

## RETROKITS RK-006 MIDI IMPLEMENTATION

This is a technical document containing a list of MIDI System Exclusive commands you can use to program or read the RK-006 Master hub

### GENERAL RK006 SYSEX FORMAT:

F0 00 21 23 00 06 <CMD/RSP> <args...> F7

- each command will be acknowledged with a response from the 005.
- <args> are 7-bit packed: 7 bytes of 7-bit data is prequelled by a byte containing the MSBs

### 0x00: INQUIRY request

F0 00 21 23 00 06 00 F7

### 0x40: INQUIRY response

F0 00 21 23 00 06 40 00 10 00 12 00 F7

```

      | | | | |
      | | | | +---+ SW version 16 bit, little endian, BCD:
      | | | |   so in this example 12 00 = 0x0012 =
      | | | |   0.1.2 (highest nibble not used)
      | | +---+----- HW version 16 bit, little endian, BCD:
      | |   so in this example 10 00 = 0x0010 =
      | |   1.0 (both highest nibbles not used)
      | +----- MSBs
      +----- INQUIRY RESPONSE
  
```

### SETPARAM\_REQ

F0 00 21 23 00 06 03 00 <paramnr> <paramval> F7

### SETPARAM\_RSP

F0 00 21 23 00 06 43 00 <paramnr> <paramval> F7

### GETPARAM\_REQ

F0 00 21 23 00 06 04 00 <paramnr> F7

### GETPARAM\_RSP

F0 00 21 23 00 06 44 00 <paramnr> <paramval> F7

### FACTORY\_RESET\_REQ

F0 00 21 23 00 06 05 F7

### FACTORY\_RESET\_RSP

F0 00 21 23 00 06 45 F7

### COMMITPARAMS\_REQ

F0 00 21 23 00 06 07 00 <preset\_nr> F7

F0 00 21 23 00 06 47 00 <res> F7

### RECALL\_PRESET\_REQ

F0 00 21 23 00 06 0F 00 <preset\_nr> F7

### RECALL\_PRESET\_RSP

F0 00 21 23 00 06 4F 00 <res> F7

**INSERTCTL\_REQ** [\*174]

F0 00 21 23 00 06 21 00 <insertctl> F7  
 0 = disable insert chain  
 1 = request insert chain on arriving port

**INSERTCTL\_RSP** [\*174]

F0 00 21 23 00 06 61 00 <res> F7

**COMMITPARAMS\_RSP**

<res>

0 : OK

<>0 : failure code

<preset>

0..9 : ROM presets

(cannot be stored ! -> i.e. COMMIT\_PRESET\_REQ will fail for these)

10..11 : USER presets

<paramnr>

0 = SOFTTHRU	: 0=off, 1=auto (only in stand-alone), 2=always
1 = POLYMUX_MODE	: b76543210
	:
	:                 +--+--> 000 = OFF
	:                 001 = port9,10
	;                 010 = port8,9,10
	;                 011 = port7,8,9,10
	;                 100 = port6,7,8,9,10
	;                 101 = port1,2,3,4,5,6,7,8,9,10
	;                 110 =
	;                 111 = -
	:           +-----> Type: 0 = Port / 1 = Channel
	: +--+-----> Input MIDI channel: 1..16
2 = ROUTING_MODE	; 0 = off
	; 1 = split-brain: IN1 -> OUT1..5
	; IN2 -> OUT6..10
	; 2 = MPE/chn splitout: CHN1 -> OUT1
	; CHN2 -> OUT2
	; ..
	; CHN10-> OUT10
	; CHN11-> OUT1..10
	; ..
	; CHN16-> OUT1..10
	; 3..255 = reserved
3 = QUIRKS	; b76543210
	;   +-> candlelight
	; +-----> USBDEV quirk : identify as
	; 1xIN/1xOUT to avoid Android Chrome mobile
	; crash :-o
4 = BOOT_INT_TEMPO	; tempo of internal clock generator at boot
	;(in bpm: 0=off, 120=120.0bpm)

<paramnr> (continued)

- 5 = BOOT\_INSERTCTL : 0 = disabled [\*r174]  
 1 = TRSMIDI (IN1 + OUT1)  
 2..255 = reserved
- 6 = RESERVED6
- 7 = RESERVED7
- 8 = FILT0\_VID\_L : filter #0 VID Low byte  
 VID: 0xFFFF=USB\_HOST\_ALL  
 0xFFFE=USB\_DEVICE  
 0xFFFD=TRS/DIN PORT  
 0x0000=disabled
- 9 = FILT0\_VID\_H : filter #0 VID High byte
- 10 = FILT0\_PID\_L : filter #0 PID Low byte
- 11 = FILT0\_PID\_H : filter #0 PID High byte
- 12 = FILT0\_CHN\_L : filter #0 channels 1..8  
 (bit0=channel1, bit1=channel2, etc.)
- 13 = FILT0\_CHN\_H : filter #0 channels 9..16  
 (bit0=channel9, bit1=channel10, etc.)
- 14 = FILT0\_EV : filter #0 event filter:  
 b76543210  
 |||||+--> midi clock  
 |||||+---> midi start/stop/continue  
 |||+++----> reserved  
 |+-----> OUT direction  
 |+-----> INP direction  
 +-----> ALL events
- 15 = FILT0\_RESERVED
- 16 = FILT0\_CABLES\_L : filter #0 cable match (bitmask)  
 in case of USB: JACK1..4 (for jacks 1..4)
- 17 = FILT0\_CABLES\_H in case of DIN: PORTS1..10 (1,2=IN/OUT, 3..10=OUT)

**Filter block above repeated for 1-4:**

- |  |  |
|--|--|
| <pre> filter #1 18 = FILT1_VID_L 19 = FILT1_VID_H 20 = FILT1_PID_L 21 = FILT1_PID_H 22 = FILT1_CHN_L 23 = FILT1_CHN_H 24 = FILT1_EV 25 = FILT1_RESERVED 26 = FILT1_CABLES_L 27 = FILT1_CABLES_H         </pre> | <pre> filter #2 28 = FILT1_VID_L 29 = FILT1_VID_H 30 = FILT1_PID_L 31 = FILT1_PID_H 32 = FILT1_CHN_L 33 = FILT1_CHN_H 34 = FILT1_EV 35 = FILT1_RESERVED 36 = FILT1_CABLES_L 37 = FILT1_CABLES_H         </pre> |
| <pre> filter #3 38 = FILT1_VID_L 39 = FILT1_VID_H 40 = FILT1_PID_L 41 = FILT1_PID_H 42 = FILT1_CHN_L 43 = FILT1_CHN_H 44 = FILT1_EV 45 = FILT1_RESERVED 46 = FILT1_CABLES_L 47 = FILT1_CABLES_H         </pre> | <pre> filter #4 48 = FILT1_VID_L 49 = FILT1_VID_H 50 = FILT1_PID_L 51 = FILT1_PID_H 52 = FILT1_CHN_L 53 = FILT1_CHN_H 54 = FILT1_EV 55 = FILT1_RESERVED 56 = FILT1_CABLES_L 57 = FILT1_CABLES_H         </pre> |

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58 = OUT1_MODE   : MIDI mode
                  : b76543210
                  : 0| | | | | | |
                  : ++++++--> reserved
-----
: GATE-mode
: b76543210
: 1| | | | | | |
: | | | | | | | +--> 0=POS, 1=NEG
: | | | | | | | +----> if mode src* = 'tempo clock':
: | | | | | | |           0=SHORT (10ms), 1=LONG (100ms)
: | | | | | | |           if mode src = 'keygate':
: | | | | | | |           0=latched (until KEY-OFF) 1=pulsed (10ms)
: | | | | | | |           if mode src = 'on'(run/stop):
: | | | | | | |           0=latched, 1=pulsed (10ms)
: | | | | | | | +----> 0=gated by start/stop,
: | | | | | | |           1=not gated by start/stop
: +---+-----> src* : 0000 = tempo clock
:                   0001 = key gate all notes
:                   0010 = key gate filtered by
:                   note_number==36+OUTPORT
:                   (so PORT1=36 only, PORT2=37 only etc.)
:                   0011 =
:                   0100 =
:                   0101 =
:                   0110 =
:                   0111 = on (run/stop)
:                   1000 = CV controller #1
:                   (modwheel)
:                   1001 = CV controller #2
:                   (breath controller)
:                   1010 = CV controller #70
:                   (Sound Controller 1)
:                   1011 = CV controller #71
:                   (Sound Controller 2)
:                   1100 = CV pitchbend
:                   1101 = CV keytrack (key 36 and up)
:                   1110 = CV velocity
:                   1111 =
: *Note: CV(PWM) src is not possible on port 5,7 and 10
59 = OUT1_PPSN   : PPSN for clock divider (default = 24*4)
  
```

**OUT\_MODEx + PPSN definition above repeated for every port**

Port #2	Port #5	Port #8
60 = OUT2_MODE	66 = OUT5_MODE	72 = OUT8_MODE
61 = OUT2_PPSN	67 = OUT5_PPSN	73 = OUT8_PPSN
Port #3	Port #6	Port #9
62 = OUT3_MODE	68 = OUT6_MODE	74 = OUT9_MODE
63 = OUT3_PPSN	69 = OUT6_PPSN	75 = OUT9_PPSN
Port #4	Port #7	Port #10
64 = OUT4_MODE	70 = OUT7_MODE	76 = OUT10_MODE
65 = OUT4_PPSN	71 = OUT7_PPSN	77 = OUT10_PPSN

78 = OUT1\_CLOCKSHIFT : In mS, 2Complement encoding  
 b00000000  
 |+++++++> Offset value (0-127)  
 +-----> 0=positive offset  
 1=negative offset  
**2Complement example:**  
 b00000011 = 3ms positive shift  
 b11111101 = 3ms negative shift

**OUTx\_CLOCKSHIFT repeated for port 2-10:**

Port #2 79 = OUT2_CLOCKSHIFT	Port #5 82 = OUT5_CLOCKSHIFT	Port #8 85 = OUT8_CLOCKSHIFT
Port #3 80 = OUT2_CLOCKSHIFT	Port #6 83 = OUT6_CLOCKSHIFT	Port #9 86 = OUT9_CLOCKSHIFT
Port #4 81 = OUT2_CLOCKSHIFT	Port #7 84 = OUT7_CLOCKSHIFT	Port #10 87 = OUT10_CLOCKSHIFT

**EASY CONTROL PARAMETERS (val 0=off):**

88 = CC\_TEMPO : Easy CC tempo control  
 MIDI chn = any (omni)  
 Set a CC number which controls RK-006 tempo  
 CC VAL:64=120bpm, 0=56bpm, 127=183bpm

89 = CC\_CLOCKSHIFT : Easy CC Clockshift control  
 MIDI chn = output#  
 Set a CC number which controls clockshift  
 CC VAL:64=0ms, 0=-64ms, 127=+63ms  
**example:** received CC value on MIDI Channel 4  
 will control clockshift on output 4

89 = CC\_CLOCKDIV : Easy CC Clockdivider control  
 MIDI chn = output#  
 Set a CC number which controls clockdivider  
 CC VAL: 0..99 = PPSN 0..99  
 CC VAL: 126 mapped to 144 (=1.5x)  
 CC VAL: 127 mapped to 192 (=2x)

**example:** received CC value on MIDI Channel 2  
 will control clock divider on output 2

91 = RESERVED  
 92 = RESERVED  
 93 = RESERVED  
 94 = RESERVED  
 95 = RESERVED