ToupTek AFW User Manual

Version 1.1

Sept 2023



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Please download the latest version from touptek-astro.com.

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1 Description and Features

ToupTek's Filter Wheel (AFW) is an electronic filter wheel with 3 interchangeable filter disks. It features a new mechanical location system for indexing the filter and is designed for easy imaging with mono astronomy camera.

The features of ToupTek Filter Wheel are listed below:

- Maximum number of slots (default disk): 7
- Filter slot (default disk): 36mm
- 3 filter disks: 7*36mm, 5*2'', 8*1.25''
- Adaptor connection: M54
- Optical Length: 20mm
- Power supply: USB2.0
- Electronic motor driven
- Weight: 510g
- Thickness: 20mm
- Casing material: aluminum
- Support ASCOM driver



2 Filter Wheel Specifications

2.1 Filter Wheel Casing

The main body of the electronic filter wheel is CNC filled from an aircraft graded aluminum block. It is made with excellent craftwork and only reaches 20mm thickness. This model comes with M54 female thread at both the front and back side, and we have prepared various adaptors for customers to modify the connection interface.

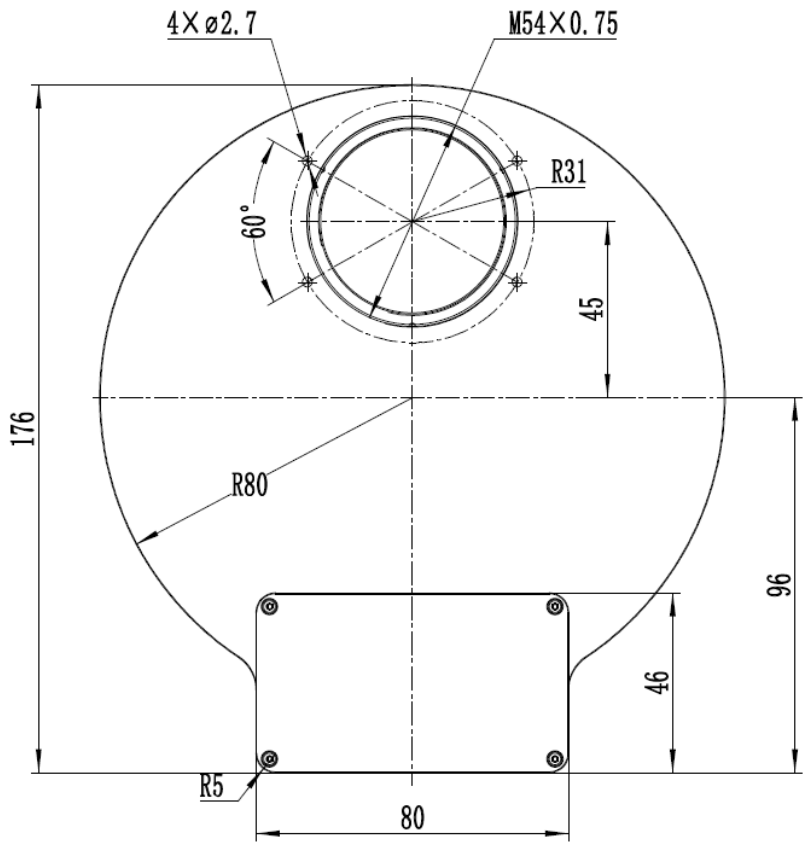


Figure 1 front face of AFW.

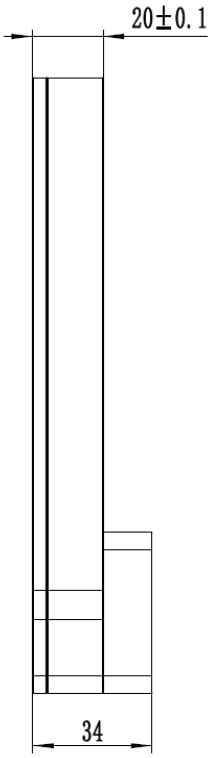


Figure 2 Side face of AFW

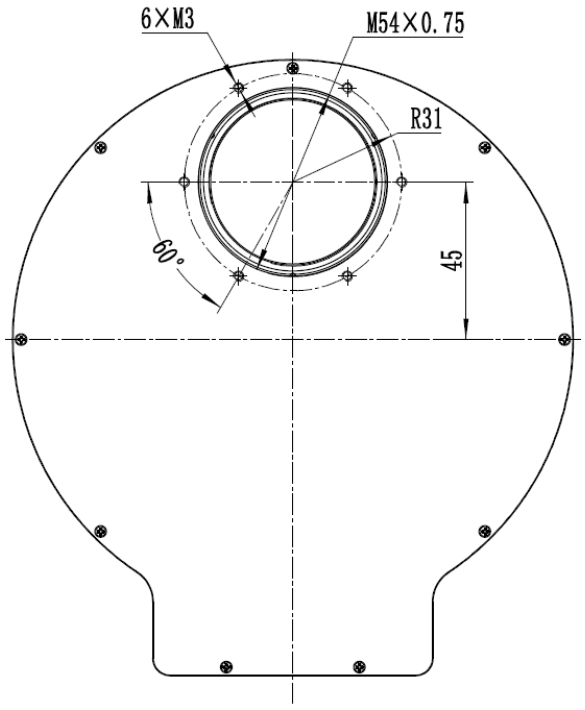


Figure 3 Back face of AFW (to telescope)

2.2 Connection and Power

ToupTek Filter Wheel supports USB2.0 interface and also is powered through the USB2.0 connection. Users simply needs to connect the filter wheel with any PC control device then the filter wheel is good to go. If users has one of our ATR3 series cooling camera, the filter wheel could also be connected through the USB2.0 hub on the cooling camera and be controlled through the USB3.0 connection on the camera.

2.3 Interchangeable Disks

For this ToupTek Filter Wheel model, we offer 3 different filter disks. Their spec are 5x2”, 7x36mm and 8x1.25” respectively. The 5x2” is compatible with 2” mounted filter lens. The 7*36mm is compatible with 36mm unmounted. The 8*1.25” is compatible with 1.25” mounted filter lens and 31.2mm unmounted filter lens.

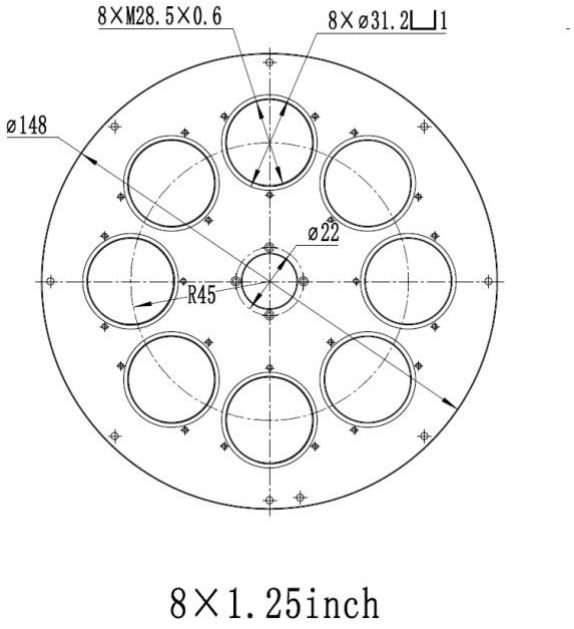


Figure 4 filter disk: 8x12.5'' front.

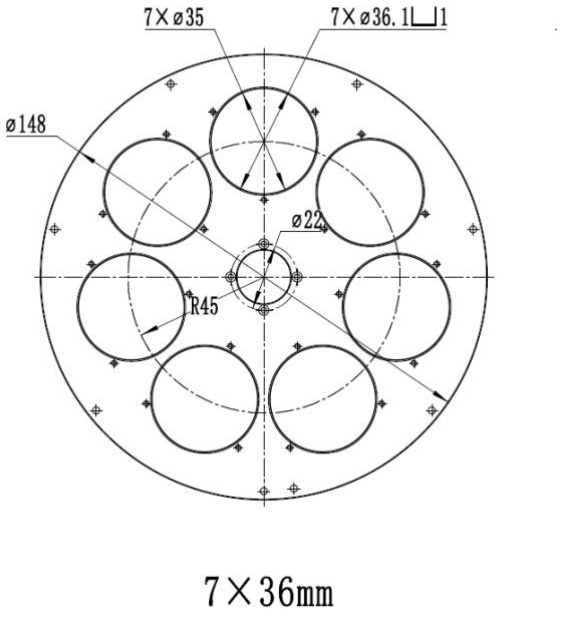


Figure 5 Filter disk 7x36mm front.

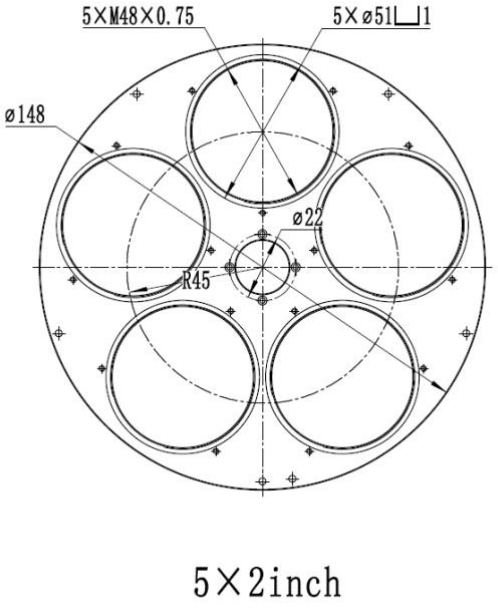


Figure 6 Filter disk 5x2'' front.

All three disks support both thread connection and screw locking. Therefore, users could fill the filter holder with both mounted and unmounted filter lens.

2.4 55 mm back focal distance connection solutions

AFW has 20mm thickness with the standard extenders and adapters included in the package, it can reaches 55mm back focal distance perfectly with any ToupTek cooling camera and other cameras with 17.5mm back focal distance or 12.5mm back focal distance.

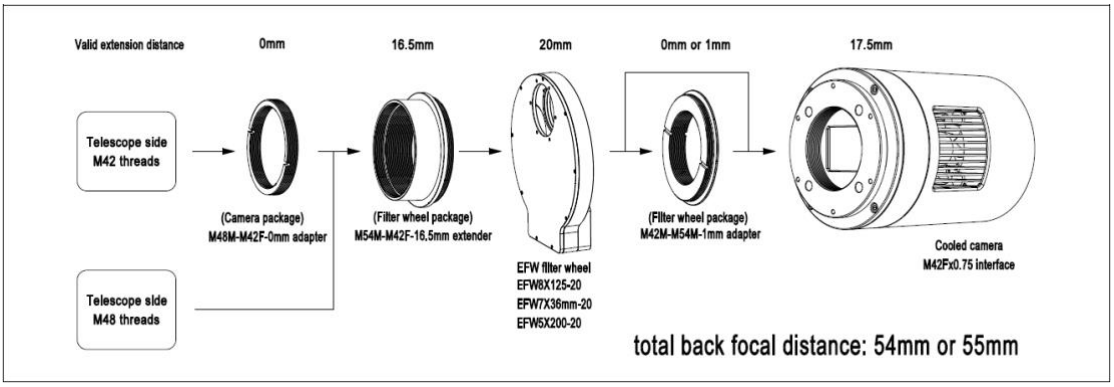


Figure 7 Connection with ToupTek cooling camera

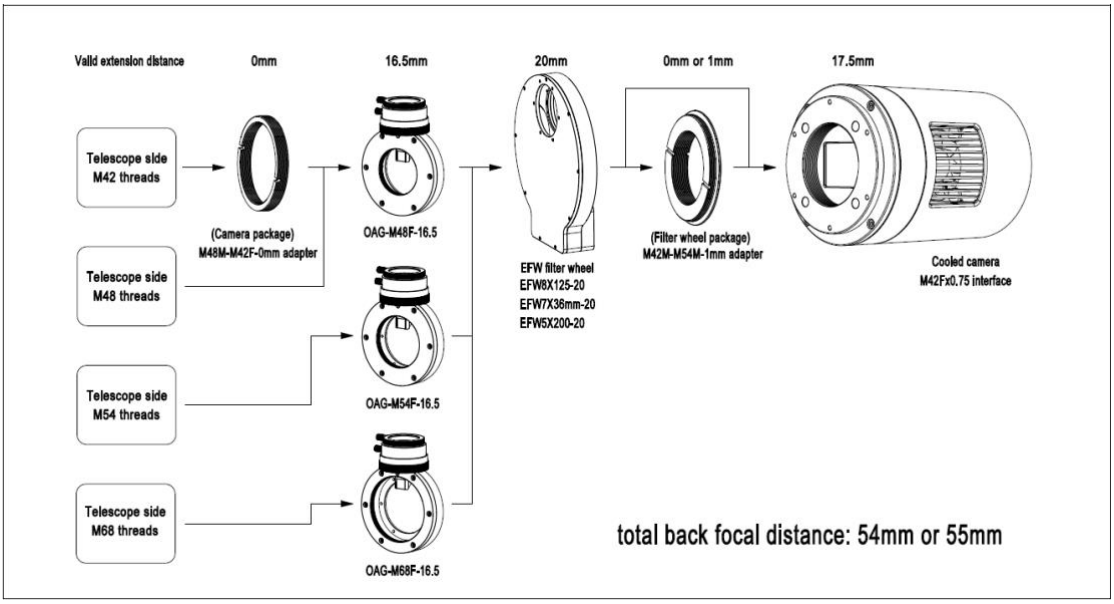


Figure 8 Connection with ToupTek cooling camera and ToupTek OAG.

3 Software Guide

3.1 ASCOM Platform and ToupTek Filter Wheel

ToupTek filter wheel can be used with any software that is compatible with ASCOM platform, Customers are welcomed to visit our website and download ToupTek ASCOM driver. Our website address: https://www.touptek-astro.com/downloads/.

Basic system requirement is listed below:

- x86: XP SP3 or above; CPU supports SSE2 instruction set or above
- x64: Win7 or above

When opening the ASCOM device selection panel, users simply need to select FilterWheel device type.

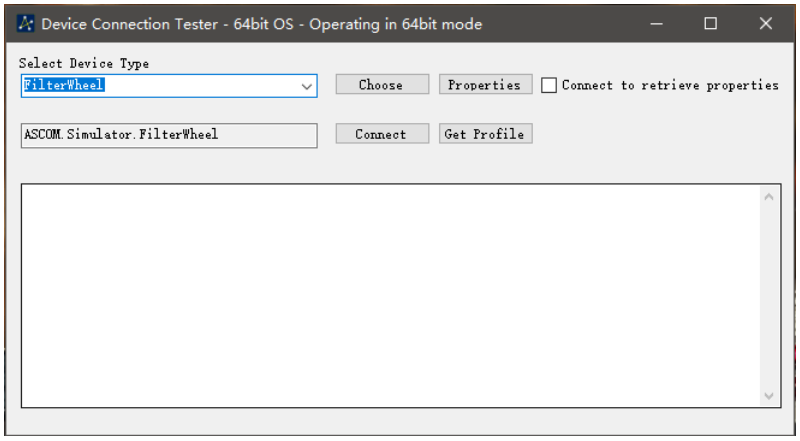


Figure 9 ASCOM Device Connection Tester: device selection

Then click **Choose** to select specific filter wheel driver. Here we choose **ASCOM ToupTek FilterWheel**, then press **OK**.

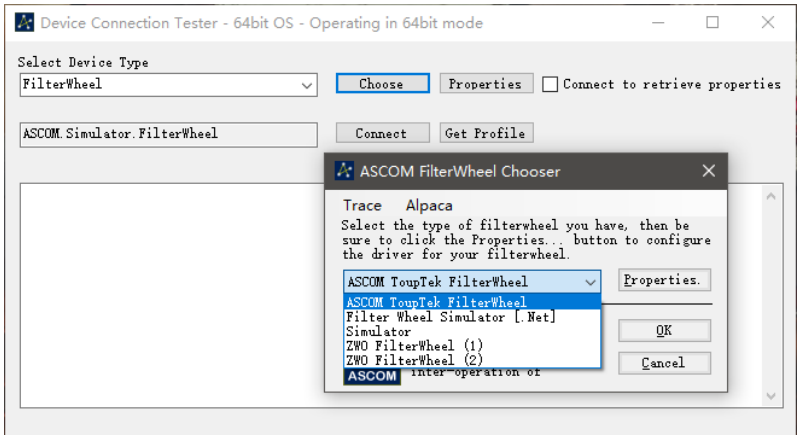


Figure 10 ASCOM FilterWheel Chooser: select ASCOM ToupTek FilterWheel

Click **Properties** to connect ToupTek Filter Wheel. Setting panel will pop up and users can control the filter wheel.

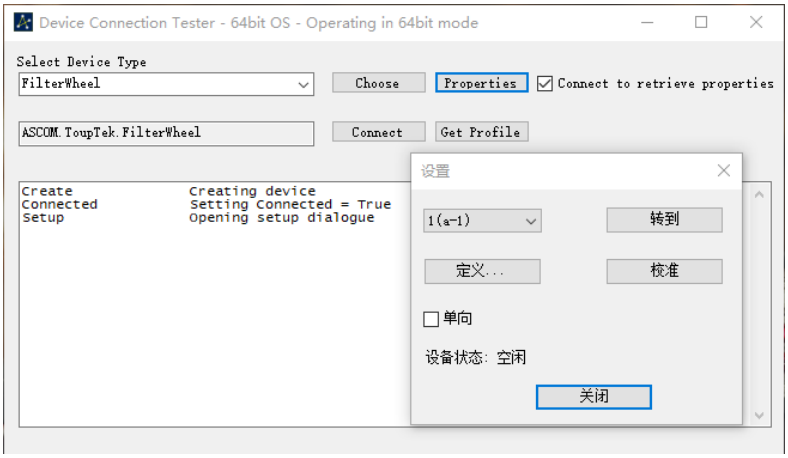


Figure 11 Setting Panel for controlling filter wheel functions

In setting panel, users can specify which slot to move to, perform filter wheel calibration, and set slot name as well as focus length.

3.2 ToupTek Filter Wheel with Third Party Software

Any software that is compatible with ASCOM platform can connect to ToupTek Filter Wheel. Here we will take N.I.N.A. (Nighttime Imaging N Astronomy) as example. By selecting ASCOM ToupTek FilterWheel driver in the Filterwheel tab, and connecting our filter wheel with computer, ToupTek filter wheel is good to go.

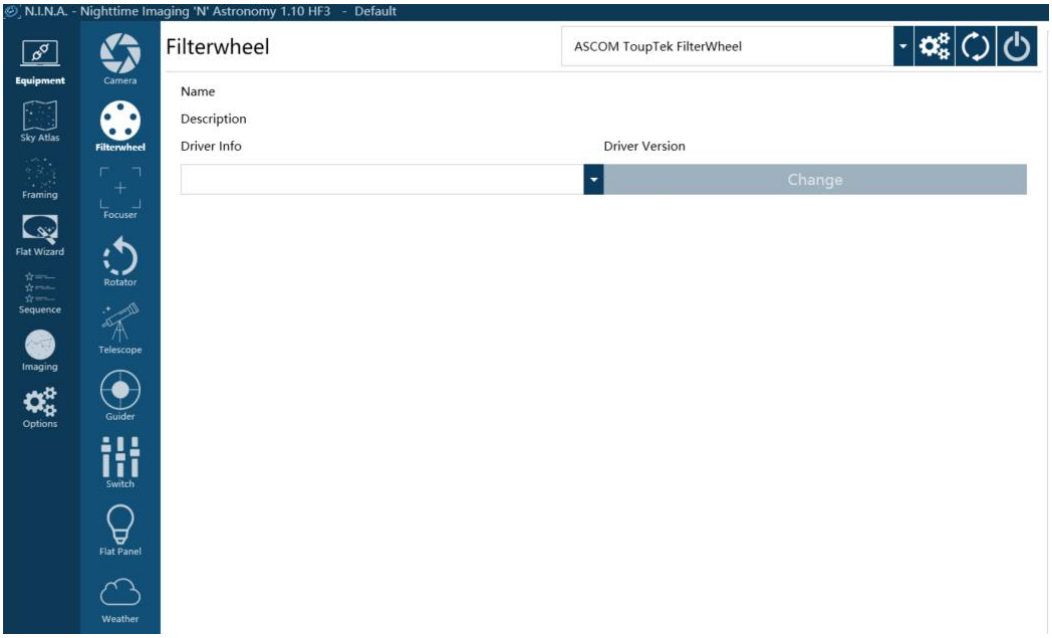


Figure 12 N.I.N.A. application and filter wheel control tab

By clicking **Connect**, the filter wheel is ready to go. Once filter wheel is connected, slot name defined by user will be displayed in the right column.

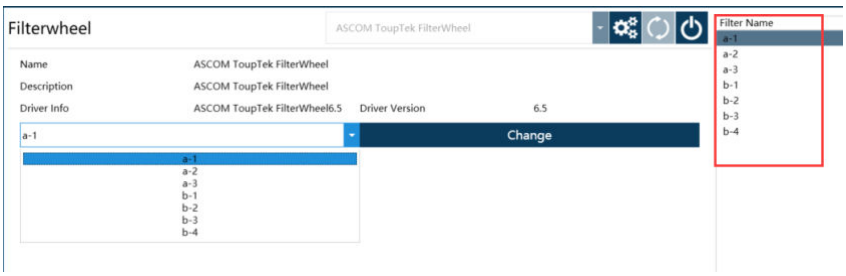


Figure 13 Filterwheel panel during connection.

User can make ToupTek filter wheel rotate to specific slot by select the slot in the drop-down menu and then click **change**, then the filter wheel will rotate and finally stop at the desired slot position. Sometimes, the filter wheel might not be calibrated well and needed a reset. User can simply click setting button and then press **Calibrate**, then the filter wheel will reset to "1" position.



Figure 14 ASCOM filter wheel calibration

3.3 ToupTek SDK for ToupTek Filter Wheel

ToupTek Filter Wheel supports various kinds of APIs, including Native C/C++, NET/C#/VB.NET, Python, Java, DirectShow, Twain,MatLab, Micro-Manager and so on. Compared with other APIs, Native C/C++ API, as a low level API, does not depend on any other runtime libraries. Camera's software SDK kit has simple interface, so that it is flexible and can be easily integrated into the customized applications. The SDK zip file contains all of the necessary resources and information. For further detail, please refer to Toupcam API Manual. Customers can download the SDK kit from our official website. https://www.touptek-astro.com.

4 Service

For software upgrades, please refer to “Download” on our official website. https://touptek-astro.com

For customers who purchase the cameras from local dealer, please contact dealer for more inquiry.

For technical support, please contact e-mail address: karas@touptek-astro.com.

5 Revision History

Date of change	Ver.	Page	Contain of Change
2022/01/21	1.0		First Edition
2023/09/12	1.1		Updated mechanic drawing of AFW