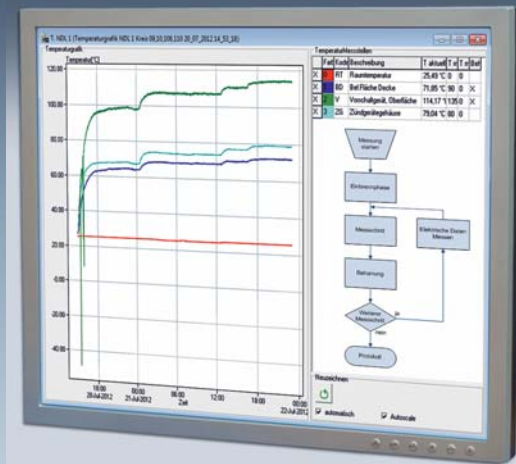


# Luminaire testing device



Thermal testing to EN60598  
**Tried and tested. Compact. Automated.**



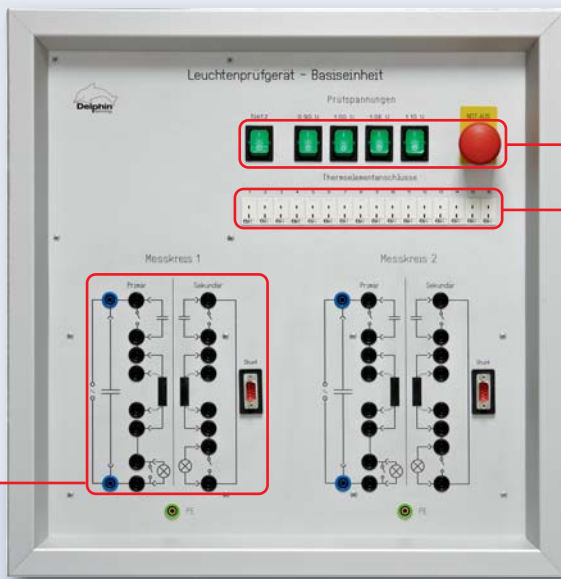
# Thermal testing to EN 60598

## Compact and easy to use hardware

EN 60598 is the certification and approval standard for luminaire devices on the European market. This standard sets down thermal testing requirements under both normal and abnormal operating conditions. For more than 20 years Delphin products have been used for the fully automated thermal testing of luminaires. New regulations and guidelines on luminaire testing, as well as the many new types of luminaires, such as LEDs, now on the market have made luminaire testing highly complex. Delphin's luminaire testing device is the ideal system to cope with this complexity. The devices minimize the time required for testing and product development, and test data is evaluated fully

automatically. Delphin's luminaire testing devices save time, deliver reproducible measurement data and document quality standards. Lead times from product conception through to the delivery of a certified luminaire can be shortened considerably.

Delphin's luminaire testing device is compact and suitable for wall-mounting. The basic system is made up of a master unit that has 2 lamp circuits and 16 thermocouple connections. A master unit can be extended by a slave unit that has a further 2 lamp circuits and 16 thermocouple connections. This combination gives users 4 parallel lamp circuits and 32 thermocouple connections. The lamp circuits can operate independently, e. g. as four luminaires on one lamp circuit, as two luminaires on two lamp circuits, or as 3- or 4-lamp luminaires.



## Master and slave unit components

### Lamp circuit connection panel

- Universal connections for any type of luminaire and luminaire component
- All connectors as touch-proof 4-mm laboratory plugs
- Clear symbols to enable intuitive operation

### Test voltages

- Test voltages at 0.9, 1.0, 1.06 and 1.1 times nominal voltage
- Individually switchable for safe connection / disconnection
- Emergency switch-off for safe operation

### Thermocouple connections

- 16 inputs per unit, extendible to 64
- Full galvanic isolation of up to 440 VAC for all channels
- Connectivity for any standard type of thermocouple

# Luminaire testing device

## Product features and functions

- Scalable device for instant connection. Includes intuitively operating software
- Over 100 devices already in use at inspection agencies and in industry
- Temperature measurement and normalization
- Electrical measurement including lamp sizes of up to 500 kHz
- Winding temperatures determined automatically
- Documentation of test sample and third-party component quality
- Easy to repeat tests
- Calibrated according to DAkkS (the German national accreditation body)

## Scalable and network compatible

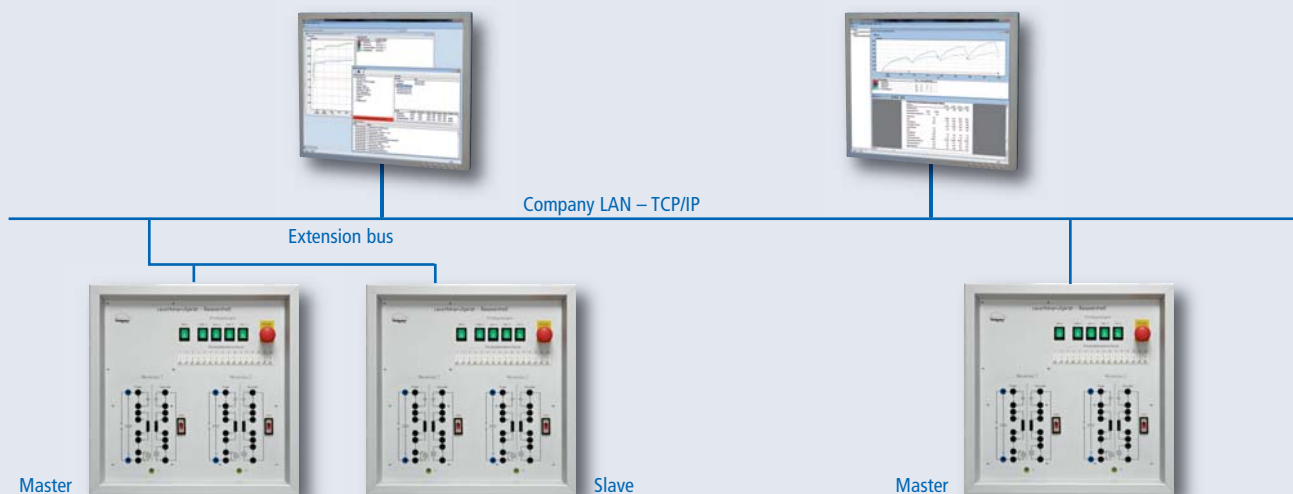
The number of testing devices required will depend on user requirements. Any number of devices can be run in parallel using a PC workstation. The devices can be integrated into a company's existing network (LAN) via an integrated network interface. Users can then prepare luminaire testing from their workstations and access test data without having to be present at the testing site.

## What can be tested

- LED luminaires and operating units
- Luminaires with ballasts (inductive, capacitive)
- Luminaires with electronic ballasts
- Low-voltage transformer luminaires
- Electronic low-voltage transformer luminaires
- Luminaires with energy saving transformers (US-luminaires)
- Luminaires with high intensity discharge lamps (HQL, NAV)
- Incandescent luminaires

## Testing to EN 60598

- Cold measurement of winding resistance for inductive ballasts
- Warm-up phase, electrical measurements post warm-up
- Tests at normal operating conditions as well as at factors of 0.9, 1.0, 1.06 and 1.1 times nominal voltage
- Testing abnormal operation at 1.1 times nominal voltage
- F-test
- TS-test (thermal cut-out) and half-wave operation



# Software

## Testing in 3 steps

Delphin's luminaire testing device includes state of the art and user friendly software. The software has been developed for Windows XP and Windows 7 and enables users to perform fully automated testing on luminaires.

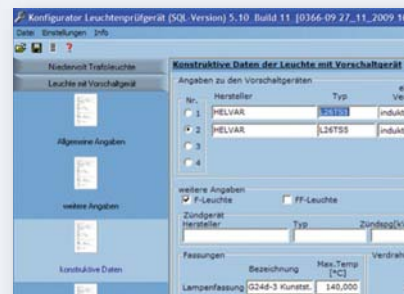
Just three steps are required to get from luminaire configuration to test end-results. The automated procedure requires practically no user intervention during testing.

## User benefits

- Intuitive and user friendly Windows software
- Software available in German / English / French
- Previous test runs available as templates
- Luminaire component database to facilitate input, selection and system maintenance
- Tests run independently and in parallel
- Network compatible software to enable system operation from any authorized PC workstation
- Continuous overview of current status of all test runs
- Standardized protocols in German, English and French
- Database export function

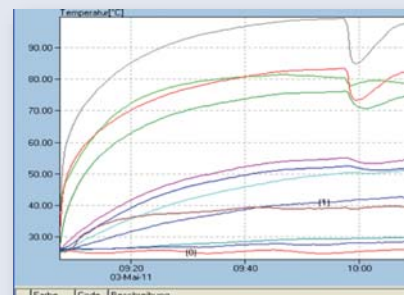
### Step 1: Prepare test sample

- Load template
- Input luminaire data
- Select luminaire components
- Define temperature measurement points
- Validity check



### Step 2: Test sample

- Attach test sample to the luminaire testing device
- Connect test sample and temperature measuring point
- Start test run
- Recording of temperatures
- Recording electrical measurements
- Visualizing and archiving of measurement data



### Step 3: Evaluation

- Output of standard protocols
- Output in different formats, e. g. for inspection agencies or for industry-based protocols
- Visualizing print of temperature curves
- Print in PDF format
- Export in ASCII / CSV files



| Industrieprotokoll  |   | 19.3.2009 22:56:30        |                      |
|---|---|---------------------------|----------------------|
| C:\Temp\Technikum_LP_038-Delphin-Environ-PR\Bsprensestand-0140-25-0208-G-w-41cm |   | Datei                     |                      |
| Delphin Technology AG   |   | Elektrotechnisches Labor  |                      |
| Ludwigsstr. 81  |   | 11427 Berlin, Deutschland |                      |
| 51427 Berlin, Deutschland   |   | Prüfer: Rembertus         |                      |
| Erwärmungsprüfung nach EN 60598   |   |                           |                      |
| Prozess-Nr.   | 609145                                    | Produktserie              | 330 - Wärmelampe     |
| Hersteller  | Delphin Technology                        | Leuchtkategorie           | 18.00 Watt           |
| Leuchtentyp   | Leuchte mit Vorschaltgerät                | Spannung                  | 230 V, 50 Hz         |
| Leuchtenart   | Wärmelampe                                | Umgebungstemper.          | 25 °C                |
| Typbezeichnung  | 3304-118 H                                | Montageart                | Drehmontage          |
| Leuchtkategorie   | Leuchtkategorie T 25 18W/330 G13 Leistung | Material                  | Glas                 |
| Nennspannung  | 230 V, 50 Hz                              | Hersteller                | Delphin Technology   |
| Umgebungstemper.  | 25 °C                                     | Typ                       | Zündspannung 0,00 kV |
| Montageart  | Drehmontage                               |                           |                      |
| Material  | Glas                                      |                           |                      |
| Hersteller  | Delphin Technology                        |                           |                      |
| Typ   | Zündspannung 0,00 kV                      |                           |                      |

# Options and extensions

Luminaire testing can be performed with a single master unit but the system is extendible via slave units. All products and accessories are available from one single source and Delphin is able to provide users with the necessary equipment to stabilize and adjust test voltage.

Acquiring data on lamps is also important in product development. Delphin can provide users with high precision power measuring units to deliver accurate and traceable electrical measurements, even for high frequency voltages and currents.

## Options

|   |  |
|---|--|
| <b>Slave unit</b>   | Extends a master unit by 2 lamp circuits and 16 temperature measurement inputs; one master unit can have one slave box attached to it                                |
| <b>Current, voltage, power measuring unit up to 50 kHz</b>  | Tabletop unit to measure secondary electrical values and lamp data for electronic ballast lamps and LEDs; 0.11 % basic precision, DC up to 50 kHz, incl. accessories |
| <b>Current, voltage, power measuring unit up to 500 kHz</b> | Tabletop unit to measure secondary electrical values and lamp data for electronic ballast lamps and LEDs; 0.03% basic precision, DC up to 500 kHz, incl. accessories |
| <b>Shunt</b>  | To measure high-frequency currents on discharge lamps and electronic transformers  |
| <b>Extended temperature measurement points</b>              | Up to 64 temperature inputs are available for temperature measurement points   |
| <b>Electromagnetic voltage regulator</b>                    | To stabilize test voltages; input 230 VAC $\pm 10\%$ , output 230 VAC $\pm 0.3\%$ , nominal power 3.88 KVA   |
| <b>Electronically controlled voltage regulator</b>          | For precision stabilization of test voltages; input 230 VAC $+15\% / -10\%$ , output 0 ... 300 VAC / 0 ... 425 VDC 0 ... 12 A  |
| <b>Variable transformers</b>                                | Variable transformers with control switch and scale for test voltages to EN 60598 0.9, 1.0, 1.06 and 1.1 times nominal voltage                                       |
| <b>Feed through wiring</b>                                  | Standard testing for feed through wiring at 6 / 10 / 16 A  |
| <b>PC</b>   | Delphin can also supply PCs with Windows 7 for luminaire testing   |



# Services

Delphin provides services ranging from initial, on-site customer consultations through to annual calibration.

Delphin customers can be assured that the products will perform for many years. Delphin services for the luminaire testing device assure users that their investment in the system is safe.

## System installation

Delphin's expert engineers are available on-site to quickly get the luminaire testing devices installed and running.

The system can be installed within days following consultations with the customer. The compact design of the luminaire testing device requires no major building or structural changes at the site of installation. Testing can then be performed immediately.

## System operation

The luminaire testing device is easy to operate. Its clear layout, intuitive software and extensive documentation makes it easy for the user to quickly get from test sample connection through to final test report output.

Delphin is happy to provide users with training to make them confident in using the testing device. Training is performed using test samples from the customer and participants receive a training certificate.

## Calibration

Delphin's luminaire testing devices are calibrated on delivery according to DAkkS. Delphin also offers its customers annual calibration services. These can be performed either on-site at the customer or at the Delphin premises. As the product manufacturer, Delphin can perform readjustments and full functionality tests as part of its calibration service. A DAkkS traceable calibration certificate documents the calibration.

## After sales support

Users have access to a cost-free hotline for any queries on testing procedures or system operation. The hotline is available from 8:00 am to 5:00 pm.



## On-site service

Delphin offers on-site services to optimize system availability for its users. Service agreements are available with guaranteed response times.

## Updates

Regular software updates guarantee that the luminaire testing device conforms to the latest developments in luminaire technology as well as to the EN 60598 standard and the latest PC technology. All updates are compatible with previous measurement data protocols.

# Technical specifications

## Luminaire testing device

|  |   |
|--|---|
| Testing capacity                             |   |
| Number of test panels per master unit        | 2 lamp circuits per unit  |
| Number of test panels per slave unit         | 2 lamp circuits per unit  |
| Number of lamp circuits per test sample      | 1 ... 4 lamp measurement circuits per test sample   |
| Number of test samples per unit              | Up to 4 test samples per master / slave combination, running simultaneously and independently |
| Temperature measurement                      |   |
| Number of thermocouple inputs                | 16 per unit as standard, extendible to 64   |
| Connector                                    | Thermal miniature connectors, polarized   |
| Thermocouple type                            | Any type, e. g. J, L, K, T, S, ...  |
| Measurement range                            | Type J: -210 ... 1.200 °C, Type K: -270 ... 1.372 °C  |
| Reference junction                           | Automatic compensation  |
| Ambient temperature measurement              | Via high precision Pt100 included in delivery   |
| Temperature normalization                    | Automatic normalization to 15 °C, 25 °C or any other value                                    |
| Resistance measurement / winding temperature |   |
| Resistance measurement                       | R-cold / R-warm, primary / secondary winding  |
| Resistance measurement range                 | 0 ... 10 kOhm, automatic range selection  |
| Measurement current                          | Automatic adaptation to measurement current   |
| Measurement procedure                        | High precision using 4-wire resistance measurement technology                                 |
| tw computation                               | Standard computation taking into account ambient temperature                                  |
| Electrical measurement                       |   |
| Voltages                                     | $U_{nom}, U_{prim}, U_{sec}, U_{lamp}, U_{ballast}$   |
| Voltage range                                | 0 ... 320 VAC, TRMS, automatic range selection  |
| Currents                                     | $I_{nom}, I_{prim}, I_{sec}, I_{lamp}, I_{ballast}$   |
| Current range                                | 0 ... 1 AAC, 10 AAC, 20 AAC (via shunt), TRMS, automatic range selection                      |
| Power  | $P_{nom}, P_{prim}, P_{sec}, P_{lamp}$ , calculation of power loss                            |
| Power range                                  | Depending on voltage and current ranges. Automatic selection of measurement range.            |
| General technical information                |   |
| Weight                                       | Master unit approx. 17 kg, slave unit approx. 15 kg   |
| Dimensions (B x H x T)                       | 500 mm x 500 mm x 300 mm  |
| Mounting                                     | Wall mounting or mobile rack (accessories)  |
| Temperature range                            | -20 ... 60 °C   |
| Power supply                                 | 230 VAC ± 10 %, alternative 115 VAC ± 10 %  |
| Power input                                  | max. 100 VA   |
| Control and data acquisition                 | TopMessage system (standard Delphin product)  |
| Network interfaces                           | RJ45, TCP-IP, HTTP, SMTP, SNTP  |

# Delphin – Product overview

Technology



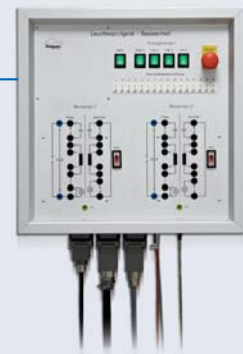
**ProfiMessage**  
Modular measurement  
technology and automation

**ProfiSignal**  
Measurement and  
inspection software



**LogMessage**  
Data logger

**Luminaire  
testing device**



**Expert Key**  
PC-supported  
measurement technology

**Mobile  
measurement case**



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