INTI-SharpCap script « Menu » version 04.01.2023:

This document quickly presents the installation and use of the *INTI_SharpCap_menu.py*.
As the name suggests, this is a script for SharpCap and since SharpCap only works on Windows, a computer with Windows is required.

Installation:
- Python (preferably 3.x, but no test done with 2.x)
- SharpCap 4.x.
  But need PRO version to have script functions
- The *INTI_SharpCap_menu.py* script can be installed anywhere

For file processing by the INTI script automatically after a scan, you must also install version 3.7 of the script from TheSmiths https://github.com/thelondonsmiths/Solex_ser_recon_EN/releases/tag/v3.7_Windows
There is also on github a version 3.6.2. Do not use version 3.6.2 because the parameters are not transmitted correctly.

Note: the *INTI_SharpCap_menu.py* script only works with TheSmiths' INTI script, so not with Valérie's INTI script.
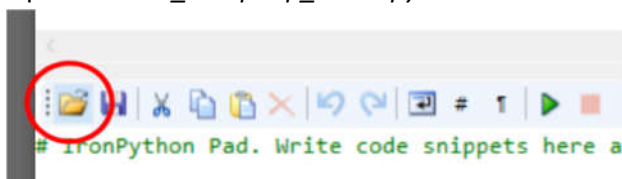
Preparing the script:
You have to make some modifications to the *INTI_SharpCap_menu.py* script before you can use it.
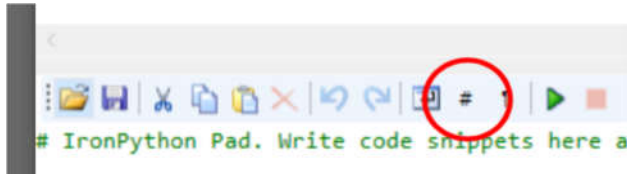The easiest way is to make the changes directly from the IronPython console in SharpCap.

- Start SharpCap Pro

- Start the IronPython console (Scripting menu – Show Console)
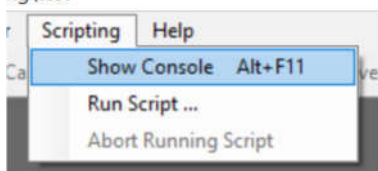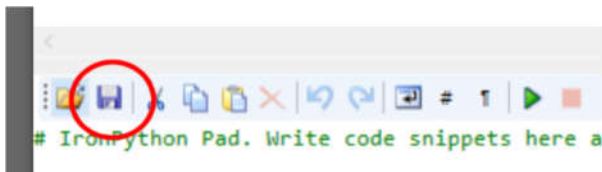

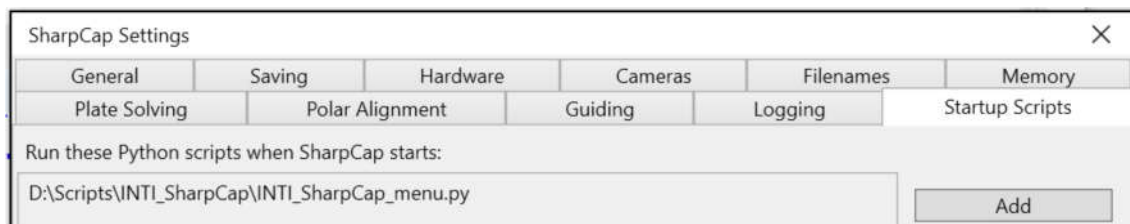- Open the *INTI_SharpCap_menu.py* file

- Show line numbers

- Go to lines 89, 90 and 91, change the information for the observer, the telescope and the identifier of the Pro-Am Solar Orbiter program.

- Go to line 105 and change the directory with the location of the SHG_ MAIN.py files of the v3.7 script of TheSmiths on your computer.

- Go to line 107 and change the directory where the SHG.ico file is saved.

- Go to line 296 and change the focal length of the telescope (if you only have one telescope with a focal length other than 432mm).

- Go to lines 669 and 774 and change the directory and filename with a SER movie from your computer, when you want to experiment with a SER file you already have.
  Or erase or comment out lines 669 and 774 to process the films of the sun directly after a scan.

- Save the script with the button.

- Open "File – SharpCap Settings", select the "Startup Scripts" tab and the "Add" button.
  Select the *INTI_SharpCap_menu.py* script. If you already have other scripts, you can change the order. Close the window with "Apply and OK".

SharpCap Settings					✕
General	Saving	Hardware	Cameras	Filenames	Memory
Plate Solving	Polar Alignment	Guiding	Logging	Startup Scripts	

Run these Python scripts when SharpCap starts:

D:\Scripts\INTI_SharpCap\INTI_SharpCap_menu.py	Add

- <u>Close and restart</u> SharpCap to load the script on startup.
  A symbol should appear in the menu bar.

Preparation of SharpCap:
- Connect the camera
- Connect the telescope (only if an ASCOM driver allows telescope control)
- Define where SER films are saved in SharpCap
- Change all parameters necessary for shooting (ROI, exposure, gain, …)
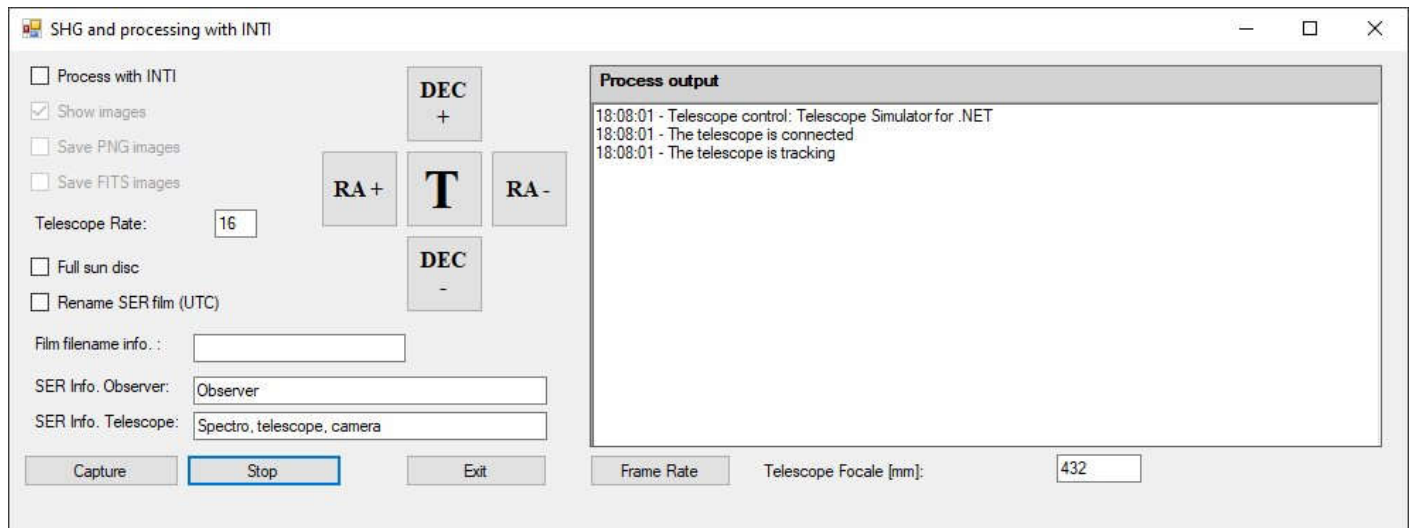
Starting the script:
- Start the *INTI_SharpCap_menu.py* script with the menu symbol

- There is no need to open the Python console window.

IMPORTANT: do not start the script without having connected the camera. Otherwise, SharpCap crashes and you have to use the Task- Manager to close SharpCap.

Using the script:

Process with INTI:

Activated: authorizes the selection of INTI processing and does the processing after the capture of the last SER movie with TheSmiths script (latest version 3.7).

Disabled: does no INTI processing.

Show images:

Activated: Shows all images and automatic processing during reconstruction. Displays the CLAHE.png image on the screen and displays the 4 images (grouped on the whole screen) at the end of the processing.

Disabled: Displays only the CLAHE.png image on the screen at the end of processing.

Save PNG images:

Activated: Saves all *.png images on disk in the same movie directory.

Disabled: Saves the CLAHE.png image only to disk in the same directory of the movie.

Save FIT images:

Activated: Saves FITS images to disk in the same directory of the movie.

Disabled: Does not save any FITS images.

Telescope Rate:

Allows selection of the telescope rate in x-times the sidereal rate. Depending on the ASCOM driver, it is possible to have intermediate speeds (not only 4, 8 or 16, but also 5, 6, 7 or 14).

Full sun disc:

Activated: "FullDisc" information will be saved in the "Teleskop" field of the SER file.

Disabled: "PartialDisc" information will be saved in the "Teleskop" field of the SER file.

Rename SER film (UTC):

Activated: The SER file name is changed to follow the format of the Pro-Am collaboration campaign.

Disabled: SER file name is not changed. The file name format is defined in SharpCap.

The format of the SER file for the Pro-Am campaign is "YYYYMMDDhhmmss_ID_*.extension" with ID the identifier (a number and the initials of the observer for example: 12345AB), YYYY = year, MM = month, DD = day and hh = hour, mm = minute, ss = second. The file may contain additional information.

Example movies:

|	
▶ 20221016094221_12345ABF.ser	16.10.2022 11:42
📄 20221016094236_12345AB_Ha_2x2.CameraSettings.txt	16.10.2022 11:42
▶ 20221016094236_12345AB_Ha_2x2.ser	16.10.2022 11:42

Film filename info:

The observer can add information in the name. For example "1x1", "Ha_2x2" …

The character "_" is added automatically.

Observer and Telescope information:

It is possible to add 2 comments in the Observer and Telescope fields which will be saved in the header of the SER file. The information can be prepared in advance (see preparing the script).

Note: only the first 40 characters are taken into account!
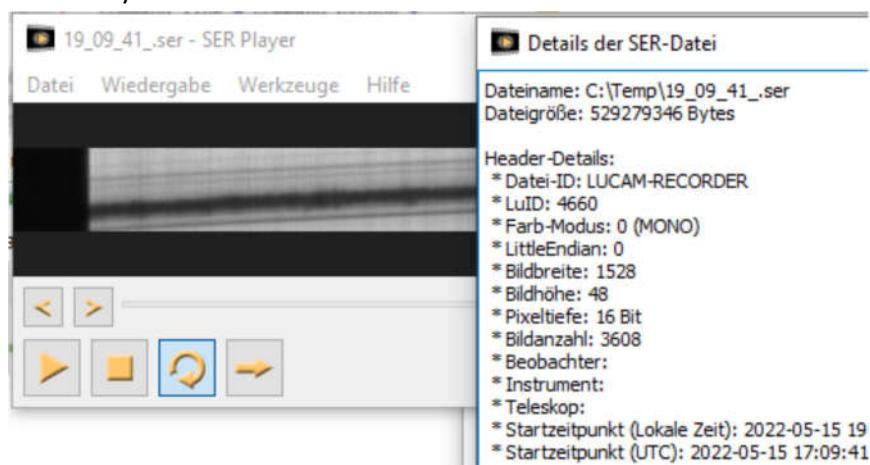
Observer and telescope information can be preset in lines 89 and 90.

The "Instrument" field is used to communicate additional information.

The axis and direction of the scan, the side of the mount, if the sun disk is complete, the speed of the scan and the angles of the sun P and Bo. The information will be used for the orientation of the sun image by the INTI script (still under development).

Capture:

A click on the "Capture" button launches the capture of a movie (if the file type in "Output Format" is AVI, or FITS, no SER file will be saved and the processing Python script will not work).

Note: the "Capture" button does not produce any movement of the telescope.

⇨   Use with the mount hand controller is possible.

Stop:

A click on the "Stop" button stops capturing the movie and saves the SER file.

Exit:

Stops the *INTI_SharpCap_menu.py* script.

Frame Rate:

A click on the "Frame Rate" button calculates the speed of the telescope for a circular image of the sun.

A 2 second film starts to get the real information of the number of frames per second. Information is displayed. The diameter of the sun in pixels is calculated for an average diameter of 32''.

Note: the film is erased at the end.

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Process output

18:08:01 - Telescope control: Telescope Simulator for .NET
18:08:01 - The telescope is connected
18:08:01 - The telescope is tracking
18:09:30 - Binning = 2x2
18:09:30 - Pixel size = 4.8 µm
18:09:30 - Frame rate = 343.2 fps
18:09:30 - Sun size = 1207.7 pixel
18:09:30 - Sun delta = -22.7 deg
18:09:30 - Telescope scan rate = 36.4 x
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Telescope control:

The central button changes according to use.
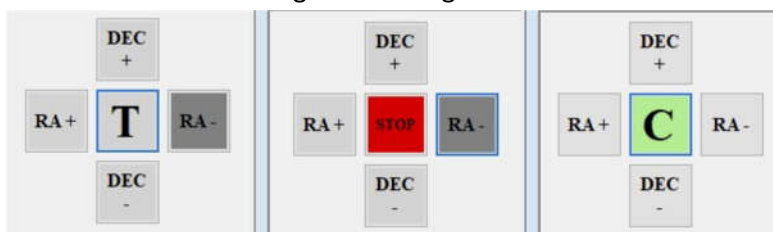
T (for Telescope):

The 4 control buttons (DEC+, RA+, RA- and DEC-) only move the telescope.

C (for Capture):

The 4 command buttons (DEC+, RA+, RA- and DEC-) move the telescope and also start saving a film.

STOP:

A movement of the telescope is stopped and if "C" was activated a SER movie is saved.

If "Process with INTI" is activated, an INTI process also starts automatically.

4 buttons DEC+, RA+, RA- and DEC-:

A click on the button starts the movement of the telescope and if "C" was selected, a movie is started.

Some important points:

- The 4 control buttons (DEC+, RA+, RA- and DEC-) do not behave like the control buttons in SharpCap telescope control. You don't have to press continuously. *A single click is required*

- To stop the movement of the telescope, press STOP in the script or STOP in the window "Scope Controls" in SharpCap.

- When an INTI processing starts, it is not possible to move the telescope or launch a second movie. But a click is memorized and is done after the INTI processing is finished.

- Several clicks on the 4 control buttons (DEC+, RA+, RA- and DEC-) one after the other, increase or reduce the speed of the telescope (very practical for centring quickly, but it depends on the driver. Works with SkyWatcher-SynScan, but not with GSS).
  Important: For constant speed, press a button only once!