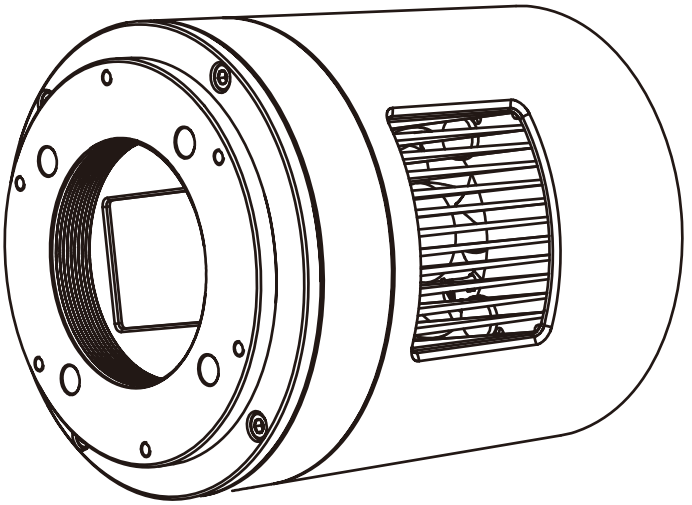
ToupTek Astro

ATR Series DSO Cooled Camera Quick Start



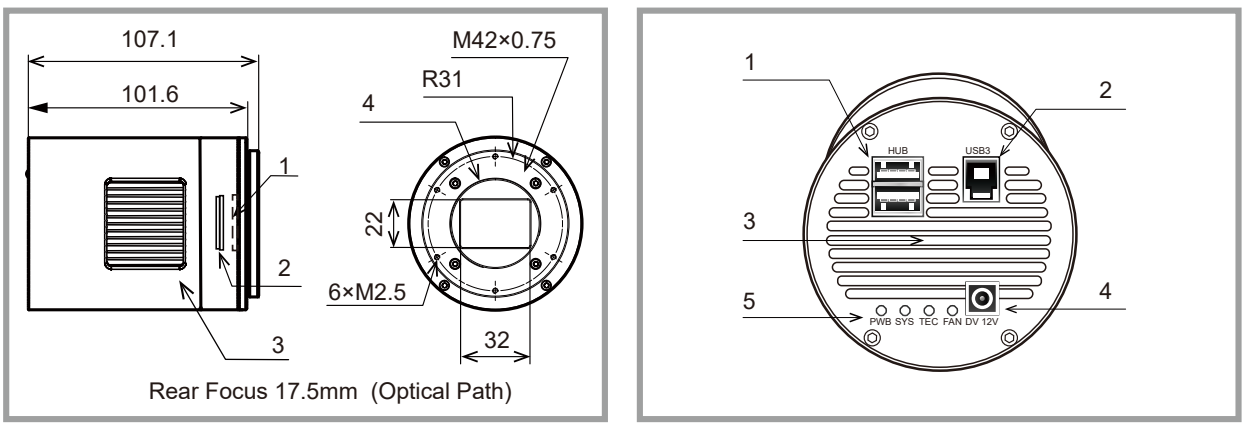
Thank you for purchasing the ATR series camera. This document provides an overview of its key features and usage instructions. For more details, visit our official website at **https://www.touptek-astro.com.**

For any issues, please contact us via email or your purchase channel.

Camera Introduction

DSO cooled cameras generally observe and photograph deep-sky objects outside the solar system, especially non-pointobjects such as galaxies, nebulae, star clusters, etc., and capture the elegance of these objects through the camera's cumulative long exposure.

The ATR series DSO cooled cameras (USB3.0) are equipped with Sony's professional high-performance image sensors, with resolutions ranging from 1.7 million to 26 million pixels, meeting the astronomy needs of a wide range of users. The newly developed efficient cooling module ensures that the camera sensor operates at temperatures 42°C to 45°C lower than the ambient temperature, significantly reducing inherent thermal noise of the sensor. For low-temperature condensation, a reliable front window heating component is equipped to ensure stable shooting in high-humidity environments.



Camera Dimensions and Interface Description

The default back focus distance for the ATR series cameras is 17.5mm.By replacing the included M42 external thread ring, the back focus length of the ATR camera can be reduced to 12.5mm; When used with the ToupTek Astro ATR series camera's optional sensor adjustment ring (sold separately), the back focus length is 17.5mm.

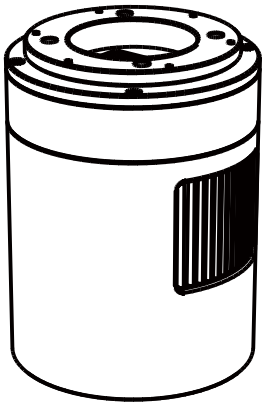
• Left Image:

1. Front window protective glass: AR anti-reflective glass (380-1100nm) for monochrome cameras and IR cut filter (380-690nm) for color cameras; 2.CMOS; 3.Cooling vent; 4.M42×0.75 internal thread.

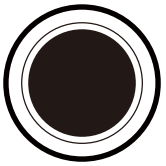
• Right Image:

1.USB 2.0 hub: Can connect electronic accessories such as electric focusers and filter wheels; 2.USB 3.0/USB 2.0 data port (USB Type-B); 3.Air intake vent; 4.DC 12V power input port: It is recommended to use a power supply of 12V 3A or above; 5.LED lights: The fan indicator light is disabled in the new 533, 585, and 2600 series cameras. The remaining indicator lights on these cameras can be turned off via software.

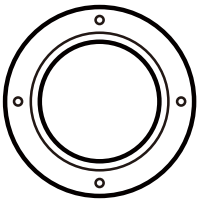
Packaging Accessories



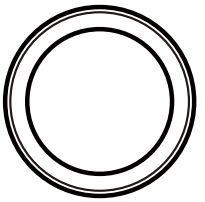
Camera Body



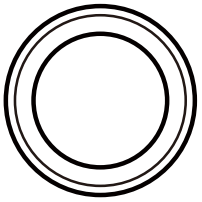
Camera Cover



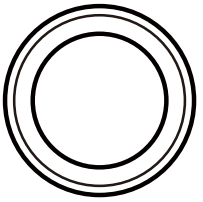
M42 External Thread Ring (12.5mm)



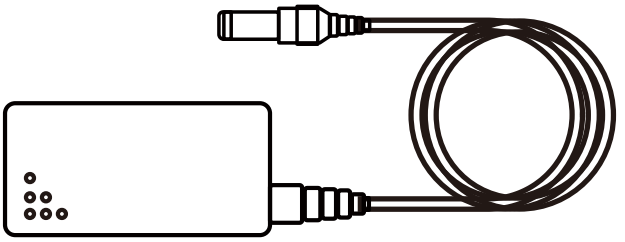
M48 to M42 Adapter Ring



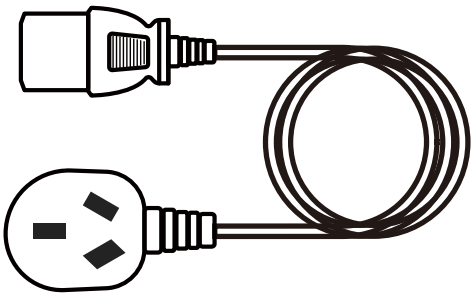
Extension Tube （16.5mm）



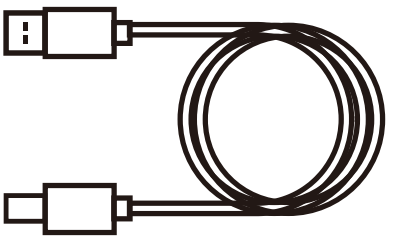
Extension Tube （21mm）



Power Adapter



Power Cable (1.5m)

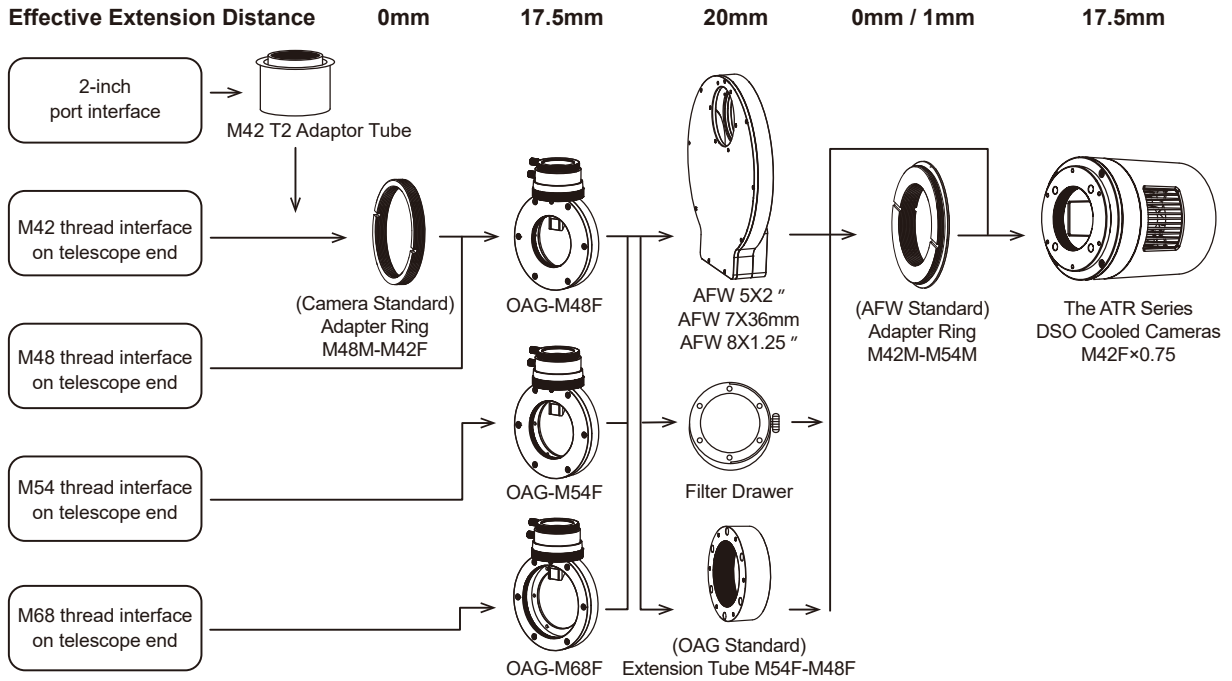


USB 3.0 Data Cable (1.5m)

Astronomical Telescope Connection Solution

Hardware Connections

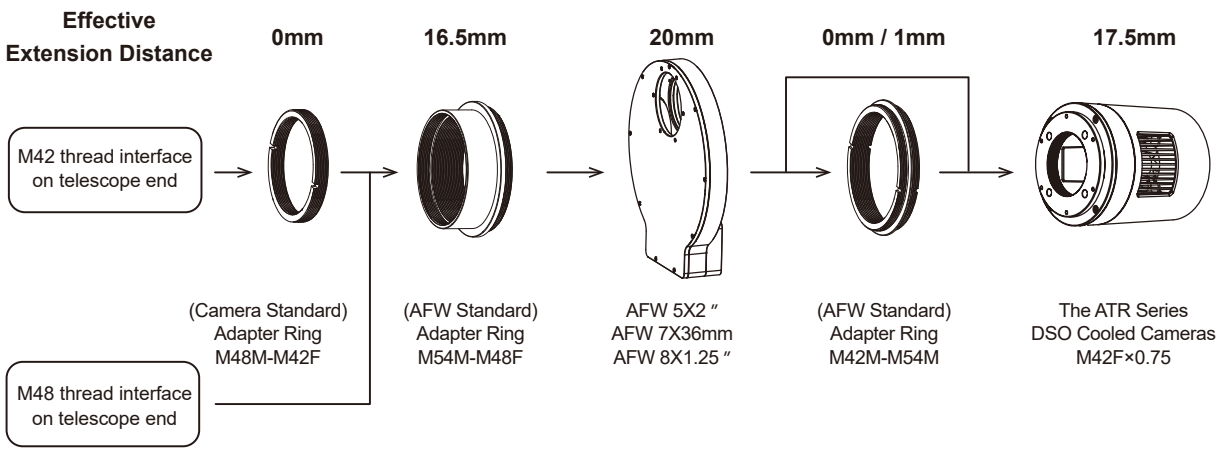
Standard Back Focal Length Connection Solution



Note: When using ToupTek Astro accessories, screw connection is recommended; for other brands of accessories, an adapter ring can also be used.

Back Focal Length: 55mm / 56mm

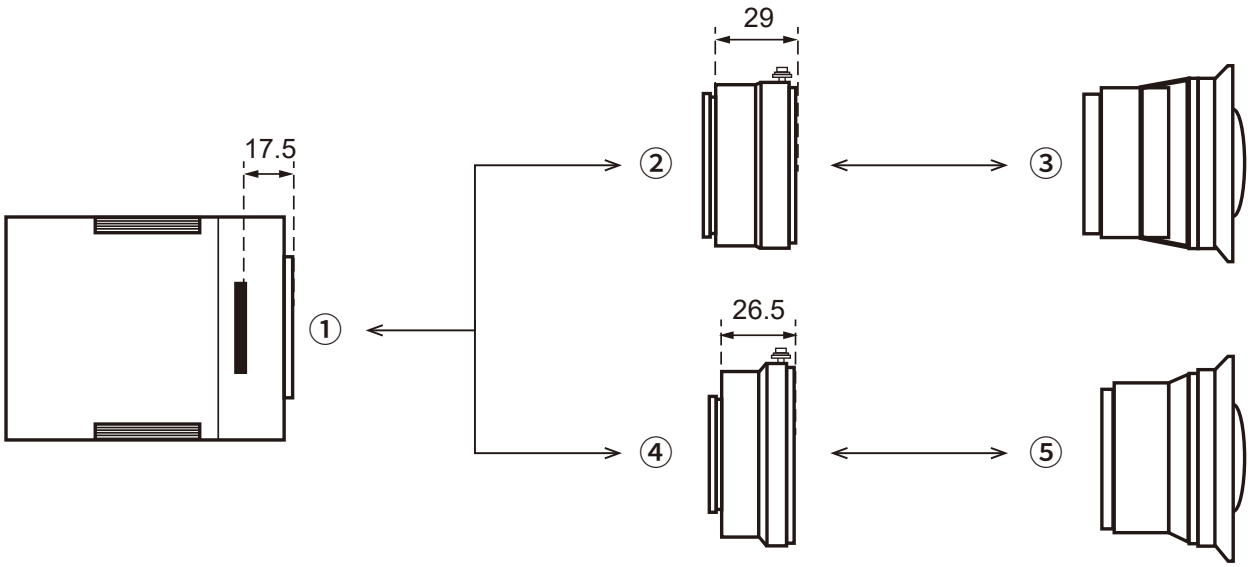
DSO Cooled Cameras + AFW Solution



Note: Connecting to the telescope's M42 interface may cause obstruction to the camera's full frame.

Back Focal Length: 54mm / 55mm

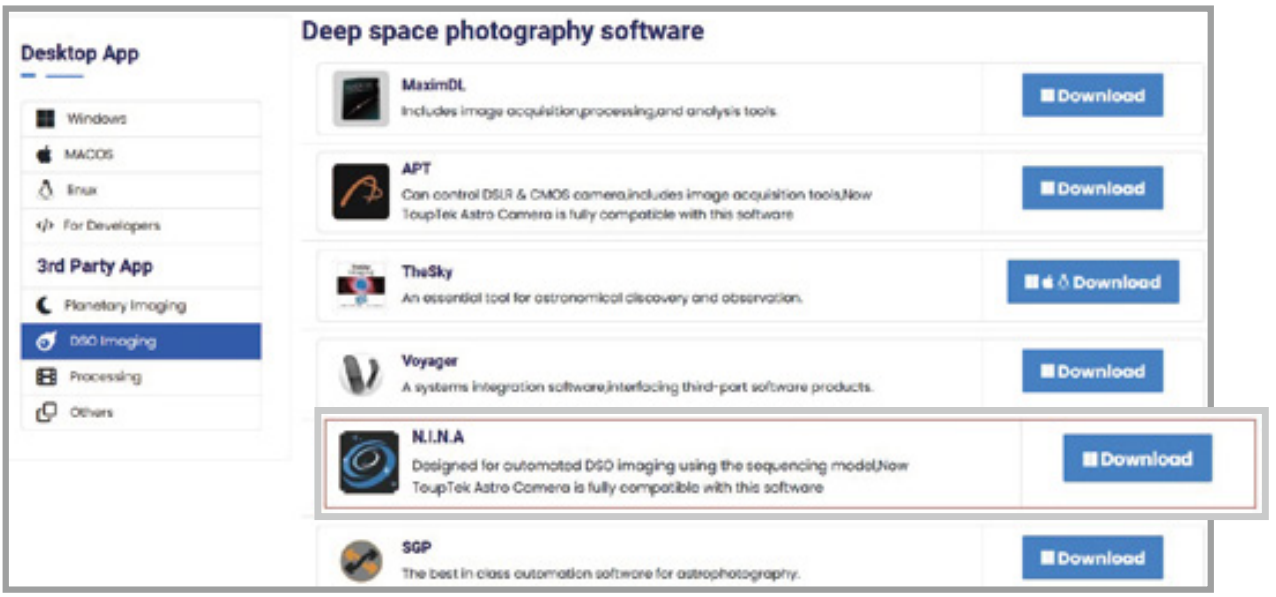
SLR Lens Connection Solution



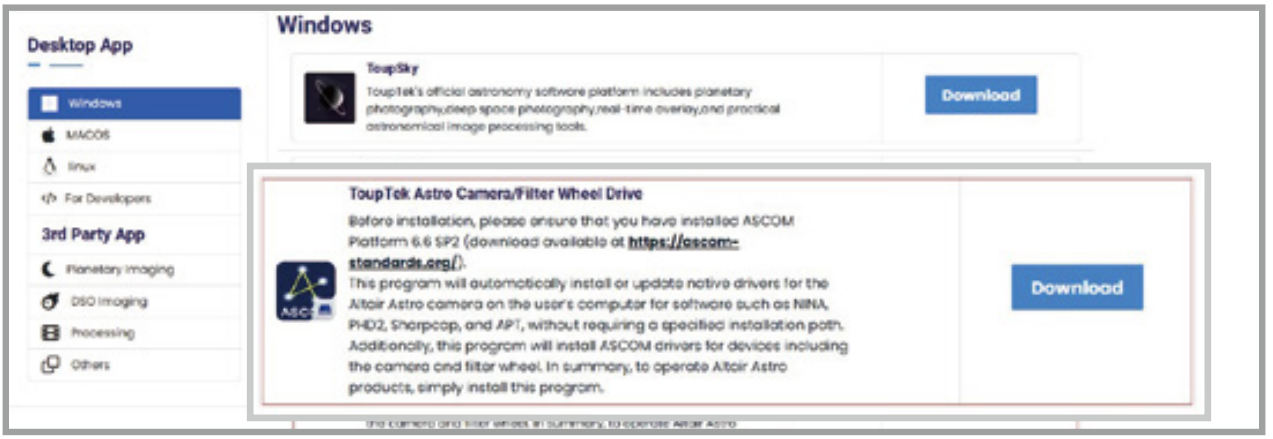
Meeting the Back Focal Length Requirements for the Respective Lens:
① The ATR Series DSO CooledCameras; ② Nikon F Mount to M42 External Thread Adapter Ring; ③ Nikon F Mount Lens; ④ Canon EF Mount to M42 External Thread Adapter Ring; ⑤ Canon EF Mount Lens.

Connecting the ATR series cameras to N.I.N.A.

1.Software Acquisition: Please visit **https://www.touptek-astro.com.cn/downloads/** to obtain the download link for N.I.N.A. Finding N.I.N.A under "Third-Party Software - Deep Sky Imaging" on that webpage. The software package includes the ToupTek Astro camera local drivers, so there is no need for additional downloads. It is recommended to use the local drivers. If ASCOM drivers are needed for use with N.I.N.A, the ASCOM platform download link can be found under "Third-Party Software - Others" on the same page.

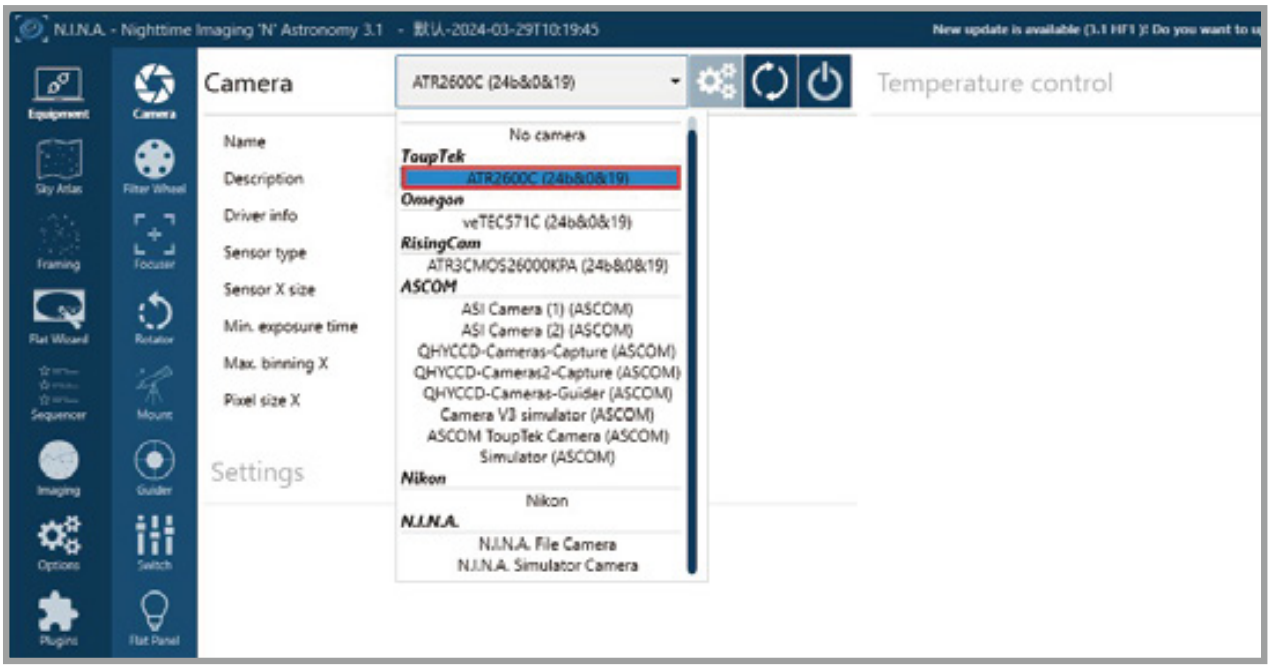


2.Driver Installation and Updates: If you encounter missing drivers after updating N.I.N.A, or if you wish to use the latest ToupTek Astro camera driver, please visit **https: //www. touptek-astro.com.cn/downloads/**. On the "Desktop Applications - Windows" section of the webpage, you can find the ToupTek Astro camera / filter wheel driver installer. This installer includes local drivers for ToupTek Astro cameras within N.I.N.A as well as ASCOM drivers. Simply download and install with a single click, without needing to specify an installation path.



3.Hardware Connection: Power on the ATR series camera and connect it to the computer using the data cable.

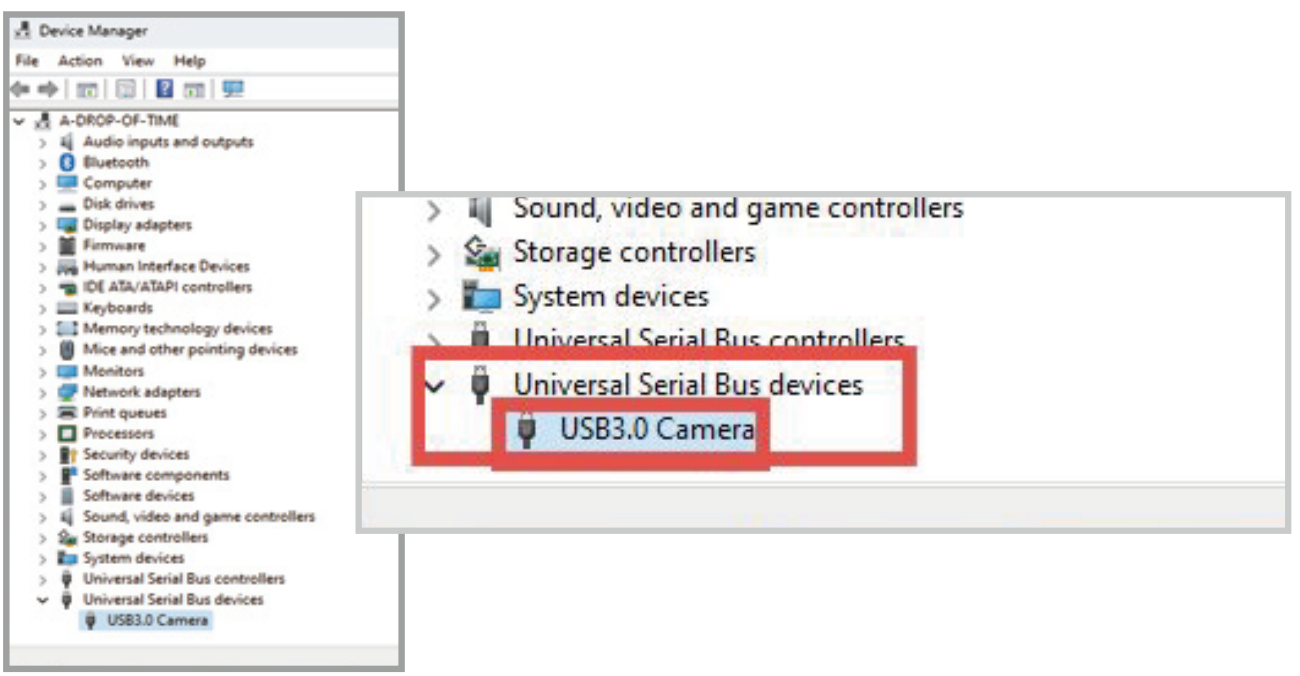
4.Open the N.I.N.A software interface, click on "Devices" -> "Camera". Under the ToupTek section, locate the corresponding local driver and select it. Click the connect button on the right side of the camera section to establish the connection.



FAQ (Frequently Asked Questions)

1.Q: How to handle it when there is no response when USB connecting the ATR series camera to the computer/AstroStation?
A: Due to the high power consumption of deep-sky cooled cameras, the ATR series camera cannot be powered on through USB. It requires a stable DC 12V power supply. It is recommended to use a power supply that can provide a stable single output of 12V 3A or higher. Using unstable power supplies or power hubs may cause abnormal camera images or even damage the camera.

2.Q: After installing the ToupTek Astro camera driver package, how to handle it if the camera still cannot be found in the software (using Windows 11 as an example)?
A: On Windows desktop, locate the Windows icon. Right-click on the icon and select "Device Manager".Open Device Manager and find the Universal Serial Bus devices. If your camera's USB connection is experiencing issues, you may see a question mark or exclamation mark icon here. Try uninstalling this device, then reconnect the camera. If using a USB hub to connect to the computer, troubleshoot by changing the USB port and checking the hub's power supply.



3.Q: How should I set the parameters for the first use of the ToupTek Astro cooled camera?
A:In astrophotography, every suitable parameter setting combines the objective condition of the equipment, the target being captured, environmental factors, and your familiarity with the device.

Use N.I.N.A with the following parameter settings as reference:

• **Default Gain:** It is recommended to use 100 during shooting. • **Default Offset (Dark Current):** For HCG mode, it is recommended to use 256 or slightly higher. • **USB Limit:** 9; • **Readout Mode for Snapshot/Sequence (Gain Conversion):** It is recommended to use High Conversion Gain (HCG). • **Low Noise Mode (available on some cameras):** It is recommended to enable. • **Full Well Mode:** When capturing high dynamic range celestial objects (such as M42, where there is a significant difference in brightness between the core and edges), consider enabling this option and setting the gain to 177 or higher. It is generally not recommended to enable this setting under normal circumstances. • **Pixel Averaging During Merge:** If pixel merging is not enabled, no settings are required. • **Anti-Dew Heating Intensity:** Adjust as needed based on environmental humidity. If unsure about the possibility or degree of condensation, start with the second setting. • Fan Speed: 1 (must be on during cooling). • **LED Lights:** When shooting with other astronomers or in remote telescope setups, it is recommended to turn off to avoid disturbing others' shooting. • **Target Temperature:** Adjust in real-time based on ambient temperature. It can be set within effective cooling temperature differentials; it is suggested to set at 0°C or below. Except in regions with extremely low winter temperatures, it is not recommended to set cooling temperatures below -20°C. • **Duration in Minutes:** You can set the time required for cooling to the target temperature. If time allows, setting a longer time can avoid some condensation issues caused by rapid cooling. • **Rewarming Duration in Minutes:** This setting gradually turns off cooling after shooting ends, which helps maintain the cooling system and extend its lifespan. If time allows, you can set it to about three to five minutes.

• **Exposure:** Adjust based on the imaging target and calibration field. Common light frame exposure parameters range from 120s to 600s, with 300s being most common. Adjust according to the tracking accuracy of the equatorial mount, brightness of the target celestial object, and light pollution conditions. For dark frames, besides blocking light, parameters should be consistent with light frames. Bias frames are recommended at 0.0001s. Flat frames require real-time exposure adjustment; it is suggested that the exposure time per frame should not be less than 1s.

4.Q: What to do if the cooling temperature doesn't decrease?

A: ①Start by taking a long exposure photo (such as 300s or 600s). It's not necessary to complete the exposure; triggering the exposure is sufficient. This reduces the camera's internal workload and heat generation.②The nominal maximum cooling temperature difference of the camera is based on testing at around 25°C room temperature. The lower the ambient temperature, the smaller the actual cooling temperature difference.③Check the power supply situation to see if the power output is sufficient.④Sometimes, when starting cooling in N.I.N.A, the camera may not receive the relevant commands, and thus cooling does not start, and the cooling power does not change. In such cases, restarting N.I.N.A and reconnecting the camera can resolve the issue.

5.Q: How to eliminate a shadow appearing in the center of the image shortly after cooling the camera?

A: Rapid cooling can cause a significant temperature difference between the inside and outside of the camera's CMOS protective glass, leading to condensation on the outer surface of the CMOS protective glass. Typically, setting the heating window to the maximum setting and waiting for a while will make the shadow in the center of the image disappear.

After-sales Service Policy

1.Standard Warranty

Warranty Period: From the date of purchase and receipt by the customer from our company, we provide a free warranty service for a period of 2 years. For AstroStation products, the warranty period starts from the date the customer's device is successfully activated.

2.Dead on Arrival (DOA) Handling

In the event of a DOA situation, please contact ToupTek within the specified time limit and provide the purchase invoice and relevant proof.ToupTek will arrange for doorstep pickup service and take the following actions based on specific circumstances:

①Replacement for Quality Issues: Within 30 days of receipt, if the product is confirmed to have quality issues by ToupTek Customer Service Center, the company will replace it with a new one free of charge.②Handling of Transportation Damage: Within 3 days of receipt, if the product's external packaging shows obvious signs of water stains, severe crushing, or other transportation damage, the user needs to submit photos of the external packaging and proof of receipt. After verification that it was caused by direct transportation by ToupTek or an authorized distributor, the company will provide return or exchange services. If sold or transported directly by a distributor, the distributor will handle the matter.

3.Non-Warranty Service Scope and Repair Policy

The following situations are not covered under warranty, and ToupTek may provide paid repair services:

Products beyond the warranty period; product damage due to water ingress, moisture, or corrosion; damage caused by external forces (such as scratches, deformation of the shell, USB interface breakage, etc.); unauthorized disassembly, third-party repairs, modifications, or firmware flashing without written authorization from ToupTek; unauthorized alteration or loss of warranty labels; quality issues caused by failure to follow product instructions; physical damage due to force majeure (such as natural disasters); damage due to improper user operation; inability to provide valid purchase invoices and warranty certificates or purchase of second-hand products.

4.Replacement Policy for Accessories

If accessories or other parts provided with the product have quality issues, users can request replacement of new accessories separately. This does not affect the main unit's return and exchange conditions.

This guide may be updated without prior notice.
You can find the latest version of the "User Manual" on the **ToupTek Astro** official website.

If you have any questions or suggestions, please contact us via the following email:

marketing@touptek.com

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