

Output Modes

For convenience here, a PC-based DMX output utility was used to generate various DMX channel:value pairs.

Using the built-in LCD, set the operating mode and DMX start address for the system. Different modes require varying quantities of DMX data, as described below. In the charts below, 'Channel 1' means 'system start address'. So if the DecaBox is set to start address 10, channel 1 means channel 10. Make sense?

The word **channel** means something different in the MIDI and DMX worlds. A MIDI channel is most easily compared to a DMX universe. Messages in a single MIDI channel can contain note on / note off information, continuous controller data, patch change messages, etc. However, a single MIDI cable can contain data for all 16 MIDI channels while a DMX cable only controls a single universe [512 DMX channels] of data.

Also, MIDI is a **zero-based** system. That is, the first MIDI channel is '0' and the last is 15, or 'F' in hex code. Note values and velocities vary between [0 127] or [0x0 0x7F] in hex. In the screen captures below, hex, zero-based data is displayed.

This simple PC-based DMX controller from ENTTEC allows precise channel:value control for testing.

Mode 1: Everything

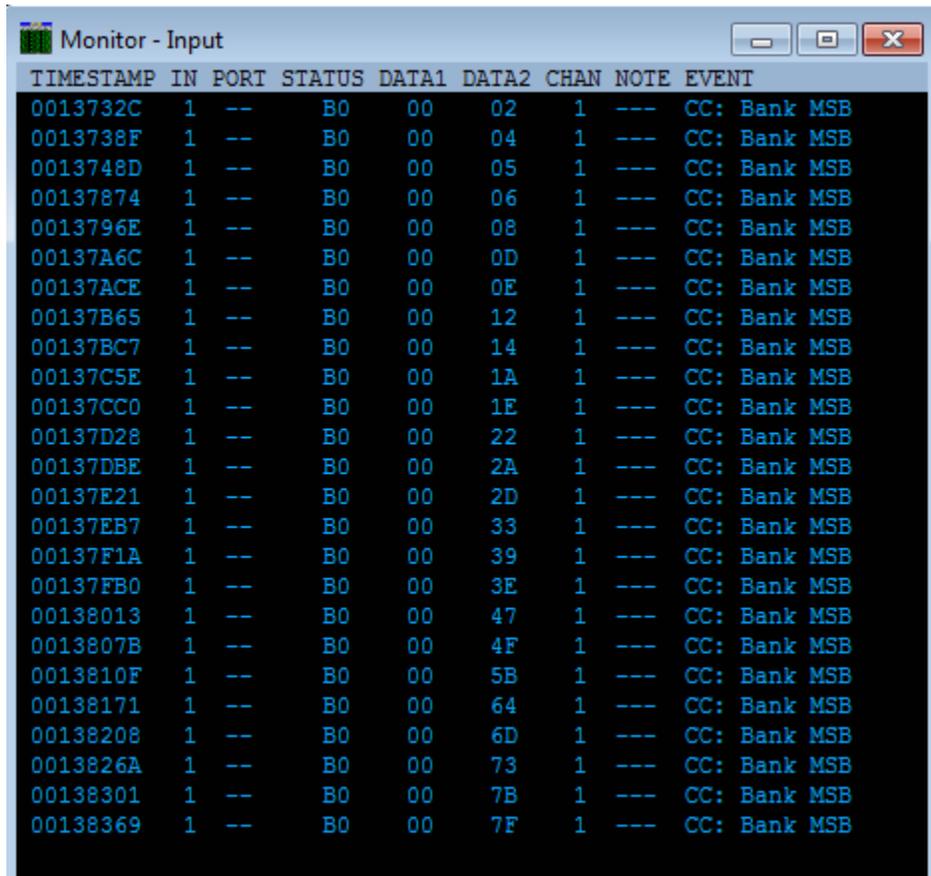
This is our most verbose mode. Sixteen sequential DMX channels generate note on / note off pairs for all 128 notes in a MIDI scale, and all 16 channels in the MIDI world. Then an additional 119 channels generate all 119 general-purpose MIDI CC messages.

The screenshot shows a software interface for a PC-based DMX controller. At the top, there are 16 vertical sliders representing DMX channels, numbered 1 through 16. Below the sliders, the text 'DMX Channels Required' is displayed. The interface also includes a 'DMX Channel' selector, a 'MIDI Output' section with a play button, and a 'Send DMX:' field set to 1. At the bottom, there are 'Enable DMX' and 'Disable DMX' buttons, and a status bar that reads 'Status: DMX ACTIVE'. The text 'MIDI channel 1, Note on / note off pairs, 128 total notes.' is visible in the MIDI Output section.

2	MIDI channel 2, Note on / note off pairs, 128 total notes.
...	
16	MIDI channel 16, Note on / note off pairs, 128 total notes.
17	MIDI CC #0, values [0 127].
...	...
Channel 136	MIDI CC #128, values [0 127].

TIMESTAMP	IN	PORT	STATUS	DATA1	DATA2	CHAN	NOTE	EVENT
0011FDBD	1	--	80	00	7F	1	C -1	Note Off
0011FEB6	1	--	90	01	7F	1	C#-1	Note On
0011FFB4	1	--	80	01	7F	1	C#-1	Note Off
00120016	1	--	90	02	7F	1	D -1	Note On
001200AD	1	--	80	02	7F	1	D -1	Note Off
0012010F	1	--	90	03	7F	1	Eb-1	Note On
00120208	1	--	80	03	7F	1	Eb-1	Note Off
00120270	1	--	90	04	7F	1	E -1	Note On
00120306	1	--	80	04	7F	1	E -1	Note Off
001203FF	1	--	90	05	7F	1	F -1	Note On
00120461	1	--	80	05	7F	1	F -1	Note Off
001204C9	1	--	90	06	7F	1	F#-1	Note On
0012055E	1	--	80	06	7F	1	F#-1	Note Off
00120656	1	--	90	07	7F	1	G -1	Note On
001206B9	1	--	80	07	7F	1	G -1	Note Off
001207B2	1	--	90	08	7F	1	G#-1	Note On
0012081A	1	--	80	08	7F	1	G#-1	Note Off
001208B0	1	--	90	09	7F	1	A -1	Note On
00120975	1	--	80	09	7F	1	A -1	Note Off
00121115	1	--	90	12	7F	1	F# 0	Note On
0012117D	1	--	80	3A	7F	1	Bb 3	Note Off
00121213	1	--	90	3E	7F	1	D 4	Note On
00121276	1	--	80	48	7F	1	C 5	Note Off
0012130C	1	--	90	4B	7F	1	Eb 5	Note On
001215C7	1	--	80	4B	7F	1	Eb 5	Note Off
001216C0	1	--	90	4C	7F	1	E 5	Note On
00121728	1	--	80	4C	7F	1	E 5	Note Off
001217BE	1	--	90	4D	7F	1	F 5	Note On
001218B7	1	--	80	4D	7F	1	F 5	Note Off
0012191A	1	--	90	4E	7F	1	F# 5	Note On
00121982	1	--	80	4E	7F	1	F# 5	Note Off
00121A7A	1	--	90	4F	7F	1	G 5	Note On
00121B11	1	--	80	4F	7F	1	G 5	Note Off
00121B73	1	--	90	50	7F	1	G# 5	Note On
00121C6C	1	--	80	50	7F	1	G# 5	Note Off
00121CD4	1	--	90	51	7F	1	A 5	Note On
00121D6A	1	--	80	51	7F	1	A 5	Note Off
00122A1D	1	--	90	57	7F	1	Eb 6	Note On
00122A7F	1	--	90	6A	7F	1	Bb 7	Note On
00122B16	1	--	80	6E	7F	1	D 8	Note Off
00122B7E	1	--	90	6F	7F	1	Eb 8	Note On
00122C14	1	--	90	77	7F	1	B 8	Note On
00122C77	1	--	80	77	7F	1	B 8	Note Off
00122DD7	1	--	90	78	7F	1	C 9	Note On
00122ED0	1	--	80	78	7F	1	C 9	Note Off
00122F32	1	--	90	79	7F	1	C# 9	Note On
00122FC8	1	--	80	79	7F	1	C# 9	Note Off
001230C1	1	--	90	7A	7F	1	D 9	Note On

Here DMX channel 1 fader was run somewhat smoothly from 0 to 100%. The entire MIDI scale, with some skipping due to how quickly the fader moved, is represented.

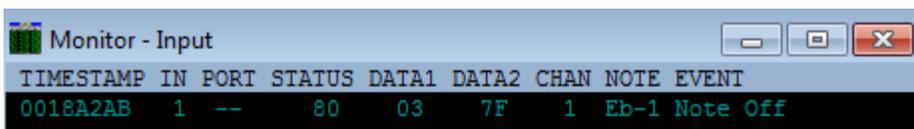


Here DMX channel 17 fader was moved. This corresponds to MIDI CC #0, 'Bank Select MSB.'

Mode 2: Easy Note & CC Messages

Mode 2 is very compact: 2 sequential DMX channels generate all note on / note off pairs for MIDI channel 1 and MIDI CC #0.

DMX Channels Required	2
DMX Channel	MIDI Output
1	MIDI channel 1, Note on / note off pairs, 128 total notes.
2	MIDI CC #0, values [0 127].



Again, values are missing because the fader was run quickly between [0 100%]. However, all values are available.

Mode 3

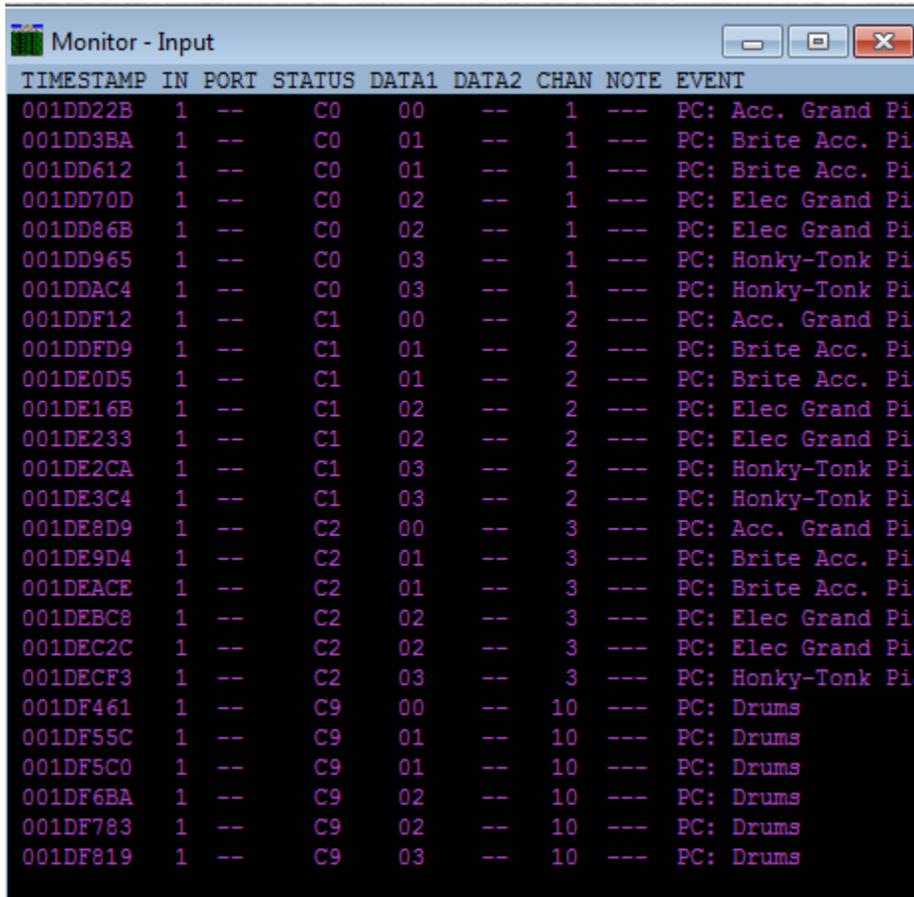
Mode 3 is a happy medium: Two sequential DMX channels generate note on / note off pairs for all 128 notes in a MIDI scale on MIDI channels 1 & 2. Then an additional 6 channels generate the first 6 general-purpose MIDI CC messages.

DMX Channels Required	8
DMX Channel	MIDI Output
1	MIDI channel 1, Note on / note off pairs, 128 total notes.
2	MIDI channel 2, Note on / note off pairs, 128 total notes.
3	MIDI CC #0, values [0 127].
...	...
8	MIDI CC #6, values [0 127].

Mode 4: Program Change / Patch Change Messages

Simple, here. 16 DMX channels generate all patch change / program change messages on MIDI channels [1 16]

DMX Channels Required	16
DMX Channel	MIDI Output
1	MIDI program change, MIDI channel 1
...	...
16	MIDI program change, MIDI channel 16



Mode 4 data, showing PC messages sent on MIDI channels 1, 2, 3 and 10.

Mode 5: Note On / Note Off With Fixed Velocities

Simple, here. 128 DMX channels generate 'note on' messages when DMX values are 100% and 'note off' messages when values are 0%. A popular TV show requested this mode for triggering sound effects via bump buttons on a console.

DMX Channels Required	128
DMX Channel	MIDI Output
1 @ 100%	MIDI channel 1, MIDI note 1, ON
1 @ 0%	MIDI channel 1, MIDI note 1, OFF
...	...
128 @ 100%	MIDI channel 1, MIDI note 128, On

TIMESTAMP	IN	PORT	STATUS	DATA1	DATA2	CHAN	NOTE	EVENT
0026B89F	1	--	90	00	7F	1	C -1	Note On
0026BCEB	1	--	80	00	00	1	C -1	Note Off
0026C4F0	1	--	90	01	7F	1	C#-1	Note On
0026C7AD	1	--	80	01	00	1	C#-1	Note Off
0026E0B2	1	--	90	04	7F	1	E -1	Note On
0026E36F	1	--	80	04	00	1	E -1	Note Off
0026E853	1	--	90	07	7F	1	G -1	Note On
0026EAAD	1	--	80	07	00	1	G -1	Note Off

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