



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 (Kompakt & 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.

$$\text{Equivalent focal length} = \frac{\text{Magnification of the eyepiece}}{\text{Focal length of camera lens}}$$



Adaptation of a DSLR to a Morpheus®-eyepiece



Adaptation of a compact camera with M43-thread to a Morpheus®-eyepiece

- M28**

SP54/M28 DT-Ring
2958028
(requires # 2958090)
- M37**

SP54/M37 DT-Ring
2958037
(requires # 2958090)
- M46**

DT-Ring SP54/M46
2958046
- M49**

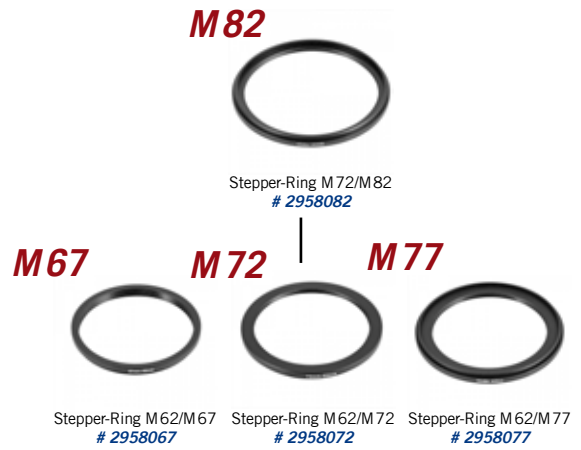
DT-Ring SP54/M49
2958049
- M52**

DT-Ring SP54/M52
2958052
- M55**

DT-Ring SP54/M55
2958055
- M58**

DT-Ring SP54/M58
2958058
- M62**

DT-Ring SP54/M62
2958062



SP 54i/SP 54a Hyperion® Extension Ring, 11mm, with threaded protective flap for the SP54 external thread
2958090

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.



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



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



Hyperion® Universal Zoom Mark IV, 8-24mm Eyepiece # 2454826



Morpheus® Eyepiece with M43-thread



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

The eyepieces of many spotting scopes are equipped with a T-thread instead of the larger M43-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.

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

Adaptation of Cameras (Kompakt & 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.

T-thread



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), 30mm (APS-C) or 15mm (Micro 4/3) to the eyepiece. The equivalent focal length compared to 35mm is calculated as follows:

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

$f_{\text{spotting scope}}$ = Focal length of spotting scope. a = Distance between sensor and eyepiece incl. 55 mm T-2-flange-back. E.g. a 40mm extension gives a distance of 95mm. f_{eyepiece} = Focal length of eyepiece.

Available T-Rings:

#2408319 Canon EOS | #2408302 Pentax-K | #2408330 Micro Four Thirds | #2408329 Four Thirds | #2408328 Minolta AF (for Minolta Maxxum and Minolta/Sony Alpha) | #2408331 Fujifilm X | #2408321 Olympus | #2408300 Nikon | #2408317 Sony E/NEX | #2408301 M42 x 1 (Praktika/Pentax-S) | #2958550 Protective CANON DSLR-T-Ring T-2/M48 and 2" (with / without filter)

Available T-2-extensions

T-2 extension 40mm (T-2 part #25B) #1508153
 T-2 extension 15mm (T-2 part #25A) #1508154
 T-2 extension 7,5mm (T-2 part #25C) #1508155
 VariLock 29 – variable, 20-29mm #2956929
 VariLock 46 – variable, 29-46mm #2956946

Full format



Camera-dependent T-Ring 55 mm flange-back

APS-C



Camera-dependent T-Ring 55 mm flange-back

Micro 4/3



#2408330 MFT-Adapter 55 mm flange-back

Extension: 40 mm



#1508153 40mm extension

Extension: 45 mm



#1508154 15mm extension
 #2456322 Quick Changer 15mm extension
 #1508154 15mm extension

Extension: 30 mm



#1508154 15mm extension
 #1508154 15mm extension

Extension: 30 mm



#1508154 15mm extension
 #2456322 Quick Changer 15mm extension

Extension: 15 mm



#1508154 15mm extension

Extension: 15 mm



#2456322 Quick Changer



Eyepiece with T-thread, e.g. included with many Celestron spotting scopes



Hyperion® / Morpheus® T-Adapter M43/T-2 # 2958080

Morpheus®/Hyperion® Wide-angle eyepiece with M43-thread

T-2 Quick Changers

The T-2-Quick Changing System with an optical height of 15mm 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.



Standard T-2-Quick-Changer



TCR T-2 Hardened Steel Change Ring with Zeiss micro bayonet



TQC Heavy Duty T-2 Quick-Changer

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_{pixel} is the length of the edge of the camera's pixels.

Adapting to a Camera Lens:

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

2958525 C-Mount Canon EOS

2958535 C-Mount Nikon

2958530 Special C-Adapter for the old Pentax-S (= T-1) thread



Effective Focal Lengths of selected **CELESTRON** spotting scopes with a standard T-adapter (55 mm flange back)

With 40 mm spacer tube (up to full frame) e.g. 40 mm extension tube #1508153

	Magnification of the eyepiece	Equivalent focal length with standard T-2 adapter			Extension tube
		Vollformat	APS-C (Crop 1,5)	Micro Four Thirds	
Ultima 65	18x	1360 mm	2040 mm	2720 mm	1x 40 mm
	55x	4853 mm	7279 mm	9705 mm	1x 40 mm
TrailSeeker 65 / Regal 65	16x	1142 mm	1713 mm	2284 mm	1x 40 mm
	48x	4198 mm	6297 mm	8396 mm	1x 40 mm
Ultima / TrailSeeker / Regal 80	20x	1420 mm	2130 mm	2840 mm	1x 40 mm
	60x	5220 mm	7830 mm	10440 mm	1x 40 mm
Ultima 100	22x	1550 mm	2325 mm	3100 mm	1x 40 mm
	66x	5730 mm	8595 mm	11460 mm	1x 40 mm
TrailSeeker / Regal 100	22x	1550 mm	2325 mm	3100 mm	1x 40 mm
	67x	5825 mm	8738 mm	11650 mm	1x 40 mm

With 30 mm spacer tubes (up to APS-C) e.g. 2x #1508154 or 1x #1508154 and T-2 quick-changer system

	Magnification of the eyepiece	Equivalent focal length with standard T-2 adapter			Extension tube
		Vollformat	APS-C (Crop 1,5)	Micro Four Thirds	
Ultima 65	18x	1176 mm	1765 mm	2353 mm	2x 15 mm
	55x	4301 mm	6452 mm	8602 mm	2x 15 mm
TrailSeeker 65 / Regal 65	16x	981 mm	1472 mm	1962 mm	2x 15 mm
	48x	3715 mm	5573 mm	7431 mm	2x 15 mm
Ultima / TrailSeeker / Regal 80	20x	1220 mm	1830 mm	2440 mm	2x 15 mm
	60x	4620 mm	6930 mm	9240 mm	2x 15 mm
Ultima 100	22x	1330 mm	1995 mm	2660 mm	2x 15 mm
	66x	5070 mm	7605 mm	10140 mm	2x 15 mm
TrailSeeker / Regal 100	22x	1330 mm	1995 mm	2660 mm	2x 15 mm
	67x	5155 mm	7733 mm	10310 mm	2x 15 mm

Without spacer tubes (only for smaller chips) Image will be vignetted and distorted when using larger camera sensors

	Magnification of the eyepiece	Equivalent focal length with standard T-2 adapter			Extension tube
		Vollformat	APS-C (Crop 1,5)	Micro Four Thirds	
Ultima 65	18x	625 mm	937 mm	1250 mm	–
	55x	2647 mm	3970 mm	5294 mm	–
TrailSeeker 65 / Regal 65	16x	499 mm	748 mm	997 mm	–
	48x	2268 mm	3402 mm	4536 mm	–
Ultima / TrailSeeker / Regal 80	20x	620 mm	930 mm	1240 mm	–
	60x	2820 mm	4230 mm	5640 mm	–
Ultima 100	22x	670 mm	1005 mm	1340 mm	–
	66x	3090 mm	4635 mm	6180 mm	–
TrailSeeker / Regal 100	22x	670 mm	1005 mm	1340 mm	–
	67x	3145 mm	4718 mm	6290 mm	–