BINOCULARS & SPOTTING SCOPES. A TECHNICAL GUIDE.

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Born in the UK

VISION ACCOMPLISHED

Hawke is at the forefront of optical performance with class-leading innovation and design.

Accuracy, strength and precision; our optics blend iconic design, exceptional engineering and unrivalled craftsmanship to create an unforgettable viewing experience.

The following guide offers further information to assist in the purchase of your new Hawke binoculars and spotting scopes.

CONTENTS

BINOCULARS

SPOTTING SCOPES

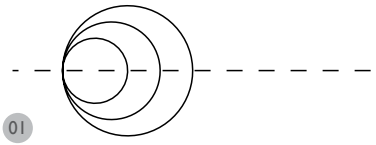
BINOCULAR SPECIFICATION & TERMINOLOGY

01 | Magnification

The binocular magnification specification is the first number in the binocular description. e.g. a 10×42 binocular has a magnification power of 10×. That is to say, the viewed image will be 10× larger than with the naked eye.

While a higher magnification will make the image larger and easier to view it will also reduce the field of view and make any movement of the binoculars more exaggerated.

Typically an 8 or 10× magnification power is the preferred choice, but 12× magnification is also available in some models.

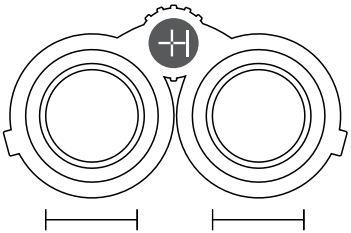


01

02 | Objective Lens

The objective lenses are at the front end of the binocular. The width of the objective lens relates to the second number in the binoculars description. e.g. a 10×42 binocular has a pair of objective lenses that each measure 42mm in diameter.

Larger objective lenses give better light transmission and allow for a brighter picture. A larger objective lens will allow the binoculars to be used in lower light conditions.

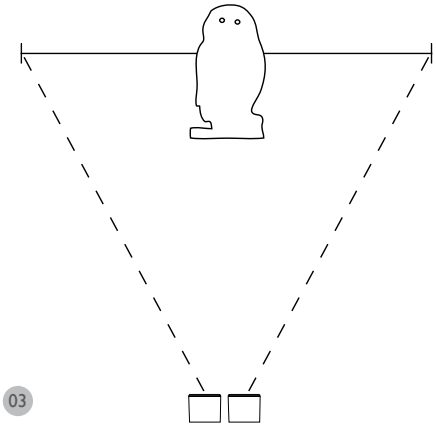


02

03 | Field of View (FOV)

The width of the binoculars view. A larger FOV allows for a wider image to be seen.

This can be measured in terms of angle (degrees), or by a set distance. e.g. the FOV of the Frontier ED X 8×42 is 142m wide when looking at an image 1000m away.
This is equivalent to 426ft wide when looking at an image 1000yds away.



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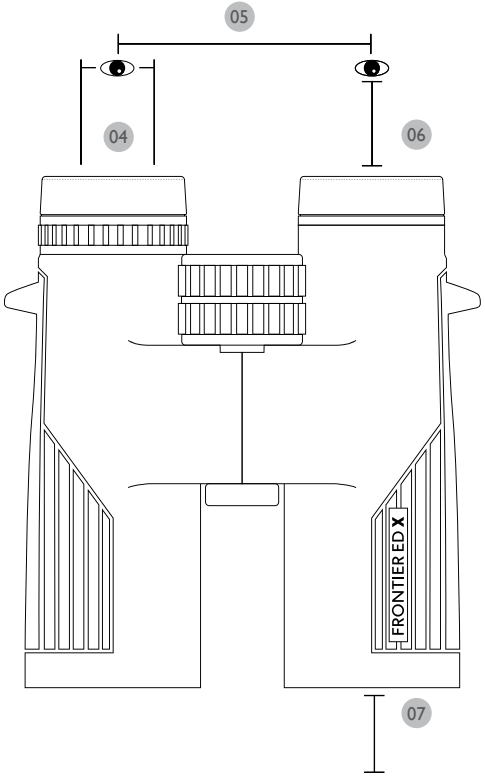


04 | Exit Pupil

The diameter of the viewing image when the eye is positioned at the correct eye relief. This is calculated by dividing the objective lens diameter by the binocular magnification. e.g. for a 10×42 binocular we divide the objective lens diameter of 42mm by the magnification power of 10 to get 4.2mm.

05 | Interpupillary Distance

The distance between the two ocular lenses. This is measured from the middle of one lens to the other. The interpupillary distance has a range, as the distance will change depending how open or closed the binoculars hinge is set.

06 | Eye Relief

The correct distance for the pupil to be located from the ocular lens. When at this distance the best viewing experience will be achieved. All Hawke binoculars are fitted with adjustable twist-up eye cups to help gain the correct eye relief distance and comfortable viewing experience. (see page 8)

07 | Close Focus

The closest possible distance that the binoculars can be focused at. Binoculars with an ability to focus at close range allow for better viewing of nearby objects such as insects.

GLASS QUALITY & COATINGS

01 | Extra-low Dispersion (ED) Lenses

ED lenses are the most effective way to improve image quality and stop colour fringing (chromatic aberration). ED glass allows for better concentration and direction of light wavelengths, which give a significantly sharper image and improved contrast of colours and light.

02 | Fully Multi-Coated (FMC) Lens Coating

There are many lenses within a binoculars optical system. Hawke's FMC lenses ensure that both sides of every lens have multiple layers of coating which assist with light transmission and help produce brighter images with improved contrast.

03 | BAK-4 Roof Prism

BAK-4 is a type of glass used within the prism, which is a system of glass elements inside the binocular that ensure the viewed image is the correct orientation after being magnified. A roof prism is a more compact and sharper version of older traditional Porro prisms.

04 | Phase Corrected Coating

The light traveling through a binocular prism is reflected several times and as such can lose its "phase", meaning that colours can appear overlapping and produce colour fringing, also known as chromatic aberration. A phase correction coating helps to stop chromatic aberration.

05 | Silver Mirror Coating

A silver mirror coating can be applied to elements within the prism and increase reflection. This also improves brightness and colour reproduction. The silver coatings have a reflectivity of 95% to 98%.

06 | Dielectric Coating

Dielectric Coating of the prisms improves internal reflection even more than a silver mirror coating. This maximises the quality of visible light and produces clear, high-contrast images, similar to those seen by the naked eye.

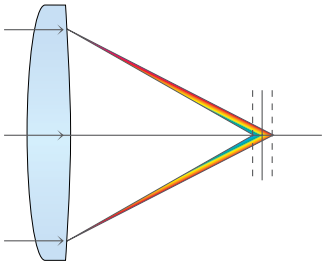
07 | Water Repellent Coating

Water repellent coatings significantly improve optical performance in wet weather conditions. The extra lens coating encourages the water droplets to "bead" and form into smaller drops that are easier to clean and will more actively run off the glass lens. Available on the Frontier ED X.

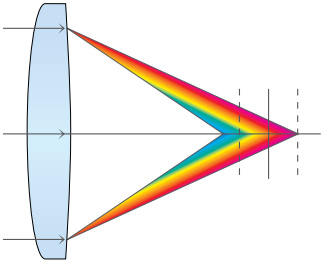
08 | Strehl Ratio Tested

Meeting the Strehl Ratio optical parameter ensures the image is crisp with no, or less, haziness. This produces a feeling of not actually looking through lenses. The Frontier ED X are optically checked for resolution, light transmission and Strehl Ratio for optical image formation.

01 ED GLASS



CONVENTIONAL GLASS

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01
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FRONTIER ED X

PARTS & MECHANICAL FEATURES

01 | Dioptre

Each binocular is equipped with an adjustable dioptre which is used to correct any imbalance in eye strength. Typically the dioptre adjuster is positioned on the right hand eyepiece. The Frontier ED X dioptre is designed for high and low temperatures.

02 | Focus Wheel

The focus wheel can be easily rotated to change the focal distance of the binoculars. All Hawke binoculars feature a central focus wheel which accurately guides and adjusts the internal lenses while keeping them protected from outside elements and dirt. The Frontier ED X focus wheel is designed for high and low temperatures.

03 | Hinge Design

The Frontier ED X model includes a high performance hinge design to withstand high and low temperatures.

04 | Tripod Attachment

All Hawke full-sized binoculars have a tripod fitting with a standard tripod thread (1/4-20 UNC). This allows for positioning and solid mounting to keep the binoculars still when in use.

05 | Twist-Up Eye Cups

With three different height settings, the twist-up eye cups can be set to ensure the best eye relief for your use. Eyeglasses users often leave the twist-up eye cups in the downward position, while non-eyeglasses users rotate the twist-up mechanism upright. The Frontier ED X model has the added feature of replaceable twist-up eye cups with position stops, allowing for the eye cups to be replaced easily.

06 | Strap Loops

All Hawke binoculars are engineered with a low-profile strap loop that provides a secure attachment point for your beloved optics.

07 | Nitrogen Purged

Hawke binoculars are filled with nitrogen gas to ensure that no condensation or humidity is held within the optical system which can otherwise haze and cloud the optical view when moving between warm and cold conditions. The nitrogen gas is sealed into the binoculars during manufacture to ensure no moisture can infringe the optics.

08 | Chassis

Designed from conception to offer the best performance available, models include lightweight magnesium alloy body or polycarbonate chassis and soft touch rubbers. The Frontier ED X model is manufactured with high grade aluminium, designed to be well balanced and fit effortlessly in the hand with high grip rubber.

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FOCUSING YOUR BINOCULAR

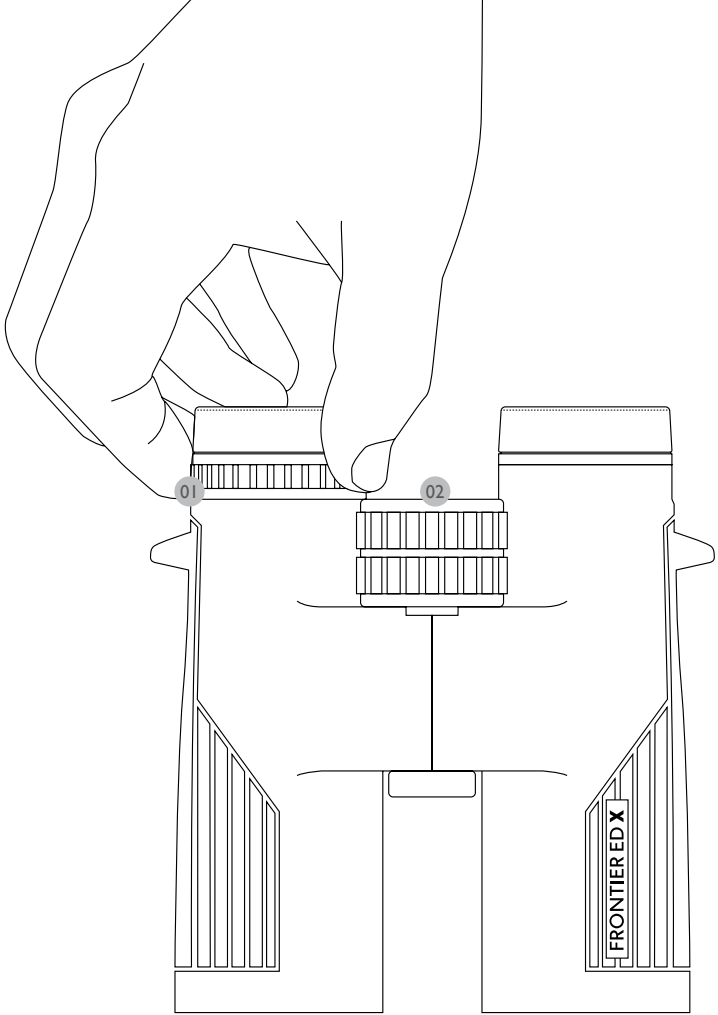
Set-up

Set the dioptre adjuster (01) to the centre position.

Close your right eye and rotate the focusing wheel (02) until the image in the left eyepiece appears sharp.

Now close your left eye and rotate the dioptre adjuster (01) until the image is sharp.

The binoculars have now been adjusted to your eyes.




02
8x42
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QUALITY CONTROL

Tested

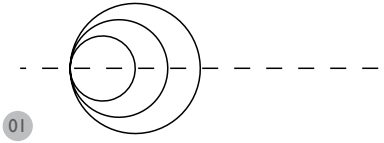
All Hawke Binoculars are tested for water, shock and fog proofing. The Frontier ED X has a final check of waterproofing to IPX7 -1m/30 minutes, fog proof -15C to +55C and in extreme operational temperature conditions from -15°C to +55°C and storage temperatures -40°C to +70°C.

SPOTTING SCOPE SPECIFICATION & TERMINOLOGY

01 | Magnification

Spotting scope magnifications are often variable as the zoom eyepiece allows the user to change from low to high magnification. The magnification range is denoted by the first two numbers in the spotting scope's description. e.g. a 20-60×85 spotting scope has a magnification power of 20 to 60×. That's to say the viewed image will be 20 to 60× larger than with the naked eye, depending on the magnification setting.

Whilst a higher magnification will make the image larger and easier to view it will also reduce the field of view and make any movement and tracking of animals more difficult.

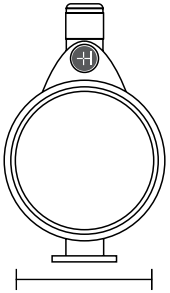


01

02 | Objective Lens

The objective lens is the front lens of the spotting scope. The width of the objective lens relates to the last number in the spotting scope's description. e.g. a 20-60×85 spotting scope has an objective lens that measures 85mm in diameter.

Larger objective lenses give better light transmission and allow for a brighter picture. A larger objective lens will allow the spotting scope to be used in lower light conditions.

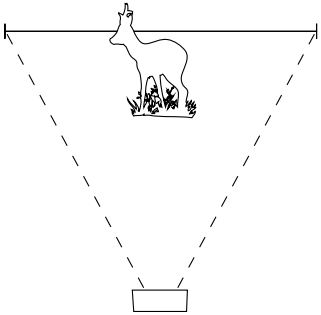


02

03 | Field of View (FOV)

The width of the spotting scope's view. A larger FOV allows for a wider image to be seen.

This can be measured in terms of angle (degrees), or by a set distance. e.g. the FOV of the Endurance 20-60×85 spotting scope is 35 – 17.5m wide when looking at an image 1000m away. The view is 35m wide when on the lowest 20× magnification and is 17.5m wide when on the highest 60× magnification. This is also equivalent to 105 – 52.5ft wide when looking at an image 1000yds away.



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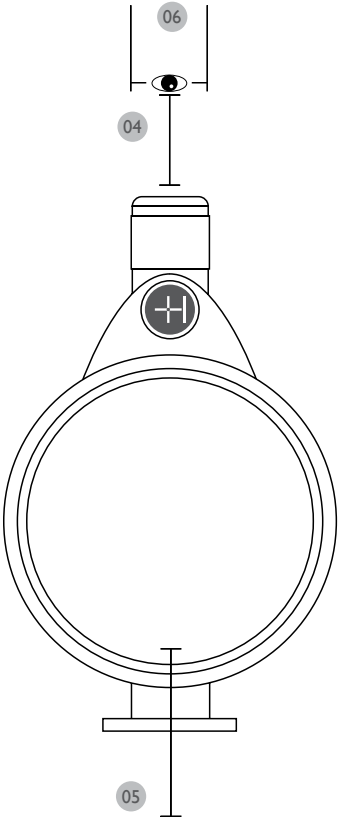


04 | Eye Relief

The distance from the pupil to the ocular lens. When at the correct distance the best viewing experience will be achieved. Some Hawke spotting scopes are fitted with an adjustable twist-up eye cup to help gain the correct eye relief distance and comfortable viewing experience.

05 | Close Focus

The closest possible distance that the spotting scope can be focused at. Spotting scopes with an ability to focus at a nearer range allow for better viewing of nearby objects such as insects.

06 | Exit Pupil

The diameter of the viewing image when the eye is positioned at the correct eye relief.

GLASS QUALITY & COATINGS

01 | Extra-low Dispersion (ED) Lenses

ED lenses are the most effective way to improve image quality and stop colour fringing (chromatic aberration). ED glass allows for better concentration and direction of light wavelengths, which give a significantly sharper image and improved contrast of colours and light.

02 | Fully Multi-Coated (FMC) Lens Coating

There are many lenses within an optical system. Hawke's FMC lenses ensure that both sides of every lens have multiple layers of coating which assist with light transmission and help produce brighter images with improved contrast.

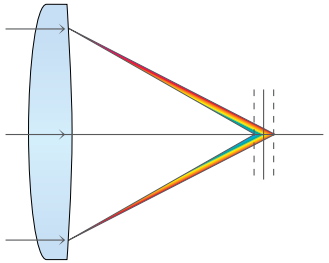
03 | BAK-4 Porro Prism

A prism is a system of glass elements inside the spotting scope that ensure the viewed image is the correct orientation after being magnified. BAK-4 glass ensures excellent light refraction properties and is superior to BK-7 glass.

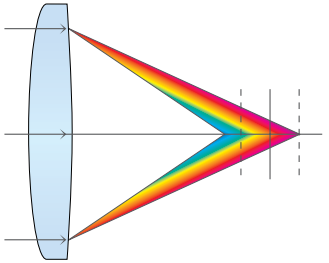
04 | Dielectric Coating

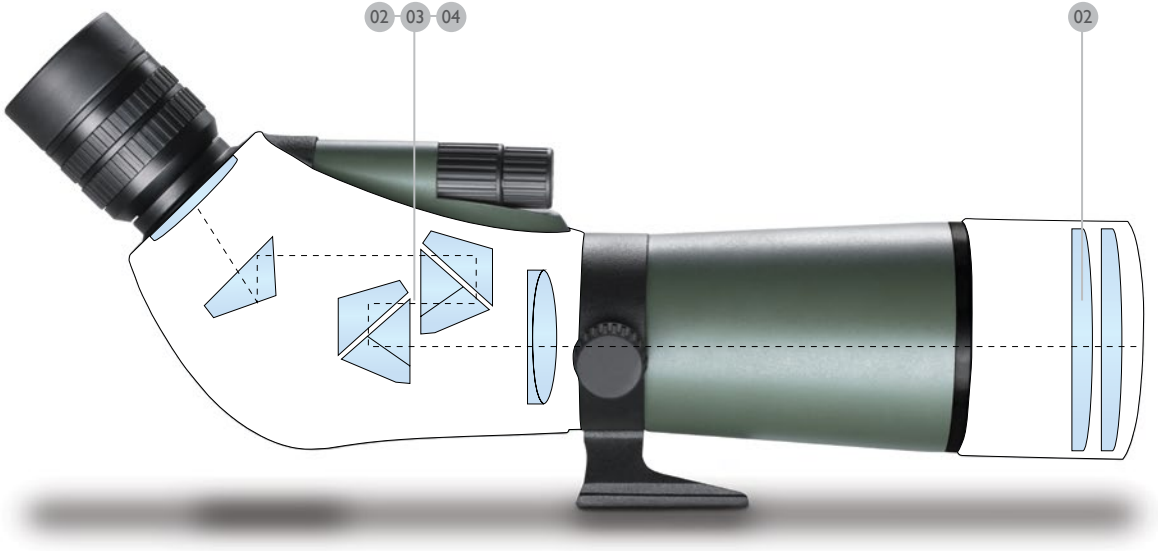
Dielectric Coating of the prisms improves internal reflection even more than a silver mirror coating. This maximizes the quality of visible light and produces clear, high-contrast images, similar to those seen by the naked eye.

01 ED LENSES



CONVENTIONAL LENSES

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PARTS & MECHANICAL FEATURES

01 | Sunshade

When using the scope in bright conditions, or when the sun is low and shining into the spotting scope's lens, the built-in extendable sunshade can be used to prevent glare.

02 | Nitrogen Purged

Hawke spotting scopes are filled with nitrogen gas to ensure that no condensation or humidity is held within the optical system which can otherwise haze and cloud the optical view when moving between warm and cold conditions. The nitrogen gas is sealed into the spotting scope during manufacture to ensure no moisture can infringe the optics.

03 | Focus Wheel

The focus wheel can be easily rotated to change the focal distance of the spotting scope. All Hawke spotting scopes are designed to accurately guide and adjust the internal lenses while keeping them protected from outside elements and dirt.

- Dual Focus Knob – a dual focus knob has two sensitivities for adjustment; coarse and fine. The coarse adjustment is fast changing for quick settings, then the fine adjustment allows for more accurate and precise focus correction.
- Focus Knob – a single focus knob that allows for adjustment from near to far focal distance.

04 | Tripod Attachment

All Hawke spotting scopes have a tripod fitting with a standard tripod thread (1/4-20 UNC). This allows for positioning and solid mounting to keep the spotting scope still when in use. A rotating tripod band is available on some models to allow body rotation and alternative scope orientation.

05 | Eye Cup Adjustment

The eye cup can be set to ensure the best eye relief for your use. Eyeglasses users often leave the eye cup adjustment in the downward position, while non-eyeglasses users keep the eye cup upright.

- Twist-Up – with 3 levels of adjustment the eye cup can be twisted into position to suit.
- Folding – the rubber eye cup can be folded down to suit eyeglasses wearers.

06 | Digi-scoping

Digi-scoping is the art of using the spotting scope's optical performance to enhance your camera and capture photos at a much higher magnification. Digi-scope adaptors are available to attach a camera to the spotting scope.

07 | Fixed Power Eyepiece

Fixed power eyepieces offer a wider view while reducing the number of elements and increasing light transmission.

STEP BY STEP GUIDE TO USING A DIGI-SCOPE

Overview

Spotting scopes can be used in conjunction with digital cameras to obtain close up photos. Hawke offers a range of precision engineered accessories that assist with the setup. Converting the Hawke range of spotting scopes to a digi-scope has never been easier.

Simply choose the digi-scope adaptor for your spotting scope and select the T2 adaptor relevant to your camera. For cameras not matching the T2 or DG rings, we suggest using the digi-scope adapter (64 027) all of which can been found online or in our current product catalogue.

Step 01

Unscrew the digi-scope adaptor top from the base (a & c). Carefully unscrew the eyepiece from your spotting scope (b).

Step 02

Place chosen digi-scope adaptor over spotting scope eyepiece opening.

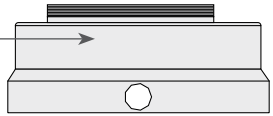
Step 03

Place the eyepiece in the digi-scope adaptor mount, and in to the eyepiece opening, (using both hands) gently tighten the eyepiece through the digi-scope adaptor and hand tighten the chrome, dome headed screw on the adaptor, securing this to the spotting scope.

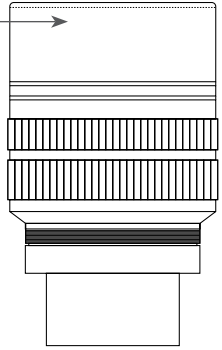
Step 04

Replace top (a) and hand tighten the dome headed screw. You are now ready to connect your camera to the digi-scope adaptor and spotting scope. (Fig. (d)).

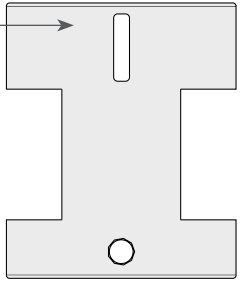
(a) Digi-scope adaptor ring top with chrome, dome headed screws



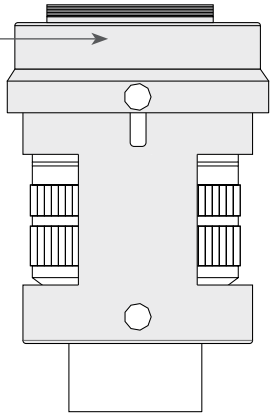
(b) Example eyepiece (not included in digi-scope pack)

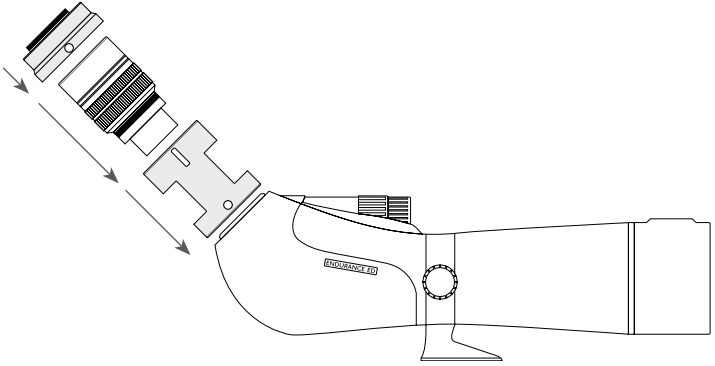


(c) Digi-scope adaptor base with chrome, dome headed screws



(d) Completed look



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EXAMPLE SET UP

CONFIGURATION

The digi-scope configuration opposite has been constructed from the following elements, all available to you from Hawke.

01 | Endurance ED spotting scope (56 200)

Whether your interest is in sports, bird watching or wildlife observation, Endurance spotting scopes are sure to provide the performance you demand for years to come. When you require the finest image reproduction, these scopes will provide the clarity and colour you desire.

Designed to produce stunning images all scopes feature a dual focus knob, 3× ratio eye pieces with twist-up eye cups and fully multi-coated optics with dielectric coated prisms.

02 | Digi-scope Adaptor (64 021)

Digi-scope Adaptor (Endurance & Endurance ED – 68mm & 85mm Models).

03 | Canon EOS Adaptor (64 001)

SLR T2 Camera Adaptor for Canon EOS.

02

64 021 – Digi-Scope Adaptor

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64 001 – SLR T2 Camera Adaptor

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