ULTRACURVE PRO DEQ2496

MIDI SysEx Implementation

ENGLISH

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MIDI implementation

Function	Transmitted	Received	Remarks
Midi Channel	1-16	1-16	
Mode	N	N	
Note Number	N	N	
Velocity	N	N	
After Touch	N	N	
Pitch Bender	N	N	
Control Change			
1-31	Y (Range: 0-61)	Y (Range: 0-61)	GEQ Left (20 Hz...20 kHz)
33-63	Y (Range: 0-61)	Y (Range: 0-61)	GEQ Right (20 Hz...20 kHz)
Program Change	Y (Range: 0-64)	Y (Range: 0-64)	Presets (1-64) and Initial Data (0)
System Exclusive	Y	Y	see SysEx Documentation
System Common	N	N	
System Real Time	N	N	
Running Status	Y (2s Timeout)	Y	

General BEHRINGER SysEx Format:

0xF0, 0x00, 0x20, 0x32, DeviceID, ModelID, Commands & Data, ..., 0xF7

(0xaa denotes a hexadecimal value)

The BEHRINGER **CompanyID** is **0x00, 0x20, 0x32**.

The **DeviceID** acts like a MIDI channel number but allows the use of up to 127 identical Devices. The **DeviceID 0x7F** (127 decimal) is used as a broadcast ID (i.e. every device accepts this DeviceID). The **ModelID** is used to identify the product. E.g. the DEQ2496 **ModelID** is **0x12** (18 decimal). Again the **ModelID 0x7F** will be accepted by every Behringer product. **ModelID 0x00** is used to expand the ModelID to two or more bytes.

Commands & Data:

0x01: identify device

Format: **0xF0, 0x00, 0x20, 0x32, DeviceID, ModelID, 0x01, 0xF7**
Response: **0xF0, 0x00, 0x20, 0x32, 0x00, 0x12, 0x02, asciidata*, 0xF7**
asciidata*: n ascii characters identifying the product and software version

0x20: write (single) preset

Format: **0xF0, 0x00, 0x20, 0x32, DeviceID, ModelID, 0x20, presetnr, len MSB, len LSB, data*, 0xF7**
presetnr: number of preset (1-64) to write or temporary edit buffer (0)
len MSB: size of data* (high 7 bits)
len LSB: size of data* (low 7 bits)
data*: single preset data block
Comment: Write preset is only accepted if preset isn't protected

0x21: write module presets

Format: **0xF0, 0x00, 0x20, 0x32, DeviceID, ModelID, 0x21, presetnr, modnr, len, data*, 0xF7**
presetnr: number of preset (1-64) to write or temporary edit buffer (0)
modnr: number of module (0-5)
len: size of data*
data*: module preset data block
Comment: Write module preset is only accepted if preset isn't protected or empty

0x22: write single value (see table)

Format: **0xF0, 0x00, 0x20, 0x32, DeviceID, ModelID, 0x22, modnr, lrmode, offset, len, data*, 0xF7**
modnr: number of module (0-12)
lrmode: channel mode: dual mono or stereo (0,1)
offset: offset to first value
len: size of data* (1 or 2)
data*: value

0x24: set MIDI channel

Format: **0xF0, 0x00, 0x20, 0x32, DeviceID, ModelID, 0x24, MidiCh, 0xF7**
MidiCh: MIDI channel (0-15)

0x34/0x35: transfer flash data block

Format: **0xF0, 0x00, 0x20, 0x32, DeviceID, ModelID, 0x34, blockdata[259+37], 0xF7**
blockdata: 7/8 coded: **blockno_h**, **blockno_l**, **crc**, **data[256]**.
crc: crc8 checksum of **blockno_h, blockno_l, data[256]**
blockno: transferred 256 byte data block number (bits 21..15, 14..8 of flash offset); blocks 0-0x1f: boot loader; blocks 0x20..0x5ef: application; blocks 0x5f0-0x5ff: startup screen; blocks 0x600-0x67f: presets; blocks 0x680-0x69f: temporary buffers; blocks 0x6a0-0x7ff: hw configuratiuon; block no 0xff00 shows text message data[0..52] on screen
data: data block

Response: **0xF0, 0x00, 0x20, 0x32, 0x00, 0x12, 0x35, blockno_h**, **blockno_l**, **status, 0xF7**
blockno: transferred 256 byte data block number (bits 21..15, 14..8 of flash offset)
status: 0: flash write executed ok, 1: missing sub block, 2: flash erase failed, 3: flash write failed

Comment: Response is sent only after receiving sub block 15.

0x60: request single preset

Format: **0xF0, 0x00, 0x20, 0x32, DeviceID, ModelID, 0x60, presetnr, 0xF7**
presetnr: number of requested preset (1-64) or temporary edit buffer (0)

Response: command 0x20

0x61: request module preset

Format: **0xF0, 0x00, 0x20, 0x32, DeviceID, ModelID, 0x61, presetnr, modnr, 0xF7**
presetnr: number of requested preset (1-64) or temporary edit buffer (0)
modnr: number of module (0-13)

Response: command 0x21

0x76: request screen dump

Format: **0xF0, 0x00, 0x20, 0x32, DeviceID, ModelID, 0x76, 0xF7**

Response: **0xF0, 0x00, 0x20, 0x32, 0x00, 0x12, 0x36, scrndata[80*46], 0xF7**

modnr	lrmode	offset	len	data	analogous value	remarks
GEQ						
0	0	0	1	0,1	left, right	channel (DUAL MONO)
0	0,1	1	1	0,1	uncorrected, TRUE RESP.	GEQ mode
0	0,1	2	1	0…30	20 Hz … 20000 Hz (+1/3 Oct.)	frequency
0	0,1	3…33	1	0…60	+15…-15 dB (-0.5 dB)	Gain left
0	0,1	34…64	1	0…60	+15…-15 dB (-0.5 dB)	Gain right
0		65…68	1	no	spare	for future use!
PEQ						
1	0,1	0	1	1,2	page 1…page 2	page
1	0	1	1	0,1	left, right	channel (DUAL MONO)
1	0,1	2	1	0…19	left #1… #10, right #1…#10	PEQ number
1	0,1	3…12	1	0…28	1/60…10 Oct.,L6,L12,H6,H12	bandwidth left
1	0,1	13…22	1	0…28	1/60…10 Oct.,L6,L12,H6,H12	bandwidth right
1	0,1	23…41	2	0…600	20 Hz … 20000 Hz (+1/60 Oct.)	frequency left
1	0,1	43…61	2	0…600	20 Hz … 20000 Hz (+1/60 Oct.)	frequency right
1	0,1	63…72	1	0…105	+15…-60 dB (-0.5/-1 dB)	gain left
1	0,1	73…82	1	0…105	+15…-60 dB (-0.5/-1 dB)	gain right
1	0,1	83…92	1	0…4	OFF, AUTO, SNGL, LOCK	filter mode left
1	0,1	93…102	1	0…4	OFF, AUTO, SNGL, LOCK	filter mode right
1		103..106	1	no	spare	for future use!
DEQ						
2	0,1	0	1	1…3	page 1…page 3	page
2	0	1	1	0,1	left, right	channel (DUAL MONO)
2	0,1	2	1	0…5	left #1… #3, right #1…#3	DEQ number
2	0,1	3…5	1	0…60	+15…-15 dB (+0.5 dB)	m-gain left
2	0,1	6…8	1	0…60	+15…-15 dB (+0.5 dB)	m-gain right
2	0,1	9…11	1	0…60	0 …-60 dB (-1 dB)	threshold left
2	0,1	12…14	1	0…60	0 …-60 dB (-1 dB)	threshold right
2	0,1	15…17	1	0…10	1:2.0…1:100	ratio left
2	0,1	18…20	1	0…10	1:2.0…1:100	ratio right
2	0,1	21…25	2	0…200	0…200 msec. (log.)	attack time left
2	0,1	27…31	2	0…200	0…200 msec. (log.)	attack time right
2	0,1	33…37	2	0…255	20…4000 msec. (log.)	release time left
2	0,1	39…43	2	0…255	20…4000 msec. (log.)	release time right
WIDTH						
3	0,1	0	1	1,2	page 1…page 2	page
3	0,1	2	2	0…180	-90°…+90° (+1°)	asymmetry
3	0,1	4	1	0…30	0.0…3.0 (+0.1)	stereowidth
3	0,1	5	1	0…90	-45°…+45° (+1°)	rotation
3	0,1	6	1	24…36	-3.0…+3.0 dB (+0.5 dB)	basstrim
3	0,1	7	1	0…105	350…1400 Hz (+10 Hz)	frequency
3	0,1	8	1	10…30	1.0…3.0 (+0.1)	shuffle
3		9…12	1	no	spare	for future use!

modnr	lrmode	offset	len	data	value	Remarks
DYN						
4	0,1	0	1	1…3	page 1…page 3	page
4	0	1	1	0,1	left, right	channel (DUAL MONO)
4	0	2	1	0,1	left, right	channel
4	0,1	3	1	0,1	EXPA., COMP.	mode left
4	0,1	4	1	0,1	EXPA., COMP.	mode right
4	0,1	5	1	0…60	+15…-15 dB (-0.5 dB)	m-gain left
4	0,1	6	1	0…60	+15…-15 dB (-0.5 dB)	m-gain right
4	0,1	7	1	0…60	0 …-60 dB (-1 dB)	threshold left
4	0,1	8	1	0…60	0 …-60 dB (-1 dB)	threshold right
4	0,1	9	1	0…15	1:1.1…1:100	ratio left
4	0,1	10	1	0…15	1:1.1…1:100	ratio right
4	0,1	11	2	0…200	0…200 msec. (log.)	attack time left
4	0,1	13	2	0…200	0…200 msec. (log.)	attack time right
4	0,1	15	2	0…255	20…4000 msec. (log.)	release time left
4	0,1	17	2	0…255	20…4000 msec. (log.)	release time right
4	0,1	19	1	0…60	0 …30 dB (+1 dB)	delta knee left (only COMP.)
4	0,1	20	1	0…60	0 …30 dB (+1 dB)	delta knee right (only COMP.)
4	0,1	21	2	0…200	0…1000 msec. (log.)	limiter hold time left
4	0,1	23	2	0…200	0…1000 msec. (log.)	limiter hold time right
4	0,1	25	2	0…240	0 …-60 dB (-1 dB)	limiter threshold left
4	0,1	27	2	0…240	0 …-60 dB (-1 dB)	limiter threshold right
4	0,1	29	2	0…255	20…4000 msec. (log.)	limiter release time left
4	0,1	31	2	0…255	20…4000 msec. (log.)	limiter release time right
4		32..35	1	no	spare	for future use!
I/O						
5	0,1	0	1	1…4	page 1…page 4	page
5	0,1	1	1	0…3	MAIN IN… DIG. IN XLR	I/O1 INPUT
5	0,1	2	1	0…3	INPUT… BEHIND WIDTH	I/O2 AUX/DIG. OUT
5	0,1	3	1	0…3	INPUT… RTA/MIC	I/O3 RTA INPUT
5	0,1	4	1	0…6	44.1 kHz…OPTIN	clock (samplerate)
5	0,1	5	1	0…60	+15°…-15° (-1 dB)	gain offset (EQ)
5	0,1	6	1	0,1	S/PDIF, AES3 (AES/EBU)	digital Protocol
5	0,1	7	1	0,1	OFF,ON	noiseshaper
5	0,1	8	1	0…3	OFF, 24 bit, 20 bit, 16 bit	dither mode
5	0,1	9	1	0,1	MAIN, AUX	delay path
5	0,1	10	1	0…2	MSEC, FEET, METER	delay unit
5	0,1	11	2	0...15000	0..300 ms / 103.08 m / 338.2ft	delay left
5	0,1	13	2	0...15000	0..300 ms / 103.08 m / 338.2ft	delay right
5	0,1	15	2	0…400	0°C/32°F…40°C/104°F (+0.1°C)	temperature (c0 = 343.6 m/s)
5	0,1	17	1	60…10	-60…-10 dB	noise gain
5		18..21	1	no	spare	for future use!
FBD						
6	0,1	0	1	1…3	page 1…page 3	page
6	0,1	1	1	0…19	left #1… #10, right #1…#10	FBD number
6	0,1	2	1	63…105	-18…-60 db (+1 dB)	max. Depth
6	0,1	3	1	30…90	-3.0…-9.0 dB (-0.1 dB)	sensitivity
6	0,1	4	1	0…85	0 …-40 dB (-1/-0.5 dB)	threshold
6	0,1	5	1	0,1	OFF, ON	active left
6	0,1	6	1	0,1	OFF, ON	active right
6		7…10	1	no	spare	for future use!

The following values are global variables:

BYP						
7	0,1	0	1	0…5	GEQ…LIMIT	module
7	0,1	1…6	1	0,1	BYPASS LEFT OFF, ON	bypass module left
7	0,1	7…12	1	0,1	BYPASS RIGHT OFF, ON	bypass module right
7		13..16	1	no	spare	for future use!
7	0,1	17	1	0,1	RELAY LEFT OFF, ON	bypass relay left
7	0,1	18	1	0,1	RELAY RIGHT OFF, ON	bypass relay right
UTIL						
8	0,1	0	1	1…2	page 1…page 2	page
8	0,1	1	1	0…15	dark…bright	contrast
8	0,1	2	1	0,1	MESSAGEBOX OFF, ON	show messagebox
8	0,1	3	1	0,1	MIDI OFF, ON	midi
8	0,1	4	1	0…15	CHANNEL 1…16	midi channel
8	0,1	5	1	0,1	MIDI OFF, ON	midi send control change
8	0,1	6	1	0,1	MIDI OFF, ON	midi send program change
8	0,1	7	1	0,1	MIDI OFF, ON	midi send system exclusive
8	0,1	8	1	0,1	MIDI OFF, ON	midi receive control change
8	0,1	9	1	0,1	MIDI OFF, ON	midi receive program change
8	0,1	10	1	0,1	MIDI OFF, ON	midi receive sysex
RTA						
9	0,1	0	1	1…3	page 1…page 3	page
9	0,1	1	1	0…2	left, right, left+right	RTA channel
9	0,1	2	1	0…12	0…-60 dB (-5 dB)	upper level (MAX:)
9	0,1	3	1	0…12	0…-60 dB (-5 dB)	upper level for RTA/MIC
9	0,1	4	1	0…3	15, 30, 60, 90 dB	range
9	0,1	5	1	0…60	20 Hz … 20000 Hz (+1/6 Oct.)	frequency
9	0,1	6	1	0,1	OFF, ON	noisecorrection
9	0,1	7	1	0,1	LINE level, MIC level	INPUT sensitivity
9	0,1	8	1	0,1	OFF, ON	auto level
9	0,1	9	1	0..3	FAST, MID, SLOW, AVRG	rate
9	0,1	10	1	0,1	OFF,FAST,MID,SLOW,HOLD	peak
9	0,1	11	1	0…36	-14.0…+22.0 dBu (+0.5 dB)	LINE sensitivity
9	0,1	12	1	0…36	-42.0…-6.0 dBV/Pa (+0.5 dB)	MIC sensitivity
9	0,1	127	1	0,1	OFF, ON	send rta values over MIDI
MEM						
11	0,1	0	1	1…2	page 1…page 2	page
11	0,1	1	1	0…2	left, right, stereo	source for new channel mode
11	0,1	2	1	0…64	INITIAL DATA…preset 64	preset number
11	0,1	3	1	0…5	GEQ,PEQ,DEQ,WIDTH,DYN,IO	module
11	0,1	4	1	0,1	OFF, ON	compare module
11	0,1	6	1	0,1	OFF, ON	compare all
METER						
12	0,1	0	1	1…3	page 1…page 3	page
12	0,1	1	1	0…2	INPUT, OUTPUT, DIGOUT	source
12	0,1	2	1	0…2	OFF, dB(A), dB(C)	SPL weight
(OTHERS)						
12	0,1	127	1	0,1	OFF, ON	send meter values over MIDI
2(DEQ)	0,1	127	1	0,1	OFF, ON	send deq level values
4(DYN)	0,1	127	1	0,1	OFF, ON	send dyn level values
5(IO)	0,1	127	1	0,1	OFF, ON	send samplerate over MIDI
MENU						
127	0,1	0	1	0…12	GEQ…METER	select menu (module)