DIGISCOPING SYSTEMS

Digiscoping Systems

What is "Digiscoping"?

Digiscoping is a method of taking photographs through the combination of a spotting scope and a digital camera. By using the spotting scope as a telephoto lens, it is easy to enjoy digital photography at effective focal lengths of over 1,000mm*.

Calculating the Effective Focal Length

Focal Length of Digital Camera x Magnification of Spotting Scope (Eyepiece) = Effective Focal Length*

*35mm film equivalent

Example: The focal length of the digital camera is 114 mm and the magnification of the eyepiece is 30x.

114 (mm) x 30 (x) = 3,420 (mm)

Kowa's Digiscoping System is Compatible with a Large Number of Digital Cameras. The Kowa lineup of adapters includes the "TSN-DA4" universal camera adapter.

The TSN-DA4 is an adapter for cameras without filter threads. The camera is attached to the adapter by utilizing the tripod mount of the camera. The TSN-DA4 allows you to quickly change between photographing and viewing through the scope with the simple slide of a button.

*The TSN-DA1 (TSN-660/600) or TSN-DA10 (TSN-880/770) is necessary to connect the TSN-DA4 to the spotting scope.
*Refer to page 29 for the allowances of the TSN-DA4.

Eyepiece and Adapter Photography Features

Kowa offers a variety of eyepieces and adapters to increase the compatibility of the many types of digital cameras on the market and to match various photography styles.

Zoom Eyepiece

With the use of a zoom eyepiece you have the option of zooming both the camera and the eyepiece.
A digiscoping system using a zoom lens allows for photography at a variety of focal lengths without changing the eyepiece.

Wide Angle Eyepiece

The wide angle eyepiece is an ideal eyepiece for 3-4x zoom compact digital cameras and in many cases vignetting will not occur through the entire zoom range of the camera. The wide angle eyepiece ensures the best picture quality when used with a digiscoping system. (Some cameras vignette.)

Long Eye Relief Eyepiece

The long eye-relief eyepiece is a specialty of Kowa and is ideal for digital cameras with large objective lenses. The long eye-relief eyepiece reduces vignetting more than any other eyepiece when using this type of camera.

Photo & Video Adapter

This adapter has a built-in lens with low magnification and ultra-long eye relief. It is ideal for digiscoping with a high magnification digital camera or video camera. (The use of an eyepiece is not necessary)

What is Vignetting?

The darkening phenomenon that appears around an image is called vignetting. When digiscoping it is important to choose the appropriate adapter and eyepiece to reduce vignetting as much as possible.

Why does "vignetting" occur? How can it be reduced?

Vignetting occurs when the angle of view of the camera is larger than the apparent field of view of the eyepiece.

A wide angle eyepiece is effective in reducing vignetting.

Vignetting occurs when the eye relief of an eyepiece is not sufficient for the camera to capture the full image.

A long eye relief eyepiece is effective in reducing vignetting.

DIGISCOPING SYSTEMS

Digiscoping is Broadening the World of Super-Telephotography.

Super-Telephotography Over 1,000mm

Connecting a digital camera to a spotting scope produces super-telephoto images. Inaccessible wildlife and scenery can be photographed with amazing detail.

Photographing at 1,000mm/F2.8

The use of a compact digital camera in a digiscoping system permits super-telephotography with a very small F-number. (The F-number changes according to the objective lens diameter of the spotting scope.)

Lightweight and Compact

There can be a lot of walking when digiscoping and it is important for the equipment to be as light as possible. A typical digiscoping system is 6 to 11 pounds, including the weight of the tripod. You can enjoy super telephotography with a system that is lighter and more compact than one telephoto SLR lens. This is a very attractive feature for long trips or traveling.

Wide Focal Range with One Camera

The focal length of a digiscoping system can be changed by simply increasing or decreasing the magnification of the eyepiece. Digiscoping can be done at a wide range of focal lengths without changing the digital camera or spotting scope.

Quickly Change from Viewing to Photographing

The Kowa digital camera adapter is secured in place with a single screw, allowing for quick and easy switching between viewing and photographing.

Digiscoping Advice

Prevent Shaking and Image Blur

- Even slight shaking and vibration can affect super-telephoto images. Use a sturdy tripod with an easy to operate head to prevent shaking and image blur.
- Due to the extremely large focal length, the use of a cable shutter release, remote control, or timer is recommended to eliminate shaking and image blur.

Digiscoping Tips

- The liquid crystal display of the camera can be difficult to see when outdoors. The use of a hood will increase visibility and make it easier to confirm the shot.
- The balance of the entire digiscoping system is very important for easy operation. The use of a balance plate or the Kowa "Universal Mount System" is recommended to properly adjust the balance of the system.
- Use the sight on the spotting scope or attach an optical sight to quickly bring an object into view.

Photograph Taken With:
Spotting scope: TSN-884
Eyepiece: TE-17W (30x)
Digital Camera: POWERSHOT S80

POWERSHOT is a registered trademark of Canon Inc.

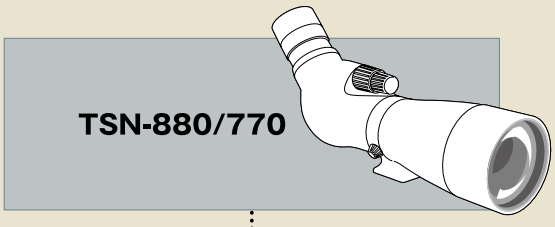
Photograph Taken With:
Spotting Scope: TSN-774
Eyepiece: TE-17W (30x)
Digital Camera: POWERSHOT S80

Environmentally Friendly Photo Session

Be aware of your surroundings when out in the field. Do not trespass on private property or enter sensitive wildlife areas.

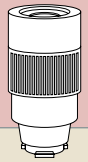
DIGISCOPING SYSTEMS

TSN-880/770 Series Digiscoping System

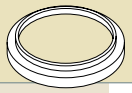


TSN-880/770

Eyepiece
TE-10Z
TE-17W
TE-20H



Conversion Ring
TSN-VA2-CR*1



*1 Refer to page 31.

Digital Camera Adapter
TSN-DA10 ②

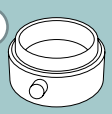
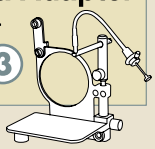


Photo & Video Adapter

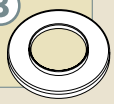
TSN-VA1 ⑥

TSN-VA2 ⑦

Universal Camera Adapter
TSN-DA4 ③

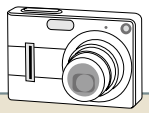


Adapter Ring
TSN-AR
*Select an adapter ring that corresponds to the filter thread size of the camera. ⑧



Adapter Ring
TSN-AR
*Select an adapter ring that corresponds to the filter thread size of the camera. ⑧

Compact Digital Camera
3-4x zoom



Compact Digital Camera
3-4x zoom
with accessory mounting screw

High-Magnification Zoom Digital Camera
7-12x zoom

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① **Digital Camera Adapter**
TSN-DA1

For TSN-660/600 Series

② **Digital Camera Adapter**
TSN-DA10

For TSN-880/770 Series

③ **Universal Camera Adapter**
TSN-DA4

④ **Short Extension Ring**
TSN-EXR

Extends the length of the TSN-DA1/DA10 outer tube.

⑤ **Zoom Extension Ring**
TSN-ARZ7

*Necessary for TSE-Z7 and TE-9Z zoom eyepieces.

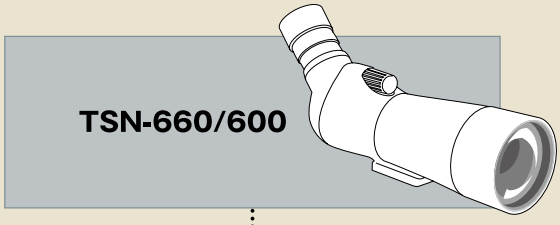
⑥ **Photo & Video Adapter**
TSN-VA1

⑦ **Photo & Video Adapter**
TSN-VA2

⑧ **Adapter Rings**
TSN-AR28/30/305/37/43/46/52/55/58/62/72

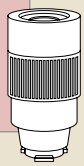
DIGISCOPING SYSTEMS

TSN-660/600 Series Digiscoping System



Eyepiece

TE-21WD
TE-9WD
TE-14WD *2
TE-17HD
TE-6Z
TE-9Z *3



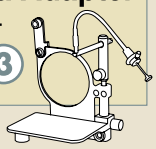
Digital Camera Adapter
TSN-DA1

Photo & Video Adapter

TSN-VA1 ⑥

TSN-VA2 ⑦

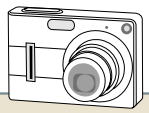
Universal Camera Adapter
TSN-DA4 ③



Adapter Ring
TSN-AR
*Select an adapter ring that corresponds to the filter thread size of the camera. ⑧

Adapter Ring
TSN-AR
*Select an adapter ring that corresponds to the filter thread size of the camera. ⑧

Compact Digital Camera
3-4x zoom



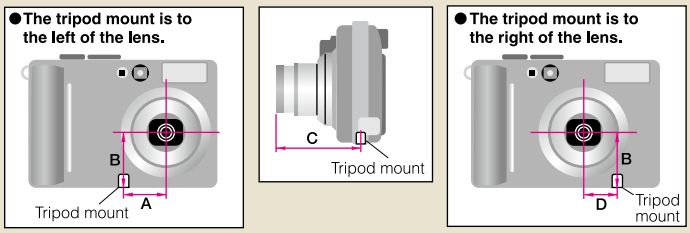
Compact Digital Camera
3-4x zoom
with accessory mounting screw

High-Magnification Zoom Digital Camera
7-12x zoom

*2 When using eyepieces TE-14WD/17HD/6Z, the TSN-EXR is necessary. It is not necessary for the TSN-DA4.
*3 The TSN-ARZ7 is necessary for the TE-9Z/TSE-Z7.

[TSN-DA4 Compatibility]

The TSN-DA4 universal camera adapter can be used with cameras that meet the following criteria.



Viewing Position

Photography

●For cameras with the tripod mount to the left of the lens (facing the lens).
A: The distance between the center of the tripod mount and the center of the lens.
B: The distance between the center of the lens and the base of the camera.
C: The distance between the center of the tripod mount and the front of the lens.

●For cameras with the tripod mount to the right of the lens (facing the lens).
D: The distance between the center of the tripod mount and the center of the lens.
B and C are the same as above.

A	B	C
0~44mm	21~40mm	~56mm*

D	B	C
0~28mm	21~40mm	~56mm*

*When the power is ON and the lens is fully extended.

●The TSN-DA4 allows a compact digital camera without filter threads to be used for digiscoping.

●Quickly change between photographing and viewing through the scope.

●The camera is attached to the adapter with the camera's tripod mount. Locking mechanisms ensure safe operation.

Super-Telephotography with a Single Lens Reflex Camera

Attach a 35mm film single lens reflex camera or digital single lens reflex camera to a Kowa spotting scope for super-telephotography.(Except TS-500 Series)

① Photo Attachment for Digital SLR

TSN-PZ

This zoom photo attachment for digital SLR cameras* offers a focal length of 680-1,000 mm with brighter and higher-quality photographs than ever before.

*This attachment is for cameras with an APS-C or Four Thirds format. The 35mm equivalent focal length is approximately 1.5 times the focal length for an APS-C format digital camera and approximately 2 times for a Four Thirds format camera.
*The focal distance is 1,000 mm when a full-size digital single lens reflex camera is used.

② Photo Attachment

TSN-PA2D

This photo attachment has a fixed focal length of 950 mm and can be used for both film and digital SLR cameras.

③ Photo Attachment for Digital SLR

TSN-PA6(for TSN-880/770 Series)

This fixed focal length photo attachment for digital SLR cameras offer a focal length of 600mm with brighter and higher-quality photographs than other photo attachment.

*This attachment is for cameras with an APS-C or Four Thirds format. The 35mm equivalent focal length is approximately 1.5 times the focal length for an APS-C format digital camera and approximately 2 times for a Four Thirds format camera.
*Vignetting occurs when attach this photo attachment to digital cameras with a larger size CCD/CMOS than APS-C format.

④ Photo Attachment

TSN-PA2
(for TSN-660/600 Series)

This photo attachment has a fixed focal length of 800 mm and can be used for both film and digital SLR cameras.

⑤ Camera Mount

TSN-PS1
(for TSN-880/770 Series straight type only)

This camera mount system is used to secure a photo-attachment/eyepiece to minimize shaking and vibration, when connecting a Kowa spotting scope TSN-882/884/772/774 to a single lens reflex camera or a compact digital camera for photography.

⑥ Camera Mounts

TSN-CM2 (TSPK)

CE [Canon EOS]
N [Nikon]
K [Pentax]
MA [Sony (Minolta/ Konica Minolta)α]
FT [Four Thirds]

Select a camera mount that corresponds to the camera make and model.

⑦ Conversion Ring

TSN-CR3

TSN-CR3 is necessary to attach the TSN-PZ/PA2D to TSN-660/600 Series.

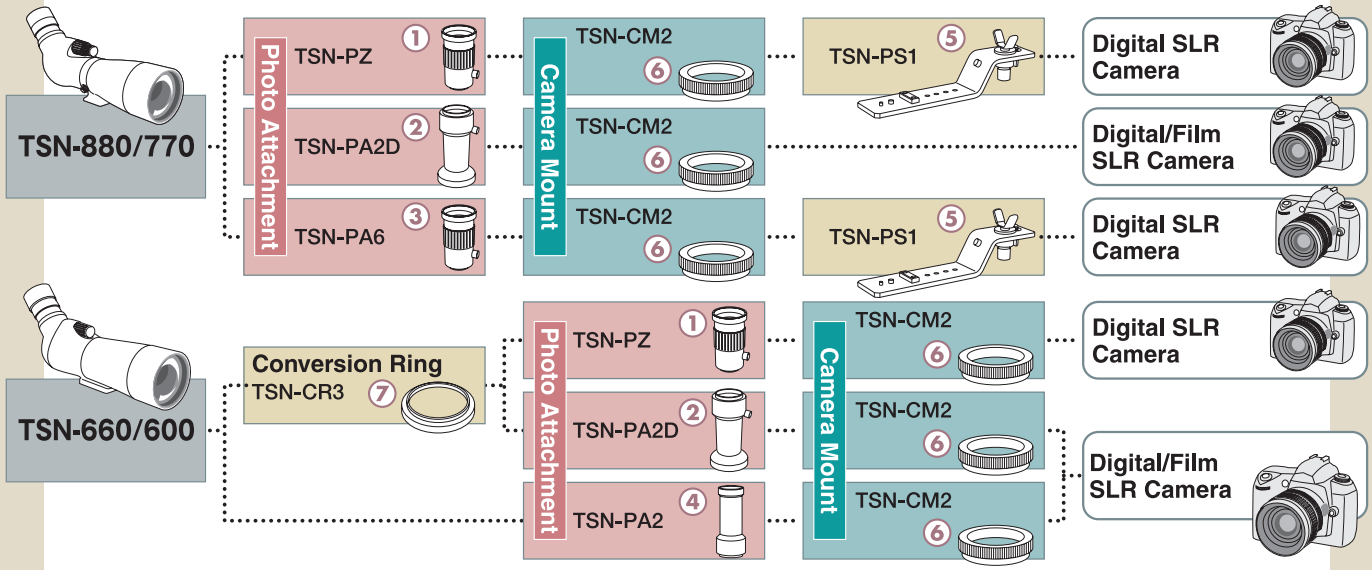
*When using the photo attachment the auto focus and aperture functions of the camera cannot be used. Use the focus knob of the spotting scope to adjust the focus.

Photo Attachment Specifications

Model	Compatible Scopes	Focal Length	F-Number	Minimum Focusing Distance	Length	Weight
TSN-PZ	TSN-880	680~1000mm	7.7~11.4	5m (16.4feet)	105mm (4.1in)	350g (12.3oz)
	TSN-770	680~1000mm	8.8~13.0	5m (16.4feet)	105mm (4.1in)	350g (12.3oz)
	TSN-660	560~840mm	8.5~12.7	6m (19.7feet)	105mm (4.1in)	350g (12.3oz)
	TSN-600	560~840mm	9.3~14.0	6m (19.7feet)	105mm (4.1in)	350g (12.3oz)
TSN-PA6	TSN-880	600mm	6.8	5m (16.4feet)	110mm (4.3in)	285g (10.0oz)
	TSN-770	600mm	7.8	5m (16.4feet)	110mm (4.3in)	285g (10.0oz)
TSN-PA2D	TSN-880	950mm	10.8	5m (16.4feet)	117mm (4.6in)	230g (8.1oz)
	TSN-770	950mm	12.3	5m (16.4feet)	117mm (4.6in)	230g (8.1oz)
	TSN-660	800mm	12.1	6m (19.7feet)	117mm (4.6in)	230g (8.1oz)
	TSN-600	800mm	13.3	6m (19.7feet)	117mm (4.6in)	230g (8.1oz)
TSN-PA2	TSN-660	800mm	12.1	6m (19.7feet)	115mm (4.5in)	210g (7.4oz)
	TSN-600	800mm	13.3	6m (19.7feet)	115mm (4.5in)	210g (7.4oz)

*When using a digital SLR camera, the focal length of the system will change according to the CCD/CMOS size. *The TSN-PA2 can be used with the TSN-1,2,3,4 and TS-610 Series.

Single Lens Reflex (SLR) Camera System



Super-Telephoto Video

Film super-telephoto video by connecting a video camera to a spotting scope. (Except TS-500 Series)

① Photo & Video Adapter TSN-VA1

This adapter is ideal for compact video cameras with filter thread sizes of 43 mm or less.

② Photo & Video Adapter TSN-VA2

This adapter is compatible with professional or large video cameras allowing for high quality images with less distortion.

③ Universal Mount System TSN-DA3

(For straight and angled spotting scopes)

This accessory secures and stabilizes the system

*Cannot be used with the TSN-881/883/771/773

④ Universal Mount System TSN-DA3 st

(for straight spotting scopes only)

This is a compact version of the TSN-DA3 for easier carrying and storage.

*Cannot be used with angled spotting scopes.

⑤ Universal Shoe TSN-DA3-40

This is used to increase the height of the spotting scope when using a video camera with a high lens position. Height: 40 mm

⑥ Adapter Rings TSN-AR28/30/305/37/43/46/52/55/58/62/72(11 sizes)

Select an adapter ring that corresponds to the filter thread size of the camera.

⑦ Conversion Ring TSN-VA2-CR

This is used to mount the photo & video adapter to the TSN-880/770 Series.

TSN-DA3/TSN-DA3st Mounting a Digital Camera/Video Camera

The TSN-DA3/TSN-DA3st can be used with cameras that meet the following criteria.

[TSN-DA3] *Cannot be used with the TSN-881/883/771/773.

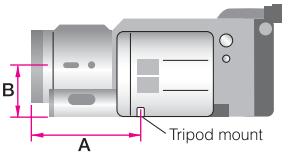
Spotting Scope Series			A	B	C
TSN-882／884 TSN-772／774	Straight Type	TSN-VA1	to 160mm	to 85mm (to 125mm) *2	55mm (right and left)
		TSN-VA2	to 140mm		
		TSN-PA2D	to 115mm		
		TSN-PZ	to 130mm		
TSN-662／664	Straight Type	TSN-VA1	to 155mm	to 75mm (to 115mm) *2	55mm (right and left)
		TSN-VA2	to 135mm		
		TSN-PA2	to 110mm		
TSN-602／604	Straight Type	TSN-VA1	to 200mm	to 70mm (to 110mm) *2	55mm (right and left)
		TSN-VA2	to 180mm		
		TSN-PA2	to 155mm		
TSN-661／663	Angled Type	TSN-VA1	to 160mm *1	to 100mm *1	55mm (right and left)
			to 55mm *1	to 205mm *1	
		TSN-VA2	to 140mm *1	to 100mm *1	
			to 35mm *1	to 205mm *1	
		TSN-PA2	to 115mm *1	to 100mm *1	
			to 10mm *1	to 205mm *1	
TSN-601／603	Angled Type	TSN-VA1	to 190mm *1	to 120mm *1	55mm (right and left)
			to 85mm *1	to 225mm *1	
		TSN-VA2	to 170mm *1	to 120mm *1	
			to 65mm *1	to 225mm *1	
		TSN-PA2	to 145mm *1	to 120mm *1	
			to 40mm *1	to 225mm *1	

*1 As the value for A increases, the value for B decreases. The maximum values for A and B are shown. *2 The values in ( ) apply when the TSN-DA3-40(Sold separately) is used.

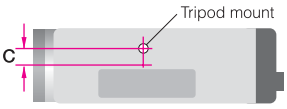
[TSN-DA3 st]

Spotting Scope Series			A	B	C
TSN-882／884 TSN-772／774	Straight Type	TSN-VA1	to 170mm	to 85mm (to 125mm) *2	55mm (right and left)
		TSN-VA2	to 150mm		
		TSN-PA2D	to 125mm		
		TSN-PZ	to 140mm		
TSN-662／664	Straight Type	TSN-VA1	to 165mm	to 73mm (to 113mm) *2	55mm (right and left)
		TSN-VA2	to 145mm		
		TSN-PA2	to 120mm		
TSN-602／604	Straight Type	TSN-VA1	to 210mm	to 68mm (to 108mm) *2	55mm (right and left)
		TSN-VA2	to 190mm		
		TSN-PA2	to 165mm		

●Camera Side View



●Bottom of Camera



A: The distance between the center of the tripod mount and the front of the lens.
B: The distance between the center of the lens and the base of the camera.
C: The distance between the center of the tripod mount and the center of the lens.

Video Camera System