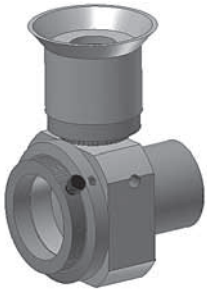
INSTRUCTION MANUAL

Orion® Newtonian Visual Centering Device for Imaging (NewtVCDI)

#8660



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Congratulations on your purchase of the Orion NewtVCDI (Orion Newtonian Visual Centering Device for Imaging). This useful imaging accessory allows easily finding and centering the planets and the Moon in the field of view of dedicated planetary cameras, with a minimum of back-focus. This is especially important for reflector telescopes (Newtonian telescopes) where the very limited back-focus does not permit the use of the traditional flip-mirror finders. For planetary imaging using a barlow-lens is extremely importance. Planetary cameras usually have very small sensors which give very narrow fields of view, using a barlow makes the task even more difficult. A system that provides a wider field of view, such as the NewtVCDI is an important tool to locate and center the object in the center of the camera.

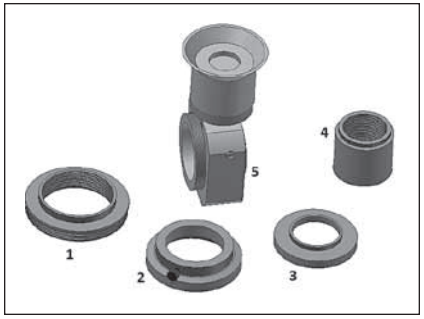

Figure 1. Parts List

Parts List (see Figure 1)

1. 2-in. focuser adapter to T-threads
2. T-threads spacer/extender
3. T-threads female to filter thread male
4. 1.25" eyepiece barrel
5. NewtVCDI body
6. Hex Key (not shown)

Vital characteristics of the NewtVCDI (see Figure 2)

- Minimum required Back focus 41mm
- Eyepiece Apparent Field of View (AFOV) 28cdeg
- Eyepiece focal length 20mm

WARNING: ***Never look directly at the Sun with the naked eye or with a telescope – unless you have a proper solar filter installed over the front of the telescope! Otherwise, permanent, irreversible eye damage may result.***

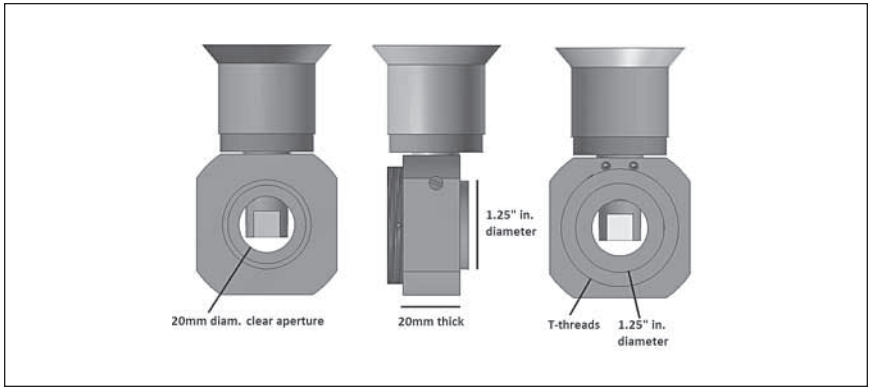

Figure 2. NewtVCDI dimensions

1. Getting Started

1.1. How does the NewtVCDI work? (see Figure 3.)

Position 1: A pick-off prism diverts the light coming from telescope to the NewtVCDI eyepiece. Looking through the NewtVCDI eyepiece it is easy to locate the planet or the Moon and center it in the Field of View (FOV).

Position 2: Pulling the eyepiece outwards the light coming from the telescope reaches the dedicated planetary camera.

If the planet was previously centered (position 1) it should continue centered in the smaller field of view of the dedicated camera. This procedure saves time and makes it easy to locate and center objects into the camera's field of view.

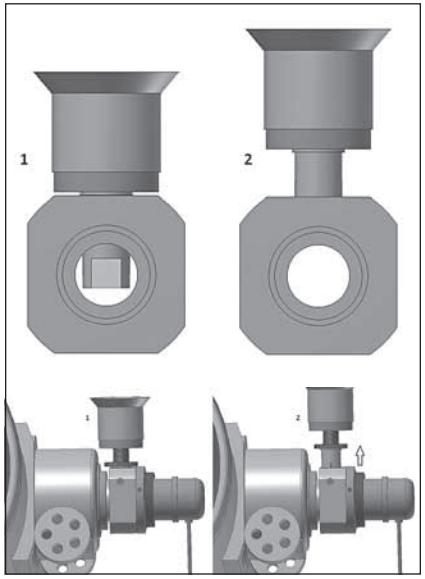

Figure 3. Position 1 (light goes to the NewtVCDI eyepiece) and Position 2 (clear aperture, the light goes to the camera)

1.2. Installing the Dedicated Astronomy Camera

The NewtVCDI accepts both T-threads and 1.25-in. eyepiece size cameras. Some cameras have both T-threads and 1.25-in. eyepiece barrel size. Choose the one configuration that provides a lower profile (i.e. that requires less back-focus).

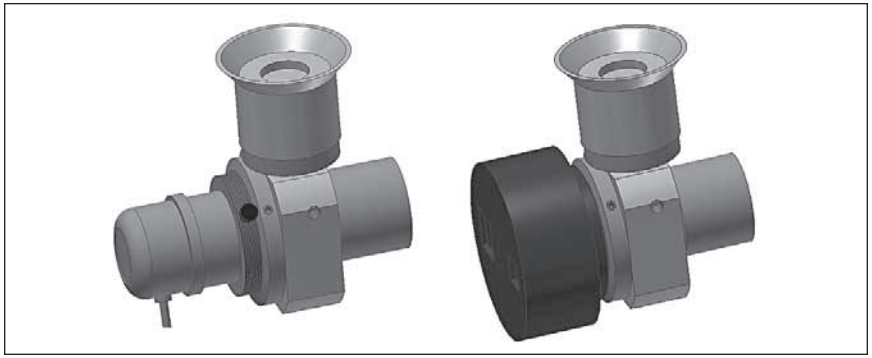

Figure 4. Using an eyepiece-size camera and a T-threads camera. Some cameras might require the addition of spacers (not included).

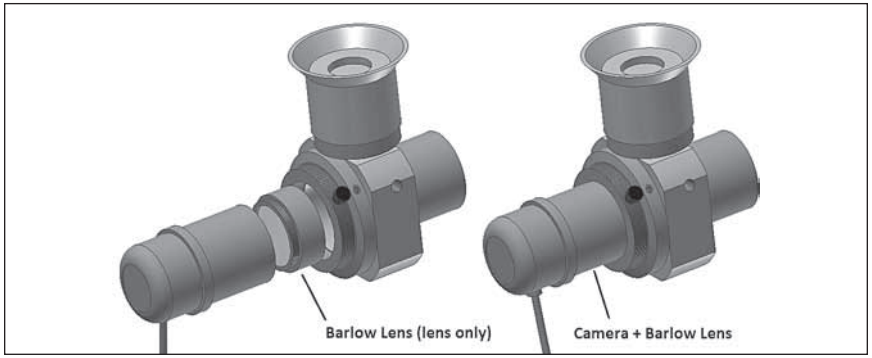

Figure 5. Using a barlow lens not only increases magnification but also provides more back-focus.

Some 1.25-in cameras may require the use of a barlow lens to achieve focus. This is also useful because the barlow lens provides a bigger image sampling (more resolution), making the planets or the Moon bigger.

1.3. Parfocalizing the NewtVCDI Eyepiece and the Dedicated Imaging Camera

It is very important to *parfocalize* the eyepiece with the camera. Parfocalizing means having the camera and the eyepiece at the same distance from the focal plane (the place where the image is formed).

1. Look for a target with the finderscope.
2. Place the NewtVCDI eyepiece in position #1 (Figure 3), this allows the light to be redirected to the eyepiece. Look through the eyepiece. Adjust the focuser until the image is perfectly focused.
3. Now, install the camera (Figure 4), use a barlow lens if needed (Figure 5).
4. Pull out the eyepiece to position #2 (Figure 3).

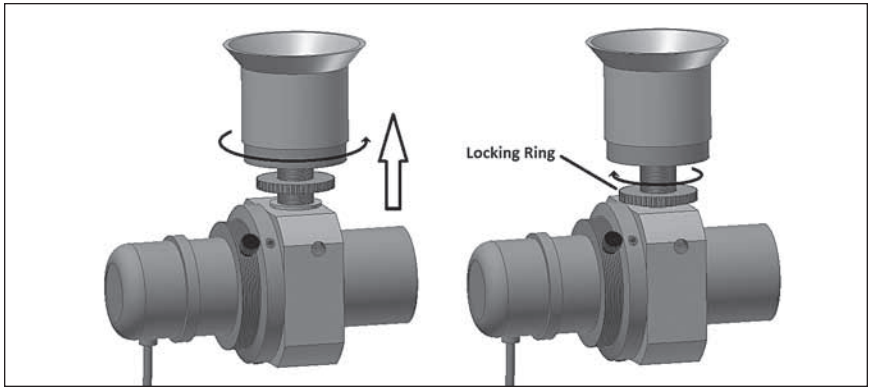

Figure 6. Adjusting the eyepiece out.

5. The image obtained by the camera will be out of focus.
6. *Rack the focuser in*, slowly, it should only be necessary by an inch of so. If the image starts to form (focused) then **the eyepiece needs to be adjusted out** (Figure 6).
7. If you don't get a focused image in the previous procedure, r*ack the focuser out*, slowly. If you get a focused image **then the eyepiececneeds to be adjusted in**.

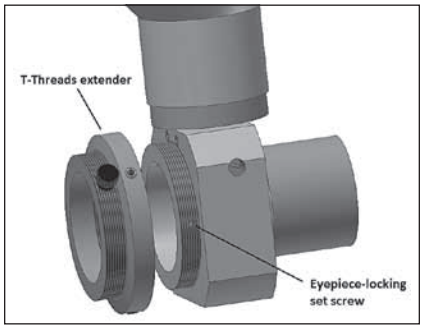

Figure 7. Adjusting the camera out. Rotate (Counter-cock wise) the T-threads extender. Slide the camera out and use the thumbscrew to lock it.

If the eyepiece is at its maximum in-position then alternatively adding spacing between the camera and the NewtVCDI is required. Sliding the camera out is also a good strategy (Figure 7).

2. Telescope Back-Focus

Telescope back-focus is the maximum distance from the focusing point to the focuser (when all racked-in). *This distance is important to know. Especially when very limited back-focus is available (like in Newtonian telescopes), because it limits the range of accessories that can be used.*

Limitations to the NewtVCDI (Back-Focus Issues)

Reflector telescopes usually have a limited back-focus (less than 41mm). Small aperture reflectors (below 6-in. in aperture) usually have too limited back-focus, these can only be used for visual astronomy (with an eyepiece). A dedicated astronomy camera can also be used, but that's it! Very few other accessories

can be used in-between the eyepiece and the focuser. The NewtVCDI is *NOT* compatible with those telescopes.

Some larger aperture telescopes (6-in. or more) which are usually compatible with DSLR cameras are compatible with the NewtVCDI. This means these telescopes have at least 55mm of back-focus – this is the minimum distance required so that the DSLR camera reaches focus.

Some examples of compatible telescopes:

- Orion Astroview 6
- Orion Skyview Pro 8
- Orion Skyview Pro 10

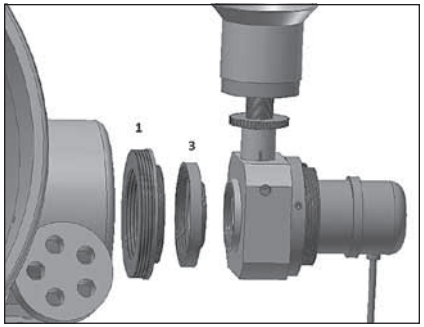

Figure 8. Using the supplied ring adapters to increase the telescope's available back-focus.

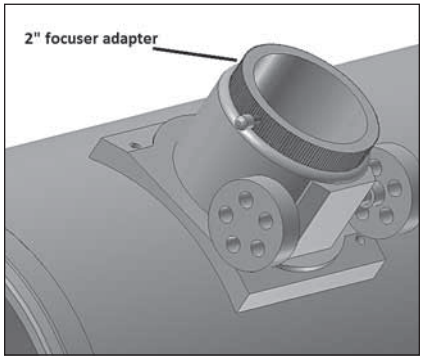

Figure 9. Remove the 2" focuser adapter and thread adapter #1 to get T-threads.

2.2. Tips to Improve the Telescope's Back-Focus

2.2.1. Using a Low Profile Adapter Ring

The included set of ring adapters, allows using the NewtVCDI with different telescopes, and configurations. Two low profile adapters are supplied (#1 and #3 in Figure 1).

Remove the telescope 2" focuser adapter from the telescope's focuser (Figures 8 and 9). Replace it by (#1) the supplied T-threads female to filter male threads. If the telescope already has T-threads male adapter use (#3) the T-threads female to filter threads adapter. Usually these T-threads adapters have a lower profile than the 1.25-in, so they are preferred to the standard 1.25-in. eyepiece adapter where the eyepiece is inserted.

2.1.2. Moving the Primary Mirror Up

If a few extra millimeters are still required to reach the necessary back-focus, a suitable option might be to move the primary mirror towards the secondary mirror. This is done by tightening the primary mirror collimation thumbscrews. The primary mirror can still be collimated but the mirror is moved up (Figure 10).

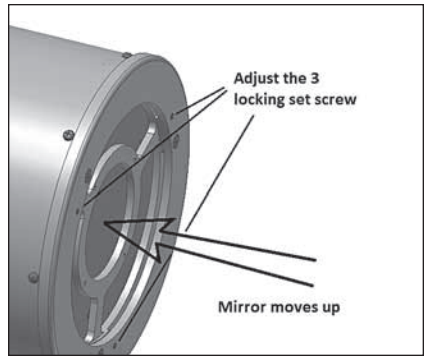

Figure 10. Moving the mirror up, increases back-focus.

3. Field-of-View (FOV)

Figure 11 shows the POVs with a 1000mm f/5 reflector such as the Orion SkyView Pro 8.

Using a Barlow lens as shown previously (Figure 5) will increase magnification. This is especially important for planetary imaging of Jupiter, Saturn, Mars and Venus.

Using the barlow lens as shown in Figure 6 will *NOT* affect the field of view as seen by the NewtVCDI eyepiece.

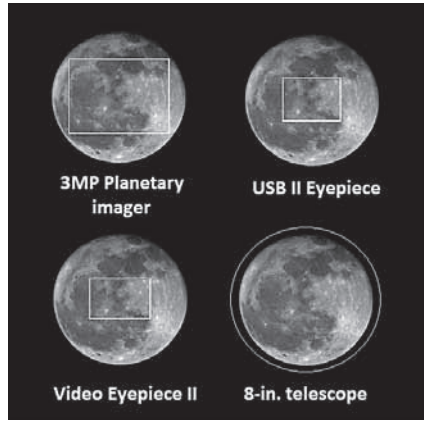

Figure 11. Field of view with different cameras thru the Orion SkyView Pro 8 telescope.

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.

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

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