

EAGLE2 / EAGLE2 PRO

control unit for telescopes and astrophotography

VERSION 1.3

Update 29-05-2018



EAGLE2 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

CAUTION

To avoid the danger of electric shock and malfunctions, do not expose EAGLE to rain or moisture. The electronics are not waterproof so in bad weather and rain, snow or the like, it is required not to use EAGLE outdoor.

PLEASE NOTE

EAGLE is designed to control telescopes and accessories for astronomy and it's not a normal computer. Please do not modify EAGLE settings (such as user name or password) since this could stop some of the Eagle features. Also updates on operative system are not needed for telescope use.

FIRST CONNECTION

For the wireless connection, EAGLE creates a WiFi network at the same frequency as those of usually modems / routers used to connect to the internet. So if you use EAGLE at home (for example the first time, to install your software) you might notice a low signal or, in some cases, have connection problems. You can move it to an area with fewer WiFi connections or connect it to a monitor (HDMI), keyboard (USB) and mouse (USB) to install your software.

QUALITY CONTROL

Each EAGLE unit, after created in our laboratories, it's tested by PrimaLuceLab technical experts to check all components. We verify the correct operation of the integrated computer, stability and speed of the wireless connection and the power bridge.

WARNING

If improperly handled, EAGLE 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 EAGLE. Do not drop.
- Do not short the electronic elements
- Do not expose at temperatures above 50 ° C
- Do not burn or incinerate any component.
- Do not wet any electronic or electric component
- Do not bend, modify or force any part of EAGLE

NOTICE

In case you check any malfunction, please contact us immediately (+ 39-0434-1696106 or support@primalucelab.com).

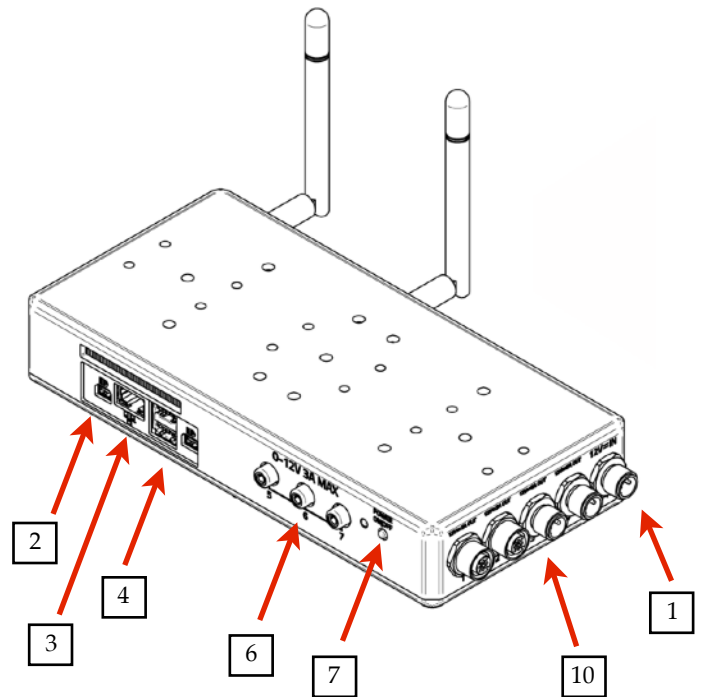
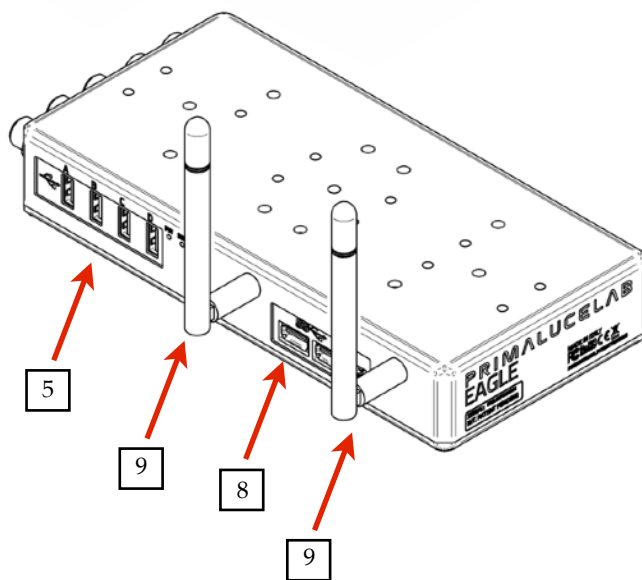
Do not try to disassemble, repair or modify yourself EAGLE, without our written approval, in order not to loose the Producer Warrantee

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Components Identification

The numbers indicate the name of the specific component. Read the paragraphs below for detailed operations description.



- 1 Power IN 12V
- 2 Mini DisplayPort for external monitor
- 3 Network port
- 4 n.2 USB 3.0 ports
- 5 n.4 USB 2.0 ports

- 6 n.3 power out ports with regulated tension
- 7 On / Off switch
- 8 n.2 USB 3.0 ports
- 9 WiFi Antenna
- 10 n.4 12V power OUT

First use: power

EAGLE allows you to distribute power to many devices used in telescopes astrophotography (such as mount, camera, filter wheel, electronic focuser, dew heaters, etc.), thus eliminating the need for many different power supplies and using only one. It is therefore necessary to select the correct power source for EAGLE so that it can properly power all the devices you want to use.

CAUTION

EAGLE must be powered with 12V stabilized voltage. You can power it via a 12V external power supply or with an external battery. If you use an external battery, this **MUST** be provided with a proper voltage stabilizer. In case of any malfunction, immediately unplug the power supply. **DO NOT CONNECT TO THE EAGLE A BATTERY WITHOUT 12V VOLTAGE REGULATOR** since it may damage the other instruments powered by EAGLE (like the CCD camera). Immediately disconnect power supplies or battery if there's any malfunction of the unit.

Which battery or power supply have I to use for my equipment?

The power supply or battery you need to use to power the EAGLE and all peripherals connected to it depend on the sum of the electric current needed to power the instruments and the EAGLE. EAGLE needs for an average of 1 Ampere. For example:

- EAGLE: 1,2A maximum consumption (average consumption: 0,8A)
- Cooled CCD camera: 4A maximum consumption (average consumption: 3A)
- Skywatcher AZ-EQ6 SynScan mount: 2A maximum consumption (average consumption: 1A)
- Guide camera: QHY5L-II mono: 0 consumption (power from the USB port of Eagle)

Total consumption maximum 7,2A.

So, for this setup, you should use the 10A AC adapter. If you want to use a battery (WARNING: The battery must have a 12V voltage regulator with protection system) that can power the entire system for 8 hours (for example for the duration of an astronomical night), you will need this battery capacity:

$$7,2A \text{ (consumption per hour)} \times 8 \text{ (hours duration)} = 57,6 \text{ Ah}$$

TIP

Since EAGLE distributes power to many devices, when many devices are powered through the EAGLE (and Ampere consumption exceeds 5A /hr) we recommend using a power supply or battery with tension between 12.8V and 13.5V.

First use: switch on and activation of wireless network

The control unit EAGLE is designed to be controlled from an external device (not included in the package). You can use any mobile device (tablet or smartphone) with any operating system (iOS, Android or Windows Mobile) or from any computer (Windows or Mac). For remote control, you need to download the App "**Microsoft Remote Desktop**" to the device you will use to control EAGLE (smartphone, tablet computer or external). Depending on the store of your system the App can also be found under the name "**RD Client Microsoft**". The app is free and compatible with all operating systems iOS, Android, Windows Mobile, Windows and Mac OSx.

Take the 2 WiFi antenna (9) included in the package of EAGLE and screw in the proper ports as in the picture (image 1).

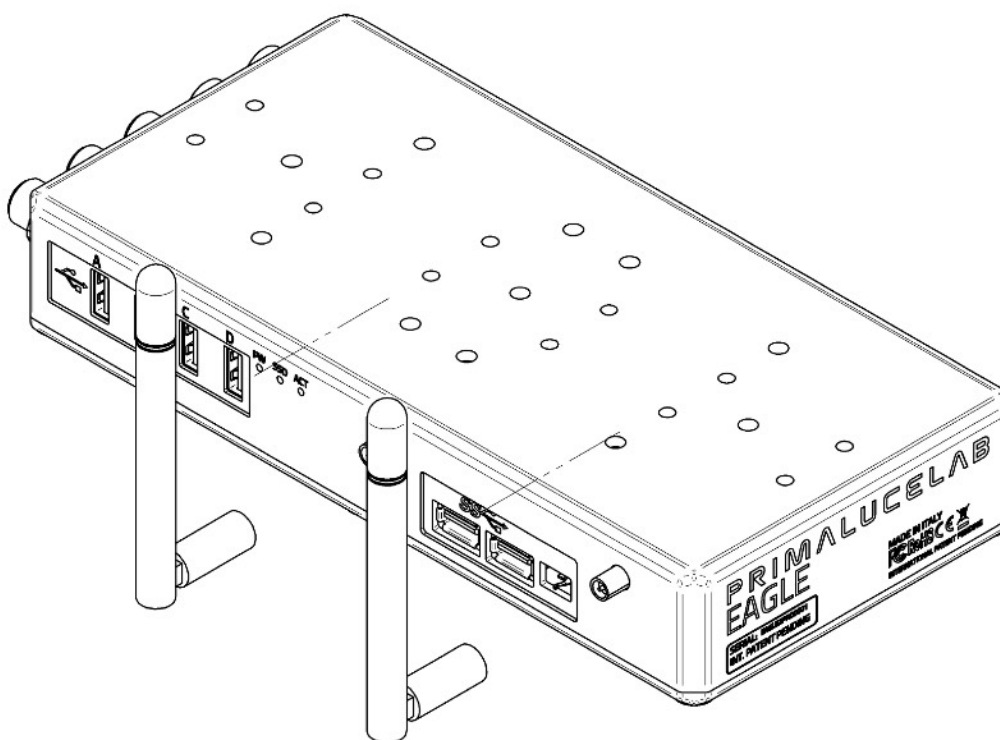


Image 1: Screw the WiFi antennas to the proper ports

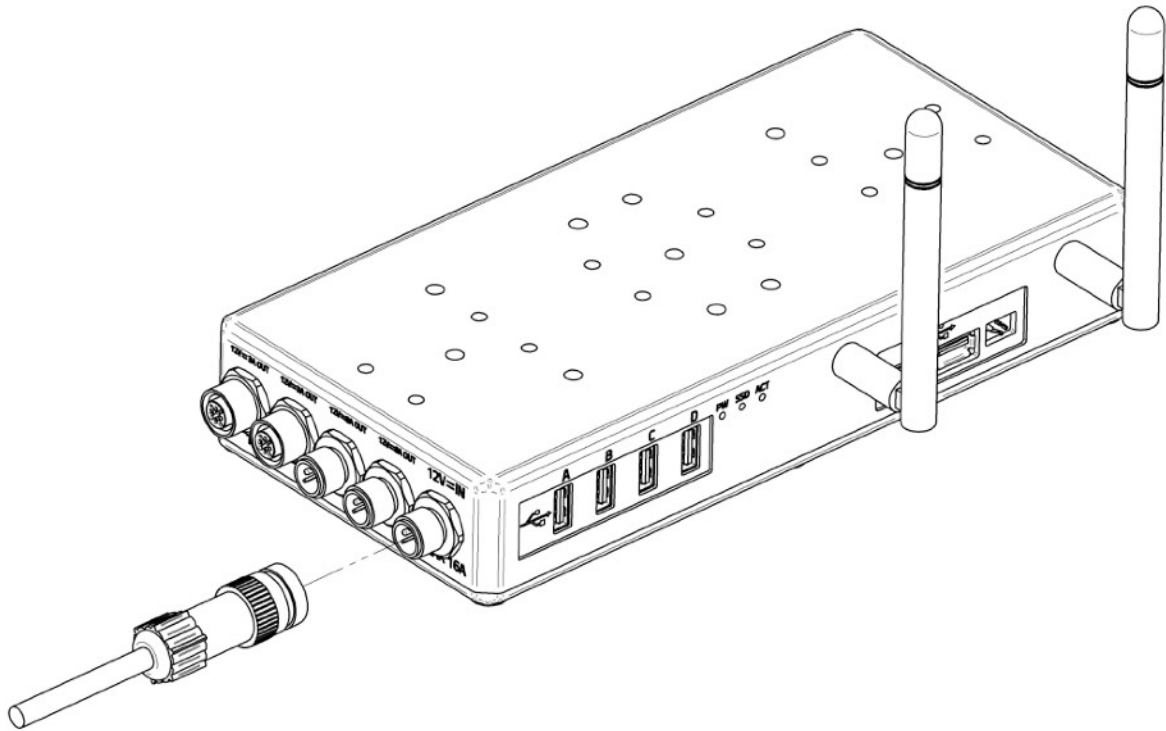


Image 2: Connect the power plug into the socket (1)

To power EAGLE from the wall Insert the "Power supply 12V for Eagle" into the socket (1 - Power Input 12V); insert the "Power cable for 12V Eagle with banana plug" in case of battery power (image 2). Then press the power button (7). A red LED will light up; the brightness is calibrated not to be annoying during the night so in daylight it might be difficult to notice.

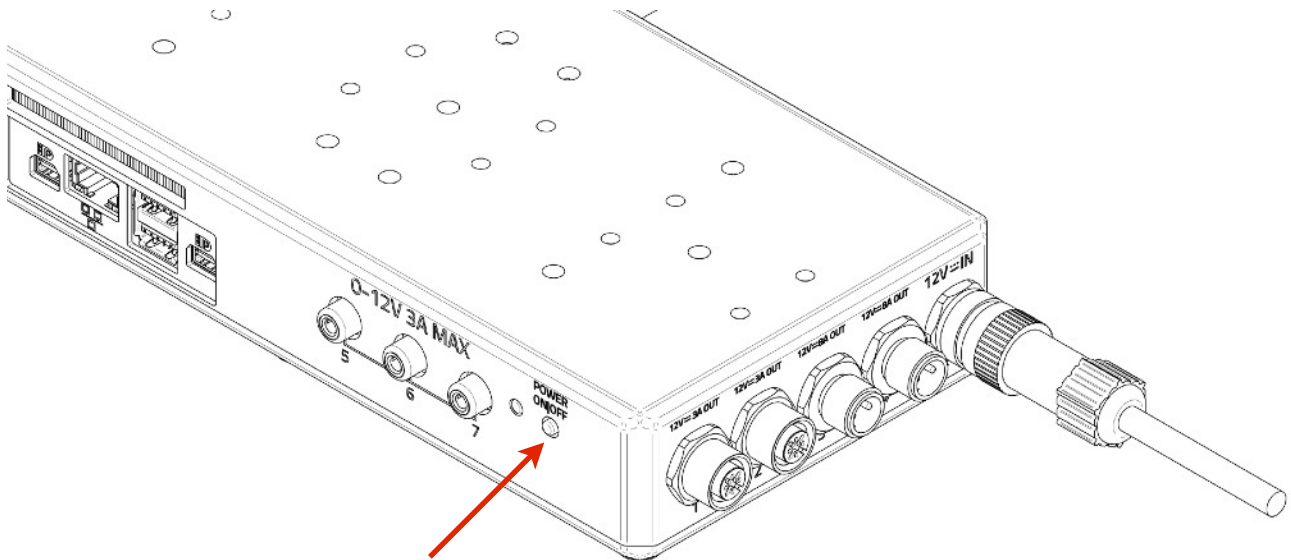


Image 3: press the Start button (7) to switch EAGLE on

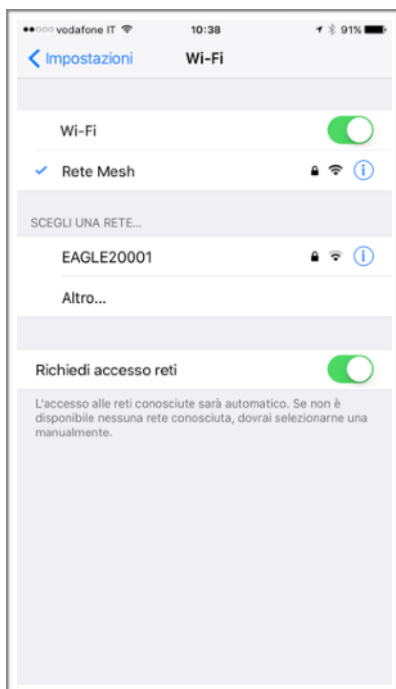


Image 4: select the WiFi net created by
EAGLE

Now wait about one minute and turn on your WiFi device you choose to control EAGLE. In about 30 seconds EAGLE creates the WiFi network to access to. The network name is EAGLExxxxx (where the xxxxx is the serial number of your EAGLE as written also is also on the front side of EAGLE).

Look at the list of WiFi networks displayed by your device (identification mode of wireless networks depends on the control device you use, so if you do not know how to search for WiFi networks, please read the manual of your device) and select the network created by EAGLE. The network name matches the serial number of your EAGLE (picture 4).

A window will appear where you will be asked to enter the password of your network (image 5). The password is **primalucelab**. The same information is also on the front of EAGLE. Using the keyboard (virtual or physical) of your device, enter the password paying attention to appropriate upper or lower case. Then press the CONNECT.

EAGLE has a own password to log on to Windows that you only know. (Each EAGLE has a different password to log Windows; the password is shown on the EAGLE box). This way it is possible and completely safe for you to use your EAGLE even when many others are working (for example during a StarParty).



Image 5: insert network password

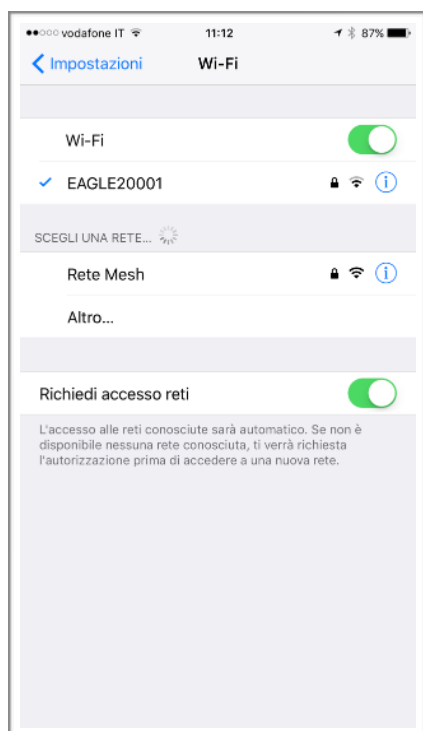


Image 6: connection to WiFi network confirmed.

Then EAGLE WiFi network connection is confirmed (image 6). The network setting is finished and the next time you want to access the EAGLE you will no longer need to enter your password: your device will connect automatically when you select the network created by EAGLE.

NOTE

Using the EAGLE, sometimes you can have a WiFi connection drop out and then connection restarts. This is normal, then the EAGLE will automatically reconnects to the WiFi and you will normally be able to continue remote control.

First use: Setting the wireless control device

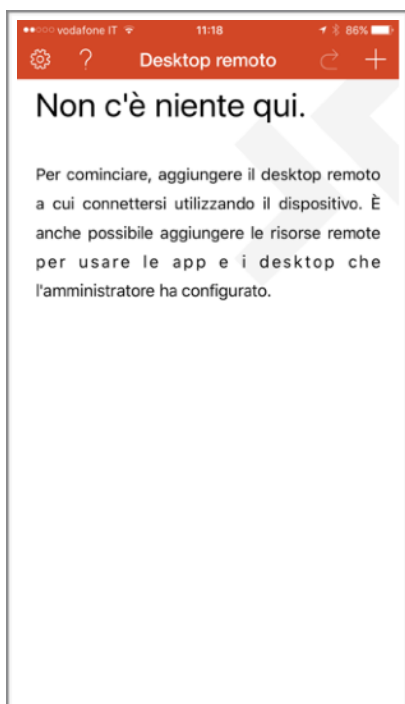


Image 7: Press the + button to add the parameters to access your EAGLE.

Download to your control device (smartphone, tablet computer or external) the "Microsoft Remote Desktop" app. Depending on the store of your system it can also be found under the name "RD Microsoft Client". How to download and install the application of remote control depends on your control device; so if you do not know how to install the app from the Store, please read the manual of your device.

Thanks to the remote control App, you have Eagle with all your software on your device screen: the remote control App uses a special mode so you can use your finger on the touch screen as if it were a mouse: simple and fast. After setting the acquisition parameters and started the auto-guide, you can launch shooting and turn off the controller: Eagle will make shooting automatically.

Start the "**Microsoft Remote Desktop**" app. You will see a screen like the one visible in the image 7.

Now link to your EAGLE: Click the + button, then select "Desktop".

In the window that opens, in "PC name" enter 192.168.137.1

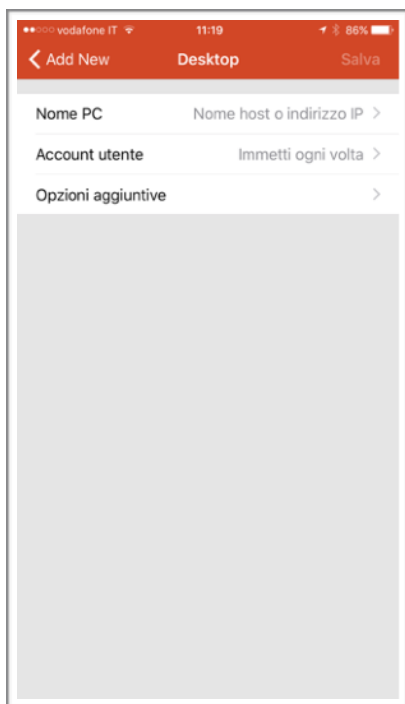


Image 9: Press "Save" to confirm access data.

Then select the "Username" field and choose "Add user account". a window will open (picture 8) where you can enter your username and password to log on to Windows.

The values are:

- Username: *PrimaLuceLab*;
- Password: (that shown on the first page of this manual)

Then press the button "Save" to save the access data.

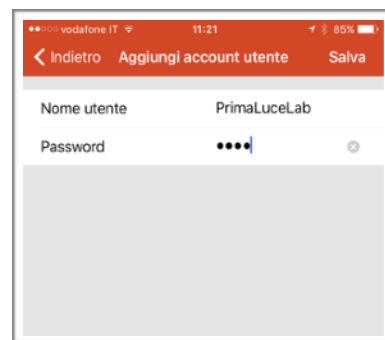


Image 8: Insert User name and Windows access password.

WARNING: when entering your data check that your device does not automatically insert a space after the word "username" and "password".

Then (image 9), press the "Save" button to confirm and save the access data.



Returning to the main page you will find a new connection (picture 10)

Image 10: Select the recently created link

Select it and the screen will change to the following (picture 11):



Image 11: Click "Connect" to confirm the link.

Select the option "Do not ask me again for connections to this computer" and press the "Accept" button.

Wait a few seconds and you'll see on your device's desktop EAGLE (image 12). Now you are ready to use the software you prefer to control your telescope.



Image 12: EAGLE start screen

If you use the app "**Microsoft Remote Desktop**" from a tablet or a smartphone, you can use the screen of your device looking like mouse and keyboard of EAGLE. There are two modes of use, that can be selected by pressing the central-up button (between the magnifying glass and the keyboard) to see the options. Press it, and several options will appear (Figure 13).

By default, the app works in "touch" with which you can directly use your finger to click on icons and buttons visible on the screen (as you usually do with your tablet or smartphone). If you prefer to view the classic arrow Windows select the "Mouse Pointer". On the screen a mouse pointer will appear that you can move with your finger.



Image 13: Click on the central-up button (between the magnifying glass and the keyboard) to see the options.

This is the mode we recommend because it allows to have a higher accuracy (especially useful for the control of EAGLE from devices with small screens). To simulate a single mouse click (like pressing the left button of the mouse) just "tap" on the screen. To simulate the right mouse button, place a finger on the screen (and do not move it), and then "tap" with another finger to make options appear.

First use: install your software

EAGLE uses a Windows O.S. This way it is compatible with all the software for astronomy. You are then free to install EAGLE on all the software that you want.

- 1) *EAGLE does not have a CD or DVD integrated player. If you have to install a software on CD or DVD, you may connect the CD or DVD external reader to a USB port of EAGLE. Then insert the CD or DVD of your software and follow the on-screen instructions to complete the installation (as if EAGLE were a normal desktop computer).*
- 2) *If you have an USB drive software to install: connect the USB stick to a USB port of the EAGLE and follow the onscreen instructions to complete the installation (as if EAGLE were a normal desktop computer).*

For a better organization of your software and to get quick access to frequently used applications, you can add your software to the "START" of Windows. To do this, select your software and do the same movement as to simulate the right mouse button (place a finger on the screen and without moving it "tap" with another finger on the screen). Select the option "Add to Start" (picture 14).

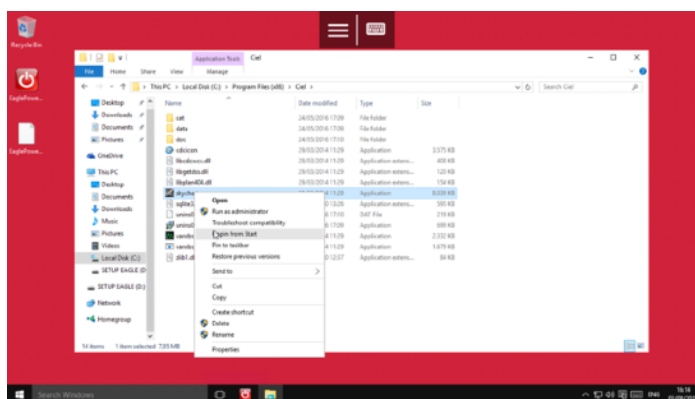


Image 14: Select your software "Add and Start"

The icon of your software will appear in the "START" button that appears pressing the screen bottom left button (picture 15).

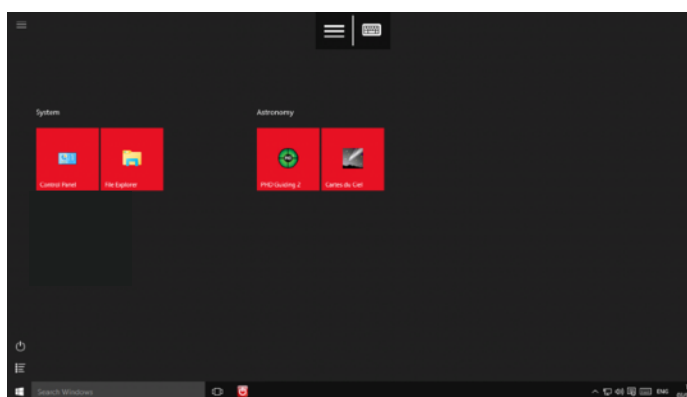


Image 15: In Start you find your software's icon

First use: turn off EAGLE

When you want to turn off EAGLE, first disconnect your remote control device. From the START screen, select the "options off" and then press "Disconnect" (picture 16).

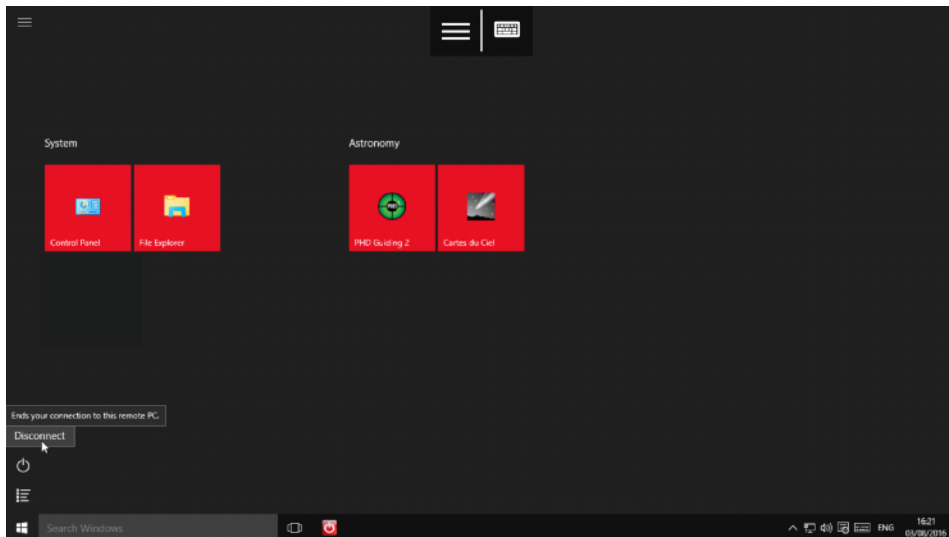


Image 16: Select "Disconnect" to terminate session

This way you can close the remote connection of your device. You can then exit the "Microsoft Remote Desktop". Then press the power button (7 - picture 17). The yellow LED at the right of the button will light up for a few seconds and then all the LEDs will go off, both the red and the yellow ones. Now EAGLE is off and you can remove also the power supply.

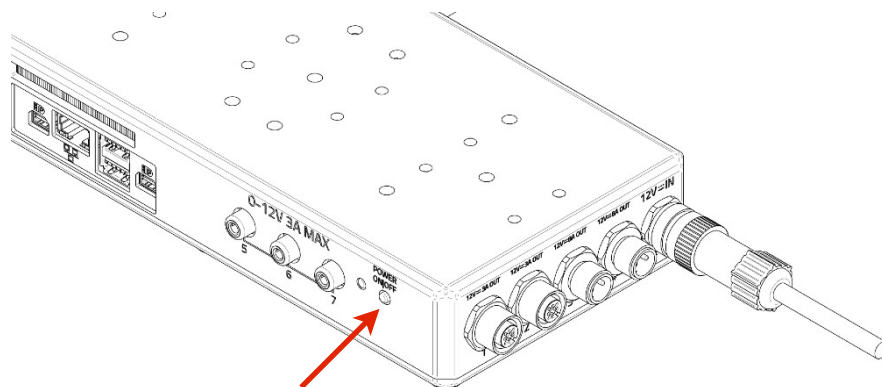


Image 17: push the ON / Off button (7) to switch EAGLE off.

First use: installing EAGLE on the telescope

EAGLE has been entirely designed with SolidEdge three-dimensional design software to offer maximum possible modularity with the PLUS elements (rings, dovetail plates or clamps) and/or telescopes of from brands. EAGLE may be positioned between support and guide rings, connected to a Vixen or Losmandy type dovetail bar through the appropriate optional clamp or, in case of telescopes with long dovetail bars, it can be screwed on the PLUS Vixen or Losmandy dovetail bar to be placed over the PLUS support ring. Let's then see the various possible configurations, depending on the telescope EAGLE has to be installed on, using both other PLUS elements and different instruments.

CAUTION: in order to connect EAGLE to other mechanical PLUS elements do not use screws longer than M6x12 and M5x12. Otherwise the screws may touch the internal elements of EAGLE and this could lead to breakage or malfunction.

Connecting to telescopes with PLUS support rings and support rings spaced up to 12cm.

When using compact apochromatic telescopes (like the AIRY APO80 , ED90 , BLACK 90T , ED100 and APO104T) the distance of the support rings is set by the PLUS Vixen or Losmandy dovetail clamp installed with the telescope. In this case , the EAGLE can be installed directly above the support ring, as if it were a dovetail bar (image 18). Thanks to the M5 threaded holes present in the upper part of the EAGLE, then you can install PLUS guide rings and then a guide scope (note: the guide scope must not exceed 3 kg in weight to prevent flexures).

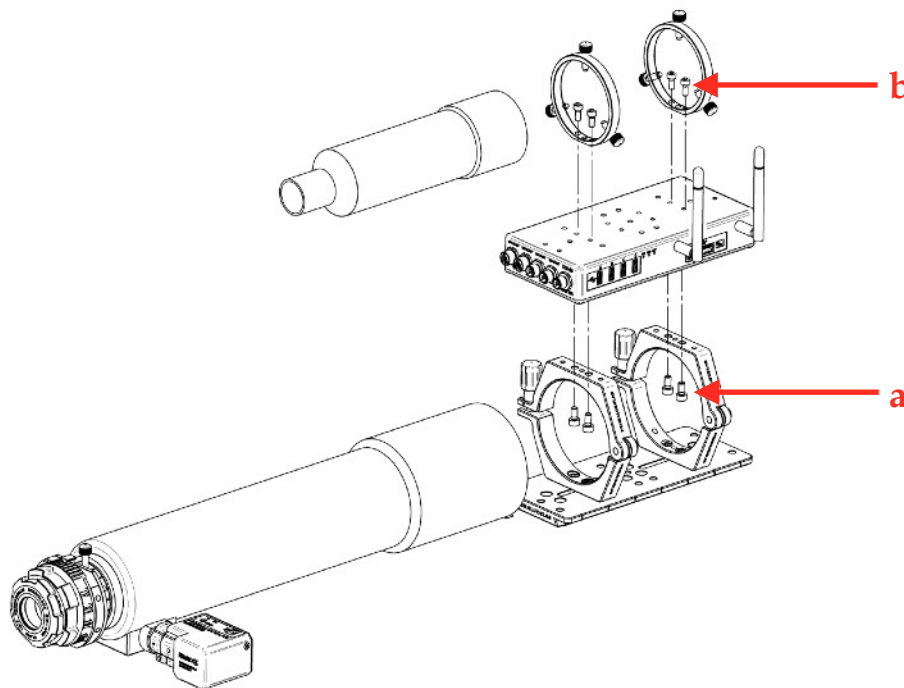


Image 18: installation of EAGLE between imaging and guide telescope

In order to use the EAGLE with this configuration, insert 2 M6x12 screws **(a)** in each PLUS ring (2 screws for each ring) and so fix the EAGLE. If you want to use a guide scope in parallel, you can install the PLUS guide rings. In order to do this, screw 2 M5x12 screws for each guide ring in the upper part of EAGLE **(b)**.

Connecting to telescopes provided with PLUS support rings and support rings spaced more than 12cm.

If you want to use EAGLE with telescopes equipped with rings PLUS spaced more than 12cm (like AIRY APO120, APO130T, AIRY APO150T and NEWTON CF), you can place EAGLE over to the support ring for supporting a compact guide scope in parallel. But to do so you first need to add a PLUS Vixen or Losmandy dovetail bar above PLUS support rings and then secure EAGLE image 19) .

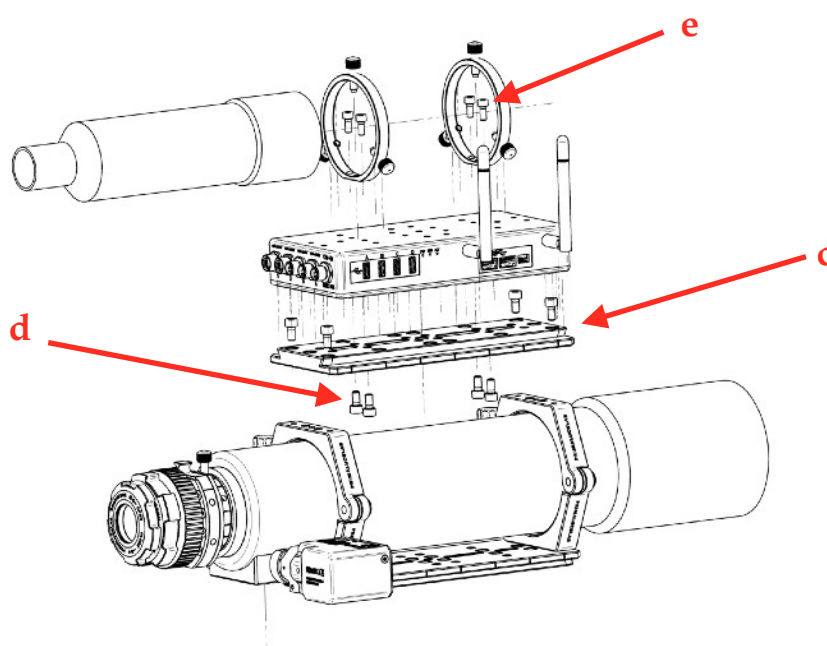


Image 19: installing the EAGLE when the main telescope support rings are spaced more than 12cm

In order to use the EAGLE with this configuration, place a PLUS Vixen or Losmandy dovetail bar (with the same length as the one placed under the support rings) and fix it with two M6x12 screws **(c)** for each ring. The dovetail bar above the telescope must be fixed in inverted position with respect to the one placed below the optical tube. Then use 4 M6x12 screws **(d)** to fix the EAGLE to the dovetail bar. Finally if you want to use a guide scope in parallel , you can install the PLUS guide rings. In order to do this, screw 2 M5x12 screws for each guide ring in the upper part of EAGLE **(e)** .

Connecting to telescopes not equipped with PLUS rings

If your telescope is not equipped with PLUS support rings, just add the "PLUS Vixen + Losmandy dovetail clamp" that is screwed directly to the EAGLE to allow to connect it to any Vixen or Losmandy dovetail bar also from different brand .

Take the "PLUS Vixen + Losmandy dovetail clamp" and, using 3 M6x12 screws (f), install it in the bottom plate of EAGLE, as shown in image 20.

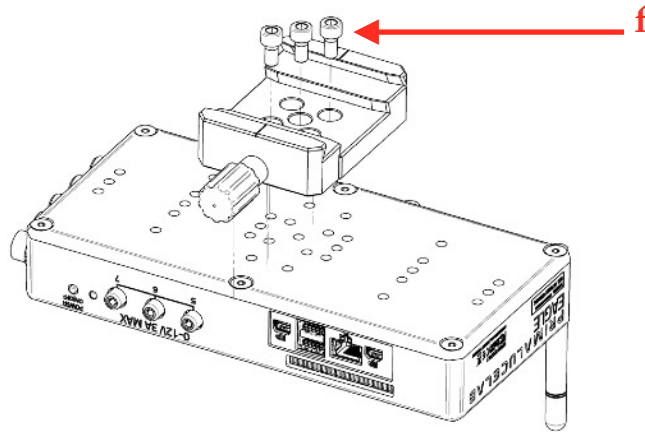


Image 20: installation of "Vixen+Losmandy PLUS dovetail clamp" on EAGLE

This way you can connect the EAGLE to any telescope , equipped with Vixen or Losmandy dovetail bar, as shown in image 21.

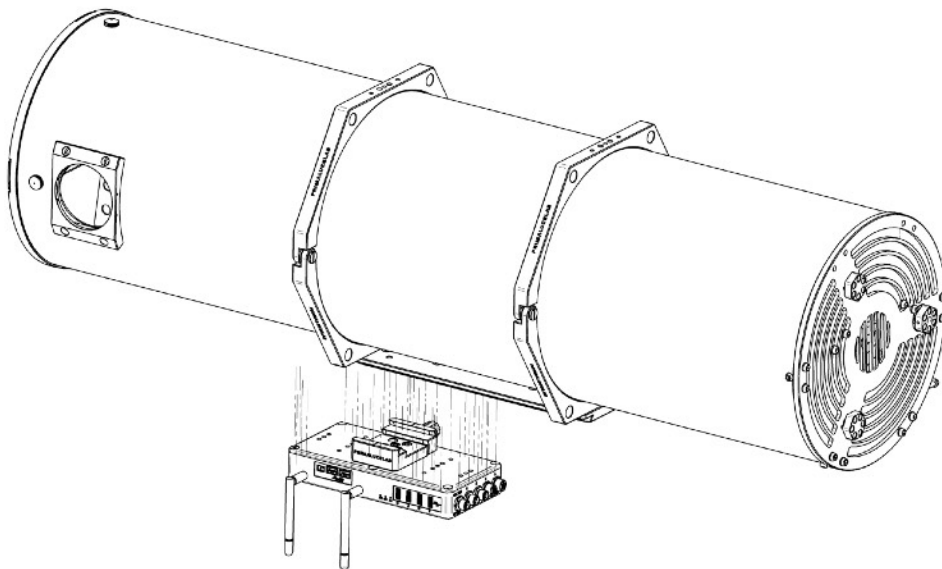


Image 21: EAGLE with the "PLUS Vixen + Losmandy dovetail clamp" can be installed on any Vixen or Losmandy style dovetail bar

First use: power other instruments connecting to the EAGLE

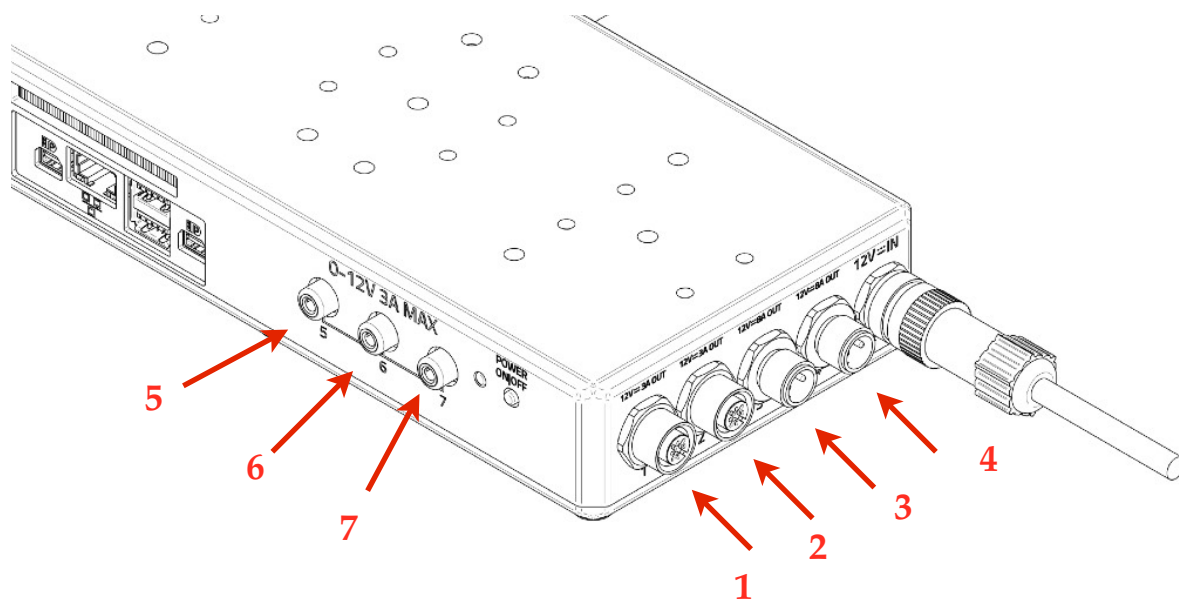
EAGLE incorporates a power bridge to which you can connect up to 4 instruments such as mount, CCD camera, filter wheel and electronic focuser. Through a special internal board, EAGLE **distributes** 12V power to 4 ports that connect the various devices using the special optional cables. All doors are equipped with power socket security screw to prevent the cable from unwanted disconnections or reverse polarity. 3 power outputs have 3 amps fuse protection each and 1 port has 5 amps protection fuse and is especially designed for connection to the cooled CCD cameras (which often have a high power consumption).

CAUTION: EAGLE distribute power only at 12V. If the instrument you want to use requires a different voltage, do **NOT** connect it to the power ports of EAGLE.

CAUTION: the power output from the OUT port of Eagle depend on power supply or battery connected to the IN power port of the EAGLE. **Since several instruments for astronomy strictly require a fixed 12V power, you have to check that your power source provides a stable 12V voltage.** So if you want power EAGLE with a battery, make sure that this is equipped with a specific 12V voltage regulator. **DO NOT CONNECT TO THE EAGLE A BATTERY WITHOUT 12V VOLTAGE REGULATOR** since it may damage the other instruments powered by Eagle (like the CCD camera).

EAGLE has 7 12V power put ports including:

- 1, 2, 3 and 4 power out ports have 12V voltage. Ports 1 and 2 have a 3-amp protection fuse while 3 and 4 ports have 8-amp protection fuse and are therefore indicated for connecting high-power consumption devices (such as cooled CCD cameras). In order to avoid confusing the connection ports, ports 1 and 2 (3A) have a different connector than the others. This makes it impossible to connect the devices to the wrong ports.
- 5, 6 and 7 power out ports have adjustable tension from 0 to 12V. They are therefore perfect for connecting dew heaters (without the need for external controllers) or flat field generators.



WHAT IF I CONNECT A DEVICE THAT NEEDS MORE POWER THAN THE PERMITTED ONE FROM THE POWER OUT PORTS OF THE EAGLE : the power board has dedicated internal fuses. If your device requires more current than the one distributed by EAGLE, fuse blocks the port (this is a protection system to avoid power surges that could damage the connected instrument).

In this case, please remove the cable connected to the power out port of the EAGLE. Power out port will be automatically re-activated in a while.

To properly power all the instruments connected to the EAGLE :

- 1) **FIRST** connect the optional EAGLE-compatible power cables to OUT power ports of the Eagle and then to the power socket of your instrument
- 2) **AFTER** connect the power supply or stabilized battery to the IN power port of the EAGLE

All devices will be powered on. You can turn on the EAGLE, activate the remote control and use the telescope. When you want to close the telescope, if you want to disconnect the cables, follow this procedure :

- 1) **FIRST** turn off the EAGLE by pressing the power on/off button **(7)** and wait until the LEDs are turned off
- 2) **THEN** unplug the power cord from the "12V power input" **(1)** of the EAGLE
- 3) **FINALLY** disconnect the power cables from the " 4 12V power OUT" ports **(10)** of the EAGLE

First use: remotely control devices with EAGLE Manager

When you remotely (with WiFi or Ethernet wired connection) to the EAGLE, you will see the EAGLE Manager control interface. Thanks to EAGLE Manager, with EAGLE2 you can:

- connect or disconnect every power out port of EAGLE2.
- set power out tension of the 3 power out ports with adjustable tension.
- connect or disconnect connection to devices connected to the 4 USB 2.0 ports.
- check for power in tension and battery lifetime.
- set WiFi connectivity.
- remotely turn on/off the entire telescope.

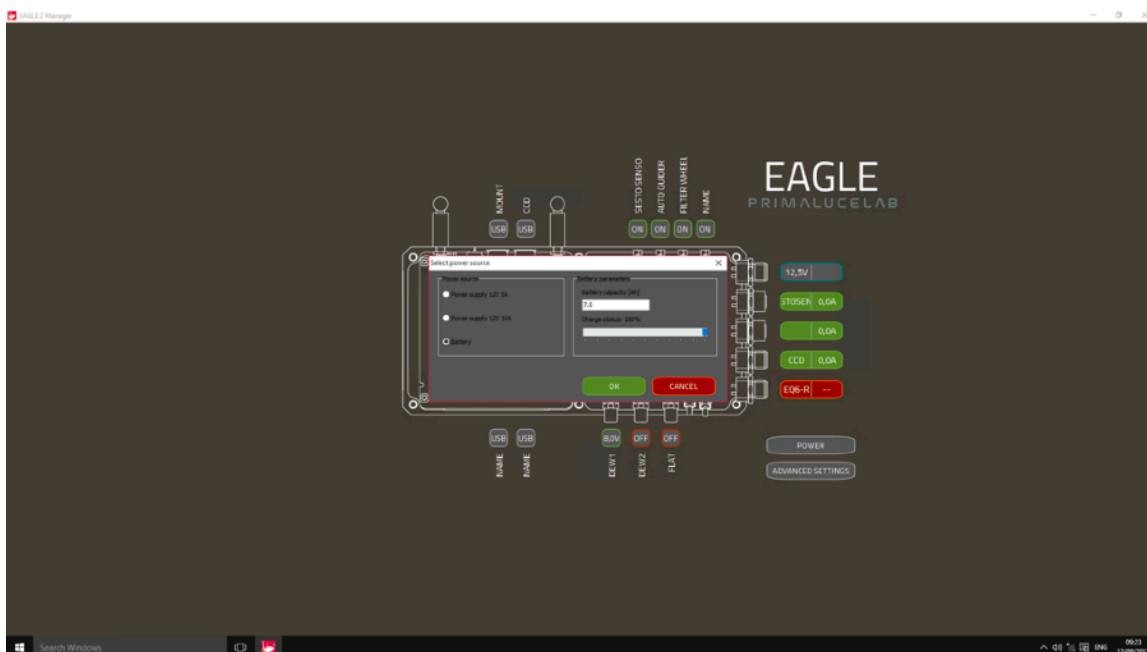


Image 22: EAGLE Manager interface

In the first window that opens ("Select power source", image 23) please check your power source, with AC power units (5A or 10A) or with a battery. If you use a battery, please insert in the "Battery parameters" area to the right the battery capacity in Ampere and the charge status. Then click OK.

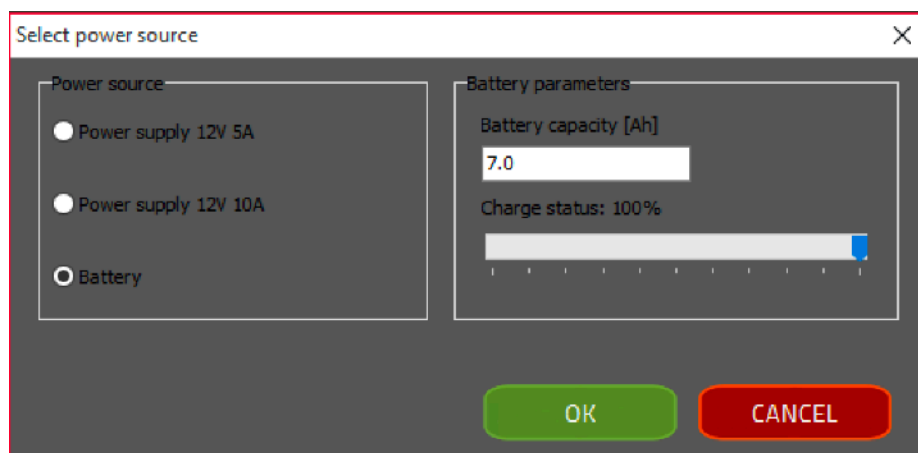


Image 23: setting the EAGLE power source

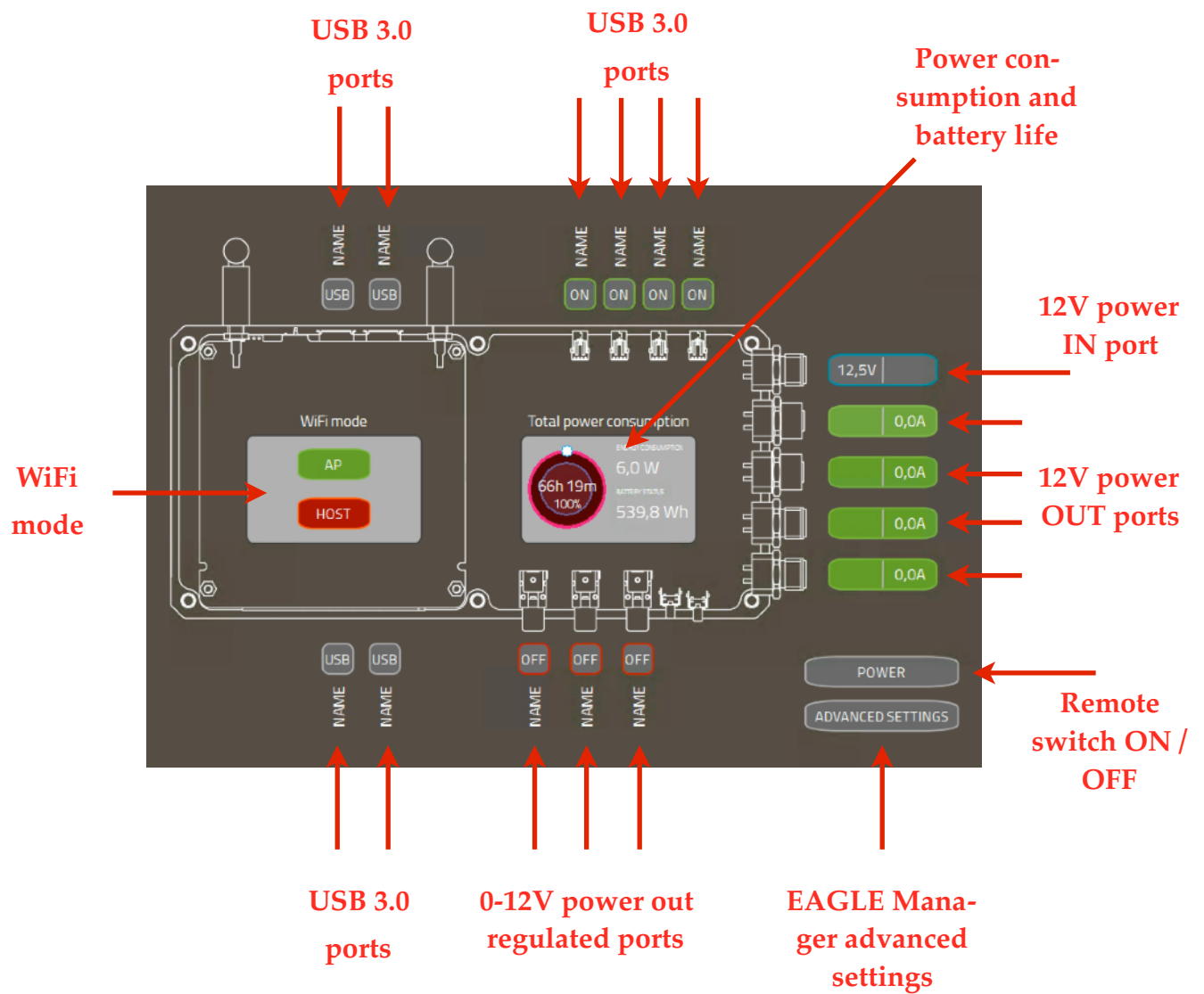


Image 24: elements in EAGLE Manager interface

- connect or disconnect every power out port of EAGLE2

This way you can keep the devices connected (for example, mount, CCD camera, filter wheel, etc.) and activate them remotely when you turn on the entire system. Each port shows the current consumption that can also be monitored over time.

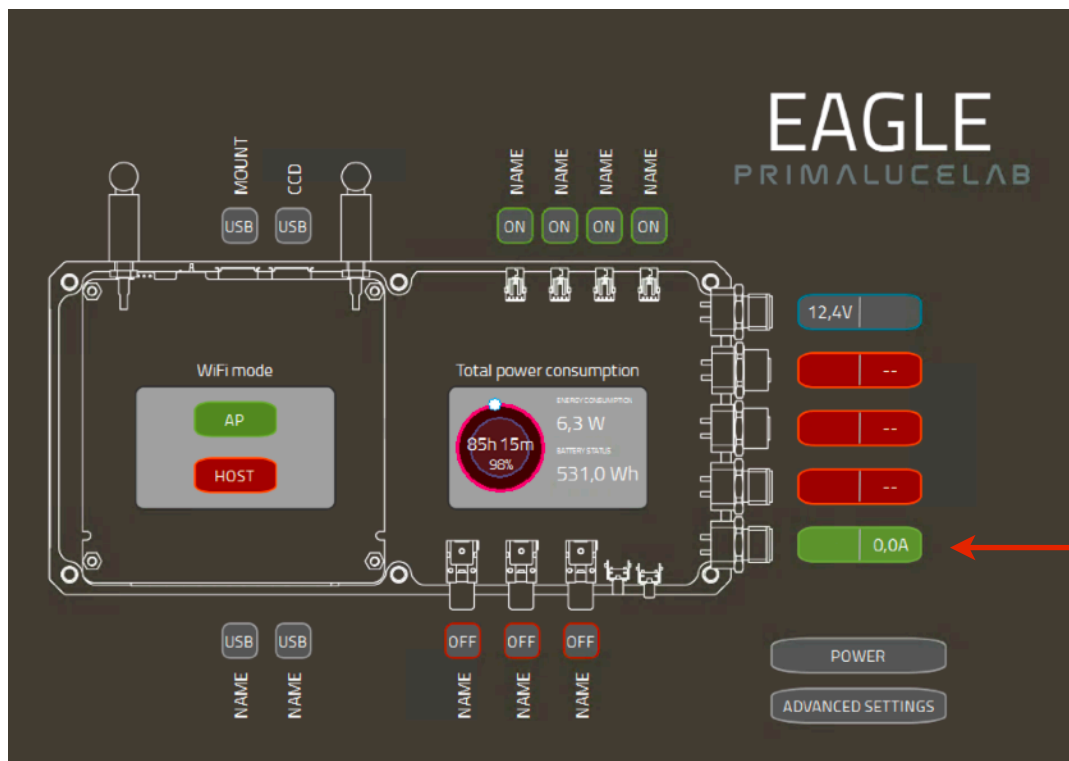


Image 25: click on one of the 4 power OUT ports to activate it

Click with the mouse left button (or a single tap on the screen of tablet or smartphone used for remote control) on one of the 12V power out ports to activate it, the port will become green and it will power the connected device. Click with the mouse right button (or a 2 finger tap on the screen of tablet or smartphone used for remote control) on one of the 12V power out ports to see advanced options of the selected power out port (image 26).

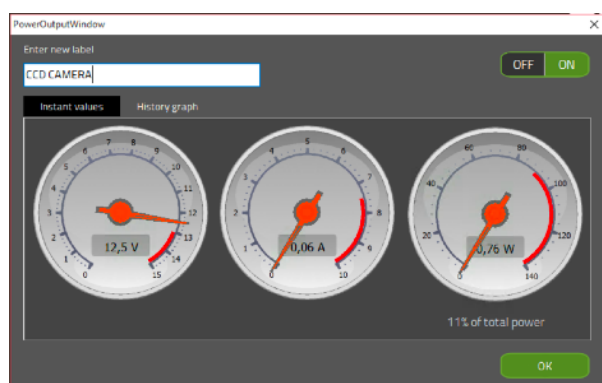


Image 26: advanced options window of one of the 12V power out ports

Here you can insert the name of the post in the field "Enter new label", visualize power consumption of the connected device and, by clicking on the "History graph" tab, visualize the power consumption (Watt) in time. Click OK button to confirm and exit from the window.

- set power out tension of the 3 power out ports with adjustable tension

For example, you can increase or decrease the heat generated by the anti-dewing heaters that are connected to EAGLE2 without an external controller. Each port shows the current consumption that can also be monitored over time.

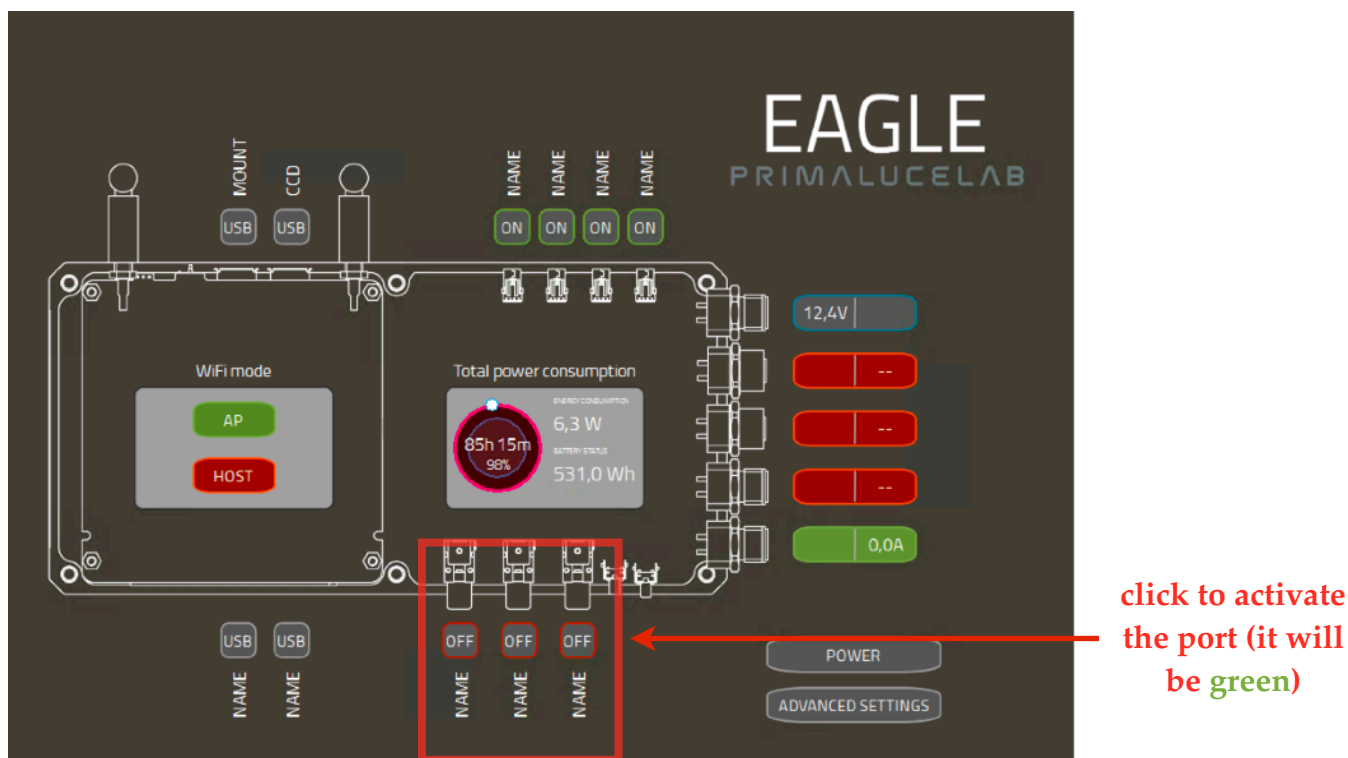


Image 27: click on one of the 3 power out ports to activate it

Click with the mouse left button (or a single tap on the screen of tablet or smartphone used for remote control) on one of the power out ports to activate it, the port will become green and it will power the connected device. Click with the mouse right button (or a 2 finger tap on the screen of tablet or smartphone used for remote control) on one of the power out ports to see advanced options of the selected power out port (image 28).

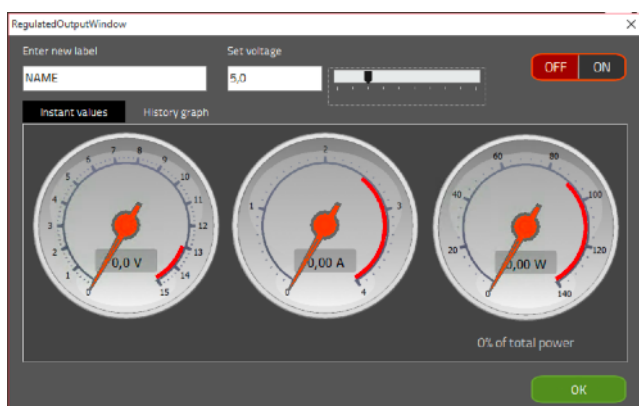


Image 28: advanced options window of one of the 0-12V power out ports

Here you can insert the name of the post in the field "Enter new label", visualize power consumption of the connected device and, by clicking on the "History graph" tab, visualize the power consumption (Watt) in time. You can also set the voltage of the power out port in the field "Set voltage" (you can modified it only when the power out port is not active, it has to be in OFF state).

Click OK button to confirm and exit from the window.

- connect or disconnect connection to devices connected to the 4 USB 2.0 ports

This feature is convenient in case of temporary crash of autoguide or planetary camera (or other devices), which can then be reactivated without the need to go to the telescope and reconnect the cable.

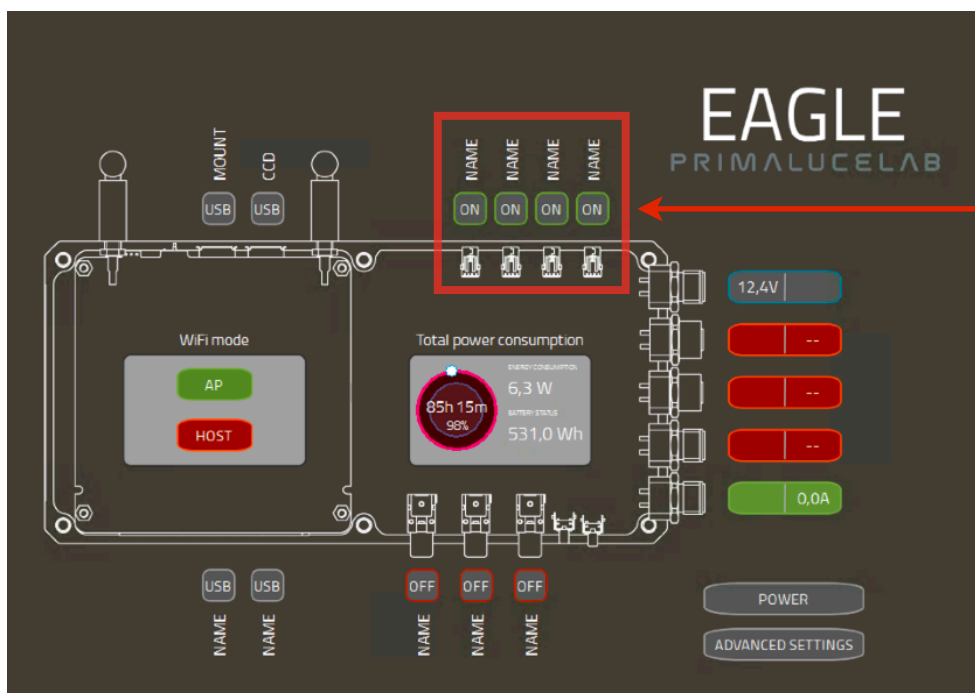


Image 29: click on one of the 4 USB 2.0 to activate it

click to activate the port (it will be green)

Click with the mouse left button (or a single tap on the screen of tablet or smartphone used for remote control) on one of the power out ports to activate it, the port will become green and it will connect the device. Make a double click on the NAME label to change its name.

- check for power in tension and battery lifetime

if you power it with a battery, a dedicated menu allows you to set the Ampere capacity of your battery and charge percentage when EAGLE2 is powered on, enabling you to check its expected lifetime.

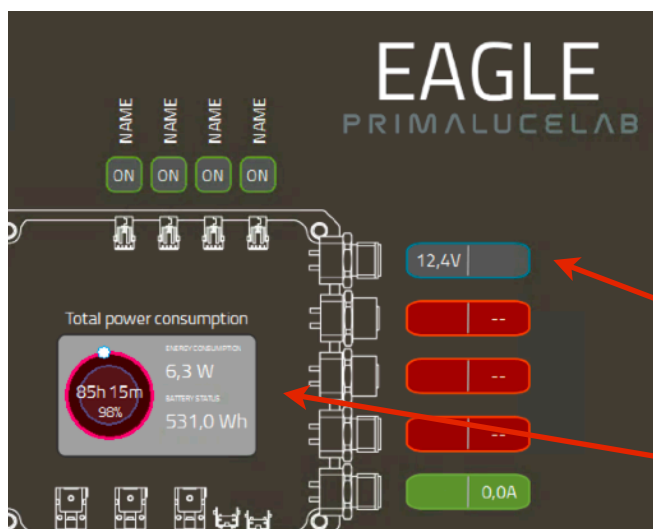


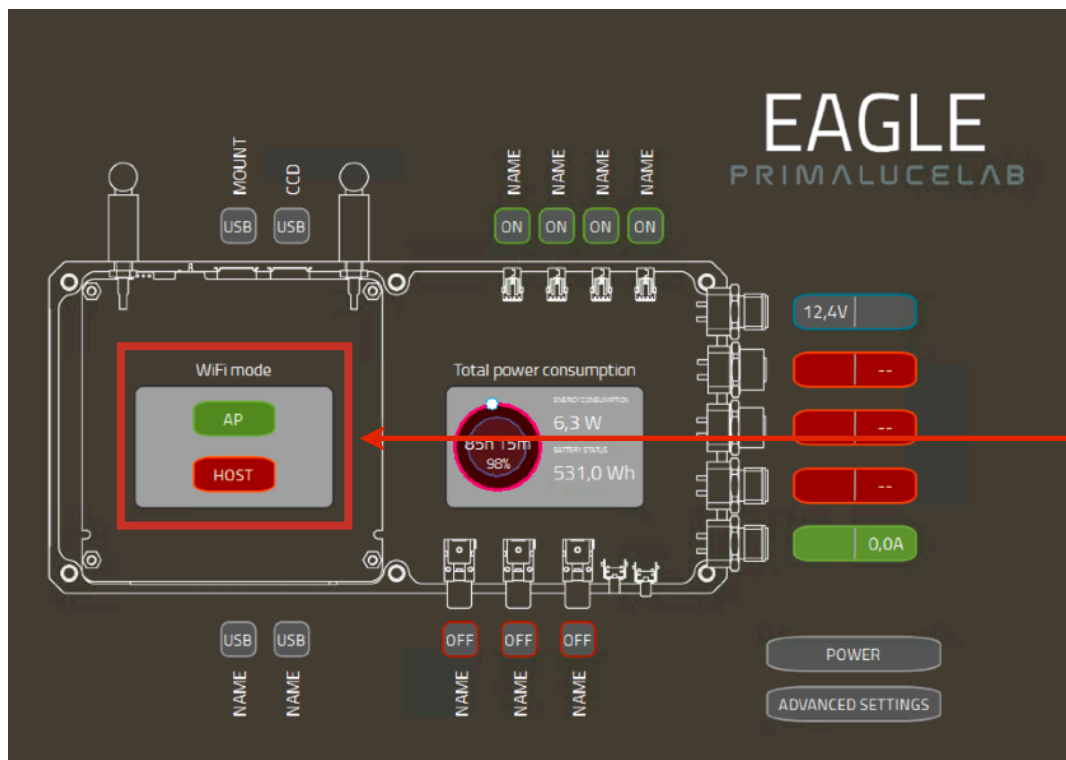
Image 30: power IN tension and battery lifetime

power IN tension

battery lifetime

- set WiFi connectivity

To access EAGLE2 in Access Point mode for field use (use your smartphone, tablet or external computer by connecting directly to EAGLE2 without the need of a WiFi router) or HOST mode for connecting to your existing network such as the home one.



click HOST to
connect
EAGLE2 to WiFi
network

Image 31: WiFi connection settings

EAGLE2 activates the Access Point mode by default. If you want to connect EAGLE2 to a pre-existing WiFi network, click the ADVANCED PARAMETERS button to activate the advanced options window. Here, in the "WiFi Host" field (Image 32), select the WiFi network that you want EAGLE2 to connect to and enter the network password. Then click OK to confirm. Now click on the HOST button to connect EAGLE2 to the previously set network.

select your WiFi
network and in-
sert password

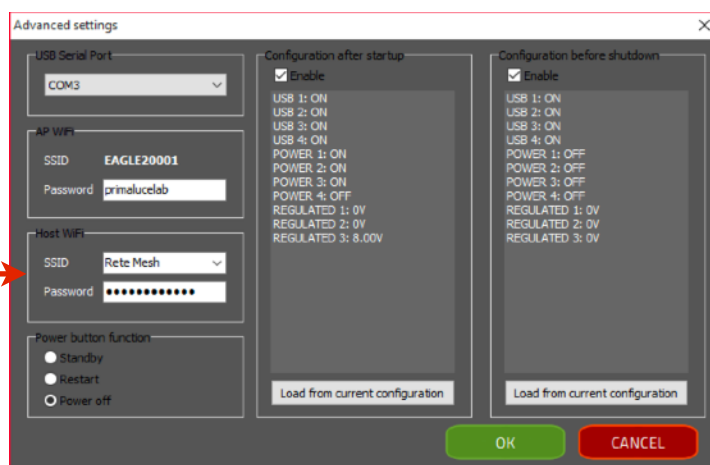
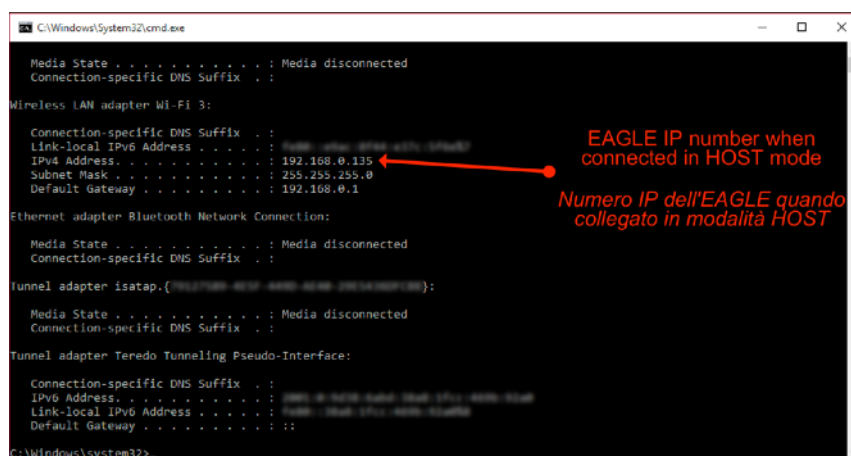


Image 32: insert access parameters to your WiFi network

ATTENTION!

Make sure that you entered the correct network parameters (especially your network password) because, if they are wrong, EAGLE2 will not be able to access your network and at the same time it will not create its network in Access Point mode: in this case you won't be able to connect to EAGLE2 anymore and you will need to click its RESET button to reset the network.

Now you have to set remote access parameters in Remote Desktop software installed in the device you want to control EAGLE2 from. First of all you need to verify what is the IP address your router assign to the EAGLE when you use the HOST feature and this may vary based on your network configuration. In order to do this, in the EAGLE please type "cmd" in the "Search Windows" bar (bottom left part of the Window) and press ENTER in the keyboard. This will open a new window. Please type "ipconfig" and press ENTER again. You will see a line with the IP number of your EAGLE connected to your network (please take a look at the picture below). This is the IP number you have to write in Remote Desktop when you want to connect to EAGLE by using the HOST feature.



You have to insert this address in the options of "Remote Desktop" software (image 33) in the device you use to control the EAGLE2 from (please see page 8 of this user manual), instead of 192.168.137.1 as previously set. Click on Save to save software connection options. Going back to main page you will find a new connection. Connect your computer (or other device) you use to control the EAGLE2 from to the same WiFi network you connected EAGLE2 and click on the new connection just created in the "Remote Desktop" software to start remote connection to EAGLE.

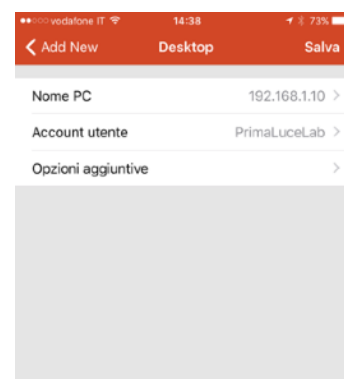


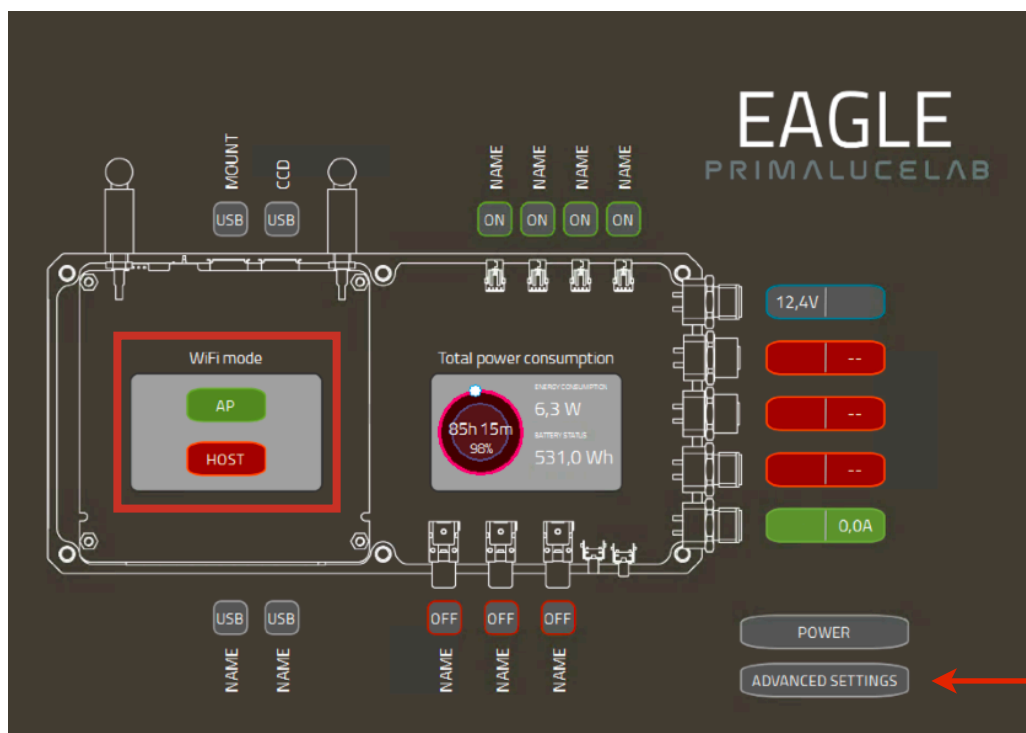
Image 33: Remote Desktop connection settings

Tip:

if during the use of the EAGLE you can no more access to its WiFi network, both in AP and HOST mode, press the RESET button on the left of the POWER button on the EAGLE case. This will reset WiFi network in AP mode. Then, in the device you use to control EAGLE from, you have to select the WiFi created by the EAGLE (EAGLE2XXXXX) and restart Remote Desktop software.

- remotely turn on/off the entire telescope

EAGLE2 has a classic ON/OFF button for turn on/off the unit. But it is pre-set to allow the user to turn on or turn off the whole system remotely (when controlled through a network cable connection). After switching on the EAGLE2, the user can activate remotely connected devices and use the telescope. At the end of the capture, the user first turns off the various devices (camera, mount, etc.) and then EAGLE2.



click on ADVANCED SETTINGS to set switch ON/OFF settings.

Image 34: ADVANCED SETTINGS button in EAGLE Manager

Press the ADVANCED SETTINGS button and, in the window that opens, you can set the switch ON/OFF setting you prefer for the POWER button of the EAGLE Manager software. In order to switch off the EAGLE when you press the POWER button, please select the "Power off" setting. You can also select the "Standby" mode (useful for remote power in when EAGLE2 is connected to a wired network, please see next paragraph) or "Restart" (to restart it). Click OK to confirm. To switch off EAGLE2 now you can press the POWER button.

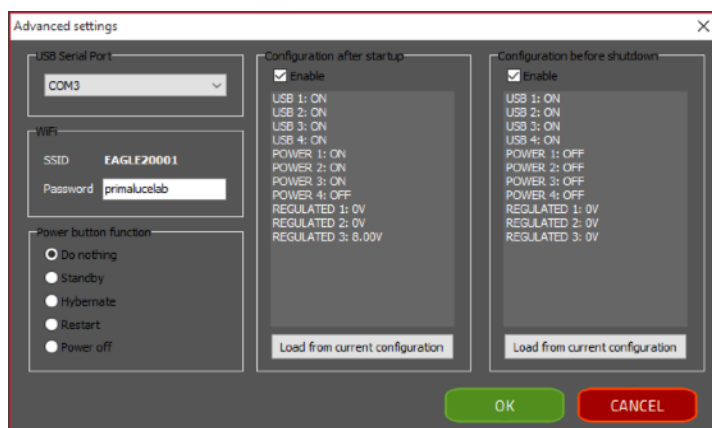


Image 35: ADVANCED SETTINGS window

Tip: if, using EAGLE Manager, you are no more able to control power out ports or USB ports of the EAGLE, go to ADVANCED SETTINGS and click RECONNECT button.

- **change the password of the WiFi network created by EAGLE2:** for default, EAGLE2 generates a WiFi network with EAGLExxxx name (where xxxx is the serial number of your EAGLE) as reported also in the front part of the EAGLE. Default password is **primalucelab** but you can change it for your safety.

This way, if you're using the telescope together with other users having other EAGLE units, only you will be able to access to your EAGLE.

In order to do this, please click the ADVANCED PARAMETERS button. In the WiFi area, you can see the WiFi network name created by your EAGLE ("SSID"). You can modify the "password" field with the password you prefer and click OK to confirm (image 36). NOTE: The password must be 8 characters long, it may contain both letters and numbers, and must not have spaces.

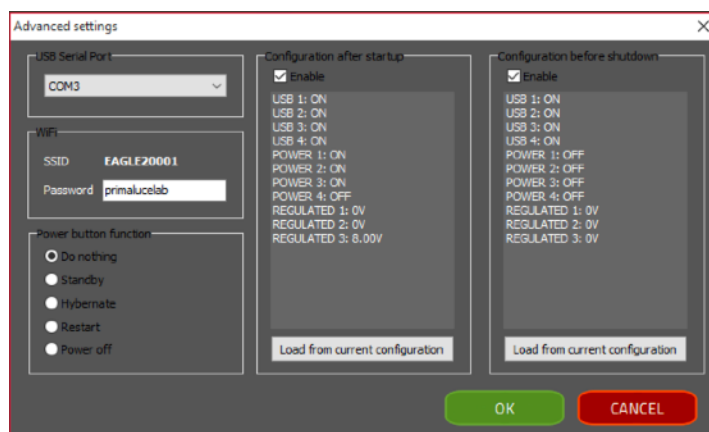


Image 36: ADVANCED SETTINGS window

NOTE!

- 1) after changing the password, you will need to access the WiFi network created by EAGLE again from your control device.
- 2) do not lose your password otherwise you will no longer be able to access EAGLE remotely.

Advanced use: program connection and power to devices

Within the ADVANCED SETTINGS window, you can set how EAGLE Manager must set all connection ports (except for the USB 3.0 ports that will always be active) when EAGLE is turned on or off. This way you can, for example, schedule to turn on or turn off your devices when you turn on or off EAGLE. The "Configuration after startup" field allows you to set the status of ports when EAGLE startups, the "Configuration before shutdown" field allows you to set the status of the ports when EAGLE is shutdown (Image 37).

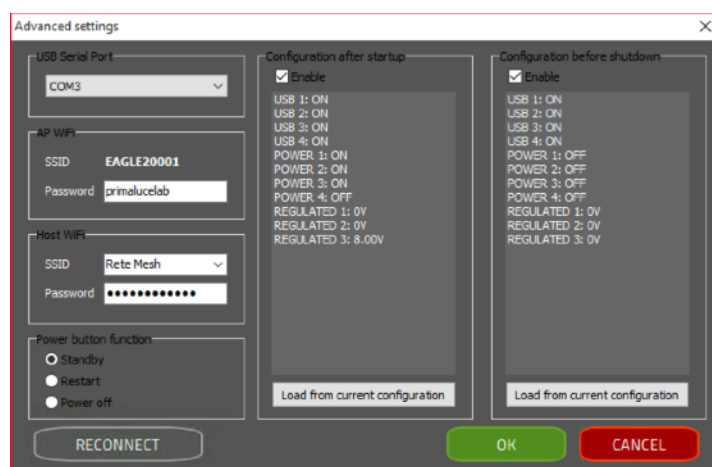


Immagine 37: ADVANCED SETTINGS window

To enable this feature, just select "Enable" for the two fields. To set the configuration you want to get, click OK to exit this window, then set the EAGLE USB and power out ports to the status you want to keep as preconfigured when you startup the EAGLE. Then click on ADVANCED SETTINGS again and, within the "Configuration after startup" area, click on the "Load from current configuration" button. The current configuration of EAGLE ports will be saved and applied each time you turn on the EAGLE.

Repeat the procedure for the "Configuration before shutdown" field if you want that, when you turn off EAGLE, ports are always set to a particular state.

Advanced use: remotely turn on EAGLE with wired connection


EAGLE is designed to allow you, in a simple and fast, to remotely control your telescope that is connected and powered by EAGLE. In this chapter we will see how to remotely switch on the EAGLE (and then all the powered devices) setting up a direct wired connection via a computer network cable to EAGLE.

NOTE:

This feature is available only with a wired connection, not with WiFi.

This methods involve the use of a cabled connection, and it is typically used to remotely control an entire telescope installed at a fixed location (for example, on observatory of amateur astronomy association or in your back yard). **In this mode you can turn on remotely EAGLE and then powered devices.** If you want to remotely control the EAGLE in a different way than described here, please contact us and we will help you customize your system.

The simplest way of remote control is the wired one, with a direct connection from a single computer to EAGLE. For this use, you will need a cross-type Ethernet network cable to be connected to the EAGLE ethernet port and in the one of your control PC . Then:

- In EAGLE, select Start button  then click on Control Panel and select "Network and sharing center"
- Select "Change settings", make a double click on the Ethernet connection (image 38) and select "Details".
- A window with the details of the network connection will open
- Write down the value for the "Physical Address" (image 39).

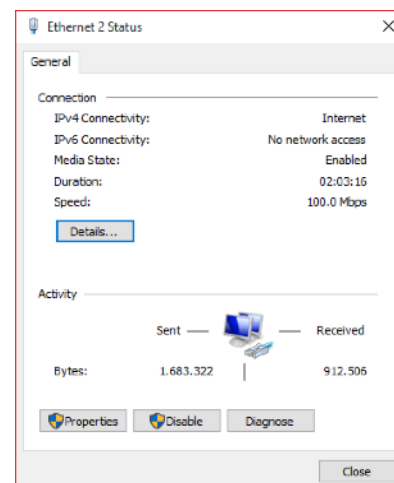
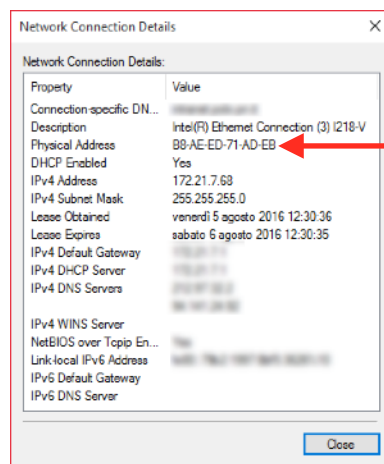


Image 38: Ethernet window



Write down the value for the
Physical Address

Image 39: Details window

It is therefore necessary to set a static IP address for EAGLE. To do this, select the Start button and then click on Control Panel and select " Network and sharing center." Mouse right click on "Ethernet" and select "Properties" (image 40).

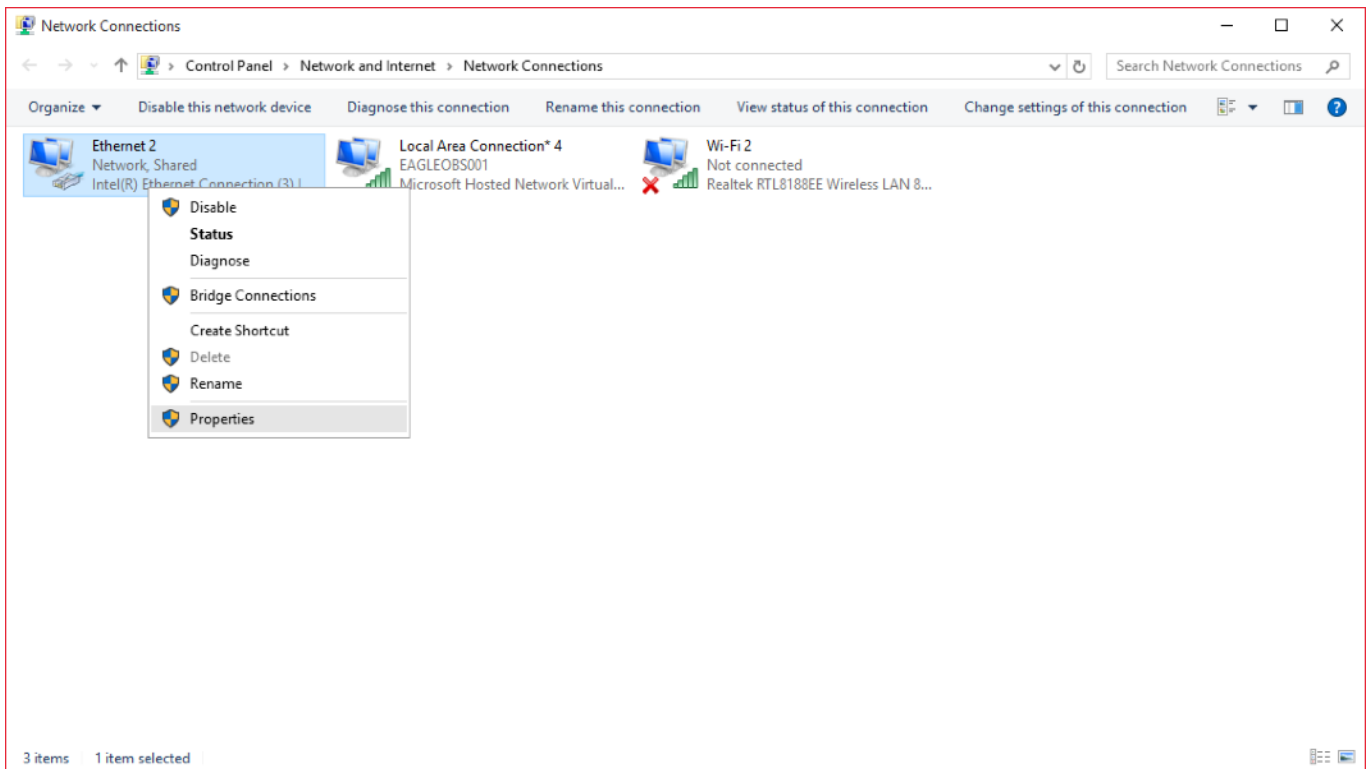


Image 40: Network connections window

In the window that opens, click on "Internet Protocol Version 4 " and press the "Properties" button.

In the window that opens, select the "Use the following IP address" and write in the first two fields the following values :

IP address: 192.168.100.100

Subnet mask: 255.255.255.0

Then click OK to confirm . Also the computer you want to use to control EAGLE must have a static IP then, in this computer, repeat the steps above but entering the following value :

IP address: 192.168.100.200

Subnet mask: 255.255.255.0

(they are the same numbers, it only changes the last digit of the "IP address"). Then click OK to confirm (image 41).

In order to remotely turn on EAGLE, now you need a software that allows you to send it a message called "Wake On Lan". There are several free or pay-to-

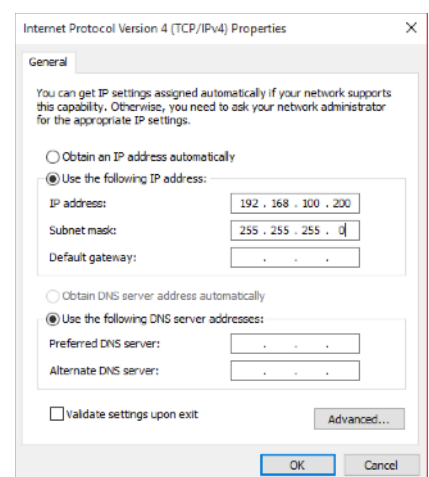


Image 41: IPv4 proprieties window of the computer used to remotely control Eagle Observatory

use solutions, in this example we will see how to do it using an Apple computer with OSX operating system. Access to the App Store and search for the application "Wake On Lan". Install it and run it.

Then set:

- in the field Mac Address: the number that you previously wrote
- in the field IP Address: 192.168.100.255
- in the field Subnet mask: 255.255.255.0
- in the field Port: 9

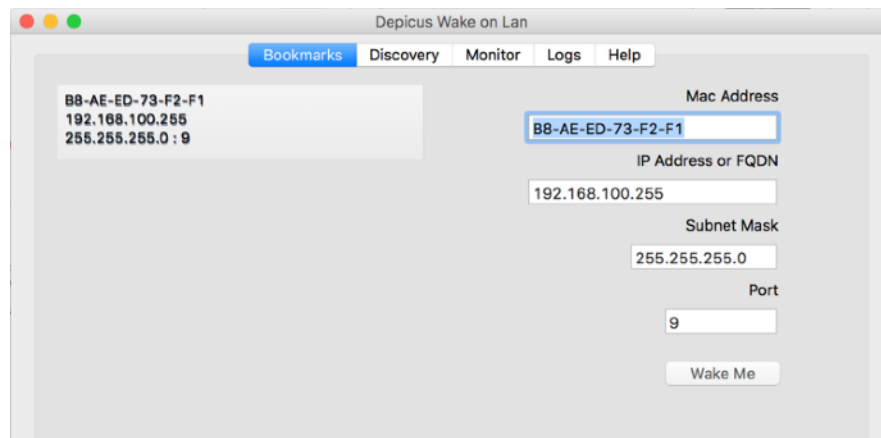


Image 42: Wake On Lan software window

By clicking the "Wake Me" button (image 42), your computer will send to EAGLE the command that turn it on remotely (then it replaces the physical press of the ON/OFF button).

After you remotely switch on EAGLE with a network cable connection, you will need to set up a new connection to the Microsoft Remote Desktop software on your computer to control it. In this example we will see how to set it from a Mac computer, but it is also valid for Windows computers. From the computer where you want to control EAGLE from, start the Remote Desktop software, then click the "New" button to set up a new connection. Then set:

- In "Connection name" field enter a name for your connection (for example "EAGLE2 Wired" to better highlight wired connection than the wireless one)
- In "PC name" field, enter the static IP of the EAGLE that is **192.168.100.100**
- In "Username" field enter **PrimaLuceLab**
- In "Password" field enter Windows access password you find in the EAGLE box

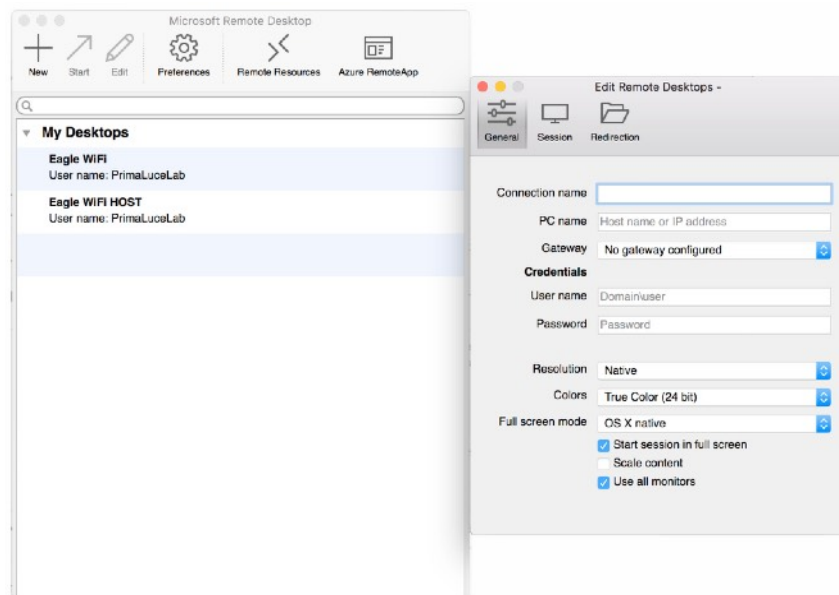
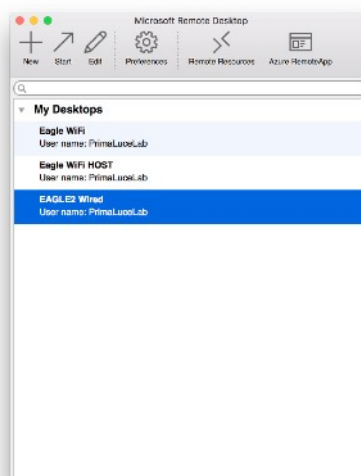


Immagine 43: set the Remote Desktop for wired connection

Create the new connection, click on the name of the newly created connection (in our example "EAGLE2 Wired") to activate the remote connection (Image 44).



Tip: if, using EAGLE Manager, you are no more able to control power out ports or USB ports of the EAGLE, go to ADVANCED SETTINGS and click RECONNECT button.

Image 44: start wired remote connection

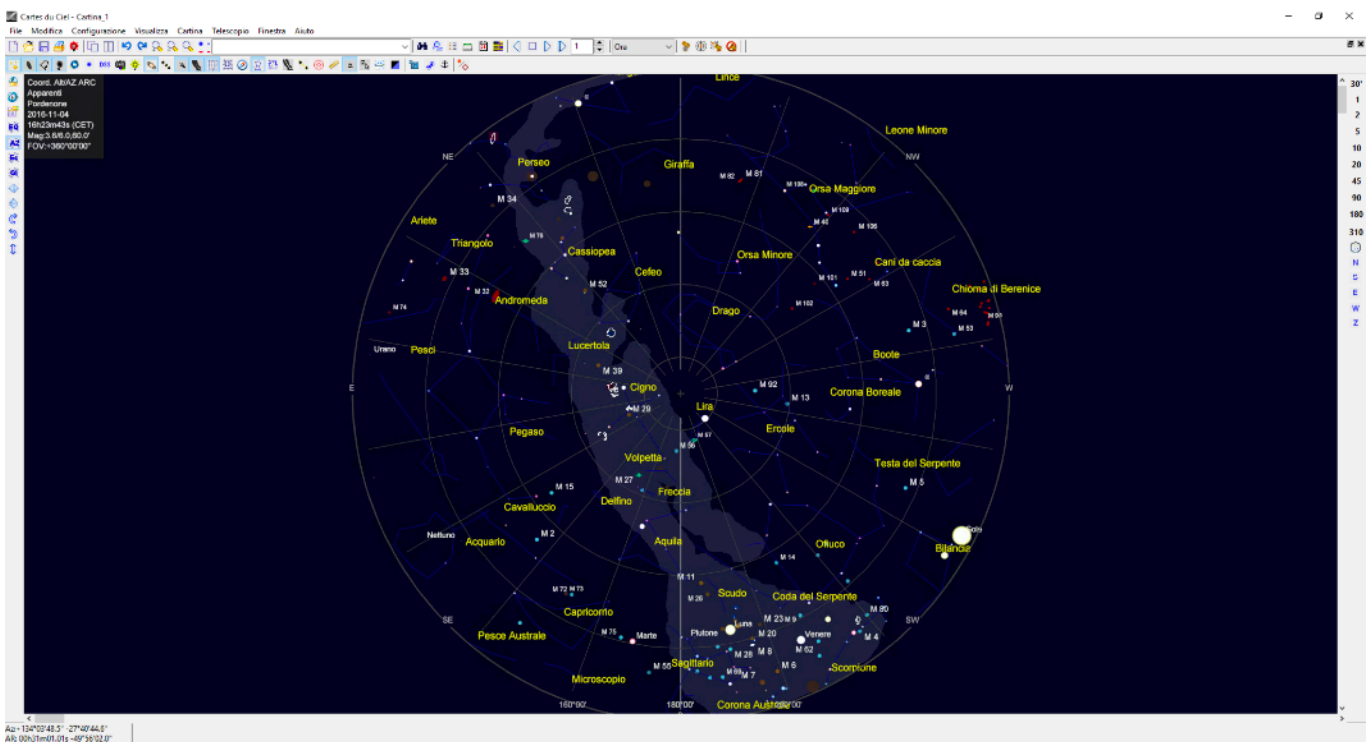
Controlling the telescope remotely with Cartes du Ciel

Eagle comes pre-installed with Sky Charts, a planetarium windows that lets you display all the sky objects but that also lets you control the telescope. In this way to you remotely control using the EAGLE the telescope position. In order to do this you need to have:

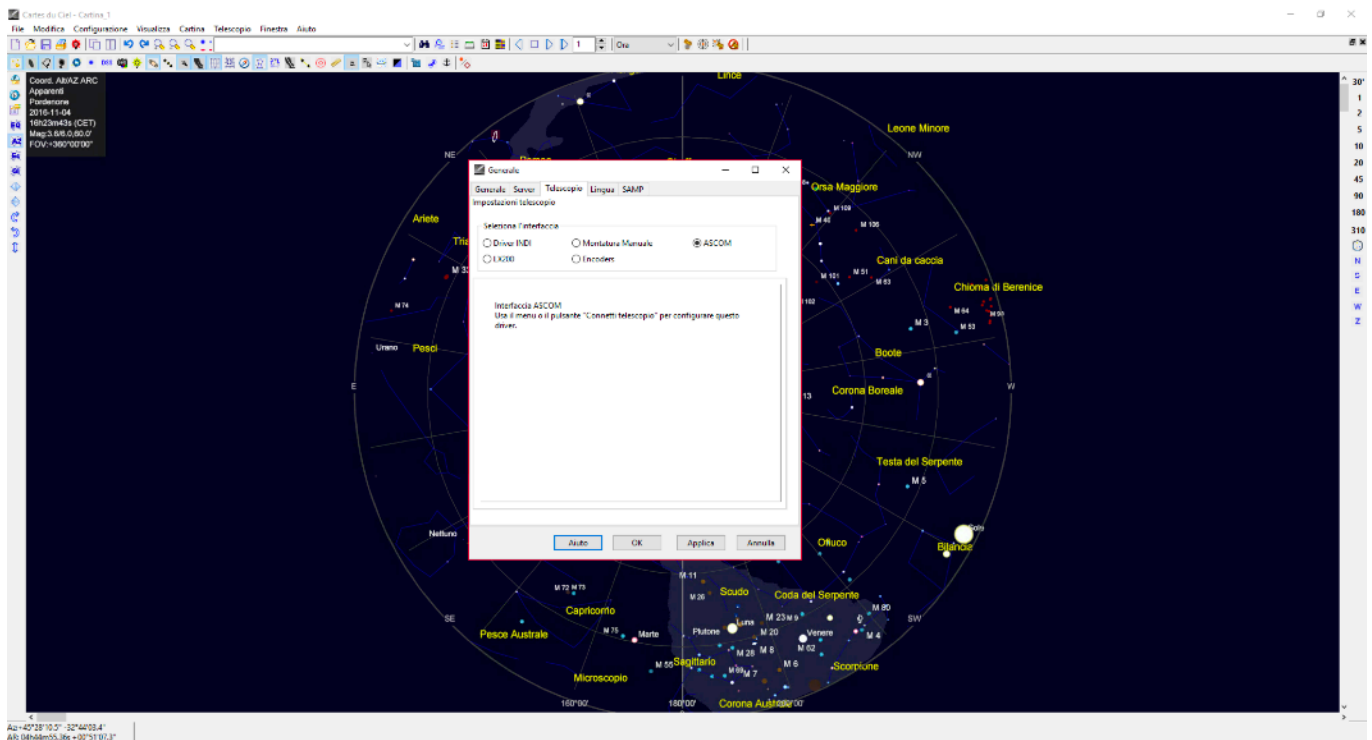
- 1) a computerized mount
- 2) installed the ASCOM driver of the computerized mount into the EAGLE (the ASCOM platform is pre-installed in the EAGLE)

Please follow this easy steps in order to remotely control the mount using Cartes du Ciel planetarium software:

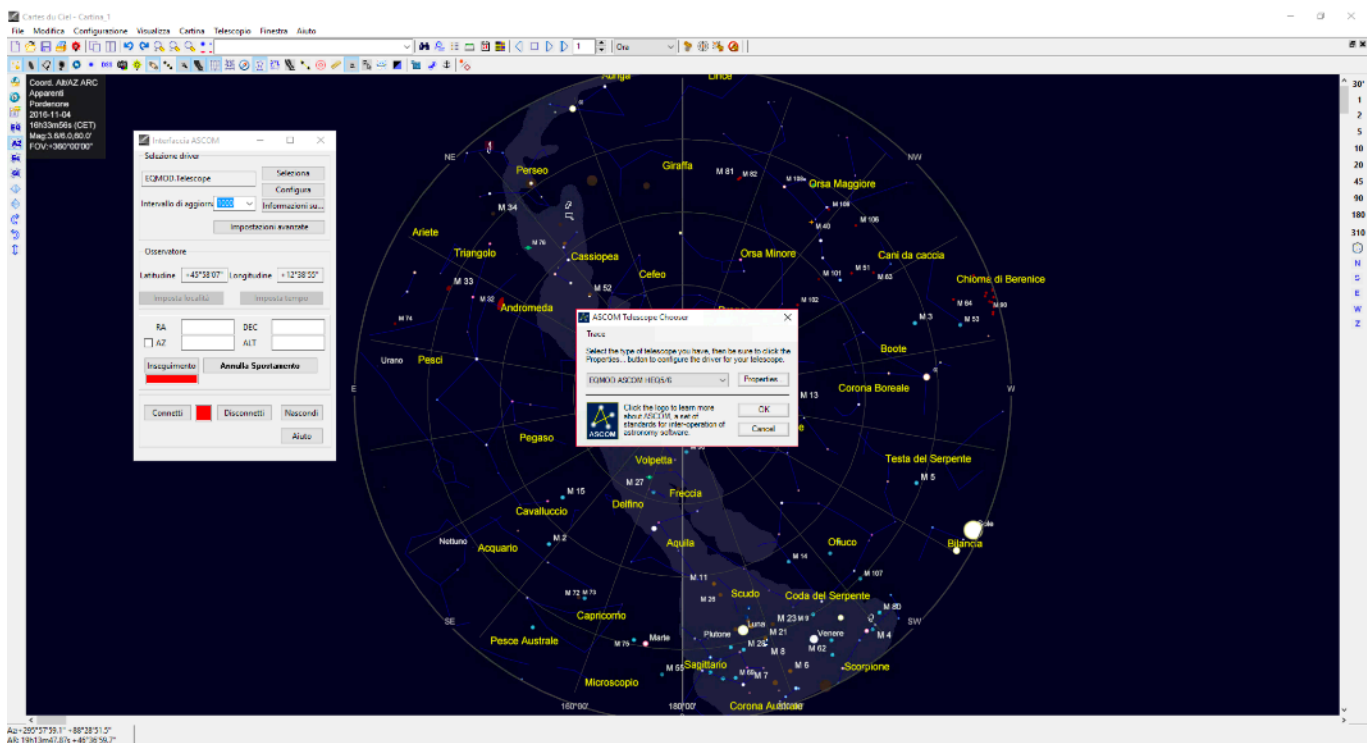
- 1) Start Cartes du Ciel, you will see this window



- 2) Select "Telescope" and then "Telescope Settings"; this will open a new window, please select that "ASCOM" option is selected under "Telescope" tab. Then click OK to close the window.

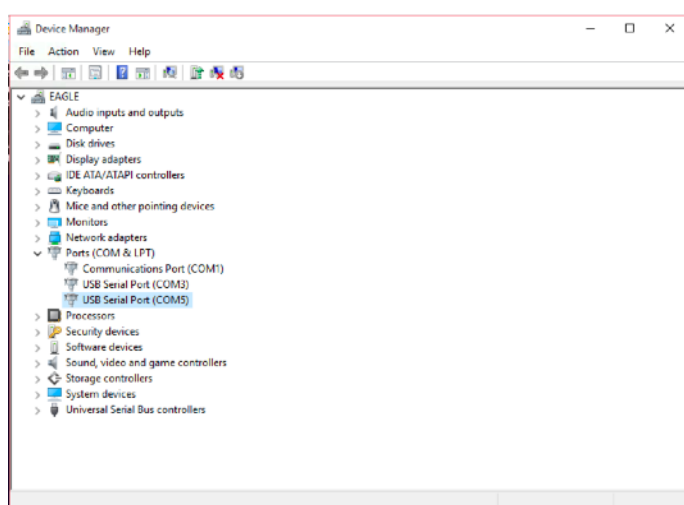
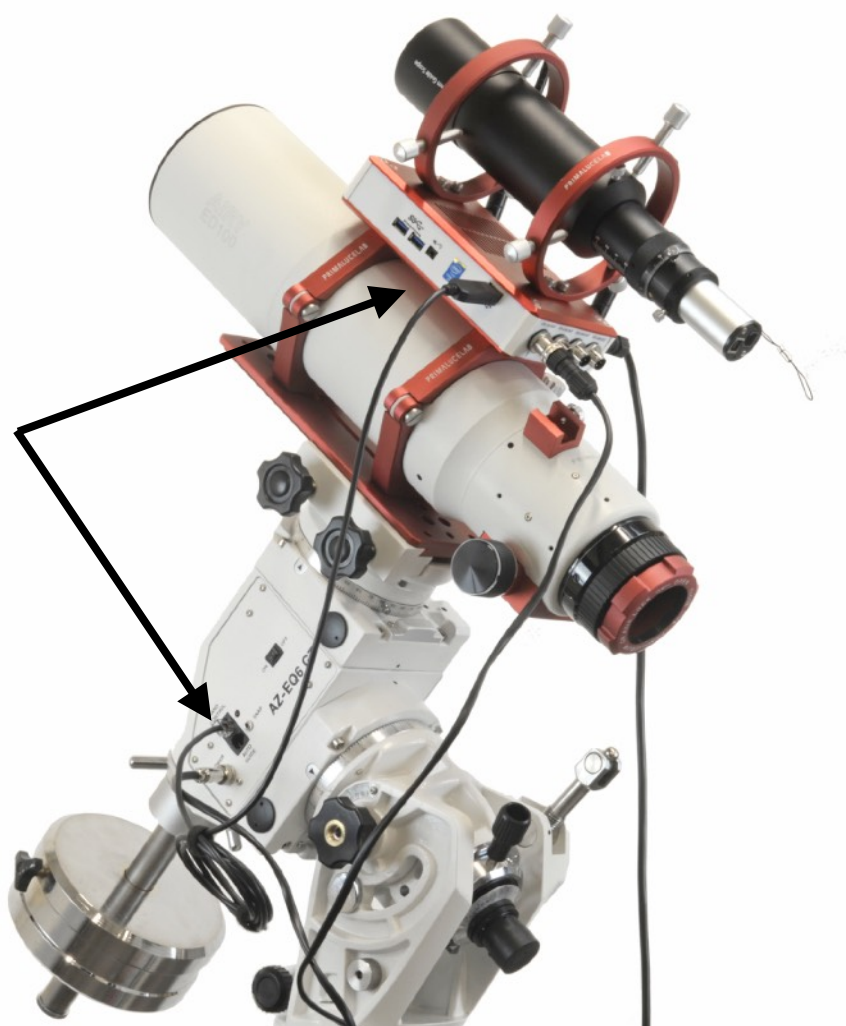


- 3) Select "Telescope" then "Control panel". This will open a new window "ASCOM interface". Click on "Select" and this will open a new window "ASCOM Telescope Chooser". Now, based on the way you connect the mount to the EAGLE, here you need to select the ASCOM driver.



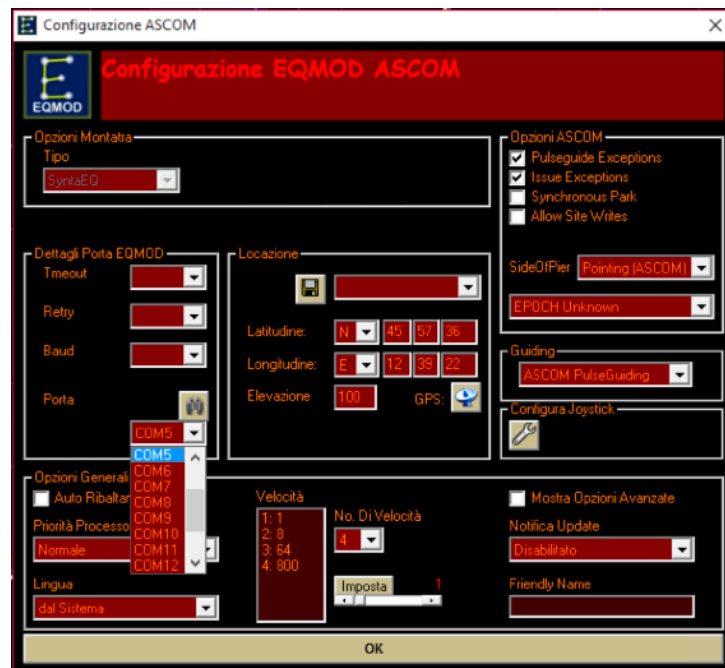
For example, if you use a SkyWatcher mount, you may use the "EQMOD USB interface for SkyWatcher mounts" that directly connects the mount electronics to the EAGLE using a USB port.

EQMOD cable directly connects the HandPad port of the SkyWatcher mounts to the USB port of the EAGLE

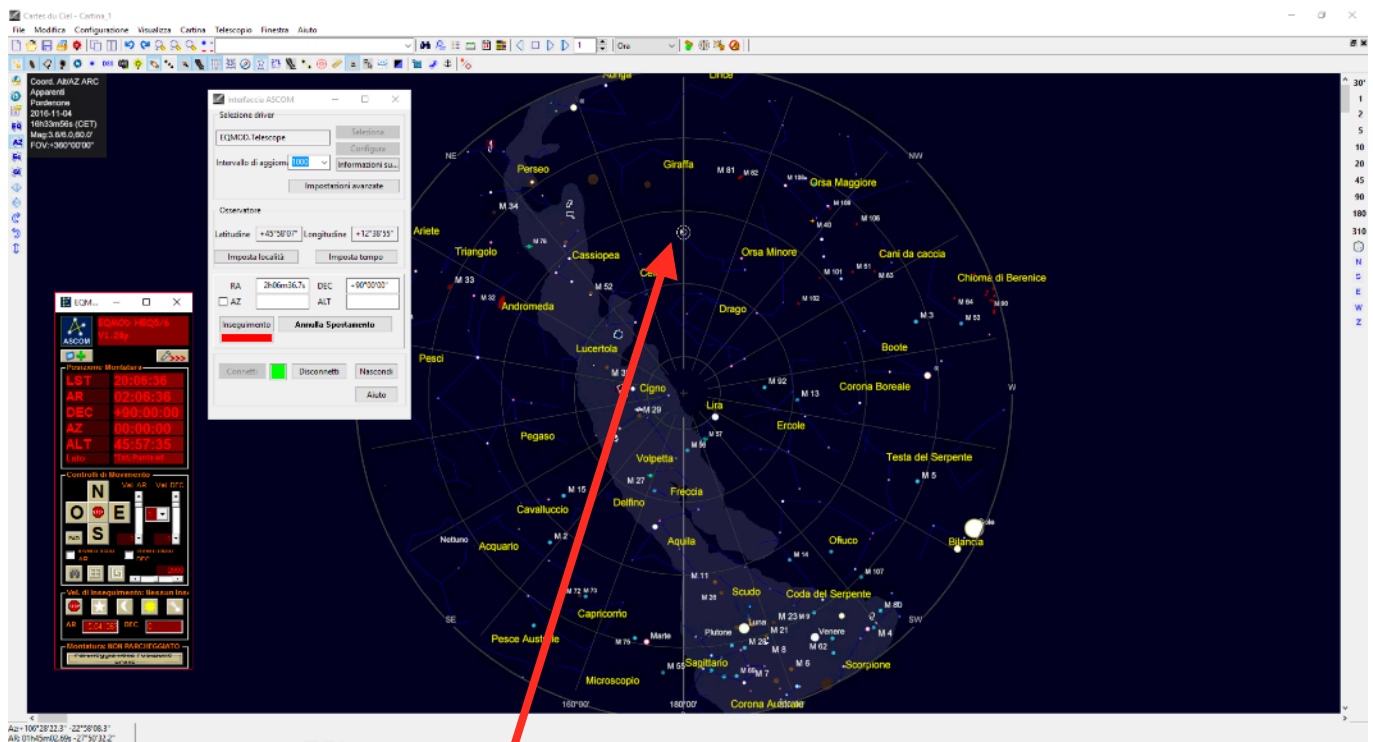


The "EQMOD USB interface for SkyWatcher mounts" comes with an ASCOM driver that you need to install BEFORE starting Cartes du Ciel planetarium software. The EQMOD creates a virtual COM port you need to know the number. In order to do that, go to Windows Control Panel, then select "System" and then "Device Manager". In the window that opens, make a double click on "Ports (COM & LPT)" and look at the "USB Serial Port" number that opens (Please note: in Eagle Observatory the COM1 and COM3 are used for other applications"). In our example, the EQMOD created a COM5 port.

- 4) In the "ASCOM Telescope Chooser" window select "Proprieties" and the "ASCOM configuration" window will open. Set the right number port in "Port" field and then press OK to close the window.

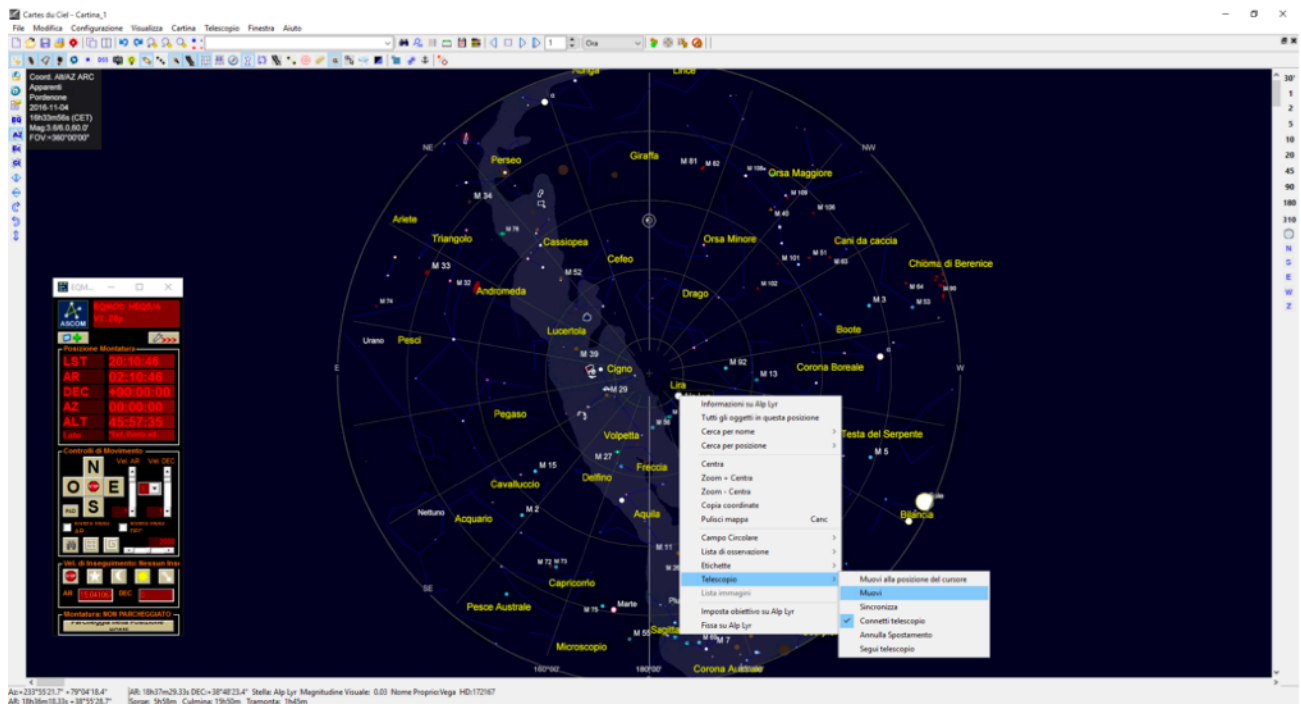


- 5) Then press OK in the "ASCOM Telescope Chooser" window and press "Connect" button in the "ASCOM interface" window. The red button will become green and the EQMOD window will appear. Now you're connected to the mount and you can remotely control it.

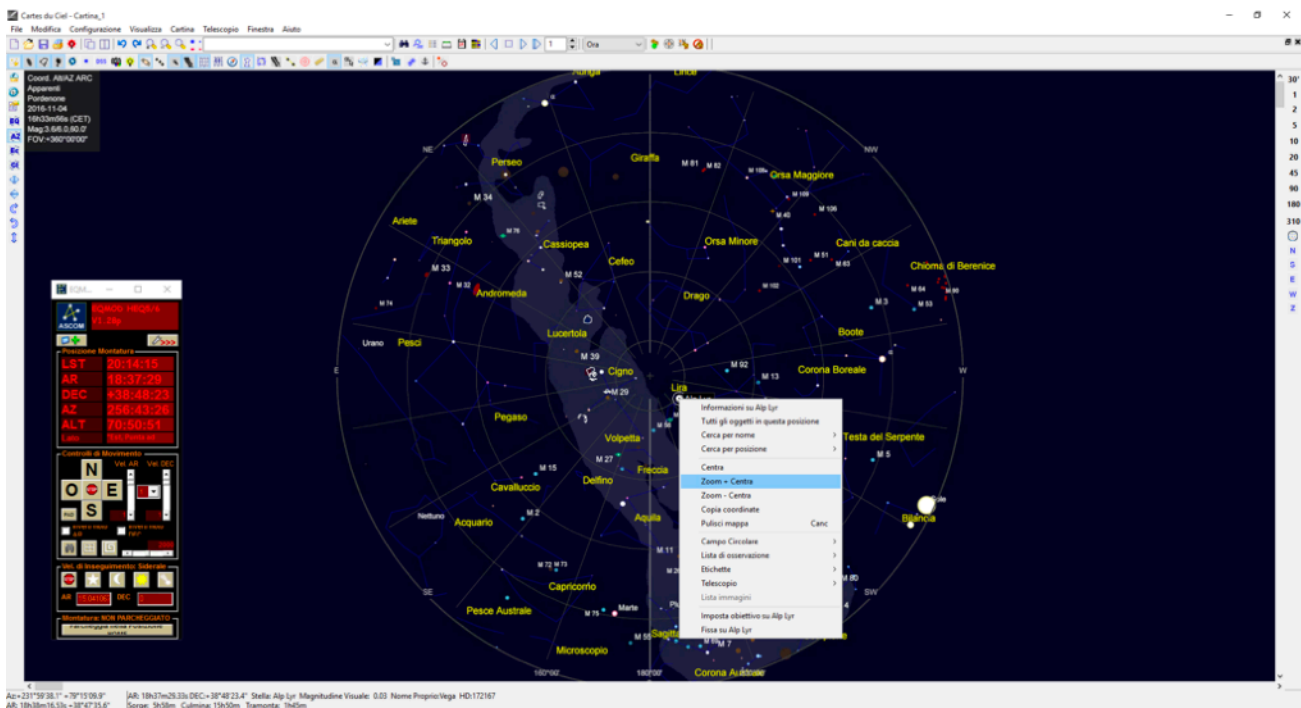


Actual telescope position

- 6) A circle indicator indicate the telescope position, in this example it's in the North Polar star. In order to move the telescope to a desired object you can see in the planetarium window, you can select the object, make a mouse right-click, select "Telescope" and then "Slew". The mount will move to the selected object.

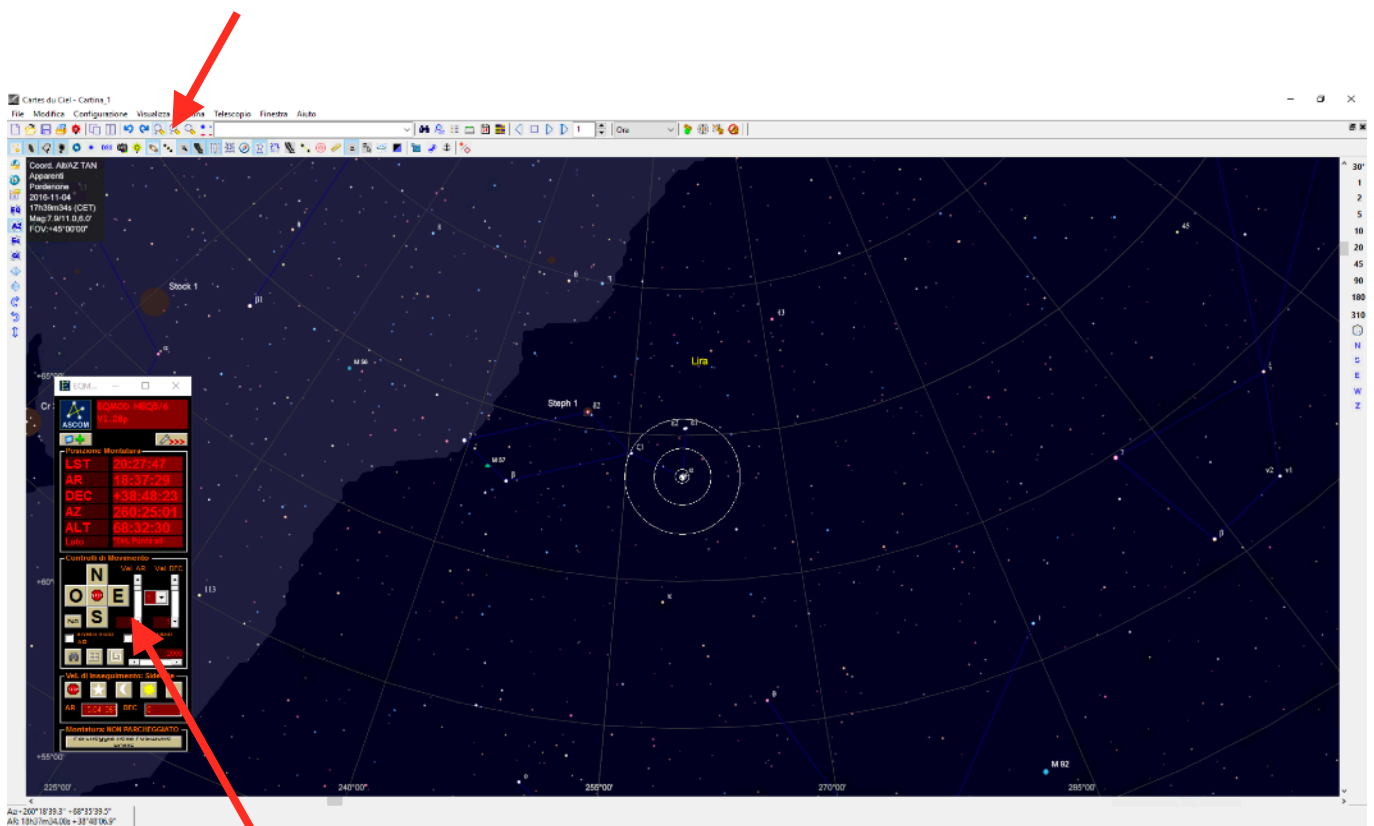


- 7) If, after automatic pointing of the mount, you see that the object is not perfect centered, you can easily align and synchronize the telescope position. In order to do that, after the telescope is moved to the required position, select the object then make a mouse right-click, select "Zoom + Center".



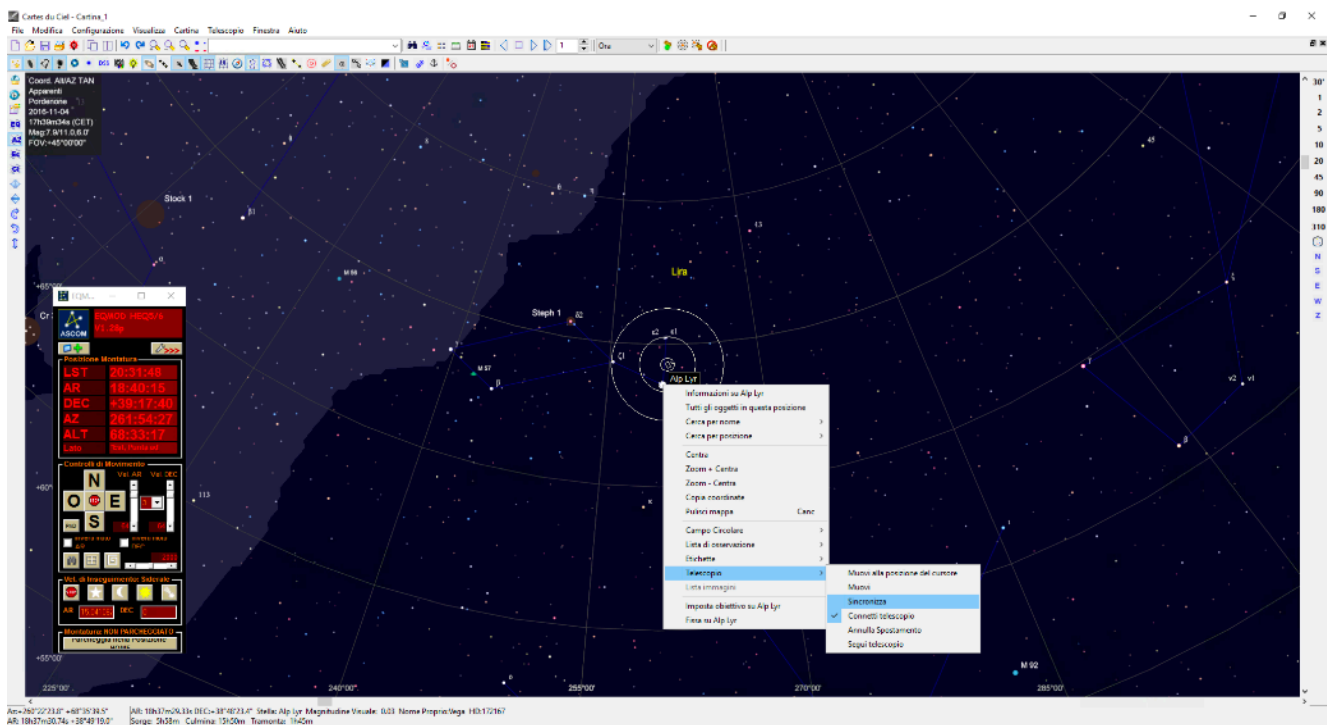
- 8) You can increase the magnification of the sky chart using the Zoom buttons. Then select one of the available speeds in the speed selector (3 or 4 are ok for object centering) and center the object in the telescope field of view (in your eyepiece or in the camera)

Zoom buttons

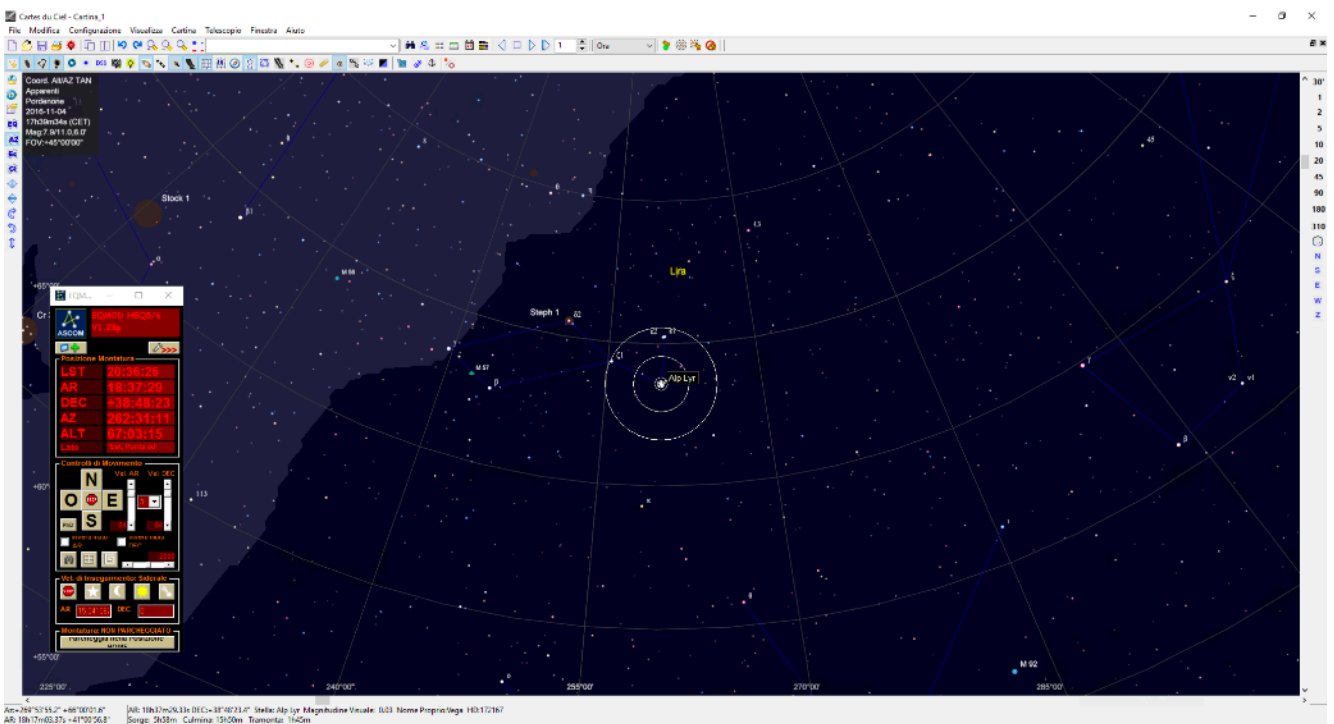


Speed selector and direction buttons

- 9) When done, select the object you're pointed in (in this example Vega star), make a mouse right-click, select "Telescope" and then "Synchronize". A new window will appear asking if the telescope is pointed at the object. Press YES to confirm.



10) The telescope will be synchronized and the sky chart position will be set to the object.



11) When you want to disconnect the planetarium software from the mount, select "Telescope" then "Control panel" and then "Disconnect". You will be able to close the Cartes du Ciel software.

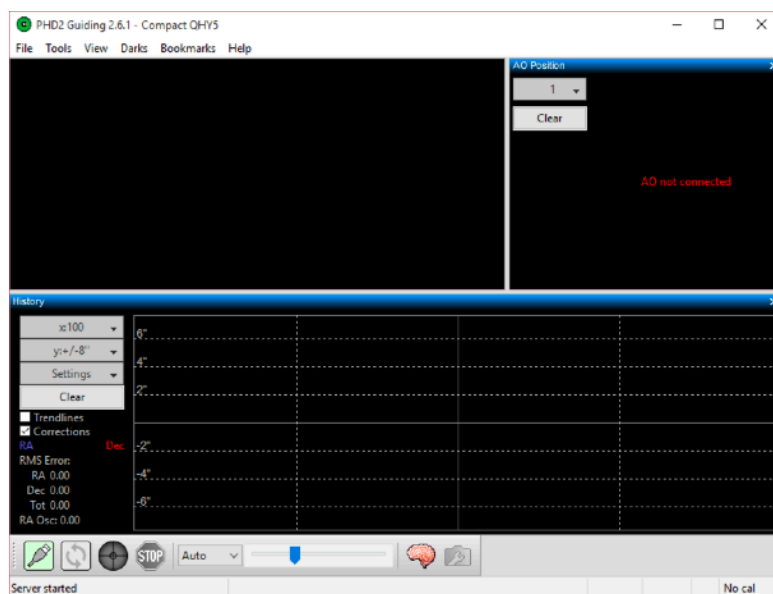
Autoguiding with PHD2 Guiding

PHD2 Guiding is a free software among the most used for autoguiding since it's very easy to use. In this tutorial we will explain how to set up this software (that is pre loaded into the EAGLE) using a QHY5L-II camera but the same steps can also be made using other autoguiding cameras.

The autoguide is a technique that involves a guider camera (usually we use cameras equipped with highly sensitive sensors to find more easily the guide stars). Connected to a secondary telescope in parallel to the main one, or to an off-axis guider, the autoguide camera generates the guide star image that is analyzed by a special software (the autoguider software) that automatically sends tracking correction signals to the mount: everything is done to obtain, even with long exposures, perfect images with pinpoint stars.

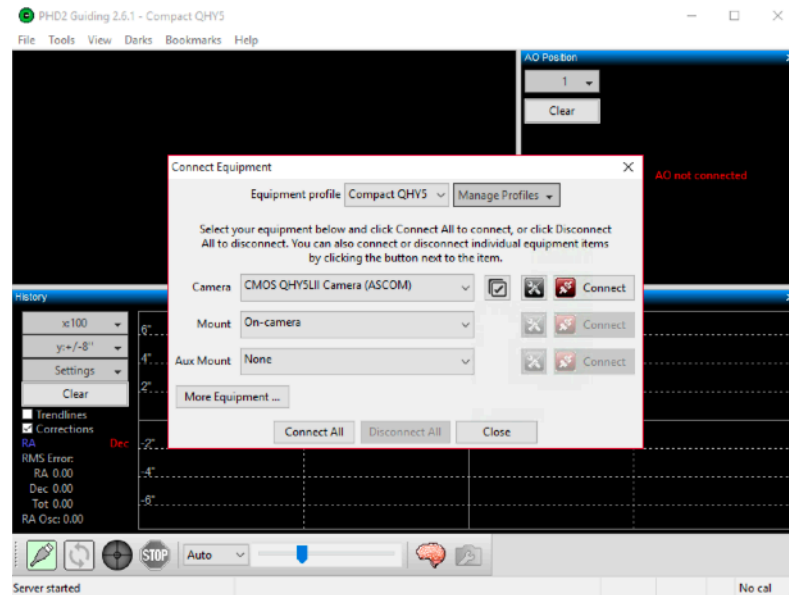
Follow these steps to get started easily in autoguiding:

- 1) Start PHD2 Guiding, the following window will open.

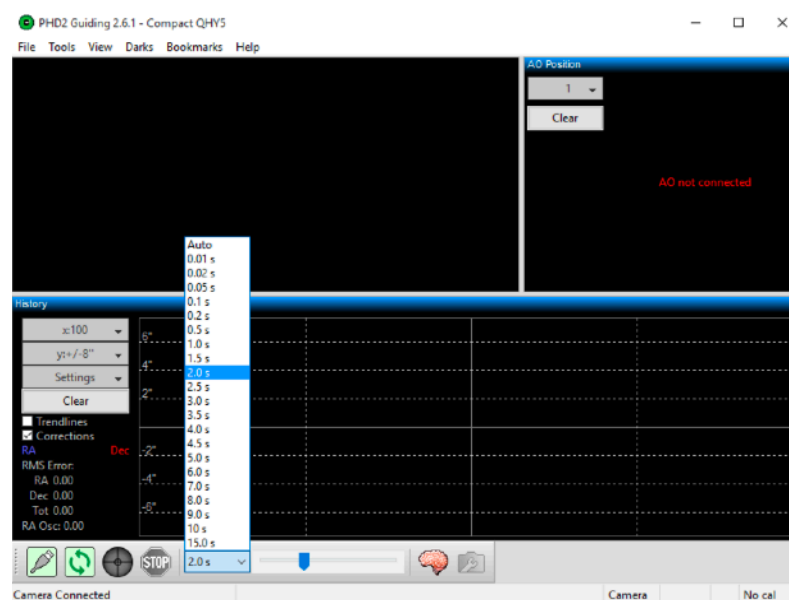


- 2) Click the first button on the bottom left, it will open the window "Connect Equipment". Select your guide camera in "Camera" option. We used a QHY5L-II camera which is equipped with ASCOM driver so we selected "CMOS QHY5LII Camera". The first time you do this, when you click "Connect" a new window will open. Press OK to proceed.

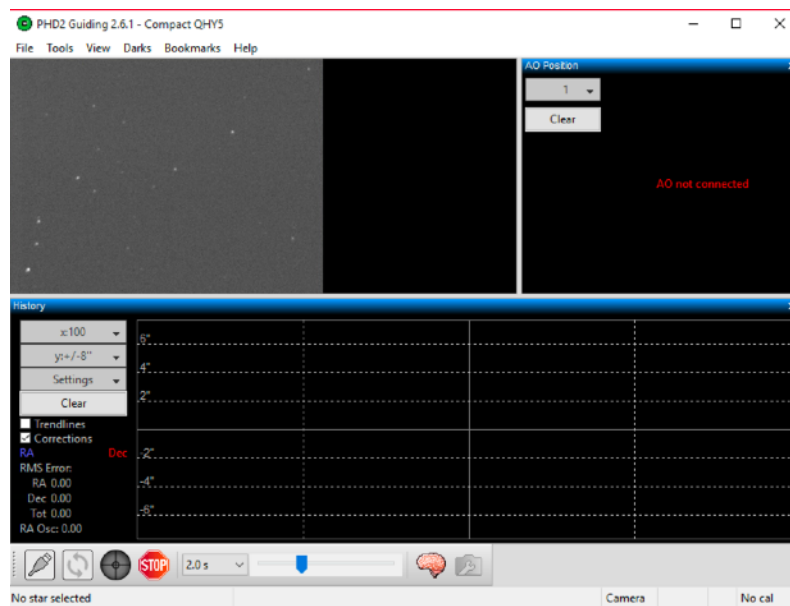
3) In the “Connect Equipment” window verify that the “Mount” option is “On-camera”. This option is used when the camera integrates an ST4 autoguide port. Press “Connect” and then press “Close”. This will close the “Connect Equipment” window.



4) Now select a proper exposition time for the guide camera (usually 1 or 2 seconds) and press the “Looping” button (the one with 2 green arrows). This will start expositions of the guide camera and you will see the image in the preview window.

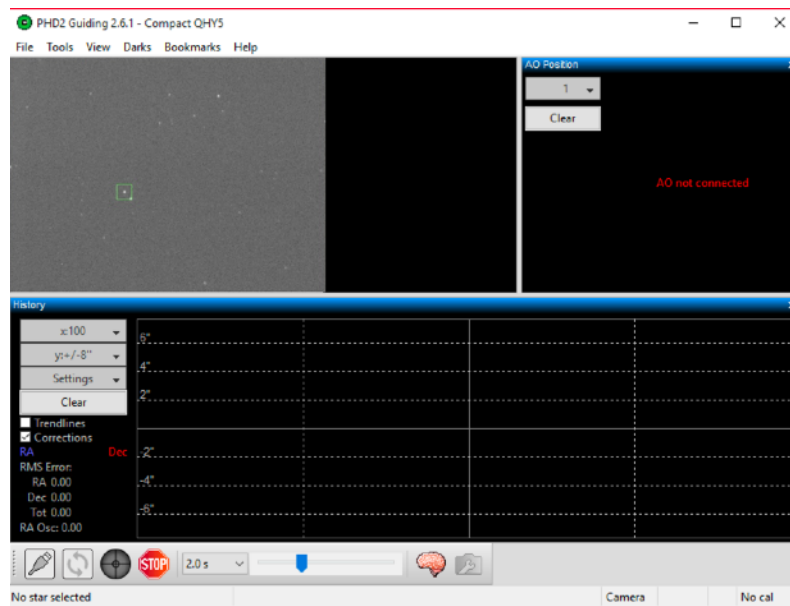


PHD2 Guiding will perform a loop images that will be displayed on the screen. Do not worry if, as in the image below, you notice a lot of background noise: in fact PHD Guiding automatically compresses the image histogram to help better visualize the guide stars and this makes especially the sky background very noisy (but it has no impact on guide accuracy). Probably your image will be out of focus so move the guide telescope focuser until you see the point stars on the screen. If you can not find the guide star you can adjust (increasing it) the shutter speed using the command in the bottom center. Tip: Never use shutter speeds that are too short, usually 1 to 2 seconds are fine.

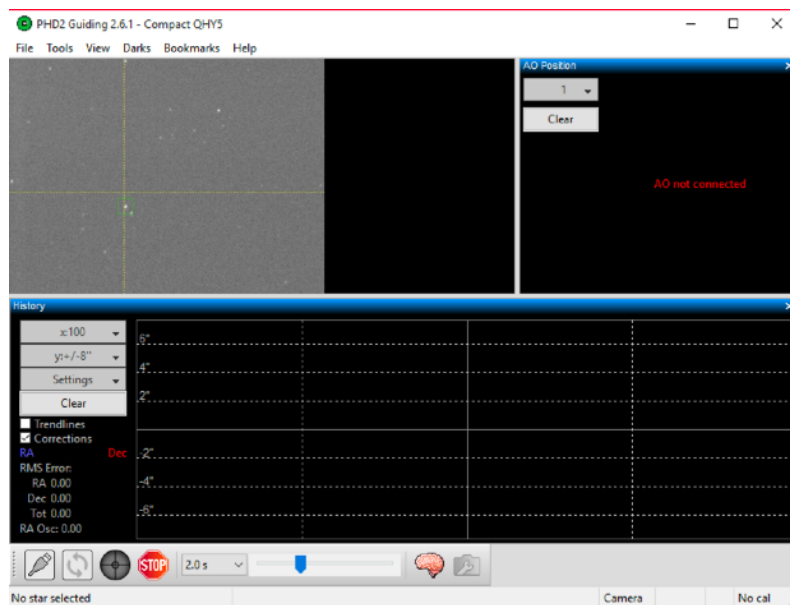


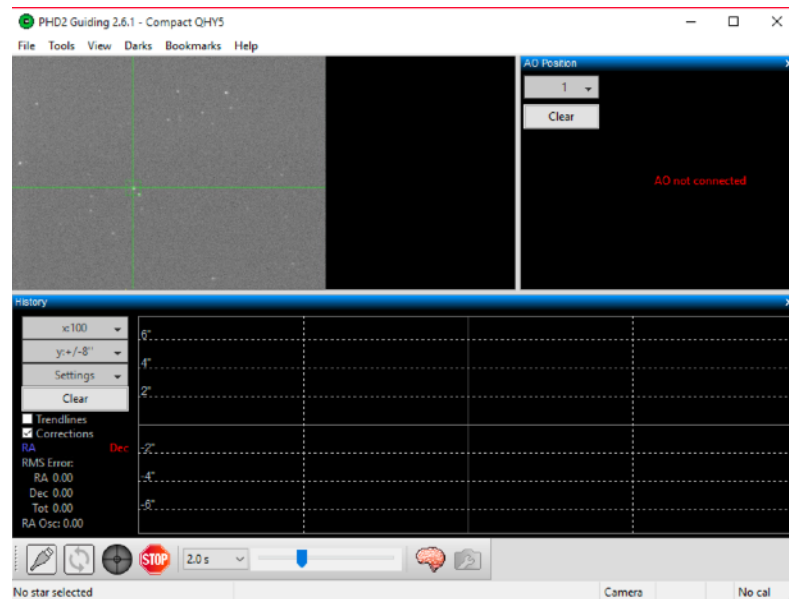
5) Now, even if the software does not strictly require it, it is advisable to match the X and Y camera axes (columns and rows of the sensor) with the axes of movement of the mount: in practice it is better to see on the screen that, if for example, you slightly move the mount in RA or DEC, the reference star moves horizontally or vertically, but not diagonally. In this way, every time PHD Guiding detects a tracking error, it send a correction to the mount only in one axis and not both (thus reducing the guiding error). Rotate the guide camera until slightly moving the telescope in RA or DEC, you see that the stars are moving perfectly horizontal or vertical.

6) Now press the "Stop" button and click with the mouse on a star not too bright on the screen. The star will be highlighted by a square with green border.



7) Then press the third button on the left (the one with the green icon): PHD2 Guiding will automatically start the calibration process that allows the software to "understand" which direction to move the guide star when a shift in the four mount movements (+ AR, AR, DEC +, DEC).





8) After the calibration, PHD2 Guiding will indicate the starting position of the guide star with two green lines (one horizontal and one vertical) and it will begin automatically guiding.

9) To check for guide quality, you can see the graph in the lower part of the PHD2 Guiding window.

This guide allows you to easily start guiding but PHD2 Guiding also has many advanced options to adjust and further improve the guide. So if you need it, since you still can't get perfectly pinpoint stars guiding your mount, I invite you to read the PHD Guiding user manual.

Drift Alignment using PHD Guiding

In order to record the best astrophotography pictures it's important to record pictures with exposition times as long as possible. In order to do that the equatorial mount polar alignment is fundamental. Here you find a great way to precisely polar align your mount using PHD2Guiding pre-loaded into the Eagle. Note: this guide is from Open PHD Guiding. All rights reserved.

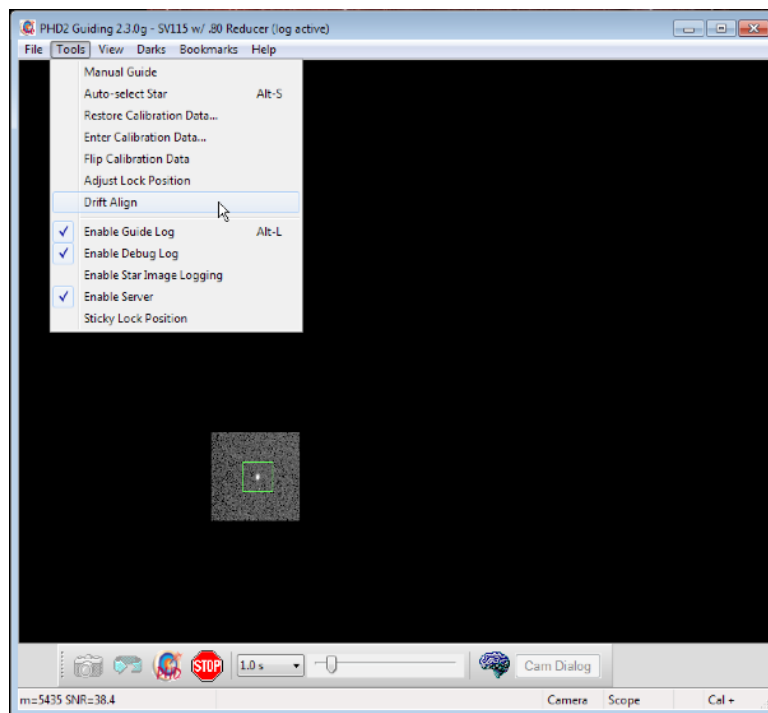
The drift align tool in PHD2 can be used to quickly obtain a precise polar alignment of your equatorial mount. The process takes a little bit of practice, but after doing it a few times, you should be able to obtain an accurate polar alignment in minutes.

Preparation

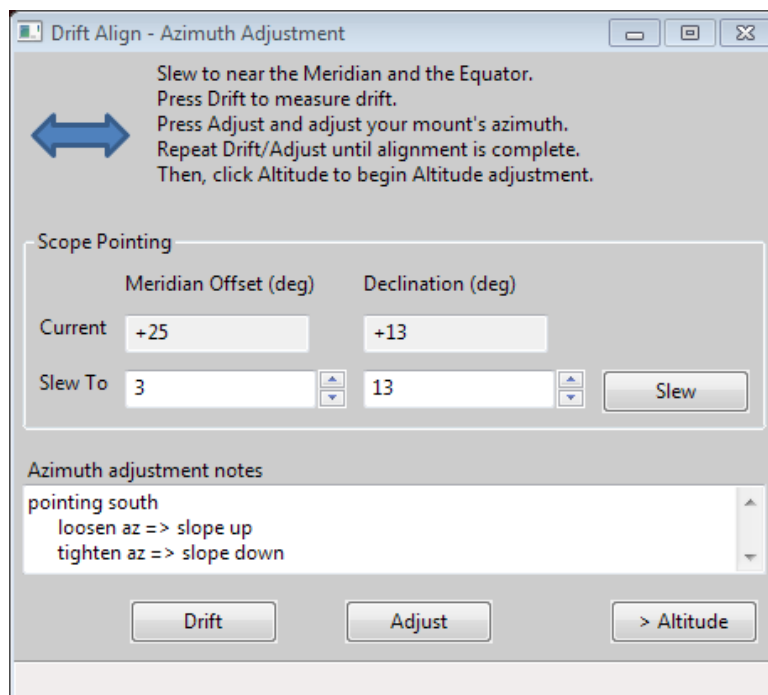
- Make sure your mount is reasonably level.
- Make sure your scope is balanced and ready for guiding.
- Try to get your mount's polar axis roughly aligned by using your mount's polar alignment scope if it has one. Otherwise, make sure the mount's polar axis is pointing towards the pole, and the altitude setting corresponds to your local latitude.
- Make sure you can see your computer screen when you are standing at the mount.
- Start PHD2 and connect your equipment.
- You should be using an up-to-date version of PHD2, preferably version 2.3.11 or newer.
- These instructions assume you have an ASCOM connection to your mount so PHD2 knows where your scope is pointing. You can still drift align without an ASCOM connection, see Note about ASCOM.
- Calibrate on any convenient guide star, preferably at a low declination.
- Make sure your PHD2 settings have the correct values for your guide scope focal length and your guide camera pixel size. (Brain => Global tab for focal length, Camera tab for pixel size)
- Now you are ready for drift aligning.

Azimuth Alignment

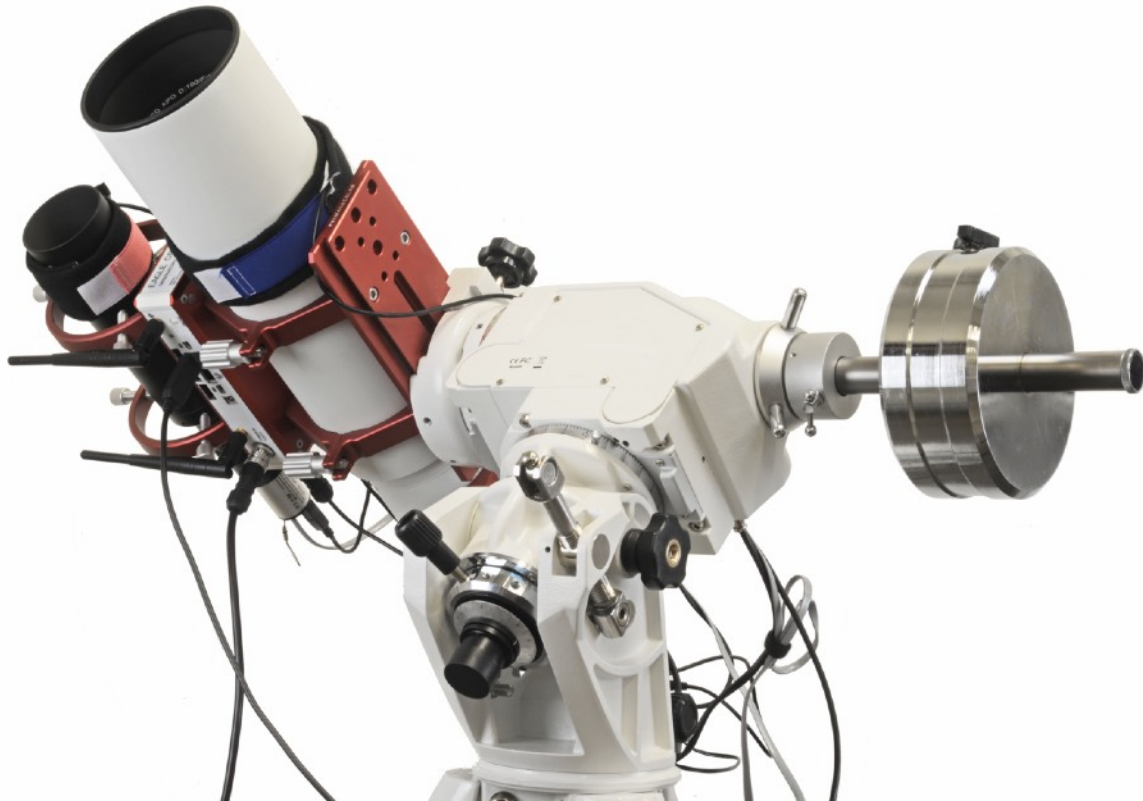
Open the Drift Align Tool:



You will see a window like this:



Position your scope for the Azimuth axis adjustment. Point near the Meridian and the celestial equator. You can either click the Slew button, or move the mount manually. Your scope should now be pointing something like this



And the Drift Align window will look like this

Drift Align - Azimuth Adjustment

↔

Slew to near the Meridian and the Equator.
Press Drift to measure drift.
Press Adjust and adjust your mount's azimuth.
Repeat Drift/Adjust until alignment is complete.
Then, click Altitude to begin Altitude adjustment.

Scope Pointing

	Meridian Offset (deg)	Declination (deg)
Current	+3	+13
Slew To	3	13

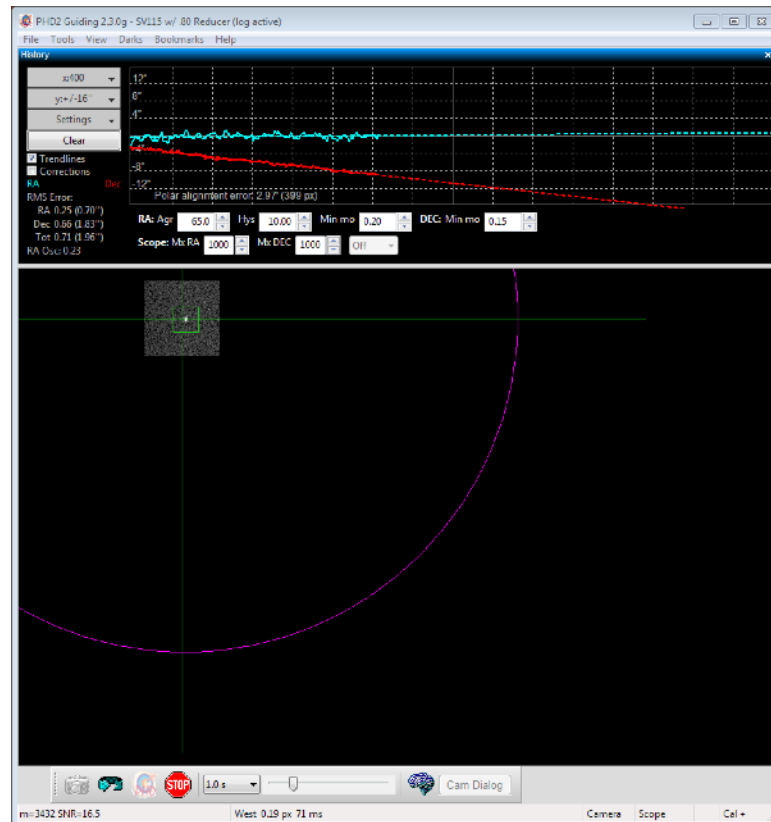
Slew

Azimuth adjustment notes

pointing south
loosen az => slope up
tighten az => slope down

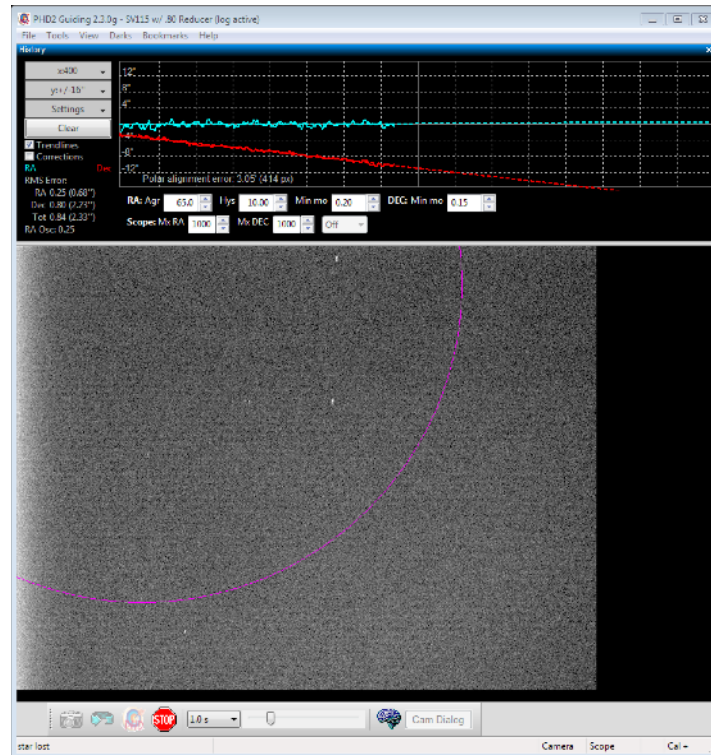
Drift Adjust > Altitude

Notice we are only a few degrees off the meridian ("Meridian offset"), and close to the equator (small value of Declination.). You are going to alternate between measuring the error (Drift), and adjusting the mount (Adjust). The rate of declination drift tells us the amount of alignment error. Each adjustment will reduce the error, and you repeat the process as many times as you need to get the error close to zero. Click Drift to start measuring the declination drift. PHD2 will select a guide star and start guiding. After a few moments you should see something like this:

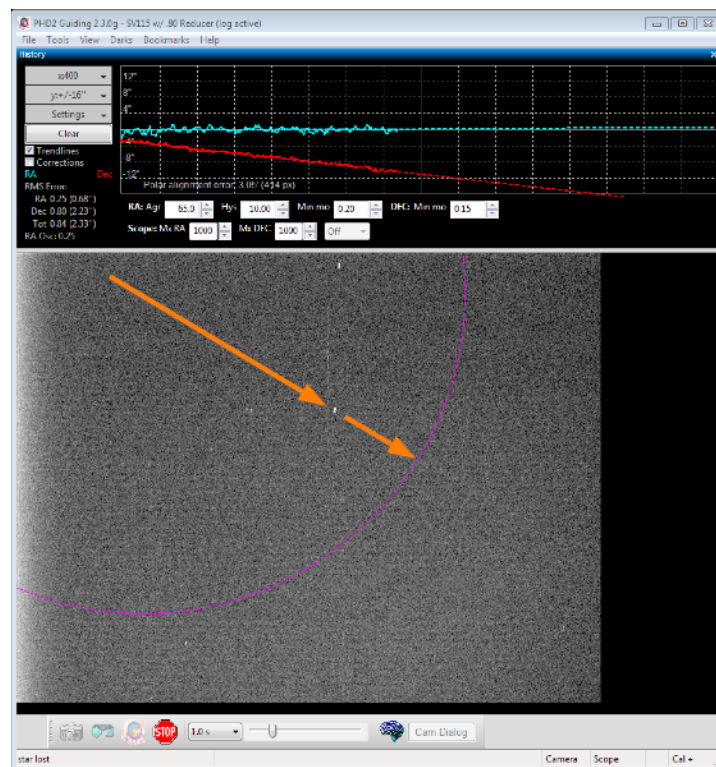


Pay particular attention to the Declination trend line (Red). At first the Dec trend line will be jumping up and down, but soon the noise should "average out" and the slope of the line will become somewhat stable. When that happens you are ready to adjust the mount's Azimuth. Our goal is to make the Dec trend line "flat" -- neither trending up nor down over time. By adjusting the mount's azimuth, you will change the slope of the Dec trend line.

If this is your first time adjusting Azimuth, you will not know which way to go--East or West? PHD2 does not know either, so you just have to guess, and you have a 50-50 chance of getting it right. If you choose correctly, the new drift line will be flatter (less steep, closer to horizontal). If you choose incorrectly, the drift rate will increase (more steeply downward in the example above.). Click the Adjust button. PHD2 will stop guiding, and you can make your adjustment. You'll see something like this.

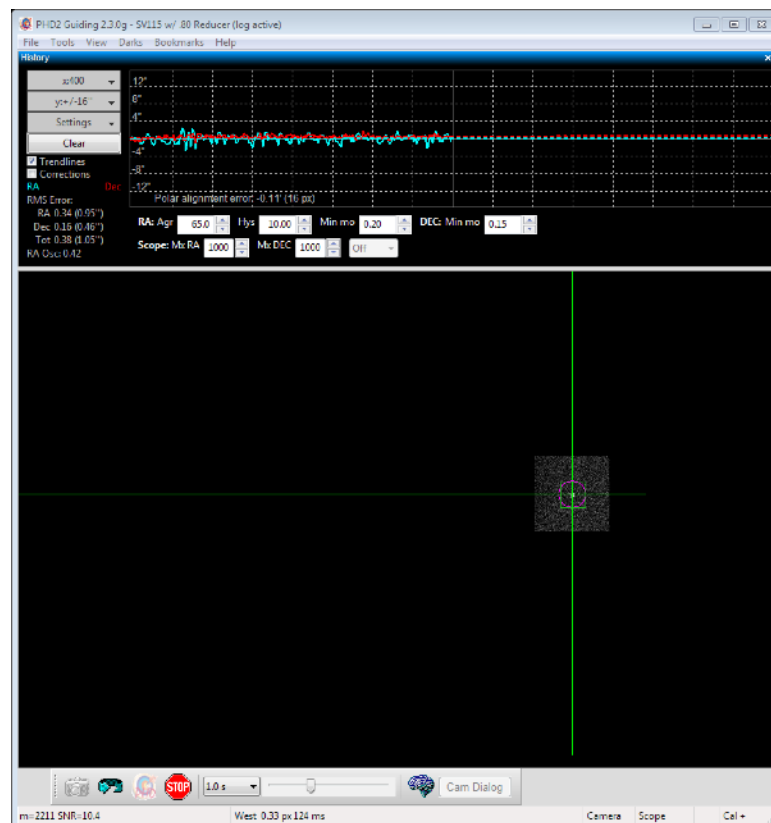


Slowly turn your mount's Azimuth adjustment, watching the screen and moving the guide star towards the magenta circle. The magenta circle shows how far the guide star needs to move. The magenta circle is larger when the Dec slope is steeper, and it may initially be so large that it is not visible on the screen. That's to be expected; if it is not visible, just



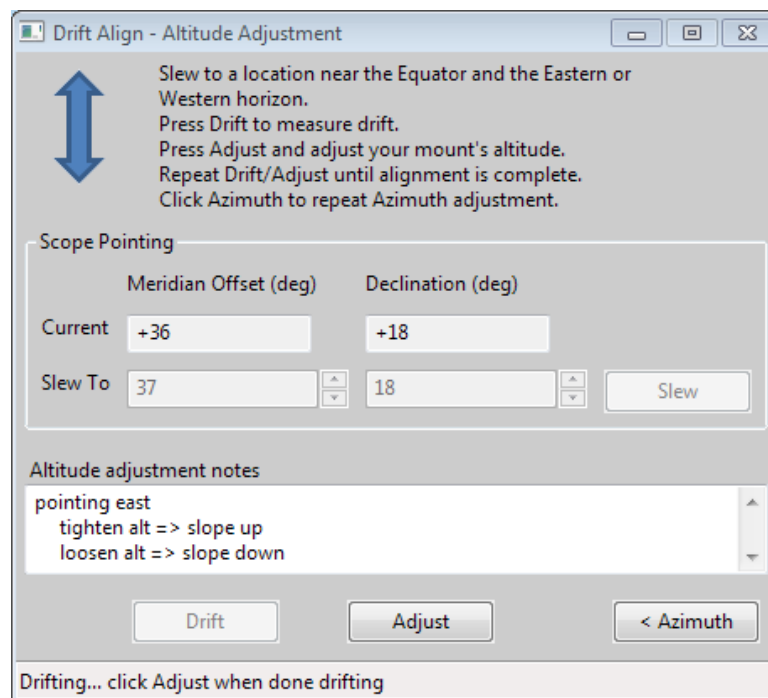
move the guide star approximately the width of the screen. If you do see the magenta circle, you should move the guide star to the circle, like this:

After moving the guide star, click Drift to make another measurement. Before you click Drift, it's OK to nudge the mount to re-center the star, or to find a different star, or to get back closer to the meridian. Also, you can choose your own guide star by clicking on it, or just let PHD2 choose. After a short time drifting, you will have another Dec trend line. Did it get better (closer to horizontal) or worse (away from horizontal)? Make a note to yourself in the "Azimuth adjustment notes" area of describing how you adjusted azimuth, and which direction the Dec slope moved. You can use this information next time you drift align so you do not have to guess which way to make the azimuth adjustment. For example, with my setup, turning the azimuth knob clockwise makes the slope go down. Having the note there reminds me that I need to turn the azimuth knob counter-clockwise to make the slope go up. Repeat the measurement and adjustment of the mount until you achieve a good flat horizontal dec trend line, like this:



Altitude Alignment

Now, you will need to repeat the process for the mount's Altitude adjustment. Click the Altitude button; the Drift tool will now look like this:



Drift Align - Altitude Adjustment

↑↓

Slew to a location near the Equator and the Eastern or Western horizon.
Press Drift to measure drift.
Press Adjust and adjust your mount's altitude.
Repeat Drift/Adjust until alignment is complete.
Click Azimuth to repeat Azimuth adjustment.

Scope Pointing

	Meridian Offset (deg)	Declination (deg)
Current	+36	+18
Slew To	37	18

Slew

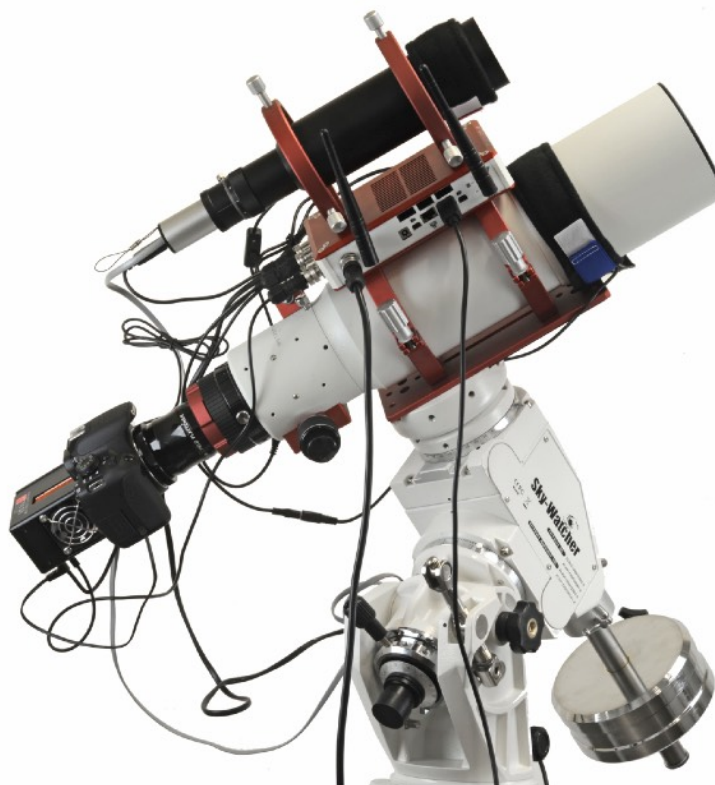
Altitude adjustment notes

pointing east
tighten alt => slope up
loosen alt => slope down

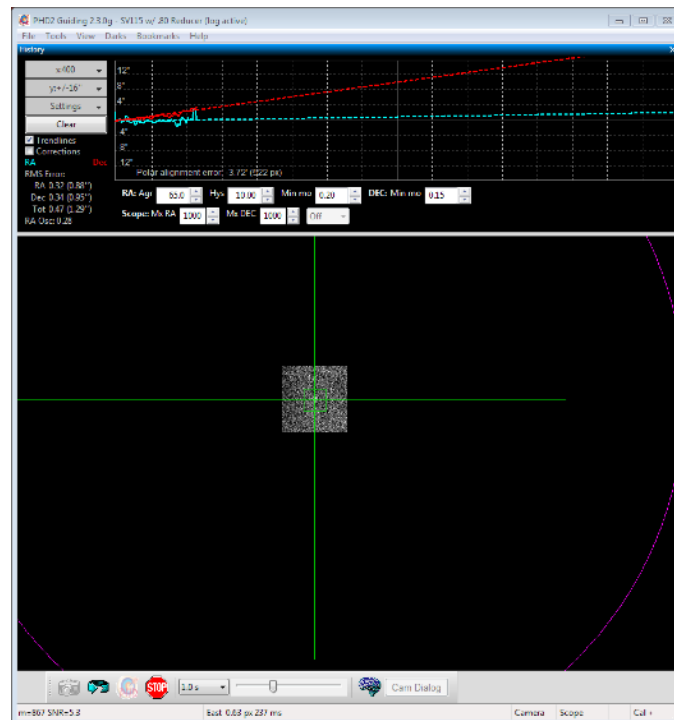
Drift Adjust < Azimuth

Drifting... click Adjust when done drifting

Click Slew or manually slew your mount towards the horizon (East or West):



The exact position is not important, but 25-35 degrees above the horizon works well. Click Drift to start drifting.



Drift until you have a stable Dec slope. Click Adjust, then turn the mount's Altitude adjustment knob. Use your notes recorded in the "Altitude adjustment notes" area from a previous session to determine which way to turn the knob to move the slope in the desired direction. For example, with my setup I turn the altitude knob clockwise to make the slope go "down". Just as with the Azimuth adjustment, repeat cycles of Drift and Adjust making the measurements and moving the guide star to the magenta circle. Again, the goal is to get the dec drift line to be horizontal.

Note about ASCOM

The instructions and screenshots above correspond to what you see in PHD2 with an ASCOM connection to the mount. There are a couple differences if you do not have an ASCOM connection.

- The scope pointing information and the Slew button are disabled. You'll need to manually slew the mount to the required location.
- The solid magenta circle becomes a dashed-line magenta circle. The dashed magenta circle represents a limit to how far the guide star needs to move, not the exact distance. We only know that the star should not move past the circle. Rather than moving the star all the way to the circle, you may want to only move it half-way or so as an initial guess. You can use Bookmarks to keep track of where the guide star was in each Drift/Adjust iteration.

Q & A

Q: Where to save my pictures or videos?

A: You can save captured images or videos directly on the hard disk of EAGLE. You can also connect a USB stick to one of the USB ports of the EAGLE, and then set the capture software you use to save images directly into the USB stick. This way, if you have an external computer that you use to process images for astrophotography, you can easily move your images.

Q: Can I use EAGLE as a normal desktop computer?

A: Sure. EAGLE has an HDMI monitor port to connect an external display. Then connect a USB mouse and a USB keyboard to 2 USB ports of the EAGLE. Connect the power supply (or battery) to the power port of the EAGLE and press the on/off button to make using the EAGLE as it was a normal desktop computer.

Q: Can I change the operating system of EAGLE?

A: The remote control settings of your EAGLE are implemented in the operating system. So if you format the EAGLE's SSD drive, you will lose the functions of the wireless remote control. Since the version of the operating system does not imply real changes in the functionality of the telescopes (that indeed depend on the astronomy software installed), we advise you not to make changes in the EAGLE pre-installed operating system.

Q: What devices can I use to control EAGLE remotely?

A: You can use any smartphone, tablet (running iOS, Android or Windows Mobile) or computer (with Windows or OSX) installing the application "Microsoft Remote Desktop". For ease of use we recommend devices with a screen size of at least 8 inches.

Q: Can I command EAGLE from my Apple computer?

A: Sure. Access to the OS X App Store and search for "Microsoft Remote Desktop" app. Install it and follow the instructions in this manual to set the remote control.

Q: Can I control multiple devices simultaneously EAGLE?

A: No, when you access to EAGLE with a new device, the connection to the previous devices is stopped and EAGLE will only appear in the new device.

Q: I have a problem with Windows operative system, can I restore the factory settings?

A: Before shipment, we record a "Windows recovery point" in the EAGLE units so you can immediately return back to the factory settings in an very easy way. Restoring won't affect your personal files but most likely will automatically solve your problem with Windows. In order to make a system restore please:

- 1) go to "Control panel"
- 2) select "Recovery"
- 3) select "Open System Restore" then press Next
- 4) choose the restore point (you will find the "EAGLE new" restore point")
- 5) press "Next" and then "Finish"

D: During remote connection, power out and USB ports are no more active in the EAGLE Manager software, how can I fix this?

A: Enter in ADVANCED SETTINGS and click on RECONNECT button, ports will be reactivated.

D: I can't connect to EAGLE WiFi network, how can I fix this?

A: if during the use of the EAGLE you can no more access to its WiFi network, both in AP and HOST mode, press the RESET button on the left of the POWER button on the EAGLE case. This will reset WiFi network in AP mode. Then, in the device you use to control EAGLE from, you have to select the WiFi created by the EAGLE (EAGLE2XXXXX) and restart Remote Desktop software.

D: Sometimes WiFi connection to the EAGLE drops out and then connection restarts, is this normal?

A: Yes, sometimes it's normal to experience a short WiFi disconnection, then the EAGLE will automatically reconnects to the WiFi and you will normally be able to continue remote control.

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.



**European
Recycling
Platform**

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 authorized by PrimaLuceLab .
 - Invasive interventions or tampering with internal and/or external parts.
 - Missing of the invoice (or receipt) of purchase.

WARRANTY DURATION: 24 months

TERMS OF SERVICE

Technical assistance is performed exclusively by PrimaLuceLab or its authorized 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.