Southern Hemisphere Polar Alignment of the StarAdventurer Tracking Mount

There are two YouTube videos that may assist you with polar alignment of the StarAdventurer:

https://www.youtube.com/watch?v=qkYxtYhKMj0&t

https://www.youtube.com/watch?v=9SZ8Otnr3rs

The following instructions cover the instructions in these two videos.

You will need three, or four, apps on your phone or mobile device:

1. A planetarium app that can display the location, and orientation in the sky, of the Sigma Octans star group. This app may also be able to tell you the latitude of your setup location.
2. A compass that can display True north or south.
3. An inclinometer app that can display the degrees of tilt of your device above the horizon.
4. You may also need another GPS app, or similar app, that can tell you the latitude of your setup location.

Start the alignment procedure with only the StarAdventurer wedge on the tripod. (The actual tracking mount will be attached later.)

Place the tripod and wedge in a location with a clear view of the southern sky. Setup in a location where the south celestial pole is not blocked by trees or buildings.

Make sure the tripod legs are extended sufficiently such that once the StarAdventurer is set-up it will be at a comfortable height for you to be able to look through its polar telescope when making final alignment adjustments. Don't set the tripod too low – it is far too uncomfortable.

Use the compass app to show you where True South (not magnetic south) is. Make sure the StarAdventurer (when attached to the wedge) will have a clear view of the south polar area.

If you stand behind the StarAdventurer wedge and face south, the rear of the alignment wedge will be facing you – so, there should now be two black adjustment knobs at the rear of the wedge and close at hand.

Level the tripod as best you can. The inclinometer app can help.

Unscrew (but not so far that they become detached) both black adjustment knobs at the rear of the wedge. You should now be able to grab the wedge with two hands and gently rotate it left and right on the tripod. Loosen the two black adjustment knobs further if the wedge has too little rotation range on the tripod. At most, the wedge will now have a maximum range of rotation left and right of about 20 degrees. Centre the rotation of the wedge at about the mid-point of its left-right rotation range. (This will provide you with some left and right freedom to accurately adjust the mount alignment shortly.)

Stand about two meters behind the wedge with you compass app. Set the app to display TRUE north or south. Look along the compass needle to the south and run an imaginary line along the needle and see if the line runs parallel with one of the straight clamp edges of the wedge.

If necessary (and it most likely will be) gently, with two hands, rotate the wedge left or right on the tripod to make your imaginary line along the true south-pointing compass needle run parallel with a clamp edge on the wedge. This may require a few attempts at repeating the process of standing

behind the wedge with your compass app and checking. The wedge should not be pointing roughly towards the south celestial pole.

Now gently tighten the two rear black adjustment knobs until you feel some slight resistance on the screws. Make sure the wedge was not rotated left or right when you gently tightened the screws (they will screw inwards until they each touch a pin hidden under the bottom of the wedge). The screws do not need to be hard tight. You will need to adjust them again soon.

Now open your inclinometer app and place the edge of your device into the top of the wedge. Read the angle of inclination. If you walk around to the southern side of the tripod and wedge you will see a tilt scale and adjustment knob. The scale should read something similar to the angle shown on your inclinometer app – but they will most likely differ as the scale on the wedge is coarse.

Check your GPS, or planetarium app, and find the latitude of your setup location.

On the side of the wedge is a locking lever. Loosen it. One the front (south) of the wedge is an adjustment knob. Wind the knob up or down until the wedge scale matches your setup location latitude angle. Then place your device and inclinometer app back on the top of the wedge and check what angle the app displays. Adjust the front knob until the app indicates the wedge tilt matches your latitude angle. Then tighten the locking lever on the side of the wedge.

You can now attach the StarAdventurer mount head onto the wedge. Make sure the counterweight attachment clamp is facing south.

Do not attach the counterweight and camera mounting plate at this point. Leave the (south facing) front of the StarAdventurer free of any attachments at this point.

Insert 4 AA batteries into the StarAdventurer.

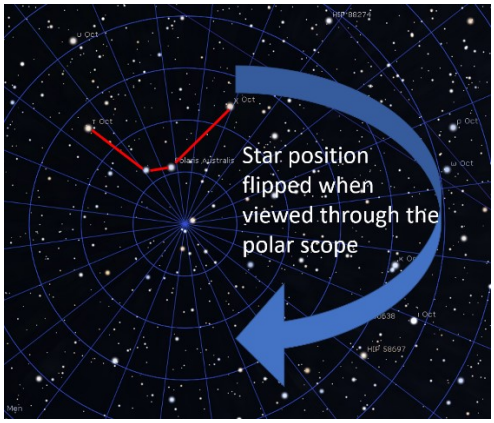
Set the StarAdventurer hemisphere switch (on the side of the mount) to S, South. On the other side of the mount, turn the dial to * so the mount tracks at the same rate as the stars.

There is a small telescope that sits in the polar rotational axis of the mount. Remove the dustcover plug from the front of the mount and unclip the conical plastic cover from the northern (lower) end of the mount.

If the sky is sufficiently dark to see stars, you can start using the mount's polar telescope to find the Sigma Octans group of stars. However, these stars are rather dim and require a reasonably dark sky to be visible through the polar scope.

Open your planetarium app and set it to display the southern sky for your current location and time. Zoom in on the south celestial pole area and locate the star Sigma Octans and the 4-star trapezium-shaped group it resides in. You need to be able to see that trapezium group through the mount's polar telescope.

On the planetarium app, note the orientation of the trapezium group relative to the actual pole location. If, for example, the app shows shortest side of the trapezium lies above the south pole, then through the polar telescope it will appear to be below the pole. The telescope flips the image as if it were a mirror.



Now look through the polar telescope towards the southern sky. If you are very lucky, you will observe the Sigma Octans trapezium group in the field of view. However, if it is not visible, you now need to move the StarAdventurer wedge and mount left/right and/or up/down to locate the trapezium group.

Start the search by gently loosening the two black adjustment knobs on the bottom of the wedge. You can either loosen them both and gently rotate the StarAdventurer to the left and/or right to see if the trapezium come into view. Or, you can gently loosen one knob while tightening the other, to make the StarAdventurer rotate to the left or right. You may also need to adjust the latitude angle of the wedge if the trapezium does not come into view. This can be a slow and frustrating process.

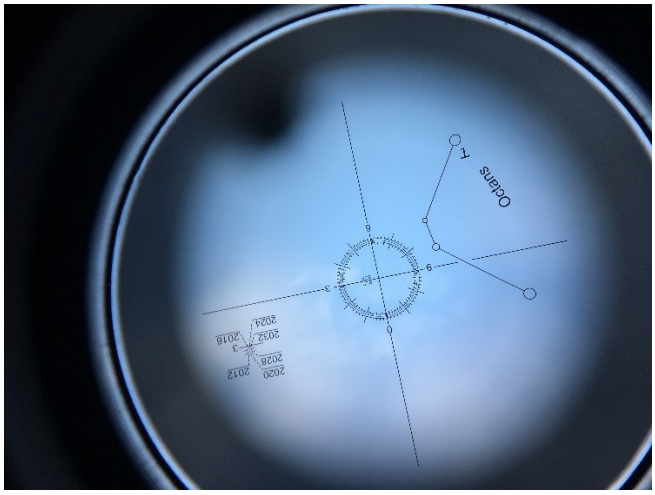
Repeat the initial compass and inclinometer alignments if you feel you are hopelessly lost, and try the entire alignment process again.

But, remember the orientation of the trapezium group that you are looking for through the polar telescope. If you know roughly how it should be aligned through the polar telescope you have a much better chance of recognizing it. Remember, its alignment is the reverse of what the planetarium app indicates.

Once the trapezium has been located, gently tighten the two black rotation-adjustment knobs on the bottom of the wedge. Then loosen the circular clutch ring on the front of the StarAdventurer so the polar telescope can be rotated around its axis.

There is a small red-LED clip-in illuminator that can be clipped into the front of the polar telescope. Insert the button battery into this LED illuminator, turn it on and insert it into the front of the StarAdventurer polar scope.

When looking through the rear of the polar scope (northern, lower end) you should now see black etched circles and lines on a reticle within the polar telescope. This reticle represents the Sigma Octans trapezium star group.



Adjust the brightness of the red-LED illuminator so that both stars and the reticle lines and circles can be seen.

Rotate the central section on the front of the mount so that the polar scope and its reticle pattern can be seen to rotate through the telescope. Rotate the reticle until it roughly aligns with the four trapezium stars you can see. Now, very gently center each of the four stars into its corresponding circle on the reticle – this is achieved by gently adjusting the two black alignment knobs on the wedge and/or the latitude adjustment knob (remember to unlock and then relock the locking lever on the side).

Go slowly and gently with these adjustments.

Once the trapezium stars are aligned, as well as you can, with the reticle circles, you are ready to lock the alignment of the mount head and then attach your camera. To lock the position of the mount head, locked the altitude lever on the side of the mount and gently tighten both rotation adjustment knobs on the rear/bottom of the wedge. But when finished, make sure the reticle pattern remains aligned with the trapezium stars.

Remove the LED illuminator and remove the button battery. Store the button battery carefully for future use. It will most likely go flat if left inside the illuminator.

Gently attach the camera mounting bracket and counterweight bar and weight. Tighten the front clutch so it now the mount now slowly tracks the sky with the StarAdventurer once powered on.

Gently attach your camera. Adjust the placement of the counterweight so the camera and weight are balanced and neither wants to rotate rapidly to the bottom. You can release and retighten the front clutch at any time of you want to change to position of the camera and where it points to in the sky. But retighten to make it track.

If you have a wi-fi or cable camera release, or intervalometer, use that to open and close your camera shutter. That will reduce camera vibration.

Finally, don't kick a tripod leg.