

NightMeter™ Light Trespass System

Model NM10



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The NightMeter™ system is a portable, integrated group of meters and accessories for the measurement of luminous intensity. It may be used to check compliance of lighting systems to outdoor lighting codes and ordinances.

Light trespass from outdoor lighting systems is increasingly becoming regarded as objectionable, unnecessary and wasteful of energy. The problem is usually related to luminaires that have inadequate optical control, resulting in light that spills over boundary lines and that also may be perceived as glare. The degree to which a lighting fixture is objectionable can be quantified by the illuminance (lux or footcandles) it produces at the eye, and by the intensity of light that the luminaire emits in particular directions. (See references 1 and 2).

Measuring of light trespass quantities has been a problem in the past, but

with the introduction of the Model NM10 NightMeter™ by Lighting Sciences Inc., such measurements now can be readily made.

The NightMeter provides the capability of measuring the intensity in candelas (candlepower), of a single luminaire or selected group of luminaires from an observation point. It combines a telescopic photometer and a laser rangefinder to allow direct measurement of eye illuminance and distance, and computes luminaire intensity.

Lighting Sciences' NightMeter is portable and can be mounted on a tripod.



System Components

The NightMeter system consists of:

Telephotometer

This is a combination telescope and digital photometer, which is aimed at the luminaire to be measured. It incorporates a variable iris under operator control, which may be set from a medium angle down to a narrow spot. Using the medium angle setting, the operator can readily sight through the meter and aim it towards the luminaire or group of luminaires of interest. The luminaire to be measured is centered on the cross-hairs, and the iris diameter is then reduced by the operator to exclude all sources of light other than what is to be measured. Of course, to measure the total light from a group of luminaires, the iris may be kept in its open position.

Digital Rangefinder

A laser-based rangefinder is incorporated into the system, and is used to measure distance to the luminaire(s). The system memorizes the distance reading in case it is desired to analyze multiple luminaires on the same pole.

Microprocessor and Digital Display

Signals from the telephotometer and rangefinder are transmitted to a microprocessor via suitable amplifier and interface electronics. The digital display module indicates luminaire intensity in candelas, automatically calculated using the inverse square law.

Accessories

A rugged carrying case, adjustable tripod and pan-tilt mounting head are included.

Range of Measurements

Candela:	1 to 1,000,000+ cd
Distance:	0 to 3280 ft (1000 m) typical; 6560 ft (2000 m) max to reflective target
Telephotometer full field of view:	0.01 to 1.0 degrees, variable iris
Receptor:	Silicon photocell, corrected to CIE photopic response
Display:	LCD readout, 2 lines

Operating Conditions

Temperature:	4°C – 44°C (40°F – 110°F)
Humidity:	0 – 75% (non-condensing)

Dimensions and Weights

Meter:	Length: 62.2 cm (24.5") Width: 13.3 cm (5.25") Height: 19.0 cm (7.5") Weight: 4.08 kg (9 lbs)
Carrying/Storage Case:	104.1 cm x 35.5 cm x 40.6 cm (41" x 14" x 16") Total weight of system, including accessories, is 48 lbs.
Batteries:	(2) AA alkaline for rangefinder (1) 9 volt alkaline for processor



Operation

The NightMeter is simple to operate.

- 1.) Aim laser range finder at the desired target using the pan-tilt knobs on the tripod.
- 2.) Press fire button on range finder to initiate a distance measurement, which will be transmitted to the microprocessor and displayed on the LCD screen. Any number of range distance measurements may be made before the illuminance is measured and intensity calculated.
- 3.) Center the image of the light source(s) to be measured in the eyepiece of the illuminance meter's telescope using the pan-tilt knobs on the tripod. The variable iris is used to limit the field of view (acceptance angle) around the desired light source to isolate it from nearby sources.
- 4.) Press fire button on hand-held remote wand to initiate an illuminance measurement. Multiple illuminance measurements are automatically made, averaged and then the calculated intensity is displayed on the LCD.

About Lighting Sciences Inc.

Since 1979, Lighting Sciences has offered an ever-broadening variety of consulting and independent testing services in addition to developing a range of specialized test equipment. Our advanced laboratories include a vast array of instrumentation calibrated and maintained to meet stringent industry and government specifications. Also, our development and testing facilities are a perfect solution for small companies without their own Research and Development departments or for supplementing facilities found in overworked larger companies or government agencies. If you require your own test equipment for laboratory or quality control, we have a wide range of photometric and electrical test systems available. Our staff is also available to design and manufacture customized equipment that you may need.

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“Excellence in Photometrics”

References:

1. Publication TM-11-00 of the Illuminating Engineering Society of North America. “Light Trespass: Research, Results and Recommendations.” IESNA, New York.
2. Lewin, Ian. “Further Consideration of Obtrusive Light.” Proceedings of the Spring 2007 meeting of the Roadway Lighting Committee of the Illuminating Engineering Society of North America. Tucson, Arizona, March 2007. Available by contacting Lighting Sciences Inc.