

TC-Helicon VoiceOne MIDI System Exclusive Control

Note: All numerical values will appear in HEXADECIMAL notation unless otherwise indicated:

0xF0 = F0h = F0 – The latter value is the expression of the hex numeral used.

Decimal equivalents will appear in brackets after their hex counterparts:

0xF0 = F0h = F0 = (240)

0x64 = 64h = 64 = (100)

General message format:

F0	MIDI System exclusive message start
00	3 byte manufacturers ID for TC-Helicon
01	...
38	...
<Device ID>	System exclusive device ID (user parameter)
4B	VoiceOne model ID
<Message ID>	VoiceOne message type identifier (see table below)
<Data>	Data – depends on message type (see format description. below)
...	
...	
F7	MIDI System exclusive message terminator

Preset numbers

Preset numbers are represented in the SysEx messages as 2 bytes (14 bit value). The first byte is the 7 most significant bits and the second is the 7 least significant bits. The preset numbers are mapped as follows:

01 (1) to 64 (100)	Factory bank
64 (101) to 96 (150)	User bank

Preset number zero is the currently edited preset.

Examples:

Factory preset number 67(decimal) would be translated into bytes 00 (MSB) and 43 (LSB – 67 in decimal).

User preset number 48 (decimal) would be translated into number 148 (decimal) = 1x128+20 and would thus be represented as bytes 01 (MSB) and 14 (LSB – 20 in decimal)

Message data format

The format of the data used/needed in the different SysEx messages depends on the type of message. Below are descriptions for each message type explaining data formatting.

SysEx message type	Identifier
VoiceOne Request Preset	45
VoiceOne Request Parameter	47
VoiceOne Request Shift Map	51
VoiceOne Preset Data	20
VoiceOne Parameter Data	22
VoiceOne Shift Map Data	31

VoiceOne Data Request messages

Preset Request - 45:

<Data> is 2 bytes representing the number of the preset requested. See above for description of preset number representation. The data transmitted by VoiceOne upon receiving this message will be formatted as a **Preset Data** message (see below for complete description)

Parameter Request - 47:

<Data> is 2 bytes. The first byte defines the group to which the parameter belongs and the second byte identifies the parameter within the group. See below for a complete listing of parameters and grouping. The data transmitted by VoiceOne upon receiving this message will be formatted as a **Param Data** message (see below for complete description)

Shift Map Request - 51:

<Data> is 1 byte. The value of this byte is ignored. The data transmitted by VoiceOne upon receiving this message will be formatted as a **Shift Map Data** message (see below for complete description)

VoiceOne Data messages

Preset Data - 20:

<Data> is 344 bytes organized as follows (in sequence):

2 bytes	Preset number (see above)
20 bytes	Preset name (as ASCII characters)
12 bytes	Custom correction scale (in chromatic scale degrees)
1 byte	Number of notes in custom scale
16 bytes (cs)	Shift map (4x3 8-bit bytes packed – see below for description)
4 bytes (cs)	Accidental attributes of custom scale (see below for description)
288 bytes (cs)	9 24-bit values for each of the 8 FX groups (packed data – see below)
1 byte	Checksum of the data marked cs (see below for description)

Packed data: The idea of packing the data is to take a 24-bit value (the normal width of parameters in Voice One) and represent it in 4 bytes of 7 bits each. The first three bytes hold (in sequence) bits 0-6, 7-13 and 14-20 of the 24-bit value. The fourth byte hold bits 21-23 of the 24-bit value as LSB's with zeros in the remaining bits.

Shift map: The shift map is represented internally as 12 8-bit bytes (see VoiceOne

manual for detailed description). For the purpose of storing and dumping, the 12 bytes are packed into 4 24-bit values each holding 3 bytes. When dumped/received these 24-bit values are packed according to the above mentioned scheme.

Accidental attributes: These 4 bytes (representing a 24-bit value packed) define the display properties of the custom scale. Bits 0-11 (of the 24-bit value) define whether flats or sharps are used for every custom scale note. A bit value of zero selects flat and a bit value of one selects sharp. Bits 18-22 define what scale type the VoiceOne displays (**MAJOR**, **MINOR**, **OTHER**, **CUSTOM** or **MIDI**) when the custom scale is selected as current scale.

Checksum: The checksum is 1 byte holding the 7 least significant bits of the sum of all bytes contributing to the checksum. In this case the contributing data is the data sections marked by **cs** in the table above.

Example: The byte values 1,2,3,...,126 would result in the following checksum. $1+2+3+\dots+126 = 8001$. To get the 7 least significant bits divide by 128 and then multiply the remainder by 128. In this example it would be 65.

Parameter data - 22:

<Data> is 4 bytes. The first two bytes identify the parameter as described above under **Parameter Request**. The last two bytes determine the value of the parameter represented as a 14 bit 2's complement signed value. If a value exceeds the limits of the parameter the value will be limited. If the parameter changed belongs to the **System Parameter Group** (see below) and the parameter was changed by the message, the message 'Kernel Par Changed' will flash on the text line of VoiceOne.

Examples:

The value 169 (decimal) = $1 \times 128 + 41$ would be represented as bytes 01 (MSB) and 29 (LSB)
The value -43 ~ 16384-43 (decimal) = $16341 = 127 \times 128 + 85$ would be bytes 7F (MSB) and 55 (LSB)

Example – Turn the Resonance Bypass Off (light in the Resonance key illuminates).

F0 00 01 38 00 4B 22 07 08 00 00 F7

F0 = SysEx start.

00 = Byte 1 of 3 byte manufacturer's ID for TC-Helicon.

01 = Byte 2 of 3 byte manufacturer's ID for TC-Helicon.

38 = Byte 3 of 3 byte manufacturer's ID for TC-Helicon.

00 = Sysex Device ID (default value of 0).

4B = VoiceOne model ID.

22 = VoiceOne Message Type Identifier (Parameter Data Identifier)

07 = Parameter Group ID.

08 = Parameter Name ID.

00 = Parameter Data MSB (Most significant bit).

00 = Parameter Data LSB (Least significant bit). Value, 0 decimal.

F7 = SysEx message end.

Sending this stream of bits will turn the Resonance effect on. This defeats the Resonance bypass. The light on the Resonance key will turn on.

Shift Map Data - 31:

<Data> is 12 bytes. Each byte represents the shift mapping for the respective note in the chromatic scale. A value of 0 is equivalent to -24 semitones (down two octaves), 1A (26 in decimal) is equivalent to +2 semitones (up two semitones), 30 (48 in decimal) is equivalent to +24 semitones (up two octaves), and 36 (54 in decimal) is equivalent to N/C (no change). Consult the VoiceOne manual for a complete description of the Shift Map user parameter. If any entry in the shift map is beyond the limits the message will be ignored.

Parameter Grouping and Listing

Group name	Group ID
Correction (COR)	0
Shifting (SHI)	1
Inflection (INF)	2
Vibrato (VIB)	3
Spectral (SPE)	4
Breath (BRE)	5
Growl (GRO)	6
Resonance (RES)	7
System (SYS)	8

(The following numbers are in Decimal notation)

Group, Parameter Name	ID	Min	Max
COR , Scale	0	0	49
COR , Root	1	0	11
COR , Window	2	0	600
COR , Attack	3	0	100
COR , Amount	4	0	100
COR , Custom	N/A		
COR , Bypass	8	0	1
SHI , Amount*	0	*Note1	*Note1
SHI , Mode*	1	0	8
SHI , Map	N/A (see above)		
SHI , PureShift	3	0	1
SHI , Formnt	4	-50	50
SHI , Hybrid	5	0	101
SHI , Bypass	8	0	1
INF , Amount	0	0	100
INF , Style	1	0	11
INF , Retrigr	2	0	1000
INF , Length	3	0	2000
INF , PitRnd	4	0	100
INF , TimRnd	5	0	100
INF , TimDly	6	0	600
INF , TimBuf	7	0	600
INF , Bypass	8	0	1
VIB , Amount	0	0	100
VIB , Style	1	0	35
VIB , OnsTim	2	0	2000
VIB , OnsRnd	3	0	100
VIB , PerTim	4	100	250
VIB , PerRnd	5	0	75
VIB , Bypass	8	0	1
SPE , Amount	0	0	100
SPE , Style	1	0	27
SPE , Bypass	8	0	1
BRE , Amount	0	0	100
BRE , Style	1	0	28

BRE, Harm'X	2	0	100
BRE, Bypass	8	0	1
GRO, Amount	0	0	100
GRO, Style	1	0	19
GRO, Bypass	8	0	1
RES, Amount	0	0	100
RES, Style	1	0	21
RES, Tract	2	50	200
RES, Bypass	8	0	1
SYS, Input	0	0	3
SYS, Output	1	0	1
SYS, Clock	2	0	2
SYS, LCut Filt	3	0	2
SYS, LCut Thrsh	4	36	90
SYS, Dither	5	0	3
SYS, StatusBits	6	0	1
SYS, Dig InGain	7	-100	6
SYS, Input Rng	8	0	1
SYS, Output Rng	9	0	3
SYS, Latency	10	0	2
SYS, BypassMode	11	0	1
SYS, MIDI Chan	12	0	16
SYS, MIDIPchShf	13	0	16
SYS, MIDIPchCor	14	1	16
SYS, MIDIPchOut	15	0	16
SYS, MIDI PrgCh	16	0	1
SYS, Bend Range	17	0	2400
SYS, BreathCtrl	18	0	1
SYS, GrowlCtrl	19	0	1
SYS, VibCtrl	20	0	1
SYS, Bulk Dump	N/A (see above)		
SYS, VMParamLock	22	0	1
SYS, Footswitch	23	0	2
SYS, SysEx ID	24	0	127
SYS, Prg Bank	25	0	2
SYS, Tuner Ref	26	400	480
SYS, ViewAngle	N/A		

*Note1: When shift mode is chromatic the max/min is +/- 2400 cents. Otherwise max/min is +/- twice the number of scale degrees in the selected scale.

