EXPLORE SCIENTIFIC®

Digital camera ·

DeepSky Astro Camera Series

EN Instruction manual

DE Besuchen Sie unsere Website über den folgenden QR Code oder Weblink um weitere Informationen zu diesem Produkt oder die verfügbaren Übersetzungen dieser Anleitung zu finden.

EN Visit our website via the following QR Code or web link to find further information on this product or the available translations of these instructions.

FR Si vous souhaitez obtenir plus d'informations concernant ce produit ou rechercher ce mode d'emploi en d'autres langues, rendez-vous sur notre site Internet en utilisant le code QR ou le lien correspondant.

NL Bezoek onze internetpagina via de volgende QR-code of weblink, voor meer informatie over dit product of de beschikbare vertalingen van deze gebruiksaanwijzing.

ES ¿Desearía recibir unas instrucciones de uso completas sobre este producto en un idioma determinado? Entonces visite nuestra página web utilizando el siguiente enlace (código QR) para ver las versioneAs disponibles.

IT Desidera ricevere informazioni esaustive su questo prodotto in una lingua specifica? Venga a visitare il nostro sito Web al seguente link (codice QR Code) per conoscere le versioni disponibili.

www.bresser.de/P0510500   www.bresser.de/P0510510   www.bresser.de/P0510520

GARANTIE · WARRANTY · GARANTÍA · GARANZIA

www.bresser.de/warranty_terms

Contents

1 Imprint

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www.explorescientific.de

For any warranty claims or service inquiries, please refer to the information on "Warranty" and "Service" in this documentation. We ask for your understanding that unsolicited returns cannot be processed.

Errors and technical changes excepted.

2 Validity note

This documentation is valid for the products with the following article numbers:

0510500 0510510 0510520

Manual version: 0422

Manual designation:
Manual_0510500-0510510-0510520_DeepSky-Astro-Camera_en_EXPSC_v042022a

Always provide information when requesting service.

3 About this Instruction Manual

> **NOTICE**
>
> **These operating instructions are to be considered a component of the device.**
>
> Read the safety instructions and the operating manual carefully before using this device.
>
> Keep this instruction manual in a safe place for future reference. When the device is sold or given to someone else, the instruction manual must be provided to the new owner/user of the product.

4 Intended use

- This device is not intended for use by persons (including children) with impaired physical, sensory or mental abilities, or for lack of experience and/or knowledge, unless they are supervised by or have received instructions from a person responsible for their safety on how to use this device.

- This device is for personal use only.

- The device was developed as an electronic accessory and may only be used to connect and operate the devices for private use described in this manual.

5 General safety instructions

⚠ DANGER

Risk of an electric shock!

This device contains electronic parts that are powered by a power source (AC adapter and/or batteries). Improper use of this product may result in electric shock. Electric shock can cause serious or fatal injuries. It is therefore imperative that you observe the following safety information.

- Check this device, cables and connections for damage before use.
- Never use the device with defective or damaged components (e.g. housing, cable, lamp, etc.).
- Do not expose the device to high temperatures. Use only the supplied AC adapter. Do not short-circuit the device or batteries or dispose of in fire! Excessive heat and improper handling can cause short circuits, fires and even explosions!
- Operate the device only in a completely dry environment and do not touch the device with wet or damp body parts.
- Place your device so that it can be disconnected from the power supply at any time. The power outlet should always be near your appliance and should be easily accessible, as the plug of the power cord serves as a disconnect device from the mains supply.
- To disconnect the unit from the mains, always pull the mains plug and never pull the cable!
- Disconnect the power supply by pulling the mains plug when the appliance is not in use, in case of a longer interruption of operation and before any maintenance and cleaning work.

⚠ DANGER

Risk of blindness!

Never use this device to look directly at the sun or in the direct proximity of the sun. There is a risk of BLINDNESS!

NOTICE

Danger of material damage!

Improper handling may result in damage to the unit and/or accessories. Therefore, use the device only in accordance with the following safety information.

- Do not disassemble the device! In the event of a defect, please contact your dealer. They will contact the Service Center and can arrange the return of this device for repair if necessary.
- For the normal operation as intended, only use the supplied cables and connect them as described in the manual.

NOTICE

Risk of voltage damage!

Only use the included power adapter for power supply! The use of other unsuitable power sources or those not authorized by the manufacturer may result in damage to the camera and will void the warranty.

NOTICE

Risk of overheating!

Always keep the ventilation slits of the thermoelectric cooling system free! Covering these slits will reduce cooling performance and may cause overheating and damage to the camera.

NOTICE

Risk of material damage due to solar radiation!

Do not expose the camera sensor to direct sunlight. When photographing the sun, always use sun filters specially designed for this purpose. Unfiltered sunlight will cause damage to the camera within a very short time.

NOTICE

Danger of data loss!

Do not interrupt an on-going data connection to a computer before all data has been transferred. This could lead to data loss for which the manufacturer is not liable.

NOTICE

Privacy Protection

Respect the privacy of your fellow human beings - do not look into flats with this device, for example!

NOTICE

Use of the maximum transmission speed rate

To use the full transmission speed rate, please use the included USB 3.0 connection cable and a corresponding computer interface.
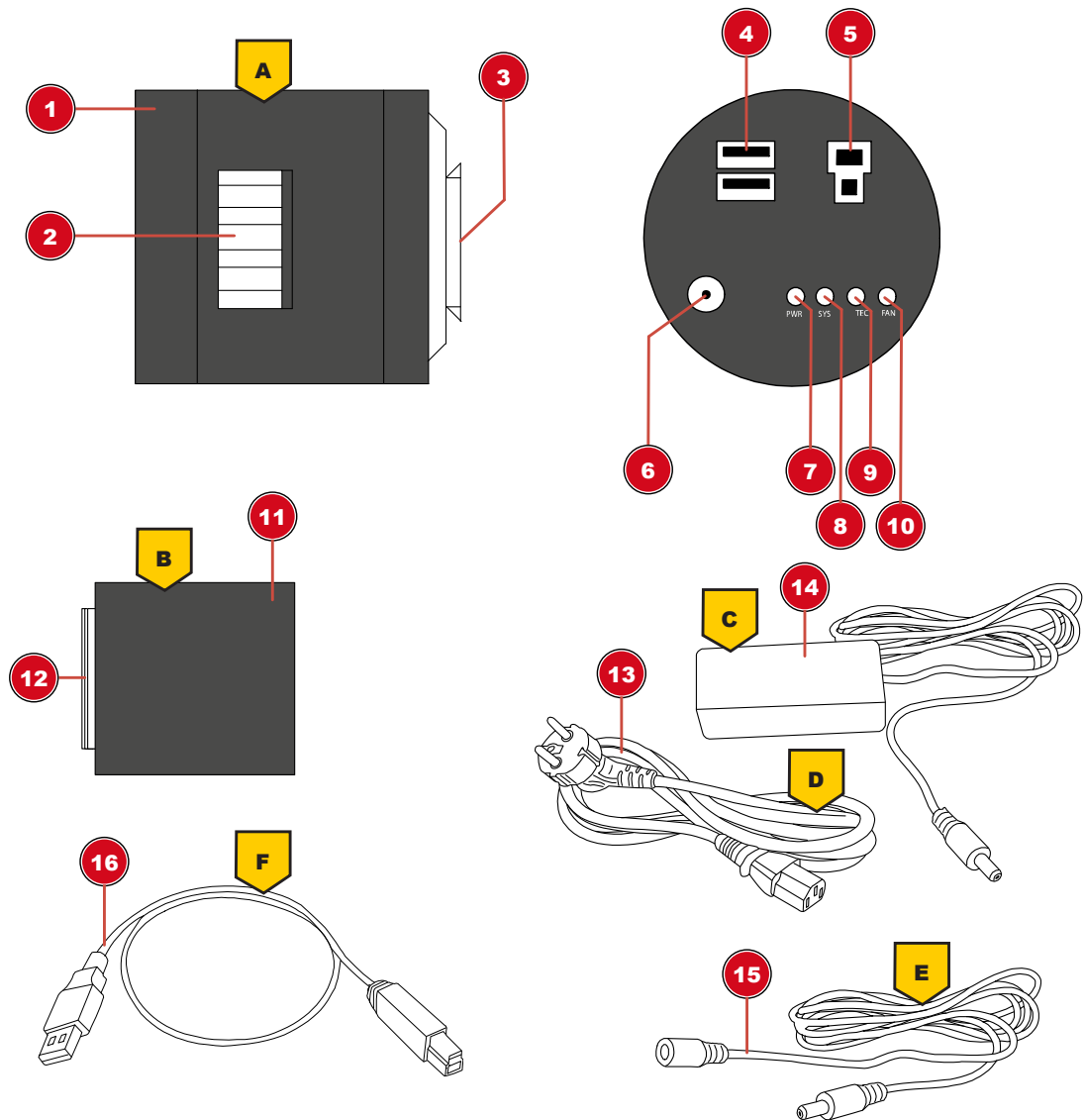
6 Parts overview and scope of delivery

Illustration 1: All parts of the Astro camera with rear view (connection area)

1	Camera housing	2	Ventilation slits
3	Holding thread	4	USB 2.0 socket (2x USB HUB)
5	USB 3.0 socket (1x)	6	Connection socket for DC barrel connector
7	PWR function light (power supply of the camera established)	8	SYS function light (USB connection established)
9	TEC function light (cooling system enabled)	10	FAN function light (fan enabled)
11	T2 adapter (50,8mm/2" plug diameter)	12	Connection thread
13	Mains power cable with Euro plug and C13 coupling	14	Mains power adapter 12V/3A with power cable, DC barrel connector and C13 connection socket
15	Power cable extension with barrel connector coupling and DC barrel connector	16	USB 3.0 connection cable (connection to computer)

Scope of delivery:

Camera (A);); T2 adapter (B); power adapter (C); power cable (D); power cable extension (E); USB 3.0 connection cable (F); software CD; hardcase

Also required (not included):
Computer running Windows 8/10

NOTICE! This is not a stand-alone camera. A computer with Windows operating system and free USB 3.0 interface is required for operation.

7 Installing the software and drivers

1. Insert the supplied CD-ROM into the CD drive of your computer. Alternatively, you can download the software package from the product page and start the installation directly. The files are stored under the category 'Software'. The link/QR code to the product page can be found on the second page of this manual.

2. Install the 'EXPLORE Capture' software. This will also install the camera drivers automatically.

3. Remove the rubber cover of the CMOS sensor on the camera and connect it to your telescope. The connection can be made directly via T2 thread (M42x0.75mm) or via 2" (50.8mm) plug-in adapter. Always ensure that the camera is securely attached.

4. Connect the supplied AC adapter to the camera.

5. Connect the camera to the computer. Use the USB 3.0 connection cable and a corresponding free USB 3.0 interface on the computer for this purpose.

6. Start the EXPLORE Capture software after successful installation.

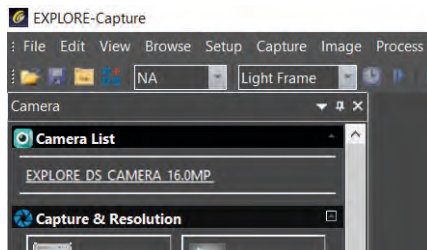7. Select the connected camera in the EXPLORE Capture software menu.

Illustration 2: EXPLORE Capture: Select camera

8. The camera now continuously sends live images to the computer at the current exposure time.

9. Use the telescope viewfinder to adjust and focus on a bright star in the field of view of the camera. To obtain a faster frame rate and a higher camera sensitivity during focusing, switch to binning mode if necessary (see software menu "Digital Binning").

10. After successful focusing, you can start recording images or video sequences.
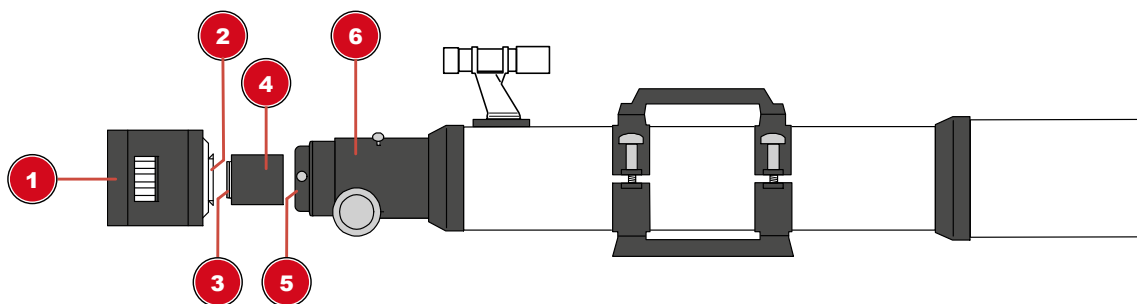
8 Camera mounting on telescope

Illustration 3: Mounting the camera on a telescope

1 Camera housing	2 Holding thread
3 Connection thread	4 50.8mm (2") T2 adapter
5 50.8mm (2") eyepiece holder	6 Eyepiece extension

9 Using the internal USB HUB (USB 2.0)

The camera is equipped with an built-in USB HUB with 2x USB 2.0 sockets at the rear. This can be used to connect additional components (e.g. autoguider camera, motor focus etc.). Separate cable connections of the accessories to the computer are omitted.

NOTICE! The use of short cable connections is recommended to reduce the risk of 'cable spaghetti' and cable breakage.

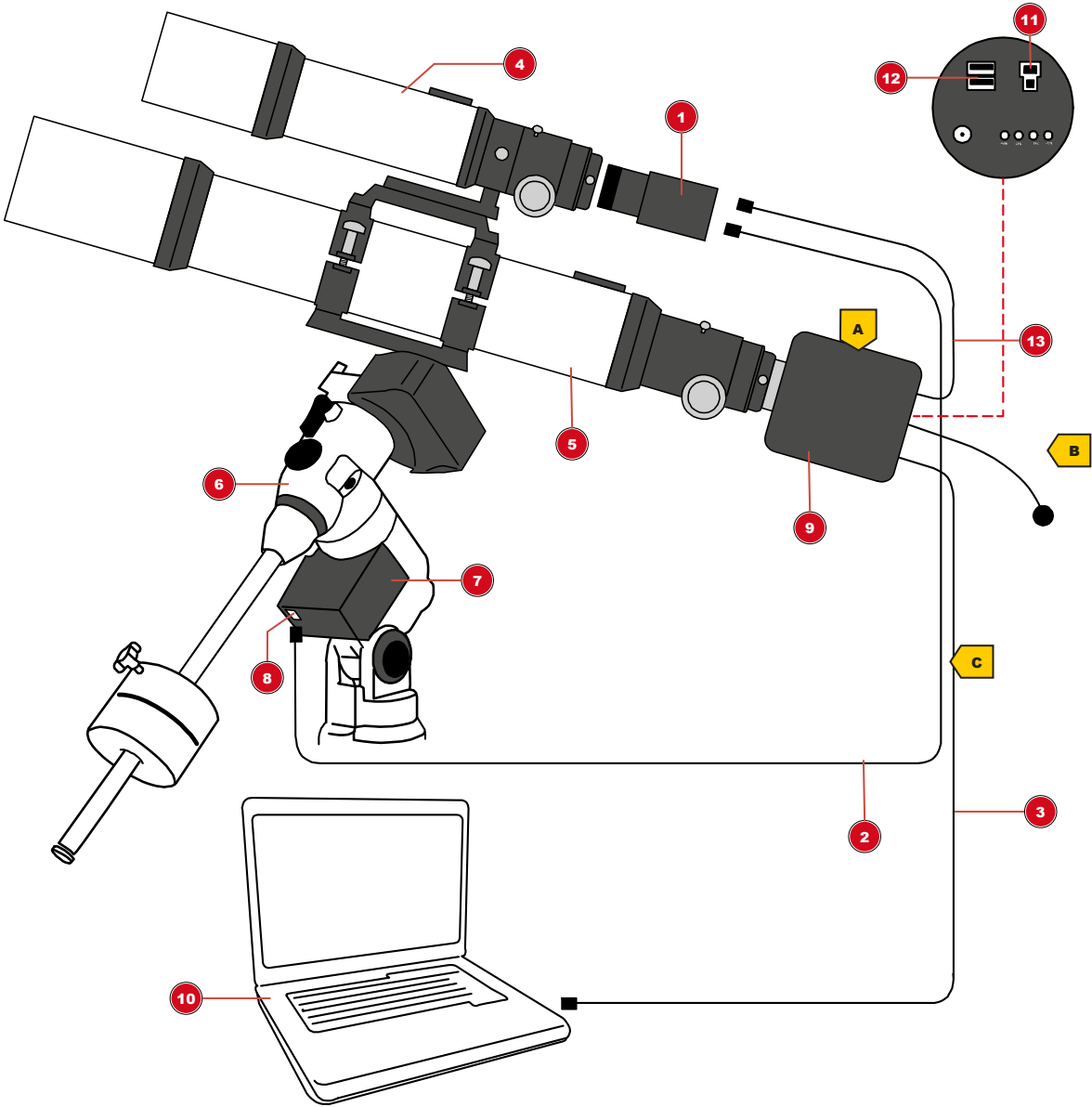# 10 Camera mounting with optional autoguider

Illustration 4: Mounting the Deep Sky Astro Camera with optional autoguider camera[1]

1 Autoguider camera[1]	2 ST4 connecting cable
3 USB 3.0 connecting cable	4 Guiding scope[1]

5 Telescope[1]	6 ST4-capable mount[1]
7 Control panel of the mount[1]	8 ST4 socket on control panel[1]
9 Deep Sky Astro Camera	10 Computer[1]
11 USB 3.0 socket on the camera	12 USB 2.0 socket on the camera
13 USB 2.0 connecting cable[1]	

[1]optional accessories; not included

NOTICE! This is not a stand-alone camera. A computer with Windows operating system is required for both, photography and autoguiding.

11 Cleaning and maintenance

- Before cleaning the device, disconnect it from the power supply (remove plug or remove batteries)!
- Only clean the device externally using a dry cloth. Do not use cleaning solution to prevent damage to the electronic parts.

NOTICE! The following steps must be performed in a clean environment to prevent dust or other dirt from entering the camera.

1. If ice crystals form on the viewing window of the camera sensor when cooling is on, the moisture that has penetrated can be removed as follows:

2. Allow the camera to dry for at least 12 hours in a dry environment with a minimum of 20°C room temperature.

3. Remove the housing lock of the camera with a suitable screwdriver.

4. **NOTICE! Do not open the oven door during the following procedure!**

5. Place the camera in a household oven at 80°C (circulating air) for 5 hours. Then reduce the temperature to 50°C for another hour

6. Switch off the oven after heating and wait until the oven has returned to room temperature.

7. **CAUTION! Risk of burns! Wear suitable protective gloves when removing the camera from the oven!**

8. Remove the camera from the oven. Replace the housing lock and screw it in place.

9. **NOTICE! Before fitting the housing lock, check that the small sealing ring is in perfect condition and correctly seated. Tighten the screw plugs by hand only.**

The camera is now ready for use again.

12 Disposal

Dispose of the packaging materials properly, according to their type, such as paper or cardboard. Contact your local waste-disposal service or environmental authority for information on the proper disposal.

Do not dispose of electronic devices in the household garbage!

According to the European Directive 2012/19/EU on Waste Electrical and Electronic Equipment and its transposition into national law, used electrical equipment must be collected separately and recycled in an environmentally sound manner.

13 EC declaration of conformity

CE A "Declaration of conformity" in accordance with the applicable directives and corresponding standards has been prepared by Bresser GmbH. The full text of the EC declaration of conformity is available at the following Internet address: www.bresser.de/download/0510500 0510510 0510520/CE/0510500 0510510 0510520_CE.pdf

14 UKCA Declaration of Conformity

UKCA Bresser GmbH has issued a "Declaration of Conformity" in accordance with applicable guidelines and corresponding standards. The full text of the UKCA declaration of conformity is available at the following internet address: www.bresser.de/download/0510500 0510510 0510520/UKCA/0510500 0510510 0510520_UKCA.pdf

Bresser UK Ltd. • Suite 3G, Eden House, Enterprise Way, Edenbridge, Kent TN8 6HF, Great Britain

15 Warranty

The regular warranty period is 2 years and starts on the day of purchase. For full warranty terms and services, please visit **www.bresser.de/warranty_terms**.

16 Technical data

Item no. 0510500	Item no. 0510510	Item no. 0510520
Camera type: ASTRO Camera 16.0MP ATR3CMOS16000KPA	Camera type: ASTRO Camera 1.7MP ATR3CMOS01700KPA	Camera type: ASTRO Camera 7.1MP ATR3CMOS07100KPA
Data output: Images and video	Data output: Images and video	Data output: Images and video
Image sensor: Panasonic NM34230PLI CMOS Color Sensor	Image sensor: SONY Exmor IMX432 CMOS Colour Sensor	Image sensor: SONY Exmor IMX428 CMOS Color Sensor
Adjustable resolution: 4648x3506 / 2304x1750 / 1536x1168	Adjustable resolution: 1600x1100	Adjustable resolution: 3200x2200
Adjustable binning: 1x1 / 2x2 / 3x3	Adjustable binning: 1x1	Adjustable binning: 1x1 / 2x2
Frame rate per second (FPS): 22,5).	Frame rate per second (FPS): 94	Frame rate per second (FPS): 51
Physical sensor size in pixels: x	Physical sensor size in pixels: x	Physical sensor size in pixels: 3200 x 2200 / 1600 x 1100
Megapixels: 16 MP	Megapixels: 1.7 MP	Megapixels: 7.1 MP
Sensor size: 17.6 x 13.3 mm (4/3 in.)	Sensor size: 14.4 x 9.9 mm (1.1 inch)	Sensor size: 14.4 x 9.9 mm (1.1 inch)
Pixel size: 3.8 μm x 3.8 μm	Pixel size: 9 μm x 9 μm	Pixel size: 4.5 μm x 4.5 μm
Bit depth: 12 bit	Bit depth: 12 bit	Bit depth: 12 bit
Flange focal length: 17.5 mm	Flange focal length: 17.5 mm	Flange focal length: 17.5 mm
Shutter type: Rolling shutter	Shutter type: Global Shutter	Shutter type: Global Shutter

Internal camera memory: DDR 3 RAM	Internal camera memory: DDR 3 RAM	Internal camera memory: DDR 3 RAM
Thermoelectric cooling with fan: Yes, up to 40°C below ambient temperature	Thermoelectric cooling with fan: Yes, up to 40°C below ambient temperature	Thermoelectric cooling with fan: Yes, up to 40°C below ambient temperature
Adjustable exposure times: 150µs up to 60min	Adjustable exposure times: 150µs up to 60min	Adjustable exposure times: 150µs up to 60min
Operating temperature: -10 to +50°C (30-80% RLH)	Operating temperature: -10 to +50°C (30-80% RLH)	Operating temperature: -10 to +50°C (30-80% RLH)
Cable length USB 3.0: 150cm	Cable length USB 3.0: 150cm	Cable length USB 3.0: 150cm
DC cable length power adapter: 200cm	DC cable length power adapter: 200cm	DC cable length power adapter: 200cm
CNC machined aluminium housing	CNC machined aluminium housing	CNC machined aluminium housing
Camera diameter: 80mm; length: 102mm	Camera diameter: 80mm; length: 102mm	Camera diameter: 80mm; length: 102mm
Camera weight: 0.53 kg	Camera weight: 0.53 kg	Camera weight: 0.53 kg
Camera connection diameter: 2.0 inch (50.8mm)	Camera connection diameter: 2.0 inch (50.8mm)	Camera connection diameter: 2.0 inch (50.8mm)
Camera connection thread: T2 (M42x0,75mm)	Camera connection thread: T2 (M42x0,75mm)	Camera connection thread: T2 (M42x0,75mm)
Filter thread: Yes, 2.0 inch in receptacle	Filter thread: Yes, 2.0 inch in receptacle	Filter thread: Yes, 2.0 inch in receptacle
Camera connection to PC: USB 3.0	Camera connection to PC: USB 3.0	Camera connection to PC: USB 3.0
Built-in USB hub with 2 x USB 2.0 sockets	Built-in USB hub with 2 x USB 2.0 sockets	Built-in USB hub with 2 x USB 2.0 sockets
Power supply: Power adapter 12 Volt 3.0 Ampere included	Power supply: Power adapter 12 Volt 3.0 Ampere included	Power supply: Power adapter 12 Volt 3.0 Ampere included
Software EXPLORE Capture included	Software EXPLORE Capture included	Software EXPLORE Capture included
Camera driver and ASCOM driver included	Camera driver and ASCOM driver included	Camera driver and ASCOM driver included
Operating system: WINDOWS 7, 8 and 10	Operating system: WINDOWS 7, 8 and 10	Operating system: WINDOWS 7, 8 and 10
PC requirements: CPU Intel Core2 2.8Ghz or higher / 2 GB Ram / USB 3.0	PC requirements: CPU Intel Core2 2.8Ghz or higher / 2 GB Ram / USB 3.0	PC requirements: CPU Intel Core2 2.8Ghz or higher / 2 GB Ram / USB 3.0
Field of view for different focal lengths in arc minutes and degrees:	**Field of view for different focal lengths in arc minutes and degrees:**	**Field of view for different focal lengths in arc minutes and degrees:**
400 mm - 151´x 114´ (2.5 x 1.9 degrees)	400 mm - 124´x 85´ (2.1 x 1.4 degrees)	400 mm - 124´x 85´ (2.1 x 1.4 degrees)
500 mm - 121´x 91´ (2.0 x 1.5 degrees)	500 mm - 99´x 68´ (1.7 x 1.1 degrees)	500 mm - 99´x 68´ (1.7 x 1.1 degrees)
600 mm - 101´x 76´ (1.7 x 1.3 degrees)	600 mm - 82´x 56´ (1.4 x 0.9 degrees)	600 mm - 82´x 56´ (1.4 x 0.9 degrees)
700 mm - 86´x 65´ (1.4 x 1.1 degrees)	700 mm - 70´x 49´ (1.2 x 0.8 degrees)	700 mm - 70´x 49´ (1.2 x 0.8 degrees)
800 mm - 76´x 57´ (1.3 x 0.9 degrees)	800 mm - 62´x 43´ (1.0 x 0.7 degrees)	800 mm - 62´x 43´ (1.0 x 0.7 degrees)

900 mm - 67´x 51´ (1.1 x 1.9 degrees)	900 mm - 55´x 38´ (0.9 x 0.6 degrees)	900 mm - 55´x 38´ (0.9 x 0.6 degrees)
1000 mm - 61´x 46´ (1.0 x 0.8 degrees)	1000 mm - 49´x 34´ (0.8 x 0.6 degrees)	1000 mm - 49´x 34´ (0.8 x 0.6 degrees)
1250 mm - 48´x 37´ (0.8 x 0.6 degrees)	1250 mm - 40´x 27´ (0.7 x 0.5 degrees)	1250 mm - 40´x 27´ (0.7 x 0.5 degrees)
1500 mm - 40´x 30´ (0.7 x 0.5 degrees)	1500 mm - 55´x 23´ (0.6 x 0.4 degrees)	1500 mm - 55´x 23´ (0.6 x 0.4 degrees)
1750 mm - 35´x 26´ (0.6 x 0.4 degrees)	1750 mm - 28´x 19´ (0.5 x 0.3 degrees)	1750 mm - 28´x 19´ (0.5 x 0.3 degrees)
2000 mm - 30´x 23´ (0.5 x 0.4 degrees)	2000 mm - 25´x 17´ (0.4 x 0.3 degrees)	2000 mm - 25´x 17´ (0.4 x 0.3 degrees)

Service

DE AT CH BE

Bei Fragen zum Produkt und eventuellen Reklamationen nehmen Sie bitte zunächst mit dem Service-Center Kontakt auf, vorzugsweise per E-Mail.

E-Mail: service@explorescientific.de
Telefon*:   +49 28 72 80 74 310

BRESSER GmbH
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Deutschland

*Lokale Rufnummer in Deutschland (Die Höhe der Gebühren je Telefonat ist abhängig vom Tarif Ihres Telefonanbieters); Anrufe aus dem Ausland sind mit höheren Kosten verbunden.

GB IE

Please contact the service centre first for any questions regarding the product or claims, preferably by e-mail.

e-mail: service@bresseruk.com
Telephone*:   +44 1342 837 098

BRESSER UK Ltd
Customer Support
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Enterprise Way
Edenbridge, Kent TN8 6HF
United Kingdom

*Number charged at local rates in the UK (the amount you will be charged per phone call will depend on the tariff of your phone provider); calls from abroad will involve higher costs.

FR BE

Si vous avez des questions concernant ce produit ou en cas de réclamations, veuillez prendre contact avec notre centre de services (de préférence via e-mail).

e-mail: sav@bresser.fr
Téléphone**:   00 800 6343 7000

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Pôle d'Activités de Nicopolis
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83170 Brignoles
France

**Prix d'un appel local depuis la France ou Belgique

NL BE

Als u met betrekking tot het product vragen of eventuele klachten heeft kunt u contact opnemen met het service centrum (bij voorkeur per e-mail).

e-mail: info@bresserbenelux.nl
Teléfono*:   +31 528 23 24 76

BRESSER Benelux
Klantenservice
Smirnoffstraat 8
7903 AX Hoogeveen
Nederland

*Het telefoonnummer wordt in het Nederland tegen lokaal tarief in rekening gebracht. Het bedrag dat u per gesprek in rekening gebracht zal worden, is afhankelijk van het tarief van uw telefoon provider; gesprekken vanuit het buitenland zullen hogere kosten met zich meebrengen.

ES PT

Si desea formular alguna pregunta sobre el producto o alguna eventual reclamación, le rogamos que se ponga en contacto con el centro de servicio técnico (de preferencia por e-mail).

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