Owner's Manual

DMX-512 to Yorkville LP-304 Translator

MODEL NUMBERS 512304 & 512304-3

DMX-tools Co.

REGULATORY COMPLIANCE

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not used and installed in accordance with the instructions, may cause harmful interference to radio communications. There is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the unit on and off, the user is encouraged to try to correct the interference by one or more of the following measures:

- ?? Reorient or relocate the receiving antenna.
- ?? Increase the separation between the equipment and the receiver.
- ?? Connect the equipment to an outlet on a different circuit from that to which the receiver is connected.
- ?? Consult the dealer or an experienced radio/TV technician for help.

The user is cautioned that changes and modifications made to this equipment without the approval of the manufacturer could void the user's authority to operate the equipment. In order to maintain compliance with FCC regulations, shielded cables must be used with this equipment.

SAFETY INSTRUCTIONS

CAUTION: To reduce the risk of electrical shock, do not remove the cover. No user-serviceable parts inside; refer servicing to qualified service personnel.

WARNING: To reduce the risk of fire or electrical shock, do not expose this device to rain or moisture.

WARNING: To avoid damage to DMX-512 equipment, NEVER connect it directly to your LP-304 light bars. The 12-volt power they normally provide to the Yorkville LP608 controller WILL damage any DMX-512 equipment – including the DMX side of the DMX-lator III.

Dear Customer,

The Yorkville LP-608/LP-304 lighting system was planned as an entry-level system and as such, provides a lot of capability at a reasonable price. What it doesn't provide is expandability: for several reasons, not the least of which was a serious attempt to hold down the final selling price, they developed their own remote control protocol.

This poses a problem for anyone wanting to upgrade an existing LP-608/LP-304 system. The ***DMX-lator III*** is my attempt at a solution.

To their credit, the people at Yorkville recognize the problem. They provided me information on their protocol and technical advice that helped make the ***DMX-lator III*** possible. They're a good company and justifiably proud of the equipment they manufacture.

As with my other products, I cut costs by using a cheap, off-the-shelf, plastic box instead of a custom-designed cabinet, using "dipswitches" for addressing and using generic bubble-wrap and a standard-size plain white box for packaging. I spent the savings on things like added protection against static electricity and ways to avoiding generating electrical noise that might get into the PA or a guitar amp. I do the sound and lighting for a lot of local-band shows… and I don't like technical difficulties interfering with my shows.

Before offering it for sale, I tested it thoroughly – meaning I had to add a couple Yorkville LP-304 light-bars to my collection. I also submitted samples to the engineers at Yorkville for their comments and went to an outside testing company for FCC interference testing.

By the way, the FCC has two standards for this type of equipment – class "A" for business and industrial equipment and the much stricter class "B" for home and office use. Although the intended use of the ***DMX-lator III*** could be considered "business/industrial," I won't sell equipment unless it meets class "B" standards.

I still do concert sound and lights – and use that as an ongoing check of product quality. I'm pleased with my design and kind of proud of it. I hope you're as happy with it as I am.

dmx-tools@ameritech.net

Addressing

Whether it's DMX-512 or Yorkville's proprietary protocol, each dimmer, relay pack or effect has an address (some have several). It's how one associates a device on stage to a fader or switch on the controller. The DMX-512 protocol has 512 addresses available, while the Yorkville LP-608/LP-304 system allows for eight. The ***DMX-lator III*** will translate 8 channels out of a possible 512 to the Yorkville protocol, four channels on each output, duplicating the functionality of the LP-608 controller.

The address switches on the ***DMX-lator III*** map the addresses of the LP-304 light bars into a contiguous block of addresses within the 512 available to a DMX-512 controller. Note the numbers beside each switch. The DMX address of each dimmer is the sum of its multiplex address plus the *DMX-lator I* switch settings. For example, I may want to assign DMX-512 addresses 1-48 to moving light effects, then put my LP-304 dimmers at addresses 49-56. I would simply set the ***DMX-lator III*** address switches to address 48, one less than the starting address I want to assign to the LP-304 light bars.

To start the LP-304 light bars at DMX address 49, turn switches 32 and 16 on and turn everything else off. 32+16=48. The DMX address of each light bar will be that light bar's connection address plus 48. LP-304 channel 1 becomes DMX channel 49; LP-304 channel 5 becomes DMX channel 53 and so on.

For those who are confused or simply bored by this math, appendix B is a chart of switch settings for all possible DMX addresses.

Note that assigning a block of addresses to your LP-304 light bars does not remove those addresses from the DMX side. This allows you to operate a DMX dimmer and an LP-304 dimmer from the same fader at the same time, if you so desire.

Connections

DMX-512 is specified to use 5-pin XLR connectors. Some manufacturers use 3-pin XLR connectors in cases where the second, return channel is not being used. The standard unit (P/N 512304) uses the 5-pin variation. Although the ***DMX-lator III*** doesn't use the return channel, it is passed through unchanged. If your DMX-512 gear requires the 3-pin connectors, P/N 512304-3 substitutes 3-pin XLR connectors on the DMX side. If you need to change at a later date, 3-pin to 5-pin and 5-

pin to 3-pin adapters are readily available. Instructions for building your own adapters are posted on the www.dmx-tools.com website, under support/for geeks only.

DMX-512 signals are fast, so DMX-512 lines must be terminated for reliable operation. This simply means placing a resistor across the two signal leads at the end of the line farthest from the controller. The resistor value must be close to the characteristic impedance of the cable being used – for standard microphone cable, 110-120 ohms. While terminators are readily available, instructions for building your own terminator are included in appendix A.

The Yorkville protocol was designed for use with 3-pin XLR connectors on standard microphone cable. If you have P/N 512304-3, with 3-pin XLR connectors on both sides, NEVER connect the LP-304 cable to the DMX side (or to any other DMX gear). The LP-304 sends 12 volt "phantom power" back up the cable to supply the LP-608 controller. This power can damage any DMX gear.

The LP-304 lines should not be terminated. Make certain the cables used are wired correctly: pin 1 to pin 1, pin 2 to pin 2 and pin 3 to pin 3. Because the light bars send power back up the cable, switching connections within the cable may damage either the light bar or the ***DMX-lator III***.

The ***DMX-lator III*** effectively replaces the LP-608 controller. It's even powered by the light bars. Connect the light bars first. Apply power to the nearest light bar. It sends power back up the cable to the ***DMX-lator III***. The "HEARTBEAT" LED, located to the left of the address switch, should flash.

The "HEARTBEAT" LED is a continuous check on the ***DMX-lator III***, blinking as an indication that the microprocessor inside is running its program properly. If it doesn't flash, re-check your wiring. Ensure that the light bar is powered and working properly.

Once you get the "HEARTBEAT" LED to flash, power down the light bar and connect the DMX side. The ***DMX-lator III*** can be placed anywhere in the DMX-512 chain. DMX devices are selected by their address, not their physical connection.

Once everything is connected and both the light bars and the DMX controller are powered, a second LED indicator, labeled "DMX GOOD," should light. It indicates that the ***DMX-lator III*** is receiving a DMX

signal within its address range. If the "DMX GOOD" LED fails to light, but the rest of your DMX equipment is working properly, recheck the address switch settings on the ***DMX-lator III***. While the DMX-512 protocol supports up to 512 channels, controllers with fewer channels generally send smaller DMX packets, stopping at the last channel they actually control. If the ***DMX-lator III*** is set to a higher channel than the controller is sending, it will use the "DMX GOOD" LED to tell you so.

Mounting

Included with the ***DMX-lator III*** is a strip of gum-backed Velcro? . A matching strip is pre-applied to the back of the ***DMX-lator III***. The ***DMX-lator III*** may be mounted in any position. In cases where the ***DMX-lator III*** is mounted somewhere in the rigging, on a lighting truss or tree, it may be useful to position it such that the "ALIVE" and "HEARTBEAT" LEDs are visible from the ground. A good location is to the back of one of the LP-304 light bars. The Velcro? makes for easy removal and reinstallation for transport.

Operation

Once the address switches have been set and the cables connected, there are no further actions required of the user specific to the ***DMX-lator III***. The ***DMX-lator III*** is powered by the LP-304 light bars. It turns on and off with them.

Maintenance

The ***DMX-lator III*** should require no user maintenance beyond periodic dusting. If further cleaning is required, surfaces may be wiped with a damp (not wet) cloth. The use of solvents or abrasive cleaners should be avoided.

Troubleshooting

Most problems can be traced to either improper address-switch settings on the ***DMX-lator III***, faulty cables or failure to properly terminate DMX-512 lines. Currently, I'm only offering technical support by e-mail: dmx-tools@ameritech.net.

Specifications

Physical:

Weight:	10 Oz.
Dimensions:	5.25”W X 3.5”H X 1.5”D

Functional:

Ambient temperature:	0-120? F
Relative Humidity:	0-90% non-condensing
Shock and vibration:	5G

Electrical:

Power:	12VDC @ 90mA (supplied by the LP-304 light bar)
Refresh rate:	80Hz
Latency:	38mS (this is the worst-case delay between the DMX-512 input and the LP-304 output)

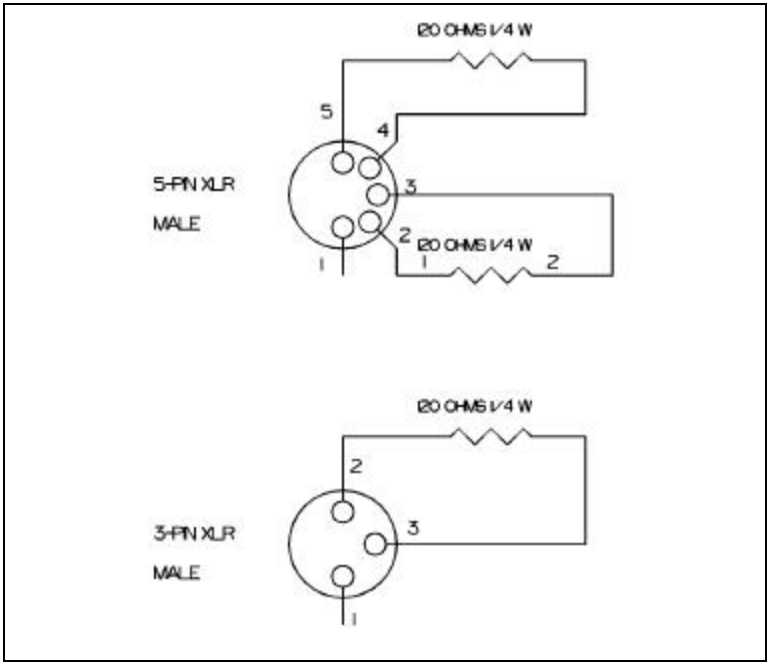
LIMITED WARRANTY

1. ***DMX-tools Co.*** warrants the ***DMX-lator III*** to be free from defects in design, materials or workmanship for a period of two years from the date of purchase. If any such defect occurs within the warranty period, ***DMX-tools Co.*** will, at our sole discretion, repair or replace the unit.
2. Specifically excluded from this warranty are damages/defects caused by:
   - ?? misuse, abuse, neglect or failure to install or operate the unit in accordance with the instructions given in this User's Manual.
   - ?? fire, flood, acts of God or natural disasters.
   - ?? war, revolution, riot or other armed conflict.
   - ?? use of the device as the 'ball,' 'puck', 'birdie' or 'target' in any sporting event or similar activity.
3. Any repair or modification by unauthorized persons will void this warranty.
4. This warranty applies to the original retail purchaser only.
5. Warranty service will be provided only if the returned product is accompanied by an original retail dealer's invoice or sales receipt (proof of purchase/purchase date).
6. For warranty service, the product must be returned, postage paid, in its original packaging to

   DMX-tools Co.
   424 FRANKLIN BLVD.
   ELGIN, IL 60120-4439

   Please include a description of the fault or failure and a contact name and phone number and/or e-mail address.
7. Items meeting the above requirements for warranty service will be repaired or replaced and returned within 10 business days.
8. Items not meeting the requirements for warranty service will elicit a call or e-mail to the contact name and number. You will be given the option of paying for service or having the item returned as-is.

APPENDIX A



DMX-512 TERMINATORS

A DMX-512 terminator can be easily built into a cable-mounted male XLR connector, per the above diagrams. A terminator should be connected to the DMX OUT jack on the LAST device in the DMX-512 chain (the device furthest from the controller).

Appendix B - Address Chart

In this chart, the Address column is the DMX-512 addresses of the LP-304 channels. In the Switches column, 0 = OFF and 1 = ON. Digits left-to-right correspond to switches top-to-bottom.

Address	Switches
1-8	0000000
5-12	0000001
9-16	0000010
13-20	0000011
17-24	0000100
21-28	0000101
25-32	0000110
29-36	0000111
33-40	0001000
37-44	0001001
41-48	0001010
45-52	0001011
49-56	0001100
53-60	0001101
57-64	0001110
61-68	0001111
65-72	0010000
69-76	0010001
73-80	0010010
77-84	0010011
81-88	0010100
85-92	0010101
89-96	0010110
93-100	0010111
97-104	0011000
101-108	0011001
105-112	0011010
109-116	0011011
113-120	0011100
117-124	0011101
121-128	0011110
125-132	0011111
129-136	0100000
133-140	0100001
137-144	0100010
141-148	0100011
145-152	0100100
149-156	0100101
153-160	0100110
157-164	0100111
161-168	0101000
165-172	0101001
169-176	0101010
173-180	0101011
177-184	0101100
181-188	0101101
185-192	0101110
189-196	0101111
193-200	0110000
197-204	0110001

Address	Switches
201-208	0110010
205-212	0110011
209-216	0110100
213-220	0110101
217-224	0110110
221-228	0110111
225-232	0111000
229-236	0111001
233-240	0111010
237-244	0111011
241-248	0111100
245-252	0111101
249-256	0111110
253-260	0111111
257-264	1000000
261-268	1000001
265-272	1000010
269-276	1000011
273-280	1000100
277-284	1000101
281-288	1000110
285-292	1000111
289-296	1001000
293-300	1001001
297-304	1001010
301-308	1001011
305-312	1001100
309-316	1001101
313-320	1001110
317-324	1001111
321-328	1010000
325-332	1010001
329-336	1010010
333-340	1010011
337-344	1010100
341-348	1010101
345-352	1010110
349-356	1010111
353-360	1011000
357-364	1011001
361-368	1011010
365-372	1011011
369-376	1011100
373-380	1011101
377-384	1011110
381-388	1011111
385-392	1100000
389-396	1100001
393-400	1100010
397-404	1100011

Address	Switches
401-408	1100100
405-412	1100101
409-416	1100110
413-420	1100111
417-424	1101000
421-428	1101001
425-432	1101010
429-436	1101011
433-440	1101100
437-444	1101101
441-448	1101110
445-452	1101111
449-456	1110000
453-460	1110001
457-464	1110010
461-468	1110011
465-472	1110100
469-476	1110101
473-480	1110110
477-484	1110111
481-488	1111000
485-492	1111001
489-496	1111010
493-500	1111011
497-504	1111100
501-508	1111101
505-512	1111110

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Revision C

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