VERSION 1.1

JULY 1, 2020

FALCON ROTATOR

INTRO

Thank you for purchasing Pegasus Astro – Falcon Rotator. Falcon Rotator is a light-weighted, low profile camera field rotator. Do not be fooled by its thin size! It can lift and handle heavy image trains – dead accurate! Very easy to operate via ASCOM drivers or standalone software will make your life easier to automatically adjust with precision your camera field.
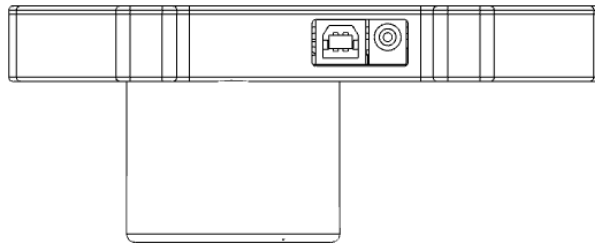
DEVICE CARE

- Rotator electronics are protected from moisture but it is not waterproof and it should be kept clean and dry.
- Excessive moisture for long periods of time can damage electronics and connectors
- Do not allow solvents or chemicals to come into contact with the device
- Store rotator indoor in a dry room when not in use for long time
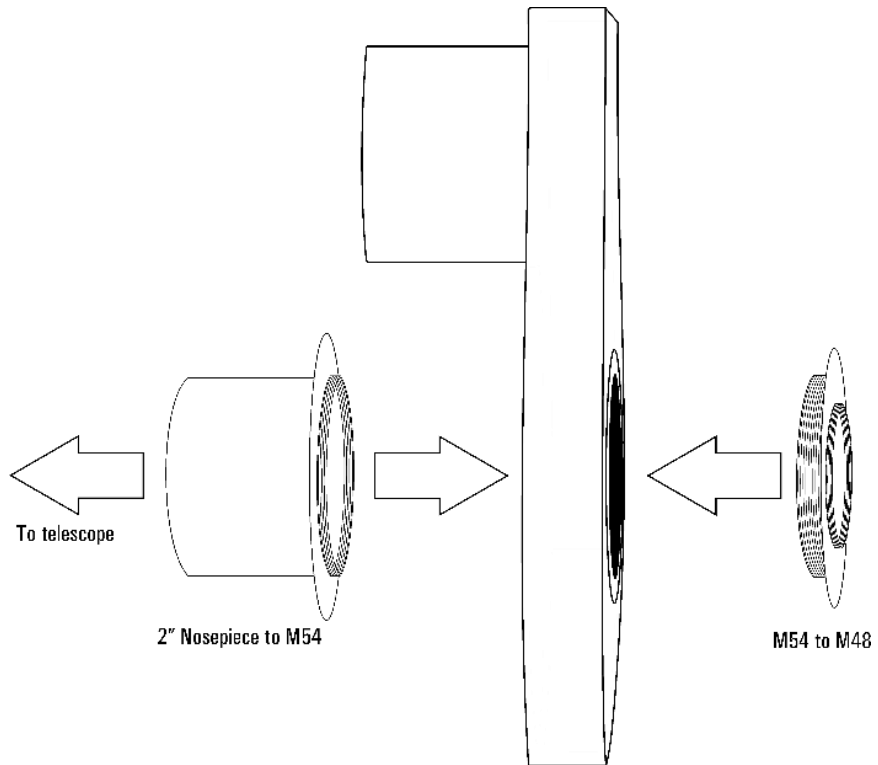- Do not open the rotator lid.

DESIGN OVERVIEW
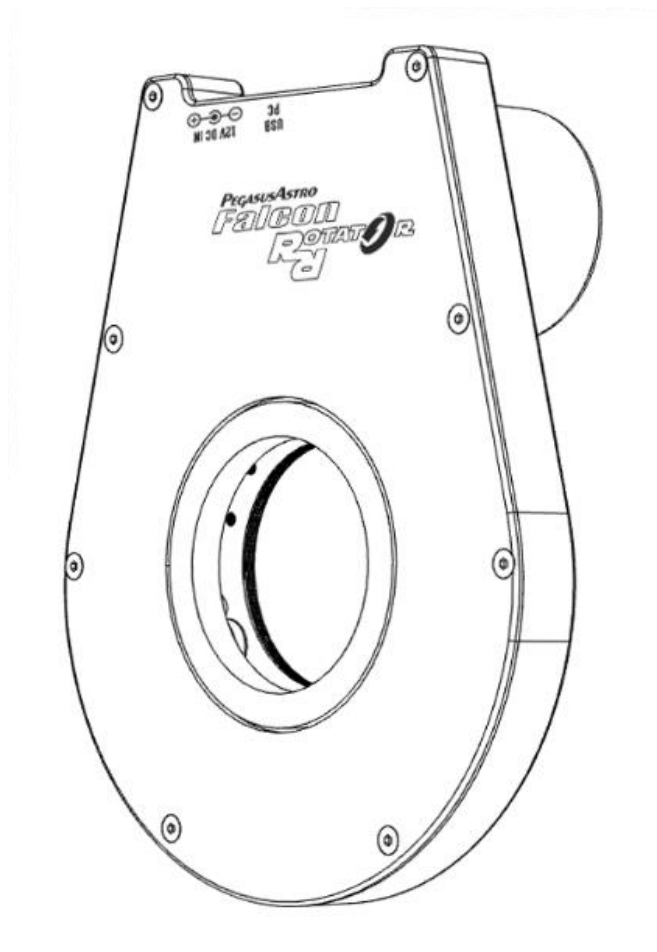
Bottom View

From left to right: USB2 TypeB Socket, 12V DC Input Socket (center pin positive)

Adaptation to telescope

To telescope

2" Nosepiece to M54

M54 to M48

	1 x Falcon Rotator	1 x M54 male to 2" Nosepiece
What is inside the box		
1 x M54 Male to M48 Male Adapter	1 x USB2 Type B cable (1.8m)	

OPERATING INSTRUCTIONS

⇒ Please check orientation of rotator displayed at the above image (USB and Power Cable on top).
⇒ Attach both M54 adapters to rotator body (one adapter on each side).
⇒ Attach the rotator to your telescope and to your imaging setup (camera / fitter wheel / OAG etc).
⇒ Plug the USB2 cable to the rotator and to your computer.
⇒ Plug the power supply (battery or power pack) into the "12V DC IN" socket.
⇒ Download USB drivers, standalone software or ASCOM drivers from pegasusastro.com/support in order to connect to the device.

Important Note: Please make sure that all of your cables are loose enough to allow a half rotation.

POWER INPUT

Rotator requires DC 12V – 13.8V in order to drive with precision its stepper motor. We strongly recommend to use our branded low ripple power supply unit of **12V DC**. A 13.8V lead (or calcium/lead) battery is also recommended. Please use a power supply that can provide at least 1 Amp of current.

Under no circumstance exceed DC 18V input as you will cause a severe damage to the internal controller

Unit has been designed with reverse polarity protection. If you accidentally reverse the power source polarity, the unit will cut the power. The rotator is fitted with a DC 2.1/5.5mm (centre positive) power connector.

DATA CONNECTIVITY

A USB2 Type B port at the top of the unit accepts the USB cable for PC connection. A 1.8m USB2 type B cable is supplied in the package

BACKFOCUS DISTANCE / CLEAN APPERTURE

BackFocus distance / Thickness of the Falcon Rotator is 18mm / 0.7". Both openings of the rotator are M54 threaded.

RATED LOAD

Falcon Rotator has been tested with 6Kg / 13.2lbs of imaging setup. The 6 stainless steel branded bearings can easily handle higher payloads with zero flexure.

BUILT IN LIMITS

Rotator has two limit sensors. One at 0 degree and another one placed at 200 degrees. Currently, rotator firmware does not enforce the 2nd limit position and it can move a 200 degrees limit. User can initiate rotator to find the zero limit and set the zero position by the supplied software. (please check software section of manual)
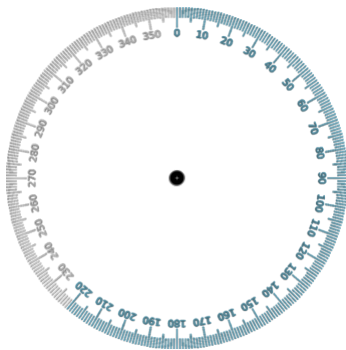
ROTATOR MOVEMENT

(Requires firmware version >= 1.2)

Rotator can perform two movements:

⟹ From 0 -> 220 degrees (clockwise)
⟹ From 0 -> 220.1 degrees (anticlockwise)

Please check the image below for available movements (Blue degree index is the clockwise / **Black Index** is the Anticlockwise)

This firmware setup prevents cable stretch / loop which can damage plugged imaging cords (USB / Power).

Rotator can move to any degree (with **at least 1 decimal point accuracy** – current firmware) and automatically decide in which direction motor should be driven to precisely rotate your camera to designated degrees.

Important note: Rotator current position is automatically stored into memory after 10 seconds of each movement inactivity. This allows the rotator to remember the last position during startup / power reset.

DE-ROTATION SUPPORT FOR ALT/AZ MOUNTS

Rotator has the step precision to support rotation compensation on an ALT-AZ mount. It requires firmware version >=1.2.
Software which calculates the Rate of Rotation (RoR) of a sky object will be available soon. (under heavy testing).

RESET WATCHDOG

A watchdog resets the device if for any reason there is no response from the controller after two (2) seconds. A neat feature in the unlikely event of a microcontroller freeze – when have a remote observatory and you need to be sure that everything works as expected.
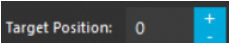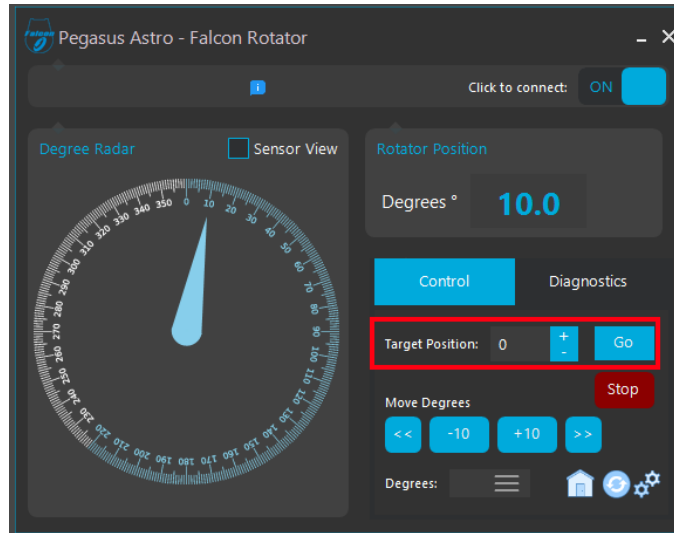
SOFTWARE

CONNECT TO ROTATOR

⇒ Open Falcon Rotator Software and Click button [ON] on the top right corner to connect with Falcon Rotator

⇒ You can observe degree position of the rotator [Degrees ° **10.0**]

MOVE TO A NEW TARGET POSITION

⇒ Type the degree number [Target Position: 0] and click "Go" [Go] button.

$\Rightarrow$ Rotator will start moving towards that position.

MOVE TO ZERO POSITION

$\Rightarrow$ Click "Home" button at the bottom of the software to move rotator to zero position.

$\Rightarrow$ Confirmation message will appear. On Yes, rotator will be moved to zero position.
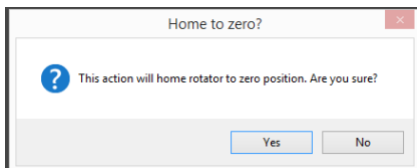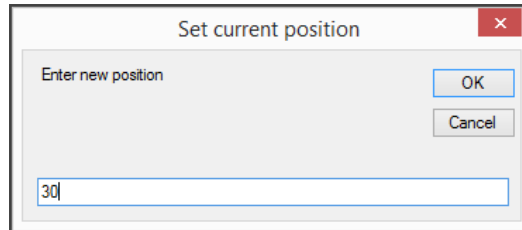

INITIALIZE ROTATOR TO ZERO LIMIT

$\Rightarrow$ This action is required **only** if rotator has lost the zero limit point.

$\Rightarrow$ Click "Sync" button.

$\Rightarrow$ Following confirmation message will popup
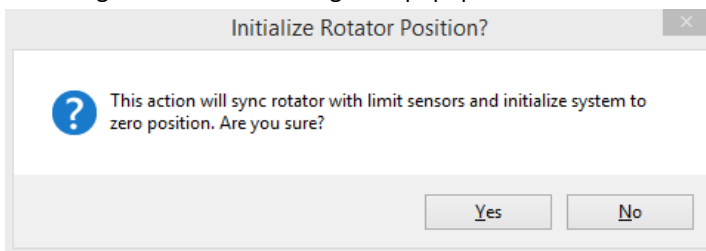
⇒ On yes, the rotator will start moving anticlockwise (reverse) until it senses / reaches the zero limit. When the limit is found, **rotator will mark this position as the zero degree point.**

MANUAL SYNC ROTATOR TO A PREDEFINED DEGREE

⇒ This action enforces rotator to synced manually to a predefined degree number.

⇒ Click Gear [icon] icon

⇒ Following message will appear asking for the new degree position. (in our example we set 30 degrees)

⇒ On OK rotator will sync its position to 30 degrees. (Please note: **Rotator will only sync – it will not move the motor**)

ASCOM DRIVER

⇒ Please download available ASCOM driver from our support website.

⇒ Software should remain open as it communicates with ASCOM driver and translates all ASCOM commands to the rotator commands.

⇒ ASCOM supports multiple clients connected to the rotator

DIMENSIONS
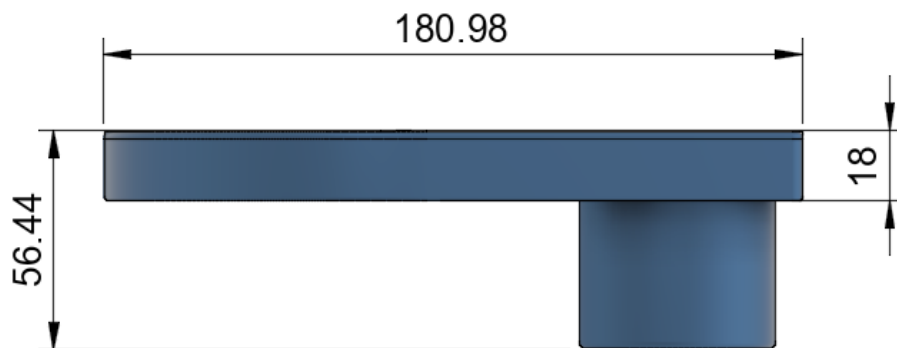
Size (Width, Depth, Height)	180mm x 140mm x 56mm
Weight	700gr / 1.54 lbs

Backfocus	18mm

FREQUENTLY ASKED QUESTIONS

Question	Answer
How many Kg can the Falcon Rotator lift	Falcon Rotator has been tested with 6Kg / 13.2lbs of imaging setup
I would like to use the Falcon Rotator to my remote observatory. What if the device freezes for some reason?	Device has a hardware watchdog and resets itself if the microcontroller is not responsive after 2 seconds
My observatory is in a very cold place. Is there any issue with the electronics of the device?	All electronic components were selected to support temperature ranges from -40 to +80 °C.
What if I accidentally reverse polarity?	Falcon Rotator has a reverse polarity protection input.
Can I upgrade the firmware?	Of course, device has been designed to support firmware upgrade for future features or bug fixes.

Device is covered by two (2) years warranty

Designed and Assembled in Greece