



SL MK III

Programmer's Reference Guide

Contents

About this Guide.....	3
<i>Number Systems and MIDI conventions.....</i>	3
InControl View.....	3
InControl API.....	3
<i>Messages To The Device.....</i>	3
LEDs.....	3
Screens.....	5
Change Layout.....	5
Empty Layout.....	6
Knob Layout.....	7
Box Layout.....	8
Center Screen Layout.....	9
Change Screen Properties.....	10
Notification Text.....	11
<i>Messages From The Device.....</i>	12
Rotary Knobs.....	12
Faders.....	12
Pads.....	13
<i>List Of Available Controls.....</i>	14
<i>Colour Table.....</i>	15
<i>SysEx Device Inquiry.....</i>	16

About this Guide

This manual contains all the information you need to be able to write software that is customized for SL MkIII.

Number Systems and MIDI conventions

We always express MIDI channels starting from 1, so MIDI channels range from 1-16. MIDI messages are also expressed in plain data, with decimal and hexadecimal equivalents. The hexadecimal number will always starts with '0x'. For example a Note On message on channel 1 is signified by the status byte 0x90.

InControl View

It is possible to access the **InControl** view by pressing the *InControl* button which is used to take control of Ableton, Logic, Reason, and all other DAWs with HUI support.

In this mode, MIDI messages are sent from SL MKIII when pressing buttons, turning knobs, moving faders and pressing keys. Sending specific MIDI messages to the device can update the colour and status of the LEDs and screens.

This means that screens and LEDs can be controlled using any software or hardware able to send MIDI messages using the **InControl API**.

InControl API

The **InControl API** can send and receive Control Change, Note, SysEx and NRPN messages.

Messages To The Device

This section shows how to set the status of the LEDs (see *List Of Available Controls*) and put data on the screens.

All MIDI messages must be sent to the *InControl* USB port.

LEDs

LEDs can be utilised in three ways: **solid** colour, **flashing** between two colours, and **pulsing** one colour.

To set an LED to a **solid** colour, a message corresponding to that LED should be sent on channel 16.

MIDI	Value
Status	Note On/CC (see indices table) - Channel 16

Data byte 1 LED index (see indices table)
 Data byte 2 Colour (see Colour Table)

Examples:

Message Hexadecimal	Message Decimal	Description
0xbf 0x29 0x48	191 41 72	Set the LED above fader 1 to red
0x9f 0x70 0x40	159 112 67	Set the lower left pad to green

To make an LED **flash**, another message is sent on channel 2. This LED will flash between the current solid color and the flashing color. Flashing can be cancelled by sending another solid color.

Flashing will behave like a square wave with a 50% duty cycle with B state on each beat 1, 2, 3, 4 for a half beat duration and A state on beats 1.5, 2.5, 3.5 and 4.5 for a half beat duration. Flash will be between color B and color A with no gradation.

MIDI	Value
Status	Note on/CC (see indices table) - Channel 2
Data byte 1	LED index (see indices table)
Data byte 2	Flashing color (see Color Table)

Examples:

Message Hexadecimal	Message Decimal	Description
0xbf 0x73 0x48	191 115 72	Make the LED on the play button flash from red
0xb1 0x73 0x40	177 115 72	red to green

To make an LED **pulse**, a message is sent on channel 3.

Pulsing always cycles between a bright and dim state of the given colour. It consists of a ramp up and a ramp down cycle across two beats. It will consist of a fast ramp up that is proportional to the tempo that starts on beat 1. Ramp down will occur as soon as the ramp up max state is reached. The ramp down rate is proportional to the tempo. The pad will be 25% lit on beat 1 prior to commencing ramp up.



Pulsing is supported for any of the selected colours in the *colour table*.

Pulsing will always use only one colour as specified in the message.

It is also possible to set LED colours using **RGB** values. This can be done using SysEx messages instead of Control Change and Note On messages.

The message is as follows:

Message Hexadecimal	Message Decimal	Description
0xf0 0x00 0x20 0x29 0x02 0x0a 0x01	240 0 32 41 2 10 1	SysEx Header
0x03	3	Set LED command
LED index	LED index	SysEx index of the LED – see indices
LED behavior	LED behavior	0x01 (1) - Solid 0x02 (2) - Flashing (Will flash with previously set solid color) 0x03 (3) - Pulsing (Will pulse between a dim and bright state)
Red	Red	0 - 127: Amount of red component
Green	Green	0 - 127: Amount of green component
Blue	Blue	0 - 127: Amount of blue component
0xf7	247	End of SysEx

Screens

Displaying data on the screens is a two-stage process. The first stage is to set the desired screen layout by choosing a *template*. The second stage is to send a series of properties to tell the device what to draw on the screens.

There are three types of properties that can be set on a screen: *colour*, *text* and *value*. The properties depend on the current layout and are specified in the 'Change Layout' section. The screens underneath the rotary knobs should be considered as eight *columns* with indices 0-7. It is not possible to change the layout for an individual column and all columns are changed together.

The rightmost screen, which is in the centre of the device, should be considered to have an independent layout (see 'Centre Screen Layout'). The centre screen can be addressed by updating column 8.

Changing layout removes all properties that have been previously set for all columns except the centre screen.

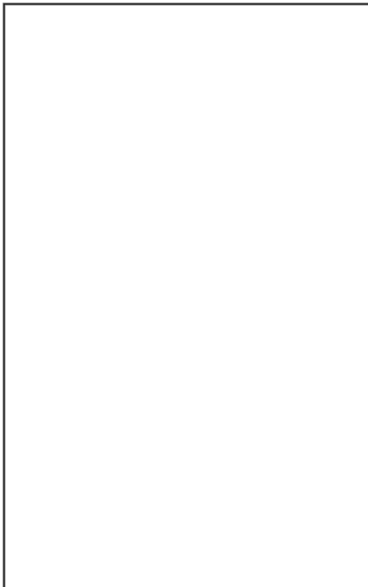
Change Layout

To change the screen layout, the 'Set Screen Layout' command needs to be sent, followed by the index of the new layout.

The change layout message is as follows:

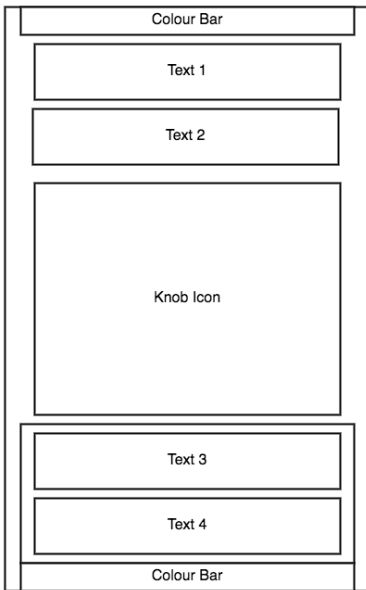
Message Hexadecimal	Message Decimal	Description
0xf0 0x00 0x20 0x29 0x02 0x0a 0x01	240 0 32 41 2 10 1	SysEx Header
0x01	1	Set Screen Layout Command ID
Layout Index	Layout Index	0x00 (0) – Empty Layout 0x01 (1) – Knob Layout 0x02 (2) – Box Layout
0xf7	247	End of SysEx

Empty Layout



This is a blank layout that clears all the screens, including the centre screen. It has no properties that can be set.

Knob Layout



Note: It is also possible to change the value of the knob icon by sending the corresponding CC message for the rotary knob on channel 16.

Layout Properties

Colours

Colour Object Index	Description
0	Top Bar Color
1	Knob Icon Line Color
2	Bottom Bar Color

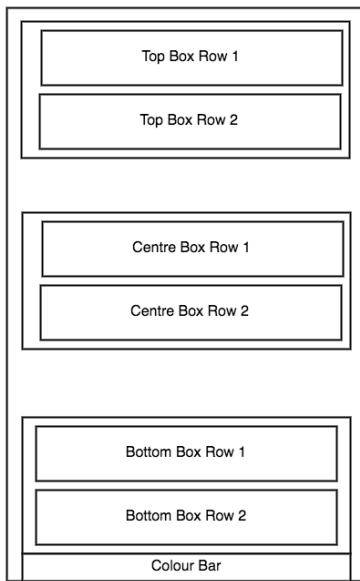
Text Fields

Text Field Index	Description	Max Length (Characters)
0	Row 1 (above icon)	9
1	Row 2 (above icon)	9
2	Row 3 (below icon)	9
3	Row 4 (below icon)	9

Value Fields

Value Field Index	Description	Comments
0	Knob value (0-127)	This changes the value shown on the rotary knob icon
1	Lower text selected (0-1)	When set, the box behind the lower text will be the same color as the bottom bar color to indicate this column is selected

Box Layout



Layout Properties

Colours

Colour Object Index	Description
0	Top Box Color
1	Centre Box Color
2	Bottom Bar Color

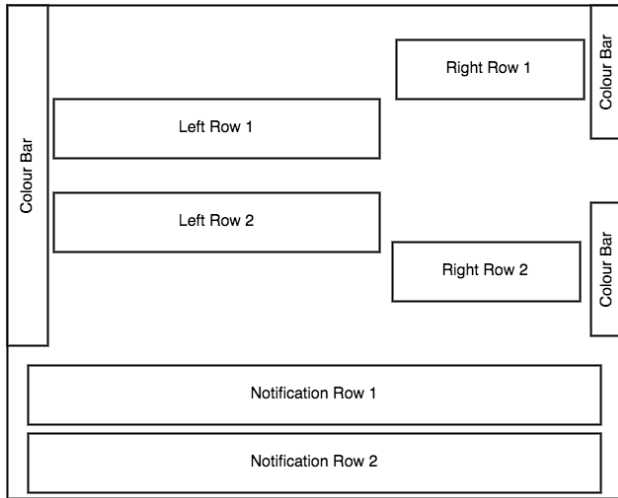
Text Fields

Text Field Index	Description	Max Length (Characters)
0	Top box row 1	9
1	Top box row 2	9
2	Centre box row 1	9
3	Centre box row 2	9
4	Lower box row 1	9
5	Lower box row 2	9

Value Fields

Value Field Index	Description	Comments
0	Top box selected	If selected, the box will be a solid colour, otherwise, it will be a border
1	Centre box selected	See above
2	Lower box selected	See above

Center Screen Layout



Layout Properties

Colours

Colour Object Index	Description
0	Left Bar Color
1	Top Right Bar Color
2	Bottom Right Bar Color

Text Fields

Text Field Index	Description	Max Length (Characters)
0	Left Row 1	9
1	Left Row 2	9
2	Right Row 1	9
3	Right Row 2	9

To display text in the notification rows, see the 'notification text' section.

Change Screen Properties

Screen properties are changed by using the 'Set Screen Properties' command ID. The property can be either text, a color, or a value. Colours can be specified using indices from the *colour table* or using RGB values.

The general format of a change property message is as follows:

Message Hexadecimal	Message Decimal	Description
0xf0 0x00 0x20 0x29 0x02 0x0a 0x01 0x02	240 0 32 41 2 10 1 2	SysEx Header Set Screen Properties Command
Column Index	Column Index	The column index for the value: 0x00 (0) to 0x07 (7) - Columns 1-8 0x08 (8) - Centre screen
Property Type	Property Type	0x01 (1) – Text 0x02 (2) - Colour 0x03 (3) - Value 0x04 (4) - RGB Color
Object Index	Object Index	The index of the object to change. This is specific to the layout. See the layout details for the values.
Data	Data	Depending the type of the property: Type 'Text': String of 7-bit ASCII characters, followed by a null (0x00) termination. Type 'Colour': Index into the colour table (0-127) Type 'Value': The value to set (0-127) Type 'RGB Color': Three bytes (each 0-127) indicating the red, green and blue colour components separately
0xf7	247	End of SysEx

Note that multiple properties can be sent in a single SysEx message by repeating everything from the column index to the data. This has the added benefit that all of the updates will take place simultaneously.

Examples:

Message Hexadecimal	Message Decimal	Description
0xf0 0x00 0x20 0x29 0x02 0x0a 0x01 0x02 0x00 0x01 0x02 0x48 0x65 0x6c 0x6c 0x6f 0x00 0xf7	240 0 32 41 2 10 1 2 0 1 2 72 101 108 111 0 247	Set the third text object in the first column to 'Hello'
0xf0 0x00 0x20 0x29 0x02 0x0a 0x01 0x02 0x08 0x02 0x02 0x41 0xf7	240 0 32 41 2 10 1 2 8 2 2 65 247	Set the colour of the bar on the left of the centre screen to green
0xf0 0x00 0x20 0x29 0x02 0x0a 0x01 0x02 0x03 0x04 0x01 0x00 0x7f 0x7f 0xf7	240 0 32 41 2 10 1 2 3 4 1 0 127 127 247	Set the colour of the second object in the fourth column to cyan
0xf0 0x00 0x20 0x29 0x02 0x0a 0x01 0x02 0x00 0x01 0x02 0x48 0x65 0x6c 0x6c 0x6f 0x00 0x08 0x02 0x02 0x41 0xf7	240 0 32 41 2 10 1 2 0 1 2 72 101 108 108 111 0 8 2 2 65 247	Set the third text object in the first column to 'Hello' and set the colour of the bar on the left of the centre screen to green

Notification Text

It is possible to display a notification on the center screen. This can be used when state changes that the user might have an interest in. The notification text will be displayed temporarily before disappearing.

The notification text will not be displayed if both text lines are empty.

To do this, the 'Set notification text' command should be used as follows:

Message Hexadecimal	Message Decimal	Description
0xf0 0x00 0x20 0x29 0x02 0x0a 0x01	240 0 32 41 2 10 1	SysEx header
0x04	4	Set notification text command ID
Text Line 1	Text Line 1	String of up to 18 characters, followed by a null (0x00) termination
Text Line 2	Text Line 2	String of up to 18 characters, followed by a null (0x00) termination
0xf7	247	End of SysEx

Example:

Message Hexadecimal	Message Decimal	Description
0xf0 0x00 0x20 0x29 0x02 0x0a 0x01 0x04 0x4c 0x69 0x6e 0x65 0x20 0x31 0x00 0x4c 0x69 0x6e 0x65 0x20 0x32 0x00 0xf7	240 0 32 41 2 10 1 4 76 105 110 101 32 49 0 76 105 110 101 32 50 0 247	Sets the first line to "Line 1" and the second line to "Line 2"

Messages From The Device

This section shows all the messages sent by the device when in **InControl** view.

All MIDI messages are sent via the *InControl* USB port.

Buttons

Buttons send the value 127 when pressed, and the value 0 when released. See the indices table for the values for each button.

Examples:

Message	Message Decimal	Description
0xbf 0x5a 0x7f	191 90 127	Options button pressed
0xbf 0x38 0x0	191 56 0	Soft button 6 released

Rotary Knobs

The knobs send two's complement encoded delta values. See the indices table for the values for each rotary knob.

MIDI value (0 - 127)	Delta (-64 - 63)
0	0
1 to 63	+1 to +63
64 to 127	-64 to -1

Examples:

Message Hexadecimal	Message Decimal	Description
0xbf 0x15 0x1	191 21 1	Knob 1 turned slightly clockwise
0xbf 0x16 0x7f	191 22 127	Knob 2 turned slightly anti-clockwise

Faders

Faders send messages with a range of 0-127. See the indices table for the values for each fader.

Examples:

Message Hexadecimal	Message Hexadecimal	Description
0xbf 0x29 0x7f	191 41 127	Fader 1 moved to the top of its range
0xbf 0x2e 0x40	191 46 64	Fader 6 moved to the middle of its range

Pads

Pads send velocity sensitive messages with velocity in the range 0-127. All note-offs are sent with velocity 0. See the indices table for the value for each pad.

Example:

Message Hexadecimal	Message Decimal	Description
0x9f 0x60 0x7f	159 96 127	Pad 1 hit hard
0x9f 0x61 0x1	159 97 1	Pad 2 hit softly
0x9f 0x62 0x0	159 98 0	Pad 3 release

List Of Available Controls

This list shows all the controls available when in **InControl** mode.

Not included in this list are the screens, which can only receive MIDI messages as shown in the **InControl API** section.

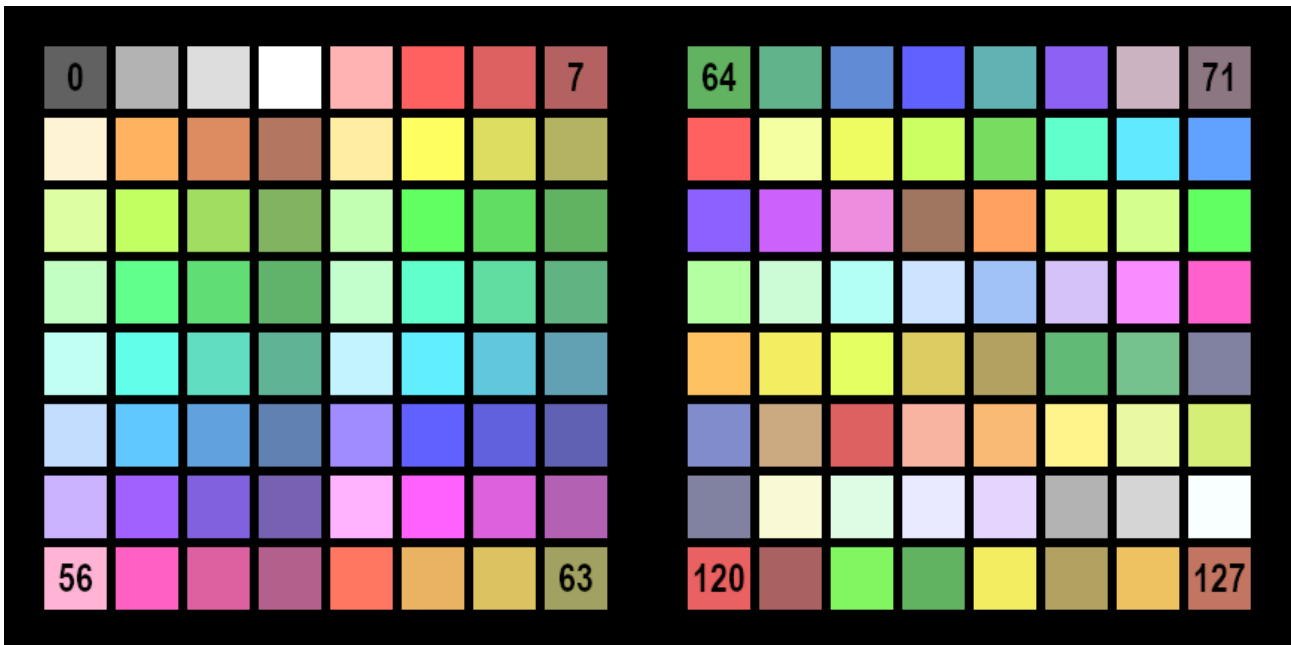
Type	Index (Decimal)	Index (Hex)	Name	LED SysEx ID Decimal	LED SysEx ID Hexadecimal	Comments
CC	21	0x15	Rotary Knob 1	N/A	N/A	Two's complement
CC	22	0x16	Rotary Knob 2	N/A	N/A	Two's complement
CC	23	0x17	Rotary Knob 3	N/A	N/A	Two's complement
CC	24	0x18	Rotary Knob 4	N/A	N/A	Two's complement
CC	25	0x19	Rotary Knob 5	N/A	N/A	Two's complement
CC	26	0x1A	Rotary Knob 6	N/A	N/A	Two's complement
CC	27	0x1B	Rotary Knob 7	N/A	N/A	Two's complement
CC	28	0x1C	Rotary Knob 8	N/A	N/A	Two's complement
CC	41	0x29	Fader 1	54	0x36	LED above fader
CC	42	0x2A	Fader 2	55	0x37	LED above fader
CC	43	0x2B	Fader 3	56	0x38	LED above fader
CC	44	0x2C	Fader 4	57	0x39	LED above fader
CC	45	0x2D	Fader 5	58	0x3a	LED above fader
CC	46	0x2E	Fader 6	59	0x3b	LED above fader
CC	47	0x2F	Fader 7	60	0x3c	LED above fader
CC	48	0x30	Fader 8	61	0x3d	LED above fader
CC	51	0x33	Soft Button 1	4	0x04	
CC	52	0x34	Soft Button 2	5	0x05	
CC	53	0x35	Soft Button 3	6	0x06	
CC	54	0x36	Soft Button 4	7	0x07	
CC	55	0x37	Soft Button 5	8	0x08	
CC	56	0x38	Soft Button 6	9	0x09	
CC	57	0x39	Soft Button 7	10	0x0a	
CC	58	0x3A	Soft Button 8	11	0x0b	
CC	59	0x3B	Soft Button 9	12	0x0c	
CC	60	0x3C	Soft Button 10	13	0x0d	
CC	61	0x3D	Soft Button 11	14	0x0e	
CC	62	0x3E	Soft Button 12	15	0x0f	
CC	63	0x3F	Soft Button 13	16	0x10	
CC	64	0x40	Soft Button 14	17	0x11	
CC	65	0x41	Soft Button 15	18	0x12	
CC	66	0x42	Soft Button 16	19	0x13	
CC	67	0x43	Soft Button 17	20	0x14	
CC	68	0x44	Soft Button 18	21	0x15	
CC	69	0x45	Soft Button 19	22	0x16	
CC	70	0x46	Soft Button 20	23	0x17	
CC	71	0x47	Soft Button 21	24	0x18	
CC	72	0x48	Soft Button 22	25	0x19	
CC	73	0x49	Soft Button 23	26	0x1a	
CC	74	0x4A	Soft Button 24	27	0x1b	
CC	81	0x51	Screen Up	62	0x3e	
CC	82	0x52	Screen Down	63	0x3f	
CC	83	0x53	Scene Launch Top	2	0x03	
CC	84	0x54	Scene Launch Bottom	3	0x04	
CC	85	0x55	Pads Up	0	0x00	
CC	86	0x56	Pads Down	1	0x01	
CC	87	0x57	Right Soft Buttons Up	28	0x1c	
CC	88	0x58	Right Soft Buttons Down	29	0x1d	
CC	89	0x59	Grid	64	0x40	
CC	90	0x5A	Options	65	0x41	
CC	91	0x5B	Shift			
CC	92	0x5C	Duplicate	66	0x42	

CC	93	0x5D	Clear	67	0x43
CC	102	0x66	Track Left	30	0x1e
CC	103	0x67	Track Right	31	0x1f
CC	112	0x70	Rewind	33	0x21
CC	113	0x71	Fast Forward	34	0x22
CC	114	0x72	Stop	35	0x23
CC	115	0x73	Play	36	0x24
CC	116	0x74	Loop	37	0x25
CC	117	0x75	Record	32	0x20
Note	96	0x60	Pad 1	38	0x26
Note	97	0x61	Pad 2	39	0x27
Note	98	0x62	Pad 3	40	0x28
Note	99	0x63	Pad 4	41	0x29
Note	100	0x64	Pad 5	42	0x2a
Note	101	0x65	Pad 6	43	0x2b
Note	102	0x66	Pad 7	44	0x2c
Note	103	0x67	Pad 8	45	0x2d
Note	112	0x70	Pad 9	46	0x2e
Note	113	0x71	Pad 10	47	0x2f
Note	114	0x72	Pad 11	48	0x30
Note	115	0x73	Pad 12	49	0x31
Note	116	0x74	Pad 13	50	0x32
Note	117	0x75	Pad 14	51	0x33
Note	118	0x76	Pad 15	52	0x34
Note	119	0x77	Pad 16	53	0x35

Note 0 - 60 0x00 - 0x3C Key LEDs 1 - 61 54 - 114 0x36 - 0x72

Key presses are still sent on the regular port(s)/channel(s)

Colour Table



SysEx Device Inquiry

Device Inquiry

Message Hexadecimal	Message Decimal
0xf0 0x7e 0x0a	240 126 10 6 1 247
0x06 0x01 0xf7	6 1 247

Device Reply

Device Reply Hexadecimal	Device Reply Decimal
F0 7E ID 6 2 0 20 29	240 127 ID 6 2 0 32
fc1 fc2 fm1 fm2 R1	41 fc1 fc2 fm1 fm2
R2 R3 R4 F7	R1 R2 R3 R4 247

With:

- **fc1 fc2:** "device family code"
- **fm1 fm2:** "device family member code"
- **R1 R2 R3 R4:** "software revision level"
- **R1 0x00 - 0x09:** firmware version number, 1st decimal digit (thousands)
- **R2 0x00 - 0x09:** firmware version number, 2nd decimal digit (hundreds)
- **R3 0x00 - 0x09:** firmware version number, 3rd decimal digit (tens)
- **R4 0x00 - 0x09:** firmware version number, 4th decimal digit (units)