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M-DA\_109250BT-4



## Digital Camera Adapter for Spotting Scopes

**TSN-DA10**

**TSN-DA1**

**TSN-DA4**

### Instruction Manual

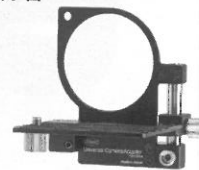
取扱説明書



TSN-DA10



TSN-DA1



TSN-DA4

Thank you for your purchase of Kowa's digital camera adapter. Before using this product we recommend that you read this instruction manual thoroughly in order to ensure proper use and setup.

この度はKOWAデジタルカメラアダプターをお買い上げいただきまして、誠にありがとうございました。ご使用になる前に必ずこの取扱説明書をお読みいただき、正しくお使いください。

## Digital Camera Adapter Accessories (Sold Separately)

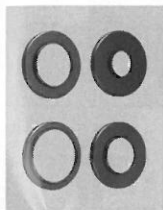
### ●TSN-DA1-AR Series Adapter Rings (10 Sizes)

Available in 28mm /30mm /30.5mm /37mm /43mm /46mm /52mm /55mm /58mm /72mm

\* An adapter ring is necessary to connect the TSN-DA1/DA10 to the digital camera.

The size of the adapter ring must match the filter thread size of the digital camera. Some digital cameras may require the use of an additional lens adapter available from the camera manufacturer and/or the use of step-up or step-down rings.

\* The TSN-DA4 does not require the use of adapter rings.



### ●TSN-DA1-EXR Extension Ring

The TSN-DA1-EXR is required when using the TE-14WD, TE-14WE, TE-17HD, TE-17HE, or TE-6Z eyepieces.

The TSN-DA1-EXR can also be used to adjust the amount of vignetting.

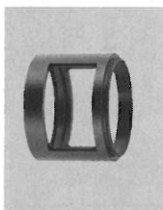
\* The TSN-DA1-EXR must be threaded to the outer tube of the TSN-DA1 before the adapter ring or TSN-DA4.



### ●TSN-DA1-ARZ7 Zoom Eyepiece Extension Ring for TE-9Z and TE-7Z

The TSN-DA1-ARZ7 is required when using the TE-9Z or TE-7Z zoom eyepieces with the TSN-DA1 or TSN-DA4.

The TSN-DA1-ARZ7 must be threaded to the spotting scope before the inner tube of the TSN-DA1 (Step 3). The inner tube is then threaded to the extension ring.



### ●TSN-DA3/DA3 st Universal Mount System

The use of the TSN-DA3/DA3 st is strongly recommended when attaching a video camera or a large or heavy digital camera to the spotting scope.



## Photography through a Spotting Scope

- ① Focus with the focus knob of the spotting scope. Due to the extremely large focal length, it may be difficult to focus when the camera is attached to the scope. If it is difficult to determine if the image is in focus, remove the camera and focus while looking through the eyepiece.
- ② 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.

- ③ Refer to the instruction manual of the digital camera for exposure and other settings.
- ④ The combined focal length of the system can be calculated with the formula below.

Combined Focal Length =  
Magnification of the eyepiece x  
Focal length of the digital camera

## Caution

- Vignetting may occur at different points throughout the digital camera's zoom range. Set the zoom of the digital camera at the point(s) where vignetting is minimized or does not occur.
- Use extra care when threading the TSN-DA1/DA10 to the digital camera's filter threads. These threads are often constructed of plastic and can be easily damaged.
- Do not carry or transport the spotting scope while a digital camera is attached to it. Remove the camera from the spotting scope to prevent the damage of equipment.
- Kowa is not responsible for any damage that occurs to any product (camera, video camera, etc.) used in conjunction with this product.
- Make sure that the equipment is properly installed to prevent damage or injury.
- Use a strong and sturdy tripod that can withstand the combined weight of the spotting scope, camera, and mount to prevent the equipment from falling over and to prevent image blurring when photographing.
- Do not use, place, or store the system on an unstable surface or in a hard to reach place. When the system is stored in a high place, use extreme caution to prevent it from falling and causing injury or damage to the system.
- Do not apply grease or lubricant to any of the moving parts.
- Be sure to clean and dry all equipment after each use. Wipe the system with a damp cloth and then wipe with a dry cloth before storage. Cleaning is especially important after using the equipment in dusty or humid conditions, or after use in the rain or near the coast. The system could rust when stored without cleaning.
- Specifications and appearance of the product are subject to change without prior notice.

## Warning

Make sure that small pieces and packaging such as eyepiece caps, covers, plastic bags etc. are out of the reach of children. If such an item is swallowed, serious injury, suffocation, or death could occur.

## Attention

Do not place this product on/in an unstable place. If it falls or tips over, injury may occur. Do not use this product while walking, riding a bicycle, or driving a car, to avoid causing an accident or injury to yourself and others.

# TSN-DA4 Universal Camera Adapter

## Installation of the TSN-DA4

① Thread the inner tube of the TSN-DA1/DA10 to the spotting scope.

\*Refer to steps ① through ④ in the TSN-DA1 or ① through ③ in the TSN-DA10 instruction manual.

② Thread the TSN-DA4 to the outer tube of the TSN-DA1/DA10.

\*When using the TSN-DA10 the locking screw of the outer tube must be removed before threading it on the TSN-DA4. After threading the TSN-DA4 to the TSN-DA10 outer tube, replace the locking screw.

\*Attach the shutter cable holder and aiming sight assembly (DA4-RS) to the TSN-DA4 before attaching the TSN-DA4 to the TSN-DA1/DA10. Please refer to the installation instructions of the DA4-RS in this manual.

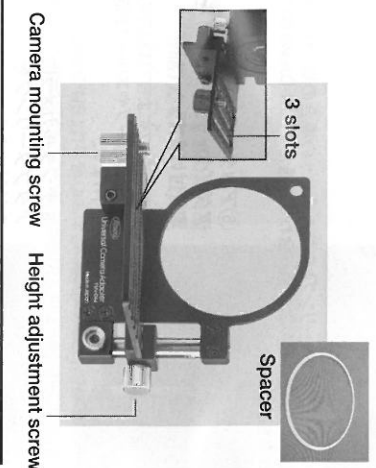
\*When the height adjustment screw of the TSN-DA4 interferes with the locking screw of the TSN-DA1/DA10, use the spacer ring included with this product.

③ Slide the outer tube of the TSN-DA1/DA10 over the inner tube and lock into place with the locking screw.

④ With the power turned on, attach the digital camera to the TSN-DA4. (If the camera has a lens that moves when zooming, set the lens at it furthest position and then attach to the TSN-DA4.)

\* Place the camera mounting screw into the slot where the camera's lens will not come into contact with the spotting scope eyepiece. Match the center of the spotting scope eyepiece with the center of the camera's lens. (The camera mounting screw can be removed at the left edge of the slot and placed in another slot.)

## Components



⑤ Height adjustment. Loosen the height adjustment screw (a) and match the center of the spotting scope eyepiece with the center of the camera's lens. When centering is complete, tighten the screw.

⑥ Optical axis adjustment. 1. Loosen the locking screw of the TSN-DA1/DA10 outer tube and increase the distance between the camera lens and the spotting scope eyepiece until vignetting appears. Lock the outer tube into place.

\* Use caution when doing this to prevent the equipment from falling.  
2. While looking at the camera's LCD screen, make fine adjustments to the positioning of the camera so that vignetting is equal on all sides.

⑦ Loosen the locking screw of the outer tube and slide along the inner tube to the point where vignetting does not appear (or where there is the least amount of vignetting) and lock into place.

\* Use caution when sliding the outer tube over the inner tube to prevent the lens of the digital camera from coming into contact with the eyepiece.

⑧ Check that the digital camera is secure.

## Using the TSN-DA4

### Viewing

Release lock button (A) by sliding it to the right. The base the camera is attached to will swing open to the right and lock. It is now possible to view through the spotting scope eyepiece.

### Photography

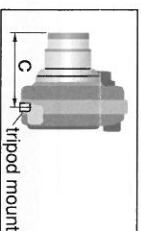
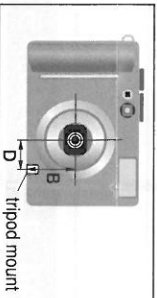
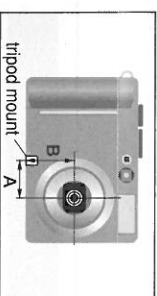
Release lock button (B) by sliding it down. Return the camera base to its original position by swinging it to the left and confirm that the base is locked in place. Photographs can now be taken through the spotting scope.  
\* If lock button (A) does not lock automatically, slide the button to the right.

## Allowances of the TSN-DA4

	A	B	C	D
1) For cameras with the tripod mount to the left of the lens [facing the lens]	The distance between the camera's tripod mount and the center of the lens.	The distance between the center of the lens and the base of the camera.	The distance between the camera's tripod mount and the lens face.	The distance between the camera's tripod mount and the center of the lens.
2) For cameras with the tripod mount to the right of the lens [facing the lens]	0-44 mm	21-40 mm	To 56 mm	0-28 mm

1) Tripod mount to the left of the lens

2) Tripod mount to the right of the lens



## TSN-DA4 Spacer

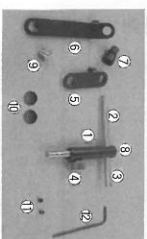
When the height adjustment screw of the TSN-DA4 (A) interferes with the locking screw of the TSN-DA1/DA10 (B), use the spacer ring included with this product. (If the two screws do not interfere with each other, the spacer does not need to be used.)

[Spacer installation]

① Place the spacer over the threads of the outer tube of the TSN-DA1/DA10.  
② Thread the TSN-DA4 to the outer tube (the spacer will be between the outer tube and the TSN-DA4).  
③ With the spacer in place, the location of the outer tube's locking screw will change by about 180 degrees.

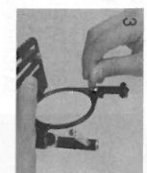
## DA4-RS Shutter Cable Holder and Aiming Sight Assembly

### Components



### Installation

1. Remove the stainless steel pole from the shutter release assembly by loosening the height adjustment screw. Place the pole into the main body of the TSN-DA4 and tighten the set screw with the supplied hexagonal wrench.



3. Attach the aiming sight holder to the shutter release cable to the TSN-DA4 with the supplied screw. Please note that there is a different spotting scopes; choose the appropriate one for your spotting scope. Attach the aiming sight to the aiming sight holder.

2. Place the shutter release holder assembly back into the pole and adjust so that the shutter holder will not interfere with installation of the camera.



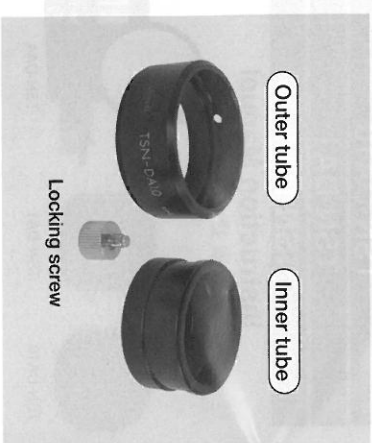
4. Attach the shutter release cable to the shutter release holder. Align the shutter release cable with the camera's shutter button and tighten the adjustment screw. Adjust the height of the assembly for proper clearance.

\* To protect the shutter button of the camera from unforeseen damage, please use the included protective rubber seal.

## TSN-DA10 Digital Camera Adapter

The TSN-DA10 can only be used with the TSN-880 and TSN-770 Series spotting scopes and their respective eyepieces (TE-10Z, TE-17W, TE-20H).

### ■ Components



### ■ Installation of the TSN-DA10



- ① Remove the twist-up eyecup or rubber eyecup of the eyepiece.
  - \* The twist-up eyecup of the TE-10Z and TE-17W can be removed by turning it counterclockwise.
  - \* The rubber eyecup of the TE-20H can be removed by pulling it off.



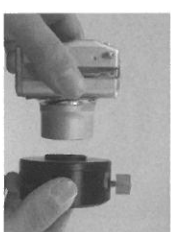
- ② Attach the eyepiece to the spotting scope.



- ③ Thread the inner tube on the eyecup threads of the eyepiece.



- ④ Thread the adapter ring (sold separately) on the outer tube.



- ⑤ Thread the adapter ring/outer tube to the filter threads of the digital camera.
  - \* Some digital cameras may require the use of an additional lens adapter available from the camera manufacturer for proper attachment.



- ⑥ Slide the outer tube over the inner tube, and lock into place with the locking screw.

#### Caution:

- \* Make sure that the eyepiece does not come into contact with the camera lens.
- \* The amount of vignetting can be slightly improved by sliding the outer tube back and forth over the inner tube.



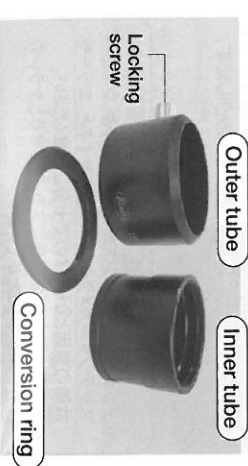
- ⑦ Check that the digital camera is secure.

- \* Reverse the order above to remove the adapter.

## TSN-DA1 Digital Camera Adapter

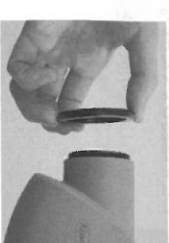
The TSN-DA1 can only be used with the TSN-820M, TSN-820, TSN-660, TSN-600, TS-610 Series spotting scopes and the TSN-1,2,3,4.

### ■ Components



\* The conversion ring is attached to the inner tube when packaged.

### ■ Installation of the TSN-DA1



- ① Thread the conversion ring to the spotting scope body.
  - \* This step is not necessary for the TSN-820M/820 series spotting scopes.



- ② Remove the twist-up eyecup or fold down the rubber eyecup of the eyepiece and attach the eyepiece to the spotting scope. When using a zoom eyepiece, set the eyepiece to the desired magnification.



- ③ Thread the inner tube to the conversion ring.
  - \* For the TSN-820M/820 series spotting scopes, thread the inner tube directly to the spotting scope. The conversion ring is not used.
  - \* For the TE-9Z/7Z eyepieces, the use of the TSN-DA1-ARZ7 extension ring (sold separately) is required.



- ④ Replace the twist-up eyecup removed in step 2 above.
  - \* Make sure that the eyecup is all the way down.



- ⑤ Thread the adapter ring (sold separately) to the outer tube.



- ⑥ Thread the adapter ring/outer tube to the filter threads of the digital camera.
  - \* Some digital cameras may require the use of an additional lens adapter available from the camera manufacturer for proper attachment.



- ⑦ Slide the outer tube over the inner tube and lock into place with the locking screw.

#### Caution:

- \* Make sure that the eyepiece does not come into contact with the camera lens.
- \* The amount of vignetting can be slightly improved by sliding the outer tube back and forth over the inner tube.



- ⑧ Check that the digital camera is secure.

- \* Reverse the order above to remove the adapter.

### Eyepieces

The following eyepiece can be used with the TSN-DA1 for digiscoping:

- TE-9Z/7Z/9WD/14WD/14WE/21WD/21WE (Turn down the twist-up eyecup before use).
- TE-17HD/17HE, TSE-17HB/17HC (Remove the rubber eyecup before use).
- TE-6Z/9W, TSE-Z7B/Z4 (Fold down the rubber eyecup before use).