DIGISCOPING
An overview of the common camera adaptations and necessary adapters for afocal photography and eyepiece projection with spotting scopes and telescopes

EXAMPLE
AFOCAL PHOTOGRAPHY

EXAMPLE
EYEPiece PROJECTION
Adaptation of Cameras (Compakt & System/DSLR) with Front-Filter-Thread using either M43- or SP54-Thread

Compact cameras and system cameras which provide a front-filter thread can be attached firmly and without risk of tilting to eyepieces with M43- or SP54-threads. Cameras with M43-thread can also be attached directly; the M43-extension rings prevents the lenses from colliding.

This kind of photography works better with tele- than wide-angle-lenses. It works better if the camera lens is smaller than the lens of the eyepiece. Wide-angle-eyepieces like Morpheus® or Hyperion® are perfect for afocal projection photography.

Equivalent focal length = Magnification of the eyepiece / Focal length of camera lens

One adjustment spacer ring made of hard plastic for the SP 54 thread is part of each Hyperion DT-ring free of charge. With these spacer rings (each ring has a thickness of only 1 mm), differences in mechanical heights may be adjusted, to be able to adapt the camera front lens as close as possible, without having to use the 11 mm extension ring (# 2958090).

Caution when mounting the camera! Camera-front lenses may be too close to the first lens of the eyepiece only by a tenth of a millimeter. When mounting an eyepiece onto any camera-front-lens, always proceed with the greatest care, possibly using the additional spacer ring. Also make sure that there is not too much weight on the camera lens, to prevent the autofocus-mechanic from damage.

Adaptation of Cameras

- SP 54/M 28 DT-Ring # 2958028
- SP 54/M 37 DT-Ring # 2958037
- DT-Ring SP 54/M 46 # 2958046
- DT-Ring SP 54/M 49 # 2958049
- DT-Ring SP 54/M 52 # 2958052
- DT-Ring SP 54/M 55 # 2958055
- DT-Ring SP 54/M 58 # 2958058
- DT-Ring SP 54/M 62 # 2958062

M 55
M 46
M 37
M 28

- M 43
Hyperion®/Morpheus® M43 Extension # 2954250 to adapt lenses with M43-thread – protects the lenses from touching each other

- SP54 / M 43
Hyperion® 68° / Hyperion® Aspheric eyepiece with fixed focal length, with M43 and SP54-threads

- Hyperion® Zoom M43/SP54 Adapter # 2958066
- Morpheus® M43/SP54 Adapter # 2954251

- Hyperion® Universal Zoom Mark IV, 8-24mm Eyepiece # 2454826
- Morpheus® Eyepiece with M43-thread

AFOCAL PHOTOGRAPHY
The eyepieces of many spotting scopes are equipped with a T-thread instead of the larger M 43-thread. Use the DT-Adapter II to connect the SP54-Rings even with these eyepieces, as described on the previous page.

This kind of photography works better with tele- than wide-angle-lenses. It works better if the camera lens is smaller than the lens of the eyepiece.

Equivalent focal length = \( \frac{\text{Magnification of the spotting scope}}{\text{Focal length of camera lens}} \)

**Adaptation of Cameras (Compakt & System/DSLR) with Front-Filter-Thread using the T-2-Thread**

One adjustment spacer ring made of hard plastic for the SP 54 thread is part of each Hyperion DT-ring free of charge. With these spacer rings (each ring has a thickness of only 1 mm), differences in mechanical heights may be adjusted, to be able to adapt the camera front lens as close as possible, without having to use the 11 mm extension ring (# 2958090).

Caution when mounting the camera! Camera-front lenses may be too close to the first lens of the eyepiece only by a tenth of a millimeter. When mounting an eyepiece onto any camera-front lens, always proceed with the greatest care, possibly using the additional spacer ring. Also make sure that there is not too much weight on the camera lens, to prevent the autofocus-mechanic from damage.

**Tip** If an eyepiece has both M 43- and SP54-threads, you should better use an SP54-adapter, as described on the previous page.

**Eyepiece with T-thread, e.g. included with many Celestron spotting scopes**
Adaptation of Camera Bodies
(System-/DSLR-Cameras) with T-Adapter
using either T- or M43-Thread

Camera bodies can be attached directly to eyepieces which are equipped with a T-thread. But to get an image which is sharp even in the corners, the front of the T-ring should be placed in a distance of 40 mm (full-frame camera), 30 mm (APS-C) or 15 mm (Micro 4/3) to the eyepiece. The equivalent focal length compared to 35 mm is calculated as follows:

\[
f_{\text{equivalent}} = f_{\text{spotting scope}} \times \left( \frac{a}{f_{\text{eyepiece}}} - 1 \right)
\]

Where:
- \( f_{\text{equivalent}} \) is the equivalent focal length,
- \( f_{\text{spotting scope}} \) is the focal length of the spotting scope,
- \( a \) is the distance between sensor and eyepiece incl. 55 mm T-2-flange-back.

E.g. a 40 mm extension gives a distance of 95 mm. \( f_{\text{eyepiece}} \) is the focal length of the eyepiece.

Available T-Rings:

- #2408319 Canon EOS
- #2408302 Pentax K
- #2408330 Micro Four Thirds
- #2408329 Four Thirds
- #2408328 Minolta AF
- #2408327 Sony E/NEX
- #2408326 M42 x 1 (Praktika/Pentax-S)
- #2408301 Olympus
- #2408300 Nikon

Available T-2-extensions:

- T-2 extension 40 mm (T-2 part #25B) #1508153
- T-2 extension 15 mm (T-2 part #25A) #1508154
- T-2 extension 7.5 mm (T-2 part #25C) #1508155

VariLock 29 – variable, 20-29 mm #2956929
VariLock 46 – variable, 29-46 mm #2956946

T-2 Quick Changers

The T-2-Quick Changing System with an optical height of 15 mm consists of a dovetail with male T-2-thread and quick changer ring. The TQC / TCR Heavy duty T-2 Quick Changing System #2456322 has got a Zeiss-compatible lock even for very heavy accessories, while the cheaper T-2 Standard Changer System #2456321 uses a M4-locking screw with a rounded tip.
Adaptation of Solar System Imagers or Video Modules with a T-Adapter

To image the planets through a telescope, you need a video module, which can capture many images in a short time, as well as a telescope with a long focal length. Cameras with small pixels require only a 2x- or 3x-Barlow; for even higher f-ratios, eyepiece projections is a common method. The equivalent focal length is calculated as described on the previous page as:

\[
f_{\text{equivalent}} = f_{\text{telescope}} \times ((a/f_{\text{eyepiece}}) - 1)
\]

The perfect f-ratio depends on the pixel size of the camera. It is calculated as \( N \leq d_{\text{pixel}}/0.28 \). \( N \) is the number of the f-ratio and \( d_{\text{pixel}} \) is the length of the edge of the camera’s pixels.

Use these adapters to attach cameras with a C-Mount-thread directly to camera lenses with Nikon-, Canon- or Pentax-S-bajonet:

- #295825 C-Mount Canon EOS
- #295835 C-Mount Nikon
- #295830 Special C-Adapter for the old Pentax-S (= T-1) thread

Adapting to a Camera Lens:

For eyepieces without thread:

At telescopes, the OPFA gives you the option to use eyepieces with an outer diameter of up to 38 mm for eyepiece projection. The T-ring of the camera can be connected directly to the T-2-thread.