

# AdrenaLinn III MIDI Implementation

## Version 3.0.0 Software

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### Channel Mode messages

Status	Second	Third	Description
1001 nnnn	0kkkkkkk	0vvvvvvv	<b>Note On</b> ; nnnn = channel, kkkkkkkk = note number and vvvvvvvv = velocity. Note On messages with velocity = 0 are ignored. Note On messages are also used to trigger events and toggle certain on/off states using the Control Destination and MIDI Source parameters. The Note Number data from Note On messages is added to Mod FX Frequency is Mod Source is set to "not" or "S-n".
1011 nnnn	0ccccccc	0vvvvvvv	<b>Control Change</b> ; nnnn = channel, cccccccc = control number, vvvvvvvv= value. Controller 32 is used as program change bank select: If value = 0, Program Change messages 0-99 select presets 0-99 (default); If value = 1, Program Change messages 0-99 select presets 100-199; If value = 2, Program Change messages 0-99 select drumbeats 0-99; If value = 3, Program Change messages 0-99 select drumbeats 100-199; Controllers 1-99 are used as modulation sources for the Pedal 1 (or 2) Source, Amount & Destination fields. Controllers 64-69 and 80-83 are used to trigger events and toggle certain on/off states using the Foot Switch Source and Foot Switch Destination parameters.
1100 nnnn	0ppppppp		<b>Program change</b> ; ppppppp = new program number. Program Change messages 0-99 are used to select presets or drumbeats depending on selected bank. See use of Controller 32 above.

### System Common messages

Status	Second	Third	Description
1111 0010	0vvvvvvv	0vvvvvvv	<b>Song Position Pointer</b> – LS Byte then MS Byte. Because the sequences are only 2 measures, incoming positions above 2 measures are reduced to give the correct position within the 2 measure sequences.

### System Real Time Messages

Status	Description
1111 1000	<b>Timing Clock.</b> If Sync parameter is set to In (sync in on) or I-O (sync in & out on), AdrenaLinn III automatically switches between internal and external tempo modes: If one or more Timing Clock messages are received, it uses the tempo from these messages; if no Clock message is received for 1 second, it uses internal tempo. If Sync parameter is Out (sync out on) or I-O (sync in and out on), MIDI Clock is sent.
1111 1010	<b>Start.</b> If Sync parameter is set to In (sync in on) or I-O (sync in and out on) and Start is received, drumbeat plays from the start. If Sync parameter is Out (sync out on) or I-O (sync in and out on) and drumbeat is started, a Start command is sent.
1111 1011	<b>Continue.</b> If Sync parameter is In (sync in on) or I-O (sync in and out on) and Continue is received, the drumbeat starts playing from the last stopped position.
1111 1100	<b>Stop.</b> If Sync parameter is In (sync in on) or I-O (sync in and out on) and Stop is received, the drumbeat stops playing. If Sync parameter is Out (sync out on) or I-O (sync in and out on) and drumbeat play is stopped, a Stop command is sent.

*NOTE: You can also use MIDI Start and Stop without Timing Clock messages for remotely starting and stopping the drumbeats at the internal tempo. For this purpose you should select either "In" or "Out" in the Sync parameter. If "In" or "I-O" is selected and you send Start without Clock messages, AdrenaLinn III waits 1 second before starting the drumbeat.*

# Universal System Exclusive Messages

## Identity Request

When this message is received, AdrenaLinn responds by sending an "Identity reply" message.

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); AdrenaLinn III always responds if 0vvvvvvv = 0000 0000.
0000 0110	ID for Inquiry Message
0000 0001	ID for Inquiry Request
1111 0111	End of Exclusive (EOX)

## Identity Reply

Status	Description
1111 0000	System Exclusive (SysEx)
0111 1110	Non-realtime message
0vvv vvvv	If MIDI Channel parameter= ALL (0), vvvvvvv = 000 0000. Otherwise vvvvvvv = Channel Number 1-16.
0000 0110	ID for Inquiry Message
0000 0010	ID for Inquiry Reply
0000 0000	Roger Linn Design ID byte 1
0000 0001	Roger Linn Design ID byte 2
0011 0111	Roger Linn Design ID byte 3
0000 0001	AdrenaLinn family ID LSB
0000 0000	AdrenaLinn family ID MSB
0000 0011	AdrenaLinn III family member ID LSB
0000 0000	AdrenaLinn III family member ID MSB
0vvv vvvv	Software version 1 <sup>st</sup> digit (ASCII character)
0vvv vvvv	Software version 2 <sup>nd</sup> digit (ASCII character)
0vvv vvvv	Software version 3 <sup>rd</sup> digit (ASCII character)
0000 0000	Always 0
1111 0111	End of Exclusive (EOX)

# System Exclusive Messages

## Receive Single Parameter (message ID 1)

The external device sends this message to AdrenaLinn III in order to change a single parameter within the preset edit buffer, drumbeat edit buffer or System parameters data structure. The AdrenaLinn III does not send this message.

Status	Description
1111 0000	System Exclusive (SysEx) ID
0000 0000	Roger Linn Design manufacturer ID byte 1
0000 0001	Roger Linn Design manufacturer ID byte 2
0011 0111	Roger Linn Design manufacturer ID byte 3
0000 0011	AdrenaLinn III product ID
0000 0001	File Version
0000 0001	Message ID for 'Receive single parameter'
0000 00vv	If vv=00, parameter within preset edit buffer If vv=01, parameter within drumbeat edit buffer If vv=10, parameter within System parameters
00vv vvvv	Address of parameter within Preset, Drumbeat or System data structures. See "Data structures" below.
0000 vvvv	LS 4 bits of datum
0000 vvvv	MS 4 bits of datum
1111 0111	End of Exclusive (EOX)

## Send or Receive Preset (message ID 2)

This message is sent by AdrenaLinn III either by the front panel DUMP command or in response to a Request Preset message. If this message is received by AdrenaLinn III, the message data overwrites the selected Preset (0-199).

Status	Description
1111 0000	System Exclusive (SysEx) ID
0000 0000	Roger Linn Design manufacturer ID byte 1
0000 0001	Roger Linn Design manufacturer ID byte 2
0011 0111	Roger Linn Design manufacturer ID byte 3
0000 0011	AdrenaLinn III product ID
0000 0001	File Version
0000 0010	Message ID for 'Send or Receive Preset'
0vvv vvvv	Preset data: 64 bytes coded into 74 bytes of 7-bit MIDI data (see "Data packing" below.)
1111 0111	End of Exclusive (EOX)

*NOTE: The AdrenaLinn III requires nearly a full second to save the received user preset to its slow flash memory. Any messages received while AdrenaLinn III is still saving the received user preset will be ignored. After the external device sends this message, it should either wait a full second or wait until a Preset or Drumbeat Save Complete message is returned before sending any further messages.*

### Send or Receive Drumbeat (message ID 3)

This message is sent by AdrenaLinn III either by the front panel DUMP command or in response to a Request Drumbeat message. If this message is received by AdrenaLinn III, the message data overwrites the selected Drumbeat (0-199).

Status	Description
1111 0000	System Exclusive (SysEx) ID
0000 0000	Roger Linn Design manufacturer ID byte 1
0000 0001	Roger Linn Design manufacturer ID byte 2
0011 0111	Roger Linn Design manufacturer ID byte 3
0000 0011	AdrenaLinn III product ID
0000 0001	File Version
0000 0011	Message ID for 'Send or Receive Drumbeat'
0vvv vvvv	Preset data: 44 bytes coded into 51 bytes of 7-bit MIDI data (see "Data packing" below.)
1111 0111	End of Exclusive (EOX)

*NOTE: The AdrenaLinn III requires nearly a full second to save the received drumbeat to its slow flash memory. Any messages received while AdrenaLinn III is still saving the received user drumbeat will be ignored. After the external device sends this message, it should either wait a full second or wait until a "Preset or drumbeat save complete" message is returned before sending any further messages.*

### Request Preset (message ID 5)

When AdrenaLinn III receives this request, it responds by sending the requested user preset as a "Send or Receive Preset" (ID 2) message.

Status	Description
1111 0000	System Exclusive (SysEx) ID
0000 0000	Roger Linn Design manufacturer ID byte 1
0000 0001	Roger Linn Design manufacturer ID byte 2
0011 0111	Roger Linn Design manufacturer ID byte 3
0000 0011	AdrenaLinn III product ID
0000 0001	File Version
0000 0101	Message ID for 'Request Preset'
0000 vvvv	LS 4 bits of preset number (0-199)
0000 vvvv	MS 4 bits of preset number (0-199)
1111 0111	End of Exclusive (EOX)

### Request Drumbeat (message ID 6)

When AdrenaLinn III receives this request, it responds by sending the requested drumbeat as a "Send or Receive Drumbeat" (ID 3) message.

Status	Description
1111 0000	System Exclusive (SysEx) ID
0000 0000	Roger Linn Design manufacturer ID byte 1
0000 0001	Roger Linn Design manufacturer ID byte 2
0011 0111	Roger Linn Design manufacturer ID byte 3
0000 0011	AdrenaLinn III product ID
0000 0001	File Version
0000 0110	Message ID for 'Request Drumbeat'
0000 vvvv	LS 4 bits of drumbeat number (0-199)
0000 vvvv	MS 4 bits of drumbeat number (0-199)
1111 0111	End of Exclusive (EOX)

### Select Drumbeat (message ID 8)

When AdrenaLinn III receives this request, it responds by making the requested drumbeat number active.

Status	Description
1111 0000	System Exclusive (SysEx) ID
0000 0000	Roger Linn Design manufacturer ID byte 1
0000 0001	Roger Linn Design manufacturer ID byte 2
0011 0111	Roger Linn Design manufacturer ID byte 3
0000 0011	AdrenaLinn III product ID
0000 0001	File Version
0000 1000	Message ID for 'Select Drumbeat'
0000 vvvv	LS 4 bits of drumbeat number (0-199)
0000 vvvv	MS 4 bits of drumbeat number (0-199)
1111 0111	End of Exclusive (EOX)

### Select Preset (message ID 9)

When AdrenaLinn III receives this request, it responds by making the requested user preset number active. This has the same effect as a MIDI Program Change message, except that this message ignores the AdrenaLinn III's front panel MIDI Channel setting.

Status	Description
1111 0000	System Exclusive (SysEx) ID
0000 0000	Roger Linn Design manufacturer ID byte 1
0000 0001	Roger Linn Design manufacturer ID byte 2
0011 0111	Roger Linn Design manufacturer ID byte 3
0000 0011	AdrenaLinn III product ID
0000 0001	File Version
0000 1001	Message ID for 'Select Preset'
0000 vvvv	LS 4 bits of preset number (0-199)
0000 vvvv	MS 4 bits of preset number (0-199)
1111 0111	End of Exclusive (EOX)

### Request Preset Edit Buffer (message ID 10)

When AdrenaLinn III receives this request, it responds by sending the requested user preset as a Transmit Preset Edit Buffer message.

Status	Description
1111 0000	System Exclusive (SysEx) ID
0000 0000	Roger Linn Design manufacturer ID byte 1
0000 0001	Roger Linn Design manufacturer ID byte 2
0011 0111	Roger Linn Design manufacturer ID byte 3
0000 0011	AdrenaLinn III product ID
0000 0001	File Version
0000 1010	Message ID for 'Request Preset Edit Buffer'
1111 0111	End of Exclusive (EOX)

### Send or Receive Preset Edit Buffer (message ID 11)

This message is sent by the AdrenaLinn III in response to a Request Preset Edit Buffer message. When received by AdrenaLinn III, its preset edit buffer is overwritten by the received data.

Status	Description
1111 0000	System Exclusive (SysEx) ID
0000 0000	Roger Linn Design manufacturer ID byte 1
0000 0001	Roger Linn Design manufacturer ID byte 2
0011 0111	Roger Linn Design manufacturer ID byte 3
0000 0011	AdrenaLinn III product ID
0000 0001	File Version
0000 1011	Message ID for 'Send or Receive Preset Edit Buffer'
0vvv vvvv	Preset data: 64 bytes coded into 74 bytes of 7-bit MIDI data (see "Data packing" below.)
1111 0111	End of Exclusive (EOX)

### Request Drumbeat Edit Buffer (message ID 12)

When AdrenaLinn III receives this request, it responds by sending the requested drumbeat as a Transmit Drumbeat Edit Buffer message.

Status	Description
1111 0000	System Exclusive (SysEx) ID
0000 0000	Roger Linn Design manufacturer ID byte 1
0000 0001	Roger Linn Design manufacturer ID byte 2
0011 0111	Roger Linn Design manufacturer ID byte 3
0000 0011	AdrenaLinn III product ID
0000 0001	File Version
0000 1100	Message ID for 'Request Drumbeat Edit Buffer'
1111 0111	End of Exclusive (EOX)

### Send or Receive Drumbeat Edit Buffer (message ID 13)

This message is sent by the AdrenaLinn III in response to a Request Drumbeat Edit Buffer message. When received by AdrenaLinn III, its drumbeat edit buffer is overwritten by the received data.

Status	Description
1111 0000	System Exclusive (SysEx) ID
0000 0000	Roger Linn Design manufacturer ID byte 1
0000 0001	Roger Linn Design manufacturer ID byte 2
0011 0111	Roger Linn Design manufacturer ID byte 3
0000 0011	AdrenaLinn III product ID
0000 0001	File Version
0000 1101	Message ID for 'Send or Receive Drumbeat Edit Buffer'
0vvv vvvv	Drumbeat data: 44 bytes coded into 51 bytes of 7-bit MIDI data (see "Data packing" below.)
1111 0111	End of Exclusive (EOX)

### Request System parameters (message ID 14)

When AdrenaLinn III receives this request, it responds by sending a Transmit System Parameters message.

Status	Description
1111 0000	System Exclusive (SysEx) ID
0000 0000	Roger Linn Design manufacturer ID byte 1
0000 0001	Roger Linn Design manufacturer ID byte 2
0011 0111	Roger Linn Design manufacturer ID byte 3
0000 0011	AdrenaLinn III product ID
0000 0001	File Version
0000 1110	Message ID for 'Request System Parameters'
1111 0111	End of Exclusive (EOX)

### Send or Receive System Parameters (message ID 15)

This message is sent by the AdrenaLinn III in response to a Request System Parameters message. When this message is received by AdrenaLinn III, its System parameters are overwritten by the received data.

Status	Description
1111 0000	System Exclusive (SysEx) ID
0000 0000	Roger Linn Design manufacturer ID byte 1
0000 0001	Roger Linn Design manufacturer ID byte 2
0011 0111	Roger Linn Design manufacturer ID byte 3
0000 0011	AdrenaLinn III product ID
0000 0001	File Version
0000 1111	Message ID for 'Send or Receive System Parameters'
0vvv vvvv	System parameters: 14 bytes coded into 16 bytes of 7-bit MIDI data (see "Data packing" below.)
1111 0111	End of Exclusive (EOX)

### Preset or drumbeat save complete (message ID 17)

After AdrenaLinn III receives either a Transmit Preset message (ID 2) or Transmit Drumbeat message (ID 3) and the transferred data has been successfully saved to flash, it sends this message. Until it is sent, the AdrenaLinn III will ignore any subsequently received messages. The external device should wait for this message before sending another message, or the external device should wait one full second before sending another message.

Status	Description
1111 0000	System Exclusive (SysEx) ID
0000 0000	Roger Linn Design manufacturer ID byte 1
0000 0001	Roger Linn Design manufacturer ID byte 2
0011 0111	Roger Linn Design manufacturer ID byte 3
0000 0011	AdrenaLinn III product ID
0001 0001	Message ID for 'Preset or Drumbeat Save Complete'
1111 0111	End of Exclusive (EOX)

### Initialize AdrenaLinn III to Factory Status (message ID 19)

This message instructs AdrenaLinn III to initialize all presets & drumbeats to factory status by copying all 200 factory presets over the 200 user presets and copying all 200 factory drumbeats over the 200 user drumbeats. Also, all System parameters are reinitialized to their default settings. This has the same effect as performing a manual initialization by holding both foot switches while connecting power.

Status	Description
1111 0000	System Exclusive (SysEx) ID
0000 0000	Roger Linn Design manufacturer ID byte 1
0000 0001	Roger Linn Design manufacturer ID byte 2
0000 0111	Roger Linn Design manufacturer ID byte 3
0000 0011	AdrenaLinn III product ID
0001 0011	Message ID for 'Initialize AdrenaLinn III to Factory Status'
1111 0111	End of Exclusive (EOX)

*NOTE: AdrenaLinn III requires nearly a full second to copy all presets & drumbeats. Any messages received before it is finished will be ignored. After the external device sends this message, it should either wait a full second or wait until a "Save Complete" (ID 17) is returned before sending any further messages.*



# Data Structures

For Range/Description details, see the description of the relevant parameter in the AdrenaLinn III manual.

## Preset Data Structure

Byte	Parameter	Range/Description															
0	Mod Effect	0-17 (list of Mod Effect types)															
1	Variation	0-x, hi limit dependent on selected Effect type. A data value of '0' = variation 1.															
2	FX-Dry Mix	0-99 (0 = unprocessed signal, 99 = full effect)															
3	FX Ster+Filt Type	Bits 4-7, Mod FX Filter Type, options 0-9: 0: Never used. 1-5: LP2, LP4, BNP, NOT, HIP (on Filter effect options) 6-7: FLA or FLI (on Flanger effects only) 8: VIB (on Pitch effects only) 9: VOL (on Volume effects only)															
4	Speed	Bits 0-3, Mod FX Stereo Width: 0 (mono center) to 90 (widest pan modulation) in 10 steps (0, 10...80, 90) If Effect = TRE, FTR, FCH, ROT, VIB, RFI or RFL, this controls LFO speed: 0-99 (fixed speeds) plus 100-115 (16 tempo-synched rates) If Effect = TSE, FSE, ARP, AFI, TAL or VOL, this controls envelope attack and decay time: 0-99 (left decimal digit is attack time 0-9; right is decay time 0-9)															
5	Depth	0-198 (-99 to 0 to 99 in display)															
6	Frequency	0-99															
7	Resonance	0-99															
8	Mod Src & LFO Wave	Bits 4-7 is LFO Wave, 0-4 (list of waveforms) Bits 0-3 is Modulation Source, 0-10 (list of mod sources)															
9	On/off switches	Bit 0 = effect on/off, bit 1 = amp on/off, bit 2 = compression on/off, bit 3 = delay on/off, bit 4 = reverb on/off, bit 5 = always 0 bits 6 & 7 = FX Order: <table border="1" style="margin-left: 40px;"> <thead> <tr> <th>Bit 7</th> <th>Bit 6</th> <th>Code:</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>MCA (Mod FX &gt; Comp &gt; Amp)</td> </tr> <tr> <td>0</td> <td>1</td> <td>CAM (Comp &gt; Amp &gt; Mod FX)</td> </tr> <tr> <td>1</td> <td>0</td> <td>MAC (Mod FX &gt; Amp &gt; Comp)</td> </tr> <tr> <td>1</td> <td>1</td> <td>AMC (Amp &gt; Mod FX &gt; Comp)</td> </tr> </tbody> </table>	Bit 7	Bit 6	Code:	0	0	MCA (Mod FX > Comp > Amp)	0	1	CAM (Comp > Amp > Mod FX)	1	0	MAC (Mod FX > Amp > Comp)	1	1	AMC (Amp > Mod FX > Comp)
Bit 7	Bit 6	Code:															
0	0	MCA (Mod FX > Comp > Amp)															
0	1	CAM (Comp > Amp > Mod FX)															
1	0	MAC (Mod FX > Amp > Comp)															
1	1	AMC (Amp > Mod FX > Comp)															
10	Mod FX Volume	0-99															
11	Amp	0-39 (list of amp models)															
12	Amp Drive	0-99															
13	Amp Bass	0-99															
14	Amp Mid	0-99															
15	Amp Treble	0-99															
16	CompVol+PostTreble	Bits 4-7: Post Treble, 0-9 (0-90 in display) Bits 0-3: Compression Volume, 0-9 (0-90 in display)															
17	Amp Volume	0-99															
18	Comprs+Boost	Bits 4-7 is Amp Boost, 0-8 (10-90 in display) Bits 0-3 is Compression Drive, 0-9 (0-90 in display)															
19	Delay Volume	0-99															
20	Delay Time	0-99 (100 fixed rates) followed by 100-118 (19 tempo-synched rates).															
21	Delay Repeats	0-99															
22	Delay Stereo+Treble	Combines the Delay Stereo and Delay Treble parameters: Bits 4-7: Delay Treble, 0-9 (0-90 in display) Bits 0-3: Delay Stereo, 0-9 (0-90 in display)															
23	Reverb Volume	0-99															

24	Reverb Time+Treble	Combines the Reverb Time and Reverb Treble parameters: Bits 4-7: Reverb Treble, 0-9 (0-90 in display) Bits 0-3: Reverb Time, 0-4
25	Pedal 1 Amount	0-198 (add; -99 to +99 in display), 199 = Scale
26	Pedal 2 Amount	0-198 (add; -99 to +99 in display), 199 = Scale
27	Pedal 1 Dest	0-21 (list of options)
28	Pedal 2 Dest	0-21 (list of options)
29	Effect Switch	List of Effect Switch options
30	Preset Tempo	Preset's assigned tempo, 30-250 BPM
31	Preset Drumbeat	Preset's assigned drumbeat, 0-199
32-63	Sequence steps	Data for 32-step user sequence, 1 byte per step: LS 7 bits contain sequence level of 0-99; MS bit sets envelope generator off (0) or on (1) for that step.

### Drumbeat Data Structure

Byte	Parameter	Range/Description
0	Volume	0-99
1	FX Send	0-99 (send level to delay) followed by 100-199 (send level to input of signal chain) followed by 200-249 (send level to reverb)
2	Treble/Dist	0: "----" (No treble filter or distortion processing) 1-10: t0-t90 (Treble filter frequency) in 10 steps (t0, t10...t80, t90) 11-2-: d0-d90 (distortion drive level) in 10 steps (d0, d10...d80, d90)
3	Timebase	0: '8n' 1: '8t' 2: '16n' 3: '16h' 4: '16s'  (The following codes are intended to be implemented in a future OS release.) 5: '9' ( 2 bars of 9 steps each) 6: '10' ( 2 bars of 10 steps each) 7: '10h' ( 2 bars of 10 steps each, half swing) 8: '10s' ( 2 bars of 10 steps each, swing) 9: '11' ( 2 bars of 11 steps each) 10: '12' ( 2 bars of 12 steps each) 11: '12h' ( 2 bars of 12 steps each, half swing) 12: '12s' ( 2 bars of 12 steps each, swing) 13: '13' ( 2 bars of 13 steps each) 14: '14' ( 2 bars of 14 steps each) 15: '14h' ( 2 bars of 14 steps each, half swing) 16: '14s' ( 2 bars of 14 steps each, swing) 17: '15' ( 2 bars of 15 steps each)
4	Bass sound-vol	10-99 (BCD: MS nibble is sound select 1-9, 2 <sup>nd</sup> decimal digit is mix volume 0-9)
5	Snare sound-vol	10-99 (BCD: MS nibble is sound select 1-9, 2 <sup>nd</sup> decimal digit is mix volume 0-9)
6	Hihat sound-vol	10-99 (BCD: MS nibble is sound select 1-9, 2 <sup>nd</sup> decimal digit is mix volume 0-9)
7	Perc sound-vol	10-99 (BCD: MS nibble is sound select 1-9, 2 <sup>nd</sup> decimal digit is mix volume 0-9)
8	Tempo	30-250 (drumbeat's assigned tempo)
9--11	Unused	
12-43	Drumbeat steps	Data for 32-step user drumbeat; 1 byte per step: Bits 0-1 = bass; 0 (off), 1 (soft), 2 (medium) or 3 (loud) Bits 2-3 = snare; 0 (off), 1 (soft), 2 (medium) or 3 (loud) Bits 4-5 = hihat; 0 (off), 1 (soft), 2 (medium) or 3 (loud) Bits 6-7 = percussion; 0 (off), 1 (perc1), 2 (perc2) or 3 (perc3)

## System Parameters Data Structure

<u>Byte</u>	<u>Parameter</u>	<u>Range/Description</u>
0	Active Preset	00-199 (default is 0)
1	Active Drumbeat	00-199 (default is 0)
2	Global tempo	30-250 (default is 100)
3	Master volume	0 (very quiet) – 99 (maximum). Default is 60.
4	Unused	
5	Preset Sets Dmbt	0 (Off) or 1 (On). Default is 1.
6	Noise Gate	0 (off) or 1-9 (9 gate thresholds). Default is 2.
7	Balance/SEP	0 (P50) to 50 (EQU) to 100 (D50), plus 101 (SEP). Default is 50.
8	Tempo Source	0 (system tempo), 1 (drumbeat tempo) or 2 (preset tempo). Default is 1.
9	Direct/Amp	0 (normal EQ) or 1 (EQ for guitar amp). Default is 0.
10	Channel	0 (receive on all channels) or 1-16 (receive on single channel 1-16). Default is 0.
11	Sync	0 (ignore incoming MIDI clock), 1 (accept incoming MIDI clock) or 2 (accept incoming MIDI clock and send outgoing MIDI clock). Default is 1.
12	Prog Chng Bank	0 (presets 0-99), 1 (presets 100-199), 2 (drumbeats 0-99), 3 (drumbeats 100-199) or 4 (none). Default is 0.
13	MIDI dump mode	0 (dump active preset), 1 (dump active drumbeat) or 2 (dump all). Default is 0.
14	Pedal 1 source	0 (none), 1-99 (MIDI controllers 1-99) Default is 27.
15	Pedal 2 source	0 (none), 1-99 (MIDI controllers 1-99) Default is 32.
16	MIDI Drums	0 (disable) or 1 (enable)
17-31	Unused	

*The following bytes contain assignments for the 2 panel foot switches and MIDI foot switches as assigned in the FOOT SWITCH SOURCE and FOOT SWITCH DESTINATION parameters.*

32	Left Foot
33	Left Foot Hold
34	Right Foot
35	Right Foot Hold
36	MIDI Controller 64
37	MIDI Controller 65
38	MIDI Controller 66
39	MIDI Controller 67
40	MIDI Controller 68
41	MIDI Controller 69
42	MIDI Controller 80
43	MIDI Controller 81
44	MIDI Controller 82
45	MIDI Controller 83

# 7-Bit Data Packing

The general data packing scheme for preset and drumbeat data dumps groups 7 bytes of data, stripping off the MS bit of each, and packing these MS bits into an additional byte. 7 bytes of internal memory yields 8 bytes of MIDI data.

Assuming 7 bytes of memory data are:

```
0:  AAAAAaaa  Memory byte 0
1:  BBBBbbbb  Memory byte 1
2:  CCCCcccc  Memory byte 2
3:  DDDDdddd  Memory byte 3
4:  EEEEEeeee  Memory byte 4
5:  FFFFffff  Memory byte 5
6:  GGGGgggg  Memory byte 6
```

Then it is sent over MIDI with the MS bits first as follows:

```
0:  0GFEDCBA  Packed MS bits
1:  0AAAAaaa  MIDI Data Bytes
2:  0BBBBbbb
3:  0CCCCccc
4:  0DDDDddd
5:  0EEEEeee
6:  0FFFFfff
7:  0GGGgggg
```

Note that fewer than 7 bytes can be sent, and the unused MS bits will be set to zero. For example, if two bytes are sent:

Assuming 2 bytes of memory data are:

```
0:  AAAAAaaa  Memory byte 0
1:  BBBBbbbb  Memory byte 1
```

Then it is sent over MIDI as a three byte sequence, with the MS bits first as follows:

```
0:  000000BA  Packed MS bits
1:  0AAAAaaa  MIDI Data Bytes
2:  0BBBBbbb
```