

INSTRUCTION MANUAL

Orion® SteadyPix™ Universal Telescope Photo Adapter for Smartphones

#5693



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Introduction

Congratulations on your purchase of the Orion SteadyPix Universal Telescope Photo Adapter for Smartphones! The adapter securely couples a wide variety of brands and models of slate-type smartphones to a standard 1.25" telescope eyepiece, enabling the capture of high-magnification digital photographs through the telescope using the smartphone'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 a smartphone! With the “SteadyPix Universal” to precisely and consistently position the smartphone's camera lens over the center of the telescope's eyepiece, you can achieve astounding results shot after shot!

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

We hope you have fun taking pictures with your smartphone using the SteadyPix Universal Telescope Photo Adapter for Smartphones!

What's Included

- Adjustable-width smartphone bracket with eyepiece clamp
- Carrying pouch

Compatibility

The Orion SteadyPix Universal Telescope Photo Adapter for Smartphones is designed to fit slate style smartphones measuring up to 3-1/8" in width. The phone's camera lens should be oriented near the top of the back side, for unobstructed alignment with a telescope eyepiece. The higher the camera sensor's resolution, i.e., the more megapixels, the better your smartphone photos are likely to be. That is, a 5MP camera should produce a sharper, more resolved image than a 2MP camera.

The SteadyPix Universal was designed with an adjustable bracket to allow compatibility with most currently available smartphones, including Apple iPhones (all versions) and many smartphones from other manufacturers that utilize operating systems other than Apple's iOS. The bracket also works with camera-equipped versions of Apple's iPod touch mobile device.

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.

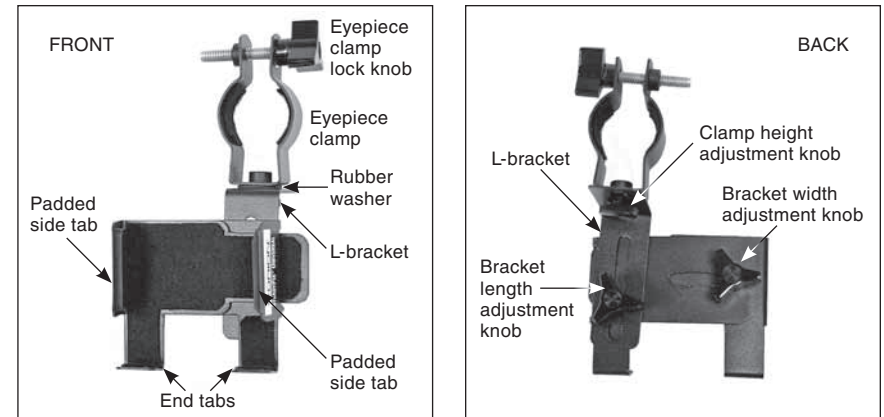


Figure 1. Front and back views of the SteadyPix Universal Telescope Photo Adapter for Smartphones.

You may or may not have to remove your smartphone from any external protective case or “bumper” to allow it to seat properly in the SteadyPix bracket. For relatively slim bumpers you will probably be able to just leave it on. Bulkier bumpers may be too big to fit in the adjustable bracket even at its widest setting, or may not allow the camera lens to be positioned close enough to the telescope eyepiece to achieve a proper image.

The SteadyPix Universal 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. 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 Large 1.25" Eyepiece Clamp for iPhone SteadyPix (sold separately), which accommodates housings of 1.5" to 1.75" in diameter.

Getting Started

Before using the SteadyPix Universal adapter, please familiarize with its features and parts, referring to **Figure 1**.

To capture images afocally projected by your telescope, the smartphone'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.

The SteadyPix Universal comes fully assembled in the box. For installation, we've found it easiest to first insert an eyepiece into the bracket and align it with the phone's camera lens. Once that is done, the eyepiece – with SteadyPix and smartphone assembly attached, can be installed on the telescope. Here's the procedure step by step:

1. Loosen the bracket width adjustment knob and open the bracket to its maximum width.

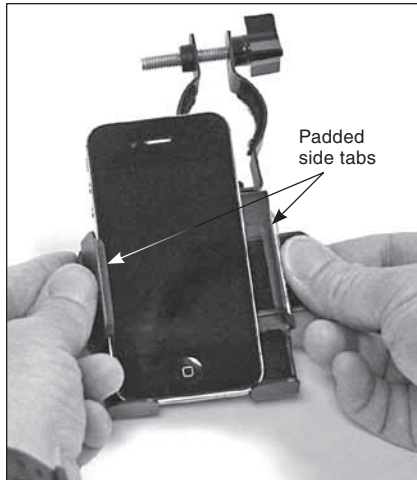


Figure 2. The bracket adjusts in width to hold phones up to 3-1/8" wide.

2. Insert your smartphone into the bracket so that the bottom end of the smartphone rests against the end tabs. Then press the sides of the bracket together until the rubber-padded side tabs are snug against the smartphone (**Figure 2**). Then tighten the bracket width adjustment knob to secure the phone in place. Check to make sure that the phone is snug in the bracket. If it is still a little loose, loosen the width adjustment knob a bit, squeeze the two padded side tabs against the sides of the phone again, then retighten the adjustment knob. Once installed in this way, the smartphone will not fall out, even when facing down toward the ground.
3. Now, place the installed smartphone face down 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 3**).
4. Rotate the eyepiece clamp so that the eye lens of the eyepiece is facing the phone's camera lens, then lower the clamp until the eyepiece lens is 1/4" or so from the phone's camera lens.
5. Looking through the bottom end of the eyepiece barrel, move the eyepiece until the lens of the phone's camera appears approximately centered in the lens of the eyepiece (**Figure 4**). Then lightly tighten both the round eyepiece clamp height adjustment knob and the triangular bracket length adjustment knob. Make sure

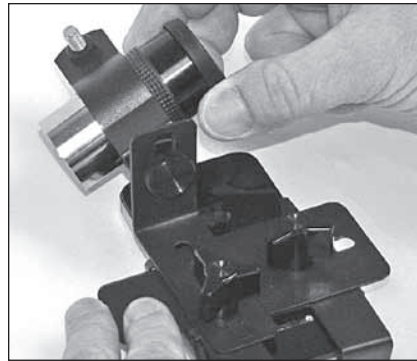


Figure 3. Rotate the eyepiece clamp and insert a 1.25" eyepiece, then tighten the clamp around the housing with the triangular lock knob.

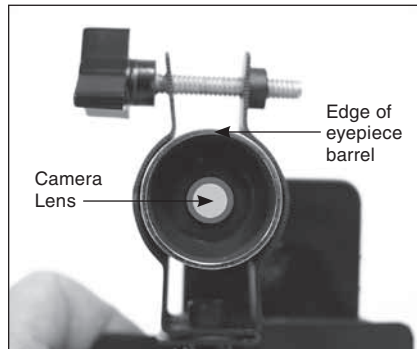


Figure 4. Align the eyepiece lens with the phone's camera lens, such that the camera lens is centered in the eyepiece barrel when viewed through the bottom end of the eyepiece.



Figure 5. The eyepiece lens should be flat relative to the smartphone (**a**), not skewed at an angle (**b**).



the eyepiece is flat relative to the smartphone (**Figure 5a**), not skewed as in **Figure 5b**.

You can check the alignment by turning on the camera app in your phone 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 phone's display (**Figure 6**). 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.)

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



Figure 6. Position the telescope eyepiece so that its field of view appears roughly centered on the phone's screen.



Figure 7. Inserting the eyepiece with adapter and phone attached into the star diagonal. Before doing this be sure that the diagonal is tightly secured in the telescope focuser!

1. 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.
2. If you have trouble achieving focus, you may have to adjust the spacing between the smartphone's camera lens and the eyepiece. 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.



Figure 8. An iPhone afocal close-up image of the lunar surface captured with an Orion StarMax 90mm Maksutov-Cassegrain at 62x magnification.

If the image is not centered in the eyepiece or the image does not appear clearly, try re-adjusting the telescope focus and the SteadyPix adjustment points. It 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 Universal Adapter and Your Smartphone

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 close-ups that showcase the craters, mountains, or maria (**Figure 8**). 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 the sharpest individual video frames.

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 smartphone'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 smart-

phone. Sunspots are constantly changing, so shooting them is always interesting and a lot of fun.

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

Mouting the SteadyPix Universal Adapter on a Photo Tripod

The SteadyPix Universal also allows you to mount your smartphone directly on a standard photo tripod as shown in **Figure 9**, 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 Universal bracket can be mounted in either portrait or landscape orientation. The only requirement is that the tripod have a 1/4"-20 threaded post.

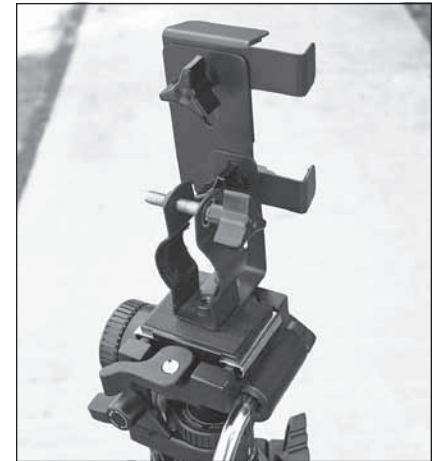


Figure 9. The SteadyPix Universal adapter can be mounted directly on a photo tripod, as shown, for steady wide-field shots and self-portraits.

1. To attach the SteadyPix Universal to the tripod, first remove the eyepiece clamp from the L-bracket by completely removing the clamp height adjustment knob. Put it and the rubber washer in a safe place as they 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 main phone bracket. Then tighten the triangular bracket length adjustment knob.
3. Assuming that the tripod has a removeable mounting shoe, remove it from the tripod head. 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. When properly attached the SteadyPix assembly should look like **Figure 9** (shown in horizontal, or "landscape," orientation).

Camera Apps

The native camera apps on most smartphones are adequate, but may not be terribly versatile. There are other, 3rd party camera apps available 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. Taking the iPhone as an example, with its 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 iPhone 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 or the app marketplace for your particular brand of smartphone.

One last thing: If your phone has a flash, make sure the flash is turned off when shooting through a telescope eyepiece!

Have fun!

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One-Year Limited Warranty

This Orion SteadyPix Universal Telescope Adapter for Smartphones 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 product 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 product 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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