INDIGO
FILTER WHEEL



PRODUCT MANUAL

Version 1.1

09-Oct-2024

VERSION HISTORY

Version #	Implemented By	Revision Date	Reason
1.0	Evans Souglakos	2023	Initial document
1.1	George Karantzalos	09/10/2024	Additional drawings and installation instructions updates
1.2	George Karantzalos	07/01/2026	Minor additions

TABLE OF CONTENTS

TABLE OF CONTENTS 3
INTRODUCTION 4
1.1 PURPOSE 4
1.2 IN THE BOX 4
1.3 DEVICE CARE 4
DEVICE DESCRIPTION 5
2.1 DESIGN OVERVIEW 5
2.2 FEATURE LIST 6
INSTALLATION 7
3.1 DEVICE DISMANTLE 7
3.2 CAMERA CONNECTION 9
3.3 FILTER INSTALLATION 12
3.4 OAG CONNECTION 13
3.5 INSTALLATION WITHOUT AN OAG 14
MAINTENANCE 14
SOFTWARE 14
ASCOM 14
INDI 14
UNITY PLATFORM 15
N.I.N.A 16
APT 16
SEQUENCE GENERATOR Pro 16
SHARPCAP 16
TECHNICAL SPECIFICATION 17
</> DEVELOPMENT 18
RETURNS AND SERVICE POLICY 18

INTRODUCTION

Thank you for purchasing Pegasus Astro Indigo Filter Wheel.

1.1 PURPOSE

Indigo Filter Wheel offers a range of cutting-edge features to enhance your astrophotography and astronomical observations. This compact and efficient device boasts seamless filter switching, ensuring precise and effortless transitions between filters for minimal image disruption. With its robust build quality and compatibility with **7 position 2inch mounted** or **50mm unmounted filters**, the Indigo Filter Wheel provides versatility and convenience.

Its integrated stepper motor technology and optical encoders allow for precise filter positioning, and it's designed to work seamlessly with popular astrophotography software for remote operation.

1.2 IN THE BOX

The box contains the following items

- 1 x Indigo FW
- 1 x USB 2, 1.8m cable
- 2 x slot cover rings
- 1 x Female M54 adapter
- 1 x Male M54 adapter
- 1 x Male M42 adapter
- M2 bolts and washers for unmounted filters
- M3 and M2.5 bolts for adapters and cameras

1.3 DEVICE CARE

The device electronics are housed inside an aluminum blue and black anodized enclosure. The enclosure is made from aircraft aluminum alloy type 6061 which provides very good corrosion resistance.

- While the device is safeguarded against moisture, it is essential to emphasize that it is not waterproof and should always be maintained in a clean and dry environment.
- Prolonged exposure to excessive moisture can pose a significant risk to electronics and connectors, potentially causing damage. It is imperative to exercise caution in this regard.
- Avoid any contact between solvents or chemicals and the device, as these substances can have adverse effects on its functionality.
- When the device is not in use for extended periods, it is advisable to store it indoors within a dry room to prevent any potential moisture-related issues.
- Take precautionary measures and refrain from touching the internal components during operation, as they may become hot. Ensuring safety and optimal performance is paramount.

DEVICE DESCRIPTION

2.1 DESIGN OVERVIEW





Camera side – Telescope side

Both sides of the filter wheel have M54 openings.



The screw slide adapter allows you to properly align the orientation of your camera or telescope side.



The carousel has seven (7) slots and accepts 2-inch mounted (Max filter height 8mm) or 50mm unmounted filters. (Max filter diameter should be 50.8mm).

2.2 FEATURE LIST

- **Precise Filter Switching:** The filter wheel uses a combination of a direct drive stepper motor and an optical encoder to ensure that your filter selection is precise, and deadly accurate on every filter location.
- **Bidirectional Filter Selection:** Filter Wheel rotates clock or counterclockwise direction for filter selection.
- **One cable operation:** Indigo Filter Wheel exclusively utilizes a USB2 (Type B) cable, streamlining connectivity by eliminating the need for a separate power supply when employing USB control.
- **Thin design:** High quality aluminum alloy allowed us to design the filter wheel as thin as possible (19.0mm, 19.6mm with adapters installed on both sides).
- **Orientation on both adapters:** The screw slide adapter (image below) allows you to properly align the orientation of your camera or telescope side. Just untie the bolts and rotate the adapter to the desired orientation.
- **7 Filter Dual Type Filter Carousel:** The carousel has seven (7) slots and accepts 2-inch mounted (Max filter height 8mm) or 50mm unmounted filters. (Max filter diameter should be 50.8mm).
- **Camera Connection:** The 12 x holes on the camera side allow direct connection with astronomical cameras that follow the 6 x hole pattern (62mm diameter pattern) – can accept

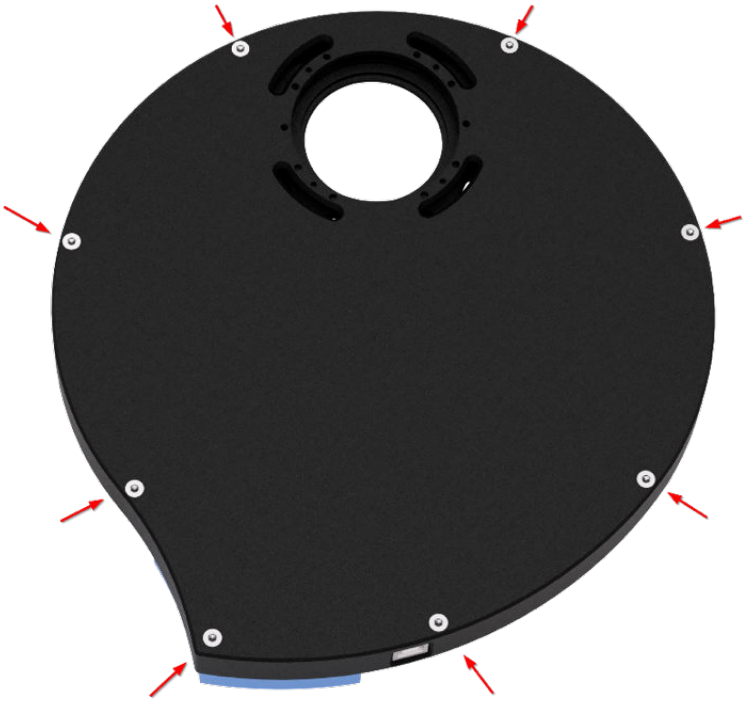
M3 or M2.5 bolts) and Player One cameras (90 diameter). A neat feature allows you to reduce the total back focus instead of placing adapters.

- **Telescope Connection:** 6 x and 4x hole pattern (62mm diameter pattern) compatible with various OAGs.
- **USB Connectivity:** Single cable for power and data.
- **Software support:** ASCOM 6 & 7, N.I.N.A., INDI.

INSTALLATION

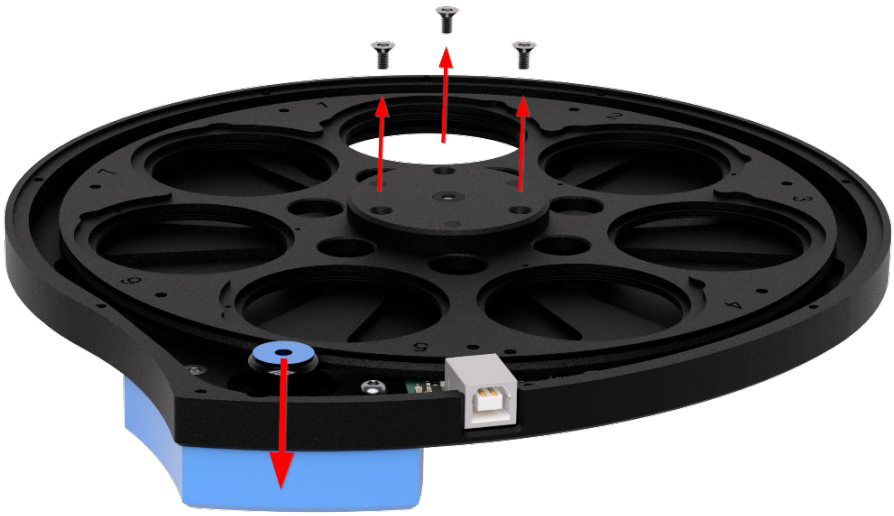
3.1 DEVICE DISMANTLE

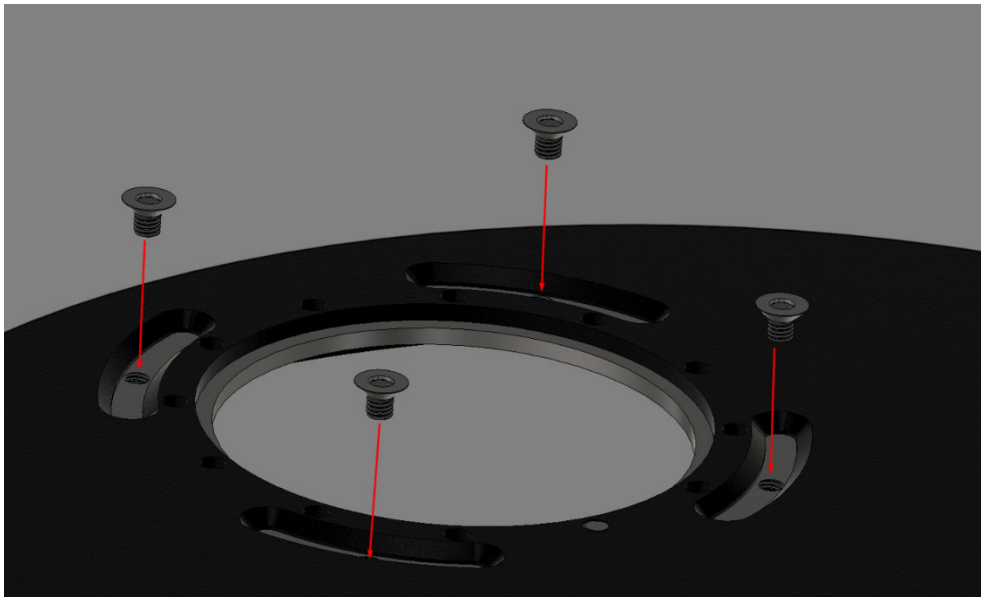
- Unscrew the eight (8) hex bolts with an Alen key and remove the lid of the filter wheel.



Indigo FW - Telescope side

- Remove the three (3) M3 hex bolts holding the carousel, push the motor pulley down to release the pressure and remove the carousel from the filter wheel.



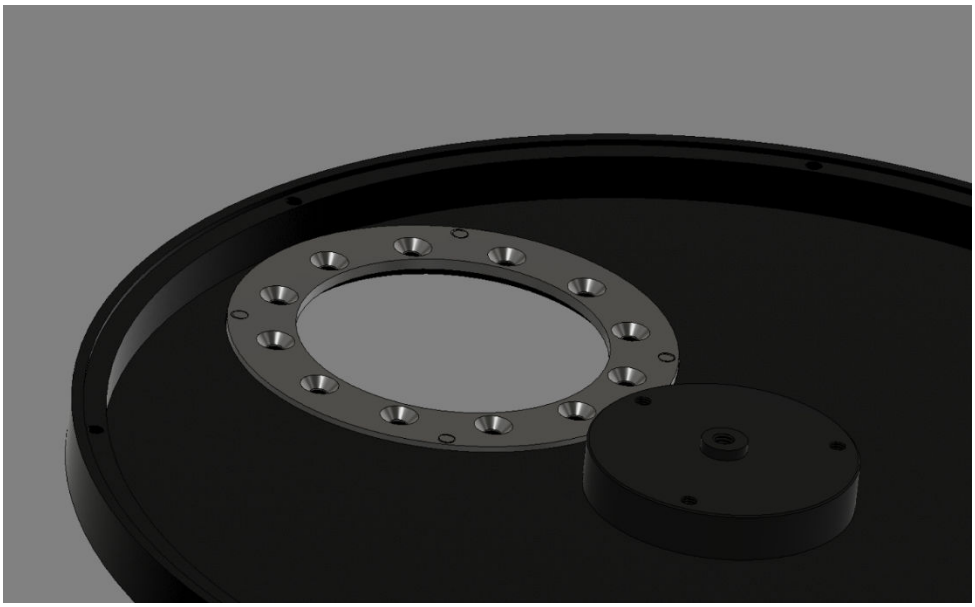


Indigo FW - Camera side inside view

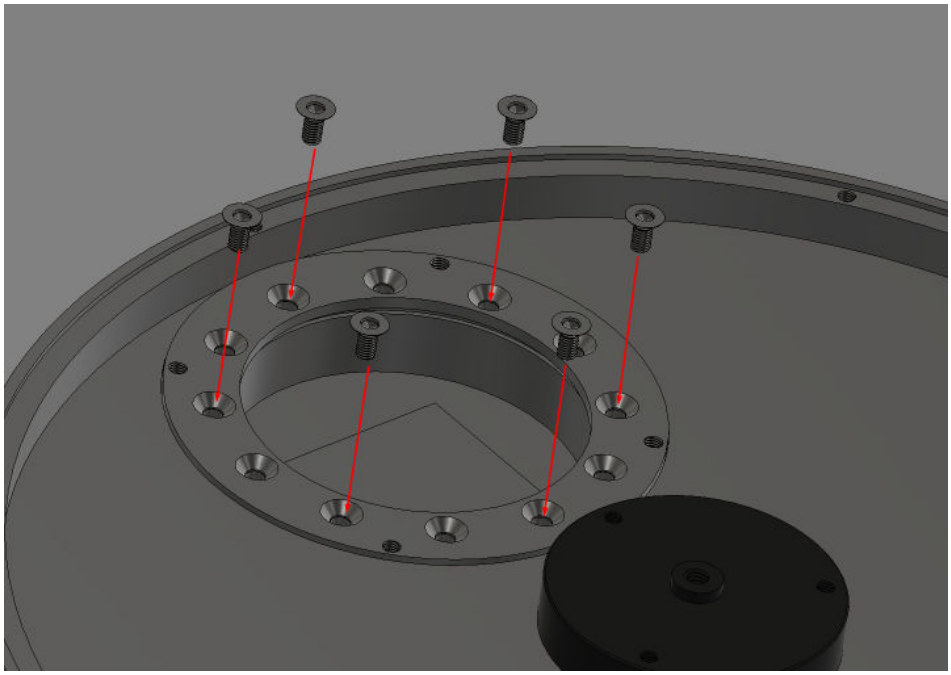
3.2 CAMERA CONNECTION

- **Installation of cameras that follow the 6 x hole pattern**
- Place the slot cover ring and secure it using 4 x M3 bolts.

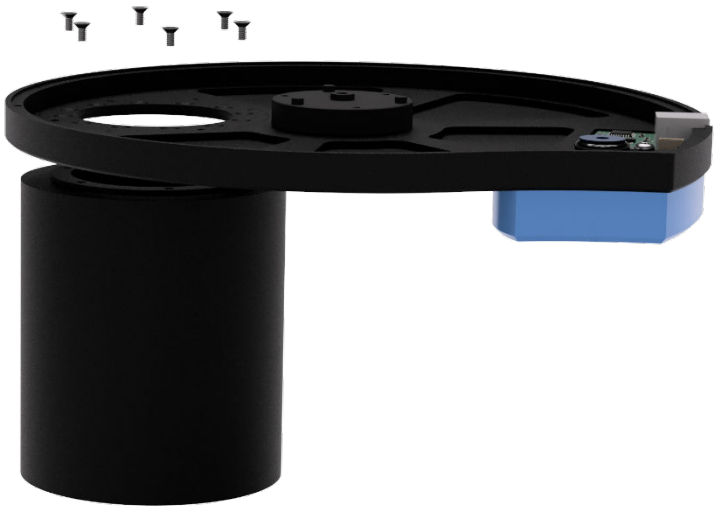
Indigo FW - Camera side outside view



- Use 6 x M3 or 6 x M2.5 bolts depending on your camera pattern thread size to connect the camera to the Indigo FW camera side plate.



Indigo FW - Camera side - inside view



Indigo FW - Camera side - outside view

➢ **Installation of Player One cameras (90mm diameter)**

- Remove the camera tilting plate.
- Use 4 x M2.5 bolts to connect the camera to Indigo FW camera side plate.



Indigo FW - Camera side outside view

➢ **Installation of cameras using the M42 Male adapter**

- Place the M42 Male adapter and fix the orientation using 4 x M3 bolts



3.3 FILTER INSTALLATION

- Push the motor pulley down and place back the carousel in the Indigo FW housing. Secure it using 3 x M3 bolts



- Place your filters into each filter number slot. Numbers are increased clockwise and there is a visible engraved number for each filter set.
- If you have unmounted filters, make sure to secure and grip them with the included M2 bolts. (4 for each filter).
- If your unmounted filters don't have blackened edges, consider 3d printing filter masks to avoid unwanted reflections. Download .stl files at https://pegasusastro.com/wp-content/uploads/2022/09/indigo_filter_mask.zip

➢ It is highly advised to wear gloves, so you won't accidentally touch the filters and transfer any sweat or oil from your fingertips to the optical surface of your filters.

➢ It is also advised to mount and dismount filters inside a room, away, as possible, from dusty environments.

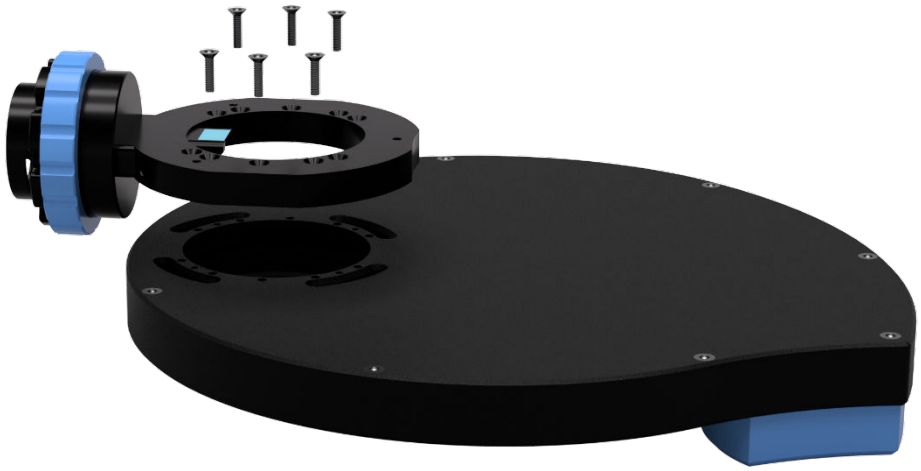
3.4 OAG CONNECTION

➢ **OAG CONNECTION FOLLOWING 6x OR 4x HOLE PATTERN**

Indigo FW is compatible with 6 x and 4 x holes pattern OAGs (62mm diameter pattern)

- Carefully close the lid and place back the eight (8) hex bolts.
- Tie the bolts in a diagonal way so you will not cause any tilt to the filter wheel (it is unlikely to happen, but this is a golden rule in mechanics)
- Use 6x or 4x M3 bolts depending on the OAG hole pattern to connect your OAG on the telescope side lid of the Indigo FW.
- Insert the USB2 cable to the filter wheel and to your PC or USB Hub.
- The device will load the firmware and after 4 seconds the wheel will spin to find the initial position and sync the optical path opening with filter number one (1) of your carousel.

We recommend using Indigo OAG. The Indigo OAG can be directly mounted onto the Indigo Filter Wheel. A combination of both products sums 19 mm + 14 mm (33 mm total) of back-focus optical distance. https://pegasusastro.com/products/indigo-oag/



Indigo Oag and Indigo Filter Wheel combination

➢ OAG CONNECTION USING THREAD PATTERN

- Place the M54 female or M54 male adapter on the telescope side of Indigo FW, rotate it to the desired orientation and secure it using 4 x M3 bolts.



- Screw your OAG on the Indigo FW telescope side.
- Carefully close the lid and place back the eight (8) hex bolts.

3.5 INSTALLATION WITHOUT AN OAG

- Place the M54 female or M54 male adapter on the telescope side of Indigo FW, rotate it to the desired orientation and secure it using 4 x M3 bolts.
- Connect the imaging train to your telescope focuser.

MAINTENANCE

The wheel requires no maintenance. Grease or any other lubricant on filter wheel's bearings is not required for many years.

SOFTWARE

ASCOM

The Indigo Filter Wheel is supported by ASCOM6 and ASCOM7

https://ascom-standards.org/

INDI

Indigo Filter Wheel is fully supported by INDI and INDIGO

Indigo: http://www.indigo-astronomy.org

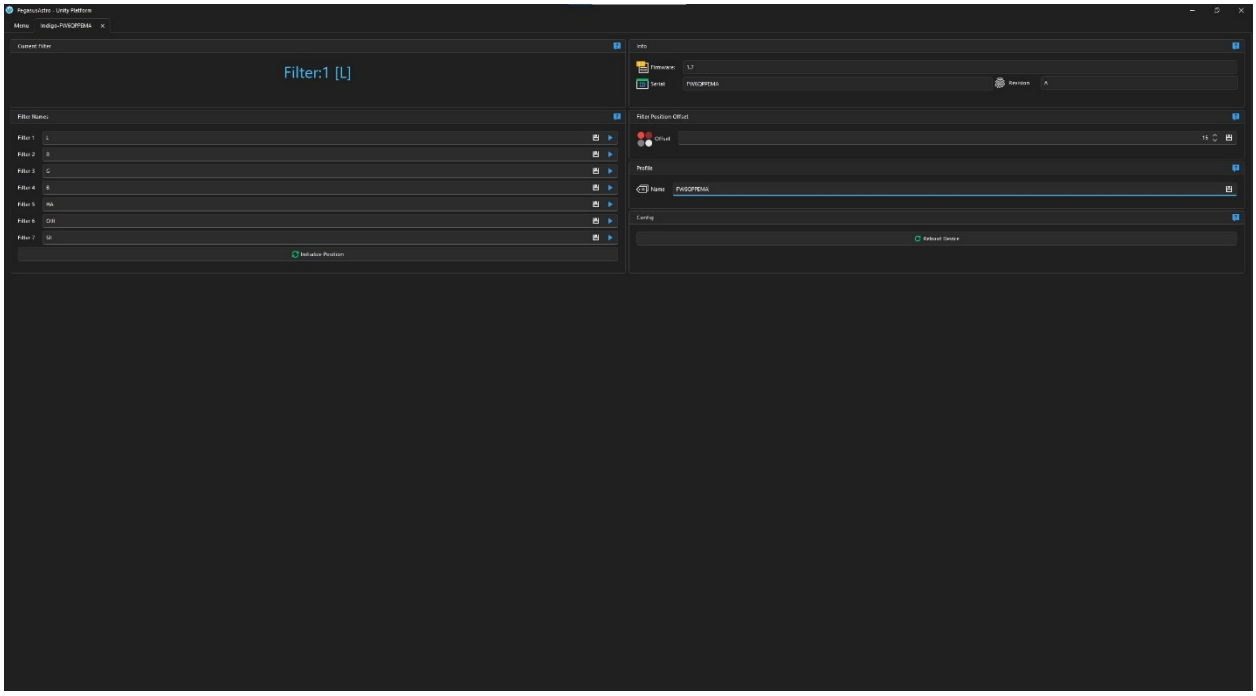
Indilib: https://indilib.org/filter/pegasus-indigo.html

UNITY PLATFORM

Pegasus Astro Unity Platform is our new all-around application. Our goal is to provide a robust and modern application that will support current and future products under one roof.

Download and install Unity platform
https://pegasusastro.com/release/unity/setup/PegasusAstroUnityPlatform.exe

Please note that **all required ASCOM drivers are included in Unity Platform installation.**



Current filter

Displays the currently active filter

Filter Names

Insert your filter names and press the SAVE icon to store them.

Click on the PLAY icon next to each filter to switch to it.

Initialize position

Click to recenter Filter Wheel to filter number 1

Info

Information about Firmware version, product serial number and revision.

Filter Position Offset

Change the filter offset if the filters are not perfectly centered after switching. The default value is 15.

Profile

Add a custom name if more than one device is used so that they can be distinguished from each other

Config

Reboot device

N.I.N.A

Follow the generic N.I.N.A. device connect guide to connect your Pegasus Astro device.

https://pegasusastro.com/troubleshooting/unityplatform-troubleshooting-guide/#a5ff6a48d96516df8

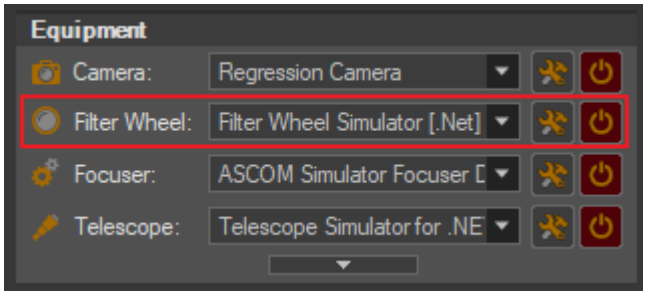
APT

Go to Gear > Filter Wheel and press the Connect Wheel ⁺, select the **PegasusAstro Indigo** driver on the ASCOM Filter Wheel chooser and then click Properties.

Select the discovered device tile on the Unity platform pop-up screen and click OK.

SEQUENCE GENERATOR Pro

In the equipment group box,



select the **PegasusAstro Indigo** driver on the drop-down menu, click on the icon and select the discovered device tile on the Unity platform pop-up screen.

To connect the filter wheel, click on the connection icon . Once connected the icon will change , click this icon to disconnect.

SHARPCAP

Go to File > Sharpcap settings > Hardware > Filter Wheel

Select the **PegasusAstro Indigo** driver on the drop-down menu, click Properties and Select the discovered device tile on the Unity platform pop-up screen.

TECHNICAL SPECIFICATION

Thickness	19.0mm (19.6mm if screw slide adapters are installed on both sides)
Weight	900 grams (1.98 lbs.)
Power	5 Volts from USB Cable (Type B) 300mA during slewing
Positions	7
Filters	2-inch Mounted or 50mm unmounted (default carousel)
Max Filter Height	8.0 mm when a 6x or 4x hole pattern OAG is used 6.4 mm when the M54F, M54M or M42M adapter is used 6.0 mm when the slot cover ring is used
Telescope side	M54F / 0.75mm pitch, M54M / 0.75mm pitch, M42 male / 0.75mm pitch 6 x and 4 x hole (62mm diameter pattern)
Camera Side	6 x hole pattern (62mm), 4 x hole pattern (85mm) M42 male / 0.75mm pitch
Filter lock	Stepper Motor and Optical Sensor for accurate lock position

</> DEVELOPMENT

Indigo Filter Wheel Serial Command Language Firmware >= v.1.1

The device is discovered as a USB to Serial Port with Device ID:
`FTDIBUS\VID_0403+PID_6015+FWXXXXXXX\0000`

Connection Settings: 9600, 8N1 (All commands should be terminated by new line /n)

Abbreviations used:

n = a digit

b = boolean (0 or 1 digit)

Command	**Description**	**Response**
W#	Status	FW_OK
WA	status:filter_position:filter_wheel_is_moving	FW_OK:n:b
WF	Report Filter Position. *If response is -1 then the filter wheel is moving*	WF:n || WF:-1
WV	Report Firmware Version	WV:n.n
WM	Move carousel to filter number	WM:n
WR	Report if filter wheel motor is moving (0 = idle, 1 = is moving)	WR:b
WI	Init Filter Wheel (this initializes the wheel to filter position #1. Same when you plug USB and wheel finds filter #1)	WI:1
WQ	Reboot / Reset Filter Wheel	-

RETURNS AND SERVICE POLICY

The device is covered by two (2) years warranty

For detailed information on returns and service policy follow the link below

https://pegasusastro.com/returns/

Designed and assembled in Greece

For any questions, feedback and support please contact: support@pegasusastro.com