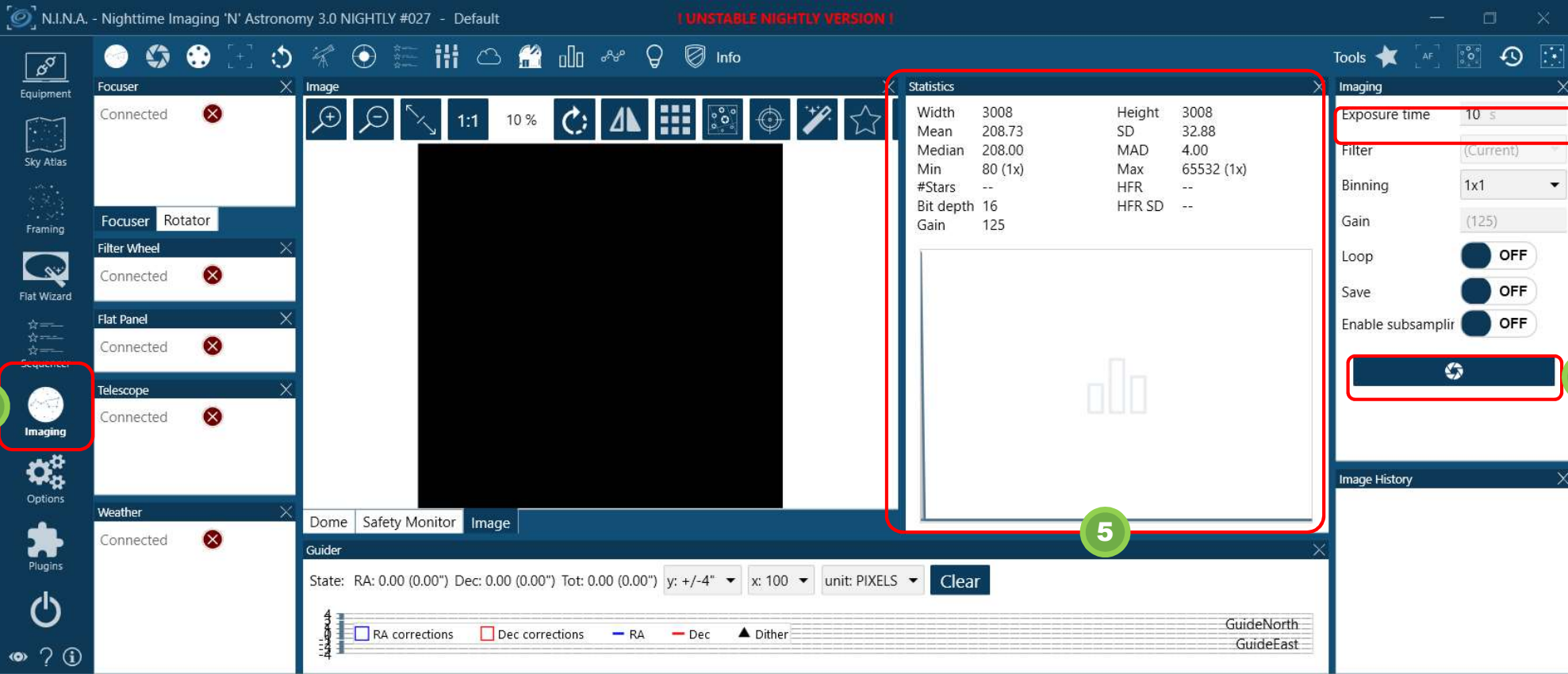
Sensor temperature

Cooler power

17:31:57 | 17:31:58 | 17:31:58 | 17:32:00 | 17:32:01

6. Camera ASCOM Settings for DSO imaging

- 2) Choose "Imaging" panel.
- 3) Set 10s exposure.
- 4) Take a single shot.
- 5) Check histogram in "Statistics".



The screenshot shows the N.I.N.A. - Nighttime Imaging 'N' Astronomy 3.0 NIGHTLY #027 - Default interface. The interface is divided into several panels:

- Left Panel:** Contains icons for Equipment, Sky Atlas, Framing, Flat Wizard, Sequencer, **Imaging** (highlighted with a red box and green circle 2), Options, Plugins, and a power button.
- Top Panel:** Contains icons for Focuser, Image, and Info. The Image panel is active, showing a dark image and various controls like zoom, pan, and exposure time (10 s).
- Statistics Panel:** A window showing statistical data for the current image. It includes a histogram and the following data:

| Width | 3008 | Height | 3008 |
|-----------|---------|--------|------------|
| Mean | 208.73 | SD | 32.88 |
| Median | 208.00 | MAD | 4.00 |
| Min | 80 (1x) | Max | 65532 (1x) |
| #Stars | -- | HFR | -- |
| Bit depth | 16 | HFR SD | -- |
| Gain | 125 | | |
- Imaging Panel:** A window on the right showing camera settings. It includes:
 - Exposure time: 10 s (highlighted with a red box and green circle 3)
 - Filter: (Current)
 - Binning: 1x1
 - Gain: (125)
 - Loop: OFF
 - Save: OFF
 - Enable subsampling: OFF
 - A red box highlights the "Take Shot" button (green circle 4).
- Image Panel:** A window at the bottom showing a histogram (highlighted with a red box and green circle 5) and a table of RA and Dec corrections.

6. Camera ASCOM Settings for DSO imaging

Offset = 50 should be the best value in Sharpcap, however it looks cut off in histogram in NINA. But when we check the Min value of pixel, it is 80, which means all pixel value is bigger than 0.

After check the histogram of image in different software, we believe Min value =80 is correct, but the preview of histogram is not precisely (maybe it isn't start from 0 point).



6) If we want entire curve show up in histogram, we try to set offset to 1000, and take a 10s dark frame again.

Settings

Default gain (0-600)

125

Default offset (0-1500)

1000

6. Camera ASCOM Settings for DSO imaging

We can see the whole curve can be seen, which means offset is high enough. But it left too much space on the left.



6) So we reduce the offset value, and take 10s dark frame again. After a few times attempts, we found 350 is the best value.

Settings

Default gain (0-600)

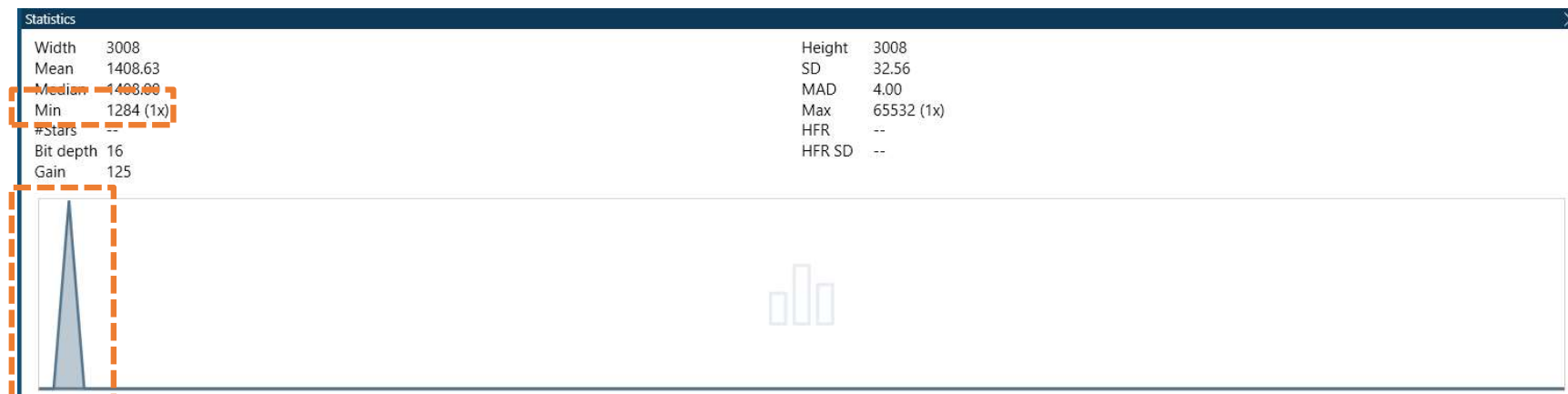
125

Default offset (0-1500)

350

This time curve can be seen and close to the left. So offset = 350 is best value when gain = 125. This is looks like the good offset in histogram, but actually cause the Min value up to 1284 ADU.

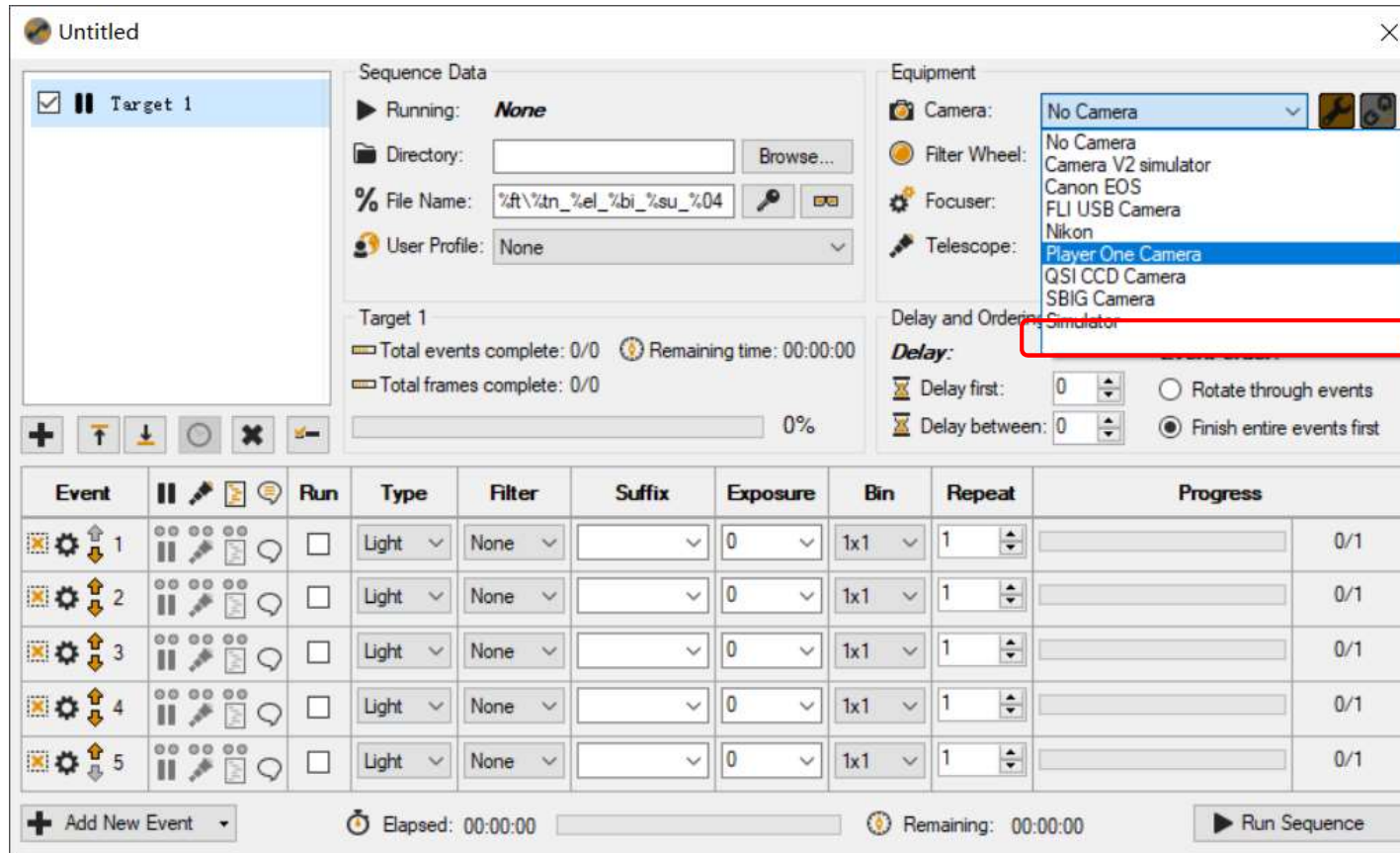
This offset value also could be used but might lose some dynamic range.



6. Camera ASCOM Settings for DSO imaging

6-7 Setup in SGP

Open the **SGP Schedule Planner** and go to the Camera section. Select Player One Camera from the dropdown list.



The screenshot shows the SGP Schedule Planner interface. The 'Equipment' dropdown menu is open, showing a list of camera options. 'Player One Camera' is highlighted in blue. A red rectangle is drawn around the 'Player One Camera' option in the dropdown list.

Sequence Data

- Running: **None**
- Directory: Browse...
- % File Name: %ft%\tn_%el_%bi_%su_%04
- User Profile: None

Target 1

- Total events complete: 0/0 Remaining time: 00:00:00
- Total frames complete: 0/0

Equipment

- Camera: No Camera
- Filter Wheel: No Camera
- Focuser: Canon EOS
- Telescope: FLI USB Camera

Delay and Order

- Delay:
- Delay first: 0 ☐ Rotate through events
- Delay between: 0 ☒ Finish entire events first

| Event | Run | Type | Filter | Suffix | Exposure | Bin | Repeat | Progress |
|-------|--------------------------|-------|--------|--------|----------|-----|--------|----------|
| 1 | <input type="checkbox"/> | Light | None | | 0 | 1x1 | 1 | 0/1 |
| 2 | <input type="checkbox"/> | Light | None | | 0 | 1x1 | 1 | 0/1 |
| 3 | <input type="checkbox"/> | Light | None | | 0 | 1x1 | 1 | 0/1 |
| 4 | <input type="checkbox"/> | Light | None | | 0 | 1x1 | 1 | 0/1 |
| 5 | <input type="checkbox"/> | Light | None | | 0 | 1x1 | 1 | 0/1 |

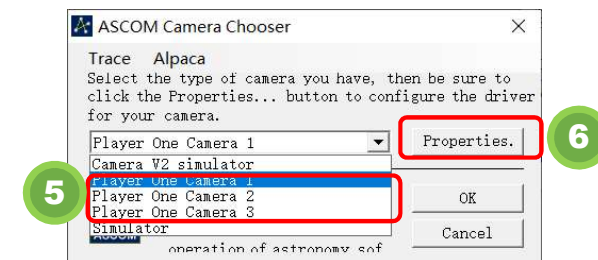
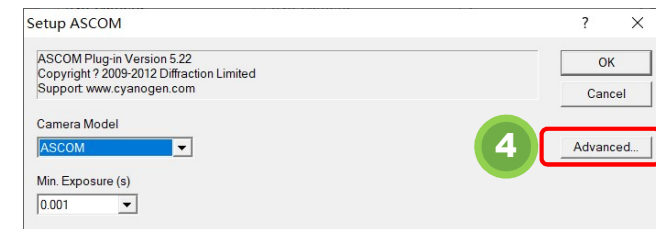
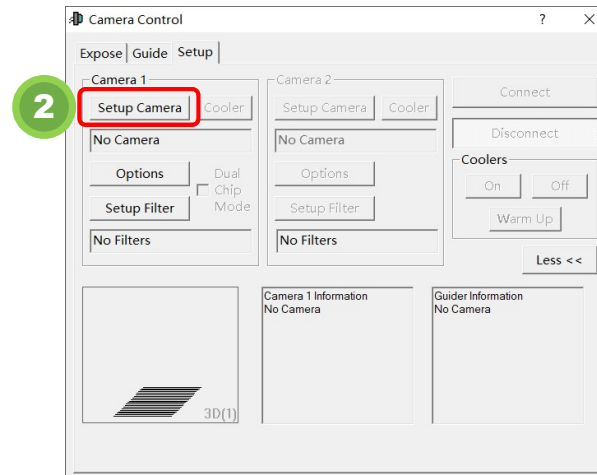
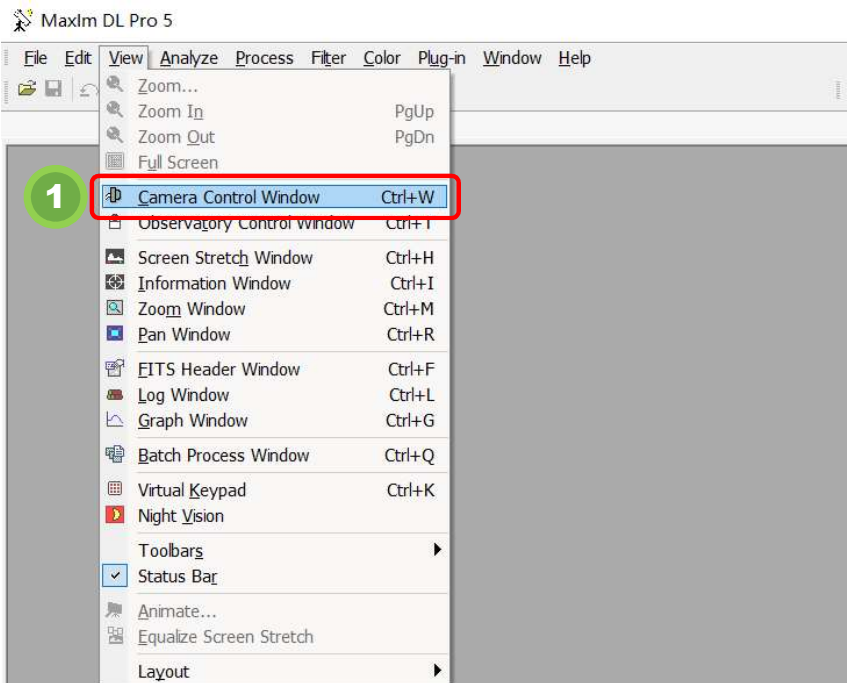
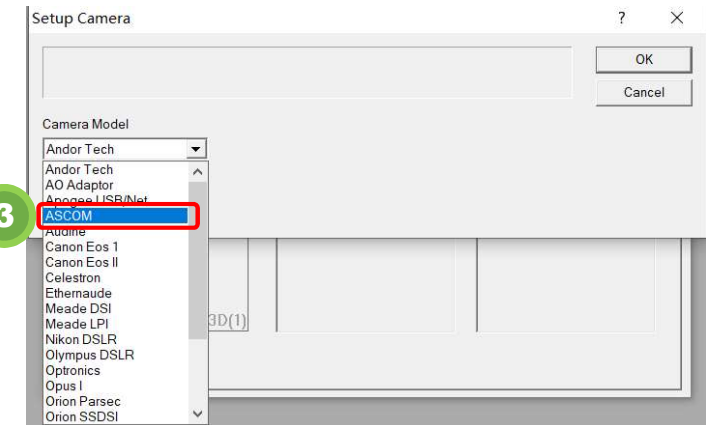
Bottom Bar

- + Add New Event
- Elapsed: 00:00:00
- Remaining: 00:00:00
- Run Sequence

6. Camera ASCOM Settings for DSO imaging



6-8 Setup in MDL

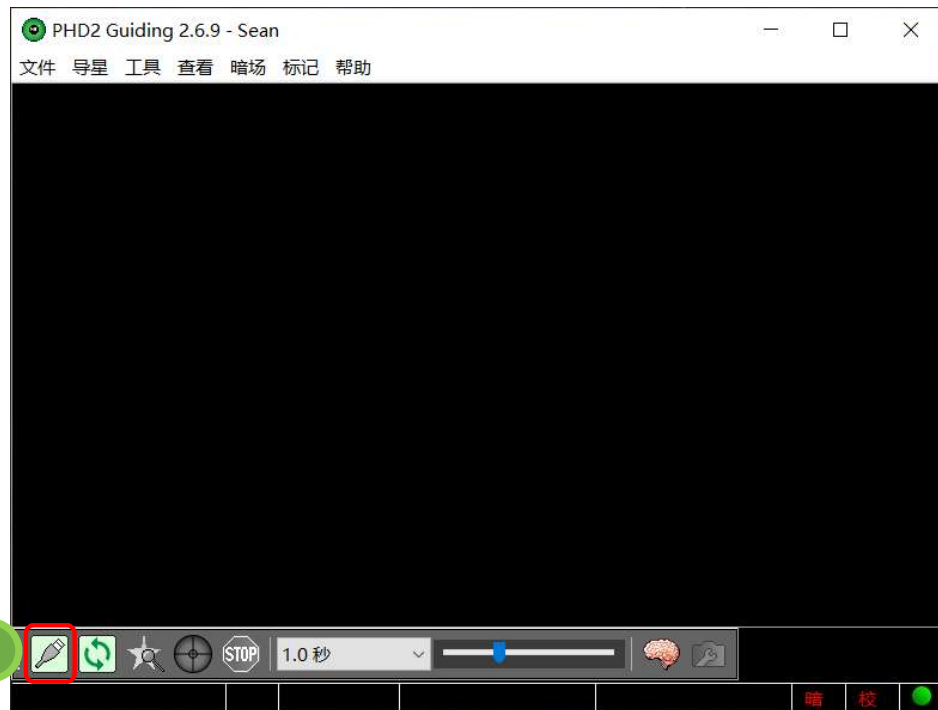
- 1) Open the Camera Control Window.
- 2) Select Camera1 or Camera2 as required and click Setup Camera.
- 3) Select the ASCOM option in Camera Model.
- 4) Click Advanced, .Pop up the ASCOM Camera Chooser.
- 5) Select Player One Camera from the dropdown list. We provide 3 ASCOM camera option, users could setup at most 3 cameras for imaging and guiding.
- 6) Click Properties to set ASCOM camera parameters



6. Camera ASCOM Settings for DSO imaging

6-9 Setup in PHD2

- 1) Click the  button to open the page of connected device.
- 2) Select "Player One Camera(ASCOM)" from the Camera dropdown list.
- 3) Click the  button to set ASCOM parameters of the camera.
- 4) Click the "Connect" button to turn on the camera.





Player One

» 07

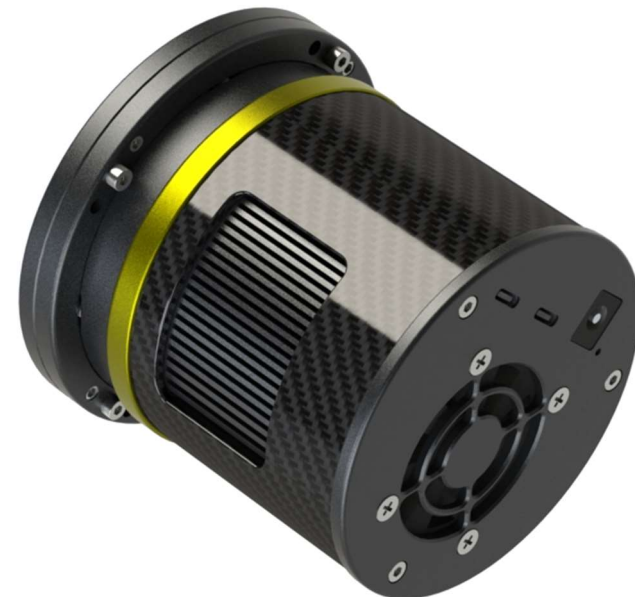
How to adjust tilter plate

Get perfect star roundness

Front 3P sensor tilter plate



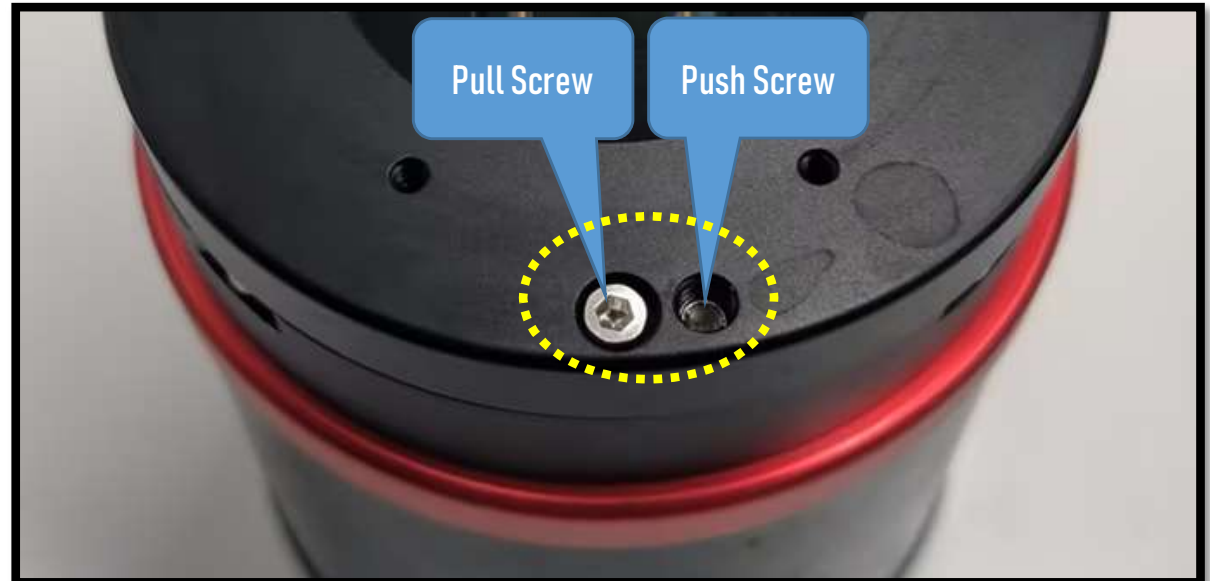
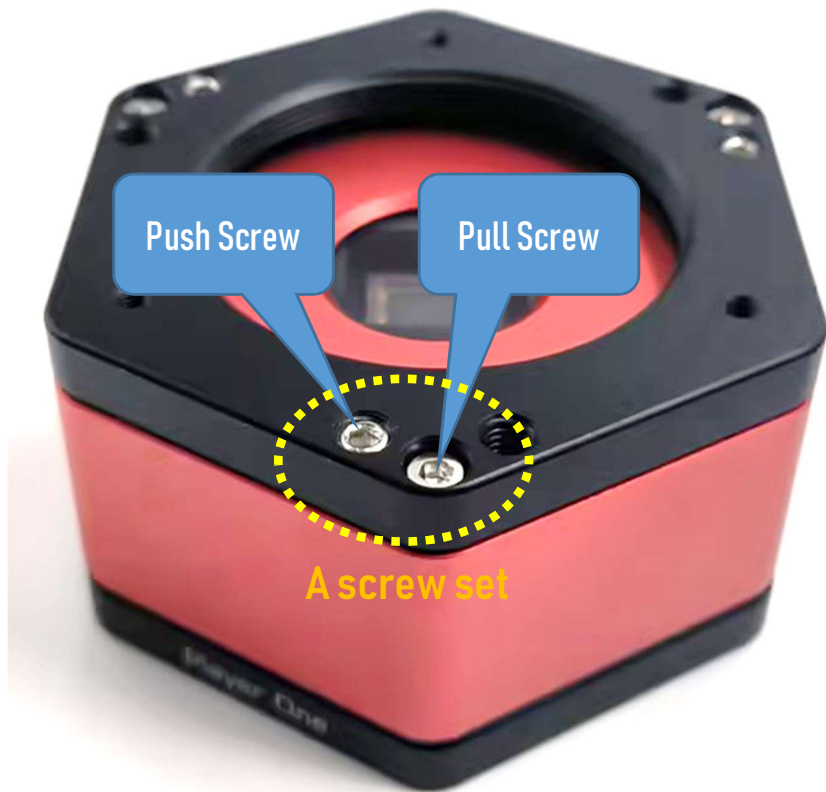
Rear 4P sensor tilter plate



How to adjust tilter plate

Basic adjust principle

A screw set has 1 pull screw and 1 push screw

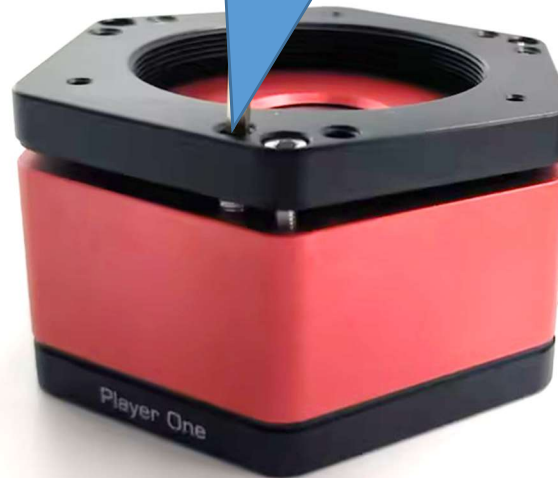


Basic adjust principle

Imagine if there is only one pull-push screw set, 2 step will make the sensor tilter plate to be tilt



2. Tighten push screw



Front view

Sensor tilter plate has been tilt

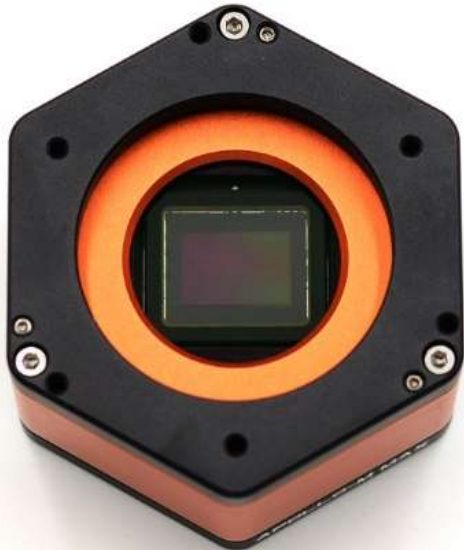


Side view

In reality, there will be 3 or 4 sets of pull-push screw. Every set will interfere others, so we need to adjust them following a sequence.

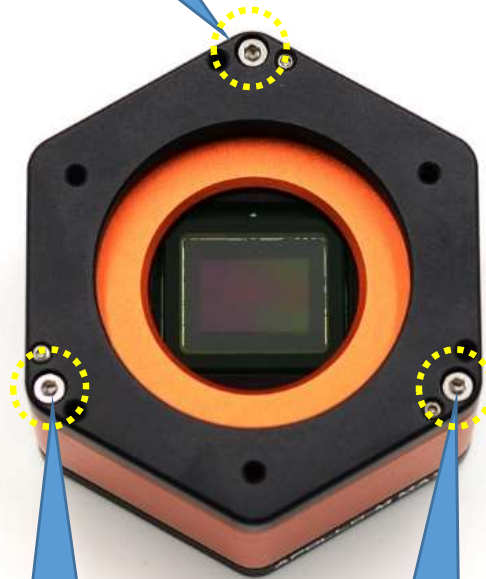
Tilt top for 0.5mm

Top



Step 1

1. Loose 1 circle

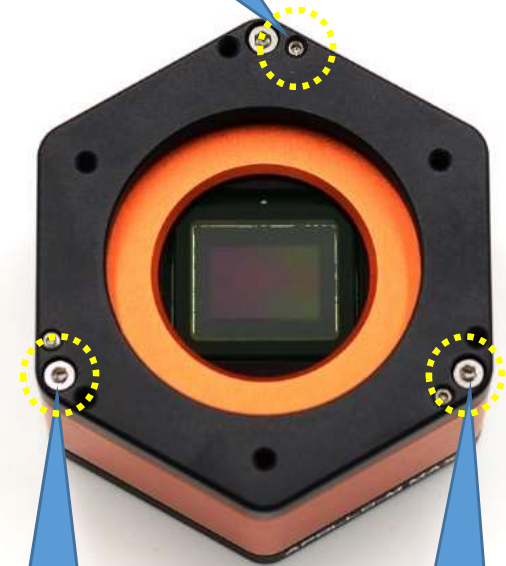


2. Loose a little

3. Loose a little

Step 2

4. Tighten push screw

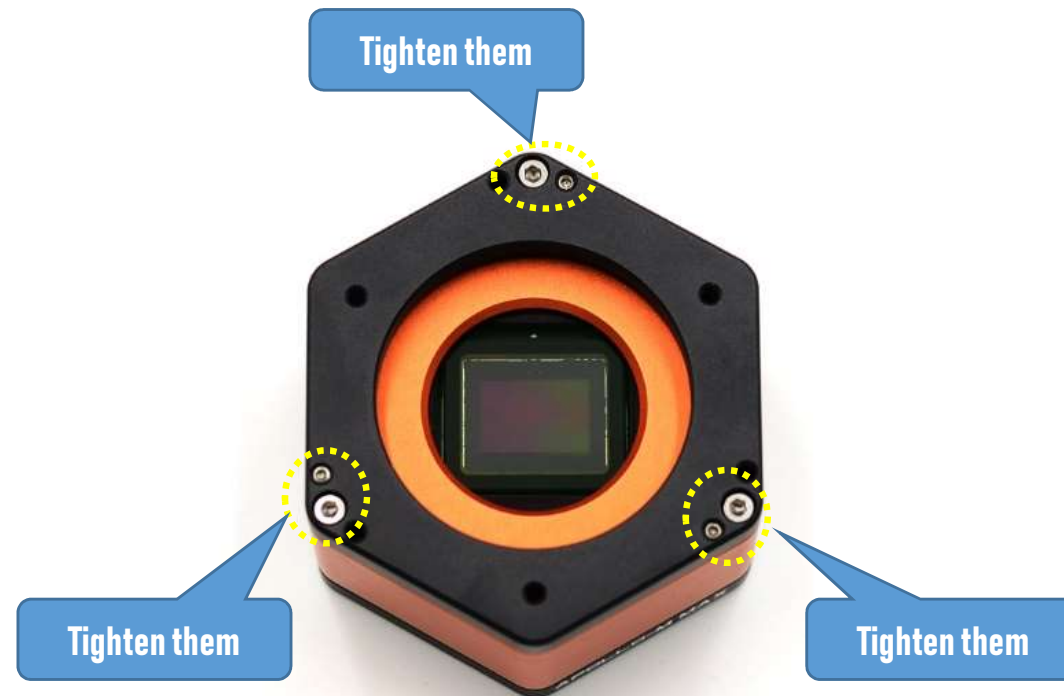


5. Tighten it

6. Tighten it

If you need to tilt top corner more, Repeat step1 and step2, until got suitable tilt angel to remove newton ring completely.

Step 3: Check and tighten all screws to lock the position



How to adjust tilter plate

Image preview on screen

Bottom



Right

Left

Top

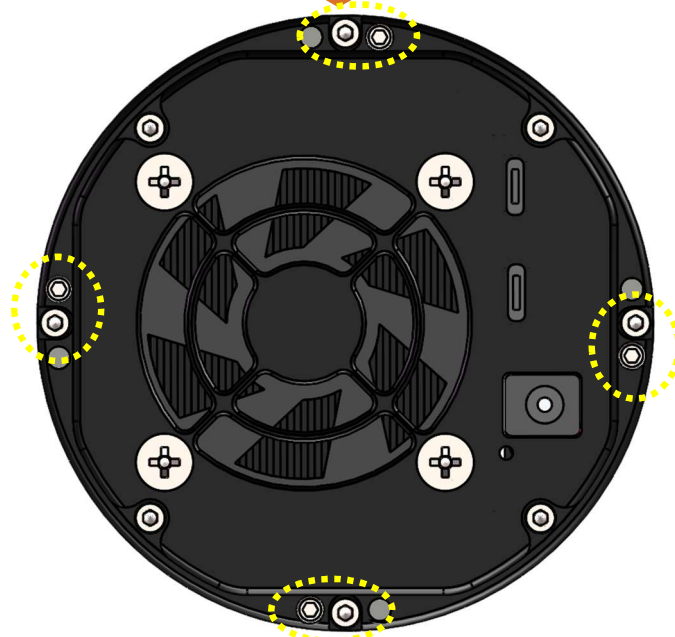
4 sets of Push/Pull screws

Top

Left

Right

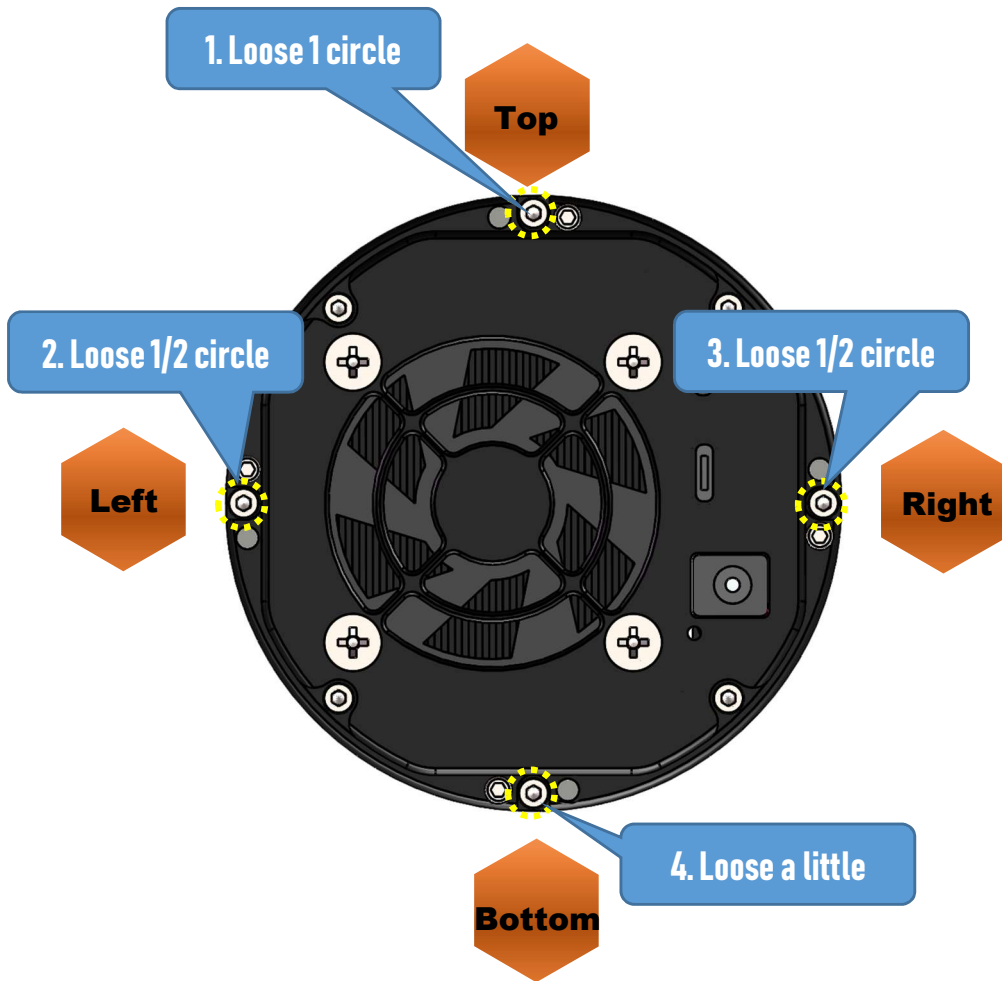
Bottom



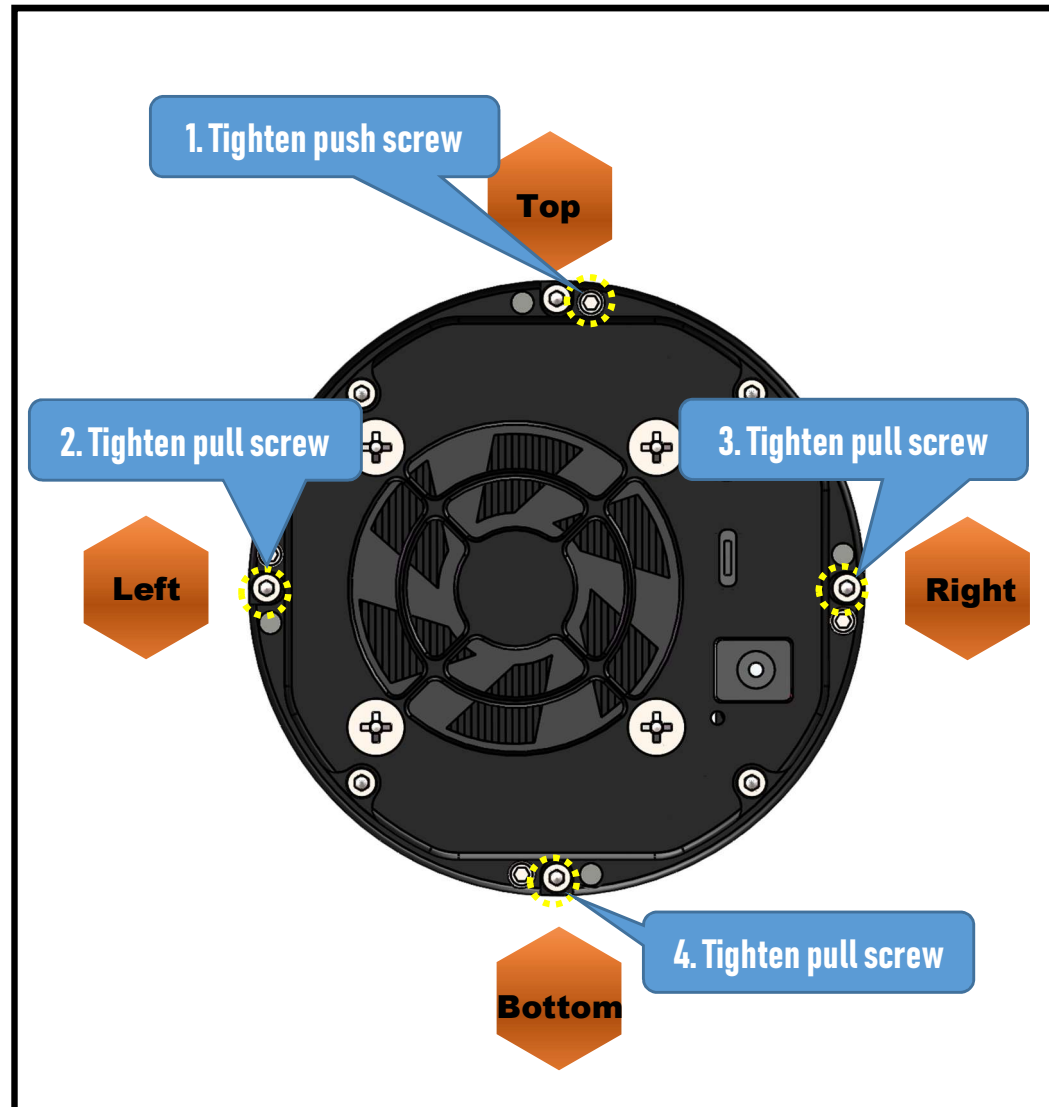
If want to tilt top for 0.5mm

How to adjust tilter plate

Step 1: Loose pull screws

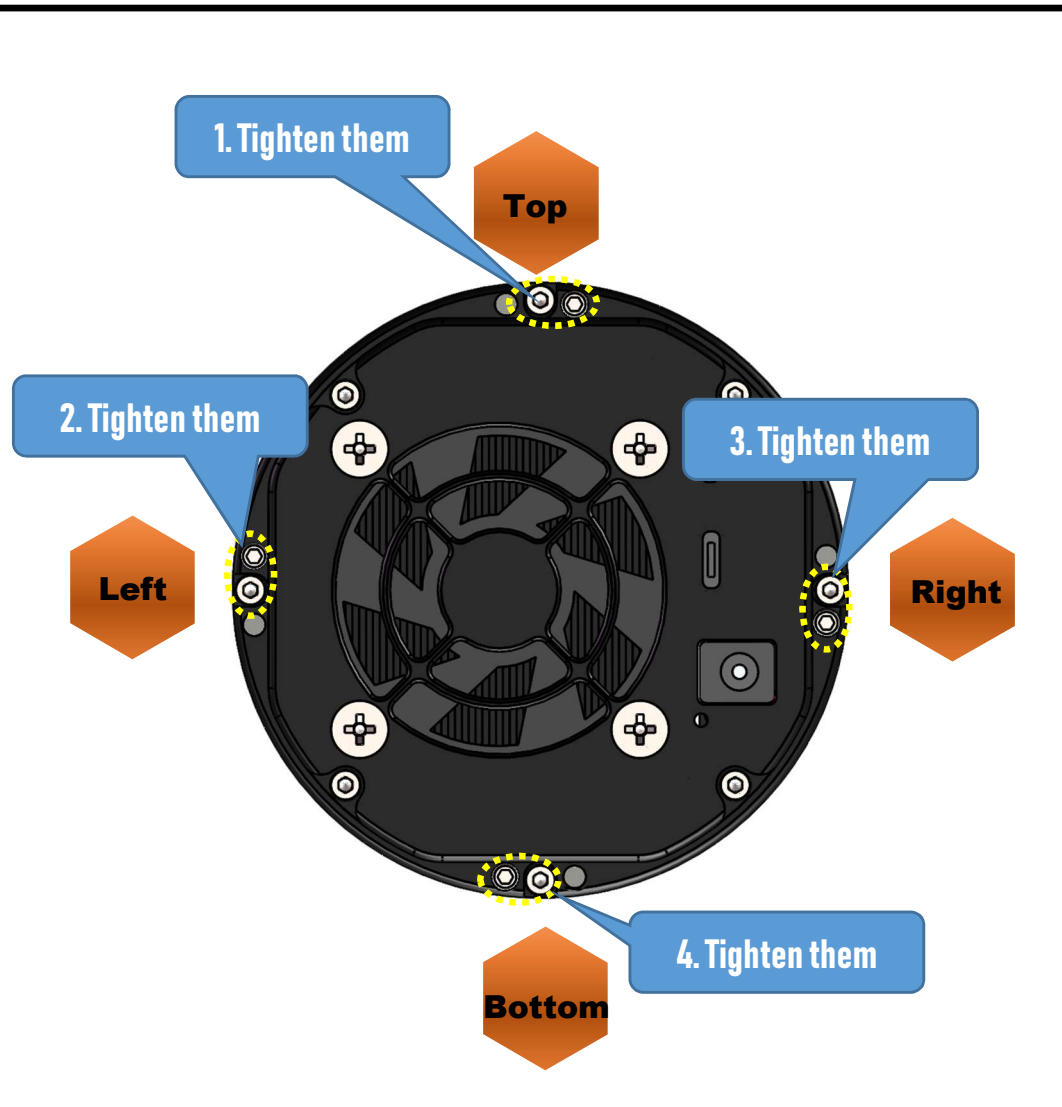


Step 2: Tighten some screws



If you need to tilt top corner more, repeat step1 and step2, until got suitable tilt angel.

Step 3: Tighten all screws



If want to tilt another direction,
just repeat those steps.

Tighten all screws to finish tilt adjustment of top direction.



Player One

» 08

Servicing and Warranty

After-sale service guide

Warranty Policy

2-year free warranty (time start from delivered) for Player One products. If the product has any issue, please send the image or video and description to support@player-one-astronomy.com for further check to confirm.

- Purchase from Player One official online store, we will provide warranty service directly.
- Purchase from dealer, we will provide warranty service through dealer.

Repair in warranty, customer only pay the shipping fee of shipping back the product to us or dealer, and no other extra fees.

Replacement Policy

You can request our Replacement Service:

- ✓ Within 30 calendar days of receiving the product if the product does not match the original description of the product in one or more significant respects.
- ✓ Within 30 calendar days of receiving the product if the product suffers performance failure.

Please contact our After-Sales team by email to support@player-one-astronomy.com within 30 calendar days of receiving the products. Player One shall be responsible for the two-way replacement freight for any products sent in for replacement due to performance faults.

Warranty and Replacement Policy Exceptions:

- × Warranty service time or replacement service time expired.
- × Legal proof-of-purchase, receipts, or invoices are not provided, or are reasonably believed to have been forged or tampered with.
- × A product sent to Player One for replacement does not include all original accessories, attachments and packaging, or contains items damaged by user error.
- × A product is found to have no defects after all appropriate tests are conducted by Player One.
- × Any fault or damage of the product is caused by unauthorized use or modification of the product, including exposure to moisture, entry of foreign bodies (water, oil, sand, etc.) or improper installation or operation.
- × Product labels or serial numbers show signs of tampering or alteration.
- × Damage is caused by uncontrollable external factors, including falling down, fires, floods, or lightning strikes, etc.
- × Proof of damage during transit issued by the carrier cannot be provided.
- × Other circumstances stated in this policy.

In those situations, repair the product might have extra cost, we will estimate cost and email customer to know the information before send product back.



Player One

» 09

FAQs

The background of the slide is a black and white photograph of a surfer riding a large, curling wave. A large, semi-transparent circular graphic is centered over the image. The word "Thanks" is written in a large, bold font, with the "T" in blue and the "hanks" in white.

Thanks

Choose Player One, to be Player One!

Company website:

<https://player-one-astronomy.com/>

Share your work and feedback

<https://www.facebook.com/PlayerOneAstronomy>