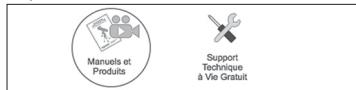


INSTRUCTION MANUAL

❶ Pour obtenir le manuel d'utilisation complet, veuillez vous rendre sur le site Web OrionTelescopes.eu/fr et saisir la référence du produit dans la barre de recherche.



❷ Cliquez ensuite sur le lien du manuel d'utilisation du produit sur la page de description du produit.



Deutsche

❶ Wenn Sie das vollständige Handbuch einsehen möchten, wechseln Sie zu OrionTelescopes.de, und geben Sie in der Suchleiste die Artikelnummer der Orion-Kamera ein.



❷ Klicken Sie anschließend auf der Seite mit den Produktdetails auf den Link des entsprechenden Produkthandbuchs.



Español

❶ Para ver el manual completo, visite OrionTelescopes.eu y escriba el número de artículo del producto en la barra de búsqueda.



❷ A continuación, haga clic en el enlace al manual del producto de la página de detalle del producto.

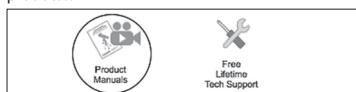


Italiano

❶ Per accedere al manuale completo, visitare il sito Web OrionTelescopes.eu. Immettere le product item number nella barra di ricerca



❷ Fare quindi clic sul collegamento al manuale del prodotto nella pagina delle informazioni sul prodotto.



Orion StarShoot™ P1 Polar Alignment Camera

#6236



 **ORION®**
TElescopes & BINOCULARS
A N E M P L O Y E E - O W N E D C O M P A N Y

Corporate Offices: 89 Hangar Way,
Watsonville CA 95076 - USA

Toll Free USA & Canada: (800) 447-1001

International: +1(831) 763-7000

Customer Support: support@telescope.com

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Congratulations on your purchase of the Orion StarShoot P1 Polar Alignment Camera! The P1 is designed to polar align your mount quickly and accurately, with an error as small as 30 arc seconds, within just a few minutes time, following easy step by step directions in the software. Forget about hunching down, squinting through a dim polar scope, guessing if you've angled it right to coincide with the position of the pole star around the reticle. Let the program do everything for you, fast and easy! And it works for both North and South Hemisphere alignment!

Parts List

- P1 Camera
- Lens cap
- USB cable
- Camera mount adapter
for specific mount
- Allen wrench

Figure 1. The
two sections of the
Mount adapter.



Drivers and software are available as a download from our website. Before plugging in the camera, please go to www.telescope.com/P1 for Windows software.

Camera Hardware Installation

To install the P1 onto your mount, you need the adapter that came with your package for the appropriate mount. Please contact Orion if you lose the adapter, or if you purchase a new mount and need a different adapter.

The adapter comes in two pieces – the mount ring, which attaches to the mount itself via two small setscrews, and the camera base portion which attaches to the back of the camera, and bolts to the mount ring via a thumbscrew (**Figure 1**).

Installation is simple:

1. Separate the two components of the adapter and slip the mount ring into the front (north end) opening of your polar housing (**Figure 2**).
2. When the ring is sitting flush and level inside the mount opening, tighten down the two small setscrews from inside the adapter ring using the included allen wrench (**Figure 3**). Do not over-tighten the screws, just snug enough to hold the ring securely. This step only needs to be done once, as the ring can be left installed in the mount head. Make sure the ring is sitting flush against the mount when installed.
3. Attach the camera base portion of the adapter onto the back of the camera, using the three included Philips screws (**Figure 4**). This step also only needs to be done once, as the camera base ring will stay attached to the camera.



Figure 2. The mount ring section inserted into the mount's polar axis opening.



Figure 3. Tighten the two setscrews using the included allen wrench. There isn't a lot of room to maneuver the wrench, so it might take a couple of turns to snug down.

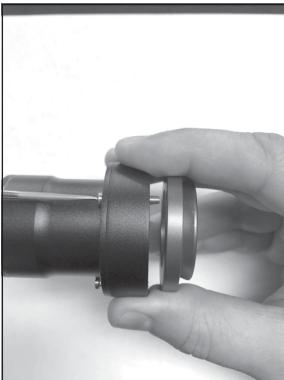


Figure 4. Screw the base ring section onto the back of the camera using the included screws, and a screwdriver.

To attach the camera when ready to polar-align, place the camera with the installed base plate onto the mounting ring, and tighten the thumbscrew to secure it in place. Orient the camera so the USB port is pointed left when you are standing in front of the camera and mount (**Figure 5**).

5. The camera can be left installed on the mount, but for safety while transporting, it's best to loosen the setscrew, remove the camera, and

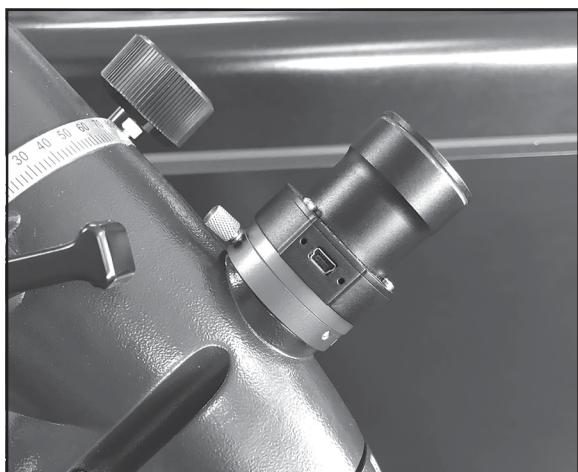


Figure 5. The camera is attached to the mount, and oriented with the USB port facing the left side of the mount.

install the adapter ring cap onto the adapter to prevent dust from entering the mount's polar axis hole. The cap is included in the camera mount adapter packaging.

Software Installation

A computer running Windows 7/8/10 is required to operate the P1 control program.

1. Before plugging in the P1, download and install both the software and drivers from the following link: www.telescope.com/P1
2. Unzip the P1 Windows driver (make sure to note where the unzipped file will save so it is easy to find on your computer).
3. Double click on the driver .exe file to install the P1 drivers. Note you may need administrator privileges in order to install the files. Click through the windows to install the driver. There will be a windows security warning asking if you want to make changes to the computer. Click "Yes" to install the drivers successfully.
4. Unzip the P1 control software you previously downloaded, and double click on the setup .exe to install the program. Click through the windows to successfully install the program.
5. Once the driver and software have been installed, plug the camera into a USB port on the computer. The first time you plug the camera in, the system will find and install the appropriate drivers.
6. Launch the P1 program once the camera is plugged into and recognized by the computer.

Using the P1 to Polar Align

Determining the center of RA rotation

Before starting, please note the P1 can be used in the North or the South Hemisphere. Click the appropriate checkbox for your hemisphere. The instructions here are for the North Pole, so simply substitute "South Pole" and "Sigma Octantis" where any reference to the North Pole and Polaris are shown.

Before you use the P1 to polar align, the mount must be roughly aligned with the North Pole. Polaris must be visible in the camera field of view for the system to work, and the field of view is 11x8 degrees, so only a rough alignment is necessary. Level your mount, point the mount northwards using a true north calibrated compass (or smartphone with a compass app set to true north, not magnetic north), and set the latitude correctly on the mount. It helps to start the mount in its home position, facing north, counterweight shaft pointing down. It's not necessary, but will help in a later step.

1. Connect the camera to your computer and launch the P1 software.
 2. Click connect (**Figure 6**), and the camera will start streaming an image.
-

3. There are onscreen directions to help navigate through the next few steps. Adjust the exposure and gain settings until Polaris and a few of the nearby stars are clearly visible on the screen. Click finish when this is done.
4. Double-click on Polaris in the camera window. If the mount is roughly Polar Aligned, Polaris is likely the brightest star in the field, as there are no other brighter stars nearby. You can compare the star pattern in the camera window with Planetarium software, or save a .bmp file under the File menu, and plate solving the image using online free plate solvers, such as nova.astrometry.net, to verify if you are in fact looking at Polaris. With a little practice, it will become obvious when Polaris is in the field of view.
5. Once you have double-clicked on Polaris, a rotatable overlay is shown – use the slider to rotate the overlay until the circles shown match up with stars in the image (**Figure 7**). You can also use the arrow keys or the mouse scroll wheel to rotate the template. Click success when finished.
6. Next the program will ask you to choose a star in the field other than Polaris and double-click on it. Choose a star not too close to Polaris so the process is more accurate. Remember which star this is as you will click on it again in subsequent steps. Double-click on the chosen star.
7. Next the program will request the mount be moved in RA. Move the mount slightly using the motor controller to make sure the stars are rotating in the requested direction. Once the direction is determined (it will either be the left or right arrow on the controller), move the star approximately 30 degrees. You can use the setting circle on the mount to determine how far 30 degrees is, or just estimate. **Note: use the motor to move the mount, do not unlock the RA clutch and move the mount by hand. Using the motor while the mount axis is locked down provides far more accuracy.**

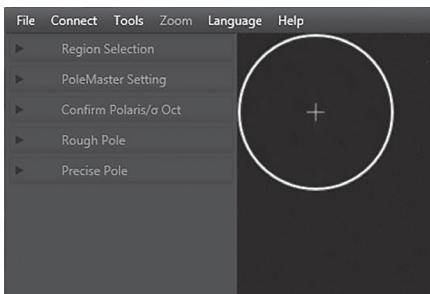


Figure 6. The screen when the program is loaded up. Click the menu item “Connect” to start up the camera.



Figure 7. Use the rotation slider to rotate the template until the circles overlap with the stars in the image.

-
8. Click “Finished” and then double-click on the same star. Make sure you remember which star it was you used in step 6!
 9. Repeat the rotation step again. The system will then draw a circle on the screen with the bright star on it. The center of this circle represents the center of rotation of the star you clicked on several times. To verify, rotate the mount back to the original position. If you started this process with the mount in the “Home” position, you can easily return home by performing a park command.
 10. If the star move along the circle, click “Correct”. If it doesn’t, click “Reset” and try again. The most likely cause of it failing is not clicking on the same star during the rotation phase.

Polar Alignment

1. Double-click on Polaris again and match up the on-screen overlay like you did in step 5, then click “Success”.
2. The small rotating circle with the cross inside (**Figure 8**) is the position where Polaris should be placed. Use the polar Altitude and Azimuth adjusters to position Polaris into this circle. Click “Finished” when this is done.
3. Double-click Polaris one last time, and use the slider to rotate the overlay to match the nearby stars, and click “Success” when done.
4. You are now very close to perfectly aligned!



Figure 8. The small rotating circle. Use the mount’s Polar adjustments to position Polaris into this circle.

Precision Polar Alignment

Click the “Start Monitor” button, and the system will begin analyzing the mount on a frame by frame basis. Fine alignment is achieved when the green polar crosshair overlaps with the red axis crosshair (**Figure 9**). As long as there are stars within the two larger boxes, the system will know where the polar axis is positioned. Fine tune the Alt and Az adjusters on the mount until the boxes overlap (**Figure 10**), and you have achieved a very precise polar alignment. The program can be closed at this time, and you can start your imaging session!

Monitoring will continuously analyze the polar axis while the camera is on, but please note as soon as you rotate the scope in RA (during any Go-To move), the system will not be able to analyze any longer, until you rotate back and put the two stars in the larger boxes.

Using Atmospheric Refraction settings

Atmospheric refraction can change the actual position of the pole and is more significant in lower latitude regions. If you wish the system to compensate for refraction,

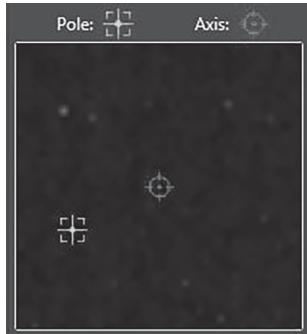


Figure 9. Line up the two crosshairs for very precise alignment.



Figure 10. The two crosshairs aligned. Precise polar alignment has been achieved.

before starting the polar alignment procedure, click on the Tool menu, and then on Astronomical Refraction. Enter your latitude and longitude here.

Previous Mount Rotational Alignment

After you align the mount the first time using the routine described above, the next time you come back to the program to do another polar alignment, after step #5, the program will ask you if you would like to use the previous R.A. axis rotational alignment already saved in the system. If you have not removed the camera from the mount, you can click “yes” to save a little time. However, if the camera has been moved, bumped, or you aren’t sure of the accuracy, you can click “no” and redo the R.A. rotational step. It will only take a minute or two longer, and will write over the previous rotational alignment data.

Specifications

Field of view	11x8 degrees
Resolution	~30 arc-seconds
USB port	Mini USB 2.0
Alignment accuracy	Rough alignment: ~5 arcminutes Fine alignment: up to 30 arc-seconds
Weight	4 oz.
Power draw	0.35 Watts, 70mA

One-Year Limited Warranty

This Orion product 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. Proof of purchase (such as a copy of the original receipt) is required. This warranty is only valid in the country of purchase.

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. It is not intended to remove or restrict your other legal rights under applicable local consumer law; your state or national statutory consumer rights governing the sale of consumer goods remain fully applicable.

For further warranty information, please visit www.OrionTelescopes.com/warranty.



Corporate Offices: 89 Hangar Way, Watsonville CA 95076 - USA
Toll Free USA & Canada: (800) 447-1001
International: +1(831) 763-7000
Customer Support: support@telescope.com

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