

## Model 45-545A: Digital Laser Power Meter

### Intermediate level radiometer for more advanced laser and photonic educational programs

The model 45-545A digital laser power meter is a multi-purpose instrument with the degree of accuracy required for many research applications and CDRH compliance measurements. This unit features settings for standard and peak/hold radiometric measurements and percentage mode for calibrating/measuring to user-defined standards. The meter employs a low-power LCD with large, 12 mm-high numerals.



In standard and peak/hold radiometric modes, the meter's four ranges display full-scale readings of 19.99  $\mu$ W, 199.9  $\mu$ W, 1.999 mW and 19.99 mW.

The detector head is black anodized aluminum for durability, 25 mm in diameter and 30 mm in depth. A 0.5 m retractable, shielded cable electrically connects the detector head to the meter's internal electronics. A snap-mount on the side chassis secures the head when not in use. Optical sensor and filters in shock-resistant mounts are located inside the head.

An analog signal, proportional to the optical power on the detector, is available from a BNC output terminal. It may be used to drive strip charge recorders, oscilloscopes and other devices. Analog output ranges from 0 to +2 volts. Signals up to 100 kHz can be detected and amplified by the optical detector and internal circuitry. (This allows the meter to demodulate audio signals from lasers in educational demonstrations.)

Calibration is within 5 percent of full scale at intensity stabilized 635nm diode laser light. For monochromatic light of other wavelengths within 500 to 950 nm, a built-in radiometric filter corrects to within 20 percent of standard. A chart in the manual lists nominal response from 450 to 950 nm.

The power meter is enclosed in a 20 x 914 x 9 cm housing and has an operating range from 10-30° C.

### Features:

- Easy-to-read digital readout
- Zero offset adjustment to compensate for ambient light
- Has a radiometric mode in 100 percent offset control; displays readings directly as percentages
- Detachable detector head with threaded mounting hole for use on a ringstand or optical bench
- Calibration charts and instruction guides included
- Dual-powered (110 VAC or two 9V batteries for portability)

## LASER CLASSIFICATIONS

All manufacturers of lasers used in the United States, must conform to regulations administered by the Center for Devices and Radiological Health (CDRH), a branch of the U.S. Department of Health and Human Services. CDRH categorizes lasers as follows:

### Class 1

A laser or laser system which does not present a hazard to skin or eyes for any wavelength or exposure time. Exposure varies with wavelength. For ultraviolet, .2 to .4 $\mu$ m exposure is less than from .8 or near IR, the exposure is < 200 $\mu$ w. Consult CDRH regulations for specific information.

### Class 2

Any visible laser with an output less than 1 mW of power. Warning label requirements — yellow caution label stating maximum output of 1 mW. Generally used as classroom lab lasers, supermarket scanners and laser pointers.

### Class 3a

Any visible laser with an output over 1 mW of power with a maximum output of 5 mW of power. Warning label requirements — red danger label stating maximum output of 5 mW. Also used as classroom lab lasers, in holography, laser pointers, leveling instruments, measuring devices and alignment equipment.

### Class 3b

Any laser with an output over 5 mW of power with a maximum output of 500 mW of power and all invisible lasers with an output up to 400 mW. Warning label requirements — red danger label stating maximum output. These lasers also require a key switch for operation and a 3.5-second delay when the laser is turned on. Used in many of the same applications as the Class IIIa when more power is required.

### Class 4

Any laser with an output over 500 mW of power. Warning label requirements — red danger label stating maximum output. These lasers are primarily used in industrial applications such as tooling, machining, cutting and welding. Most medical laser applications also require these high-powered lasers

