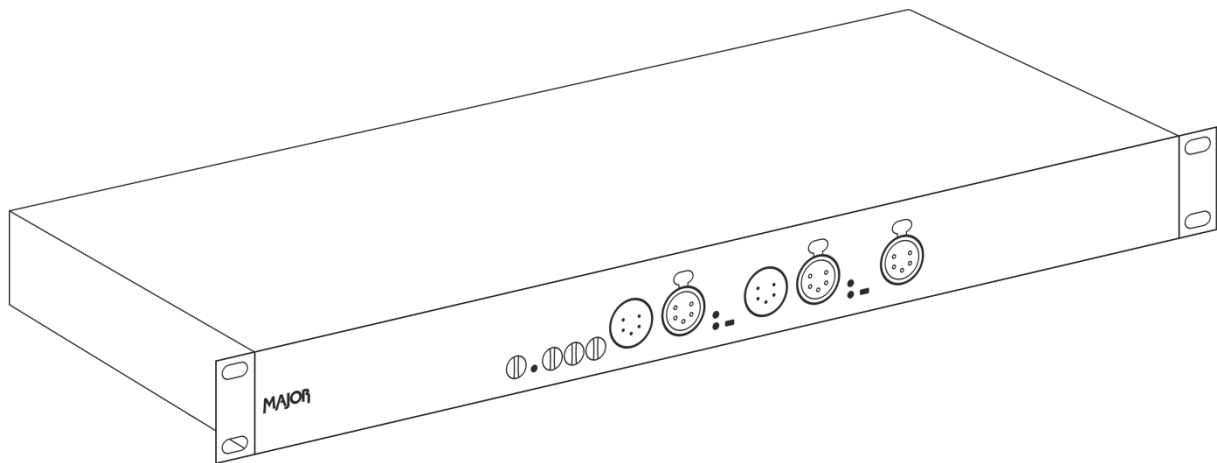


Major

DMX-Merger 3in1

User Manual



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1 Installation

A DMX merger is usually a "permanent operating device" which is, for example, permanently installed in a data distribution unit. Therefore, the device does not have a separate power switch.

Plug in the appropriate power outlet (powerCON supply on the rearside of the device, 100-240V AC, 50/60 Hz). The device performs a self-test and is then ready for operation.

All of the seven colored LEDs on the front of the device flash briefly from left to right during the self-test. Then the yellow RDM LED for input B flashes to indicate the main version number of the firmware currently loaded in the device, then the sub-number of the software version via the RDM LED for input C.

At the time of printing this manual the current software version is V1.03. Therefore the RDM-B flashes one time, the RDM-C three times.

Afterwards the red „Power“ – LED shows the operation of the device.



After a short delay, the unit switches to its standard operating mode.

2 Standard Operating Mode - Display

INP | MODE
ABC | HTPF

In the standard operating mode the display shows the following information:

The upper line is static. Below the text "INP", the letters A, B and C indicate a valid DMX signal present at the respective input.

If no signal is present at one of the three inputs, a line appears at the same position instead of the character.

In addition, for each input a possibly activated termination switch (for the 120 Ohm line termination) is indicated by an underscore below the relevant character.

Since the user can also hide the display (configuration menu), there are two LEDs's on the front for visualizing the main device function for each input.

The status of each input, where a valid DMX signal is present, is indicated by slow flashing of the assigned green DMX LED.

If RDM communication (bidirectional) with the line at the output is currently running via an input, the associated yellow RDM LED flashes.

The merger can only allow one input at a time for RDM communication with the output line. The device decides which is ultimately the "winner" with simultaneous RDM telegrams at several inputs based on the time of RDM detection and a fixed, internal priority sequence (B > C > A).

The currently set MERGE MODE ("HTP" / "LOW" (LoTP) or "LTP") is shown below the text "MODE", followed by the characters "F" / "M" or "S" (for FAST / MEDIUM or SLOW) to indicate the speed of the output signal.

3 Termination Switch

There is also a switch for each input ("TERMINATION"), which allows the user to simply connect the terminating resistor (120 Ohm in position I on the right) required at the end of a DMX line. However, if the respective signal line runs further from the "THRU" output socket to downstream devices, the switch must be set to position 0 (left).

4 Configuration

All configuration settings of the device (except the line termination switch) can be adjusted via the menu.

Two push buttons are located to the left and right of the plain text display.

The upper left "MENU / ESC" - key is used to enter the "configuration menu".

Any deactivated display is automatically switched on.

If no key is pressed within 15 seconds in the activated menu function, the menu operation is automatically terminated **WITHOUT CHANGING CONFIGURATION DATA** and the module returns to the **STANDARD OPERATING MODE**. Entries already made in the individual submenus are also lost.

After the first press of the left "MENU" - key, the first submenu is proposed for selection. Use the two "UP/DOWN" - keys to the right of the display to scroll to the desired submenu item in both directions.

The current software version V1.03 offers the following menu items:

1 > OUTP. SPEED	to set the transmission speed for the output (44 / 33 / 22 Hz)
2 > MERGE MODE	to select the Merge-Modus (HTP / LOW (LoTP) / LTP)
3 > INP A OFFSET	to specify the DMX insert address for input A
4 > INP B OFFSET	to specify the DMX insert address for input B
5 > INP C OFFSET	to specify the DMX insert address for input C
6 > DISP. CONTROL	to activate / deactivate the function for the automatic "display-dark switching"
7 > USER- RESET	to trigger a warm start for the device

Pressing the upper left "MENU / ESC" - key automatically returns the unit to the STANDARD OPERATING MODE.

To enter the desired submenu, press the "OK" - key at the bottom left.

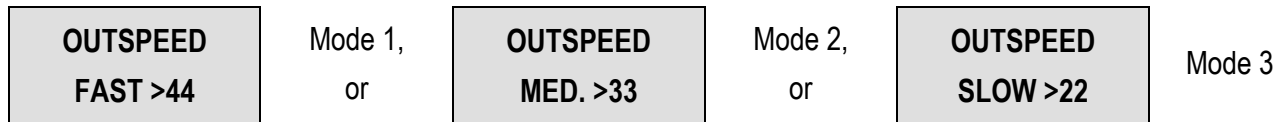
Please notice:

Even after entering the menu level, the device continues its intended function without restriction.

5 Submenu 1 – Output

The merger offers the possibility to reduce the data transmission speed of the output. This can often solve problems such as flickering or total failure with extremely old DMX devices in the network.

After entering the submenu 1 (OUTPUT SPEED), the following display appears:



The right "UP/DOWN" - keys change as often as desired between these 3 settings, the left, lower „OK“ - key saves the current selection.

You can cancel and return to the main menu with "MENU / ESC" - key.

The repetition rates of the DMX output signal are approximate only.

Also, the output signal is not simply slowed down by a waiting time at the end of each data stream.

This would not have a positive effect, as experience has shown that receivers with problems with too high transmission speed also require longer break and signal times within the data stream, for example:

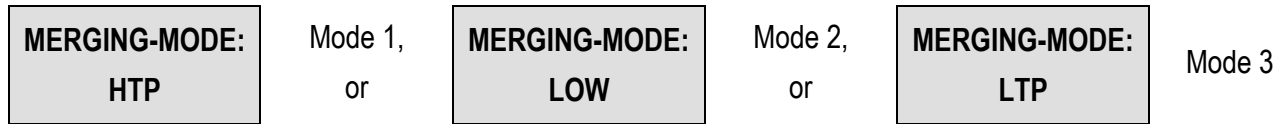
- a longer BREAK signal,
- a longer delay afterwards (MAB - MARK AFTER BREAK),
- a break between the data words (MBS - MARK BETWEEN SLOTS), and
- a break after the last data word before a new data stream starts with BREAK (MBB - MARK BEFORE BREAK)

The following table shows the times currently used in the three speed variants:

DMX- Rate	BREAK LENGTH	MAB MARK AFTER BREAK	MBS MARK BETWEEN SLOTS	MBB MARK BEFORE BREAK	PERIOD TIME	REFRESH RATE
44 Hz	92 µs	12 µs	-	44 µs	22,7 ms	44,0 Hz
33 Hz	176 µs	24 µs	16 µs	176 µs	31,1 ms	32,1 Hz
22 Hz	220 µs	44 µs	44 µs	440 µs	45,8 ms	21,8 Hz

6 Submenu 2 – Merge Modus

After entering the Submenu 2 (MERGE MODE), the following display appears:



Changes, selections and cancel are performing as described in the chapter "submenu 1" above.

This configuration can be used to set the standard operating mode of the device. There are currently 3 different types of functions (MODI) available:

MODE 0: HTP – HIGHEST TAKES PRECEDENCE

This is the most frequently used mode in practice. Each output channel receives the value which is the highest of all three inputs. Thus each input (in each channel) can increase the value up to 100 percent, but a complete dark regulation is only possible if all input values = 0. In practice, this allows parallel operation, while simultaneously ensuring a possible minimum level for each input channel (safety function, emergency light, through-light, etc.).

MODE 1: LoTP (display shows: LOW) – LOWEST TAKES PRECEDENCE

The opposite is of course also possible. This also allows parallel operation. In this case maximum values can be specified for individual or all channels, which then cannot be exceeded.

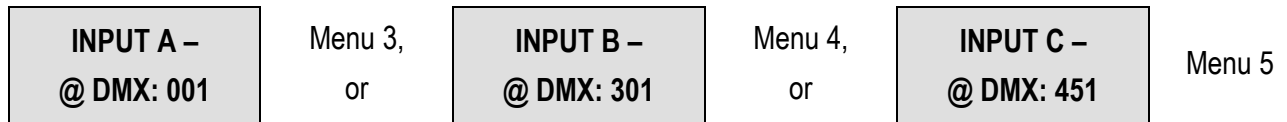
Applications could be for example lamp protection, energy saving as well as the protection of sensitive art objects from excessive lighting intensity.

MODE 2: LTP - LATEST TAKES PRECEDENCE

The channel value that was last modified on all 3 inputs always passes to the output channel. This allows parallel operation WITHOUT a single input being able to permanently block or restrict the values. This means that every source has the possibility of sole control. Unfortunately, lighting jumps may occasionally occur during transfer in this mode.

7 Submenu 3,4,5 – DMX insert address for input A, B, C

Via these 3 sub-menus, an insert address (OFF-SET) can be assigned to each of the three inputs, from which the respective channel values are then merged into the output values according to the set MERGE MODE.



With the "UP/DOWN" - keys the currently displayed address value can now be changed either up or down. In this case, the value changes slowly at first, and much faster in the corresponding direction after one second. Click on the "OK" - key to save the settings.

Here is a possible application using the given example addresses:

A „large“ lighting console controls at input A the entire DMX area of one event location. A second, smaller lighting console has access to the lighting circuits of the foyer at input B from DMX 301, but via its own DMX channels from address 1.

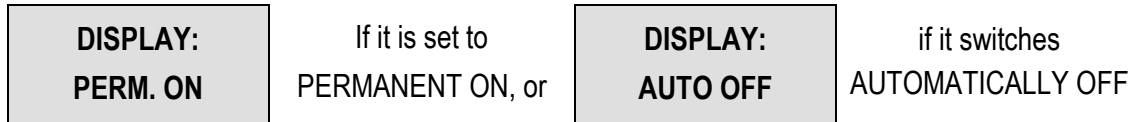
A mobile dimmer controls temporary added lights for object lighting from address 451, which can be set with a simple 12 channel DMX console without influencing the permanently installed circuits.

Please notice:

If the OFFSET address is changed for an input, the management table for the "last value changes" is reset internally. All channels below the new address are assigned the value 0 ("source unknown"), from and above the address the assignment to the currently reconfigured input. If the merger is working in LTP mode, this input temporarily takes over control in its address range, all other values initially fall back to control through input A.

8 Submenu 6 - Display dark switching

After entering the Submenu 6 (DISP. CONTROL), the following display appears:



If the "AUTO OFF" function is activated, the display is switched off after a period of approx. 30 seconds without pressing a button in order to avoid unnecessarily "additional light".

Since the device also has LED's, its basic function remains observable.

9 Submenu 7 – User Reset

This allows the user to initiate a restart (warm start) of the device with the "OK"-key.

This may be useful, since the merger as „permanent operating device“ does not have a separate power switch. Also, any "held" channels (in "HTP" or "LoTP" mode) of a source that has meanwhile been switched off or staked out are reset.

Electrical data	
Approvals	2006/95/EG (Low Voltage Directive) 2004/108/EG (EMC Directive) EN 60204-1 (EU Directive on Machinery)
Protection class:	I
Operating voltage	230V (100V ... 240V AC, 50 / 60 Hz)
Power	15 VA // maximum 80 VA

10 EU Declaration of Conformity



EU Declaration of Conformity

in accordance with the Low Voltage Directive (LVD) 2014/35/EU

Manufacturer: Lightpower GmbH
An der Talle 24-28
D-33102 Paderborn

Authorized person for the issuance
of the declaration of conformity: André Raude
Ulmenweg 2
32832 Augustdorf

Product model	Product description
4001408	DMX-Merger 2in1, XLR5
4001733	DMX-Merger 3in1, XLR5
4002164	DMX-Merger 3in1, RJ45

We hereby certify that the above-named product(s), as we put the execution into circulation, is/are conform with the regulations of the following EU-directives:

Low Voltage Directive (LVD) 2014/35/EU
(EMC) Directive 2014/30/EU
RoHS Directive (2011/65/EU)

Applied harmonized standards:

EN 60204-1
91/263/EWG; 92/31/EWG; 93/68/EWG

The object of the declaration described above is in conformity with the relevant Union harmonisation legislation. Any modification of this product(s) without confirmation shall automatically annul this declaration.

Paderborn, 28th August, 2018

André Raude

