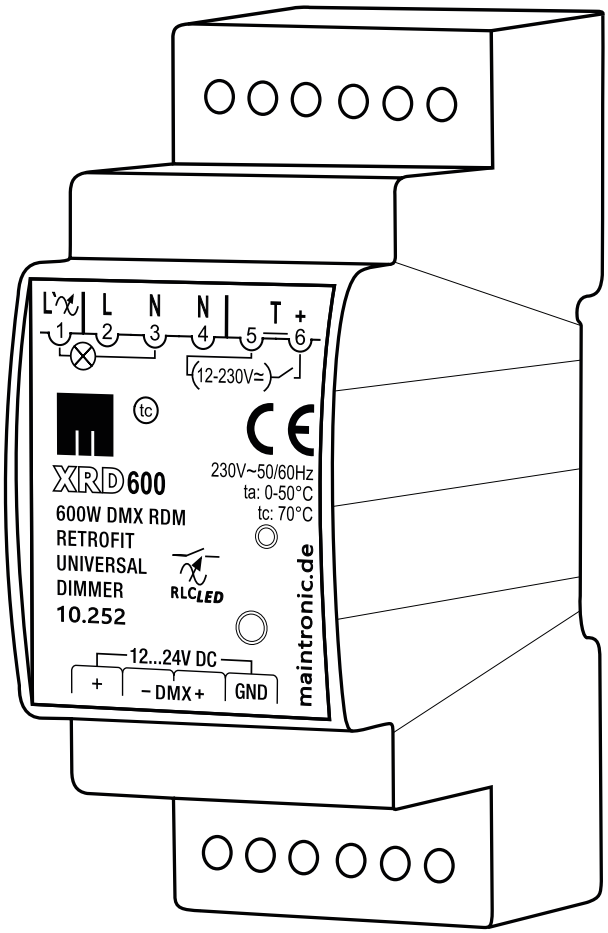
XRD600 REG

DMX-Retrofit-Dimmer



Manual

Gültig ab Version: / Valid from version:
(H=Hardware | F=Firmware)

10.252 - **XRD600 REG** H2 F2.4

Dokument: 10252_MA_en_A4_XRD600REG_20210920

maintronic

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1. General information

1.1 About this Document

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Due to continuous product development, some of the information may not be complete and up-to-date.

The information in this document is subject to change without prior notice. Please check our website www.maintronic.de, if there is a newer version.

1.2 Service and contact

You can find information, onlinehelp as well as downloads for the product on our website. Contact us if you have any problems or questions about your device.

1.3 Legals

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1.4 Symbol explanation

DANGER

The signal word „DANGER“ indicates an imminent danger. If not avoided, death or serious injury will result.

WARNING

The signal word „WARNING“ indicates a possibly imminent danger. If it is not avoided, death or very serious injuries may result.

CAUTION

The signal word „CAUTION“ indicates a possibly imminent danger. If it is not avoided, slight or minor injuries may result.

ATTENTION

The signal word „CAUTION“ indicates a situation that can lead to material damage. Either to the product itself or to other objects in the environment.

NOTE

The signal word „NOTE“ indicates tips and recommendations to help you get the most out of the product.

2. Safety information

WARNING

For your own safety, read all instructions and information in this manual carefully before initial operation. Keep this manual for future reference.

The instructions are an integral part of the product and must be handed to the end customer.

All information and instructions in this manual must be observed completely and in detail. The manufactuer is not responsible for any direct or consequential damage that results from disregarding any information in this manual.

2.1 Waste disposal

In accordance with European Directive 2002/96/EC (it`s) not longer usable electronic devices and defective or used batteries (European Directive 2006/66EG) must collected separately and disposed by an environmentally sound recycling.

This symbol indicates that electrical and electronic equipment must be disposed of separately from normal waste at the end of its operational lifetime.

Should these product are no longer be useable, the user is required by law to dispose of old appliances separately from their household waste e. g. at a local authority collection point or recycling center.

2.2 CE-marking

The devices comply with the EU directives applicable at the time they are placed on the market.

DANGER

The unit must only be installed and serviced by a proven electrican specialist, in accordance of all relevant regulations, safety and accident prevention directives of the country.

Be sure that the existing mains voltage corresponds with the specified operating voltage before operating the device.

Risk of electric shock. Do not operate the device without a cover. Even when switched off, voltage may be present at the outputs. When working on the device or connected loads, always disconnect the upstream fuse from the power supply.

Apply the „Five Safety Rules“ (DIN VDE 0105, EN 50110):

1. Disconnect
2. Secure against being switched on again
3. Determine absence of voltage
4. Ground and short circuit
5. Cover or isolate nearby live parts

Only install the device in places with a good ventilation and without humidity or high temperatures. Do not expose the unit to rain or snow. Do not operate the unit near heat sources, e.g. radiators.

If any of the following occurs, do not operate the device without first checking it:

- if objects have fallen or liquid has been spilled into the unit.
- if the device has been exposed to rain.
- if the device does not operate normally or with altered characteristics.if the device has been dropped or has a broken housing.

For cleaning only use a dry, soft cloth, by no means liquids.

3. Device properties

3.1 Intended use

One-channel phase dimmer for brightness control of R,L,C including LED retrofit loads. Operates as a digital leading and trailing edge phase dimmer with automatic load detection.
Please use this product only for its intended purpose:

- As a dimmer for switching and dimming luminaires
- Solid in dry and clean environment
- Only approved for indoor use
- Installation in switch cabinets top-hat rail, in a junction box with insulated enclosure
- Access is only possible with tools
- Only operate on 1 phase with 230V AC
- With a back-up fuse of max. 16A

3.2 Functions and features

- DMX retrofit-universal-dimmer
- Control via DMX / RDM or push button input
- Load types: LED retrofit, NV halogen lamps with coiled or electronic transformers and incandescent lamps
- Adaptive dimming
- Manual min-level
- Load number display
- Zero load dimming
- Soft-Off
- Fadetime

4. Models

4.1 XRD600 REG (top-hat rail)

Module	Item.No.	Power	Construction
XRD600 REG	10.252	600W	DIN rail housing (REG)

Rail-mounted device according to DIN 43 880 for mounting on a top-hat rail in a switch cabinet (2TE = 36mm), in a junction box or small distributor (insulated enclosure).

4.1.1. Housing dimensions

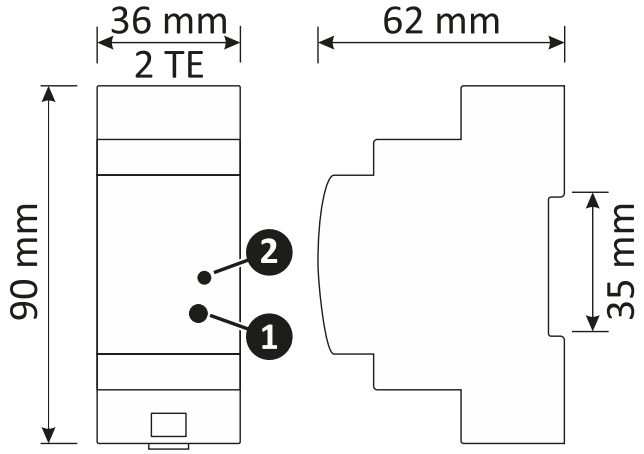
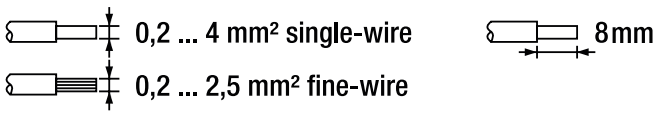


Fig. 1 - Housing dimensions and connections

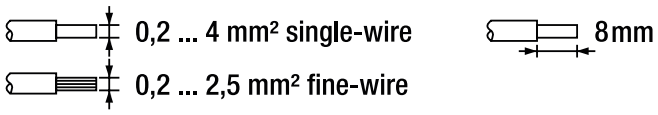
Operating elements and indicators		
1	Device button	Commissioning; Programming
2	Status LED	Display Status of the device

4.1.2. Connections

Top connections **(-X1)**					
L'	1	Load output	N	4	Neutral conductor
L	2	Input Voltage 230V AC	T (-)	5	Push button input GND / N
N	3	Neutral conductor	T (+)	6	Push button input 12...230V ≂



Bottom connections **(-X2)**					
+24V	7	+24V DC	DMX (+)	9	DMX / DMX RDM Signal +
DMX (-)	8	DMX/DMX RDM Signal -	GND	10	-24V / DMX Shield



4.1.3. Connection diagram

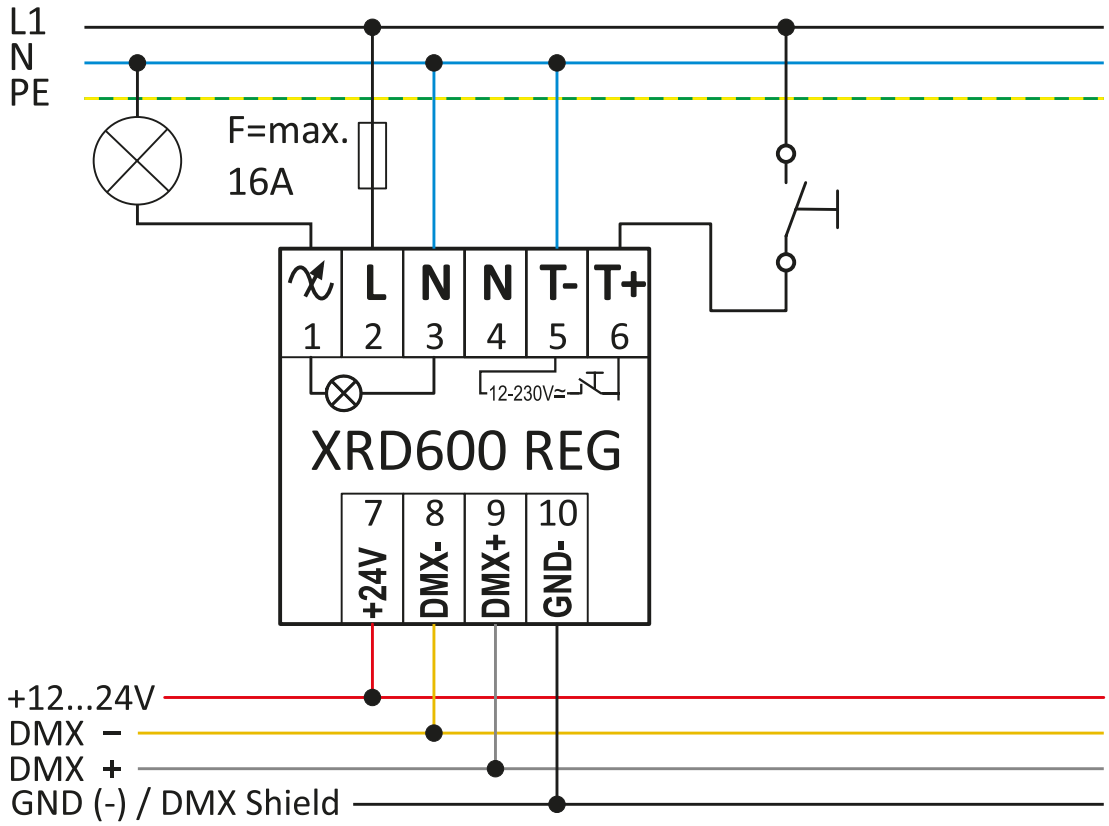


Fig. 2 - Connection diagram with push button 230 VAC

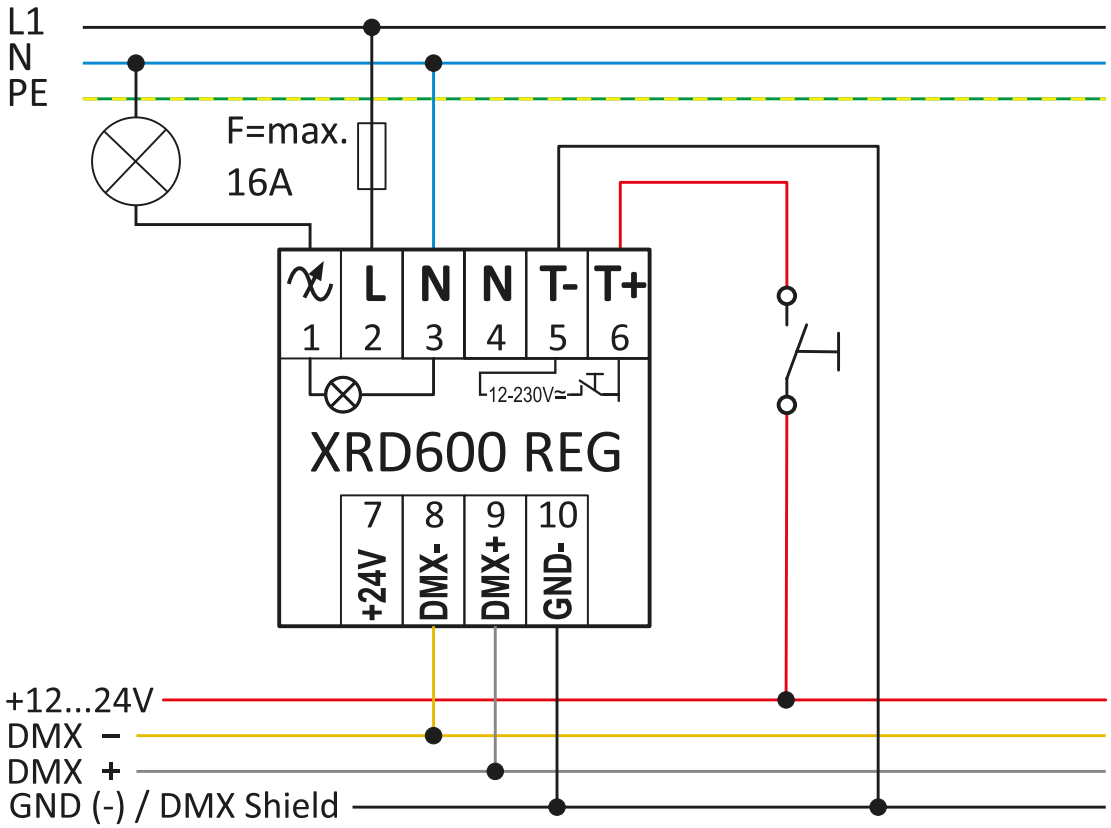


Fig. 3 - Connection diagram with push button 24 VDC

5. Comissioning

5.1 Measuring procedure (AdaptivDIM)

When starting up for the first time (voltage is applied to the device for the first time after installation), the dimmer will start a measuring procedure and calibrate accordingly to the connected load.

For minor calibration, the dimmer decides which cutting method (leading or trailing edge) is used and adjusts itself to load type 3 or 4.

Should a new calibration be required by changing the light source or to set a different load type, the device must be recalibrated, for a new calibration see 7.

NOTE - During calibration, the connected lights may flicker. This is system-conditioned and not a defect of the device. The calibration must be completed and can not be interrupted by switching off the device.

The maximum load is possible up to an ambient temperature of 50 ° C. Between 50 ° C and 70 ° C, the power is reduced by 15 watts / ° C, please consider this during installation.

5.2 Power rating of retrofit dimmers

Load type	cutting method	Power output in percent	Calculated power load
Ohmic	trailing edge	approx. 100% of the rated power	600 VA
LED	trailing edge	approx. 70% of the rated power	420 VA
LED	leading edge	approx. 20% of the rated power	120 VA
As a rule: Example 28x 4W (rated power LED) + 20% power factor = 135 VA power to be processed. Specifications depend on the light source used and may vary upwards and downwards.			

6. Operation via buttons

6.1 Device button 1

It is possible to operate and program the device via the device button.

NOTE - Operation with the device button is only possible within the first 60 minutes after Power-On and will be deactivated after 60 minutes.

6.2 Push button input Universal voltage input

The device is equipped with a push button input (T), on which standard 230V AC buttons can be connected. Both DC voltage (from 12V DC) or AC voltage can be used on the push button input.

The mains voltage will be used as alternating voltage. No polarity has to be observed.

For DC voltage, the supply voltage of the DMX signal side (-X2) can be used. It is absolutely necessary to pay attention to the correct polarity. DC(+) must be connected to terminal 6, DC(-) to terminal 5.

6.3 Functions push button operation:

		1x	On / Off		☀ / ○
		> 1s	Dimming up / down		LED ↑/↓
		2x	Max-Level 100%	100%	LED
		3x	Show DMX channel	n x ☀ ○ ○ ☀ ○ ○	
		4x	Programming Min-Level *See 6.4*	100%	LED ↑/↓
		> 20s ...	Start New measurement *See 7.0*	n x ☀☀☀☀○○○☀	
		> 2s	DMX address Programming *See 8.2*	○ ○ ☀ ☀ ○ ○	
		> 2s + ... x	DMX Parameter Programming *See 8.3*	n x ☀☀☀☀○○○☀	

Max-Level 100% - When double-clicking 100%, the brightness jumps to maximum 100%. The previous dimming level will not be overwritten and will be reactivated the next time it is switched on. If the brightness is subsequently „lowered“ again with a single keystroke, the previous output brightness is restored.

So you can quickly switch from a low level to full brightness and back.

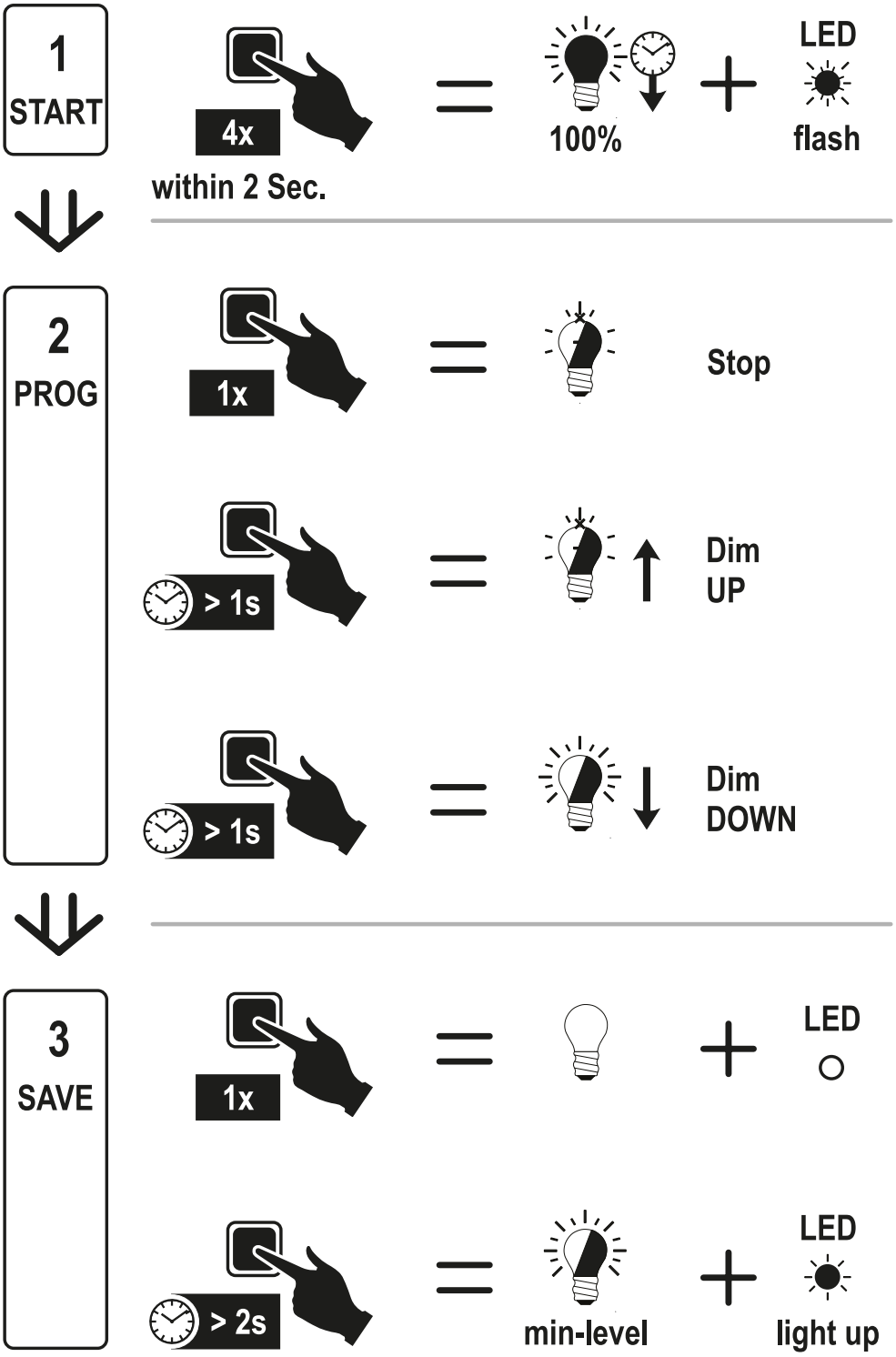
Last Memory Level - The last set brightness level is saved and will be recalled at next power up.

6.4 Set min-level with push button

In case of a flickering load or if the load remains too bright, the in-level (the lowest dimming value) can be adjusted via a push button connected to the push button input.

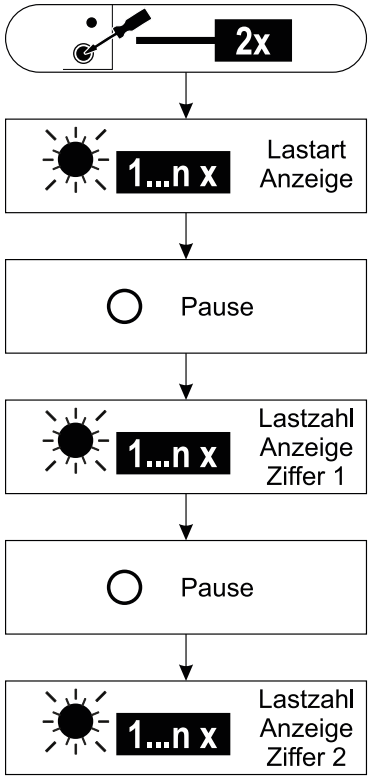
(Alternatively the min level can be configured via DMX - see 9.3)

Perform the configuration with the following steps:



6.5 Commissioning and diagnosis

The device button can be used to display the current dimming mode (load type) and the load number (max. Luminaires of the same type).



Press device button twice briefly

A single digit is displayed for the load type.

The number of luminaires is displayed as a two-digit number with half brightness. For each digit, the LED flashes/blinks as many times as the value of the digit. For the number 0, the LED flashes/blinks longer.

6.5.1. Display load type (currently used dimming mode)

Display load type	Blinking pattern Status-LED 100%
Ohmic load (trailing edge)	✸
Inductive load halo. (leading edge)	✸ ✸
LED / CFL load (trailing edge)	✸ ✸ ✸
LED / CFL load (leading edge)	✸ ✸ ✸ ✸
Inductive load (leading edge)	✸ ✸ ✸ ✸ ✸
Non-dimmable load	✸ ✸ ✸ ✸ ✸ ✸
No load connected	quick flashing

If the load used is not compatible with the selected dimming mode, the system switches to a compatible mode.

6.5.2. Determine load no. (max. number of lamps of the same type)

In order to optimally use the dimmer and to see how many luminaires of the same type can be used, it is possible to determine the load number of the luminaire. To do this, measure with a single luminaire. After the measurement, the load type is displayed and afterwards the load number is indicated by the LED flashing.

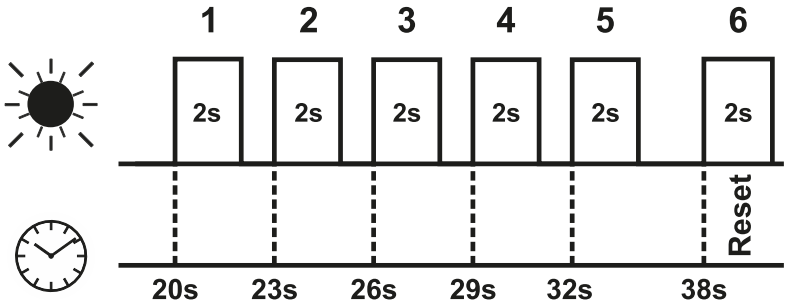
Display Load No.	
value as number	Flashing pattern with half brightness - Load No.
10	✸---------✸✸✸✸✸✸✸✸✸✸
1x short; pause; 1x long for 0	
35	✸-✸-✸---------✸-✸-✸-✸-✸
3x short; pause; and 5x short	

NOTE - A load number is only available for load type LED.

The integrated load number display is a recommendation and helps to determine the maximum number of lamps.

7. Start new measument with the device button

Some situations may require a re-measuring of the dimmer, e.g. if the load is changed or the load type is modified. To start programming, press and hold the device button or push button . After 20 sec. the programming mode starts (LED and load turns off), each parameter is indicated by a flashing of the LED and load for 2 seconds. To activate, release the button ***within*** these 2 seconds, a flashing pattern follows and the parameter will be processed. If the button is released outside this 2 sec. window, the programming will be terminated.



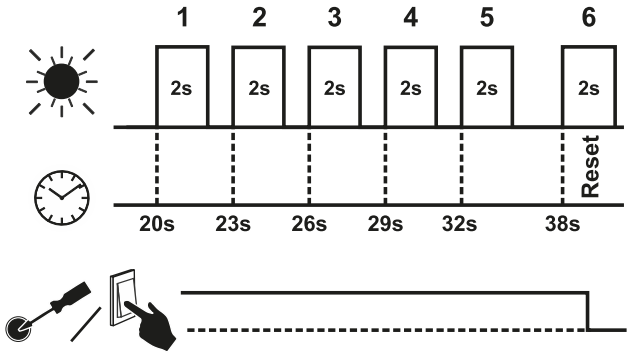
Select a parameter from below table.

NOTE - Programming must be done within the first 60min after power-on.
The key must be released within the active phase for each parameter (as long as the LED is on).

Parameter	Load / Function	Features	
1	any load	Automatic calibration - the load type is determined automatically, dimming parameters are set automatically and the dimming curve is adjusted to achieve the best possible dimming result	Dimmmode
2	Ohm Induktiv	; Dimming curve (linear characteristic)	
3 *	LED 1 CFL	; Dimming curve (fixed LED curve) * Factory setting	
4	LED 2 Induktiv	; Dimming curve (automatic)	
5	LED 3 Induktiv	; Dimming curve (fixed)	
6	Reset	reset to factory default settings	

For example, perform a factory reset:

Press one of the two buttons (device button or push button , after 20 seconds the LED illuminates for 2 seconds, which shows phase 1. Hold the button pressed in, phase 5 is followed by a slightly longer pause until phase 6 is activated. During these 2 seconds of the activated phase the push button must be released.



The dimmer is now reset to the factory settings.

8. Operation via DMX

8.1 Preparation

To operate a device with DMX, a DMX512 controller is required. A gateway can also be used to create an interface to other protocols such as KNX...

A supply voltage of 24V DC must be available (current consumption per module <7mA). Within the DMX protocol, a correct clamping of the signal line with + 24V and -GND must be ensured.

NOTE - Before operating the dimmer, it is necessary to send a DMX signal once. As long as the DMX input is used (DMX signal is transmitted), the device button and push button inputs are not active. One second after the last DMX signal has been received, the button inputs are reactivated again.

According to the DMX standard, no more than 32 DMX devices (with separate power supply) should be connected to a DMX signal. Then the DMX signal must be amplified with a repeater. To supply the bus, a supply voltage of 12 - 24V DC must be present (current consumption per module <7mA).

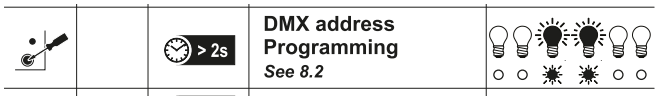
If your controller has a masterfader or overall volume control, make sure that the DMX value 255 (Max. Level) is adjustable, otherwise no programming can be performed.

A value from 1 to 512 can be assigned as start address. In the delivery state, the start address (of the device) is preset to 1. The module uses one DMX channel.

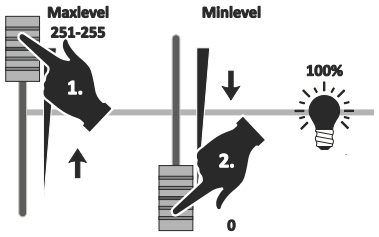
8.2 Assign DMX start address

NOTE - Programming must be done within the first 60min after power-on.

- Press the device button> 2 seconds ... (load jumps to 0 and 100% for half a second each), then the LED flashes consistently.



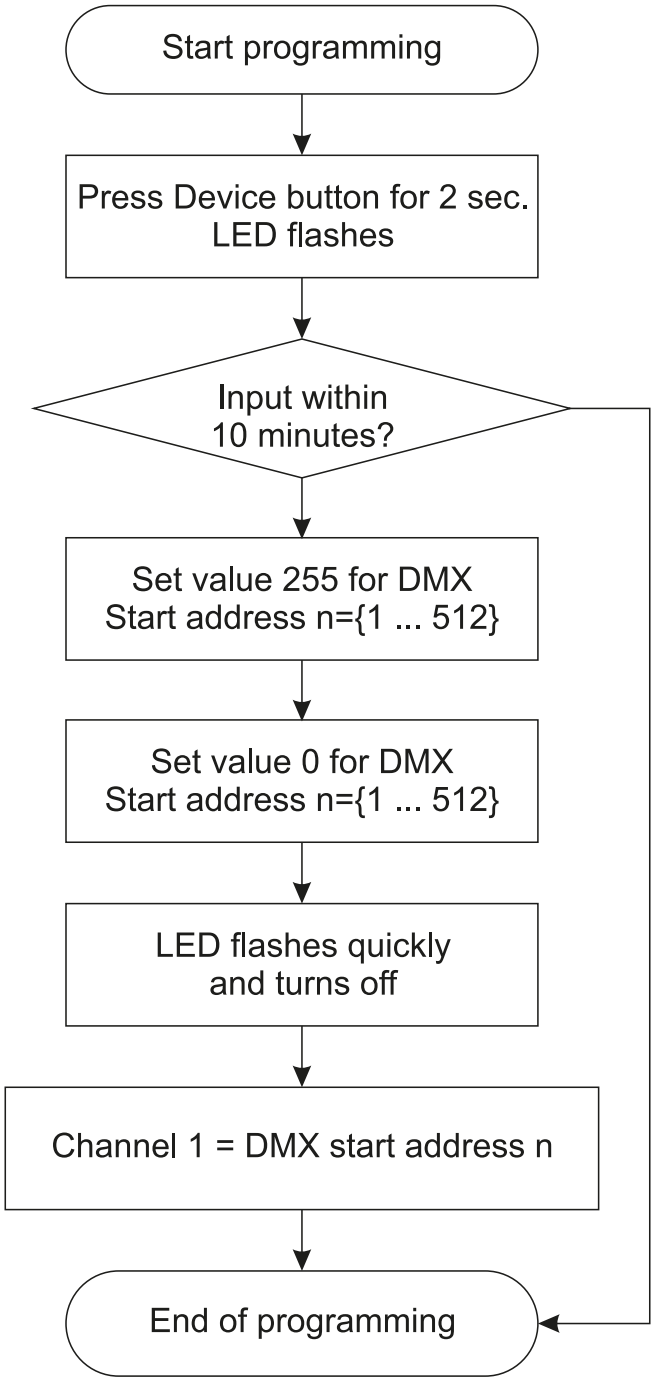
- At the desired start address (1-512) briefly set or fade the value to 251-255 (full on) and set to 0 (full off) again.



- The dimmer accepts this channel as a new DMX start address. This is indicated by two long flashes of the LED and possibly connected lights go to 100% brightness for about one second. Afterwards, the programming mode is exited.

NOTE - If the programming does not take place after 10 minutes, the programming mode will be exited and the device is back in normal operation.

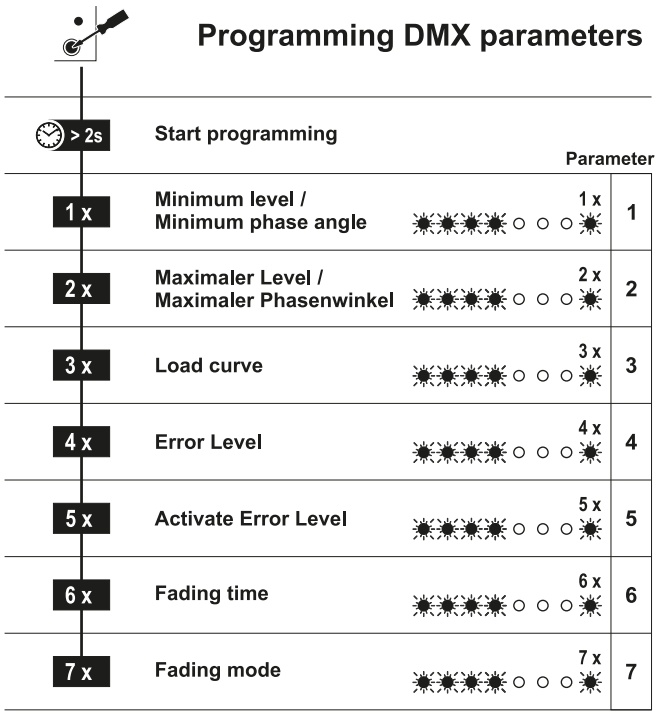
The module can display the currently configured DMX address via the LED To do this, press the device button 3 times in succession. The address is displayed as a digit, for each digit the LED flashes as often as the value of the digit is. For the digit 0 the LED flashes long.



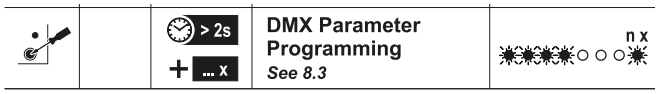
8.3 DMX parameters

Some system parameters can be programmed via DMX telegrams. In this case, a separate DMX address is used for each parameter. The addresses have the same values as the parameter IDs (1 - 7). The appropriate parameter selection during programming determines which parameter should be programmed.

NOTE - Programming must be done within the first 60min after power-on.
Each parameter must be set and stored individually one after the other.

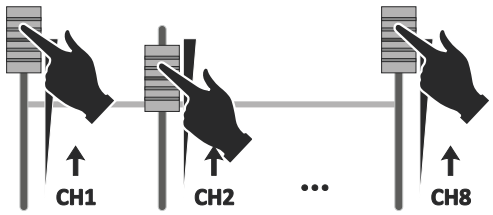


1. Press the device button > 2 seconds ... (load jumps to 0 and 100% for half a second each), then the LED flashes consistently.



2. Select the desired parameter by pressing the button again. Again a parameter change is indicated by the output level 0 and 100% (as at start). The flashing pattern is then indicated by a long light followed by a brief flash of the LED.

3. Set the fader of the desired parameter:



4. To save, press the device button > 1 second ... (load jumps to 100%, 7%, 100% for half a second each), then the LED flashes consistently.

NOTE - If the programming does not take place after 10 minutes, the programming mode will be exited and the device is back in normal operation.

8.4 Operating notes

8.4.1. Derating

In the event of over temperature, an automatic derating occurs (status derating is indicated by the LED), which means that the dimmer‘s power is reduced and the load dimmed down.

8.4.2. Short circuit

Automatic shutdown in the event of a short circuit. Every 30 sec. it is tested whether the short circuit is still present. As soon as the short circuit is eliminated, an automatic restart takes place. If the error is still present after 5 min, the device is switched off completely.

Turn off the power and remove the error.

8.4.3. Noise emission

It may occur that the dimmers cause acoustic noise when they are not used under unfavourable conditions or with certain consumers.

Make sure the phases are evenly balanced.

8.4.4. Flickering

The dimmer requires a faultless mains, flickering may occur in case of mains supply fluctuations or ripple control signals as well as during calibration. This circumstance is system related and not a defect of the device.

8.5 Excerpt from technical data

Rated Voltage		
Connected Load		
Power loss	Standby - 0,75W; Operation at full load - 1,8W	
DMX512 / DMX RDM		1 DMX channel; power supply via external power supply unit 12 - 24V DC is required parallel connection of modules possible
Alternative control		Push button input (Universal voltage) 12...230V AC oder DC
		

Detailed technical data can be found in the datasheet of the product.

8.6 LED indicator

Operating states are indicated over the LED.

Status LED indicators	Blinking pattern approx. 3 sec. 0s 1,5s 3s
Modulstart INIT	OOOOOOOOO----------
Once when applying the operating voltage	
Standby	O-------------------
During operation with switched off channel	
Output Switched On	OOOOOOOOOOOOOOOOOOO
Switched on, the brightness of the LED depends on the output level	
Receive bus event	O-O-----------------
DMX-telegram received	
Operation via push button input	OOOO-OO----------
DMX input button is pressed, mains voltage is present	
Programming mode	OOOOO-----OOOOO-----
DMX identification display; ready for load calibration	
Error 1	O-O-O-O-O-O---O-----
Switching off outputs due to overload.	
Error 2	O-O-O-O-O-O---O-O---
Reduction of output level due to overload.	
Fatal Error	O-O-O-O-O-O-O-O-O-O-
Shutdown due to overload or overtemperature	
Measuring procedure	O--O--O--O--O--O--O-
Performing calibration with dimming mode	
Corridor function activated	OOOOOOOO--OOOOOOOO--
If the corridor mode is activated	

8.7 Appendix - Symbols

Symbols / legend	
	Connected load ON = full brightness
	Connected load dimmed
	Connected load OFF = Off
	Device LED ON = full brightness
	Device LED LED - dimmed
	Device LED OFF = Off
	Load type with leading edge
	Load type with trailing edge
	Device button
	External push button input
	Time for a key press in this case, press the button for more than 2 sec.

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