WandererCover V4 Series

Motorized Flat Panel

User Manual

2025.4.5



Contents

1.Introduction **1**

2.Installation and use **4**

2.1 Driver installation *4*
2.2 Connecting the WandererCover (Using N.I.N.A. as an Example) *5*
2.3 Set Opening and Closing Angles *7*
2.4 Control Flat Panel Dew Heater in N.I.N.A. *9*
2.5 Control Using Infrared Remote *10*

3.Control with ASIAIR/StellaVita **12**

4.Firmware upgrade **15**

5.Specification/Dimension **17**

6.FAQs **18**

1.Introduction

WandererCover V4 series are available in three models:

1. **WandererCover V4-EC** (Illumination Diameter: 80-240mm)
2. **WandererCover V4-EC IR** (Illumination Diameter: 80-240mm)
3. **WandererCover V4 Pro-EC** (Illumination Diameter: 280-380mm)



The WandererCover V4-EC, WandererCover V4-EC IR, and WandererCover V4 Pro-EC are motorized flat panels designed for professional astrophotographers, and they all **support control through ASCOM, INDI and ASIAIR/StellaVita**

Currently, the WandererCover V4-EC and WandererCover V4-EC IR are available in seven illumination diameter sizes: 80mm, 100mm, 125mm, 150mm, 190mm, 225mm, and 240mm. The WandererCover V4 Pro-EC is available in three illumination diameter sizes: 280mm, 320mm, and 380mm, catering to telescopes of various apertures.

The only difference between the WandererCover V4-EC and the WandererCover V4-EC IR is the addition of an infrared remote control feature. This allows users to control the

opening/closing and illumination of the flat panel via an infrared remote, making it particularly convenient for portable setups and ASIAIR users.

The WandererCover V4 Pro-EC is a motorized flat panel designed for large-aperture telescopes. It features a more powerful motor and a more robust structural design to accommodate the increased requirements of larger systems.

The differences between the three models are summarized in the following table:

	V4-EC	V4-EC IR	V4 Pro-EC
Illumination Diameter Available（mm）	80 to 240	80 to 240	280 to 380
Encoder	Yes	Yes	Yes
Flat Panel Heater	Yes	Yes	/
IR Remote	/	Yes	/
Installation	Cable ties	Cable ties	Cable ties/Bracket
Control with ASIAIR/StellaVita	Yes	Yes	Yes
ASCOM	Yes	Yes	Yes
INDI	Yes	Yes	Yes

Feature 1: Made of 100% aluminum alloy + carbon fiber material, ensuring rigidity while minimizing weight. The total weight of the 80mm model is only 254g, and the total weight of the 240mm model is only 594g. Such a lightweight design means that it will not place unnecessary burden on the lens hood or equatorial mount.

Feature 2: Compared with the previous generation product (WandererCoverV3), it uses a stronger motor, with a load capacity increased by 50%. After testing, the life of WandererCover V4-EC exceeds 3,000 opening and closing cycles. The built-in micro encoder provides real-time and accurate feedback on the current position of the flat panel. The positioning accuracy is higher than ±0.5 degrees, and the opening and closing angle can be precisely controlled. You no longer need to look through the camera to see if the cover is open or closed.

Feature 3: In humid areas, dew will occur on the flat plate at night. If the dew does not evaporate in time, it will easily make the inside of the telescope moist after closing, which

may cause the lens to become damp and moldy in the long term. V4-EC and V4-EC IR has built-in heating elements to keep the cover dry all night or quickly evaporate dew in the morning. The dew heater can be controlled in NINA advanced sequence using the plugin "Device Actions and Commands".

Feature 4: It can set the opening and closing angles respectively, with the maximum opening angle exceeding 270 degrees, thus adapting to the installation of different telescopes.

Feature 5: WandererCover V4-EC and V4-EC IR is capable of automatically detecting opening and closing position, which allows users to remotely set the appropriate opening and closing position.

Feature 6: It provides 255 levels of high-frequency PWM dimming. Compared with WandererCover V3, the PWM frequency is doubled to further avoid bandings. 255 levels of dimming meet the needs of flat-field shooting in most situations.

2. Installation and use

Pass the included nylon ties through the two slots of the WandererCover and tighten them（Figure1）, then fix the WandererCover to the tube or dew shield of the telescope. Connect the 12V power supply and connect to the PC. Note that plugging in USB or connecting to 12V power will both cause the power indicator to light up.



Figure1

For the WandererCover V4 Pro-EC, the bottom of the motorbox is equipped with M3 and M4 threaded holes, allowing for installation via mounting brackets.

WandererAstro provides corresponding bracket kits to facilitate mounting the WandererCover onto Losmandy/Vixen dovetail plates or truss telescopes (such as the Celestron HD series, RASA series, and GSO truss RC telescope series).

2.1 Driver installation

Visit the official website www.wandererastro.com to download the WandererEmpire software (Figure 2).



Figure 2

2.2 Connecting the WandererCover (Using N.I.N.A. as an Example)

After installing WandererEmpire, double-click to open the software. In the left-side menu, locate and select the "WandererCover" option (Figure 3).

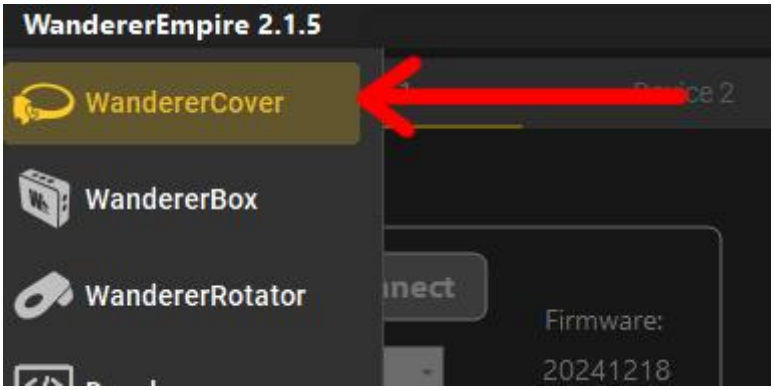


Figure 3

At the top of the interface, you will see options labeled "Device 1," "Device 2," and "Device 3." This indicates that WandererEmpire supports simultaneous connections for **up to three WandererCovers**. If you need to operate more than three WandererCovers on a single PC, please contact us (Email: skywatcherwsl2000@gmail.com, Frank Wang).

If you know the COM port of the WandererCover (the COM port can be found in Device Manager; Wanderer devices have a CH340 suffix), select "Select COM Manually" and choose the COM port from the dropdown menu on the left (Figure 4). Click **Connect**, and

WandererEmpire will automatically identify and display the WandererCover's model and firmware version.

If you are unsure which COM port to select, deselect "Select COM Manually" and click **Connect**. WandererEmpire will sequentially search for the COM port associated with the Wanderer WandererCover and connect automatically.If your computer has multiple COM ports, this process might be slow and could result in connection failures. Once WandererEmpire automatically identifies the correct COM port, it is recommended to enable "Select COM Manually" and select the identified COM port to speed up future connections.

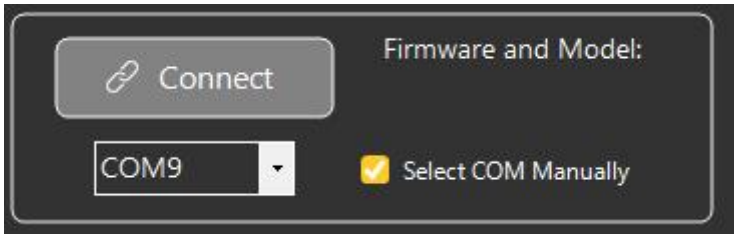


Figure 4

Next, locate the corresponding ASCOM device driver in N.I.N.A. If you connected the WandererCover under the "Device 1" option in WandererEmpire, select **WandererEmpire Device 1** in N.I.N.A. (Figure 5). Similarly, for devices 2 and 3, select **WandererEmpire Device 2** and **WandererEmpire Device 3**, respectively.

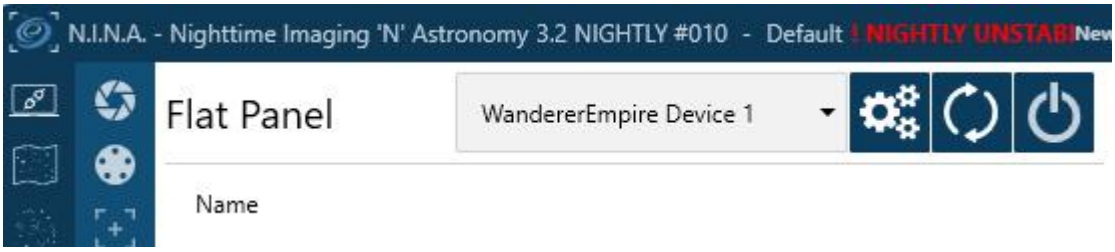


Figure 5

Simply click **Connect** , and the ASCOM driver will establish communication with WandererEmpire. Once connected, operations in N.I.N.A. will be synchronized and equivalent to those in WandererEmpire. For example, if you rotate the WandererCover using N.I.N.A., you will see the angle in WandererEmpire update simultaneously.

After completing the steps above, for subsequent connections, you only need to click **Connect**  in N.I.N.A. The ASCOM driver will automatically launch WandererEmpire and connect the device using the saved configuration, **no need to manually open WandererEmpire**.

2.3 Set the opening and closing angles

Once connected, in WandererEmpire, you can input the angles in the text boxes and click "OK" to configure the opening and closing angles(Figure 6). Upon successful configuration, the new opening and closing angles will be displayed. Generally, the default closing position is set to approximately 20 degrees.

After configuring the angles, click "Open/Close" to test whether the set positions are appropriate. If the positions are not suitable, adjust the settings until you find the optimal opening and closing angles.

When the WandererCover is not moving, you can manually open and close it. Close the flat panel by hand, then read the real-time angle displayed in WandererEmpire and set it as the closing angle. Similarly, adjust the opening angle by opening the panel manually and recording the displayed angle.

Note: The motor has significant rotational damping. When manually opening or closing the panel, avoid applying excessive force to prevent damage to the motor.

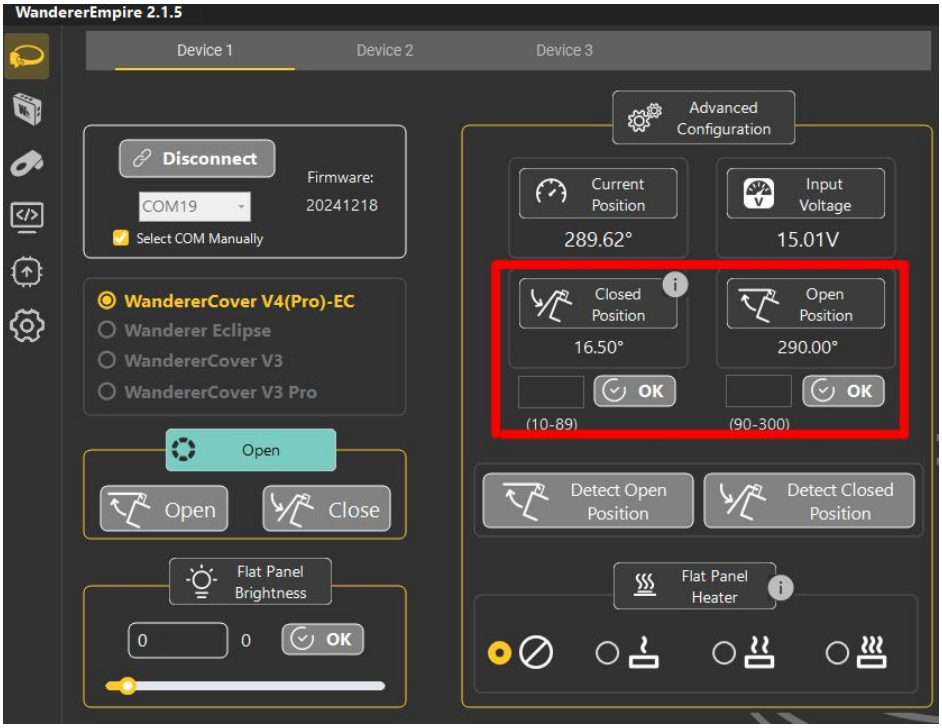


Figure6

When it is inconvenient to observe whether the flat panel is open or closed, you can click **Detect Open/Close Position**. The WandererCover will stop upon detecting resistance and set the current position as the open or close position. This feature is only supported on the **WandererCover V4-EC** and **WandererCover V4-EC IR** .

Note that it is always recommended to set the open and closed angles manually! Use automatic detection as the last option only when the flat panel angle cannot be observed.The angle detected is affected by many factors and success is not guaranteed. Do not try multiple times if unsuccessful.

2.4 Control Flat Panel Dew Heater in N.I.N.A.

When the ambient humidity is high, the dew heater can be turned on (Figure 7). The max level is suitable for quickly evaporating the dew that has formed, and the min level is suitable for keeping the panel from condensation during the night. Please note that it is **not recommended** to turn the heating power to maximum during imaging, otherwise excessive thermal airflow may affect image quality. (The maximum power can let the surface

temperature of the flat panel reach 50 degrees Celsius or above)

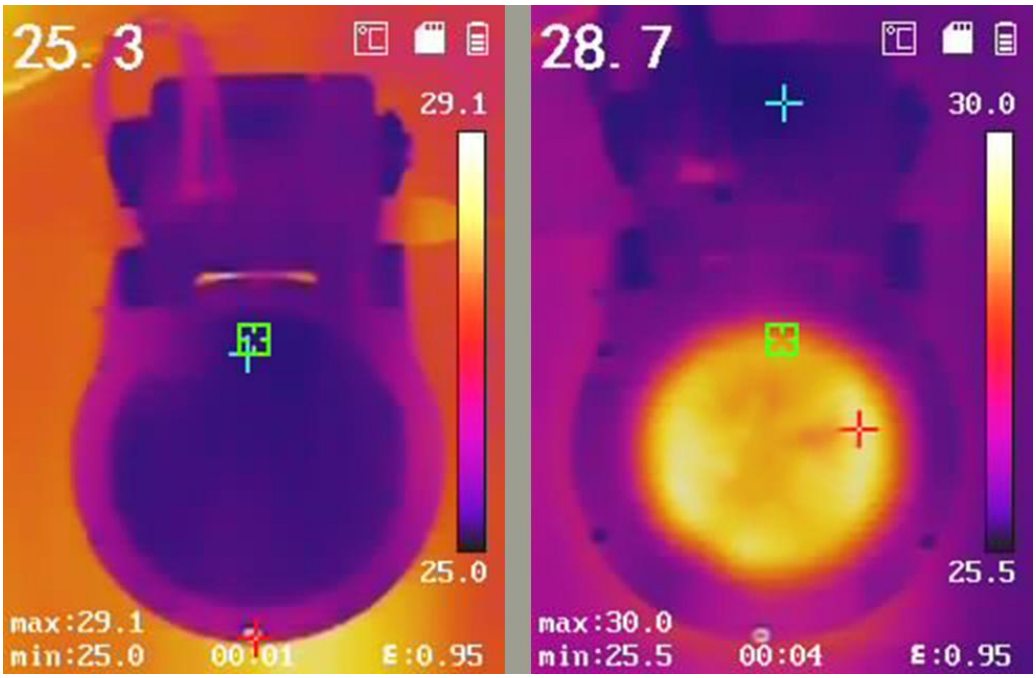


Figure 7 Dew heater turned off(left) and on(right)

Using N.I.N.A.'s **Device Actions and Commands** plugin (Figure 8), you can control the flat panel's heating function within the Advanced Sequencer.



Figure 8

After connecting the ASCOM driver, add a **Device Action** command to the sequence and select the flat panel. You will see four operations provided by the driver (Figure 9): Turn Off Heating, Heating Level 1, Heating Level 2, and Heating Level 3. Leave the parameters section blank.

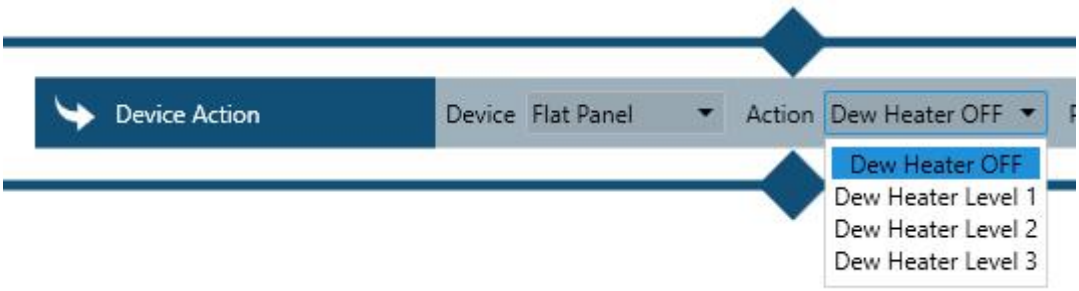


Figure 9

2.5 Control Using Infrared Remote

For **WandererCover V4-EC IR**, an infrared remote controller is included as standard (Figure 10). Before using the infrared remote to control the panel, you must first configure the opening and closing angles through the **WandererEmpire** software, as described in Section 2.3. Once the configuration is complete, you can unplug the USB cable and power the motorized flat panel using only the DC power cable.



Figure 10

The button at the top of the infrared remote control is used to control the opening and closing of the lens cover, while the two buttons below are used to adjust the brightness of the flat panel. The **up arrow** button increases the brightness, and the **down arrow** button decreases the brightness.

When using the remote control, please ensure that you are within a 15-meter range of the WandererCover and that there are no obstructions. The infrared receiver of the WandererCover V4-EC IR is located on the back of the motorbox. If you are facing the WandererCover, the remote control signal may not be received.

Note: When controlling with the infrared remote, the brightness adjustment is limited to **8 levels** for convenience, unlike the **255 levels** available when using the ASCOM driver.

3.Control with ASIAIR/StellaVita

Starting from firmware version 20250404, the WandererCover V4-EC, WandererCover V4-EC IR, and WandererCover V4 Pro-EC will support control via ZWO ASIAIR Plus, ToupTek StellaVita, and any device capable of controlling the DC switch (ZWO ASIAIR Mini cannot control the DC switch and does not support controlling the WandererCover). If your firmware is not up to date, please update it according to the instructions in Chapter 4.

To clarify, the following will use the ASIAIR Plus as an example to explain how to control it.

When using ASIAIR for control, the DC input of the WandererCover needs to be connected to the DC output of the ASIAIR. The PC port of the WandererCover can be connected to the USB port on the ASIAIR or any powered USB port. By controlling the on/off state of the DC port according to specific rules (Figure 10), the WandererCover can be controlled.

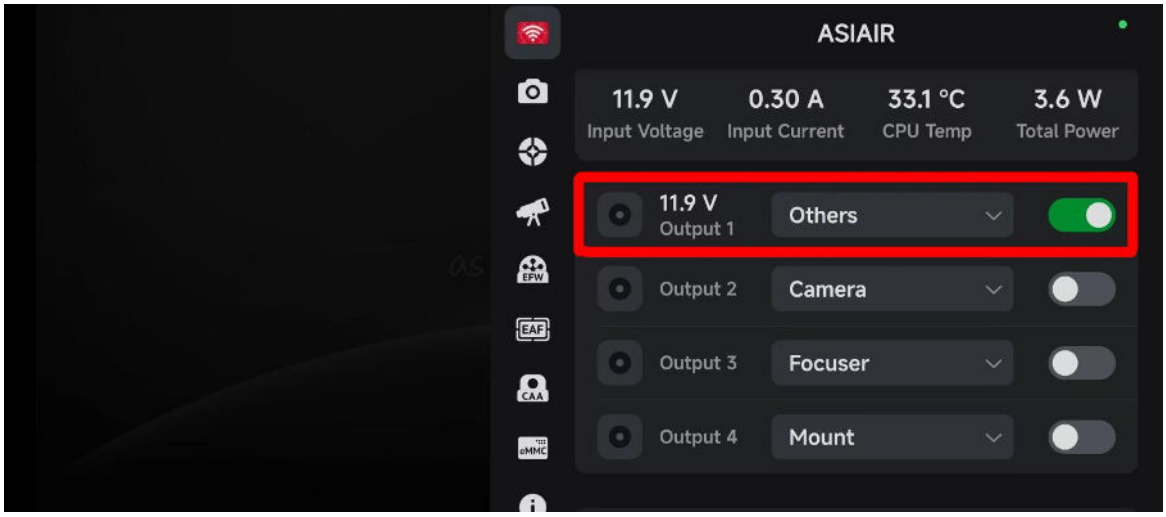


Figure 10

Control Methods:

Default Standby State: Keep the DC port in the powered-on state for more than 10 seconds.

Open/Close the Cover: In the standby state, turn off the DC and turn it back on within 2-4 seconds to activate the open/close operation. If the current angle is closer to the closed

position, the opening operation will be performed; otherwise, the closing operation will be performed. The open and close angles need to be set in advance in WandererEmpire (refer to Chapter 2).

Adjust Flat Panel Brightness: In the standby state, turn off the DC and turn it back on within 2 seconds to activate the increase in flat panel brightness. Repeating this operation will cycle the brightness from 0 to the maximum brightness. For ease of operation, the number of brightness levels is limited to nine (0, 1, 2, 4, 8, 15, 30, 60, 120, 255), covering the full brightness range of the flat panel, with the brightness difference between each level approximately equal to one F-stop.

Quickly Turn Off the Flat Panel: In the standby state, turn off the DC and turn it back on within 4-10 seconds to immediately set the flat panel brightness to 0.

Custom Flat Panel Brightness: To achieve more precise adjustment of the flat panel brightness, WandererCover provides three editable custom flat panel brightness levels for user convenience. Custom brightness levels need to be set in advance in WandererEmpire (WandererEmpire version must be at least 2.2.2). As shown in Figure 11, first adjust the flat panel brightness to the desired value (0-255), and then click the three buttons in the red circle to save the current brightness to one of the three custom brightness levels in WandererCover.

When using ASIAIR for control, first turn off the DC in the standby state and turn it back on within 4-10 seconds (this step is the same as the quick turn-off flat panel operation). Then immediately turn off the DC again and turn it back on within 2-4 seconds to activate Custom Brightness 1. Immediately turn off the DC again and turn it back on within 2-4 seconds to activate Custom Brightness 2. Similarly, repeat the operation to activate Custom Brightness 3. This cycle will allow the flat panel to switch between brightness 0, Custom Brightness 1, Custom Brightness 2, and Custom Brightness 3.

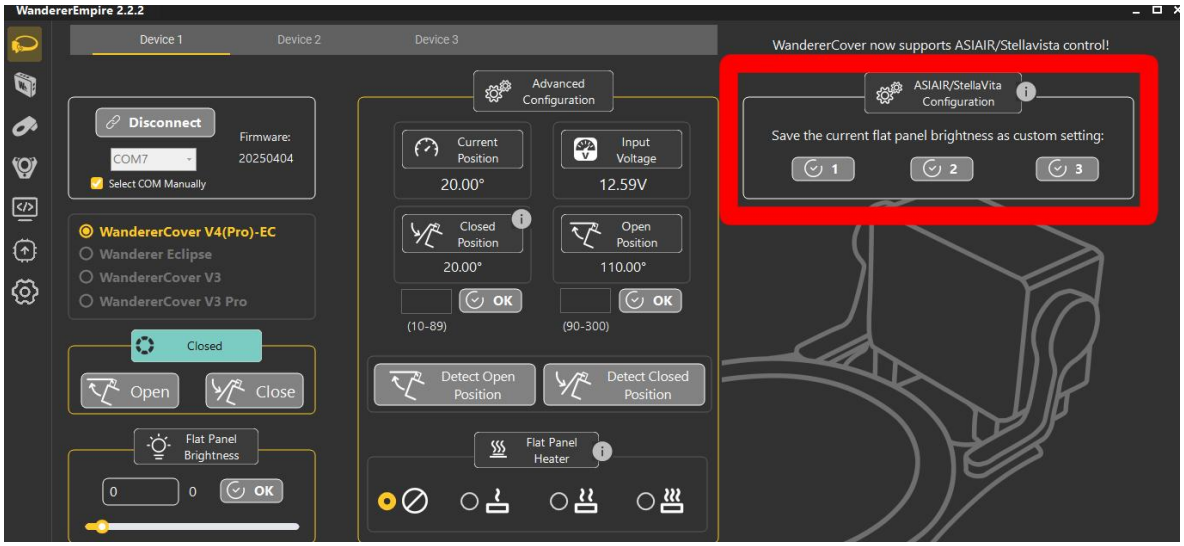

WandererEmpire 2.2.2
Device 1
Device 2
Device 3
Disconnect
COM7
Select COM Manually
Firmware:
20250404
WandererCover V4(Pro)-EC
Wanderer Eclipse
WandererCover V3
WandererCover V3 Pro
Closed
Open
Close
Flat Panel Brightness
0
0
OK
Advanced Configuration
Current Position
20.00°
Input Voltage
12.59V
Closed Position
20.00°
Open Position
110.00°
OK
(10-89)
OK
(90-300)
Detect Open Position
Detect Closed Position
Flat Panel Heater
WandererCover now supports ASIAIR/Stellavista control!
ASIAIR/StellaVita Configuration
Save the current flat panel brightness as custom setting:
1
2
3

Figure 11

4.Firmware Upgrade

The firmware upgrade feature has been integrated into WandererEmire. Click on the left-side menu to access the firmware upgrade interface (Figure 11). We recommend carefully reading the firmware upload tutorial on the right side of the interface.

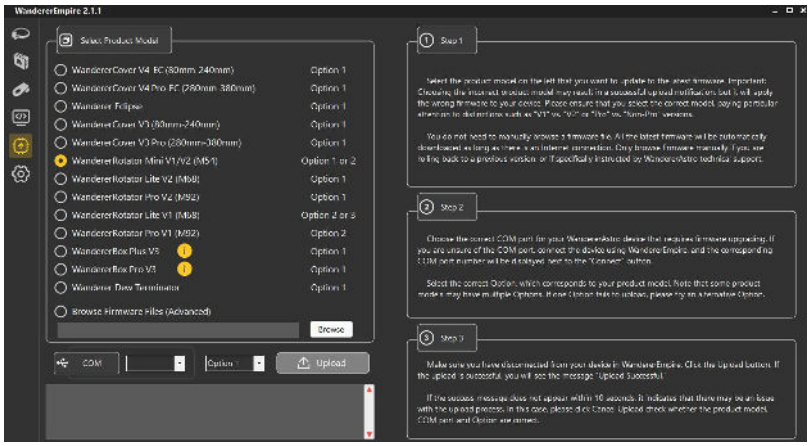


Figure 11

On the left side of the interface, select the corresponded WandererCover model (Figure 12).

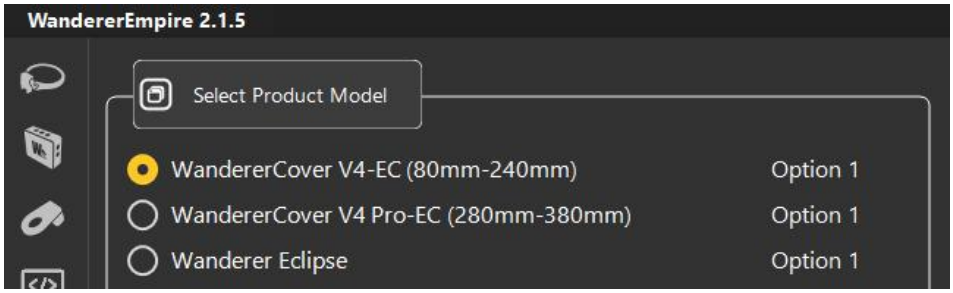


Figure 12

Below, select the correct COM port (if unsure, refer to Chapter 2.2 to automatically search for and note the COM port) and the Option1 (Figure 13). After completing the settings, click "Upload." Upon successful upload, the dialog box will confirm that the upload was successful. Please note that before the upload, you need to disconnect from the WandererCover in WandererEmire, or it will result in an error indicating a failure to open the COM port.



Figure 13

5.Specification/Dimension

WandererCover V4-EC/V4-EC IR

Illumination diameter（mm）	80	100	125	150	190	225	240
Weight（g）	254	281	322	365	448	553	594
Outer diameter（mm）	105	125	150	175	215	250	265
Heating Power（W）	3		9			15	
USB	2.0 Type-B						
Power	12V 2A DC5521						

WandererCover V4 Pro-EC

Illumination diameter（mm）	280	320	380
Weight（g）	940	1120	1360
Outer diameter（mm）	310	350	410
USB	2.0 Type-B		
Power	12V 2A DC5521		

6. FAQs

Q: What illumination diameter should I choose?

A: The illumination diameter should be slightly larger than the diameter of the telescope tube or the dew shield. For example, if the outer diameter of the dew shield of the SharpStar 107PHQ is 138mm, you should choose the 150mm model.