SYNSCAN TOOLS v1.0

USER MANUAL

Astr' Au Dobson : astraudobson@gmail.com

SCOPE

Synscan Tools (ST) is a software that runs on Windows (10 or higher) and Android (10 or higher).

ST works with Synscan App (SA), it adds features to SA but does not replace it.

Therefore, there are no additional settings or parameters to change in all software that runs with SA : ASCOM, NINA, APT etc…

IMPORTANT: you must start your session as you usually do, that is to say by starting your mount, launching SA, aligning the telescope and activating the sidereal tracking in SA.

DRIFT CONTROL

Drift Control is the main feature of ST. It offers improved sidereal tracking with an algorithm that differs from that of SA. Drift Control then allows fine adjustment of the speed of each axis separately.

This feature is therefore very useful in astrophotography because it will reduce or even eliminate the drift of the target.

In order to be able to act easily on each axis, it is important to properly adjust the orientation of the camera. To do this, activate the Live View function of your camera in order to have immediate visual feedback of the movements of the stars when you use the directional arrows in SA. The movement of the stars must be as close as possible to the following illustration:
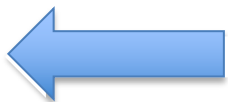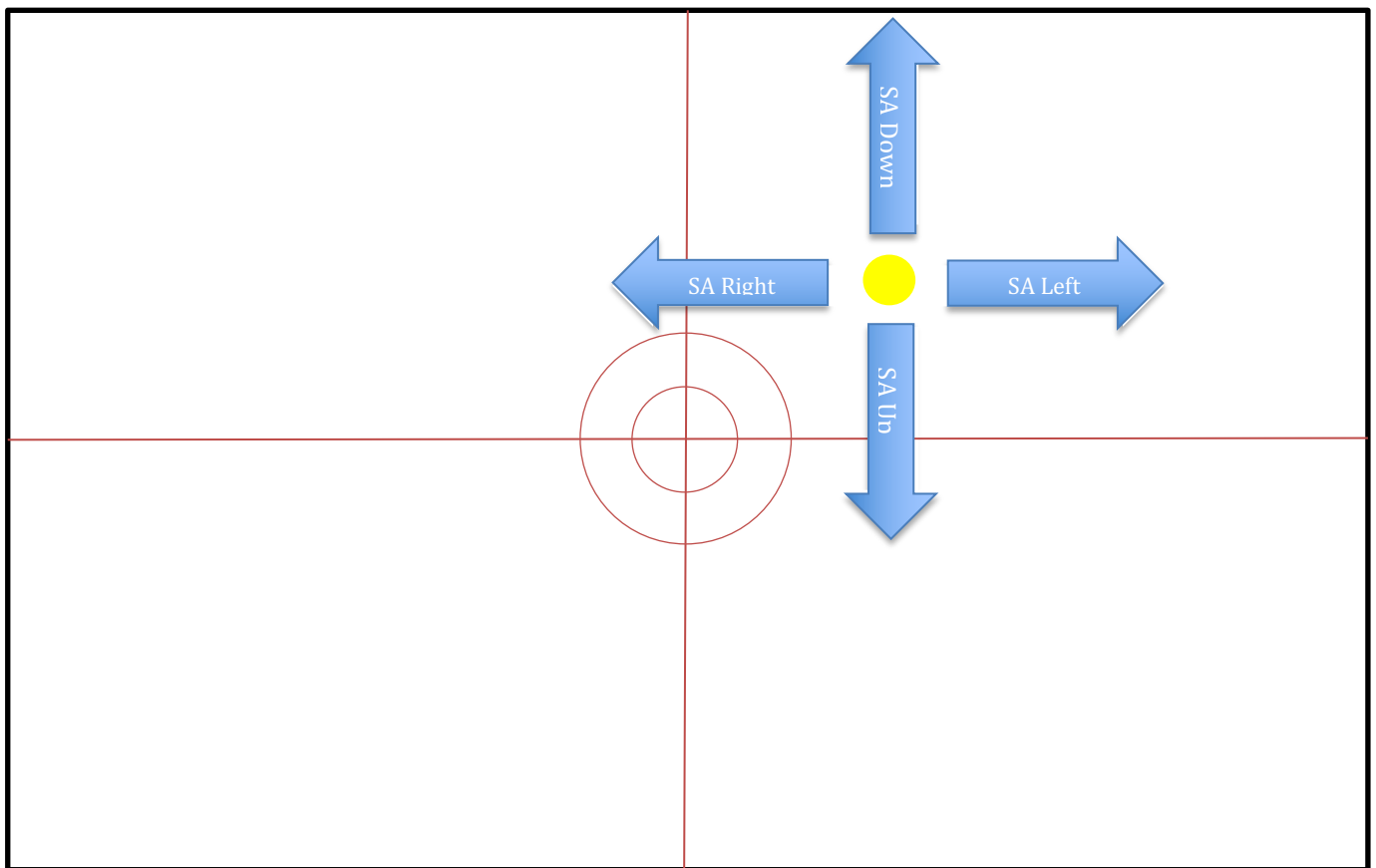
 Stars drift direction

Example: When you click the right directional arrow in SA, the star should drift to the left. If it doesn't, turn your camera and try this again.

How to interpret target drift:

ST through Drift Control allows you to speed up or slow down the speed of each axis independently, but for this it is important to understand how to interpret target drift.

Azimuth :

	Drift to the left	Drift to the right
If Az Speed > 0	Az Speed too High	Az Speed too Low
If Az Speed < 0	Az Speed too Low	Az Speed too High

Altitude :

	Drift up	Drift down
If Alt Speed > 0	Alt Speed too Low	Alt Speed too High
If Alt Speed < 0	Alt Speed too High	Alt Speed too Low

Usage:

1. Point the desired target using SA and your favorite capture software.

2. Switch to sidereal tracking in ST by pressing "Start Tracking"

3. Wait a bit to see if the target drifts.

4. Increase or decrease the Az speed and/or Alt speed using the buttons '--', '-', '+', '++'

5. Start your photo session.

6. If during it you observe a slow drift of the target, adjust with the buttons '-' or '+', it is better to go slowly.

7. To change target, give control back to SA by clicking on "Stop Tracking", change target and start again if necessary from 1.

MAX. EXPOSURE TIME

This feature allows to calculate the maximum exposure time without having star trails caused by field rotation.

This time is determined by the following equations:

$$Vrotation_{champ} = Vrotation_{terre} \cdot \frac{\cos(Az).\cos(Lat)}{\cos(Alt)} \quad rad/s$$

$$Tmax = \frac{1}{\frac{1}{2}.Lcapteur.Vrotation_{champ}} \quad secondes$$

This means that we need the Az, Alt coordinates of the target, the Latitude of the observation location and the Width of the camera sensor in pixels.

The first 3 variables are provided by SA, the last one must be filled in by the user.

Usage:

1. Choose a Sensor Width approaching that of your sensor.

2. Click on "Calculate".

Note :

This is not an oversight or an error, the focal length of your telescope does not enter into the calculation.

EASY SYNC

This feature is particularly useful when traveling or when you don't have a computer available and was therefore designed primarily for the Android version of ST.

Easy Sync is an equivalent of "Sync" in Stellarium or a Sync by PlateSolving. That is to say, we synchronize the theoretical and real position of the telescope without having to do an alignment with stars.

Usage:

1. Position your telescope horizontally and make sure it is level.

2. Power it on.

3. Connect Synscan App.

4. Point to a star using the directional arrows.

5. Go to the "Align with Sync" or "Sync Samples" menu depending on the SA version.

6. In ST, go to "Easy Sync".

7. Select the star that the telescope is pointing to.

8. Press "Align with Sync".

GUIDING

Download and install the ASCOM AzGuiding driver. This driver is only for PHD2, its only use is to redirect the guiding pulses to ST instead of SA.

Guiding is an experimental feature in the sense that Dobsonians are not designed to autoguide.

The function requires that ST is controlling the sidereal tracking (Start Tracking in Drift Control).

To start taking into account the guiding pulses from PHD2, it is necessary to click on "Start Listening".

Then, PHD2 is used in a classic way **but it is mandatory to uncheck the following option in PHD2**: "Stop guiding when mount slews". Go into the 'Guiding' tab of the Advanced Settings dialog.

In ST, it is possible to adjust the strength of the pulses via the two selectors. When calibrating the guidance in PHD2, it is recommended that these 2 values are set to 1. It is then possible to adjust them at any time during the Guidance.

Tip:

It is possible to measure the quality of the sidereal tracking using PHD2. To do this, simply do "Stop Listening", the PDH2 guidance pulses will be ignored by ST and the curves in PDH2 will represent the drift generated by the sidereal tracking alone. By going to the Drift Control menu, it will then be possible to adjust the speed of the axes and measure the impact of the adjustments in PHD2.

Note:

The "Smooth" guidance mode is not recommended at the moment, the results obtained were not satisfactory during the tests.