

DMG

DMX512 2x1 Merger

With HTP Append and Backup Options



**ELM Video
Technology, Inc.**

"Innovative Midi and DMX Products"



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IMPORTANT SAFEGUARDS

Read and follow all instructions BEFORE installing or using this product.

Do not attach any product or accessories that the manufacturer does not recommend.

Keep in a well ventilated environment.

Never use or store the unit in places that are:

- Subject to temperature extremes (direct sunlight, in an enclosed vehicle, near a heating duct)

- Wet, damp and humid areas

- Dusty

- Subject to high levels of vibration

Use proper Power Sources. This product should be operated only from the type of power source indicated on the marking label or as is described in this manual.

Route power cord safely. Don't allow twist's, bend the power cord, or place heavy objects on it.

Ground your equipment whenever possible.

Do not attempt to service this product unless noted otherwise.

If the unit stops working for any reason, unplug the power and other connections until repaired.

This unit should be used only with a rack or chassis that is recommended by the manufacturer.

Unplug the device when not in use.

Keep away from small children.

NOTE - ALWAYS KEEP THE DMG ACCESSIBLE ! - INSTALL THE DMG NEAR OPERATORS AND THE GENERATING DEVICES. NEVER INSTALL ON A TRUSS OR HARD TO REACH AREA.
Because the DMG is a DMX SIGNAL GENERATING DEVICE, keeping the unit accessible is essential, in the event of a cable failure or unit malfunction the output may send false data which could cause erratic behavior with the receiving DMX system, could be dangerous to the public, and could

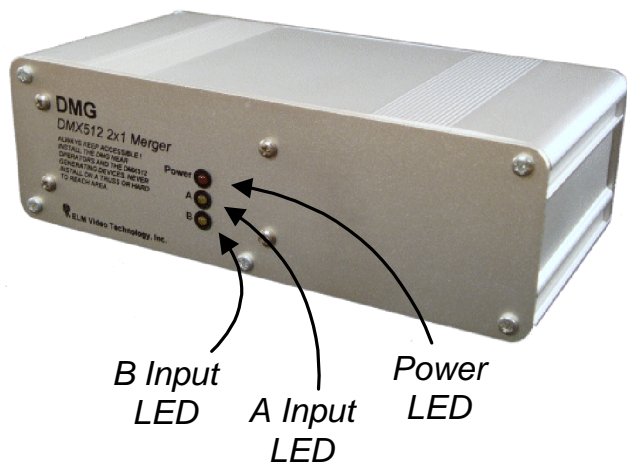
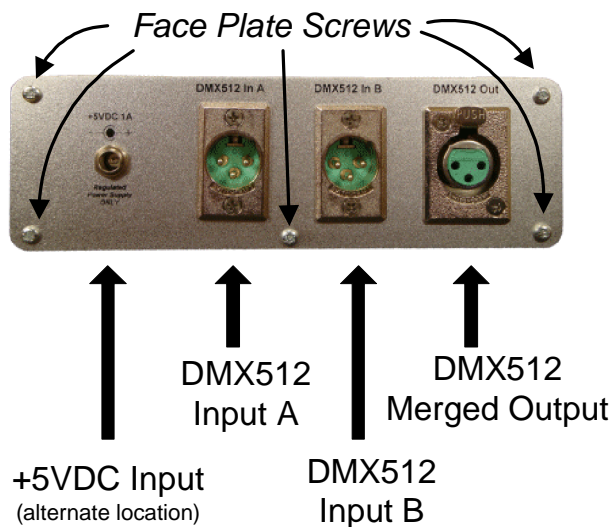
Before connecting the A or B inputs it is recommended that the output and/or power be disconnected to prevent false data transmission that could blink or trigger the receiving DMX system.

DMG OVERVIEW

The DMG is a 1 in 2 out software processed DMX512 merger with versatile uses. Combines two DMX512 signals or universes into one universe, by a selected mode type: HTP (Highest Takes Priority), Append, or Backup. Multiple DMG's can be combined to merge more than two universes or provide multiple functions. By configuring several DMG's in different mode types, each can perform a specific task. Thus multiple DMG's could be configured to merge two or more universes into one universe, the combined output could be appended to another universe, and then the final output could operate in parallel with a backup DMX512 source with auto switch over.

CONNECTION

Loop the power cord through the strain relief. Connect the power supply to the power input connector and apply power. Connect a DMX512 source into the input connectors (5 or 3 pin) and insure the data LED is illuminated (showing data is present). The DMG will work with only one (A or B) data input connected. Use the 'Merged Output' connector to source up to 32 DMX512 devices (*depending on the devices and configuration*). As with any DMX512 daisy chain, each output must be terminated at the end of each daisy chain.



MODES

Plan all DMX512 changes carefully, understand how each mode will react, and thoroughly test each device after any configuration changes.

MERGE HTP The HTP mode will merge two universes into one universe using HTP (Highest Takes Priority) processing of the level of each channel. In this mode two lighting boards (or any two DMX512 generating devices) can control the same devices.

If only one input is connected, the input data (channels, levels, packet size, and start code) are transmitted as received. By adding a DMX512 signal to other input the two sources will be merged with HTP - the highest level will be the transmitted on a specific channel. The packet size will be largest of the two. Input A has start code priority - Input A's start code will always be transmitted, unless there isn't a signal in input A then input B's start code will be transmitted.

This mode is useful for controlling the same DMX512 equipment and devices with two DMX512 generating devices in one universe. For example a lighting board and a computer controlled DMX512 controller.

HTP Examples: If the A input has a level of 25 on channel 10 and input B has a level of 200 on channel 10 the output will be 200 on channel 10. If A has a level of 5 on channel 100 and B has a level of 12 on channel 100 the output will be 12 on channel 100. If both inputs are 0 the output will be 0 on the respective channel, etc.

APPEND The Append mode will append input B after input A, input A is the 1st part of the DMX512 packet and the B input is the 2nd part of the transmitted output. In this mode two lighting boards (or any two DMX512 generating devices) can be combined, each controlling different equipment but on one cable (or universe).

In the Append mode the start code transmitted will be zero until a valid signal is received on input A and that start code is then transmitted until the unit is reset or re powered (even if input A is lost). The packet size or channel block size, (e.g. 48 channel lighting board) is loaded from the processor permanent memory each time the unit is powered or reset, and will not be changed by the input. See the *Append Packet Size Setup* section for instructions on setting transmit packet size (or channel block size).

This mode is useful for controlling different DMX512 equipment or devices with two DMX512 generating devices in one universe. For Example: If a packet or block size is stored as 32 and input A input has a level of 25 on channel 10 and input B has a level of 200 on channel 10, the output of channel 10 will be 25, the output of channel 42 will be 200, (B input Ch 10 now has an offset of 32).

NOTE - By APPENDING or changing the DMX512 channels, each receiving device will need to be set to the new DMX512 channel. Plan any changes carefully and test each device after any configuration changes.

BACKUP The Backup mode will transmit input A continuously, ignoring input B as long as input A is a valid* DMX512 signal. If input A's signal is not valid input B will be transmitted.

This mode is useful if a backup lighting board (or any DMX512 generating device) is always on standby to switch over in the case of a failure, the DMG in the backup mode would AUTOMATICALLY switch over, preventing the user from physically having to switch the connectors. The DMG will switch over in one second of a lost signal.

**A valid DMX512 signal - an active signal present with consistent start code, consistent packet size, and meets the DMX512 standard. Activating an input is considered valid when four continuous packets are received with the same start code and the same size packet.*

An invalid DMX512 signal - if a signal is not present for more than 1 second, or if the start code or packet size change. (If this happens and four continuous packets are received with the same start code within 1 second of the change the signal is still considered valid.)

APPEND PACKET SIZE SETUP WITH JUMPERS

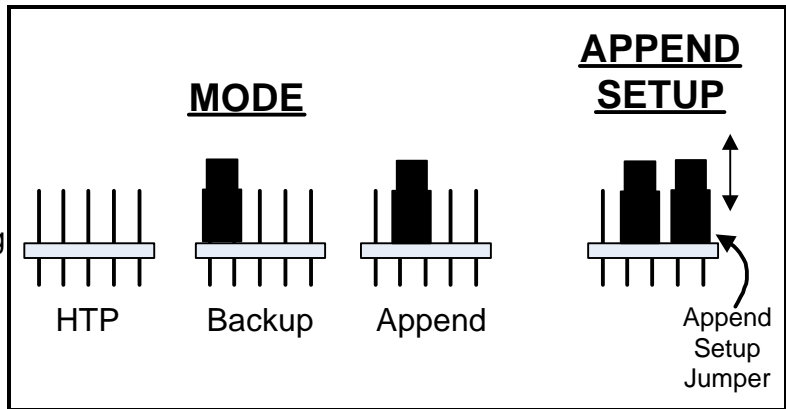
The packet (or channel block) size is set by one of two ways:

A valid DMX512 signal on the A input OR

By manually programming the packet size in 16 channel block increments

To setup the append packet size by *AUTO DETECT

1. Select the APPEND SETUP by placing jumpers to the pins shown
2. Connect a **DMX512 generating device into input A (e.g. lighting board) with a known DMX512 packet size (output channel count) known or preset.
3. Reset the power - The DMG enters the setup mode, indicated by LED A blinking
4. If a valid DMX512 signal is connected to input A, the packet size is stored in permanent memory. LED's A and B will alternately blink indicating completion.
5. Remove the APPEND SETUP jumper leaving the APPEND jumper
6. Reset the power
7. Test for accuracy



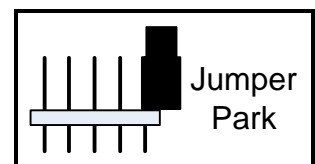
To setup the append block size MANUALLY by 16 increment blocks

1. Remove DMX512 signal input
2. Select the APPEND SETUP by placing jumpers to the pins shown
3. Reset the power - The DMG enters the setup mode, indicated by LED A blinking
4. Remove only the APPEND SETUP Jumper - LED A will turn off and a block size of 16 is stored.
5. For each multiple of 16 Channel Blocks needed, place the jumper onto the Append Setup header pins, LED A will illuminate for each connection/count. See the *Channel Block Size Table*. (If 512 is exceeded the setup mode is exited and enters standby mode indicated by LED's A and B alternately blinking and the block size is set at 512)
6. PARK THE APPEND SETUP JUMPER
7. Reset the power
8. Test for accuracy

Channel Block Size Table					
# of taps	block size	# of taps	block size	# of taps	block size
0	16	11	192	22	368
1	32	12	208	23	384
2	48	13	224	24	400
3	64	14	240	25	416
4	80	15	256	26	432
5	96	16	272	27	448
6	112	17	288	28	464
7	128	18	304	29	480
8	144	19	320	30	496
9	160	20	336	31	512
10	176	21	352		

*AUTO DETECT - by Input A's attached lighting board or generating DMX512 device

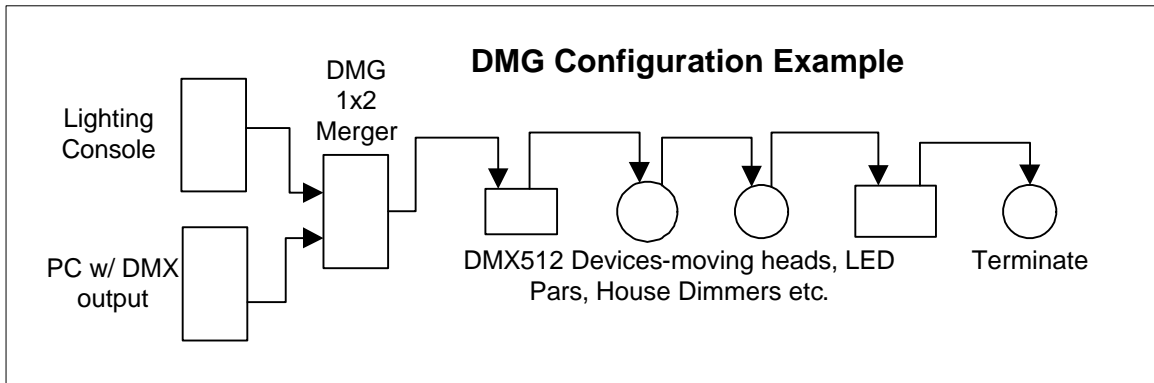
**In order to know where input B will begin in the DMX Channel assignment, the output packet size must be known or preset.



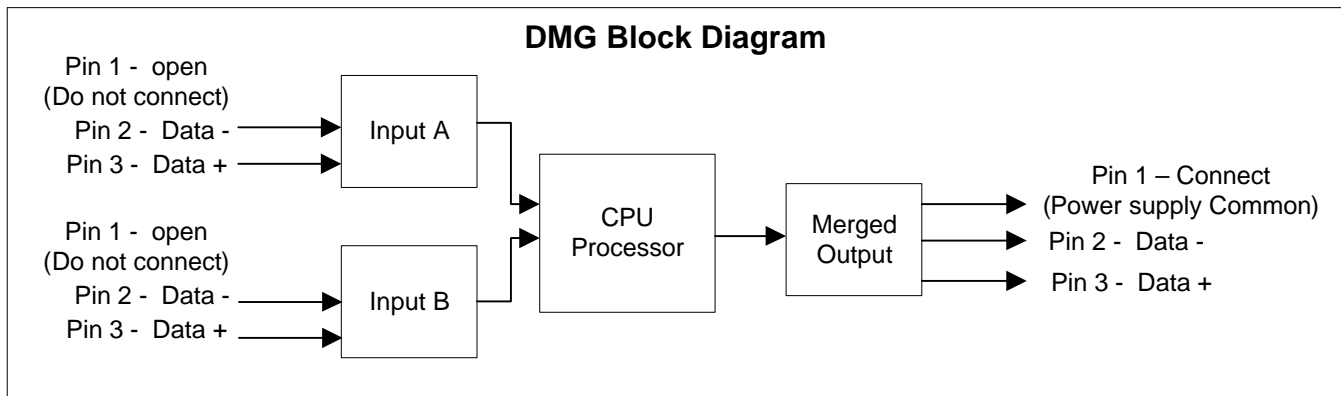
OPERATION

Select the mode by the selector switch (or by internal jumper settings). Connect a DMX512 signal into inputs A and/or B and apply power, the red LED will illuminate. Once a valid DMX512 signal is received the DMG will immediately begin transmitting a DMX512 signal in the mode type selected. In all modes, the input LED's for A and B inputs will illuminate indicating data is present on the respective input. If an overrun error occurred (caused by quick packet size changes/processing) the respective LED will blink. The DMG will continue to run as normal and is NOT in an error condition, the LEDs are indicating that an error has occurred. This error is cleared by a power reset. To change modes, select the desired mode and perform a power reset.

CONFIGURATION EXAMPLE



PCB BLOCK DIAGRAM



INPUT: The inputs (pins 2 and 3) connect to a 75176 data input ICs, and send to the processor.

OUTPUT: The processor sends merged data to the output that supplies data to the output connectors. Pin 1 is connected to the power supply common.

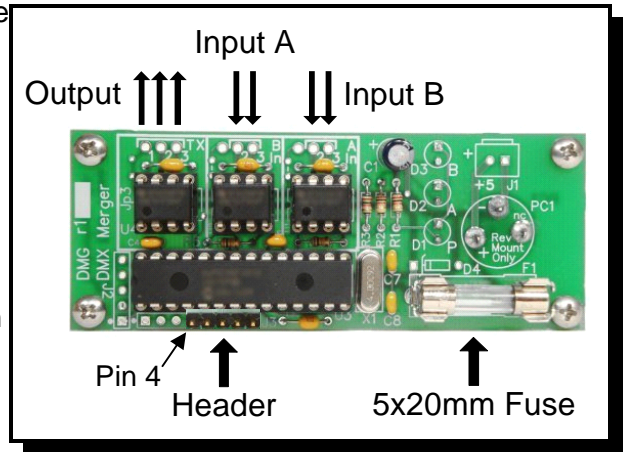
SERVICING

FIELD SERVICE: For Experienced Technicians

Note - Take care not to touch the component pins or the inner pins of the connectors. Electrostatic discharge may cause permanent damage to the unit.

Disconnect all power and data connections. Remove the 5 face plate mounting screws on the PCB side. Use only direct replacement parts and use static discharge precautions.

To replace an IC, using a small flat screwdriver carefully remove the IC by gently lifting up between the socket and the IC keeping the IC as flat as possible. Bend the replacement IC's legs so they are pointing straight down and not angled outward. Align each pin in the center of each pin hole and gently snap into place, all legs at one time, DO NOT insert at an angle. Insure the IC is flush on the socket and all pins are inserted.



TROUBLESHOOTING

PROBLEM	CHECK
Unit won't power up	check fuse and power connections
If only one of the inputs doesn't work	replace the respective input IC (i.e. input A doesn't work replace IC # for input A).
If output doesn't work	<p>check if power is present via the power LED, if not check the internal fuse.</p> <p>check if the input has a DMX512 signal by bypassing the unit, if not check the DMX512 console or source.</p> <p>check if the input has a DMX512 signal by bypassing the unit, if not check the DMX512 console or source.</p> <p>If the data and power are o.k. replace the output IC and possibly the input IC's.</p>
If both data LED's don't work	<p>check data input</p> <p>possible CPU failure</p>

SPECIFICATIONS

CHASSIS:	Anodized Aluminum .093" thick RoHS compliant.
POWER INPUT:	+5VDC regulated 5%, 5.5 x 2.1 x 9.5 connector - center positive
FUSE:	.7 ~ 1 Amp Fast Acting 5 X 20 mm
POWER:	Apx 160mA (output full source)
DATA TYPE:	DMX512 (250Khz)
DATA INPUT:	DMX512 - 5 (or 3) pin male XLR, <i>Pin 1 - (Shield) Not connected, Pin 2 Data - , Pin 3 Data +</i>
DATA OUTPUT:	DMX512 outputs - 5 (or 3) pin female XLR's, <i>Pin 1 - Power supply common, Pin 2 Data -, Pin 3 Data +</i>
Dimensions:	3.7 x 6.7 x 2.1 inches
Weight:	1.5 pounds

for more information aboutDMX512 visit -<http://www.usitt.org/DMX512.aspx>