

ASTROMECHANICS

astromechanics.org

ASCOM Canon Lens Controller

Simple solution for external focus & iris drive

Device assembly and software using manual
This manual is related to ASCOM platform based usage



JULY/2020

STEP 1: Device assembly

Assembly process is easy. Choose your controller and use the links below:

- [M42 x 0.75 mm adapter for APS-C camera](#)
- [M54 x 0.75 mm adapter for APS-H / FF camera](#)
- [Special adapter for SBIG STL series camera](#)
- [Special adapter for QSI camera with WS\(-8\) cover](#)
- [Special adapter for FLI PL/ML camera without FW](#)
- [Special adapter for Moravian G4 camera](#)
- [Special adapter for ZWO ASI6200MM camera with FW](#)

These documents contain all the necessary information about mechanical drawings, connection methods and application notes.

STEP 2: Connecting to your computer

- Mount ASCOM Lens Controller on your camera. Achieve a secure fit, the connection should be tough and have no backlash.
- Attach your lens. Rotate the lens clockwise until it locks. To remove the lens, press and hold the lens lock and rotate the lens counterclockwise. Attach and remove your lens **only when the USB cable is disconnected!**

Note: Some thin adapters (QSI WS, Moravian G4) don't have a lens lock because its use will be inconvenient due to the small thickness of the adapter. In this case, rotate the lens all the way. Don't worry, the bayonet's petal will prevent it from scrolling further than the correct position.

- Set the MF/AF switch to AF. Set the focal range switch to the maximum value, for example 1.5 m-∞.
- Connect ASCOM Lens Controller to your computer using USB cable. Since May 2020 all devices use a micro USB connector with a single wire to a PC (no additional power connector).

Note: When testing the ASCOM Lens Controller, first connect it directly to your computer. Then you can test it with various USB hubs. For proper operation, prefer to use active (powered) USB hubs.



Computer connection

STEP 2: Software installation

The software doesn't require high performance from the user computer. Basic software components:

- Microsoft Windows XP/Vista/7/8/10;
- ASCOM Platform V6.x. or higher.

Install the software from downloaded package. Before installing the ASCOM driver you must install a special driver for communicating with ASCOM Lens Controller (FT232RL chip). The device uses a standard and popular FT232RL chip for USB connection instead of a cheap CH340G in old version. FT232RL is the most reliable and frequently used chip for creating virtual COM ports based on USB connection.

Usually these drivers are installed automatically (you may need to connect to the Internet), but if it doesn't happen, then you can install them manually. You can download the latest version of the driver on the official website: <https://www.ftdichip.com/Drivers/VCP.htm>. There you can download drivers for other operating systems (Linux, Max OS X).

You can also find the driver in the appropriate folder of the distribution package. Open **FT232 Drivers** folder and click on **CDM21228_Setup.exe**. Follow the install wizard instructions. This process can take few minutes and will be completed automatically.

Then double click on **ASCOM Lens Driver.exe**. Installation process is very simple, just follow instructions on the screen.



Install Wizard window

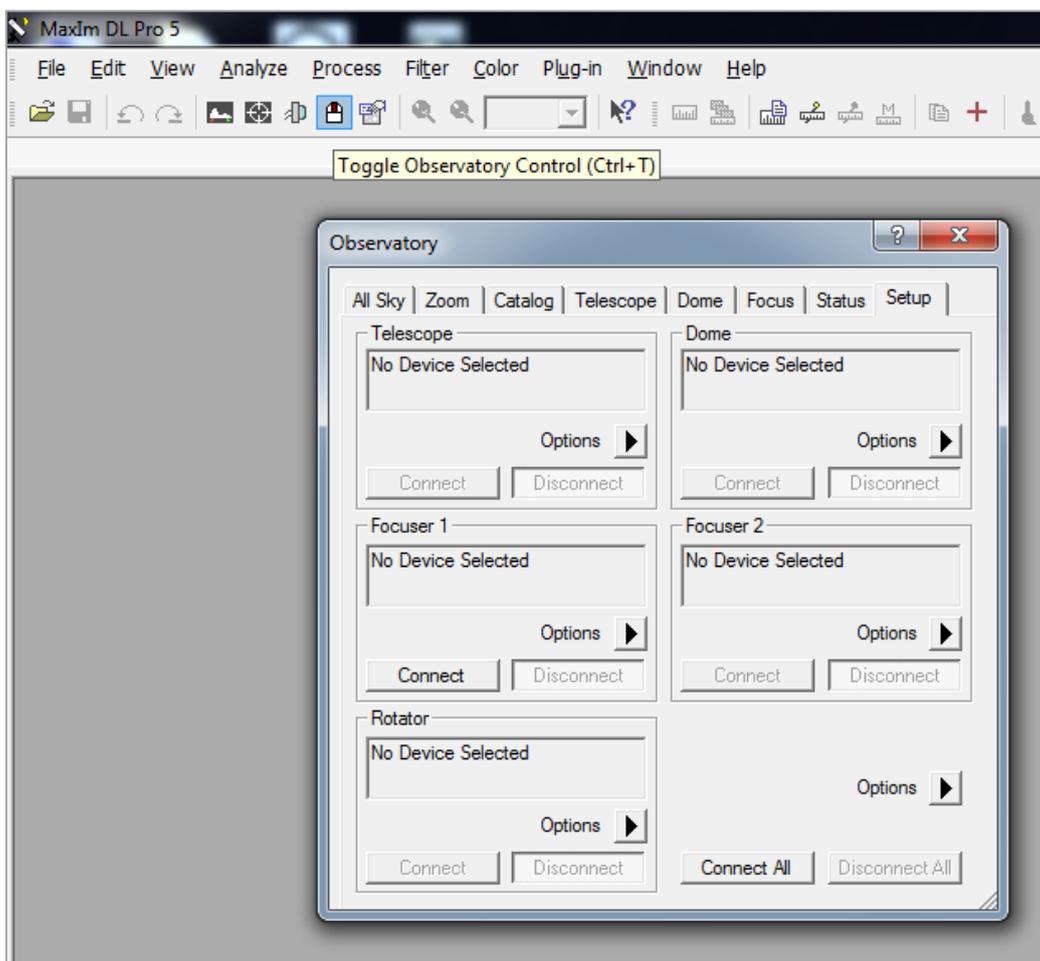
Note: If you need lens control software for Linux and Mac OS X, please visit this page: https://rti-zone.org/macosex2focuser_plugins.php. Rodolphe Pineau has created great X2 plugins for various systems. You can control the device even with a Raspberry Pi!

Also if you need drivers to use your controller with INDI based applications - you can download them here: <https://indilib.org/devices/focusers/astromechanics-canon-lens-controller.html> (Christian Liska, Austria).

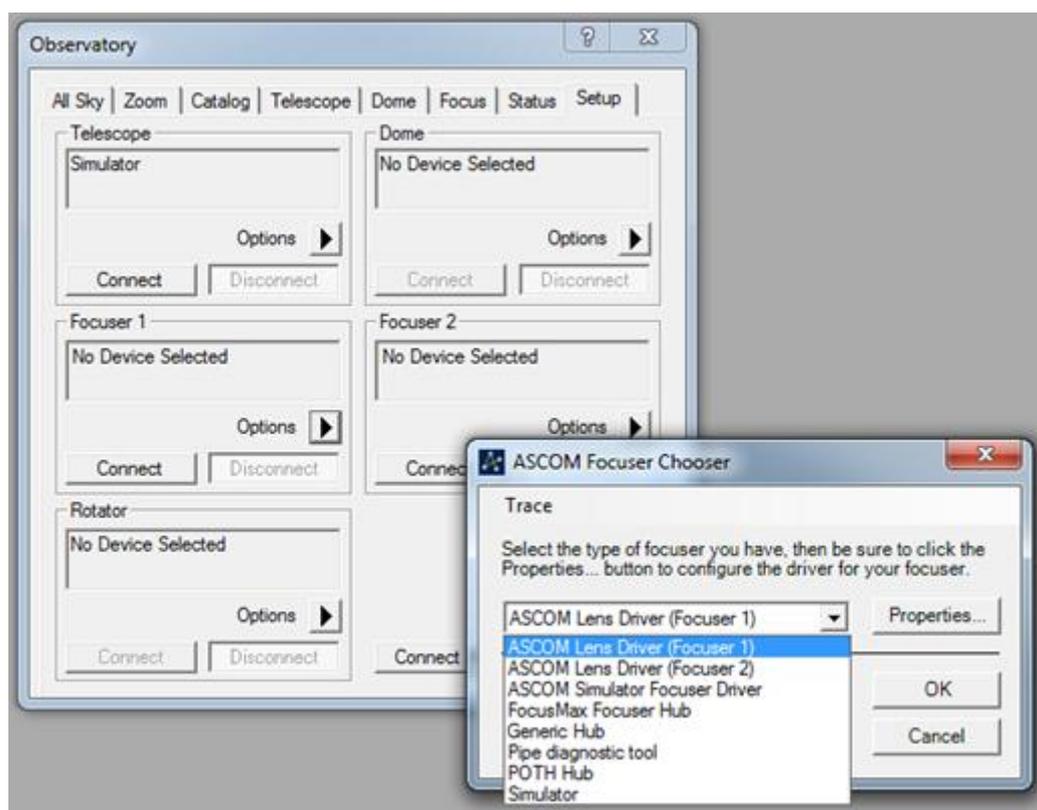
We are grateful to the developers of third-party drivers for the ASCOM Canon Lens Controller Mark III!

STEP 3: Driver usage

After installation is completed open your focusing software (Maxim DL, APT, SGP etc.) and choose the driver using standard ASCOM controls and dialog windows. Maxim DL based example is shown below.



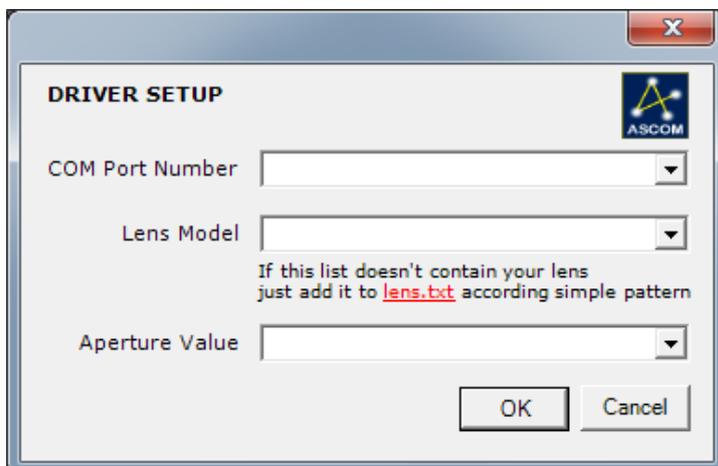
Observatory control window



ASCOM Focuser Chooser window

Note: The installer contains two DLL libraries. Therefore, you can control two devices at the same time (Focuser1 and Focuser2). This can be useful when controlling two lenses (on the main and guide camera or on a color and monochrome camera).

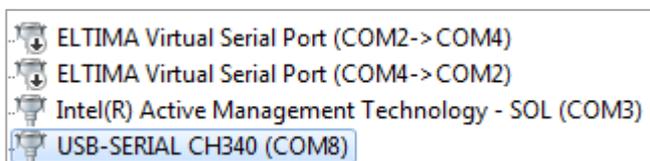
Choose ASCOM Lens Driver (Focuser1) or ASCOM Lens Driver (Focuser2) and click **Properties**.



Driver setup dialog window

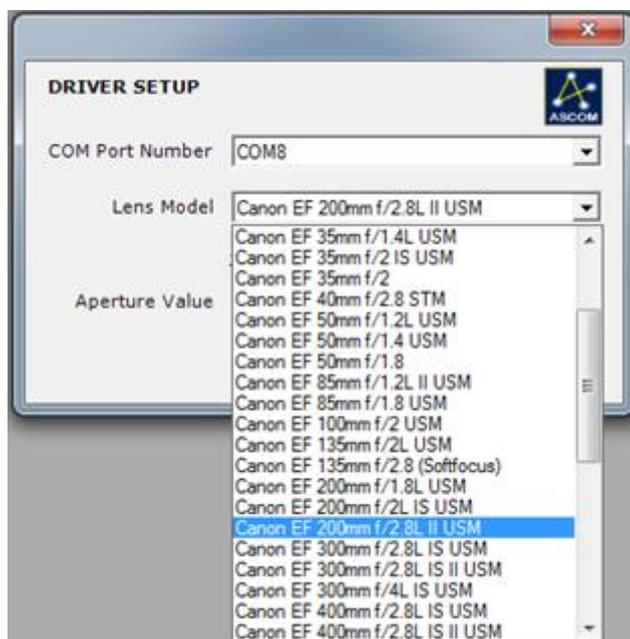
You need to configure several parameters in this window:

- COM Port Number - virtual port created by operating system for the connected device (COM8 for example). You can find port number in the Windows Device Manager.



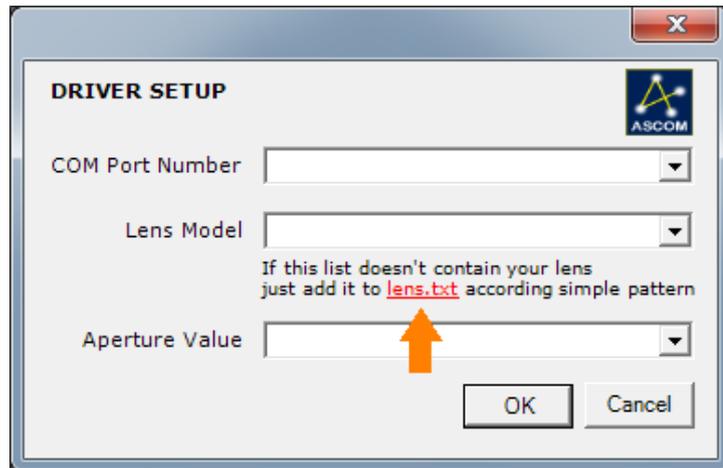
List of available COM ports

- Lens Model – select your lens from a drop down list. Canon EF/EF-S and Sigma ART lenses are presented by default, but you can add and describe your own lens compatible with Canon EOS protocol.



List of available lenses

This can be done by editing [lens.txt](#). Click on the highlighted link.



[Fast link to lens.txt](#)

Append new entry to the end of this file: specify lens name and enumerate all aperture values of your lens according the simple pattern. Be careful, syntax is important!

```
Canon EF 14mm f/2.8L USM | 2.8 3.2 3.5 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22
Canon EF 15mm f/2.8 | 2.8 3.2 3.5 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22
Canon EF 20mm f/2.8 USM | 2.8 3.2 3.5 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22
Canon EF 24mm f/1.4L II USM | 1.4 1.6 1.8 2.0 2.2 2.5 2.8 3.2 3.5 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22
Canon EF 24mm f/2.8 IS USM | 2.8 3.2 3.5 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22
Canon EF 28mm f/1.8 USM | 1.8 2.0 2.2 2.5 2.8 3.2 3.5 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22
Canon EF 28mm f/2.8 IS USM | 2.8 3.2 3.5 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22
Canon EF 35mm f/1.4L USM | 1.4 1.6 1.8 2.0 2.2 2.5 2.8 3.2 3.5 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22
Canon EF 35mm f/2 IS USM | 2.0 2.2 2.5 2.8 3.2 3.5 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22
Canon EF 35mm f/2 | 2.0 2.2 2.5 2.8 3.2 3.5 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22
Canon EF 40mm f/2.8 STM | 2.8 3.2 3.5 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22
Canon EF 50mm f/1.2L USM | 1.2 1.4 1.6 1.8 2.0 2.2 2.5 2.8 3.2 3.5 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22
Canon EF 50mm f/1.4 USM | 1.4 1.6 1.8 2.0 2.2 2.5 2.8 3.2 3.5 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22
Canon EF 50mm f/1.8 | 1.8 2.0 2.2 2.5 2.8 3.2 3.5 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22
Canon EF 85mm f/1.2L II USM | 1.2 1.4 1.6 1.8 2.0 2.2 2.5 2.8 3.2 3.5 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16
Canon EF 85mm f/1.8 USM | 1.8 2.0 2.2 2.5 2.8 3.2 3.5 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22
Canon EF 100mm f/2 USM | 2.0 2.2 2.5 2.8 3.2 3.5 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22
Canon EF 135mm f/2L USM | 2.0 2.2 2.5 2.8 3.2 3.5 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22 25 29 32
Canon EF 135mm f/2.8 (Softfocus) | 2.8 3.2 3.5 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22 25 29 32
Canon EF 200mm f/1.8L USM | 1.8 2.0 2.2 2.5 2.8 3.2 3.5 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22
Canon EF 200mm f/2L IS USM | 2.0 2.2 2.5 2.8 3.2 3.5 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22
Canon EF 200mm f/2.8L II USM | 2.8 3.2 3.5 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22 25 29 32
Canon EF 300mm f/2.8L IS USM | 2.8 3.2 3.5 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22 25 29 32
Canon EF 300mm f/2.8L IS II USM | 2.8 3.2 3.5 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22 25 29 32
Canon EF 300mm f/4L IS USM | 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22 25 29 32
Canon EF 400mm f/2.8L IS USM | 2.8 3.2 3.5 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22 25 29 32
Canon EF 400mm f/2.8L IS II USM | 2.8 3.2 3.5 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22 25 29 32
Canon EF 400mm f/4 DO IS USM | 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22 25 29 32
Canon EF 400mm f/5.6L USM | 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22 25 29 32
Canon EF 500mm f/4L IS II USM | 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22 25 29 32
Canon EF 600mm f/4L IS II USM | 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22 25 29 32
Canon EF 800mm f/5.6L IS USM | 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22 25 29 32
Canon EF 50mm f/2.5 Compact Macro | 2.5 2.8 3.2 3.5 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22
Canon MP-E 65mm f/2.8 1-5x Macro Photo | 2.8 3.2 3.5 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22
Canon EF 100mm f/2.8 Macro USM | 2.8 3.2 3.5 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22
Canon EF 100mm f/2.8L Macro IS USM | 2.8 3.2 3.5 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22
Canon EF 180mm f/3.5L Macro USM | 3.5 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22 25 29 32
Canon EF 8-15mm f/4L Fisheye USM | 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22
Canon EF 16-35mm f/2.8L II USM | 2.8 3.2 3.5 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22
Canon EF 17-40mm f/4L USM | 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22
Canon EF 24-70mm f/2.8L II USM | 2.8 3.2 3.5 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22
Canon EF 24-105mm f/4L IS USM | 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22
Canon EF 70-200mm f/2.8L IS II USM | 2.8 3.2 3.5 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22 25 29 32
Canon EF 70-200mm f/2.8L USM | 2.8 3.2 3.5 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22 25 29 32
Canon EF 70-200mm f/4L USM | 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22 25 29 32
Canon EF 200-400mm f/4L IS | 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22 25 29 32
```

[Lens description in lens.txt](#)

Note: For zoom lenses with a different range of aperture values at different focus values (Canon EF-S 18-55 f/3.5-5.6) set the range for the planned for use focal length. For example:

- at 18 mm f/3.5: | 3.5 4.0 4.5 5.0 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22 25 29 32
- at 55 mm f/5.6: | 5.6 6.3 7.1 8 9 10 11 13 14 16 18 20 22 25 29 32

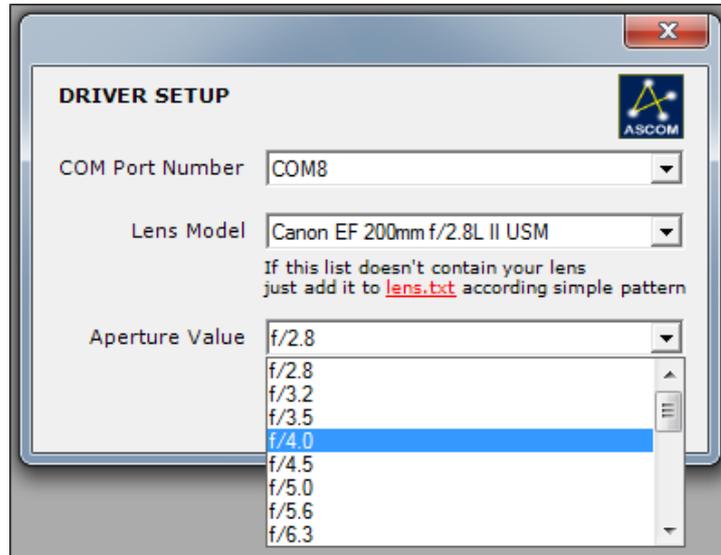
This doesn't apply to zoom lenses with constant aperture value (Canon EF 70-200 f/4 for example).

Note 2: Also you can prevent sending of aperture control commands. This function can help you to avoid software malfunction with some third-party lenses. We are aware of one such lens: Sigma 85mm F1.4 DG HSM Art. Focus control works and an attempt to send a command to control the iris leads to the driver freezing.

So use the definition below for such lenses ("lens name | -1").

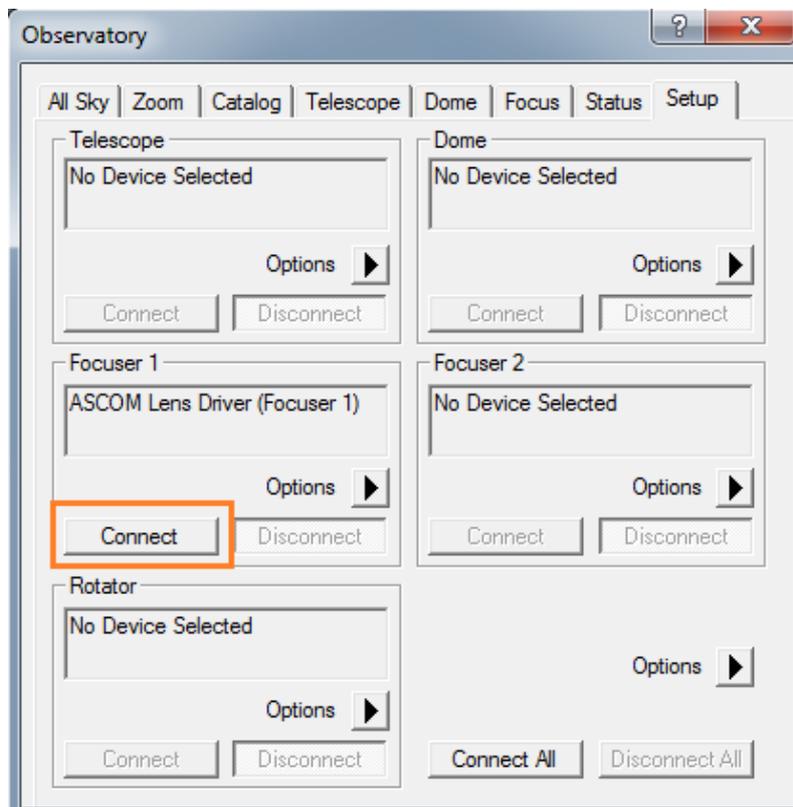
Sigma 85mm F1.4 DG HSM Art | -1

- Select the aperture value you want to use.



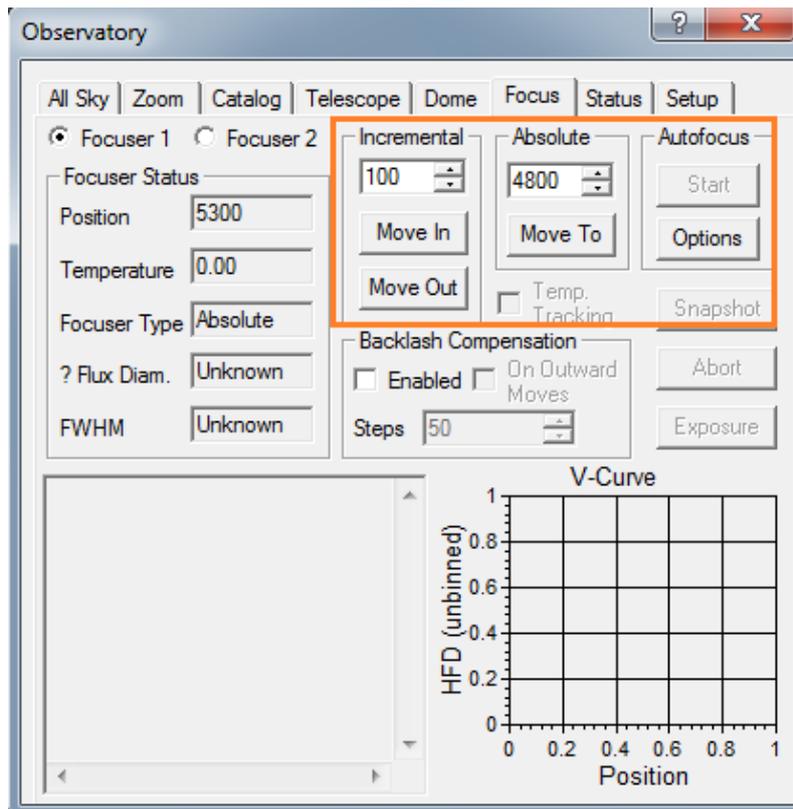
List of available aperture values

Click **Connect** button to start the driver.



Starting the driver

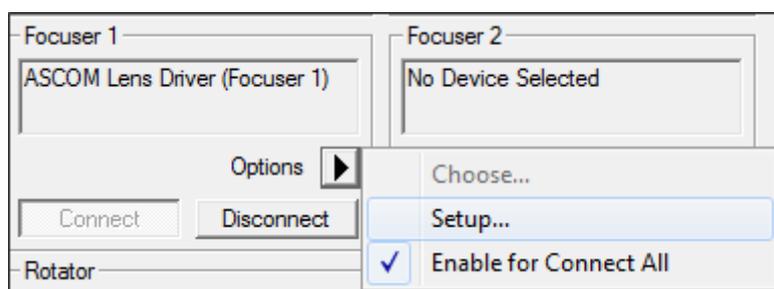
Now you can use the driver for manual and auto focus procedures. Test the driver in manual mode, check focus movements and aperture control.



Focus tab

Note: All focus positions are relative. The driver will return 5000 after power up (USB connection) regardless of the real focus position. Absolute positioning doesn't make much sense, because there is no normal position feedback (encoder, etc). The user can focus manually, and the controller (and even the Canon camera) will not know anything about it.

If you want to change the aperture value, call the driver setup dialog box (click on **Setup** menu item), change aperture value settings and click **OK**. You don't need to reconnect the driver. Changes will take effect immediately.



Popup menu

TROUBLESHOOTING: no focus or aperture control

- Make sure you attach the lens correctly. Rotate the lens clockwise until it locks (you can hear a slight click). For adapter without a lock mechanism: turn the lens until it stops (the bayonet's petal will prevent it from scrolling further than the correct position);
- Make sure you are using the correct lens. Only M42x0.75 mm adapter for ASP-C cameras mechanically supports EF-S lenses. Other adapters (M54x0.75 mm, QSI WS, Moravian G4, FLI) only support EF lenses;
- Try cleaning spring-loaded electrical contacts with alcohol or gasoline;
- Check the adapter connection. During the initial test, it is recommended to use a direct connection to a computer or an active USB hub;
- Try changing the USB cable. For testing purposes, you can use a shorter cable, for example 0.25 m. The length of the supplied cable is 0.5 or 1 m;
- Make sure the AF/MF switch is set to AF;
- Check that you have selected the correct com port in the program settings when connecting to the device.

If the lens doesn't respond to commands at all or only one function works (focusing or aperture control), please contact us and describe your case. You can find the current list of tested lenses [here](#). This information is collected both on our personal tests and on the reviews of our customers. If your lens is not listed, this doesn't mean that it is not supported. We just don't have any feedback about it.

Thanks to all our customers for helping make the product better!