

# TD - Power Supply LP DALI&Switch Dim Mono PRE (CV) MM-IP20 User Manual



Item no.: NT-244-101

## 1. Product Description

The TD-Power Supply SC DALI & Switch Dim Mono is a dimmable 24V constant voltage LED driver for Mono LED Strips. Power Supply and Dimmer in one housing. LED dimming and power on, power off with DALI Signal or when using a commercially available switch (push, touch or switch dim function). Suitable for emergency escape lighting systems acc. to EN 50172

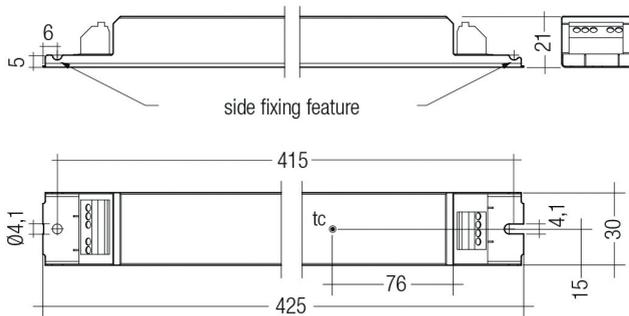
## 2. Specifications

Input Voltage	198-264VAC, 176-280VDC
max. Output Power	1x4,17A (100W) - 24VDC
Inrush Current	46,6A / 197ms
PWM Frequency	1000Hz
max. wire cross-section	max. 1,5mm <sup>2</sup>
Dimensions (L x W x H)	425 x 30 x 21mm
Weight	329g

## 3. Description

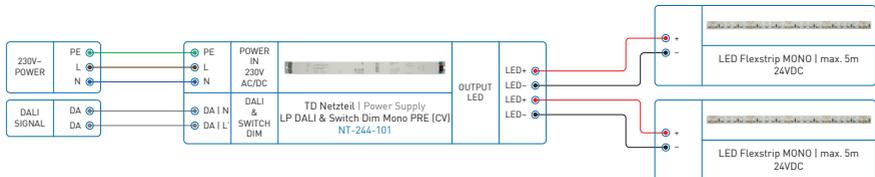
1. Dimmable 24V constant voltage LED Driver
2. Dimming range 1 to 100%
3. LED Dimming and power on, power off with DALI signal or when using a commercially available switch (push, touch or switch dim function.)
4. The Dimmer have 1 output channel with max. 4,17A output power
5. Suitable for emergency escape lighting systems acc. to EN 50172
6. Ideal using for cove lighting, ceiling integration
7. Small design (425x30x21mm) with stretched-compact strain relief

## 4. Dimensions



## 5. Conjunction Diagram

Variante DALI



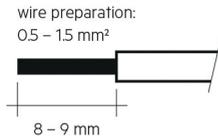
Variante Switch/Touch/Push DIM



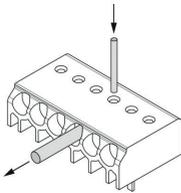
## 6. Installation / Wiring

### Wiring type and cross section

Solid wire with a cross section of 0.5 – 1.5 mm<sup>2</sup>. Strip 8 – 9 mm of insulation from the cables to ensure perfect operation of terminals.



### Loose wiring



Loosen wire through twisting and pulling or using a 1 mm diameter release tool

### Wiring guidelines

- The cables should be run separately from the mains connections and mains cables to ensure good EMC conditions.
- The LED wiring should be kept as short as possible to ensure good EMC. The max. secondary cable length is 2 m (4 m circuit).
- Secondary switching is not permitted.
- The LED Driver has no inverse-polarity protection on the secondary side. Wrong polarity can damage LED modules with no inverse-polarity protection.
- Wrong wiring of the LED Driver can lead to malfunction or irreparable damage.

### Hot plug-in

Hot plug-in is not supported due to residual output voltage of > 0 V.

If a LED load is connected the device has to be restarted before the output will be activated again. This can be done via mains reset or via interface (DALI, DSI, switchDIM, ready2mains).

## Earth connection

The earth connection is conducted as protection earth (PE). The LED Driver can be earthed via earth terminal. If the LED Driver will be earthed, protection earth (PE) has to be used.

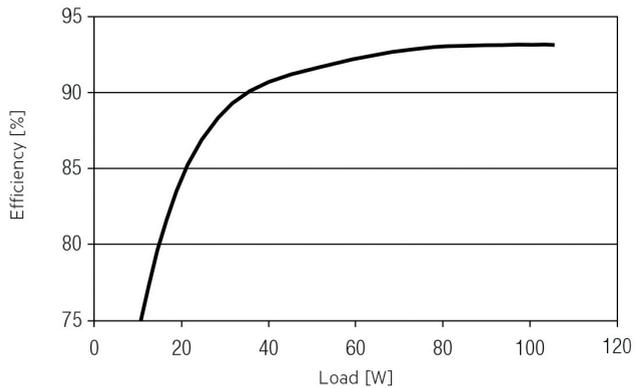
There is no earth connection required for the functionality of the LED Driver. Earth connection is recommended to improve following behaviour:

- Electromagnetic interferences (EMI)
- LED glowing at standby
- Transmission of mains transients to the LED output

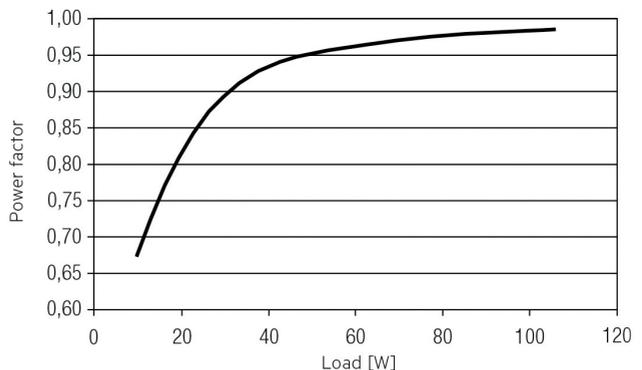
In general it is recommended to earth the LED Driver if the LED module is mounted on earthed luminaire parts respectively heat sinks and thereby representing a high capacity against earth.

## 7. Electrical values

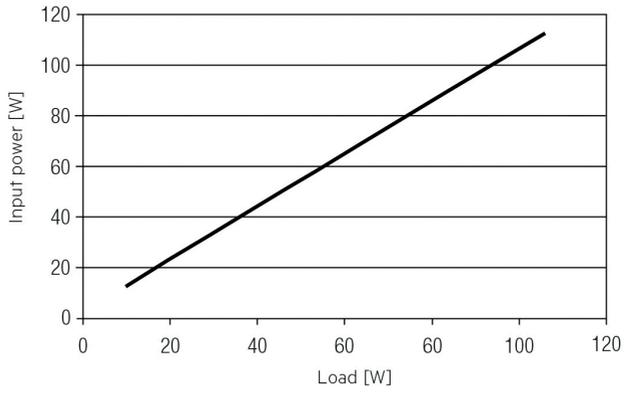
Efficiency vs. load



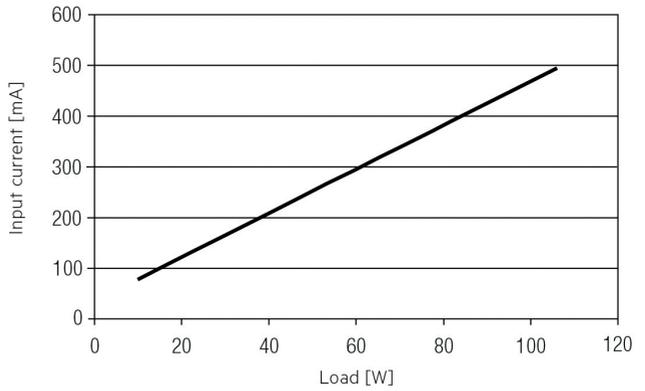
Power factor vs. Load



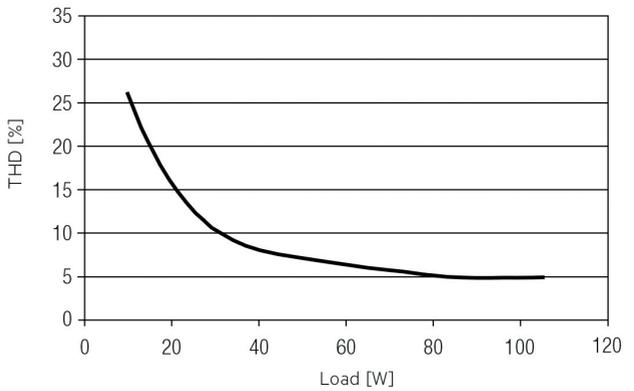
Input power vs. Load



Input current vs. Load



THD vs. Load



## Maximum loading of automatic circuit breakers

Automatic circuit breaker type	C10	C13	C16	C20	B10	B13	B16	B20	Inrush current	
Installation Ø	1.5mm <sup>2</sup>	1.5mm <sup>2</sup>	2.5mm <sup>2</sup>	2.5mm <sup>2</sup>	1.5mm <sup>2</sup>	1.5mm <sup>2</sup>	2.5mm <sup>2</sup>	2.5mm <sup>2</sup>	$I_{in}$	t <sub>lim</sub>
<b>LCA 100W 24V one4all lp PRE</b>	8	12	15	20	5	7	9	12	466 A	197 µs

Typical values for MCB from ABB series S200 as reference.

Actual values can differ due to used MCB types and installation environment.

Harmonic distortion in the mains supply (at 230 V / 50 Hz and full load) in %

	THD	3.	5.	7.	9.	11.
<b>LCA 100W 24V one4all lp PRE</b>	5	5	1	1	1	1

## Dimming

Dimming range 1 % to 100 % Digital control with:

- DSI signal: 8 bit Manchester Code, Speed 1 % to 100 % in 1.4 s
- DALI signal: 16 bit Manchester Code, Speed 1 % to 100 % in 0.2 s

Programmable parameter:

Minimum dimming level

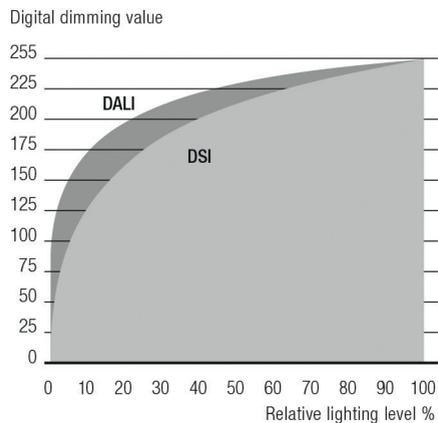
Maximum dimming level

Default minimum = 1 %, Programmable range 1 % ≤ MIN ≤ 100 %,

Default maximum = 100 %, Programmable range 100 % ≥ MAX ≥ 1 %,

Dimming is realized by PWM dimming.

Dimming characteristics



Dimming characteristics as seen by the human eye

## 8. Interfaces / communication

### Control input (DA/N, DA/L)

Digital DALI signal or switchDIM can be wired on the same terminals (DA/N and DA/L). The control input is non-polar for digital control signals (DALI, DSI). The control signal is not SELV. Control cable has to be installed in accordance to the requirements of low voltage installations. Different functions depending on each module.

### switchDIM

Integrated switchDIM function allows a direct connection of a pushbutton for dimming and switching.

Brief push (< 0.6 s) switches LED control gear ON and OFF. The dimm level is saved at power-down and restored at power-up. When the pushbutton is held, LED modules are dimmed. After repush the LED modules are dimmed in the opposite direction.

In installations with LED control gears with different dimming levels or opposite dimming directions (e.g. after a system extension), all LED control gears can be synchronized to 50 % dimming level by a 10 s push.

Use of pushbutton with indicator lamp is not permitted.

### DC operation

The DC power supply is designed for operation on DC voltage and pulsed DC voltage.

Light output level in DC operation: programmable 1 – 100 % (E<sub>OFu</sub> = 0.13).

Programming by DALI or ready2mains.

In DC operation dimming mode can be activated.

The voltage-dependent input current of Driver incl. LED module is depending on the used load.

The voltage-dependent no-load current of Driver (without or defect LED module) is for:

AC: < 55 mA

DC: < 11 mA

## 9. Functions

### ready2mains – configuration

The ready2mains interface can be used to configure the main parameters of LED Drivers via the mains wiring, such as CLO and DC level. These parameters can be adjusted either via ready2mains-capable configuration software or directly via the ready2mains programmer.

### ready2mains – dimming

ready2mains allows for mains-based group dimming, controlled via the ready2mains protocol and appropriate dimming interfaces.

For details on the operation of ready2mains and its components see the relevant technical information.

### Short-circuit behaviour

In case of a short-circuit at the LED output the LED output is switched off. After restart of the LED Driver the output will be activated again. The restart can either be done via mains reset or via interface (DALI, DSI, switchDIM, ready2mains).

### Overload protection

If the output voltage range is exceeded the LED Driver turns off the LED output.

After restart of the LED Driver the output will be activated again.

The restart can either be done via mains reset or via interface (DALI, DSI, switchDIM, ready2mains).

### Overtemperature protection

The LED Driver is protected against temporary thermal overheating. If the temperature limit is exceeded the LED Driver will be dimmed. The temperature protection is activated approx. +5 °C above  $t_{c\ max}$  (see page 2).

On DC operation this function is deactivated to fulfill emergency requirements.

## **corridorFUNCTION**

The corridorFUNCTION can be programmed in two different ways.

To program the corridorFUNCTION by means of software a DALI-USB interface is needed in combination with a DALI PS. The software can be the masterCONFIGURATOR.

To activate the corridorFUNCTION without using software a voltage of 230 V has to be applied for five minutes at the switchDIM connection. The unit will then switch automatically to the corridorFUNCTION.

Note:

If the corridorFUNCTION is wrongly activated in a switchDIM system (for example a switch is used instead of pushbutton), there is the option of installing a pushbutton and deactivating the corridorFUNCTION mode by five short pushes of the button within three seconds.

switchDIM and corridorFUNCTION are very simple tools for controlling gears with conventional pushbuttons or motion sensors.

To ensure correct operation a sinusoidal mains voltage with a frequency of 50 Hz or 60 Hz is required at the control input.

Special attention must be paid to achieving clear zero crossings. Serious mains faults may impair the operation of switchDIM and corridorFUNCTION.

## **Constant light output (CLO)**

The luminous flux of an LED decreases constantly over the life-time. The CLO function ensures that the emitted luminous flux remains stable. For that purpose the LED current will increase continuously over the LED life-time.

In masterCONFIGURATOR it is possible to select a start value (in percent) and an expected life-time. The LED Driver adjusts the current afterwards automatically.

## **Power-up/-down fading**

The power-up/-down function offers the opportunity to modify the on-/off behavior.

The time for fading on or off can be adjusted in a range of 0.2 to 16 seconds.

According to this value, the device dims either from 0 % up to the power-on level or from the current set dim level down to 0 %. This feature applies while operating via switchDIM, ready2mains and when switching the mains voltage on or off. By factory default no fading time is set (= 0 seconds).

## **Light level in DC operation**

Programmable from 1 – 100 %

Programming by extended DSI or DALI signal (16 bit).

Light output level in DC operation (EOFx): 0.13 (cannot be adjusted).

In DC operation dimming mode can be activated.

## **Software / programming**

With appropriate software and a interface different functions can be activated and various parameters can be configured in the LED Driver.

To do so, a DALI-USB or ready2mains programmer and the software (masterCONFIGURATOR) are required.

### **masterCONFIGURATOR**

From version 2.8:

For programming functions (CLO, power-up fading, corridorFUNCTION) and device settings (fade time, ePowerOnLevel, DC level, etc.).

For further information see masterCONFIGURATOR manual.

## **10. Miscellaneous**

### **Isolation and electric strength testing of luminaires**

Electronic devices can be damaged by high voltage. This has to be considered during the routine testing of the luminaires in production.

According to IEC 60598-1 Annex Q (informative only!) or ENEC 303-Annex A, each luminaire should be submitted to an isolation test with 500 V DC for 1 second. This test voltage should be connected between the interconnected phase and neutral terminals and the earth terminal.

The isolation resistance must be at least 2 MΩ. As an alternative, IEC 60598-1 Annex Q describes a test of the electrical strength with 1500 V AC (or 1.414 x 1500 V DC).

To avoid damage to the electronic devices this test must not be conducted.