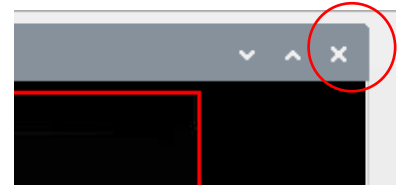


eFinder GUI Manual

Always close the program using the GUI window close function. This will ensure any changed set up parameters are saved.



Location and time

The eFinder will read this information from the Nexus DSC at power up.

Exposure & Gain

Select the values you find work best. Suggested you start with 1 second and Gain of 25. Your selection will be saved if you close the program using the top right close window button. The range of values presented can be changed in the efinder.config file.

Finder focal length

The program will assume a 50mm focal length, otherwise check the 200mm finder option. Check this option if using the Polaris or M13 test images.

Graticule

Check this option to display the crosswires. A dim crosswire shows the finder centre, a bright crosswire shows the main scope centre. (Coincident if offset = 0,0)

Polaris Image

Check this option to 'capture' and solve a reference 200mm test image of Polaris. This image can also be used to test and practice measuring the offset function.

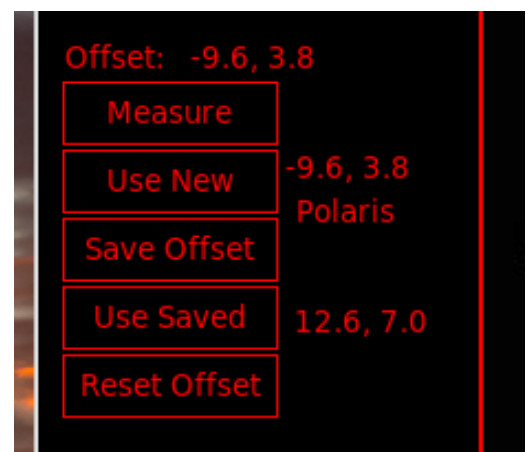
M13 image

Check this option to 'capture' and solve a reference 200mm test image of M13. This image file is stored as test.jpg in the ~/Solver folder.

Offset

The eFinder can measure, apply and save the angular offset between the finder and main telescope. At the top of the display section is shown the currently applied offset, in arc minutes: dx, dy. 'Measure' will cause the eFinder to capture an image, find the brightest star, and display the star name and offset from that star to the finder centre field. Thus if the main scope is pointed accurately at a bright star, this function will accurately measure the finder-main scope offset.

If the correct star name is displayed, then 'Use New' will apply that offset to all future solves and aligns.



The current applied offset can be saved to disk, using 'Save Offset'. The currently saved value (if one has been saved) is displayed to the right of the 'Use Saved' button. This button will cause the currently applied offset to be the saved value.

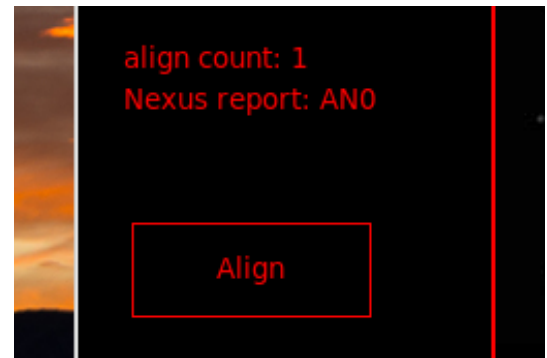
'Reset Offset' will set the applied offset to be zero.

Align

The Align button causes the eFinder to capture and solve an image, apply any offset, and send the value (RA & Dec) to the Nexus DSC.

The Nexus DSC will take the first two aligns, to be the initial two-star alignments (assuming two-star alignment has been set in the Nexus setup.) After these two have been successful, the 'Nexus report' will change to AT2. A = AltAz mode, N = not aligned, T= aligned, 2 = number of alignment stars.

Thereafter the aligns are treated as 'local syncs' by the Nexus DSC.



Note: the align or local sync can be performed without actually centring on an actual star. The eFinder will send the RA & Dec of the scope, as if it was a star.

The align count shows how many times this function has been used. This is useful when deciding whether to try an MPoint analysis on the Nexus DSC. Note: The Nexus may have rejected some of the aligns if they were too far from the expected values.

Capture

This button starts the acquisition and display of an image, using the selected exposure and gain values. If the Polaris or M13 options have been checked then no capture will take place and a test image will be displayed instead. The current Nexus DSC RA & Dec is read and displayed.

Solve

This causes the current displayed image to be solved (or attempted). The result is displayed, along with the elapsed time taken for the solve. The first solve is a little slower as the index files are initially read from the SD card.

Two columns of deltas may be displayed. Between the Nexus data and Solution data, the delta x,y in arc minutes is shown. If a Target has been set, (see below) then a delta x,y between Solution and Target will also be shown.

Nexus

The Nexus button will immediately read and display the current Nexus RA & Dec, and computed AltAz.

Target

This button reads from the Nexus the current 'Target'. This is using the LX200 protocol and will therefore display either the last align coordinates, or the last goto target coordinates, whichever was actioned most recently via the LX200 communication channel.

The delta in x&y in arc minutes is displayed also. This is convenient when judging the performance of a goto for instance.

Finish GoTo (aka 'GoTo++')

This button is used to refine a conventional GoTo that has already been performed by the telescope drive. This conventional GoTo will usually result in the scope pointing at where the Nexus/Scope Drive thinks the target is, but will have an error due to alignment and mount tolerances. This error is typically in the range 10-60 arc minutes.

'Finish GoTo' undertakes the following sequence of actions:

- Reads the desired GoTo RA & Dec from the Nexus DSC (the 'Target')
- Captures and solves an image at the current telescope position.
- Sends that position to the Nexus DSC as a 'Local Align'
- Requests the Nexus/Scope Drive to do another GoTo, to the Target.

Performing the Local Sync cancels out any alignment or mount errors, and since the 2nd GoTo is very small, the final position will now be as accurate as your drive can achieve - normally just limited by backlash compensation.

Move to Finish

This is an alternative method of achieving GoTo++. The sequence undertake is:

- Reads the desired GoTo RA & Dec from the Nexus DSC (the 'Target')
- Captures and solves an image at the current telescope position.
- Calculates the error in Az & Alt.
- Sends 'Slew' commands to the Nexus/scope drive, with durations calculated to correct the error.

This is equivalent to seeing the target in the field of view and manually using the telescope hand box controls to centre the target. The eFinder will use the 2nd slowest slew speed to move the scope, and the slew speed does need to be set up via the efinder.config file.

Display

The 'Display' button causes the displayed image to be refreshed with any new selected options. These options are:

| | |
|--------------|---|
| Graticule | Show the crosswires (with any applied offset) |
| Scope Centre | Shift the displayed image such that the main scope centre is now in the display centre. |
| zoomx2 | Zooms the displayed image by 2. |
| flip | Flips the image vertically |
| mirror | Flips the image horizontally |
| auto-rotate | Automatically rotates the displayed image according to telescope altitude to |

show an 'eyepiece view'. Not yet tested.

rotate angle Rotates the display clockwise by the number of degrees entered in the box below.

FOV indicator Shows a circle, centred on the main scope sightline, indicating the chosen eyepiece AFOV. These can be set up in the efinder.config file.

Annotate

This button causes the eFinder to re-solve and annotate the image - as currently displayed. Thus despite any display actions eg flip or rotate that have been applied, the annotated text will be still be 'right way up' and easily legible.

If 'Scope centre' has been applied with a large offset, or a large rotate angle has been set, then the annotate may fail. This is a function of the solver not being able to cope with large parts of the image 'blank'.

Six catalogues are available to apply annotations.

FOV indicator

Depending on the efinder.config file, a list of eyepieces is presented. Select the 'FOV indicator' and an eyepiece to display a circle on the display. If the image has already been captured, then use the 'Display' button to apply the indicator.

Message Box.

At the bottom right is a scrolling window showing various system reports.

The screenshot shows the ScopeDog eFinder v12_3_wifi interface. The main display is a star field with a large circle centered on HD 8890. Other stars labeled include HD 14369, HD 5914, and HD 1687. The interface includes various controls on the left and bottom, and a message box at the bottom right.

Left Panel Controls:

- Date: 03 Sep 2022
- UTC: 09:57:14
- LST: 8h 44m 28s
- Loc: -0.71° 51.35°
- Exposure: 0.1, 0.5, 1, 5, 10
- Gain: 1, 2, 5, 25, 50
- ☒ 200mm finder
- ☒ graticule
- ☒ Polaris image
- ☐ M13 image
- Offset: -9.6, 3.8
- Measure
- Use New: -9.6, 3.8
- Save Offset: Polaris
- Use Saved: 12.6, 7.0
- Reset Offset
- align count: 1
- Nexus report: AN0
- Align
- Capture
- Solve
- Finish GoTo
- Move to Finish

Bottom Panel:

| | Nexus | delta x,y | Solution | delta x,y | Target |
|-----|-----------|-----------|-----------|-----------|-----------|
| RA | 03:27:41 | | 03:00:40 | | 03:00:40 |
| Dec | -08:49:26 | | +89:21:15 | | +89:21:14 |
| Az | 255:47:42 | 6191.1 | 358:58:05 | 0.0 | 358:58:04 |
| Alt | -00:00:35 | 3083.8 | +51:23:44 | 0.1 | +51:23:41 |

elapsed time 2.17 sec

Display:

- ☐ Scope centre
- ☐ zoom x2
- ☐ flip
- ☐ mirror
- ☐ auto-rotate
- ☒ rotate angle

Annotate:

- ☐ Bright
- ☐ Hip
- ☒ H-D
- ☐ ngc/cic
- ☐ Abell
- ☐ Tycho2

FOV indicator:

- ☒ 8mm Ethos
- ☐ 10mm Ethos
- ☐ 13mm Ethos
- ☐ 21mm Ethos

Message Box:

09:55:37 sent: SR+03:00:40#
09:55:37 sent: SD+89*21:15#
09:55:37 sent: CM#
09:55:37 Align reply: AN0
09:56:51 annotation successful