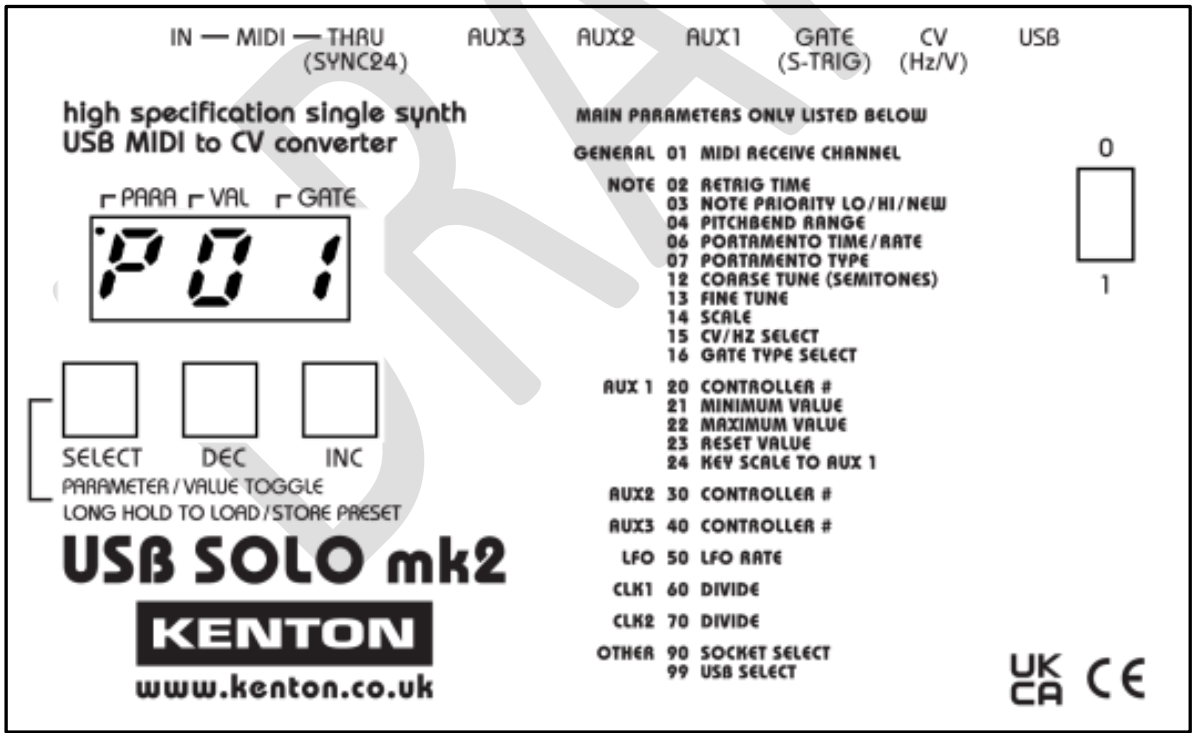
KENTON

USB SOLO mk2

HIGH SPEC USB and DIN MIDI TO CV CONVERTER



SysEx Implementation

Introduction

There are four SysEx messages that the USB SOLO mk2 can receive:

Firmware Version Request	requests the firmware version as a Firmware Version Receive message
Serial Number Request	requests the USB serial number as a Serial Number Receive message
Program Dump Request	requests configuration info in the form of a Program Dump Receive message.
Info Change	Sets a parameter, loads and stores presets

The first five bytes of SysEx are the same for every message, and are always followed by the device ID and message type:

Byte	Data	Description
[1]	F0h	Start of System Exclusive
[2]	00h	Company ID
[3]	20h	Company ID
[4]	13h	Company ID (Kenton Electronics Ltd.)
[5]	1Bh	Product ID (USB Solo mk2)
[6]	xxh	Device ID (00h – 15h, or 7Fh*)
[7]	xxh	[10h] Program Dump Request
		[20h] Info Change
		[40h] Program Dump Receive
		[60h] Firmware Version Request
		[61h] Serial Number Request
		[6Eh] Serial Number Receive
		[6Fh] Firmware Version Receive
[x]	xxh	Optional data bytes
[x]	F7h	End of System Exclusive

* 7Fh is the "all-call" device ID, to which all devices matching the manufacturer ID and product ID should respond, regardless of their device ID. The response will include the device ID of the device responding.

Regardless of the mode that the USB Solo is set to, it will respond to the port that the SysEx request was received on.

Firmware Version Request

Firmware Version Request asks the USB Solo to report its firmware version. If the device ID matches, the USB Solo mk2 will respond by sending a Firmware Version Receive message to the same port that it received the message from (either USB or 5 pin DIN).

Note: 'Socket Select' (Parameter 90) must be set to MIDI Out for SysEx messages to be sent over 5 pin DIN.

Examples:

F0 00 20 13 1B **00 60** F7	will request version from device ID 1
F0 00 20 13 1B **01 60** F7	will request version from device ID 2
F0 00 20 13 1B **7F 60** F7	will request version from any USB Solo

Firmware Version Receive

…

[8-11]	xxh	where xx is the ASCII code for a digit of the firmware version
[12]	F7h	End of exclusive

Examples:

F0 00 20 13 1B **00 6F 32 30 30 38** F7 device ID 1 has responded with version 2008
F0 00 20 13 1B **01 6F 32 30 30 38** F7 device ID 2 has responded with version 2008

Note: when responding to an "all-call" Firmware Version Request, the Firmware Version Receive message contains the device ID of the responding USB Solo.

Serial Number Request

Serial Number Request asks the USB Solo to report its USB serial number. If the device ID matches, the USB Solo mk2 will respond by sending a Serial Number Receive message to the same port that it received the message from (either USB or 5 pin DIN).

Note: 'Socket Select' (Parameter 90) must be set to MIDI Out for SysEx messages to be sent over 5 pin DIN.

Examples:

F0 00 20 13 1B **00 61** F7	will request version from device ID 1
F0 00 20 13 1B **01 61** F7	will request version from device ID 2
F0 00 20 13 1B **7F 61** F7	will request version from any USB Solo

Serial Number Receive

…		
[8-23]	xxh	where xx is the ASCII code for a character of the serial number
[24]	F7h	End of exclusive

Examples:

F0 00 20 13 1B **00 6E 20 36 30 56 34 31 50 30 32 30 30 33 41 30 30 35 44** F7 device ID 1 has responded with serial number _60V41P02003A005D
F0 00 20 13 1B **01 6E 20 36 30 56 34 31 50 30 32 30 30 33 41 30 30 35 44** F7 device ID 2 has responded with serial number _60V41P02003A005D

Note: when responding to an "all-call" Serial Number Request, the Serial Number Receive message contains the device ID of the responding USB Solo.

Program Dump Request

Program Dump Request will request configuration information for a given program. There are multiple sources available to this request:

Config	The saved configuration (parameters 1-89)
Config Edit Buffer	The current, unsaved configuration (parameters 1-89)
Global	The saved global configuration (parameters 90-99)
Global Edit Buffer	The current, unsaved global configuration (parameters 90-99)
Preset	Saved preset configuration (parameters 1-89)

…			
[8]	xxh	[00h] -	Saved configuration
		[01h] to [20h] -	Preset
		[7Dh]	Configuration Edit Buffer
		[7Eh]	Global Edit buffer

		[7Fh]	Saved global configuration
[9]	F7h	End of System Exclusive	

The USB Solo will respond by sending a Program Dump Receive message to the same port that it received the message from (USB or 5 pin DIN)

The "all-call" device ID is supported by this message type. In addition to responding with the Program Dump Receive message, the Program Dump Request message will be forwarded to MIDI THRU if received over MIDI IN in Standard mode or USB in Interface mode.

Note: 'Socket Select' (Parameter 90) must be set to MIDI Out for SysEx messages to be sent over 5 pin DIN.

Examples (Device No = 1):

F0	00	20	13	1B	**00**	**10**	**00**	F7	will request the saved configuration
F0	00	20	13	1B	**00**	**10**	**7D**	F7	will request the configuration edit buffer
F0	00	20	13	1B	**00**	**10**	**7E**	F7	will request the global edit buffer
F0	00	20	13	1B	**00**	**10**	**7F**	F7	will request the saved global configuration
F0	00	20	13	1B	**00**	**10**	**01**	F7	will request preset 1
F0	00	20	13	1B	**00**	10	**20**	F7	will request preset 32

Program Dump Receive

Program Dump Receive will contain configuration information for a given program. There are multiple sources of configuration information:

Config	The saved configuration (parameters 1-89)
Config Edit Buffer	The current, unsaved configuration (parameters 1-89)
Global	The saved global configuration (parameters 90-99)
Global Edit Buffer	The current, unsaved global configuration (parameters 90-99)
Preset	Saved preset configuration (parameters 1-89)

…			
[8]	xxh	[00h] -	Saved configuration
		[01h] to [20h] -	Preset
		[7Dh]	Configuration Edit Buffer
		[7Eh]	Global edit buffer
		[7Fh]	Saved global configuration
[9]	00h / 01h	High 7 bits of data (either 00h or 01h)	
[10]	0nnnnnnn	Where nnnnnnn = low 7 bits of data	
…	…	[9] & [10] are executed 12 or 61 times (for 12 global parameters or 61 configuration parameters)	
[33 or 131]	F7h	End of System Exclusive	

See the table at the end of this document for details of the configuration data.

Note: Only the first 55 values (addresses 00 to 54) of configuration data are valid (55 to 60 are reserved for possible future use). Only the first 9 values (addresses 00 to 8) of global data are valid (9-12 are reserved for possible future use)

Note: when responding to an "all-call" Program Dump Request, the Program Dump Receive message contains the device ID of the responding USB Solo.

Info Change

The USB SOLO mk2 is sent a two-byte address, which directly corresponds to a parameter. It is also sent two bytes of data, which represent the value at the parameter. It responds by changing the parameter and briefly updating the display. The new value is **NOT** stored in EEPROM, as would be the case if you were using the front panel to change a parameter. The list of addresses and possible data values is listed in the table ate the end of this document.

…		
[8]	00h	High 7 bits of parameter address (always 00h)
[9]	0nnnnnnn	Where nnnnnnn = low 7 bits of parameter address
[10]	00h / 01h	High 7 bits of data (either 00h or 01)
[11]	0nnnnnnn	Where nnnnnnn = low 7 bits of data
[12]	F7h	End of System Exclusive

Info Changes are not automatically stored to EEPROM, only in the edit buffer – changes will be lost after a power cycle. You can explicitly save the changes you have made using the **store** version of the message (using program 00) – see the **Info (Parameter) Change – store/load presets** section below.

Examples (Device No = 1):

F0	00	20	13	1B	00	20	**00**	**00**	**00**	**0F**	F7	will set the MIDI Receive Channel to 16
F0	00	20	13	1B	00	20	**00**	**31**	**00**	**01**	F7	will set the ADSR envelope to Inverted
F0	00	20	13	1B	00	20	**00**	**25**	**00**	**08**	F7	will set the LFO wave to Sample & Hold

Info (Parameter) Change – store/load presets

The Info Change message can be used to store the edit buffer to EEPROM, or to a preset.

…			
[7]	20h	Info Change	
[8]	00h	Always 00h	
[9]	7Eh / 7Fh	[7Eh] Loads into the edit buffer	
		[7Fh] Stores the edit buffer	
[10]	00h	Always 00h	
[11]	xxh	[00h]	Stores/loads configuration edit buffer to/from EEPROM
		[01h] to-[20h]	Stores/Loads configuration edit buffer to/from preset
		[07Fh]	Stores/loads global edit buffer to/from EEPROM
[12]	F7h	End of System Exclusive	

Examples (Device No = 1):

F0	00	20	13	1B	00	20	**00**	**7E**	**00**	**20**	F7	Load Preset 32
F0	00	20	13	1B	00	20	**00**	**7F**	**00**	**20**	F7	Store Preset 32

To change a parameter and then store it to EEPROM:

F0	00	20	13	1B	00	20	**00**	**00**	**00**	**0F**	F7	will set the MIDI Receive Channel to 16
F0	00	20	13	1B	00	20	**00**	**7F**	**00**	**00**	F7	Store the configuration edit buffer to EEPROM

Configuration Data

Note: All SysEx addresses and data are range checked and out-of-range values will either be ignored or adjusted to give a valid response.

Add.	(Hex)	Parameter	Range	Notes
00	00h	P01 MIDI Receive Channel	0 to 15	Corresponds to channels 1 to 16
01	01h	P02 Retrigger Time	0 to 25	0 = Off / 1 to 25 ms
02	02h	P03 Note Priority	0 to 2	0 = New / 1 = Low / 2 = High
03	03h	P04 Pitch Bend Range	0 to 48	
04	04h	P05 Portamento Controller	253 > 0 > 119	See note (1)
05	05h	P06 Portamento Rate	1 to 127	
06	06h	P07 Portamento Type	0 or 1	0 = Fixed Rate / 1 = Fixed Time
07	07h	P08 LFO to CV Controller	252 > 0 > 119	See note (2)
08	08h	P09 LFO to CV Min Value	0 to 127	
09	09h	P10 LFO to CV Max Value	0 to 127	
10	0Ah	P11 LFO to CV Reset Value	0 to 127	
11	0Bh	P12 Coarse Tune	232 > 0 > 24	See note (3)
12	0Ch	P13 Fine Tune	129 > 0 > 127	129 to 255 negative / 0 to 127 positive
13	0Dh	P14 Scale	129 > 0 > 127	129 to 255 negative / 0 to 127 positive
14	0Eh	P15 CV / Hz Select	0 to 2	0 = CV / 1 = Hz / 2 = 1.2V
15	0Fh	P16 Gate Type	0 to 6	See note (4)
16	10h	P20 Aux 1 Controller	246 > 0 > 119	See note (5)
17	11h	P21 Aux 1 Min Value	0 to 127	Corresponds to -27 to +100
18	12h	P22 Aux 1 Max Value	0 to 127	Corresponds to -27 to +100
19	13h	P23 Aux 1 Reset Value	0 to 127	
20	14h	P24 Aux 1 Key Scale	0 to 127	
21	15h	P25 LFO to Aux 1 Controller	252 > 0 > 119	See note (2)
22	16h	P26 LFO to Aux 1 Min Value	0 to 127	
23	17h	P27 LFO to Aux 1 Max Value	0 to 127	
24	18h	P28 LFO to Aux 1 Reset Value	0 to 127	
25	19h	P29 Aux 1 Drum Trig. Note No.	0 to 127	
26	1Ah	P30 Aux 2 Controller	246 > 0 > 119	See note (4)
27	1Bh	P31 Aux 2 Min Value	0 to 127	Corresponds to -27 to +100
28	1Ch	P32 Aux 2 Max Value	0 to 127	Corresponds to -27 to +100
29	1Dh	P33 Aux 2 Reset Value	0 to 127	
30	1Eh	P34 Aux 2 Drum Trig. Note No.	0 to 127	
31	1Fh	P40 Aux 3 Controller	246 > 0 > 119	See note (5)
32	20h	P41 Aux 3 Min Value	0 to 100	
33	21h	P42 Aux 3 Max Value	0 to 100	
34	22h	P43 Aux 3 Reset Value	0 to 100	
35	23h	P44 Aux 3 Drum Trig. Note No.	0 to 100	
36	24h	P50 LFO Rate	0 to 191	
37	25h	P51 LFO Waveshape	0 to 8	See note (6)
38	26h	P52 LFO Sync	0 or 96	0 = Off / 1 to 96 corresponds to divide ratio
39	27h	P53 LFO Start Point Offset	0 to 255	
40	28h	P54 LFO Key-On Reset	0 or 1	0 = Off / 1 = On
41	29h	P60 Clock 1 Divide Ratio	0 to 24	0 = C24 / 1 to 23 = d2 to d24 / 24 = C48
42	2Ah	P61 Clock 1 Shift	0 to 255	
43	2Bh	P70 Clock 2 Divide Ratio	1 to 23	Corresponds to d2 to d24
44	2Ch	P71 Clock 2 Shift	0 to 255	
45	2Dh	P80 EG Attack Time	0 to 127	
46	2Eh	P81 EG Decay Time	0 to 127	
47	2Fh	P82 EG Sustain Level	0 to 127	
48	30h	P83 EG Release Time	0 to 127	
49	31h	P84 EG Invert	0 or 1	0 = Off / 1 = On
50	32h	P85 EG Reset to Zero	0 or 1	0 = Off / 1 = On

Continued on next page…

Add.	(Hex)	Parameter	Range	Notes
51	33h	P86 EG Attack Time CC	0 to 119	
52	34h	P87 EG Decay Time CC	0 to 119	
53	35h	P88 EG Sustain Level CC	0 to 119	
54	36h	P89 EG Release Time CC	0 to 119	
64	40h	P90 Socket Select	0 to 3	See note (7)
65	41h	P91 SysEx Device Number	0 to 15	Corresponds to numbers 1 to 16
66	42h	P92 Continue = Start	0 or 1	0 = Off / 1 = On
67	43h	P93 Drum Trigger Length	0 to 127	
68	44h	P94 Aux 1 Slew Rate	0 to 31	
69	45h	P95 Aux 2 Slew Rate	0 to 31	
70	46h	P96 Aux 3 Slew Rate	0 to 31	
71	47h	P97 Prog. Change Rx Enable	0 or 1	0 = Off / 1 = On
72	48h	P99 USB Select	0 or 1	0 = Standard Mode / 1 = Interface Mode

Notes:

(1) **253** = On / **254** = Off / **255** = Auto / (CCs) **0 to 119**

(2) **252** = Ignore / **253** = Pitch Bend / **254** = Velocity / **255** = Aftertouch / (CCs) **0 to 119**

(3) **232** = -24 Semitones / **0** = No Transpose / **24** = + 24 Semitones (25 to 231 are invalid)

(4) **0** = Gate 5V / **1** = G 10V / **2** = G 15V / **3** = S no pull-up / **4** = S 5V pu / **5** = S 10V pu / **6** = S 15V pu

(5) **246** = EG / **247** = Drum Trig. / **248** = Start/Stop / **249** = CL2 / **250** = CL1 / **251** = Note Trig.
252 = Ignore / **253** = Pitch Bend / **254** = Velocity / **255** = Aftertouch / (CCs) **0 to 119**

(5) **0** = Tri / **1** = Saw Up / **2** = Saw Down / **3** = 10 / **4** = 20 / **5** = 30 / **6** = 40 / **7** = 50% Pulse / **8** = S&H

(6) **0** = MIDI Thru, Out / **1** = Sync 24 (fixed) / **2** = Sync 24 (Clock 1) / **3** = Sync 24 (Clock 2)

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