



Sharp Max

Instructions for use



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1 Product safety

The unit described in this manual has been designed and tested in accordance with Carl Zeiss safety standards and with national and international regulations. A very high degree of instrument safety is thus ensured.

We would like to inform you on the safety aspects involved in operating the instrument. This chapter contains a summary of the most important precautions to be observed.

Further safety notes are also contained in other parts of this manual; they are marked with frames. Please pay special attention to these safety notes.

Safety is only ensured when this instrument is operated properly. Please read through this manual carefully before starting up this unit. You may obtain further information from our service organization.

1.1 CE marking

The version supplied of this unit meets the requirements stipulated in the 89/336/EEC "Electromagnetic Compatibility" and 73/23/EEC "Low Voltage" Directives.

1.2 Intended use

The unit must only be used for the measurements described in this manual. The manufacturer will not assume any liability for different measuring procedures.

1.3 Standards

The unit described in this manual is short-circuit-proof and has been designed in compliance with the following standards:

- **IEC / EN 61010 - 1**
- IEC / EN 60825 - 1**

The unit contains light-emitting diodes (LEDs). This is a laser class 1 instrument as defined by IEC/EN 60825-1:(2001).

The production, inspection, maintenance and repair are performed in compliance with German and international regulations (Good Manufacturing Practice).

The unit is a protection class 3 instrument.



1.4 Notes on use

General

- Do not use the unit in explosion-risk areas
- Do not station or use the instrument in damp rooms. Do not expose the instrument to water splashes, dripping water or sprayed water.
- Modifications and repairs on this instrument may only be performed by our service staff or by other persons authorized by us.
- The manufacturer shall not be liable for any damage caused by tampering with the instrument. In addition, this will forfeit any rights to claim under warranty.
- The manufacturer shall not be liable for any damage caused by the use of accessories supplied by other manufacturers. In addition, this will forfeit any rights to claim under warranty.
- Only personnel who have undergone training and instruction are allowed to use this instrument. It is the responsibility of the customer operating the instrument to train and instruct all staff using the instrument.
- Keep this user's manual where it is easily accessible at all times.

Safe working order

This instrument is a high-grade technological product. To ensure optimum performance and safe working order, we recommend having the unit checked by our service staff once every 12 months.

Requirements for operation

- A functioning 9V battery is in the battery compartment.
- An appropriate lens flange has been screwed on.
- Before use, the instrument must have been exposed for at least 2 hours to the ambient temperature of the location where the test will be performed.



2 Description of the unit

2.1 General

In digital cameras with a B4 mount, the distance between the mechanical interface (bayonet) and the CCD chip of the camera is not clearly defined. For this reason, the back focus of the lens can be varied to allow every lens to be adapted to the camera used.

Sharp Max is used to adjust this back focus of Carl Zeiss Digi Prime lenses.

A sturdy design, easy operation and high accuracy are the hallmarks of this unit. This provides the user with the following benefits:

- Due to an athermal design, the factory adjustment is maintained over a wide range of temperatures.
- No additional aids such as illumination systems, a Siemens star printed on carton, or a tape measure are needed to adjust the back focus.
- High adjustment accuracy, little time needed

For this reason, Sharp Max is particularly suitable for use by service staff and in the field during film productions.

The unit is comprised of the following main modules:

- Basic body with collimator lens, Siemens star, illumination system, battery compartment and controls
- Interchangeable lens flange

The basic configuration of the unit allows the lenses of the Carl Zeiss Digi Prime line to be tested. With different lens flanges, lenses supplied by other manufacturers can also be tested.

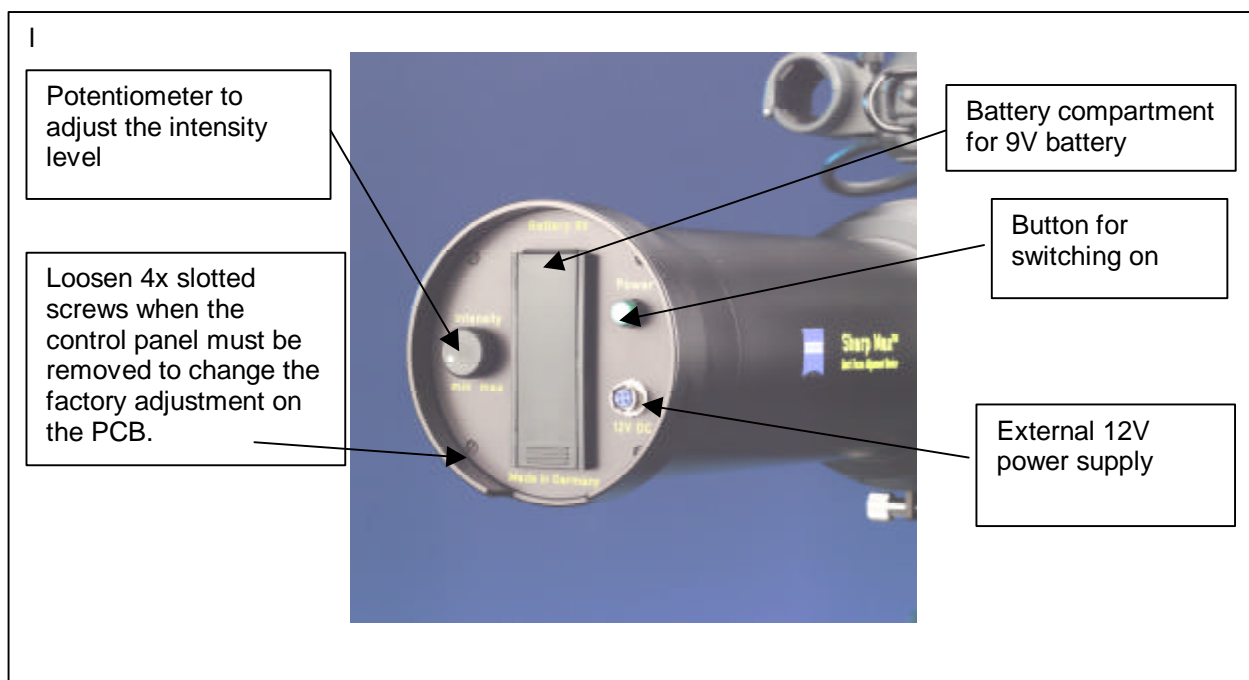
2.2 Principle of operation

A collimator lens exactly images a Siemens star illuminated by LEDs at infinity. The lens under test whose focusing ring has been set to infinity projects the image of the Siemens star onto the CCD chip. This Siemens star can be viewed through the camera's viewfinder and focused using the back focus ring of the lens.



2.3 Controls

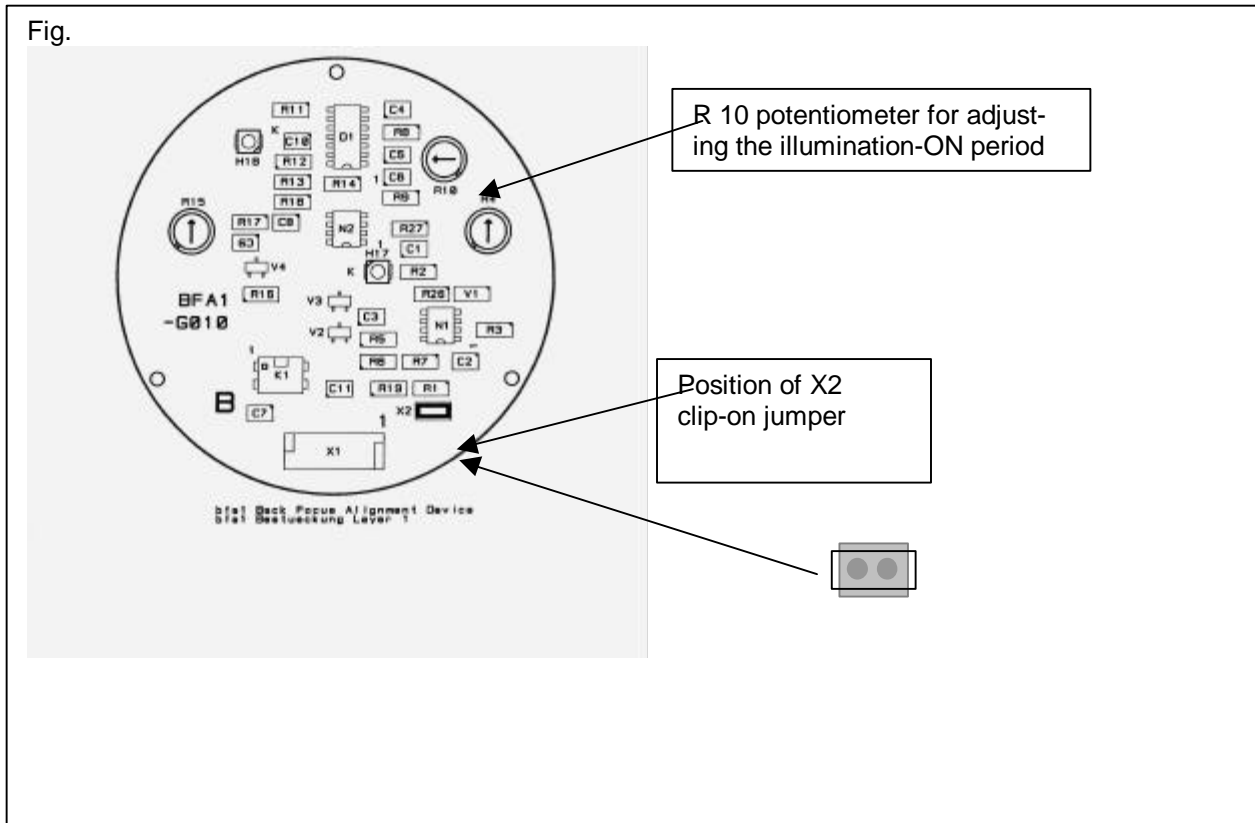
The controls and the battery compartment are located on the back of the unit, see the sketch below.



2.4 Starting up the unit

- Check that the battery is fresh: switch on the unit by pressing the power button. The light in the button must now be on. If it is not, replace the battery.
- You can use a rechargeable NiCd battery instead of the non-rechargeable standard battery supplied.
- The period during which the Siemens star is illuminated has been set to approx. 1 min in the factory. You can change this period from 1 minute to 10 minutes using the R 10 potentiometer.

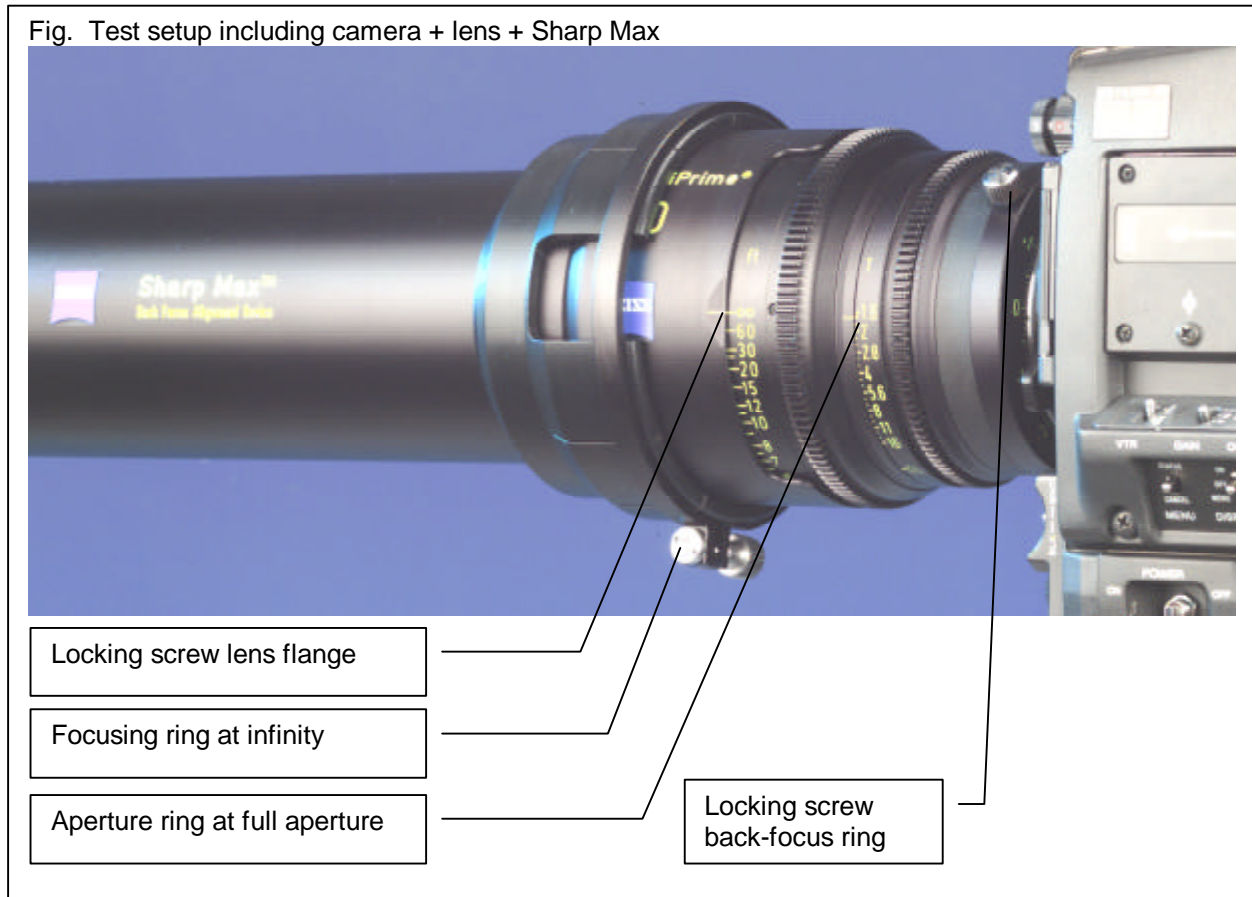
Caution: Prevent the build-up of electrical static. The components on the PCB can be destroyed by electrostatic discharge !



4 Lens testing

The following describes the testing of Carl Zeiss Digi-Prime lenses (see photo). Use the same procedure for testing the lenses from other manufacturers. However, check beforehand whether the lens flange is suited for use with the lens to be tested.

Fig. Test setup including camera + lens + Sharp Max



- Insert the lens into the bayonet of the camera.
- Turn the focusing ring of the lens to the infinity marking.
- Turn the aperture ring to maximum aperture.
- Turn the back-focus ring to the 0 marking.
- Loosen the locking screw on the lens flange of Sharp Max.
- Slip the lens flange on the Digi Prime lens.
- Slightly tighten the locking screw on the lens flange.



- Switch on the camera. Connect an external monitor to the camera, if necessary.
- Press the Power button to switch on the Sharp Max unit, view the Siemens star in the eyepiece of the camera and adjust brightness using the 'Intensity' control. If you want to reduce brightness even further, you can also swing in a neutral-density (ND) filter of the camera into the beam path. Brightness has been correctly adjusted when the circle of confusion (see below) stands out from its surroundings with high contrast and the center of the Siemens star is not affected by glare.
- Loosen the locking screw on the back-focus ring.
- View the image in the eyepiece of the camera or on the external monitor and adjust it to maximum focus. Owing to the different horizontal and vertical resolution of the CCD screen in the camera eyepiece, the circle of confusion is an ellipse. The Siemens star has been optimally adjusted when the horizontal and vertical extensions of the circle of confusion around the center of the Siemens star are minimum.
- Tighten the locking screw on the back-focus of the lens.
- Loosen the locking screw on the lens flange of Sharp Max and remove the unit from the lens.



5 Maintenance

The unit does not contain any components that need maintenance, with the exception of the battery.

We recommend you to have the unit serviced by Carl Zeiss service staff once every 12 months.

5.1 Replacing the battery

Using a small screwdriver, prize up the cover of the battery compartment. Remove the cables from the old battery and plug them onto the new battery.

Insert the battery into its compartment and press the cover down to close the compartment. Switch on the unit. The light in the 'Power' button must come on.

The electronics module does not contain any components that need maintenance!



6 Technical data

Optical data, Sharp Max

Collimator: achromat, $f = 200\text{mm}$
Exit pupil: 50mm
Siemens star: 72 sectors, smallest grating constant approx. $4.4\mu\text{m}$
Illumination: green LEDs, $\lambda 570\text{nm}$, adjustable brightness and illumination-ON period

Admissible testpiece data

Focal length: 5mm to 70mm

Ambient conditions

Temperature range: -20°C to $+40^{\circ}\text{C}$

Power supply

9V block battery, 6LR 61 type, alternatively 9V NiCd rechargeable battery or external 12V DC / 100mA power source

Options

Lens flange for lenses from other manufacturers

Subject to change.