

MIDI-DMX

User's Guide



Artistic Licence Engineering Ltd

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I N T R O D U C T I O N

Overview

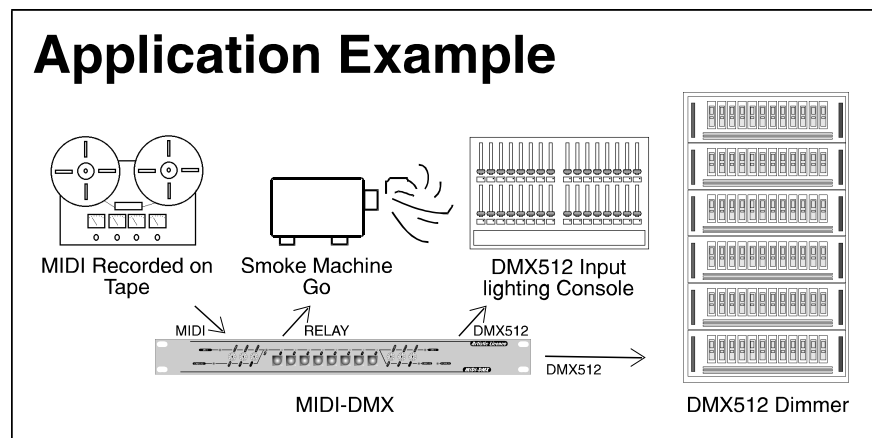
The MIDI-DMX is a 1U rack mount solution to the problem of interfacing MIDI and DMX512 equipment.

MIDI-DMX provides the following input and output ports:

- DMX512 Input/Output
- MIDI Input/Output
- Eight volt free relay outputs
- Eight LED indicators
- Eight front panel push buttons

MIDI-DMX can operate as either a MIDI to DMX512 translator or as a DMX512 to MIDI translator.

Application Example



MIDI TO DMX512 TRANSLATION

Operation

MIDI to DMX512 translation mode is selected when the shorting plug is NOT connected to the MIDI loop port. In this mode received MIDI Note On data is translated to DMX512 level data. The translation equation is as follows:

$$\begin{aligned}(\text{DMX512 Level}) &= 2 * (\text{MIDI Note Velocity}) \\ (\text{DMX512 Channel}) &= (\text{MIDI Channel} * 128) + (\text{MIDI Note})\end{aligned}$$

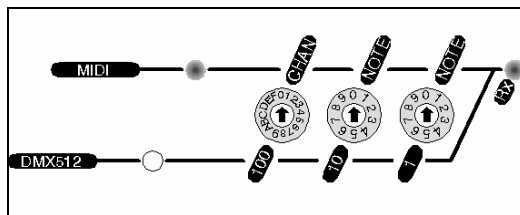
MIDI Receive

MIDI data is received at the MIDI Input connector. The Input specification conforms to the MIDI standard and is an optically isolated current loop. Received data is regenerated and provided at the MIDI Loop connector. This signal may be used to connect to additional MIDI devices. The MIDI Output connector is not used in this mode of operation. Received data is parsed to ensure that it is a Note On command and that the MIDI Channel and Note values are greater than or equal to the MIDI Base address. Data which does not pass this test is discarded. Data which passes the test is forwarded to the Relay processor.

MIDI Base Address

The MIDI base address defines the lowest MIDI Channel and Note values which are to be received. The address is set by the three thumbwheels on the left of the front panel. The first wheel selects the MIDI Channel. This value ranges from 0 to 15 and is selected as a hexadecimal value from 0 to F. The second two wheels select the MIDI Note. This value ranges from 00 to 99.

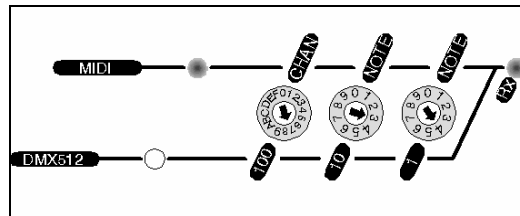
Example 1



The MIDI Input LED is illuminated showing that MIDI to DMX512 translation is operating.

All three wheels are set to zero showing that data from MIDI Channel 0 and MIDI Note 0 will be accepted. The first channel of received data will be MIDI command **90 00 XX**

Example 2



The MIDI Input LED is illuminated showing that MIDI to DMX512 translation is operating.

The wheels are set to 734. So, data from MIDI Channel 7 and MIDI Note 34 upward will be accepted. The first channel of received data will be MIDI command **97 22 XX** (Decimal 34 is Hexadecimal 22).

Relay Processor

Data received from the MIDI input is then passed to the Relay Processor. MIDI-DMX contains eight change-over relays which are controlled by both received data and the eight front panel switches.

The relay is switched on when the received MIDI command velocity level is greater than 64 or when the front panel button is pressed. The LED indicator illuminates to show this.

The relay is switched off when a MIDI command with a velocity level less than 64 is received.

Additionally all relays switch off when any front panel wheels are changed.

Using the wheel settings shown in Example 2:

Relay 1 switches on upon receipt of MIDI command 97 22 41
Relay 2 switches on upon receipt of MIDI command 97 23 41
Relay 3 switches on upon receipt of MIDI command 97 24 41
Relay 4 switches on upon receipt of MIDI command 97 25 41
Relay 5 switches on upon receipt of MIDI command 97 26 41
Relay 6 switches on upon receipt of MIDI command 97 27 41
Relay 7 switches on upon receipt of MIDI command 97 28 41
Relay 8 switches on upon receipt of MIDI command 97 29 41

Relay 1 switches off upon receipt of MIDI command 97 22 3F
Relay 2 switches off upon receipt of MIDI command 97 23 3F
Relay 3 switches off upon receipt of MIDI command 97 24 3F
Relay 4 switches off upon receipt of MIDI command 97 25 3F
Relay 5 switches off upon receipt of MIDI command 97 26 3F
Relay 6 switches off upon receipt of MIDI command 97 27 3F
Relay 7 switches off upon receipt of MIDI command 97 28 3F
Relay 8 switches off upon receipt of MIDI command 97 29 3F

DMX512 Output

DMX512 data is provided at the DMX512 Output connector. The output conforms to the USITT DMX512 (1990) specification.

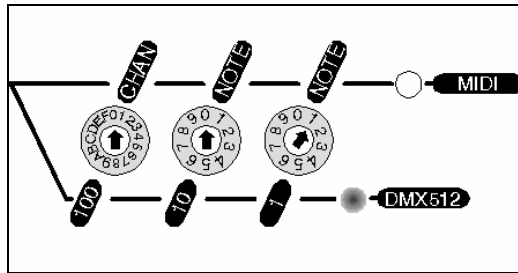
Output channel data is formed by merging the received MIDI data with the front panel switch settings. The front panel switches allow the first eight channels to be forced to full.

The DMX512 output can be offset from channel one using the wheels on the right of the front panel.

This can be useful when the DMX512 output is to be merged with another data stream.

The three wheels are used to set the offset. Wheel settings of 000 and 001 have the same meaning of No Offset. Valid settings are 001 to 512.

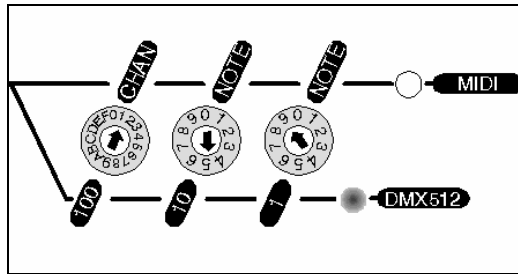
Example 1



The DMX512 output LED is illuminated showing that the current translation mode is MIDI to DMX512. The wheels are set to 001 so there is no output offset.

The first valid MIDI command will control channel 1 of the DMX512 output.

Example 2



The DMX512 output LED is illuminated showing that the current translation mode is MIDI to DMX512. The wheels are set to 159 so DMX512 output channels 1 to 158 are at

zero The first valid MIDI command will control channel 158 of the DMX512 output.

DMX512 TO MIDI TRANSLATION

Operation

DMX512 to MIDI translation mode is selected when the shorting plug is connected to the MIDI loop port.

In this mode received DMX512 data is translated to MIDI Note On data. The translation equation is as follows:

$$\begin{aligned}(\text{MIDI Note Velocity}) &= (\text{DMX512 Level}) / 2 \\ (\text{MIDI Note}) &= (\text{DMX512 Channel}) - (\text{MIDI Channel} * 128)\end{aligned}$$

DMX512 Receive

The DMX512 input is connected to the male 5 pin XLR on the rear panel. The female 5 pin XLR provides a passive loop through such that multiple DMX512 receivers can be connected to the same signal. When the MIDI-DMX is to be used at the end of a DMX512 cable, a termination connector should be fitted to the loop through.

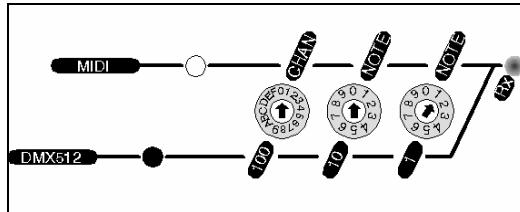
The DMX Output connector is not used in this mode of operation. Channel data is received starting at the DMX Base address. Channel data of lower channel numbers is discarded. Data is then forwarded to the Relay processor.

DMX512 Base Address

The DMX512 base address defines the lowest DMX512 channel which is to be received. The address is set by the three thumbwheels on the left of the front panel.

The Address value ranges from 001 to 512. A value of 000 will disable the input.

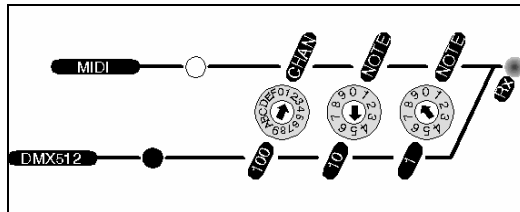
Example 1



The DMX512 Input LED is illuminated showing that DMX512 to MIDI translation is operating.

The wheels are set to 001 indicating that the input is active with no offset.

Example 2



The DMX512 Input LED is illuminated showing that DMX512 to MIDI translation is operating.

The wheels are set to 159 indicating that the input is active and that data from channels 159 to 512 will be processed.

Relay Processor

Data received from the DMX512 input is then passed to the Relay Processor. MIDI-DMX contains eight change-over relays which are controlled by both received data and the eight front panel switches.

The relay is switched on when the received DMX512 channel level exceeds 50% or when the front panel button is pressed. The LED indicator illuminates to show this.

The relay is switched off when the received DMX512 channel level drops below 50% or when the front panel button is pressed a second time.

Additionally all relays switch off when any front panel wheels are changed.

MIDI Output

MIDI data is provided at the MIDI Out connector.

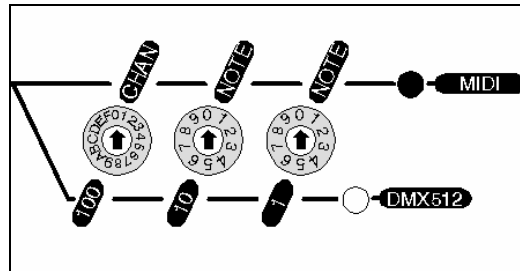
Output data is formed by merging the received DMX512 data with the front panel switch settings. The front panel switches allow the first eight channels to be forced to full.

The MIDI output can be offset from MIDI Channel zero and Note zero using the wheels on the right of the front panel.

The first wheel selects the MIDI Channel. This value ranges from 0 to 15 and is selected as a hexadecimal value from 0 to F.

The second two wheels select the MIDI Note. This value ranges from 00 to 99.

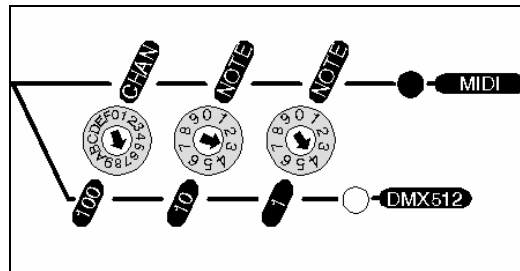
Example 1



The MIDI output LED is illuminated showing that the current translation mode is DMX512 to MIDI. The wheels are set to 000, showing that the output starts from MIDI Channel

zero and MIDI Note zero. The first valid DMX512 channel will control Note zero on MIDI channel zero (90 00 XX).

Example 2



The MIDI output LED is illuminated showing that the current translation mode is DMX512 to MIDI. The wheels are set to 734, showing that the output starts from MIDI Channel 7

and MIDI Note 34. The first valid DMX512 channel will control Note 34 on MIDI channel 7 (97 22 XX).

C U S T O M V E R S I O N S

Introduction

The software driven nature of MIDI-DMX allows us to offer custom versions which implement different MIDI commands to those described above.

Please feel free to contact Artistic Licence with your requirement.

Generally custom versions can be provided at a nominal additional cost.

The following section details existing custom versions, which if requested when ordering are supplied at no extra charge.

Avolites

The Avolites custom version is used in DMX512 to MIDI translation mode.

Received DMX512 data is monitored for the 50% level transition. When a level exceeds 50% the MIDI command is transmitted as normal but the velocity data is set to 03.

This allows a DMX512 signal to be used to step on submaster stacks on Avolites consoles.

AC

The AC custom version simply translates the front panel switches to the MIDI output with offset.

Pressing a switch once sends a Note On command and illuminates the LED.

A second switch press extinguishes the LED and sends a Note Off command.

Dataton

The Dataton custom version is used in DMX512 to MIDI translation mode.

Thirty two consecutive channels of DMX512 input data is translated to MIDI Continuous Controller.

The DMX base address and MIDI channel are set as per normal operation. The MIDI Note wheels are used to set the starting Continuous Controller Channel.

Example: Set DMX Base to 001, MIDI Channel to 0, Note to 00.

DMX input channel 1 will produce a MIDI output of B0 00 xx

DMX input channel 3 will produce a MIDI output of B0 02 xx

DMX input channel 32 will produce a MIDI output of B0 1F xx

Where xx is a value in the range 000 to 127 and represents half of the DMX channel level.

P I N D E T A I L

Front Panel Indicators

The front panel shows status for both power and received data. The Power LED is illuminated when power is applied to the MIDI-DMX. The Data LED is illuminated when valid DMX512 or MIDI is received.

DMX512 Input

The DMX512 input is optically isolated from the outputs and mains earth. Cable connection is as follows:

| | | |
|-------|-------------------|------------------------------|
| Pin 1 | Protective ground | Connect to cable screen |
| Pin 2 | Data complement | Connect to twisted pair wire |
| Pin 3 | Data true | Connect to twisted pair wire |

The termination connector is constructed by soldering a 120 ohm resistor between pin 2 and pin 3 of a male 5 pin XLR connector.

Relay Outputs

The relay outputs are all accessed via the 25 pin female DB connector on the rear panel. Cable connection is as follows:

| Connector Pin | O/P Con |
|---------------|-------------|
| 1 | Relay 1 NC |
| 2 | Relay 1 Com |
| 3 | Relay 1 NO |
| 4 | Relay 2 NC |
| 5 | Relay 2 Com |
| 6 | Relay 2 NO |
| 7 | Relay 3 NC |
| 8 | Relay 3 Com |
| 9 | Relay 3 NO |
| 10 | Relay 4 NC |
| 11 | Relay 4 Com |
| 12 | Relay 4 NO |
| 13 | |
| 14 | Relay 5 NC |
| 15 | Relay 5 Com |
| 16 | Relay 5 NO |
| 17 | Relay 6 NC |
| 18 | Relay 6 Com |
| 19 | Relay 6 NO |
| 20 | Relay 7 NC |
| 21 | Relay 7 Com |
| 22 | Relay 7 NO |
| 23 | Relay 8 NC |
| 24 | Relay 8 Com |
| 25 | Relay 8 NO |

Relay Ratings

Each relay channel has the following electromechanical specification:

| | |
|------------------------|----------------------------------|
| Maximum Voltage | 30V |
| Maximum switch current | 250mA |
| Minimum contact load | 100mA @ 5V |
| Electrical Life | 100,000 operations at rated load |
| Mechanical life | 100,000,000 operations |
| Typical operation time | 10mS |
| Typical release time | 5mS |
| Typical bounce time | 10mS |
| Shock resistance | 10g |

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