

Instruction Sheet

HOTECH SCA Laser Collimator

LASER COLLIMATION for SCHMIDT CASSEGRAIN TELESCOPE

Please read the ENTIRE instruction sheet before using your SCA Laser Collimator

Thank you for purchasing the state of the art HOTECH SCA Laser Collimator instrument. Our laser collimator is a quick and easy way to verify your telescope collimation each time prior to viewing. Collimation is a method to align your telescope's optics. Your telescope is aligned at the factory, but during shipping to your home or transporting to the observing field can misalign collimation. Misaligned collimation can mean decrease of optical efficiency and astigmatism to your telescope showing blurry images. The following describes how to collimate your Schmidt Cassegrain Telescope (SCT) with the aid of HOTECH SCA Laser Collimator to optimize the optical efficiency of your telescope.

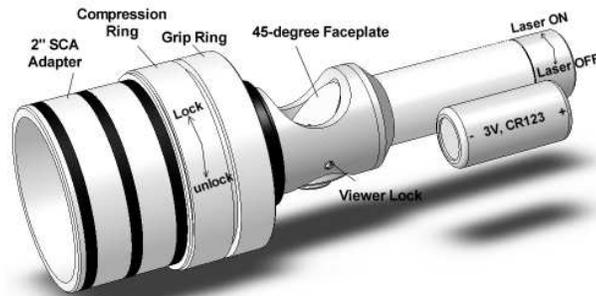
Commercially made SCTs all have slight optical and mechanical alignment errors. The error typically is in the centering of the secondary mirror. As the result, when a laser is installed and emitted from the focuser, the beam will seldom return to dead center, even though star testing would indicate perfect collimation. In addition, the secondary mirror, convex shape, magnifies any error by about 5 times. The error of deviation for a typical well collimated SCT will return laser beam at around 0.125" to 0.250" off center. In order to compensate the mechanical alignment errors and optical magnification of a commercially made SCT, a different collimation approach is required. If the procedure is followed through correctly, users can still accurately collimate their SCT in a very short time with the aid of HOTECH SCA Laser Collimator.

Due to the convex shape secondary mirror surface, the mirror will expand the returning collimating laser to a larger spot making it harder to discern the center of the return laser spot for collimation. For best result, the single laser dot laser model is more suitable for the SCT collimation for ease of finding the center of the expanded spot.

For an SCT, the only component a user can adjust during collimation is the secondary mirror. Therefore, it is a simpler process but you will need to **prepare** ahead for your laser collimation **only once**. You will have to pre-mark the returning laser dot on the target grid and the installed laser orientation when your SCT is collimated by either the manufacture or by star collimation. If you are unsure if your telescope is collimated, please use the conventional star collimation method described in the Star Collimation page to confirm collimation.

Be aware of the following as you use your Laser Collimator:

Only turn ON your laser when you are going to use it. Turn ON your laser with adult supervision for collimating the telescope purpose use only. Do not point the laser directly, indirectly, or via reflected glass or mirror to anyone's eye. We will demonstrate the laser collimation on a typical SCT which applies to collimating all similar reflective telescopes in the same way. For additional information, please visit our website, www.HoTechUSA.com/LaserCollimatorQA.html, for demo videos and details.



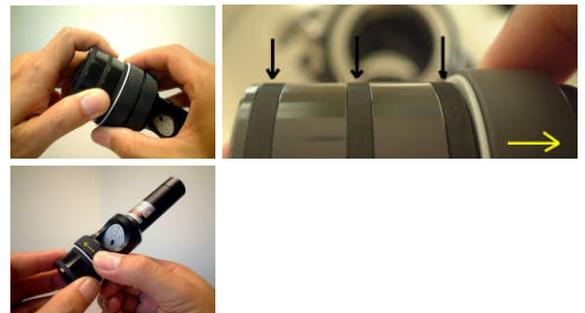
STEP 1: Installing the Laser Collimator

- a). Remove the diagonal.
- b). Loosen the thumbscrew on the eyepiece holder.
- c). Make sure the tip of the thumbscrew is completely recessed from the inner tube of the eyepiece holder allowing complete opening of the inner diameter.



STEP 2: Pre-adjust the Fitting of the SCA Adapter

- a). Loosen the compression ring first by unthreading the compression ring in the unlock direction. You may slide the spacers toward the compression ring to check if the rubber rings are in its uncompressed stage.
- b). Hold the front of the adapter and thread the compression ring in the lock direction until you feel resistant on the grip ring squeezing the rubber rings.



STEP 3: Adapting the Laser Collimator

- Slide the collimator into the focuser and feel if the adapter is tight* during the insertion.
- If too loose, gently pull out the collimator and repeat STEP 2b until you feel the insertion is snugly fit into your focuser.
- If too tight or unable to insert the adapter into the focuser, unthread the compression ring slightly then repeat STEP 3.

Note: "tight" means a strong resistant from the rubber rings during insertion but still able to rotate the collimator with resistant when the white ring on the collimator is flushed against the focuser shoulder.



STEP 4: Adapting the Laser Collimator on Eyepiece Holder

- Hold the grip ring and push the adapter flush against the shoulder of the eyepiece holder rim.

For first time setup: Orient the collimator to a position where you can easily recall during next collimation. Mark both the telescope and the collimator correspondingly so you know the position next time you install. i.e. line up the thumbscrew and the viewer set screw as your reference.

For all collimation: Orient the laser collimator to align with above pre-marked position.

- Push the laser collimator flush against the eyepiece holder rim, then twist the compression ring in the lock direction to tighten further.
- Tighten the adapter until you feel the laser collimator is clamped onto the eyepiece holder and the white ring on the collimator is flushed against the focuser shoulder.
*DO NOT tighten the thumbscrew on the focuser.

Note: A good fit does not mean extremely tight fit. As long as the collimator stays square on the eyepiece holder without slop is a good fit.



STEP 5: Activating the Laser Collimator

- Turn the end cap of the laser collimator clockwise until the laser is activated.
- Bump the grip ring (not the end of the battery compartment section) and check if the projecting laser dot on the 45 degree faceplate is shifting loosely. If loose, repeat step 4 until the laser collimator is securely adapted.

Note: If the laser collimator is still loose, your eyepiece holder's diameter is larger than standard tolerance. You may need to use your thumbscrew to slightly hold the laser collimator in place. The laser will not be perfectly centered but it has taken out most of the tolerances and keeps the laser close to your telescope's optical center.



STEP 6: Adjusting the Secondary Mirror

- Check out the 45 degrees faceplate and look for the **expanded** laser dot projecting on the target grid.

For first time setup: Mark the center of the laser beam on the target grid. Then you are ready for the collimation in the future.

- Use necessary screwdriver or knobs to adjust the alignment screw on the secondary mirror holder until the center of the expanded laser dot is centered in the pre-marked position.

At this point, your telescope is collimated.



STEP 7: Removal of the Laser Collimator

- Turn off the laser by twisting the end cap counterclockwise until laser is deactivated.
- Hold the collimator grip ring and twist the compression ring in the unlock direction to loosen the adapter.
- Grab the grip ring and pull out the laser collimator gently.
- If the adapter still bites onto the eyepiece holder, press the collimator back into the eyepiece holder and pull back out again. Repeat this process (b to d) until you can pull the collimator straight out of the eyepiece holder.

Note: DO NOT forcefully pull the collimator in an angle. It may damage both the adapter and the eyepiece holder.

