

# Detailed Installation and Operations Manual





Thank you for purchasing the ZWO EAF. This guide will give you a brief introduction to the installation of your new Electronic Automatic Focuser. Please take the time to read it thoroughly and if you have any other questions, feel free to contact our support team at <u>info@zwoptical.com</u>



# Catalogue

Electronic Automatic Focuser1
Detailed Installation and Operations Manual1
Welcome to Your New Focuser Experience
Product Description
EAF Specifications6
Installation7
Dimensions8
Connecting your EAF9
Software Installation and Configuration11
Connecting EAF to your Astronomy Software12
ASIStudio12
ASIAIR
Sharpcap17
FireCapture18
Sequence Generator Pro19
Maxim DL Pro19
Nebulosity20
The SkyX20
Manual/Automatical Focus Control22
ASIStudio23
ASIAIR
Sequence Generator Pro28
FocusMax
Measuring the Focuser Backlash
6 Warranty and Return Policy



## **1. Welcome to Your New Focuser Experience**

The EAF is a high quality Electronic Automatic Focuser (EAF) designed to suit a wide range of Optical Tube Assemblies (OTA). It is supplied with a versatile mounting bracket system suitable for flexible installation across a wide range of telescope focuser systems.

## **2. Product Description**

The ZWO EAF is an all metal bodied electronic focus drive system designed for installation across a wide range of Optical Tube Assemblies. The flexible mounting system allows installation across refractors, Newtonians, Cassegrain and many other telescope designs. The accessories coming with the box offer a quick and simple installation using the supplied hardware and wrenches.

Finished in an attractive red anodised finish, the EAF's original design will grace any telescope. The EAF logo uses the Airy spot as an embellishment to reflect its precise focusing performance.

The EAF utilises a 35mm stepper motor which is subdivided into 5760 steps capable of being accurately positioned at any angle.





### Features (Standard Version)

- High quality metal focuser with anodized finish.
- Precise focus control for planetary and deep sky imaging.
- Can be used in both autofocus and manual modes.
- Flexible installation for use on a variety of refractors, Newtonians, schmidt cassegrain and other Optical Tube Assemblies.
- Versatile mounting bracket system with other adapters available for purchase.
- ASCOM/INDI compatible drivers available for download interfaces with many well-known astronomy software packages.
- **ASICAP support** built in.
- Native support in ASIAIR.
- Integrated USB interface.
- Powered by USB 2.0 cable.

#### **Features (Advanced Version)**



In addition to the features of the Standard version, the Advanced version offers:

- Temperature sensor
- Hand controller

### **Supplied Accessories**



- 1. **EAF Body** contains the focuser motor and controller.
- 2. Motor Bracket for attaching the body to the OTA focuser assembly.
- 3. **Flexible Coupling** to attach the focus motor shaft to the OTA focuser drive shaft.
- 4. **Mounting Hardware** Spacers and screws to mount the focuser body.
- 5. **M4 and M5 Wrenches** for secure the shaft locking screws and bracket hex screws.
- 6. **USB 2.0 Cable** connection of computers or ASIAIR to the focus controller.



## **3. EAF Specifications**

Construction Material	All metal, red anodised finish
Motor Specification	35mm Stepper Motor
Subdivision Steps	5760 steps
Torque	1.5N/M
Focuser Payload Limit	5KG
Power/Data Interface	USB 2.0
Sensor/Hand Controller Interface	3.5mm audio, Centre Positive

The ZWO EAF utilises a USB2.0 interface for data communication which supports ASCOM and can be used in association with a wide variety of astronomy software.

Planetary imagers can use ZWO's ASICAP or other third-party software packages such as Sharpcap, FireCapture.

Deep sky astrophotographers can enjoy support from ZWO's ASIAIR or other well known packages such as Maxim DL, The SkyX, Sequence Generator Pro, Nebulosity and many more. Third party focus software such as FocusMax, is also supported.

Your EAF is also fitted with a small multi-function interface that supports a temperature sensor or external hand controller.

A dedicated temperature sensor can be connected to collect temperature data and allow focuser control from your chosen software. The hand controller allows for manual control of focuser position and focus motor speed.



## 4. Installation

Your EAF is supplied with a bracket for connection to a wide variety of focusers. The standard bracket supports:

SkyWatcher Astrophotography Reflectors, SkyWatcher Black Diam ond, SkyWatcher Dobsonians, SkyWatcher Maksutov-Newtonians. TS Optics,

Astro Tech,

Feather Touch,

SharpStar telescopes,

SkyRover telescopes,

Explore Scientific telescopes

•••••

We recommend you refer to this instruction to confirm whether your telescopes and focusers are compatible to EAF.

https://www.yuque.com/zwopkb/hardware/eaf-support-list#G2tSm

You can also check the mechanical drawing below to estimate the compatibility by yourself.

A range of brackets for other telescopes are going to be available with time. Please keep your eyes on the ZWO site.



## 5. Dimensions



coupling

on

the



## 6. Connecting your EAF





flexible

Install

lock screw.

the

Remove the coarse adjustment knob of the telescope focuser with a suitable sized wrench.



telescope focuser shaft and tighten the

Attach the bracket to the focuser and then fix it to the EAF body with the screws.

Attach the bracket to the focuser and then fix it to the EAF body with the screws.



EAF Manual





For curved focusing seats, such as those on the Sharpstar and the Feathertouch focusers, you only need use the original locking screws and 3 spacers to fix the EAF. There are grooves on the bottom of the EAF connecting plate, and the single screw provides sufficient stability.



## 7. Software Installation and Configuration

#### **ASCOM** Installation

The latest version of ASIStudio has native support for the EAF. Other software packages will require the use of an ASCOM driver. EAF ASCOM drivers can be found on the ZWO website: <u>https://astronomy-imaging-camera.com/software-drivers</u>

	ASCOM Drivers (optional)					
ASCOM Platform	After installing the ASCOM Platform, please install below ASCOM drivers, then you can use many 3rd party astro software through ASCOM. <b>Note:</b> This software is not from ZWO, we just provide another download node. <u>Official Site</u>	v6.5	Released 11/20/2020	<u>Download</u>		
ASCOM	ASCOM driver to support ASI Cameras, EAF, EFW and USBST4.	v6.5.1.4 <u>Change</u> Log	Released 3/1/2021	<u>Download</u>		

Download and install the ASCOM driver and launch the EAF dashboard from within your astronomy software.





## 8. Connecting EAF to your Astronomy

## Software

## ASIStudio

Take ASICap for example:

1. Open the focuser control panel.

	—	$\times$
🕄 🛞 🔍 🖊	<b>Y</b> Ö	8
Camera(via USB3.0)		~
ZWO ASI1600MM-Cool(05008904)	- 🚫 💽	0
Image		~
Format RAW8 B	in Binl	-

2. choose the focuser that you connected.



3. Set suitable settings for your EAF.





### ASIAIR

The newest ASIAIR App version supports Manual Focus and Auto

Focus.

1. Tap the Focuser icon on the top navigation bar to enter the

Focuser Settings page.





#### 2. Manual Focus Settings



There are three types of settings,

#### 1) Info Display

**Temp** shows the environmental temperature in Celsius format with an extra Temperature Sensor (comes with the ZWO-EAF-A kit), or the EAF inner temperature without one.

**Position Info > Current** shows the EAF stepper count of the current position based on the last ZERO position. Also, you can do a position GoTo here.



#### 2) Action Settings

GoTo, see above.

**Reverse**, turning it on means make the EAF Motor rotates in the reverse direction based on the current direction.



#### 3) Parameters

Tap the Focuser icon in the left Auxiliary Tools area to show the Focus Control Pad, switch the move step size which is set in the Fine (Slow) Step and Coarse (Fast) Step options by tapping the text button 'Slow'/'Fast'.

**Max Step Limit**, the max step that the EAF can move, which is based on your telescope focuser and has the upper limit of 60,000. Recommended to set it to 60,000 by default.

Backlash, see 12 section of this document to measure.

**Beep**, make a sound which is described as the tip text tells after the EAF moved.



#### 3. Auto Focus



Tap the 'Next' icon (>) to enter the Auto Focus Settings.

(î:	< Auto Focus Settings
0	AF EXP
<b>*</b>	Step Size 10 Specifies the number of focus steps between the data points to adjust the change of Star Size and only effects in AF
**	Run Auto focus in Autorun every X°C change 1°C 2°C 5°C
	every X hours 0.5H 1H 2H
	on filter change
	before Autorun start
	after Auto Meridian flipped
	'every X °C change' and 'every X hours' are based on the latest successful focus record, 'before Autorun start' not include on resume

**All the settings** have the meanings as the title or the tip text tells. **AF EXP**, here the value is a common setting if there is no ZWO EFW is connected and only effects while AF is enabled in Autorun mode. If a ZWO EFW is connected, go to the EFW Settings page to set different AF EXP for each filter.



AF has two trigger ways, **manually** or **automatically**. AF runs automatically in the Autorun progress if any of the options are enabled in the above settings.

Trigger it manually by tapping the AF icon on the Focus Control Pad.



## Sharpcap

1.Open Sharpcap settings.



2. Choose ZWO focuser.



🔵 Sharp	Cap Setting	IS					×
General	Hardware	Filenames	Memory	Plate Solving	Polar Alignment	Startup Scripts	
Focuser:	·	ZWO Foo	user			Ŷ	Properties
Filter Wh	eel:	None				~	Properties
Mounts:		None				~	Properties
Connect hardware automatically when opening a camera							

## **FireCapture**

1. Open the focuser panel in settings menu.



2. Check "Use ASCOM Focuser"

🥮 Settings: Focuser		
Search:	✓ Use ASCOM Focuser	
General	#1 1 Position 300 A	×
🛅 Layout 🌖 Filters	FireCapture will now try to initialize your focu Please choose your ASCOM focuser from the follow	
Profiles Shortcuts	确定	
🐻 Log	#5 Position	

3. Choose ZWO Focuser in ASCOM panel.





### **Sequence Generator Pro**

🥔 Untitled* - (No equipment	profile; No user profile)		×
	Target Data	Equipment	
Target List ()	Selected: Target 1	🚳 Camera: No Camera 🗸 🦉	- 2
	Running: None	Filter Wheel: No Filter Wheel	- 🧖
	Directory: C:\Users\WHY\Downloads Browse	🧬 Focuser: ZWO Focuser 🗸 🏑	<mark>-</mark> _
	% File Name: %ft\%tn_%el_%bi_%su_%fn 🖉 📼	Telescope: No Focuser ASCOM Simulator Focuser Drive	وم ا
+ 🚹 Ł 📀 🗶 🖛		DXFocuser Arduino Edition FocusMax Focuser Hub	
Sequence Status	Target Status	Delay and Ordering Generic Hub	
Remaining time: 00:00:00	Total events complete: 0/1 () Remaining time: 00:00:00		
Elapsed time: 00:00:00	Total frames complete: 0/1		/ents
	0%	Delay between ZWO Focuser	ts first

## Maxim DL Pro

1.Open "Observatory panel", in "Focuser 1" option, click "Choose...".

🕅 MaxIm DL Pro 5		
<u>File Edit View Analyze Process Filter Col</u>	or Pl <u>ug</u> -in <u>W</u> indow <u>H</u> elp	
🎽 🖬   요 근   🎞 🔀 🕸 🚹 📴   역 🍳 🗍	Observatory	
🗅 🛎 🗳 🇁 🚳 日 🗳 🖉 🗞 🏠	All Sky Zoom Catalog Telescope	Dome Focus Status Setup
· · · · · · · · · · · · · · · · · ·		Dome
<ul> <li></li> <li><th>No Device Selected</th><th>No Device Selected</th></li></ul>	No Device Selected	No Device Selected
* 🕲 🔁 🕂	Options	Options 🕨
	Connect Disconnect	Connect Disconnect
♠ △ 🗑 🖾 🗢 🕙 🍛 🖏 /   🛥 4	Focuser 1	Focuser 2
$0 = 0 \otimes b \otimes 0 \otimes   \Delta = 2   1$	ZWO Focuser	No Device Selected
	Options	Choose
	Connect Disconnect	Setup
	Rotator	Enable for Connect All
	No Devices Coloridad	

2. Choose ZWO Focuser in ASCOM panel.

×



🗽 ASCOM Focuser Chooser	×
Trace Select the type of focuser you have, to click the Properties button to driver for your focuser.	
ZWO Focuser 💌	Properties
ASCOM Simulator Focuser Driver	
FocusMax Focuser Hub	OK
Generic Hub Pipe diagnostic tool	Cancel
POTH Hub Simulator	
ZWO Focuser	

### Nebulosity

To be added

#### The SkyX

1. Open "Telescope" menu, and select "Telescope Setup"

X Chart Settings - TheSkyX Professional Edition



#### 2.Select "Focuser Setup"

✗ Imaging System Setup - ImagingSystem

Mount <no mount="" selected="">       Focuser     <no focuser="" selected="">       Camera     ASCOM Camera       Dome     <no dome="" selected="">       Filter Wheel     <no filter="" selected="" wheel="">       Rotator     <no rotator="" selected="">       Video Device     <no device="" selected="" video=""></no></no></no></no></no></no>	ırdware	Selection	ſ	Focuser: o Focuser Selected>	Focuser Setup 🔻
Focuser        Settings         Camera       ASCOM Camera       Timeout:       45 set         Dome <no dome="" selected="">       Timeout:       45 set         Filter Wheel       <no filter="" selected="" wheel="">       Temperature source:       Focuse         Rotator       <no rotator="" selected="">       Disconnect       Disconnect         Video Device       <no device="" selected="" video="">       Disconnect</no></no></no></no>	naging System Mount	<no mount="" selected=""></no>		Status: Not Connected	Choose
Dome <no dome="" selected="">       Filter Wheel     <no filter="" selected="" wheel="">       Rotator     <no rotator="" selected="">       Video Device     <no device="" selected="" video=""></no></no></no></no>			1		Settings
Video Device <no device="" selected="" video=""></no>	Camera Dome Filter Wheel	<no dome="" selected=""> <no filter="" selected="" wheel=""></no></no>			
	·· Rotator ·· Video Device ·· Autoguider				



 $\times$ 



#### 3. select ASCOM Focuser

X Choose Focuser		×
Current selection: Ascom ASCOM F	ocuser	
Focuser	Comment	<b>_</b>
No Focuser Selected>	Please select your focuser from the lis	t below.
- Ascom		
ASCOM Focuser	Any ASCOM Focuser	
+ Astro-Physics		
Finger Lakes Instrumentation		
⊡ Gemini		
⊞ Meade		
⊡ Officina Stellare		
Optec		-
		OK Cancel

- 4. Setup the settings of ASCOM focuser.
- 🗙 Imaging System Setup ImagingSystem

Hardware	Selection	Focuser: ASCOM Focuser	Focuser Setup 🔻	]	
Imaging System		Status: Not Connected	Choose	[	
Mount	<no mount="" selected=""></no>	Hardware and Driver Informatio	Settings		
Focuser	ASCOM Focuser	Hardware and briver informatio	settings		
Camera	ASCOM Camera	Device name: ASCOM Fo	Connect	ion:	1.60
Dome	<no dome="" selected=""></no>	Device description: ASCOM Fo	connect	rsion:	
- Filter Wheel	<no filter="" selected="" wheel=""></no>	Driver information: ASCOM Fo	Disconnect		No Device
Rotator	<no rotator="" selected=""></no>	· · · · · · · · · · · · · · · · · · ·		1	
Video Device	<no device="" selected<="" td="" video=""><td></td><td></td><td></td><td></td></no>				

#### 5. Choose ZWO Focuser



#### **Additional Installation Information**

There is significant torque from the EAF stepper motor. We recommended setting the 0 position and the maximum number of steps as a first step to prevent possible damage to the focuser.



#### For the standard bracket installation:

The 0 position is recommended to be set to the position when the focuser is fully retracted.

The maximum number of steps is recommended to be set to a limit position less than or equal to the full focuser stroke.

#### For the curved saddle installation:

The 0 position is recommended to be set near the focus of the focus of the focus holder.

The maximum number of steps is recommended to be set to a limit position less than or equal to the focus seat stroke.

## 9. Manual/Automatical Focus Control

Your EAF is able to be manually controlled and there are two ways to achieve this. One is via the optional hand controller and secondly via the astronomy software package in use.

We recommend you align your EAF in the daytime and use a distant target such as a building to focus on when setting up the focuser for the first time. This will help you in finding the correct focus position with plenty of light to illuminate the chosen object.

When you have found the correct focus position during the daytime, make a note of the step count number. When observing in the dark later, this will make finding the focus position easier and trouble free.



### **ASIStudio**

ASIStudio supports both manual and auto focus. Take ASICap for

an example of how to manually do focusing.

1. When the image looks very fuzzy, use "coarse" button.



2. When the image looks slightly blurred, use "fine" button.



preview fps:14.7, total frames:556, dropped frames:0

#### 3.Done



4. Goto ZERO position.

EAF Manual

buttor	2: press Goto b, go back to 0 bosition.
General	Switch         ZWO EAF(ID:0)         Image: Comparison of the state
ST4 Auto Guide	Goto position 50000 \$ Reverse Set coarse steps << 1000 \$ >> Beep
	Set fine steps < 100 \$ > Advanced Set maximum steps 60000 \$
	Set backlash 0

And then take ASIImg for an example of autofocus.

1. Turn on the camera.



2. Click the EAF icon in the Vertical Tool Bar.





3. Click the AF icon in the Horizontal Tool Bar.



4. Set EXP value and choose the bin mode.





5. Click the Run button and wait a moment.



#### 6. Done!





## ASIAIR

ASIAIR also supports both manual and auto focus. For the detailed

instruction, we recommend you head over here:

https://www.yuque.com/zwopkb/asiair/focus

#### **Sequence Generator Pro**

SGP's autofocus is very easy to use. When using SGP please set the freewheel setting in the ASCOM driver to 0 to avoid affecting the focusing speed.

1. Open the focus control dialog box



2. Enter the settings menu by clicking the setting icon



Focus Control		×		
💣 Current position:	0			
Temperature:	27.30			
🖉 Last Focus Tem	p: NA			
🕑 Last Focus Time	e: NA			
Focus Control				
↑ In: Fine	Coarse	Zero		
Steps: 10 🚖	100 🜲	Go To		
↓ Out: Fine	Coarse	Stop		
Auto Focus Sett	ings			
\star Min star size at 1x1 (px): 6 🚖				
Run 🖌 Settings				

3. Set the Auto Focus parameters as below

Triggers of auto focus process.	<ul> <li>Auto Focus Netrio</li> <li>Haf Flux Radus</li> <li>Atto Focus Frequency</li> <li>Chose the frequency at which the suto focus routine will run dwing the sequence:</li> <li>Auto focus evei0</li></ul>		Data points, recommend to set 9. The number of steps moved during the focusing process, recommend range from 5 to 20. According to the situation of focusing curve, the number of steps is too small, the focusing curve changes too slowly, the number of steps is too large, and the focusing curve is too steep. In both cases, it is not conducive to find the best focus point.
	OK	Cancel	

4. Set the focuser backlash settings



5. With the telescope roughly in focus before you start, click the run

button to start the autofocus procedure.

Focus Control ×					
Current position: 0 I Temperature: 27.36 Last Focus Temp: NA Current Last Focus Time: NA Focus Control					
↑ In: Fine	Coarse	Zero			
Steps: 10 🚖	100 🖨	Go To			
↓ Out: Fine	Coarse	Stop			
Auto Focus Setti	Auto Focus Settings				
Min star size at 1x1 (px): 6					
🕨 Run 🥻 Settings					



SGP will automatically take exposures and move the focuser steps drawing a V curve tracking the stars HFR value. Once the curve is complete SGP will drive the focuser to the best measured value.



#### FocusMax

Step 1: Set up the camera. Open the software, click System to enter the settings interface. Click the button 2 as shown below, click Choose to enter the EAF settings menu.



<mark>♥</mark> FocusMax My — □ × <u>F</u> ile <u>O</u> pen Wi <u>z</u> ard <u>S</u> et <u>H</u> elp	<mark>♥</mark> FocusMax My — □ × File <u>O</u> pen Wi <u>z</u> ard <u>S</u> et <u>H</u> elp
Profile Vourve Log Tele- Scope Jog Mini Focuser ZWO Focuser Connect Connect Temp Comp Disconnect Not Connected Backlash Comp. Enabled  100 Steps Apply when focuser moves: Profile Position Int. Diff. Slope L Paths MySystem Mini	Profile Vcurve Log Tele- Scope Jog Mini Focuser ZWO Focuser Connect Temp Comp 3 Disconnect Choose Backlash Comp. – Setup Enabled 100 Steps Maxim DL Apply when focuser moves: Coll CCD Soft Profile Position Int. Diff. Slope L R System Paths MySystem
Focus Setup Features System	Focus Setup Features System

Step 2: Select the ZWO Focuser in the dialog and click OK.



Step 3: Next, connect the EAF. Click the Connect button and wait for the connection to be made



EAF Manual

💆 FocusMax My — 🗆 🗙	💆 FocusMax My — 🗆 🗙
<u>F</u> ile <u>O</u> pen Wi <u>z</u> ard <u>S</u> et <u>H</u> elp	<u>F</u> ile <u>O</u> pen Wi <u>z</u> ard <u>S</u> et <u>H</u> elp
Profile Vcurve Log Tele- Scope Jog Mini	Profile Vourve Log Tele-Scope Jog Mini
Focuser	Focuser
ZWO Focuser	ZWO Focuser
Connect Temp Comp Disconnect Not Connected	Connect > Temp Comp Disconnect Connected
Backlash Comp Camera	Backlash Comp. ————————————————————————————————————
Enabled I 100 Steps Apply when focuser moves: Out I CCDSoft Profile	Enabled 2 100 Steps Apply when focuser moves: 0 CCDSoft Profile Position
Int. Diff.	Int. Diff.
Slope L R	Slope L R
_ System	System
Paths	Paths
MySystem	MySystem
Focus Setup Features System	Focus Setup Features System

### Step 4: Next set the Backlash Compensation and Camera Control

Set backlash: Recommend to set 100-200, direction=Out	▼ FocusMax My       -       ×         File Open Wizard Set       Help         Profile Vcurve Log Tele- Scope Jog Mini         ▼ Focuser         ZW0 Focuser         Connect       > Temp Comp         Disconnect       Connected         Backlash Comp.       Camera         Enabled       100 Steps       Maxim DL         Apply when focuser moves:       Out        O CCDSoft         Profile       Position Int. Diff.       Diff.	Choose the capture software: Support Maxim DL and CCD Soft, Capture software and camera
Recommend to set	- Proble	Maxim DL and CCD

Step 5: Set the Exposure and Focus Mode

zwo



Step 6: Open the Vcurve dialog box and set the number of steps per move (generally set to -10). Run the autofocus routine:



💆 FocusMax My — 🗆 🗙	💆 Vcurve Sequence 🗕 🗆 🗙
<u>F</u> ile <u>O</u> pen Wi <u>z</u> ard <u>S</u> et	File Set
Help	Run 2 Stop
Profile Vcurve Log Tele- Scope Jog Mini	Vcurve Parameters End O Half Points Width
Near Focus — Move — Move	Autofocus 🗹 Initial 48 Center 0
HFD 8 Oln Out	Repeat 0 Final 0 Half 24
Exposures 5 Settle Time sec 0	Images 1 Move 10 Steps 5
Autofocus Exp. Flux [sec] (1000)	1
Frame 100 Min 1.00 100	
Tgt Star 1 → Max 10.00 500	
Focus Bin 1 V Base 1.00	
Focus Start	
Position OPosition	
HFD 12	
Prev. Focus 0 O Current Pos.	Fit Lines Left Right Slope Difference
Focus Setup Features System	Position Intercept

After the V curve is drawn the focuser will be driven to the optimal focus position.

Run	itop			
Vcurve Par	Er P(	nd O	Ha Wid	lf 💿
Autofocus	🗌 Initi	al 1105	Center	955
Repeat 0		al 805	Half Width	
Images 1 /position		e 10	Steps	30
Sold Bar			đ	Ø
	A BAR		f.	8 <sup>d</sup>
Fit Lines =	Left	Righ	p <sup>f</sup>	Þ
	- All	Righ	40	f f f f f f f f f f f f f f f f f f f



### **Measuring the Focuser Backlash**

It is relatively easy to measure the focuser backlash. The following example uses ASICAP as the software application driving the EAF:

Set the coarse step size to 1000 and the fine step size to 10.

🥑 Sett	ing	×
<b>\$</b>	General	Switch EAF: ZWO EAF(ID:0) -
$\bigcirc$	EFW	Current Position: 50000 Set 0 23.4 C -
	ST4 Auto Guide	Goto position 50000 🖨 🗌 Reverse
0	EAFocuser	
	LAFOCUSET	Set coarse steps
		Set fine steps < 10 🗘 > 🖌 Advanced
		Set maximum steps 60000 🌲
		Set backlash 30 🗘

Click the Coarse Button and move the focuser out by 1000 steps.



Next set the fine tuning steps to 10 and move the focuser in and observe that the focus knob on the side of the focus rotates.



Click the fine adjustment button that moves the focuser inwards and click once. Observing the focuser knob on the opposite side to the EAF note how many steps the EAF moved before the knob moves. The number of times you click x 10 is the number of steps measured as backlash.







Set the number of steps in the Set Backlash settings box

🥑 Sett	ing	×	
₽	General	Switch EAF: ZWO EAF(ID:0) -	
$\bigcirc$	EFW	Current Position: 50000 Set 0 23.4 C -	
	ST4 Auto Guide	Goto position 50000 🖨 🗌 Reverse	
	EAFocuser	Set coarse steps << 1000 \$ >> Beep	
		Set fine steps	
		Set maximum steps 60000 🌩	
		Set backlash 30 🜩	

If you want to measure the backlash setting more accurately then chose Step Size 5 in the fine step setting and repeat the above steps.

## **10. Warranty and Return Policy**

We provide 2-year warranty for our products.





We will offer the repair service for free or replace the item for free if the EAF does not work properly within the warranty period. After the warranty period, we will continue to provide repair support and service on a charged basis.

This warranty does not apply to damage that occurred because of abuse or misuse, or damage caused by a fall, or any other accidental failures after purchase.

The customer must pay for shipping when shipping the EAF back for repair or replacement.

If you get a faulty EAF, please contact us as soon as possible via the ZWO support page:

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

Please describe the problem in detail, and we will do our best to solve the problem. Most instances are perceived problems which are caused by a bad driver install or software configuration.

For customers who bought the camera from our dealer, the dealer is responsible for the customer service.