

Telephotography with Digital Compact Cameras/Camcorders (Eyepiece Projection)

The nature of image capture with digital cameras allows many Opticron telescopes to be converted into long focal length telephoto lenses for wildlife photography.

There are however limitations to this conversion as viewing eyepieces of generally 20x to 60x magnification are not specifically designed for taking photographs with digital cameras. As a result it is often not possible for a viewing eyepiece to project a large enough dia. path of light into the lens of the camera and onto the Charged Coupled Device CCD within. This results in a partial image being created in the camera and a condition known as vignetting or circular image within the available rectangular image frame. This vignetting can be 'cropped out' of the final image using Image or Photo software but the final image obtained is still equivalent to using a narrow field eyepiece.

A common way to 'eliminate' this problem is to reduce the effective aperture of the camera lens by using the optical zoom function. This however has its own problems, as the final magnification using a 20x eyepiece will increase by a factor of the optical zoom function. E.g. 20x eyepiece plus 3x optical zoom = 60x magnification.

Therefore if you are thinking about using your telescope to take digital photographs and want to:
a. minimise vignetting [circular image within the available rectangular image frame] b. be able to take photographs at magnifications of less than 60x - choose an eyepiece around 20x magnification or less.

Tips for Taking Pictures

- Focusing for different distances is performed by the focus wheel or knob on the telescope
- Remember to set the flash function to OFF
- You may find setting the camera to macro mode will improve the final image
- If the camera has a remote control you may find this useful in reducing system shake

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**40849 Universal Digital Camera Adapter
Instruction Guide**

Opticron Universal Digital Camera Adapter [UDCA]

The Universal Digital Camera Adapter is designed to allow you to take high magnification photographs using Opticron telescopes and eyepieces in conjunction with most digital compact cameras and some digital camcorders using eyepiece projection.

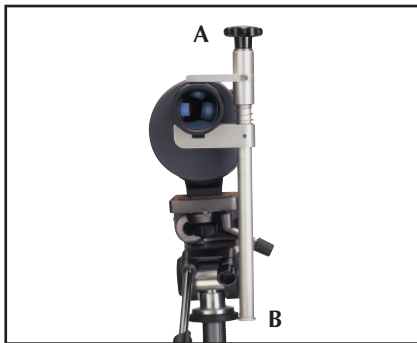
Many digital compact cameras do not have screw threads on the lens assemblies to allow for direct coupling, so the UDCA is designed as a three-way adjustable balance plate that fixes directly to the telescope eyepiece. The camera is fixed onto the Adapter and can be adjusted in three planes to enable correct positioning with respect to the eyepiece.

Instructions for Use

Before connecting the Adapter, set up your telescope and eyepiece on a tripod as you would for viewing - focusing on an object in the normal way until the image being viewed comes into sharp focus.

Choosing an Eyepiece

Many eyepieces will work but recommended lenses are: 40812, 40810 and 40929 as these give the largest exit pupil diameters and will project more light onto the camera lens. Some zoom eyepieces are not recommended as the UDCA is connected directly to the eyepiece.



[Fig. 1] Jaw Clamp Assembly

Fixing the Jaw Clamp Assembly onto the Eyepiece [Fig. 1]

- Unscrew Jaw Clamp Assembly to a distance greater than the diameter of the eyepiece.

Place the Jaw over the eyepiece and tighten using knob [A].

- Remove Stop Plate [B].



[Fig. 2] Fixing the Balance Plate Assembly

Fixing the Balance Plate Assembly [Fig. 2]

- Using one of the three available holes, slide the Balance Plate Assembly into the vertical pole with the grooved channel facing up.

[The hole nearest the tightening screw [C] is recommended for straight-through viewing telescopes.]

- Tighten the Balance Plate Assembly using knob [C] in a convenient position for fixing the camera.

- Re-attach Stop Plate [B].

Height Adjusting Post [D] [Fig. 3]

This screws onto 1/4inch thread equipment and raises the height of small cameras enough to achieve vertical alignment with the eyepiece. Recommended for use with cameras where the distance from the base of the camera to the centre of the lens is less than: 28mm - HR eyepieces 32mm - HR2 & HDF eyepieces.



[Fig. 3] Fixing and Aligning the Camera

Fixing the Camera onto the Balance Plate Assembly [Fig. 3]

- Screw the camera / camera + height adjustment post onto the Balance Plate via the sliding 1/4 inch thread.

Tighten, leaving just enough play to allow you to slide the camera along the channel later on.

Aligning the Camera to the Eyepiece [Fig. 3]

To take photographs the camera and eyepiece need to be aligned in three planes: horizontal [X], vertical [Y] and left to right [Z]. Optimum alignment position will be different for each camera and eyepiece combination used. To obtain the optimum position, the camera and Balance Plate Assembly must be moved in three planes and can take a little practice.

Important

Before you begin aligning the camera turn it on making sure the lens is fully extended¹ and the LCD Monitor is on. Doing this will help you make the alignment by viewing the LCD Monitor and avoid extending the lens into the eyepiece which may cause damage to both the camera and the eyepiece lens.

¹*The ability to obtain full frame images will be dependant on the objective lens diameter of the Telescope, the Eyepiece being used and the diameter of the camera lens. Some camera lenses will extend or retract when the optical zoom is increased. Make sure the lens is fully extended even if this means the zoom function is at its lowest value. The zoom function can then be adjusted safely after the camera is aligned correctly.*

- To correctly position the camera move it in three dimensions as illustrated.

As you move the camera into position the LCD monitor will begin to show a single rounded picture of the image you originally set your scope and eyepiece to. Once this single rounded picture is obtained you can adjust the zoom function to eliminate any vignetting and make any fine focus adjustments using the focus on the telescope.