Guide Camera Manual



ASI120MM Mini

ASI220MM Mini

ASI174MM Mini

Thank you for purchasing ZWO ASI camera! Please make sure you've read this manual before you use the product.

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1 Product Introduction

ASI120MM Mini



The ASI120MM Mini camera integrates the AR0130CS 1/3" sensor (4.8 mm x 3.6 mm). It is a new model in the "mini"-series of cameras from ZWO. This camera has 1280 x 960 pixels with a pixel size of 3.75 µm x 3.75 µm. It provides 12-bit ADC and the QE peak is almost 80%.

ASI220MM Mini



The ASI220MM Mini camera integrates Type 1/1.8 SC2210 sensor (7.68 mm x 4.32 mm). It is a mono guide camera with excellent

near infrared sensitivity. This camera has 4μm x 4μm pixels with an array of 1920 x 1080 and a full well capacity of 8780e. The protective window is AR coated.

ASI174MM Mini



ASI174MM Mini camera integrates Sony IMX174LLJ 1/1.2" sensor (11.3 mm x 7.1 mm). It is the first model in the "mini"-series of cameras from ZWO. This camera has 1936 x 1216 pixels with a pixel size of 5.86 μm x 5.86 μm. It camera provides 12-bit ADC and its QE peak is 77%.

USB 2.0 Port & ST4 Port

USB 2.0 Port: Mini camera has one USB2.0 type-C port. Type-C port is very popular in mobile phones, as it doesn't matter which way you connect it (unlike for example type-A or type-B)

#USB-C to USB-A cable is required.

ST4 Port: The camera can be connected directly to the auto-guider port of the mount.

2 Notice for Use

Before you use the camera, please read the guide below.

Storage temperature	-20℃ ~ 60℃
Storage humidity	20% ~ 95%
Operating temperature	-5℃ ~ 50℃
Operating humidity	20% ~ 80%

Please do not use any corrosive solutions to clean the camera to avoid damaging the camera. Also don’t expose the camera directly to the sun for long time to avoid surface discoloration.

3 Getting to Know Your Camera

3.1 External View



① ST4 Port

② USB 2.0 Port

3.2 Camera Specifications

Model	ASI120MM Mini	ASI220MM Mini	ASI174MM Mini
Sensor	1/3" CMOS AR0130CS	Type 1/1.8 SC2210_BW	1/1.2" IMX249
Diagonal	6mm	8.81mm	13.2mm
Resolution	1.2MP 1280×960	2.07MP 1920×1080	2.30MP 1936×1216
Pixel size	3.75μm	4μm	5.86μm
Sensor size	4.8mm×3.6mm	7.68mm×4.32mm	11.3 mm x 7.1 mm
Max frame rate	35fps	14fps	18fps(12bitADC)
Shutter	Rolling shutter	Rolling shutter	Global shutter
Exp range	64μs-2000s	32μs~10s	32μs-300s
Read noise	4.0e~6.6e	0.6-3.2 e(1.97e@10.6db gain)	3.5e @30db
QE peak	80%	500nm 92%	77%
Full well capacity	14.5ke	8.78ke	32ke
ADC	12bit		
USB port	USB 2.0 Type-C		
Connection adapter	1.25"/ M28.5×0.6		
Protective window	AR		
Camera diagonal	36mm		
Net weight	60g		
Back focus distance	8.5mm		
Supported OS	Windows, Linux & Mac OSX		

the fastest frame rate at typical resolution:

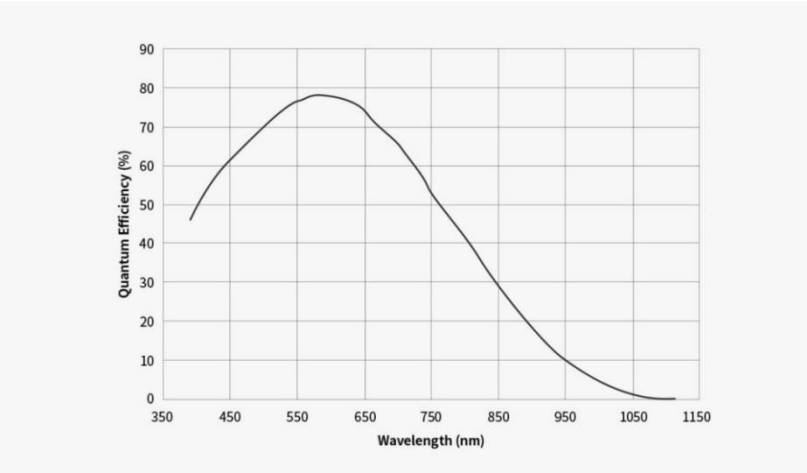
Camera	ASI120MM Mini		ASI220MM Mini		ASI174MM Mini	
Mode	**USB 2.0 Normal Mode：12BIT ADC**					
Resolution	**RAW16**	**RAW8**	**RAW16**	**RAW8**	**RAW16**	**RAW8**
1936×1216	\	\	\	\	9.2fps	18.4fps
1936×1096	\	\	\	\	\	\
1920×1080	\	\	7fps	14fps	10.4fps	20.9fps
1280×960	17.5fps	30fps	\	\	\	\
1280×720	\	\	10.4fps	20.8fps	23.5fps	33.8fps
1024×768	27.4fps	37.2fps	\	\	\	\
640×480	58.3fps	58.3fps	15.3fps	30.5fps	49.5fps	49.5fps
320×240	111fps	111fps	28.7fps	57.4fps	92.3fps	92.3fps

3.3 Quantum Efficiency & Readout Noise

ASI120MM Mini

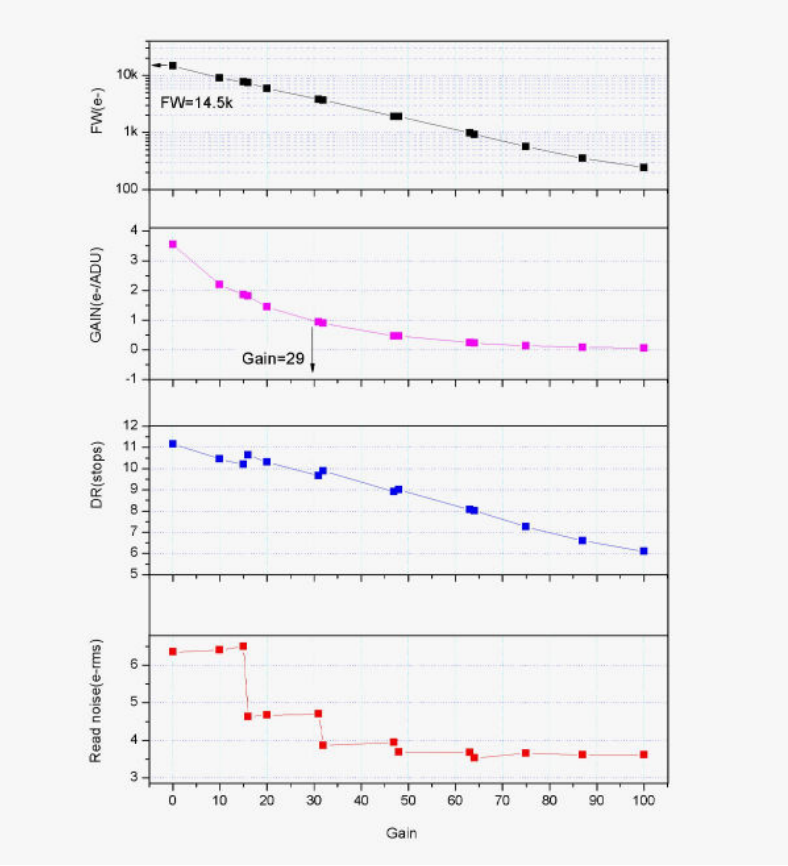
Quantum Efficiency

Regarding the absolute QE Curve, we estimate the Peak Value to be almost 80%.



Readout Noise

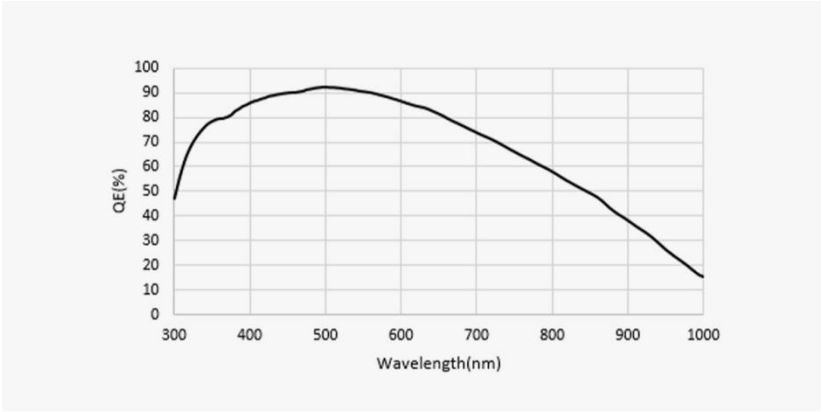
The readout noise of ASI120MM Mini can be as low as fewer than 4e.



ASI220MM Mini

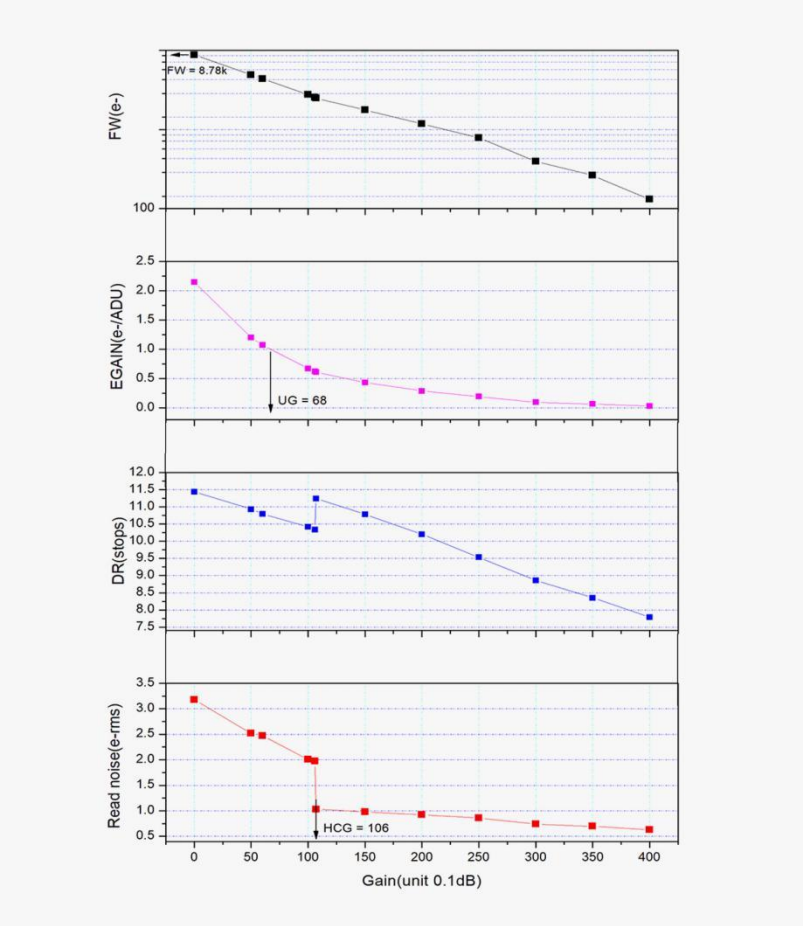
Quantum Efficiency

Regarding the absolute QE Curve, we estimate the Peak Value to be almost 92%（500nm）.



Readout Noise

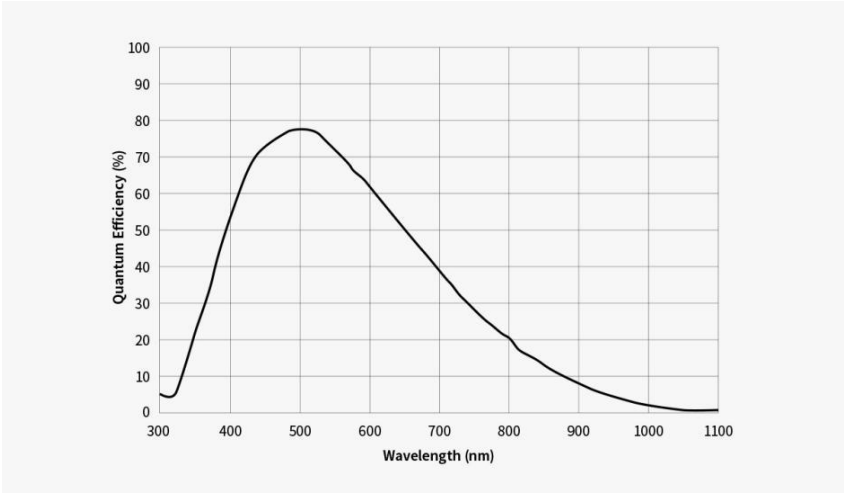
The readout noise of ASI220MM Mini can be as low as 0.6 e.



ASI174MM Mini

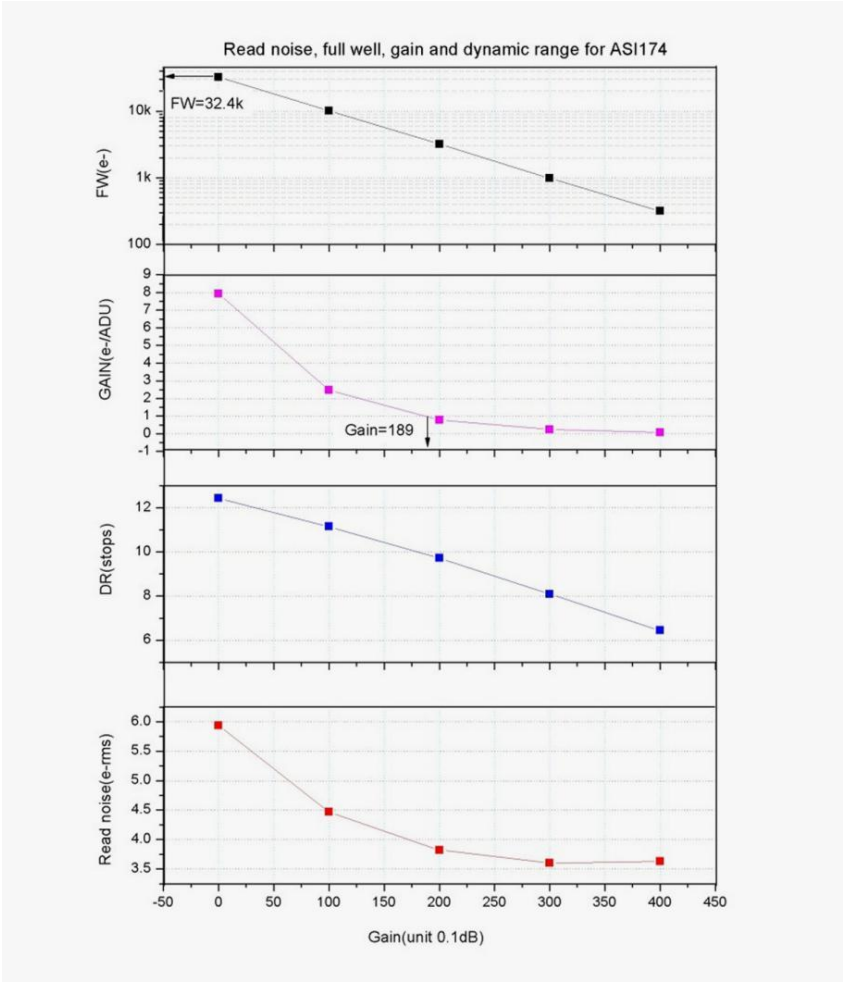
Quantum Efficiency

Regarding the absolute QE Curve, we estimate the Peak Value to be almost 77%.



Readout Noise

The readout noise of ASI174MM Mini can be as low as fewer than 3.6e.

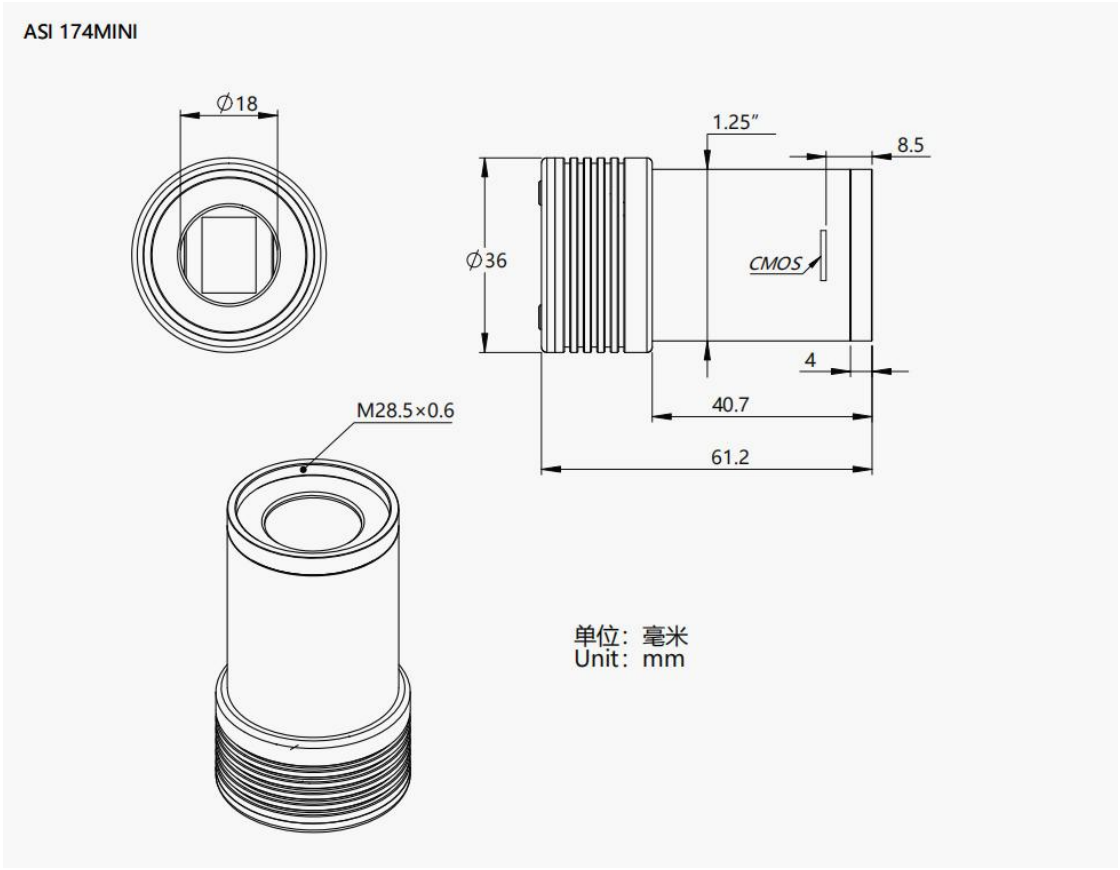


4 What's in the Box

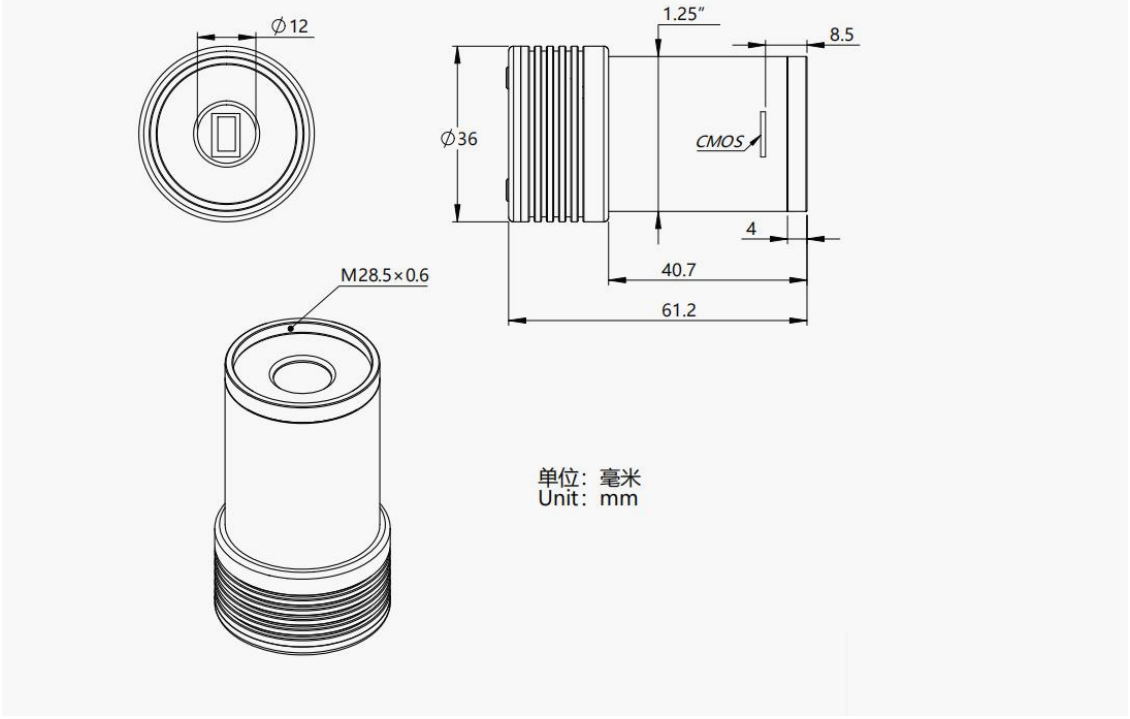


5 Mechanical Drawing

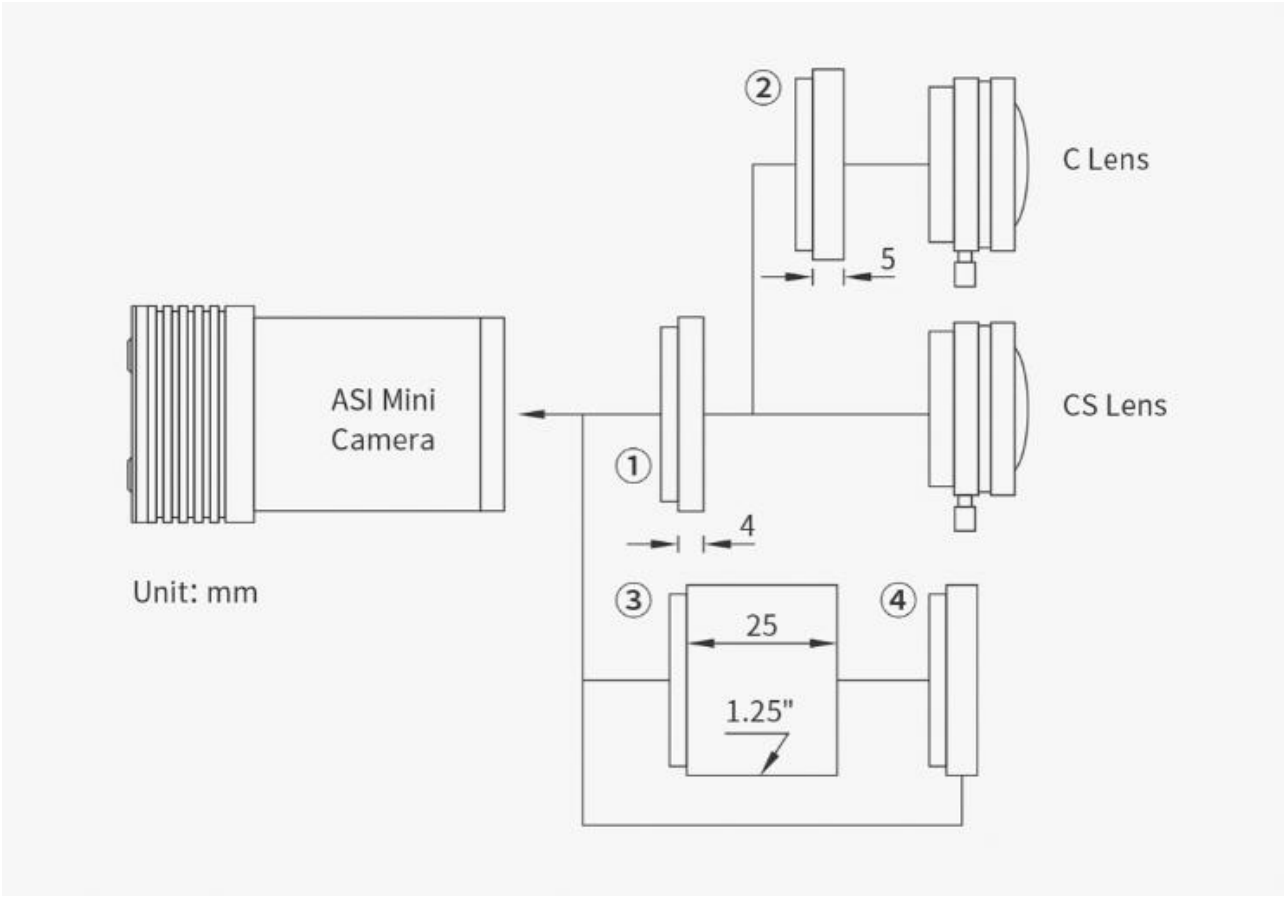
ASI 174MINI



ASI 120&220MINI



6 Connection Methods



① M28.5-CS adapter

② CS-C adapter（optional）

③ 1.25” extender

④ 1.25” filter（optional）

Work with OAG

The Mini-camera series are well suited for OAG use: They have a much bigger focus range than normal ASI cameras. No more worrying about your guide camera and main camera not being able to find focus at the same time.



Work with CS adapter and CS lens



Work with 1.25” extender



7 Warranty Policy

1. ZWO will provide a 2-year free warranty service (Warranty Period) for ZWO products purchased by Users from ZWO ("Products") in accordance with this Policy, commencing on the day following receipt of the Products by Users. For ASIAIR Plus users, commencing on the day of device activation.

2. If a User encounters the following Dead on Arrival (DOA) and contacts ZWO within the corresponding time limit to issue the Product purchase invoice and relevant evidence, ZWO will provide door-to-door pick-up service and, as appropriate, after-sale replacement (or partial replacement), repair or return (or partial return) service for the following Products:

1) Product quality problem

Provided that a User detects a quality problem and contacts ZWO within 180 days after receipt of the Products, and ZWO support team confirms that the Products indeed have a quality problem or defect after their inspection, ZWO will provide free replacement service towards such Products;

2) Product transportation problem

Provided that a User finds obvious signs of bubbling, serious overstocking, or deformation on the outer package of the Products upon receipt of the Products, and provides ZWO with pictures of the outer package and proof of receipt within 3 days after receipt of such Products, ZWO support team will verify the actual shipper and determine the responsible party for such transportation problem. In the event that ZWO is the actual shipper, ZWO will be responsible for providing the relevant return or replacement service, however, if the Products are directly sold or transported to the User by an agent of ZWO, the agent will be responsible for providing the relevant return or replacement service;

3) Any quality problem with the accessories or other parts of the Products is not a condition for the return or change of the Products, and the User may solely request to replace the accessories with new ones, which shall be handled after verification by ZWO support team.

3. If the Products are under the following circumstances, they are not within the scope of warranty service. ZWO may provide maintenance services to the Users:

1) The Warranty Period of the Products has expired;

2) The Products are injected into liquid or affected by moisture or corrosion;

3) The Products are damaged by an external force (such as the broken of the camera protection window glass, the deformation of the product shell, the broken of the USB port, etc.);

4) Disassembling, repairing by a third party, refurbishment of the Products (such as downloading erroneous firmware) without the written authorization of ZWO;

5) The product system is modified, or the maintenance notice is lost or changed;

6) Product quality problem caused by installation not following the requirements or instructions for the Products;

7) Physical damage or failure of the Products caused by the force majeure (such as strong vibration or extrusion such as flood, fire, earthquake, or thunder stroke);

8) Damage caused by the improper User operation during the period of shooting or use, such as using without the equipment protection or direct shooting of the sun;

9) No valid purchase invoice or warranty certificate;

10) The Products are second-hand products.

8 After-sale Service

For software upgrades, please refer to “Guide & Manuals” on our official website.

https://www.zwoastro.com/guides-and-manuals/

For repairs and consultation, you can visit here:

https://support.astronomy-imaging-camera.com/

Email: info@zwoptical.com.

Phone: 0512-65923102

1. For the normal repair or replacement of the Products during the Warranty Period, the User will bear the return cost. When returning the Products, Users shall specify the actual reasons for the damage to the Products, and shall provide the corresponding valid certificates, such as pictures or videos, etc.

For the Products that need to be replaced after being confirmed by ZWO in writing, the User shall return the Products with the complete package, together with all accessories, manuals, etc., to the address designated by ZWO.

By sending back the product to ZWO, the User agrees to pay out-of-warranty fees that may arise during the repair process of the product. ZWO will send back the product after charging.

2. For the Products that need to be returned for after-sales service, ZWO will provide the corresponding RMA code for reference. ZWO will not accept any products having no RMA code that have been returned privately without ZWO written confirmation.

3. If a User purchases the ZWO Products from a ZWO agent, the User may contact the ZWO agent directly for the relevant after-sales service.