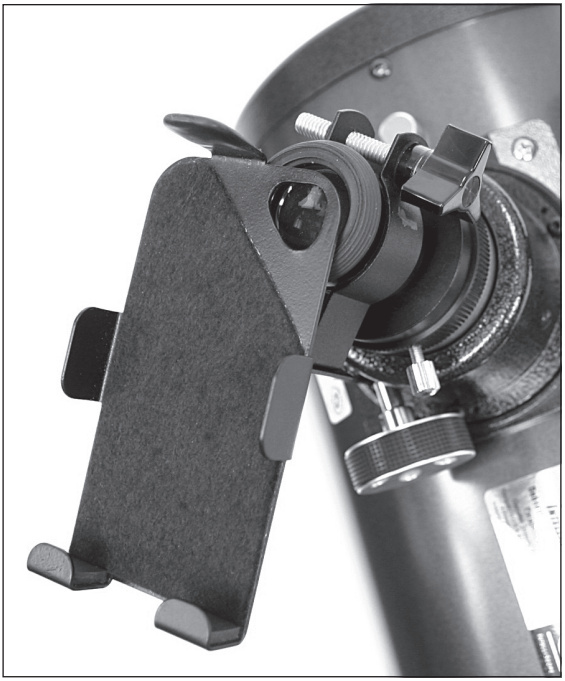
INSTRUCTION MANUAL

Orion® SteadyPix™ Telescope Afocal Adapter for iPhone®

#5303



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Introduction

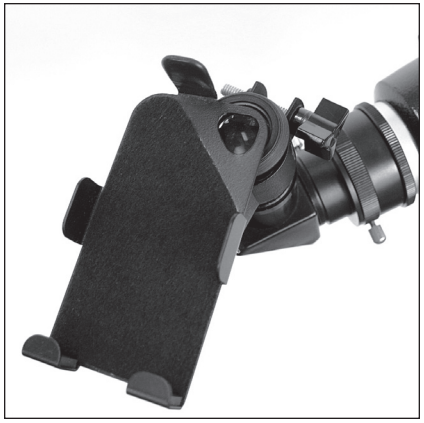


Figure 1. The SteadyPix Afocal Adapter for iPhone mounted on the 1.25" eyepiece of a refractor telescope.

Congratulations on your purchase of the Orion SteadyPix Telescope Afocal Adapter for iPhone! The adapter securely couples an Apple iPhone to a standard 1.25" telescope eyepiece, enabling the capture of high-magnification digital photographs through the telescope using the iPhone's built-in camera – in daytime or at night. The technique of afocal, or "eyepiece projection," photography has been used for decades with standard cameras. The new wrinkle is that now you can do it with an iPhone. And with the SteadyPix Telescope Afocal Adapter for iPhone to precisely position and hold the iPhone's camera lens over the center of telescope's eyepiece, you can achieve astounding results!

The SteadyPix for iPhone also lets you display a live view of the image projected by your telescope on your iPhone screen, which is perfect for sharing real-time views of the night sky with friends and family. The iPhone becomes a mini display monitor!

We hope you have fun taking pictures with your iPhone using the SteadyPix Telescope Afocal Adapter!

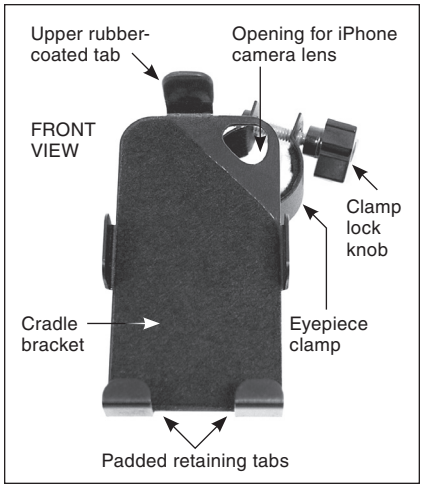
What's Included

- iPhone cradle bracket
- Slotted L-bracket with lock knobs
- Eyepiece clamp (for 1.25" eyepieces) with lock knob
- Carrying pouch

Compatibility

The Orion SteadyPix Telescope Afocal Adapter for iPhone is designed to fit the Apple iPhone 4S, 4, 3GS, 3, and original iPhone. The SteadyPix for iPhone was designed specifically for use with the Apple iPhone. It is not intended or known to work with the iPod Touch, or any other brand or model of smartphone.

WARNING: Never look directly at the Sun through your telescope or its finder scope – even for an instant – without a professionally made solar filter that completely covers the front of the instrument, or permanent eye damage could result. Young children should use this telescope only with adult supervision.



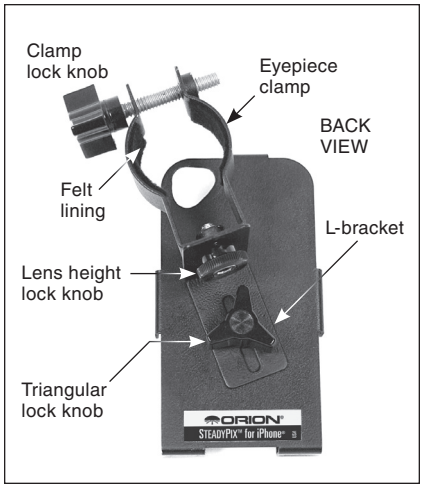


Figure 2. Front and back views of the SteadyPix Afocal Adapter for iPhone.

Note that you will likely have to remove the iPhone from any external protective case, sleeve, or bumpers to allow it to seat properly in the SteadyPix bracket.

The SteadyPix can be mounted to virtually any size or type of telescope – refractor, reflector, or Cassegrain-type – that utilizes a standard 1.25"-diameter telescope eyepiece (**Figure 1**). The included eyepiece clamp fits eyepieces with housing diameters up to 1.5". If your 1.25" eyepiece has a housing diameter larger than 1.5", you may need the Orion Large 1.25" Eyepiece Clamp for iPhone SteadyPix (sold separately), which accommodates housings of 1.5" to 1.75" in diameter.

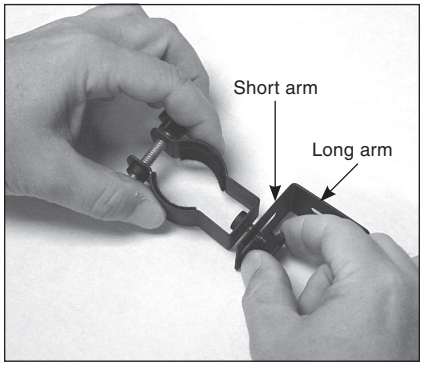


Figure 3. Attach the eyepiece clamp to the short arm of the slotted L-bracket using the round lens height lock knob.

Getting Started

Before using the SteadyPix Telescope Afocal Adapter for iPhone, please familiarize with its features and parts, referring to **Figure 2**.

To capture images afocally projected by your telescope, the iPhone's camera lens must be carefully aligned over the center of the telescope's eyepiece and the two properly spaced apart. The following steps will help you achieve the necessary alignment and positioning of the SteadyPix bracket.

1. Begin assembly by attaching the eyepiece clamp to the shorter arm of the slotted L-bracket **(Figure 3)** with the round lens height lock knob.

2. Now attach the longer arm of the L-bracket to the back of the cradle bracket using the triangular lock knob **(Figure 4)**. Leave both lock knobs slightly loose for now to allow adjustment.

   It is easiest to first align the telescope eyepiece with the phone's camera lens before installing the whole eyepiece/SteadyPix/iPhone assembly on the telescope.

3. Insert your iPhone into the cradle bracket by placing the bottom of the iPhone into the padded retaining tabs, then pushing the top of the iPhone under the upper, rubber-coated tab **(Figure 5).** Once installed in this way, the iPhone will not fall out, even when facing down toward the ground.

4. Now, place the iPhone face down (place a cloth on the table to protect the iPhone's screen from getting scratched) so the eyepiece clamp is facing up. Using a fairly low-power (long focal length) eyepiece to start with, like a 25mm, insert it into the eyepiece clamp and tighten the clamp bolt **(Figure 6).**

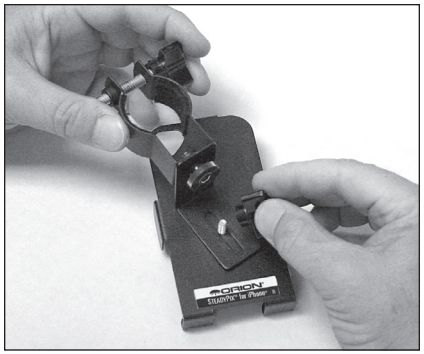


Figure 4. The triangular lock knob fastens the long arm of the L-bracket to the cradle bracket.

Figure 5. Push the iPhone under the rubber-coated upper tab to secure it in place.

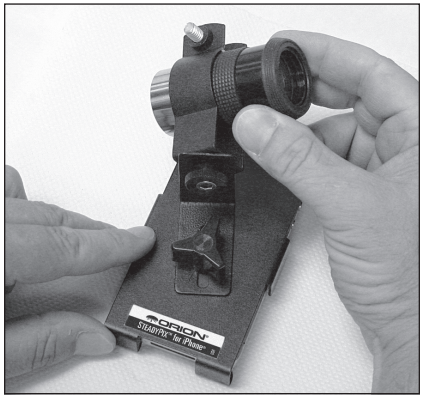


Figure 6. Rotate the eyepiece clamp and insert the eyepiece, then tighten the clamp around the housing with the triangular lock knob.

5. Rotate the eyepiece clamp so that the eye lens of the eyepiece is facing the iPhone's camera lens, then lower the clamp until the eyepiece is touching, or nearly touching, the cradle bracket.

6. Looking through the rear of the eyepiece barrel, move the eyepiece until the lens of the iPhone appears approximately centered in the lens of the eyepiece **(Figure 7).** Then lightly tighten both the lens height thumbscrew and the triangular L-bracket lock knob. Make sure the eyepiece is flat relative to the cradle bracket, not skewed **(Figure 8).**

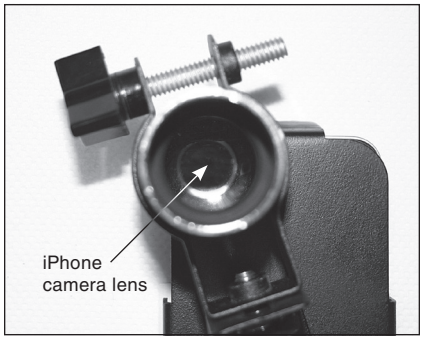


Figure 7. Adjust the eyepiece clamp in the L-bracket so that the iPhone's camera lens appears roughly centered in the eyepiece lens, as shown in this view from the bottom of the eyepiece.

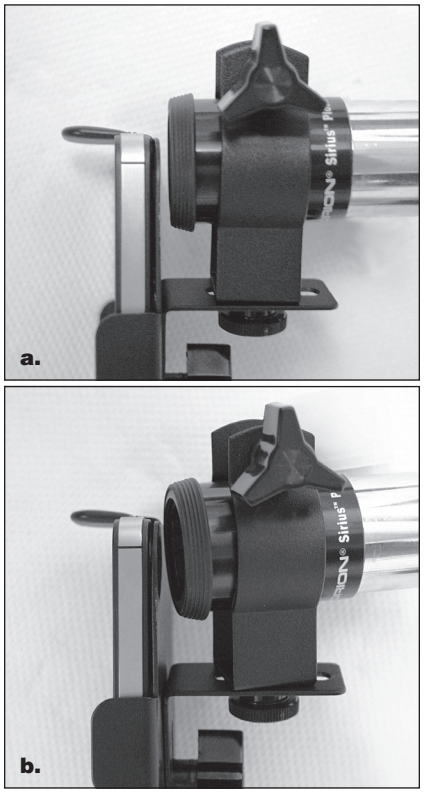


Figure 8. The eyepiece lens should be flat relative to the cradle bracket **(a)**, not skewed at an angle **(b)**.

You can check the alignment by turning on the camera app in your iPhone to view through the camera lens and the attached telescope eyepiece. You should see a distinct, round (but possibly clipped) "field of view" centered on the iPhone's display **(Figure 9).** If needed, you can adjust the position of the L-bracket and eyepiece clamp until the field of view appears centered in the display. (Any objects in the field of view will *not* be in focus.)

7. Now you're ready to install the eyepiece and iPhone assembly into the telescope's focuser. Carefully insert the eyepiece into the focuser or star diagonal and secure it firmly with the locking setscews(s) **(Figure 10).**

CAUTION! The SteadyPix and iPhone combination adds additional weight to your telescope and eyepiece. Make sure that the eyepiece and any diagonal and Barlow lens are firmly secured in place! Failure to do so could result in a dropped iPhone!

8. With the telescope aimed at a fairly bright object and with the camera app turned on, use the telescope's focuser to bring the object into focus.

9. If you have trouble achieving focus, you may have to adjust the spacing between the iPhone's camera lens and the eyepiece lens. This is done by adjusting the eyepiece clamp position on the slotted L-bracket arm, using the lens height thumbscrew. If the slot on the L-bracket does not provide enough travel, the height of the eyepiece can be adjusted further by sliding it forward or back in eyepiece clamp, and tightening with the clamp bolt.

If the image is not centered in the eyepiece or the image does not appear clearly, try re-adjusting the telescope focus and the

Figure 9. Position the telescope eyepiece so that its field of view is centered on the iPhone's display.

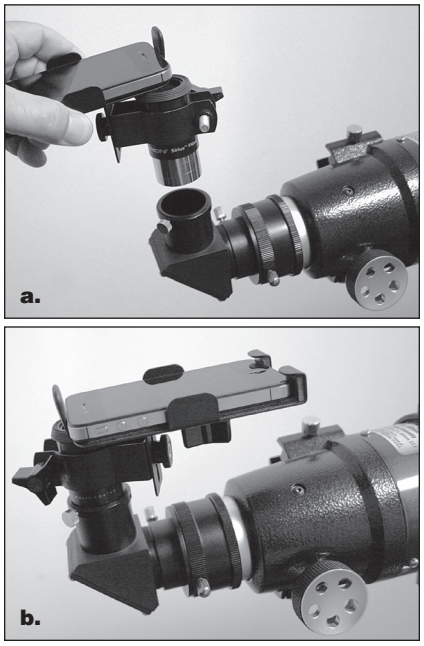


Figure 10. Inserting the eyepiece with iPhone attached into the star diagonal. Before doing this be sure that the diagonal is tightly secured in the telescope!

SteadyPix adjustment points. It's takes a little time initially to get everything adjusted just right, so be patient. After a couple of sessions, you'll get the hang of it.

Taking Photographs with the SteadyPix Afocal Adapter and Your iPhone

Moon: Our closest neighbor in the solar system is dazzling through even a very small telescope. The SteadyPix will allow you to take beautiful images of the whole Moon or closeups that showcase the craters, mountains, or maria (**Figure 11**). Single snapshots work well and multiple shots can be stacked later in a program such as Registax to increase the signal-to-noise ratio and dynamic range of the image. Also, you can take video and then stack a series of individual video frames.

Figure 11. An iPhone afocal close-up image of the lunar surface captured with an Orion StarMax 90mm Maksutov-Cassegrain at 62x magnification.

Bright Planets: The bright planets Venus, Mars, Jupiter and Saturn also make excellent targets for afocal photography. Try using a higher power eyepiece and maybe a Barlow lens to boost the magnification – planets are tiny objects in the sky! You'll need a steady atmosphere, i.e., good "seeing," to get sharp planetary images. The iPhone's display will allow you to show off your target object to friends and passers-by – no waiting in line at the eyepiece!

No need to stop at Saturn, though. At least one amateur astronomer has captured the distant planet Neptune with his iPhone and an 8" Schmidt-Cassegrain telescope!

Deep-sky Objects: Most deep-sky objects are extremely difficult to photograph using afocal photography. Try working with brighter objects such as M42 (Orion Nebula) or M13 (Hercules Cluster). You will likely need a mount that tracks the motion of the sky so that you can take "long" exposures using a 3rd-party app that offers that capability (try Slow Shutter by Tomoki Kobayashi), and you will have to stack multiple images to get a good final image.

Sun: If you have a proper solar filter to cover the front of your telescope, you can get terrific images of sunspots on the surface of our nearest star in the daytime with your iPhone. Sunspots are constantly changing, so shooting them is always interesting and a lot of fun.

Nature/Terrestrial: The SteadyPix can be used to take through-the-telescope photos and videos of distant subjects in daylight.

Mouting the SteadyPix on a Photo Tripod

The SteadyPix also allows you to mount your iPhone directly on a standard photo tripod as shown in **Figure 12**, for taking scenic panoramas and for holding the camera while taking self-portraits or group photos (when you're part of the group). The SteadyPix bracket can be mounted in either portrait or landscape orientation. The only requirement is that the tripod have a 1/4"-20 threaded post.

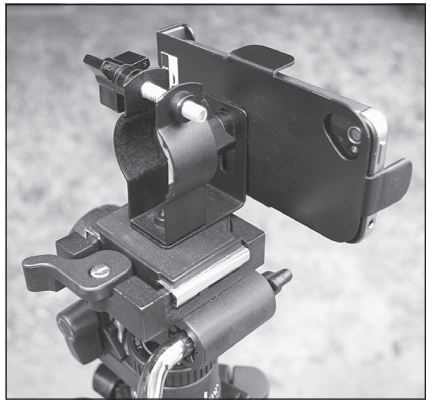


Figure 12. The SteadyPix can mount directly on a photo tripod for steady wide-field shots and self-portraits.

1. To attach the SteadyPix to the tripod, first remove the eyepiece clamp from the L-bracket by completely removing the clamp height thumbscrew. Put the thumbscrew in a safe place as it will not be needed for tripod mounting of the SteadyPix.
2. Adjust the L-bracket for the orientation you want (portrait or landscape). Make sure the bottom of the L-bracket clears the lower edge of the cradle bracket. Then tighten the traingular lock knob.
3. Assuming that the tripod has a removeable mounting shoe, remove it from the tripod. Place the 1/4"-20 threaded bolt on the shoe through the slot in the short arm of the L-bracket, then place the empty eyepiece clamp onto the threaded bolt.
4. Now thread the 1/4"-20 bolt into the eyepiece clamp by turning the bolt itself until tight. The SteadyPix and iPhone assembly should look like **Figure 12** (shown in landscape orientation).

Camera Apps

The camera app that comes pre-installed on the iPhone is adequate, but not terribly versatile. There are other, 3rd party camera apps available in the App Store that offer additional features and settings that you may find useful, such as shutter delay (or self-timer), burst mode, and the ability to take "long exposures" (really probably just multiple exposures digitally stacked).

Exposure delay is nice to have. With the native camera app, when you tap the camera icon on the screen to take the picture, the exposure commences immediately. The vibration from the tap is enough to cause blurring of the image in many instances. Having a delay of

a few seconds between the screen tap and the onset of exposure eliminates the problem by allowing any vibration to dissipate prior to image capture.

Two camera apps that offer exposure delay are Camera Plus (by Global Delight Technologies) and Slow Shutter (by Tomoki Kobayashi). For more 3rd party camera apps, type "camera apps" in the search field on the iTunes App Store.

Have fun!

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One-Year Limited Warranty

This Orion SteadyPix Telescope Afocal Adapter for iPhone is warranted against defects in materials or workmanship for a period of one year from the date of purchase. This warranty is for the benefit of the original retail purchaser only. During this warranty period Orion Telescopes & Binoculars will repair or replace, at Orion's option, any warranted instrument that proves to be defective, provided it is returned postage paid to: Orion Warranty Repair, 89 Hangar Way, Watsonville, CA 95076. If the product is not registered, proof of purchase (such as a copy of the original invoice) is required.

This warranty does not apply if, in Orion's judgment, the instrument has been abused, mishandled, or modified, nor does it apply to normal wear and tear. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state. For further warranty service information, contact: Customer Service Department, Orion Telescopes & Binoculars, 89 Hangar Way, Watsonville, CA 95076; (800) 676-1343.

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