Model IRV2 Infrared Viewing Device

Application

The IRV2 is a high performance infrared viewer designed to observe radiation emitted by infrared sources.

The lightweight, compact device can be used handheld, post mounted with the ¼-20 internal thread, or facemask-mounted for hands-free operation. The IRV2 works from one AAA type battery with 35 hours of permanent work or from an external power supply with 3VDC (not supplied by Newport). It is a very convenient device for any OEM integration.

Specifications

	IRV2-270	IRV2-2000	IRV2-1700	IRV2-1300
Spectral response (nm)	270-1700	350-2000	350-1700	350-1300
Resolution (lp/mm, center)	30	60		
Magnification	1X	1X or 2.5X		
Objective lens	F1.6/26mm quartz without iris	F1.4/26mm without iris (1X) or F2/50mm with iris (2.5X)		
Field of view (degrees)	20	40 with 1X lens, 20 with 2X		
Focus (m)	0.15 to ∞	0.15 to ∞		
Battery type	1 x AAA	1 x AAA		
Input voltage from external power source (VDC/mA max)*	3/20	3/20		
Weight (kg)	0.38	0.38 with 1X, 0.42 with 2.5X		
Dimensions (mm)	155 x 78 x 55	155 x 78 x 55mm with 1X, 220 x 78 x 55mm with 2.5X		
Temperature range (°C)	-10° to +40°	-10° to +40°		

* While the IRV2 can be powered from an external power source, Newport recommends against doing so. If the user chooses to power the instrument in this manner, then the user MUST verify that the power supply selected conforms to all applicable safety and EMC regulations.

NOTE: Tripod or handle connection – R1/4”

Standard kit includes: IR viewer, IR filter, handle, 1x and 2x lenses, 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/cm^2.

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 battery into cell compartment (1), observing the polarity.
2.) To switch on the unit, press button (2).
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.

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1.) Cell compartment
2.) ON/OFF switch
3.) Objective lens 1X or 2X
4.) Cut-off filter (700-1700nm)
5.) Eyepiece
6.) Plug for DC 3V power
7.) Handle
8.) DC 3V control diode

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.

Accessories available upon request:

1.) Facemask for hands-free operation.
2.) Neutral density filter
3.) CCD camera adapter
4.) Microscope adapter
5.) Iris diaphragm

Spectral Sensitivity of IRV2

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

- 20µW/cm^2 for a 1, 06µm
- 500µW/cm^2 for a 1, 3µm

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 x w x h. For example, if h = 10mm and w = 40mm, then the area of the beam = 2/3 x 10mm x 40mm = 2/3 x 400mm^2 = 266.7mm^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 2.7 cm^2 figure. For example, if the laser output is 5mW, the required power density will be 5mW/2.7 cm^2, or 1.85mW/ cm^2.

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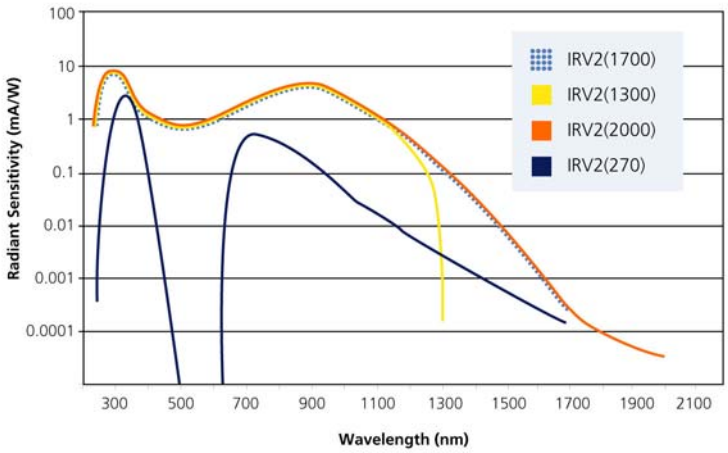
For a circular beam, area is equal to Π **x r^2**, where r = the radius of the beam. For example, if both the height and width of a beam at the distance to be measured are 5mm, then the area of a beam at this distance = 3.14 x 2.5mm^2 (half the diameter, squared) = 3.14 x 6.25mm = 19.6mm. Divide by 100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

The drawing below illustrates the typical spectral response of our IRV2 viewer.



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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.

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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.

⚠	**WARNING** **Situation has the potential to cause bodily harm or death.**

⚠	**CAUTION** **Situation has the potential to cause damage to property or equipment.**

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:

⚠	**WARNING** **Before operating the Model IRV2 Infrared Viewing Device, please read and understand this entire instruction sheet.**

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⚠	**WARNING** **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.**

⚠	**WARNING** **Before cleaning the enclosure of the Model IRV2 Infrared Viewing Device, the battery must be removed from the instrument.**

⚠	**CAUTION** **There are no user serviceable parts inside the Model IRV2 Infrared Viewing Device. Work performed by persons not authorized by Newport Corporation will void the warranty.**

⚠	**WARNING** **If this equipment is used in a manner not specified in this manual, the protection provided by this equipment may be impaired.**

⚠	**WARNING** **If this equipment is powered via an external supply, the user must verify that the supply conforms to all applicable safety regulations.**

⚠	**WARNING** **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.**

CE	**The Model IRV2 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.**

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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.

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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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