

PHOTO RESEARCH[®], Inc.

The PR[®]-9000 FPD Tester

Photo Research has been the leading supplier of light measurement equipment to the display industry for more than 50 years. Our world renowned expertise in display measurement has culminated in the development of an integrated, turnkey FPD Tester, the PR[®]-9000, that combines speed and precision to reduce test times by several hours in both R&D and QC/QA environments.



PR-9000 Features and Benefits

- The system incorporates Photo Research photometers and spectroradiometers that are the industry standard.
- It tremendously reduces setup and test time for fully characterizing an FPD display.
- The flexible design makes it possible to measure FPD and CRT displays of varying sizes.
- Software has capability to perform manual measurements or VESA and User-Defined test sequences.
- THE PR-9000 does accurate and repeatable measurements of Luminance, Contrast, Chromaticity, Correlated Color Temperature (CCT) and Spectral Power Distribution (SPD).

The Photo Research PR-9000 is a completely automated Flat Panel Display (FPD) Inspection System that offers a fast and reliable solution for FPD manufacturers and their customers to solve brightness and color quality problems. The PR-9000 completely characterizes an FPD over its entire range of viewing angles by performing accurate measurements of luminance, contrast and chromaticity.

Open Architecture guarantees flexibility - The PR-9000 includes world renowned Photo Research photometers and spectroradiometers, a 5-axis positioning stage and Display Under Test (DUT) fixturing mounted on a high quality optical bench.

Three linear stages (X,Y and Z) move the measuring instruments and two rotary stages (θ and ϕ) position the DUT. The rotary stages allow rotation and elevation so that the DUT can be tested at a multitude of viewing angles.

A wide range of stage sizes are available depending on the size and weight of the DUT. The unique two-part design of the linear and rotary stages gives the user the flexibility of placing the DUTs in an environmental chamber, while the measuring instruments are positioned outside the chamber.

The DUT fixturing can be custom designed to meet the needs of low volume quality control testing, or high volume 100% manufacturing inspection. It can even be configured for a standard hole pattern mount with mechanically keyed components. The standard fixturing will accommodate a wide variety of FPD and CRT monitors.

Joysticks are used to manually position the 5-axis stage, while video camera feedback allows the user to conveniently and precisely position the measuring instruments in front of the desired area on the DUT.

Easy-to-use Software - The PR-9000 software allows full control of the 5-axis stage, DUT pattern generation and measuring instruments. The Graphical User Interface (GUI) allows the user to make individual measurements, or follow predefined test sequences recommended by the Video Electronics Standards Association (VESA). The software has an Automatic Mode, so that user-defined test sequences can be recorded and executed. The measured data can either be printed as predefined test reports (VESA compliant), saved as ASCII formatted files or graphically displayed as isometric spatial plots or CIE chromaticity diagrams.

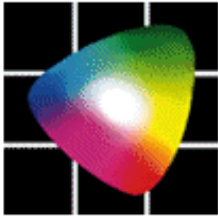
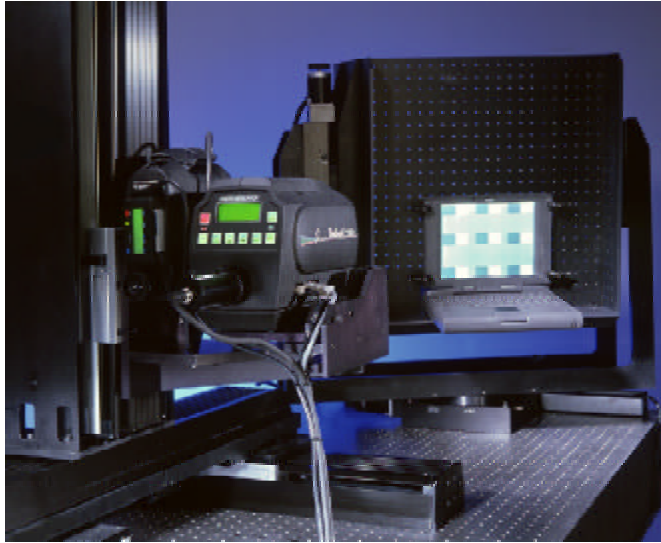


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Contact us for a demonstration of the PR-9000.

State-of-the-Art Instruments Are the Difference - The PR-9000 incorporates Photo Research instruments of proven quality that deliver exceptional performance for measuring FPD and CRT displays. The instruments incorporate Pritchard spot optics that provide unambiguous alignment on the area being measured. Field coverages start at 0.125 mm permitting measurements of extremely small areas. These instruments are designed for accurate display measurement and feature low errors due to polarization and lens flare.

The fully automated PR[®]-880 colorimeter is already the instrument of choice worldwide for ATE testing of FPDs. It has a highly sensitive Photomultiplier Tube (PMT) detector for fast testing of contrast. Each PR-880 used on PR-9000 systems is supplied with tristimulus filters that are individually matched to the 1931 CIE functions to ensure the best color accuracy possible from a filter colorimeter.

Spectroradiometers have the highest accuracy for color measurements and the portable PR[®]-650 is the ideal instrument for chromaticity testing of FPDs. The newly released PR-705 is a state-of-the-art spectroradiometer with multiple measuring apertures that combines spectroradiometric accuracy, with the sensitivity to measure light levels as low as 0.003 cd/m².

PR-9000 Specifications

Main Component	Sub-Component	Specification	Main Component	Sub-Component	Specification
System Controller	Processor	Pentium Pro Class	Goniometer	DUT Movement	± 90° (Both θ and φ)
	Operating System	Microsoft Windows NT 4.0		Unidirectional Repeatability	0.5 Arc mins.
Motion Base	XYZ Linear axes travel	30.5cm - 1.07m		Accuracy	10 Arc mins.
Light Measuring Devices	Positional Accuracy	1.50μm / cm (7.75μm / m max.)		Runout	± 76μm
	Straightness	0.80μm / cm (4.64μm / m max.)		Concentricity	± 0.127mm
	Bi-directional Repeatability	± 5.08μm		Payload Weight	20 pounds typ.
Joysticks	Photometer Colorimeter	PR-880 with RS-232 I/F PR-650 / PR-705 with RS-232 I/F		DUT Fixturing	¼-20 thread, 53.3cm x 53.3cm screw mount platform with adjustable rear support
Options	Software	XYZ, θ and φ		Motor Type	Microstepping NEMA size 23
	Pattern Generator	VESA Measurement Suite		Motor Controller	Single cooled full-tower computer enclosure
	Interfaces	Single PC board with SVGA, RS-232 (or user defined I/F).		Optical Bench	10.2cm x 15.2cm x 20.3cm
	Encoders	RS-422, IEEE-488	Monitoring System	Camera	B/W CCD with power supply, instrument eyepiece adapter and cables
	Viewfinder	Optical absolute		Display	B/W CRT
		Color camera, (B/W standard)			