OT DMX 6x 350/700 DIM SO

OT DMX 12x 350/700 DIM SO

LED dimmer
Operating instructions

Contents

Safety

General instructions

The dimmer must only be installed and put into operation by a qualified electrician.

The applicable safety regulations and accident prevention regulations must be observed.

Safety instructions

WARNING!

Exposed, live cables.

Danger of electric shock!

- Only work on the dimmer when it is de-energized.
- Do not use the dimmer if power cables are damaged.

WARNING!

Hot housing.

Risk of burns!

- Disconnect the power before installing, wiring or servicing the unit.

CAUTION!
Destruction of the dimmer and other devices through incorrect mounting!

- Do not hot-plug ports. Especially in larger LED matrix systems, voltage potential differences in different parts of the system may damage ports when hot-plugging. Always turn off fixture supplies before connecting or disconnecting.
- Ensure proper ventilation.
- Avoid areas where corrosion, deteriorating or explosive vapors, fumes or gases may be present.
- Ensure that the unit is securely attached, properly mounted, and free of excessive vibration.
- The control unit is designed for cabinet installations only.
- Only use original accessories.
- Adhere to the DMX standard.

CAUTION!
Destruction of the dimmer and other devices through electrostatic discharge (ESD)!

- Do not touch the components.
- Do all preparation work on a static-free surface.
- Wear an antistatic wrist strap.

Description

Purpose, function and application

The LED dimmer controls high-power LED fixtures by a DMX signal using linear current dimming. It is designed for use with both high-power 1W and 3W LED fixtures. The two versions 6CH and 12CH provide control over 6 or 12 individual channels, which allows control of 2 or 4 highpower RGB triplets, respectively.

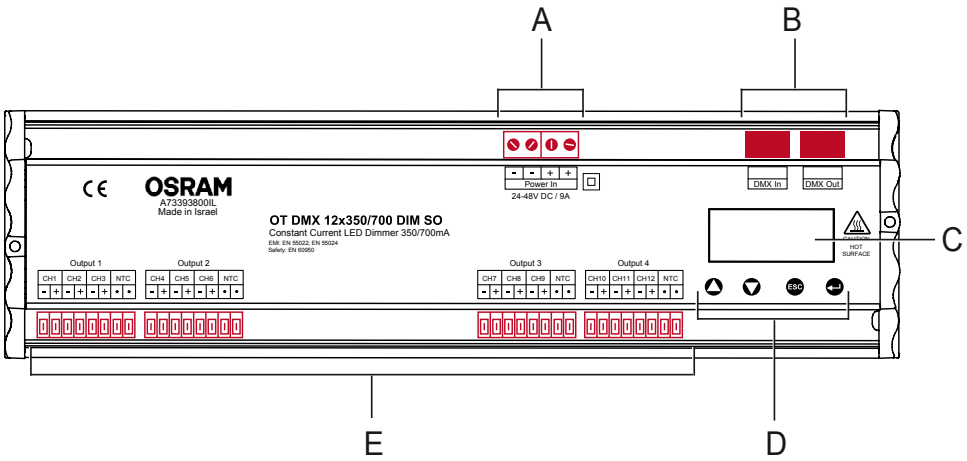
The dimmers can be interconnected to control large installations by DMX signal. Within a DMX network, connected highpower LED fixtures can be controlled by a central DMX controller (e.g. OSRAM EASY DMX SO).

The dimmer is designed for installation on DIN rail in switch cabinets.

Design

The dimmer is made up of the following components:

- Power In connection (A)
- DMX signal input/output (B)
- LCD screen (C)
- Function keys (D)
- LED outputs 1-4 (E)



Installation

Mounting the control unit

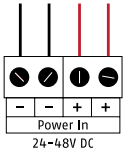
- Follow the safety instructions.
- The dimmer is designed for installation on DIN rail in switch cabinets.
- The dimmer must be oriented with the power-in terminal block and DMX data connectors towards the top to permit proper heat dissipation.
- Allow for proper distance of unit enclosure and wiring terminals for easy access, hardware configuration and maintenance.
- When installed in an enclosure utilizing 45 mm cutouts, the front panel LCD of the dimmer stays visible while the connections are concealed.

Connecting the power supply

CAUTION!
Destruction of the dimmer through incorrect mounting!

- Maintain correct polarity.

The Power In connections are made using a screw terminal block (4 pins, pitch 5 mm).



- Cable type and length limitations: see appendix.
  Use at least 15 AWG (1.5 mm^2) for mains connection.
- Connect all 4 terminals of the captive screw terminal.
- Select the correct power supply unit (PSU):
  The PSU must be selected keeping in mind the maximum number of serial LEDs per channel in the application, output cable type/length, and the power rating needed to drive the LEDs at the desired current. See the following table:

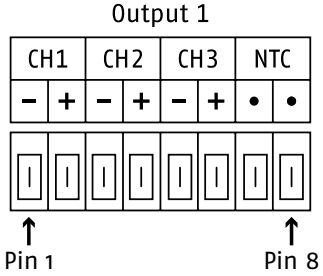
No. of LEDs in a series	Total Vf of LEDs (typ.)	Recom. PSU voltage	6CH Dimmer: Minimal PSU Power Rating		12CH Dimmer: Minimal PSU Power Rating	
			@350 mA	@700 mA	@350 mA	@700 mA
1	3.5 V	24 V	10.0 W	20.0 W	20.0 W	40.0 W
2	7.0 V	24 V	18.8 W	37.6 W	37.6 W	75.2 W
3	10.5 V	24 V	26.5 W	53.0 W	53.0 W	106.0 W
6	21.0 V	24 V	50.3 W	100.6 W	100.6 W	201.2 W
9	31.5 V	36 V	72.8 W	145.6 W	145.6 W	291.2 W
12	42.0 V	48 V	92.6 W	185.2 W	185.2 W	370.4 W

After applying power to the unit, the dimmer will perform a quick self-test for proper voltage from the PSU.

If the PSU voltage is within normal range, the message **PSU OK** will be displayed on the LCD screen. Otherwise, the message **PSU FAIL** will be displayed and the dimmer will not operate.

Connecting LED fixtures

LED-wiring connections are made using pluggable terminals blocks (8 pins, pitch 3.5 mm).



- Cable type and length limitations: see appendix and PSU specific limitations.
- NTC = connection for NTC sensor. If the NTC sensor is not connected, Fixture Thermal Protection (TP) will be disabled for that output.

TP - Fixture Thermal Protection

This feature allows the unit to receive feedback about the temperature of the connected fixture. If the environment temperature causes the fixture to overheat (max. allowed LED fixture temperature is 75 °C), the unit will lower the level of the current passing through the fixture until the temperature of the fixture is stabilized within the allowed limitations. If the environment temperature declines, the unit will raise the level of the current passing through the fixture.

Note:
The changes of current will not affect the color of the light, but only its intensity. The light intensity depends very much on the temperature of the LED. For example, if an LED driven at 700 mA reaches a high temperature, its light output may decline by half. So, if you lower the current passing through this LED, you will in fact get the same light intensity while the temperature of the LED will be able to stabilize.

The dimmer has been calibrated using the following NTC sensor:

Thinking Electronics Industrial - TSM2A103F3802RZ

LED Wiring Test

This unit has a unique algorithm for the detection of load type and wrong LED connections. It can detect, if there is a short circuit between the LED's (+) and (-) lines, or mixed connection with a neighboring channel inside the terminal plug.

If the unit detects incorrect wiring on one of the outputs, that group of channels will not be operational until the problem is fixed. If during normal operation some of the LEDs are reconnected, the LED-wiring test will be initiated on that group to which the disconnected channel belongs.

That way, LEDs can be hot-plugged into the system. However, connecting/disconnect-

ing LEDs under power is not recommended. It is recommended to make all connections first and then to turn on the power.

Autoload Detection

Each channel of the dimmer is capable of auto-detecting the LED load type connected to it, and selecting the appropriate operating mode to control that load.

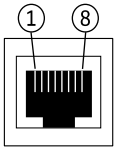
DRTP – Driver Thermal Protection

The dimmer has an internal temperature sensor allowing it to monitor the temperature of the internal power circuitry. If, by any reason, the external environment temperature exceeds the permitted limit, the unit will not permit the internal circuitry to overheat by reducing the output power. By doing so, it avoids driver malfunction caused by overheating, while still driving the LEDs even under worst conditions and preserving the lifetime of the dimmer.

Connecting DMX devices

DMX signal output

The DMX connections are made using the RJ-45 connectors.



Pin	DMX In	DMX Out
1	DMX –	
2	DMX +	
3	DMX GND	
4	N.C.	
5	+16 V_{DC} / 0.3 A	N.C.
6-8	N.C.	

CAUTION!
Destruction of the dimmer and other devices through incorrect mounting!

- **If onboard 16 V_{DC} power output is not used, make sure that this line is insulated from any other pins!**
- Before connecting any DMX controller, refer to the installation guide of the controller manufacturer.

The dimmer has an active DMX signal level repeater eliminating the need for a DMX splitter/repeater when daisy-chaining dimmers together.

Note:
The onboard 16 V_{DC} can be used to supply power to a DMX controller from the DMX In RJ-45 connector.

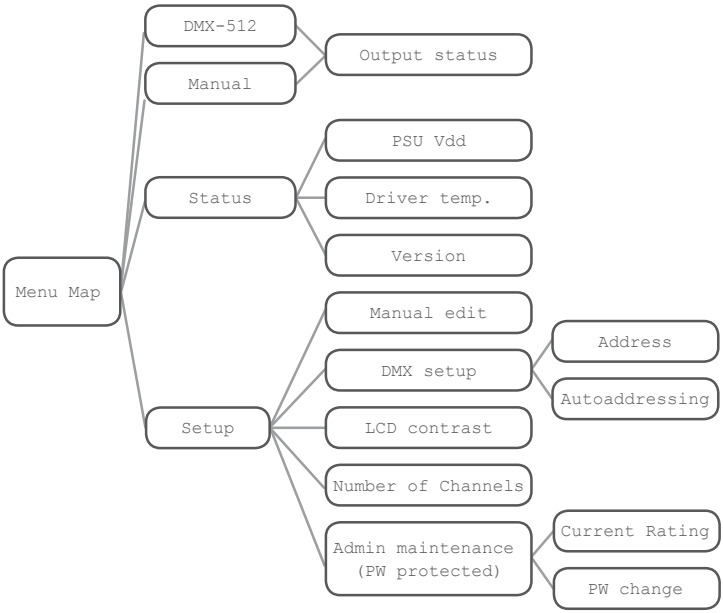
Operation

Function keys

The dimmer is equipped with following function keys:

Key	Function
▲/▼	Navigate through the options/change setting.
↵	Enter sub menu/confirm changes. Hold to enter output status from DMX-512 or manual modes.
ESC	Go back to the previous menu/discard changes. Hold to return from DMX-512 or manual modes.

Menu map



DMX-512 and Manual menu

The dimmer can be operated in the following modes:

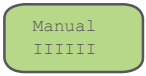
- DMX-512 mode: Standard DMX-512 signal control.
- Manual mode: Static scene output. The channel values are set manually in the setup menu.

DMX-512 menu

1st LCD line: DMX-512 Start address of the dimmer. ADMX means that auto-addressing is enabled.

2nd LCD line: Graphic-bar representation of DMX input signal values.

Manual menu



2nd LCD line: Graphic-bar representation of channel values which can be set in the setup menu.

Status menu

PSU Vdd

Shows PSU voltage.

Driver temp.

Temperature of the internal PCB of the driver (approx. value, only accurate for temperatures > 40 °C).

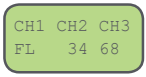
Version

Firmware version and current rating of the driver (also shown after applying power to the unit).

Setup menu

Manual edit

Manually edit the values of each channel (Manual mode).

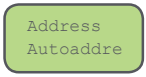


1st line: Channel number

2nd line: Channel value

Press ↵ to highlight the channel number or channel value. The highlighted option flashes.

DMX setup



- **Address**: Change the DMX address of the dimmer.
- **Autoaddressing**: Enable/disable the auto-addressing function.

Press ▲ to enable auto-addressing, press ▼ to disable auto-addressing.

LCD contrast

Change the contrast level of the LCD.

Number of Channels

Limit the maximum number of control channels from 1 to 6 (6CH) or 1 to 12 (12CH). This function is designed to allow synchronous operation of several/all channels.

Examples:

- If the number of channels is set to 6, the channels 7-12 will be a copy of channels 1-6.
- If the number of channels is set to 3, the channels 4-6, 7-9, 10-12 will be a copy of channels 1-3.

Admin maintenance

Change the current rating. The current rating is the maximum current in [mA] that the unit will output at full (FL) channel value.

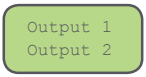
Note:
This menu is password-protected in order to prevent accidental change of the current rating. The **default password** is: **512**. The password can be changed in the Password menu.

Entering the password:

The highlighted digit will flash. Press ▲ and ▼ to change the highlighted digit. Press ↵ to highlight next digit.

- **Current Rating**: Set the current rating from 50 to 700 mA.
- **Password**: Change the password.

Output status menu

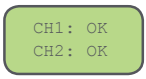


Shows information about the status of connected fixtures.

This menu can be accessed by pressing and holding ↵.

LED status / Thermal status

Select the desired output and press ↵.

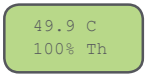


- **CHXX: OK**: Indicates that the LEDs connected to the channel operate normally.
- **CHXX: Unplugged**: Indicates that no LEDs are connected to the channel.

(**XX** indicates number of channel, can vary from 1 to 12.)

Thermal status:

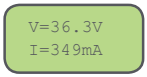
Note:
Only available on supported fixtures with thermal sensors on-board.



- fixture temperature in [°C].
- Thermal Dimmer value. Displays the percentage of output current in reference to the nominal current rating value, which is affected by the thermal protection. See “Connecting LED fixtures”.

Channel statistics

Select the desired channel and press ↵ to briefly show the channel statistics for a few seconds.



1st line: Channel drop voltage.

2nd line: Channel driving current of every channel.

Troubleshooting

If you cannot remedy the fault, please contact the Customer Service department.

Fault	Possible cause	Remedy
Device does not function.	Dimmer is not receiving power from the external DC power supply.	Verify Power In connections. Ensure that the AC circuit breaker of the PSU is not tripped.
Device not responding to DMX-512 input signal.	Dimmer is not in DMX-512 mode.	Set dimmer to DMX-512 mode.
	Bad DMX-512 wiring or DMX-512 signal is missing.	Check DMX-512 wiring. When unit is receiving a correct DMX-512 signal, the icon will blink at the top right of the LCD display.

Error messages on LCD display:

Message	Possible cause	Remedy
`Output x FAULT!!!`	Possible wiring problem output x.	Enter Output status menu, select the output x and review the status messages.
In the „Output status“ menu:		
`CHx: Short circuit!!!`	Short circuit on channel x.	Check the output wiring.
`CHx: Wiring fault!!!`	Incorrect connection wiring on channel x.	Check the output wiring.
`Hardware fault!!!`	Internal circuitry malfunction.	Contact Customer Service department.

Technical data

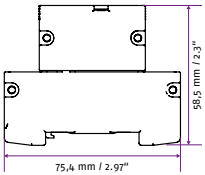
Operating voltage	24 … 48 V_{DC}
Current consumption	6CH: max. 4.5 A 12CH: max. 9 A
Power consumption	6CH: max. 180 W 12CH: max. 360 W
Efficiency	Up to 95 %
Heat dissipation	< 20 W
Max. driving current	Adjustable (50 … 700 mA per channel)
Output current tolerance	< 5 %
Load regulation	1 %
Output voltage	Max. 48 V_{DC}
Fixture output	Up to 12 LEDs per channel
Protection type	IP 40, dry location
Working temperature	–10 … +40 °C
Storage temperature	–20 … +70 °C
Working humidity	20 … 90 % RH, non-condensing
Storage humidity	10 … 90 % RH, non-condensing
Color grades	256 level (each color), in total 16,770,000 colors
Fixture protection	Open line, short line and wrong interconnection protection
Output protection	PTC (positive temperature coefficient) auto-recovery after fault condition is removed
Thermal protection (unit)	Reduces output current to eliminate unit overheating
Standards	EN 55022, EN 55024, EN 60950-1, EN 61000-3-2, EN 61000-3-3

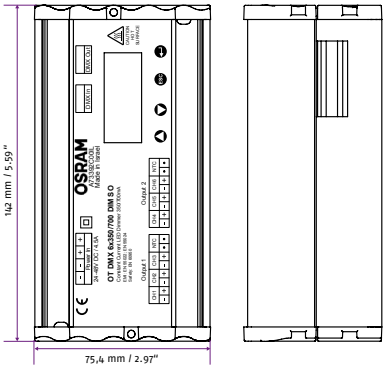
CE Conformity with the relevant EU directives is confirmed by the CE symbol.

Appendix

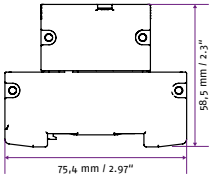
Dimensions

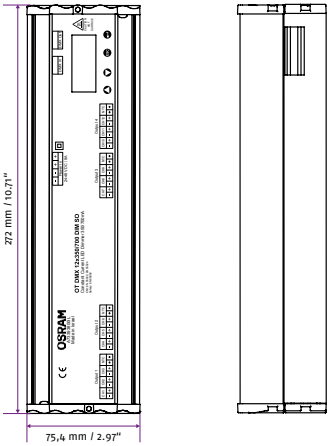
OT DMX 6CH



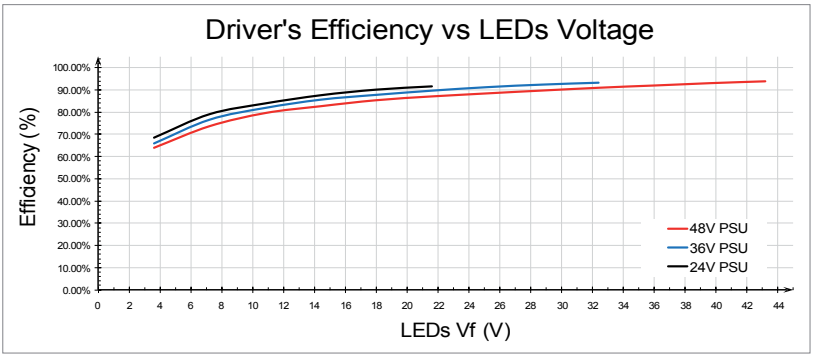


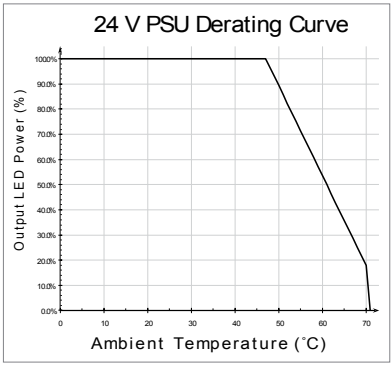
OT DMX 12CH

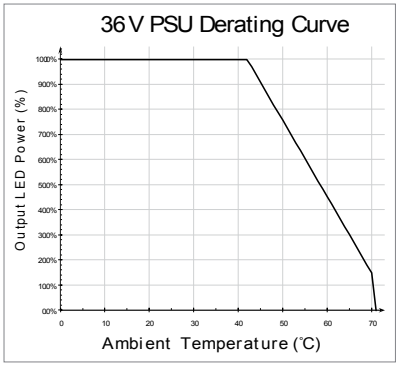


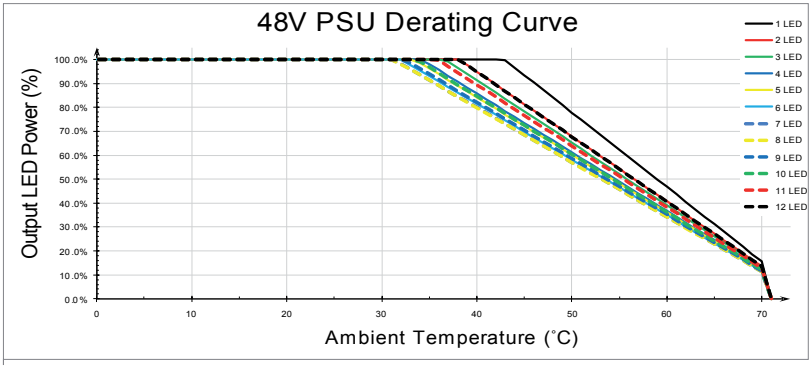


Derating curves









@ 350mA

AWG COPPER	Diameter mm	Ohms per km	Max amps for power transmission	Voltagedrop (100 m, 350 mA)	max. LEDs 50 m	max. LEDs 100 m	max. LEDs 150 m	max. LEDs 200 m	max. LEDs 250 m	max. LEDs 300 m	max. LEDs 400 m	max. LEDs 500 m
26	0.40386	134	0.36 (2.2)	4.69	12	10	9	8	7	5	3	X
24	0.51054	85	0.57 (3.5)	2.975	12	12	11	10	9	8	6	5
22 (0.34 mm^2)	0.64516	53	0.92 (7)	1.855	12	12	12	11	11	10	9	8
18 (0.75 mm^2)	1.02362	21	2.3 (16)	0.735	12	12	12	12	12	12	11	11
15 (1.5 mm^2)	1.45034	11	4.7 (28)	0.385	12	12	12	12	12	12	12	12

@ 700 mA

AWG COPPER	Diameter mm	Ohms per km	Max amps for power transmission	Voltagedrop (100 m, 350 mA)	max. LEDs 50 m	max. LEDs 100 m	max. LEDs 150 m	max. LEDs 200 m	max. LEDs 250 m	max. LEDs 300 m	max. LEDs 400 m	max. LEDs 500 m
26	0.40386	134	0.36 (2.2)	9.38	12	10	8	5	3	X	X	X
24	0.51054	85	0.57 (3.5)	5.95	12	11	10	8	7	3	X	X
22 (0.34 mm^2)	0.64516	53	0.92 (7)	3.71	12	12	11	10	9	7	5	3
18 (0.75 mm^2)	1.02362	21	2.3 (16)	1.47	12	12	12	11	11	11	10	10
15 (1.5 mm^2)	1.45034	11	4.7 (28)	0.77	12	12	12	12	11	11	10	9

X = specified cable type / length cannot be used

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