

## Description of the OccultWatcher add-in SC\_Report:

This document describes the installation and the use of the OccultWatcher add-in for SharpCap and it describes the use of the SharpCap script for the automatic event observation.

### 1. OccultWatcher Add-in:

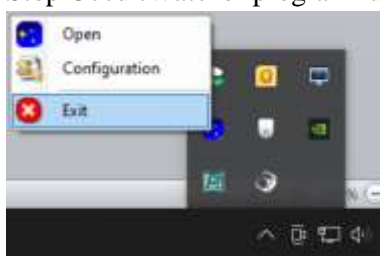
#### 1.1. Installation of the add-in SC\_Report:

**First!** Update OccultWatcher with the latest version 5.2.0 (2023-05-06) or above.

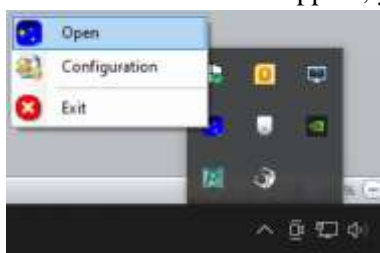
The file “OccultWatcher.SC\_report.dll” has to be installed in the same directory as the program “OccultWatcher.exe”.

The new add-in is available only after a re-start of the OccultWatcher software. For that, it is necessary to stop OccultWatcher.

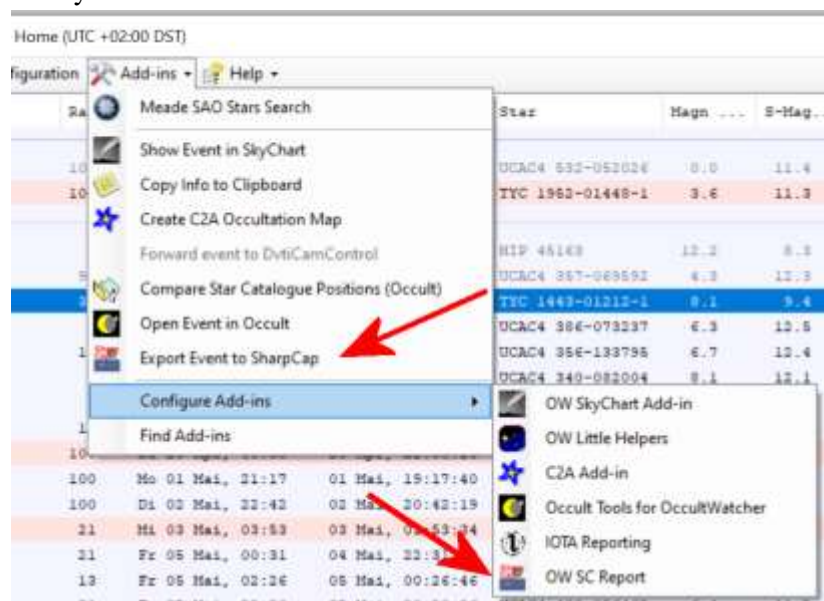
- Close the window of OccultWatcher
- Stop OccultWatcher program running with the Exit button from here:



- Restart OccultWatcher by double click on the “OccultWatcher.exe” program
- If the window does not appear, you can open the window from here:

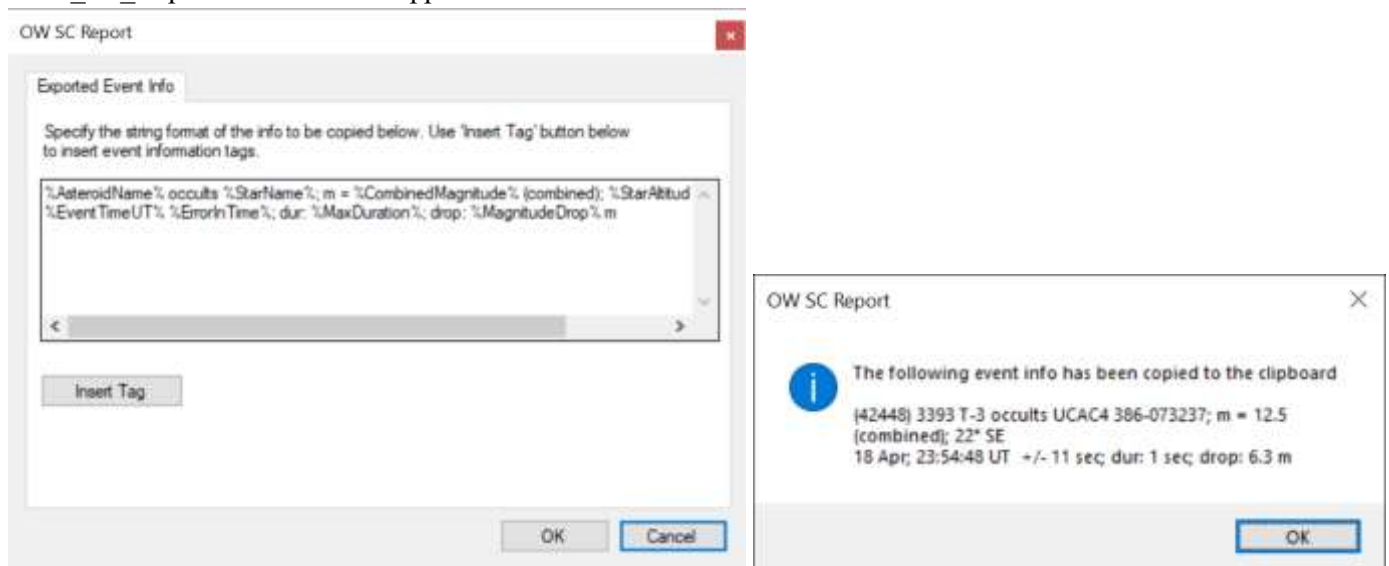


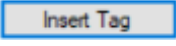
Verify that the new add-in is available:



## 1.2. Preparation of the clipboard export:

Configuration of the add-in OW\_SC\_Report: click in OccultWatcher menu “Add-ins” – “Configure Add-ins” – “OW\_SC\_Report”. The window appears:

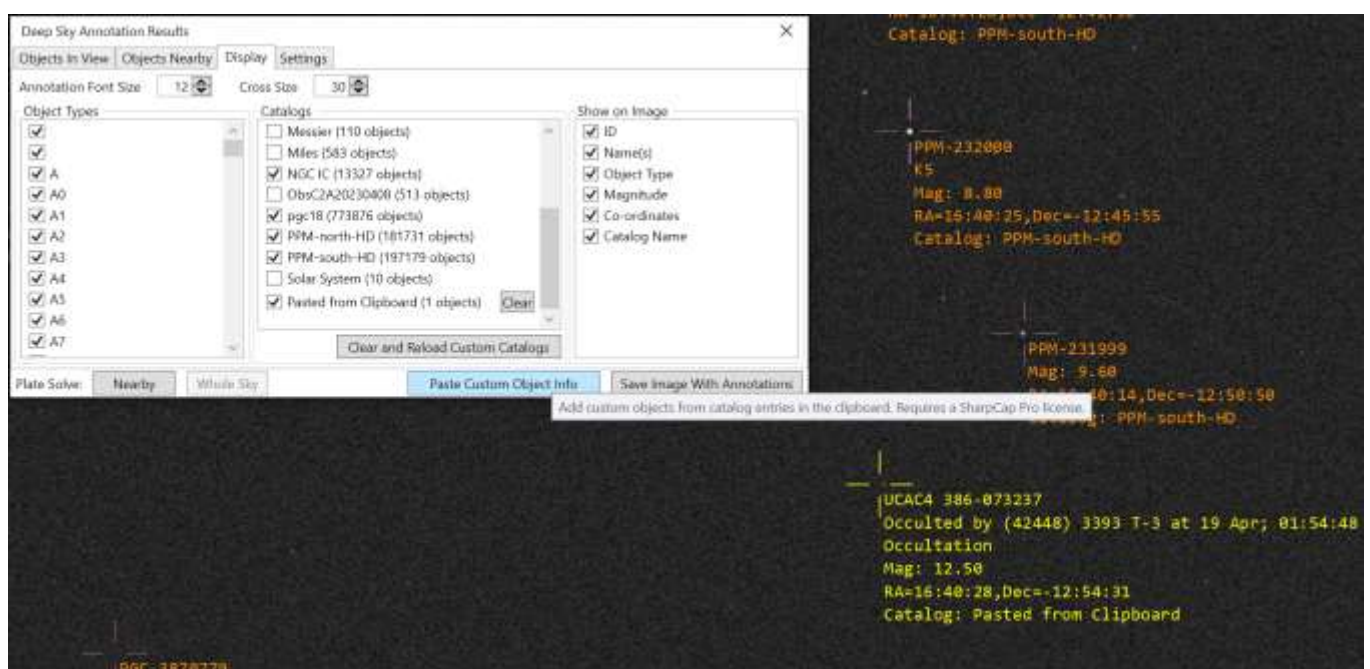
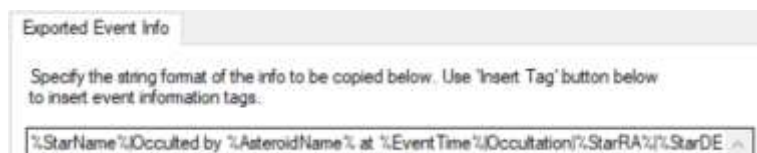


You can insert a new tag with the button . These tags will be copied only in the clipboard.

If you want to add manually an annotation in SharpCap Pro with the tool “Tools” – “Deep Sky Image Annotation”, then change the string in the “Exported Event Info” field with the following:

```
%StarName%|Occulted by %AsteroidName% at  
%EventTime%|Occultation| %StarRA%| %StarDE%| %CombinedMagnitude%| |
```

Use the text capture of your PDF software for avoiding a typo error. Delete any “Return” after “AsteroidName% at”.



### 1.3. Preparation of the document template:

The next important preparation is the document template. The user has two possibilities: a modified SODIS template or a new document only for the event information.

#### 1.3.1. SODIS template:

Here an example with the SODIS template. In **blue** the normal tags exported from OccultWatcher, in **orange** for example your information and in **green** the additional tags for the OW\_SC\_Report add-in. The **blue** normal tags and the **green** additional tags shall be present in the SODIS template.

#IOTA-ES ASTEROIDAL OCCULTATION - REPORT FORM 2.03

#Event

#Occultation: xxxxTIVE

#DATE: %EVENT-DATE%

#PREDICTTIME: %EventTimeUT%

#STAR: %STAR%

#ASTEROID: %ASTEROID%

#Nr: %ASTEROID-NO%

#OBSERVER

#Observer1: your name

#Observer2:

#moreObs:

#E-mail: your email address

#Address: your address

#OBSERVING\_STATION

#NearestCity: xxxxxx

#Countrycode: xx

#Coordinates LAT +/-DD MM SS.S LON +/-DDD MM SS.S

#Latitude: xx xx xx

#Longitude: xx xx xx

#Altitude: xx

#Datum \_blank=WGS84 N=NAD1927 E=ED1950 T=Tokyo G=GB1936 \*=unspecified, or other

#Datum:

#Teleskop \_=unstated 1=Refractor 2=Newtonian 3=SCT 4=Dobsonian 5=Binoculars 6=Other 7=None 8=eVscope

#Telescope: x

#Aperture in cm

#Aperture: x

#FocalLength in cm

#FocalLength: x

#ObservingMethod \_=unspecified a=Analogue & digital video b=Digital SLR-camera video c=Photometer  
d=Sequential images e=Drift scan f=Visual g=Other

#ObservingMethod: x

#Observation

#StartObs:

#D D=Main Star d=second Star G=satellite main star g=satellite 2nd star N=ring M=non detection +time hh:mm:ss.s

#D:

#Acc\_D:

#R R=Main Star r=second Star B=satellite main star b=satellite 2nd star N=ring M=non detection +time hh:mm:ss.s

#R:

#Acc\_R:

#EndObs:  
 #Duration:  
 #Exp\_Time:  
 #Timesource \_=unspecified a=GPS b=NTP c=Telephone (fixed or mobile) d=Radio time signal e=Internal clock of recorder f=Stopwatch g=Other  
 #Timesource: x  
 #Camera: xxxxx  
 #Signal/Noise:  
 #Weatherconditions  
 #Wind:  
 #Temperature:  
 #Transparency \_=**unstated** 1=Clear 2=Fog 3=Thin cloud <2 [mag loss <2 mag.] 4=Thick cloud >2 [mag loss >2 mag.] 5=Broken opaque cloud [that is, observed thru gaps in the cloud] 6=Star faint 7=By averted vision  
 #Transparency:  
 #Stability \_=unstated 1=Steady 2=Slight flickering 3=Strong flickering  
 #Stability:  
 #Comments:

# Information for SharpCap script

\*\*\*\*\*

#Note

#

#

#Star %STAR%

#StarName %StarName%

#StarRA %StarRA%

#StarDEC %StarDE%

#StarAzi %StarAzimuth%

#StarAlt %StarAltitude%

#StarMag %StarMagnitude%

#Constellation %Constellation%

#Asteroid %ASTEROID%

#AstName %AsteroidName%

#AstNumber %ASTEROID-NO%

#PredictTime %EventTimeUT%

#EventDate %EVENT-DATE%

#EventTime %EventTime%

#CenterDistance %CenterDistance%

#ChordOffset %ChordOffset%

#CombinedMagnitude %CombinedMagnitude%

#ErrorInTime %ErrorInTime%

#EventRank %EventRank%

#FeedName %FeedName%

#MaxDuration %MaxDuration%

#MagnitudeDrop %MagnitudeDrop%

#MagnitudeDropR %MagnitudeDropR%

#MoonAltitude %MoonAltitude%

#Probability %Probability%

#ShadowWidth %ShadowWidth%

#StarMagnitudeR %StarMagnitudeR%

#SunAltitude %SunAltitude%

```
#SunDistance %SunDistance%
#TravelDistance %TravelDistance%
#CenterDistance %CenterDistance%
```

Note the additional “\_ =unstated” in the line #Transparency.

For the details ... the line with “:” character is used in the SODIS website. The line without “:” character is ignored by the SODIS webpage, but the line is taken in account by the SharpCap script! So if you write a line in your SODIS template, do not add a character “:” in the “green” lines. Use the text capture of your PDF software for avoiding a typo error.

```
#StarName %StarName%
#StarRA %StarRA%
#StarDEC %StarDE%
#StarAzi %StarAzimuth%
```

Note that not all the tags are yet used in the SharpCap script, but it is simple to have all the tags now ... in case of a future function in the SharpCap script.

### 1.3.2. New document template:

Here an example with a new document only for the event observation with SharpCap.

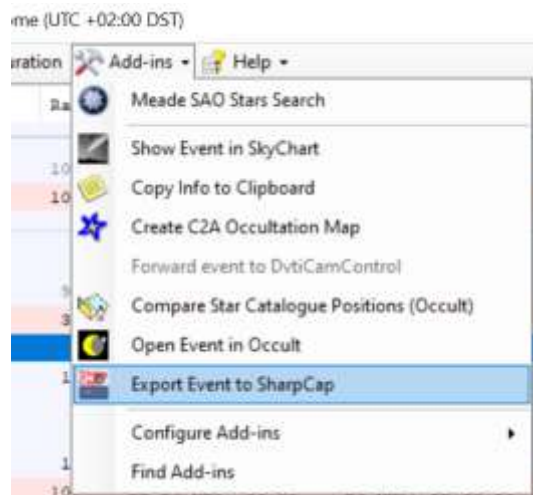
```
# Information for SharpCap script
#*****
#Note
#
#Star %STAR%
#StarName %StarName%
#StarRA %StarRA%
#StarDEC %StarDE%
#StarAzi %StarAzimuth%
#StarAlt %StarAltitude%
#StarMag %StarMagnitude%
#Constellation %Constellation%
#Asteroid %ASTEROID%
#AstName %AsteroidName%
#AstNumber %ASTEROID-NO%
#PredictTime %EventTimeUT%
#EventDate %EVENT-DATE%
#EventTime %EventTime%
#CenterDistance %CenterDistance%
#ChordOffset %ChordOffset%
#CombinedMagnitude %CombinedMagnitude%
#ErrorInTime %ErrorInTime%
#EventRank %EventRank%
#FeedName %FeedName%
#MaxDuration %MaxDuration%
#MagnitudeDrop %MagnitudeDrop%
#MagnitudeDropR %MagnitudeDropR%
#MoonAltitude %MoonAltitude%
#Probability %Probability%
```

```
#ShadowWidth %ShadowWidth%
#StarMagnitudeR %StarMagnitudeR%
#SunAltitude %SunAltitude%
#SunDistance %SunDistance%
#TravelDistance %TravelDistance%
#CenterDistance %CenterDistance%
```

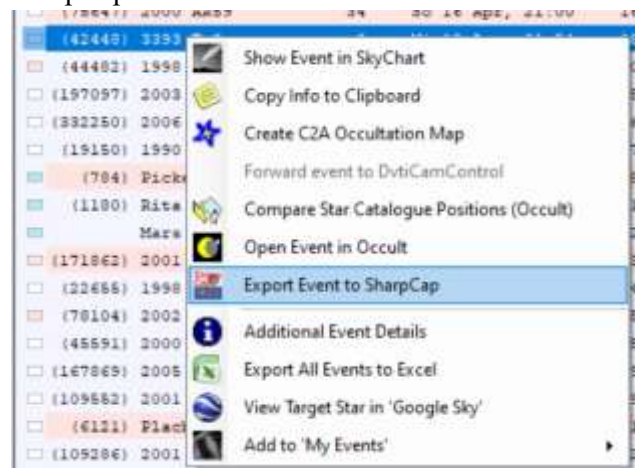
### 1.1. Use of the add-in SC Report:

The use of the OccultWatcher add-in is simple ... with a right click on a future event or from the menu line.

From the menu: first click on the event you wish to export, then from the menu, select “Export Event to SharpCap”.

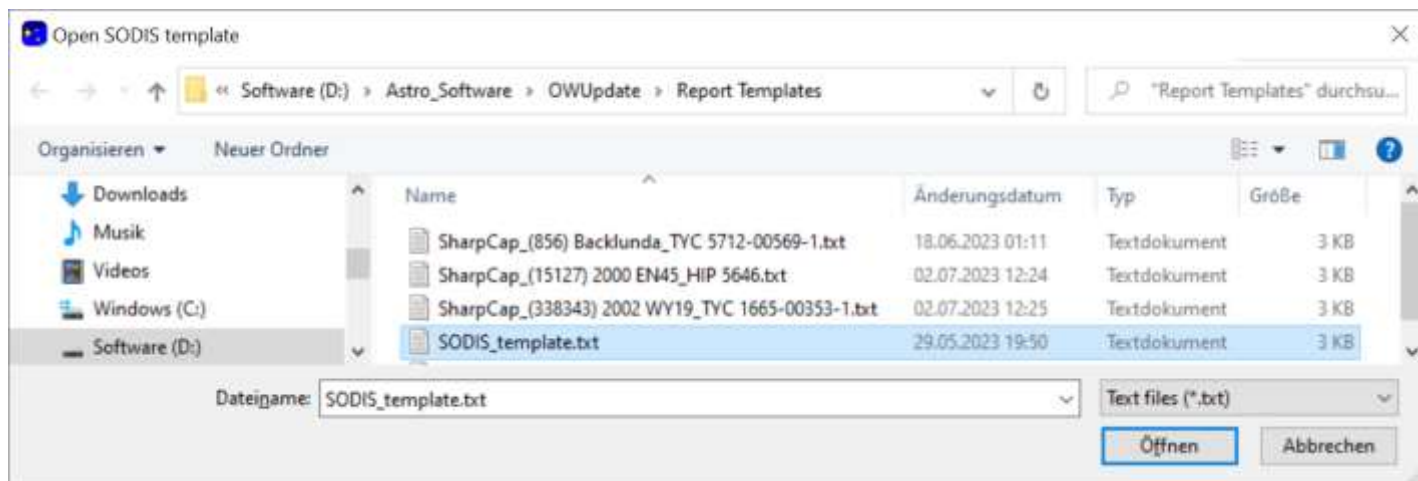


With a right-click on an event: first click on the event you wish to export, then right-click and select “Export Event to SharpCap”.



A window appears for the selection of the template. You need to select the path the first time. The path is memorised for the next time.

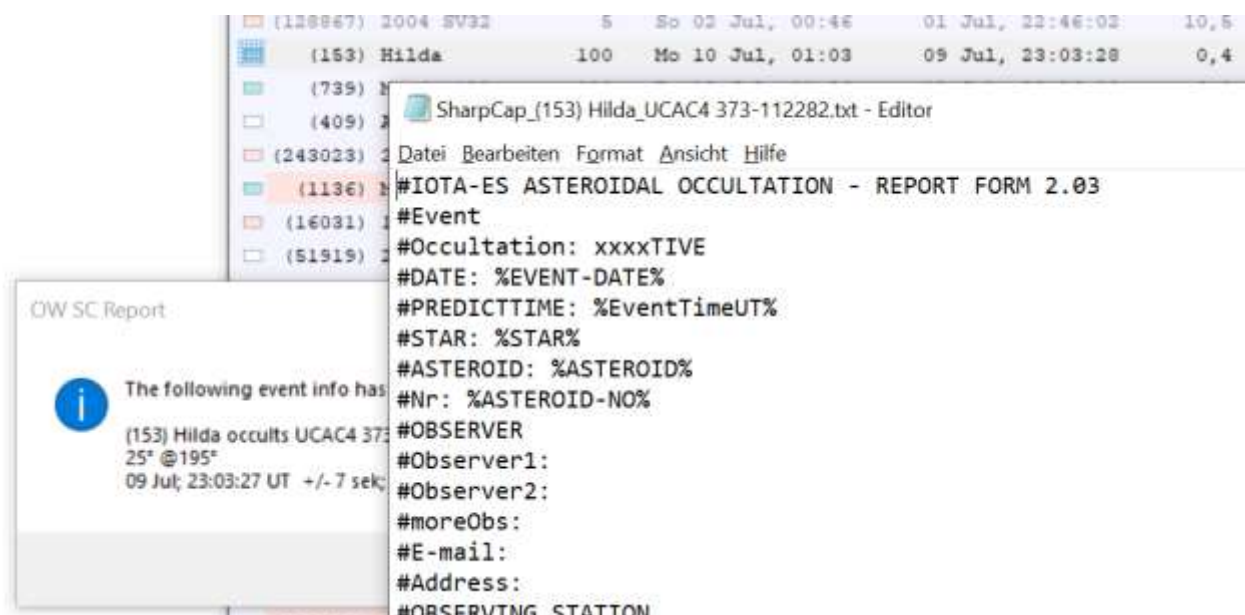




A window of the selected tags is showed and the information is copied in the clipboard.

At the same time Notepad.exe program opens the generated file. You can check the information and you can add or change the location, observer or other information (if you change or add something, do not forget to save the file before closing Notepad). The file is saved in the same directory as the template file.

The file name is for example: “SharpCap\_(153) Hilda\_UCAC4 373-112282.txt”, with the asteroid number, the asteroid name and the star name.



The next step is to use the generated file with SharpCap.

Copy or shift the text file from the preceding step in the directory where you plan to save the film (SER, ADV or FITS images). If you use a different computer, then transfer the file in the observation computer.

## 2. Use of the SC Report with SharpCap:

### 2.1. Installation of the SharpCap script:

You need for that the SharpCap **Pro** version for the use of the IronPython scripting language. In addition, it is necessary to use the **4.1** version, while the ASCOM connection changed.

Three files are necessary, two for the script itself, the third for the LED calibration script of the QHY-174 GPS camera in the case you use this camera. Note that you can use the script with each camera that can be connected with SharpCap, but the function “LED Calibration” will work only with QHY-174GPS camera.

Copy the ZIP file on your computer. Unzip the files where you want. The files are the following:

- |                                     |                                      |
|-------------------------------------|--------------------------------------|
| - Occultation_XXXX-XX-XX_menu_41.py | The script for the event observation |
| - Occultation.ico                   | The icon of the script               |
| - Calibration_LED_XXXX-XX-XX_41.py  | The script for the LED calibration   |

The 3 files have to be saved in the same directory.

For the people with an EAGLE computer:

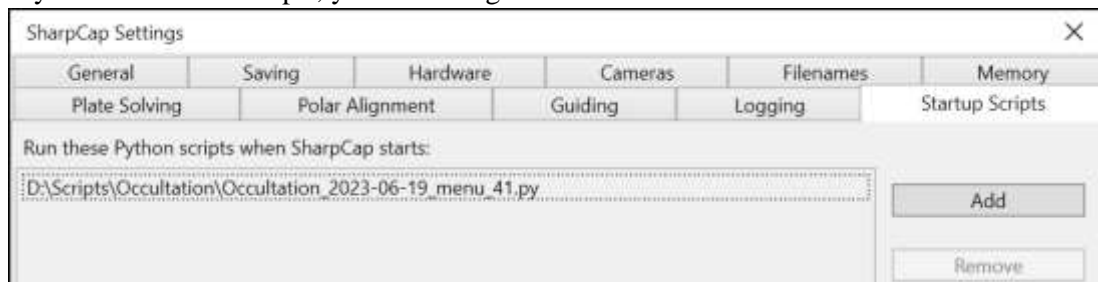
- Open the script Occultation\_XXXX-XX-XX\_menu\_41.py with a text editor or the script console in SharpCap
- Go to the line 83 and un-comment the line `#EAGLE = "not known"`
- Go to the line 84 and delete or comment this line
- Save the file

For changing the voice and the language ... the best is to contact me for more information.

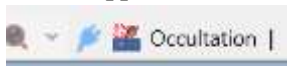
Alternative is to modify the lines 101, 102, 105 and 106 with the wanted voice or language (only “en”, “de”, “fr” and “it” available yet).

In SharpCap, open the menu “File – SharpCap Settings” and add the script “Occultation\_XXXX-XX-XX\_menu\_41.py”.

If you have several scripts, you can change the order.



The script will appear in the menu only after a restart of SharpCap. So close and restart SharpCap. The following menu should appear:



### 2.2. Use of the SharpCap script:

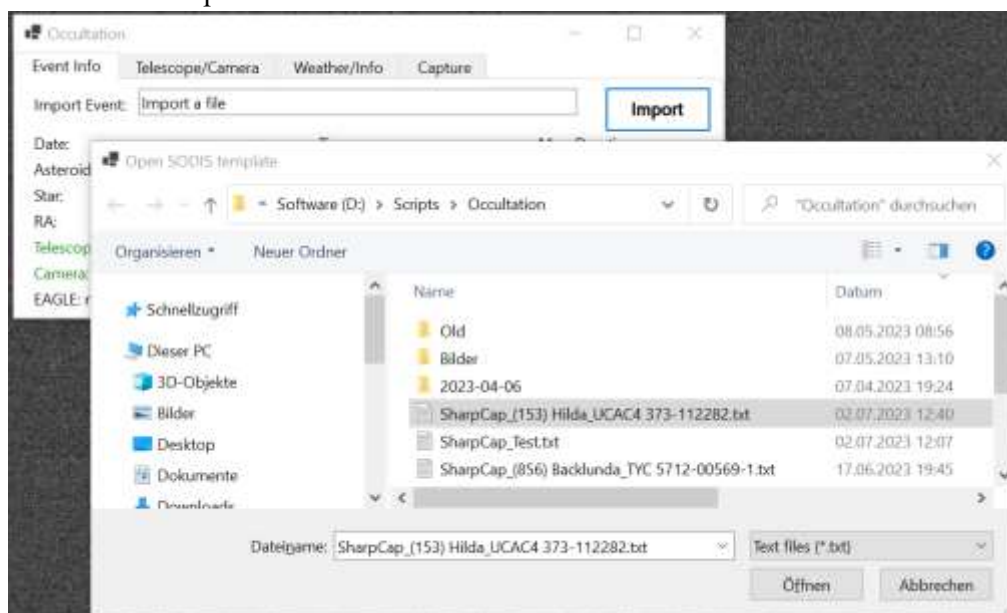
Connect the camera, the mount and the focuser (if available). Start the script by clicking on the “Occultation” button.





The script detects the telescope, the focuser, the camera (if GPS) and an EAGLE computer. The EAGLE computer is optional.

Click on the “Import” button for the selection of the event file:



In the first tab:

Select the event to observe. The event information and the equipment status are showed.



In the second tab:

The script can perform a GOTO to the target star coordinates and then a Plate Solve (if necessary).

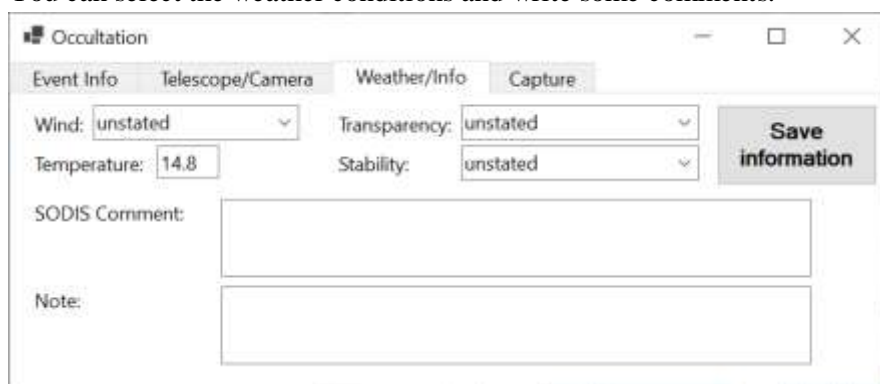
With a QHY-174GPS camera, the LED calibration can be performed. The mount has to be controlled by SharpCap for a GOTO and the following Plate Solve. A different exposure time can be selected for the Plate Solve.



If you have no GOTO mount or if you do not need the LED calibration ... ignore the second tab.

In the third tab:

You can select the weather conditions and write some comments.



The “SODIS Comment” is for only *really important* information to the reviewer.

The “Note” is for any other personal information.

The temperature comes from the focuser temperature. The following weather conditions can be selected.



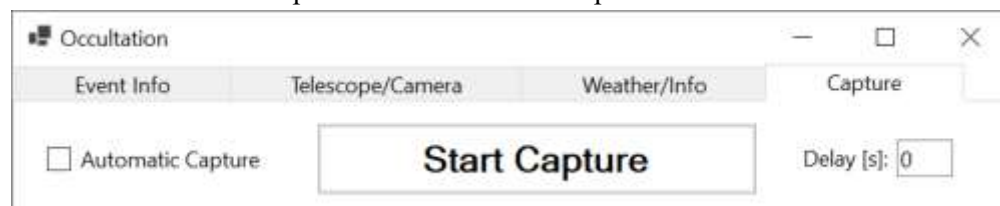
With a click on the “Save information” button, it is possible to save manually the information in the event text file. Note that the information is saved automatically after a manual or the automatic capture (next tab). It is possible to change and resave the information after the automatic capture (in the case you forget to set the weather condition before the capture of the event).

In the fourth tab:

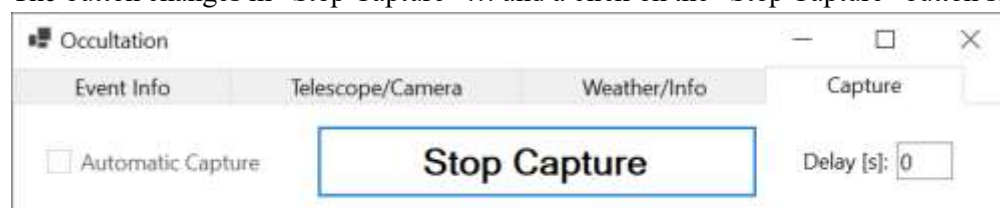
It is possible to start and stop a manual capture, for example to check the capture settings and to verify the number of dropped frame.

The main purpose is the automatic capture (start and stop) at a defined time before the event.

A click on the “Start Capture” button starts the capture of a film:



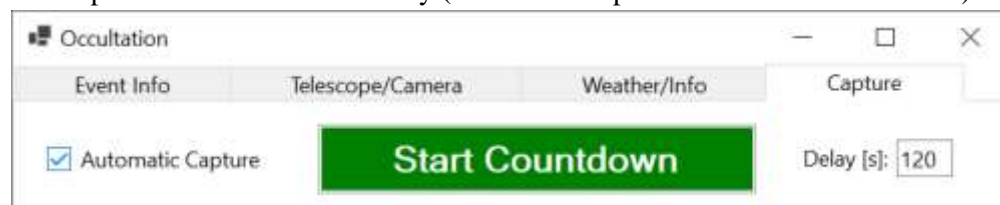
The button changes in “Stop Capture” ... and a click on the “Stop Capture” button stops the capture of the film:



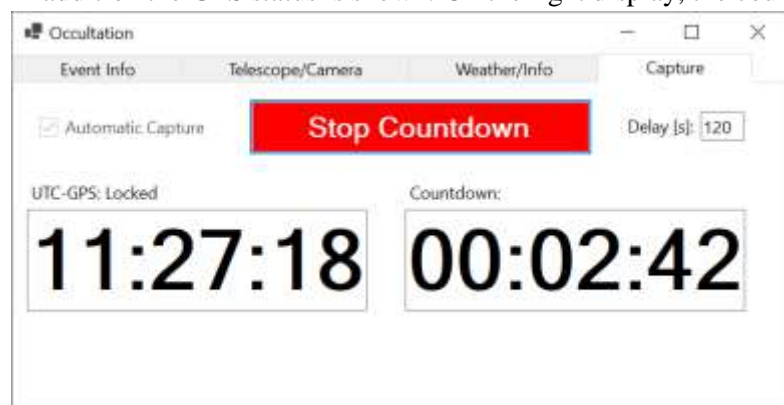
The selection of the “Automatic Capture” changes the mode in the automatic capture.

The button changes in “Start Countdown”. Set the time delay (in seconds) before the event time (from the predicted event time).

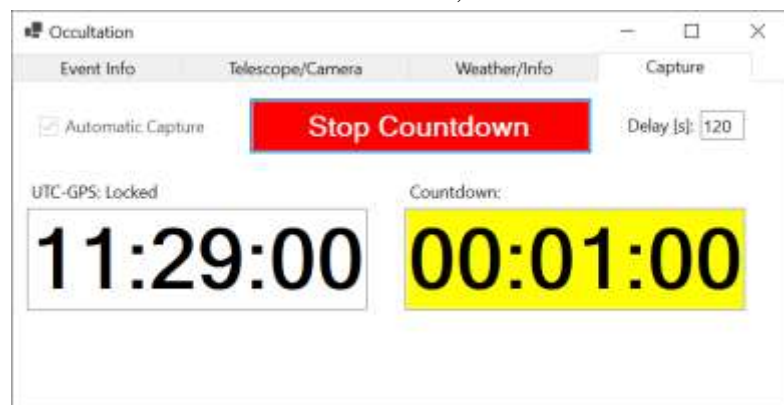
Here “120” seconds ... the capture will then starts automatically 120 seconds before the predicted event time. The capture duration is 2x the delay (here for example 240 seconds film duration).



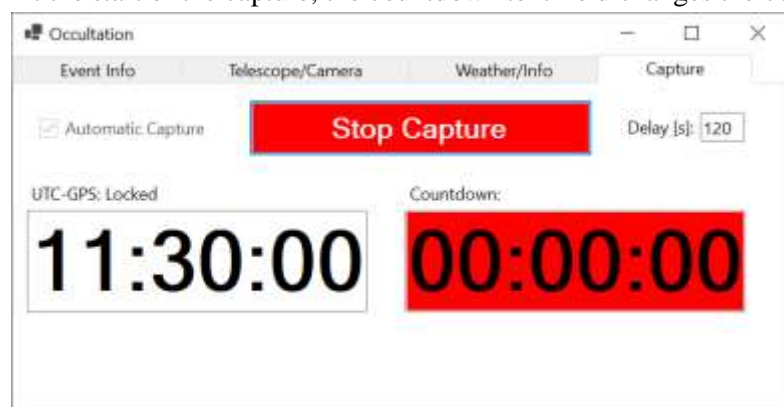
The left display shows the UTC time. If no GPS camera is connected (or the GPS is not activated), the display shows the computer UTC time. If the GPS camera is connected, the display shows the UTC time from the camera GPS. In addition the GPS status is shown. On the right display, the countdown is visible.



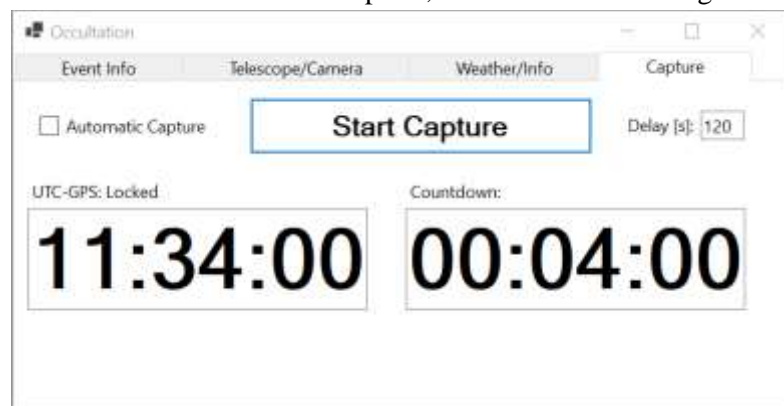
One minute before the automatic start, the countdown text field changes the colour to yellow.



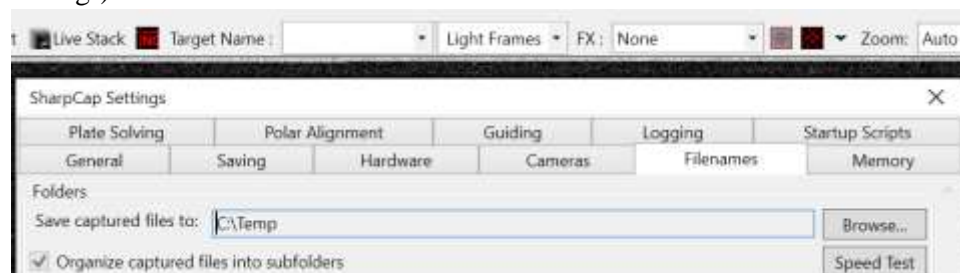
At the start of the capture, the countdown text field changes the colour to red.



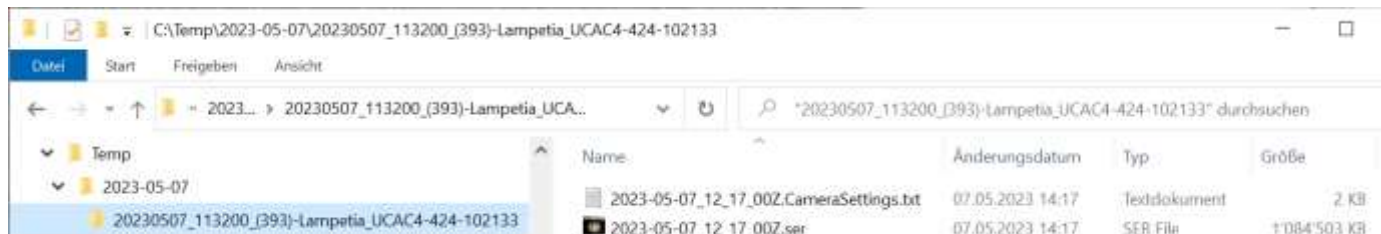
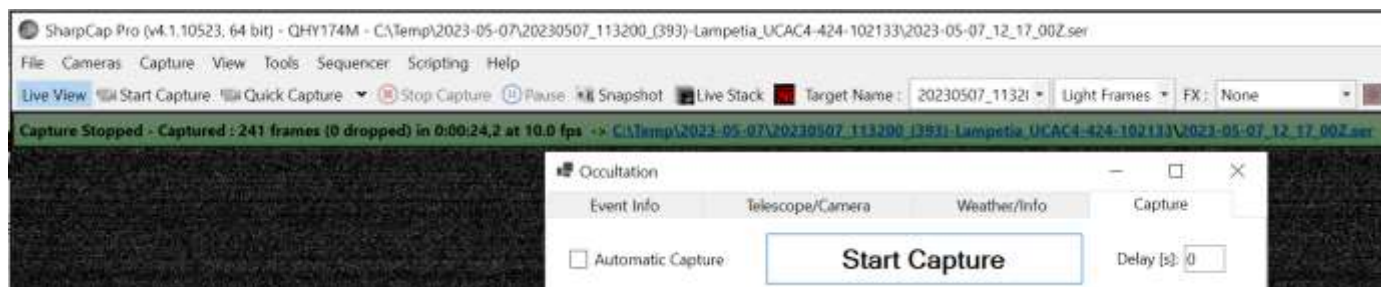
At the end of the automatic capture, several text field change back.



After a manual capture or the automatic capture, the film is saved in the directory (standard location in SharpCap settings).

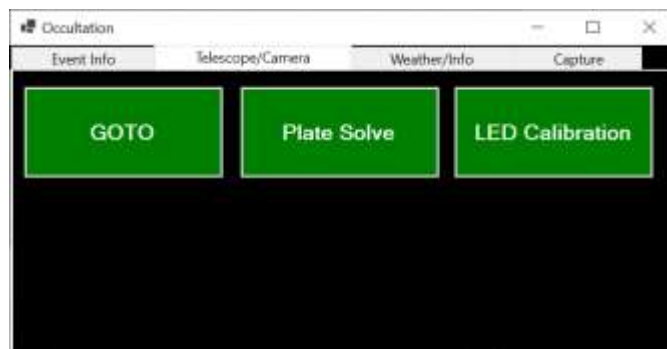


The “Target Name” is set automatically by the script.



### Night Vision Colours:

When SharpCap is in Night Colours mode, the script will start with the same colours. The script does not change the colours if SharpCap colours changes when the script is running, but a click on a different tab will change the window in the Night Colour mode.



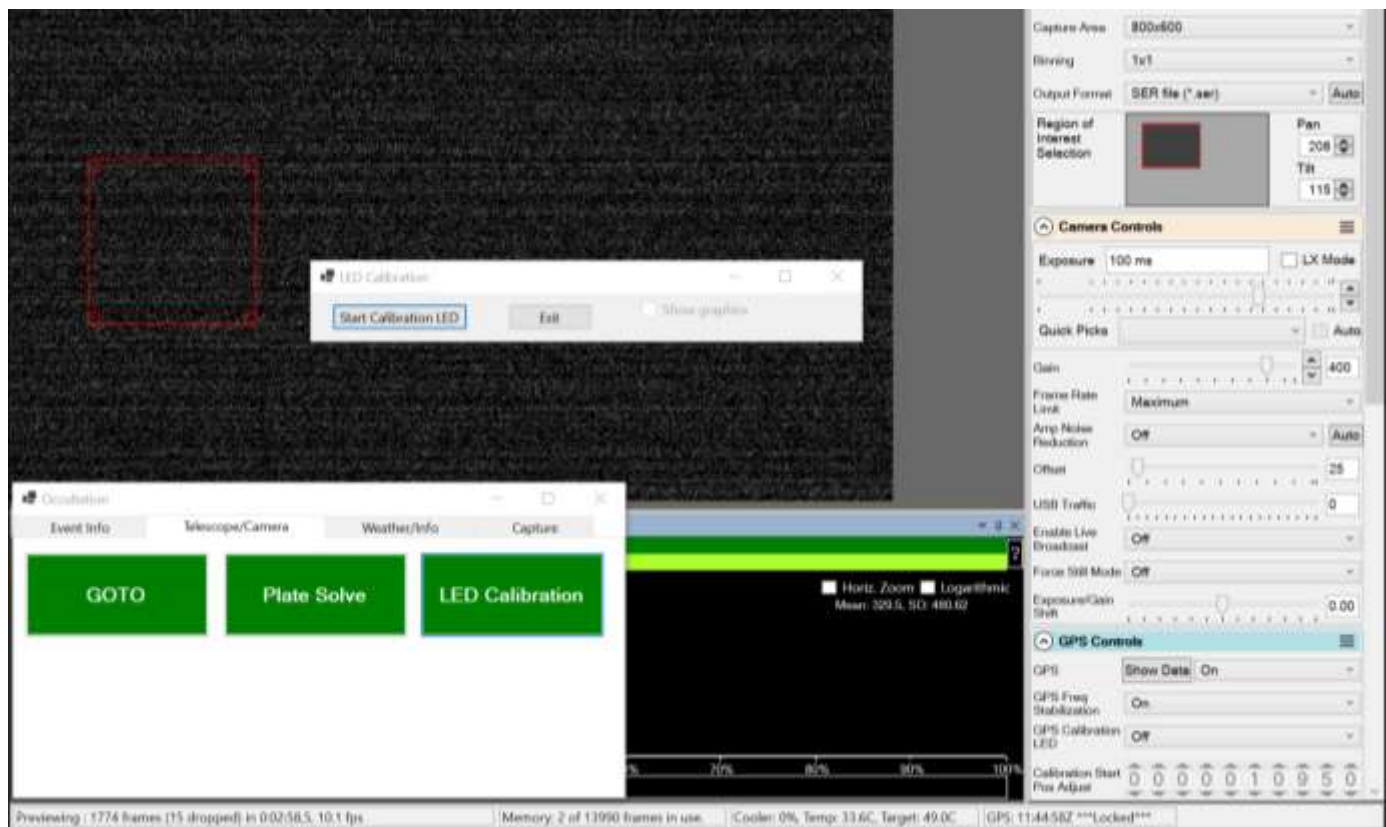
### LED Calibration of the QHY-174GPS camera:

With the Occultation script, it is possible to start the LED Calibration script for the GPS camera. Here an example when an 800x600 region is selected with decentres. In addition the “analysis red rectangle” is too small.

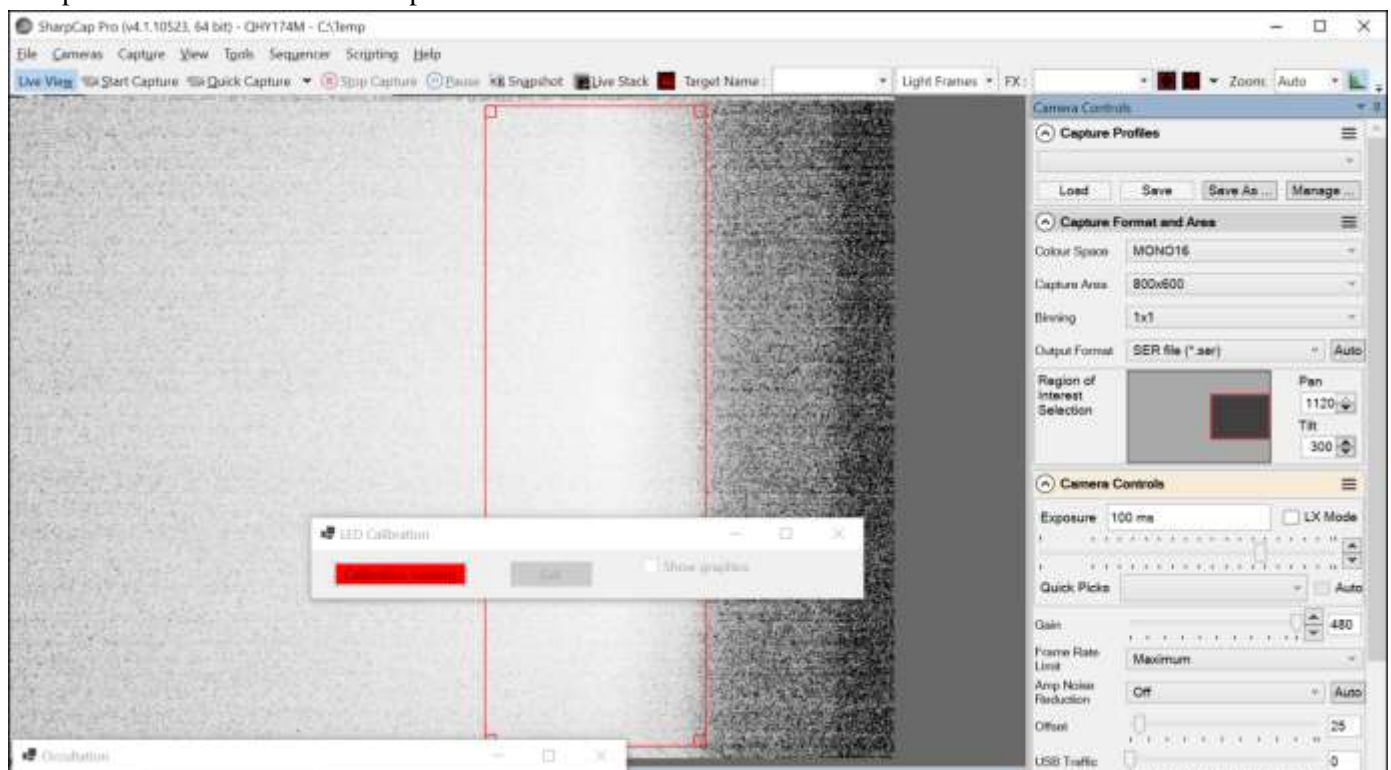
Note that the camera settings “Colour Space”, “size”, “binning”, “exposure” and “USB Traffic” shall be set before the start of the LED calibration. After the LED calibration, these settings shall not be changed.

If changed, then a new calibration has to be started.





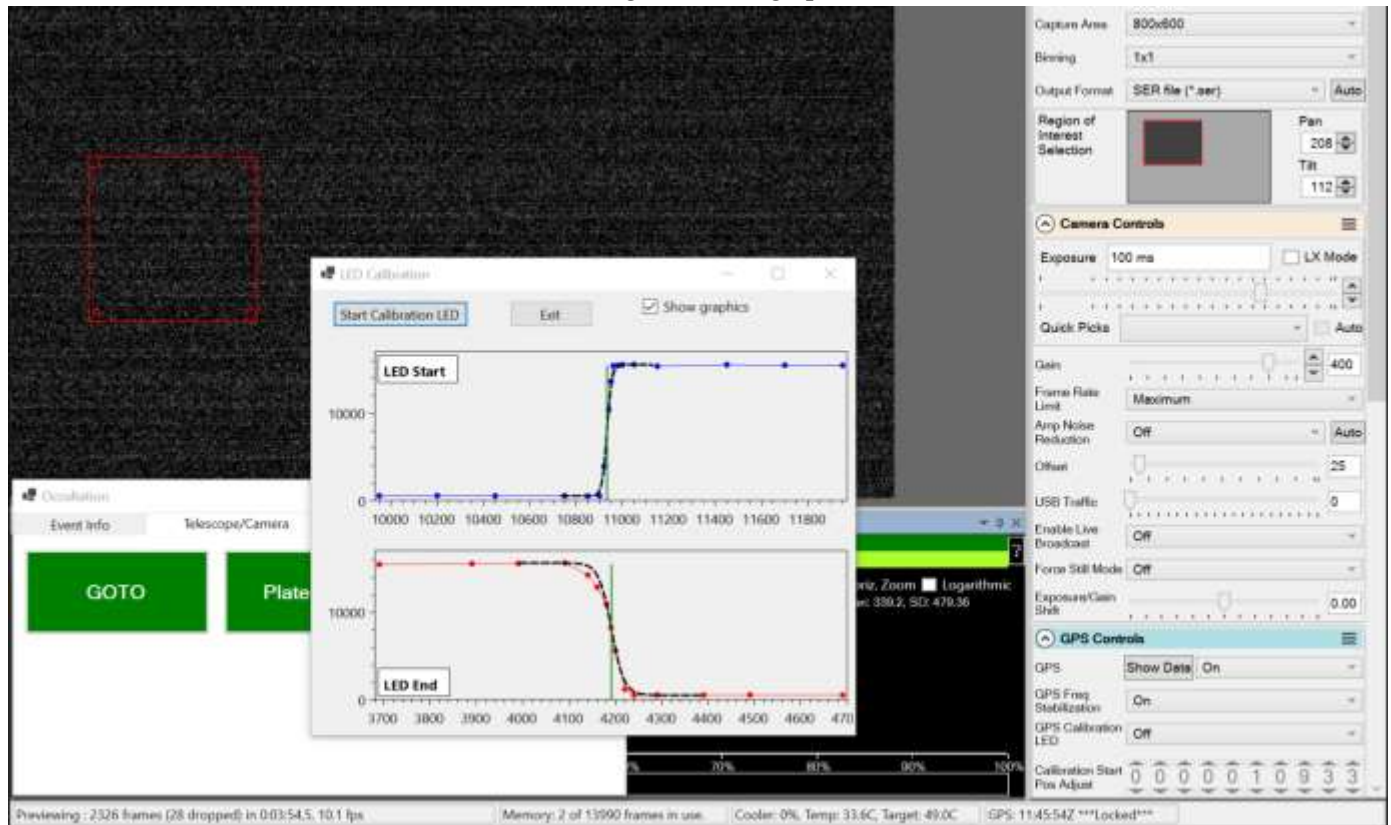
The LED Calibration script moves the ROI above the illumination of the LED and sets the analysis rectangle size. The position of the ROI has no impact on the LED calibration.



After the calibration, the ROI position and the analysis rectangle size are set back.



You can see the LED calibration curves after clicking on “Show graphics”.



With the full detector (1920x1200, binning 1x1, 16 bit) the LED calibration is done in 5 s with 10 ms exposure time and ~ 10 s with 100 ms exposure time.

If the SharpCap starting value of the “LED Start Pos” is too far, then you can restart the calibration of the LED. On the right, the result after the second calibration of the LED:

