

exalux

LEDMASTER STUDIO 1

1 - GENERAL INFORMATION

This hardware instruction manual contains specifications and important notifications regarding the safe use of the EXALUX™ LEDMASTER STUDIO 1. Please take the time to read this manual carefully and thoroughly before installing and operating the device. We recommend that you keep a copy for future use and transfer it to the buyer if you resell the device.

EXALUX™ reserves the right to modify and upgrade its range of products, with no obligation to integrate these changes into products already sold. Therefore, all the information found in this manual is subject to change without notice.

2 - OVERVIEW

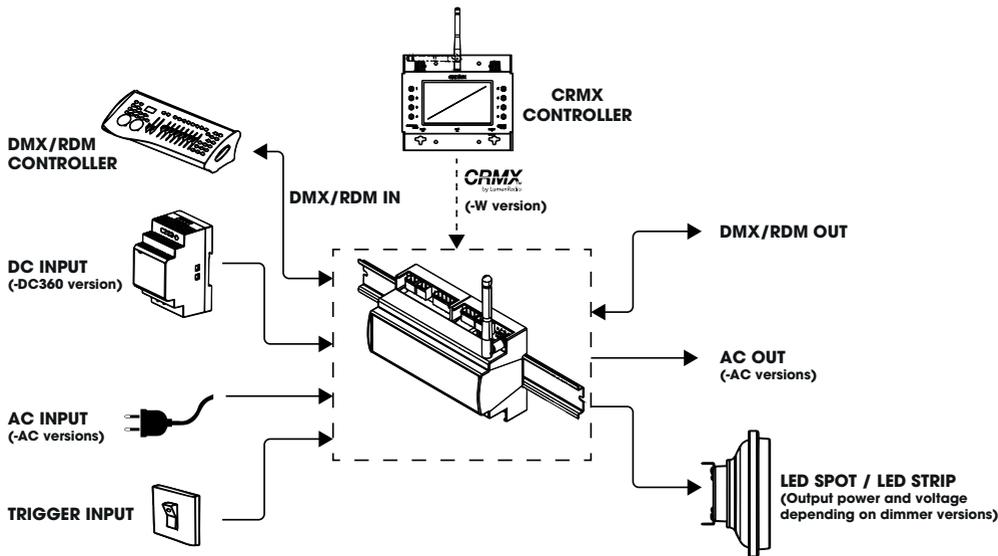
EXALUX™ LEDMASTER STUDIO 1 is a single channel high output constant voltage LED dimmer. It has been designed to dim up to 360W LED fixtures (depending on the version), controlled from DMX/RDM console or CRMX transmitter (optional). This dimmer is integrated in a standard DIN rail enclosure with 5.08mm pluggable terminal blocks for quick and easy set-up. The LEDMASTER STUDIO 1 is available in several versions which can be equipped with LumenRadio™ CRMX receiver.

Input	Output		Designation	DMX/RDM	Wireless CRMX
AC	30W	12VDC	LM-STUDIO1-AC30-12	-D	-W (optional)
		24VDC	LM-STUDIO1-AC30-24		
	60W	12VDC	LM-STUDIO1-AC60-12		
		24VDC	LM-STUDIO1-AC60-24		
DC	7.5Amax/pin (180W@12V / 360W @24V)		LM-STUDIO1-DC360		

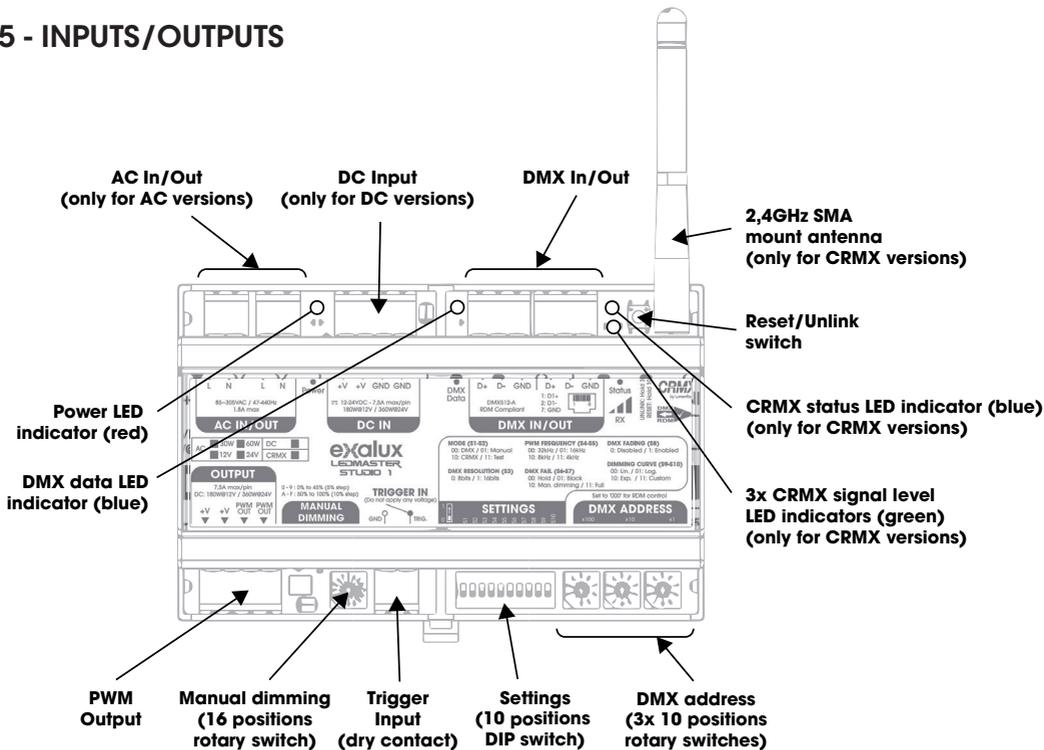
3 - FEATURES

- AC input/output for power supply daisy chain,
- Low side PWM constant voltage output,
- Wired DMX/RDM input/output interface,
- Wireless DMX/RDM integrated receiver (CRMX by LumenRadio™),
- Long range whip, hinged and removable antenna,
- LED indicators, pushbutton, trigger input port,
- DMX address settings, 3x 10 positions rotary switches,
- Custom settings (mode, DMX fail, PWM frequency, dimming curve), 1 x DIP switch,
- Local (manual) dimming control, 16 positions rotary switch,
- Software updates from DMX interface,
- Small form factor, DIN rail, pluggable terminal blocks.

4 - BLOCK DIAGRAM



5 - INPUTS/OUTPUTS



6 - POWER SUPPLY

Version	-AC30-12	-AC60-12	-AC30-24	-AC60-24	-DC360
Input Voltage	85-305VAC / 47~440Hz				12 to 24VDC
Output Voltage	12VDC		24VDC		12 to 24VDC
Power Rating	30W	60W	30W	60W	180W @12VDC 360W @24VDC
Current Load	2.5A	5A	1.25A	2.5A	15A

AC version:

The LEDMASTER STUDIO 1 integrates a built-in AC/DC converter. The output power and voltage depends on the version. Do not daisy chain more than 20 LEDMASTER STUDIO 1 on the AC line. Exceeding this limit can cause overheating of connectors and damage the printed circuit board.

DC360 version:

The typical input voltage of LEDMASTER STUDIO 1 is **+12 to +24VDC**. Using the dimmer outside of this range can cause malfunctions and even destruction of the device. Input voltage is monitored in case of over voltage detection (device shutdown) and can be read from a RDM controller.

Static DC input voltage & PWM output voltage are electrically connected. Input is protected against polarity inversion. Maximum current should not exceed **7.5A per contact** on terminal blocks and cables. In case of a load higher than 7.5A, it is imperative to distribute the power on the four input and output pins.

7 - GENERAL SPECIFICATIONS

AC Power input/Passthrough	2x 5.08mm terminal block (black), 2 positions (L+N)
DMX input/Passthrough	2x 5.08mm terminal block (green), 3 positions (GND, D+, D-)
PWM output	1 channel, 0 to 100%, low side PWM technology Adjustable frequency (4, 8, 16 or 32kHz) 1x 5.08mm terminal block (green), 2/4 positions (V+, PWM OUT)
Dimming Curve	Linear, Logarithm, Exponential & Custom
Modes	Local (manual), DMX/RDM, CRMX, Test
Controls	Local (rotary coded wheels & DIP switches) & DMX/RDM
Trigger Input	1x 5.08mm terminal block (orange), 2 positions (dry contact)
Display	LED indicators
Dimmer own consumption	<1W
Firmware update	Bootloader, via specific cable on DMX input
Housing / Mounting	DIN Rail 8M enclosure (142,3 x 90,5 x 64,9mm) plastic (PC/ABS), grey (RAL7035), DIN rail (EN 60715) mounting (with plastic hook)
Protection, IP rating	IP2X (indoor use only)
Certifications	
Weight	Min : 160g (-DC360-D version) Max : 370g (-AC60-W version, with antenna)
Storage T°	Min : -30°C Typ : 25°C Max : +80°C
Operating T°	Min : -20°C Typ : 25°C Max : +50°C

8 - SETTINGS

The parameters of the LEDMASTER STUDIO 1 can be changed from the DIP switch "SETTINGS", or from a RDM controller (only in RDM mode, refer to RDM section for details).

#	SETTING	DESCRIPTION
S1-S2	MODE	Selection of the operating mode: - "00" = DMX/RDM . Device control from wired DMX interface (Refer to DMX section for details) - "01" = Manual . Allows user to control the output brightness from the local rotary switch (Refer to Manual Dimming section for details) - "10" = CRMX/RDM . Device control from wireless CRMX interface. (Refer to CRMX section for details) - "11" = Test . Allows user to test the device when installing, without any controller (Output brightness variation loop, indicators blinking).
S3	DMX RESOLUTION	Switch between 8 bits and 16 bits DMX resolution for fine/coarse adjustments: - "0" = 8 bits - "1" = 16 bits
S4-S5	PWM FREQUENCY	Output PWM frequency selection: - "00" = 32kHz - "01" = 16kHz - "10" = 8kHz - "11" = 4kHz
S6-S7	DMX FAIL	Select the behaviour in case of DMX stream interruption (lost signal, DMX cable issue, controller Off ...): - "00" = Hold (Hold the current/last valid DMX values) - "01" = Black (Forced blackout, turn off output) - "10" = Man. dimming (Apply the brightness output according to the value set on the "Manual Dimming" Rotary switch. Refer to MANUAL MODE section for details) - "11" = Full (Forced Full-On, turn on output)
S8	DMX FADING	Assigns an additional DMX channel for fading timing adjustment, 20ms steps, from "000" (no fading) to "255" (= 5s fading time)
S9-S10	DIMMING CURVE	Output dimming curve selection: - "00" = Linear - "01" = Logarithmic - "10" = Exponential - "11" = Custom (optimized for 18,5W 12V AR111 LED spot at 32kHz) Refer to DIMMING CURVE section for details.

9 - DMX

To enable the DMX feature, the device must be set in DMX mode (S1-S2 = "00"). When DMX signal is received, the blue "DMX Data" indicator turns ON. Use the three rotary switches to set the DMX address. In case an out of range address is entered, the device will automatically assign the highest DMX address usable.

Note: The DMX address "000" is reserved for RDM control. When "000" address is selected, **the default DMX address is "001"**.

Protocols	DMX512-A & RDM (ANSI E.1.20) - RDM manufacturer ID: "0084h"
Universe	1
DMX frame rate	0,8-830Hz
DMX input/output	1x DMX input/Passthrough, 2x 5.08mm terminal block (green), 3 positions
DMX options	DMX resolution: 8 bits or 16 bits DMX fail: Hold, Black, Full or Manual setting DMX fading: On/Off

DMX CHARTS:

	Addr	Addr+1	Addr+2
DMX - 8bits	Output brightness (0% to 100%)	-	-
DMX - 16bits	Output brightness (0% to 100%, MSB/Coarse dimming)	Output Brightness (LSB/Fine dimming)	-
DMX - 8bits + Fading	Output brightness (0% to 100%)	Fading (0s to 5s)	-
DMX - 16bits + Fading	Output brightness (0% to 100%, Coarse dimming)	Output Brightness (Fine dimming)	Fading (0s to 5s)

10 - RDM

To enable the RDM control, the device must be set in DMX or CRMX mode (S1-S2 = "00" or "10") and **the DMX address must be set to "000"**.

When the DMX address "000" is selected, DMX modes (resolution, fading) can be changed from RDM controller. In that case, values sets on the DIP switch settings do not necessarily correspond to the current operating mode.

The RDM features can be used on both wired DMX and wireless CRMX.

- RDM manufacturer identifier: «0084h».
- RDM labels: "LEDMASTER STUDIO 1 DMX" & "LEDMASTER STUDIO 1 CRMX"
- RDM sensors: input voltage & CRMX signal reception (for CRMX versions only)

The device supports the following RDM PIDs:

DISC_UNIQUE_BRANCH DISC_MUTE DISC_UN_MUTE SUPPORTED_PARAMETERS DEVICE_INFO FACTORY_DEFAULTS	SOFTWARE_VERSION_LABEL DMX_START_ADDRESS IDENTIFY_DEVICE DEVICE_MODEL_DESCRIPTION MANUFACTURER_LABEL SENSOR_DEFINITION	DEVICE_LABEL DMX_PERSONALITY DMX_PERSONALITY_DESCRIPTION SLOT_INFO SLOT_DESCRIPTION SENSOR_VALUE
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11 - CRMX RADIO INTERFACE

Standard / Technology	CRMX by LumenRadio™
Frequency	2.402 ~ 2.480 GHz
Antenna	Swivel whip omnidirectional, 2.4GHz 2.0dBi, SMA (SMA-F onboard, SMA-M on antenna)
RF Output	20 dBm (100mW) - ETSI compliant
RF Modulation	GFSK
End to end latency	< 5ms
Range	Up to 300m (depending on the transmitter and the environment)
Interface	3x green LEDs for radio signal level, 1x pushbutton (hold 3s to unlink from transmitter)

LEDMASTER STUDIO 1 embeds a radio CRMX receiver, RDM compliant, based on LumenRadio™ technology, enabling to receive a single wireless DMX universe. To enable the CRMX feature, the device must be set in CRMX mode (S1-S2 = "10"). Antenna orientation should be optimized according to the expected radio performances and the LEDMASTER STUDIO 1 environment.

Link procedure:

- Make sure that both devices are powered, and dimmer is unlinked.
- Start the linking procedure on the transmitter.
- During the linking procedure (~10s), any unlinked receiver in range will automatically link to the transmitter.
If LEDMASTER STUDIO 1 is linked to a transmitter, the blue Status LED indicator turns on (even if the transmitter is off).
- During the linking procedure, the DMX signal is not transmitted.

Unlink procedure:

- Long press (>3s) the pushbutton on the dimmer until the status indicator turns off. You can also unlink all linked receivers from the transmitter.

Signal level indicators:

- Blinking = no signal
- 1 LED = poor reception
- 2 LEDs = correct reception
- 3 LEDs = excellent reception

Status indicator:

- Off: Device is not linked to any transmitter
- Flashing: off 100ms / on 100ms: Device is linked but no active radio link
- Flashing: off 900ms / on 100ms: Device is linked, no DMX present
- On: Device is linked to a transmitter, DMX data present

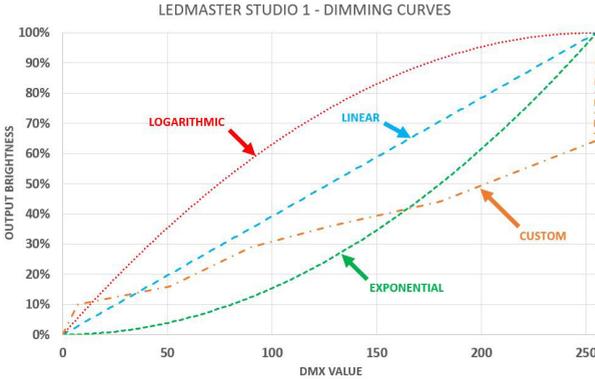
Once everything is set up, the LEDMASTER STUDIO 1 works the same way as it does for wired DMX: the address and mode are the same.

12 - MANUAL DIMMING

To enable the MANUAL DIMMING feature, the device must be set in manual mode (S1-S2 = "01"). In this mode, the output brightness can be manually controlled from the 16 positions rotary switch. Use a small flat screwdriver to select the value. The first 10 positions (0 to 9) allows to adjust with 5% steps, the last 6 positions (A to F) allows to adjust with 10% steps.

0	0% (Off)	5	25%	A	50%
1	5%	6	30%	B	60%
2	10%	7	35%	C	70%
3	15%	8	40%	D	80%
4	20%	9	45%	E	90%
				F	100% (Full On)

13 - DIMMING CURVES



Note 1: the CUSTOM dimming curve has been optimized for 18,5W 12V AR111 spot at 32kHz

Note 2: dimming curves correspond to the 8 bits mode (0-255), but 16 bits mode is very similar

14 - TRIGGER

The trigger input is a dry-contact between the two pins of the terminal block connector. **Do not apply any voltage on this input.** Dry contact trigger input should be used with passive switches, in respect with the common GND equipotential reference.

- In DMX & CRMX mode, when the contact is closed, the DMX/CRMX commands are by-passed and the value set on the 16-position rotary switch is applied to the output.
- In manual mode, when the contact is closed, the output is turn off (black out).

15 - INSTALLATION & CABLING

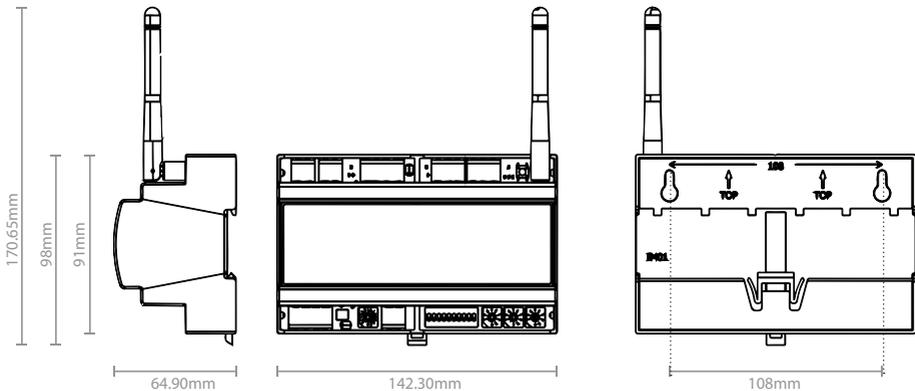
LEDMASTER STUDIO 1 enclosure is designed to be mounted onto a standard DIN rail 35mm width (EN 60715), but wall mounted is another option. Use the embedded plastic hook to attach or detach from the rail. This device is delivered with all required terminal block plugs.

16 - FACTORY RESET

To factory reset the device, press and hold the RESET push button during 10secs. The device will flash memory to default factory settings and restart.

Note: Hardware settings on the DIP switch (SETTINGS) and rotary switches (DMX ADDRESS, MANUAL DIMMING) will be automatically restored.

17 - DRAWINGS



18 - SAFETY INSTRUCTIONS

Term of use

This system is designed to control lighting sources, for indoor use only. To prevent damage, do not expose it to liquid or moisture and keep the devices away source of heat and flames. Avoid clogging and strong vibrations. Use the devices only in its intended use as described in this manual. Any other use, as well as use in other conditions, will be considered non-compliant and can cause injury and damage. No liability will be assumed for damages resulting from improper use.

Risk of electric shock

This device operates AC/DC conversion and regulation, which can result in an electrical shock. Do not remove cover when powered, do not disassemble. The parts inside the device are maintenance free. Check the feature compliancy and correct operation of the power supply before connecting it to the device. Before connection, check if the voltage corresponds to the voltage of your local power network and if the socket is equipped with a GFCI. In case of non-compliance, the device may be damaged and the user may be injured. In case of non-compliance, there is a risk of electric shock and fire hazard. If in doubt, contact a certified technician.

Load

Check the feature compliancy and correct operation of the power supply unit, dimmer and LED fixture before connecting it. In case of non-compliance, devices may be damaged and the user may be injured.

Cable

The section of power cables on AC and DC input / output should match the load power requirements and the cable length should be minimized as much as possible, in order to avoid voltage dropout and heating. Use only the connectors delivered with the device. If those instructions are not complied, the system may exhibit inconsistent behaviour.

Care

Unplug LEDMASTER STUDIO 1 before cleaning it. Do not use cleaning product, use a dry cloth and rub gently. Gently wipe off any stains with a soft lint-free cloth. Store the devices in a clean and dry place, away from exposure to direct sunlight and dust.

Maintenance

Unplug the devices from power during all maintenance operations. The device should only be installed and opened by people in full possession of their physical, sensory and mental abilities who must have the required knowledge and experience. All the other persons are only allowed to operate the devices under the supervision or direction of a person responsible for their safety.

Warranty

EXALUX™ cannot be responsible for material or personal damage resulting from improper use of the product or non-compliance to the instructions. The warranty will not be applied in these cases.

EXALUX™ is a registered trademark of the French Tech Company LEDIXIS

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