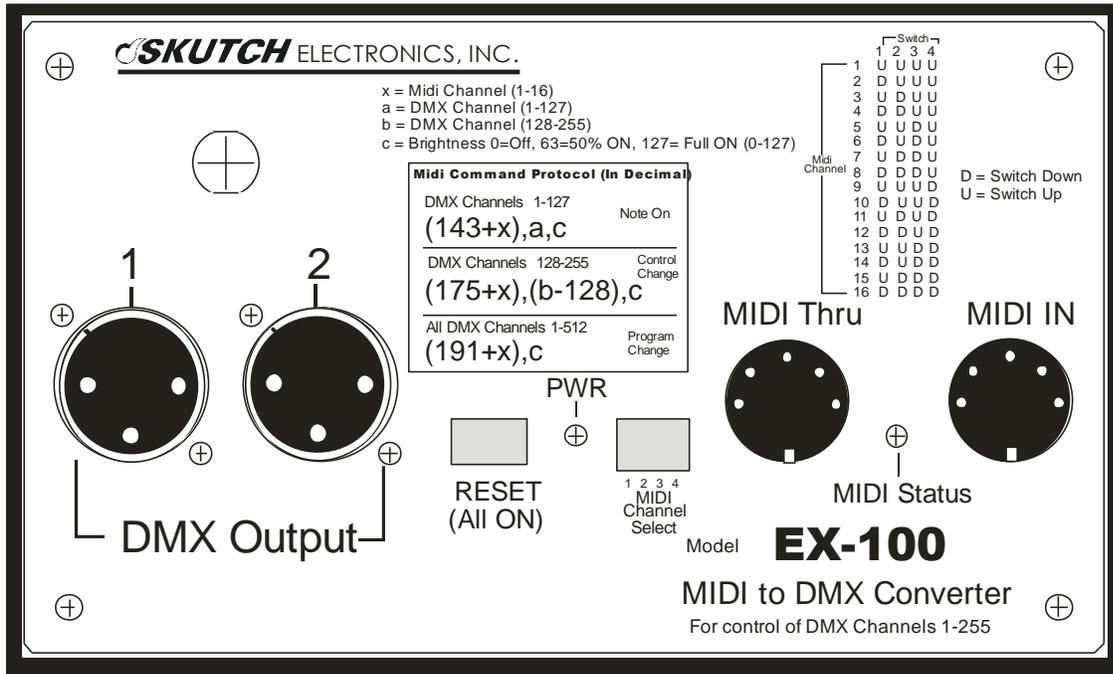


## EX-100 Midi to DMX Converter



## Introduction

The EX-100 is a MIDI to DMX converter. It allows you to use MIDI commands from your MIDI sequencer, MIDI keyboard, MIDI Footswitch, or any other MIDI output device, to control your DMX stage lighting. If used with a sequencer, you can completely automate your stage lighting so that your lighting changes will be in perfect time with your songs. Just think of the possibilities. The EX-100 has two separate DMX outputs so that each side of the stage can have their own daisy chained output.

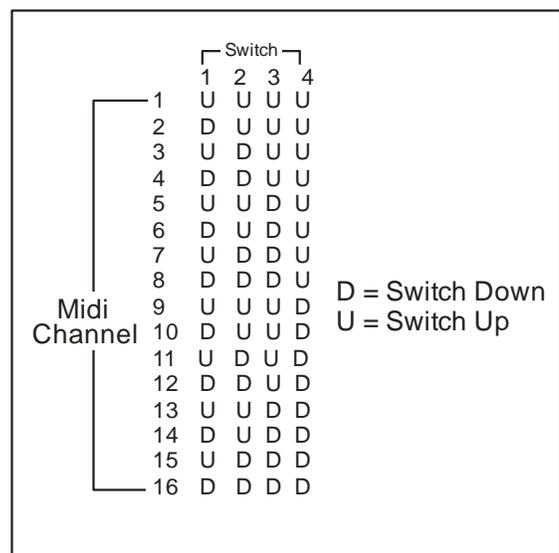
## Operation

### PWR LED

The EX-100 does not have a power switch. The PWR led indicates that power is connected to the EX-100 device.

### Midi Channel Select

The MIDI Channel Select Switch, which consists of 4 small DIP switches, MUST be configured for the desired Midi Channel that you wish to use to control the EX-100. It can be changed with power applied, on the fly if desired.





## **MIDI Status LED**

On Power Up= Flashes RED/GREEN 6 times.

When any Midi Command on the selected Channel is detected= Flashes GREEN one time

When any Midi Command is detected that is NOT on the selected Channel= Flashes RED one time

While the RESET Switch is Depressed = Steady RED

## **Midi IN Jack**

This is connected to the Midi Device that is used to control the EX-100. This is an INPUT.

## **Midi Thru Jack**

This passes all of the Midi Commands straight through the EX-100. This is a buffered output.

## **DMX Outputs**

There are two separate DMX Outputs, but have the same DATA on both of them. This allows you to have two separate runs for each side of the stage. DMX devices are “daisy chained” together. A maximum of 32 DMX devices can be daisy chained to each output. Each output run, should be terminated with a 120 ohm resistor on the output of the last DMX device in the “daisy chain”. The two DMX outputs are NOT isolated. They share a common ground.

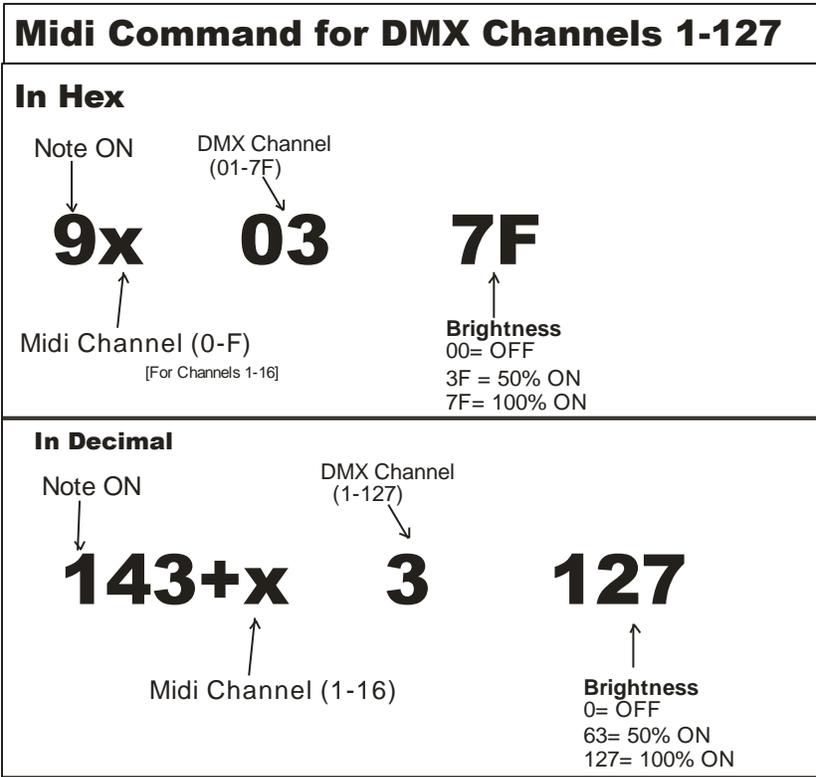
## **Reset Switch**

The RESET switch does two things. While fully depressed, it outputs maximum brightness for DMX channels 1-255 (255). When released, it turns all DMX (1-512) channels OFF(0). This is a big help when trouble shooting your light system. The MIDI Status LED turns solid RED while the RESET switch is depressed. The EX-100 always outputs an OFF (0) condition for DMX channels 256 through 512.

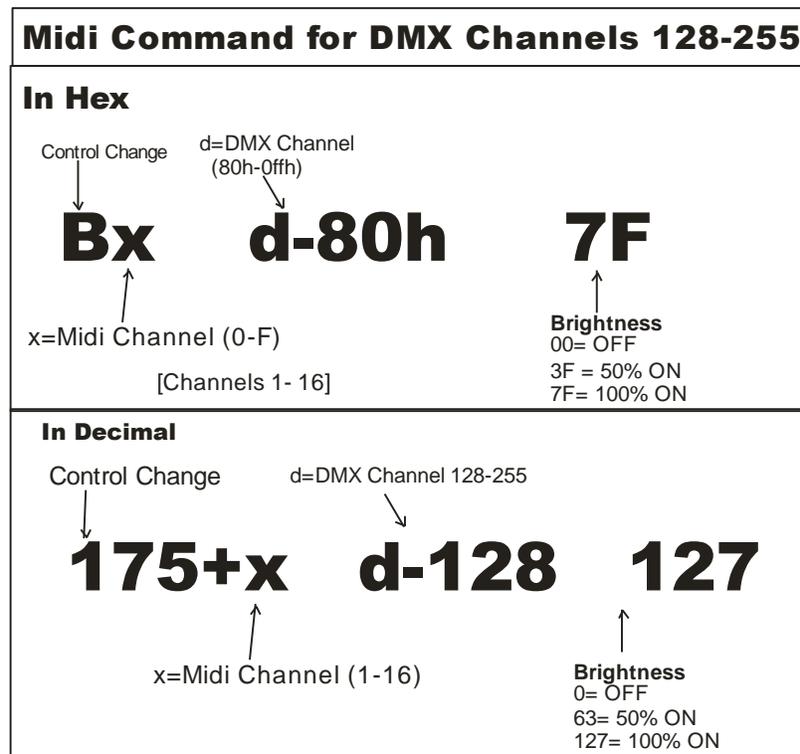
## **EX-100 Midi Commands**

The EX-100 allows you to control ONLY DMX channels 1 through 255. DMX channels 256 through 512 are NOT accessible with the EX-100. The EX-100 outputs an OFF (0) condition for DMX channels 256 through 512.

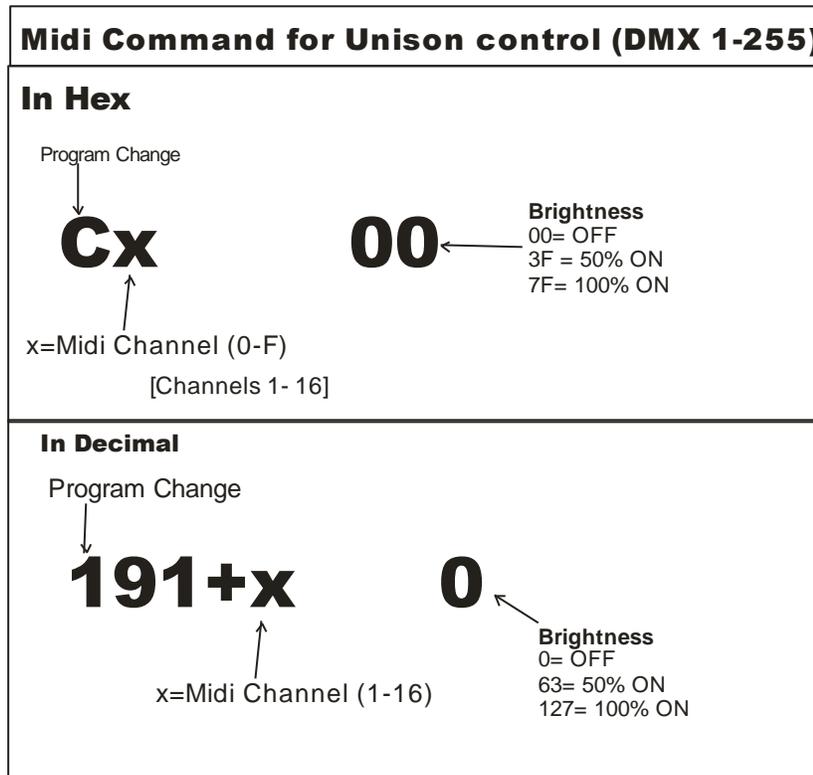
The Midi “NOTE ON” command, which consist of three consecutively transmitted bytes, is used to control DMX channels 1-127. The format is as follows:



The Midi “Control Change” command, which consist of three consecutively transmitted bytes, is used to control DMX channels 128-255. The format is as follows:



The Midi "Program Change" command, which consist of only two consecutively transmitted bytes, is used to control DMX channels 1-255 all at the same time, in unison. The most common use of this command is to turn all DMX channels OFF (brightness of 0). The format is as follows:



## General Information

### MIDI and DMX

In the Musician word, MIDI is the standard way of controlling things. From instruments to effect boxes, even switching between devices or amps, MIDI is the protocol that links everything together. Stage Lighting, on the other hand, is controlled by the DMX512 communication protocol. Unfortunately the two protocols do not mix. The Skutch EX-100 bridges that GAP by converting MIDI messages into DMX512 messages. This gives you the ability to control your stage lighting directly with your MIDI output. It should be noted that all stage lighting is not DMX compatible. DMX512 is definitely the NEW standard for controlling stage lights. You MUST make sure that the lights used with the EX-100 are DMX512 type. Even some FOG machines and HAZERS are DMX controllable.

## **Why didn't they use MIDI as the stage lighting standard?**

The answer is "CABLE Length". The official maximum SAFE length of cable for MIDI is only 20 feet. In the real world you can get 40, possibly 50 feet if you are really lucky, but that's it. That simply is too short for stage lighting needs. DMX512 maximum cable length is rated at a maximum length of 546.8 yards or 1640.419 feet. This is over a ¼ mile in length. You can see why they used a different protocol.

## **Automating your Stage Lights**

The Skutch EX-100 is a MIDI to DMX512 converter. This unit allows you to control your DMX Stage lighting via MIDI messages. If you are using a MIDI sequencer for your performances, you can completely automate your stage lighting using your existing MIDI sequencer. Your lighting changes will always be in perfect sync with your sequenced songs. You now have the ability to create your own mini light show for each individual song. Just think, during the lead solo, you could kill all the lights and have just the solo musician illuminated. The EX-100 gives you total control over your stage lighting via MIDI.

Since the EX-100 works with standard MIDI messages, any device that outputs MIDI messages can be used to control your stage lights; ie keyboards, footswitches, and sequencers.

## **More about DMX512 and fixtures**

With the DMX512 protocol you have 512 different light channels that can be individually controlled. They are numbered 1 through 512. Each of these channels you can control the brightness from 0 to 255. 0 being OFF, and 255 is full ON. Many DMX light fixtures use multiple DMX channels for the same fixture. The cool thing about LED light fixtures is that they do not require a DMX DIMMER unit, and they use about 1/10<sup>th</sup> of the power that of an incandescing light uses. That's right, no more annoying circuit breaker problems. They also can have multiple colors in one fixture, while an incandescent light only has one color.

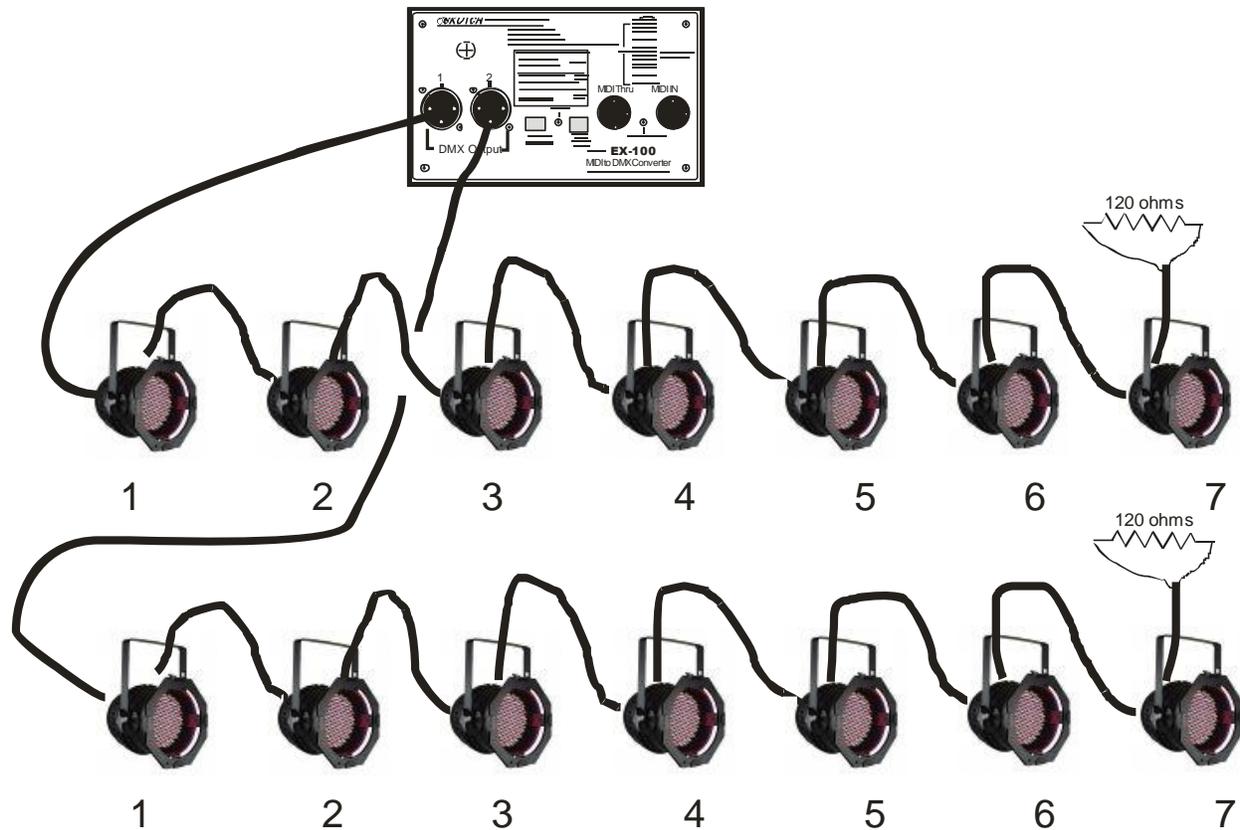
A RGB PAR 64 LED Fixture might use 6 DMX channels for one fixture. All DMX devices have either a DIP switch, or programmable means, to set the DMX starting channel on the device. Each additional channel is in sequence from the starting channel. The following shows a typical channel allocation for a 6 channel DMX light.

Channel----Usage

- 1- Red
- 2- Green
- 3- Blue
- 4- Color Macro
- 5- Strobe
- 6- Sound Activated/ Auto color shift

# SKUTCH

DMX devices are hooked together in a “Daisy Chain” fashion. This means you take the output from the DMX control device and run it to the DMX INPUT on the first DMX light fixture. You then take the DMX output from the first light fixture and run it to the input of the second DMX light fixture. And so ON. You may have a maximum of 32 fixtures or devices (Not Channels) on an individual DMX512 output. The EX-100 gives you two independent, outputs, so you can hook a maximum of 32 devices on each output, for a total of 64 fixtures. This allows a separate output for each side of the stage. A 120 ohm termination resistor MUST be connected to the DMX output on the last fixture on each DMX Output to insure proper communications. If more fixtures are required, then you can use a DMX splitter.



The DMX Light Fixtures can be programmed, through a DIP switch, or through a program option, to operate on any desired starting DMX channel. Unlike MIDI, multiple DMX light fixtures can share the same DMX channel assignment. In this case the lights will respond the same way.

## Specifications

- a- Power requirements = 115VAC @ 60Hz. 5Watts
- b- Midi Input Jack (No Power Output Available)
- c- Midi Thru Jack (No Power Output Available)
- d- Two individual DMX Output Jacks. Not Isolated.



- e- RESET Button. When pressed, channels 1-255 all FULL ON. When Released, all DMX Channels 1-255 = OFF
- f- Status LED shows Midi Activity.
- g- Power LED
- h- Midi Channel Select Switch (1-16). Can be changed on the fly.
- i- Controls DMX Channels 1- 255. Channels 256-512 always = 0.
- j- Midi "NOTE ON" command 1-127 controls DMX Channels 1-127
- k- Midi "Control Change" command 0-127 controls DMX Channels 128-255
- l- Midi "Program Change" command changes all DMX Channels (1-255) in unison.

## **Technical Support**

Technical support is available from 7:30am to 4:30pm, Monday through Friday, excluding Holidays. The support phone number is (916) 786-6186.

## **Limited Warranty**

This SKUTCH PRODUCT is warranted against defects for a period of one (1) year from the date of the original invoice. Within this period, we will repair it without charge for parts and labor. To obtain warranty service the product must be returned, at the customer's expense, to SKUTCH Electronics along with a copy of the original invoice. After the unit has been repaired, SKUTCH will ship the PRODUCT back via UPS GROUND service at our expense, only within the Continental United States . If any other form of return shipment is requested, the customer will pay for 100% of the shipping cost.

This Warranty does not apply if in the sole opinion of SKUTCH Electronics, the PRODUCT has been damaged by lightning or any other Acts of God, or by accident, misuse, neglect, or improper packing, shipping, modification or servicing by other than an authorized SKUTCH Service Center.

EXCEPT AS SPECIFICALLY PROVIDED IN THIS AGREEMENT, THERE ARE NO OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND IN NO EVENT SHALL SKUTCH ELECTRONICS BE LIABLE FOR LOSS OF PROFITS OR BENEFITS, INDIRECT, SPECIAL, CONSEQUENTIAL OR OTHER SIMILAR DAMAGES ARISING OUT OF ANY BREACH OF THIS WARRANTY OR OTHERWISE.