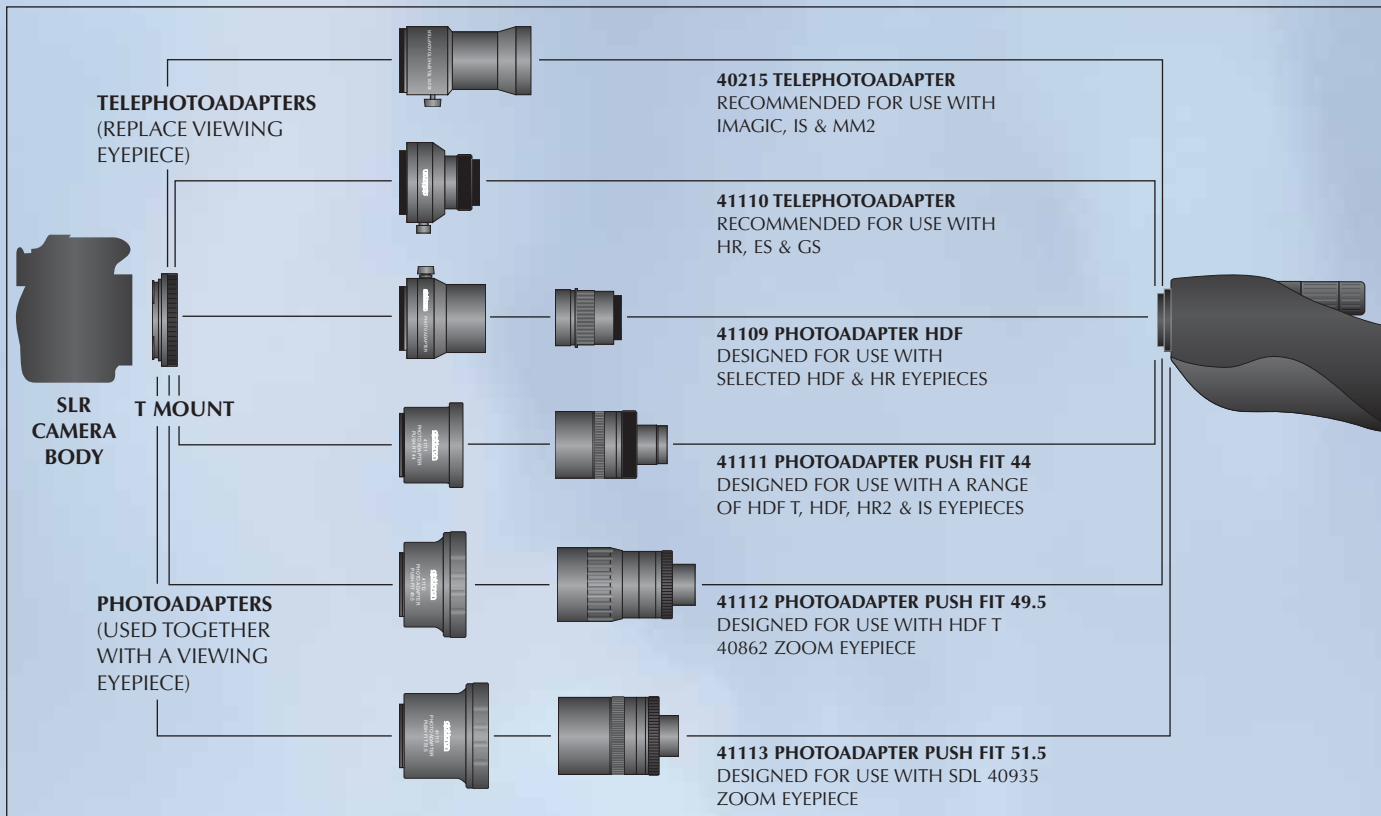


TELEPHOTOGRAPHY WITH OPTICRON TELESCOPES

Telephotography (taking high magnification photographs) is now easier than ever to enjoy using Opticron telescopes in conjunction with either SLR cameras (digital or film), or digital compact cameras and camcorders. In addition to wildlife observation, images can be taken, edited, printed and stored with relative ease, enabling the creation of a unique personal library to be shared in print or via a PC. The two main options open to the prospective telephotographer are to **a.** combine a telescope with an SLR or D-SLR camera **b.** use a telescope together with a compact digital camera or camcorder.

Telephotography with SLR and D-SLR Cameras

In this system the camera lens is substituted for the telescope and coupled directly to the SLR camera body using either a telephotoadapter or an eyepiece+photoadapter combination. T mounts, available for nearly all makes of SLR cameras are also needed to connect the scope assembly to the camera body. The chart below shows the current range of telephotoadapters and photoadapters available to enable you to convert your Opticron telescope into a long focal length telephoto lens.



40215 TELEPHOTOADAPTER
Equivalent focal lengths⁽¹⁾

IMAGIC 65 780mm/f.12	IS 50 585mm/f.11.7 ⁽²⁾
IMAGIC 80 985mm/f.12.3	IS 60 700mm/f.11.7 ⁽²⁾
MM2 52 530mm/f.10	IS 70 780mm/f.11.1 ⁽²⁾

⁽²⁾ Optional 40927S close focus adapter

41110 TELEPHOTOADAPTER
Equivalent focal lengths⁽¹⁾

HR 66 1000mm/f.15	ES 100 1500mm/f.15
HR 80 1350mm/f.16.8	GS 665 900mm/f.13.5
ES 80 1150mm/f.14.4	GS 815 1150mm/f.14.1

41109 PHOTOADAPTER HDF
Equivalent focal lengths with HR, ES & GS scopes fitted with either HDF 40810(F) or HR 40812 eyepieces and using a 35mm SLR camera⁽¹⁾

HR66 1000mm/f.15	ES100 1500mm/f.15
HR 80 1350mm/f.16.8	GS 665 900mm/f.13.5
ES 80 1150mm/f.14.4	GS 815 1150mm/f.14.1

41111 PHOTOADAPTER PUSH FIT 44
Equivalent focal lengths with HR, ES & GS scopes fitted with either HDF T 40810 eyepiece or HR2 40933 eyepiece at lowest magnification setting and using a 35mm SLR camera⁽¹⁾

HR 66 1000mm/f.15	ES 100 1500mm/f.15
HR 80 1350mm/f.16.8	GS 665 900mm/f.13.5
ES 80 1150mm/f.14.4	GS 815 1150mm/f.14.1

Fitting smaller dia. eyepieces
The 41111 Photoadapter push fit 44 can be used with smaller dia. eyepieces by replacing the inner sleeve supplied with one of the following reducer sleeves;

- 41117 reducer 44~40 enabling connection to HR2 40930, 40931 & IS 40916S, 40918S eyepieces.
- 41118 reducer 44~37 enabling connection to fold down rubber eyecup versions of HDF eyepieces 40810 and 40809.

Using smaller dia. HR (MK1) eyepieces
For customers wishing to use HR 40812, 40813 and 40815 eyepieces we offer the 41111 Photoadapter push fit 44 short with 41119 reducer 44~33. Please email or phone for further information.

41112 PHOTOADAPTER PUSH FIT 49.5
Equivalent focal lengths with HR, ES & GS scopes fitted with HDF T 40862 zoom eyepiece and using a 35mm SLR camera⁽¹⁾

HR66 900mm/f.13.7	ES100 1350mm/f.13.5
HR 80 1200mm/f.15	GS 665 800mm/f.12
ES 80 1000mm/f.12.5	GS 815 1000mm/f.12.3

41113 PHOTOADAPTER PUSH FIT 51.5
Equivalent focal lengths with HR, ES & GS scopes fitted with SDL 40935 zoom eyepiece and using a 35mm SLR camera⁽¹⁾

HR 66 900mm/f.13.7	ES 100 1350mm/f.13.5
HR 80 1200mm/f.15	GS 665 800mm/f.12
ES 80 1000mm/f.12.5	GS 815 1000mm/f.12.3

T MOUNTS
Needed to connect telephoto & photoadapters to SLR camera bodies

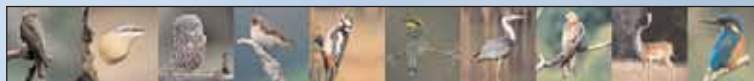
40601 Olympus OM 42mm screw
40602 Pentax / Praktica - 42mm screw
40603 Pentax K - bayonet fitting
40604 Minolta MD - manual focus
40605 Minolta AF / Sony α - auto focus
40606 Canon FD - manual focus
40607 Canon EOS - auto focus
40608 Nikon

Notes. Focusing is facilitated on the telescope. Camera may need to be operated in 'MANUAL' mode with shutter locks disengaged where necessary.

The high magnification to aperture ratios result in slower shutter speeds compared with conventional telephoto lenses so ISO 400+ settings are suggested when using D-SLRs. For 35mm SLRs 400/800 ASA film is recommended.

If possible use a cable release or remote control to reduce camera shake when operating the shutter.

⁽¹⁾ This is an approximate figure based on 35mm SLR cameras. D-SLR cameras use different size image sensors compared to 35mm and so an equivalent conversion figure must be calculated separately.



Telephotography with Digital Compact Cameras and 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 application however as viewing eyepieces are not 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 resulting image will be equivalent to using a very narrow field eyepiece.



Samsung NV3 camera kit fitted to an ES 80 GA ED + 40810 HDF T 23xWW eyepiece using 50065 DCC Adapter + 50067 insert.

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 you to use the optical zoom to attain anything close to 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 on camera = 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.

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: **SDL 40935 zoom or HDF 40862 zoom**
3. Taking pictures at lower magnifications: **HDF 40937 or DTL 40929**

Taking pictures at lower magnifications: HDF 40937 or DTL 40929

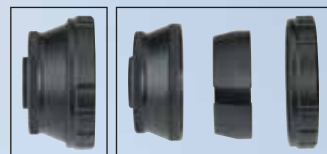
These eyepieces are designed to maximise the diameter of the path of light exiting the telescope and being projected into the camera lens. As such they allow full frame photographs to be taken on more types of cameras at their lowest zoom setting. The eyepieces screw directly into HR, GS and ES bodies.

MODEL	40937	40929
HR 66/60	16x	10.5x
HR 80	22x	14x
GS 665	15x	9.5x
GS 815	19x	12.5x
ES 80	19x	12.5x
ES 100	25x	16.25x

Digital Compact Camera Adapters

(50065 DCC adapter & 50064 SDL DCC adapter)

The DCC adapter is designed to provide a secure connection between selected Opticron eyepieces and digital compact cameras that feature screw threads normally associated with fitting teleconverters or lens hoods.



Each DCC adapter is an aluminium 2 piece locking ring fitted with a flexible delrin insert or set of inserts that pushes over and locks down onto the eyepiece. Connection to any given camera is via a 28mm external thread, a suitable tube for which should be sourced separately.

40849 Universal Digital Camera Adapter

The Universal Digital Camera Adapter is designed to allow you 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 housing 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 on three planes to enable correct positioning with respect to the eyepiece.

The vertical position of the balance plate can be 'fixed' using the Vertical Locking Ring (VLR) accessory (not illustrated). This enables the camera + balance plate to be swung in and out of position allowing you to alternate between taking pictures and viewing through the eyepiece in the normal way.



Note. Mounting the UDCA requires an eyepiece dia. less than or equal to 56mm and fixed (non rotating) eyepiece tube length of 15mm.

For more information on the 40849 UDCA, DCC adapters and current camera kits please contact us by telephone or visit www.opticron.co.uk and look for TELEPHOTOGRAPHY.