

Launchpad X
Programmer's reference manual

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About this Guide

This document provides all the information you need to be able to control Launchpad X.

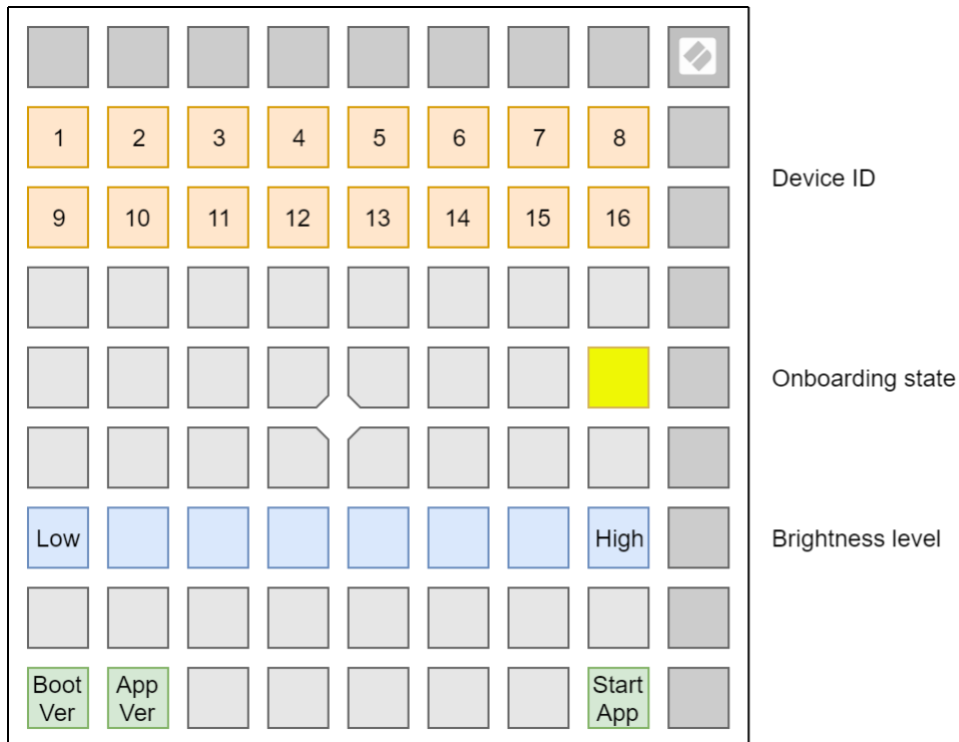
Launchpad X communicates using MIDI over USB. This document describes the MIDI implementation for the device, which can be used to control LEDs and access Launchpad X's various features.

MIDI data is expressed in this manual in several different ways:

- A plain English description of the message.
- When we describe a musical note, middle C is deemed to be 'C3' or note 60. MIDI channel 1 is the lowest-numbered MIDI channel: channels range from 1 - 16.
- MIDI messages are also expressed in plain data, with decimal and hexadecimal equivalents. The hexadecimal number will always be followed by an 'h' and the decimal equivalent given in brackets. For example, a note on message on channel 1 is signified by the status byte 90h (144).

Bootloader

Launchpad X has a bootloader mode that allows the user to configure and save certain settings. The bootloader is accessed by holding the Capture MIDI button whilst plugging the device in.



The top two rows of pads can be used to set the USB device ID of the Launchpad X. The device ID ranges from 1 to 16, the selected ID is represented by a brightly lit pad. The default ID from factory is 1. If more than one Launchpad X is used on the same USB, each should have a different device ID selected.

The single yellow pad on the middle right can be used to toggle Onboarding. When Onboarding is ON, the Launchpad X shows up as a Mass Storage Device to provide a more convenient first-time experience. You can turn this off once you are familiar with the device to disable this Mass Storage Device.

The blue row of pads can be used to adjust the Launchpad X's brightness level to something comfortable for the environment the device is used in. This control is also available on the Setup display when starting the Launchpad X normally. Note that low brightness levels may be required for Launchpad X to be powered on by certain devices.

The green pads on the bottom left can be used to display the version number of the Bootloader and the Application respectively.

The single green pad on the bottom right can be used to start the Application.

MIDI on Launchpad X

The Launchpad X has two MIDI interfaces providing two pairs of MIDI inputs and outputs over USB. They are as follows:

- LPX DAW In / Out (or first interface on Windows): This interface is used by DAWs and similar software to interact with the Launchpad X's Session mode.
- LPX MIDI In / Out (or second interface on Windows): This interface is used to receive MIDI from Note mode and Custom modes; and is used to provide external MIDI input or Light controls in Lighting Custom Modes and Programmer mode.

If you wish to use Launchpad X as a control surface for a DAW (Digital Audio Workstation), you will likely want to use the DAW interface (See [Software Interaction](#) chapter).

Otherwise, you may interact with the device using the MIDI interface.

The Launchpad X sends Note On (90h – 9Fh) with velocity zero for Note Offs. It accepts either Note Offs (80h – 8Fh) or Note Ons (90h – 9Fh) with velocity zero for Note Off.

Device Inquiry message

The Launchpad X responds to the Universal Device Inquiry Sysex message, which can be used to identify the device. This exchange is as follows:

Host => Launchpad X:

Hex: F0h 7Eh 7Fh 06h 01h F7h
Dec: 240 126 127 6 1 247

Launchpad X => Host (Application):

Hex: F0h 7Eh 00h 06h 02h 00h 20h 29h 13h 01h 00h 00h <app_version> F7h
Dec: 240 126 0 6 2 0 32 41 19 1 0 0 <app_version> 247

Launchpad X => Host (Bootloader):

Hex: F0h 7Eh 00h 06h 02h 00h 20h 29h 13h 11h 00h 00h <boot_version> F7h
Dec: 240 126 0 6 2 0 32 41 19 17 0 0 <boot_version> 247

The <app_version> or <boot_version> field is 4 bytes long, providing the Application or the Bootloader version respectively. The version is the same version which can be viewed using the lower left green pads on the Bootloader's surface, provided as four bytes, each byte corresponding to one digit, ranging from 0 – 9.

SysEx message format used by the device

All SysEx messages begin with the following header regardless of direction (Host => Launchpad X or Launchpad X => Host):

Hex: F0h 00h 20h 29h 02h 0Ch
Dec: 240 0 32 41 2 12

After the header, a command byte follows, selecting the function to use.

Several of the messages have a readback variant which can be accessed in the following manner:

Host => Launchpad X:
Hex: F0h 00h 20h 29h 02h 0Ch <command> F7h
Dec: 240 0 32 41 2 12 <command> 247

Launchpad X => Host:
Hex: F0h 00h 20h 29h 02h 0Ch <command> <data> F7h
Dec: 240 0 32 41 2 12 <command> <data> 247

Where the <data> is formatted in the same manner as normally it would be provided to the Launchpad X after the command. These readback forms are described for each of the commands where available.

Selecting layouts

The Launchpad X has several layouts to choose from, which can be controlled by either the device's User Interface (see the User Guide for more details), or the following SysEx message:

Host => Launchpad X:
Hex: F0h 00h 20h 29h 02h 0Ch 00h <layout> F7h
Dec: 240 0 32 41 2 12 0 <layout> 247

Where the available layouts are:

- 00h (0): Session (only selectable in DAW mode)
- 01h (1): Note mode
- 04h (4): Custom mode 1 (Drum Rack by factory default)
- 05h (5): Custom mode 2 (Keys by factory default)
- 06h (6): Custom mode 3 (Lighting mode in Drum Rack layout by factory default)
- 07h (7): Custom mode 4 (Lighting mode in Session layout by factory default)
- 0Dh (13): DAW Faders (only selectable in DAW mode)
- 7Fh (127): Programmer mode

Readback variant is available by the following SysEx message:

Host => Launchpad X:
Hex: F0h 00h 20h 29h 02h 0Ch 00h F7h
Dec: 240 0 32 41 2 12 0 247

When selecting Programmer mode using this SysEx message, the Setup entry (holding down Session for half a second) is disabled. To return the Launchpad X to normal operation, use this SysEx message to select any other layout than Programmer mode.

Programmer / Live mode switch

There is a dedicated SysEx message for Programmer / Live mode select:

Host => Launchpad X:
Hex: F0h 00h 20h 29h 02h 0Ch 0Eh <mode> F7h
Dec: 240 0 32 41 2 12 14 <mode> 247

Where <mode> is 0 for Live mode, 1 for Programmer mode.

Readback variant is available by the following SysEx message:

Host => Launchpad X:

Hex: F0h 00h 20h 29h 02h 0Ch 0Eh F7h

Dec: 240 0 32 41 2 12 14 247

When selecting Live mode with this message, Launchpad X switches to Session layout, or Note mode when not in DAW mode.

When selecting Programmer mode using this SysEx message, the Setup entry (holding down Session for half a second) is disabled. To return the Launchpad X to normal operation, use this SysEx message to switch back to Live mode.

Controlling the Surface

This chapter describes the wide range of possibilities for controlling and lighting up the Launchpad X surface. If you aim to light Launchpad X's surface, this chapter contains all the information you will likely need for it. You can also use these capabilities to realize surfaces for interacting with software, however for that purpose, using the DAW mode is preferable as it keeps the MIDI port free for playing and interacting with virtual instruments. See chapter [Software Interaction](#).

Switching to Lighting modes

If you aim to control the Launchpad X using scripts, the best option for lighting pads/buttons or creating an interactive surface is switching to Programmer mode. You can use the Programmer / Live mode switch message to achieve this or access it from the setup menu (hold Session, then press bottom Scene Launch button). Programmer Mode sends out a message for every pad or button that is pressed, and equally lights pads or buttons when the same message is received. Remember to switch the device back to Live mode once done.

Alternatively, you may use Lighting Custom Modes in the same way, but you are limited to interacting only with the 8x8 grid. On a Launchpad X in its factory default state, Custom mode 3 and Custom mode 4 are set up for lighting pads, each with a different layout. You can switch to either of these using the Launchpad X's User Interface. In these Lighting Custom Modes, you may enable Ghost mode which allows the lighting area to expand beyond the 8x8 grid into the top and side button rows and logo. Access Ghost Mode by pressing the Note and Custom buttons in rapid succession (with the appropriate Custom mode already selected).

In a Lighting Custom Mode, Ghost mode is automatically enabled when:

- Sending any Control Change message on the MIDI interface (these can be used to light up the top row of buttons, the logo and the right-side buttons).
- Sending the LED lighting SysEx message.

Programmer mode layout

CC 91	CC 92	CC 93	CC 94	CC 95	CC 96	CC 97	CC 98	CC 99
81	82	83	84	85	86	87	88	CC 89
71	72	73	74	75	76	77	78	CC 79
61	62	63	64	65	66	67	68	CC 69
51	52	53	54	55	56	57	58	CC 59
41	42	43	44	45	46	47	48	CC 49
31	32	33	34	35	36	37	38	CC 39
21	22	23	24	25	26	27	28	CC 29
11	12	13	14	15	16	17	18	CC 19

CC 5Bh	CC 5Ch	CC 5Dh	CC 5Eh	CC 5Fh	CC 60h	CC 61h	CC 62h	CC 63h
51h	52h	53h	54h	55h	56h	57h	58h	CC 59h
47h	48h	49h	4Ah	4Bh	4Ch	4Dh	4Eh	CC 4Fh
3Dh	3Eh	3Fh	40h	41h	42h	43h	44h	CC 45h
33h	34h	35h	36h	37h	38h	39h	3Ah	CC 3Bh
29h	2Ah	2Bh	2Ch	2Dh	2Eh	2Fh	30h	CC 31h
1Fh	20h	21h	22h	23h	24h	25h	26h	CC 27h
15h	16h	17h	18h	19h	1Ah	1Bh	1Ch	CC 1Dh
0Bh	0Ch	0Dh	0Eh	0Fh	10h	11h	12h	CC 13h

Note that in Programmer mode, all buttons and pads accept either Note or Control Change messages. The indicated type is which is sent by the device on the MIDI interface when the corresponding button or pad is pressed.

Factory default Lighting Custom Mode layouts

Custom Mode 3:

CC 91	CC 92	CC 93	CC 94	CC 95	CC 96	CC 97	CC 98	CC 99
64	65	66	67	96	97	98	99	CC 89
60	61	62	63	92	93	94	95	CC 79
56	57	58	59	88	89	90	91	CC 69
52	53	54	55	84	85	86	87	CC 59
48	49	50	51	80	81	82	83	CC 49
44	45	46	47	76	77	78	79	CC 39
40	41	42	43	72	73	74	75	CC 29
36	37	38	39	68	69	70	71	CC 19

CC 5Bh	CC 5Ch	CC 5Dh	CC 5Eh	CC 5Fh	CC 60h	CC 61h	CC 62h	CC 63h
40h	41h	42h	43h	60h	61h	62h	63h	CC 59h
3Ch	3Dh	3Eh	3Fh	5Ch	5Dh	5Eh	5Fh	CC 4Fh
38h	39h	3Ah	3Bh	58h	59h	5Ah	5Bh	CC 45h
34h	35h	36h	37h	54h	55h	56h	57h	CC 3Bh
30h	31h	32h	33h	50h	51h	52h	53h	CC 31h
2Ch	2Dh	2Eh	2Fh	4Ch	4Dh	4Eh	4Fh	CC 27h
28h	29h	2Ah	2Bh	48h	49h	4Ah	4Bh	CC 1Dh
24h	25h	26h	27h	44h	45h	46h	47h	CC 13h

Custom Mode 4:

CC 91	CC 92	CC 93	CC 94	CC 95	CC 96	CC 97	CC 98	CC 99
81	82	83	84	85	86	87	88	CC 89
71	72	73	74	75	76	77	78	CC 79
61	62	63	64	65	66	67	68	CC 69
51	52	53	54	55	56	57	58	CC 59
41	42	43	44	45	46	47	48	CC 49
31	32	33	34	35	36	37	38	CC 39
21	22	23	24	25	26	27	28	CC 29
11	12	13	14	15	16	17	18	CC 19

CC 5Bh	CC 5Ch	CC 5Dh	CC 5Eh	CC 5Fh	CC 60h	CC 61h	CC 62h	CC 63h
51h	52h	53h	54h	55h	56h	57h	58h	CC 59h
47h	48h	49h	4Ah	4Bh	4Ch	4Dh	4Eh	CC 4Fh
3Dh	3Eh	3Fh	40h	41h	42h	43h	44h	CC 45h
33h	34h	35h	36h	37h	38h	39h	3Ah	CC 3Bh
29h	2Ah	2Bh	2Ch	2Dh	2Eh	2Fh	30h	CC 31h
1Fh	20h	21h	22h	23h	24h	25h	26h	CC 27h
15h	16h	17h	18h	19h	1Ah	1Bh	1Ch	CC 1Dh
0Bh	0Ch	0Dh	0Eh	0Fh	10h	11h	12h	CC 13h

Colour palette

When providing colours by MIDI notes or control changes, the colours are chosen according to the following table, decimal:

0	1	2	3	4	5	6	7	64	65	66	67	68	69	70	71
8	9	10	11	12	13	14	15	72	73	74	75	76	77	78	79
16	17	18	19	20	21	22	23	80	81	82	83	84	85	86	87
24	25	26	27	28	29	30	31	88	89	90	91	92	93	94	95
32	33	34	35	36	37	38	39	96	97	98	99	100	101	102	103
40	41	42	43	44	45	46	47	104	105	106	107	108	109	110	111
48	49	50	51	52	53	54	55	112	113	114	115	116	117	118	119
56	57	58	59	60	61	62	63	120	121	122	123	124	125	126	127

The same table with hexadecimal indexing:

00	01	02	03	04	05	06	07	40	41	42	43	44	45	46	47
08	09	0A	0B	0C	0D	0E	0F	48	49	4A	4B	4C	4D	4E	4F
10	11	12	13	14	15	16	17	50	51	52	53	54	55	56	57
18	19	1A	1B	1C	1D	1E	1F	58	59	5A	5B	5C	5D	5E	5F
20	21	22	23	24	25	26	27	60	61	62	63	64	65	66	67
28	29	2A	2B	2C	2D	2E	2F	68	69	6A	6B	6C	6D	6E	6F
30	31	32	33	34	35	36	37	70	71	72	73	74	75	76	77
38	39	3A	3B	3C	3D	3E	3F	78	79	7A	7B	7C	7D	7E	7F

Sending colours by MIDI events

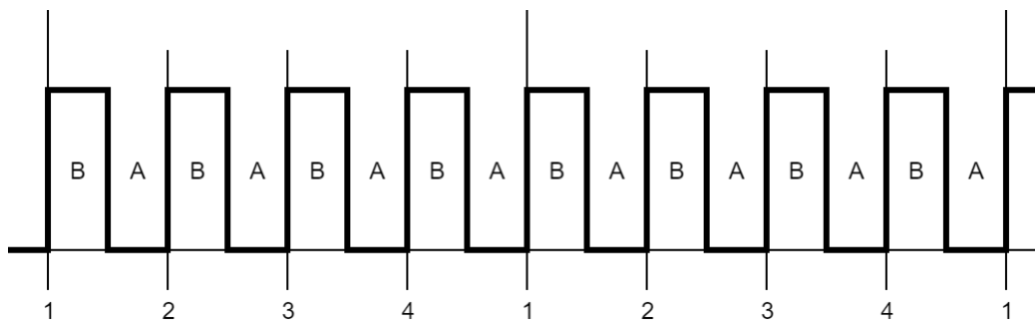
In Lighting Custom Modes (and Programmer mode) the Launchpad X accepts colours through the MIDI interface. Channels are used as follows:

- Channel 1, Notes: 90h (144), Control Changes: B0h (176): Static colour.
- Channel 2, Notes: 91h (145), Control Changes: B1h (177): Flashing colour.
- Channel 3, Notes: 92h (146), Control Changes: B2h (178): Pulsing colour.

The Note number selects the pad to control (as shown on the layout mappings) and the velocity the colour to use (as shown on the [colour palette](#)). Similarly, for Control Changes the CC number selects the pad to control and the value the colour to use.

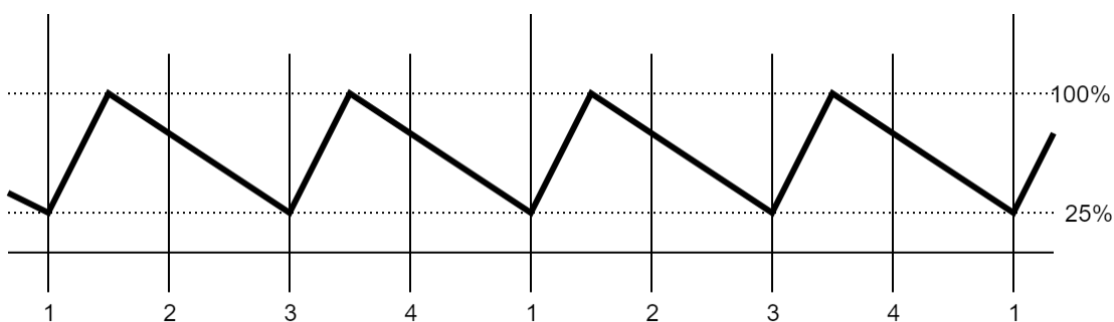
Flashing colour

When sending Flashing colour, the colour flashes between that set as Static or Pulsing colour (A), and that contained in the MIDI event setting flashing (B), at 50% duty cycle, synchronized to the MIDI beat clock (or 120bpm or the last clock if no clock is provided). One period is one beat long.



Pulsing colour

The colour pulses between dark and full intensity synchronized to the MIDI beat clock (or 120bpm or the last clock if no clock is provided). One period is two beats long, using the following waveform:



Examples

For these examples, switch the Launchpad into Programmer Mode.

Lighting the lower left pad static red:

```
Host => Launchpad X:  
Hex:   90h 0Bh 05h  
Dec:   144 11 5
```

This is Note On, Channel 1, Note number 0Bh (11), with Velocity 05h (5). The Channel specifies the lighting mode (static), the Note number the pad to light (which is the lower left one in Programmer mode), the Velocity the colour (which is Red, see [Colour Palette](#)).

Flashing the upper left pad green:

```
Host => Launchpad X:  
Hex:   91h 51h 13h  
Dec:   145 81 19
```

This is Note On, Channel 2, Note number 51h (81), with Velocity 13h (19). The Channel specifies the lighting mode (flashing), the Note number the pad to light (which is the upper left one in Programmer mode), the Velocity the colour (which is Green, see [Colour Palette](#)).

Pulsing the lower right pad blue:

```
Host => Launchpad X:  
Hex:   92h 12h 2Dh  
Dec:   146 18 45
```

This is Note On, Channel 3, Note number 12h (18), with Velocity 2Dh (45). The Channel specifies the lighting mode (pulsing), the Note number the pad to light (which is the lower right one in Programmer mode), the Velocity the colour (which is Blue, see [Colour Palette](#)).

Turning a colour off:

```
Host => Launchpad X:  
Hex:   90h 12h 00h  
Dec:   144 18 0
```

This is Note Off (Note On with Velocity of zero), Channel 1, Note number 12h (18), with Velocity 00h (0). The Channel specifies the lighting mode (static), the Note number the pad to light (which is the lower right one in Programmer mode), the Velocity the colour (which is blank, see [Colour Palette](#)). If the Pulsing colour was set up there with the previous message, this would turn it off. Alternatively, a Midi Note Off message can also be used for the same effect:

```
Host => Launchpad X:  
Hex:   80h 12h 00h  
Dec:   128 18 0
```

LED lighting SysEx message

This message can be sent to Lighting Custom Modes and the Programmer mode to light up LEDs. The LED indices used always correspond to those of Programmer mode, regardless of the layout selected:

Host => Launchpad X:

Hex: F0h 00h 20h 29h 02h 0Ch 03h <colourspec> [<colourspec> [...]] F7h

Dec: 240 0 32 41 2 12 3 <colourspec> [<colourspec> [...]] 247

The <colourspec> is structured as follows:

- Lighting type (1 byte)
- LED index (1 byte)
- Lighting data (1 – 3 bytes)

Lighting types:

- 0: Static colour from [palette](#), Lighting data is 1 byte specifying palette entry.
- 1: Flashing colour, Lighting data is 2 bytes specifying Colour B and Colour A.
- 2: Pulsing colour, Lighting data is 1 byte specifying palette entry.
- 3: RGB colour, Lighting data is 3 bytes for Red, Green and Blue (127: Max, 0: Min).

The message may contain up to 81 <colourspec> entries to light up the entire Launchpad X surface.

Example:

Host => Launchpad X:

Hex: F0h 00h 20h 29h 02h 0Ch 03h 00h 0Bh 0Dh 01h 0Ch 15h 17h 02h 0Dh 25h F7h

Dec: 240 0 32 41 2 12 3 0 11 13 1 12 21 23 2 13 37 247

Sending this message to the Launchpad X in Programmer layout sets up the bottom left pad to static yellow, the pad next to it to flashing green (between dim and bright green), and the pad next to that pulsing turquoise.

Software Interaction

This chapter describes the means to interact with the Launchpad X by DAW (Digital Audio Workstation) or DAW like software. This mostly involves interacting with the Session layout to realize surfaces through which the DAW may provide its user interface.

Enabling / disabling DAW mode

Launchpad X must be switched into DAW mode before software may interact with it. When DAW mode is enabled, the Session button will light and become available to press.

When the DAW/software exits, it should send SysEx to revert the device to Standalone mode. Doing this ensures that all the state is cleared, and the device remains useful as a standalone device once the DAW is done using it (without power cycling to restore it).

When entering DAW mode, all DAW states start cleared.

The SysEx message is as follows:

```
Host => Launchpad X:  
Hex:   F0h 00h 20h 29h 02h 0Ch 10h <mode> F7h  
Dec:   240 0 32 41 2 12 16 <mode> 247
```

Where <mode> is 0 for Standalone, 1 for DAW (Session / DAW Fader layouts enabled).

Readback variant is available by the following SysEx message:

```
Host => Launchpad X:  
Hex:   F0h 00h 20h 29h 02h 0Ch 10h F7h  
Dec:   240 0 32 41 2 12 16 247
```

The DAW In/Out interface

The DAW should interact with the Launchpad X through the USB DAW In/Out interface. MIDI events sent on this interface control the DAW state within the Launchpad X as follows:

- Channel 1, Notes: 90h (144), Control Changes: B0h (176): Static colour on Session layout.
- Channel 2, Notes: 91h (145), Control Changes: B1h (177): Flashing colour on Session layout.
- Channel 3, Notes: 92h (146), Control Changes: B2h (178): Pulsing colour on Session layout.
- Channel 5, Control Changes: B4h (180): DAW Fader position sets.
- Channel 6, Control Changes: B5h (181): DAW Fader colour sets.
- Channel 9, Notes: 98h (152): Static colour on DAW Drum Rack layout.
- Channel 10, Notes: 99h (153): Flashing colour on DAW Drum Rack layout.
- Channel 11, Notes: 9Ah (154): Pulsing colour on DAW Drum Rack layout.
- Channel 16, Notes: 9Fh (159): External note injection on all External MIDI channels.

The Launchpad X sends button and pad events to the DAW as follows:

- Channel 1, Notes: 90h (144), Control Changes: B0h (176): Session layout activities.
- Channel 5, Control Changes: B4h (180): DAW fader activities.
- Channel 9, Notes: 98h (152): DAW Drum Rack layout activities.

For the available colours, see the [colour palettes](#) in the Controlling the Surface chapter.

Note that Aftertouch (either as key aftertouch or channel pressure depending on configuration) is also sent on the appropriate channels (Channel 1 for Session, Channel 9 for Drum Rack).

These interactions are all available regardless of which layout is selected on the Launchpad X, and the state set up by the MIDI events is preserved even when it is not visible (the Launchpad X is not on the corresponding layout).

Text scrolling can also be used in DAW mode as desired to display information, the text scroll overlaying on top of the surface without affecting it.

DAW state clear

This message can be used as a shortcut to clear DAW state, instead of sending out all the corresponding MIDI events with a data value of zero:

```
Host => Launchpad X:
Hex:   F0h 00h 20h 29h 02h 0Ch 12h <session> <drumrack> <controlchanges>   F7h
Dec:   240 0  32  41  2  12  18  <session> <drumrack> <controlchanges>  247
```

Each of <session>, <drumrack> and <controlchange> can be either 0 to keep the corresponding state intact or 1 to clear it. Clearing is equivalent of sending 128 MIDI events with value of zero as follows:

- <session>: 90h (144) (Session layout Note states)
- <drumrack>: 98h (152) (DAW Drum Rack layout states)
- <controlchange>: B0h (176) (Control Change states)

Example:

```
Host => Launchpad X:
Hex:   F0h 00h 20h 29h 02h 0Ch 12h 01h 00h 00h F7h
Dec:   240 0  32  41  2  12  18  1  0  0  247
```

This message clears the Session layout Note states without affecting the DAW Drum Rack or Control Change states.

Session mode

Session mode is selectable by the Session button, it is the surface on which most interactions should take place. Its layout is as follows:

CC 91	CC 92	CC 93	CC 94	CC 95	CC 96	CC 97	CC 98	CC 99
81	82	83	84	85	86	87	88	CC 89
71	72	73	74	75	76	77	78	CC 79
61	62	63	64	65	66	67	68	CC 69
51	52	53	54	55	56	57	58	CC 59
41	42	43	44	45	46	47	48	CC 49
31	32	33	34	35	36	37	38	CC 39
21	22	23	24	25	26	27	28	CC 29
11	12	13	14	15	16	17	18	CC 19

CC 5Bh	CC 5Ch	CC 5Dh	CC 5Eh	CC 5Fh	CC 60h	CC 61h	CC 62h	CC 63h
51h	52h	53h	54h	55h	56h	57h	58h	CC 59h
47h	48h	49h	4Ah	4Bh	4Ch	4Dh	4Eh	CC 4Fh
3Dh	3Eh	3Fh	40h	41h	42h	43h	44h	CC 45h
33h	34h	35h	36h	37h	38h	39h	3Ah	CC 3Bh
29h	2Ah	2Bh	2Ch	2Dh	2Eh	2Fh	30h	CC 31h
1Fh	20h	21h	22h	23h	24h	25h	26h	CC 27h
15h	16h	17h	18h	19h	1Ah	1Bh	1Ch	CC 1Dh
0Bh	0Ch	0Dh	0Eh	0Fh	10h	11h	12h	CC 13h

The top row's Session, Note and Custom buttons are not available for control by the DAW, however they still send the corresponding CC messages on interaction, allowing the DAW to catch relevant events as the user interacts with the device (layout changes). All the other pads and buttons (as well as the logo) are available, and reflect the state set up by the corresponding MIDI events.

DAW Faders

The DAW can use the DAW Fader layout to set up banks of faders. There are up to 8 faders on a fader bank, which all share orientation (either horizontal or vertical), however each may be configured individually to be either unipolar or bipolar.

CC 91	CC 92	CC 93	CC 94	CC 95	CC 96	CC 97	CC 98	CC 99
127	127	7Fh	7Fh	127	127	7Fh	7Fh	CC 89
108	108	6Ch	6Ch	106	106	6Ah	6Ah	CC 79
89	89	59h	59h	85	85	55h	55h	CC 69
70	70	46h	46h	64	64	40h	40h	CC 59
52	52	34h	34h	63	63	3Fh	3Fh	CC 49
34	34	22h	22h	42	42	2Ah	2Ah	CC 39
17	17	11h	11h	21	21	15h	15h	CC 29
0	0	00h	00h	0	0	00h	00h	CC 19

CC 5Bh	CC 5Ch	CC 5Dh	CC 5Eh	CC 5Fh	CC 60h	CC 61h	CC 62h	CC 63h
0	17	34	52	70	89	108	127	CC 59h
0	17	34	52	70	89	108	127	CC 4Fh
00h	11h	22h	34h	46h	59h	6Ch	7Fh	CC 45h
00h	11h	22h	34h	46h	59h	6Ch	7Fh	CC 3Bh
0	21	42	63	64	85	106	127	CC 31h
0	21	42	63	64	85	106	127	CC 27h
00h	15h	2Ah	3Fh	40h	55h	6Ah	7Fh	CC 1Dh
00h	15h	2Ah	3Fh	40h	55h	6Ah	7Fh	CC 13h

DAW Fader bank set-up

The DAW Fader bank can be set up using the following SysEx message:

Host => Launchpad X:

```
Hex:  F0h 00h 20h 29h 02h 0Ch 01h 00h <orientation> <fader> [<fader> [...]] F7h  
Dec:  240 0 32 41 2 12 1 0 <orientation> <fader> [<fader> [...]] 247
```

The <orientation> byte can be 0 for Vertical faders or 1 for Horizontal faders.

The <fader> entry specifies the configuration of one fader as follows:

- Fader index (1 byte), 0 – 7, left to right (vertical) or top to bottom (horizontal).
- Fader type (1 byte), 0: Unipolar, 1: Bipolar.
- Control Change associated (1 byte).
- Fader's colour (1 byte), a [palette](#) entry.

The fader's colour can be set to 0, this may be used to disable the fader (as it will not show on the surface then).

The message may contain up to 8 <fader> entries to set up the entire DAW Fader bank.

Readback variant is available by the following SysEx message:

Host => Launchpad X:

```
Hex:  F0h 00h 20h 29h 02h 0Ch 01h F7h  
Dec:  240 0 32 41 2 12 1 247
```

Example:

Host => Launchpad X:

```
Hex:  F0h 00h 20h 29h 02h 0Ch 01h 00h 00h 00h 07h 25h 01h 01h 08h 15h F7h  
Dec:  240 0 32 41 2 12 1 0 0 0 7 37 1 1 8 21 247
```

Host => Launchpad X:

```
Hex:  F0h 00h 20h 29h 02h 0Ch 00h 0Dh F7h  
Dec:  240 0 32 41 2 12 0 13 247
```

The first message populates a DAW Fader bank with:

- Vertical orientation
- A turquoise unipolar fader on the leftmost column set to CC 7
- A green bipolar fader in the next column along set to CC 8

The second message switches to the fader layout (blank by default). DAW Mode must be enabled for these messages to work. Keep in mind that the state of the fader layout persists even when switching away from it, so it is recommended to set up the faders first and switch to the layout afterwards when a new fader layout is to be set up to prevent the previous state momentarily showing up when switching from a different layout.

DAW Drum Rack

The DAW can request the Note Mode to show a Drum Rack instead of the regular Note Mode layout. This layout is designed for Ableton Live's Drum Rack, normally set up according to the available drum samples using the MIDI events described in the DAW In/Out interface chapter. The layout of this Drum Rack is as follows:

CC 91	CC 92	CC 93	CC 94	CC 95	CC 96	CC 97	CC 98	CC 99
64	65	66	67	96	97	98	99	CC 89
60	61	62	63	92	93	94	95	CC 79
56	57	58	59	88	89	90	91	CC 69
52	53	54	55	84	85	86	87	CC 59
48	49	50	51	80	81	82	83	CC 49
44	45	46	47	76	77	78	79	CC 39
40	41	42	43	72	73	74	75	CC 29
36	37	38	39	68	69	70	71	CC 19

CC 5Bh	CC 5Ch	CC 5Dh	CC 5Eh	CC 5Fh	CC 60h	CC 61h	CC 62h	CC 63h
40h	41h	42h	43h	60h	61h	62h	63h	CC 59h
3Ch	3Dh	3Eh	3Fh	5Ch	5Dh	5Eh	5Fh	CC 4Fh
38h	39h	3Ah	3Bh	58h	59h	5Ah	5Bh	CC 45h
34h	35h	36h	37h	54h	55h	56h	57h	CC 3Bh
30h	31h	32h	33h	50h	51h	52h	53h	CC 31h
2Ch	2Dh	2Eh	2Fh	4Ch	4Dh	4Eh	4Fh	CC 27h
28h	29h	2Ah	2Bh	48h	49h	4Ah	4Bh	CC 1Dh
24h	25h	26h	27h	44h	45h	46h	47h	CC 13h

DAW Note / Drum Rack mode select

This message can be used to select the DAW Drum Rack mode. It is only available in DAW mode. Changing the mode does not change the currently active layout on the Launchpad X. If Note mode is selected, the change is immediately visible, otherwise the change will be seen when Note Mode is next selected.

Host => Launchpad X:

Hex: F0h 00h 20h 29h 02h 0Ch 0Fh <mode> F7h

Dec: 240 0 32 41 2 12 15 <mode> 247

Where the <mode> byte can be one of the followings:

- 0: Note mode.
- 1: Simple Drum Rack.
- 2: Intelligent Drum Rack.

Readback variant is available by the following SysEx message:

Host => Launchpad X:

Hex: F0h 00h 20h 29h 02h 0Ch 0Fh F7h

Dec: 240 0 32 41 2 12 15 247

Simple Drum Rack

In this mode, the layout is fixed, while the DAW may control the four directional buttons on the upper right (with the same Control Change messages like available on Session layout).

Intelligent Drum Rack

In this mode, the layout is scrollable by the four directional buttons, which the Launchpad X operates on its own (colouring them yellow if the control is available, blank if not), allowing to pan the view over the 128 possible drum samples.

- Up / Down moves one 4x4 grid up/down.
- Left / Right moves an 1x4 row down/up.

Intelligent Drum Rack position

This message can be used to set or retrieve the Intelligent Drum Rack's position, so the DAW could retain its position or control it by itself:

```
Host => Launchpad X:  
Hex:   F0h 00h 20h 29h 02h 0Ch 13h <position> F7h  
Dec:   240 0 32 41 2 12 19 <position> 247
```

Where <position> is the lower left pad's index, which may range between 0 and 64.

Readback variant is available by the following SysEx message:

```
Host => Launchpad X:  
Hex:   F0h 00h 20h 29h 02h 0Ch 13h F7h  
Dec:   240 0 32 41 2 12 19 247
```

DAW Session button colour set

This message can be used to change the active and inactive colours of the Session button:

```
Host => Launchpad X:  
Hex:   F0h 00h 20h 29h 02h 0Ch 14h <active> <inactive> F7h  
Dec:   240 0 32 41 2 12 20 <active> <inactive> 247
```

Each of <active> and <inactive> is a [palette](#) entry. Setting <active> to zero reverts to the default colours. When entering DAW mode, the Session button always has the default colouring.

Readback variant is available by the following SysEx message:

```
Host => Launchpad X:  
Hex:   F0h 00h 20h 29h 02h 0Ch 14h F7h  
Dec:   240 0 32 41 2 12 20 247
```

DAW Note mode Active colour set

This message can be used to change the active colour of Note mode (which is normally green):

```
Host => Launchpad X:  
Hex:   F0h 00h 20h 29h 02h 0Ch 17h <colour> F7h  
Dec:   240 0 32 41 2 12 23 <colour> 247
```

The <colour> is a [palette](#) entry. Setting it to zero reverts to the default (green) colour.

Readback variant is available by the following SysEx message:

```
Host => Launchpad X:  
Hex:   F0h 00h 20h 29h 02h 0Ch 17h F7h  
Dec:   240 0 32 41 2 12 23 247
```

Miscellaneous surface control

Text scrolling

The Launchpad X can display scrolling text across the pads and the right-side buttons. The top row buttons and the logo is not affected by the scroll, and any lighting covered by the scroll is retained (will return once the scroll is stopped or completed).

Host => Launchpad X:

```
Hex:  F0h 00h 20h 29h 02h 0Ch 07h [<loop> [<speed> [<colourspec> [<text>]]] F7h
Dec:  240 0 32 41 2 12 7 [<loop> [<speed> [<colourspec> [<text>]]] 247
```

- <loop> (1 byte) specifies whether the text should loop, 0: don't loop, 1: loop.
- <speed> (1 byte) is the scrolling speed expressed in pads / second units.
- <colourspec> (2 – 4 bytes) is a colour specification.
- <text> is the text to display.

The colour specification <colourspec>:

- If first byte is 0, then the next byte is colour from [palette](#), 2 bytes total.
- If first byte is 1, then Red, Green and Blue follows (127: Max, 0: Min), 4 bytes total.

When the message is empty:

Host => Launchpad X:

```
Hex:  F0h 00h 20h 29h 02h 0Ch 07h F7h
Dec:  240 0 32 41 2 12 7 247
```

Any text scroll which was ongoing is terminated.

Omitting <text> results in changing the currently scrolling text's configuration (looping, speed or colour). Turning off looping for a text scroll which was looping results in ending the scroll after the text completely scrolled out of the surface.

If <speed> is 40h or above, it is interpreted as a negative number, formed by subtracting 80h from it (text scrolls from left to right).

Example:

Host => Launchpad X:

```
Hex:  F0h 00h 20h 29h 02h 0Ch 07h 01h 07h 00h 25h 48h 65h 6Ch 6Ch 6Fh 20h 57h 6Fh 72h 6Ch 64h F7h
Dec:  240 0 32 41 2 12 7 1 7 0 37 72 101 104 104 111 32 87 111 114 104 100 247
```

This message will make the Launchpad displaying "Hello World" scrolling across its surface.

- Yellow: Sets Looping to enabled.
- Green: Sets Speed to 7 pads / seconds.
- Turquoise: Sets the colour of the text to turquoise.
- Grey: The text to display, it is the ASCII codes of the string "Hello World".

Power management

This chapter contains messages used for accessing power management features of the Launchpad X.

Sleep SysEx message

The Sleep message can be used to turn off all lights until turning them back on with this message or interacting with the device:

Host => Launchpad X:

Hex: F0h 00h 20h 29h 02h 0Ch 09h <mode> F7h

Dec: 240 0 32 41 2 12 9 <mode> 247

Where <mode> is 0 to turn the LEDs Off, 1 to turn them back On.

Readback variant is available by the following SysEx message:

Host => Launchpad X:

Hex: F0h 00h 20h 29h 02h 0Ch 09h F7h

Dec: 240 0 32 41 2 12 9 247

Configuration messages

The messages described further can be used to change various settings of the Launchpad X.

Brightness level

This message sets the Launchpad X's brightness level on a 0 – 127 scale. Value 0 corresponds to the lowest brightness level, 127 to the highest. This setting is normally available on the LED view of the Setup menu, where 8 brightness levels can be set.

```
Host => Launchpad X:  
Hex:   F0h 00h 20h 29h 02h 0Ch 08h <brightness>F7h  
Dec:   240 0 32 41 2 12 8 <brightness>247
```

Readback variant is available by the following SysEx message:

```
Host => Launchpad X:  
Hex:   F0h 00h 20h 29h 02h 0Ch 08h F7h  
Dec:   240 0 32 41 2 12 8 247
```

LED Feedbacks

This message sets the Internal and External Feedbacks, which are normally available on the LED view of the Setup menu:

- Internal Feedback: Whether notes played, or controls activated should light up.
- External Feedback: Whether MIDI notes coming from the MIDI In / Out interface should light up corresponding pads.

```
Host => Launchpad X:  
Hex:   F0h 00h 20h 29h 02h 0Ch 0Ah <internal> <external> F7h  
Dec:   240 0 32 41 2 12 10 <internal> <external> 247
```

For both <internal> and <external>, 0 corresponds to inactive, 1 to active.

Readback variant is available by the following SysEx message:

```
Host => Launchpad X:  
Hex:   F0h 00h 20h 29h 02h 0Ch 0Ah F7h  
Dec:   240 0 32 41 2 12 10 247
```

Velocity curve

This message configures the Velocity curve, which is normally available on the VEL view of the Setup menu:

```
Host => Launchpad X:  
Hex:   F0h 00h 20h 29h 02h 0Ch 04h <curve> <fixed> F7h  
Dec:   240 0 32 41 2 12 4 <curve> <fixed> 247
```

For <curve>, the followings are available:

- 0: Low (Playing soft notes is easier).
- 1: Medium.
- 2: High (Playing hard notes is easier).
- 3: Fixed velocity.

The <fixed> parameter provides the fixed velocity value to use when selecting Fixed velocity. By default, this is 7Fh. Changing this is not possible on the Setup menu.

The velocity curve (or fixed velocity) is also used for Faders when the Faders are configured to be Velocity sensitive.

Readback variant is available by the following SysEx message:

```
Host => Launchpad X:
Hex:   F0h 00h 20h 29h 02h 0Ch 04h F7h
Dec:   240 0  32  41  2  12  4  247
```

Aftertouch

This message configures Aftertouch, which is normally available on the AFT view of the Setup menu:

```
Host => Launchpad X:
Hex:   F0h 00h 20h 29h 02h 0Ch 0Bh <type> <threshold> F7h
Dec:   240 0  32  41  2  12  11 <type> <threshold> 247
```

For <type>, the followings are available:

- 0: Polyphonic Aftertouch (Key Pressure events, A0h – AFh).
- 1: Channel Aftertouch (Channel Pressure events, D0h – DFh).
- 2: Aftertouch Off.

For <threshold>, the followings are available:

- 0: Low (Aftertouch is very sensitive)
- 1: Medium
- 2: High (Aftertouch only kicks in at high pressure on the pads)

Readback variant is available by the following SysEx message:

```
Host => Launchpad X:
Hex:   F0h 00h 20h 29h 02h 0Ch 0Bh F7h
Dec:   240 0  32  41  2  12  11  247
```

Fader velocity toggle

This message configures whether Faders should be velocity sensitive, which is normally available on the FAD view of the Setup menu:

```
Host => Launchpad X:
Hex:   F0h 00h 20h 29h 02h 0Ch 0Dh <mode> F7h
Dec:   240 0  32  41  2  12  13 <mode> 247
```

Setting <mode> 0 turns off Fader velocity sensitivity, 1 turns it on.

Readback variant is available by the following SysEx message:

```
Host => Launchpad X:  
Hex:   F0h 00h 20h 29h 02h 0Ch 0Dh F7h  
Dec:   240 0 32 41 2 12 13 247
```

Set Note Mode's mode

This message can set Note Mode's mode: either Chromatic or Scale mode. This setting is independent of DAW Drum Racks and is normally accessible on the Note Mode setup display.

```
Host => Launchpad X:  
Hex:   F0h 00h 20h 29h 02h 0Ch 15h <mode> F7h  
Dec:   240 0 32 41 2 12 21 <mode> 247
```

Where <mode> is 0 for Chromatic mode, 1 is for Scale mode.

Readback variant is available by the following SysEx message:

```
Host => Launchpad X:  
Hex:   F0h 00h 20h 29h 02h 0Ch 15h F7h  
Dec:   240 0 32 41 2 12 21 247
```

Set Note Mode's configuration

This message configures either the Chromatic or Scale mode of Note Mode. Most of the settings are shared, except for Width. These configuration options are normally accessible on the Note Mode setup display.

```
Host => Launchpad X:  
Hex:   F0h 00h 20h 29h 02h 0Ch 16h <mode> <parameters> F7h  
Dec:   240 0 32 41 2 12 22 <mode> <parameters> 247
```

The <mode> byte is 0 for configuring Chromatic mode, 1 for Scale mode.

Where <parameters> are as follows:

- Selected octave (1 byte), signed 2's complement with 0 selecting C2.
- Selected transposition (1 byte), signed 2's complement, -12 to +12.
- MIDI channel (1 byte), 0 – 15 selecting MIDI channel 1 to 16 respectively.
- Width (1 byte), number of pads which don't overlap (fingers).
- Scale type (1 byte), 0 for selecting one of the presets, 1 for a custom scale.
- Scale definition (1 or 11 bytes).

When Scale type is 0, the Scale definition is 1 byte, ranging from 0 to 15, selecting one of the preset scales on the Note Mode setup display.

When Scale type is 1, a custom scale can be supplied, 11 bytes, specifying whether each note is in-scale (1) or out-of-scale (0), apart from the Root note, which is always in-scale.

For Octave and Transposition, signed 2's complement means that values including and above 40h represent negative numbers, which can be obtained by subtracting 80h from the message byte.

The Note Mode setup display adapts to the changes performed by this message, always matching its surface as best as possible for the passed configuration (such as recognizing if a custom scale matched one of the presets). If a configuration is not possible to be represented (Width or Scale), neither of the corresponding set of pads would light up.

For navigating on Note Mode, you can send this message only supplying Octave and Transposition:

```
Host => Launchpad X:  
Hex:   F0h 00h 20h 29h 02h 0Ch 16h <mode> <octave> <transposition> F7h  
Dec:   240 0 32 41 2 12 22 <mode> <octave> <transposition> 247
```

Readback variant is available by the following SysEx message:

```
Host => Launchpad X:  
Hex:   F0h 00h 20h 29h 02h 0Ch 16h F7h  
Dec:   240 0 32 41 2 12 22 247
```

This reads back the currently selected mode's (Chromatic / Scale) configuration.

```
Host => Launchpad X:  
Hex:   F0h 00h 20h 29h 02h 0Ch 16h <mode> F7h  
Dec:   240 0 32 41 2 12 22 <mode> 247
```

This reads back the specified mode's (0: Chromatic, 1: Scale) configuration.

Example:

```
Host => Launchpad X:  
Hex:   F0h 00h 20h 29h 02h 0Ch 16h 01h 7Fh 02h 04h 05h 00h 00h F7h  
Dec:   240 0 32 41 2 12 22 1 127 2 4 5 0 0 247
```

This message sets Scale mode configuration, Octave at C1, Transposed to D1, MIDI channel to 5, Width to 5 (5 fingers), and a Major scale.

- First Yellow: Selects Scale mode to configure.
- First Green: Octave set to -1 (127 in 7 bits signed 2's complement corresponds to -1).
- First Turquoise: Transposition set to +2.
- Second Yellow: Midi channel set to 5 (Note: the value of 0 corresponds to Channel 1).
- Second Green: Width set to 5 fingers.
- Second Turquoise: Scale type is one of the 16 presets, selects Preset 0 (Major scale).

SysEx command summary

The following table summarizes the SysEx messages occurring in this document for a quick reference.

Parameter Name	Command Code	Value 1	Value 2	Value 3	Value 4	Repeatable?	Read back
Select Layout	00h (0)	<layout>	-	-	-	-	Yes
DAW Fader Setup	01h (1)	00h (0)	<orientation>	<fader>	-	<fader> only	Yes
LED Lighting	03h (3)	<colourspec>	-	-	-	<colourspec>	No
Velocity Curve	04h (4)	<curve>	<fixed>	-	-	-	Yes
Text Scrolling	07h (7)	<loop>	<speed>	<colour spec>	<text>	-	No
Brightness Level	08h (8)	<brightness>	-	-	-	-	Yes
LED Sleep	09h (9)	<mode>	-	-	-	-	Yes
LED Feedback	0Ah (10)	<internal>	<external>	-	-	-	Yes
Aftertouch Config	0Bh (11)	<type>	<threshold>	-	-	-	Yes
Fader Velocity	0Dh (13)	<mode>	-	-	-	-	Yes
Programmer/Live Toggle	0Eh (14)	<mode>	-	-	-	-	Yes
DAW Note/Drum Rack	0Fh (15)	<mode>	-	-	-	-	Yes
DAW / Standalone	10h (16)	<mode>	-	-	-	-	Yes
Clear DAW state	12h (18)	<session>	<drumrack>	<control changes>	-	-	No
Drum Rack (Intelligent)	13h (19)	<position>	-	-	-	-	Yes
Session Colour	14h (20)	<active>	<inactive>	-	-	-	Yes
Note Mode Scale/Chro	15h (21)	<mode>	-	-	-	-	Yes
Note Mode Configuration	16h (22)	<mode>	<parameters>	-	-	-	Yes
DAW Note Active Colour	17h (23)	<colour>	-	-	-	-	Yes