User's manual Program control for ASI cameras 1. Create new folder and copy three files: ASI_CamerasPRO.exe, ASI_ControlPRO.exe, SFFTW.DLL, ASICameras2.dll and eclipse.c2.

🔜 🎽 📙 🗢 Eclipse				– 🗆 🗙
Soubor Domů Sdíle	ní Zobrazení			~ 😮
\leftarrow \rightarrow \checkmark \uparrow \square \rightarrow Te	ento počítač 🔸 Místní disk (C:) 🔸 Eclipse	ٽ ~	🔎 Prohledat: Eclip	ose
Images4	Název	Datum změny	Тур	Velikost
Manual	ASI_CamerasPRO	27.3.2023 5:55	Aplikace	777 kB
Mereni_2022101	ASI_ControlPRO	4.3.2023 20:12	Aplikace	683 kB
Trophox	ASI_ControlPRO	27.3.2023 6:38	Nastavení konfigu	1 kB
Se proppox	ASI1600F.cfg	27.3.2023 6:38	Soubor CFG	1 kB
OneDrive	ASI1600F.exp	27.3.2023 6:11	VisualStudio.exp.1	1 kB
Tento nočítač	ASI1600F	27.3.2023 6:38	Nastavení konfigu	1 kB
	ASI1600N.cfg	27.3.2023 6:38	Soubor CFG	1 kB
J 3D objekty	ASI1600N.exp	27.3.2023 6:11	VisualStudio.exp.1	1 kB
🖆 Dokumenty	SI1600N	27.3.2023 6:38	Nastavení konfigu	1 kB
👌 Hudba	ASICamera2.dll	11.1.2023 11:20	Rozšíření aplikace	1 673 kB
📰 Obrázky	ASIControl_UsersManual	22.11.2021 5:13	Dokument Adobe	2 066 kB
Plocha	🕗 ASISetName	19.10.2021 12:13	Aplikace	414 kB
Stažené souborv	eclipse.c2	27.3.2023 6:43	Soubor C2	1 kB
Videa	🕒 SetSystemDT	7.11.2020 5:24	Aplikace	416 kB
Minter (Jinle (C))	SFFTW.DLL	18.2.2003 17:57	Rozšíření aplikace	246 kB
🔛 Mistni disk (C:) 🗸				
Počet položek: 15				

2. Run ASI_ControlPRO.exe. The application finds all connected cameras and it will automatically run ASI_CamerasPRO.exe program for each ASI camera. Windows are arranged on computer display automatically.

O ASI1600F		- 0	× 💿 AS	11600N						-	
ASI Camera	Lens focus	It is necessary to fill the filter type correctly in the file ASI1600F.ini !	- ASI Ca	mera	Lens focus	It is necessary I	o fill the filter type	correctly in the f	le ASI1600N.ini !		
Activate Deactivate min=80 max=1760			Activ	ate Deactivate max=1456							
MIN=176 MAX=288 mean=223.42			MIN=1 mean-	50 MAX=256 207.20							
sdev=11.36			soev=	2.31							
					10						
Cooling 0 24.3°C			Coolin	0 23.5°C							
Show Expand			Sho	W Expand							
Zoom in Zoom out			Zoor	nin Zoom out	A Carela						
Set full frame				Set full frame							
Show central cross			Sho	w central cross							and the second second
Offset = 15				Offset = 15							
Gain = 0				Gain = 0							
Gamma = 1	1000-10			Gamma = 1							
Exposute = 0,006969			Expo	suite = 0,006969							
Canture Auto save			Can	ure L Auto save	1 States						
Capturing	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1			Capturing							
0.05			0.05								
0.20 0.40			0.20								
0.80 1.60	1.		0.80		and and a						
3.20 6.40			3.20 6.40								
					and the						
			~								
Show 1	<		> Sh	w 1	<						>
					Cameras	×					
		Capture Eclipse Dark	Flat	DarkFlat	Get ang	ie C1 C2					
		Time C2		Difference							• ×
		27.3.2023 06:26:27 20.4.202	23 03:28:45	23d - 2	21:02:17	Test C2					

3. After previous step you have to close ASI_ControlPRO.exe program which automatically closes all running ASI_CamerasPRO.exe programs. It is done for creations of INI and EXP files which are create automatically.

4. Now it is necessary to edit cameras INI files and to fill parameters ION, WAVEL and TYPE.

冯 Lister - [c:\Eclipse\ASI1600F.ini] — 🗆 🗙	🚡 Lister - [c:\Eclipse\ASI1600N.ini] — 🗆 🛛 🕹
<u>S</u> oubor <u>U</u> pravit <u>M</u> ožnosti Kó <u>d</u> ování <u>N</u> ápověda 100 <u>%</u>	<u>S</u> oubor <u>U</u> pravit <u>M</u> ožnosti Kó <u>d</u> ování <u>N</u> ápověda 100 <u>%</u>
ION = FeXI WAUEL = 7880 TYPE = ofband	ION = FeXI WAVEL = 7892 TYPE = onband
< >	< >

5. Run ASI_ControlPRO.exe again. Each window shows basic information from corresponding INI files above the image area.

🙆 ASI1600F — 🗆	× 🙆 ASH600N – 🗆 ×
ASI Camera Lens focus FeXI_7880_ofband	ASI Camera Lens focus FeXI_7892_onband
Activate Deactivate	Activate Deactivate
min=96 max=2320 MIN=176 M4X=288	min=80 max=2560 MIN=160 M4X=256
mean=223.55 sdev=12.01	mean=207.45 sdev=12.35
Cooling 0 25.5°C	Cooling 0 28.0°C
Show Expand	Show Expand
gm= 2.20 th= 0.01%	gm= 2.20 th= 0.01%
Zoom in Zoom out	Zoom in Zoom out
Set full frame	Set full frame
Show central cross	Show central cross
Offset = 15	Offset = 15
Lian = U	Lian = U
Gamma = 1	Liamma = 1
Exposule = 0,00cdcd	EXposure = U,Ubbbbb
Cashen Automain	Costus
Capturing	Capitule Addo save
0.05	0.05
0.10	0.10 0.20
0.40	0.40
1.60	1.60
640	6.40°
Show 1 c	Show 1 <
@ ASI_CONTROL	×
Capture	Cameras
Capturing Eclipse Dark	Flat DarkFlat Get angle C1 C2
Time C2	Difference
27.3.2023 07:07:36 20.4.2023 0	03:28:45 23d - 20:21:08 Test CZ

6. ASI_ControlPRO.ini file contained basic settings (list of cameras, window position and number of flats). These values are set automatically and it is not necessary to change them.

🔄 Liste	er - [c:\Ecli	\times			
Soubor	Upravit	Možnosti	Kódování	Nápověda	100 %
FEXI: FEXI: LEFT = TOP = NUMBEF NUMBEF BEFORE	ASI1600 ASI1600 781 726 Rofdark Rofflat E_C2 =	F N Series = S = 300 60	· 20		
<					>

7. Capturing starts automatically after C2. The date and time are set in the eclipse.c2 file.

🔄 Liste	r - [c:\Ecli	pse\eclipse.	c2]	—		\times
Soubor	Upravit	Možnosti	Kódování	Nápo	věda	100 %
4/20/2 3:28:4	2023 15					
<						>

8. Files with *.exp extension contain exposure parameters for automatic controlling. Two cameras forming a couple have to have identically parameters.

🔄 Liste	er - [c:\Ecli	pse\ASI1600	F.exp]	_		\times
Soubor	Upravit	Možnosti	Kódování	Nápov	/ěda	100 %
0.05 0.10 0.20 0.40 0.80 1.60 3.20 6.40						
<						>

It is necessary to set $Offset = 15,\,Gain = 0$ and Gamma = 1 .

Now everything is ready to capturing images.

Descrition of ASI cameraPRO.exe program control

- Capture Get one image and automatically save to corresponding subdirectory when activates Auto save (for example Fe_XI_7892\Image). It is used just for taking test images (not eclipse ones).
- Capturing Get sequence of images and automatically save them to corresponding subdirectory when activates Auto save (for example Fe_XI_7892\Image). It is used just for taking test images (not eclipse ones).
- Auto save Activates auto save
- Cooling Start/Stop cooling to the desired temperature.
- Show Show image with the specific parameters (gm-gamma correction, th-percentage of under-flown and over-flown pixels). This parameters has not influence on taken images. They change only their viewing.
- **Expand** It is switch activating the auto contrast for images display (it is advisable to switch it ON).
- Set full frame Deactivate the selection of an active frame.
- Show central cross It shows central cross. In the fullframe mode shows the sun circle as well.
- Lens focus Semi-automatic lens focussing tool (will be explained later).

It is possible to use the fast display of small image area (frame) for precise lens focusing. The frame is set by means of left mouse button and dragging the corresponding rectangle. The positions and size can by change by standard methods used in Windows.



Ones the frame is set the set of buttons appears and it is possible to use these buttons for setting of predefined sizes of the frame and it's centering.

If the frame is set to image central a cross will mark the center of the whole image. It is used for making onband and ofband cameras parallel.

Set sundisc diameter button enables to set sun circle diameter. The circle diameter is defined by the rectangle which positions and size can by change by standard methods used in Windows. (The circle diameter is an arithmetic mean of rectangle width and height)



During the partial eclipse centering of the lenses is done by sun circle.



Semi-automatic lens focusing

This tool allows to optimally focus the lens based on image processing. After pressing the **Lens** Focus button, the tool window will appear.

Before starting the process, roughly focus the lens and adjust the focus ring to approximately the center of the focus interval and tighten the ring.

0 ASI1600F							– o x	
ASI Camera	Lens focus	FeXI_78	30_ofban	d				
Activate Deactivate	Positions	12 📤	Images	3		Get SEQ		_
min=5792 max=46864 MIN=5952 MAX=46336 mean=41380.66 sdev=9401.63		<u></u>	mages		<u> </u>	^		
Cooling 0 25.2°C								
Show Expand								
gm= 2.20 th= 0.01%						×		
Zoom in Zoom out	<					,		
Set full frame								
Show central cross								
Offset = 15								
Gain = 0								
Gamma = 1								
Exposute = 0,052477								
Capture Auto save								
Capturing								
0.05								

The **Position** parameter specifies the number of focus positions and the **Images** the number of images per position. Parameters are preset but can be changed.

Now set the position of the focusing ring to one of the extreme positions and start the sharpening process with the "Get SEQ" button.

Press the "OK" button to confirm the image capture for each position which can correspond to one revolution of the microfocusing screw. This process can be cancelled by pressing the "Cancel" button.

After all images have been taken, an automatic analysis is performed. The result is written to a text window and also plotted on a graph.



Now we can set the optimal position of the focus ring and fix it with the microfocusing screws.

Description of ASI ControlPRO.exe program control

SI_CONTROL							×
Capture	TSE				Cameras —		
Capturing	Eclipse	Dark	Flat	DarkFlat	Get angle	C1	C2
Time 27.3.2023	06:30:39	<mark>C2</mark> 20.4.2023	03:28:45	Difference 23d - 20:	58:05	Test	C2

Buttons Capture and Capturing are use for test images making. This images are taken with both cameras simultaneously.

Get angle button calculates the angle of the rotation between pair of cameras with 0.5° precision. C1 resp. C2 button switches enable to maximize program window of camera no.1 resp. camera no.2. If both these switches are OFF the program windows share the desktop.

Taking of eclipse images

The eclipse sequence is started automatically. Start time is set in eclipse.c2 file. You can also start the sequence manually with the **Eclipse** button.

Before eclipse check if all image parameters, the filter temperatures and the camera chips temperatures are correct.

After C3 it is necessary to stop taking images with the Eclipse button.

Before the sequence, Offset is automatically set to 100 and Gamma to 1.

Taking of dark-frames

It is necessary to cover the lenses of cameras by non-transparent cups. It is advisable to cover the cups by Al-foil in order to prevent any light to come in the optical system. Then press the **Dark** button and the sequence of dark-frames will be taken automatically. It will take approximately 10-15 min.. Dark frames must be created after the eclipse. Exposures list is saved in ...\vid_on and ...\vid_of in subdirectories. The last *.exp file is always used.

Before the sequence, Offset is automatically set to 100 and Gamma to 1.

Taking of flat-fields

Wait till the end of partial eclipse. Orient the cameras to the zenith, remove the cups and place plastic opaque panels in-front of both lenses. Press the **Flat** button and camera will estimate correct exposure time. You will be ask to validate the exposure time. Simply press OK. Sequence of flatfields will be taken automatically. In the middle of the sequence you will be asked to change mutually the flat-field panels and press OK.

Before the sequence, Offset is automatically set to 50, Gain to 0 and Gamma to 1.

Taking of dark-frames for flat-fields

It is necessary to cover the lenses of cameras by non-transparent cups. It is advisable to cover the cups by Al-foil in order to prevent any light to come in the optical system. Then press the **DarkFlat** button and the sequence of dark-frames for flat-fields will be taken automatically. It will take approximately 10-15 min.. (Do not touch flat-field button again after taking flat-fields is finished !).

Before the sequence, Offset is automatically set to 50, Gain to 0 and Gamma to 1.

Other software

ASISetName.exe - the application can set the camera name. It is necessary to set different camera names in one pair.

SetSystemDT.exe - the application can set the system time. It is necessary to set UTC time zone. We have to run the application as administrator.