

# PHOTO RESEARCH®

## PR-920 Digital Video Photometer (DVP)

**Innovation** - Photo Research developed the first commercially available video photometer over 15 years ago. We are proud to introduce our newest and most advanced video photometer - the **PR-920 Digital Video Photometer (DVP)**. Our video photometers are being used world-wide for applications ranging from FAA testing of radar screens to ISO certification of information displays.

**Digital Precision** - The heart of the new **PR-920** is a thermoelectrically cooled, 1024 x 1024 element digital CCD camera which helps to make it the most accurate, sensitive and repeatable video photometer in its class. Because the **PR-920** detector consists of 1.048 million pixels, superior spatial resolution is guaranteed.

**Hand Matched Filters** - In addition to the proprietary camera design, the detector response of each **PR-920** is painstakingly matched to the CIE  $V(\lambda)$ , (photopic) response by our proprietary filter matching techniques that have been developed over the last 50 years. Our filter matching experience, combined with an individual calibration of each and every

detector element means that the **PR-920** delivers the most accurate measurement results of any commercially available video photometer. In addition to the standard photopically matched filter, the **PR-920** can be equipped with high-accuracy, hand-matched CIE Tristimulus filters (option CFS-302).

**Versatility** - The **PR-920** is the only commercially available video photometer that utilizes a focusable objective lens as standard equipment providing capability of addressing virtually any application without change lenses. System versatility is further enhanced by 5 neutral density filters, giving the **PR-920** the widest measuring range of any video photometer available today.

**Standard Equipment - System** - Optical Head, Controller, Cables **Optical Head** - CCD Camera,

Dual Filter Turrets (CIE Photopic and 5 Neutral Density filters) **Controller** - Pentium III based controller with monitor, keyboard and mouse **Software** - **PanelWin™** or **VideoWin™**. **Calibration** - Certified for 6 months **Certification and Instruction Manual**.

### Options:

- CIE Tristimulus (Xr, Xb, Z) Filters (P/N CFS-302 or CFS-302C)
- High Resolution Positioning Stages
- PR-650 SpectraScan for Color Measurements (P/N CFS-302A)
- Remote Control Software - Control VideoWin or PanelWin Macros from a Host PC over an RS-232 interface.
- Absolute spatial calibration (line width, profile capability)

### Measurement Capabilities

- |   |   |
|---|---|
| • Luminance                             | • Convergence (opt.)                        |
| • Luminance Uniformity and Profile      | • Modulation Transfer Function (MTF) (opt.) |
| • Pseudo Color Luminance Representation | • Flicker (opt.)                            |
| • Line Width, Profile (opt.)            | • Jitter (opt.)                             |
| • CIE Chromaticity (opt.)               | • Geometric Distortion (opt.)               |



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## PR-920 Lens Capability Chart

Objective Lens Magnification	Working Distance	Minimum Resolution	Minimum Line Width (5 pixels across line)	Field of View Horizontal & Vertical
<b>MS-50</b>				
0.02X	99.33 in. (2.52 m)	0.024 in. (600 μm)	0.118 in. (3.00 mm)	23.91 in. (60.7 cm)
0.5X	4.84 in. (12.3 cm) At Infinity	9.45e-4 in. (24 μm) 50.4 arc sec.	4.75e-3 in. (120 μm) 4.14 arc min.	0.956 in. (24.3 mm) 13.7 deg.
<b>OL-VM Vari. Mag.</b>				
0.8X	3.86 in. (98 mm)	5.91e-4 in. (15 μm)	2.95e-3 in. (75 μm)	0.383 in. (9.72 mm)
4X	3.86 in. (98 mm)	1.18e-4 in. (3 μm)	5.91e-4 in. (15 μm)	0.077 in. (1.95 mm)
<b>OL-8X</b>	2.95 in. (75 mm)	5.91e-5 in. (1.5 μm)	2.95e-4 in. (7.5 μm)	0.038 in. (972 μm)
<b>TL-210</b> (Focusable from 60.0 cm to infinity)	23.6 in. (60.0 cm) 4.92 ft (1.50 m) At infinity	9.45e-4 in. (24 μm) 2.97e-3 in. (75.4 μm) 11.8 arc sec.	4.72e-3 in. (120 μm) 1.49e-2 in. (377 μm) 58.9 arc sec.	0.956 in. (24.3 mm) 3.01 in. (76.3 mm) 3.312 deg.

## PR-920 Performance Specifications

Resolution:	CCD - 14 Bit    A/D - 16 Bit    CCD Pixel - 1024 x 1024
CCD Pixel Size:	12 μm x 12 μm
Standard Filters:	Photopic (f <sub>1</sub> ' ≤ 3%), ND-0.2, 0.5, 1.0, 1.5, 2.0, OPEN
Variable Focusing Range:	12.3 cm to infinity with standard MS-50 Lens
Minimum Measuring Area:	≥ 120 μm with MS-50 (see Lens chart)
Field of View	24.3 mm with standard MS-50 Lens (see Lens chart)
Measurement Time Range:	100 msec to 60 sec
Calibration Uncertainty:	± 5% (Absolute) ± 2% (Relative to NIST traceable 2856 K standard)
Luminance Precision:	± 0.25% at 0.3 cd/m <sup>2</sup> against 2856K standard (10x10 pixel avg.)
Linearity (f3):	≤ 0.2% per ND filter position, ≤ 1% Overall (10x10 pixel avg.)
Polarization (f8):	≤ 1%
Spatial Uniformity:	± 2% (10x10 pixel avg.)
Luminance Range (10x10 pixel):	0.01 to 14,389,000 cd/m <sup>2</sup>
Color Accuracy @ 0.3 cd/m <sup>2</sup> (10x10 pixel average):	± 0.0015 x, ± 0.001 y at 2856K- (CFS-302 option) ± 20 Kelvin meas. blackbody @ 2000K-3000K - (CFS-302 option)
Color Repeatability (10x10 pixel):	± 0.0008 for CIE x,y at 0.3 cd/m <sup>2</sup> , 2856K - (CFS-302 option)
Power Requirements:	90 to 240 VAC 50 - 60 Hz
Operating Temps. / Humidity:	5° to 30°C (41° to 86°F) / ≤ 90% Non-Condensing