

# Circuit MIDI Parameters

## Synths 1 & 2

(Send messages on MIDI Channel 1 for Synth 1 and Channel 2 for Synth 2)

Section	Parameter	CC / NRPN	Control No.	Range	Default Value	Notes
<b>Voice</b>						
	Polyphony Mode	CC	3	0 – 2	2	0=Mono, 1=Mono AG, 2=Poly
	Portamento Rate	CC	5	0 – 127	0	
	Pre-Glide	CC	9	52 – 76 (-12 – 12)	64 (0)	
	Keyboard Octave	CC	13	58 – 69 (-6 – 5)	64 (0)	60=-4 Octaves, 64=0 Octaves, 68=+4 Octaves
<b>Oscillator</b>						
	osc 1 wave	CC	19	0 – 29	2	See Osc Waveform Table
	osc 1 wave interpolate	CC	20	0 – 127	0	
	osc 1 pulse width index	CC	21	0 – 127 (-64 – 63)	127 (63)	
	osc 1 virtual sync depth	CC	22	0 – 127	0	
	osc 1 density	CC	24	0 – 127	0	
	osc 1 density detune	CC	25	0 – 127	0	
	osc 1 semitones	CC	26	0 – 127 (-64 – 63)	64 (0)	
	osc 1 cents	CC	27	0 – 127 (-64 – 63)	64 (0)	
	osc 1 pitchbend	CC	28	52 – 76 (-12 – 12)	76 (12)	
	osc 2 wave	CC	29	0 – 29	2	See Osc Waveform Table
	osc 2 wave interpolate	CC	30	0 – 127	0	
	osc 2 pulse width index	CC	31	0 – 127 (-64 – 63)	127 (63)	
	osc 2 virtual sync depth	CC	33	0 – 127	0	
	osc 2 density	CC	35	0 – 127	0	
	osc 2 density detune	CC	36	0 – 127	0	
	osc 2 semitones	CC	37	0 – 127 (-64 – 63)	64 (0)	
	osc 2 cents	CC	39	0 – 127 (-64 – 63)	64 (0)	
	osc 2 pitchbend	CC	40	52 – 76 (-12 – 12)	76 (12)	
<b>Mixer</b>						
	osc 1 level	CC	51	0 – 127	127	
	osc 2 level	CC	52	0 – 127	0	
	ring mod level	CC	54	0 – 127	0	
	noise level	CC	56	0 – 127	0	
	pre FX level	CC	58	52 – 82 (-12 – 18)	64 (0)	-12 to +18 dB
	post FX level	CC	59	52 – 82 (-12 – 18)	64 (0)	-12 to +18 dB
<b>Filter</b>						
	routing	CC	60	0 – 2	0	0=Normal 1=Osc 1 bypasses the filter 2=Osc 1 + Osc 2 bypasses the filter
	drive	CC	63	0 – 127	0	
	drive type	CC	65	0 – 6	0	See Filter Table
	type	CC	68	0 – 5	1	
	frequency	CC	74	0 – 127	127	
	tracking	CC	69	0 – 127	127	
	resonance	CC	71	0 – 127	0	
	Q normalize	CC	78	0 – 127	64	
	env 2 to frequency	CC	79	0 – 127 (-64 – 63)	64 (0)	
<b>Envelope</b>						
	env 1 velocity	CC	108	0 – 127 (-63 – 64)	64 (0)	
	env 1 attack	CC	73	0 – 127	2	
	env 1 decay	CC	75	0 – 127	90	
	env 1 sustain	CC	70	0 – 127	127	
	env 1 release	CC	72	0 – 127	40	
	env 2 velocity	NRPN	0:0	0 – 127 (-63 – 64)	64 (0)	
	env 2 attack	NRPN	0:1	0 – 127	2	
	env 2 decay	NRPN	0:2	0 – 127	75	
	env 2 sustain	NRPN	0:3	0 – 127	35	
	env 2 release	NRPN	0:4	0 – 127	45	
	env 3 delay	NRPN	0:14	0 – 127	0	
	env 3 attack	NRPN	0:15	0 – 127	10	
	env 3 decay	NRPN	0:16	0 – 127	70	
	env 3 sustain	NRPN	0:17	0 – 127	64	
	env 3 release	NRPN	0:18	0 – 127	40	
<b>LFO</b>						
	lfo 1 waveform	NRPN	0:70	0 – 37	0	See LFO waveform table
	lfo 1 phase offset	NRPN	0:71	0 – 119	0	(0° - 357°) in steps of 3°
	lfo 1 slew rate	NRPN	0:72	0 – 127	0	
	lfo 1 delay	NRPN	0:74	0 – 127	0	
	lfo 1 delay sync	NRPN	0:75	0 – 35	0	
	lfo 1 rate	NRPN	0:76	0 – 127	68	
	lfo 1 rate sync	NRPN	0:77	0 – 35	0	

	lfo 1 one shot	NRPN	0:122	12 – 13	12 (OFF)	12=OFF, 13=ON
	lfo 1 key sync	NRPN	0:122	14 – 15	14 (OFF)	14=OFF, 15=ON
	lfo 1 common sync	NRPN	0:122	16 – 17	16 (OFF)	16=OFF, 17=ON
	lfo 1 delay trigger	NRPN	0:122	18 – 19	18 (OFF)	18=OFF, 19=ON
	lfo 1 fade mode	NRPN	0:123	0 – 3	0	0=Fade In, 1=Fade Out, 2=Gate In, 3=Gate Out
	lfo 2 waveform	NRPN	0:79	0 – 37	0	See LFO Waveform Table
	lfo 2 phase offset	NRPN	0:80	0 – 119	0	(0° - 357°) in steps of 3°
	lfo 2 slew rate	NRPN	0:81	0 – 127	0	
	lfo 2 delay	NRPN	0:83	0 – 127	0	
	lfo 2 delay sync	NRPN	0:84	0 – 35	0	
	lfo 2 rate	NRPN	0:85	0 – 127	68	
	lfo 2 rate sync	NRPN	0:86	0 – 35	0	
	lfo 2 one shot	NRPN	0:122	22 – 23	22 (OFF)	22=OFF, 23=ON
	lfo 2 key sync	NRPN	0:122	24 – 25	24 (OFF)	24=OFF, 25=ON
	lfo 2 common sync	NRPN	0:122	26 – 27	26 (OFF)	26=OFF, 27=ON
	lfo 2 delay trigger	NRPN	0:122	28 – 29	28 (OFF)	28=OFF, 29=ON
	lfo 2 fade mode	NRPN	0:123	4 – 7	4	4=Fade In, 5=Fade Out, 6=Gate In, 7=Gate Out
<b>Effects and EQ</b>						
	distortion level	CC	91	0 – 127	0	
	chorus level	CC	93	0 – 127	0	
	EQ bass frequency	NRPN	0:104	0 – 127	64	
	EQ bass level	NRPN	0:105	0 – 127 (-63 – 64)	64 (0)	
	EQ mid frequency	NRPN	0:106	0 – 127	64	
	EQ mid level	NRPN	0:107	0 – 127 (-63 – 64)	64 (0)	
	EQ treble frequency	NRPN	0:108	0 – 127	125	
	EQ treble level	NRPN	0:109	0 – 127 (-63 – 64)	64 (0)	
	distortion type	NRPN	1:0	0 – 6	0	See Distortion Table
	distortion compensation	NRPN	1:1	0 – 127	100	
	chorus type	NRPN	1:24	0 – 1	1	0=Phaser, 1=Chorus
	chorus rate	NRPN	1:25	0 – 127	84 (20)	
	chorus rate sync	NRPN	1:26	0 – 35	0	
	chorus feedback	NRPN	1:27	0 – 127 (-63 – 64)	74 (10)	
	chorus mod depth	NRPN	1:28	0 – 127	64	
	chorus delay	NRPN	1:29	0 – 127	64	
<b>Mod Matrix</b>						
	mod matrix 1 source 1	NRPN	1:83	0 – 12	0	See Mod Matrix Table
	mod matrix 1 source 2	NRPN	1:84	0 – 12	0	See Mod Matrix Table
	mod matrix 1 depth	NRPN	1:86	0 – 127 (-63 – 64)	64 (0)	
	mod matrix 1 destination	NRPN	1:87	0 – 17	0	See Mod Matrix Table
	mod matrix 2 source 1	NRPN	1:88	0 – 12	0	See Mod Matrix Table
	mod matrix 2 source 2	NRPN	1:89	0 – 12	0	See Mod Matrix Table
	mod matrix 2 depth	NRPN	1:91	0 – 127 (-63 – 64)	64 (0)	
	mod matrix 2 destination	NRPN	1:92	0 – 17	0	See Mod Matrix Table
	mod matrix 3 source 1	NRPN	1:93	0 – 12	0	See Mod Matrix Table
	mod matrix 3 source 2	NRPN	1:94	0 – 12	0	See Mod Matrix Table
	mod matrix 3 depth	NRPN	1:96	0 – 127 (-63 – 64)	64 (0)	
	mod matrix 3 destination	NRPN	1:97	0 – 17	0	See Mod Matrix Table
	mod matrix 4 source 1	NRPN	1:98	0 – 12	0	See Mod Matrix Table
	mod matrix 4 source 2	NRPN	1:99	0 – 12	0	See Mod Matrix Table
	mod matrix 4 depth	NRPN	1:101	0 – 127 (-63 – 64)	64 (0)	
	mod matrix 4 destination	NRPN	1:102	0 – 17	0	See Mod Matrix Table
	mod matrix 5 source 1	NRPN	1:103	0 – 12	0	See Mod Matrix Table
	mod matrix 5 source 2	NRPN	1:104	0 – 12	0	See Mod Matrix Table
	mod matrix 5 depth	NRPN	1:106	0 – 127 (-63 – 64)	64 (0)	
	mod matrix 5 destination	NRPN	1:107	0 – 17	0	See Mod Matrix Table
	mod matrix 6 source 1	NRPN	1:108	0 – 12	0	See Mod Matrix Table
	mod matrix 6 source 2	NRPN	1:109	0 – 12	0	See Mod Matrix Table
	mod matrix 6 depth	NRPN	1:111	0 – 127 (-63 – 64)	64 (0)	
	mod matrix 6 destination	NRPN	1:112	0 – 17	0	See Mod Matrix Table
	mod matrix 7 source 1	NRPN	1:113	0 – 12	0	See Mod Matrix Table
	mod matrix 7 source 2	NRPN	1:114	0 – 12	0	See Mod Matrix Table
	mod matrix 7 depth	NRPN	1:116	0 – 127 (-63 – 64)	64 (0)	
	mod matrix 7 destination	NRPN	1:117	0 – 17	0	See Mod Matrix Table
	mod matrix 8 source 1	NRPN	1:118	0 – 12	0	See Mod Matrix Table
	mod matrix 8 source 2	NRPN	1:119	0 – 12	0	See Mod Matrix Table
	mod matrix 8 depth	NRPN	1:121	0 – 127 (-63 – 64)	64 (0)	
	mod matrix 8 destination	NRPN	1:122	0 – 17	0	See Mod Matrix Table
	mod matrix 9 source 1	NRPN	1:123	0 – 12	0	See Mod Matrix Table
	mod matrix 9 source 2	NRPN	1:124	0 – 12	0	See Mod Matrix Table
	mod matrix 9 depth	NRPN	1:126	0 – 127 (-63 – 64)	64 (0)	
	mod matrix 9 destination	NRPN	1:127	0 – 17	0	See Mod Matrix Table
	mod matrix 10 source 1	NRPN	2:0	0 – 12	0	See Mod Matrix Table
	mod matrix 10 source 2	NRPN	2:1	0 – 12	0	See Mod Matrix Table

	mod matrix 10 depth	NRPN	2:3	0 – 127 (-63 – 64)	64 (0)	
	mod matrix 10 destination	NRPN	2:4	0 – 17	0	See Mod Matrix Table
	mod matrix 11 source 1	NRPN	2:5	0 – 12	0	See Mod Matrix Table
	mod matrix 11 source 2	NRPN	2:6	0 – 12	0	See Mod Matrix Table
	mod matrix 11 depth	NRPN	2:8	0 – 127 (-63 – 64)	64 (0)	
	mod matrix 11 destination	NRPN	2:9	0 – 17	0	See Mod Matrix Table
	mod matrix 12 source 1	NRPN	2:10	0 – 12	0	See Mod Matrix Table
	mod matrix 12 source 2	NRPN	2:11	0 – 12	0	See Mod Matrix Table
	mod matrix 12 depth	NRPN	2:13	0 – 127 (-63 – 64)	64 (0)	
	mod matrix 12 destination	NRPN	2:14	0 – 17	0	See Mod Matrix Table
	mod matrix 13 source 1	NRPN	2:15	0 – 12	0	See Mod Matrix Table
	mod matrix 13 source 2	NRPN	2:16	0 – 12	0	See Mod Matrix Table
	mod matrix 13 depth	NRPN	2:18	0 – 127 (-63 – 64)	64 (0)	
	mod matrix 13 destination	NRPN	2:19	0 – 17	0	See Mod Matrix Table
	mod matrix 14 source 1	NRPN	2:20	0 – 12	0	See Mod Matrix Table
	mod matrix 14 source 2	NRPN	2:21	0 – 12	0	See Mod Matrix Table
	mod matrix 14 depth	NRPN	2:23	0 – 127 (-63 – 64)	64 (0)	
	mod matrix 14 destination	NRPN	2:24	0 – 17	0	See Mod Matrix Table
	mod matrix 15 source 1	NRPN	2:25	0 – 12	0	See Mod Matrix Table
	mod matrix 15 source 2	NRPN	2:27	0 – 12	0	See Mod Matrix Table
	mod matrix 15 depth	NRPN	2:28	0 – 127 (-63 – 64)	64 (0)	
	mod matrix 15 destination	NRPN	2:29	0 – 17	0	See Mod Matrix Table
	mod matrix 16 source 1	NRPN	2:30	0 – 12	0	See Mod Matrix Table
	mod matrix 16 source 2	NRPN	2:32	0 – 12	0	See Mod Matrix Table
	mod matrix 16 depth	NRPN	2:33	0 – 127 (-63 – 64)	64 (0)	
	mod matrix 16 destination	NRPN	2:34	0 – 17	0	See Mod Matrix Table
	mod matrix 17 source 1	NRPN	2:35	0 – 12	0	See Mod Matrix Table
	mod matrix 17 source 2	NRPN	2:37	0 – 12	0	See Mod Matrix Table
	mod matrix 17 depth	NRPN	2:38	0 – 127 (-63 – 64)	64 (0)	
	mod matrix 17 destination	NRPN	2:39	0 – 17	0	See Mod Matrix Table
	mod matrix 18 source 1	NRPN	2:40	0 – 12	0	See Mod Matrix Table
	mod matrix 18 source 2	NRPN	2:42	0 – 12	0	See Mod Matrix Table
	mod matrix 18 depth	NRPN	2:43	0 – 127 (-63 – 64)	64 (0)	
	mod matrix 18 destination	NRPN	2:44	0 – 17	0	See Mod Matrix Table
	mod matrix 19 source 1	NRPN	2:45	0 – 12	0	See Mod Matrix Table
	mod matrix 19 source 2	NRPN	2:47	0 – 12	0	See Mod Matrix Table
	mod matrix 19 depth	NRPN	2:48	0 – 127 (-63 – 64)	64 (0)	
	mod matrix 19 destination	NRPN	2:49	0 – 17	0	See Mod Matrix Table
	mod matrix 20 source 1	NRPN	2:50	0 – 12	0	See Mod Matrix Table
	mod matrix 20 source 2	NRPN	2:52	0 – 12	0	See Mod Matrix Table
	mod matrix 20 depth	NRPN	2:53	0 – 127 (-63 – 64)	64 (0)	
	mod matrix 20 destination	NRPN	2:54	0 – 17	0	See Mod Matrix Table
<b>Macro Knob</b>						
	macro knob 1 position	CC	80	0 – 127	0	
	macro knob 1 destination A	NRPN	3:0	0 – 70	0	
	macro knob 1 start position A	NRPN	3:1	0 – 127	0	
	macro knob 1 end position A	NRPN	3:2	0 – 127	127	
	macro knob 1 depth A	NRPN	3:3	0 – 127 (-64 – 63)	64 (0)	
	macro knob 1 destination B	NRPN	3:4	0 – 70	0	
	macro knob 1 start position B	NRPN	3:5	0 – 127	0	
	macro knob 1 end position B	NRPN	3:6	0 – 127	127	
	macro knob 1 depth B	NRPN	3:7	0 – 127 (-64 – 63)	64 (0)	
	macro knob 1 destination C	NRPN	3:8	0 – 70	0	
	macro knob 1 start position C	NRPN	3:9	0 – 127	0	
	macro knob 1 end position C	NRPN	3:10	0 – 127	127	
	macro knob 1 depth C	NRPN	3:11	0 – 127 (-64 – 63)	64 (0)	
	macro knob 1 destination D	NRPN	3:12	0 – 70	0	
	macro knob 1 start position D	NRPN	3:13	0 – 127	0	
	macro knob 1 end position D	NRPN	3:14	0 – 127	127	
	macro knob 1 depth D	NRPN	3:15	0 – 127 (-64 – 63)	64 (0)	
	macro knob 2 position	CC	81	0 – 127	0	
	macro knob 2 destination A	NRPN	3:16	0 – 70	0	
	macro knob 2 start position A	NRPN	3:17	0 – 127	0	
	macro knob 2 end position A	NRPN	3:18	0 – 127	127	
	macro knob 2 depth A	NRPN	3:19	0 – 127 (-64 – 63)	64 (0)	
	macro knob 2 destination B	NRPN	3:20	0 – 70	0	
	macro knob 2 start position B	NRPN	3:21	0 – 127	0	
	macro knob 2 end position B	NRPN	3:22	0 – 127	127	
	macro knob 2 depth B	NRPN	3:23	0 – 127 (-64 – 63)	64 (0)	
	macro knob 2 destination C	NRPN	3:24	0 – 70	0	
	macro knob 2 start position C	NRPN	3:25	0 – 127	0	
	macro knob 2 end position C	NRPN	3:26	0 – 127	127	
	macro knob 2 depth C	NRPN	3:27	0 – 127 (-64 – 63)	64 (0)	

macro knob 2 destination D	NRPN	3:28	0 – 70	0	
macro knob 2 start position D	NRPN	3:29	0 – 127	0	
macro knob 2 end position D	NRPN	3:30	0 – 127	127	
macro knob 2 depth D	NRPN	3:31	0 – 127 (-64 – 63)	64 (0)	
macro knob 3 position	CC	82	0 – 127	0	
macro knob 3 destination A	NRPN	3:32	0 – 70	0	
macro knob 3 start position A	NRPN	3:33	0 – 127	0	
macro knob 3 end position A	NRPN	3:34	0 – 127	127	
macro knob 3 depth A	NRPN	3:35	0 – 127 (-64 – 63)	64 (0)	
macro knob 3 destination B	NRPN	3:36	0 – 70	0	
macro knob 3 start position B	NRPN	3:37	0 – 127	0	
macro knob 3 end position B	NRPN	3:38	0 – 127	127	
macro knob 3 depth B	NRPN	3:39	0 – 127 (-64 – 63)	64 (0)	
macro knob 3 destination C	NRPN	3:40	0 – 70	0	
macro knob 3 start position C	NRPN	3:41	0 – 127	0	
macro knob 3 end position C	NRPN	3:42	0 – 127	127	
macro knob 3 depth C	NRPN	3:43	0 – 127 (-64 – 63)	64 (0)	
macro knob 3 destination D	NRPN	3:44	0 – 70	0	
macro knob 3 start position D	NRPN	3:45	0 – 127	0	
macro knob 3 end position D	NRPN	3:46	0 – 127	127	
macro knob 3 depth D	NRPN	3:47	0 – 127 (-64 – 63)	64 (0)	
macro knob 4 position	CC	83	0 – 127	0	
macro knob 4 destination A	NRPN	3:48	0 – 70	0	
macro knob 4 start position A	NRPN	3:49	0 – 127	0	
macro knob 4 end position A	NRPN	3:50	0 – 127	127	
macro knob 4 depth A	NRPN	3:51	0 – 127 (-64 – 63)	64 (0)	
macro knob 4 destination B	NRPN	3:52	0 – 70	0	
macro knob 4 start position B	NRPN	3:53	0 – 127	0	
macro knob 4 end position B	NRPN	3:54	0 – 127	127	
macro knob 4 depth B	NRPN	3:55	0 – 127 (-64 – 63)	64 (0)	
macro knob 4 destination C	NRPN	3:56	0 – 70	0	
macro knob 4 start position C	NRPN	3:57	0 – 127	0	
macro knob 4 end position C	NRPN	3:58	0 – 127	127	
macro knob 4 depth C	NRPN	3:59	0 – 127 (-64 – 63)	64 (0)	
macro knob 4 destination D	NRPN	3:60	0 – 70	0	
macro knob 4 start position D	NRPN	3:61	0 – 127	0	
macro knob 4 end position D	NRPN	3:62	0 – 127	127	
macro knob 4 depth D	NRPN	3:63	0 – 127 (-64 – 63)	64 (0)	
macro knob 5 position	CC	84	0 – 127	0	
macro knob 5 destination A	NRPN	3:64	0 – 70	0	
macro knob 5 start position A	NRPN	3:65	0 – 127	0	
macro knob 5 end position A	NRPN	3:66	0 – 127	127	
macro knob 5 depth A	NRPN	3:67	0 – 127 (-64 – 63)	64 (0)	
macro knob 5 destination B	NRPN	3:68	0 – 70	0	
macro knob 5 start position B	NRPN	3:69	0 – 127	0	
macro knob 5 end position B	NRPN	3:70	0 – 127	127	
macro knob 5 depth B	NRPN	3:71	0 – 127 (-64 – 63)	64 (0)	
macro knob 5 destination C	NRPN	3:72	0 – 70	0	
macro knob 5 start position C	NRPN	3:73	0 – 127	0	
macro knob 5 end position C	NRPN	3:74	0 – 127	127	
macro knob 5 depth C	NRPN	3:75	0 – 127 (-64 – 63)	64 (0)	
macro knob 5 destination D	NRPN	3:76	0 – 70	0	
macro knob 5 start position D	NRPN	3:77	0 – 127	0	
macro knob 5 end position D	NRPN	3:78	0 – 127	127	
macro knob 5 depth D	NRPN	3:79	0 – 127 (-64 – 63)	64 (0)	
macro knob 6 position	CC	85	0 – 127	0	
macro knob 6 destination A	NRPN	3:80	0 – 70	0	
macro knob 6 start position A	NRPN	3:81	0 – 127	0	
macro knob 6 end position A	NRPN	3:82	0 – 127	127	
macro knob 6 depth A	NRPN	3:83	0 – 127 (-64 – 63)	64 (0)	
macro knob 6 destination B	NRPN	3:84	0 – 70	0	
macro knob 6 start position B	NRPN	3:85	0 – 127	0	
macro knob 6 end position B	NRPN	3:86	0 – 127	127	
macro knob 6 depth B	NRPN	3:87	0 – 127 (-64 – 63)	64 (0)	
macro knob 6 destination C	NRPN	3:88	0 – 70	0	
macro knob 6 start position C	NRPN	3:89	0 – 127	0	
macro knob 6 end position C	NRPN	3:90	0 – 127	127	
macro knob 6 depth C	NRPN	3:91	0 – 127 (-64 – 63)	64 (0)	
macro knob 6 destination D	NRPN	3:92	0 – 70	0	
macro knob 6 start position D	NRPN	3:93	0 – 127	0	
macro knob 6 end position D	NRPN	3:94	0 – 127	127	
macro knob 6 depth D	NRPN	3:95	0 – 127 (-64 – 63)	64 (0)	
macro knob 7 position	CC	86	0 – 127	0	

	macro knob 7 destination A	NRPN	3:96	0 – 70	0	
	macro knob 7 start position A	NRPN	3:97	0 – 127	0	
	macro knob 7 end position A	NRPN	3:98	0 – 127	127	
	macro knob 7 depth A	NRPN	3:99	0 – 127 (-64 – 63)	64 (0)	
	macro knob 7 destination B	NRPN	3:100	0 – 70	0	
	macro knob 7 start position B	NRPN	3:101	0 – 127	0	
	macro knob 7 end position B	NRPN	3:102	0 – 127	127	
	macro knob 7 depth B	NRPN	3:103	0 – 127 (-64 – 63)	64 (0)	
	macro knob 7 destination C	NRPN	3:104	0 – 70	0	
	macro knob 7 start position C	NRPN	3:105	0 – 127	0	
	macro knob 7 end position C	NRPN	3:106	0 – 127	127	
	macro knob 7 depth C	NRPN	3:107	0 – 127 (-64 – 63)	64 (0)	
	macro knob 7 destination D	NRPN	3:108	0 – 70	0	
	macro knob 7 start position D	NRPN	3:109	0 – 127	0	
	macro knob 7 end position D	NRPN	3:110	0 – 127	127	
	macro knob 7 depth D	NRPN	3:111	0 – 127 (-64 – 63)	64 (0)	
	macro knob 8 position	CC	87	0 – 127	0	
	macro knob 8 destination A	NRPN	3:112	0 – 70	0	
	macro knob 8 start position A	NRPN	3:113	0 – 127	0	
	macro knob 8 end position A	NRPN	3:114	0 – 127	127	
	macro knob 8 depth A	NRPN	3:115	0 – 127 (-64 – 63)	64 (0)	
	macro knob 8 destination B	NRPN	3:116	0 – 70	0	
	macro knob 8 start position B	NRPN	3:117	0 – 127	0	
	macro knob 8 end position B	NRPN	3:118	0 – 127	127	
	macro knob 8 depth B	NRPN	3:119	0 – 127 (-64 – 63)	64 (0)	
	macro knob 8 destination C	NRPN	3:120	0 – 70	0	
	macro knob 8 start position C	NRPN	3:121	0 – 127	0	
	macro knob 8 end position C	NRPN	3:122	0 – 127	127	
	macro knob 8 depth C	NRPN	3:123	0 – 127 (-64 – 63)	64 (0)	
	macro knob 8 destination D	NRPN	3:124	0 – 70	0	
	macro knob 8 start position D	NRPN	3:125	0 – 127	0	
	macro knob 8 end position D	NRPN	3:126	0 – 127	127	
	macro knob 8 depth D	NRPN	3:127	0 – 127 (-64 – 63)	64 (0)	

### Filter Table

Value	Type
Drive Type	
0	diode
1	valve
2	clipper
3	cross-over
4	rectifier
5	bit reducer
6	rate reducer
Type	
0	low pass 12dB
1	low pass 24dB
2	band pass 6/6 dB
3	band pass 12/12 dB
4	high pass 12dB
5	high pass 24dB

### Distortion Table

Value	Type
0	diode
1	valve
2	clipper
3	cross-over
4	rectify
5	bit reducer
6	rate reducer

### Mod Matrix Table

Value	Type
Source	
0	direct
1	modulation wheel
2	after touch
3	expression
4	velocity
5	keyboard
6	LFO 1 +
7	LFO 1 +/-
8	LFO 2 +
9	LFO 2 +/-
10	env amp
11	env filter
12	env 3
Destination	
0	osc 1 pitch
1	osc 1 pitch
2	osc 2 pitch
3	osc 1 v-sync
4	osc 2 v-sync
5	osc 1 pulse width
6	osc 2 pulse width
7	osc 1 level
8	osc 2 level
9	noise level
10	ring modulation 1*2 level
11	drive amount
12	frequency
13	resonance
14	LFO 1 rate
15	LFO 2 rate
16	amp envelope decay
17	mod envelope decay

### OSC Waveform Table

Value	Type
Waveforms	
0	sine
1	triangle
2	sawtooth
3	saw 9:1 PW
4	saw 8:2 PW
5	saw 7:3 PW
6	saw 6:4 PW
7	saw 5:5 PW
8	saw 4:6 PW
9	saw 3:7 PW
10	saw 2:8 PW
11	saw 1:9 PW
12	pulse width
13	square
Wavetables	
14	sine table
15	analogue pulse
16	analogue sync
17	triangle-saw blend
18	digital nasty 1
19	digital nasty 2
20	digital saw-square
21	digital vocal 1
22	digital vocal 2
23	digital vocal 3
24	digital vocal 4
25	digital vocal 5
26	digital vocal 6
27	random collection 1
28	random collection 2
29	random collection 3

### Patch and Session Select

MIDI Channel	Parameter	Value	Notes
1	PGM*	0 – 63	select synth 1 patch
2	PGM	0 – 63	select synth 2 patch
16	PGM	0 – 31	select session (instant)
16	PGM	64 – 95	select session (queued)

\*PGM = Program Change

Note, for drum patch selection see Drum Control table

### LFO Waveform Table

Value	Type
0	sine
1	triangle
2	sawtooth
3	square
4	random S/H
5	time S/H
6	piano envelope
7	sequence 1
8	sequence 2
9	sequence 3
10	sequence 4
11	sequence 5
12	sequence 6
13	sequence 7
14	alternative 1
15	alternative 2
16	alternative 3
17	alternative 4
18	alternative 5
19	alternative 6
20	alternative 7
21	alternative 8
22	chromatic
23	chromatic 16
24	major
25	major 7
26	minor 7
27	min arp 1
28	min arp 2
29	diminished
30	dec minor
31	minor 3rd
32	pedal
33	4ths
34	4ths x12
35	1625 maj
36	1625 Min
37	2511

### Supported Realtime Messages

Message
start
stop
continue
timing clock

### Supported System Common Messages

Message
song position pointer
song select

## Drum Control

(messages on MIDI Channel 10)

Parameter	CC / NRPN	Control No.	Range	Default Value	Notes
drum 1 patch select	CC	8	0 – 63	0	
drum 1 level	CC	12	0 – 127	0	
drum 1 pitch	CC	14	0 – 127 (-63 – 64)	64 (0)	
drum 1 decay	CC	15	0 – 127	0	
drum 1 distortion	CC	16	0 – 127	0	
drum 1 EQ	CC	17	0 – 127 (-63 – 64)	64 (0)	
drum 2 patch select	CC	18	0 – 63	0	
drum 2 level	CC	23	0 – 127	0	
drum 2 pitch	CC	34	0 – 127 (-63 – 64)	64 (0)	
drum 2 decay	CC	40	0 – 127	0	
drum 2 distortion	CC	42	0 – 127	0	
drum 2 EQ	CC	43	0 – 127 (-63 – 64)	64 (0)	
drum 3 patch select	CC	44	0 – 63	0	
drum 3 level	CC	45	0 – 127	0	
drum 3 pitch	CC	46	0 – 127 (-63 – 64)	64 (0)	
drum 3 decay	CC	47	0 – 127	0	
drum 3 distortion	CC	48	0 – 127	0	
drum 3 EQ	CC	49	0 – 127 (-63 – 64)	64 (0)	
drum 4 patch select	CC	50	0 – 63	0	
drum 4 level	CC	53	0 – 127	0	
drum 4 pitch	CC	55	0 – 127 (-63 – 64)	64 (0)	
drum 4 decay	CC	57	0 – 127	0	
drum 4 distortion	CC	61	0 – 127	0	
drum 4 EQ	CC	76	0 – 127 (-63 – 64)	64 (0)	

## Session Control

(Send messages on MIDI Channel 16)

Section	Parameter	CC / NRPN	Control No.	Range	Default Value	Notes
<b>Reverb</b>						
	synth 1 send level	CC	88	0 – 127	0	
	synth 2 send level	CC	89	0 – 127	0	
	drum 1 send level	CC	90	0 – 127	0	
	drum 2 send level	CC	106	0 – 127	0	
	drum 3 send level	CC	109	0 – 127	0	
	drum 4 send level	CC	110	0 – 127	0	
	type	NRPN	1:18	0 – 5	2	0=Chamber, 1=Small Room, 2=Large Room 3=Small Hall, 4=Large Hall, 5=Great Hall
	decay	NRPN	1:19	0 – 127	64	
	damping	NRPN	1:20	0 – 127	64	
<b>Delay</b>						
	synth 1 send level	CC	111	0 – 127	0	
	synth 2 send level	CC	112	0 – 127	0	
	drum 1 send level	CC	113	0 – 127	0	
	drum 2 send level	CC	114	0 – 127	0	
	drum 3 send level	CC	115	0 – 127	0	
	drum 4 send level	CC	116	0 – 127	0	
	time	NRPN	1:6	0 – 127	64	
	time sync	NRPN	1:7	0 – 35	20	
	feedback	NRPN	1:8	0 – 127	64	
	width	NRPN	1:9	0 – 127	127	
	left-right ratio	NRPN	1:10	0 – 12	4	0=1:1, 1=4:3, 2=3:4, 3=3:2, 4=2:3, 5=2:1, 6=1:2 7=3:1, 8=1:3, 9=4:1, 10=1:4, 11=1:OFF, 12=OFF:1
	slew rate	NRPN	1:11	0 – 127	5	
<b>Master Filter</b>						
	frequency	CC	74	0 – 127 (-63 – 64)	64 (0)	0=63=Low Pass, 64=OFF, 65=127=High Pass
	resonance	CC	71	0 – 127	30	
<b>Sidechain</b>						
	synth 1 source	NRPN	2:55	0 – 4	0	0=Drum 1, 1=Drum 2, 2=Drum 3, 3=Drum 4, 4=OFF
	synth 1 attack	NRPN	2:56	0 – 127	0	
	synth 1 hold	NRPN	2:57	0 – 127	50	
	synth 1 decay	NRPN	2:58	0 – 127	70	
	synth 1 depth	NRPN	2:59	0 – 127	0	
	synth 2 source	NRPN	2:65	0 – 4	0	0=Drum 1, 1=Drum 2, 2=Drum 3, 3=Drum 4, 4=OFF
	synth 2 attack	NRPN	2:66	0 – 127	0	
	synth 2 hold	NRPN	2:67	0 – 127	50	
	synth 2 decay	NRPN	2:68	0 – 127	70	
	synth 2 depth	NRPN	1:69	0 – 127	0	
<b>Mixer</b>						
	synth 1 level	CC	12	0 – 127	100	
	synth 2 level	CC	14	0 – 127	100	