FAQ ElectroViewer 7215 Frequently Asked Questions (and their answers)

Can I see an infrared laser beam in "mid-air" with my ElectroViewer?

It is a misconception that an IR viewer can be used to view infrared laser beams in "mid-air". However, as with the beam from a flashlight, if dust particles are in the beam path, the beam will become partly visible. Ordinarily, IR viewers can be used to see the projection of the infrared beam spot on a flat diffusing surface such as a white card.

How sensitive is my ElectroViewer?

The minimum detectable signal for a near-infrared viewer depends upon a large number of factors, namely: the wavelength of incident radiation (μm), the power density (density of radiation in $\mu W/cm^2$ at the faceplate), 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.

With detailed information on all these relevant factors and the spectral response characteristic (shown on the ElectroViewer Technical Data Sheet), the viewing performance can be precisely calculated. As an approximation, the following are the minimum power densities required to view an infrared laser beam from a distance of approximately one meter: $30\mu W/cm^2$ for a 1.06μm laser, $600\mu W/cm^2$ for a 1.3μm laser, and $10\ mW/cm^2$ for a 1.5μm laser diode. Other intermediate values can be estimated by considering the spectral response characteristic.

How much more sensitive is the ElectroViewer 7215P over the standard 7215?

The Premium extended ElectroViewer is a "selected" version of the 7215 and exhibits exceptional performance at longer wavelengths. In both versions, the photocathode material is cesium-based exhibiting an S1 spectral response characteristic. However, the improved performance is due to lower noise levels rather than higher sensitivity at longer wavelengths.

How does the ElectroViewer 7215 compare with a CCD camera?

Firstly, it is important to note that the ElectroViewer 7215 is a Viewer and not a video camera. The image output is not rasterized and can only be viewed optically; there is no electronic signal output. (Video output from the 7215 can be obtained with the use of the video relay lens adapter, part number 7215-202). Because CCD cameras utilize silicon-based detectors, certain models can be used to observe near-infrared radiation at wavelengths up to about 1.1μm. However, because these cameras are designed for optimum performance in the visible wavelength range, as a result, they exhibit mediocre performance in the near-infrared range. Image bleeding, blooming, low sensitivity and low contrast imaging are some of the observed characteristics.

The ElectroViewer produces significantly better results for viewing radiation at wavelengths longer than about 0.75μm.

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FAQ ElectroViewer 7215 Frequently Asked Questions (continued)

How can I use the ElectroViewer 7215 to align an infrared emitter and detector separated by a distance?

Since the ElectroViewer 7215 cannot see laser beams in mid-air, to align a narrow laser beam so that it illuminates an infrared detector located at some distance away, we recommend the following procedure:

1) Start at the infrared emitter side.
2) Place a white card (such as a white business card) in the beam path and view the diffuse reflection of the beam on the card.
3) Follow the beam from the emitter to the detector by moving the card along the beam path and viewing the reflection with the ElectroViewer. If the distance between the emitter and detector is very far (one mile, for example), it may be more expedient to begin at the detector and view the emitter. Although this is a more difficult alignment procedure, in the latter situation, moving the emitter will brighten and darken the beam as viewed at the detector.

Do I need to use eye safety goggles when I use the ElectroViewer?

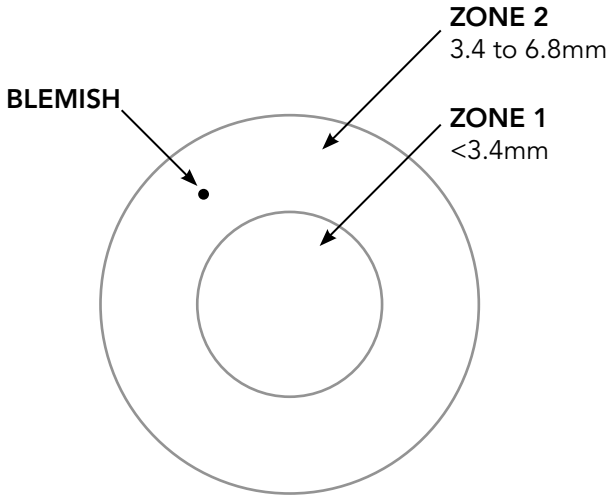
YES. An IR Viewer is not a replacement for eye-safety equipment. It is not designed to withstand high power laser beams. In fact, the ElectroViewer has been designed to accommodate the use of these goggles and still permit a clear view of the infrared image.

What happens when the 7215-202 CCD relay lens is used on 2/3" cameras?

The 7215-202 was designed for use on 1/2" format CCD cameras. If this relay lens is used on a 2/3" camera, the video image will vignette and show an infrared image surrounded by a dark circle. The circle will have a diameter approximately equal to the picture width (so only the corners of the image will show dark). If the 7215-202 relay lens is used on a 1/3" CCD camera, the center of the image will be magnified and no vignetting will appear. Note that the 7215-202 has been designed for use on C-mount cameras — not CS-mount. For the use on the latter, a 5mm spacer will be required.

Why are there small black spots in the image of my IR viewer?

Small black spots can be found for several reasons. Because the image converter tube utilizes high voltage signals, the front and back face plates very often attract dust. These can easily be removed with a cotton swab or lens cleaning cloth. In addition, because of the manufacturing processes involved in producing all similar electro-optical devices, sometimes very small cosmetic blemishes can actually occur inside the image converter tube. These black spots do not affect the performance or reliability of the near-infrared viewer. We select only those image converters that have blemishes smaller than the maximum size constraints shown in the image below. For example, a blemish in the central part of the image can only be as large as 0.13mm (<2% of the screen size).



MAXIMUM BLEMISH SIZE CONSTRAINTS

REGION	7215	7215P
ZONE 1	<0.13mm	<0.05mm
ZONE 2	<0.33mm	<0.10mm

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