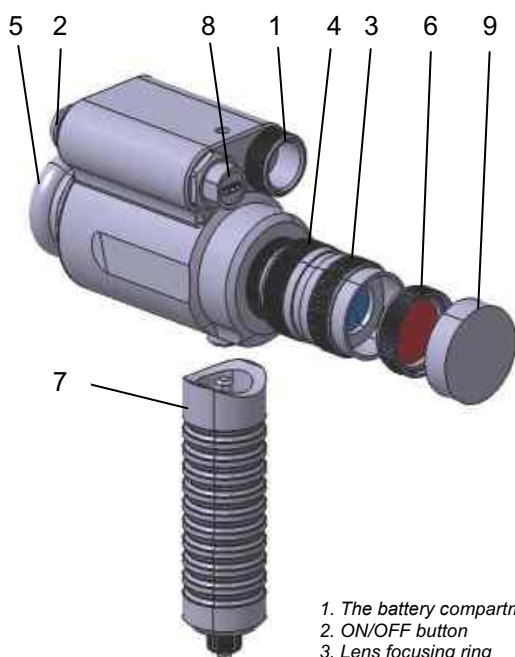


INFRARED VIEWER ABRIS-M series

USER MANUAL



1. The battery compartment cover
2. ON/OFF button
3. Lens focusing ring
4. Lens aperture ring
5. Eyepiece
6. IR filter
7. Handle
8. USB type-C interface
9. Lens cover

INTRODUCTION

High performance image conversion viewers are designed for viewing, recording and digitization of radiation emitted by ultraviolet and infrared sources in the 270...2000 nm spectral range and are ideal for a wide field of applications involving laser beam alignment and inspection, optical fiber alignment, telecommunications, photo processing, surveillance and investigation in botany, biophysics, medicine, forensics and art restoration, examine documents, records, engravings, paintings, infrared microscopy, infrared luminescence (by ultraviolet stimulation), fluorescence.

How infrared viewer works.

Infrared viewer works by focusing the infrared light reflected by or emitted from a selected subject onto the image tube. An electronic image is generated on the image tube screen in accordance with the radiation intensity and the S-1 spectral sensitivity of the photocathode material. The unit is powered from one CR123, 3V battery or one 16340, 3.7V rechargeable battery and from external power 5V with interface USB-C.

SPECIFICATIONS

Version	ABRIS-M 1X	ABRIS-M 2X	Abri-M 3X
Spectral sensitivity	ABRIS-M 1300 nm ABRIS-M 1700 nm ABRIS-M 2000 nm		ABRIS-M 1300 nm ABRIS-M 1700 nm
Resolution (center)	60 Lp/mm		
Field of view	40°	20°	14°
Magnification	1X	2X	3X
Objective lens	F1.4/26 mm	F1.4/50 mm	F2.8/75 mm
Focus	0.2... ∞ cm	0.4... ∞ cm	0.85... ∞ cm
Lens mount thread	CS - mount		
Battery	1xCR123, 3V or 1x16340, 3.7V		
Non-uniformity of screen	<20%		
Non-uniformity of response	<15%		
Distortion of image	<18%		
Battery life (continuous)	35 hours		
External power supply	DC 5B, 30 mA		
Interface	USB type-C		
Weight	0.38kg	0.42kg	0.5kg
Dimensions	145x78x52 mm		150x78x52 mm
Temperature range	-10°C...40°C		
Handle connection	R"1/4"		

Delivery set:

1. ABRIS-M
2. Lens cover
3. IR cut-off filter
4. Handle
5. Battery
6. Bag
7. Manual

THE MAINTENANCE INSTRUCTION

1. There is no danger of electric shock during the IR viewer operation.
2. When brought into a warm room from the cold outside some mist may appear on the optical elements.
3. Prevent the viewer from mechanical damage and moisture.
4. Protect the lenses from dirt. If necessary, clean them with clean soft cloth; remove oily spots or deposit with cotton with rectified alcohol or alcohol-ether mix.
5. If necessary, unscrew the lens and clean the photocathode, because the dust can be viewed through the hole of the lens cover.

Black spots on the screen.

Black spots on the screen are cosmetic blemishes in the image converter, which do not affect the performance, or reliability of an infrared viewers and some amount of varying size are inherent in the manufacturing processes.

OPERATION

CAUTION! Do not use the device for direct beam viewing. Long-term over-exposure may cause saturation of screen and decrease of resolution or irreversible reduction of photocathode response. The threshold of damage power density of the screen depends on the radiation wavelength and varies from 100mW at 800nm to 2W at 2000nm.

1. Unscrew the battery compartment cover (1). Install one CR123 size battery into the battery compartment, observing the polarity.
2. Screw ON the handle (7) into the tripod thread (1/4 inches) in body.
3. Remove the lens cover (9). Press button (2) to switch the unit ON. The button (2) will light after powered.

Note: after switching OFF, the device continues to work some minutes due to the reserved energy.

4. Rotate the ring (3) to focus the lens, set the required aperture using the ring (4). Turn the ring (5) for eyepiece focusing. Lenses 1X, 2X, 3X are exchangeable.
5. When viewing in the near-infrared range, use the cut-off filter (6) with transmission from 680 nm and further. When viewing the reflected radiation, use a metallic surface as a reflector. Any paper surface absorbs the radiation greatly.
6. The USB type-C interface (8) is designed to connect an external power sources such as a Power Bank or a network adapter.

PHOTOSENSITIVITY

The minimum detectable signal for a near-infrared viewer depends on:

- the power density;
- the wavelength of incident radiation (nm);
- the effective aperture of the objective lens;
- the distance between the spot and the viewer;
- the time duration of the signal (pulsed or continuous);
- the reflectivity of the diffusing surface;
- the sensitivity of the human eye or device used in viewing the output of the IR viewer.

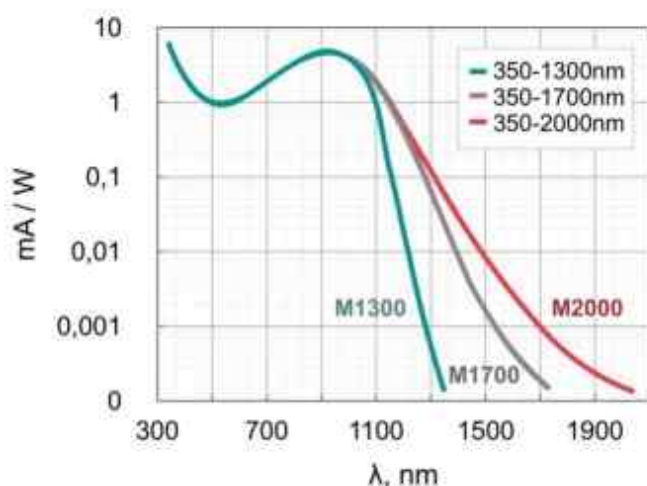
The minimum power densities (approx.) required for viewing an infrared laser beam from a one-meter distance:

- 20 $\mu\text{W}/\text{cm}^2$ for a 1,06 μm
- 500 $\mu\text{W}/\text{cm}^2$ for a 1,3 μm

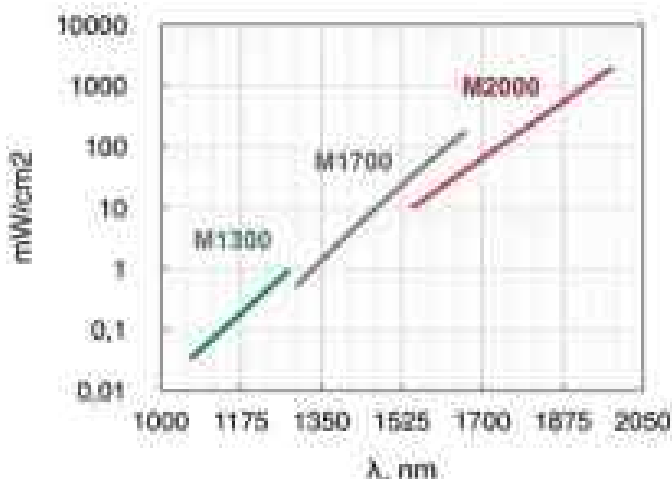
The IR viewer with sensitivity 350...2000 nm has the photocathode S-1+ type that contains the increased concentration of oxygen that provides higher sensitivity of the photocathode and moves it in the infrared area. The IR viewer can be used to view 2.0 μm laser beam at minimum power density 2 W/cm^2 . When operated in the 1500...2000 nm range, the IR viewer has a low spectral response; therefore, observations can be performed when the following requirements are met:

1. Use an IR cut-off filter or interference filter and darken the room to reduce the external background.
2. Use a metallic surface for viewing the laser infrared reflective radiation, as any paper for these purposes will absorb infrared radiation.

The Abris-M allows viewing continuous lasers radiation as well as pulsed lasers radiation with pulse duration from **ps** to **μs** without synchronization.



Spectral sensitivity for Abris M series IR viewers



Approximately minimum power densities required to view an infrared laser beam with Abris M-series from a 1-meter distance

TYPICAL SPECTRAL SENSITIVITY OF THE ABRIS-M

The minimum power density values (approx.) required to view an infrared laser beam from a one-meter distance:

ABRIS-M 1300	ABRIS-M 1700	ABRIS-M 2000
40 $\mu\text{W}/\text{cm}^2$ at 1,06 μm	500 $\mu\text{W}/\text{cm}^2$ at 1,3 μm	10 mW/cm^2 at 1,5 μm
700 $\mu\text{W}/\text{cm}^2$ at 1,3 μm	50 mW/cm^2 at 1,5 μm	50 mW/cm^2 at 1,7 μm
	150 mW/cm^2 at 1,7 μm	180 mW/cm^2 at 1,8 μm
		2 W/cm^2 at 2,0 μm

ACCEPTANCE CERTIFICATE AND MANUFACTURER'S WARRANTY

Infrared viewer ABRIS-M,

Serial № _____ Version _____

Range of spectral sensitivity _____

meets specifications of the manufacturer and declared operable.

Date of issue: _____

The warranty period of the viewer is 24 months from the date it was sold to the consumer. Please note that the batteries are not subject to the warranty coverage.

Claims to quality of work of the viewer are not accepted, and warranty repair is not made, if refusal has arisen as a result of the improper use or non-observance of service and maintenance rules. The final decision on the reason of failure of the viewer is made by experts of the company – manufacturer or distributor. The company shall not accept warranty claim:

- At non-authorized alteration,
- At opening and disassembly,
- At mechanical damages,
- At non-observance of conditions of operation.

Manufacturer: Electrooptic Ltd.
www.electrooptic.by