TEO-5 MIDI Implementation

The TEO-5 receives MIDI data according to the settings you have chosen in GLOBALS. In addition, there is interaction between some of the program parameters that determine the overall response of TEO-5 to MIDI data. These are the GLOBALS parameters that affect response to MIDI:

MIDI Channel: All, 1…16—Selects which MIDI channel to send and receive data, 1 to 16. All receives on all 16 channels.

MIDI Clock Mode: Sets the TEO-5's ability to send and receive MIDI clock messages:

- Off: MIDI Clock is neither sent nor received
- Out: MIDI Clock + Start and Stop are sent
- Out No S/S (No Start and Stop): Sends MIDI clock, but no Start or Stop Commands
- In: MIDI Clock is received
- In/Thru: MIDI Clock is received and routed to Thru jack
- In No S/S: Receives MIDI Clock but does not respond to MIDI Start or Stop command.

When set to IN or IN/THRU, if no MIDI clock is present at the selected input, the arpeggiator and sequencer will not function.

MIDI Clock Cable In: MIDI, USB—Sets the port, MIDI or USB, by which MIDI clock signals are received.

MIDI Clock Cable Out: None, MIDI, USB, All—Sets the port, MIDI, USB, or both, by which MIDI clock signals are sent.

MIDI Param Send: Off, CC, NRPN—Changes to the values of front panel controls are transmitted via MIDI as Continuous Controllers (CC) or Non-Registered Parameter Number (NRPN). Transmission of parameters can also be turned off.

MIDI Param Receive: Off, CC, NRPN—Sets the method by which parameter changes are received via MIDI. As with transmission, NRPNs are the preferred method.

MIDI Control: Off, On—When set to On, the synth will respond to MIDI controllers, including pitch wheel, mod wheel, pedal, and volume.

MIDI Sysex On: Off, On—When set to On, the synth will respond to MIDI controllers, including pitch wheel, mod wheel, pedal, and volume.

MIDI SysEx Cable: MIDI, USB—When set to MIDI it will receive and transmit MIDI SysEx messages using the MIDI ports/cables When set to USB it will receive and transmit MIDI SysEx messages using the USB port/cable. MIDI SysEx messages are used when sending and receiving a variety of data including, programs, alternative tunings, system updates, and more.

MIDI Out Select: Off, MIDI, USB, All—Sets the port by which MIDI data will be transmitted.

MIDI Prog Send: Off, On—When set to On, the synth will send MIDI Program Change messages.

MIDI Prog Receive: Off, On—When set to On, the synth will respond to MIDI Program Change messages.

MIDI Messages

System Real-Time Messages

Status	Description
1111 1000	MIDI Timing Clock

Received Channel Messages

Status	Second	Third	Description
1000 nnnn	0kkkkkkk	0vvvvvvv	Note Off. Velocity is ignored
1001 nnnn	0kkkkkkk	0vvvvvvv	Note On. Note off if vvvvvvv = 0
1010 nnnn	0kkkkkkk	0vvvvvvv	Polyphonic Key Pressure
1011 nnnn	0vvvvvvv	0vvvvvvv	Control Change; see “Received Controller Messages”
1100 nnnn	0ppppppp		Program change, 0-127 for Programs 1-127 within current Bank
1101 nnnn	0vvvvvvv		Channel Pressure
1110 nnnn	0vvvvvvv	0vvvvvvv	Pitch Bend LS Byte then MS Byte

Notes: 0kkkkkkk Note number 0-127
nnnn Channel number 0 to 15 (MIDI channel 1-16). Ignored if MIDI channel set to ALL
0vvvvvvv Value

Received Controller Messages

Status	Second	Third	Description
1011 nnnn	0000 0001	0vvvvvvv	Mod Wheel: directly assignable controller
1011 nnnn	0000 0100	0vvvvvvv	Foot Controller: directly assignable controller
1011 nnnn	0000 0111	0vvvvvvv	Volume: Combined with Master Volume and Program Volume
1011 nnnn	0100 1010	0vvvvvvv	Brightness: Offset added to filter cutoff frequency
1011 nnnn	0010 0000	0vvvvvvv	Bank Select: 1 - 4 select user banks 1 - 4; 5 - 8 select factory banks 1 - 4; 9 - 12 select add-on banks 1 - 4 others ignored
1011 nnnn	0100 0000	0vvvvvvv	Damper pedal: Holds envelopes in Sustain if 0100 0000 or higher
1011 nnnn	0111 1011	0vvvvvvv	All Notes Off: Clear all MIDI notes
1011 nnnn	0111 1001	0vvvvvvv	Reset All Controllers: Clears all MIDI controllers to 0, MIDI volume to maximum

See subsequent sections for additional Continuous Controller (CC) and Non-Registered Parameter Number (NRPN) messages received.

Transmitted Channel Messages

Status	Second	Third	Description
1000 nnnn	0kkkkkkk	0000000	Note Off.
1001 nnnn	0kkkkkkk	0vvvvvvv	Note On.
1011 nnnn	0vvvvvvv	0vvvvvvv	Control Change; see “Transmitted Controller Messages”
1100 nnnn	0ppppppp		Program change, 0-127 for Programs 00-128 within current Bank
1101 nnnn	0vvvvvvv		Channel Pressure
1110 nnnn	0vvvvvvv	0vvvvvvv	Pitch Bend LS Byte then MS Byte

Notes: 0kkkkkkk Note number 0 — 127
nnnn Channel number 0 to 15 (MIDI channel 1-16). Ignored if MIDI channel set to ALL
0vvvvvvv Value

Transmitted Controller Messages

Status	Second	Third	Description
1011 nnnn	0000 0001	0vvvvvvv	Mod Wheel
1011 nnnn	0000 0010	0vvvvvvv	Breath Controller: When assigned to Pedal/CV
1011 nnnn	0000 0100	0vvvvvvv	Foot Controller: When assigned to Pedal/CV
1011 nnnn	0000 1101	0vvvvvvv	Expression: When assigned to Pedal/CV
1011 nnnn	0000 0111	0vvvvvvv	Volume: When assigned to Pedal/CV
1011 nnnn	0100 1010	0vvvvvvv	Brightness: Assigned to Pedal/CV
1011 nnnn	0010 0000	0vvvvvvv	Bank Select: 0 – 9
1011 nnnn	0100 0000	0vvvvvvv	Damper pedal: Sends 0 if off, 0111 1111 when on
1011 nnnn	0000 0111	0vvvvvvv	Volume knob

See sections that follow for additional Continuous Controller (CC) and Non-Registered Parameter Number (NRPN) messages transmitted.

Additional Continuous Controllers Transmitted/Received

The following table details how MIDI Continuous Controllers (CCs) are mapped to Pro 3 controls. They are transmitted when MIDI Param Send is set to CC, and recognized/received when MIDI Param Receive is set to CC.

CC#	Param	Range
0	Bank Select MSB	0-15
1	Mod Wheel	0-127
2	Breath Controller	0-127
3	BPM	15-127
4	Foot Controller	0-127
5	Glide Mode (Porta-mento Time)	0-3
6	Data Entry MSB	
7	Master Volume	0-127
8	Osc 1 Freq	0-63
9	Osc 1 On	0-1
10	Osc 2 On	0-1
11	Expression	0-127
12	Voice Volume	0-127
13	Osc 2 Freq	0-63
14	Sub On	0-1
15	Noise On	0-1
16	FX On/Off	0-1
17	FX Select	0-12
18	FX Time	0-127
19	FX Mix	0-127
20	FX Misc	0-127
21	FX Sync On/Off	0-1
22	FX Sync Rate	0-10
23	Reverb On	0-1
24	Reverb Mix	0-127
25	Reverb Size	0-127
26	Reverb PreDelay	0-127
27	Reverb Decay	0-127
28	Reverb Tone	0-127
29	Key Split	0-1
30	Key Split 2	0-1

CC#	Param	Range
31	Unison On	0-1
32	Bank Select LSB	
33	Filter Cutoff	0-127
34	Filter Resonance	0-127
35	Filter State	0-127
36	Filter Key Amt	0-127
37	Vintage Amt	0-127
38	Data Entry LSB	
39	Osc 1 Sync	0-1
40	Osc 1 Level	0-127
41	Osc 2 Level	0-127
42	Sub Level	0-127
43	Noise Level	0-127
44	X-Mod Amt	0-127
45	Env 1 Delay	0-127
46	Env 1 Attack	0-127
47	Env 1 Decay	0-127
48	Env 1 Sustain	0-127
49	Env 1 Release	0-127
50	Env 1 Amount	0-127
51	Env 1 Vel On	0-1
52	Env 2 Delay	0-127
53	Env 2 Attack	0-127
54	Env 2 Decay	0-127
55	Env 2 Sustain	0-127
56	Env 2 Release	0-127
57	Env 2 Amount	0-127
58	Env 2 Vel On	0-1
59	Arp. On	0-1
60	Arp. Mode	0-4
61	Arp. Range	0-2
62	Arp Repeat	0-3

CC#	Param	Range
63	Clock Divide	0-7
64	Sustain Pedal	0-127
65	Osc 1 Glide	0-127
66	Osc 2 Glide	0-127
67	Distortion	0-127
68	Glide On	0-1
69	Env Rout	0-2
70	Unison Voices	0-5
71	Unison Detune	0-7
72	Key Mode	0-2
73	Env Retrig	0-1
74	Brightness	0-127
75	LFO 1 Freq	0-127
76	LFO 1 Amt	0-127
77	LFO 1 Shape	0-4
78	LFO 1 Sync	0-1
79	LFO 1 Note Reset	0-1
80	LFO 2 Freq	0-127
81	LFO 2 Amt	0-127
82	LFO 2 Shape	0-4
83	LFO 2 Sync	0-1
84	LFO 2 Note Reset	0-1
85	PBend Range Up	0-12
86	PBend Range Dn	0-24
87	Osc 1 Key On	0-1
88	Osc 2 Key On	0-1
89	KeySplit Note	0-43
90	Seq On/Off	0-1
91	Seq Rec Arm	0-1
92	LFO 1 Slew	0-127
93	LFO 2 Slew	0-127
94	Osc 1 PW	0-127

CC#	Param	Range
95	Osc 2 PW	0-127
96	Data Inc	
97	Data Dec	
98	NRPN Param LSB	
99	NRPN Param MSB	
100	RPN Param LSB	
101	RPN Param MSB	
102	Osc 1 Tri	0-1
103	Osc 2 Tri	0-1
104	Osc 1 Saw	0-1
105	Osc 2 Saw	0-1
106	Osc 1 Pulse	0-1
107	Osc 2 Pulse	0-1
108	Noise Type	0-1
109	Osc 2 Detune	0-63
110	Filter Bandpass	0-1
111	LFO 1 Freq Sync	0-15
112	LFO 2 Freq Sync	0-15
113	Pan	0-127
114	Scale Select	0-65
115	Transpose	0-4
116	Env Repeat	0-3
117	Osc 2 Filter Bypass	0-1
118	Unassigned	
119	Unassigned	
120	All Sound Off	
121	Reset Controllers	
122	Local Control On/Off	
123	All Notes Off	
124	Omni Mode Off	
125	Omni Mode On	
126	Mono Mode On	
127	Poly Mode On	

NRPN Messages

The Non-Registered Parameter Number (NRPN) MIDI messages are used to transmit and receive both global and program parameters. They are transmitted when MIDI Parameter Send is set to NRPN in GLOBALS, and received when MIDI Parameter Receive is set to NRPN in GLOBALS.

The messages are handled in standard MIDI format using the NRPN CC commands in running status byte format. Below is the format used for transmitting a NRPN parameter.

Transmitted NRPN Messages

Status	Description
1011 nnnn	Control Change
0110 0011	NRPN parameter number MSB CC
0vvv vvvv	Parameter Number MSB
0110 0010	NRPN parameter number LSB CC
0vvv vvvv	Parameter Number LSB
0000 0110	NRPN parameter value MSB CC
0vvv vvvv	Parameter value MSB
0010 0110	NRPN parameter value LSB CC
0vvv vvvv	Parameter value LSB

The parameter number can be found in the two tables below, one for global parameters, and the other for program parameters. The parameter numbers and the parameter values are broken into two 7-bit bytes for MIDI transmission; the LSB has the seven least-significant bits, and the MSB has the seven most-significant bits, though in most cases the MSB will be zero or one, and never more than two.

When receiving an NRPN, all messages do not necessarily need to be transmitted, since the synth will track the most recent NRPN number, though it is usually good practice to send the entire message above.

Once an NRPN is selected, the synth will also respond to NRPN Data Increment and Decrement commands, which some controllers utilize. Finally, it responds to one RPN (Registered Parameter Number) command, the RPN/NRPN Reset command, which can be handy for resetting the currently selected parameter to a known state.

Received NRPN Messages

Status	Second	Third	Description
1011 nnnn	0110 0011	0vvvvvvv	NRPN parameter number MSB CC
1011 nnnn	0110 0010	0vvvvvvv	NRPN parameter number LSB CC
1011 nnnn	0000 0110	0vvvvvvv	NRPN parameter value MSB CC
1011 nnnn	0010 0110	0vvvvvvv	NRPN parameter value LSB CC
1011 nnnn	0110 0000	0xxxxxxx	NRPN parameter value Increment
1011 nnnn	0110 0001	0xxxxxxx	NRPN parameter value Decrement
1011 nnnn	0010 0101	0111111	RPN parameter number MSB CC - Reset NRPN parameter number (when both MSB and LSB received)
1011 nnnn	0010 0100	0111111	RPN parameter number LSB CC - Reset NRPN parameter number (when both MSB and LSB received)

Program Parameter Data

The following table lists TEO-5 program parameters 0-352.

NRPN#	Param	Range
1	Osc 1 Freq	0-63
2	Osc 2 Freq	0-63
3	Osc 1 Detune	0-63
4	Osc 2 Detune	0-63
5	Osc 1 PW	0-127
6	Osc 2 PW	0-127
7	Osc 1 Tri	0-1
8	Osc 2 Tri	0-1
9	Osc 1 Saw	0-1
10	Osc 2 Saw	0-1
11	Osc 1 Pulse	0-1
12	Osc 2 Pulse	0-1
13	Osc 1 On	0-1
14	Osc 2 On	0-1
15	Osc 1 Level	0-127
16	Osc 2 Level	0-127
17	Sub Osc On	0-1
18	Sub Osc Level	0-127
19	Noise On	0-1
20	Noise Type	0-127

NRPN#	Param	Range
21	Noise Level	0-127
22	Osc 1 Glide	0-127
23	Osc 2 Glide	0-127
24	Osc 1 Key On	0-1
25	Osc 2 Key On	0-1
26	X-Mod Amount	0-127
27	Osc 1 Sync	0-1
28	Osc 2 Filter Bypass	0-1
30	Glide Mode	0-3
31	Glide On	0-1
32	Pitch Bend Rng Up	0-12
33	Pitch Bend Rng Dn	0-24
34	Filter Cutoff	0-1024
35	Filter Cutoff MSB	0-7
36	Filter Res	0-265
37	Filter Bandpass	0-1
38	Filter State	0-512
39	Filter State MSB	0-127
40	Filter Key Amt	0-127
41	Unused	

NRPN#	Param	Range
42	FX On	0-1
43	FX Select	0-12
44	FX Mix	0-127
45	FX Time	0-127
46	FX Misc	0-127
47	FX Sync	0-1
48	FX Sync Rate	0-10
50	Reverb On	0-1
52	Reverb Mix	0-127
53	Reverb Size	0-127
54	Reverb PreDelay	0-127
55	Reverb Decay	0-127
56	Reverb Tone	0-127
58	LFO 1 Freq	0-127
59	LFO 2 Freq	0-127
60	LFO 1 Amt	0-256
61	LFO 2 Amt	0-256
62	LFO 1 Shape	0-4
63	LFO 2 Shape	0-4
64	LFO 1 Sync	0-1
65	LFO 2 Sync	0-1
66	LFO 1 Dest	0-61
67	LFO 2 Dest	0-61
68	LFO 1 Freq Sync	0-15
69	LFO 2 Freq Sync	0-15
70	LFO 1 Note Reset	0-1
71	LFO 2 Note Reset	0-1
72	LFO 1 Slew	0-127
73	LFO 2 Slew	0-127

NRPN#	Param	Range
75	Env 1 Amt	0-256
76	Env 2 Amt	0-256
77	Env 1 Vel On	0-1
78	Env 2 Vel On	0-1
79	Env 1 Delay	0-127
80	Env 2 Delay	0-127
81	Env 1 Att	0-256
82	Env 2 Att	0-256
83	Env 1 Dec	0-256
84	Env 2 Dec	0-256
85	Env 1 Sus	0-127
86	Env 2 Sus	0-127
87	Env 1 Rls	0-256
88	Env 2 Rls	0-256
89	Env Routes	0-2
90	Env 1 Dest	0-61
91	Env Repeat	0-3
93	Voice Volume	0-127
95	Distortion	0-127
96	Vintage	0-127
97	Unison On	0-1
98	Unison Voices	0-5
99	Unison Detune	0-7
100	Unison Note 1	0-43
101	Unison Note 2	0-43
102	Unison Note 3	0-43
103	Unison Note 4	0-43
104	Unison Note 5	0-43

NRPN#	Param	Range
105	Mod 1 Source	0-19
106	Mod 2 Source	0-19
107	Mod 3 Source	0-19
108	Mod 4 Source	0-19
109	Mod 5 Source	0-19
110	Mod 6 Source	0-19
111	Mod 7 Source	0-19
112	Mod 8 Source	0-19
113	Mod 9 Source	0-19
114	Mod 10 Source	0-19
115	Mod 11 Source	0-19
116	Mod 12 Source	0-19
117	Mod 13 Source	0-19
118	Mod 14 Source	0-19
119	Mod 15 Source	0-19
120	Mod 16 Source	0-19
121	Mod 1 Amt	0-255
122	Mod 2 Amt	0-255
123	Mod 3 Amt	0-255
124	Mod 4 Amt	0-255
125	Mod 5 Amt	0-255
126	Mod 6 Amt	0-255
127	Mod 7 Amt	0-255
128	Mod 8 Amt	0-255
129	Mod 9 Amt	0-255
130	Mod 10 Amt	0-255
131	Mod 11 Amt	0-255
132	Mod 12 Amt	0-255
133	Mod 13 Amt	0-255
134	Mod 14 Amt	0-255
135	Mod 15 Amt	0-255

NRPN#	Param	Range
136	Mod 16 Amt	0-255
137	Mod 1 Dest	0-64
138	Mod 2 Dest	0-64
139	Mod 3 Dest	0-64
140	Mod 4 Dest	0-64
141	Mod 5 Dest	0-64
142	Mod 6 Dest	0-64
143	Mod 7 Dest	0-64
144	Mod 8 Dest	0-64
145	Mod 9 Dest	0-64
146	Mod 10 Dest	0-64
147	Mod 11 Dest	0-64
148	Mod 12 Dest	0-64
149	Mod 13 Dest	0-64
150	Mod 14 Dest	0-64
151	Mod 15 Dest	0-64
152	Mod 16 Dest	0-64
153	Key Mode	0-2
154	Env Retrig	0-1
155	Scale	0-64
156	Transpose	0-4
157	Clock BPM	30-250
158	Clock Div	0-7
180	Key Split	0-1
181	Key Split 2	0-1
182	Key Split Note	0-43
183	Arp On	0-1
184	Arp Mode	0-4
185	Arp Range	0-2
186	Arp Repeat	0-3
187	Arp Relatch	0-1

Global Parameter Data

The table shows the global data sent and received on global parameter dumps, and corresponding NRPN number when sent/received individually.

NRPN	Range	Description
4096	0-100	Master Coarse Tune
4097	0-24	Master Fine Tune
4098	0-16	MIDI Channel 0 = All
4099	0-3	MIDI Clock Mode 0 = Off 1 = Out 2 = In 3 = In Thru
4100	0-1	MIDI Clock Cable In 0 = MIDI Port 1 = USB
4101	0-3	MIDI Clock Cable Out 0 = None 1= MIDI 2 = USB 3 = All
4102	0-2	MIDI Param Send* 0 = NRPN 1 = CC 2= Off
4103	0-2	MIDI Param Receive† 0 = NRPN 1 = CC 2= Off
4104	0-1	MIDI Control Enable 0 = Off 1 = On
4105	0-1	MIDI SysEx Enable 0 = Off 1 = On
4106	0-1	MIDI SysEx Cable 0 = MIDI 1 = USB
4107	0-2	MIDI Cable Out 0 = MIDI 1 = USB 2= All
4108	0-1	MIDI Program Send 0 = Off 1 = On
4109	0-1	MIDI Program Recv 0 = Off 1 = On

NRPN	Range	Description
4110	0-1	MIDI Arp Notes 0 = Off 1 = On
4111	0-2	Local Control 0 =All Off 1= Key/Wheels Off 2= On
4112	0-1	Mono/Stereo 0 = Mono 1= Stereo
4113	0-2	Pot Mode 0 = Relative 1 =Passthru 2 = Jump
4114	0-4	Foot Pedal Assign 0 = Breath CC2 1 = Foot CC4 2 = Exp CC11 3 = LPF Full 4 = LPF Half
4115	0-1	Sustain Pedal Polarity 0 = Normal 1 = Reversed
4116	0-3	Sustain Mode 0 = Sustain 1 = Arp Hold 2= Apr Hold Moment. 3 = Seq Start/Stop
4117	0-64	Global Scale
4118	0-1	Pressure Enable 0 = Off 1 = On
4119	0-7	Pressure Curve
4120	0-7	Velocity Curve
4121	0-1	OLED Screen-saver 0 = Off 1 = On
4122	0-1	Arp Beat Sync 0 = Off 1 = Quantize

Control NRPN Data

The following table lists the TEO-5's control NRPN data. It is received and transmitted but not saved as part of a program.

NRPN	Value	Description
4188	0-1	Seq Play/Stop

SysEx Messages

Universal System Exclusive Message (Device Inquiry)

Status	Description
1111 0000	System Exclusive (SysEx)
0111 1110	Non-realtime message
0vvv vvvv	If MIDI channel is set to 1 - 16, 0vvvvvvv must match (unless MIDI Channel = ALL); always responds if 0vvvvvvv = 0111 1111.
0000 0110	Inquiry Message
0000 0001	Inquiry Request
1111 0111	End of Exclusive (EOX)

The TEO-5 responds with:

Status	Description
1111 0000	System Exclusive (SysEx)
0111 1110	Non-realtime message
0vvv vvvv	If MIDI Channel = ALL, 0vvvvvvv = 0111 1111. Otherwise 0vvvvvvv = Channel Number 0 - 15.
0000 0110	Inquiry Message
0000 0010	Inquiry Reply
0000 0010	Oberheim ID
0b1011010	TEO-5 ID (Family LS)
0000 0001	Family MS
0000 0000	Family Member LS
0000 0000	Family Member MS
0000 nnnn	Main OS Version High Byte
0000 nnnn	Main OS Version Middle Byte
0000 nnnn	Main OS Version Low Byte
1111 0111	End of Exclusive (EOX)

Request Program Dump

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0010	Oberheim ID
0b1011010	TEO-5 ID
0000 0101	Request Program Transmit
0000 00vv	Bank Number, 0 - 15
0vvv vvvv	Program Number, 0 - 127
1111 0111	End of Exclusive (EOX)

The TEO-5 will respond by sending out the program data in the format described below in *Program Data Dump*.

Request Program Edit Buffer Dump

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0010	Oberheim ID
0b1011010	TEO-5 ID
0000 0110	Request Program Edit Buffer Transmit
1111 0111	End of Exclusive (EOX)

The TEO-5 will respond by sending out the current program edit buffer in the format described below in *Program Edit Buffer Data Dump*.

Request Global Parameter Dump

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0010	Oberheim ID
0b1011010	TEO-5 ID
0000 1110	Request Global Parameter Transmit
1111 0111	End of Exclusive (EOX)

The TEO-5 will respond by sending out the current values of the global parameters in the format described in *Global Parameters Data Dump*.

Program Data Dump

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0010	Oberheim ID
0b1011010	TEO-5 ID
0000 0010	Program Data
0000 00vv	Bank Number: 0 - 9
0vvv vvvv	Program Number: 0 - 99
0vvv vvvv	4096 bytes expanded to 4690 MIDI bytes in “packed MS bit” format
1111 0111	End of Exclusive (EOX)

Program Edit Buffer Data Dump

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0010	Oberheim ID
0b1011010	TEO-5 ID
0000 0011	Edit Buffer Data
0vvv vvvv	4096 bytes expanded to 4690 MIDI bytes in “packed MS bit” format
1111 0111	End of Exclusive (EOX)

Global Parameters Data Dump

Value	Description
1111 0000	System Exclusive (SysEx)
0000 0010	Oberheim ID
0b1011010	TEO-5 ID
0000 1111	Main Parameter Data
0vvv vvvv	50 nibbles (LS then MS) for 25 Global parameters
1111 0111	End of Exclusive (EOX)

The Global Parameters Data Dump is not recognized when received. It is only transmitted when requested. NRPN messages are used to change Globals.

Packed Data Format

Data is packed in 8 byte "packets", with the MS bit stripped from 7 parameter bytes, and packed into an eighth byte, which is sent at the start of the 8 byte packet.

Example:

Input Data

```
1 A7 A6 A5 A4 A3 A2 A1 A0
2 B7 B6 B5 B4 B3 B2 B1 B0
3 C7 C6 C5 C4 C3 C2 C1 C0
4 D7 D6 D5 D4 D3 D2 D1 D0
5 E7 E6 E5 E4 E3 E2 E1 E0
6 F7 F6 F5 F4 F3 F2 F1 F0
7 G7 G6 G5 G4 G3 G2 G1 G0
```

Packed MIDI data

```
1   00 G7 F7 E7 D7 C7 B7 A7
2   00 A6 A5 A4 A3 A2 A1 A0
3   00 B6 B5 B4 B3 B2 B1 B0
4   00 C6 C5 C4 C3 C2 C1 C0
5   00 D6 D5 D4 D3 D2 D1 D0
6   00 E6 E5 E4 E3 E2 E1 E0
7   00 F6 F5 F4 F3 F2 F1 F0
8   00 G6 G5 G4 G3 G2 G1 G0
```