

# The Photo Research® SpectraMetrics™ PR®-1530AR NviSpot™ Night Vision Radiometer/Photometer/Colorimeter

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The NviSpot Night Vision Radiometer/Photometer/Colorimeter is a multi-purpose instrument designed to meet the NVIS radiance light measurement compatibility requirements of MIL-L-85762 for NVIS applications, and also perform the conventional fast and accurate luminance and colorimetric light measurements long associated with the PR-1500 SpotMeter.®

It consists of a modified Pritchard®-type filtered photometer system with interchangeable objective lenses and an internal calibration source. For NVIS measurements it includes a proprietary, filtered, extended-red gallium arsenide photomultiplier tube with overload protection, threshold detection and an NVIS-compatible digital display readout. Although the NviSpot does not replace the requirement for a laboratory-grade spectroradiometer specified in the MIL Spec, it does provide a relatively inexpensive and highly accurate means of light measurement for all phases of production and quality testing.

## NVIS RADIANCE MODE

For the Aviators Night Vision Imaging System (NVIS) applications, the PR-1530AR includes a special filter/detector combination whose transmission curve precisely matches the NVIS relative response curve in MIL-L-85762.

When operated in the NVIS Mode, the NviSpot display reads out in NVIS Radiance (AR) units (watts/cm<sup>2</sup>/steradian). Relative colorimetric filters are optionally available for evaluating the color of the device under test, i.e., Green A, Green B and Yellow.

The digital display of the PR-1530AR is specifically NVIS-filtered to eliminate any inaccuracy its own light output might introduce into the test results.

A very important feature in the NVIS Mode is the user adjustable threshold detection. An audible tone is generated when the display reading exceeds the maximum value of AR units set by the user for the device and/or test. This feature enables the PR-1530AR to be used as a rapid GO/NO-GO test instrument for on-line inspection of a series of devices that share a common AR upper limit, for instance  $1.7 \times 10^{-10}$  AR units. An optional

fiber optic probe, the LP-15, further enhances the GO/NO-GO testing feature. Optional CATS EYE measuring capability will be made available.

The calibration accuracy required by MIL-L-85762 is assured through the inclusion of an extremely stable internal reference standard. Correct calibration can be instantly verified at any time without the need for any external calibration sources or relying upon some vague factory calibration. And to prevent accidental damage to the sensitive photodetector, a resettable automatic overload protection circuit has been designed into the PR-1530AR.

Lens accessories are available to modify the field coverage of the PR-1530AR over the entire range of devices likely to be measured for NVIS requirements. A uniquely shaped fiber optic probe, the LP-15, is available for measurements best suited to its field coverage capabilities. Analog output is included, and a BCD output is optionally available to permit interfacing to a host computer or data-logger.

## LUMINANCE/COLORIMETER MODES

While the NviSpot is designed primarily for measurements relating to MIL-L-85762, it also functions as an extremely sensitive luminance and colorimetric measuring instrument. In this mode it acts as a high performance PR-1500 SpotMeter. Many of the standard PR-1500 accessories can be used with the NviSpot to extend its versatility to include the features currently available with the PR-1500 SpotMeter.



## FEATURES

- NviSpot for direct NVIS (AR) measurements and GO/NO-GO testing
- Adjustable sensitivity threshold (AR units) with beeper
- Stand-alone, high-performance, photopically corrected Filter Photometer
- NVIS Radiance measurements of Green A, Green B, or Yellow panels or filters
- Resettable detector overload protection with beeper
- Illuminance/Irradiance measurements (with optional accessories)
- Relative colorimetric measurements of NVIS devices (optional)
- Capabilities of the PR-1500 SpotMeter (see Product Bulletin 560)
- Internal calibration source
- NVIS compatible readout
- Wide range of optical accessories

## SPECIFICATIONS

- Measuring field aperture**—3 degrees
- Spot size\***—3° to 0.003 inches, (0.016 inches standard) (See Table I)
- Spectral response (NVIS filtered)**—per MIL-L-85762 (450 nm to 930 nm)
- Spectral response (photopic)**—380 nm to 760 nm
- Photometric accuracy**— $\pm 5\%$  or reading  $\pm 1$  digit (whichever is greater)
- Readout**—3½ digits green LED display (filtered for NVIS compatibility)
- Output signals**—0–2 volts analog standard; BCD parallel optional
- Sensitivity**— $10^{-4}$  to  $10^4$  footLamberts,  $10^{-11}$  to  $10^{-3}$  AR units
- Power**—117  $\pm$  13 volts, 50 to 400 Hz, 5 watts max. (230  $\pm$  40 volts available on request)
- Size**—12½ inches (31.3 cm)  $\times$  6¼ inches (15.9 cm) high  $\times$  5¾ inches (14.6 cm)
- Weight**—8½ pounds (3.6 Kg)

**TABLE I: FIELD COVERAGE AND RELATIVE SENSITIVITY**

Lens/* Optical Accessory	Lens-to- Subject Distance	Nominal Field Coverage	Relative** Sensitivity Multiplier
MS-55 (1X)	1.75 in. (44.5 mm) to infinity	0.114 in. (2.90 mm) (at 1.75 in.)	1.
MS-1X	3.8 in. (96.5 mm)	0.114 in. (2.90 mm)	1.
MS-2.5X	1.76 in. (44.7 mm)	0.046 in. (1.17 mm)	1.
MS-77 (3X)	4.1 in. (104 mm)	0.038 in. (0.97 mm)	1.
MS-5X	1.11 in. (28.2 mm)	0.023 in. (0.58 mm)	1.
MS-7X (Standard Objective)	0.7 in. (17.8 mm)	0.016 in. (0.41 mm)	1.
MS-10X	0.61 in. (15.5 mm)	0.011 in. (0.29 mm)	10.
MS-25X	0.6 in. (15.24 mm)	0.005 in. (0.12 mm)	100.
MS-50X	0.6 in.	0.003 in. (0.06 mm)	100.
LP-15	Contact	0.015 $\times$ 0.090 in. (0.38 $\times$ 2.29 mm)	10.

\*All lenses are fixed focus except the MS-55 Lens. Contact factory for lenses of other field coverages.