
SESTO SENSO 2 robotic focusing motor-

USER MANUAL

VERSION 1.3

Update 24-10-2020



SESTO SENSO 2 is made by PrimaLuceLab iSRL (Italy). For any matters relating to the use, service and warranty, please refer to the addresses given in the relevant documents.

English

WARNING

If improperly handled, SESTO SENSO 2 may damage. So please follow the instructions below:

- Do not disassemble
- Do not open, damage or subject to electric shock or excessive impact any part of SESTO SENSO 2. Do not drop.
- Do not short the electronic elements
- Do not expose at temperatures below -20°C and above $+60^{\circ}\text{C}$
- Do not burn or incinerate any component.
- Do not expose to rain or other atmospheric effect related to water
- Do not bend, modify or force any part of SESTO SENSO 2

QUALITY CONTROL

Each SESTO SENSO 2 unit, after created in our laboratories, it's tested by PrimaLuceLab technical experts to check all components. We verify mechanics and electronics. In case you check any malfunction, please contact us immediately (+ 39-0434-1696106 or support@primaluclab.com). Do not try to disassemble, repair or modify yourself SESTO SENSO 2, without our written approval, in order not to loose the Producer Warrantee.

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Components Identification



Contents of the package

- SESTO SENSO 2 robotic focusing motor
- 5 bushings
- Allen keys with grub screws
- Power cable for cigarette plug
- USB-C to USB cable
- Quick Start guide



CAUTION

In order to correctly use SESTO SENSO 2, you have to connect it to your telescope's focuser. The installation procedure changes based on the telescope's focuser so please refer to the next paragraphs. But if you want, you can proceed with the SESTO SENSO 2 first use also without having the focuser not installed on the telescope's focuser.

Technical specifications

Power	12V
Power consumption @ 12V	800mA max
Working temperature	-20°C / +60°C
Control with:	USB WiFi
Resolution	0,7 microns per step
Temperature probe	Internal to read motor temperature (in the package) External for focus temperature compensation (optional)
Provided software	Driver for Windows 64 bits (compatible with Windows Vista, 7, 8 and 10) FOCUSER Manager for control with Windows operative system ASCOS driver for control from external software (tested with ASCOM platform 6.4) SESTO SENSO 2 Virtual HandPad for WiFi control
Weight	380 grams

NOTE

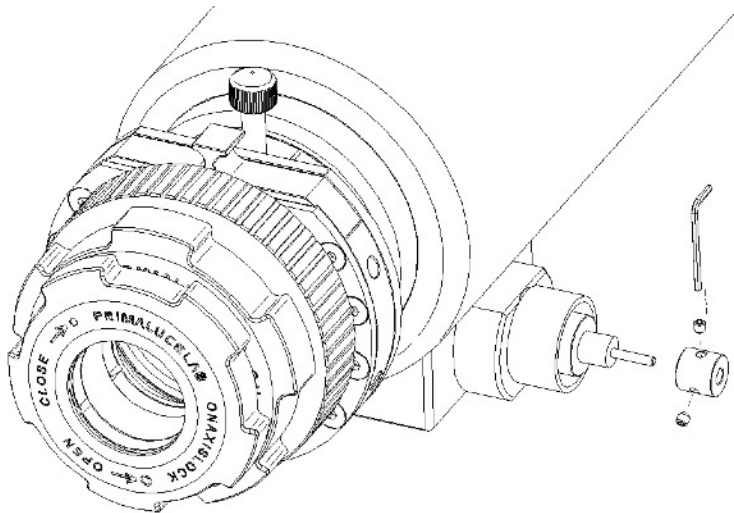
In order to proceed with installation you have to download the SESTO SENSO 2 drivers and softwares package from our website:

www.primalucelab.com/astronomy/downloads

Save the package (it's in zip format) in the EAGLE or computer you want to use to control the SESTO SENSO 2 and unzip it with the proper unzip software (if you haven't an unzip software, you can use <https://www.winzip.com>).

Installing SESTO SENSO 2 on the telescope's focuser

In order to connect SESTO SENSO2 to the focuser of your telescope, remove the manual focus micrometric knob by unscrewing the screw normally present on the knurled knob. After pulling it out, you also need to disconnect the coarse focuser knob, by means of an Allen screw on the knob. On some plastic-covered focusers, you need to remove the plastic to access the disassembly screw. Connect one of the bushings you find in the SESTO SENSO 2 box (based on the diameter that fits your focuser) to the small focuser shaft of your focuser.



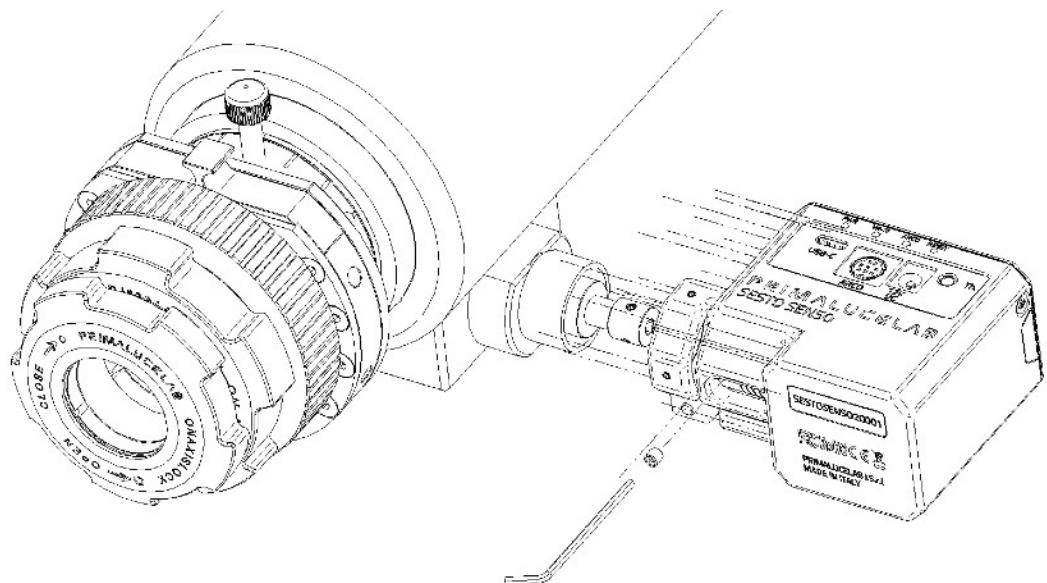
NOTE

in order to work, SESTO SENSO 2 requires your focuser to have the micro metric knob.

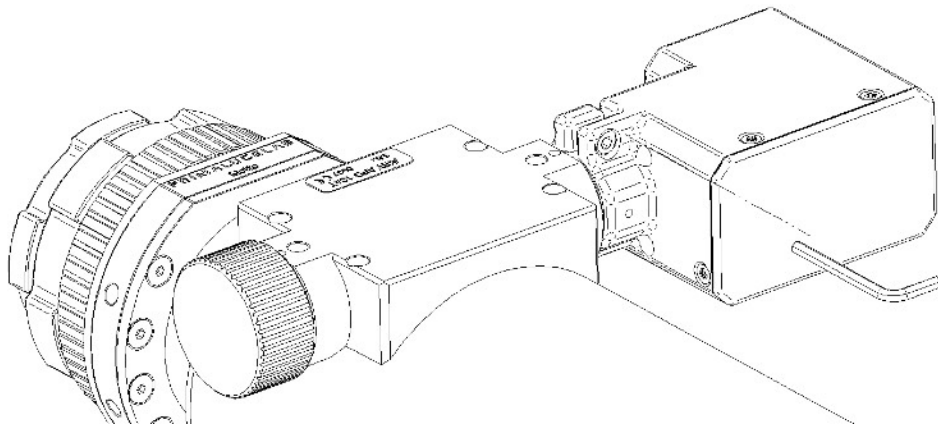
NOTE

SESTO SENSO 2 is designed to be connected to 25mm shaft. If you have another diameter, you may add the optional 26, 33 or 37mm adapters. Please refer to page 25 in order to know how to install the adapters.

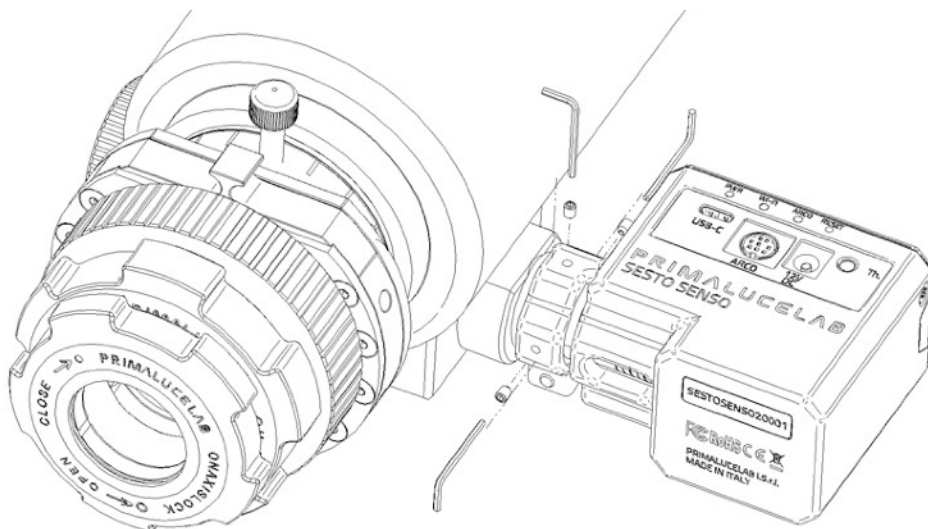
Now you can connect SESTO SENSO 2 to your focuser by paying attention to centering the micrometric pin with the pre-assembled bushing on SESTO SENSO 2, until it stops. By using the provided Allen screw, lock the 2 grub screws that fix the pre-assembled bushing on SESTO SENSO 2 to the bushing you just installed on your focuser's shaft.



Then, by using the provided Allen screw, please fix the screws that fix the outer ring of SESTO SENSO 2 to your focuser.



Finally, use the Allen screw to lock the 3 small grub screws fix the outer ring of SESTO SENSO 2 to your focuser.



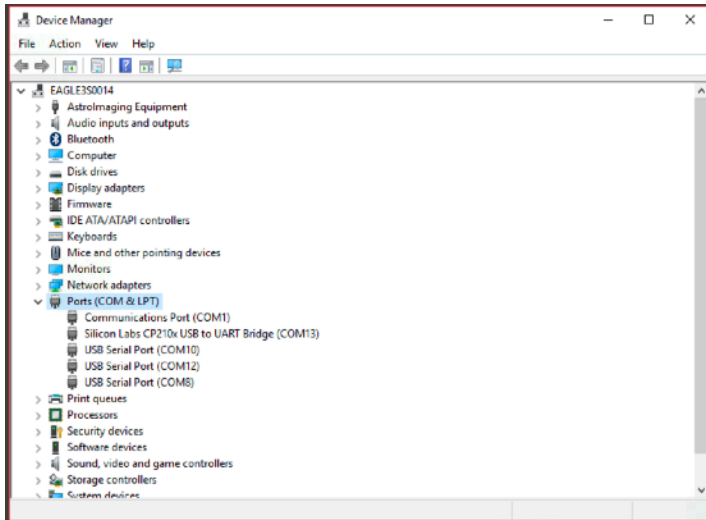
NOTE: After installing SESTO SENSO 2 on your focuser, check the smoothness of the movement keeping SESTO SENSO 2 powered off and then manually moving the focus knob of your focuser. The presence of SESTO SENSO 2 will make the movement harder (since the motor is connected) but the motion must still be uniform. If you notice an uneven movement, repeat the installation procedure.

NOTE: SESTO SENSO 2 connects to several focusers that may have different machining and tolerances precisions. Focusing accuracy, especially when using automatic focusing procedures, depends on the focuser mechanics and not only strictly on SESTO SENSO 2. If your focuser has an important backlash, you can adjust the **backlash** parameter in the software.

Controlling SESTO SENSO 2 with EAGLE or computer with Windows OS

SESTO SENSO 2 can be controlled with the EAGLE or any external computer that comes with Windows operative system (at least version 7 64 bits). In the SESTO SENSO 2 package you can find a 12V power cable with cigarette plug and a PC connection cable for USB port. Connect the USB-C cable to the USB port of your EAGLE or personal computer. You will see

the PWR LED on (this means SESTO SENSO 2 is powered) and, after a few seconds the Wi-Fi LED will be on too and this means that also the SESTO SENSO 2 WiFi connection is ready to be used.



When you connect it to USB port of the EAGLE or of an external computer, SESTO SENSO 2 should be automatically detected and Windows should automatically install the new driver. In order to check this, please go to Control Panel and then choose Device Manager. You should see the SESTO SENSO 2 listed under "Ports (COM & LPT)" and described as "Silicon Labs CP210x" (in order to check, you can disconnect and then reconnect the SESTO SENSO 2 USB cable and see how Windows lists it).

If you can't find it, Windows is not able to automatically install the SESTO SENSO 2 driver. In order to do this, please follow this procedure:

- 1) go to "Device Manager"
- 2) locate "CP2102N USB to UART Bridge Controller" under "Other devices"
- 3) make a mouse right-click and select "Update Driver Software"
- 4) select the second option "Browse my computer for driver software" in order to install the driver from a specific folder
- 5) select the folder where you saved the content of the SESTO SENSO 2 software package you downloaded from our website

www.primaluce.com/astronomy/downloads

Please remember to unzip the file you downloaded before starting the installation of the SESTO SENSO 2.

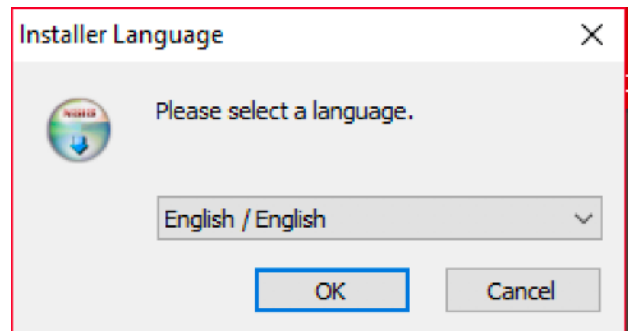
- 6) at the end of the procedure, a message will appear indicating the correct installation.

Now, under "COM and LPT devices", you will see a new COM port (in this example COM16) which is the one used by your computer to communicate with SESTO SENSO 2.

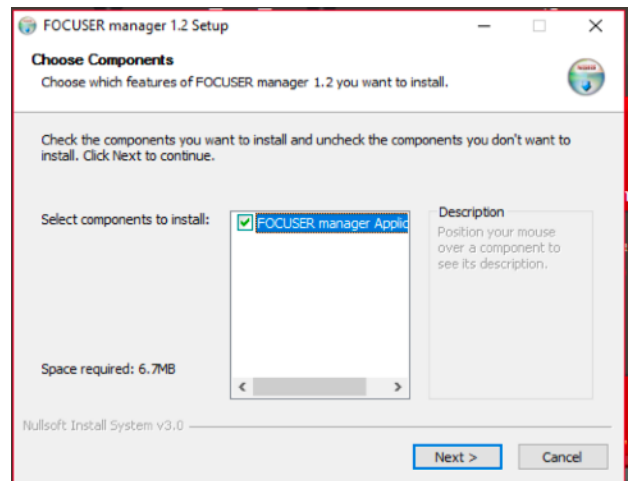
NOTE

If the driver is not correctly installed in your Windows operative system, SESTO SENSO 2 won't be able to connect to your EAGLE or external computer and it won't work. So please check that the COM driver is correctly installed before proceeding to the next step.

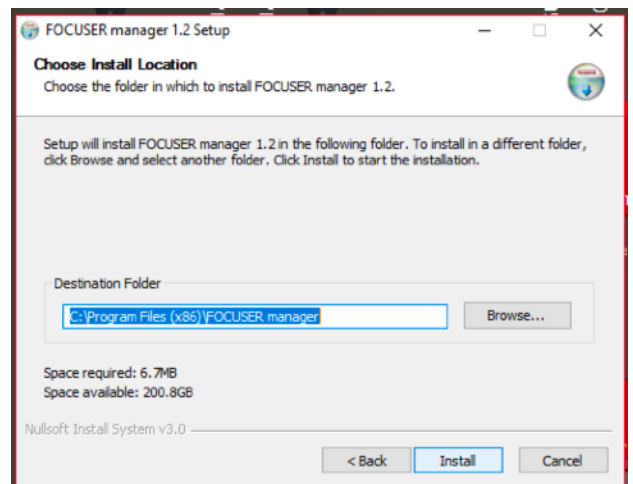
SESTO SENSO 2 is supplied with a complete Windows software “FOCUSER Manager” (included in the file that you download from the download section of our website) that allows you to control the SESTO SENSO 2 and manage all its functions. Make a double click on FOCUSERManagerSetup.exe file to start installation. Click OK to proceed. In the first window that opens, please select your language and click the “OK” button to start the installation.



Then, in the next window, click the “Next” button.

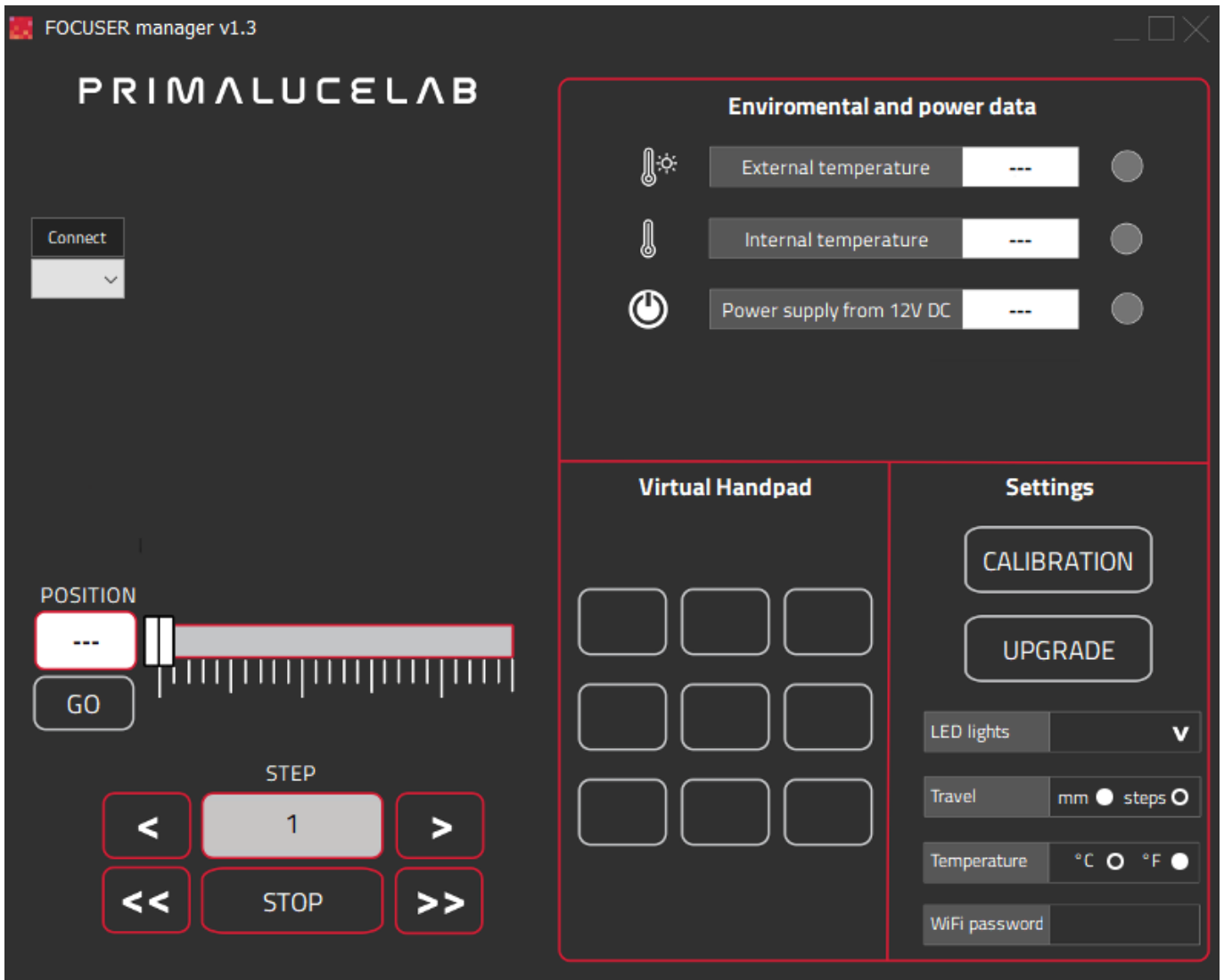


Select the folder where you want to install FOCUSER Manager software (if you want to change the default one, you can click on the Browse button and choose for a different folder). Then click on the “Install” button to start installation.



At the end of installation process, please click on “Close” button to finish. Now you will find the FOCUSER Manager software among the softwares installed in your EAGLE or Windows computer. If you leaved the default folder, it will be located in “C:\Program Files (x86)\FOCUSER manager” folder.

Having connected SESTO SENSO 2 to a USB port of your EAGLE or Windows computer and powered with an external power source (a 12V battery by using the supplied cigarette plug cable, a 12V AC adapter with at least 1A and Ø5.5/2.5mm connector or the EAGLE power cable to power it through the EAGLE), please select "FOCUSER Manager" software to start it and you will see this interface:

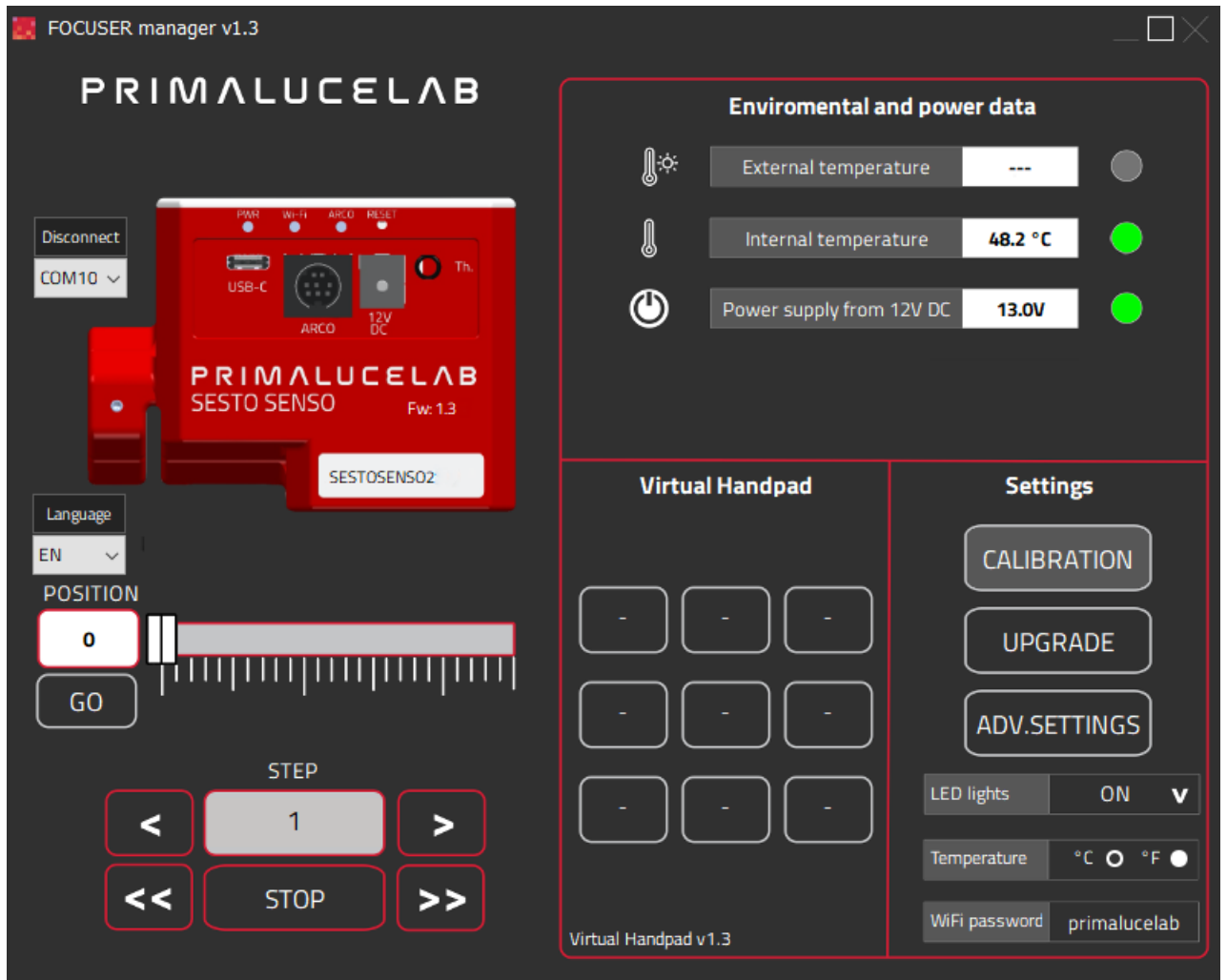


On the left, select the COM port number your computer assigned to the SESTO SENSO 2 and click on the "Connect" button. You will see the lights on the right become green. If you connected also the optional temperature sensor, you will get the green light also in correspondence to the "External temperature" row.

When you press "Connect" button, if you get a message stating that SESTO SENSO 2 firmware is wrong, please update its firmware before continue. Please read page 24.

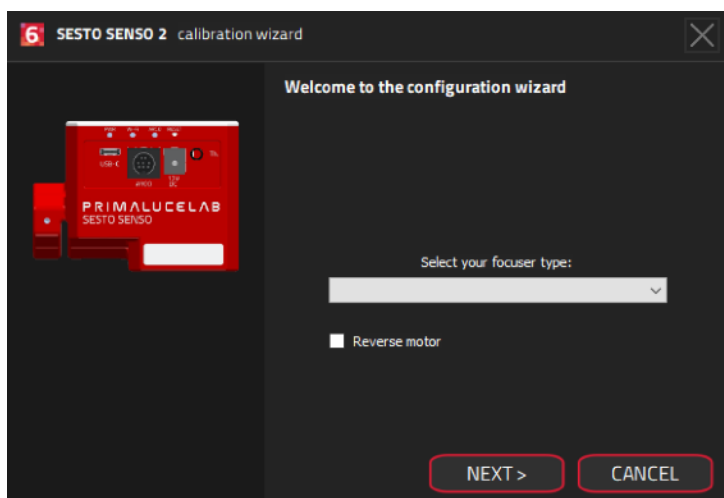
What happens if I can't connect by pressing the "Connect" button?

At this stage, if you can't connect to SESTO SENSO 2 by pressing the "Connect" button, please check the COM port number that your EAGLE or personal computer assigned to the SESTO SENSO 2. In order to do that, please go to Control Panel -> Device Manager and search for the SESTO SENSO 2 COM port number. This is the number you have to select in the FOCUSER Manager software, before starting the connection.



Before moving SESTO SENSO 2, you have to start the calibration. Please click on the CALIBRATION button and you will see a new window:

a) if you installed SESTO SENSO 2 on an external focuser (for example a Crayford or Rack and Pinion focuser), please select "Telescope with external focuser".

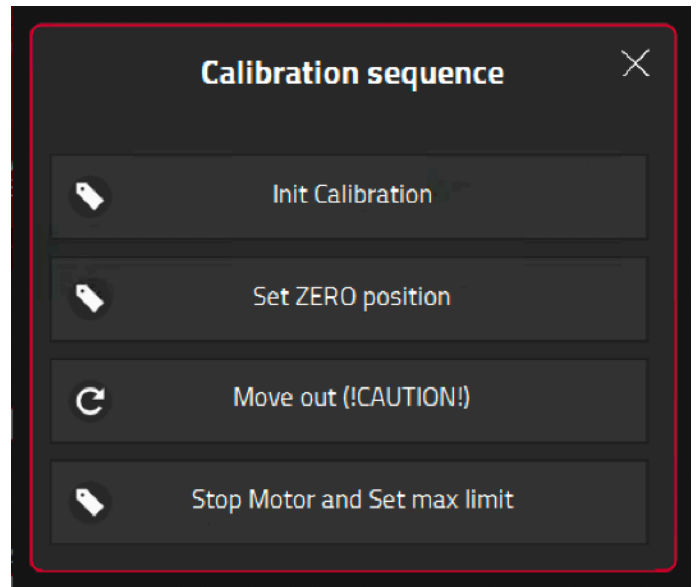


NOTE

If your focuser requires the motor to move in the opposite direction, please select the "Reverse motor" before pressing the NEXT button.

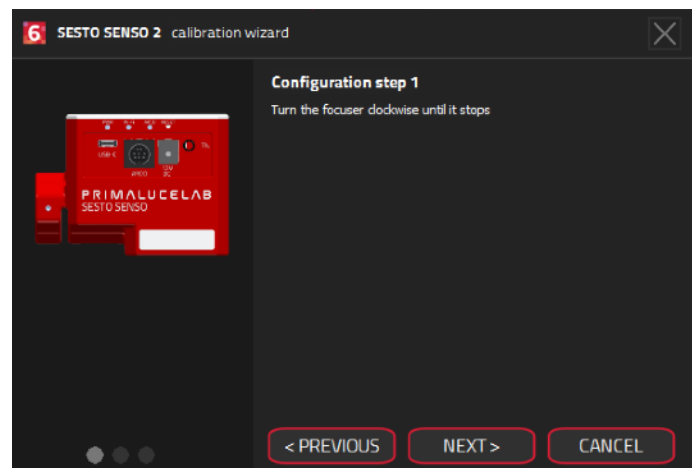
You will see a new window. Move by hand the focuser position to the innermost position of your focuser then:

1. press the "Init Calibration" button to start calibration
2. then press the "Set ZERO position" button in order to set the 0 value of your calibration.
3. click the "Move out (!CAUTION!)" button: this will start moving your focuser to the outer position. This will move the focuser.
4. When your focuser is close to the outermost position, click the " Stop Motor and Set max limit" button. **Attention: please remember to stop the motor BEFORE it will reach the end of draw tube travel or you may cause problems to the focuser or to the SESTO SENSO 2 motor.**

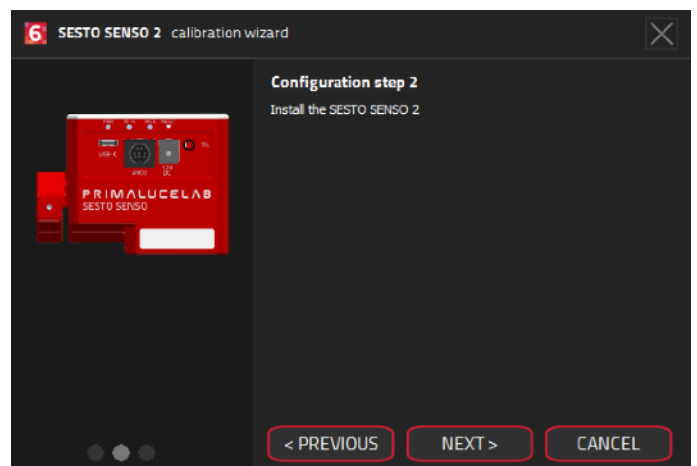


b) if you want to SESTO SENSO 2 on an SC type telescope with internal focuser and microfocuser, please select "SCT Telescope with Microfocuser".

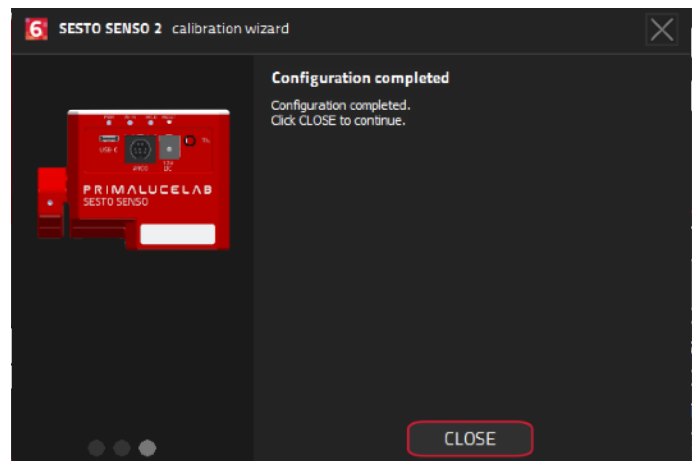
You will see a new window. please turn the coarse knob of the original focuser clockwise until it stops. Then please click on NEXT button.



Now install SESTO SENSO 2 on the microfocuser of your telescope. When SESTO SENSO 2 is installed, press NEXT button.



Configuration is completed, press the CLOSE button to save and come back to the main window.



Calibration data is automatically stored in the SESTO SENSO 2 electronics so you don't need to do it again or you don't need to make it again if you change the computer to control it.

Moving the SESTO SENSO 2 focuser is very easy. You can do this in different ways:

1. **move the slider until you reach the desired position and press the GO button**
2. **make a double click on the POSITION area, write the number you prefer and then press the GO button**
3. **make a double click on the number below STEP label, insert the number you prefer and press the < or > buttons to move the focuser by the number you selected. Press the << or >> buttons to move the focuser by 10 times the number you selected.**

You will see the focuser moving and you will see the focuser draw tube also moving in the software, this is designed to let you easily understand that it's really moving also in case of remote operations (that is, when you can't directly look at the focuser). In any moment, if you need to stop the movement, press the STOP button in the lower part of the window.

NOTE 1

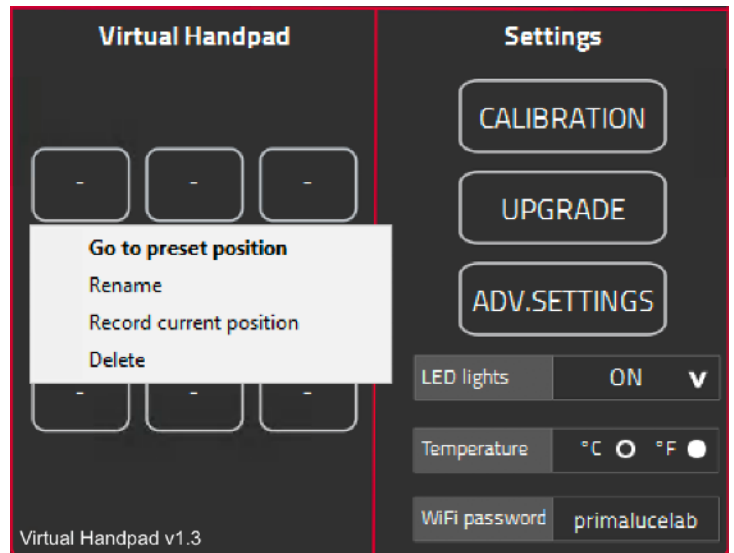
If you moved the focuser manually, you can simply re-calibrate SESTO SENSO 2 by manually moving the focuser to the inner-most position and pressing the "Set ZERO position" button.

NOTE 2

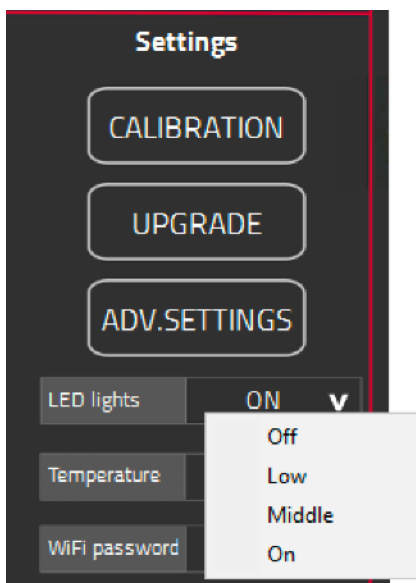
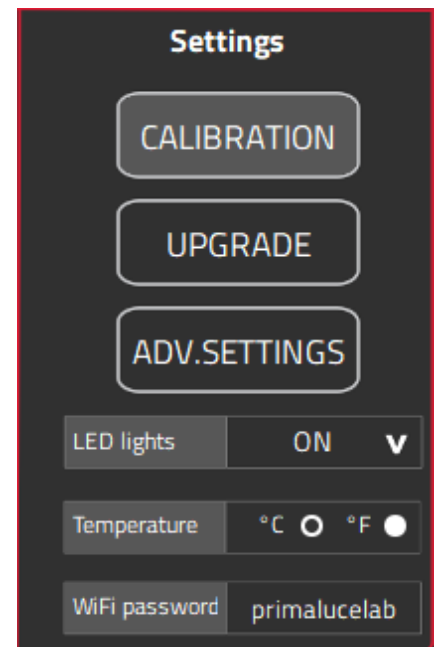
If you can't see any movement, maybe you set a too small value to be seen. Please remember that, for the SESTO SENSO 2 microfocuser, 1 step is only 0.7

As you will read in the next paragraph, SESTO SENSO 2 robotic microfocuser includes also a WiFi connection (to let you control it without the need of a personal computer) with WiFi and the included SESTO SENSO 2 Virtual HandPad. You can use the Virtual HandPad also by controlling the SESTO SENSO 2 with USB and with the FOCUSER Manager software. This way you can save up to 9 positions, for example to let you recall the focus position of a camera or a visual accessory. In order to save a new position in the Virtual HandPad, first of all you have to move the SESTO SENSO 2 to a position where your telescope is in perfect focus (you will need an optical accessory or a camera in order to do this) and then follow this procedure:

1. Click on one of the empty buttons and select the **"Record current position"** option. A new window will appear asking you to type the name of the button.
2. By clicking OK the new position will be saved and the SESTO SENSO 2 Virtual HandPad will show the new button in red color, with the name you choose.
3. In order to change the name of the button, you can make a right click of the mouse on the button and choose **"Rename"**.
4. If you want to delete a pre saved position, you can make a right click of the mouse on the button and choose **"Delete"**. If you want to change the value of a saved button, you have to delete it first and then save the value as a new button.

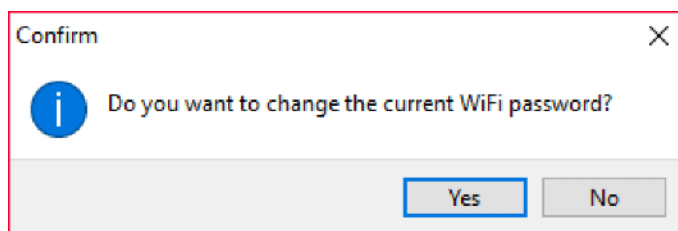


To the right of the FOCUSER Manager window you can find the settings of the focuser. Here you can set the LED lights intensity, the temperature to be visualised in °C (Celsius) or °F (Fahrenheit) and change the WiFi password to access and control SESTO SENSO 2 from a smartphone or tablet.



SESTO SENSO 2 allows you to change the LED lights intensity and you can even turn them off completely (please note, if you turn them off you won't be able to check the SESTO SENSO 2 status without controlling it via the provided software). In order to change the LED lights intensity, please make a left mouse click on the arrow to the right of the "LED lights" option and set the value you prefer. LED status will be automatically stored in the SESTO SENSO 2 electronics.

The third option in the SESTO SENSO 2 settings window allows you to change the unit of measurement of temperature from °C (Celsius) to °F (Fahrenheit). The last option in the SESTO SENSO 2 settings allows you to change the password to connect to SESTO SENSO 2 with WiFi. The default password is "primalucelab" and, in order to change it, please make a mouse left click on the "primalucelab" word, and you will be able to change it. Press ENTER button of your keyboard to confirm and you will see a new window asking you to confirm. Press Yes button to confirm.



NOTE on motor internal temperature

About the internal motor temperature, it's normal to see values from 10 to 50 °C.

Controlling SESTO SENSO 2 with Virtual HandPad

SESTO SENSO 2 can be controlled also without EAGLE or a computer, by connecting from any smartphone or tablet (also a computer) with WiFi and using the included SESTO SENSO 2 Virtual HandPad. In order to set the WiFi control, please follow this guide (that has been created on a smartphone with iOS operative system but it's similar for Android devices)

After you power up the SESTO SENSO 2, turn on the WiFi of your device (that can be a smartphone or a tablet).

NOTE

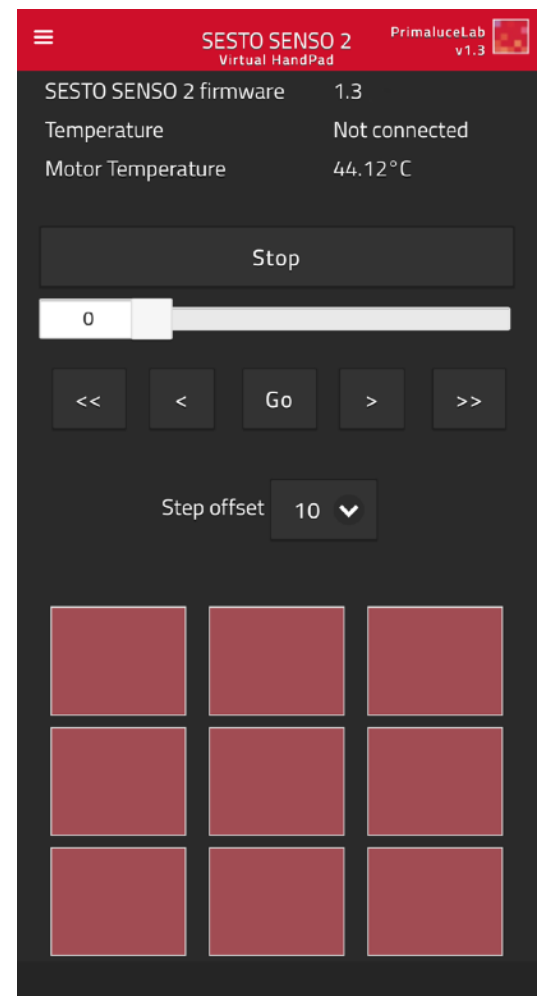
When you save the focus position in the SESTO SENSO 2 Virtual HandPad, you will find the same positions when you will control the SESTO SENSO 2 with WiFi from your smartphone or tablet.

You will see the SESTOSENSO2xxxx network created by your SESTO SENSO 2, the network name corresponds to your SESTO SENSO 2 serial number. Select the SESTOSENSO2xxxx network. Using the keyboard (virtual or physical) of your device insert "primalu-

celab" as the default password (or the password you choose if you changed with the FOCUSER Manager software as described in the previous paragraph) and then press the "Login" button. The next time you want to access SESTO SENSO 2, you will no longer have to enter your password: your device will automatically connect when you select the network created by SESTO SENSO 2 unless you change the login password. Wait for a few seconds until you get confirmation that your device is connected to the SESTOSENSO2xxxx network.

Now you can open the browser of the device (for example Chrome or Safari), in the url area (in the field where you usually write the url like www.primalucelab.com), type the address 192.168.4.1 and press the button RETURN: you will see the SESTO SENSO 2 Virtual HandPad on your screen.

To create a link directly to your device desktop, simply press the "share" button and then "Add to Home". You can personalise the name, or just leave "SESTO SENSO 2". Press Add button to confirm. The SESTO SENSO 2 connection will be created and you will have a direct and immediate connection to SESTO SENSO 2 in your device. Press the SESTO SENSO 2 button to start the SESTO SENSO 2 Virtual HandPad.

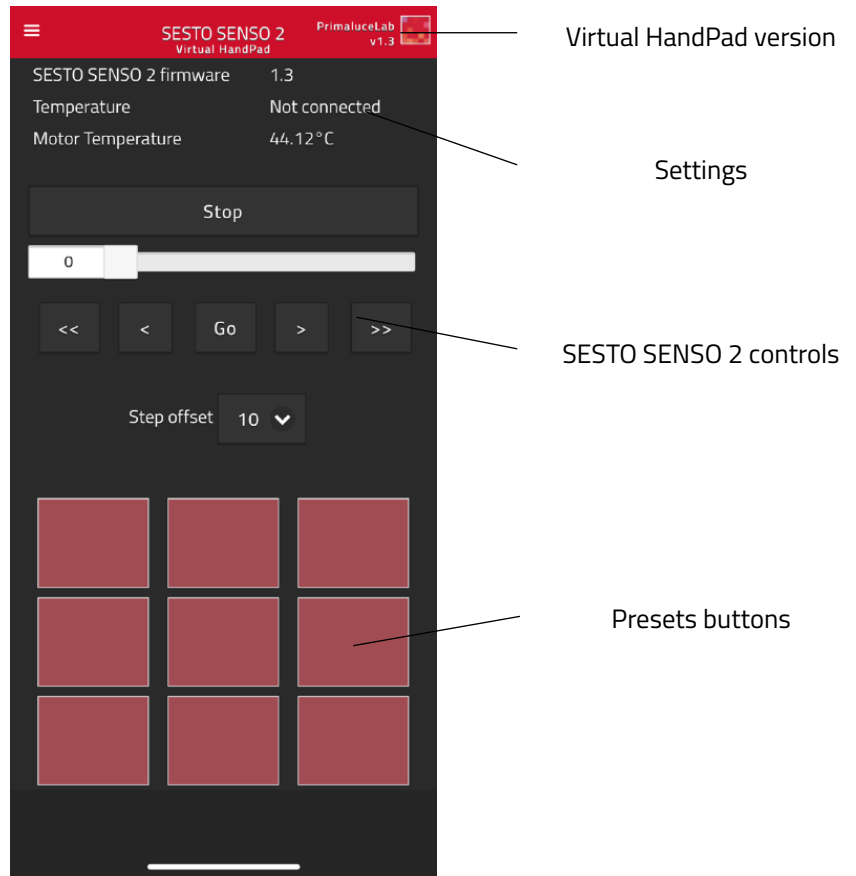


The SESTO SENSO 2 Virtual HandPad allows you to control and use SESTO SENSO 2 micro focuser without the need of an EAGLE or of a computer.

On the top-right of your screen you can find the SESTO SENSO 2 Virtual HandPad version. Then you can read the SESTO SENSO 2 firmware version, the external temperature (if you connected the optional temperature sensor) and the internal motor temperature.

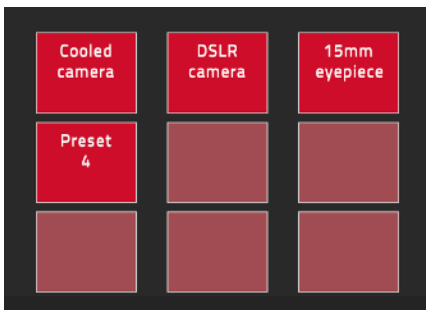
Below you can find the slider and the button to move the SESTO SENSO 2, together with the step selector.

In the lower part you can find the 9 programmable buttons that allow you to save up to 9 different focus positions, name them and easily recall focus position with just the push of a button.



Moving the SESTO SENSO 2 focuser with the SESTO SENSO 2 Virtual HandPad is very easy. You can do this in different ways:

1. move the slider until you reach the desired position and tap on the GO button
2. make a double tap on the left field (where you can read the number in step of your focuser), write the number you prefer with the virtual keyboard of your device and then press the GO button
3. select a value in the "Step offset" selector (from 100 to 2000 steps) and tap the < or > buttons to move the focuser by the number you selected. Tap the << or >> buttons to move the focuser by 10 times the number you selected.



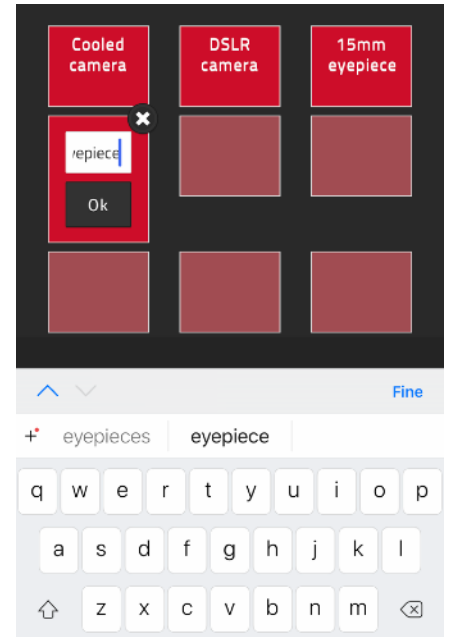
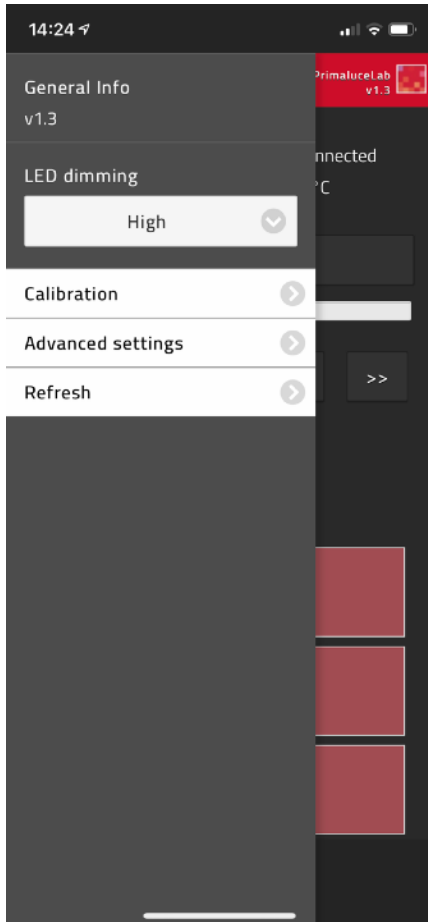
In any moment, if you need to immediately stop the movement, press the STOP button in the upper part.

In order to save a new position in the SESTO SENSO 2 Virtual HandPad, first of all you have to move the SESTO SENSO 2 to a position where your telescope is in perfect focus (you will need an optical accessory or a camera in order to do this) and then follow this procedure:



Tap and keep your finger on one of the empty buttons: the position will be automatically saved with a "Preset" name.

Tap on the name of the button and you will be able to change it by using the virtual keyboard of your device. Press ENTER button to confirm the new name.



By pressing the top-left button in the SESTO SENSO 2 Virtual HandPad main screen, the option menu will appear. Here you will be able to set:

- 1) LED dimming: you can change the SESTO SENSO 2 LED lights intensity to the value you prefer. LED status will be automatically stored in the SESTO SENSO 2 electronics.
- 2) Calibration: if you want to redo the calibration, by pressing this button you will recalibrate SESTO SENSO 2 again.
- 3) Advanced settings: here you can set the advanced settings of your SESTO SENSO 2 unit, please refer to the previous paragraphs to understand the use of the advanced settings.

NOTE

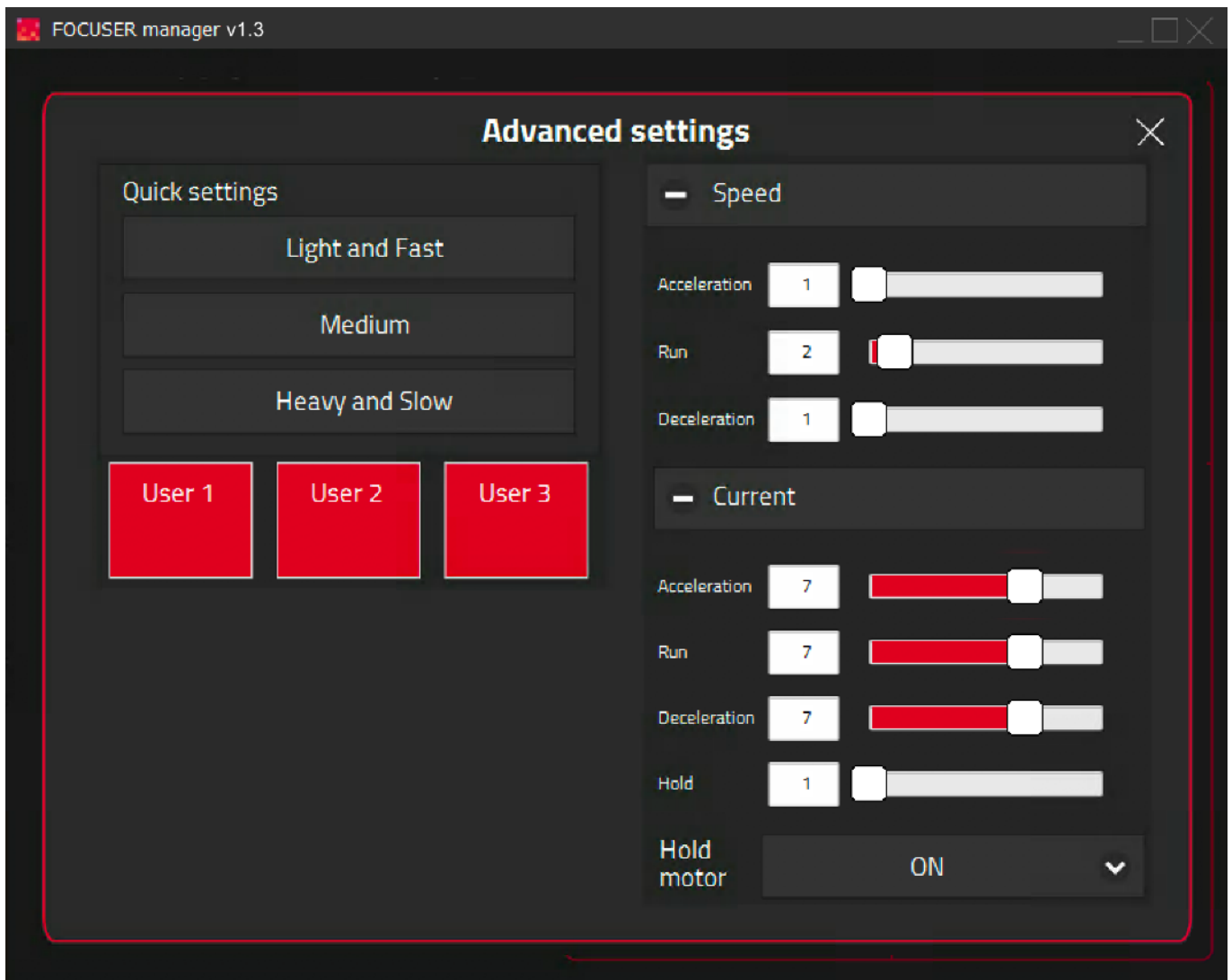
When you save the focus position in the SESTO SENSO 2 Virtual HandPad, you will find the same positions when you will control the SESTO SENSO 2 with USB from your EAGLE or external computer.

ATTENTION

In the event you need to manually reset SESTO SENSO 2 please proceed this way: with the SESTO SENSO 2 not connected to USB port and without power, press the "RST" reset button (keep it pressed for 10 seconds) and, at the same time, connect to power. The SESTO SENSO 2 will reboot and it will be reset to factory settings.

SESTO SENSO 2 Advanced Settings

By clicking the upper right button on SESTO SENSO software, it will show the advanced parameters that may be used, for example, to have a perfect match of SESTO SENSO with your telescope's focuser, to better support the weight of the imaging accessories you use (camera, off axis guider, filter wheel, etc.) used in astrophotography.



Quick Settings:

In order to simplify SESTO SENSO 2 settings, we created some preset profiles from which you can start to create the ideal configuration based on the weight load applied to the focuser and the moving speeds you want.

Light and Fast button is recommended for light loads.

Medium button is recommended for medium loads.

Heavy and Slow button is recommended for heavy loads.

The 3 buttons "User 1", "User 2" and "User 3" allow you to save up to 3 quick settings based on your personalised values of Speed and Current.

Advanced Settings:

In the first set of commands, the operating currents of the SESTO SENSO 2 motor are reported, the values that can be set range from 0 to 10.

- **Acceleration:** set the current in acceleration ramp
- **Run:** set the current after acceleration ramp during RUN
- **Deceleration:** set the current in deceleration ramp

In the second set of commands ("Speed settings), the SESTO SENSO 2 motor movement speed parameters are set.

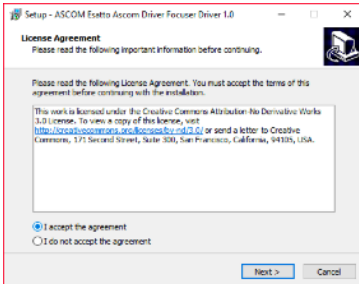
- **Acceleration:** set the acceleration during starting ramp (Range from 0 to 10)
- **Run:** set the speed value after acceleration ramp (Range from 0 to 10)
- **Deceleration:** set deceleration value after slowdown ramp (Range from 0 to 10)
- **Hold:** set the hold current, when the motor is stopped

The third option allows you to activate the Hold current.

NOTE: if the focus micrometer reduction system has slippages between the micrometer pin and focuser shaft, you can solve this problem by setting the Acceleration, Run, and Deceleration (in Speed Settings) to 1.

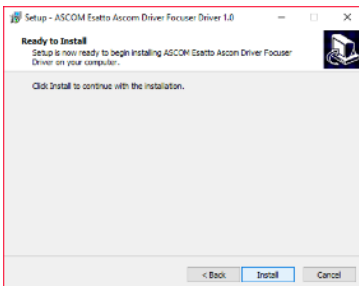
Controlling SESTO SENSO 2 with ASCOM drivers and third party softwares

In order to control your telescope focus with SESTO SENSO 2 you can also use third party softwares instead of the FOCUSER Manager described in the previous paragraphs. In order to do this, you can use SESTO SENSO 2 ASCOM drivers. In order to install SESTO SENSO 2 ASCOM driver in the EAGLE or Windows computer you use to control SESTO SENSO 2, please follow these steps:

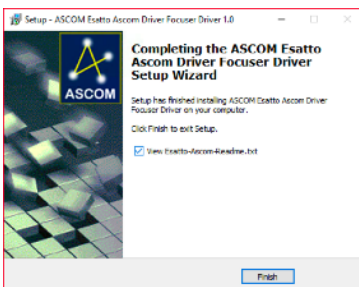


Make a double click on the SESTOSENSO2AscomDriverSetup.exe that is part of the SESTO SENSO 2 software package you downloaded from our website <https://www.primaluce.com/astronomy/downloads>

A new window will appear, select "I accept the agreement" and press Next button to proceed.



In the next window, press the Install button to proceed with installation.



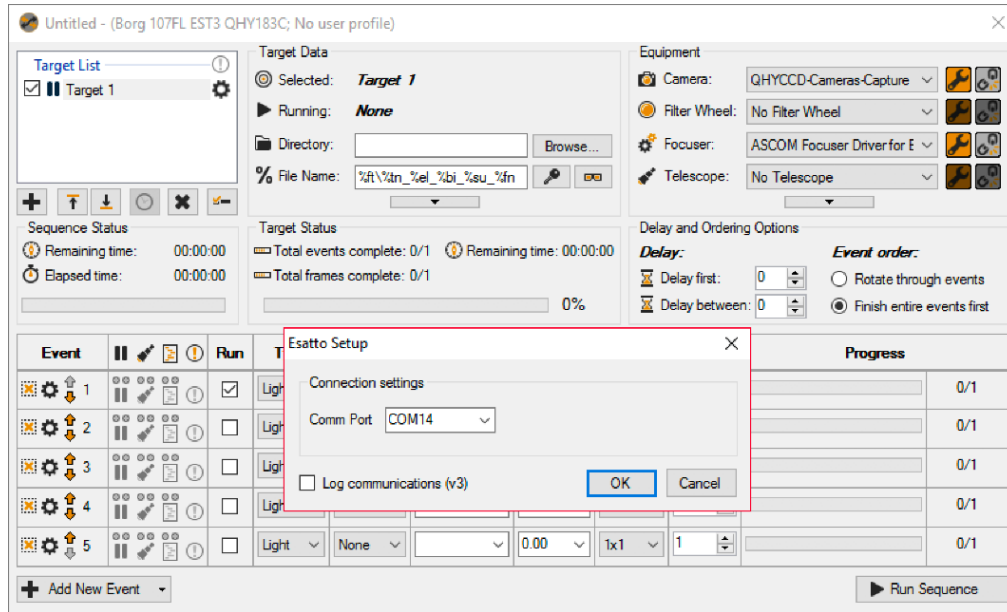
When the installation is completed, press the Finish button


Now you can use and control SESTO SENSO 2 by using third party softwares for Windows and that supports ASCOM platform. In this guide we'll show two examples with 3 softwares commonly used in astrophotography:

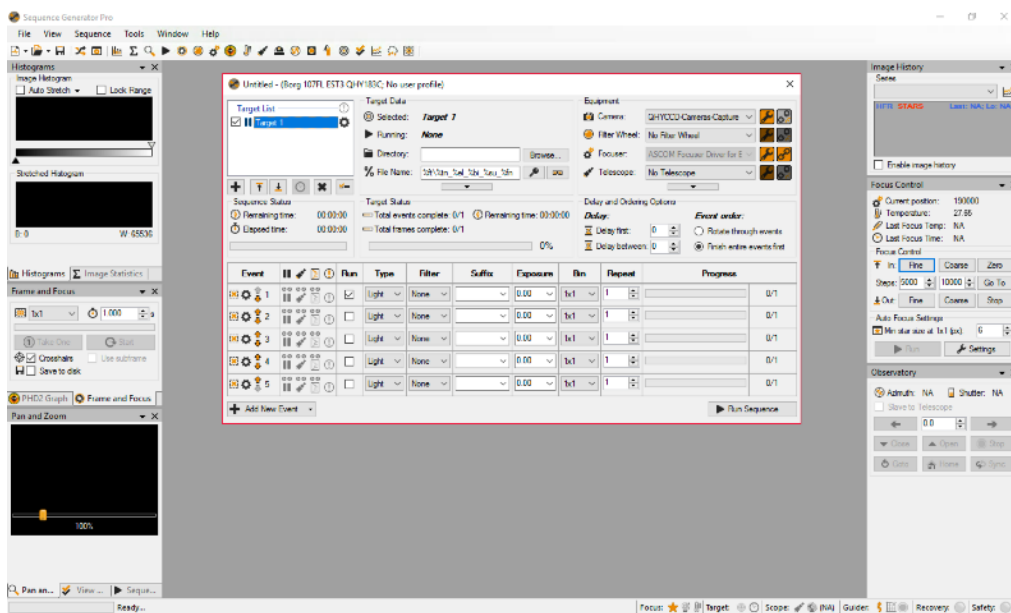
NOTE

ASCOM is an open platform that allows an integration between astronomy softwares and devices. In order to use ESATTO with ASCOM drivers, first all you have to download the ASCOM platform (from <https://ascom-standards.org> website, SESTO SENSO 2 has been tested with ASCOM platform 6.4) and install it in the Windows computer you use to control SESTO SENSO 2.

1) Sequence Generator Pro: <http://mainsequencesoftware.com>

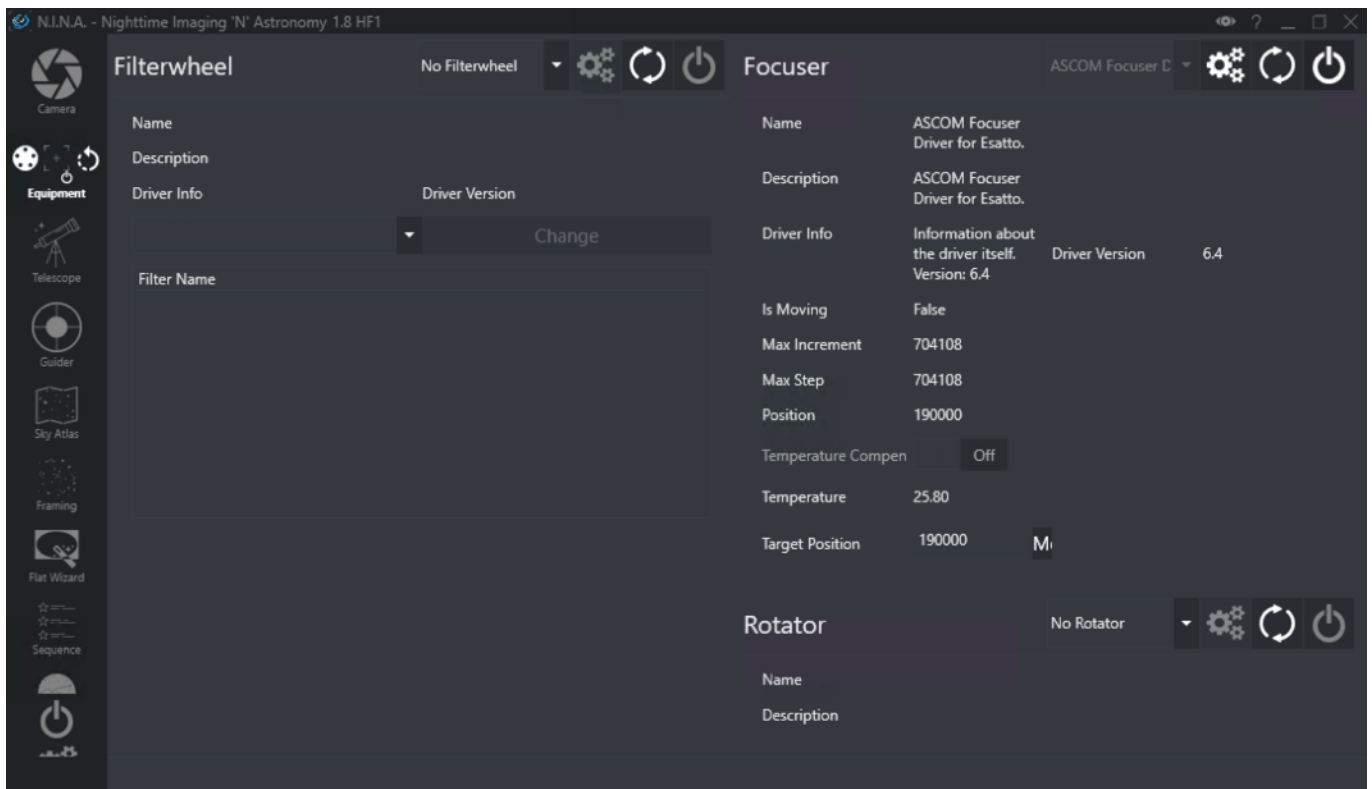



Start Sequence Generator Pro and, in the Equipment profiler, select “ASCOM Focuser Driver for SESTO SENSO 2” then click on the first icon  to the right. This will open a new window asking for the COM port number. Select the COM port related to SESTO SENSO 2 and press the OK button.



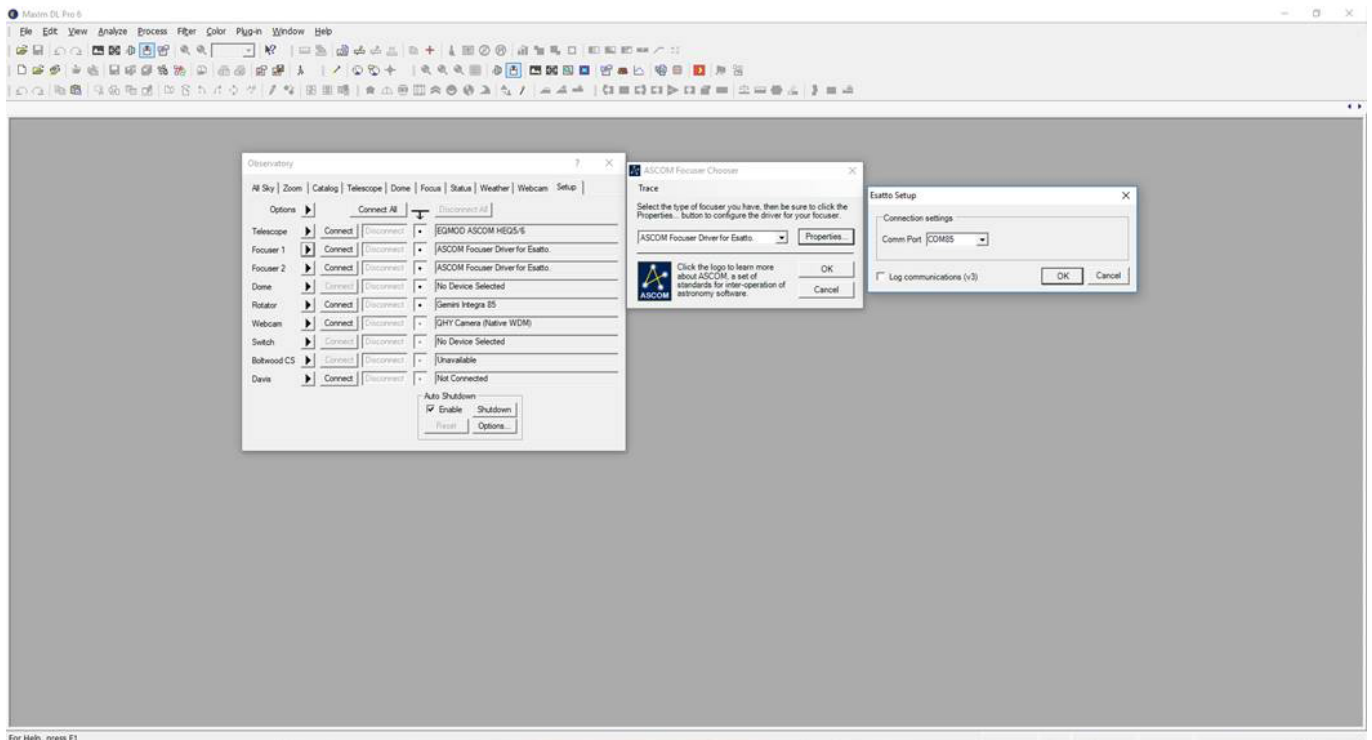
This will start the connection to the SESTO SENSO 2 and you will see position, temperature (if you connect the optional temperature probe) and movement buttons in the “Focus Control” tab (to the right of the above image).


2) N.I.N.A.: <https://nighttime-imaging.eu>



Select the "Equipment" tab, select "ASCOM Focuser Driver for SESTO SENSO 2" then click and click on the  button to the right of the "Focuser" area. This will open a new window asking for the COM port number. Select the COM port related to SESTO SENSO 2 and press the OK button. This will start the connection to the SESTO SENSO 2 and you will see position and temperature (if you connect the optional temperature probe).

3) MaximDL: <http://diffractionlimited.com/product/maxim-dl/>



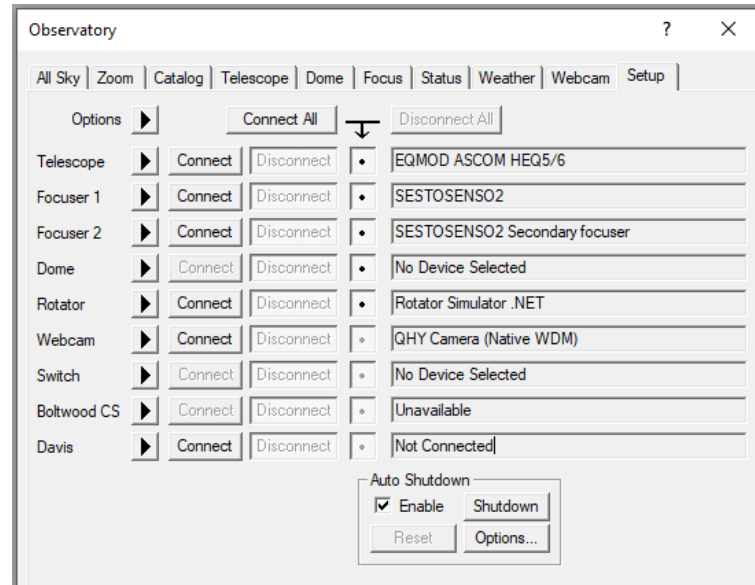
Select "Observatory", click on the button  to the right of "Focuser" and select "ASCOM Focuser Driver for SESTO SENSO 2". This will open a new window asking for the COM port number. Select the COM port related to SESTO SENSO 2 and press the OK button. This will start the connection to the SESTO SENSO 2 and you will see position and temperature (if you connect the optional temperature probe).

NOTE

The SESTO SENSO 2 ASCOM driver included a log file record feature that allows your computer to save a file with all the events related to the use of SESTO SENSO 2 with ASCOM and third party software. If you find any problem with your astrophotography software, enable the "Log communication" option in the SESTO SENSO 2 ASCOM properties and send us with an email to support@primaluce.com the log files you will find under C:/Documents/ASCOM

Controlling 2 SESTO SENSO 2 units at the same time

Starting by firmware 1.2, you can control 2 SESTO SENSO 2 units at the same time, by using ASCOM drivers and third party software (not with FOCUSER Manager software) that supports the use of more focusers at the same time (in this example we used MaximDL software).



In the ASCOM devices control window, please select:

- 1) "SESTO SENSO 2" as primary focuser
- 2) "SESTO SENSO 2 Secondary focuser" as secondary focuser

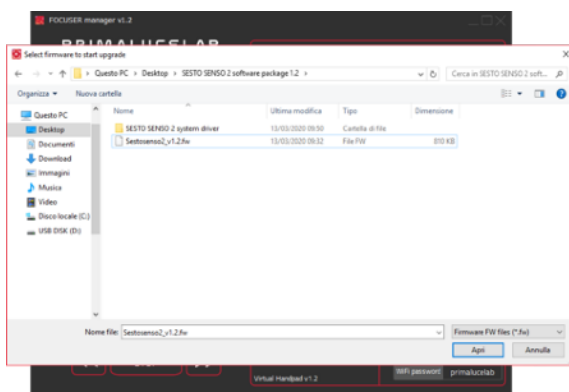
Updating SESTO SENSO 2 firmware

By using FOCUSER Manager (starting by version 1.2) you can also update the SESTO SENSO 2 firmware. In order to apply the latest firmware update, SESTO SENSO 2 has to be correctly powered with the 12V port and connected to the USB port of the computer where FOCUSER Manager is installed.

NOTE

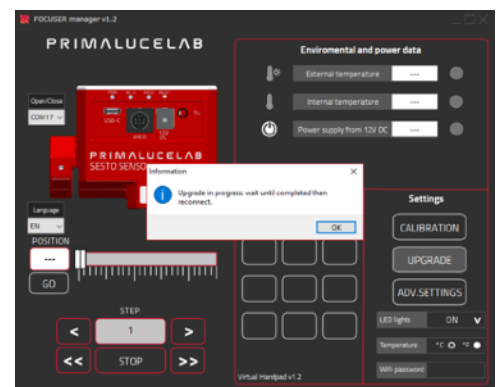
If you use a previous version of FOCUSER Manager, before updating SESTO SENSO 2 firmware please uninstall FOCUSER Manager and then install the new version by making a double click on file FOCUSERManagerSetup.exe

Please follow screen instructions to complete the installation, then start FOCUSER Manager and connect to SESTO SENSO 2.



On the right part of the FOCUSER Manager software, please press the UPGRADE button and a new window will appear. Please select the new firmware to install (with .fw extension) and press the Open button.

The new firmware will be installed. ATTENTION: do not disconnect power supply and/or SESTO SENSO 2 USB cable during firmware update procedure, otherwise SESTO SENSO 2 could be damaged and will no longer work. At the end of the firmware update procedure, press the OK button and then reconnect to SESTO SENSO 2 by pressing the Open/Close button. The firmware update has been applied.



NOTE

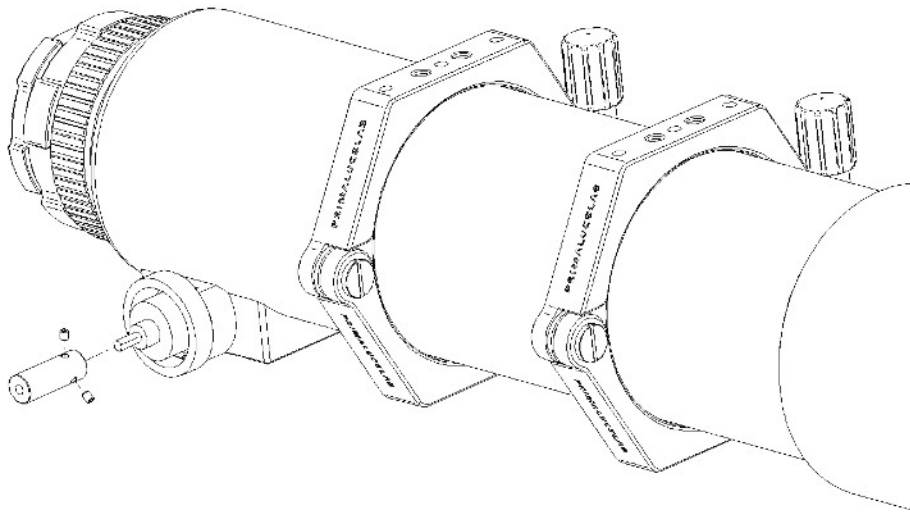
SESTO SENSO firmware, software and ASCOM driver are designed to be used all together with the same version.

In order to properly use SESTO SENSO, please check that you're using the same version number of:

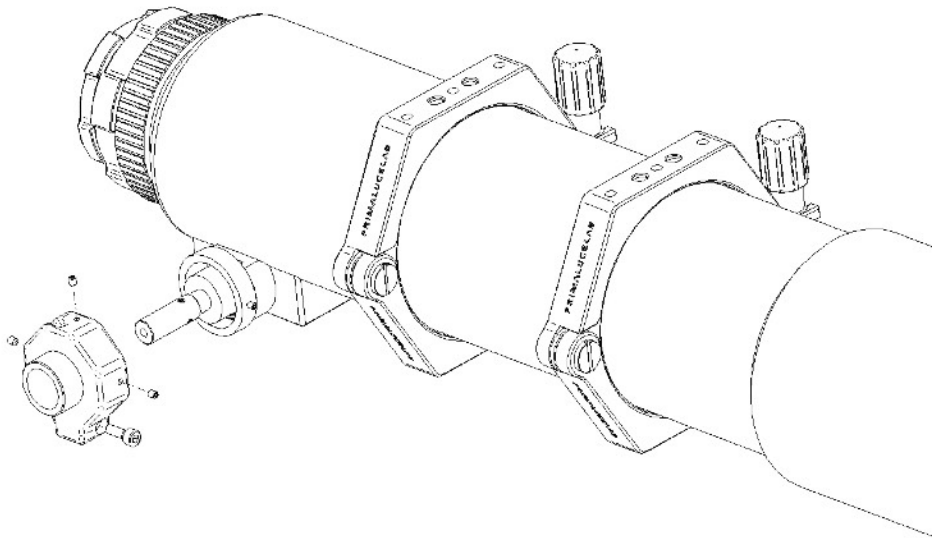
- SESTO SENSO firmware
- FOCUSER Manager
- ASCOM drivers

Installing 26mm, 33mm or 37mm adapters for SESTO SENSO 2

SESTO SENSO 2 is designed to be connected to focusers that comes with 25mm diameter shaft (that you can see by removing fine and coarse knobs of your focuser) because most of the focusers come with 25mm diameter shaft. If your focuser have another diameter, you can add the 26mm (SESTOSENSO-AD26II), 33mm (SESTOSENSO-AD33II) or 37mm (SESTOSENSO-AD37II) adapters. Any other diameter won't work. Please note that these adapters are compatible only with SESTO SENSO 2 and not with SESTO SENSO first generation. In order to install the adapter, first of all please connect the long bushing (the one that comes within the adapter box) to your focuser's shaft and lock it by using the 2 grub screws. Please note, it's normal that the other side of the bushing has no threaded holes.



Then take the red adapter and connect to your focuser, by fixing it with the provided screws.



Then you will be able to connect the SESTO SENSO 2 main body, by following the instructions you at page 4.

Troubleshooting

Q: I connect SESTO SENSO 2 to my computer and 12V power, but when I start FOCUSER Manager it doesn't connect.

A: Please check that, after selecting the COM port of your SESTO SENSO 2 focusing motor, you press the "Open/Close" button. If the SESTO SENSO 2 doesn't still connect, this may be related to the USB-C cable that is not working. Please try to change the USB-C cable with another one and connect SESTO SENSO 2 to the same computer. Please enter in Windows Device Manager and check that the "Silicon Labs CP210x" driver (under "Ports (COM & LPT)") is correctly loaded. If the USB-C cable works correctly, the driver will be loaded and you will be able to connect with FOCUSER Manager software.

Q: I connect SESTO SENSO 2 to computer but it doesn't move and PWR LED blinks.

A: If the PWR LED light blinks, it means that the computer's USB port (where you connected the SESTO SENSO 2 to) is not able to provide enough power. In this case you have to provide external 12V power by using the provided 12V power cable with cigarette plug or a 12V power unit with at least 1A (and 5.5/2.5 connector, center tip positive).

Q: My SESTO SENSO 2 is connected and correctly powered but the PWR LED still blinks.

A: PWR LED light also blinks when the SESTO SENSO 2 is not calibrated. Please use the CALIBRATION button in the control software to start the calibration of SESTO SENSO 2 connected to your focuser.

Q: Focus point position in steps changes over time.

A: FOCUSER manager and the SESTO SENSO ASCOM driver shows the focuser position in steps or in millimetres. If you move the SESTO SENSO 2 focusing motor to reach the perfect focus position, then move the focuser in another position and recall the previous focus position, your image should be in perfect focus again. If this is not happening, this means that your focuser has some mechanical slippage (that can't be automatically detected by SESTO SENSO 2 since it's an external focusing motor), and this may be a normal limitation in inexpensive focusers. In order to minimise this effect, you can set your SESTO SENSO 2 to move with lower speed: in FOCUSER Manager software please click on "ADV SETTINGS" button. Here please set the Acceleration, Run, and Deceleration values (in Speed Settings) to 1.

Q: My SESTO SENSO 2 focuser doesn't connect with ASCOM drivers.

A: SESTO SENSO 2 focusing motor has been tested with ASCOM Platform 6.4 and later. By using third party softwares to control SESTO SENSO 2 through ASCOM platform, please check you are using ASCOM Platform at least version 6.4.

Q: When I connect external temperature sensor to my SESTO SENSO 2 I get wrong temperature readings.

A: External temperature probes are tested in our laboratory before shipment. If you get a strange value in the "External temperature" field of FOCUSER Manager software, the temperature probe may have an hardware issue and has to be fixed or changed.

Q: When I connect SESTO SENSO 2 to FOCUSER Manager, I can't connect to another software.

A: This is normal. In fact, when you connect SESTO SENSO 2 to any software, it can't be used from another software, until you disconnect it from the first software, because the serial connection can be done only once. If you want to use SESTO SENSO 2 with more softwares, please remember to disconnect it from the first software before moving to the other one.

Q: When I start my autofocus routine, focusing graph looks flat instead of creating the V-curve.

A: This happens when, in the autofocusing routine of the software you choose, the step size is too small. Correct step size may depend also on your focuser so you may have to try different values, but, by considering the SESTO SENSO 2 resolution of 0,7 microns per step, you can start with 200.

INFORMATION TO USERS



According to art. 26 of Decreto Legislativo 14 marzo 2014, n. 49 "Attuazione della Direttiva 2012/19/UE sui rifiuti di apparecchiature elettriche ed elettroniche", the symbol of the barrel placed on the equipment or its packaging indicates that the product at the end of its useful life must be collected separately from other waste.

The user will therefore have to give the end-of-life equipment to the appropriate separate collection centers for electronic and electrotechnical waste or to return it to the reseller upon the purchase of a new type of equivalent equipment, one by one.

Properly differentiated collection for the subsequent start of dismantled equipment for recycling, treatment and environmentally compatible disposal helps to avoid possible adverse effects on the environment and health and favors the reuse and / or recycling of the materials contained in the equipment.

The abusive disposal of the product by the user implies the application of the administrative sanctions as per D.Lgs. 152/2006.

Compliance with the RAEE legislation (D.Lgs. 49/2014)

PrimaLuceLab is registered to AEE Register with number IT17030000009790

PrimaLuceLab adheres to Sistema Collettivo ERP Italia for the compliance to RAEE legislation.



WARRANTY

- 1) The PrimaLuceLab product warranty is effective from the date of purchase and is valid only if it is with the invoice (or receipt) of purchase.
- 2) The warranty covers the product against defects in workmanship and includes the cost of the replaced material and labor.
- 3) The warranty does not cover any damage caused to the product or defects or failures that occur due to improper installation , improper use and/or deterioration due to normal wear.
- 4) THE GUARANTEE DOES NOT APPLY IN THE FOLLOWING CASES:
 - Repair by anyone not authorised by PrimaLuceLab .
 - Invasive interventions or tampering with internal and/or external parts.
 - Missing of the invoice (or receipt) of purchase.

TERMS OF SERVICE

Technical assistance is performed exclusively by PrimaLuceLab or its authorised resellers. All returns must be received with our permission (to be asked writing an email to support@primalucelab.com) . YOU HAVE TO add to the shipping the invoice (or receipt) of purchase and the detailed description of the defect. For products without the invoice (or receipt) of purchase, repair and shipping costs are always paid by the customer.