

# QHY5L-II User Manual 2016 Edition

Because of the software/driver version changed a lot from first QHY5L-II come out several years ago. We write a new version of the user manual to match the latest driver/software.

## Software Installation

1. Download the latest system driver from QHYCCD QHY5L-II web page and install it.

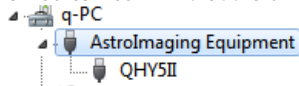
<http://www.qhyccd.com/QHY5L-II.html>

2. You can skip "obtaining driver software from website" and after a while it will show QHY5II installed.

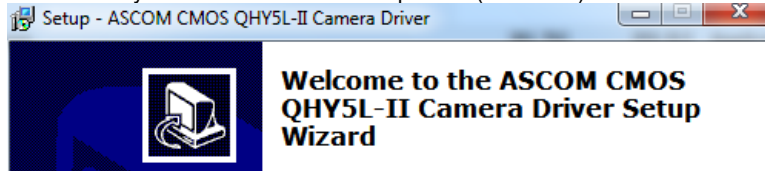
QHY5II installed

QHY5II ✔ Ready to use

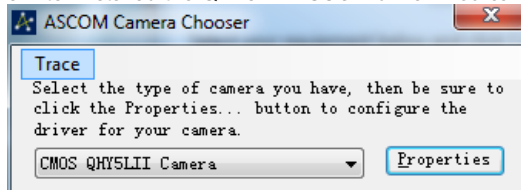
3. You can confirm that the driver is successfully installed in Device Manager.



4. Make sure you have installed ASCOM platform (6.1 or 6.2). Download the ASCOM driver for QHY5L-II and install it.



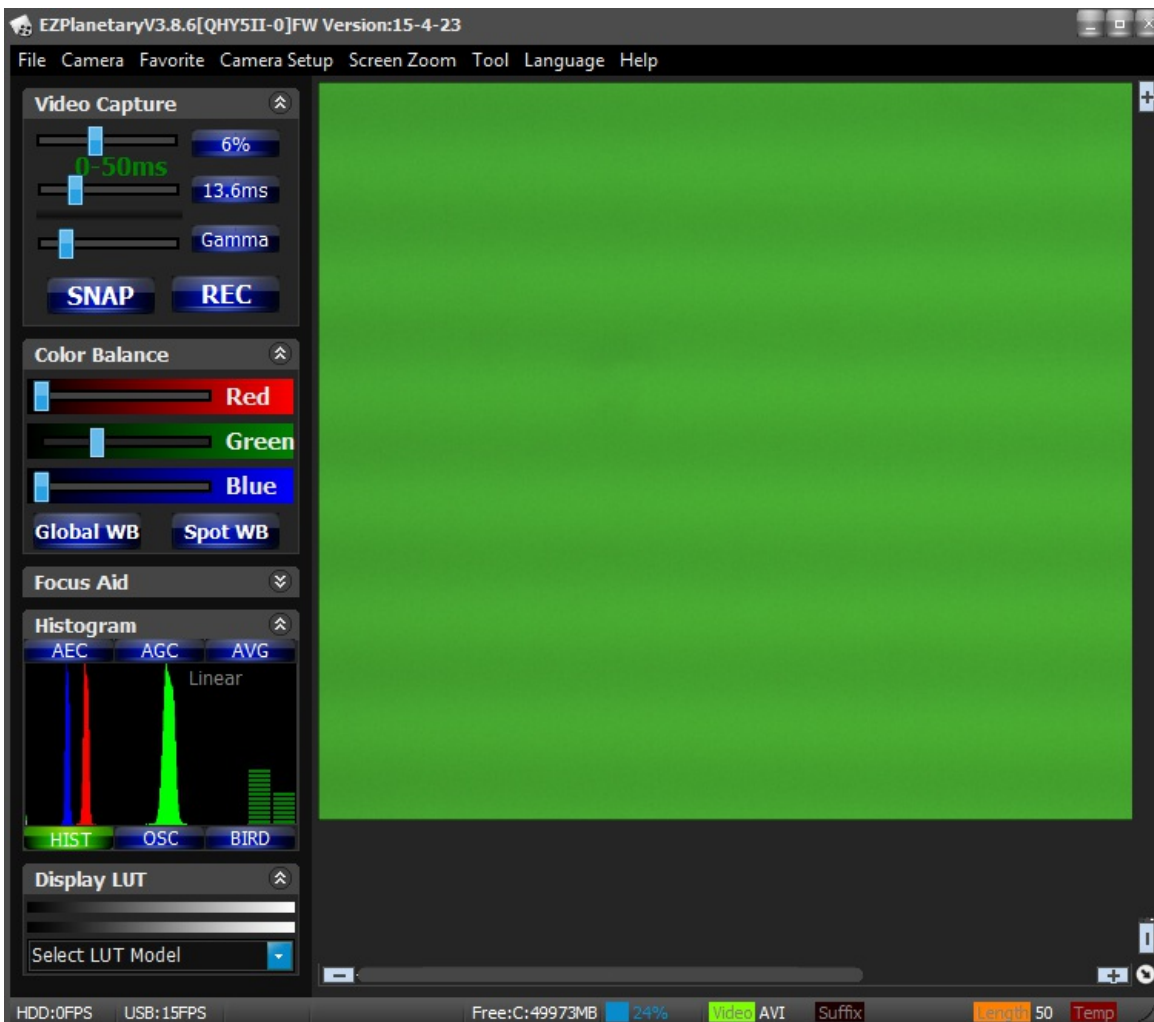
5. After installed the QHY5L-II ASCOM driver. You can find this driver in ASCOM Camera Choose



6. Install EZPlanetary. EZP software is the default capture software for QHY5L-II. You can download it at the QHY5L-II web page.

When you first run the EZP, you can set the gain and the exposure time to less than 30ms. you may see this screen (if you camera is QHY5L-II-C).

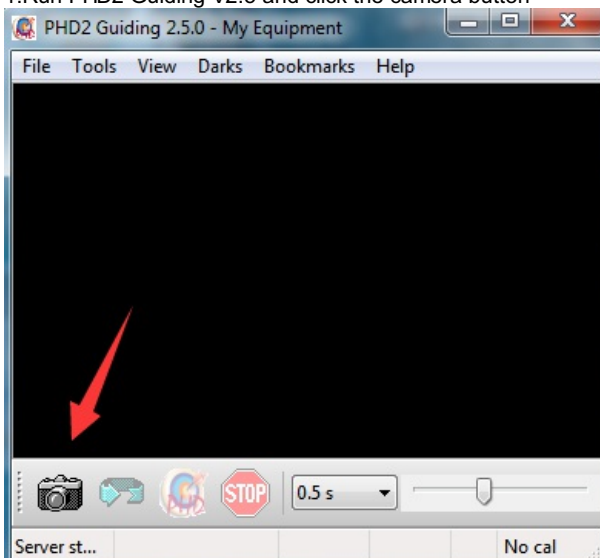
Please check the bottom left of the software. You will see the frame rate. If the frame rate is zero and the image is hang. Please check the topic in FAQ.



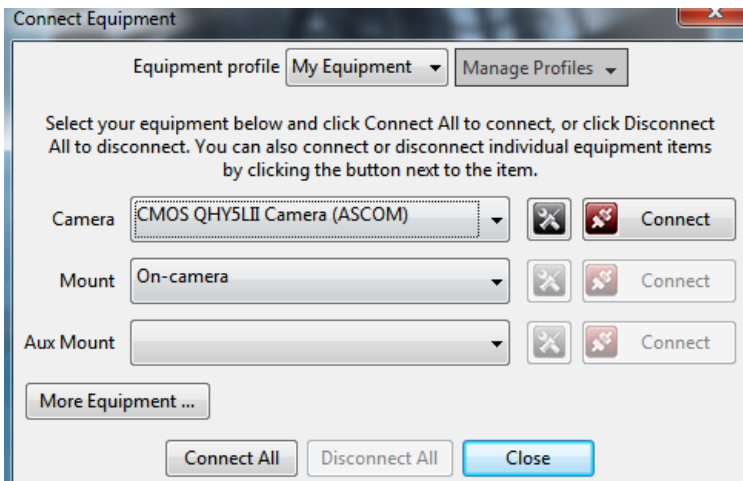
## Use PHDGuiding with QHY5L-II


QHY5L-II is the most popular autoguiding camera. You can use PHDGuiding with this camera and it is pretty easy to start autoguiding.

1. Run PHD2 Guiding V2.5 and click the camera button




2. You will see the Connect equipment window



In Camera, You can select the  This is the ASCOM for QHY5L-II Camera.  
 In Mount , you can select the on-camera

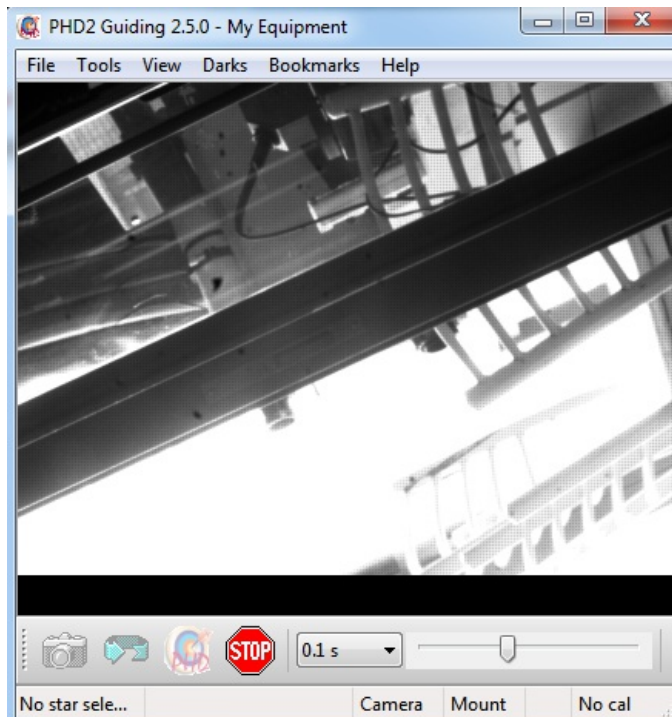



If necessary, you can click  button and set the ASCOM camera parameters. Like the gain etc.

For QHY5L-II. The on-camera guide port only works for 8bit imaging. It can not work with the 12bit imaging. If you want to use 12bit imaging for guiding. You need use another method to connect the mount. like use the Mount's ASCOM pulse guide connection via RS232.



3. Now you can click  button. You will see image here.



4. Select a star in the image. And Click  button . The PHD will start calibration and guiding. Enjoy it!

#### About the camera selections in PHD

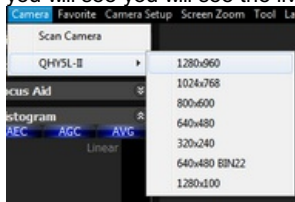
You may find more than one method to connect in PHD. In latest PHD2. They are all working. But in old version. We recommend to use the **CMOS QHY5LII Camera(ASCOM)** or **QHYCCD-Cameras-Capture(ASCOM)**. **Don't use the QHY5L-II Color and QHY5L-II Mono. These two driver sometimes hang and popup "time out" issue.**

The QHYCCD-Cameras-Capture(ASCOM) is a new ALL-IN-ONE driver for most of the QHYCCD's camera. You can obtain this driver from <http://www.qhyccd.com/ASCOM-Camera.html>

Atik Gen3, color  
 Atik Gen3, mono  
 Camera V2 simulator (ASCOM)  
 CCD Labs Q-Guider  
**CMOS QHY5LII Camera (ASCOM)**  
 Fishcamp Starfish  
 i-Nova PLC-M  
 Long exposure LXUSB webcam  
 Long exposure Parallel webcam  
 Long exposure Serial webcam  
 MagZero MZ-5  
 Meade DSI I, II, or III  
 None  
 OpenCV webcam 1  
 OpenCV webcam 2  
 Orion StarShoot DSCI  
 QHY 5-II  
 QHY 5L-II Color  
 QHY 5L-II Mono  
 QHYCCD-Cameras-Capture (ASCOM)  
 SAC4-2  
 SBIG  
 SBIG Rotator  
 Simulator  
 Simulator (ASCOM)  
 Starlight Xpress SXV  
 StarShoot Autoguider  
 StarShoot Planetary Imager & Autoguider  
 Windows WDM-style webcam camera

## Use EZPlanetary with QHY5L-II

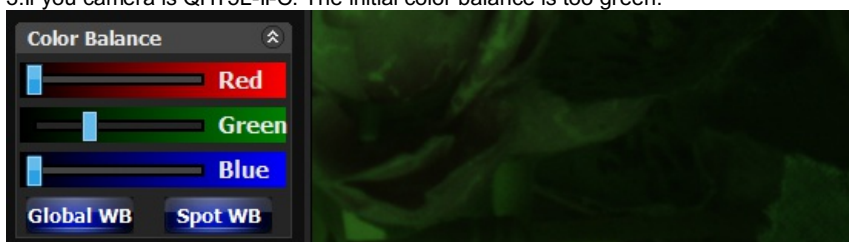
1. The EZPlanetary is the default capture software for QHY5L-II. After run it, select model from menu->camera and select a resolution, you will see you will see the live video image immediately.



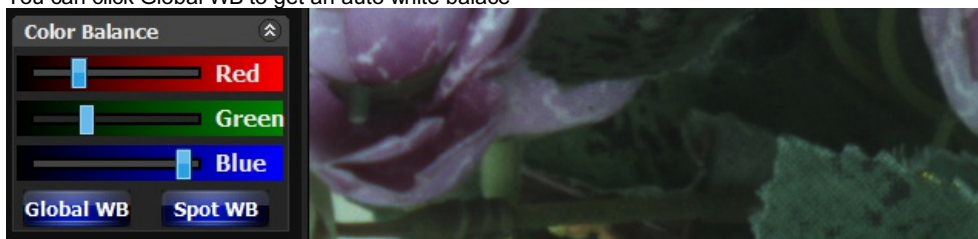
2. You can also see the software version and firmware version of the camera in the EZP title after you select the resolution.

**EZPlanetaryV3.8.6[QHY5II-0]FW Version:15-4-23**

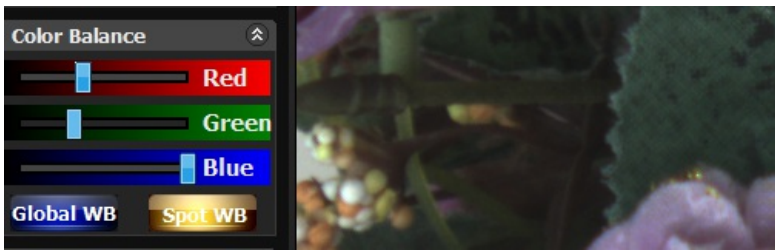
3. If your camera is QHY5L-II-C. The initial color balance is too green.



You can click Global WB to get an auto white balance



If you want to get balance based on a small area. You can use the "Spot WB" After activated it, you can double click a position (the position you think it should be grey/white) in the image and the color balance will recalculate based on this position.

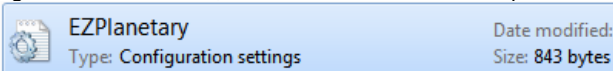


You can also adjust the scrollbar of red/blue to adjust the white balance by manual. Normally green position is fixed because the color balance is the ratio between R:G and B:G. So we fixed the green value.

#### 4. Optimize the maximum frame rate

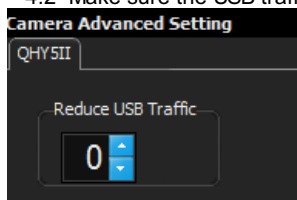
The QHY5L-II has the maximum frame rate at 30FPS@1280\*960. This frame rate is close to the limitation speed of the USB2.0. Not all computer or chipset can get this rate. If the data traffic exceeds the maximum capability of the computer/chipset. It will cause some data lost. These frames with lost data will be dropped by the driver. If it is always lost you will see there is no good frame comes and video looks hang, if part of the frame is lost you will see the video streaming is not very smooth and always stuck.

When you start the EZP3.86 at first time it will start at low readout speed and USB traffic is zero. If everything is OK, the frame rate is 15FPS@1280\*960. If still image is hang. You can try to delete the ezplanetary.ini file in the EZPlanetary folder. And try to start EZP again. In this condition, EZP will start at low readout speed and USB traffic is 30. In this condition, it is 7FPS.

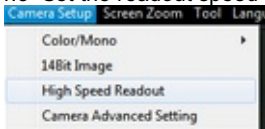


Once the camera is running and the image does not hang, you can optimize the maximum frame rate. The method is:

- 4.1 Use 1280\*960 resolution, Set exposure time to 30ms
- 4.2 Make sure the USB traffic is set to max value (50). USB traffic is in Menu->Camera Setup->Camera Advanced Setting



- 4.3 Set the readout speed to high in Menu->Camera Setup



- 4.4 If the video is still smooth and no hang. Try to reduce the USB traffic value. You will see the frame rate is increasing
- 4.5 If the frame rate drops with the USB traffic value decreased. It shows the USB bandwidth is getting the maximum capability of the computer/chipset. You need to increase the USB traffic value a little and keep it.

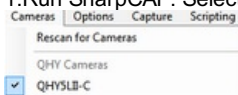
Please note not all computer/chipset and not all CPU condition you can set the USB bandwidth to zero and get 30FPS. Sometimes you can set zero and frame rate is 30frames but you may find sometimes the video streaming is hang. Especially there is a big white area existing in image. You can increase the USB bandwidth in this condition.

Besides the USB traffic. There is some other thing may cause the camera hang etc. Please check the FAQ in this user manual.

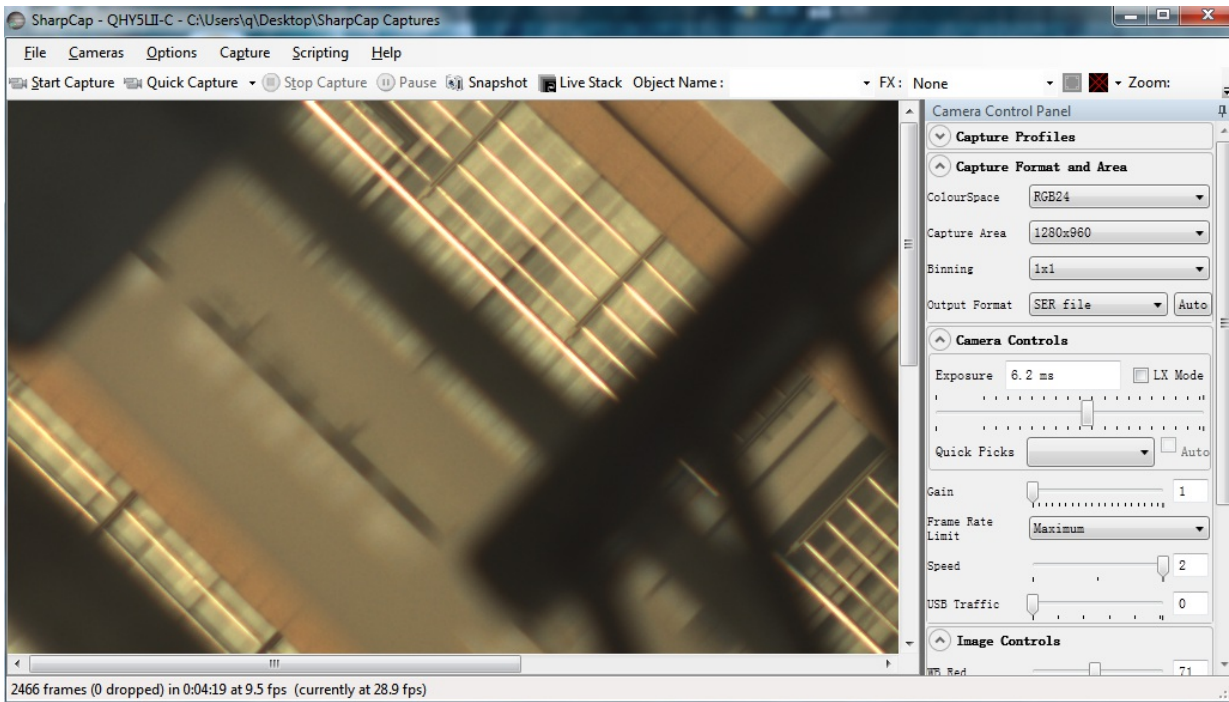
## User SharpCAP with QHY5L-II

SharpCAP supports QHY5L-II directly via QHYCCD's SDK. You can download and install the latest SharpCAP software from website <http://www.sharpcap.co.uk/sharpcap/downloads>

1. Run SharpCAP. Select QHY5L-II from Menu->Cameras



2. You can adjust the Speed and USB traffic to optimize the frame rate. The concept is the same as the readout speed and USB traffic in EZP. But each time when the SharpCAP starts, it will use the lowest speed to boot. In SharpCAP there is speed=0, speed=1, speed=2. speed=0 is the slowest readout speed.



## FAQs

### 1. Very low disk write speed when use QHY5L-II-C to save the color image

We suggest to use the RAW format to save the image . The data is only 1/3 of the color format. For example, in 1280\*1024 or 1280\*960 the bandwidth will exceed 100MB/s , Most HDD can not match this speed. While use RAW only 36MB/s-39MB/s .

### 2. The RAW AVI color is wrong after using stack software converted into color. Image is pink color, or image has many grid.

The selected debayer RGGB sequence is wrong. Stack software has four selections. You can test one by one and find the correct color. It is best to do some experiment to find the correct selection in daylight by capture some color object.

### 3. How to avoid the camera hangs

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

3.1 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 effect the USB transfer and cause the data packet lost and cause it hang. You need make sure the computer and the mount is well grounded.

3.2 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.

3.3 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.

3.4 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 always hangs. 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.

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

3.6 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 hangs on front USB port. You can try the USB port on backside of the computer (which is connect to chipset directly on the mainboard).

### 4. Why flicker or wide scrolling banding appears in the image

This is the flicker of fluorescent lamp(50Hz or 60Hz) .Adjust the exposure time to 20ms(in 50Hz AC area) or 16.6ms(in 60Hz AC area) to avoid this issue

### 5. Why in EZPlanetary QHY5L-II stop exposure after 3sec and start a new exposure even exposure time set to above 3sec

To improve the feature of QHY5L-II in long exposure, we add a options called "Long exposure mode" It can be set in the advanced settings. After check it. Any long exposure can be ok. If not checked, 3sec exposure is limited.

### 6. Any requirement of the length of USB cable?

Yes , shorter USB cable is recomand for QHY5-II series camera. Because QHY5-II works close to the max limit of USB2.0 (apprx 39MB/s) . Long cable will cause the USB packet damaged and bad frame increased and even cause all frame lost. The software looks like halt with zero FPS. If must use long cable. the sepcially USB extender cable is required.

### 7. ASCOM Diagnostics shows: This 64bit capable driver is only registered as a 32bit COM driver

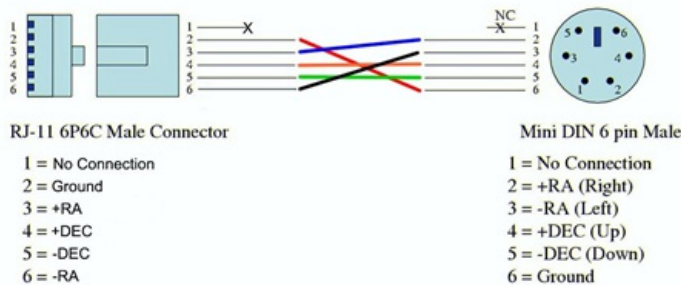
When running ASCOM diagnostics it shows: Incompatible Driver This 64bit capable driver is only registered as a 32bit COM driver. Pleas contact the driver author and request an updated installe.

You can ignore this information. This is just an information but it do not effect anything. The camera ASCOM driver work well on WIN7, WIN8 64bit system.

If you meet any problem that ASCOM driver can not run. It should be other reason, for example, the installation of the ASCOM driver or platform etc.

### 8. How to convert the QHY5II series Guide port with Takahashi Mount

#### *QHY5II Guiding Cable for Takahashi Mount*



### Items in the standard Package



Location Ring



Guide cable (1.5meters)



1.25inch Extender



USB cable (1.8 meters)



CS lens spacer 1

Note: The spacer is used to set the back focus of the CS/C lens to correct value. The CS/C standard backfocus is 12.5/17.5mm. While QHY5L-II backfocus is a little short than this value (This is to guarntte the camera/lens combination to get focus at infinite distance)

