



Spider Valve MkII



MIDI Implementation Guide (Firmware version 1.50, or later)

Spider Valve MkII 112, 212 and HD100

ElectroPhonic Limited Edition

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OVERVIEW

Welcome to the *Spider Valve MkII MIDI Implementation Guide*. This document is provided as a supplement to the original *Spider Valve MkII Advanced Guide*, containing MIDI implementation specifications for the Spider Valve™ MkII amplifier with the Spider FX Infusion update installed (firmware version 1.50 or later). Included are tables containing MIDI CC, Preset Memory and System Exclusive message data for your reference.

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Spider FX Infusion Update

For the specifications in this document to accurately match your amplifier, it is necessary that you install the free Spider FX Infusion firmware update (firmware version 1.50, or later).* The Spider FX Infusion update adds 28 additional effects Models, as well as several enhancements to your Spider Valve MkII amplifier's existing Models, controls and FBV™ MkII performance. Just as with your amplifier's original FX models, the added Spider FX Infusion Models are also accessible via FBV MkII Series controller device, or via external MIDI hardware & software products. MIDI messages pertaining to these new FX models are included in this document.

*For information on using Line 6 Monkey for firmware updates, please see the *Spider Valve MkII Advanced Guide* and other additional documentation available from <http://line6.com/manuals/spidervalvemkii/>.

BASIC MIDI & MIDI CONTROL MESSAGES

In this chapter we've provided reference tables of Basic MIDI, MIDI CC and Program Change messages that control basic functions of your Spider Valve™ MkII.

To configure the MIDI Channel used for transmitting and receiving MIDI, press the PRESETS button on your Spider Valve MkII to enter Edit Mode, then use the 4-way Nav Disc button to select the MIDI option.

Basic MIDI Messages

The following table shows the types of MIDI messages supported (and not supported) by Spider Valve MkII amplifiers. Note that Spider Valve MkII will receive MIDI messages via its 5-pin MIDI IN jack (as indicated by the “Recognize / Import” column), and will transmit as well as send incoming MIDI messages out its 5-pin MIDI OUT/THRU jack.

BASIC MIDI MESSAGES				
Message Type		Transmit / Export	Recognize / Import	Notes
1. Basic Information				
MIDI channels		1-16	1-16	
Note numbers		None	None	Note messages not supported
Program change		Yes	Yes	
Bank Select response? (Yes/No) (If yes, list banks in remarks column)			Yes	Banks 0, 1, 128-255, 256-383, 16383
Modes supported:	Mode 1: Omni-On, Poly (Yes/No)		No	
	Mode 2: Omni-On, Mono (Yes/No)		No	
	Mode 3: Omni-Off, Poly (Yes/No)		Yes	(Note messages not supported)

BASIC MIDI MESSAGES				
Message Type		Transmit / Export	Recognize / Import	Notes
	Mode 4: Omni-Off, Mono (Yes/No)		Yes	(Note messages not supported)
	Multi Mode (Yes/No)		No	
Note-On Velocity (Yes/No)		No	No	
Note-Off Velocity (Yes/No)		No	No	
Channel Aftertouch (Yes/No)		No	No	
Poly (Key) Aftertouch (Yes/No)		No	No	
Pitch Bend (Yes/No)		Yes	Yes	Pitch effect only
Active Sensing (Yes/No)		No	Yes	
System Reset (Yes/No)		No	No	
Tune Request (Yes/No)		No	No	
Universal System Exclusive:	Sample Dump Standard (Yes/No)	No	No	
	Device Inquiry (Yes/No)	No	Yes	
	File Dump (Yes/No)	No	No	
	MIDI Tuning (Yes/No)	No	No	
	Master Volume (Yes/No)	No	Yes	

BASIC MIDI MESSAGES				
Message Type		Transmit / Export	Recognize / Import	Notes
	Master Balance (Yes/No)	No	Yes	
	Notation Information (Yes/No)	No	No	
	Turn GM1 System On (Yes/No)	No	No	
	Turn GM2 System On (Yes/No)	No	No	
	Turn GM System Off (Yes/No)	No	No	
	DLS-1 (Yes/No)	No	No	
	File Reference (Yes/No)	No	No	
	Controller Destination (Yes/No)	No	No	
	Key-based Instrument Ctrl (Yes/No)	No	No	
	Master Fine/Coarse Tune (Yes/No)	No	No	
	Other Universal System Exclusive	No	No	
	Manufacturer or Non-Commercial System Exclusive	Yes	Yes	
NRPNs (Yes/No)				
	RPN 00 (Pitch Bend Sensitivity) (Yes/No)	No	No	

BASIC MIDI MESSAGES				
Message Type		Transmit / Export	Recognize / Import	Notes
	RPN 01 (Channel Fine Tune) (Yes/No)	No	No	
	RPN 02 (Channel Coarse Tune) (Yes/No)	No	No	
	RPN 03 (Tuning Program Select) (Yes/No)	No	No	
	RPN 04 (Tuning Bank Select) (Yes/No)	No	No	
	RPN 05 (Modulation Depth Range) (Yes/No)	No	No	
2. MIDI Timing and Synchronization				
MIDI Clock (Yes/No)		No	Yes	
Song Position Pointer (Yes/No)		No	No	
Song Select (Yes/No)		No	No	
Start (Yes/No)		No	No	
Continue (Yes/No)		No	No	
Stop (Yes/No)		No	No	
MIDI Time Code (Yes/No)		No	No	
MIDI Machine Control (Yes/No)		No	No	

BASIC MIDI MESSAGES				
Message Type		Transmit / Export	Recognize / Import	Notes
MIDI Show Control (Yes/No)		No	No	
	If yes, MSC Level supported			
3. Extensions Compatibility				
General MIDI compatible? (Level(s)/No)		No	No	
Is GM default power-up mode? (Level/No)		No	No	
DLS compatible? (Levels(s)/No)		No	No	
(DLS File Type(s)/No)		No	No	
Standard MIDI Files (Type(s)/No)		No	No	
XMF Files (Type(s)/No)		No	No	
SP-MIDI compatible? (Yes/No)		No	No	

MIDI Controller Messages

The following table the MIDI Continuous Controller messages utilized (and not utilized) by Spider Valve MkII amplifiers. Note that Spider Valve MkII will receive MIDI CC messages via its 5-pin MIDI IN jack (as indicated by the “Recognizes” column), and will transmit as well as send incoming MIDI CC messages out its 5-pin MIDI OUT/THRU jack.

MIDI Controller Messages			
MIDI CC	Transmits	Recognizes	Spider Valve MkII Function
0	Yes	Yes	See “Preset Select” on page 2•14 for Bank number assignments
1			
2			
3			
4	Yes	Yes	Controls Wah Position. Generated by FBV pedal
5			
6			
7	Yes	Yes	Controls Volume Pedal Position. Generated by FBV pedal
8			
9			
10		Yes	Balance (Pan) - NOTE: Output for all Spider Valve MkII amps is mono. It is <u>not</u> recommended to use any value other than 64 for MIDI CC 10.
11	Yes	Yes	Front panel amp model control; see “Amp Model Select” on page 2•12 or values to access individual Models
12		Yes	Amp Model Select; see “Amp Model Select” on page 2•12 for values to access individual Models
13	Yes	Yes	Amp Drive
14	Yes	Yes	Amp Bass

MIDI Controller Messages			
MIDI CC	Transmits	Recognizes	Spider Valve MkII Function
15	Yes	Yes	Amp Mid
16	Yes	Yes	Amp Treble
17	Yes	Yes	Amp Channel Volume
18	Yes	Yes	Reverb Mix
19			
20			
21			
22		Yes	Gate mode: 0 = Off, 1 = Gate, 2 = NR, 3 (and up to 127) = Gate + NR
23		Yes	Gate Threshold: 0-31 = -96dB, 32-127 = -97 to 0dB in 1dB steps
24		Yes	Gate Decay
25		Yes	Stomp Enable: 0-63 = Off, 64-127 = On
26		Yes	Boost Enable: 0-63 = Off, 64-127 = On
27	Yes	Yes	Stomp SmartFX “Swoosh” position
28		Yes	Delay Enable: 0-63 = Off, 64-127 = On
29			
30	Yes	Yes	Delay SmartFX “Swoosh” position
31			
32	Yes	Yes	See “Preset Select” on page 2•14 for Bank number assignments
33			
34		Yes	Delay Mix
35			
36		Yes	Reverb Enable: 0-63 = Off, 64-127 = On
37		Yes	Reverb Model Select; see “FX Model Select” on page 2•13 for Model values
38			

MIDI Controller Messages			
MIDI CC	Transmits	Recognizes	Spider Valve MkII Function
39			
40			
41		Yes	Reverb Pre/Post position: 0-63 = Pre, 64-127 = Post
42			
43			
44			
45		Yes	Volume pedal maximum level
46		Yes	Volume pedal minimum level
47		Yes	Volume Pre/Post position: 0-63 = Pre, 64-127 = Post
48			
49			
50		Yes	Mod Enable: 0-63 = Off, 64-127 = On
51			
52			
53			
54			
55			
56		Yes	Mod mix
57		Yes	Mod Pre/Post position: 0-63 = Pre, 64-127 = Post
58		Yes	Mod Model select; see “FX Model Select” on page 2•13 for Model values
59			
60			
61			
62			
63			
64		Yes	Same as pressing Tap button; value is ignored

MIDI Controller Messages			
MIDI CC	Transmits	Recognizes	Spider Valve MkII Function
65			
66			
67			
68			
69		Yes	Tuner Mode: 0-63 = Exit, 64-127 = Enter
70			
71			
72		Yes	Pitch Glide Enable: 0-63 = Disable, 64-127 = Load and/or enable
73			
74		Yes	Stomp Pre/Post position: 0-63 = Pre, 64-127 = Post
75		Yes	Stomp Model Select; see “FX Model Select” on page 2•13 for Model values
76			
77			
78			
79			
80			
81			
82			
83			
84			
85			
86			
87		Yes	Delay Pre/Post position: 0-63 = Pre, 64-127 = Post
88		Yes	Delay Model Select; see “FX Model Select” on page 2•13 for Model values

MIDI Controller Messages			
MIDI CC	Transmits	Recognizes	Spider Valve MkII Function
89			
90			
91			
92			
93			
94			
95			
96	Yes	Yes	Mod SmartFX “Swoosh” position
97			
98			
99			
100			
101			
102			
103			
104			
105			
106			
107			
108			
109			
110			
111			
112			
113			
114			
115			

MIDI Controller Messages			
MIDI CC	Transmits	Recognizes	Spider Valve MkII Function
116			
117			
118			
119			
120			
121			
122			
123			
124			
125			
126			
127			

Amp Model Select

CC 12 selects the Amp Model only, with no change to the Tone controls, FX or Channel Volume.

AMP MODELS (MIDI CC 11 or 12)	
Value	Amp Model Name
1	Clean Amber
2	Clean Blue
3	Twang Amber
4	Twang Blue
5	Class A Amber
6	Class A Blue
7	Blues Amber
8	Blues Blue
9	Crunch Amber
10	Crunch Blue
11	Hi Gain Amber
12	Hi Gain Blue
13	Metal Amber
14	Metal Blue
15	Insane Amber
16	Insane Blue

FX Model Select

Use the MIDI CC numbers indicated in the tables below to select the Models for FX-1, FX-2, FX-3 and Reverb. For example, CC 58 with value 10 loads the U-Vibe Model.

Note: It is important that you do not use values other than those listed within these tables for each specific MIDI CC. Other values are unsupported and may create unexpected results.

FX-1 MODELS (MIDI CC 75)		
Value	FX Model Name	Swoosh
0	Off	
1	Red Comp	Gain
2	Fuzz Pi	Gain
3	Auto Wah	Auto
4	Auto Swell	Auto
5	Pitch Glide	Pitch
6	Smart Harmony	Pitch
21	Bass Overdrive	Gain
22	Blue Comp	Gain
27	Killer Z	Gain
30	Vetta Juice	Gain
31	Boost + EQ	Gain
32	Octave Fuzz	Gain
33	Screamer	Gain
35	Clean Sweep	Auto

FX-2 MODELS (MIDI CC 58)		
Value	FX Model Name	Swoosh
0	Off	
7	Sine Chorus	Chorus
8	L6 Flanger	Chorus
9	Phaser	Phaser
10	U-Vibe	Phaser
11	Opto Trem	Tremolo
12	Bias Trem	Tremolo
39	Analog Chorus	Chorus
41	Jet Flanger	Chorus
43	Expo Flange	Chorus
44	Random Chorus	Chorus
45	Square Chorus	Chorus
47	Lumpy Phase	Phaser
50	Warble-Matic	Phaser

FX-3 MODELS (MIDI CC 88)		
Value	FX Model Name	Swoosh
0	Off	
13	Digital Delay	Delay
14	Analog w/Mod	Delay
15	Tape Echo	Tape Echo
16	Multi-Head	Tape Echo
17	Sweep Echo	Sweep Echo
18	Reverse	Sweep Echo
51	Analog Delay	Delay
52	Dual Delay	Delay
55	Bubble Echo	Sweep Echo

REVERB MODELS (MIDI CC 37)	
Value	Reverb Model Name
0	Off
19	Lux Spring
20	Vintage Plate
58	King Spring
60	Chamber
62	Large Hall
63	Large Plate
64	Medium Hall
67	Small Room
68	Tiled Room

Preset Select

The following table shows the MIDI commands for accessing amp Presets.

PRESET SELECT					
Bank No.	Bank MSB	Bank LSB	Program Range	Program Bank	Program No.
0	0	0	0-127	User Presets	*1A-32D
16256	0	1	0-15	Amp Models	
16383	127	127		Edit Buffer	

User Presets - Spider Valve Mk II User Presets are comprised of 32 Banks of A, B, C & D Channels. To call up a particular User Preset, insert a Program Change value of 0-127. Value "0" loads Preset 1A, "1" loads 1B, "4" Loads 2A, "5" loads 2B, and so on, up to value "127" for 32D.*

Amp Model Defaults - For each Amp Model, there is a default preset. This is used to store default tone and FX settings for each Model. For Amp Model 1, Amp Model default “0” is recalled, for Amp Model 2, default “1” is recalled, etc. These locations are writable.

Edit Buffer Program - The Edit Buffer Program, location “0” in Bank number 16383 (0x7f 0x7f), represents the amp’s Edit Buffer. This Bank number can be used with preset retrieval and loading. It cannot be used for program changes.

MIDI SYSTEM EXCLUSIVE MESSAGES

In this chapter we've provided reference tables for MIDI System Exclusive (SysEx) messages utilized by Spider Valve™ MkII amplifiers.

Spider Valve MkII Amplifiers - Model ID Numbers

The model ID number is used to identify the specific amplifier model, and to prevent the unit from attempting to interpret messages from incompatible devices. The ID number consists of a Product Family ID and a Product ID. A Spider Valve MkII amplifier will respond to messages from any amp in the same family (Spider Valve MkII 112, 212 or HD). The MIDI Product Family ID for all Spider Valve MkII models is 0x12.

SPIDER VALVE MKII MODEL ID NUMBERS	
Product ID Number	Device (Product Name)
0x06	Spider Valve MkII 112
0x07	Spider Valve MkII 212
0x08	Spider Valve MkII HD

Command Messages

The tables in this section show the format utilized for SysEx command messages, and a complete list of command messages.

Message Format

SysEx command messages are formatted as shown here:

F0 00 01 0C 12 pp cc <arguments and data> F7

Please refer to the following table for the description of each segment of the message format.

COMMAND MESSAGE FORMAT		
Offset	Data (hex)	Field
Offset	Data (hex)	Field
0	F0	Start of SysEx
1	00 01 0C	Line 6 (Fast Forward Designs) manufacturer ID
4	12	Spider Valve MkII family ID
5	pp	Product ID
6	cc	Command code
7	uu	Unit number (omitted in some messages)*
8	Variable	Zero or more bytes of data
n	F7	End of SysEx

*The **Unit number** serves a similar purpose to the MIDI channel number used in MIDI channel messages. The Unit number can be any number from 0 to 126. A Spider Valve MkII will respond only to messages which have its assigned Unit number, or to messages with Unit number 127 (0x7f). For compatibility with other Line 6 products, certain Spider Valve MkII command messages do not include the Unit number.

List of SysEx Command Messages

The following table shows the list of SysEx command messages utilized by Spider Valve MkII amplifiers.

LIST OF COMMAND MESSAGES					
Code	Name	Impl.	Unit no.?	Section	Description
0x60	CmdParmReq		Yes		
0x62	CmdParmValue		Yes		
0x63	CmdParmChange		Yes		
0x78	CmdSaveProg		Yes		
0x79	CmdInitProg		Yes		
0x7B	CmdProgData		Yes		
0x7C	CmdProgReq		Yes		
0x7D	CmdProgAllUser		Yes		

LIST OF COMMAND MESSAGES

Code	Name	Impl.	Unit no.?	Section	Description
0x7E	CmdProgSaveAck		Yes		

Parameter Messages

This section covers SysEx Parameter Messages - See [“Parameter Reference” on page 4•1](#) for descriptions of Spider Valve MkII parameters.

Value Encoding

The value field in the **CmdParmChange** and **CmdParmValue** messages is an unsigned 21-bit integer transmitted in three bytes, each byte containing seven bits of the integer, with the most significant bits transmitted first. The following table provides encodings for various data types.

VALUE ENCODINGS

Data Type	Natural Range	Encoded Range	Comment
Integers	[0, 2097151]	[0, 2097151]	
Normalized	[0.0, 1.0]	[0, 2097151]	
Boolean	True, False	0 = False, non-zero = True	
Tempo	[20, 650]	[0, 2097151]	Tempo is given in 1/1000 units
Decibels	[-1048.575, 1048.575]	[-1048575, 1048575]	Encoded as sign + magnitude, in 1/1000 units; high bit is sign
Time	[0, 2097.151]	[0, 2097151]	Time is transmitted in milliseconds

CmdParmReq

This command requests the current value of a parameter. When a Spider Valve MkII receives this message, if the parameter number is valid, it broadcasts a [“CmdParmValue”](#) with the latest value of the parameter.

Byte string (hex): F0 00 01 0C 12 pp 60 uu gg pp F7

CmdParmReq MESSAGE FORMAT		
Offset	Data (hex)	Field
0	F0 00 01 0C 12	Header
5	pp	Product ID
6	60	Command code
7	uu	Unit number
8	gg	Group number
9	pp	Parameter number
10	F7	End of SysEx

CmdParmChange

This commands sets the value of a parameter.

Byte string (hex): F0 00 01 0C 12 cc 63 uu gg pp vv vv vv F7

CmdParmChange MESSAGE FORMAT		
Offset	Data (hex)	Field
0	F0 00 01 0C 12	Header
5	cc	Product ID
6	63	Command code
7	uu	Unit number
8	gg	Group number
9	pp	Parameter number
10	vv vv vv	Value
13	F7	End of SysEx

CmdParmValue

Reports the value of a parameter. This message can be used by devices or programs to display the latest value of a parameter. Spider Valve MkII can broadcast a CmdParmValue message whenever a parameter is changed, allowing attached devices to maintain an up-to-date display of parameter values. (This message is typically ignored if received by a Spider Valve MkII.)

SysEx string: F0 00 01 0C 12 pp 62 uu gg pp vv vv F7

CmdParmValue MESSAGE FORMAT		
Offset	Data (hex)	Field
0	F0 00 01 0C 12	Header
5	pp	Product ID
6	62	Command code
7	uu	Unit number
8	gg	Group number
9	pp	Parameter number
10	vv vv vv	Parameter value
13	F7	End of SysEx

CmdDSPStatus

Byte string (hex): F0 00 01 0C 12 pp 64 uu vv 00 F7

CmdDSPStatus MESSAGE FORMAT		
Offset	Data (hex)	Field
0	F0 00 01 0C 12	Header
5	pp	Product ID
6	64	Command code
7	uu	Unit number
8	vv	Status code
9	00	Reserved – ignore
10	F7	End of SysEx

CmdProgReq

Requests data for a single program to be transmitted. The program is sent in a CmdProgData message.

- To request the Edit Buffer, use 0x7F for both bank MSB and bank LSB, and 0 for the Program number.
- To request an entire bank, send this message once for each program to be transferred.
- User data can be requested using the USERREQ message.

SysEx string: SysEx string: F0 00 01 0C 12 pp 7C uu mm ll pp F7

CmdProgReq MESSAGE FORMAT		
Offset	Data (hex)	Field
0	F0 00 01 0C 12	Header
5	pp	Product ID
6	7C	Command code
7	uu	Unit number
8	mm	Bank MSB
9	ll	Bank LSB
10	pp	Program number
11	F7	End of SysEx

CmdProgData

This message contains the data for a single program, used to save programs to a Spider Valve MkII amp's memory. When a Spider Valve MkII receives this message, it stores the program data in the given location. Patch saving in a Spider Valve Mk II requires from 300-500ms. To prevent loss of patch data, wait for the ["CmdProgAck"](#) message, or give at least 500ms between messages.

This message is also used in retrieval of program data. A Spider Valve MkII transmits this message in response to ["CmdParmReq"](#). This message supports multiple program data formats. At present, only format 0 is defined. Format 0 is the Spider Valve MkII patch structure encoded in MIDI File Dump Standard format, where each group of seven eight-bit bytes is encoded as eight seven-bit bytes, by transmitting the most-significant bits of each byte into a single byte, then transmitting the seven bytes with their MSBs set to zero.

For example, the seven bytes...

AAAAaaaa BBBBbbbb CCCccccc DDDDdddd EEEEeeee FFFFffff GGGGgggg

...would be transmitted as follows:

0ABCDEFG 0AAAAaaa 0BBBBbbb 0CCCcccc 0DDDdddd 0EEEEeee 0FFFffff
0GGGgggg

If the last fragment contains fewer than seven bytes, zeros are appended to the group to make seven bytes. The patch struct carries a Fletcher-8 checksum. The message is not otherwise checksummed.

SysEx string: F0 00 01 0C 12 pp 7B uu mm ll pp ff dd .. F7

CmdProgData MESSAGE FORMAT		
Offset	Data (hex)	Field
0	F0 00 01 0C 12	Header
5	pp	Product ID
6	7B	Command code
7	uu	Unit number
8	mm	Bank MSB
9	ll	Bank LSB
10	pp	Program number
11	ff	Format number; 0 for Spider Valve MkII
12	dd dd ..	Program data; see above
n	F7	End of SysEx

CmdProgAck

In response to a CmdProgData message, Spider Valve MkII returns a CmdProgAck message, indicating whether the patch was received successfully.

SysEx string: F0 00 01 0C 12 pp 7E uu ss F7

CmdProgAck MESSAGE FORMAT		
Offset	Data (hex)	Field
0	F0 00 01 0C 12	Header
5	pp	Product ID
6	7E	Command code
7	uu	Unit number
8	mm	Bank number, MSB
9	ll	Bank number, LSB
10	pp	Program number
11	ss	Status code (see following table)*
12	F7	End of SysEx

* The types of **Status codes** are as follows (any code not listed in the following table should be interpreted as an error):

CmdProgAck STATUS CODES	
Code	Status
0	Patch data received successfully
1	Data integrity error in patch
2	Unsupported patch format
3	Invalid patch location
4	Request message invalid
5	Read-only location
6	Write operation failed

CmdUserReq

Requests all user-editable patches. In Spider Valve MkII, this causes all of the Amp Model programs to be sent, followed by all of the user programs. Each program is sent as a separate message.

SysEx string: F0 00 01 0C 12 pp 7D uu F7

CmdUserReq MESSAGE FORMAT		
Offset	Data (hex)	Field
0	F0 00 01 0C 12	Header
5	pp	Product ID
6	7D	Command code
7	uu	Unit number
8	F7	End of SysEx

Patch Format

The following table describes the patch format encoded in the [“CmdProgData”](#) message with format 0. Unless otherwise noted:

- Multi-byte values are stored in little-endian byte order.
- Values are signed two’s-complement.
- Values are either unitless mappings, where 0 is minimum and 32767 is maximum, or restricted to a list of integers.
- Reserved fields and bits must be ignored when parsing a patch, and set to 0 when writing.

CmdProgData PATCH FORMAT			
Offset	Length	Range	Description
0	16	See “Patch Name”	Patch name
16	2	Bitmap	See “Patch Flags”
18	1	0 - 15	See “Amp Model ID”
19	1	0	Reserved
20	2	0 - 32767	Drive
22	2	0 - 32767	Bass
24	2	0 - 32767	Mid

CmdProgData PATCH FORMAT			
Offset	Length	Range	Description
26	2	0 - 32767	Treble
28	2	0 - 32767	Channel volume
30	2	0 - 65535	Tempo; 1/100 BPM; unsigned
32	2	0 - 32767	Pedal min
34	2	0 - 32767	Pedal max
36	2	-32768 - 32767	Gate threshold, 1/100 dB
38	2	0 - 32767	Gate decay
40	2	0 - 32767	Boost pre
42	2	0 - 32767	Boost post
44	1	See “Effect Model IDs”	Reverb model ID
45	1	0 - 7, See “Effect Model IDs”	Wah model ID
46	2	0 - 32767	Reverb mix
48	1	See “Effect Model IDs”	Stomp model ID
49	1	See “Effect Model IDs”	Mod model ID
50	1	See “Effect Model IDs”	Delay model ID
51	1	See “FBV Pedal Mode”	FBV pedal mode
52	2	0 - 32767	Stomp mix
54	2	0 - 32767	Mod mix
56	2	0 - 32767	Delay mix
58	8	See “Effect Control Block”	Stomp effect control block
66	8	See “Effect Control Block”	Mod effect control block
74	8	See “Effect Control Block”	Delay effect control block
82	10	See “Custom Effect Parameters”	Stomp effect custom parameters
92	10	See “Custom Effect Parameters”	Mod effect custom parameters
102	10	See “Custom Effect Parameters”	Delay effect custom parameters
112	10	See “Custom Effect Parameters”	Reverb effect custom parameters
122	1	0-127	Wah position

CmdProgData PATCH FORMAT			
Offset	Length	Range	Description
123	1	0-16, See “Cabinet Model ID”	Cabinet model
124	2	0	Reserved
126	2	See “Checksum”	Checksum

Patch Name

The name is a string of up to 16 ASCII characters. It may be zero-terminated; any character following a zero is ignored.

Patch Flags

All other bits are reserved and should be set to zero.

PATCH FLAGS	
Bit	Description
0	Gate active; 0 = off, 1 = on
1	Hush active; 0 = off, 1 = on
2	Volume pedal position; 0 = pre, 1 = post
3	Reverb position; 0 = pre, 1 = post
4	Reverb enable; 0 = off, 1 = on
5	Boost enable; 0 = off, 1 = on
6	Wah enable; 0 = off, 1 = on

FBV Pedal Mode

FBV pedal mode is a bitmap. The lower four bits represent the mode for pedal 0 (left pedal), and the upper four bits represent the mode for pedal 1 (right pedal). Each nybble can take the following values:

FBV PEDAL MODE	
Value	Mode
0	Off
1	Volume
2	Wah
3	Whammy (legacy patches only)*

* Mode 3 can be set in older firmware versions (pre-1.50). Later versions never set mode 3, relying instead on the whammy effect's FBV mode parameter.

Amp Model ID

The amp model ID is in the range 0 to 15, where 0 indicates the first amp model. Note that this numbering is different from the amp model parameter and controls, where 0 indicates no amp model.

Cabinet Model ID

If the cabinet model ID is 0, the cabinet model is set to the default cabinet model for the selected amp. This is the way patches are typically written. IDs 1 - 16 select the cabinet model regardless of the amp model. ID 1 represents the first cabinet model (note that this is different from the amp model field).

Effect Model IDs

For all effect slots, ID 0 indicates no effect. For ID listings, see the section [“FX Model Select”](#).

Effect Control Block

Each control block has the format given in the following table. Note that there is no control block for the reverb slot. (See [“Effects Parameters”](#) for more information about SmartFX.)

EFFECT CONTROL BLOCK		
Offset	Length	Description
0	1	Flags; see below*
1	1	SmartFX value; range 0 - 127
2	1	Reserved
3	1	Custom model ID
4	1	Range 1 model ID
5	1	Range 2 model ID
6	1	Range 3 model ID
7	1	Parameter lock bits; See “10: Parameter Lock Bitmap”

* The meaning of the flag bits is:

EFFECT CONTROL BLOCK - FLAG BITS	
Bit	Description
0	Tempo control: 0 = off, 1 = on (mod and delay slots only)
1	Routing: 0 = pre, 1 = post
2	Effect enable: 0 = off, 1 = on
3-7	Reserved; set to 0

Custom Effect Parameters

The custom effect parameters apply to locked parameters in the custom effect. For these parameters to take effect, the corresponding lock bit in the effect control block must be set, and the selected model must be the custom model.

Checksum

The checksum is generated using the 8-bit Fletcher algorithm, as described in [RFC1146](#). Although the checksum operates on 8-bit bytes, it generates a 16-bit result. The following C function can be used to calculate the checksum:

```
unsigned short fletcher8(uint8_t *data, size_t len)
{
    unsigned short sum1 = 0xff, sum2 = 0xff;

    while (len) {
        size_t tlen = len > 21 ? 21 : len;
        len -= tlen;
        do {
            sum1 += *data++;
            sum2 += sum1;
        } while (--tlen);
        sum1 = (sum1 & 0xff) + (sum1 >> 8);
        sum2 = (sum2 & 0xff) + (sum2 >> 8);
    }

    /* Second reduction step to reduce sums to 8 bits */
    sum1 = (sum1 & 0xff) + (sum1 >> 8);
    sum2 = (sum2 & 0xff) + (sum2 >> 8);

    // result packed per RFC1146
    return (sum1 << 8) | sum2;
}
```

PARAMETER REFERENCE

In this chapter we've provided reference tables for Spider Valve™ MkII Parameter Groups and Parameters.

Parameter Groups

The parameter groups in Spider Valve MkII are listed in the following table. Unlisted group numbers are reserved.

PARAMETER GROUPS		
Group Number	Group Name	Description
0x00	GroupGlobal	Parameters which are not stored in patches, and are not saved between reboots.
0x02	GroupPatch	Various parameters stored in patches, except for effects parameters.
0x04	GroupPersistent	Parameters which are not stored in patches, but are saved between reboots.
Effects Control Groups	Parameters which govern effects slots, and which do not change depending on the loaded effect; e.g. model number, mix, etc.	
0x10	GroupFX1Ctl	Controls for the 'Stomp' slot
0x11	GroupFX2Ctl	Controls for the 'Mod' slot
0x12	GroupFX3Ctl	Controls for the 'Delay' slot
0x13	GroupReverbCtl	Controls for the Reverb slot
Custom Effects Parameter Groups	Customized parameters for the effects slots	
0x30	GroupFX1Custom	Customized parameters for the 'Stomp' slot
0x31	GroupFX2Custom	Customized parameters for the 'mod' slot

PARAMETER GROUPS		
Group Number	Group Name	Description
0x32	GroupFX3Custom	Customized parameters for the 'delay' slot
0x33	GroupReverbCustom	Customized parameters for the reverb slot
Effects Parameter Groups	Parameters which govern effects, and which change depending on the loaded effect	
0x30	GroupFX1	Parameters for the 'Stomp' slot
0x31	GroupFX2	Parameters for the 'Mod' slot
0x32	GroupFX3	Parameters for the 'Delay' slot
0x33	GroupReverb	Parameters for the Reverb slot

GroupGlobal

The following table shows the list of Global Group parameters.

GLOBAL GROUPS			
No.	Name	Type	Note
0	Master volume	Proportional	See following description
1	Balance	Proportional	Center = 1/2; See following description
2	Mute	0 = normal, 1 = mute	
3	Invert	0 = normal, 1 = invert	
4	Volume pedal position	Proportional	
5	Tuner status	Enum	
6	Looper state	Enum	
8	Wah pedal position	Proportional	
9	Wah effect active	0 = off, 1 = on	

GLOBAL GROUPS			
No.	Name	Type	Note
10	Amp model select with defaults	0 = none, 1-16	See following description
11	Enable parameter value update messages	0 = off, 1 = on	See following description
16	DSP tube model enable	0 = off, 1 = on	
17	Master gain	dB / 1000	
19	AIR mix	Proportional	

0: Master Volume - This parameter adjusts master gain linearly from -80dB to 0dB. Note that this does not use the same curve as the volume knob on the front panel, which is intended to simulate the feel of a volume knob on a typical tube-based guitar amplifier.

1: Balance - This adjusts the balance of the stereo output. This parameter does not function as expected on Spider Valve MkII, which does not have a stereo signal path. The middle value gives equal balance.

10: Amp Model Select with Defaults - Adjusting this parameter performs the same action as turning the amp model knob on the amp's front panel. Depending on the Manual Mode and AutoFX settings, changing this parameter may cause some or most parameters to be changed, as amp model defaults are loaded. To change only the amp model, regardless of AutoFX settings, use Patch Group parameter 0.

11: Notification Message Enable - If this parameter is enabled, a notification message (CmdParmValue) is transmitted for each parameter change. This is useful for remote editor software. See also "[CmdParmValue](#)". The default is off, and parameter is set to off when the unit is powered on.

GroupPatch

The following table lists the Patch Group parameters.

PATCH GROUP PARAMETERS			
No.	Name	Type	Notes
0	Amp model	0 = none, 1-16 = amp model	See also “10: Amp model select with defaults” above
1	Drive	Proportional	
2	Bass	Proportional	
3	Mid	Proportional	
4	Treble	Proportional	
5	Ch Vol	Proportional	
6	Tempo	BPM / 100	
7	Volume pedal routing	0 = pre, 1 = post	
8	Volume pedal min	Proportional	
9	Volume pedal max	Proportional	
10	Gate Threshold	dB / 1000	
11	Gate Decay	Proportional	
12	Gate Mode	0 = off, 1 = gate, 2 = nr, 3 = Both	
13	Boost Active	0 = off, 1 = on	
14	Boost Pre	dB / 1000	
15	Boost Post	dB / 1000	
16	FBV pedal 0 mode	0 = off, 1 = vol, 2 = wah	
17	FBV pedal 1 mode	0 = off, 1 = vol, 2 = wah	

GroupPersistent

PERSISTENT GROUP PARAMETERS			
Persistent Group Parameters ID	Name	Type	Notes
1	Quick loop position	0 = pre, 1 = post	
2	AutoFX	0 = off, 1 = on	
3	Backlight timeout enable	0 = off, 1 = on	
4	Tap light timeout enable	0 = off, 1 = on	
6	Manual mode enable	0 = off, 1 = on	
7	Program number	0 - 127	
8	Bank number	See following description	See following description
13	Direct out mode (SV only)	0 = normal, 1 = studio	
14	MIDI thru mode (SV only)	0 = out, 1 = thru	
15	MIDI channel (SV only)	0-15	Also sets unit number

8: Current Bank and Program Number - This parameter contains the current bank and program number (see Preset banks). The program number is in the range 0 - 127. The bank number is encoded across the 21 bits in the three data bytes – to recover it, concatenate the lower 7 bits of each byte together, just as is done with a normal integer value.

Effects Parameters

Each effect slot is controlled using parameters from three groups: a **control group**, which contains common effect control parameters such as model select; a **parameter group**, which contains parameters specific to each effect; and, for the SmartFX slots, a **custom group**, which contains the parameters to use for the ‘custom’ effect.

The **effect parameter groups** contain the parameter settings in effect. They are affected by the SmartFX knob. Each parameter depends on the selected effect, except parameter 0, which is always mix.

The **custom effect groups** contain parameter settings for the ‘customized’ effect (see the user manual for information on this). These settings take effect for ‘unlocked’ parameters when the custom effect is selected.

In Spider Valve MkII, the first three effect slots have SmartFX capability; the fourth slot does not. The second and third slots support tempo control.

EFFECT CONTROL PARAMETERS			
Effect Control Parameters No.	Name	Type	Notes
0	Effect model	Enum	Always takes effect; see following description
1	Position	0 = pre, 1 = post	
2	Mix	Proportional	
3	Active	0 = inactive, 1 = active	
4	Tempo control	0 = off, 1 = on	See “4: Tempo Control”
5	SmartFX	Proportional	See “5: SmartFX”
6	Customized model	Enum	See “6: Custom Model”
7	Default model for range 1	Enum	See “7-9: Range Models”
8	Default model for range 2	Enum	See “7-9: Range Models”
9	Default model for range 3	Enum	See “7-9: Range Models”
10	Parameter lock bitmap	Bitmap	

4: Tempo Control

If this parameter is “1”, the time or speed parameter for the effect is overridden by the global tempo setting. This parameter is only valid for the second and third effect slots.

5: SmartFX

This parameter controls the SmartFX position. Turning a SmartFX knob through one of the three SmartFX ranges varies this parameter between minimum and maximum.

6: Custom Model

This parameter contains the ID of the effect chosen to be the ‘customized’ effect. When the effect model setting matches this ID, the effect is considered to be customized; the lock bits and custom parameters can then take effect.

7-9: Range Models

These are the IDs for the models which will be selected when the SmartFX knob for this slot is turned through its three ranges.

10: Parameter Lock Bitmap

This parameter selects whether each model parameter in the custom model will be controlled by SmartFX. The lock state only affects a parameter if the custom model is selected. If any other model is selected, all effect parameters are controlled by SmartFX, regardless of the value of this parameter.

The parameter value is a bitmap. If a bit is 1, that parameter is not controlled by SmartFX; if the bit is 0, the parameter is controlled by SmartFX. Each bit controls the locked state of the corresponding parameter: the LSB controls the lock state for parameter 0, the next bit controls parameter 1, etc. 1 locks the parameter, and 0 unlocks it. When a parameter is not controlled by SmartFX, the parameter value from the custom group is used.

Effects Slot Control Groups

The Effect Slot Control Groups contain effect parameters for slots which are not affected by SmartFX, and which are the same for every effect, not being dependent on the selected model (with a few exceptions). There are four effect slots in Spider Valve MkII.

- The first three slots have SmartFX capability; all parameters in this group are valid for the first three slots, except for ParmTapCtl, which is ignored for the first slot, as it does not support tempo control.
- The fourth slot (Reverb) does not have SmartFX capability or tempo control. Only the first four parameters (ParmModel, ParmRouting, ParmMix, and ParmActive) are valid for the Reverb slot.

EFFECTS SLOT CONTROL GROUPS		
No.	Symbol	Type
0	ParmModel	Enum
1	ParmRouting	Enum
2	ParmMix	Proportional
3	ParmActive	Boolean
4	ParmTapCtl	Boolean
5	ParmSmartFX	Proportional
6	ParmCustomModel	Enum
7	ParmSmartFXRange1Model	Enum
8	ParmSmartFXRange2Model	Enum
9	ParmSmartFXRange3Model	Enum
10	ParmParamLock (see following section)	Enum

ParmParamLock

This parameter controls the ‘locked’ state of each model parameter. A locked parameter is not changed by the SmartFX mechanism, and when the corresponding custom effect parameter value is changed, the real effect parameter is also changed. An unlocked parameter is changed by the SmartFX mechanism, and unaffected by the custom effect parameter.

The locked state only affects the parameter if the custom model is selected. If any other model is selected, all effect parameters are controlled by SmartFX, regardless of the value of this parameter. The parameter value is a bitmap. Each bit controls the locked state of the corresponding parameter. 1 locks the parameter, and 0 unlocks it.

