MIDI Chart for KMI SoftStep (VK2)

Data token from Keith McMillen SoftStep Firmware VK2

Chart version 1.1
Date: 2012-03-07
Author: Peter Ostry
Email: po@ostry.com

This MIDI chart may help you to parse and control a KMI Softstep device by Control Changes. The messages were collected by monitoring the MIDI stream between a SoftStep device and a computer.

Please inform me if you find errors in this chart or if parts of it are not clearly understandable.

Note:
This MIDI chart is NOT a replacement for the KMI Max/MSP Development Kit. It just provides information about raw data coming from the device and (more important) about sending Control Changes directly to the device to control the LEDs and the 4-digit display. You still need the KMI Max/MSP Development Kit for example to initialize the SoftStep.

Receiving CCs from the SoftStep

(The SoftStep sends CCs on MIDI channel 1)

Pad Corner Numbers:

1 2

3 4

Navigation Pad Corner Numbers:

3
1 2
4

Source	Corner	Output	Source	Corner	Output
Pad 1	1	CC 44	Pad 6	1	CC 40
	2	CC 45		2	CC 41
	3	CC 46		3	CC 42
	4	CC 47		4	CC 43
Pad 2	1	CC 52	Pad 7	1	CC 48
	2	CC 53		2	CC 49
	3	CC 54		3	CC 50
	4	CC 55		4	CC 51
Pad 3	1	CC 60	Pad 8	1	CC 56
	2	CC 61		2	CC 57
	3	CC 62		3	CC 58
	4	CC 63		4	CC 59
Pad 4	1	CC 68	Pad 9	1	CC 64
	2	CC 69		2	CC 65
	3	CC 70		3	CC 66
	4	CC 71		4	CC 67
Pad 5	1	CC 76	Pad 10	1	CC 72
	2	CC 77		2	CC 73
	3	CC 78		3	CC 74
	4	CC 79		4	CC 75
			Nav Pad	1	CC 80
				2	CC 81
				3	CC 82
				4	CC 83

The optional expression pedal sends CC 86

Controlling the LEDs

(The SoftStep receives CCs on any MIDI channel)

Each SoftStep LED contains a green and a red element which are independently switched. If both colors are turned on, it lights yellow.

You can switch between green and red without turning the LED off.

If you turn yellow on, green+red get both switched on and the LED lights yellow. Vice versa, by sending "yellow off" you can switch a LED completely off regardless of its current state.

If a LED is yellow and you turn green off, it lights red.
If a LED is yellow and you turn red off, it lights green.

Each LED message via CCs consists of three consecutive number/value pairs.

1st pair:	LED Number	40 <0–9>	*The number of the pad -1*
2nd pair:	LED Color	41 <0–2>	*Green, Red, or both (Yellow)*
3rd pair:	LED State	42 <0–4>	*Various behavior (on/off or blinking)*

Example LED messages:
40 0 **41** 0 **42** 0 (LED 1, green, off)
40 3 **41** 1 **42** 4 (LED 4, red, blink once)
40 8 **41** 2 **42** 3 (LED 9, yellow, blink fast)

LED Number	**CC**
1	40 0
2	40 1
3	40 2
4	40 3
5	40 4
6	40 5
7	40 6
8	40 7
9	40 8
10	40 9
All LEDs	40 127

LED Color	**CC**
Green	41 0
Red	41 1
Yellow	41 2

LED State	**CC**
Off	42 0
On	42 1
Blink slow	42 2
Blink fast	42 3
Blink once	42 4

"LED leaking" and how to avoid it

If you send the 3-element LED CC-messages immediately after another, for example to set a couple of LEDs at once, you may occasionally switch another LED, not the one you wanted to switch. This happens because the SoftStep cannot interpret the incoming 3-element messages quickly enough as LED-messages and gets confused.

To avoid "LED leaking" it is save to add a short pause after each LED message by sending a couple of zeros. They give the firmware more processing time without doing anything else.

With this method …

40 1, 41 1, 42 1	(Pad 2 red on)
0 0, 0 0, 0 0	(dummy)
0 0, 0 0, 0 0	(dummy)
40 2, 41 0, 42 1	(Pad 3 green on)
0 0, 0 0, 0 0	(dummy)
0 0, 0 0, 0 0	(dummy)
40 3, 41 2, 42 2	(Pad 4 yellow blink slow)
0 0, 0 0, 0 0	(dummy)
0 0, 0 0, 0 0	(dummy)

… your LED message will never trigger the wrong LED.

Controlling the 4-digit display

(The SoftStep receives CCs on any MIDI channel)

Each digit of the SoftStep display can be controlled via CC by a number/value pair:

1st display digit:	**50** <character number>
2nd display digit:	**51** <character number>
3rd display digit:	**52** <character number>
4th display digit:	**53** <character number>

Example display messages:
50 65 **51** 66 **52** 67 **53** 68 (displays ABCD)
50 70 **51** 73 **52** 78 **53** 69 (displays FINE)

It is not necessary to send display messages in a particular order. You can even control the digits individually. If the display for example reads "GOOD" and you send 50 71, you replace just the first digit and the display will read "FOOD".

To clear the display, send 4 space characters (#32):
50 32 **51** 32 **52** 32 **53** 32 (displays 4 spaces = blank display)