

- *Temperature range from +5°C to +85°C (TEC heating and cooling)*
- *Interchangeable sockets for all common high-power LEDs and small Level 2 printed circuit boards*
- *Accuracy to 0.1°C*
- *Maximum LED power rating of 10 W*



WE BRING QUALITY TO LIGHT

LED-850

TEC Test Adapter for High-Power LEDs

High-power also means high-temperature

The temperature of the LED's chip has an enormous influence on the light output emitted and on the radiation spectrum (LED color). This interdependency must be taken into account particularly in the case of high-power LEDs because the high operating temperatures lead to an

undesirable deterioration in performance (i.e. reduction in their light output). To be able to integrate high-power LEDs successfully in final applications, it is therefore essential to understand the optical properties as a function of the temperature.



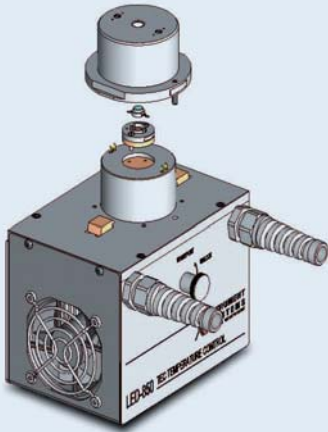
INSTRUMENT SYSTEMS
LIGHT MEASUREMENT

Measuring thermal behavior with the LED-850

TEC test adapter LED-850 enables the influence of electrical and thermal operating conditions on the optical parameters of high-power LEDs to be assessed quickly and easily. A Peltier element with cooler fan is used to cool or heat the test LED within a range

between +5 and +85°C. What's more, the integral PT100 sensor and the Peltier element can be connected to a TEC controller that controls and displays the temperature. Robust test probes also ensure reliable electrical contacting of the LED.

Modular design for flexible usage



The modular system consists of the basic LED-850 unit with Peltier element and heat sink, and a socket (with centering cap) specifically matched to the respective model of high-power LED. A mechanical locking lever locks the centering cap securely in place, guaranteeing correct mounting of the LED every time. The centering cap also provides the electrical connection.

Two types of centering caps are available:

- A sand-blasted, white anodized cap for measuring the luminous flux using integrating spheres (this centering cap belongs to the scope of delivery of the LED socket)
- A black anodized cap for measuring the luminous intensity using CIE compliant, LED25-xxx series averaged LED intensity adapters (cap optional)



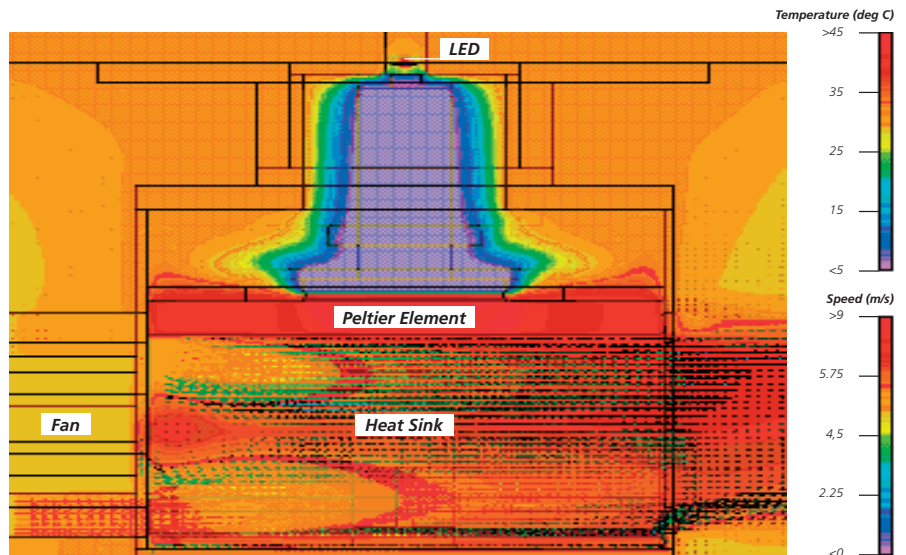
Rapid change-over of the LED socket

The LED socket can be changed over easily and quickly. The modular design principle makes it possible to test various types of LED using just a single base unit and interchangeable sockets. The range of LED sockets (with matching centering cap) covers all commonly available high-power LEDs from the world's leading LED manufacturers, as well as Level 2 printed circuit boards (e.g. Luxeon Star). Customer-specific adapters can also be supplied on request.



Efficient heat transfer using a copper-zirconium rod

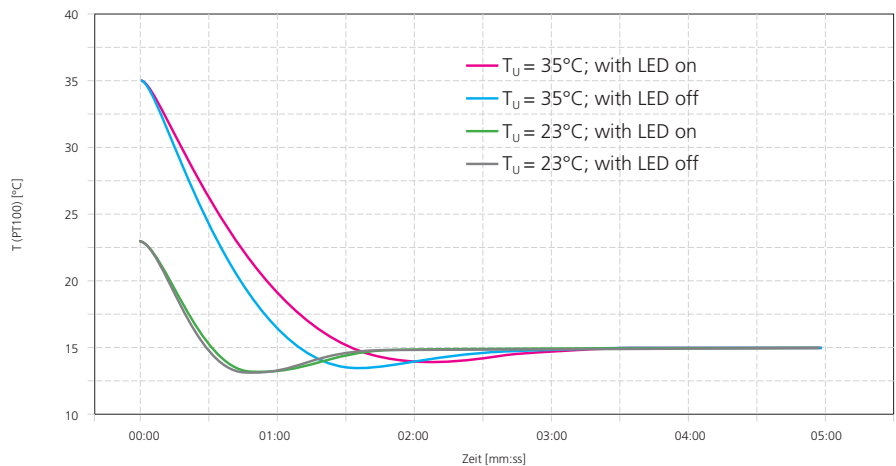
Thermal simulation results: The LED is efficiently cooled and the heat at the Peltier element dissipated by means of the heat sink



The temperature of the LED is controlled by means of a gold-plated copper-zirconium rod that is pressed against the heat-conducting slug of the LED's housing by springs. The high thermal conductivity of the copper-zirconium rod and the Peltier element – with maximum cooling/heating capacity in excess of 120 W – allow the temperature to be set quickly to the desired value within a

range from +5 to +85°C. In addition, a large heat sink and a fan assist efficient dissipation of the heat loads. This results in temperature control times of just a few minutes. What's more, a PT100 temperature sensor that guarantees setting accuracy down to 0.1°C is housed in the copper-zirconium rod beneath the contact surface for the LED.

Setting time from ambient temperature ($T_u=23^\circ\text{C}$ and 35°C) to 15°C ; LED power dissipation 5 W; Peltier power rating 50W; PID parameters: $P=80$, $I=0.3$, $D=0$



Precise 4-wire system for electrical contacting

Electrical contacting of the LED is provided by a four-wire system, a set of test probes and contact springs in the centering cap. This enables not only the operating current to be applied but also the forward voltage to be measured

precisely at the same time. TEC test adapter LED-850 is rated for LED power ratings of up to 10 W. The test probes can easily be changed by users themselves.

Power supply and TEC controller

Instrument Systems recommends the TEC 2510 Sourcemeeter made by Keithley for controlling the temperature. We have developed control software for this device that is included in the scope of delivery of the LED-850. This user-

friendly software can be used to automate measurements. A Keithley 2400/2600 series source-meeter is highly suitable as the current source. Instrument Systems has developed software for this device, too.

Specifications

Thermal specifications	
Temperature control accuracy	+/- 0.1°C
Maximum temperature	85°C
Minimum temperature	5°C
Temperature control time to obtain min. and max. temperatures	8 min
Thermal resistance from LED slug to PT 100	2 K/W
Electrical specifications	
Max. current of Peltier element	8.5 A
Max. voltage of Peltier element	14.4 V
Max. power dissipation of LED	10 W
Operating conditions	
Temperature range	15°C – 35°C
Max. humidity	70% rF
General specifications	
Outside dimensions (H, W, D)	135 x 140 x 160 mm
Weight	2.5 kg

Ordering information

Order No.	Description
TEC test adapter LED-850	
LED-850-0	Base unit with active TEC cooling and heating; including universal mount for LED adapters with 50-mm diameter; for LEDs and LED clusters with max. 10 W power dissipation; incl. PT100 temperature sensor and 4-wire connection; socket for specific LED package not included.
LED-851-1	Socket for LUMILEDS LUXEON EMITTER LEDs (Type: Batwing, Lambertian, High Dome); socket dimensions: 7.95 x 7.3 mm; incl. centering cap with 50 mm diam. for luminous flux measurement
LED-851-1-3	Centering cap with 50 mm diam. for luminous intensity measurement; for LUMILEDS LUXEON EMITTER socket LED-851-1
LED-851-2	Socket for LUMILEDS LUXEON K2 LEDs; socket dimensions: 7.5 x 7.5 mm; incl. centering cap with 50 mm diam. for luminous flux measurement
LED-851-2-3	Centering cap with 50 mm diam. for luminous intensity measurement; for LUMILEDS LUXEON K2 socket LED-851-2
LED-851-5	Socket for LUMILEDS LUXEON STAR LEDs; centering cap with 50 mm diam. for luminous flux measurement
LED-851-5-3	Centering cap with 50 mm diam. for luminous intensity measurement; for LUMILEDS LUXEON STAR socket LED-851-5
LED-852-1	Socket for OSRAM OS GOLDEN DRAGON LEDs; socket dimensions: 7.1 x 6.1 mm; incl. centering cap with 50 mm diam. for luminous flux measurement
LED-852-1-3	Centering cap with 50 mm diam. for luminous intensity measurement; for OSRAM OS GOLDEN DRAGON socket LED-852-1
LED-853-1	Socket for CREE XLamps 7090 LEDs; socket dimensions: 7.2 x 9.2 mm; incl. centering cap with 50 mm diam. for luminous flux measurement
LED-853-1-3	Centering cap with 50 mm diam. for luminous intensity measurement; for CREE XLamps 7090 socket LED-853-1
LED-854-1	Socket for NICHIA JUPITER NCCx022 LEDs; socket dimensions: 7.4 x 8.9 mm; incl. centering cap with 50 mm diam. for luminous flux measurement
LED-851-1-3	Centering cap with 50 mm diam. for luminous intensity measurement; for NICHIA JUPITER NCCx022 socket LED-854-1
Accessory	
LED-710	Keithley Sourcemeter 2400 (IEEE-488 interface for PC and interface cable are not included)
LED-730	Keithley TEC Sourcemeter 2510 (IEEE-488 interface for PC and interface cable are not included)

INSTRUMENT SYSTEMS GmbH

Neumarkter Str. 83
D-81673 Munich, Germany
Tel.: +49 89 454943-0
Fax: +49 89 454943-11
e-mail: info@instrumentsystems.de
www.instrumentsystems.de

