
LSS

Manual

PowerDim



Mobile dim/non-dim switchable Thyristor-Dimmer with power switching, power distribution and controllable network node

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Operating instructions

Notes on this manual

This manual provides you with instructions and information on the function and configuration of the PowerDim. It describes the basic operation and shows how to set the menu-based parameters of the device.

The PowerDim is customized. For this reason, functions and settings may be described here that are not relevant or available for certain specifications of the dimmer. The illustrations also do not necessarily correspond to your PowerDim.

This manual uses the following symbols to indicate important information for your safety and configuration.



Here you will find additional information



Attention draws your attention to situations in which decisions can lead to technical problems with the device or to data loss.



A warning refers to situations in which injury or damage to life and limb may occur.

Handling instructions

The LSS PowerDim is designed for continuous operation. However, you should note the following:



- Only use the device for its intended purpose!
- Avoid extreme mechanical loads!
- Avoid any mechanical impact on the display!
- Avoid direct exposure to moisture and excessive heat on the appliance!
- Do not install the device directly above headlights!

Safety instructions

Proper handling of the PowerDim is not dangerous. However, please observe the following instructions:



Caution! High voltage is present inside the dimmer housing! There is a risk to life if the housing is opened!



Opening the PowerDim housing will invalidate any warranty claims!



- Never operate visibly damaged appliances!
- If a defect is suspected, disconnect the appliance from the power supply immediately! Secure the appliance against restarting!
- Never open the appliance! There is a danger to life if you open the appliance!
- Never touch any of the internally installed components!
- Repairs may only be carried out by employees of LSS GmbH!



The dimmer must not be lifted by the side brackets with lifting gear or by hand!

We look forward to receiving your comments on this manual. Please send them by e-mail to mail@lss-lighting.de.

History

Date	Firmware	Description
07/2017	1.02	First description
12/2019	1.08	Update menu
04/2021	1.10	Extension of the Ethernet setting to include Art-Net 4 & RDMnet
07/2024	2.12	New Firmware

Display, connection and operating elements

Overview

Range of configurations

The LSS PowerDim is a leading edge phase control dimmer in duct design. The dimmer is available in various device configurations and output powers:

- 6x 3 kVA Dim/NonDim on Schuko, 400 V/32 A infeed
- 6x 3 kVA Dim/NonDim on Schuko & parallel multipin, 400 V/32 A supply
- 6x 3 kVA Dim/NonDim on multipin, 400 V/32 A supply
- 6x 3 kVA Dim/NonDim & 6x 3 kVA NonDim on Schuko, infeed 400 V/32 A
- 6x 3 kVA Dim/NonDim & 6x 3 kVA NonDim on Schuko and multipin, 400 V/32 A power supply
- 6x 3 kVA Dim/NonDim & 6x 3 kVA NonDim on Multipin, 400 V/32 A supply
- 6x 3 kVA Dim/NonDim & 6x 3 kVA NonDim on connection terminals, 400 V/32 A power supply
- 6x 3 kVA Dim/NonDim & 6x 3 kVA NonDim on Schuko and LL heating coil, 400 V/32 A input
- 6x 5 kVA Dim/NonDim on DBS, 400 V/63 A supply
- 6x 5 kVA Dim/NonDim on DBS & parallel MultiCore, 400 V/63 A input
- 6x 3 kVA / 5 kVA Dim/NonDim & 6x 3kVA NonDim on DBS/Schuko, switchable, 400 V/63 A power supply
- 6x 3 kVA / 5 kVA Dim/NonDim & 6x 3kVA NonDim on DBS/Schuko and parallel multipin, switchable, 400 V/63 A input

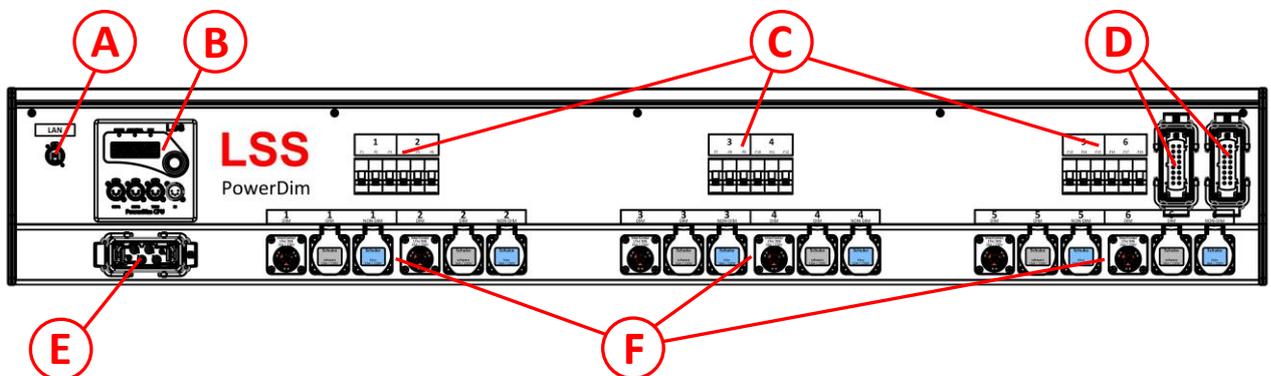
The channel design allows installation on galleries, trusses and other locations close to the stage. The aluminum housing with generously dimensioned cooling fins enables cooling without a fan, which further supports use close to the stage. The duct design also enables a mechanical connection with the LSS MF 250x140 multifunctional duct.

Further performance features:

- Up to 6 Dim/NonDim circuits
- Up to 6 NonDim circuits
- 3 kVA / 5 kVA power per load circuit possible
- Power switching 3kVA / 5kVA via DMX address, possible under full load and without changing connectors
- Bypass function for loss reduction of the dimmer circuits at maximum load
- 8Bit/16Bit control
- Internal switchable base load
- 14 stored dimmer curves
- Adjustable fade-in/fade-out times
- Control via Ethernet or DMX
- Can be used as an RDM proxy
- Control incl. Ethernet/DMX node, remotely configurable
- Internal current measurement (single phase/ total) incl. voltage & frequency monitoring, automatic switch-off adjustable
- Housing made of extruded aluminum profile
- Fan less cooling via housing

Technical structure

Schematic drawing of an LSS PowerDim as a duct variant with an example configuration:



- | | |
|---------------------------------------|--|
| A Ethernet connection | D Load connections multipin plug connector Dim/NonDim |
| B Dimmer-CPU with network node | E Power supply |
| C Lower fuse Dim/NonDim | F Load connections Schuko/DBS and other Dim/NonDim |

The individual dimmers can be grouped and routed to the load outlets by using switching units. These outlets can be configured according to customer requirements. In addition to controlling spotlights, the LSS PowerDim also offers the option of perfectly controlling and dimming fluorescent lamps.



Caution! High voltage is present inside the housing! There is a danger to life when opening the housing!



The dimmer must not be lifted by the side brackets by hand or with lifting equipment! The side brackets serve as safety devices for the plug connectors and connection cables. They are not intended for carrying or lifting the dimmer!



Opening the housing will invalidate any warranty claims!

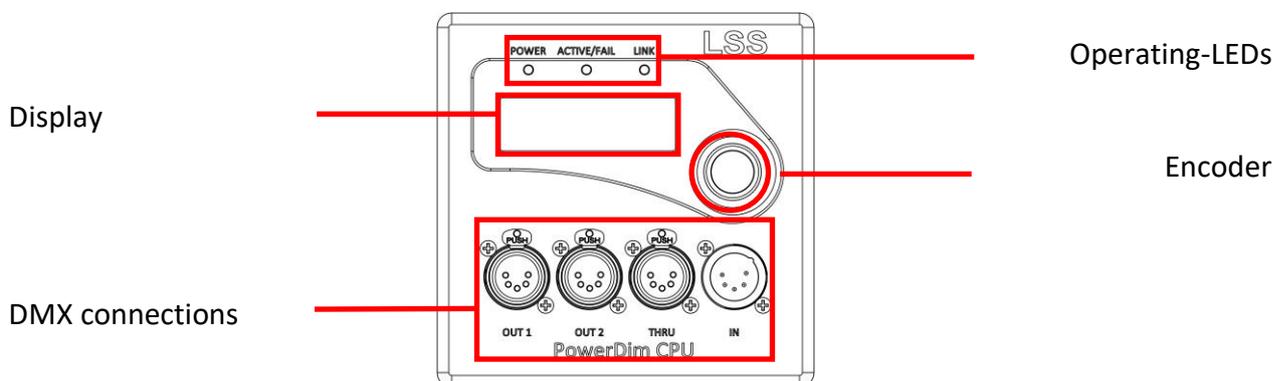
Control unit and network node

The settings for the LSS PowerDim are made via the control unit. The control unit also serves as a controller and network node. In order to perform these tasks without overlapping and therefore without process conflicts, the CPU is designed as a dual-core processor. To ensure maximum operational reliability, the core responsible for the dimmer cannot be addressed directly by the user and the data.

Structure of the control unit

All operating steps are menu-guided with a single control element, an encoder (rotary control). The encoder has a turn/push function.

DMX-IN, DMX-THRU and both DMX-OUT are located below the encoder. The inputs and outputs are electrically isolated using optical couplers and equipped with EMC filters.



Display

The LSS PowerDim can be configured locally via a convenient menu system. For this purpose, the device contains a blue and white 20x4 display with energy-saving LED backlighting and a long service life.



Use the screen saver! This extends the life of the display many times over.



You can adjust the contrast of the display in the menu. However, readjustment is usually not necessary as the display is already temperature-compensated.



Another option for configuring the LSS PowerDim is to use the ConfigStudio configuration software developed by LSS. All the necessary information can be found later in this manual.

Operating LED

LED	Color	Meaning
POWER	Blue	illuminated: Operating voltage present not illuminated: Operating voltage not present
ACTIVE/FAIL	Green	On: At least 1 dimmer is activated Flashing: At least 1 dimmer is controlled manually
	Red	Flashes briefly: No input voltage on a module Flashes 50:50: Switched off due to overcurrent / temperature Flashes for a long time: No output voltage, DimmerCube defective Permanently lit: Short circuit Mutually Red/Green or yellow flashing: Temperature warning! Non-prioritized channels are reduced in power. Attention! Messages displayed in red have highest priority!
LINK	Yellow	continuously lit: Ethernet is connected flashing: Data reception



The operating LEDs can be switched off in the Options menu.

Encoder

Turn the encoder wheel to select the various menu items and buttons. Briefly pressing the encoder marks this menu item or button as selected.

Network

The LSS PowerDim can be controlled either via Ethernet or DMX. The control unit is equipped with an Ethernet/DMX network node that supports RDM and can be used as a RDM proxy.

DMX parameters

DMX-In

Max. receivable data rate:	44 frames/s = Protocol length 22,4ms
Min. receivable mark-after-break:	4 μ s
Timeout time until reception failure:	2 s

The DMX signals are logically processed and analyzed by the controller. It therefore fulfils the ANSI E1.11 - 2008 (R2013) and USITT DMX512-A standards.

DMX-Out

The following parameters can be set for all DMX outputs:

Behavior in the event of reception failure of all sources:	Switch off, hold or send zeros
Break length:	90...42.28 ms
Mark-after-Break:	10 μ s...42.28 ms

DMX termination

If the LSS PowerDim is the last DMX device on a long and/or interfering DMX line, a commercially available termination plug (resistor 120...130 Ω between pins 2 and 3) should be plugged into the DMX-THRU as a bus termination to avoid malfunctions.

Ethernet parameters

Supported network protocols

The LSS PowerDim supports the following protocols:

- Art-Net
- AVAB/UDP
- sACN
- ShowNet
- AVAB/IPX

Data transfer rate

The LSS PowerDim is characterized by a high throughput rate and low latency (delay time) in both directions. The network interface is 100 MBit-capable and the internal CPU works with a very fast

real-time multitasking operating system. This enables a maximum throughput of >1000 network packets per second.

The standard network protocol of the LSS PowerDim on delivery is the manufacturer-independent streaming ACN. The protocol version currently used is Art-Net 4

Light parameters

You can set the following parameters for all light protocols:

- Minimum transmission rate without value change 20 ms ... 4s
- Timeout time 1...999 s (hold etc. is set per DMX-Out, see there)
- Timeout can only be set globally, but is checked individually for each Universe used

IP parameters

You can also specify the following parameters for all TCP/IP-based lighting protocols:

Selection	Meaning
Static manual:	Free setting option for the IP, subnet and gateway address. The setting is retained after a restart.
Art-Net2/8:	Art-Net address in the 2 network. The address and subnet mask are generated automatically.
Art-Net10/8:	Art-Net address in the 10 network. The address and subnet mask are generated automatically.
10.0.0.0/8:	Manual setting of an IP address in the 10 network (RFC 1918). First byte and subnet mask are defined.
172.16.0.0/12:	Manual IP address in the 172.16 network (RFC 1918). Octet 3 and 4 are freely adjustable.
192.168.0/16:	Manual IP address in the 192.168 network (RFC 1918). Octet 3 and 4 are freely adjustable.
Test1 /24:	Manual IP address for test purposes (RFC 6890). Network 192.0.2.0. octet 4 is freely adjustable
Test2 /24:	Manual IP address for test purposes (RFC 6890). Network 198.51.100.0. octet 4 is freely adjustable
Test3 /24:	Manual IP address for test purposes (RFC 6890). Network 203.0.113.0. octet 4 is freely adjustable
DHCP:	Automatic assignment of an IP address by a DHCP server.
LinkLocal/16	IPv4LL/ZeroConf address, 169.254.0.0/16

Merge behavior

The LSS PowerDim can merge up to 4 HTP or LTP systems that transmit on the same sub-net/universe. This distinguishes it from most other devices of this type. Art-Net, for example, only provides for 1 or max. 2 systems.

Priorities are also supported if the lighting protocol permits this. However, no manufacturer-specific extensions, such as "Priorities per circuit", are supported

Remote configuration

For all LSS devices, we recommend the free LSS ConfigStudio software, which supports all features of the LSS PowerDim and other LSS devices, as well as Art-Net devices from other manufacturers. Only with this software is it possible to locate all devices in the network and configure the LSS PowerDim completely remotely.

As an Art-Net-compatible device, the LSS PowerDim works seamlessly with Art-Net software tools from other manufacturers, such as the DMX-Workshop program. A limited remote configuration is also possible via this tool. Please note that Art-Net can only configure a subset of the LSS PowerDim here.



The LSS PowerDim can always be configured with ConfigStudio even if lighting protocols other than Art-Net are set; the only requirement is that the PC is within the IP address range of the LSS PowerDim.

The menu and its settings

Notes on using the menu

Structure and selection

The menu structure of the PowerDim is arranged hierarchically. The first level is the run-through, from which the main menu is accessed. From the main menu, the other submenus are divided automatically into levels.

Menu selection

Turning the encoder selects the different menu items and buttons with a moving . Pressing the encoder briefly selects this menu item or button.

Make and save settings

The settings for the PowerDim are made in the “Config”, Options and Manual main menus. Turn and press to call up submenus or select and adjust settings. The settings are only applied and thus become effective when you save them. The settings are saved by returning to the higher-level menu. The question as to whether the changes should be saved must be answered with „Yes“.



Please note that any changes to the settings can have far-reaching consequences for your lighting system. The setting options described below also assume that you have experience and knowledge of configuring DMX and Ethernet lighting protocols.

Throughput

Pages in the flow

The LSS PowerDim menu scrolls through various diagnostic pages that provide a quick overview of various settings and the operating status of the device. The scroll can be interrupted by turning the encoder. The pages can be called up manually by turning the encoder again. Automatic scrolling is indicated by a flashing  symbol at the top right. When switching to manual mode, the symbol changes to .

If the encoder is not operated for a longer period of time, the PowerDim automatically returns to the cycle. The length of the timeout can be set under Options→Display (default 30s). In the same menu under "Default", you can define a higher-level display for the cycle. Monitor screens are excluded from the automatic return to the cycle.

Messages in flow

The control unit of the LSS PowerDim can be supplied with power either via the fixed connection or via PoE. With PoE supply, the control unit can also be active when the dimmer, i.e. the power unit, is switched off. The following error messages are then displayed in the cycle.

Error message	Meaning
All Dimmers „B“	Baseboard error The dimmer boards are switched off or have not started correctly.
Current monitors show „-.-“	Current monitoring failed Power supply is switched off.
Relays show „H“	Switching position of the relays is unknown and HOLD is active. The switching position of the relays is held
Voltage monitors show „0“	Voltage monitoring failed Power supply is switched off.
Frequency monitoring does not change	Frequency monitoring failed Power supply is switched off
Display „F!“ in Lvl	An error has occurred.
Display „U“ in Fail	A circuit breaker was tripped.

When the dimmer is switched on, all circuit boards must start correctly and report to the control unit. If a board does not start or the feedback to the control unit fails, the dimmer is switched off by the control unit.

Menu structure



In the initial state, the device displays one of the 11 information pages. Pressing the encoder wheel for 1 second takes you to the main menu of the LSS PowerDim. The menu structure is hierarchical and includes submenus for information, function settings and general device settings. This results in level 1 (right-hand column) being labelled View, “Config” and Options. The structure of the submenus is described below.

Monitoring with the View menu

The monitors in the View menu give you an overview of the current settings of the LSS PowerDim. Current events, data input and output are displayed as well as the merge situation. The displays in the View menu are monitors and are in real time. This means they can easily be used as monitoring and diagnostic tools.

Level 1	Level 2	Level 3	Level 4	Level 5	Description	
View	Dimmer	3kVA, 5kVA, ND	Addr, Curve, DMX, Cur, Tmp. PWM, CI		Display of the current DMX address, dimmer curve, DMX value (decimal and percentage), power consumption, temperature of the cube, hexadecimal DMX value I	
	DMX	In, Out, Fps			Display of incoming DMX signals, set hold values, sent packets and set frame rate	
	RDM	Port 1, 2, D, I	RDM displays		Display of current RDM information per DMX port (except THRU), received device information	
	Network	Monitor	Port1, 2, 3	Hexadecimal display		Display DMX port settings
		Counters	In, Out, Data	kByte, packets, Errors, Dropped, Overrun, Length, CRC, Frame, FIFO		Display counter of sent/received data
		Data	Pack./s., kByte		Display counter data packets	

Settings with the Config menu

Dimmer settings

Joined or single – dimmer- and relays settings as a whole or individually

The LSS PowerDim offers the option of setting all dimmer channels to the same parameters or assigning individual parameters to each circuit.

Level 1	Level 2	Level 3	
Config	Dimmer	<u>ConfigMode</u>	<u>Joined:</u> All settings are adopted for all dimmer or relay (NonDim) switching channels, DMX addresses are assigned automatically after the start address.
			<u>Single:</u> Each circuit is set individually

DimmerOut and RelayOut – Address- and parameter settings

Level 1	Level 2	Level 3	Level 4
Config	Dimmer	Dimmer Out	Setting of all dimmer-relevant parameters such as DMX address, curve, backup level, baseload, fade-in and fade-out times etc. NonDim mode can also be set for the dimmer
		Relay Out	DMX address, switch level and backup level for the NonDim channels

The **bypass** parameter is a special setting. If this is set to Auto, the bypass function is activated after a preset time at 100% load, bypassing the Thyristor and thus reducing the load. If the dimmer load is reduced, the bypass is deactivated immediately.

When operating inductive loads (fluorescent lamps) or LEDs, a minimum load is required for correct operation. This can be switched on as a **base load** in the dimmer.

The minimum and maximum dimmable light values as well as the **fade-in and fade-out times** can be set in the device for the dimmer channels. These values cannot be influenced by the lighting control panel.

In the NonDim settings, a switching threshold can be specified as a percentage. The **Switch level** parameter can be set here between 0 and 100 %.

8 Bit/16 Bit control for the Dimmer Mode

For smooth and permanent fade-in/outs with fast-acting loads the LSS PowerDim is equipped with a 16 bit control. This can be switched on and off via the configuration menu.

setting	meaning
Off	8 Bit-control active
On	16 Bit control active



Switching the control to 16 bits can have an effect on the DMX addressing! If you are using "Single" operating mode, check whether DMX addresses have been assigned twice!

Allocation of DMX addresses in AddressMode Joined in 8-bit and 16-bit mode

The number of DMX addresses depends on the number of channels in the PowerDim. If the start address of the first channel is $\neq 1$, the following addresses change according to the set start address.

Default DMX address for all PowerDim 6x 3kVA without Power switching

channel	DMX address 8 Bit	DMX address 16 Bit
Dim/NonDim 1	1	1 and 2
Dim/NonDim 2	2	3 and 4
Dim/NonDim 3	3	5 and 6
Dim/NonDim 4	4	7 and 8
Dim/NonDim 5	5	9 and 10
Dim/NonDim 6	6	11 and 12
NonDim 1	7	13
NonDim 2	8	14
NonDim 3	9	15
NonDim 4	10	16
NonDim 5	11	17
NonDim 6	12	18

Default DMX addresses for all PowerDim 3x 5kVA/3kVA with Power switching

channel	DMX address 8 Bit	DMX address 16 Bit
3kVA Dim/NonDim 1	1	1 and 2
3kVA Dim/NonDim 2	2	3 and 4
3kVA Dim/NonDim 3	3	5 and 6
3kVA Dim/NonDim 4	4	7 and 8
3kVA Dim/NonDim 5	5	9 and 10
3kVA Dim/NonDim 6	6	11 and 12
5kVA Dim/NonDim 1	7	13 and 14
5kVA Dim/NonDim 3	8	15 and 16
5kVA Dim/NonDim 5	9	17 and 18
NonDim 1	10	19
NonDim 2	11	20
NonDim 3	12	21
NonDim 4	13	22
NonDim 5	14	23
NonDim 6	15	24
3kW/5kW Switching 1	16	25
3kW/5kW Switching 3	17	26
3kW/5kW Switching 5	18	27

Default DMX-Adressen PowerDim mit Leistungsumschaltung 6x 5kVA/3kVA

channel	DMX address 8 Bit	DMX address 16 Bit
3kVA Dim/NonDim 1	1	1 and 2
3kVA Dim/NonDim 2	2	3 and 4
3kVA Dim/NonDim 3	3	5 and 6
3kVA Dim/NonDim 4	4	7 and 8
3kVA Dim/NonDim 5	5	9 and 10
3kVA Dim/NonDim 6	6	11 and 12
5kVA Dim/NonDim 1	7	13 and 14
5kVA Dim/NonDim 2	8	15 and 16
5kVA Dim/NonDim 3	9	17 and 18
5kVA Dim/NonDim 4	10	19 and 20
5kVA Dim/NonDim 5	11	21 and 22
5kVA Dim/NonDim 6	12	23 and 24
NonDim 1	13	25
NonDim 2	14	26
NonDim 3	15	27
NonDim 4	16	28
NonDim 5	17	29
NonDim 6	18	30
3kW/5kW switching 1	19	31
3kW/5kW switching 2	20	32
3kW/5kW switching 3	21	33
3kW/5kW switching 4	22	34
3kW/5kW switching 5	23	35
3kW/5kW switching 6	24	36

Routing – settings for data processing and merging

The dimmer as its own universe

The settings for merging and data processing are defined for each DMX-Out in this menu. The dimmer is regarded as a separate universe, as DMX-Out 3, so to speak

Menu structure

Level 2	Level 3	Level 4	Level 5	Description
Routing	DMX-Out 1/2, Dimmer	Failmode	Off , Hold, Backup	Setting behavior in the event of reception failure. Off switches off, Hold retransmits the last received value, Backup sends packets with "0" values or the set backup level is maintained.
		Merge	Off, Network, Net+Dmx	Merge source setting.
		Precedence	HTP, LTP	HTP- or LTP merging
		Universe	(protocol-dependent)	Setting the universe.
		Subnet / Priority	(protocol-dependent)	Subnet/Priority setting.
	DMX-In	Timeout	1 ... 10	Setting the DMX-In timeout in seconds
		Mode	On, Off	Activation of routing into the network

DMX – Setting the DMX and RDM properties

Menu structure

Factory Settings are shown in **bold**.

Level 2	Level 3	Level 4	Level 5	Level 6	Description
DMX	Def				Load default values of all DMX settings for max. data speed. Settings must be saved to activate.
	RDM	RDM	Port1,2,In	Off, On	Switch on RDM for selected port
		Discovery	Port1,2	Off, On	Switch on RDM Discovery.
		Intervall	1 - 65535s		Setting the interval times for Discovery.
		Incremental	Off, On		Switch on Incremental Discovery.
		Background	Off, On		Switch on the background mode for Incremental Discovery.
	Break	90 - 200 - 42280µs			Setting the break length.
	MAB	10 - 20 - 42280µs			Setting the length of the mark-after break.
	Frames	3 - 44 /s			Setting the frame rate.
	Channels	0 – 512			Setting the bit length of the DMX protocol.
	ProtTime	Nur Anzeige			Display of the calculated protocol time
	AdrMode	Joined , Single			Enter whether the DMX address can be set as a start address or individually. Attention! This setting overrides the "Config" Mode setting in the dimmer menu!!

Network – Setting the Ethernet settings

Rx Prot – Setting the receive protocol

Selection	Meaning
Rx Prot	Setting the light protocol for data reception: <ul style="list-style-type: none"> • Art-Net • AVAB/UDP • AVAB/IPX • ShowNet • sACN
Rx Tmo	Setting the timeout for data reception 1...999.

Tx Prot – Setting the transmission protocol

Selection	Meaning
Tx Prot	Setting the transmission network protocol: <ul style="list-style-type: none"> • Art-Net • AVAB/UDP • AVAB/IPX • ShowNet • sACN
Tx Rate	Setting the minimum transmission rate if no values change. 20ms ... 4s

IP Mode – Setting the Ethernet IP address

Selection	Meaning
Static manual:	Free setting option for the IP, subnet and gateway address. The setting is retained after a restart.
Art-Net2/8:	Art-Net address in the 2 network. The address and subnet mask are generated automatically.
Art-Net10/8:	Art-Net address in the 10 network. The address and subnet mask are generated automatically.
10.0.0.0/8:	Manual setting of an IP address in the 10 network. The first byte of the address and subnet mask are set.
172.16.0.0/12:	Manual setting of an IP address in the 172.16.0.0/12 network. The first and second byte of the address and subnet mask are set.
192.168.0.0/16:	Manual setting of an IP address in the 192.168.0.0/16 network. The first and second byte of the address and subnet mask are set.
Test1:	Manual setting of an IP address in the 192.0.2.0/24 network. The first, second and third byte of the address and subnet mask are defined.
Test2:	Manual setting of an IP address in the 198.51.100.0/24 network. The first, second and third byte of the address and subnet mask are defined.
Test3:	Manual setting of an IP address in the 200.0.113.0/24 network. The first, second and third byte of the address and subnet mask are defined.
DHCP:	Automatic assignment of an IP address by a DHCP server.

LinkLocal/16	Automatic address for mDNS networks.
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IP2 – Setting a second IP address

This can be used to set a second alias IP address if this is required for Art-Net and the actual IP address is in a different network.

Selection	Meaning
Off:	Second IP address is deactivated.
Art-Net2/8:	Art-Net address in the 2 network. The address and subnet mask are generated automatically.
Art-Net10/8:	Art-Net address in the 10 network. The address and subnet mask are generated automatically.

Setting the manual IP, subnet mask, gateway and DNS-server address

If the "Static manual" setting is selected in IP mode, the IP address and subnet mask can be entered freely. For all other settings, only individual octets can be changed or the addresses are only displayed here.

The gateway and DNS server address can always be set freely.

Selection	Meaning
IP	Input/display of the IP address.
SN	Input/display of the subnet address (network mask)
GW	Input/display of the gateway address.
DN	Enter/display the DNS server address for RDMnet.

Services – Setting network services for RDMnet

Selection	Meaning
Telnet	Switches on the Telnet protocol for log messages. On: Activates Telnet Off: Deactivates Telnet
mDNS	Switches on the multicast DNS protocol. On: Activates mDNS Off: Deactivates mDNS

Selection	Meaning
RDM	Setting how RDM is sent to evaluation devices via Ethernet. Off: The LSS PowerDim does not send RDM via Ethernet ArtNet: RDM data is sent via ArtNet.
Hostname	Display of a unique network name consisting of the device name and part of the MAC address. Example: "PowerDim-2ba6d9"
Domain	Entry of a top-level domain as part of a Fully Qualified Domain Name (FQDN). Always "..local" in internal networks Example of an FQDN: "PowerDim-2ba6d9.local"

Options – Setting optional Properties

Selection	Meaning
ArtNet 3 Net	Setting the ArtNet 3 network address. Values 0 ... 127
ArtNet Bcast	Art-Net is sent as a broadcast. On: Activated Send as broadcast Off: Deactivated Send as broadcast
ArtNet 4	Switches on the Art-Net 4 protocol. On: Activates the Art-Net 4 protocol Off: Deactivates the Art-Net 4 protocol
Light TxChan	Setting the circuits of a Universe sent to the Ethernet network. This function is only active if the selected transmission network protocol supports this function.
sACN Discov	Switches on the sACN Discovery protocol. On: Activates the sACN Discovery protocol Off: Deactivates the sACN Discovery protocol
sACN Draft	Selection of the supported sACN protocol On: sACN according to standard E1.31 R0 Draft Off: sACN according to standard E1.31 2018
sACN ChanPri	Switch on the channel priority, if supported by the protocol
UDPChksm	Setting for calculating the checksums of UDP data packets Rx & Tx Checksums for received and sent packets Rx only Checksums only for received packets Tx only Checksums only for sent packets Off Checksum calculation from
TCP MSS	TCP Maximum Segment Size Only change the default setting if necessary
EthMedia	Setting the transmission speed Autoneg. Automatic determination of the transmission speed 10 Half 10 MBit/s Half Duplex

	10 Full	10 MBit/s Full Duplex
	100 Half	100 MBit/s Half Duplex
	100 Full	100 MBit/s Full Duplex

Power – Setting the current monitoring

Menu structure

Level 2	Level 3	Level 4	Description
Power	LineVoltage	85 - 230 - 300V	Setting the nominal mains voltage.
	MaxCurr L1	1 - 63 - 80A	Setting the maximum current for phase 1.
	MaxCurr L2	1 - 63 - 80A	Setting the maximum current for phase 2.
	MaxCurr L3	1 - 63 - 80A	Setting the maximum current for phase 3.
	MaxCurr Sum	1 - 189 - 240A	Setting the total amperage. Attention! For optional relays, their load current must be taken into account here.
	FreqControl	Off, On	Activates averaging of the mains frequency of the power supply to reduce flickering of lamps.
	SyncTime		Expert setting! Adaptation of the dimmer to the zero crossing of the local power grid.
	JitterTime		Expert setting! Adaptation of the dimmer to interference signals from the local power grid.
	Relay Time	Off, On	Time-delayed switching of the relays with simultaneous signal reception
	Fan		On customer request, adjustable fans can be installed, which are controlled here.



The maximum total current setting always has priority over the three individual Phase currents!



Setting the limit values for the current does not affect the maximum current. This is always defined on the hardware side by the circuit breakers used and the division of the phases of the incoming three-phase alternating current. The circuit diagrams of the PowerDim, which can be found in the project documentation, must be consulted in order to make a final valid setting!

Operating setting in the Options menu

Level 2	Level 3	Description	
Options	Defaults	Loading the operating settings.	
	Display	Shortname	Art-Net short name up to 17 characters long. Confirm with a tick at the end of the line.
		Contrast	Setting contrast in the display
		MenuTimeout	Setting the time until the menu returns to the initial state if no changes are made. Attention! Un-saved settings will be discarded!
		ScreenSaver	Setting the time until the backlight is switched off after the last rotation of the encoder.
		Front LEDs	Setting whether operating LEDs are switched off with the display
		Events	Setting whether the display (and operating LEDs) should "wake up" due to changes.
		Default	Setting the display during scrolling. Scrolling of all pages, permanent display of a fixed page, DMX address or user text (7 characters)
	Security	Pin	Enter a PIN to block access to the device. Values 0 (off) ... 30000
		RemoteCtl	Setting whether device can be addressed and set via ArtNet (ConfigStudio/DMX-Workshop).
	Debug	Debug	See below
		Log	Setting the log sources and destinations
		I2C	Bus analysis of the I2C, if I2C available
		Dimmer	Analyse DIM-CPU and bus transfer between both CPUs
	Reset	Triggering a device reset.	

Debug

The debug functionality of the PowerDim is used for troubleshooting. Message priorities and log destinations (e.g. Telnet or Syslog) and up to 32 log sources can be selected in the Log subdirectory. The device's internal crash log can also be deleted here.

```

◀Opt→Debug
Debug:      Off
Log
I2C

```

```

◀Opt→Debug→Log
Clear crashlog: -
Priority: Notice
Enable targets

```



The settings here should be selected with care. Please only ever select the sources and destinations that are actually required. Otherwise, the amount of information is so large that troubleshooting becomes more complicated.

```

Opt→Debug→Log
Priority: Notice
Enable targets
▶Enable sources

```

Manual – Manual control of the dimmer- and relays

Prioritizing settings and entries

The values set in this menu are saved when the menu is exited and then HTP merged with incoming light values.



If a transmitter with higher values transmits at the same time, these are immediately merged with the manually set values! Manually set values are not accepted in this case!

All settings in this menu are always subject to the settings in the previous menus, especially those of the dimmer configuration!

Example: If a dimmer circuit is selected via "Channel" that has been defined as a NonDim circuit under **Config→Dimmer→Dimmer Out**, then this NonDim circuit switches on its relay when the defined SwitchLevel is reached or exceeded at the intensity setting.

Manual input of values

Menu structure

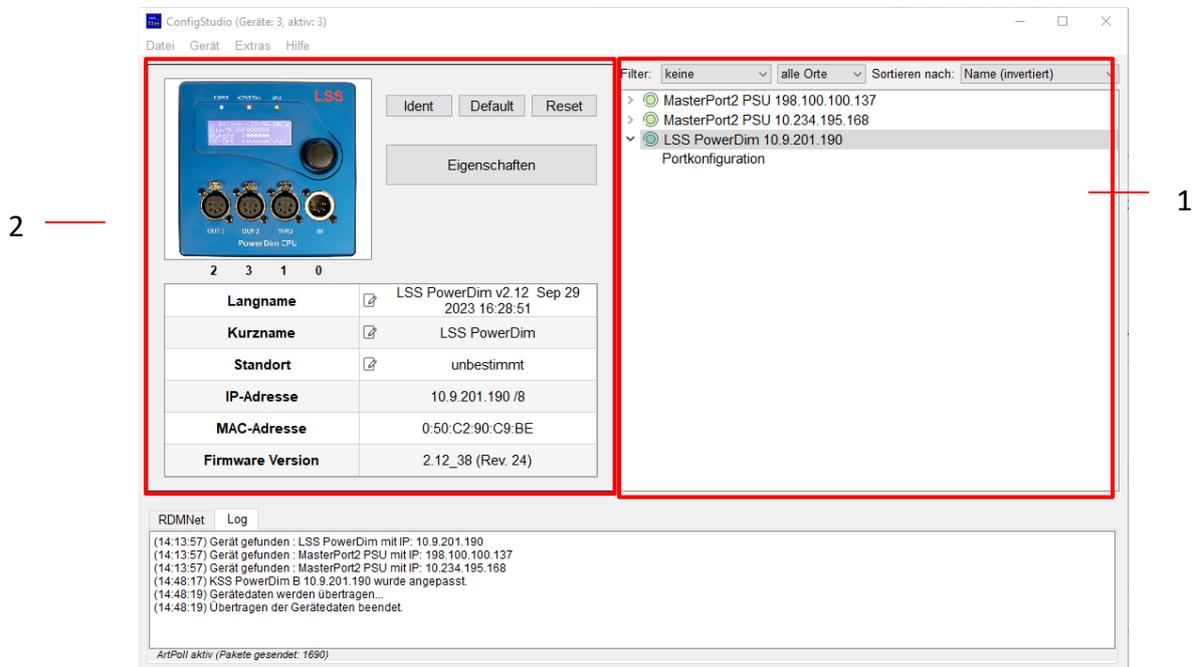
Level 1	Level 2	Level 3	Description
Manual	Channel	Dimmer 1 - 6, 5kVA 1 - 6, Relay	Selection of dimmer or relay circuit
	Dim	0 - 100% (nur bei Dimmer)	Manual setting of the dimmer values. If HTP is merged with received values!
	Rel	Off, On	Manual relay switching (On/Off) Channel = Dimmer: Switching 3kVA dim/non dim relay Channel = 5kVA-Dimmer: switching 3/5kVA changeover relay Channel = Relay: Switching opt. relay

Configuration with ConfigStudio

Configuration software ConfigStudio

The LSS PowerDim can also be configured using the LSS ConfigStudio configuration software. ConfigStudio is available as free software to download from the LSS homepage. The basics of the software are explained in the "ConfigStudio" manual. The LSS PowerDim manual assumes that these basics have been mastered.

From firmware version 2, the LSS PowerDim can only be configured using the ConfigStudio software. The older ConfigCore version is no longer suitable for this. ConfigStudio has a main interface that displays devices in a list and contains basic information about them.



Device list

Devices

ConfigStudio searches all accessible subnets for devices that respond to ArtPoll network packets. Devices found are displayed with their IP address and ArtNet short name.

Each device entry also has a circular symbol that shows the accessibility status in color. The colours have the following meaning:

- Green: Device is active and responds to status queries
- Yellow: A response from the device has been pending for at least 4 queries
- Red: Device is inactive and has not responded to the last queries
- Blue: Device was added manually and does not exist in the network or phantom mode (continuous queries deactivated) is switched on

Most LSS device entries also have a drop-down menu item called *Port configuration*.

Dynamic windows

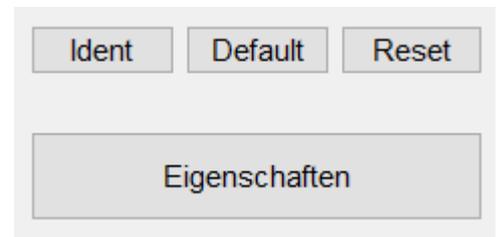
In the left-hand area of the program window, you will find the main functions and information for the currently selected device. The content of this window always refers to the currently active device in the list and changes accordingly.

In the normal state, you will find function buttons, basic information and a sample image here.

Function keys

The function buttons provide quick access to important functions:

- *Ident*: Sends a command to the device, whereupon it is signaled acoustically and visually. Must be deactivated again to continue after activation.
- *Default*: Resets the device to factory settings. **All individual settings will be lost!**
- *Reset*: Restarts the device.
- *Eigenschaften (Properties)*: Opens the configuration window with which all changeable properties of the device (except for DMX ports, see Port configuration) can be customized.



Basic information

The most important information about the selected device is displayed here in tabular form:

- *Langname (Long name)*: The Art-Net long name of the device (usually contains the device type, firmware version, revision and firmware date)
- *Kurzname (Short name)*: The Art-Net short name (device type designation by default)
- *Standort (Location)*: The location of the device (optional, if empty "undefined")
- *IP-Adresse*: Currently active IPv4 address of the device
- *MAC-Adresse*: MAC address of the device in hexadecimal format
- *Firmware Version*: Firmware version number of the device

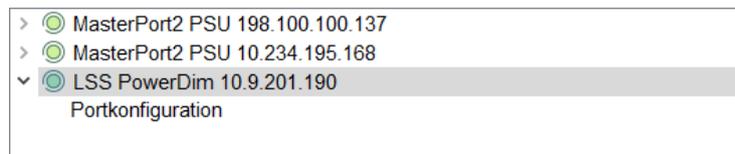
Langname	 LSS PowerDim v2.12 Sep 29 2023 16:28:51
Kurzname	 LSS PowerDim
Standort	 unbestimmt
IP-Adresse	10.9.201.190 /8
MAC-Adresse	0:50:C2:90:C9:BE
Firmware Version	2.12_38 (Rev. 24)



Texts with this symbol can be edited at the respective point and modified for the corresponding device.

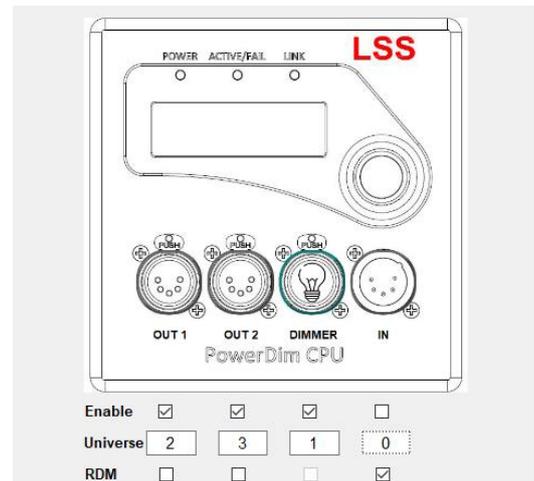
Port configuration

If a device entry is "expanded" in the device list and *port configuration* is selected, the content of the dynamic window changes.



The ports of the selected device are displayed graphically and serve as buttons to configure the selected port in more detail.

Alternatively, important port properties can be customized using the elements below the display:



Enable activates or deactivates the physical or network-side output of DMX data.

Universe contains the network universe that is to be used for sending/receiving light data.

RDM activates/deactivates RDM functions on the physical DMX port.

The colored outline of the port shown visualizes the current state:

- grey: Port is inactive - does not send/receive DMX data
- blue: Zero/Backup - Port is not currently receiving any DMX data, but is sending a basic value of 0
- yellow: Hold - Port is not currently receiving DMX data, but continues to send the last received data
- orange: RDM - Port receives/sends RDM packets
- green: Port is active and sends or receives DMX data

If you click on one of the ports, the following window appears. It contains all the settings for the selected port.

The screenshot shows a dialog box titled "Erweiterte Portkonfiguration Dimmer". It has three main settings:

- Mergemode:** A dropdown menu showing "HTP;Network;DMX-In4".
- Universe:** A numeric input field containing the value "1".
- Verhalten ohne Signal:** A dropdown menu showing "ZERO".

At the bottom right of the dialog, there are two buttons: "Übernehmen" (Accept) and "Abbrechen" (Cancel).

Transferring settings

Settings on the devices are not made directly and in real time, but after confirmation by the user. This is done on the one hand to keep data traffic in the network low and to minimize errors in the settings. A note under the device list indicates that changes have been made locally and could be sent

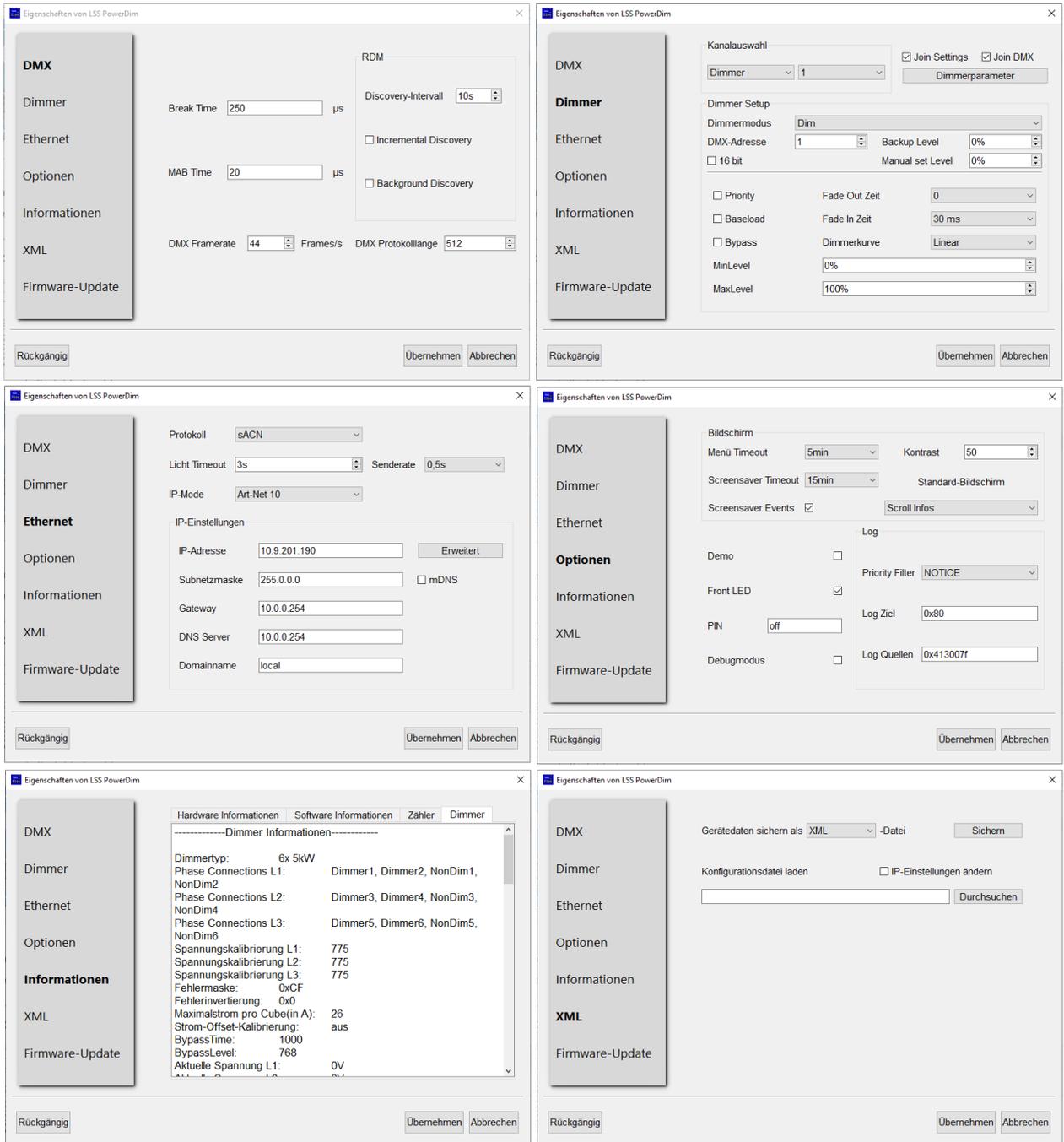
Änderungen vorgemerkt für LSS PowerDim 10.9.201.190

Update

Verwerfen

The properties window

All settings that do not belong to the physical DMX ports can be adjusted in the *Properties* window. These settings are shown in the following illustrations.

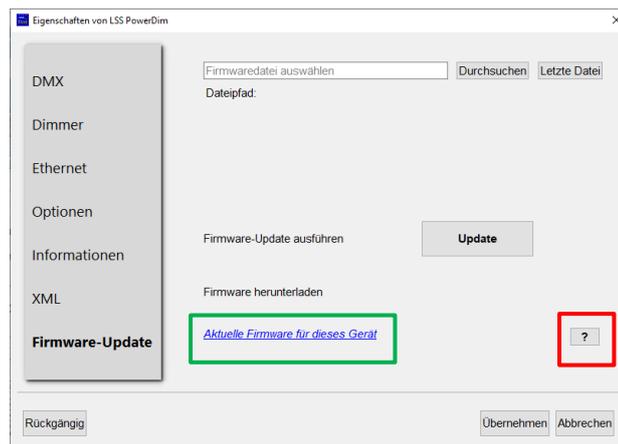


The data from the Information category is particularly important for support enquiries. Using these values, the technician can recognize device properties that are useful for troubleshooting or determining the correct firmware file.

The Firmware update category contains the settings that are important for updating the operating software of the PowerDim. Please only update this software after consultation

The latest firmware can be downloaded from the LSS website via a link (green marking). A password is required for this.

By clicking on the button with the question mark (marked in red), you will receive information on errors that occurred during the update process.



Attachments

Contact us

If problems occur during operation of the LSS PowerDim, the descriptions and instructions in this manual should help you to analyze and rectify the fault. If this is not the case and further assistance is required, please contact LSS Service.

The following information should be available when contacting us:

- Location of the overall system and position of the LSS PowerDim
- Detailed error description
- Detailed description of the troubleshooting carried out so far
- Description of related system or device problems

Contact address:

LSS GmbH

Licht-, Steuer- und Schaltanlagenbau GmbH

Sonnenstraße 5

D-04600 Altenburg

Tel.: +49 3447 83550

mail@lss-lighting.de

Licht-, Steuer- und Schaltanlagenbau GmbH

LSS

EU Declaration of Conformity

The manufacturer: Licht-, Steuer- und Schaltanlagenbau GmbH
Manufacturer's address: Sonnenstraße 5
D-04600 Altenburg/Germany

declares that the product

Product designation: PowerDim

Complies with the following safety guidelines and standards:

- Low Voltage Directive 2014/35/EU
- EMV Directive 2014/30/EU

The following harmonized standards were applied:

- EN 55015
- EN 55103
- EN 60669
- EN 61000

The following national standards were applied:

- DIN 56930
- DIN VDE 0100-100
- DIN VDE 0100-410
- DIN VDE 0298

Altenburg, 15.01.2018



Markus Kaminski
Managing Director

Device configurations and order numbers

Item number	Description of the
L02011-11	6x 3 kVA Dim/NonDim on Schuko, 400 V/32 A infeed
L02011-12	6x 3 kVA Dim/NonDim on Schuko & parallel multipin, 400 V/32 A supply
L02011-13	6x 3 kVA Dim/NonDim on Multipin, 400 V/32 A supply
L02011-14	6x 3 kVA Dim/NonDim & 6x 3kVA NonDim on Schuko, 400 V/32 A supply
L02011-15	6x 3 kVA Dim/NonDim & 6x 3kVA NonDim on Schuko and Multipin, 400 V/32 A infeed
L02011-16	6x 3 kVA Dim/NonDim & 6x 3kVA NonDim on Multipin, 400 V/32 A supply
L02011-17	6x 3 kVA Dim/NonDim & 6x 3kVA NonDim on connection terminals, 400 V/32 A supply
L02011-18	6x 3 kVA Dim/NonDim & 6x 3kVA NonDim on Schuko and LL heating coil, 400 V/32 A infeed
L02011-31	6x 5 kVA Dim/NonDim on DBS, 400 V/63 A supply
L02011-32	6x 5 kVA Dim/NonDim on DBS & parallel MultiCore, 400 V/63 A infeed
L02011-51	6x 3 kVA / 5kVA Dim/NonDim & 6x 3kVA NonDim on DBS/Schuko, switchable, 400 V/63 A infeed
L02011-52	6x 3 kVA / 5kVA Dim/NonDim & 6x 3kVA NonDim on DBS/Schuko and parallel multipin, switchable, 400 V/63 A infeed

Technical data

General data

Mechanical structure	Prefabricated appliance in duct design
Operation	Local: Menu control with encoder and menu display Remote: Configuration with LSS software „ConfigStudio”
RDM	RDM message of all settings and measured values
Display	Text display with white backlighting (4 lines of 20 characters each)
Ambient temperature	0 °C – 40 °C
Operating temperature	0 °C – 60 °C
Device cooling	Standard: Passive via housing Optional: Fan with temperature management
RoHS compliant	Yes
Degree of protection/protection class	IP 20 / SK I
Color	Housing: Aluminum, black anodized
Dimensions (L x H x D)	1604 x 210 x 250 mm (minimum length, can be adapted to longer lengths)
Weight	Depending on size and equipment, fully equipped Single appliance in minimum length: 47 kg

Device functions

Operating modes	Dimmer: Phase control dimmer for all resistive/inductive loads occurring in practical operation NonDim: Switching with adjustable switching point (e.g. electronic ballasts for fluorescent lamps and other loads)
Dimmer	<ul style="list-style-type: none"> - Global or single circuit setting - Switchable base load - Bypass circuit at 100 % load - 8Bit/16Bit control - 14 Dimmer curves - Adjustable fade-in and fade-out times - Adjustable minimum and maximum dimming values - On reception failure Off, Hold and adjustable backup values
NonDim (depending on device configuration)	<ul style="list-style-type: none"> - Hardware NonDim circuit - Bistable relay - On reception failure Off, Hold - Adjustable switching points for all load types

Interfaces

DMX interface	DMX-Out: 2x 5-pin XLR DMX-In: 1x 5-pin XLR, HTP DMX-THRU: 1x 5-pin XLR (ISOLATED according to ANSI E1.11 A1)
Ethernet interface	1x RJ45 10/100 Mbit/s, transmission speed and automatic detection manually adjustable
Network protocols	sACN (ANSI E1.31 2018), RDM-Net (ANSI E1.33), Art-Net and Art-RDM 4, AVAB-IPX, AVAB-UDP, ShowNet

Power supply

Depending on the device configuration and performance data, the following power supplies are possible:

400 VAC/32 A	- Multipin connector - Internal via connection terminal (max. 50 mm ²) - 1.5 m connection cable with CEE plug connector (400 V/32 A, 5-pin)
400 VAC/63 A	- Multipin connector - Internal via connection terminal (max. 50 mm ²) - 1.5 m connection cable with CEE plug connector (400 V/63 A, 5-pin)
EMV-Standards	EN 55022, class B, FCC part 15, level B

Load connections

Depending on the device configuration and performance data, the following load connections are possible:

For LL channels	Plug connector 3-pin + PE (230 - 400 V/10 A) 4-pin plug connector + PE (230 - 400 V/10 A)
For 3 kVA channels	Multipin- plug connector 16-pin + PE (250 V/16 A) Schuko (230 V/16 A) 2-pin + PE (253 V/16 A) DBS 2-pin + PE (230 V/16 A)
For 5 kVA channels	Multipin- plug connector 6-pin + PE (400 – 690 V/35 A) DBS 2-pin + PE (230 V/26 A)

The type, size and number of connections for supplying spotlights can be customized to the specific project. However, they are always subject to the legal regulations and the physical conditions.

Device protection

Safeguarding the power circuits	Standard: MCB (LS switch) per channel Optional: - MCB per channel & RCD (FI) per 6 channels - RCBO (FI/LS) per channel
Current monitoring	Overload protection with single-phase monitoring, manual setting of the max. load per phase with adjustable switch-off thresholds

and max. total load with adjustable total switch-off threshold and prioritization of individual circuits

Electrical key figures

Power loss of dimmable circuits	3 kVA: max. 30 W/ power circuit 5 kVA: max. 50 W/ power circuit In each case at 100% control and nominal load
Rise time	180 μ s
Minimum load	0 VA (not required), for current monitoring 150 W

Pin assignment

DMX ports

Assignment according to DMX512 standard

Pin	Occupancy
1	DMX Ground
2	Data -
3	Data +
4	Spare
5	Spare

PE can be routed via the shielding

Ethernet

The Ethernet connection supports Power-over-Ethernet according to IEEE 802.3af

Pin	Occupancy
1	Rx +
2	Rx -
3	Tx +
4	V +
5	V +
6	Tx -
7	V -
8	V -
S	Cable shield