TRIDONIC

TALEX: LED LIGHTING CONTROLS

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TALEX(control LNU M 12 – 24 V IP67 G1

TALEXcontrol PWM dimmer

Product description

- Constant voltage 3-channel PWM dimmer with adjustable, fully automatic or controlled dimming
- For 12 or 24 VDC LED modules
- Integrated light sensor (twilightCONTROL) dims LED systems automatically to minimum necessary LED power according to ambient light situation
- switchDIM (with memory function)
- Individual adjustment of LED brightness to meet statutory requirements
- Approved as DARK SKY Friendly Device
- Protection class II
- switchDIM electrically insulated from input and output
- Reverse polarity protection on the input and output
- · Short-circuit and overcurrent protection for output channels
- Automatic shutdown on overheating
- Strain relief connection cable 0.5 m
- Protection type IP67
- Casing: polycarbonate transparent (UV resistant)
- Nominal life of 50,000 h (at ta 55 °C with a failure rate max. 0.1 % per 1,000 h)
- Synchronisation with up to 19 TALEXcontrol LNU S possible
- 5-year guarantee

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Ordering data

Туре	Article number	Packaging	Packaging, carton	Weight per pc.
LNU M 12 – 24 V IP67 G1	28000018	1 pc(s).	10 pc(s).	0,355 kg

Technical data

DC voltage range input	12 / 24 V
Max. DC voltage range input	10 – 28 V
Input reverse polarity protection	yes, reversible
Max. input current	15 A
AC voltage range switchDIM	90-277 V ± 10 %
Mains frequency switchDIM	0 / 50 / 60 Hz
Sync. short circuit protection	yes, reversible
Sync. voltage output	9 V
Sync. voltage input	5 – 12 V
Sync. frequency	ca. 8 Hz (125 ms)
Number of output channels	3 x PWM
DC voltage output	12 / 24 V
Output current	max. 5 A / channel
Output overcurrent protection	yes (6 A, -10 / +15 %)
Output short circuit protection	yes, reversible
PWM frequency	495 Hz
Voltage drop	max. 150 mV
Max. loss power ^①	< 2.5 W
Stand-by losses [@]	< 100 mW
Turn on time	< 0.1 s
Turn off time	< 0.1 s
Hold on time	< 100 ms
Ambient temperature ta	-40 +60 °C
Storage temperature	-40 +85 °C
Max. casing temperature tc	70 °C
Dimensions L x W x H	141 x 40 x 20.5 mm
Hole spacing D	133 mm
Dimming range twilightCONTROL [®]	0-98 %
Dimming range switchDIM	0 % / 0.1 - 100 %

 $^{\textcircled{1}}$ At full load and 12 V: 3x5 A load at the output.

 $^{\odot}$ No LNU S connected, no switchDIM activation. The power loss increases for every LNU S connected by around 30 mW at 12 V and around 50 mW at 24 V.

[®] The maximum possible dimming value in twilightCONTROL depends on the LEDs used, the particular application and the sensitivity level.

Standards

EN 55015 EN 61000-3-2 / classe C (only with suitable class C LED control gear) EN 61000-3-3 EN 61347-1 EN 61347-2-13 EN 61547 EN 62384 EN 60598-1 EN 60695-2-11 EN 60529

Device overtemperature protection

Overtemperature protection protects the LNU against excessive thermal loads by reducing the output.

The Temperature Guard therefore protects the LNU beyond the thermal limits. Overtemperature protection becomes active at 5 - 10 °C above the specified tc temperature.

LED overtemperature protection

To protect the connected LED modules against thermal overloads, the controlgear acts as shown in the following table. The LED overtemperature protection is not enabled by default, but can be enabled via the programming device LNU I.

Temperature behaviour

Device overtemperature protection	LED overtemperature protection	Function	Error
tc temperature range increasin	g		
< 75 °C	< 65 °C	Normal operation	_
75 – 85 °C	65 – 75 °C	Power limited operation	Error 1
> 85 °C	> 75 °C	Device is switching off	-
tc temperatur range decreasin	g		
85 – 70 °C	75 – 60 °C	Device is switched off	-
< 70 °C	< 60 °C	Normal operation	_

Short-circuit behaviour

In case of a short-circuit on the output side the controlgear is not damaged. In the event of a short-circuit the output it switched off and a check is carried out approximately every second to see whether the short-circuit has been cleared. After 5 retries the output will switch off until the power supply is disconnected and restored.

In case of a short-circuit of Sync. the controlgear is not damaged. Please check the status display in the event of a fault.

No-load operation of output, Sync. and switchDIM

The controlgear is not damaged in the no-load operation. A minimum load on the output is not required. For small loads (< 1 A) the maximum level may have to be reduced in accordance with the status diagram on page 5 to guarantee optimum operation in twilightCONTROL mode.

The max. output voltage can be obtained during no-load operation.

Reverse polarity behaviour

In case of reverse polarity on the input side the controlgear is not damaged. In case of reverse polarity of Sync. the controlgear is not damaged.

Behaviour on overload

If 6 A (-10 / +15 %) is exceeded the output is disconnected (Error 3). The device checks approximately every second whether the load is in the correct range. After 5 retries the output will switch off until the power supply is disconnected and reconnected.

Behaviour if the input voltage range is exceeded or undershot

The device monitors the correct operation and voltage of the power supply unit (LCU) connected on the input side. If the voltage goes outside the permitted range the device disconnects the output to protect the device and the LED. If the input voltage exceeds 28 V the device also goes into a reversible short-circuit. As a result the automatic cutout disconnects the power supply and the device is not damaged.

Behaviour if the sync and output voltage range is exceeded

The device will be damaged if the permitted voltage is exceeded at sync and output.

Glow wire test according to IEC 60695-2-11

650 °C, 850 °C and 960 °C passed.

Expected life-time

Туре		ta = 40 °C	ta = 50 °C	ta = 60 °C
LNULM 12 - 24 V ID67 C1	tc	30 °C	40 °C	70 °C
LINU IVI 12 - 24 V IF07 UT	Life-time	> 100.000	75.000	50.000

Label LNU M 12 - 24 V IP67 G1

● red (+) ● black (-)	12/24VDC	TRIDONIC TALE X control	MM.YY XXXXXXXX ZZ.ZZ		> t black (-)●
 white white 	Sync.	Art. No. 28 000 018	-	wiring and mounting see datasheet	● (+) black (•)
● blue (D1) ● brown (D2	90-277V 0/50/60/Hz 50/50/60/Hz 90/50/60/Hz 90/50/60/Hz 90/50/60/Hz 90/50/60/Hz 90/50/60/Hz 90-277V 90-277V 90-277V 90-277V 90-277V 90-277V 90-277V 90-277V	Uin: 12/24VDC Iin max: 15A Iout max: 3x5A ta: -40°C +60°C tc: +70°C		Input Out +25+ Made in Austria	> ☆ black (-)● ₩ 5 red (+) ●

MM.YY: month-year XXXXXXXX: production batch ZZ.ZZ: firmware

switchDIM

Integrated switchDIM function allows a direct connection of a push to make switch for dimming and switching.

Brief push (< 0.6 s) switches LED modules on and off. When switching on the latest dimming level will be activated again (switchDIM memory). Default setting is no dimming.

When the push to make switch is held, LED modules are dimmed or brightened. After repush the LED module is dimmed in the opposite direction. Use of push to make switch with indicator lamp is not permitted.

twilightCONTROL

The light sensor integrated in the LNU enables the outputs or connected LEDs to be dimmed depending on the ambient brightness.

For information on dimming see the diagrams on the right.

All 3 output channels are dimmed simultaneously.

Switching of operation modes

Toggling between the two operating modes ("twilightCONTROL" and "switch-DIM") is achieved by 3 short pushbutton presses at the "switchDIM" input. When the system is switched on again after a power outage the last mode selected is activated again with the appropriate settings.

twilightCONTROL - course of the day



The ambient brightness values shown in the diagram depend on the translucence of the acrylic.

twilightCONTROL - dimming behaviour

Power LED module [%]



The ambient brightness values shown in the diagram depend on the translucence of the acrylic.

Min. and max. values adjustable from 0 to 98 %.

The default value is 30 % for the min. value and 98 % for the max. value. To adapt to different materials the sensitivity can be set to "high", "normal" or "low". Default setting is "high".

Sensitivity levels:

- High: recommended for light transmission rates of the acrylic from 3 to 12 %.
- Normal: recommended for light transmission rates of the acrylic from 13 to 25 %.
- Low: recommended for light transmission rates of the acrylic from 26 to 50 %.

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State diagram



Short press: 50 - 600 ms, time between 2 presses < 800 ms

Long press: 3 – 7 s

Hold down: Holding down the pushbutton dims the LED modules for as long as the pushbutton is held down. Releasing the pushbutton and then holding it down again will reverse the dimming direction.

[®] When the green and blue LED are turned on or blinking at the same time the indicated colour may appears white due to the colour mixing.

Resetting the factory defaults:

To restore the factory defaults press the button 5 times. All the LEDs will flash (wait state) then hold down the button. All 3 LEDs will flash five times in rapid succession.

Factory settings:

The device is in switchDIM mode with the ON dimming level set to 100 % and the switchDIM memory level set to 25 %.

In twilightCONTROL mode the sensitivity is set with the minimum level at 30 % and the maximum level at 98 %.

Note: While the display LEDs are on the output of the connected LED modules is always at least 5 % even if a lower minimum value has been set or if the dimming value would be less than 5 % because of the ambient brightness.

Customer-specific settings:

These can be made via the LNU I computer interface.

Status display on error

Error 1				
Red	Green	Blue		
Blinking	Off	Off		

Error 2			
Red	Green	Blue	
Blinking	On	Off	

Error 3				
Red	Green	Blue		
Blinking	Off	On		

Note for choosing the sensitivity:

- Increasing ambient light: the sign turns off too early. Choose the sensitivity one level lower.
- Increasing ambient light: the sign turns off too late. Choose the sensitivity **one level higher.**
- Decreasing ambient light: the sign turns on too late. Choose the sensitivity **one level lower.**
- Decreasing ambient light: the sign turns on too early. Choose the sensitivity one level higher.

Note: twilightCONTROL settings

The dimming behaviour of the LNU in twilightCONTROL mode depends on the LEDs used and on the application. If the dimming behaviour differs significantly from that on page 4 please reduce the maximum dimming level by 10 to 15 % in accordance with the status diagram on page 5.

Internal fault/overtemperature - possible actions:

- Disconnect power supply and reconnect the last mode selected is activated again with the chosen settings.
- Press the switchDIM-push button 5 x short and 1 long. This will restore the default settings.
- Check the casing temperature. If the max. casing temperature is exceeded, reduce the casing temperature.

Sync fault - action:

Check sync cable (e.g. measure voltage level, check compliance with maximum cable length)

Disconnect power supply and reconnect. The last mode selected is activated again with the chosen settings.

Overload – action:

Reduce the load. If necessary disconnect power supply and reconnect.

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Wiring diagram



Wiring diagram switchDIM cable length > 5 m to 50 m

Add a 33 k Ω - 2 W and a 2.2 k Ω - 2 W resistor as shown below which can be located in the push button housing.



Wiring example

Cable input: AWG 14 with end sleeves Cable switchDIM / Sync. / Ch 1-3: AWG 18 with end sleeves



Note

The EMC requirements must be met by the lighting device, even if more than one LED control gear is used. For a good EMC performance keep the LED wiring as short as possible.

Optimum EMC behavior has been demonstrated with Tridonic LCU LED control gears and TALEXchain CRYSTAL chains.

Installation instructions

Fastening the device: Max. torque 1 Nm / M4 or 1 Nm / ST3.9.

For further information see the installation instructions provided with the product.

Tridonic LCU LED control gears and TALEX/chain CRYSTAL modules are recommended for optimum operation of the LNU.