



**QHYCCD**

COLDMOS Astronomy Camera<sup>v1</sup>

# QHY163M

User's manual Rev.1.6



This document is an online document. You may save this PDF file or print it out. QHYCCD reserves the right to change this user manual without prior notice.

## Package Contents

please confirm that the package contains the following items:

USB3.0 cable(1.5m)	1
Self-locking power cable	1
6pin guide cable	1
Car power adapter	1
Drying tube	1
desiccant	1
M42/2inch adaptor(Maximum diameter: 56mm)	1
Driver download card	1
Inspection report	1
QHY163M camera	1

## Optional accessories

12V power adapter + power cable	1
C-MOUNT lens adapter	1

**Note that if the user wants to buy 12V power adapter by themselves, its output current is at least 3.5A, and the polarity must be center positive.**

# Table of Contents

- 01 Software Installation
- 02 Use QHY163M with Filter Wheel
- 03 Use QHY163M in SharpCap
- 04 Use QHY163M on ASCOM platform
- 05 Use QHY163M in FireCapture
- 06 Use QHY163M in EZCAP\_QT
- 07 Use Broadcast Video Streaming
- 08 QHY163M Color Wheel Control Port
- 10 FAQ
- 11 Camera Maintenance
- 12 Specifications
- 13 Mechanical Dimensions
- 14 Revision History

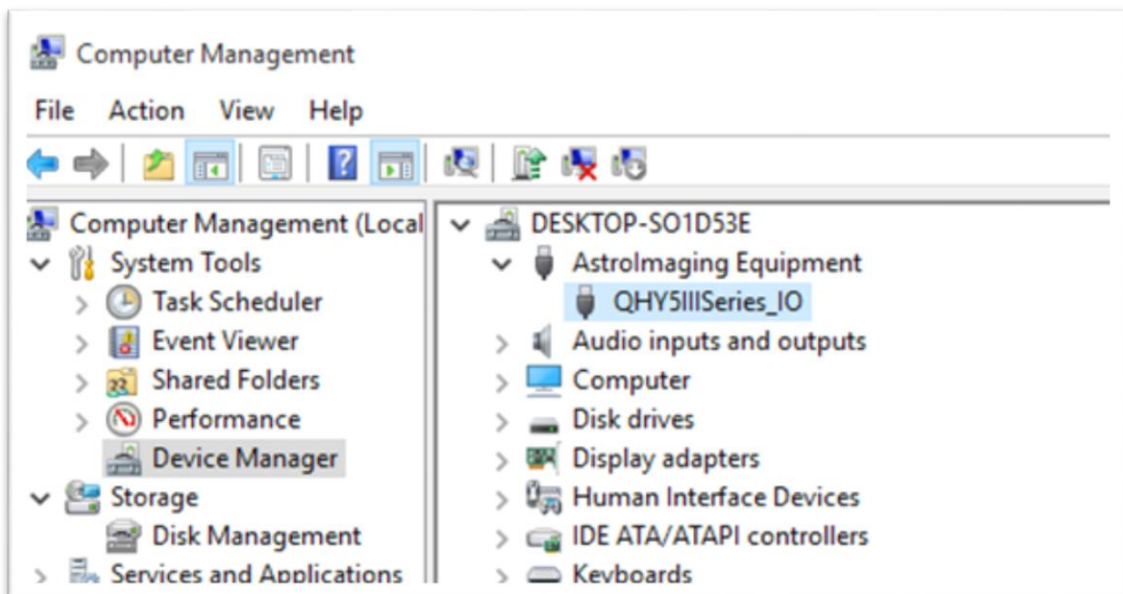
## 01 Software Installation

1. Download and install [ASCOM platform](#)
2. Download and install [Camera Driver](#)
3. Download and install [ASCOM Driver](#)

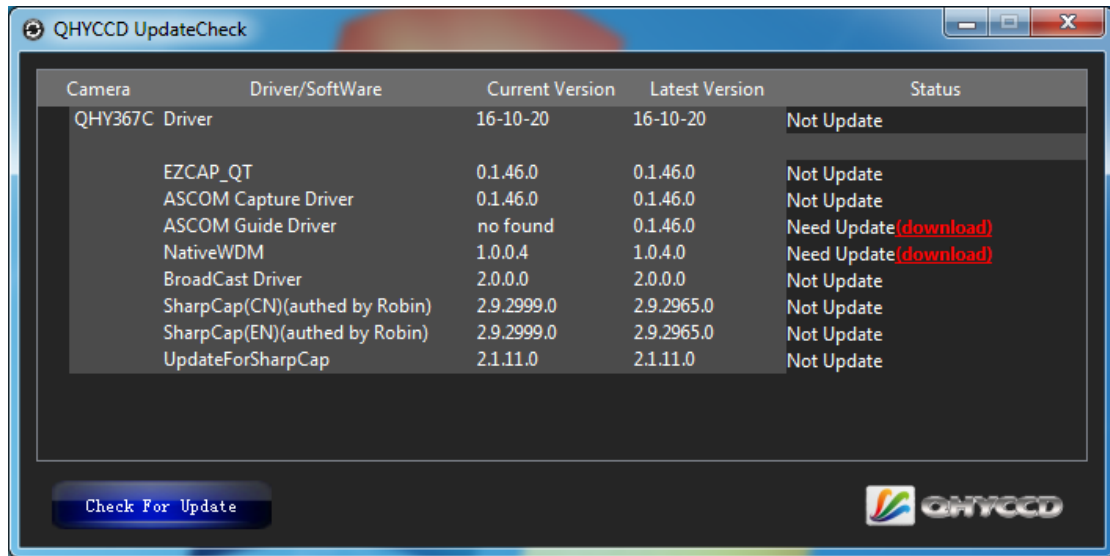
As you most probably want to use your QHY163M as an expose camera, please download the Capture version. If you want to use it as a guide camera, please download the Guide version.

4. QHY163M camera uses SharpCap as the default capture software. Please download [SharpCap](#). QHY163M camera can run on SharpCap 2.9 or later versions  
Note that QHY163M requires the latest qhyccd.dll for the new version of SharpCap, and QHYCCD has already made [SharpCap Patch](#) for it. You should download and install it prior to using SharpCap.

5. Connect QHY163M to your PC with USB3.0 cable. For the first time the system will find a new device and search the driver. You can skip the online searching by clicking “Skip obtaining driver software from Windows Update” and the computer will find the drivers. After installation is complete successfully, you can find the device in the device manager as shown in the picture below



QHYCCD has developed a software named [UpdateCheck](#) that can check if the drivers installed on your computer are the latest versions as well as update the drivers if needed. If the status of some driver is “Need Update”, you can directly download its update package in this software freeing you from the inconvenience of looking for and downloading it from our website. Take QHY367C for example, you can see the drivers we need are the latest versions and don’t need to be updated as shown in the following picture.



Note that after you downloading and installing the new drivers by using this software, be sure to pull the USB cable out and then plug it in to enable the new drivers.

## 02 Use QHY163M with Filter Wheel

QHY163M is a monochromatic camera and it is frequently used with color filter wheel. With its M42/2inch lens mount (this has already been installed on QHY163M), connecting it with QHY color filter wheel will be simple and quick. QHY163M supports connections both with QHYCFW2-S and QHYCFW2-M.

Take QHYCFW2-M for example, you can refer to a [tutorial](#) to set up your QHYCFW-M.

After you've installed color filters for your QHYCFW2-M properly, you can begin to connect it with QHY163M as shown in the picture below.



First, you need to stick QHY163M into QHYCFW2-M as shown in the picture above. Then you should screw those three bolts in. At the first time you screw bolts, you may find it a little bit difficult to screw in, in this case, please make sure that the bolts are pointing towards the center and apply a little bit more of force. Finally, you should connect your QHY163M with QHYCFW2-M by using DIN4/RJ11 cable, which is included in the box.

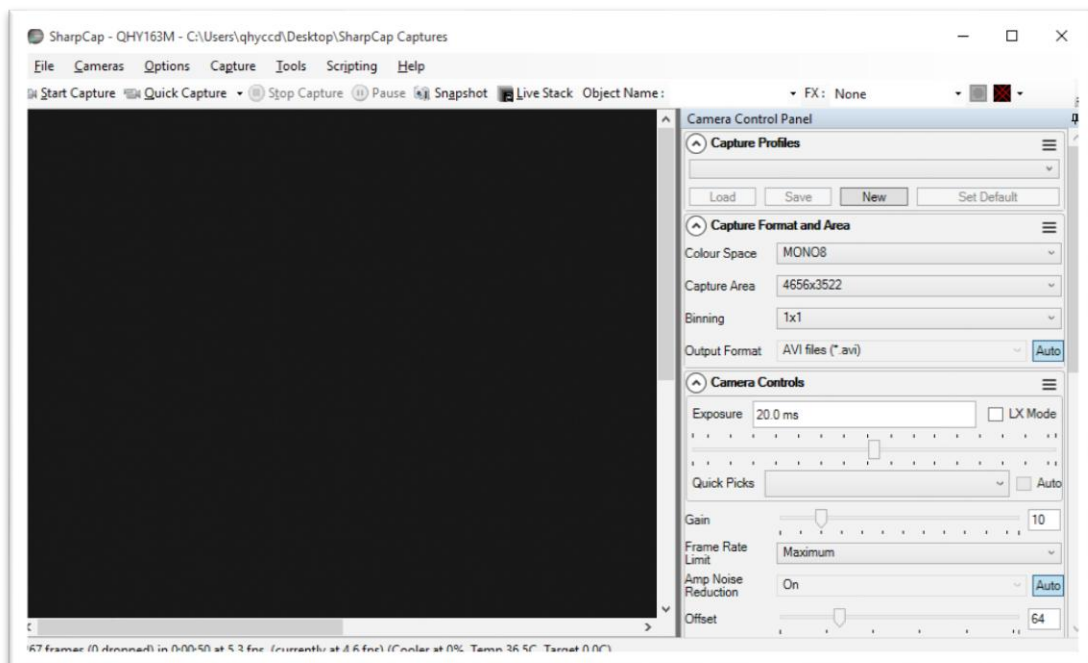
The last thing you need to do before using QHY163M with QHYCFW2-M is to open the link below to download and install the driver ([ASCOD FiltersPlug-in](#)) for QHYCFW2-M.

Now, you should be all set. Read the following parts to know how to use QHY163M with color filter wheel in SharpCap, MAXIMDL, and Sequence Generator Pro.

## 03 Use QHY163M in SharpCap

1. Connect your QHY163M to color filter wheel with DIN4/RJ11 cable. Connect your QHY163M to 12V power supply. Connect your QHY163M to your computer with USB3.0 cable. Before running SharpCap, make sure filter wheel's initialization is finished. When it is initializing, you can hear the sound gear makes. When it is finished, you will see the color lights flash. If you start SharpCap before initialization is finished, SharpCap cannot detect the filter wheel.

2. Run SharpCap. If the aforementioned software and drivers all have been installed properly, the video image will appear automatically and you will see the frame rate at the lower-left corner of the software as shown below



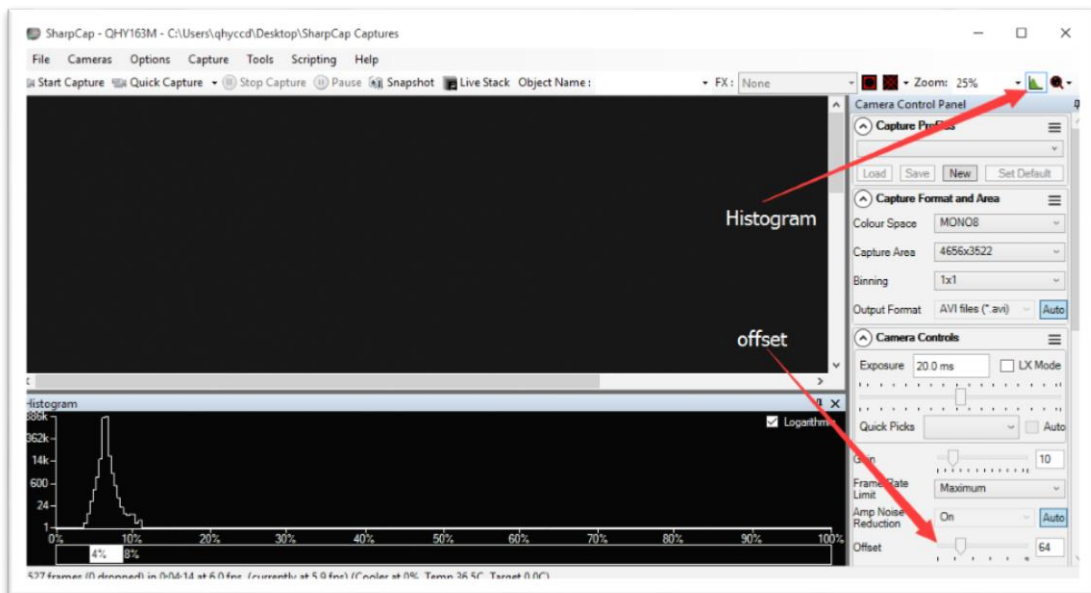
3. If you have started the SharpCap before connecting camera to your PC. You can click menu->cameras->rescan for cameras to search the camera and check on the camera name (QHY163M in this case).

4. To make sure the camera can run properly, the software will start the camera at the lowest speed, which makes the frame rate much lower than the highest frame rate declared on its webpage. Now you can try to get the most out of it by changing several settings. First you can try to set the exposure time to 1ms, then try to reduce the "USB traffic" value. For modern computer with i7-4 core, it should get the max performance. But please note that not all computers can get the best performance due to various reasons such as the CPU loading, the saving-energy mode setting, the mainboard performance and USB3.0 port performance. Sometimes the display size may also impede obtaining the best performance. So you can try to use the "Zoom" function to reduce the display size to see if it helps. Normally speaking the QHY163M can get more than 22.5FPS@16mega full resolution.

5. Adjust filter wheel position. You can select which filter you are going to use by changing the position of filter wheel as shown in the following picture.



6. Adjust the offset. When you block the light thoroughly, you may find that the image is not really zero. Sometimes this will lower the quality of image contrast. You can adjust the offset to make the histogram peak close to zero in order to get a better background. You can open the histogram to confirm that.

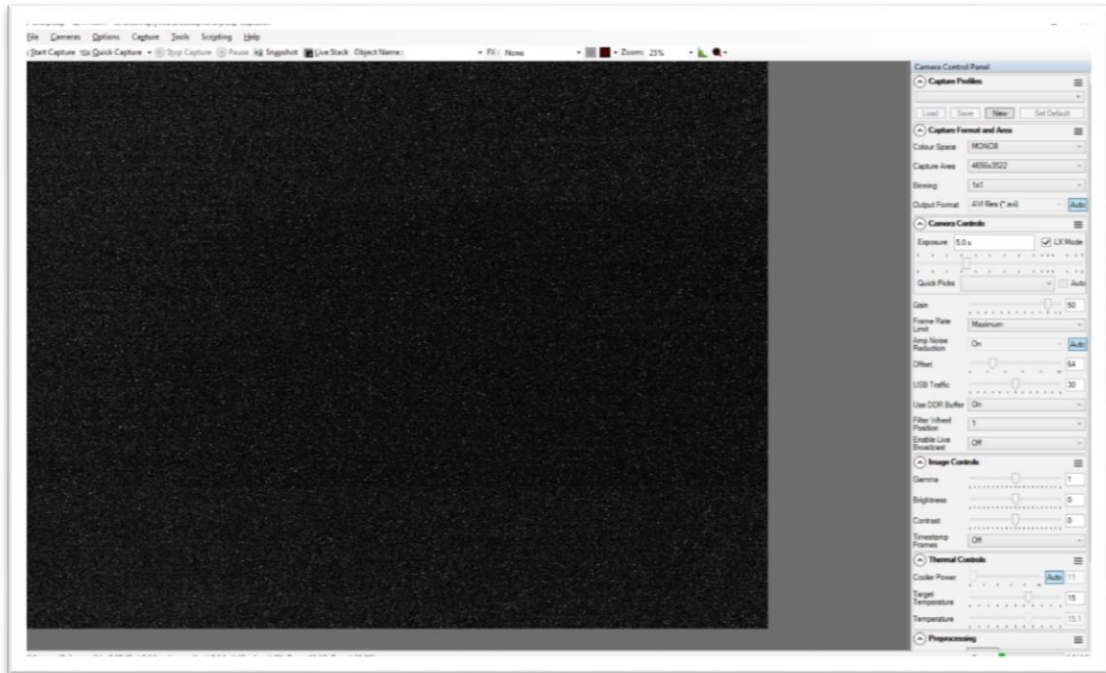


7. If you want to try 16bit image, you can switch the Colour Space to "MONO16".

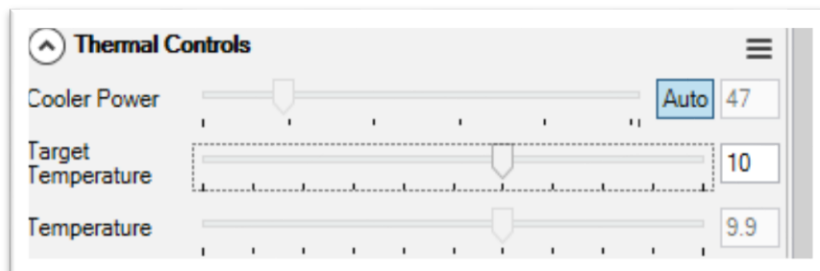
8. By check the "LX" mode you can expand the exposure setting range and take long exposure shot. QHY163M camera has the anti-amp light control circuit and it can reduce the amplifier glow significantly. Note that it's impossible to reduce the glow in the corner thoroughly, and it's normal to see a very small amount of glow in the corner when you do long exposure.

A typical long exposure image in +20°C, 5 sec exposure and 50% gain of QHY163M is shown below.





9. After you connect 12V power supply for QHY163M to power the TEC cooling circuit, you can set the CMOS sensor cooling temperature in the “Thermal Controls” section in SharpCap as shown in the following picture.



Basically, you can control the temperature of CMOS by either adjusting “Cooler Power” or clicking “Auto” and adjusting “Target Temperature”. You can also see the CMOS temperature at lower-left corner of the software.

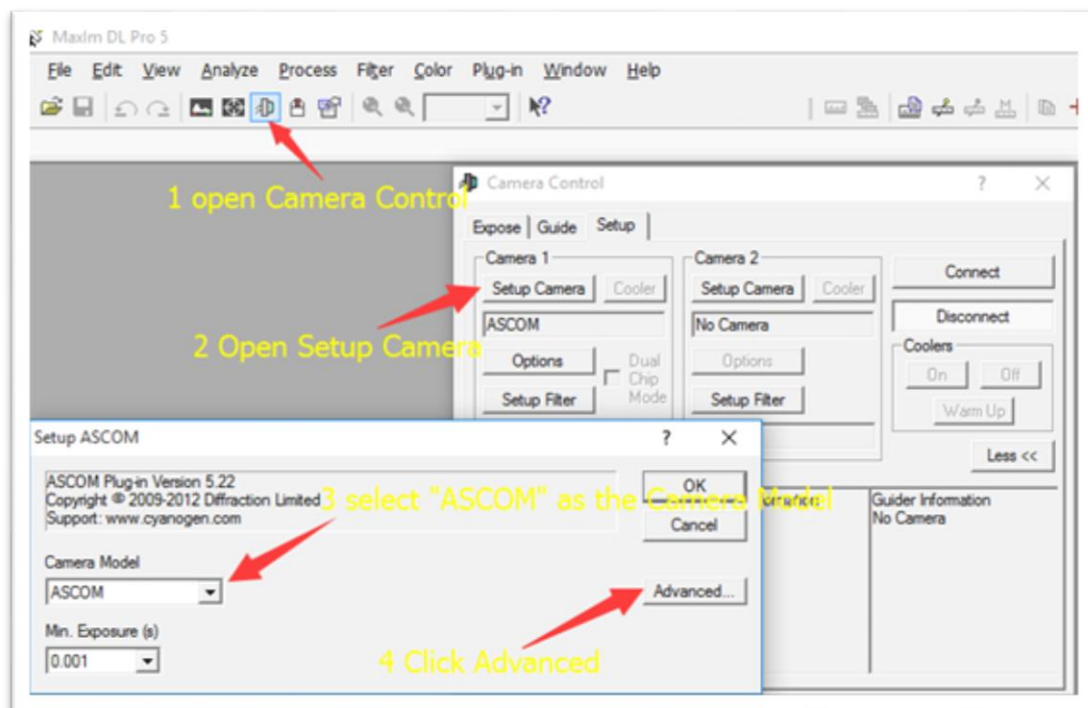
Before use this function, you should read the content about how to protect the cooler in the FAQ section.

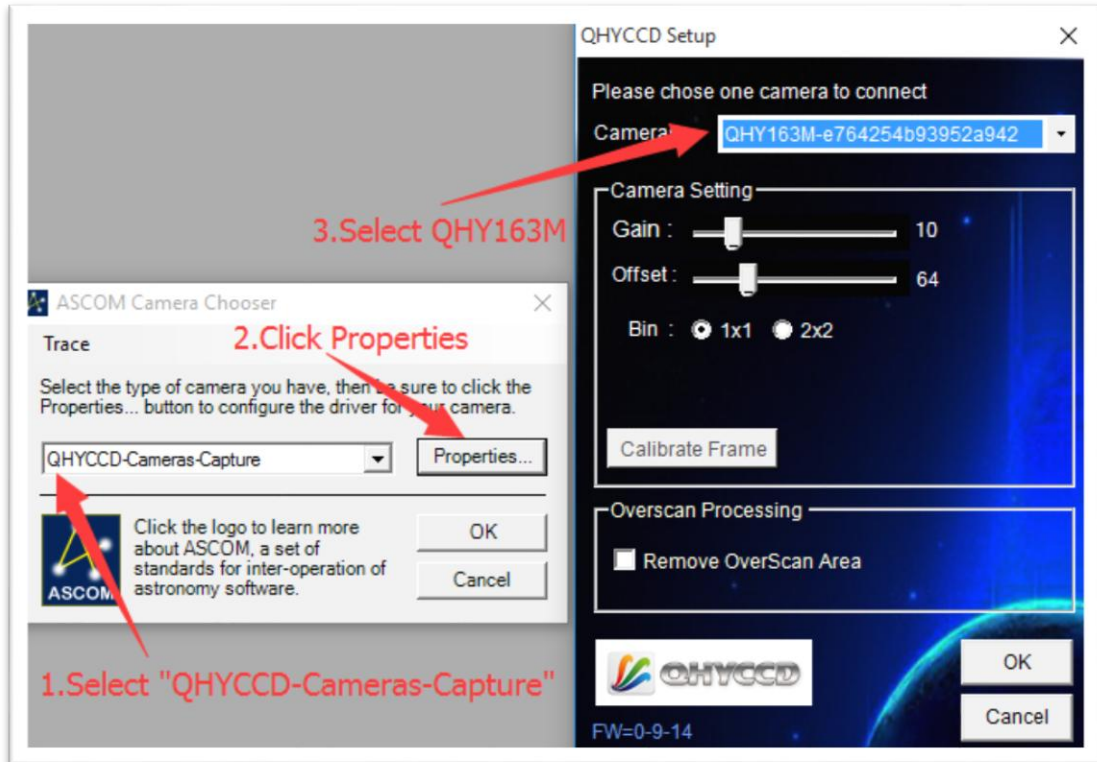
## 04 Use QHY163M with ASCOM

You can connect many software that support ASCOM. Currently QHY63M only supports normal ASCOM connection and does not support the ASCOM VIDEO connection. Please note that QHY163M always transfers maximum bit depth by ASCOM to make the best DSO imaging performance. The image format is 16bit width and patch zero on low bit.

### MaxIM DL

1. First you have to make sure that both ASCOM Platform and ASCOM driver have been installed. If not, please install it first.
2. Start MAXIMDL
3. Follow the instructions shown below to finish the setup

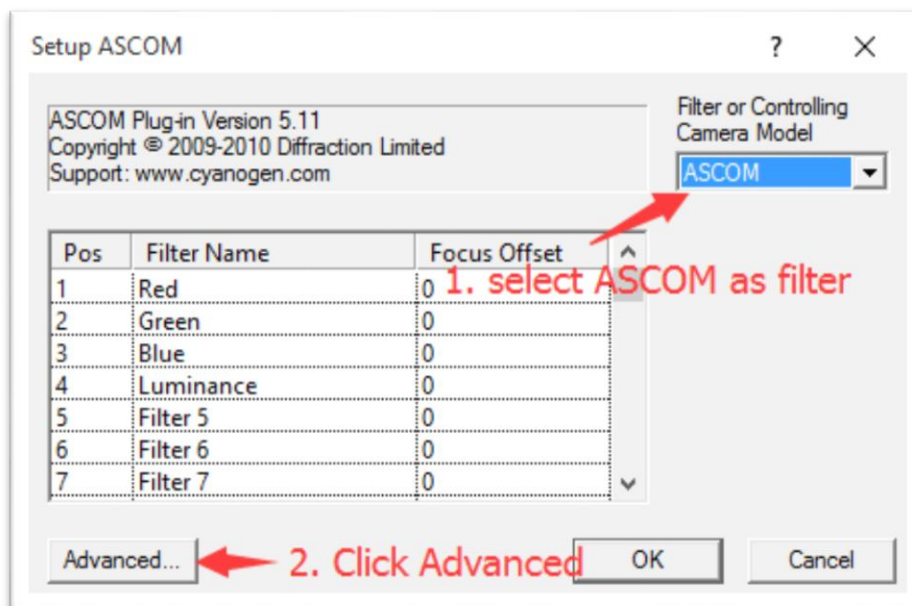
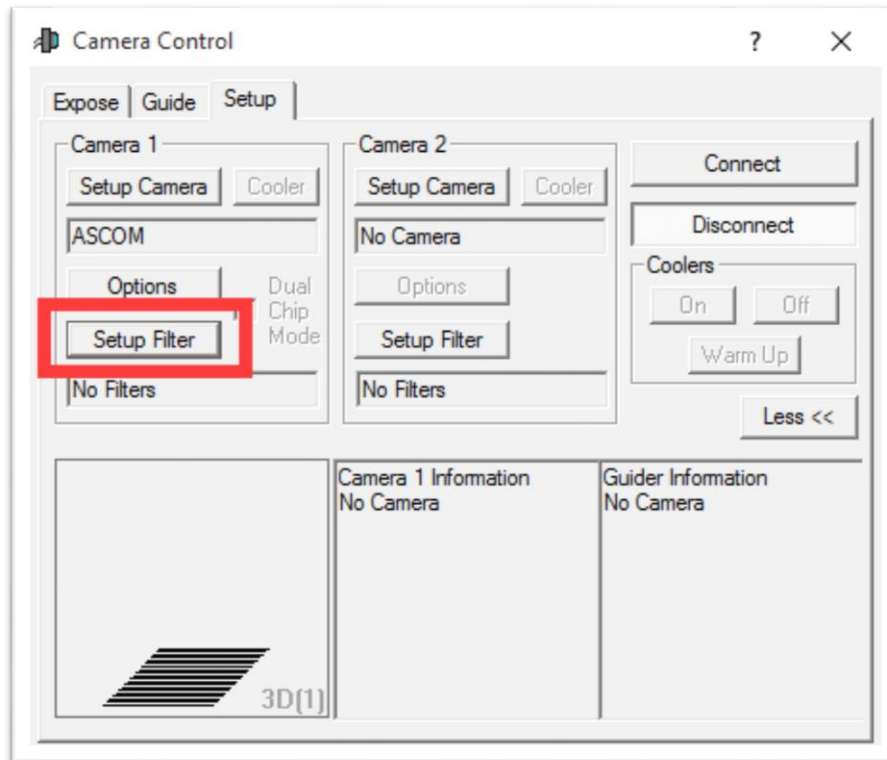


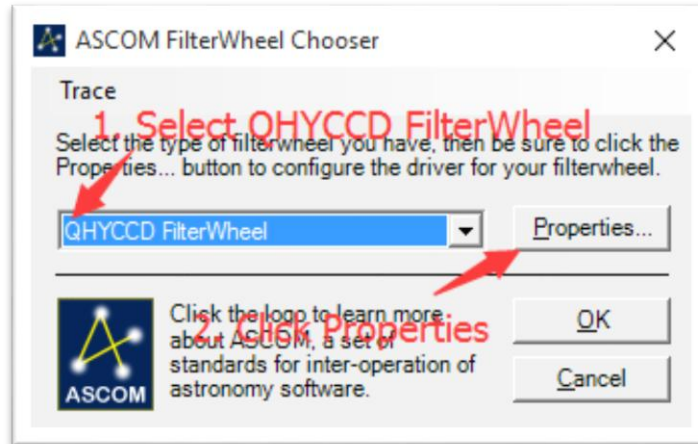


Normally, you can set the gain=1 and offset=10 to start. Keep clicking "Okay" to return to Camera Control window.

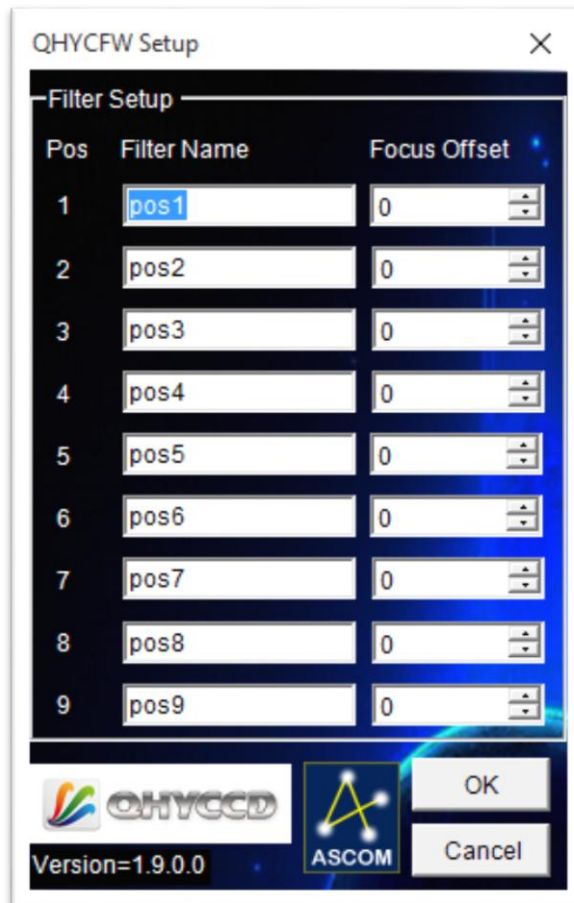
The following instructions are going to show you how to configure filter wheel (QHYCFW2-M) in MAXIMDL.

Click "Setup Filter" in the Camera Control window.

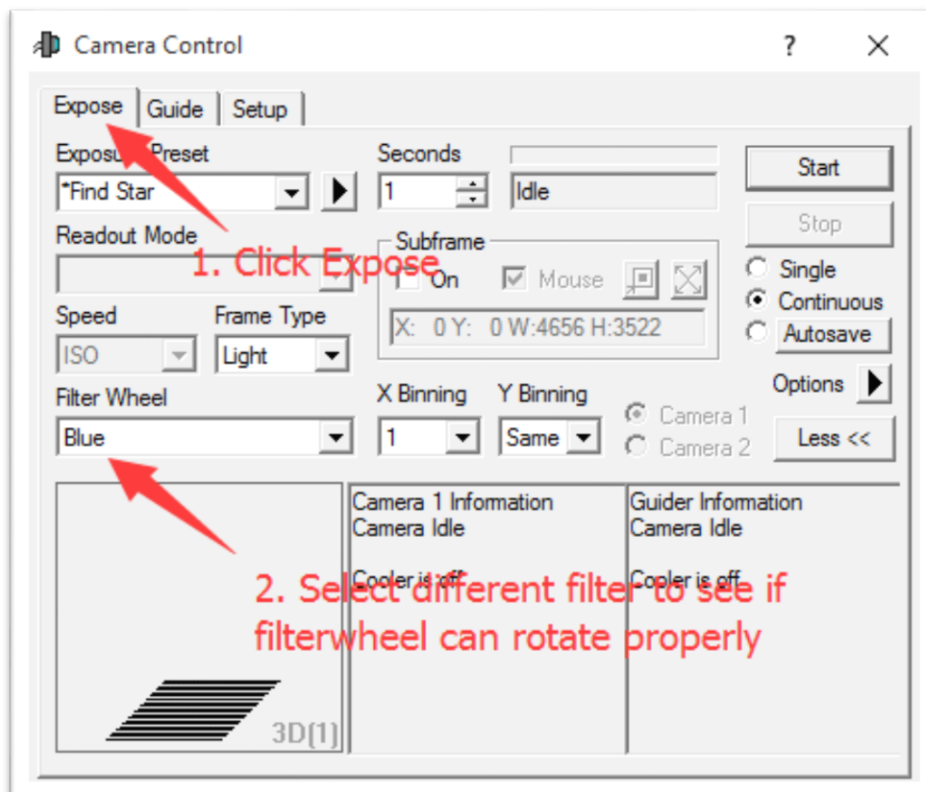
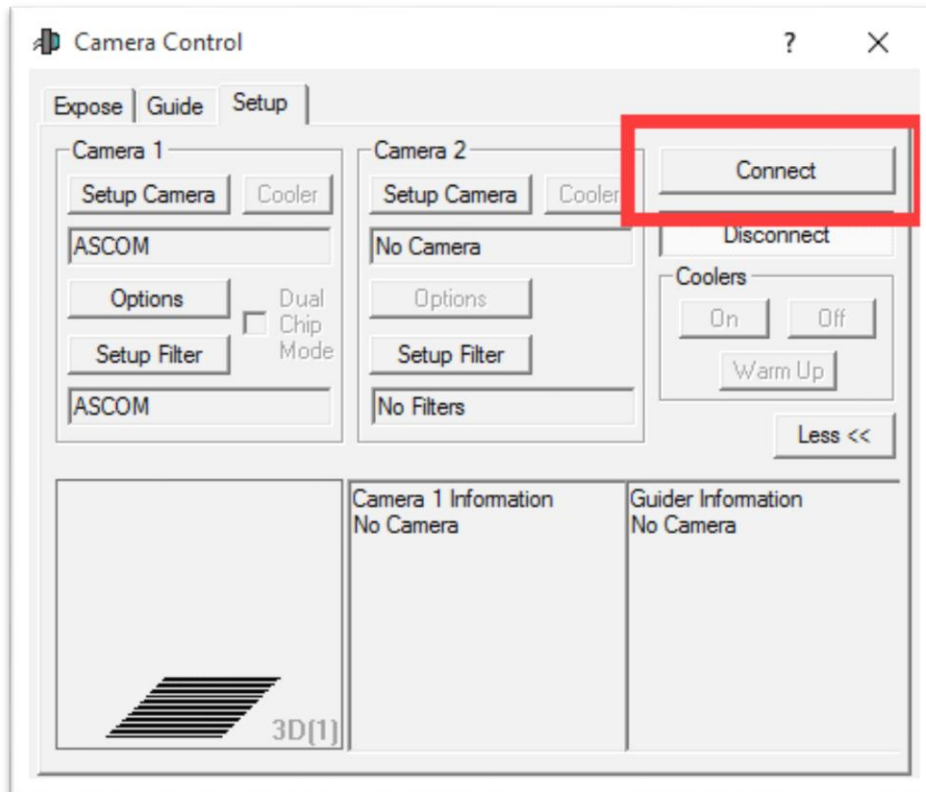




In the window shown below, you can set up your filter wheel



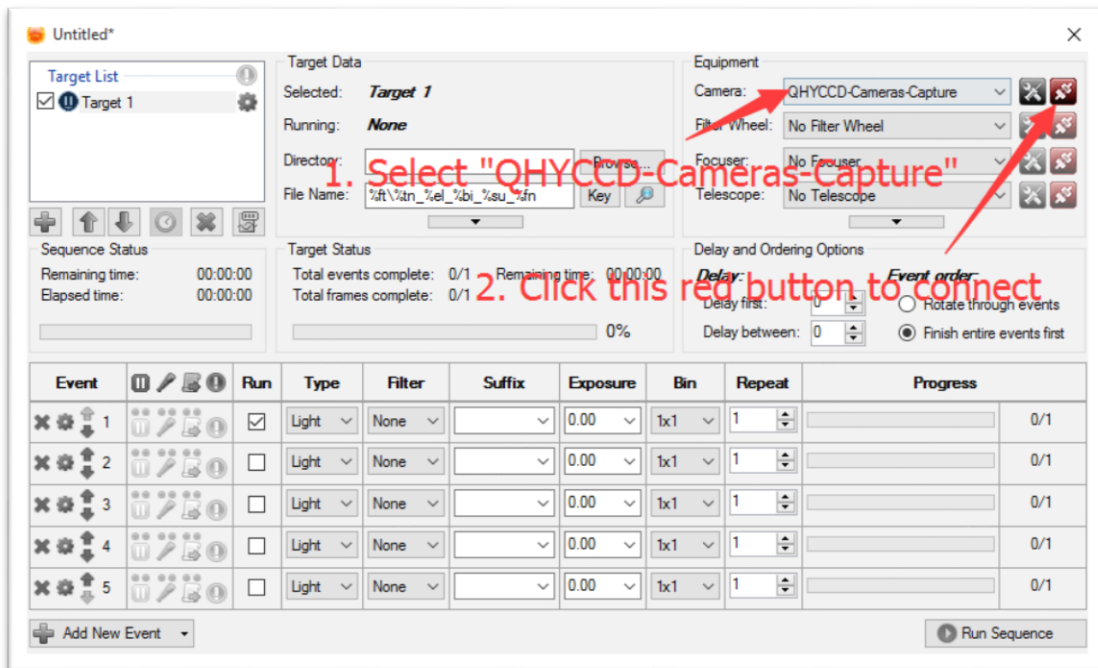
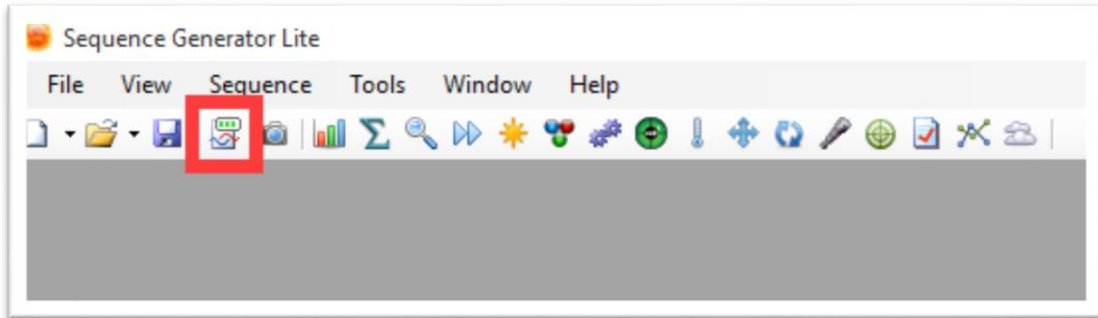
Keep clicking "OK" to return to the Camera Control window. Click "Connect"



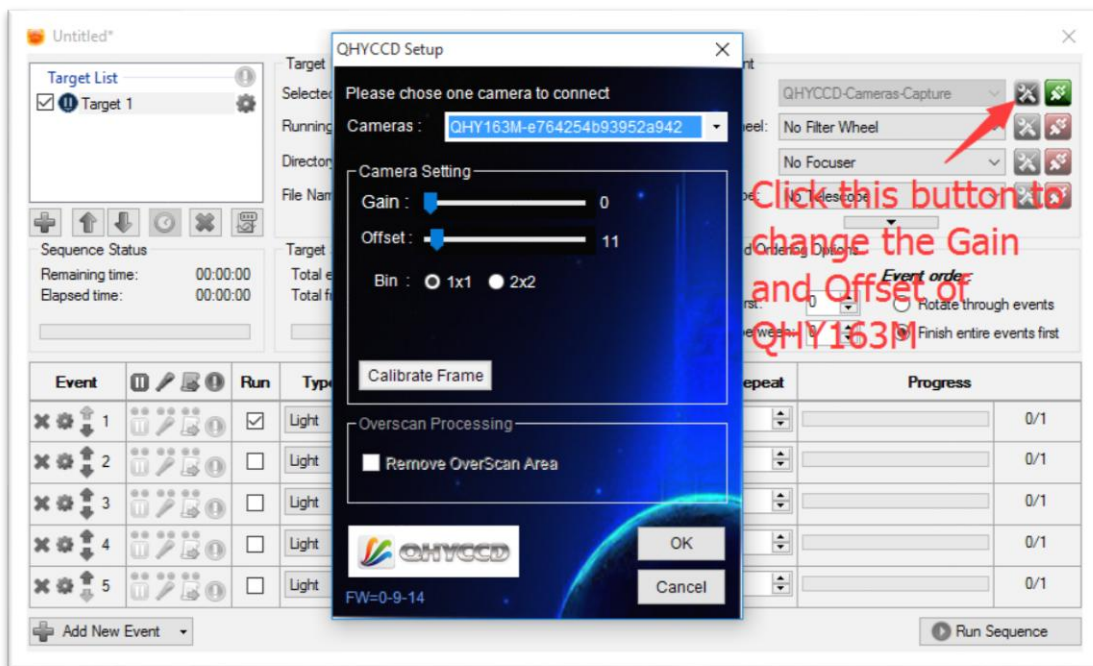
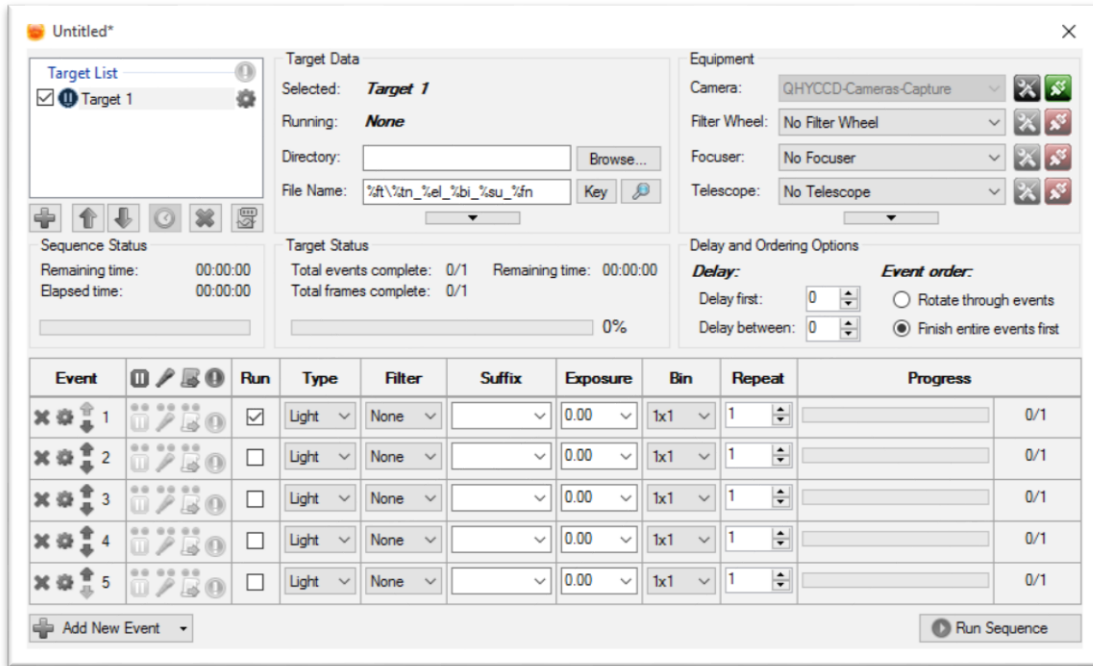
## Sequence Generator Pro

Sequence Generator Pro is an extremely powerful image capture suite. It can perform many complex tasks in order to meet your imaging needs. After you connect your gears and configure Sequence Generator Pro properly, you can go to sleep and see images in the morning.

To use QHY163M in Sequence Generator Pro, you can follow the instructions listed below. Open sequencer by clicking the button in the red rectangle as shown in the picture below.

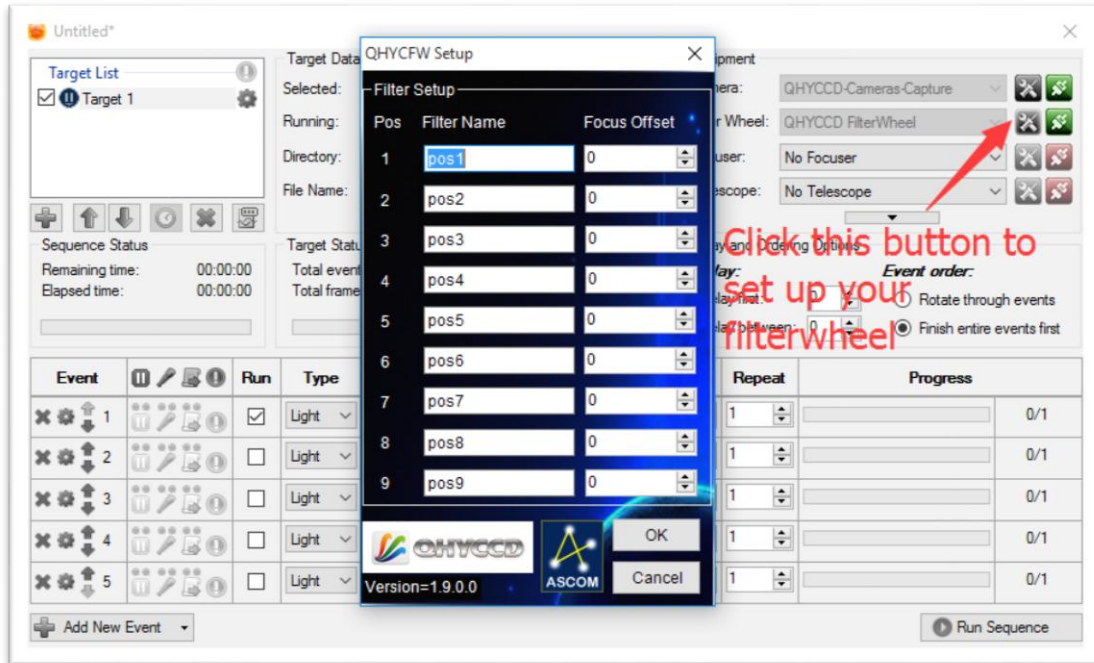


If you've connected QHY163M to your PC before click that red button. The red button will turn to green as shown in the picture below.

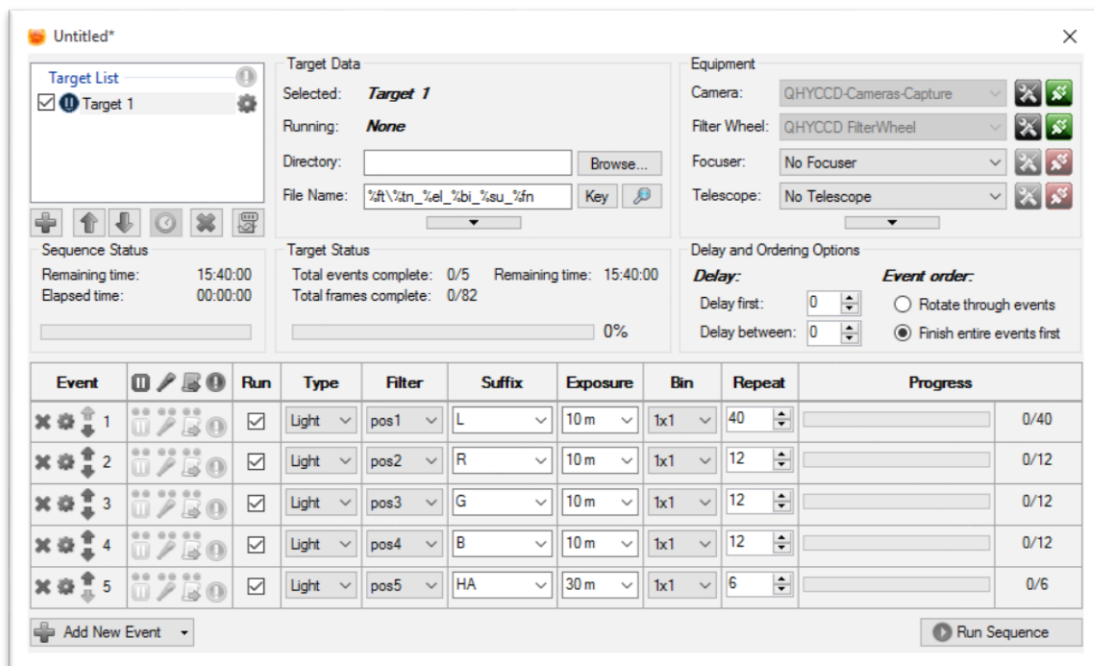


The next step is going to connect your filter wheel (QHYCFW2-M). Before you select QHYCCD Filter wheel as the filter and click the red connect button, you should also make sure you've connected QHY163M to filter wheel (QHYCFW2-M) with DIN4/RJ11 cable, you've plugged in the 12V power supply cable, you've installed the Filter wheel drivers, and the initialization of filter wheel has been finished.

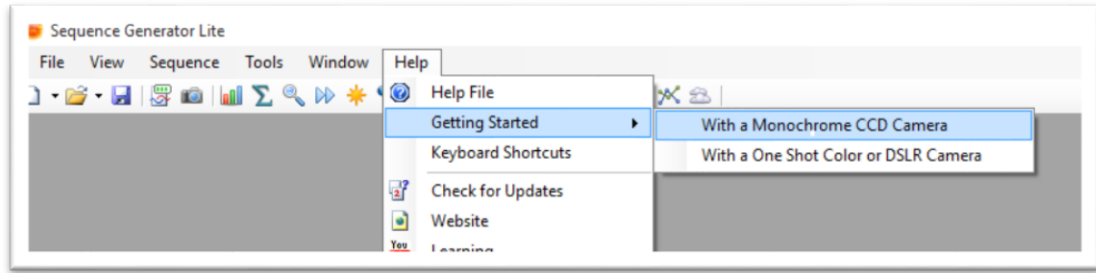




For example, you can change the filter names to Lum, Red, Green, Blue, and Ha as you installed them this way. Then you make schedule events to take turns to use these filters as shown in the following picture.



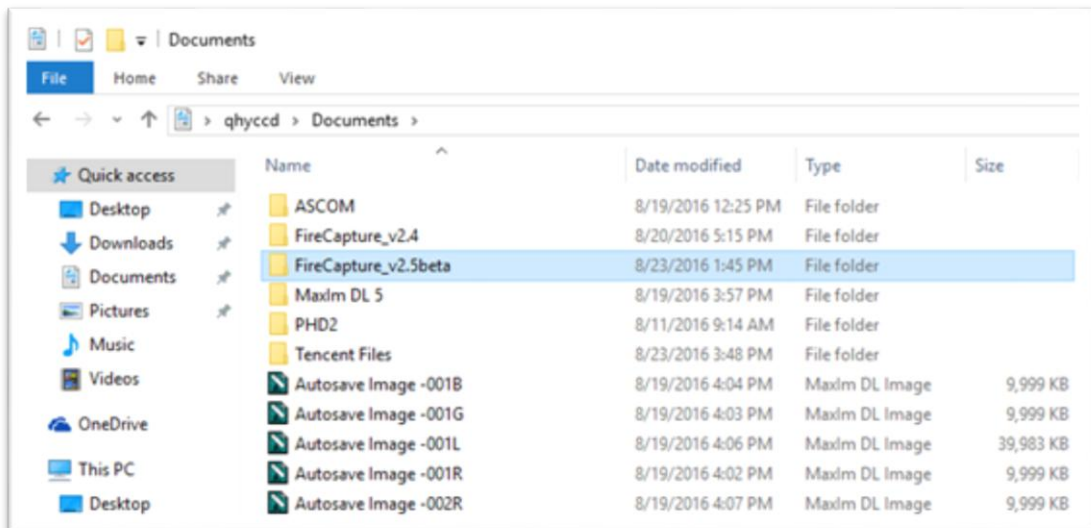
For detailed and helpful tutorial of this software, please go to its website to check its help content.



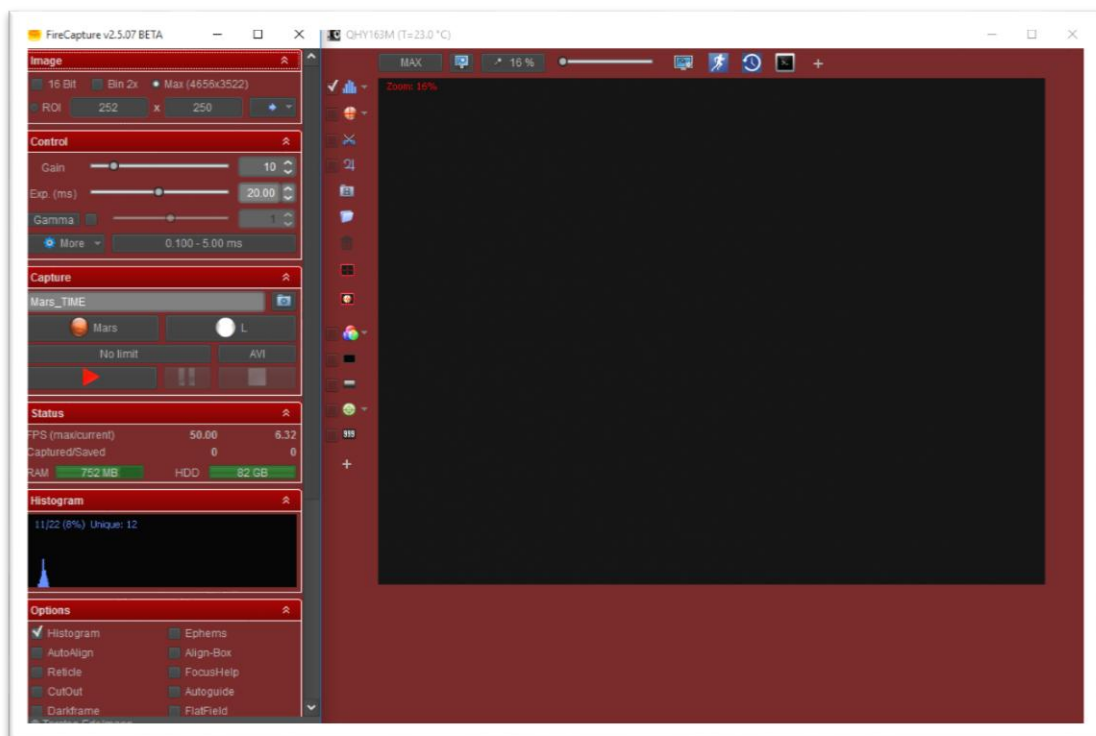
## 05 Use QHY163M in FireCapture

The latest FireCapture supports QHY63M already. Please go to FireCapture website to download its [v2.5 BETA \(32-bit\) version](#).

By default, it will be installed in the “Documents” folder. After it was installed successfully, navigate to “Document folder”, and you will find its installation folder as shown below.



Enter that folder and run “FireCapture.exe”, then select QHYCCD camera. And after the loading, you will see the image on FireCapture like shown below.

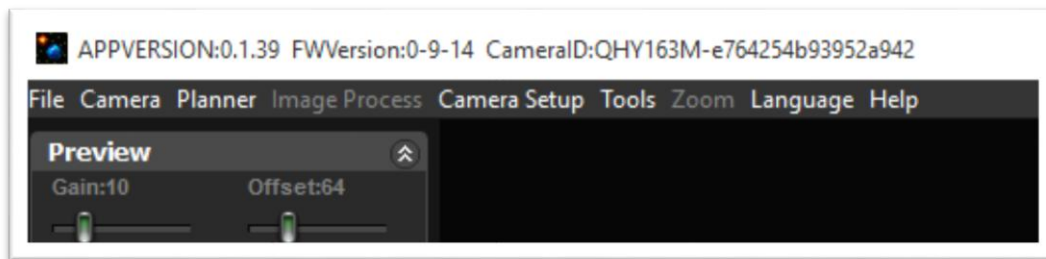


For detailed and helpful tutorial of this software, please go to its website to check the tutorial section at <http://www.firecapture.de/>

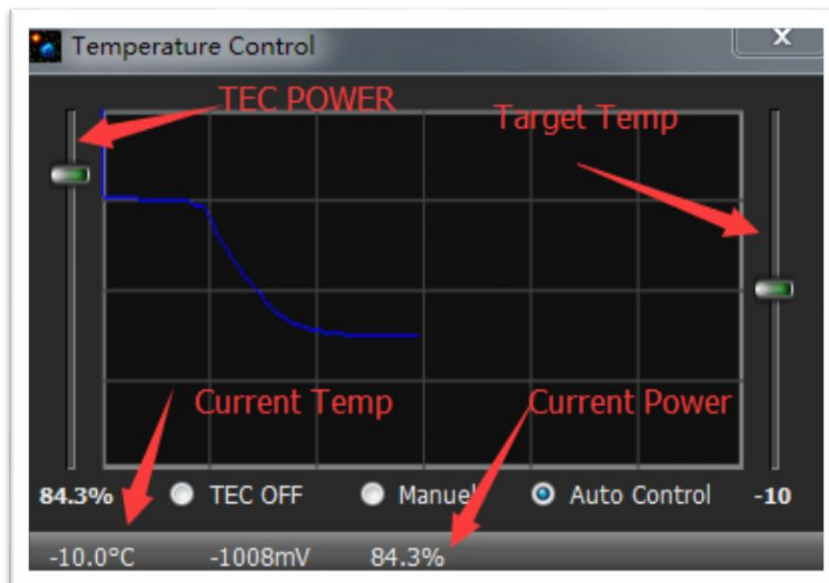
## 06 Use QHY163M in EZCAP\_QT

EZCAP\_QT is the software developed by QHYCCD. This software has the basic capture function for QHYCCD deep sky cameras. You can use this QHY63M camera with filter wheel in this software.

1. Install [EZCAP\\_QT](#)
2. Connect your QHY163M to 12V power supply. Connect your QHY163M to color filter wheel with DIN4/RJ11 cable. Connect your QHY163M to your computer with USB3.0 cable.
3. Run EZCAP\_QT. Select "Connect" in Menu->Camera. If the camera is successfully connected. The title of EZCAP\_QT will display the camera firmware version and the camera ID as shown below.

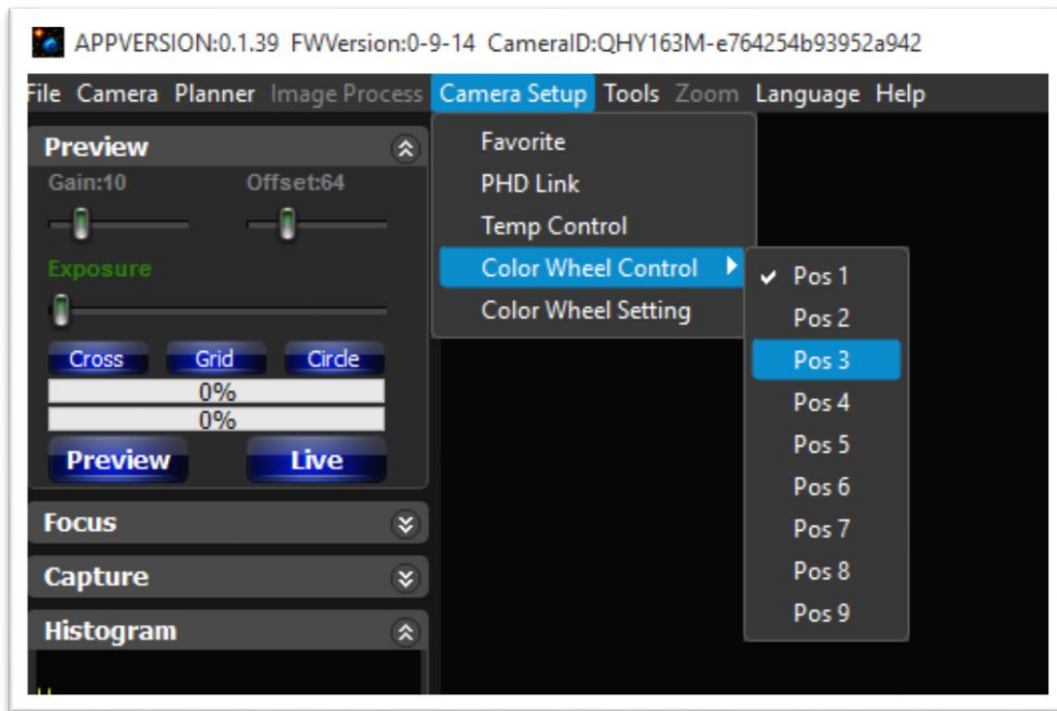


4. In Menu->Camera Setup, Click "Temp Control" and set the CMOS sensor temperature. You can enable the "Auto Control" and set the target temperature. For example here we set the temperature to -10C. The CMOS temperature will come to -10C very fast (in about 2-3minute). If you want to close the TEC, you can select "TEC OFF". If you just want to set the TEC power but not the temperature. You can select "Manual" and then set the percent of the TEC power.



5. You can select which filter you are going to use by changing the position of filter wheel as

shown in the following picture.



6. You can use the preview tab to do preview. And use the focus tools to do focus. Then use the capture tab to capture image.

7. In EZCAP\_QT there is a planner for image tasking. You can capture a series images by using the table below.

Planner

	UseBIN	ExpTime(s)	Repeat	CFW	Delay(s)	Gain	Avg	SubBlack	SubBias
1	<input type="checkbox"/>	1	1	1	0	0	0	0	0
2	<input type="checkbox"/>	1	1	1	0	0	0	0	0
3	<input type="checkbox"/>	1	1	1	0	0	0	0	0
4	<input type="checkbox"/>	1	1	1	0	0	0	0	0
5	<input type="checkbox"/>	1	1	1	0	0	0	0	0
6	<input type="checkbox"/>	1	1	1	0	0	0	0	0
7	<input type="checkbox"/>	1	1	1	0	0	0	0	0
8	<input type="checkbox"/>	1	1	1	0	0	0	0	0
9	<input type="checkbox"/>	1	1	1	0	0	0	0	0
10	<input type="checkbox"/>	1	1	1	0	0	0	0	0

Add Row Save Table Load Table

Folder

FileName

NGC 1 2 3  
M 4 5 6  
IC 7 8 9  
Clear 0 ( )

Start  
Force Stop

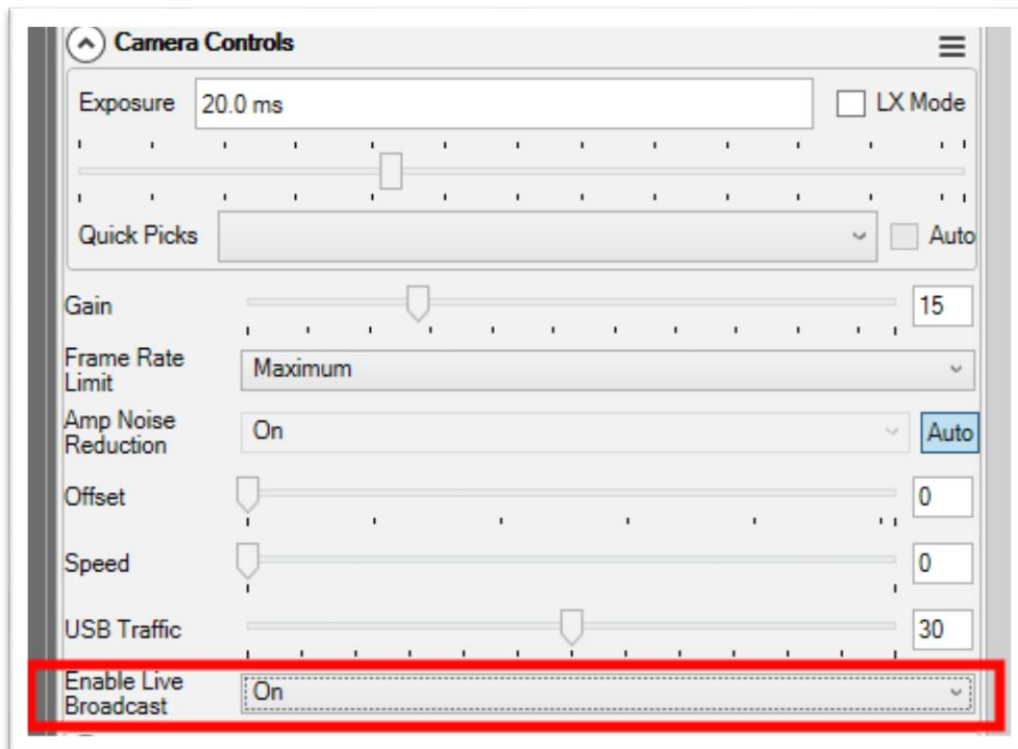
Capture DarkFrame  
 High Readout Speed  
 Color Wheel Loop 2

No Task

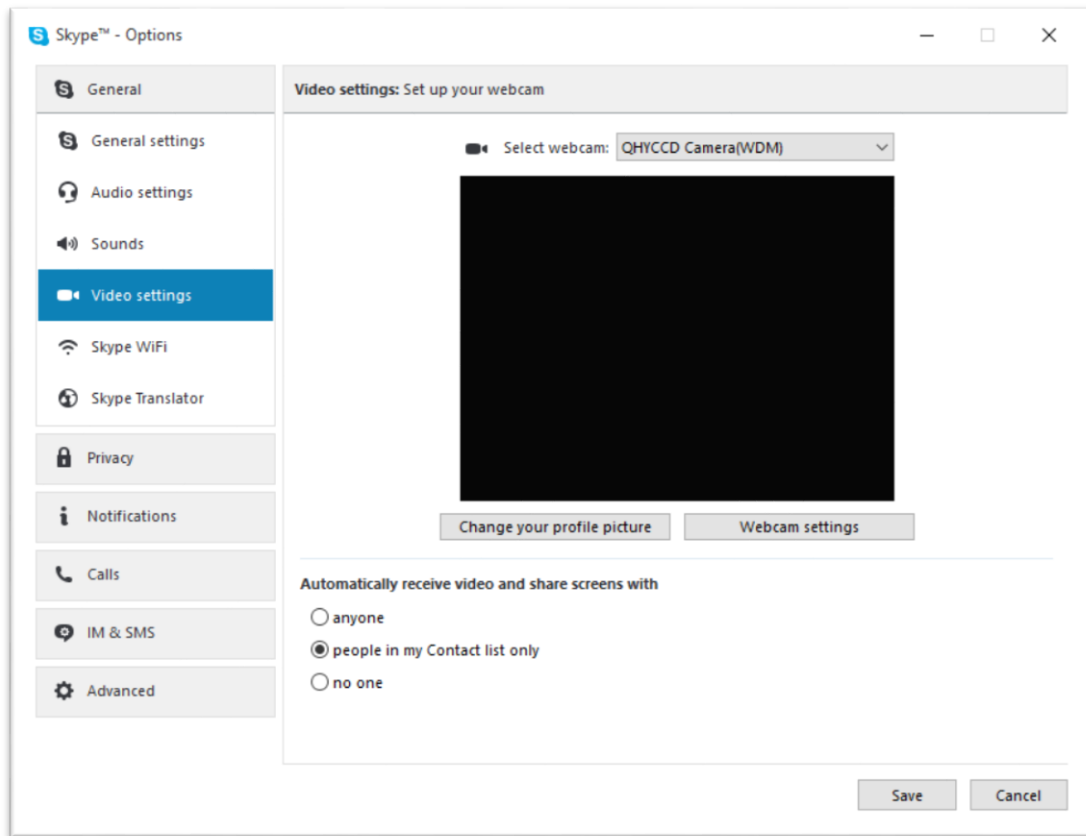
## 07 Use BroadCast Video Streaming

BroadCast video steaming is a special function that QHY163M supports. It can send the video image to multiple target software via QHYCCD BroadCast video driver. For example, you can use the SharpCap software to control the QHY163M camera and at the same time the video appearing on the SharpCap will be sent to any of software that support the WDM camera, like the HandyAvi, Adobe video encoder, online chat software etc. This function is very useful for the video live broadcast applications.

1. Install the [BroadCast Driver](#)
2. Connect QHY163M to your PC and start SharpCap
3. Turn on “Enable Live Broadcast” at the bottom of Camera Control panel in SharpCap as shown below.

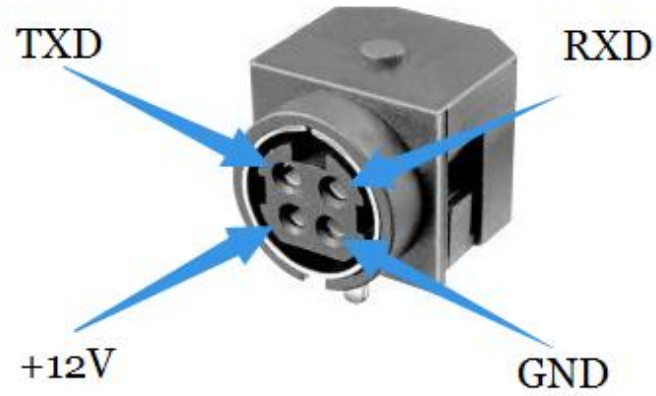


4. Select “QHYCCD camera (WDM)” as your webcam in the software you are using.





## 08 QHY163M Color Wheel Control Port



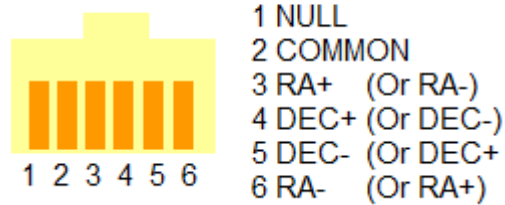
Pin number arrangement

Note: The TXD and RXD is standard RS232 level (+-10V). Not the TTL standard.

## 09 QHY63M Guide Port Cable RJ11 Pin sequence

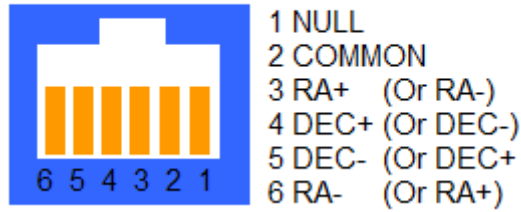
This connector is fully compatible with the EQ5/EQ6/Celestron/iOptron Guide Socket. The Pin Sequence is (When face to the connector of the cable)

Face to QHY5III Guide Cable RJ11 Head



The Socket side (mount side) is

RJ11 Mount Side  
(HEQ5/EQ6/EQ-G) Celestron



If you are using other mount, please check if it is the same pin sequence with the HEQ5/EQ6/Celestron/iOptron.

## 10 FAQ

### 1. Does QHY163M support 10bit or 12bit?

QHY163M supports both 10bit and 12bit output(For 10bit, it is 0-255, and it only uses the high 8bit, for 12bit it is 0-4095 map to 0-65535).

### 2. How to get maximum FPS?

Since QHY163M has very high data bandwidth. Not all computer can get the maximum FPS. Normally I7-4core should have no problem for that. The CPU loading will also affect the maximum FPS. So please reduce the CPU load by close other applications when using camera. If the CPU load is too high, the software may become very slow or hang.

### 3. How to avoid the camera hanging?

If your camera always hangs. It may be caused by many reasons. You can check the following things.

If your computer is via chipset, or some type of the mainboard. In SharpCap it cannot get image at all. (But in ASCOM it works well). In this condition, you need enable the DDR buffer of the camera. Current SharpCap supports DDR function enable. The next version SharpCap will support it.

If there is power leak for your mounts and computers? The power leak may cause the leak current transfer from computer to the camera via the GND. This may affect the USB transfer and cause the data packet lost and cause it hang. You need to make sure the computer and the mount is well grounded.

If the USB port's voltage not enough? Some computer's USB port +5V is not enough. It may cause the camera always hangs. In this condition you can use a powered USB3.0 HUB to connect camera and get the good +5V power for camera.

If your CPU load is too high? If CPU load is too high, it will cause many frame lost and cause the camera hangs. You can increase the USB traffic value to reduce the FPS and get more stable video transfer.

If the USB cable connection is good enough? Sometimes the contact issue in the USB cable to camera or USB cable to computer will cause the signal loss and cause camera to hang. Especially when you move the cables. In this condition. You can try to add a little silicon oil into the USB socket/plug .This can increase the contact a lot better.

Avoid the statics. Sometimes the static electricity on human body will cause the camera to hang. You can touch the computer metal case for first before touch the camera to let the static electricity on your body release.

Some computer's front USB port is not so good for high speed transfer (The reason is it connected to mainboard by a cable and which has no good signal integrity). If you found the camera always hang on front USB port. You can try the USB port on backside of the computer (which is connected to chipset directly on the mainboard).

#### **4. What's the interface to telescope? How to use C/CS lens on QHY163M?**

QHY163M supports C lens but currently doesn't support CS lens. You need order the optional C adapter for QHY163M with this adapter the back focal is 17.5mm and you can use the C-mount lens with it. Since this sensor is 4/3 inch, you need to choose the lens which can cover the 4/3 inch image circle.

#### **5. How to clean the CMOS sensor and the optic windows of the camera?**

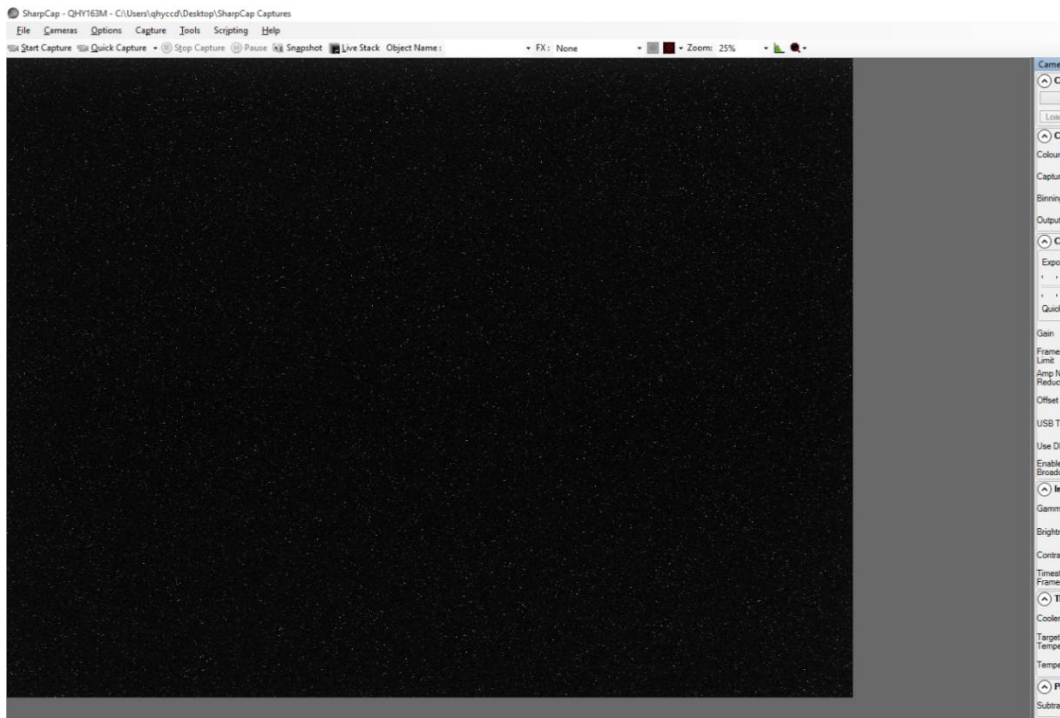
If you found there is dust on the CMOS sensor. You can screw off the front part of the QHY163M. The QHY163M's CMOS sensor has the AR coating so you need to be careful to clean it. You can use the clean kit for DSLR sensor to do it.

The optic window is the IR cut coating or AR coating. So you need to be careful when cleaning it. You can also use the DSLR clean tools or the lens paper. Don't use strong force to clean it. The coating is not so hard and it is easy to get scratch when you use strong force on it.

#### **6. How is the anti-amplifier function in QHY163M?**

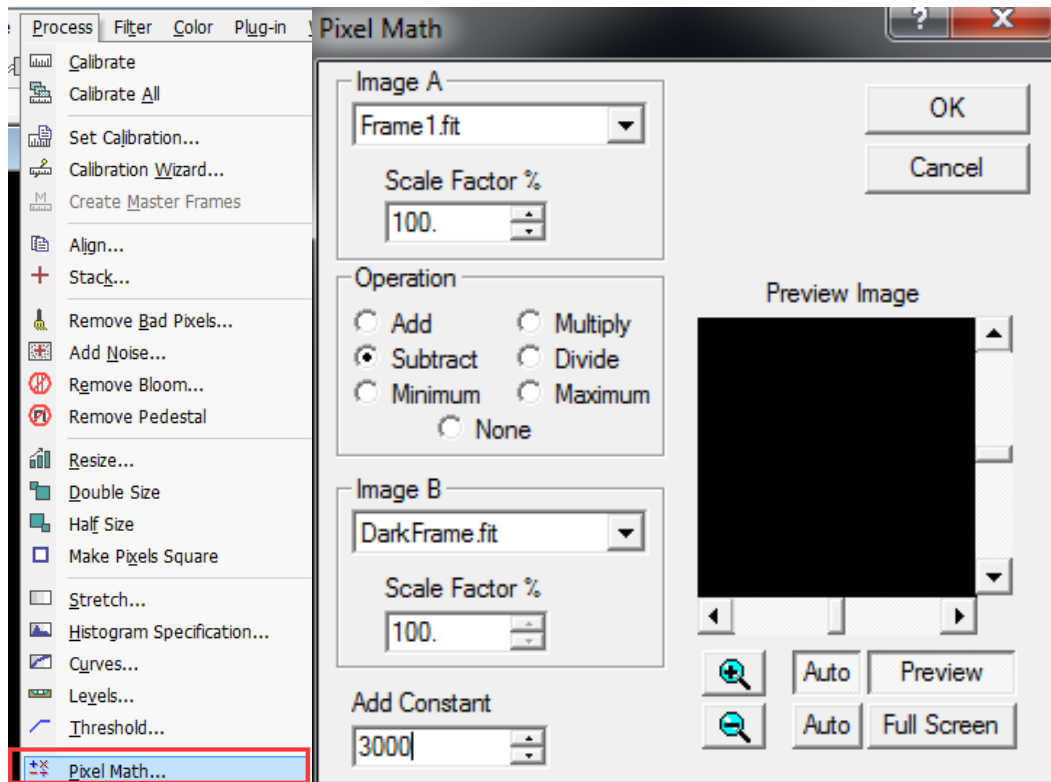
QHY163M camera has the anti-amp light control circuit and it can reduce the amplifier glow significantly. Note that it's impossible to reduce the glow in the corner thoroughly, and it's normal to see a very small amount of glow in the corner when you do long exposure.

This is a demo picture for the QHY163M glow in 60sec exposure and high gain. Dark frame calibration can remove it completely.



## 7. How to eliminate the bad effects of the amplifier glow?

When the exposure time is very long, amplifier glow in the corner will become more obvious. This is normal, and there is no need to worry because you can use dark frame calibration to eliminate its bad effects totally. Before or after you take a normal frame, you should take a dark frame with the same setting (exposure time, gain, temperature, etc.). Then open these two images by using MaxIm DL and subtract dark frame from the normal frame with its Pixel Math function as shown below, then the bad effects of amplifier glow will be eliminated. Note that, when doing subtraction, you should add a constant to prevent pixel value from being subtracted to negative value and becoming zero. The constant should not be too big, otherwise, its RMS will be too big; It should not be too small either, otherwise, the pixel value will be subtracted to negative value and becomes zero, too. The value of the constant can be determined with the assistance of Histogram and should guarantee that the pixel value are in the effective range, which is from 0 to 65535.



## 8. What's on-camera DDR buffer and what is benefit for?

The QHY163M has the on-camera 128MB DDRII image buffer. It brings two advantages: It can buffer whole image and avoid it lost during USB transfer. Because CMOS sensor outputs the image continuous after exposure end and it does not allow the pause. But the computer may have some pause due to the multi-task feature of the windows. If the pause is too long, the small buffer in the USB transfer chip will full and the coming image data will lost. And it will cause one frame is lost some data and this frame will be a bad frame. For short exposure it maybe not cause big problem because the next frame will comes soon. But for long exposure it means you lost a long exposure frame. The 128MB DDRII buffer can solve this problem by storing the whole frame into it and transfer. Even the computer has big pause it will not lost data.

Another advantage is that it will make the video more smooth when in some slow computer or some mainboard which is not friendly to USB3.0 (like the VIA chipset). In these computers they cannot handle the high speed USB data well and the data is always lost. With this DDR it can buffer the input image data and then send to computer. Even the high frequency pause happens, it can keep the USB data lossless.

SharpCap version has options for enabling/disabling the DDR buffer. The current ASCOM driver is always working under DDR enabled mode.

## 9. How to protect the cooler in QHY163M?

The cooler in QHY163M can lower the CMOS temperature to a value that's almost 40 degrees centigrade below the ambient temperature. So you need to be careful to avoid thermal shock, which refers to when the cooler's temperature rises or fall dramatically, the cooler is subjected to strong internal stress due to contraction principle. Drastic thermal shock can shorten cooler's service life or permanently break it.

So when you begin to adjust the CMOS temperature, you should avoid setting "Cooler Power" to its maximum value, and you should gradually turn up the "Cooler Power" value. When you turn off the power, if the "Cooler Power" value is very big, you should gradually turn it down before turn off the power.

## 10. The FPS of cameras sometimes suddenly drops to zero under DDR mode on SharpCap, what's the solution for this problem?

Recently, we have been told by our users that the FPS of their cameras sometimes suddenly drops to zero under DDR mode on SharpCap. It is caused by the fact that the receiving speed of computer is relatively slower than the sending speed of camera. Once CMOS sensor starts working, it will incessantly conduct exposure and output image data over and over again, and it cannot be interrupted. If USB transmission was interrupted too often by the operating system, the data overflow of DDR would ensue resulting in bad frame. Therefore, not a single frame is a complete frame, and the FPS will drop to zero.

Solutions:

The first solution to this problem is to increase the value of USB traffic to decrease the FPS of the cameras. Note that by using previous version of SharpCap Patch, the value of USB traffic cannot be set to a value large enough, so you should go to our website to download the latest version of SharpCap Patch.

The second solution to this problem is to turn off the DDR mode, but for computers whose performance isn't very good, this solution may not work very well.

## 11. How to reduce the amplifier glow of QHY163M?

Some users say there is amplifier glow on their images shot by using MaxIm. Part of the glow is produced during the readout process of CMOS, so by turning down the USB traffic value, we can increase the transfer speed of images, decrease the readout time so that the glow can be reduced.

We have run two tests to show how turning down the USB traffic value can reduce the amplifier glow. For more information about it, please check the document "How to reduce the amplifier glow of QHY163M" on the webpage of QHY163M.

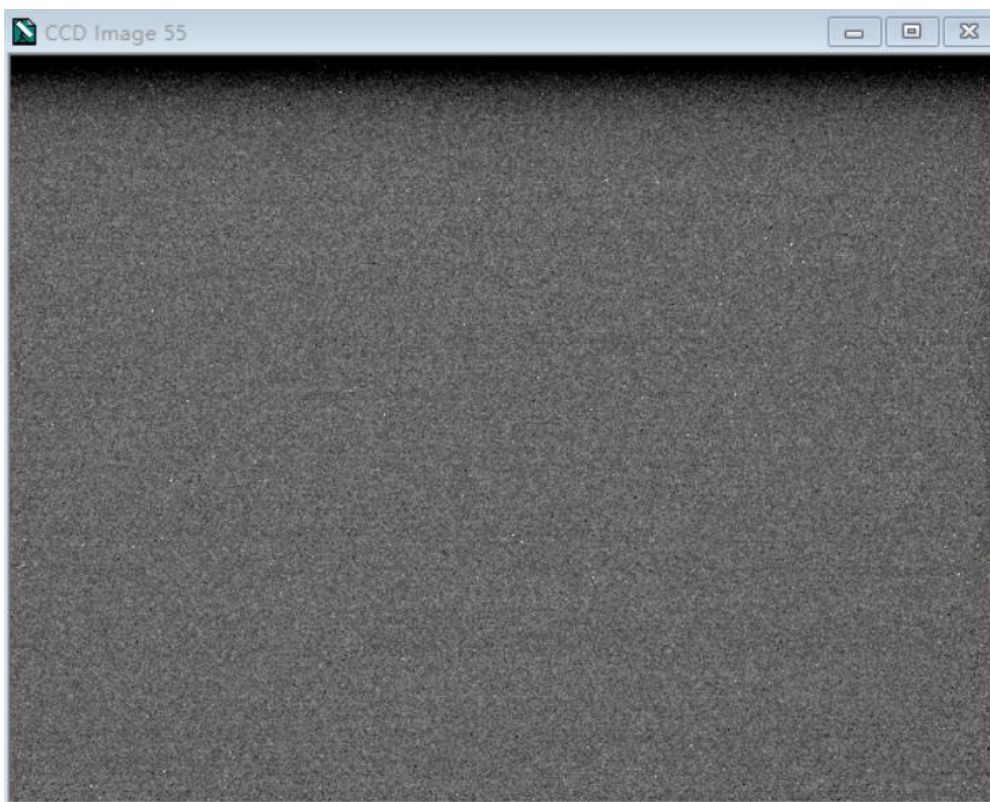
**12. Can QHY163M still work when the temperature is thirty degree below zero Celsius (-22°F)?**

Yes, we test it in the temperature of thirty five degree below zero Celsius (-31°F), and it still works very well.

**13. There's a dark banding on the top of the image. How should I avoid it?**

For QHY163 ASCOM or EZCAP\_QT Capture, you sometimes will find a dark banding appear if you capture first frame then wait some time and capture again. This will happen when the exposure time is very short.

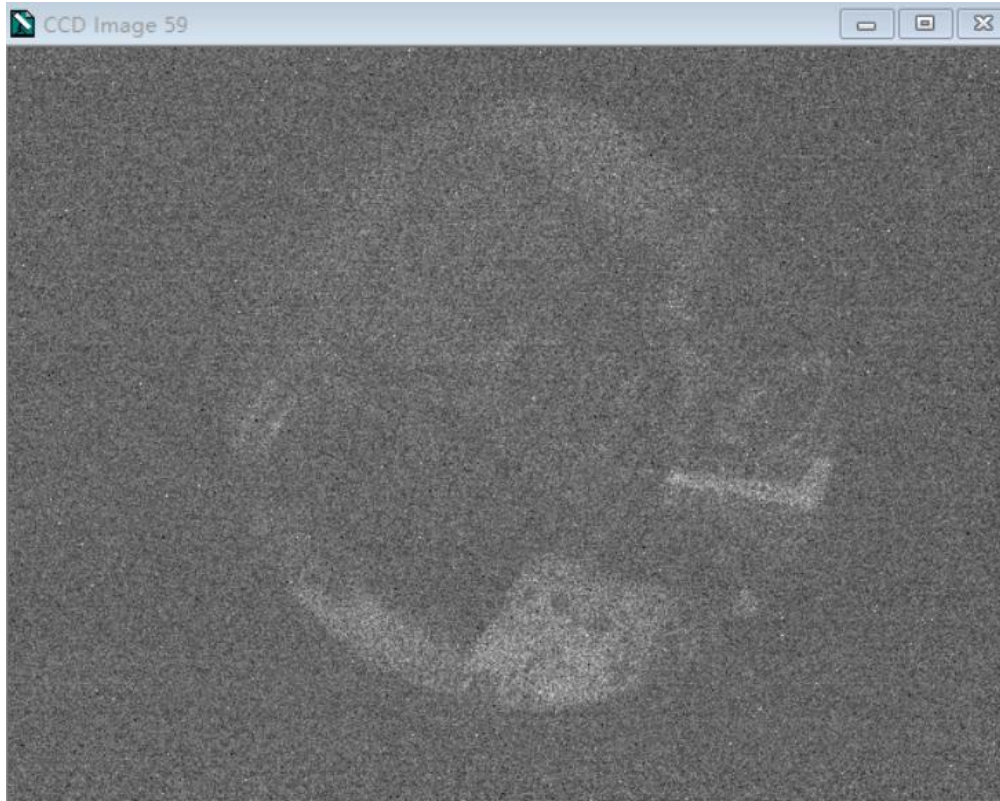
This is due to the Optic Black Calibration Circuit in the sensor.



E.g., this is the secondary image which has an exposure of 0.1sec. It is about 60sec after first image was captured.

Don't worry about it. To avoid this. You can use a longer exposure time to do bias frame. For example: 0.3sec. There is no such black banding even you wait a long time and then capture. Please look at the following pictures. We wait for one minute then do the secondary capture and it is uniform and has no such banding.





E.g., this is the secondary image which has an exposure of 0.3sec. It is about 60sec after first image captured. It doesn't show any dark banding here. And we have tested for more longer like the 10minutes and still get the same result.

## 11 Camera Maintenance

### Drying the CCD Chamber

The CCD sensor is located in a CCD chamber. This chamber is airproof and connect to the socket of the silicone gel tube on one side of the QHY63M front case. If there is moisture and cause the CCD sensor glass get dew. You can connect the silicone gel tube on the socket to dry it.

Please put the effective silicone gel into the silicone gel tube. Make sure there is a small amount of cotton inside to prevent the silicone gel get into the CCD chamber.

### Avoid CCD chamber optic window get dew

If the environment humidity very high, the optic window of the CCD chamber may get dew. The QHY163M has the build-in heat board on this optic window to heat the optic window to avoid it. In most conditions it can take effect.

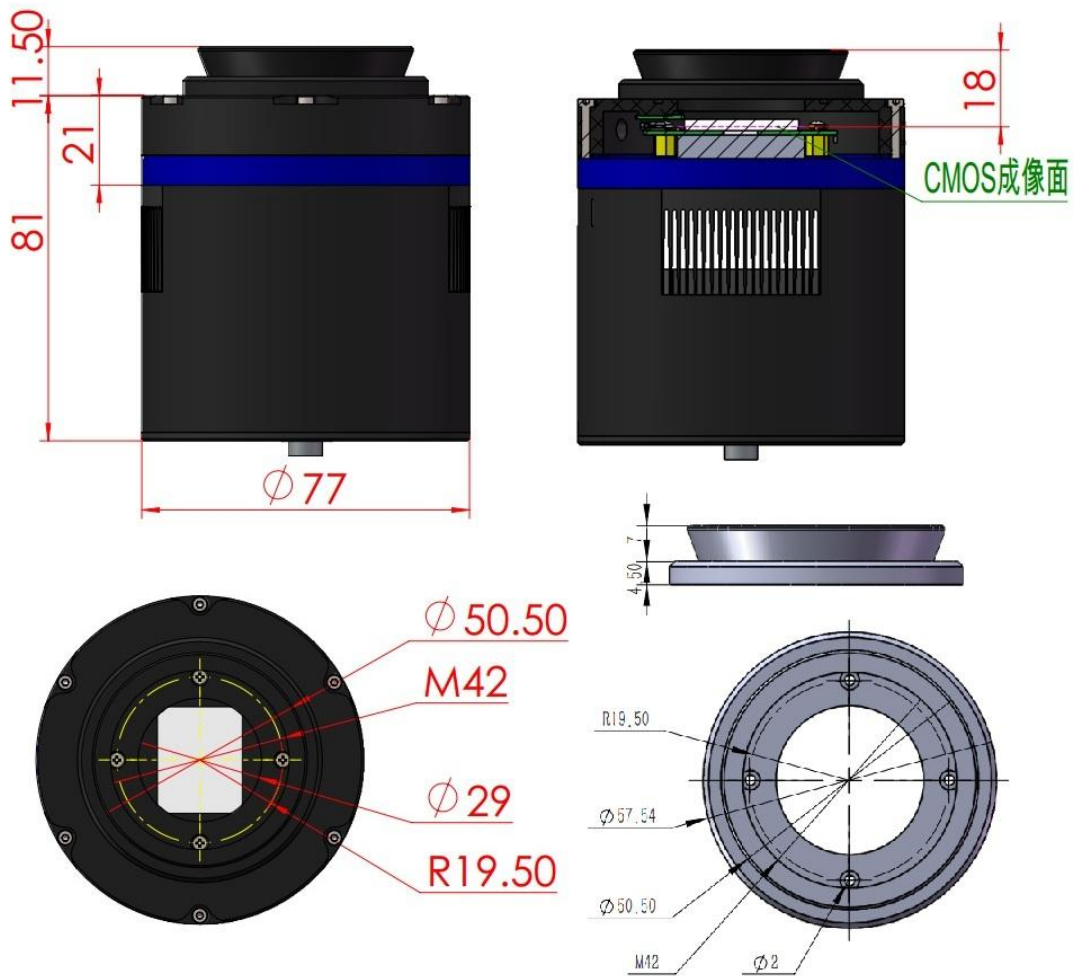
If the optic window still get dew please try the following method.

1. Avoid the CCD Camera face down to ground. The cold air is heavy than warm air, if you put the camera facing down to the ground, the cold air is easy to get the optic window and cause it very cold and get dew
2. Increase the temperature of the CCD sensor. You can increase the CCD sensor temperature a little to prevent the optic window get dew.
3. Check if the heat board working. If the heat board not working, the optic window is easy to get dew. Normally the heat board can get about 65-70C in +25C environment. If it is not so warm, it maybe the problem of the heat board damaged. Need to contact QHYCCD to replace one heat board.

## 12 Specifications

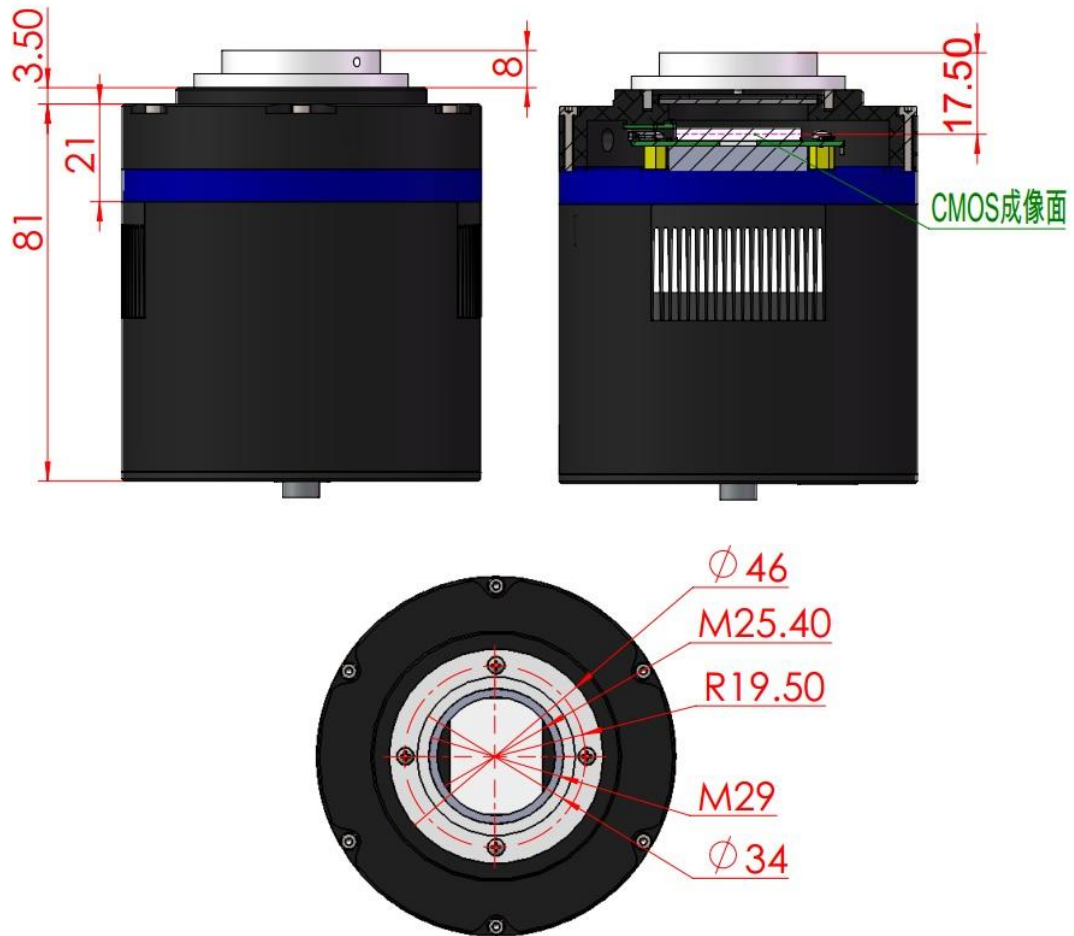
CMOS Sensor	4/3inch 16mega pixel mono CMOS Sensor
Effective Pixels	4656*3522
Pixel Size	3.8um*3.8um
Effective Area	17.7mm*13.4mm
Shutter	Electric Rolling Shutter.
FullWell	TBD
QE	TBD
Readout Noise	1.2e
Frame Rate (on 8bit)	22.5FPS@16mega Full Resolution 30FPS@4K HD Video 57FPS@1920*1080 60FPS@1280*1024 80FPS@1024*768 100fps@800*600
ROI Support	Yes. Any Area ROI
Exposure Time	50us-1800sec
AD Sample Depth	10bit/12bit (8bit/12bit output)
On Camera Image Buffer	128MB DDRII Buffer
Cooling	2-stage TEC, Typical -40 below Ambient. Temperature Regulated
Power	USB Powered for camera and +12V powered for TEC
Anti-Dew Control	Air Connector for removable silicone gel tube Heat board for optic window of airproof CCD chamber
Computer Interface	USB3.0 Super Speed
Telescope Interface	M42/0.75&2inch adapter. Optional C-mount adapter
Color Wheel Port	4PIN QHYCFW2 socket
Guide Port	6PIN RJ11 Guide Port
Optic Window	AR+AR

### 13 Mechanical Dimensions



drawing of QHY163M with a M42 lens mount

The back focal length of QHY163M with M42/2inch lens mount is about 18 mm.



drawing of QHY163M with C-MOUNT lens adapter

The back focal length of QHY163M with C-MOUNT lens adapter is about 17.50mm.

Note that C mount is an optional accessory that you can order from us. Its part number is 020017.



dimensions of C-MOUNT lens adapter

Back Focus with some typical setup:

QHY163M+QHYCFW2-M-US=36mm

QHY163M+QHYCFW2-M-SR=41mm

QHY163M+QHYCFW2-S =37mm

For OAG, it is 13mm add-on.

## 14 Revision History

<b>Date of change</b>	<b>Revision</b>	<b>Content of change</b>
November 29 <sup>th</sup> , 2016	1.0	First edition
December 20 <sup>th</sup> , 2016	1.1	Added solution to the problem that cameras halt under DDR mode in the FAQ section
January 5, 2017	1.2	Added notes about 12V power adapter
January 6, 2017	1.3	Added introduction about how to eliminate bad effects of amplifier glow by using dark frame calibration
February 16, 2017	1.4	Added solution for reducing the amplifier glow in the FAQ section
March 2, 2017	1.5	Added notes about camera working under low temperature
April 10, 2017	1.6	Added instructions for avoiding dark banding on the top of the image