

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

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      | | | | |
      | | | | +---+--- 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
  
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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>

<p>0 = SOFTTHRU 1 = POLYMUX_MODE</p>	<p>: 0=off, 1=auto (only in stand-alone), 2=always : 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</p>
<p>2 = ROUTING_MODE</p>	<p>; 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</p>
<p>3 = QUIRKS</p>	<p>; 3..255 = reserved ; b76543210 ; +-> candlelight ; +-----> PolyMUX 'Round Robin' mode [*186] ; +-----> USBDEV quirk : identify as ; 1xIN/1xOUT to avoid Android Chrome mobile ; crash :-o</p>
<p>4 = BOOT_INT_TEMPO</p>	<p>; tempo of internal clock generator at boot ;(in bpm: 0=off, 120=120.0bpm)</p>

<paramnr> (continued)

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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
                   +++----> 000 = do not match on event type [ *r202 ]
                           001 = note_on/note_off
                           010 = controlchange
                           011 = pitchbend
                           100 = programchange
                           101 = aftertouch
                           110 = sysex (only for DIN-OUTPUT ports)
                           111 = 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:

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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

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

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

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
  
```

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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 : CC # for 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 : CC # for 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

90 = CC_CLOCKDIV : CC # for 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: See Parameter #89

91 = CC_TRANSPORT : CC # for Per-Port Clock Transport
 MIDI chn = output #
 Set a CC number which controls MIDI Start/Stop
 CC VAL:0 = MIDI Stop command, other=MIDI Start
example: See Parameter #89

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