
LSS

DMX-Merger



Merger for DMX512
Single 6 in 2 or Dual 3 in 1

Manual

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Introduction

How to use this manual

This manual provides advices and information's about the function and configuration of the *Merger 6 in 2*.

Like all devices of LSS GmbH the *Merger 6 in 2* is constantly evolving technology. It is therefore possible that this manual does not explain later development forms.

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



Here you get additional information's.



Attention alerts you to situations in which decisions can provoke to technical problems with the equipment or losing data.



A Warning statement indicates situations in which can result in injury or damage to life and limb.

Safety advices

Proper care of the *Merger 6 in 2* is not dangerous. However please note the following:



- Authorized personnel must install the device!
- Never operate with visibly damaged devices!
- If the suspect prior to a defect, immediately disconnect the device from the power supply! Secure the device to restart!
- Employees of the LSS GmbH may only make repairs

Instructions for use *Merger 6 in 2*

The *Merger 6 in 2* is designed for continuous operation. However please note the following:



- Use the device only for its intended purpose!
- Avoid extreme mechanical loads!
- Avoid direct exposure to moisture and excessive heat on the device!

Der Merger

The *Merger 6 in 2* is a component for professional lighting networks. The development of this device profited from the many years of experience with DMX512 networks in a variety of large and small installations with cutting-edge knowledge of microcontrollers by LSS GmbH.

The *Merger 6 in 2* is a high-end device with a very high throughput rate and the lowest possible delay of DMX signals. The merging is done in step with the incoming DMX signal. This allows a maximum latency of a protocol (22.4 ms) occur only. The internal CPU operates therefore with a very fast real-time multitasking operating system.

The *Merger 6 in 2* is designed as a plug-in device with 1 unit for a 19" rack system. So it can be installed in control cabinets easily. Due to the small size and mass, the device can also be operated locally.

Two in One Merger

Of particular advantage is the flexibility of the *Merger 6 in 2*. The *Merger 6 in 2* offers the opportunity to use the device as well as 6 in 2 or as two separate 3 in 1 merger devices.

In operating mode "Two 3 in 1" both merger behave by the potential separation as completely independent units. In many cases this may be a further device can be saved.

Characteristics

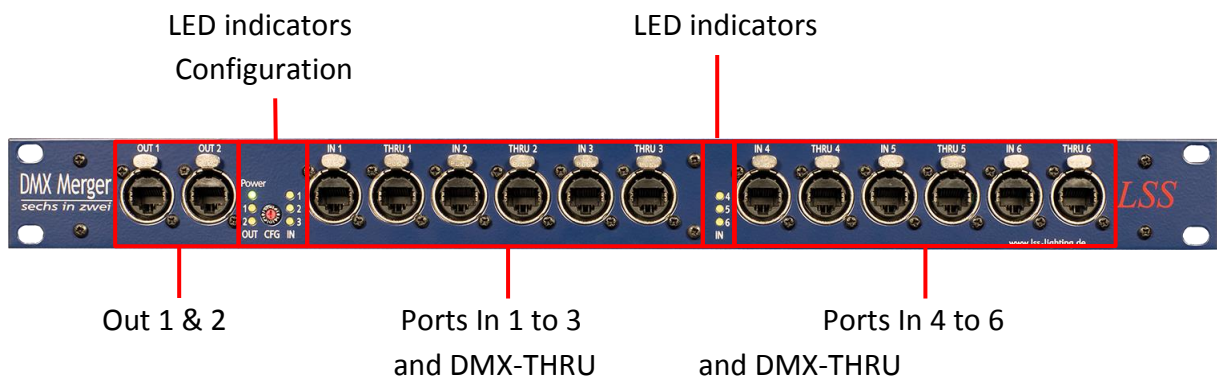
These main features characterize the *Merger 6 in 2*:

- 6 isolated DMX inputs with DMX Thru
- 2 independent, isolated DMX outputs
- Merging of up to six DMX lines into one signal (outputted in parallel to the two outputs)
- Two in One Merger: Merging of each three DMX lines into one output signal
- Configuration via hexadecimal rotary switch
- LEDs for report
- Intelligent DMX signal detection and restoration by microcontrollers
- Small, lightweight and energy-saving design using the latest processor technology
- No active cooling, noiseless
- Universal power supply

Functional survey

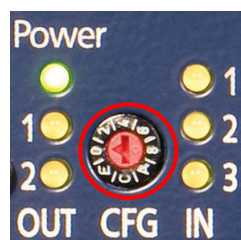
Device overview

All interfaces, LED indicators and settings are located on the front side of the *Merger 6 in 2*.



Configuration rotary switch

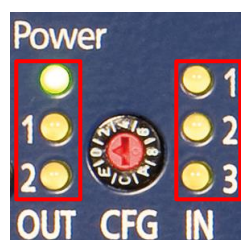
The configuration of the *Merger 6 in 2* is easy using a hexadecimal rotary switch.



hexadecimal rotary switch

LED indicators

The LED indicators are located on the front panel. With this status messages of the device and the interfaces are displayed.



Merging configurations

The merger has the following configuration options:

Merger settings:

- *6 in 2*
Inputs 1 to 6 are assigned to both outputs. Both outputs provide the same signal, which has been calculated from both ports independently.
- Two 3 in 1
Inputs 1 to 3 are assigned to output 1 and input 4 to 6 to output 2.

Settings at receiving error:

- OFF
About 2 seconds after the reception of the last data packet, the output is switched off. Nevertheless, the last DMX protocol has been completely sent.
- HOLD last protocol
The last merged and transmitted data packet is saved and sent until one of the inputs is active again or the device is switched off.
- Send zero
The merger sends data packets with zero values until one of the inputs is active again or the device is switched off.



HTP-merging is the default merging-mode of the *Merger 6 in 2*.



Firmware settings when the device is switched on and existing receiving error:

- HOLD: The merger requires an incoming DMX data packet to activate the output.
- Send zero: When the merger is switched on the output is immediately activated and sends null values.

Merger 6 in 2

The setting of the *Merger 6 in 2* will be made using the hexadecimal rotary switch. The following table lists the settings associated with the switch values:

Value	Operation mode	Setting at receiving error
0	Merger 6 in 2	OFF
1	Merger 6 in 2	HOLD last protocol
2	Merger 6 in 2	HOLD last protocol
3	Merger 6 in 2	HOLD last protocol
4	Merger 6 in 2	OFF
5	Merger 6 in 2	Send zero
6	Merger 6 in 2	Send zero
7	Merger 6 in 2	Send zero
8	2 Merger 3 in 1	IN1 to 3 error →OUT1 OFF, IN4 to 6 error →OUT2 OFF
9	2 Merger 3 in 1	IN1 to 3 error →OUT1 HOLD last protocol, IN4 to 6 error → OUT2 OFF
A	2 Merger 3 in 1	IN1 to 3 error → OUT1 OFF, IN4 to 6 error→ OUT2 HOLD last protocol
B	2 Merger 3 in 1	IN1 to 3 error → OUT1 HOLD last protocol, IN4 to 6 error → OUT2 HOLD last protocol
C	2 Merger 3 in 1	IN1 to 3 error → OUT1 OFF, IN4 to 6 error → OUT2 OFF
D	2 Merger 3 in 1	IN1 to 3 error → OUT1 Send zero, IN4 to 6 error → OUT2 OFF
E	2 Merger 3 in 1	IN1 to 3 error → OUT1 OFF, IN4 to 6 error → OUT2 Send zero
F	2 Merger 3 in 1	IN1 to 3 error → OUT1 Send zero, IN4 to 6 error → OUT2 Send zero

LED reports

The LEDs can flash different. So the LEDs indicate various status reports:

LED	Light	Meaning
POWER	Off	No power. Check power supply.
POWER	On	Power on.
IN	Off	No DMX signal present.
IN	Flash	Error report with more than one meaning: <ul style="list-style-type: none"> • No incoming protocols. • Permanently other start code. • Protocols have more than 512 values.
IN	On	DMX signal is fine.
IN	On, Constant flash	DMX signal is fine, connected devices send RDM signals
OUT	Off	Output is off.
OUT	Off, flashes briefly cyclically	Output sends zero.
OUT	Flashes	Output holds last protocol.
OUT	On, flashes briefly cyclically	Output signal is fine.

Remote Device Management

The Merger acts towards RDM devices as filters. RDM signals are detected and displayed by occasional flickering of the LED of the respective input. But the RDM signals are not forwarded.

RDM signals have no effect on the function of the merger!

Technical Data

Generals

Design type:	19" rack slide in 1U
CPU:	Infineon XC161
Frequency:	40MHz
Cooling:	Noiseless without fan
Configurations:	Via hexadecimal rotary switch
Power supply:	110...240V AC single-phase, 47...63 Hz
Current consumption:	0,03A typ.; 0,1A max.
Electric consumption:	20W
EMC standards:	EN 55022, class B, FCC part 15, level B
Security standards:	IEC/EN 60950, UL/cUL 1950 (File E141988)
RoHS-conform:	yes
Dimensions:	B x T x H 446 x 106 x 40 mm
Weight:	0,85 kg (without power supply cable)
Scope of supply:	19" rack slide in / 1 U finished device Power supply cable 1,8 m
Order number:	5005

Interface

Power:	Low heat device socket (IEC320)
DMX:	Optional RJ45 (Neutrik EtherCon®) or XLR

DMX

General

DMX protocol:	DMX512 (USITT 1990)
Baud rate:	250 kbps
Inputs:	6, individual isolated
Thru:	6
Outputs:	2, individual isolated
Electrical isolator:	Optocoupler
Insulation voltage:	650V DC
Insulation resistant:	10 GΩ

Receive

Start code:	=0 Light protocol	(IN LED on)
	<>0 no Light protocol, RDM	(IN LED flashes)
Minimum protocol length:	Start code only	
Maximum protocol length:	Startcode + 512 values (Values over 512 will be lost)	
Minimum cycle delay:	44μs	
Maximum cycle delay:	22,4ms	
Reception timeout:	2s	
Max. distance between 2 packets:	2s	
Minimum realized break length:	48μs	
Maximum valid break length:	1,95s	

Send

Start code:	0
Protocol length:	Start code + 512 value
Minimum protocol time:	22,4ms
Send protocols per second:	44
Break length:	200μs
Mark After Break:	25μs
Break after Start code:	25μs

Pinouts

DMX

5 Pin XLR

Pinout is according to DMX512 standard.

Pin	Description
1	Ground
2	Data -
3	Data +
4	Spare
5	Spare

PE can be connected to the cable shielding.

RJ45

Pinout is according to DMX512 standard.

Pin	Description
1	Data +
2	Data -
3	Spare
4	
5	
6	Spare
7	Ground
8	Ground
S	Kabelschirm