

# ASTROMECHANICS

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## ASCOM Canon Lens Controller

Simple solution for external focus & iris drive

Device assembly and software using manual  
This manual is related to desktop utility based usage

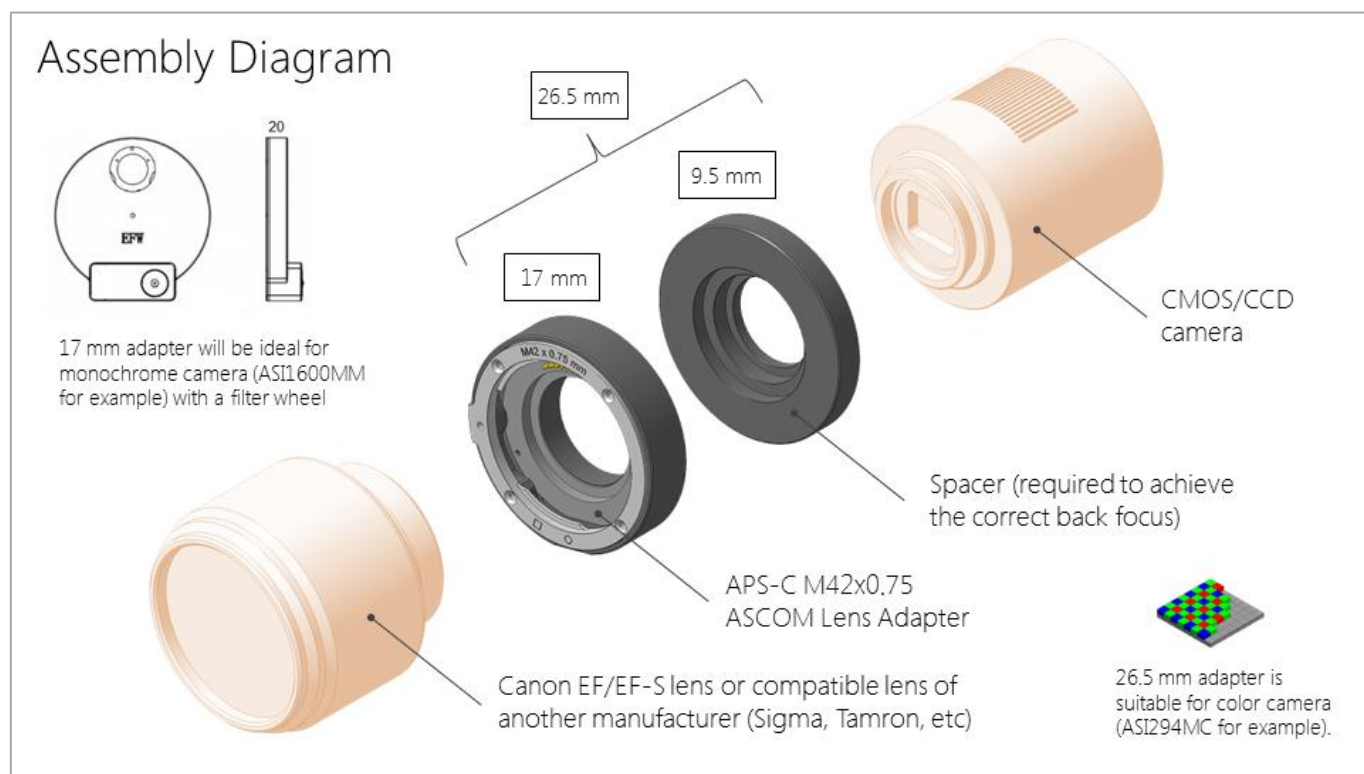


APR/2019

## STEP 1: Device assembly

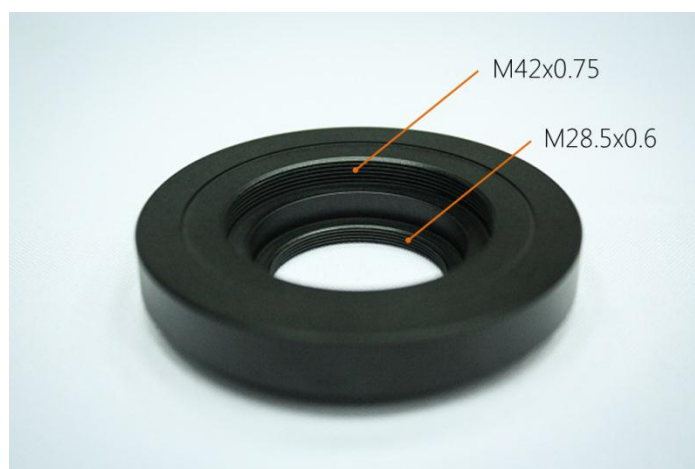
Assembly process is easy, use the diagram below. Choose the right parts depending on your lens and camera:

- **17 mm adapter** is ideal for monochrome camera (ASI1600MM for example) with filter wheel. 17 mm (ASCOM Canon Lens Controller) + 20 mm (ZWO EFW) + 6.5 mm (ZWO cooled camera) = 43.5 mm;
- **26.5 mm adapter** is suitable for color camera (ASI294MC for example). 26.5 mm (ASCOM Canon Lens Controller) + 11mm (T2 ring) + 6.5 mm (ZWO cooled camera) = 44 mm.

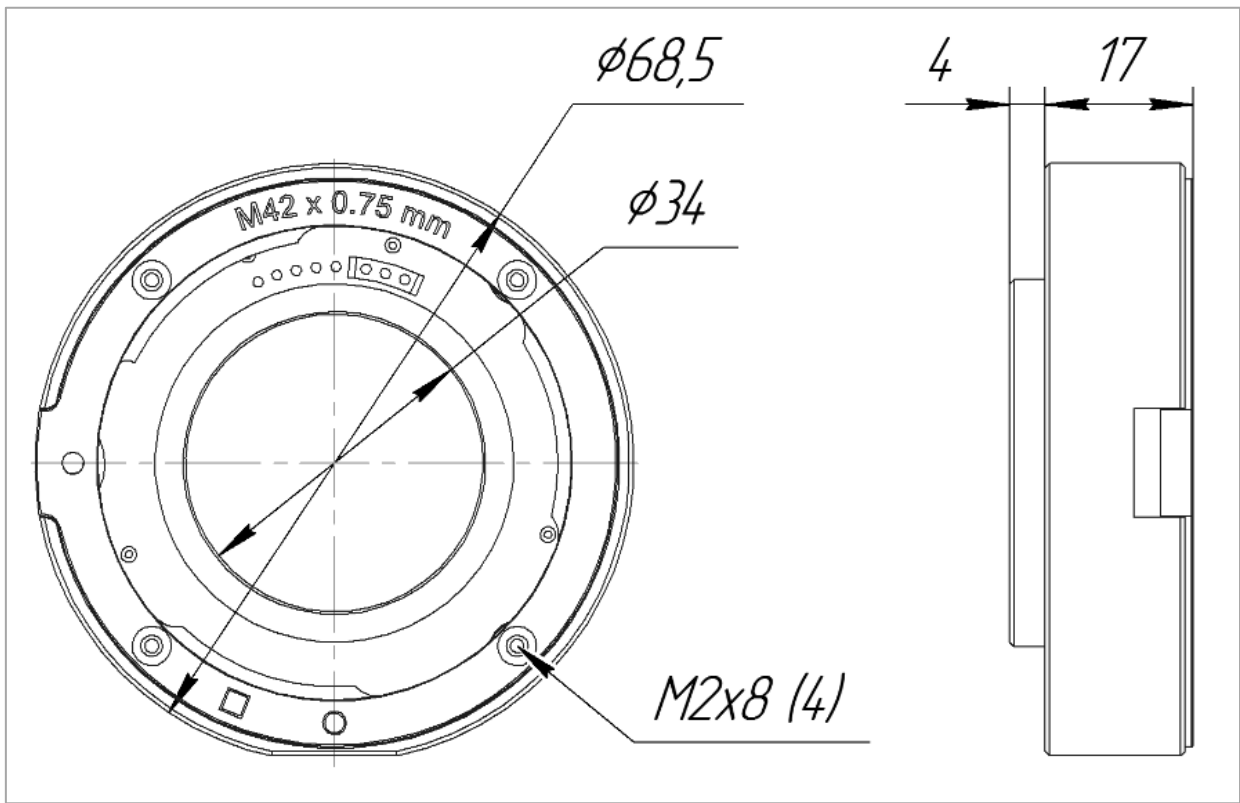


Assembly diagram

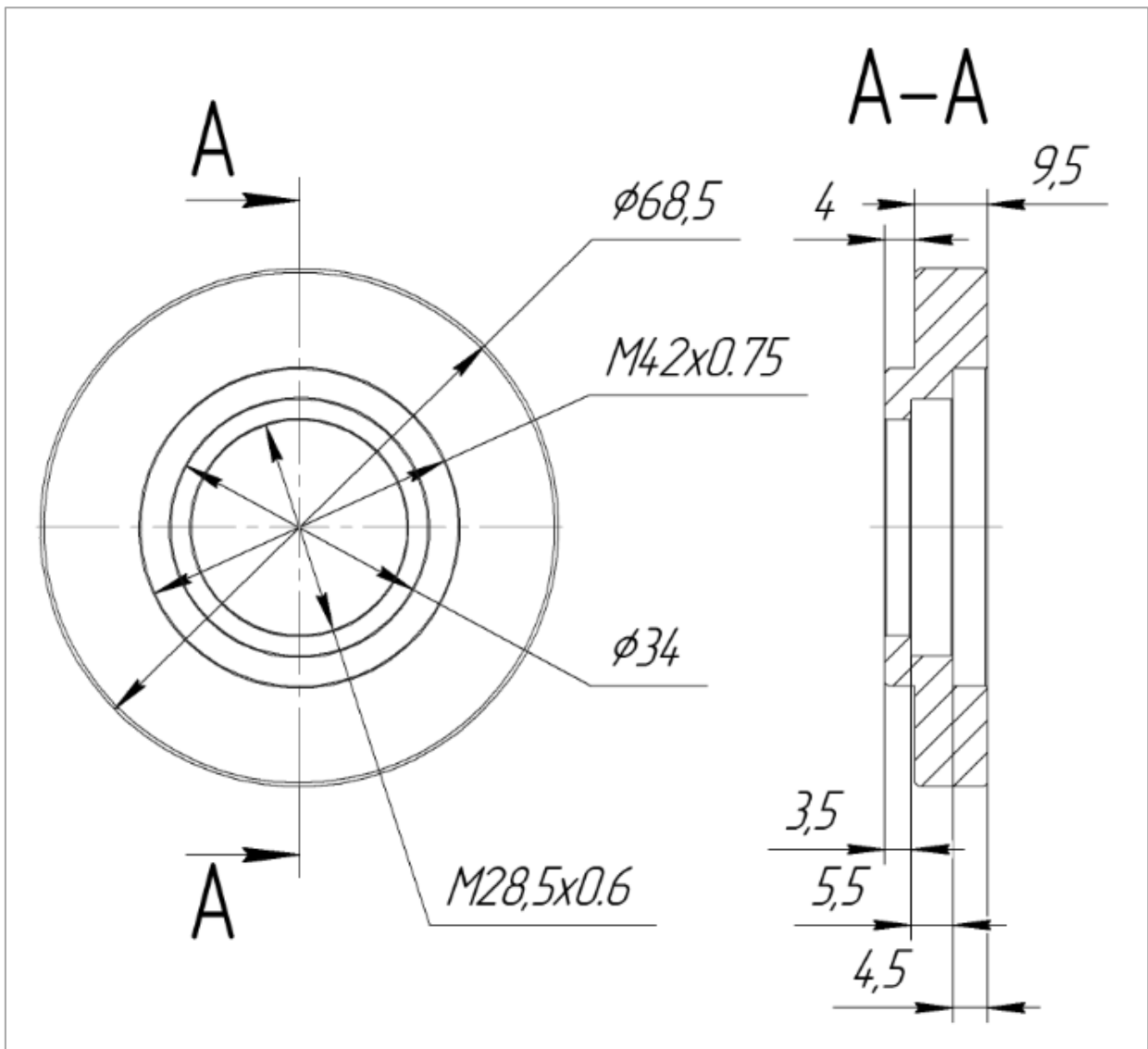
Now 26.5 mm adapter is a combination of 17 mm base adapter and 9.5 mm spacer. This design will be much more versatile. 17 mm base adapter has no filter mount (designed for use with the filter wheel). 9.5 mm spacer has M28.5x0.6 thread for mounting 1.25" filters.



Use cases of ASCOM Lens Controller



Drawing of 17 mm base adapter



Drawing of the standard spacer (9.5 mm)

- Minimal adapter thickness (17 mm) is limited by spring electrical contacts and standard lens mount mechanism;
- By default, the spacer thickness is 9.5 mm. In this case, the total thickness of the assembly with the adapter is about 26.5 mm. This solution is suitable for cameras with back focus of about 17.5 mm (most of the QHY/ZWO/SBIG, etc). As you know, the back focus of Canon lenses is 44 mm;
- Moreover at your request, we can adapt the thickness of the spacer to match your particular setup. For example, QHY8L/10/12 cameras have a back focus of about 20 mm. Therefore the spacer thickness must be  $44 - 20 - 17 = 7$  mm. We can make this spacer especially for you.



ASCOM Canon Lens Controller

- 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 mechanism button and rotate the lens counterclockwise. Attach and remove your lens **only when the USB cable is disconnected!**
- Connect ASCOM Lens Controller to your computer using USB-Mini cable. Your cable has a dual USB-A connector for high current consumption lenses. In most cases, it is enough to connect only one connector (main, data transfer), even for large white Canon telephoto lenses. But if you need more power use a second (power) connector. You can even connect it to an external power supply and get more power than from standard USB ports.

Configuration	USB 2.0	USB 3.0	USB 2.0 / USB 3.0 + External power supply
Main connector	2.5W	4.5W	2.5W / 4.5W
Power connector	2.5W	4.5W	unlimited *

\* depends on the selected power supply

**Note:** When testing the ASCOM Lens Controller, first connect it directly to your computer. Then you can test it with various USB hubs. Keep in mind that connecting both connectors to unpowered (passive) USB hub doesn't make sense because it is powered from a single computer port. Moreover, several connected devices can share the power supplied. In this case, the correct functioning of the device is not guaranteed. Use powered (active) USB hubs for proper operation.



USB cable with dual connector



Powering the device from external power supply

## STEP 2: Software installation

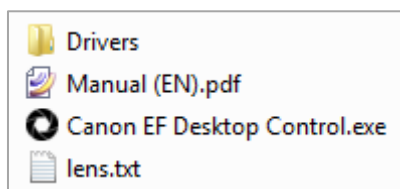
The software doesn't require high performance from the user computer. Basic software components:

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

Install the software from downloaded package. Before launching the application 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, Mac OS X).

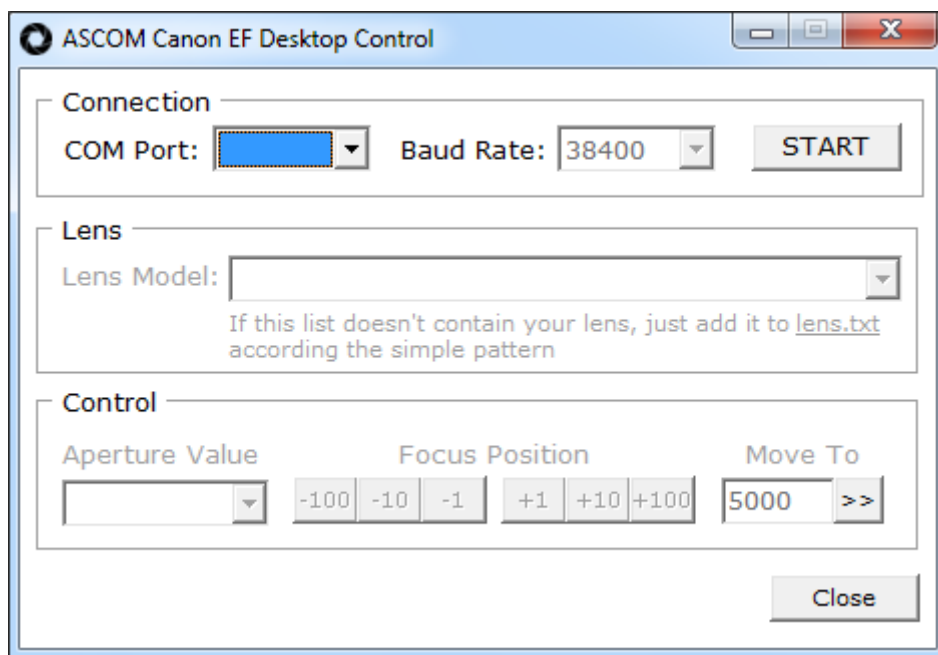
You can also find the driver in the appropriate folder of the distribution package. Open **Drivers** folder and click on **CDM21228\_Setup.exe**. Follow the install wizard instructions. This process can take few minutes and will be completed automatically.



**Note:** If you need lens control software for Linux and Mac OS X, please visit this page: [https://rti-zone.org/macosx\\_x2focuser\\_plugins.php](https://rti-zone.org/macosx_x2focuser_plugins.php). Rodolphe Pineau has created great X2 plugins for various systems. You can control the device even with a Raspberry Pi!

### STEP 3: Software usage

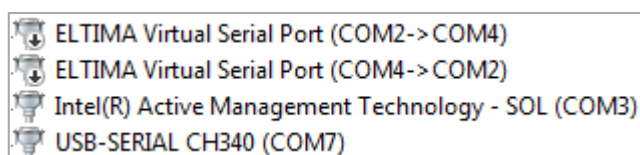
After installation is completed launch the **Canon EF Desktop Control.exe**.



Main window

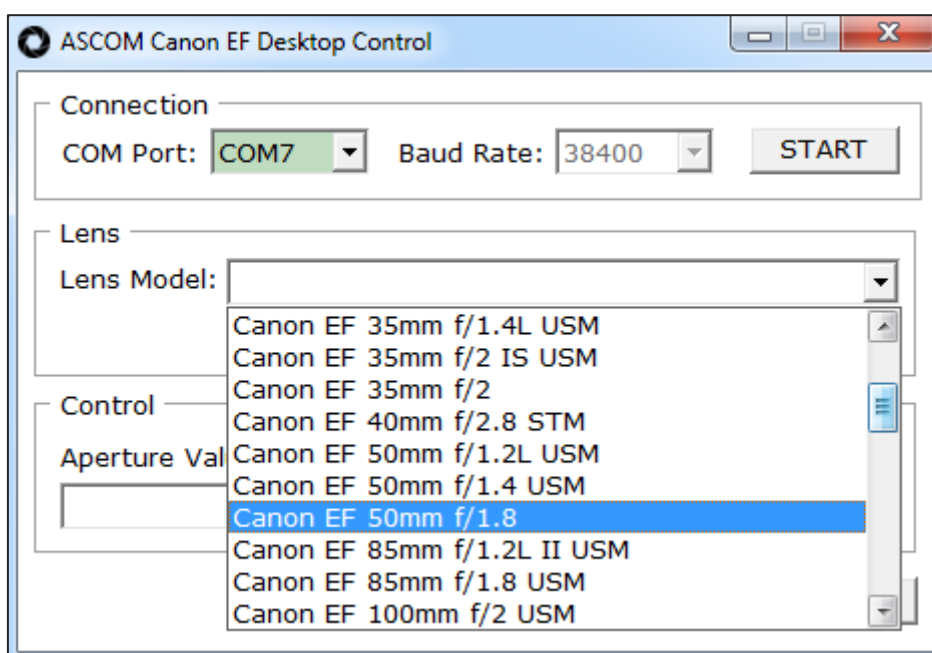
You need to configure several parameters in this window:

- COM Port - virtual port created by operating system for the connected device (COM7 for example). You can find port number in the Windows Device Manager. Then click on **START** button.



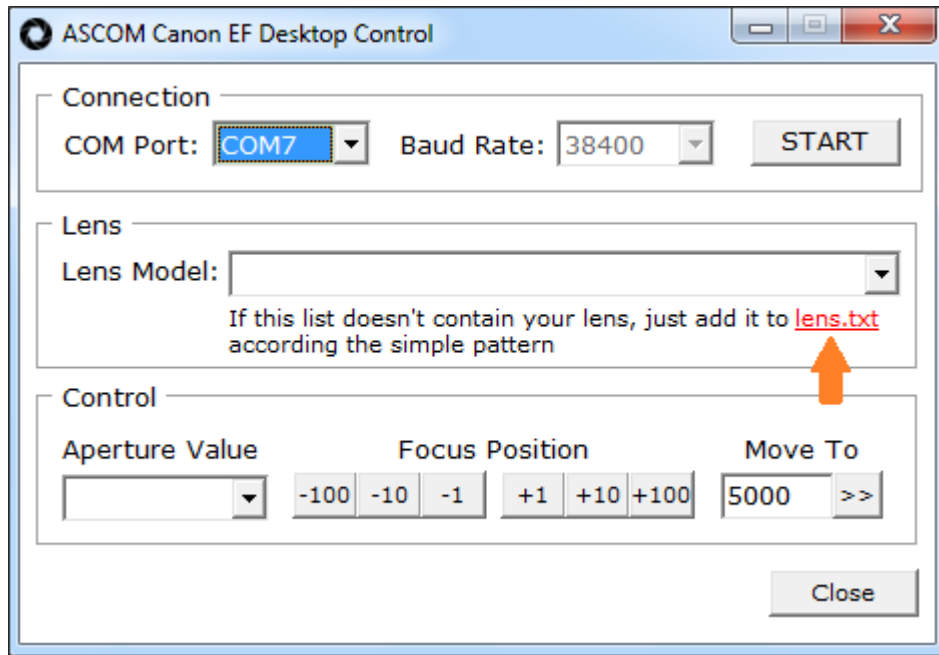
List of available COM ports

- Lens model – select your lens from a drop down list. Canon lenses by default, but you can add and describe 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 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 18 20 22
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](#)

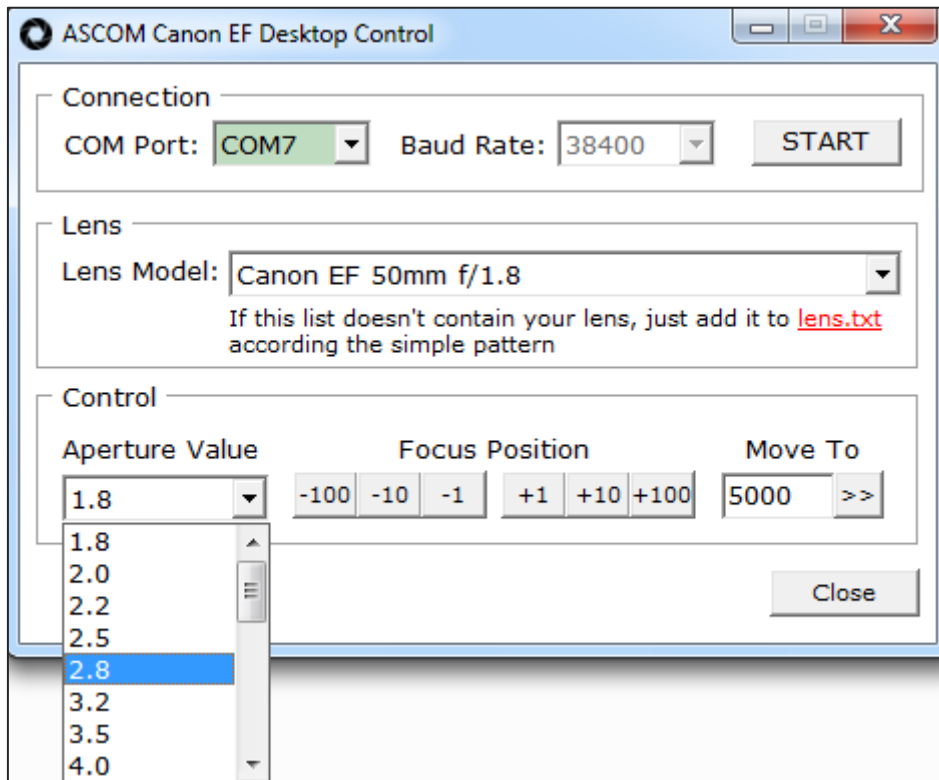
**Note:** For zoom lenses with a different range of aperture values at different focus values (Canon EF-S 18-55 f/3.5-5.6) set the range for the planned for use focal length. For example:

- 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).



- Select the aperture value you want to use. Changes will take effect immediately.



List of available aperture values

- Use **Focus Position** buttons for relative focus adjustments or **Move To** input box to set absolute focus position. Maximum number of steps depends on the specific lens model and can be determined experimentally.

**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.