Infrared Viewers

High-performance IR Viewing Devices

Applications

- Telecommunications
- Photo processing
- Thermal imaging
- IR luminescence
- Semiconductor inspection
- IR microscopy
- Art restoration
- Spectroscopy
- Fiber optic diagnostic
- Laser beam alignment
- Optical fiber alignment
- Forensics

Our infrared viewing devices are excellent choices for a variety of applications requiring observation of light emitted by IR sources. We offer five models of infrared viewers.

The IRVH(1700) is a hybrid-intensified CCD camera with an infrared image converter. The IRVH features an integrated 4-inch TFT-LCD display and is designed for viewing radiation in the 350 to 1700nm spectral region. The unit enables recording and digitization of images using a PC and may be hand-held or used with a tripod.

Our IRVM is a CCD camera that allows for viewing and recording of radiation in the 400 to 1700nm spectral range. The IRVM features a built-in 4-inch TFT-LCD monitor for digital viewing of images. The unit may be hand-held or used with a tripod.

The IRVE is a compact CCD camera designed for viewing, registering, and recording radiation in the 400 to 1700nm spectral range. The device features a highly sensitive, low noise silicon CCD sensor with increased sensitivity in near-infrared light regions. The IRVE does not include a TFT-LCD monitor.

Our miniature IRV1 viewers are available in two versions: one with a spectral response that extends from 350 to 2000nm and one with a 350 to 1700nm spectral response. A facemask is available for those requiring hands-free operation. Users may also mount the viewers on a post via the 1/4-20 internal threads, or they may use them as hand-held devices.

Our IRV2 units are hand-held viewers designed for observing radiation in the 350 to 2000, 350 to 1700nm, 350 to 1300nm, or even 270 to 1700nm spectral range. These devices may be post-mounted using their 1/4-20 internal threads or attached to a facemask for hands-free operation.

In addition to our IR viewers, we offer a variety of laser modules that can host diodes with wavelengths in the infrared, up to 1600nm. We also offer a variety of accessories for our viewers, as may be seen on the following pages.

Specifications	IRVH(1700)	IRVM	IRVE	IRV1(2000) / IRV1(1700)	IRV2(270)	IRV2(2000) / IRV2(1700) / IRV2(1300)
Spectral response	350-1700	400-1700	400-1700	350-2000 / 350-1700	270-1700	350-2000 / 350-1700 / 350-1300
System resolution	300 TV lines	570 TV lines	570 TV lines	50 lp/mm	30 lp/mm	60 lp/mm
Field of view (degrees)	25 with 1X lens, 12 with 2.5X lens	20	20	25	20	40 with 1X lens 18 with 2.5X
Standard lens	1X (F1.4/26mm)	1X (F1.4/26mm)	1X (F1.4/26mm)	1.8X (F1.4/26mm)	1X(F1.6/26mm)	1X (F1.4/26mm)
Optional lens	2.5X (F2/58mm)	2.5X (F2/58mm)	2.5X (F2/58mm)	4X (F2/58mm)	-	2.5X (F2/58mm)
Focus (m)	0.15 with 1X lens 0.25 with 2.5X lens	0.15	0.15	0.15 to ∞	0.15 to ∞	0.15 to ∞ with 1X, 0.25 to ∞ with 2.5X
S/N ratio (dB)	>40	46	48	-	-	-
Video output	RCA connector	std composite, 1Vp-p, 75, RCA	std composite -	-	-	
Input volt (VDC/mA max)	12/350	12/400	10-14/150	-	3/20	3/20
Battery type	4xAA, 1xAAA	4xAA	-	2xLR44	1xAAA	1xAAA
Battery life (contin., hrs)	1.4 (AA), 50 (AAA)	1	-	18 (typical)	35	35
Temperature range (°C)	0 to +40	+5 to +40	+5 to +40	-10 to +40	-10 to +40	-10 to +40

Power Technology Incorporated

DS_IR Viewers 5-05

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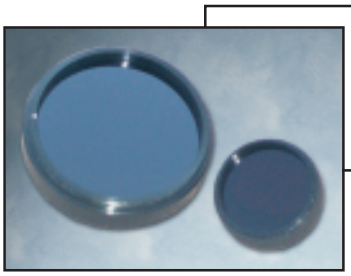
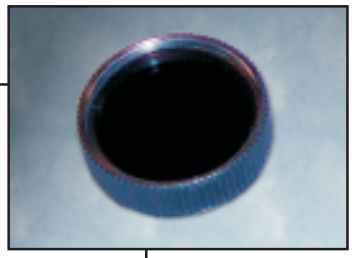
A variety of accessories are available to enhance the capabilities of each viewer and to make them more suitable for your application.

1 **Microscope adapter**
Interfaces between the objective lens of viewer and microscope eyepiece.
Suitable for IRVH, IRVM, IRVE, IRV1, and IRV2.



2 **Infrared cut-off filter**
Absorbs visible light and transmits only infrared light.
Suitable for IRVH, IRVM, IRVE, IRV1, and IRV2.

3 **Neutral-density filter**
Used to decrease high power radiation from YAG and other solid-state lasers. Transmits light at 1064nm only; transmission of ND filter is 3 to 5% at this wavelength.
Suitable for IRVH, IRVM, IRVE, IRV1, and IRV2.



4 **Face mask**
Fully adjustable with flip-up mechanism and left/right eye rail adjustment.
Suitable for IRV1 and IRV2.

5 **Infrared illuminator**
Detachable and focusable. Intended for darkroom applications and for increased contrast in infrared images. Not intended for viewing lasers or IR radiation. Specially designed lens system allows illumination of objects up to 20 meters in total darkness. Beam focus can be adjusted from 10 to 30 degrees.
Suitable for IRV1 and IRV2.

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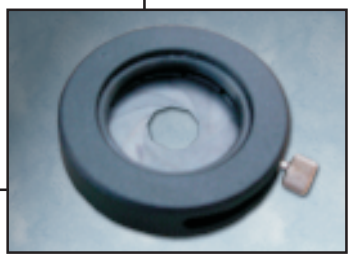
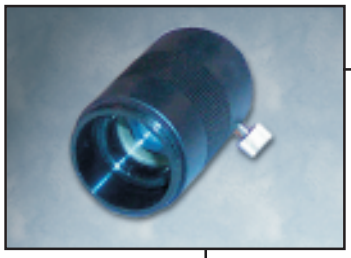
6 **AAA battery adapter**
Can be mounted to the battery compartment of viewer to enable use with two AAA batteries. Continuous time of operation increases by 100 hours.
Suitable for IRV1.

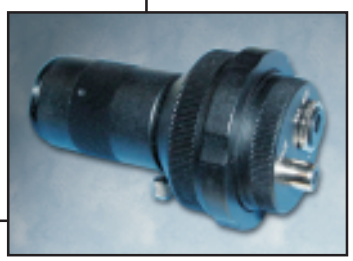
7 **Iris diaphragm**
Enables user to control intensity of the light that radiates on the viewer's detector surface. Optional for use with F1.4/26mm and F1.6/26mm lenses. Has a fixing screw and 2-20mm level adjustable aperture.
Suitable for IRVM, IRVE, IRV1, and IRV2.





8 **C-Mount adapter for CCD camera**
Interfaces between the IRV2 viewer (350 to 1300nm, 350 to 1700nm, and 350 to 2000nm versions only) and any user-supplied C-standard CCD camera for video registration. A four-inch LCD-TFT monitor is available.
Suitable for IRV2.

9 **CCD camera option**
Designed for viewing, recording, and digitizing images in a near-IR spectral band. Ideal for real-time, hands-free monitoring. Unit's relay lens transmits light from the image converter screen to a high resolution CCD camera (570 TV lines, 1/3") without any distortions and with minimal loss of radiation.
Suitable for IRV2.

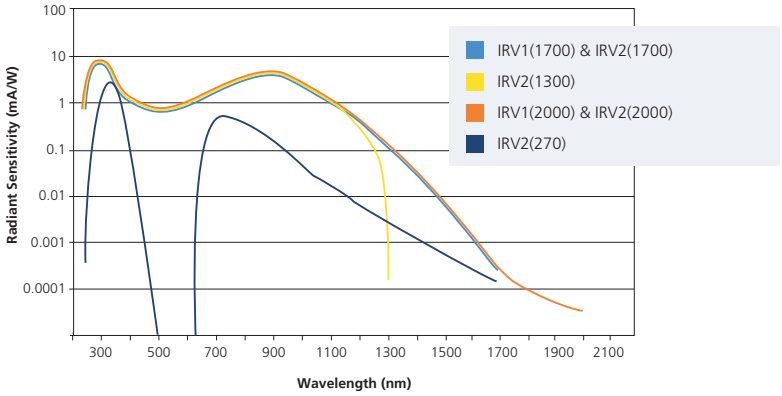


10 **2.5X lens**
Provides 2.5X magnification of an object. Lens is physically compatible with the IRV2(270) but not optically compatible, as it does not transmit light below 350nm. Lens includes built-in iris, as well as an IR viewer adapter, distance ring, and IR cut-off filter.
Suitable for IRVM, IRVE, IRVH, IRV2(2000), IRV2(1700), and IRV2(1300).

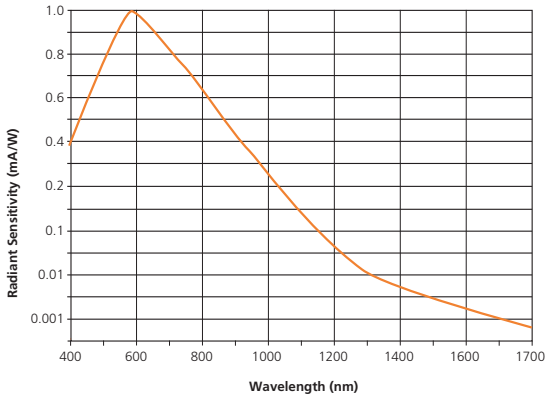
If you have questions about any of our IR viewers or accessories, give one of our sales engineers a call at **501.407.0712,** or email us at **sales@powertechnology.com**.

Typical Spectral Response of IR Viewers

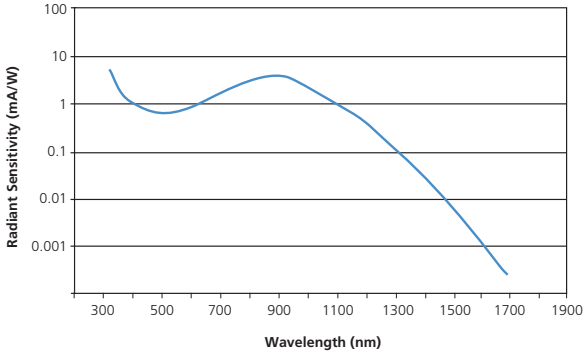
IRV1 & IRV2



IRVM & IRVE



IRVH



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

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

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.

For a circular beam, area is equal to $\prod$ **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 0.19cm^2. Now divide laser power by 0.19cm^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.

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