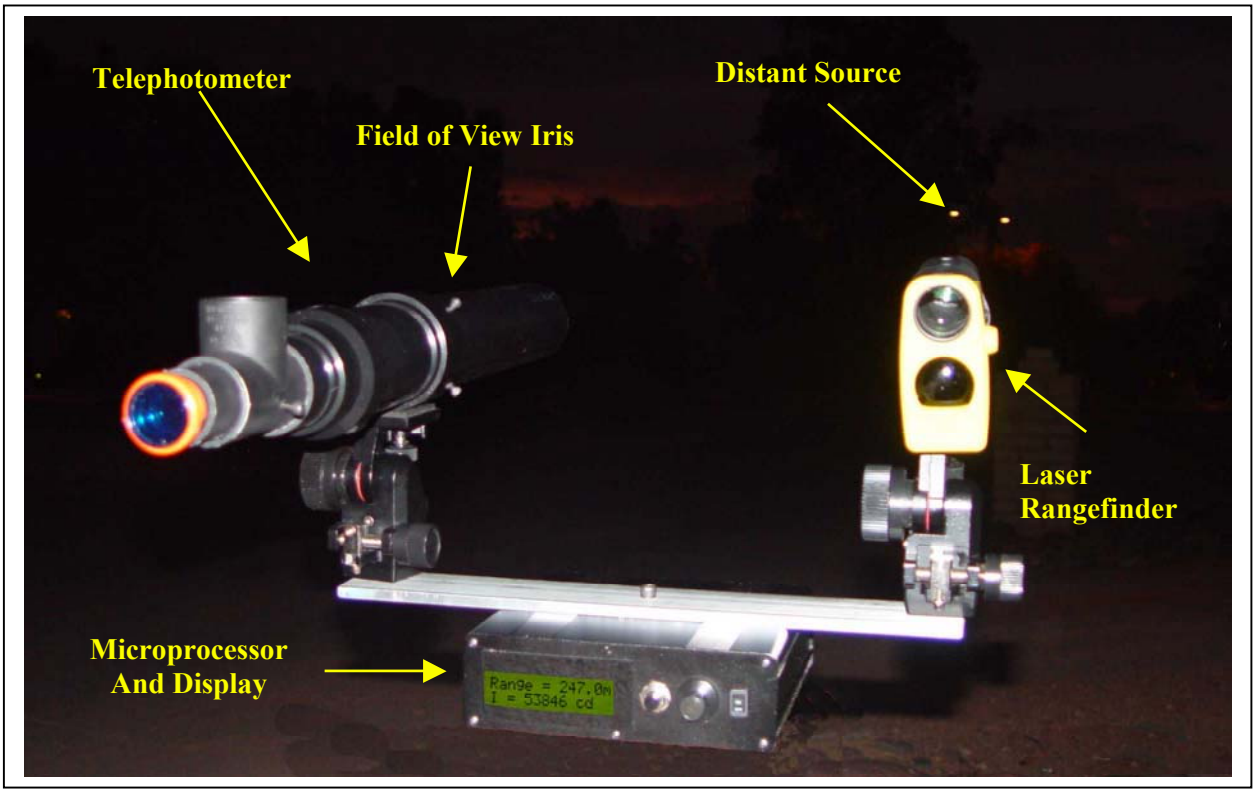
NightMeter™ Light Trespass System

Model NM10



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 the luminaire from an observation point. It also is able to measure the illuminance at the eye from a single luminaire or selected group of luminaires. 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 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 either eye illuminance in lux, or luminaire intensity in candelas, automatically calculated using the inverse square law.

- **Coming soon…**

  Illuminance Measurement Gimbal Mount. (Optional) The photo detector is removable from the telephotometer, and can be inserted into a special purpose gimbal mount. The gimbal device provides automatic leveling of the photo detector for the measurement of horizontal illuminance. The signal is sent to the electronic interface and microprocessor, giving a direct digital reading in lux.

  The gimbal mount device incorporates a swivel feature that allows the photo detector to click into a vertical measurement plane. It again self "levels" in the vertical plane, and the digital display provides readings of vertical lux.

  The illuminance gimbal mount may be placed on any surface sloping as much as 30° from horizontal and the photo detector will self level. It may also be tripod mounted, as may be useful for self "leveling" in a vertical orientation.

Range of Measurements

Distance: 0 to 3280 ft (1000 m) typical; 6560 ft (2000 m) max to reflective target

Illuminance (horizontal, vertical or eye): 0.001 to 1500 lux (0.01 to 150 fc)

Telephotometer field of view: 0.15 to 0.80 degrees, variable iris

Dimensions

Telephotometer: Length: 70 cm (26 ins.)
Diameter: 6 cm (2.5 ins.)

Rangefinder: 13 x 9 x 4 cm (5.25 x 3.5 x 1.6 ins.)

The complete system may be placed in a carrying case (optional) measuring approximately 69 x 48 x 36 cm (27 x 19 x 14 ins.).

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 photometeric 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.