

Model IRV1 Infrared Viewing Device

Application

The IRV1 is a high performance infrared viewer with extended spectral sensitivity designed to observe radiation emitted by infrared sources such as GaAs IR LEDs, diode- or solid-state lasers as well as for use in industry, professional darkrooms, etc. It is a very convenient viewer for applications involving the alignment of infrared laser beams and of optical components in near-infrared systems.

The lightweight, compact device can be used handheld, post mounted with the ¼-20 internal thread, or facemask-mounted for hands-free operation.

Specifications

	IRV1-2000	IRV1-1700
Spectral response (nm)	350-2000	350-1700
Resolution (lp/mm, center)		50
Field of view (degrees)		25
Magnification		1.8X
Objective lens (mm)		F1.4/26mm
Focus (m)		0.15 to ∞
Battery type		2 x LR44
Weight (kg)		0.28
Dimensions (mm)		130 x 65 x 43
Temperature range (°C)		-10° to +40°

NOTE: Tripod or handle connection – R1/4”

Standard kit includes: IR viewer, IR filter, handle, case

Caution!

Do not use the device for direct beam viewing. Damage to the highly sensitive photocathode material will occur if the incident light on the objective lens exceeds 10mW/cm².

Long-term over-exposure may cause satiation of screen and decrease in resolution or irreversible reduction of photocathode response.

See the Warnings, Cautions, and Symbol Explanations Section of this instruction sheet.

Operation

1. Install the batteries into cell compartment (1), observing the polarity.
2. To switch on the unit, first press and then turn button (2) to the right or to the left by an angle of 90 degrees.
3. By focusing **both** the objective (3) and eyepiece (4) in turn, try achieving a bright image of the object under observation.
4. For “goggle” operation, place the IR viewer onto the “swallow tail” of the facemask, and clamp it with screw. Using the facemask screws, adjust the unit position to achieve the most convenient operation.
5. When observations are made in the near-IR, use the IR cut-off filter.





- 1.) Cell compartment
- 2.) ON/OFF switch
- 3.) Objective lens
- 4.) Eyepiece

Please note

You may notice an occasional small black spot on the viewer screen. These spots do not affect performance or reliability of the viewer and are due to cosmetic blemishes in the image converter. They are inherent in the manufacturing process.

Spectral Sensitivity of IRV1

Please note that the minimum detectable signal for a near-infrared viewer depends on the following.

- Power density
- Wavelength of incident radiation (nm)
- Effective aperture of the objective lens
- Distance between the spot and the viewer
- Time duration of the signal (pulsed or continuous)
- Reflectivity of the diffusing surface
- Sensitivity of the human eye or device used in viewing the output of the IR viewer

The minimum power densities required to view an IR beam from a distance of one meter are approximately

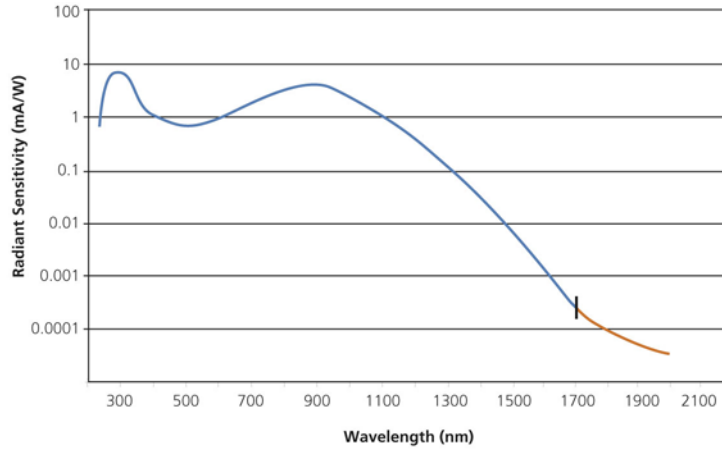
- $20\mu\text{W}/\text{cm}^2$ for a $1.06\mu\text{m}$
- $500\mu\text{W}/\text{cm}^2$ for a $1.3\mu\text{m}$

To determine the minimum power density in mW/cm^2 required to yield a detectable signal, use the following procedure. Divide the laser power in milliWatts by the area of the beam at the distance to be measured. For an elliptical beam, the area is equal to $2/3 \times w \times h$. For example, if $h = 10\text{mm}$ and $w = 40\text{mm}$, then the area of the beam = $2/3 \times 10\text{mm} \times 40\text{mm} = 2/3 \times 400\text{mm}^2 = 266.7\text{mm}^2$. To convert to cm^2 , divide by 100. Therefore, the area = approximately 2.7cm^2 . To determine the required power density, divide the laser power by the 2.7cm^2 figure. For example, if the laser output is 5mW , the required power density will be $5\text{mW}/2.7\text{cm}^2$, or $1.85\text{mW}/\text{cm}^2$.

For a circular beam, area is equal to $\pi \times r^2$, where r = the radius of the beam. For example, if both the height and width of a beam at the distance to be measured are 5mm , then the area of a beam at this distance = $3.14 \times 2.5\text{mm}^2$ (half the diameter, squared) = $3.14 \times 6.25\text{mm} = 19.6\text{mm}^2$. Divide by 100 to convert to cm^2 , so the area = approximately $.19\text{cm}^2$. Now divide laser power by $.19\text{cm}^2$ to determine the required power density. For example, if the laser output is 5mW , the required power density will be $5\text{mW}/.19\text{cm}^2$, or $26.31\text{mW}/\text{cm}^2$.

The drawing on the following page illustrates the typical spectral response of our IRV1 viewer.



**Accessories available upon request:**

1. Facemask for hands-free operation.
2. Neutral density filter
3. Iris diaphragm



WARNINGS, CAUTIONS, AND SYMBOL EXPLANATIONS



General Warning or Caution: The Exclamation Symbol in the figure above appears on the product and in Warning and Caution tables throughout this document. This symbol designates that documentation needs to be consulted to determine the nature of a potential hazard, and any actions that have to be taken.



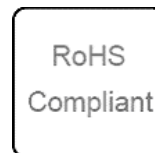
Electric Shock: The Electrical Shock Symbol in the figure above appears throughout this manual. This symbol indicates a hazard arising from dangerous voltage. Any mishandling could result in irreparable damage to the equipment, and personal injury or death.



CE Symbol: The presence of the CE Mark on Newport Corporation equipment means that this instrument has been designed, tested and certified compliant to all applicable European Union (CE) regulations and recommendations.




Waste Electrical and Electronic Equipment (WEEE): This symbol on the product or on its packaging indicates that this product must not be disposed with regular waste. Instead, it is the user responsibility to dispose of waste equipment according to the local laws. The separate collection and recycling of the waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For information about where the user can drop off the waste equipment for recycling, please contact your local Newport Corporation representative.




Control of Hazardous Substances (RoHS): This label indicates the products comply with the EU Directive 2002/95/EC that restricts the content of six hazardous chemicals.



Warnings, Cautions, and Notes: The following are definitions of the Warnings, Cautions and Notes that are used throughout this manual to call your attention to important information regarding your safety, the safety and preservation of your equipment or an important tip.

	<p>WARNING</p> <p>Situation has the potential to cause bodily harm or death.</p>
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	<p>CAUTION</p> <p>Situation has the potential to cause damage to property or equipment.</p>
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NOTE

Additional information the user or operator should consider.

General Warnings:

Observe these general warnings when operating or servicing this equipment:

- Heed all warnings on the unit and in the operating instructions.
- Do not use this equipment in or near water.
- Remove the battery before cleaning the instrument. Do not use liquid or aerosol cleaners; use only a damp lint-free cloth.
- To avoid explosion, do not operate this equipment in an explosive atmosphere.


General Cautions:

Observe these cautions when operating this equipment:







- If this equipment is used in a manner not specified in this manual, the protection provided by this equipment may be impaired.
- Do not block ventilation openings.
- Use only the specified replacement parts and accessories.
- Follow precautions for static sensitive devices when handling this equipment.
- This product should only be powered as described in the manual.
- There are no user-serviceable parts inside the Model IRV2 instrument.
- Adhere to good laser safety practices when using this equipment.

Summary of Warnings and Cautions:

The following general warning and cautions are applicable to this instrument:

	<p>WARNING</p> <p>Before operating the Model IRV1 Infrared Viewing Device, please read and understand this entire instruction sheet.</p>
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	<p style="text-align: center;">WARNING</p> <p>Do not attempt to operate this equipment if there is evidence of shipping damage or you suspect the unit is damaged. Damaged equipment may present additional hazards to you. Contact Newport technical support for advice before attempting to operate damaged equipment.</p>
	<p style="text-align: center;">WARNING</p> <p>Before cleaning the enclosure of the Model IRV1 Infrared Viewing Device, the batteries must be removed from the instrument.</p>
	<p style="text-align: center;">CAUTION</p> <p>There are no user serviceable parts inside the Model IRV1 Infrared Viewing Device. Work performed by persons not authorized by Newport Corporation will void the warranty.</p>
	<p style="text-align: center;">WARNING</p> <p>If this equipment is used in a manner not specified in this manual, the protection provided by this equipment may be impaired.</p>
	<p style="text-align: center;">WARNING</p> <p>This instrument is intended for use by qualified personnel who recognize shock hazards or laser hazards and are familiar with safety precautions required to avoid possible injury. Read this instruction sheet thoroughly before using, to become familiar with the instrument's operations and capabilities.</p>
	<p>The Model IRV1 Infrared Viewing Device is intended for use in an industrial laboratory environment. Use of this product in other environments, such as residential, may result in electromagnetic compatibility difficulties due to conducted as well as radiated disturbances.</p>



Warranty and Repair Return Policy

Newport Corporation warrants that this product will be free from defects in material and workmanship and will comply with Newport's published specifications at the time of sale for a period of one year from date of shipment. If found to be defective during the warranty period, the product will either be repaired or replaced at Newport's option.

To exercise this warranty, write or call your local Newport office or representative, or contact Newport headquarters in Irvine, California. You will be given prompt assistance and return instructions. Send the product, freight prepaid, to the indicated service facility. Repairs will be made and the instrument returned freight prepaid. Repaired products are warranted for the remainder of the original warranty period.

Newport is not responsible for damage occurring in transit and is not obligated to accept products returned without an RMA#.

Limitation of Warranty

The above warranties do not apply to products which have been repaired or modified without Newport's written approval, or products subjected to unusual physical, thermal or electrical stress, improper installation, misuse, abuse, accident or negligence in use, storage, transportation or handling. This warranty also does not apply to fuses, batteries, or damage from battery leakage.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE. NEWPORT CORPORATION SHALL NOT BE LIABLE FOR ANY INDIRECT, SPECIAL, OR CONSEQUENTIAL DAMAGES RESULTING FROM THE PURCHASE OR USE OF ITS PRODUCTS.

This manual has been provided for information only and product specifications are subject to change without notice. Any change will be reflected in future printings.

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EU Declaration of Conformity

We declare that the accompanying product, identified with the **CE** mark, complies with requirements of the Electromagnetic Compatibility Directive, 2004/108/EC and the Low Voltage Directive 2006/95/EC.

Model Numbers: IRV1-series and IRV2-series

Year CE mark affixed: 2011

Type of Equipment: Electrical equipment for measurement, control and laboratory use in industrial locations.

Manufacturer: Newport Corporation

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United States of America

Standards Applied:

Compliance was demonstrated to the following standards to the extent applicable:

BS EN61326-1: 2006 “Electrical equipment for measurement, control and laboratory use – EMC requirements”.

This equipment meets the CISPR 11:2009+A1:2010 Class A Group 1 radiated and conducted emission limits.



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