

## Telephotography with digital compact cameras/camcorders (Eyepiece projection)

The nature of image capture with digital cameras allows Opticron telescopes to be used as long focal length telephoto lenses for wildlife photography. There are some limitations to this conversion however as viewing eyepieces are not specifically designed for taking photographs with digital cameras. As a result it is often difficult for a viewing eyepiece to project a large enough dia. path of light into the camera lens and onto the 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. Vignetting can be 'cropped out' of the final image using photo editing software but the final image is equivalent to using a narrow field eyepiece.

To get the best results:

1. Choose a camera with a small lens diameter. The smaller the lens diameter the more of its' surface area will be covered by light exiting from the eyepiece. Commonly camera lenses of diameter less than 20mm give best results and camera lenses over 30mm in diameter will require at least 3x optical zoom to attain a 'full frame' image.
2. Use the optical zoom function on the camera/camcorder to effectively reduce the aperture of the lens to 'match up' with light exiting from the eyepiece. Remember the higher the optical zoom setting, the higher the magnification of the final image. E.g. 20x eyepiece plus 3x optical zoom = 60x\* magnification \*assuming 1x setting = 1x magnification.

**Note.** In addition to eyepiece magnification and camera lens diameter, variables such as eyepiece eyerelief and F.O.V together with individual camera zoom lens mechanisms all play an important role in achieving the best overall 'set-up' for this type of telephotography. There is therefore no substitute for individual testing.

### 40929 Opticron digital telephotography lens [DTL]

This eyepiece is designed specifically to maximise the diameter of the path of light exiting the telescope [EPD] and being projected onto the lens of the digital compact camera/camcorder. As such it allows full frame photographs to be taken on more types of camera when used at their lowest magnification setting. The eyepiece screws directly into HR80, H66, HR60MT, GS, ES, Imagic, Classic IF-2 MT, IS and MM2 models.

Model	Magnification	Model	Magnification
HR80	14x	CLASSIC IF-2 75*	9.5x
HR66/60	10.5x	CLASSIC IF-2 60*	8x
ES100	16.25x	IS60*	9x
GS815/ES80/IM80*	12.5x	IS50*	7x
GS665/IM65*	9.5x	MM2 52*	6.9x

\* Due to the large aperture of the DTL eyepiece, the image projected from it with some of the smaller prism scopes is rectangular and not circular as with normal viewing eyepieces. This condition does not affect the overall quality of the image for telephotography purposes.

The 40929 Digital telephotography lens [DTL] is a metric threaded lens eyepiece and cannot be fitted to the following Opticron models: HR60/80 pre 1998, Classic IF, Classic IFMKII, Piccolo 60.



## 40849 Universal Digital Camera Adapter Instruction Guide

PO Box 370 • Unit 21 • Titan Court • Laporte Way • Luton • Bedfordshire • LU4 8YR • UK  
Telephone: 01582 726522 • Facsimile: 01582 723559 • E-mail: sales@opticron.co.uk

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 UDCA and can be adjusted in three planes to enable correct positioning with respect to the eyepiece.

#### Connection criteria

**Maximum camera size:** distance from front of lens to centre of tripod adapter socket no greater than 140mm. Distance from centre of lens to base of camera no greater than 150mm.

**Eyepiece:** eyepiece diameter must be less than or equal to 56mm and have a fixed/non rotating tube length of 15mm or more.

### 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

As a general rule, the following eyepieces provide the best overall images with a wide range of different compact digital cameras. To help they have been graded according to particular requirement.

1. Overall image quality: **HDF 40810** or **HR 40812**
2. Flexibility across the widest range of different magnifications: **HDF 40862 zoom**
3. Taking pictures at lower magnifications: **40929 DTL**

#### Fixing the jaw clamp assembly onto the eyepiece [Fig. 1]

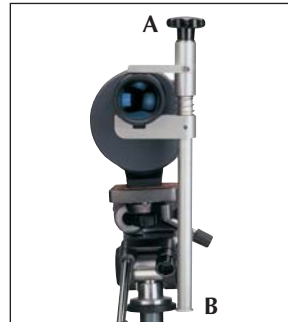
- Unscrew jaw clamp assembly to a distance greater than the diameter of the eyepiece.  
Place the jaw over the eyepiece and tighten using knob [A].
- Remove stop plate [B].

#### 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]

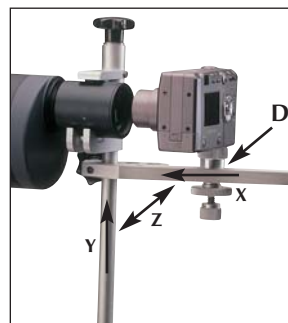
This screws onto 1/4inch thread equipment and raises the height of small cameras enough to achieve vertical alignment with the eyepiece. Recommended for use with cameras where the distance from the base of the camera to the centre of the lens is less than: 28mm - HR eyepieces 32mm - HR2 & HDF eyepieces.



[Fig. 1] Jaw clamp assembly



[Fig. 2] Fixing the balance plate assembly



[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 locate 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 extended<sup>1</sup> 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.*

*<sup>1</sup>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.

#### Optional accessory vertical lock ring

The vertical lock ring permits you to 'fix' the position of the balance plate assembly at any point along the tube of the jaw clamp assembly. This in turn allows you to loosen the tightening screw [C] and swing the camera + balance plate away from the eyepiece in order to view with the naked eye. You can then swing the camera back into position ready for filming or taking photographs.

#### How to use

1. Fix the camera into position as per **Instructions for use.**
2. Remove stop plate [B] from jaw clamp assembly and slide the vertical lock ring into position at point of contact with the underside of balance plate assembly and tighten.
3. Re-attach stop plate [B].

#### Important

*When using the UDCA + vertical lock ring with 45 degree angled telescopes, make sure the camera is fixed firmly to the balance plate assembly before 'swinging.'*

#### 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