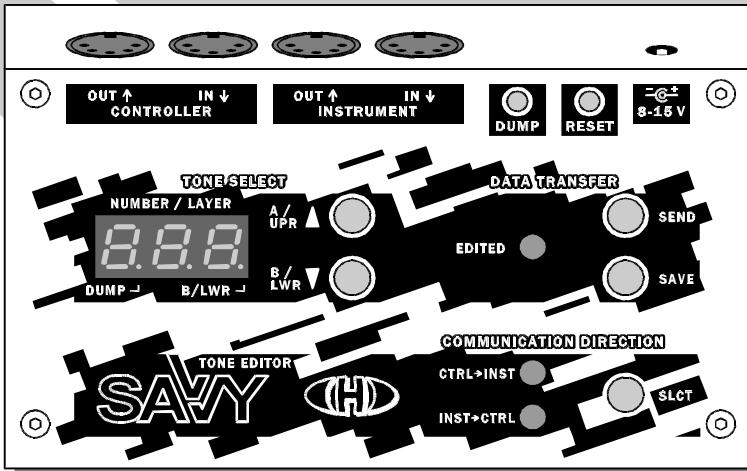


SAVVY

Tone Parameters Editor & Controller



MIDI System Exclusive Communication
Roland MKS-50

OS 004 ver. 2.0



© 2018 CHD Elektroservis

1 SYSEX MESSAGES STRUCTURE

For Roland MKS-50, SAVVY receives / transmits own specific SysEx messages with the following structure:

[hex]	[bin]	Byte	Range [dec]
F0	11110000	Start SysEx	
00	00000000	Manufacturer ID (always 3 byte)	
20	00100000		
21	00100001		
ii	0iiiiiii	Device ID ¹⁾	0 ~ 15 (MIDI Chnl) / 127 (Universal)
41	01000001	Model ID	
cc	0ccc0000	Command ²⁾	16 / 32 / 48 / 64
04	00000100	Instrument ID = Roland MKS-50	
20	00100000	Version ID = OS ver. 2.0	
d1	0ddddd	Data Bytes ³⁾	
..		
dn	0ddddd		
xx	0xxxxxxx	Checksum ⁴⁾	
F7	11110111	End SysEx	

Remarks:

¹⁾ The 'Device ID' byte is equal to a number of active MIDI channel (00h for channel Nr. 1, 01h for channel Nr. 2 etc.) for both received and transmitted messages. For messages sent to SAVVY, universal ID 127 can also be set – "Universal ID" message will be always recognized independently on the active MIDI channel number.

²⁾ The 'Command' byte specifies the message type i.e. the SAVVY activity after the whole SysEx message is received – see next chapters.

³⁾ Number of databytes and their structure is variable in dependence on 'Command' byte. Length of the datablock can be 12, 65, 60 or 3 bytes.

⁴⁾ The 'Checksum' byte confirms the validity of the SysEx message. It must be calculated as 7-bit complement of the sum of bytes from 'Model ID' to 'Data Bytes'. By other words, seven-bit sum of bytes from the 'Model ID' to 'Checksum' must be equal to zero (for the 'Checksum' calculation see also chapter 2).

1.1 BULK DUMP LOAD SYSTEM PARAMETERS COMMAND

By transmitting of the "**Bulk Dump Load System Parameters**" message to the device, it is allowed to change the content of system parameters memory bank saved in the device's user memory. This type of SysEx message is also sent from the device as immediate response to received "**Bulk Dump Request System Parameters**" SysEx command (see chapter 1.5). When **DUMP** button on the device's panel is pressed, "**Bulk Dump Load System Parameters**" message is sent from the device as one part of stream of SysEx messages.

Value of "cc" (Command) byte is 16 (i.e 10 hex) for "**Bulk Dump Load System Parameters**" command.

The data block "d1...dn" always contains 12 bytes with the following structure:

Byte	[hex]	[bin]	Range [dec]	Parameter
d1	xx	0xxxxxxx	0 ~ 15	Global Parameter: MIDI Channel
d2	00	00000000	0 ¹⁾	not used
d3	00	00000000	0 ¹⁾	not used
d4	xx	00f000ba		Inst → Ctrl Data Transfer Parameters:
			a: 0 ~ 1	Select Device ID for Bulk Dump
			b: 0 ~ 1	Send All CCs (Tone Change)
			f: 0 ~ 1	Send Manual Tone Slct as Pgm Chng

Byte	[hex]	[bin]	Range [dec]	Parameter
d5	xx	00fedcba		Ctrl → Inst Data Transfer Parameters:
			a: 0 ~ 1	Cache Modifications in Edit Buffer
			b: 0 ~ 1	Cache Macro Settings in Edit Buffer
			c: 0 ~ 1	Cache Random Setting in Edit Buffer
			d: 0 ~ 1	Transfer Pgm Chng from Ctrl to Inst
			e: 0 ~ 1	Accept Pgm Chng from Ctrl
			f: 0 ~ 1	Send Manual Tone Slct as Pgm Chng
d6	0x	00000cba		Global Parameters:
			a: 0 ~ 1	MIDI Errors Auto Reset
			b: 0 ~ 1	Remember Last Tone
			c: 0 ~ 1	Tone Number Format
			d: 0 ~ 1	Use Bank Select Command
d7	00	00000000	0 ¹⁾	not used
d8	00	00000000	0 ¹⁾	not used
d9	00	00000000	0 ¹⁾	not used
d10	00	00000000	0 ¹⁾	not used
d11	00	00000000	0 ¹⁾	not used
d12	0x	0000xxxx	0 ~ 15	Global Parameter: Display Brightness

Remarks:

¹⁾ These bytes must be always equal to 0! If not, the SAVVY will not work correctly.

1.2 BULK DUMP LOAD INSTRUMENT PARAMETERS COMMAND

By transmitting of the "Bulk Dump Load Instrument Parameters" message to the device, it is allowed to change the content of instrument parameters memory bank saved in the device's user memory. This type of SysEx message is also sent from the device as immediate response to received "Bulk Dump Request Instrument Parameters" SysEx command (see chapter 1.5). When DUMP button on the device's panel is pressed, "Bulk Dump Load Instrument Parameters" message is sent from the device as one part of stream of SysEx messages.

Value of "cc" (Command) byte is 32 (i.e. 20 hex) for "Bulk Dump Load Instrument Parameters" command.

The data block "d1...dn" always contains 65 bytes with the following structure:

Byte	[hex]	[bin]	Range [dec]	CC Assignment to a Parameter
d1	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	DCO ENV MODE
d2	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	VCF ENV MODE
d3	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	VCA ENV MODE
d4	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	DCO WAVEFORM PULSE
d5	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	DCO WAVEFORM SAWTOOTH
d6	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	DCO WAVEFORM SUB
d7	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	DCO RANGE
d8	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	DCO SUB LEVEL
d9	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	DCO NOISE LEVEL
d10	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	HPF CUTOFF FREQ
d11	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	CHORUS
d12	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	DCO LFO MOD DEPTH
d13	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	DCO ENV MOD DEPTH
d14	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	DCO AFTER DEPTH
d15	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	DCO PW/PWM DEPTH
d16	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	DCO PWM RATE
d17	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	VCF CUTOFF FREQ
d18	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	VCF RESONANCE
d19	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	VCF LFO MOD DEPTH
d20	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	VCF ENV MOD DEPTH
d21	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	VCF KEY FOLLOW
d22	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	VCF AFTER DEPTH
d23	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	VCA LEVEL
d24	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	VCA AFTER DEPTH



Byte	[hex]	[bin]	Range [dec]	CC Assignment to a Parameter
d25	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	LFO RATE
d26	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	LFO DELAY TIME
d27	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	ENV T1
d28	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	ENV L1
d29	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	ENV T2
d30	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	ENV L2
d31	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	ENV T3
d32	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	ENV L3
d33	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	ENV T4
d34	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	ENV KEY FOLLOW
d35	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	CHORUS RATE
d36	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	BENDER RANGE
d37	7F	01111111	127 ²⁾	not used
d38	7F	01111111	127 ²⁾	not used
d39	7F	01111111	127 ²⁾	not used
d40	7F	01111111	127 ²⁾	not used
d41	7F	01111111	127 ²⁾	not used
d42	7F	01111111	127 ²⁾	not used
d43	7F	01111111	127 ²⁾	not used
d44	7F	01111111	127 ²⁾	not used
d45	7F	01111111	127 ²⁾	not used
d46	7F	01111111	127 ²⁾	not used
d47	7F	01111111	127 ²⁾	not used
d48	7F	01111111	127 ²⁾	not used
d49	7F	01111111	127 ²⁾	not used
d50	7F	01111111	127 ²⁾	not used
d51	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	Modifier: MOD RATE
d52	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	Modifier: MOD DEPTH
d53	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	Modifier: BRILLIANCE
d54	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	Modifier: BASS BOOST
d55	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	Modifier: ENV TIME
d56	7F	01111111	127 ²⁾	not used
d57	7F	01111111	127 ²⁾	not used
d58	7F	01111111	127 ²⁾	not used
d59	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	Macro: ENV 4-SEG
d60	7F	01111111	127 ²⁾	not used
d61	7F	01111111	127 ²⁾	not used
d62	7F	01111111	127 ²⁾	not used
d63	7F	01111111	127 ²⁾	not used
d64	7F	01111111	127 ²⁾	not used
d65	xx	0xxxxxxxx	0 ~ 126 / 127 ¹⁾	RANDOM FUNCTION

Remarks:

¹⁾ Values 0 to 126 assign corresponding CC number to the parameter, value 127 means that no CC is assigned to the parameter.

²⁾ These bytes must be always equal to 127! If not, the SAVVY will not work correctly.

1.3 BULK DUMP LOAD TONE DATA COMMAND

By transmitting of the "Bulk Dump Load Tone Data" message to the device, it is allowed to change the content of one part of tone data memory bank saved in the device's user memory. This type of SysEx message is also sent from the device as immediate response to received "Bulk Dump Request Tone Data" SysEx command (see chapter 1.5). When DUMP button on the device's panel is pressed, "Bulk Dump Load Tone Data" messages are sent from the device for each of stored tones as 128 parts of stream of SysEx messages.

Value of "cc" (Command) byte is 48 (i.e 30 hex) for "Bulk Dump Load Tone Data" command.

The data block "d1...dn" always contains 60 bytes with the following structure:



Byte	[hex]	[bin]	Range	Tone Parameter	Remark ⁴⁾ : TONE NAME CHR Values
					Value Character
d1	xx	00000xxx	0 ~ 6	BANK NUMBER ¹⁾	0 A
d2	xx	0xxxxxxx	0 ~ 127	TONE NUMBER ²⁾	1 B
d3	xx	00000xxx	0 ~ 3	DCO ENV MODE	2 C
d4	xx	00000xxx	0 ~ 3	VCF ENV MODE	3 D
d5	xx	00000xxx	0 ~ 3	VCA ENV MODE	4 E
d6	xx	00000xxx	0 ~ 3	DCO WAVEFORM PULSE	5 F
d7	xx	00000xxx	0 ~ 5	DCO WAVEFORM SAWTOOTH	6 G
d8	xx	00000xxx	0 ~ 5	DCO WAVEFORM SUB	7 H
d9	xx	00000xxx	0 ~ 3	DCO RANGE	8 I
d10	xx	00000xxx	0 ~ 3	DCO SUB LEVEL	9 J
d11	xx	00000xxx	0 ~ 3	DCO NOISE LEVEL	10 K
d12	xx	00000xxx	0 ~ 3	HPF CUTOFF FREQ	11 L
d13	xx	00000xxx	0 ~ 1	CHORUS	12 M
d14	xx	0xxxxxxx	0 ~ 127	DCO LFO MOD DEPTH	13 N
d15	xx	0xxxxxxx	0 ~ 127	DCO ENV MOD DEPTH	14 O
d16	xx	0xxxxxxx	0 ~ 120	DCO AFTER DEPTH	15 P
d17	xx	0xxxxxxx	0 ~ 127	DCO PW/PWM DEPTH	16 Q
d18	xx	0xxxxxxx	0 ~ 127	DCO PWM RATE	17 R
d19	xx	0xxxxxxx	0 ~ 127	VCF CUTOFF FREQ	18 S
d20	xx	0xxxxxxx	0 ~ 127	VCF RESONANCE	19 T
d21	xx	0xxxxxxx	0 ~ 127	VCF LFO MOD DEPTH	20 U
d22	xx	0xxxxxxx	0 ~ 127	VCF ENV MOD DEPTH	21 V
d23	xx	0xxxxxxx	0 ~ 127	VCF KEY FOLLOW	22 W
d24	xx	0xxxxxxx	0 ~ 120	VCF AFTER DEPTH	23 X
d25	xx	0xxxxxxx	0 ~ 127	VCA LEVEL	24 Y
d26	xx	0xxxxxxx	0 ~ 120	VCA AFTER DEPTH	25 Z
d27	xx	0xxxxxxx	0 ~ 127	LFO RATE	26 a
d28	xx	0xxxxxxx	0 ~ 127	LFO DELAY TIME	27 b
d29	xx	0xxxxxxx	0 ~ 127	ENV T1	28 c
d30	xx	0xxxxxxx	0 ~ 127	ENV L1	29 d
d31	xx	0xxxxxxx	0 ~ 127	ENV T2	30 e
d32	xx	0xxxxxxx	0 ~ 127	ENV L2	31 f
d33	xx	0xxxxxxx	0 ~ 127	ENV T3	32 g
d34	xx	0xxxxxxx	0 ~ 127	ENV L3	33 h
d35	xx	0xxxxxxx	0 ~ 127	ENV T4	34 i
d36	xx	0xxxxxxx	0 ~ 127	ENV KEY FOLLOW	35 j
d37	xx	0xxxxxxx	0 ~ 127	CHORUS RATE	36 k
d38	xx	0xxxxxxx	0 ~ 12	BENDER RANGE	37 l
d39	00	00xxxxxxx	0 ~ 63 ⁴⁾	TONE NAME (CHR1)	38 m
d40	00	00xxxxxxx	0 ~ 63 ⁴⁾	TONE NAME (CHR2)	39 n
d41	00	00xxxxxxx	0 ~ 63 ⁴⁾	TONE NAME (CHR3)	40 o
d42	00	00xxxxxxx	0 ~ 63 ⁴⁾	TONE NAME (CHR4)	41 p
d43	00	00xxxxxxx	0 ~ 63 ⁴⁾	TONE NAME (CHR5)	42 q
d44	00	00xxxxxxx	0 ~ 63 ⁴⁾	TONE NAME (CHR6)	43 r
d45	00	00xxxxxxx	0 ~ 63 ⁴⁾	TONE NAME (CHR7)	44 s
d46	00	00xxxxxxx	0 ~ 63 ⁴⁾	TONE NAME (CHR8)	45 t
d47	00	00xxxxxxx	0 ~ 63 ⁴⁾	TONE NAME (CHR9)	46 u
d48	00	00xxxxxxx	0 ~ 63 ⁴⁾	TONE NAME (CHR10)	47 v
d49	40	01000000	64 ³⁾	not used	48 w
d50	40	01000000	64 ³⁾	not used	49 x
d51	40	01000000	64 ³⁾	not used	50 y
d52	40	01000000	64 ³⁾	not used	51 z
d53	xx	0xxxxxxx	0 ~ 127	Modifier: MOD RATE	52 0
d54	xx	0xxxxxxx	0 ~ 127	Modifier: MOD DEPTH	53 1
d55	xx	0xxxxxxx	0 ~ 127	Modifier: BRILLIANCE	54 2
d56	xx	0xxxxxxx	0 ~ 127	Modifier: BASS BOOST	55 3
d57	xx	0xxxxxxx	0 ~ 127	Modifier: ENV TIME	56 4
d58	40	01000000	64 ³⁾	not used	57 5
d59	40	01000000	64 ³⁾	not used	58 6
d60	40	01000000	64 ³⁾	not used	59 7
					60 8
					61 9
					62 (space)
					63 - (dash)

Remarks:

- ¹⁾ The 'Bank Number' byte specifies what tone data memory bank will be affected by the SysEx message.
- ²⁾ The 'Tone Number' byte specifies what part of selected tone data memory bank (i.e. what tone number) will be affected by the SysEx message.
- ³⁾ These bytes must be always equal to 64! If not, the SAVVY will not work correctly.

1.1 BULK DUMP REQUEST COMMAND

When the "**Bulk Dump Request**" SysEx message is sent to the device, the device responds immediately with "**Bulk Dump Load**" message (see above). This message contents data from requested memory bank saved in the device's user memory.

Value of "cc" (Command) byte is 64 (i.e 40 hex) for "**Bulk Dump Request**" command.

The data block "**d1...dn**" always contains 3 bytes the following structure:

Byte	[hex]	[bin]	Range	Meaning
d1	01	00000001		Sub-command: Bulk Dump Request
d2	xx	00xx0000	16 / 32 / 48 ~ 54 ¹⁾	Bank Type
d3	xx	0xxxxxxx	0 or 0 ~ 127 ²⁾	Bank Part Number

Remarks:

- ¹⁾ The 'Bank Type' byte specifies the memory area for the command processing: 16 (i.e 10 hex) is for System Parameters Bank, 32 (i.e 20 hex) is for Instrument Parameters Bank and 48 ~ 54 (i.e 30 hex to 36 hex) is for a Tone Data Bank Nr. 1 to 7.
- ²⁾ If Bank Type byte is 48 to 54 (i.e. Tone Data Bank Nr. 1 to 7), the 'Bank Part Number' byte specifies number of requested tone in the selected bank exactly (0 to 127). If 'Bank Type' byte is 16 or 32, the 'Bank Part Number' byte must be always equal to 0.

1.2 BULK DUMP INITIALIZE COMMAND

When the "**Bulk Dump Initialize**" SysEx message is sent to the device, data in requested memory bank in the device's user memory are rewritten with default "factory reset" data . Original data are lost!

Value of "cc" (Command) byte is 64 (i.e 40 hex) for "**Bulk Dump Initialize**" command.

The data block "**d1...dn**" always contains 3 bytes the following structure:

Byte	[hex]	[bin]	Range	Meaning
d1	00	00000000		Sub-command: Initialize
d2	xx	00xx0000	16 / 32 / 48 ~ 54 ¹⁾	Bank Type
d3	xx	0xxxxxxx	0 or 0 ~ 127 ²⁾	Bank Part Number

Remarks:

- ¹⁾ The 'Bank Type' byte specifies the memory area for the command processing: 16 (i.e 10 hex) is for System Parameters Bank, 32 (i.e 20 hex) is for Instrument Parameters Bank and 48 ~ 54 (i.e 30 hex to 36 hex) is for a Tone Data Bank Nr. 1 to 7.
- ²⁾ If Bank Type byte is 48 to 54 (i.e. Tone Data Bank Nr. 1 to 7), the 'Bank Part Number' byte specifies number of requested tone in the selected bank exactly (0 to 127). If 'Bank Type' byte is 10 or 32, the 'Bank Part Number' byte must be always equal to 0.

2 SYSEX MESSAGES CREATING

2.1 SYSEX MESSAGES GENERATORS

As a support for the users we have made special software generators to create any SysEx messages to control the SAVVY editor. Usage of these generators is very easy for any user. Please see Manual Supplement for detailed description of SysEx Messages Generator.

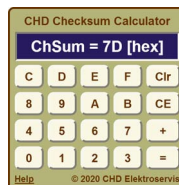
2.2 CHECKSUM CALCULATOR

If you want to create a SysEx message yourself, you need to calculate the 'Checksum' byte. This is difficult for most musicians because calculation with hexadecimal / binary numbers is necessary. For easy calculation of the checksum, special software **Checksum Calculator** is prepared.

The Checksum Calculator is based on Java scripts so it can run on any computer with web browser (Windows, OSX, etc.). Note that scripts and ActiveX elements must be enabled in the web browser for proper function of the calculator.

The Checksum Calculator is available at our website (www.chd-el.cz) on Support page.

The Checksum Calculator works on-line or it can be downloaded to your computer and then launched from it.



Tone Parameters Editor & Controller
Model TPE-1 Nr. 8-361 / Bios v. 1.00 / OS Nr. 004 v. 2.0
Document: 8361100-00420_sysex

Manufacturer:
CHD Elektroservis, Czech Republic
www.chd-el.cz info@chd-el.cz



SAVVY

Tone Parameters Editor & Controller