

Version OS 1.0



# Mod FM

EURORACK FM SYNTHESIZER

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# 1 MIDI Implementation

## 1.1 Midi Note Commands

### 1.1.1 Single Mode

The note number is added to the pitch of the voice. The basic internal tuning is on note C1 (36) and is added from there on to the internal pitch.

Instrument	Note Number	Note	Channel
FM Synth (max. 8 voices polyph.)	36-97	C1-C6	1..16

### 1.1.2 Multi Mode

In Split Mode 0, the ModFM offers a key mapping for all Multi instruments. Each Multi maps 4 notes on the keyboard. The 4 notes play the octaves of C1.

Instrument	Note Number	Key note	Play note	Channel
Multi 1	36-39	C1-D#1	C1, C2, C3, C3	1..16
Multi 2	40-43	E1-G1	C1, C2, C3, C3	1..16
Multi 3	44-47	G#1-B1	C1, C2, C3, C3	1..16
Multi 4	48-51	C2-D#2	C1, C2, C3, C3	1..16
Multi 5	52-55	E2-G2	C1, C2, C3, C3	1..16
Multi 6	56-59	G#2-B2	C1, C2, C3, C3	1..16
Multi 7	60-63	C3-D#3	C1, C2, C3, C3	1..16
Multi 8	64-67	E3-G3	C1, C2, C3, C3	1..16
Multi 1	68-71	G#3-B3	C1, C2, C3, C3	1..16
Multi 2	72-75	C4-D#4	C1, C2, C3, C3	1..16
Multi 3	76-79	E4-G4	C1, C2, C3, C3	1..16
Multi 4	80-83	G#4-B4	C1, C2, C3, C3	1..16
Multi 5	84-87	C5-D#5	C1, C2, C3, C3	1..16
Multi 6	88-91	E5-G5	C1, C2, C3, C3	1..16
Multi 7	92-95	G#5-B5	C1, C2, C3, C3	1..16
Multi 8	96-101	C6-D#6	C1, C2, C3, C3	1..16

In Split Mode 1, each Multi voice plays on an own channel.

<b>Instrument</b>	<b>Note Number</b>	<b>Note</b>	<b>Channel</b>
Multi voice 1-8	36-97	C1-C6	1..8 = Multi voice

## 1.2 Program Change

<b>Function</b>	<b>Value</b>	<b>Channel</b>
Single Preset recall	0-127	1..16
Multi Set recall	0-118	1..16

## 1.3 Sound Parameter (Continuous Controllers)

Midi CH 1-15

<b>FM Synth Engine</b>	<b>Controller No.</b>	<b>Value range</b>
OP Cents	96	0-100
OP1 Tune	100	0-127
OP2 Tune	101	0-127
OP3 Tune	102	0-127
OP4 Tune	103	0-127
FM Amount 1→2	104	0-127
FM Amount 1→3	105	0-127
FM Amount 1→4	106	0-127
FM Amount 2→1	107	0-127
FM Amount 2→3	108	0-127
FM Amount 2→4	109	0-127
FM Amount 3→1	110	0-127
FM Amount 3→2	111	0-127
FM Amount 3→4	112	0-127
FM Amount 4→1	113	0-127
FM Amount 4→2	114	0-127

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FM Amount 4→3	115	0-127
OP1 Env Attack	14	0-127
OP2 Env Attack	15	0-127
OP3 Env Attack	16	0-127
OP4 Env Attack	17	0-127
OP1 Env Decay	18	0-127
OP2 Env Decay	19	0-127
OP3 Env Decay	20	0-127
OP4 Env Decay	21	0-127
OP1 Env Sustain	34	0-127
OP2 Env Sustain	35	0-127
OP3 Env Sustain	36	0-127
OP4 Env Sustain	37	0-127
OP1 Env Release	38	0-127
OP2 Env Release	39	0-127
OP3 Env Release	40	0-127
OP4 Env Release	41	0-127
OP1 EG→VCA Amount	22	0-127
OP2 EG→VCA Amount	23	0-127
OP3 EG→VCA Amount	24	0-127
OP4 EG→VCA Amount	25	0-127
OP1 EG→FM Amount	26	0-127
OP2 EG→FM Amount	27	0-127
OP3 EG→FM Amount	28	0-127
OP4 EG→FM Amount	29	0-127
OP1 LFO1→FM Amount	70	0-127
OP2 LFO1→FM Amount	71	0-127
OP3 LFO1→FM Amount	72	0-127
OP4 LFO1→FM Amount	73	0-127
OP1 LFO2→AM Amount	74	0-127
OP2 LFO2→AM Amount	75	0-127
OP3 LFO2→AM Amount	76	0-127
OP4 LFO2→AM Amount	77	0-127
LFO1→MIX Volume	78	0-127
LFO2→MIX Volume	79	0-127
LFO1 Rate	80	0-127
LFO2 Rate	81	0-127
LFO1 Waveform	82	0-63
LFO2 Waveform	83	0-63

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LFO1 VCO Oct	84	0-6
LFO2 VCO Oct	85	0-6
LFO1 VCO Mode	86	0:LFO, 1:VCO
LFO1 VCO Mode	87	0:LFO, 1:VCO
MULTI Target	33	0-7
ALGORITHM select	42	0-26
OVERTONE Mode	67	0-5
STORE Preset	62	64
Volume	7	0-127

<b>Filter Engine</b>	<b>Controller No.</b>	<b>Value range</b>
FIL Cutoff	43	0-127
FIL Resonance	44	0-127
FIL Shape LP/BP/HP	45	0-127
FIL Env Amt	46	0-127
FIL Env Attack	47	0-127
FIL Env Decay	48	0-127
FIL Env Sustain	49	0-127
FIL Env Release	50	0-127
FIL LFO Rate	69	0-127
FIL LFO Waveform	52	0-127
FIL LFO Intensity	53	0-127
FIL TP24 Mix Vol	66	0-127
FIL MM12 Mix Vol	57	0-127
FIL Key Track	55	0-127
FIL Noise Mix Vol	56	0-127
FIL Noise Metal	58	0-127 0:Off, 1:White

## 1.4 Global Controllers on Channel 16

<b>FX Reverb</b>	<b>Controller No.</b>	<b>Value range</b>
Room Size	100	0-127
Low Pass Reflections	101	0-127
Hi Pass Reflections	102	0-127
Reverb Level	103	0-127

<b>FX Delay</b>	<b>Controller No.</b>	<b>Value range</b>
Delay1 Time	14	0-127
Delay1 Feedback	15	0-127
Delay1 Slow/Medi/Fast	17	0-2
Delay1 Level	18	0-127
Delay2 Time	19	0-127
Delay2 Feedback	20	0-127
Delay2 Slow/Medi/Fast	21	0-2
Delay2 Level	22	0-127

## 1.5 Sysex Commands

### Single Preset bulk dump

\$F0(SysEx begin), \$31(JoMoX-manufact. code), \$3F(Command Sys Ex dump), \$68(Product code), \$01(Single Preset),\$55, XX(Data0),XX(Data1),..., \$F7(End of SysEx)

### All Preset bulk dump

\$F0(SysEx begin), \$31(JoMoX-manufact. code), \$3F(Command Sys Ex dump), \$68(Product code), \$02(All Presets),\$55, XX(Data0),XX(Data1),..., \$F7(End of SysEx)

### Single Multi bulk dump

\$F0(SysEx begin), \$31(JoMoX-manufact. code), \$3F(Command Sys Ex dump), \$68(Product code), \$03(Single Multi),\$55, XX(Data0),XX(Data1),..., \$F7(End of SysEx)

### All Multi bulk dump

\$F0(SysEx begin), \$31(JoMoX-manufact. code), \$3F(Command Sys Ex dump), \$68(Product code), \$04(All Multis),\$55, XX(Data0),XX(Data1),..., \$F7(End of SysEx)

### OS bulk dump

\$F0(SysEx begin), \$31(JoMoX-manufact. code), \$7F(Command Sys Ex dump), \$68(Product code), \$10(CodeUpdate),\$55, \$00(14 Bit Block ID HB), \$00(14 Bit Block ID LB), \$77, XX(Data0),XX(Data1),..., \$F7(End of SysEx)

### OS Filter Engine bulk dump

\$F0(SysEx begin), \$31(JoMoX-manufact. code), \$7F(Command Sys Ex dump), \$68(Product code), \$11(SlaveUpdate),\$55, \$00(14 Bit Block ID HB), \$00(14 Bit Block ID LB), \$77, XX(Data0),XX(Data1),..., \$F7(End of SysEx)



## 2 Specifications

- 8 voices fully multi timbral FM synth
- 4 operators per voice
- Full modulation matrix / 26 algorithms
- 2 LFO/VCOs per voice
- CV/Gate per voice
- CV modulation inputs per operator
- Outputs for each voice plus mix out
- True audio FM modulation inputs
- True analog filters per voice
- 24db low pass
- 12dB multimode LP/BP/HP cont. shape
- True analog VCAs per voice
- Midi TRS type A
- USB C device
- Digital reverb, 2x stereo delay
- Full storeability, also CV amounts
- 128 presets, 118 multi sets
- 2x 128x64px OLED displays

### **Power consumption:**

+12V: 370mA max.

-12V: 170mA max.

Total power: 6,5W

### **Dimension:**

Size: 56 HP = 284mm

Height: 3 RU = 129mm

Depth: 40mm

Service, updates, tips and tricks

are available at:

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We hope that you'd have lots of entertainment, joy and timeless awareness with our products.

Any feedback you might have is very welcome!

Cheers,  
Jürgen Michaelis

Berlin, 2023

Editors: Jürgen Michaelis