

ALLEN&HEATH



MIDI Protocol

Issue 5

SQ Firmware V1.5.0 or later

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1. Introduction and setup

MIDI (**M**usical **I**nstrument **D**igital **I**nterface) is a standardised communication protocol that enables digital devices to communicate and allows one piece of equipment to control another.

The SQ sends and receives MIDI over USB (via the USB-B port) as well as over ethernet (using MIDI over TCP/IP via the network port).

These can be broken down into two sets of bi-directional messages. Those that are used with SQ mixing parameters (i.e. level control of SQ audio channels), and those used to control external software or equipment (i.e. to control a DAW).

1.1 Connection

When connected to a computer using the USB-B port, the SQ will appear as a MIDI input and output device. This can be used with software directly or through use of the [Allen & Heath MIDI Control](#) application.

To connect a computer to the SQ over a network, [Allen & Heath MIDI Control](#) can be used.

All other clients used for network communication should be configured to send messages to the SQ's IP address and use port 51325.



→ MIDI over TCP/IP (via network)

→ MIDI over USB (direct to computer)

1.2 MIDI channels

There are 16 MIDI channels available, and the SQ makes use of 2 of these, one for the mixer itself and one for the MIDI channel strips which can be used with [Allen & Heath MIDI Control](#) to emulate a DAW control surface.

Press the **'Utility'** screen key, then touch the **'General'** tab followed by the **'MIDI'** tab to view and adjust the MIDI channel setting. This screen also displays MMC (**MIDI Machine Control**) buttons for control of computer sequencers and DAW's.



- Touch the **'MIDI Channel'** value and use the touchscreen rotary to adjust.
- Touch the **'Apply'** or **'Cancel'** buttons to apply or disregard changes.
- Touch the **'NRPN Fader Law'** value to switch NRPN level control (to and from the SQ core) between Linear Taper or Audio Taper.

The channel used for MIDI DAW control (and therefore all MIDI fader strips) is always one higher than the MIDI Channel the SQ itself is set to. To use MIDI channel 1 for DAW control purposes, set the main SQ MIDI channel to 16.

The audio taper option allows the SQ level control to be used with external linear controls such as MIDI faders or pots and have them behave in the same way as SQ faders.

❗ See the [3.4 Levels](#) section for more information on Fader Laws.

Touching any of the MMC Controls sends standard MMC transport messages to **all** channels. These are also used by the DAW control driver to send transport messages for the control surface emulation being used.

1.3 Types of message

MIDI messages can be presented in different ways in various hardware and software, including plain text, binary, decimal and hexadecimal.

As an example, here are four representations of the same message:

Plain text	MIDI Channel 1, C-1, Note on
Binary	1001 0000 0000 0000 0111 1111
Decimal	144 0 127
Hexadecimal	0x90 0x00 0x7F

This document uses the representations you are most likely to come across for each kind of message when communicating with the SQ.

Note On/Off – The SQ uses a note on followed by a note off for MIDI strip keys and MIDI triggering of the SQ SoftKeys.

MMC – **MIDI Machine Control** is used to send transport control messages from the SQ.

i MMC messages are 'Real Time Universal System Exclusive' messages and are sent to all connected devices rather than being assigned to a single MIDI channel.

CC (Continuous Controller) – For each MIDI channel there are 128 continuous controllers, each of which can have a value between 0 and 127 (128 steps). These are used by MIDI strip faders, MIDI on Soft Rotaries and other parameters with more than just an on/off state.

NRPN (Non-Registered Parameter Number) – For high-resolution control (16384 steps) and access to many more parameters, NRPN messages are used to communicate with SQ to control levels, panning, mutes and assignments.

NRPN messages can be thought of as a specific string of CC messages, with MSB (**M**ost **S**ignificant **B**yte) and LSB (**L**east **S**ignificant **B**yte) representing a parameter number and data bytes representing parameter value.

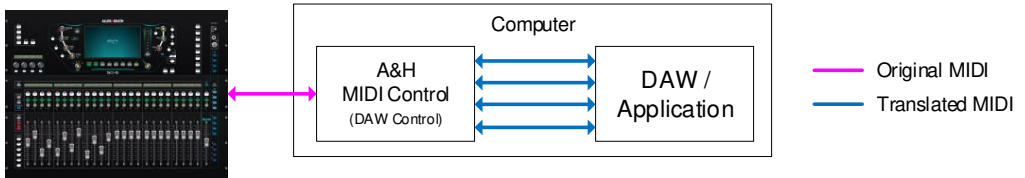
NRPNs can be used to set the absolute value of a parameter or to increment/decrement a parameter value.

These are displayed as hexadecimal values in this document and it should be noted that the '0x' prefix has been removed for brevity.

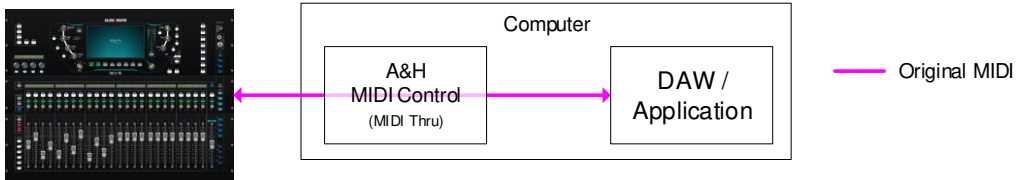
1.4 Allen & Heath MIDI Control and DAW Control

Previously known as the ‘DAW Control Driver’, **Allen & Heath MIDI Control** works by creating virtual MIDI ports in Mac OS or Windows and then facilitating a MIDI connection between these virtual ports and the SQ either with or without translation.

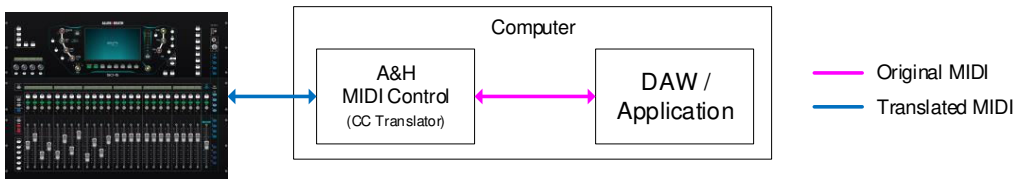
This enables MIDI channel strips and SoftKey options on the SQ to control DAW software on Mac OS or Windows by emulating popular HUI or Mackie Control protocols.



It can be used to send and receive MIDI control messages directly to and from the SQ core for remote control of mixing parameters, scene changes and other functions (as detailed in this document).



Simplified control of the most common mixing parameters using MIDI CC and Note On/Off messages from the computer is also made possible with the ‘CC Translator’ options.



Visit the Allen & Heath website (www.allen-heath.com) to download the latest version of Allen & Heath MIDI Control and refer to the Help document for information on setup and configuration.

2. MIDI Faders and Soft Controls

2.1 MIDI faders

The SQ has 32 freely assignable MIDI fader strips. Refer to the SQ Reference Guide for information on strip assignments.

Each strip sends and responds to the following messages sent on the 'MIDI DAW Control Channel':

MIDI Strip	Mute Key	Sel Key	PAFL Key	Fader
1	C-1 Note ON/OFF	G#1 Note ON/OFF	E4 Note ON/OFF	CC#0
2	C#-1 Note ON/OFF	A1 Note ON/OFF	F4 Note ON/OFF	CC#1
3	D-1 Note ON/OFF	A#1 Note ON/OFF	F#4 Note ON/OFF	CC#2
4	D#-1 Note ON/OFF	B1 Note ON/OFF	G4 Note ON/OFF	CC#3
5	E-1 Note ON/OFF	C2 Note ON/OFF	G#4 Note ON/OFF	CC#4
6	F-1 Note ON/OFF	C#2 Note ON/OFF	A4 Note ON/OFF	CC#5
7	F#-1 Note ON/OFF	D2 Note ON/OFF	A#4 Note ON/OFF	CC#6
8	G-1 Note ON/OFF	D#2 Note ON/OFF	B4 Note ON/OFF	CC#7
9	G#-1 Note ON/OFF	E2 Note ON/OFF	C5 Note ON/OFF	CC#8
10	A-1 Note ON/OFF	F2 Note ON/OFF	C#5 Note ON/OFF	CC#9
11	A#-1 Note ON/OFF	F#2 Note ON/OFF	D5 Note ON/OFF	CC#10
12	B-1 Note ON/OFF	G2 Note ON/OFF	D#5 Note ON/OFF	CC#11
13	C0 Note ON/OFF	G#2 Note ON/OFF	E5 Note ON/OFF	CC#12
14	C#0 Note ON/OFF	A2 Note ON/OFF	F5 Note ON/OFF	CC#13
15	D0 Note ON/OFF	A#2 Note ON/OFF	F#5 Note ON/OFF	CC#14
16	D#0 Note ON/OFF	B2 Note ON/OFF	G5 Note ON/OFF	CC#15
17	E0 Note ON/OFF	C3 Note ON/OFF	G#5 Note ON/OFF	CC#16
18	F0 Note ON/OFF	C#3 Note ON/OFF	A5 Note ON/OFF	CC#17
19	F#0 Note ON/OFF	D3 Note ON/OFF	A#5 Note ON/OFF	CC#18
20	G0 Note ON/OFF	D#3 Note ON/OFF	B5 Note ON/OFF	CC#19
21	G#0 Note ON/OFF	E3 Note ON/OFF	C6 Note ON/OFF	CC#20
22	A0 Note ON/OFF	F3 Note ON/OFF	C#6 Note ON/OFF	CC#21
23	A#0 Note ON/OFF	F#3 Note ON/OFF	D6 Note ON/OFF	CC#22
24	B0 Note ON/OFF	G3 Note ON/OFF	D#6 Note ON/OFF	CC#23
25	C1 Note ON/OFF	G#3 Note ON/OFF	E6 Note ON/OFF	CC#24
26	C#1 Note ON/OFF	A3 Note ON/OFF	F6 Note ON/OFF	CC#25
27	D1 Note ON/OFF	A#3 Note ON/OFF	F#6 Note ON/OFF	CC#26
28	D#1 Note ON/OFF	B3 Note ON/OFF	G6 Note ON/OFF	CC#27
29	E1 Note ON/OFF	C4 Note ON/OFF	G#6 Note ON/OFF	CC#28
30	F1 Note ON/OFF	C#4 Note ON/OFF	A6 Note ON/OFF	CC#29
31	F#1 Note ON/OFF	D4 Note ON/OFF	A#6 Note ON/OFF	CC#30
32	G1 Note ON/OFF	D#4 Note ON/OFF	B6 Note ON/OFF	CC#31

2.2 Soft Keys and Footswitch

The SQ-5 features 8 assignable Soft Keys, while the SQ-6 and SQ-7 both feature 16 assignable Soft Keys and all SQ models feature a dual footswitch input. Any of these can be assigned the following MIDI functions:

Function	Option 1	Option 2
MMC	-	Rewind, Play, Pause, Stop, FFwd, Record
DAW Control	-	Bank Up, Bank Down
MIDI note On/Off	MIDI Channel 1 to 16	C-1 (0) to G9 (127)
Program Change	MIDI Channel 1 to 16	0 to 127

i Refer to the SQ Reference Guide for information on assigning Soft Key and footswitch functions.

2.3 Soft Rotaries

The SQ-6 and SQ-7 feature 4 and 8 Soft Rotaries respectively, with options for these to send the following messages:

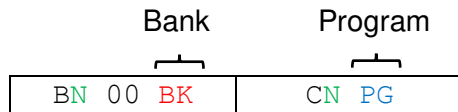
Function	Option 1	Option 2	Key Option
MIDI Absolute	MIDI Channel 1 to 16	CC# 0 to 127	Unassigned, Note On/Off C-1 (0) to G9 (127)
MIDI Relative	MIDI Channel 1 to 16	CC# 0 to 127	Unassigned, Note On/Off C-1 (0) to G9 (127)
Program Change	MIDI Channel 1 to 16	0 to 127	Sends MIDI

i Refer to the SQ Reference Guide for information on assigning Soft Rotary functions.

3. Control to and from the Mixer

3.1 Scene change

A scene change uses a bank change followed by a program change.



Where: **N** = MIDI Channel, **BK** = Bank, **PG** = Program

The bank change (**BK**) selects between three ranges of scenes:

Scenes 1 to 128 = Bank 1 = 00
Scenes 129 to 256 = Bank 2 = 01
Scenes 257 to 300 = Bank 3 = 02

The program change (**PG**) is then a value between 00 and 7F (decimal 0-127), which selects a scene in that range.

i Note that there is an offset of -1 between the SQ values and the MIDI values due to the SQ counting from 1 to 128 and MIDI counting from 0 to 127.

So scene 96 is bank change 00 (1) and program change 5F (95) and scene 264 is bank change 02 (3) and program change 07 (8).

The scene being recalled must exist as a saved scene in the SQ, blank scenes cannot be recalled.

Examples:

Scene, MIDI Ch	Message
Scene 7, Ch1	B0 00 00 C0 06
Scene 120, Ch1	B0 00 00 C0 77
Scene 156, Ch1	B0 00 01 C0 1B
Scene 156, Ch3	B2 00 01 C2 1B

3.2 Soft Keys

The SQ Soft Keys can be controlled using standard MIDI Note On/Off messages, allowing the control of many more internal functions of the SQ by proxy.

- ❗ The SQ does not send note on/off messages when a Soft Key is pressed unless the Soft Key is set to a MIDI note on/off function. See the [Soft Keys and Footswitch](#) section for more details.

A key press is triggered with note on and a release is triggered separately with a note off, this means it is possible to replicate a held key (i.e. for use with the talkback function).

Each Soft Key is controlled with a different sequential note starting at C3 (30).

SoftKey	Note	HEX
1	C3	30
2	C#3	31
3	D3	32
4	D#3	33

SoftKey	Note	HEX
5	E3	34
6	F3	35
7	F#3	36
8	G3	37

SoftKey	Note	HEX
9	G#3	38
10	A3	39
11	A#3	3A
12	B3	3B

SoftKey	Note	HEX
13	C4	3C
14	C#4	3D
15	D4	3E
16	D#4	3F

- ❗ The HEX values shown here are accurate, but some applications and hardware use different octave designations. i.e. If C3 is not controlling SoftKey 1, try C2/C4.

Note On (Soft Key press)

On Note Velocity



Note Off (Soft Key release)

Off Note Velocity



Both where: **N** = MIDI Channel, **SK** = Soft Key Note

- ❗ The SQ will respond to both MIDI note off standards, i.e. a specific note off message or a note on message with zero velocity.

Examples:

Soft Key, MIDI Ch	Message (Press)	Message (Release)
Soft Key #1, Ch1	90 30 7F	80 30 00
Soft Key #7, Ch5	94 36 7F	84 36 00

3.3 Mutes

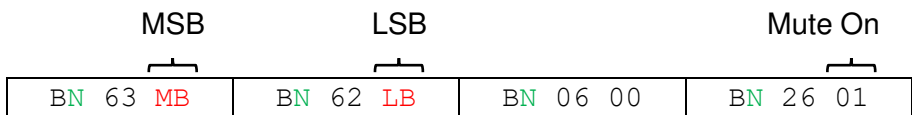
The SQ sends and receives absolute On or Off mute messages. It will also toggle the mute state when either an increment or decrement message is received.

MSB and LSB are a parameter number for the channel you wish to mute or unmute.

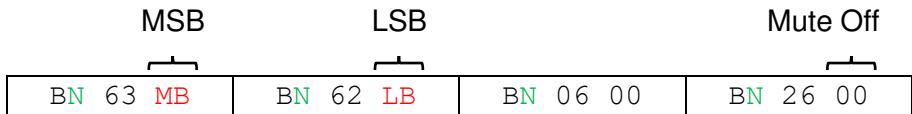
❗ MSB/LSB parameter numbers are shown in the [reference tables](#) section.

The last byte of the full message then represents a mute on or off.

Mute On



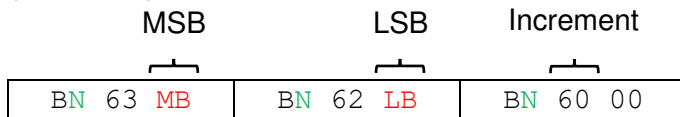
Mute Off



Both where: N= MIDI Channel, MB/LB = MSB/LSB Parameter number

When either a data increment or decrement message is received, the SQ will toggle between states, in the same way as pressing a mute key on the SQ does.

Mute Toggle (increment)



Where: N= MIDI Channel, MB/LB = MSB/LSB Parameter number

Examples:

Channel, Cmnd, MIDI Ch	Message
lp1, Mute On, Ch1	B0 63 00 B0 62 00 B0 06 00 B0 26 01
LR mix, Mute Off, Ch1	B0 63 00 B0 62 44 B0 06 00 B0 26 00
Mute Grp 4, Mute On, Ch7	B6 63 04 B6 62 03 B6 06 00 B6 26 01
lp1, Mute Toggle, Ch1	B0 63 00 B0 62 00 B0 60 00

3.4 Levels

Levels can be set using either absolute values or in relative 1dB increments/decrements.

MSB and LSB are a parameter number showing where the signal is being sent from and where it is being sent to.

❗ MSB/LSB parameter numbers are shown in the [reference tables](#).

An absolute level is represented with a combination of course and fine values.

MSB		LSB		Value Coarse		Value Fine					
BN	63	MB	BN	62	LB	BN	06	VC	BN	26	VF

Where: N= MIDI Channel, MB/LB = MSB/LSB Parameter number, VC/VF = Value

NRPN Fader Law

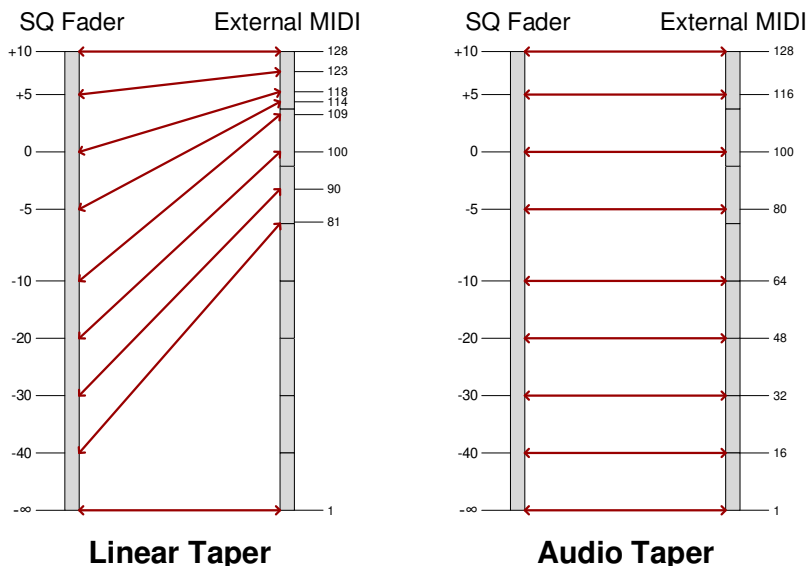
The way the SQ responds to and sends level messages can be switched between two modes.

Press the 'Utility' screen key, then touch the 'General' tab followed by the 'MIDI' tab to view and adjust this setting.



The standard mode is a high-resolution Linear Taper, with 16384 possible values.

Audio taper has a lower resolution, with 255 possible values, but allows mapped external linear controls (e.g. MIDI faders or pots) to work in a similar way to the SQ faders, with more control about the unity gain (0dB) position.



❗ See 'Example Linear Taper Level Values' and 'Approximate Audio Taper Level Values' in the [reference tables](#).

Standard (Linear) Examples:

Address, Value, MIDI Ch	Message
lp1 to LR, 0dB, Ch1	B0 63 40 B0 62 00 B0 06 76 B0 26 5C
lp1 to LR, -20dB, Ch1	B0 63 40 B0 62 00 B0 06 63 B0 26 49
lp40 to LR, -20dB, Ch1	B0 63 40 B0 62 27 B0 06 63 B0 26 49
lp40 to Aux5, -20dB, Ch1	B0 63 44 B0 62 1C B0 06 63 B0 26 49
lp40 to Aux5, -12dB, Ch4	B3 63 44 B3 62 1C B3 06 6B B3 26 06
Grp4 to Aux8, -24dB, Ch4	B3 63 45 B3 62 2F B3 06 5F B3 26 57
lp36 to FX3, -12dB, Ch14	BD 63 4D BD 62 22 BD 06 6B BD 26 06

Audio Taper Examples:

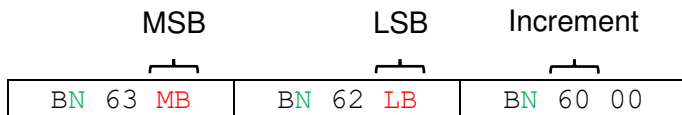
Address, Value, MIDI Ch	Message
lp1 to LR, 0dB, Ch1	B0 63 40 B0 62 00 B0 06 62 B0 26 00
lp1 to LR, -20dB, Ch1	B0 63 40 B0 62 00 B0 06 2E B0 26 40
lp40 to LR, -20dB, Ch1	B0 63 40 B0 62 27 B0 06 2E B0 26 40
lp40 to Aux5, -20dB, Ch1	B0 63 44 B0 62 1C B0 06 2E B0 26 40
lp40 to Aux5, -12dB, Ch4	B3 63 44 B3 62 1C B3 06 3B B3 26 00
Grp4 to Aux8, -24dB, Ch4	B3 63 45 B3 62 2F B3 06 28 B3 26 40
lp36 to FX3, -12dB, Ch14	BD 63 4D BD 62 22 BD 06 3B BD 26 00

A relative level message uses the same parameter number, but with an increment or decrement byte.

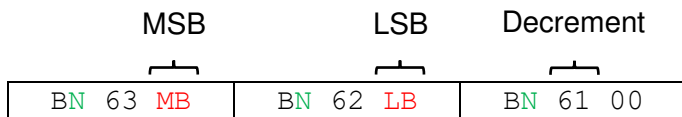
This raises or lowers a level in 1dB steps.

❗ The NRPN Fader Law setting has no effect on relative control.

+1dB (increment)



-1dB (decrement)



Both where: N= MIDI Channel, MB/LB = MSB/LSB Parameter number

Examples:

Address, Inc/Dec, MIDI Ch	Message
lp1 to LR, Increment, Ch1	B0 63 40 B0 62 00 B0 60 00
Grp5 to LR, Decrement, Ch5	B4 63 40 B4 62 34 B4 61 00
FX2Rtn to Aux3, Increment, Ch12	BB 63 46 BB 62 22 BB 60 00

3.5 Panning/Balance

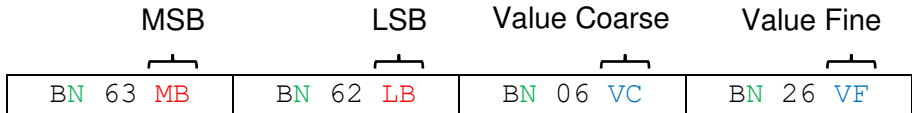
Panning (mono sources) or balance (stereo sources) can be set using either absolute values or in relative increments/decrements.

MSB and LSB represent a parameter number showing where the signal is being sent from and where it is being sent to.

❗ MSB/LSB parameter numbers are shown in the [reference tables](#).

Absolute values are set with a combination of coarse and fine values. Ranging from 00 00 (full left) to 7F 7F (full right), with centre being 3F 7F.

❗ See 'Example Pan/Balance Values' in the [reference tables](#).



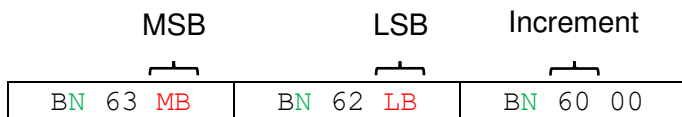
Where: N= MIDI Channel, MB/LB = MSB/LSB Parameter number, VC/VF = Value

Examples:

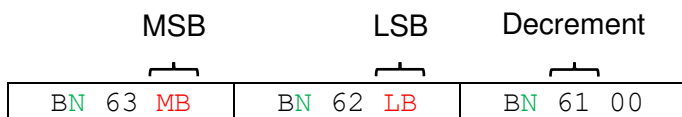
Address, Value, MIDI Ch	Message
lp1 to LR, L100%%, Ch1	B0 63 50 B0 62 00 B0 06 00 B0 26 00
lp1 to LR, CTR, Ch1	B0 63 50 B0 62 00 B0 06 3F B0 26 7F
lp24 to LR, R20%, Ch1	B0 63 50 B0 62 17 B0 06 4C B0 26 65
lp24 to Aux5, R20%, Ch1	B0 63 52 B0 62 5C B0 06 4C B0 26 65
lp24 to Aux5, L50%, Ch4	B3 63 52 B3 62 5C B3 06 1F B3 26 7F
Grp3 to Aux2, L50%, Ch4	B3 63 55 B3 62 1D B3 06 1F B3 26 7F
LR to Mtx3, R100%, Ch11	BA 63 5E BA 62 26 BA 06 7F BA 26 7F

A relative pan/balance message uses the same parameter number, but with an increment or decrement byte. Incrementing moves to the right and decrementing moves to the left.

Right one step (increment)



Left one step (decrement)



Both where: N= MIDI Channel, MB/LB = MSB/LSB Parameter number

Examples:

Address, Left/Right, MIDI Ch	Message
lp1 to LR, Right, Ch1	B0 63 50 B0 62 00 B0 60 00
lp1 to LR, Left, Ch1	B0 63 50 B0 62 00 B0 61 00
lp37 to Aux8, Right, Ch1	B0 63 53 B0 62 7B B0 60 00
Aux5 to Mtx1, Right, Ch3	B2 63 5E B2 62 33 B2 60 00

3.6 Mix Assignments

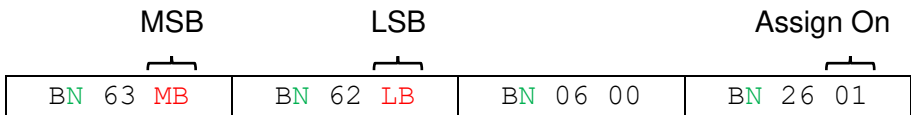
The SQ sends and receives absolute On or Off assign messages. It will also toggle the assign state when either an increment or decrement message is received.

MSB and LSB represent a parameter number showing where the signal is being sent from and where it is being sent to.

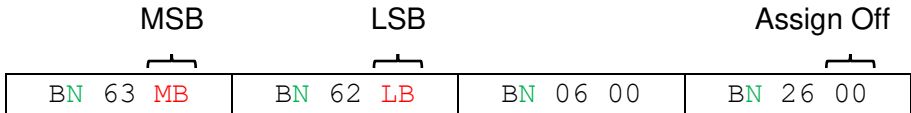
❗ MSB/LSB parameter numbers are shown in the [reference tables](#) section.

The last byte of the full message then represents assignment on or off.

Assign On



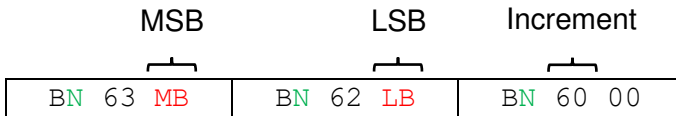
Assign Off



Both where: N= MIDI Channel, MB/LB = MSB/LSB Parameter number

When either a data increment or decrement message is received, the SQ will toggle between assign states, in the same way as holding the Assign key and pressing a Sel key on the SQ does.

Assign Toggle (increment)



Where: N= MIDI Channel, MB/LB = MSB/LSB Parameter number

Examples:

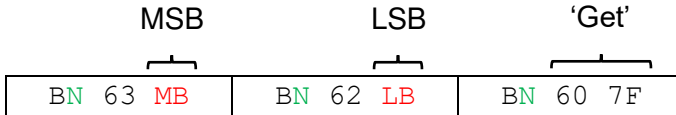
Channel, Cmnd, MIDI Ch	Message
lp1 to LR, On, Ch1	B0 63 60 B0 62 00 B0 06 00 B0 26 01
lp1 to LR, Off, Ch1	B0 63 60 B0 62 00 B0 06 00 B0 26 00
FX1Rtn to Aux 7, On, Ch1	B0 63 66 B0 62 1A B0 06 00 B0 26 01
Grp1 to Aux3, Off, Ch2	B1 63 65 B1 62 06 B1 06 00 B1 26 00
Grp2 to Mtx2, Toggle, Ch4	B3 63 6E B3 62 4F B3 60 00

3.7 Getting values

A 'get' command can be sent to the SQ in order to return the current value of any mute, level, pan/balance or assignment parameter listed in this document.

MSB and LSB represent the parameter number of the value being requested, followed by a data increment with value 7F (i.e. the same as a standard increment message but with a value of 7F instead of 00).

- ⓘ All MSB/LSB parameter numbers are shown in the [reference tables](#), be sure to use the correct parameter number for either mute, level, panning/balance or assignments.



Where: N= MIDI Channel, MB/LB = MSB/LSB Parameter number

Examples:

Parameter Requested, MIDI Ch	Message
LR Mute, Ch1	B0 63 00 B0 62 00 B0 60 7F
lp1 to LR Level, Ch1	B0 63 40 B0 62 00 B0 60 7F
lp30 to Aux5 Pan, Ch1	B0 63 53 B0 62 24 B0 60 7F
Aux7 to Mtx1 Balance, Ch5	B4 63 5E B4 62 39 B4 60 7F
FX2Rtn to FX3Snd Assign, Ch12	BB 63 6E BB 62 0A BB 60 7F

4. Reference Tables

MIDI channels 1 to 16 (N)

Channel	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hex	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F

SQ Value to Note to Hexadecimal (PG and other values from 1-128)

VAL	HEX	Note
1	00	C-1
2	01	C#-1
3	02	D-1
4	03	D#-1
5	04	E-1
6	05	F-1
7	06	F#-1
8	07	G-1
9	08	G#-1
10	09	A-1
11	0A	A#-1
12	0B	B-1
13	0C	C0
14	0D	C#0
15	0E	D0
16	0F	D#0
17	10	E0
18	11	F0
19	12	F#0
20	13	G0
21	14	G#0
22	15	A0
23	16	A#0
24	17	B0
25	18	C1
26	19	C#1
27	1A	D1
28	1B	D#1
29	1C	E1
30	1D	F1
31	1E	F#1
32	1F	G1

VAL	HEX	Note
33	20	G#1
34	21	A1
35	22	A#1
36	23	B1
37	24	C2
38	25	C#2
39	26	D2
40	27	D#2
41	28	E2
42	29	F2
43	2A	F#2
44	2B	G2
45	2C	G#2
46	2D	A2
47	2E	A#2
48	2F	B2
49	30	C3
50	31	C#3
51	32	D3
52	33	D#3
53	34	E3
54	35	F3
55	36	F#3
56	37	G3
57	38	G#3
58	39	A3
59	3A	A#3
60	3B	B3
61	3C	C4
62	3D	C#4
63	3E	D4
64	3F	D#4

VAL	HEX	Note
65	40	E4
66	41	F4
67	42	F#4
68	43	G4
69	44	G#4
70	45	A4
71	46	A#4
72	47	B4
73	48	C5
74	49	C#5
75	4A	D5
76	4B	D#5
77	4C	E5
78	4D	F5
79	4E	F#5
80	4F	G5
81	50	G#5
82	51	A5
83	52	A#5
84	53	B5
85	54	C6
86	55	C#6
87	56	D6
88	57	D#6
89	58	E6
90	59	F6
91	5A	F#6
92	5B	G6
93	5C	G#6
94	5D	A6
95	5E	A#6
96	5F	B6

VAL	HEX	Note
97	60	C7
98	61	C#7
99	62	D7
100	63	D#7
101	64	E7
102	65	F7
103	66	F#7
104	67	G7
105	68	G#7
106	69	A7
107	6A	A#7
108	6B	B7
109	6C	C8
110	6D	C#8
111	6E	D8
112	6F	D#8
113	70	E8
114	71	F8
115	72	F#8
116	73	G8
117	74	G#8
118	75	A8
119	76	A#8
120	77	B8
121	78	C9
122	79	C#9
123	7A	D9
124	7B	D#9
125	7C	E9
126	7D	F9
127	7E	F#9
128	7F	G9

Soft Key Notes and Hexadecimal Values (SK)

SoftKey	Note	HEX
1	C3	30
2	C#3	31
3	D3	32
4	D#3	33

SoftKey	Note	HEX
5	E3	34
6	F3	35
7	F#3	36
8	G3	37

SoftKey	Note	HEX
9	G#3	38
10	A3	39
11	A#3	3A
12	B3	3B

SoftKey	Note	HEX
13	C4	3C
14	C#4	3D
15	D4	3E
16	D#4	3F

Example Linear Taper Level Values (VC/VF)

dB	VC	VF
-inf	00	00
-89	24	16
-85	27	71
-80	2C	42
-75	31	14
-70	35	65
-65	3A	37
-60	3F	09
-55	43	5A
-50	48	2C

dB	VC	VF
-45	4C	7D
-40	51	4F
-38	53	3C
-36	55	2A
-35	56	21
-34	57	17
-33	58	0E
-32	59	05
-31	59	7C
-30	5A	72

dB	VC	VF
-29	5B	69
-28	5C	60
-27	5D	56
-26	5E	4D
-25	5F	44
-24	60	3B
-23	61	31
-22	62	28
-21	63	1F
-20	64	16

dB	VC	VF
-19	65	0C
-18	66	03
-17	66	7A
-16	67	70
-15	68	67
-14	69	5E
-13	6A	55
-12	6B	4B
-11	6C	42
-10	6D	39

dB	VC	VF
-9	6E	2F
-8	6F	26
-7	70	1D
-6	71	14
-5	72	0A
-4	73	01
-3	73	78
-2	74	6F
-1	75	65
0	76	5C

dB	VC	VF
+1	77	53
+2	78	49
+3	79	40
+4	7A	37
+5	7B	2E
+6	7C	24
+7	7D	1B
+8	7E	12
+9	7F	08
+10	7F	7F

Approximate Audio Taper Level Values (VC/VF)

dB	VC	VF
-inf	00	00
-89	01	40
-85	02	00
-80	02	40
-75	03	40
-70	04	00
-65	05	00
-60	06	00
-55	07	00
-50	08	00

dB	VC	VF
-45	0C	00
-40	0F	40
-38	12	40
-36	15	40
-35	17	00
-34	19	00
-33	1A	40
-32	1C	00
-31	1D	40
-30	1F	00

dB	VC	VF
-29	20	40
-28	22	00
-27	23	40
-26	25	00
-25	26	40
-24	28	40
-23	2A	00
-22	2B	40
-21	2D	00
-20	2E	40

dB	VC	VF
-19	30	00
-18	31	40
-17	33	00
-16	34	40
-15	36	00
-14	38	00
-13	39	40
-12	3B	00
-11	3C	40
-10	3E	00

dB	VC	VF
-9	41	40
-8	44	40
-7	48	00
-6	4B	00
-5	4E	40
-4	52	40
-3	56	40
-2	5A	00
-1	5E	00
0	62	00

dB	VC	VF
+1	65	40
+2	69	00
+3	6C	40
+4	70	00
+5	73	40
+6	75	40
+7	78	00
+8	7A	40
+9	7D	00
+10	7F	40

Example Pan/Balance Values (VC/VF)

L/R	VC	VF
L100%	00	00
L90%	06	33
L80%	0C	66
L70%	13	19
L60%	19	4C

L/R	VC	VF
L50%	1F	7F
L40%	26	32
L30%	2C	65
L20%	33	18
L15%	36	32

L/R	VC	VF
L10%	39	4B
L5%	3C	65
CTR	3F	7F
R5%	43	18
R10%	46	32

L/R	VC	VF
R15%	49	4B
R20%	4C	65
R30%	53	18
R40%	59	4B
R50%	5F	7F

L/R	VC	VF
R60%	66	32
R70%	6C	65
R80%	73	18
R90%	79	4B
R100%	7F	7F

Level Parameter Numbers – Inputs to LR (+Groups) and Aux (MB/LB)

	LR	Aux1		Aux2		Aux3		Aux4		Aux5		Aux6		Aux7		Aux8		Aux9		Aux10		Aux11		Aux12		
	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB
lp1	40	00	40	44	40	45	40	46	40	47	40	48	40	49	40	4A	40	4B	40	4C	40	4D	40	4E	40	4F
lp2	40	01	40	50	40	51	40	52	40	53	40	54	40	55	40	56	40	57	40	58	40	59	40	5A	40	5B
lp3	40	02	40	5C	40	5D	40	5E	40	5F	40	60	40	61	40	62	40	63	40	64	40	65	40	66	40	67
lp4	40	03	40	68	40	69	40	6A	40	6B	40	6C	40	6D	40	6E	40	6F	40	70	40	71	40	72	40	73
lp5	40	04	40	74	40	75	40	76	40	77	40	78	40	79	40	7A	40	7B	40	7C	40	7D	40	7E	40	7F
lp6	40	05	41	00	41	01	41	02	41	03	41	04	41	05	41	06	41	07	41	08	41	09	41	0A	41	0B
lp7	40	06	41	0C	41	0D	41	0E	41	0F	41	10	41	11	41	12	41	13	41	14	41	15	41	16	41	17
lp8	40	07	41	18	41	19	41	1A	41	1B	41	1C	41	1D	41	1E	41	1F	41	20	41	21	41	22	41	23
lp9	40	08	41	24	41	25	41	26	41	27	41	28	41	29	41	2A	41	2B	41	2C	41	2D	41	2E	41	2F
lp10	40	09	41	30	41	31	41	32	41	33	41	34	41	35	41	36	41	37	41	38	41	39	41	3A	41	3B
lp11	40	0A	41	3C	41	3D	41	3E	41	3F	41	40	41	41	41	42	41	43	41	44	41	45	41	46	41	47
lp12	40	0B	41	48	41	49	41	4A	41	4B	41	4C	41	4D	41	4E	41	4F	41	50	41	51	41	52	41	53
lp13	40	0C	41	54	41	55	41	56	41	57	41	58	41	59	41	5A	41	5B	41	5C	41	5D	41	5E	41	5F
lp14	40	0D	41	60	41	61	41	62	41	63	41	64	41	65	41	66	41	67	41	68	41	69	41	6A	41	6B
lp15	40	0E	41	6C	41	6D	41	6E	41	6F	41	70	41	71	41	72	41	73	41	74	41	75	41	76	41	77
lp16	40	0F	41	78	41	79	41	7A	41	7B	41	7C	41	7D	41	7E	41	7F	42	00	42	01	42	02	42	03
lp17	40	10	42	04	42	05	42	06	42	07	42	08	42	09	42	0A	42	0B	42	0C	42	0D	42	0E	42	0F
lp18	40	11	42	10	42	11	42	12	42	13	42	14	42	15	42	16	42	17	42	18	42	19	42	1A	42	1B
lp19	40	12	42	1C	42	1D	42	1E	42	1F	42	20	42	21	42	22	42	23	42	24	42	25	42	26	42	27
lp20	40	13	42	28	42	29	42	2A	42	2B	42	2C	42	2D	42	2E	42	2F	42	30	42	31	42	32	42	33
lp21	40	14	42	34	42	35	42	36	42	37	42	38	42	39	42	3A	42	3B	42	3C	42	3D	42	3E	42	3F
lp22	40	15	42	40	42	41	42	42	42	43	42	44	42	45	42	46	42	47	42	48	42	49	42	4A	42	4B
lp23	40	16	42	4C	42	4D	42	4E	42	4F	42	50	42	51	42	52	42	53	42	54	42	55	42	56	42	57
lp24	40	17	42	58	42	59	42	5A	42	5B	42	5C	42	5D	42	5E	42	5F	42	60	42	61	42	62	42	63
lp25	40	18	42	64	42	65	42	66	42	67	42	68	42	69	42	6A	42	6B	42	6C	42	6D	42	6E	42	6F
lp26	40	19	42	70	42	71	42	72	42	73	42	74	42	75	42	76	42	77	42	78	42	79	42	7A	42	7B
lp27	40	1A	42	7C	42	7D	42	7E	42	7F	43	00	43	01	43	02	43	03	43	04	43	05	43	06	43	07
lp28	40	1B	43	08	43	09	43	0A	43	0B	43	0C	43	0D	43	0E	43	0F	43	10	43	11	43	12	43	13
lp29	40	1C	43	14	43	15	43	16	43	17	43	18	43	19	43	1A	43	1B	43	1C	43	1D	43	1E	43	1F
lp30	40	1D	43	20	43	21	43	22	43	23	43	24	43	25	43	26	43	27	43	28	43	29	43	2A	43	2B
lp31	40	1E	43	2C	43	2D	43	2E	43	2F	43	30	43	31	43	32	43	33	43	34	43	35	43	36	43	37
lp32	40	1F	43	38	43	39	43	3A	43	3B	43	3C	43	3D	43	3E	43	3F	43	40	43	41	43	42	43	43
lp33	40	20	43	44	43	45	43	46	43	47	43	48	43	49	43	4A	43	4B	43	4C	43	4D	43	4E	43	4F
lp34	40	21	43	50	43	51	43	52	43	53	43	54	43	55	43	56	43	57	43	58	43	59	43	5A	43	5B
lp35	40	22	43	5C	43	5D	43	5E	43	5F	43	60	43	61	43	62	43	63	43	64	43	65	43	66	43	67
lp36	40	23	43	68	43	69	43	6A	43	6B	43	6C	43	6D	43	6E	43	6F	43	70	43	71	43	72	43	73
lp37	40	24	43	74	43	75	43	76	43	77	43	78	43	79	43	7A	43	7B	43	7C	43	7D	43	7E	43	7F
lp38	40	25	44	00	44	01	44	02	44	03	44	04	44	05	44	06	44	07	44	08	44	09	44	0A	44	0B
lp39	40	26	44	0C	44	0D	44	0E	44	0F	44	10	44	11	44	12	44	13	44	14	44	15	44	16	44	17
lp40	40	27	44	18	44	19	44	1A	44	1B	44	1C	44	1D	44	1E	44	1F	44	20	44	21	44	22	44	23
lp41	40	28	44	24	44	25	44	26	44	27	44	28	44	29	44	2A	44	2B	44	2C	44	2D	44	2E	44	2F
lp42	40	29	44	30	44	31	44	32	44	33	44	34	44	35	44	36	44	37	44	38	44	39	44	3A	44	3B
lp43	40	2A	44	3C	44	3D	44	3E	44	3F	44	40	44	41	44	42	44	43	44	44	44	45	44	46	44	47
lp44	40	2B	44	48	44	49	44	4A	44	4B	44	4C	44	4D	44	4E	44	4F	44	50	44	51	44	52	44	53
lp45	40	2C	44	54	44	55	44	56	44	57	44	58	44	59	44	5A	44	5B	44	5C	44	5D	44	5E	44	5F
lp46	40	2D	44	60	44	61	44	62	44	63	44	64	44	65	44	66	44	67	44	68	44	69	44	6A	44	6B
lp47	40	2E	44	6C	44	6D	44	6E	44	6F	44	70	44	71	44	72	44	73	44	74	44	75	44	76	44	77
lp48	40	2F	44	78	44	79	44	7A	44	7B	44	7C	44	7D	44	7E	44	7F	45	00	45	01	45	02	45	03

Level Parameter Numbers – Groups to LR/Aux (MB/LB)

	LR		Aux1		Aux2		Aux3		Aux4		Aux5		Aux6		Aux7		Aux8		Aux9		Aux10		Aux11		Aux12	
	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB
Grp1	40	30	45	04	45	05	45	06	45	07	45	08	45	09	45	0A	45	0B	45	0C	45	0D	45	0E	-	-
Grp2	40	31	45	10	45	11	45	12	45	13	45	14	45	15	45	16	45	17	45	18	45	19	-	-	-	-
Grp3	40	32	45	1C	45	1D	45	1E	45	1F	45	20	45	21	45	22	45	23	45	24	-	-	-	-	-	-
Grp4	40	33	45	28	45	29	45	2A	45	2B	45	2C	45	2D	45	2E	45	2F	-	-	-	-	-	-	-	-
Grp5	40	34	45	34	45	35	45	36	45	37	45	38	45	39	45	3A	-	-	-	-	-	-	-	-	-	-
Grp6	40	35	45	40	45	41	45	42	45	43	45	44	45	45	-	-	-	-	-	-	-	-	-	-	-	-
Grp7	40	36	45	4C	45	4D	45	4E	45	4F	45	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Grp8	40	37	45	58	45	59	45	5A	45	5B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Grp9	40	38	45	64	45	65	45	66	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Grp10	40	39	45	70	45	71	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Grp11	40	3A	45	7C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Grp12	40	3B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Level Parameter Numbers – FX Returns to LR/Aux (MB/LB)

	LR		Aux1		Aux2		Aux3		Aux4		Aux5		Aux6		Aux7		Aux8		Aux9		Aux10		Aux11		Aux12	
	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB
FX1Rtn	40	3C	46	14	46	15	46	16	46	17	46	18	46	19	46	1A	46	1B	46	1C	46	1D	46	1E	46	1F
FX2Rtn	40	3D	46	20	46	21	46	22	46	23	46	24	46	25	46	26	46	27	46	28	46	29	46	2A	46	2B
FX3Rtn	40	3E	46	2C	46	2D	46	2E	46	2F	46	30	46	31	46	32	46	33	46	34	46	35	46	36	46	37
FX4Rtn	40	3F	46	38	46	39	46	3A	46	3B	46	3C	46	3D	46	3E	46	3F	46	40	46	41	46	42	46	43
FX5Rtn	40	40	46	44	46	45	46	46	46	47	46	48	46	49	46	4A	46	4B	46	4C	46	4D	46	4E	46	4F
FX6Rtn	40	41	46	50	46	51	46	52	46	53	46	54	46	55	46	56	46	57	46	58	46	59	46	5A	46	5B
FX7Rtn	40	42	46	5C	46	5D	46	5E	46	5F	46	60	46	61	46	62	46	63	46	64	46	65	46	66	46	67
FX8Rtn	40	43	46	68	46	69	46	6A	46	6B	46	6C	46	6D	46	6E	46	6F	46	70	46	71	46	72	46	73

Level Parameter Numbers – FX Sends (MB/LB)

	FX1Snd		FX2Snd		FX3Snd		FX4Snd	
	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB
lp1	4C 14	4C 15	4C 16	4C 17				
lp2	4C 18	4C 19	4C 1A	4C 1B				
lp3	4C 1C	4C 1D	4C 1E	4C 1F				
lp4	4C 20	4C 21	4C 22	4C 23				
lp5	4C 24	4C 25	4C 26	4C 27				
lp6	4C 28	4C 29	4C 2A	4C 2B				
lp7	4C 2C	4C 2D	4C 2E	4C 2F				
lp8	4C 30	4C 31	4C 32	4C 33				
lp9	4C 34	4C 35	4C 36	4C 37				
lp10	4C 38	4C 39	4C 3A	4C 3B				
lp11	4C 3C	4C 3D	4C 3E	4C 3F				
lp12	4C 40	4C 41	4C 42	4C 43				
lp13	4C 44	4C 45	4C 46	4C 47				
lp14	4C 48	4C 49	4C 4A	4C 4B				
lp15	4C 4C	4C 4D	4C 4E	4C 4F				
lp16	4C 50	4C 51	4C 52	4C 53				
lp17	4C 54	4C 55	4C 56	4C 57				
lp18	4C 58	4C 59	4C 5A	4C 5B				
lp19	4C 5C	4C 5D	4C 5E	4C 5F				
lp20	4C 60	4C 61	4C 62	4C 63				
lp21	4C 64	4C 65	4C 66	4C 67				
lp22	4C 68	4C 69	4C 6A	4C 6B				
lp23	4C 6C	4C 6D	4C 6E	4C 6F				
lp24	4C 70	4C 71	4C 72	4C 73				

	FX1Snd		FX2Snd		FX3Snd		FX4Snd	
	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB
lp25	4C 74	4C 75	4C 76	4C 77				
lp26	4C 78	4C 79	4C 7A	4C 7B				
lp27	4C 7C	4C 7D	4C 7E	4C 7F				
lp28	4D 00	4D 01	4D 02	4D 03				
lp29	4D 04	4D 05	4D 06	4D 07				
lp30	4D 08	4D 09	4D 0A	4D 0B				
lp31	4D 0C	4D 0D	4D 0E	4D 0F				
lp32	4D 10	4D 11	4D 12	4D 13				
lp33	4D 14	4D 15	4D 16	4D 17				
lp34	4D 18	4D 19	4D 1A	4D 1B				
lp35	4D 1C	4D 1D	4D 1E	4D 1F				
lp36	4D 20	4D 21	4D 22	4D 23				
lp37	4D 24	4D 25	4D 26	4D 27				
lp38	4D 28	4D 29	4D 2A	4D 2B				
lp39	4D 2C	4D 2D	4D 2E	4D 2F				
lp40	4D 30	4D 31	4D 32	4D 33				
lp41	4D 34	4D 35	4D 36	4D 37				
lp42	4D 38	4D 39	4D 3A	4D 3B				
lp43	4D 3C	4D 3D	4D 3E	4D 3F				
lp44	4D 40	4D 41	4D 42	4D 43				
lp45	4D 44	4D 45	4D 46	4D 47				
lp46	4D 48	4D 49	4D 4A	4D 4B				
lp47	4D 4C	4D 4D	4D 4E	4D 4F				
lp48	4D 50	4D 51	4D 52	4D 53				

	FX1Snd		FX2Snd		FX3Snd		FX4Snd	
	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB
Grp1	4D 54	4D 55	4D 56	4D 57				
Grp2	4D 58	4D 59	4D 5A	4D 5B				
Grp3	4D 5C	4D 5D	4D 5E	4D 5F				
Grp4	4D 60	4D 61	4D 62	4D 63				
Grp5	4D 64	4D 65	4D 66	4D 67				
Grp6	4D 68	4D 69	4D 6A	4D 6B				
Grp7	4D 6C	4D 6D	4D 6E	4D 6F				
Grp8	4D 70	4D 71	4D 72	4D 73				
Grp9	4D 74	4D 75	4D 76	4D 77				
Grp10	4D 78	4D 79	4D 7A	4D 7B				
Grp11	4D 7C	4D 7D	4D 7E	4D 7F				
Grp12	4E 00	4E 01	4E 02	4E 03				

	FX1Snd		FX2Snd		FX3Snd		FX4Snd	
	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB
FX1Rtn	4E 04	4E 05	4E 06	4E 07				
FX2Rtn	4E 08	4E 09	4E 0A	4E 0B				
FX3Rtn	4E 0C	4E 0D	4E 0E	4E 0F				
FX4Rtn	4E 10	4E 11	4E 12	4E 13				
FX5Rtn	4E 14	4E 15	4E 16	4E 17				
FX6Rtn	4E 18	4E 19	4E 1A	4E 1B				
FX7Rtn	4E 1C	4E 1D	4E 1E	4E 1F				
FX8Rtn	4E 20	4E 21	4E 22	4E 23				

Level Parameter Numbers – Master Sends (MB/LB)

	Mtx1		Mtx2		Mtx3	
	MSB	LSB	MSB	LSB	MSB	LSB
LR	4E 24	4E 25	4E 26			
Aux1	4E 27	4E 28	4E 29			
Aux2	4E 2A	4E 2B	4E 2C			
Aux3	4E 2D	4E 2E	4E 2F			
Aux4	4E 30	4E 31	4E 32			
Aux5	4E 33	4E 34	4E 35			
Aux6	4E 36	4E 37	4E 38			
Aux7	4E 39	4E 3A	4E 3B			
Aux8	4E 3C	4E 3D	4E 3E			
Aux9	4E 3F	4E 40	4E 41			
Aux10	4E 42	4E 43	4E 44			
Aux11	4E 45	4E 46	4E 47			
Aux12	4E 48	4E 49	4E 4A			

	Mtx1		Mtx2		Mtx3	
	MSB	LSB	MSB	LSB	MSB	LSB
Grp1	4E 4B	4E 4C	4E 4D			
Grp2	4E 4E	4E 4F	4E 50			
Grp3	4E 51	4E 52	4E 53			
Grp4	4E 54	4E 55	4E 56			
Grp5	4E 57	4E 58	4E 59			
Grp6	4E 5A	4E 5B	4E 5C			
Grp7	4E 5D	4E 5E	4E 5F			
Grp8	4E 60	4E 61	4E 62			
Grp9	4E 63	4E 64	4E 65			
Grp10	4E 66	4E 67	4E 68			
Grp11	4E 69	4E 6A	4E 6B			
Grp12	4E 6C	4E 6D	4E 6E			

	Output	
	MSB	LSB
LR	4F 00	
Aux1	4F 01	
Aux2	4F 02	
Aux3	4F 03	
Aux4	4F 04	
Aux5	4F 05	
Aux6	4F 06	
Aux7	4F 07	
Aux8	4F 08	
Aux9	4F 09	
Aux10	4F 0A	
Aux11	4F 0B	
Aux12	4F 0C	

	Output	
	MSB	LSB
FX1Snd	4F 0D	
FX2Snd	4F 0E	
FX3Snd	4F 0F	
FX4Snd	4F 10	
Mtx1	4F 11	
Mtx2	4F 12	
Mtx3	4F 13	

	Control	
	MSB	LSB
DCA1	4F 20	
DCA2	4F 21	
DCA3	4F 22	
DCA4	4F 23	
DCA5	4F 24	
DCA6	4F 25	
DCA7	4F 26	
DCA8	4F 27	

Panning/Balance Parameter Numbers – Inputs to LR (+Groups) and Aux (MB/LB)

	LR		Aux1		Aux2		Aux3		Aux4		Aux5		Aux6		Aux7		Aux8		Aux9		Aux10		Aux11		Aux12	
	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB
lp1	50	00	50	44	50	45	50	46	50	47	50	48	50	49	50	4A	50	4B	50	4C	50	4D	50	4E	50	4F
lp2	50	01	50	50	50	51	50	52	50	53	50	54	50	55	50	56	50	57	50	58	50	59	50	5A	50	5B
lp3	50	02	50	5C	50	5D	50	5E	50	5F	50	60	50	61	50	62	50	63	50	64	50	65	50	66	50	67
lp4	50	03	50	68	50	69	50	6A	50	6B	50	6C	50	6D	50	6E	50	6F	50	70	50	71	50	72	50	73
lp5	50	04	50	74	50	75	50	76	50	77	50	78	50	79	50	7A	50	7B	50	7C	50	7D	50	7E	50	7F
lp6	50	05	51	00	51	01	51	02	51	03	51	04	51	05	51	06	51	07	51	08	51	09	51	0A	51	0B
lp7	50	06	51	0C	51	0D	51	0E	51	0F	51	10	51	11	51	12	51	13	51	14	51	15	51	16	51	17
lp8	50	07	51	18	51	19	51	1A	51	1B	51	1C	51	1D	51	1E	51	1F	51	20	51	21	51	22	51	23
lp9	50	08	51	24	51	25	51	26	51	27	51	28	51	29	51	2A	51	2B	51	2C	51	2D	51	2E	51	2F
lp10	50	09	51	30	51	31	51	32	51	33	51	34	51	35	51	36	51	37	51	38	51	39	51	3A	51	3B
lp11	50	0A	51	3C	51	3D	51	3E	51	3F	51	40	51	41	51	42	51	43	51	44	51	45	51	46	51	47
lp12	50	0B	51	48	51	49	51	4A	51	4B	51	4C	51	4D	51	4E	51	4F	51	50	51	51	51	52	51	53
lp13	50	0C	51	54	51	55	51	56	51	57	51	58	51	59	51	5A	51	5B	51	5C	51	5D	51	5E	51	5F
lp14	50	0D	51	60	51	61	51	62	51	63	51	64	51	65	51	66	51	67	51	68	51	69	51	6A	51	6B
lp15	50	0E	51	6C	51	6D	51	6E	51	6F	51	70	51	71	51	72	51	73	51	74	51	75	51	76	51	77
lp16	50	0F	51	78	51	79	51	7A	51	7B	51	7C	51	7D	51	7E	51	7F	52	00	52	01	52	02	52	03
lp17	50	10	52	04	52	05	52	06	52	07	52	08	52	09	52	0A	52	0B	52	0C	52	0D	52	0E	52	0F
lp18	50	11	52	10	52	11	52	12	52	13	52	14	52	15	52	16	52	17	52	18	52	19	52	1A	52	1B
lp19	50	12	52	1C	52	1D	52	1E	52	1F	52	20	52	21	52	22	52	23	52	24	52	25	52	26	52	27
lp20	50	13	52	28	52	29	52	2A	52	2B	52	2C	52	2D	52	2E	52	2F	52	30	52	31	52	32	52	33
lp21	50	14	52	34	52	35	52	36	52	37	52	38	52	39	52	3A	52	3B	52	3C	52	3D	52	3E	52	3F
lp22	50	15	52	40	52	41	52	42	52	43	52	44	52	45	52	46	52	47	52	48	52	49	52	4A	52	4B
lp23	50	16	52	4C	52	4D	52	4E	52	4F	52	50	52	51	52	52	52	53	52	54	52	55	52	56	52	57
lp24	50	17	52	58	52	59	52	5A	52	5B	52	5C	52	5D	52	5E	52	5F	52	60	52	61	52	62	52	63
lp25	50	18	52	64	52	65	52	66	52	67	52	68	52	69	52	6A	52	6B	52	6C	52	6D	52	6E	52	6F
lp26	50	19	52	70	52	71	52	72	52	73	52	74	52	75	52	76	52	77	52	78	52	79	52	7A	52	7B
lp27	50	1A	52	7C	52	7D	52	7E	52	7F	53	00	53	01	53	02	53	03	53	04	53	05	53	06	53	07
lp28	50	1B	53	08	53	09	53	0A	53	0B	53	0C	53	0D	53	0E	53	0F	53	10	53	11	53	12	53	13
lp29	50	1C	53	14	53	15	53	16	53	17	53	18	53	19	53	1A	53	1B	53	1C	53	1D	53	1E	53	1F
lp30	50	1D	53	20	53	21	53	22	53	23	53	24	53	25	53	26	53	27	53	28	53	29	53	2A	53	2B
lp31	50	1E	53	2C	53	2D	53	2E	53	2F	53	30	53	31	53	32	53	33	53	34	53	35	53	36	53	37
lp32	50	1F	53	38	53	39	53	3A	53	3B	53	3C	53	3D	53	3E	53	3F	53	40	53	41	53	42	53	43
lp33	50	20	53	44	53	45	53	46	53	47	53	48	53	49	53	4A	53	4B	53	4C	53	4D	53	4E	53	4F
lp34	50	21	53	50	53	51	53	52	53	53	53	54	53	55	53	56	53	57	53	58	53	59	53	5A	53	5B
lp35	50	22	53	5C	53	5D	53	5E	53	5F	53	60	53	61	53	62	53	63	53	64	53	65	53	66	53	67
lp36	50	23	53	68	53	69	53	6A	53	6B	53	6C	53	6D	53	6E	53	6F	53	70	53	71	53	72	53	73
lp37	50	24	53	74	53	75	53	76	53	77	53	78	53	79	53	7A	53	7B	53	7C	53	7D	53	7E	53	7F
lp38	50	25	54	00	54	01	54	02	54	03	54	04	54	05	54	06	54	07	54	08	54	09	54	0A	54	0B
lp39	50	26	54	0C	54	0D	54	0E	54	0F	54	10	54	11	54	12	54	13	54	14	54	15	54	16	54	17
lp40	50	27	54	18	54	19	54	1A	54	1B	54	1C	54	1D	54	1E	54	1F	54	20	54	21	54	22	54	23
lp41	50	28	54	24	54	25	54	26	54	27	54	28	54	29	54	2A	54	2B	54	2C	54	2D	54	2E	54	2F
lp42	50	29	54	30	54	31	54	32	54	33	54	34	54	35	54	36	54	37	54	38	54	39	54	3A	54	3B
lp43	50	2A	54	3C	54	3D	54	3E	54	3F	54	40	54	41	54	42	54	43	54	44	54	45	54	46	54	47
lp44	50	2B	54	48	54	49	54	4A	54	4B	54	4C	54	4D	54	4E	54	4F	54	50	54	51	54	52	54	53
lp45	50	2C	54	54	54	55	54	56	54	57	54	58	54	59	54	5A	54	5B	54	5C	54	5D	54	5E	54	5F
lp46	50	2D	54	60	54	61	54	62	54	63	54	64	54	65	54	66	54	67	54	68	54	69	54	6A	54	6B
lp47	50	2E	54	6C	54	6D	54	6E	54	6F	54	70	54	71	54	72	54	73	54	74	54	75	54	76	54	77
lp48	50	2F	54	78	54	79	54	7A	54	7B	54	7C	54	7D	54	7E	54	7F	55	00	55	01	55	02	55	03

Balance Parameter Numbers – Groups to LR/Aux (MB/LB)

	LR		Aux1		Aux2		Aux3		Aux4		Aux5		Aux6		Aux7		Aux8		Aux9		Aux10		Aux11		Aux12	
	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB
Grp1	50	30	55	04	55	05	55	06	55	07	55	08	55	09	55	0A	55	0B	55	0C	55	0D	55	0E	-	-
Grp2	50	31	55	10	55	11	55	12	55	13	55	14	55	15	55	16	55	17	55	18	55	19	-	-	-	-
Grp3	50	32	55	1C	55	1D	55	1E	55	1F	55	20	55	21	55	22	55	23	55	24	-	-	-	-	-	-
Grp4	50	33	55	28	55	29	55	2A	55	2B	55	2C	55	2D	55	2E	55	2F	-	-	-	-	-	-	-	-
Grp5	50	34	55	34	55	35	55	36	55	37	55	38	55	39	55	3A	-	-	-	-	-	-	-	-	-	-
Grp6	50	35	55	40	55	41	55	42	55	43	55	44	55	45	-	-	-	-	-	-	-	-	-	-	-	-
Grp7	50	36	55	4C	55	4D	55	4E	55	4F	55	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Grp8	50	37	55	58	55	59	55	5A	55	5B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Grp9	50	38	55	64	55	65	55	66	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Grp10	50	39	55	70	55	71	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Grp11	50	3A	55	7C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Grp12	50	3B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Balance Parameter Numbers – FX Returns to LR/Aux (MB/LB)

	LR		Aux1		Aux2		Aux3		Aux4		Aux5		Aux6		Aux7		Aux8		Aux9		Aux10		Aux11		Aux12	
	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB
FX1Rtn	50	3C	56	14	56	15	56	16	56	17	56	18	56	19	56	1A	56	1B	56	1C	56	1D	56	1E	56	1F
FX2Rtn	50	3D	56	20	56	21	56	22	56	23	56	24	56	25	56	26	56	27	56	28	56	29	56	2A	56	2B
FX3Rtn	50	3E	56	2C	56	2D	56	2E	56	2F	56	30	56	31	56	32	56	33	56	34	56	35	56	36	56	37
FX4Rtn	50	3F	56	38	56	39	56	3A	56	3B	56	3C	56	3D	56	3E	56	3F	56	40	56	41	56	42	56	43
FX5Rtn	50	40	56	44	56	45	56	46	56	47	56	48	56	49	56	4A	56	4B	56	4C	56	4D	56	4E	56	4F
FX6Rtn	50	41	56	50	56	51	56	52	56	53	56	54	56	55	56	56	56	57	56	58	56	59	56	5A	56	5B
FX7Rtn	50	42	56	5C	56	5D	56	5E	56	5F	56	60	56	61	56	62	56	63	56	64	56	65	56	66	56	67
FX8Rtn	50	43	56	68	56	69	56	6A	56	6B	56	6C	56	6D	56	6E	56	6F	56	70	56	71	56	72	56	73

Balance Parameter Numbers – Master Sends (MB/LB)

	Mtx1		Mtx2		Mtx3	
	MSB	LSB	MSB	LSB	MSB	LSB
LR	5E	24	5E	25	5E	26
Aux1	5E	27	5E	28	5E	29
Aux2	5E	2A	5E	2B	5E	2C
Aux3	5E	2D	5E	2E	5E	2F
Aux4	5E	30	5E	31	5E	32
Aux5	5E	33	5E	34	5E	35
Aux6	5E	36	5E	37	5E	38
Aux7	5E	39	5E	3A	5E	3B
Aux8	5E	3C	5E	3D	5E	3E
Aux9	5E	3F	5E	40	5E	41
Aux10	5E	42	5E	43	5E	44
Aux11	5E	45	5E	46	5E	47
Aux12	5E	48	5E	49	5E	4A

	Mtx1		Mtx2		Mtx3	
	MSB	LSB	MSB	LSB	MSB	LSB
Grp1	5E	4B	5E	4C	5E	4D
Grp2	5E	4E	5E	4F	5E	50
Grp3	5E	51	5E	52	5E	53
Grp4	5E	54	5E	55	5E	56
Grp5	5E	57	5E	58	5E	59
Grp6	5E	5A	5E	5B	5E	5C
Grp7	5E	5D	5E	5E	5E	5F
Grp8	5E	60	5E	61	5E	62
Grp9	5E	63	5E	64	5E	65
Grp10	5E	66	5E	67	5E	68
Grp11	5E	69	5E	6A	5E	6B
Grp12	5E	6C	5E	6D	5E	6E

	Output	
	MSB	LSB
LR	5F	00
Aux1	5F	01
Aux2	5F	02
Aux3	5F	03
Aux4	5F	04
Aux5	5F	05
Aux6	5F	06
Aux7	5F	07
Aux8	5F	08
Aux9	5F	09
Aux10	5F	0A
Aux11	5F	0B
Aux12	5F	0C

	Output	
	MSB	LSB
Mtx1	5F	11
Mtx2	5F	12
Mtx3	5F	13

Assignment Parameter Numbers – Inputs to LR/Aux (MB/LB)

	LR	Aux1	Aux2	Aux3	Aux4	Aux5	Aux6	Aux7	Aux8	Aux9	Aux10	Aux11	Aux12
	MSB LSB	MSB LSB	MSB LSB	MSB LSB	MSB LSB	MSB LSB	MSB LSB	MSB LSB	MSB LSB	MSB LSB	MSB LSB	MSB LSB	MSB LSB
lp1	60 00	60 44	60 45	60 46	60 47	60 48	60 49	60 4A	60 4B	60 4C	60 4D	60 4E	60 4F
lp2	60 01	60 50	60 51	60 52	60 53	60 54	60 55	60 56	60 57	60 58	60 59	60 5A	60 5B
lp3	60 02	60 5C	60 5D	60 5E	60 5F	60 60	60 61	60 62	60 63	60 64	60 65	60 66	60 67
lp4	60 03	60 68	60 69	60 6A	60 6B	60 6C	60 6D	60 6E	60 6F	60 70	60 71	60 72	60 73
lp5	60 04	60 74	60 75	60 76	60 77	60 78	60 79	60 7A	60 7B	60 7C	60 7D	60 7E	60 7F
lp6	60 05	61 00	61 01	61 02	61 03	61 04	61 05	61 06	61 07	61 08	61 09	61 0A	61 0B
lp7	60 06	61 0C	61 0D	61 0E	61 0F	61 10	61 11	61 12	61 13	61 14	61 15	61 16	61 17
lp8	60 07	61 18	61 19	61 1A	61 1B	61 1C	61 1D	61 1E	61 1F	61 20	61 21	61 22	61 23
lp9	60 08	61 24	61 25	61 26	61 27	61 28	61 29	61 2A	61 2B	61 2C	61 2D	61 2E	61 2F
lp10	60 09	61 30	61 31	61 32	61 33	61 34	61 35	61 36	61 37	61 38	61 39	61 3A	61 3B
lp11	60 0A	61 3C	61 3D	61 3E	61 3F	61 40	61 41	61 42	61 43	61 44	61 45	61 46	61 47
lp12	60 0B	61 48	61 49	61 4A	61 4B	61 4C	61 4D	61 4E	61 4F	61 50	61 51	61 52	61 53
lp13	60 0C	61 54	61 55	61 56	61 57	61 58	61 59	61 5A	61 5B	61 5C	61 5D	61 5E	61 5F
lp14	60 0D	61 60	61 61	61 62	61 63	61 64	61 65	61 66	61 67	61 68	61 69	61 6A	61 6B
lp15	60 0E	61 6C	61 6D	61 6E	61 6F	61 70	61 71	61 72	61 73	61 74	61 75	61 76	61 77
lp16	60 0F	61 78	61 79	61 7A	61 7B	61 7C	61 7D	61 7E	61 7F	62 00	62 01	62 02	62 03
lp17	60 10	62 04	62 05	62 06	62 07	62 08	62 09	62 0A	62 0B	62 0C	62 0D	62 0E	62 0F
lp18	60 11	62 10	62 11	62 12	62 13	62 14	62 15	62 16	62 17	62 18	62 19	62 1A	62 1B
lp19	60 12	62 1C	62 1D	62 1E	62 1F	62 20	62 21	62 22	62 23	62 24	62 25	62 26	62 27
lp20	60 13	62 28	62 29	62 2A	62 2B	62 2C	62 2D	62 2E	62 2F	62 30	62 31	62 32	62 33
lp21	60 14	62 34	62 35	62 36	62 37	62 38	62 39	62 3A	62 3B	62 3C	62 3D	62 3E	62 3F
lp22	60 15	62 40	62 41	62 42	62 43	62 44	62 45	62 46	62 47	62 48	62 49	62 4A	62 4B
lp23	60 16	62 4C	62 4D	62 4E	62 4F	62 50	62 51	62 52	62 53	62 54	62 55	62 56	62 57
lp24	60 17	62 58	62 59	62 5A	62 5B	62 5C	62 5D	62 5E	62 5F	62 60	62 61	62 62	62 63
lp25	60 18	62 64	62 65	62 66	62 67	62 68	62 69	62 6A	62 6B	62 6C	62 6D	62 6E	62 6F
lp26	60 19	62 70	62 71	62 72	62 73	62 74	62 75	62 76	62 77	62 78	62 79	62 7A	62 7B
lp27	60 1A	62 7C	62 7D	62 7E	62 7F	63 00	63 01	63 02	63 03	63 04	63 05	63 06	63 07
lp28	60 1B	63 08	63 09	63 0A	63 0B	63 0C	63 0D	63 0E	63 0F	63 10	63 11	63 12	63 13
lp29	60 1C	63 14	63 15	63 16	63 17	63 18	63 19	63 1A	63 1B	63 1C	63 1D	63 1E	63 1F
lp30	60 1D	63 20	63 21	63 22	63 23	63 24	63 25	63 26	63 27	63 28	63 29	63 2A	63 2B
lp31	60 1E	63 2C	63 2D	63 2E	63 2F	63 30	63 31	63 32	63 33	63 34	63 35	63 36	63 37
lp32	60 1F	63 38	63 39	63 3A	63 3B	63 3C	63 3D	63 3E	63 3F	63 40	63 41	63 42	63 43
lp33	60 20	63 44	63 45	63 46	63 47	63 48	63 49	63 4A	63 4B	63 4C	63 4D	63 4E	63 4F
lp34	60 21	63 50	63 51	63 52	63 53	63 54	63 55	63 56	63 57	63 58	63 59	63 5A	63 5B
lp35	60 22	63 5C	63 5D	63 5E	63 5F	63 60	63 61	63 62	63 63	63 64	63 65	63 66	63 67
lp36	60 23	63 68	63 69	63 6A	63 6B	63 6C	63 6D	63 6E	63 6F	63 70	63 71	63 72	63 73
lp37	60 24	63 74	63 75	63 76	63 77	63 78	63 79	63 7A	63 7B	63 7C	63 7D	63 7E	63 7F
lp38	60 25	64 00	64 01	64 02	64 03	64 04	64 05	64 06	64 07	64 08	64 09	64 0A	64 0B
lp39	60 26	64 0C	64 0D	64 0E	64 0F	64 10	64 11	64 12	64 13	64 14	64 15	64 16	64 17
lp40	60 27	64 18	64 19	64 1A	64 1B	64 1C	64 1D	64 1E	64 1F	64 20	64 21	64 22	64 23
lp41	60 28	64 24	64 25	64 26	64 27	64 28	64 29	64 2A	64 2B	64 2C	64 2D	64 2E	64 2F
lp42	60 29	64 30	64 31	64 32	64 33	64 34	64 35	64 36	64 37	64 38	64 39	64 3A	64 3B
lp43	60 2A	64 3C	64 3D	64 3E	64 3F	64 40	64 41	64 42	64 43	64 44	64 45	64 46	64 47
lp44	60 2B	64 48	64 49	64 4A	64 4B	64 4C	64 4D	64 4E	64 4F	64 50	64 51	64 52	64 53
lp45	60 2C	64 54	64 55	64 56	64 57	64 58	64 59	64 5A	64 5B	64 5C	64 5D	64 5E	64 5F
lp46	60 2D	64 60	64 61	64 62	64 63	64 64	64 65	64 66	64 67	64 68	64 69	64 6A	64 6B
lp47	60 2E	64 6C	64 6D	64 6E	64 6F	64 70	64 71	64 72	64 73	64 74	64 75	64 76	64 77
lp48	60 2F	64 78	64 79	64 7A	64 7B	64 7C	64 7D	64 7E	64 7F	65 00	65 01	65 02	65 03

Assignment Parameter Numbers – Inputs to Groups (MB/LE)

	Grp1		Grp2		Grp3		Grp4		Grp5		Grp6		Grp7		Grp8		Grp9		Grp10		Grp11		Grp12	
	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB
lp1	66	74	66	75	66	76	66	77	66	78	66	79	66	7A	66	7B	66	7C	66	7D	66	7E	66	7F
lp2	67	00	67	01	67	02	67	03	67	04	67	05	67	06	67	07	67	08	67	09	67	0A	67	0B
lp3	67	0C	67	0D	67	0E	67	0F	67	10	67	11	67	12	67	13	67	14	67	15	67	16	67	17
lp4	67	18	67	19	67	1A	67	1B	67	1C	67	1D	67	1E	67	1F	67	20	67	21	67	22	67	23
lp5	67	24	67	25	67	26	67	27	67	28	67	29	67	2A	67	2B	67	2C	67	2D	67	2E	67	2F
lp6	67	30	67	31	67	32	67	33	67	34	67	35	67	36	67	37	67	38	67	39	67	3A	67	3B
lp7	67	3C	67	3D	67	3E	67	3F	67	40	67	41	67	42	67	43	67	44	67	45	67	46	67	47
lp8	67	48	67	49	67	4A	67	4B	67	4C	67	4D	67	4E	67	4F	67	50	67	51	67	52	67	53
lp9	67	54	67	55	67	56	67	57	67	58	67	59	67	5A	67	5B	67	5C	67	5D	67	5E	67	5F
lp10	67	60	67	61	67	62	67	63	67	64	67	65	67	66	67	67	67	68	67	69	67	6A	67	6B
lp11	67	6C	67	6D	67	6E	67	6F	67	70	67	71	67	72	67	73	67	74	67	75	67	76	67	77
lp12	67	78	67	79	67	7A	67	7B	67	7C	67	7D	67	7E	67	7F	68	00	68	01	68	02	68	03
lp13	68	04	68	05	68	06	68	07	68	08	68	09	68	0A	68	0B	68	0C	68	0D	68	0E	68	0F
lp14	68	10	68	11	68	12	68	13	68	14	68	15	68	16	68	17	68	18	68	19	68	1A	68	1B
lp15	68	1C	68	1D	68	1E	68	1F	68	20	68	21	68	22	68	23	68	24	68	25	68	26	68	27
lp16	68	28	68	29	68	2A	68	2B	68	2C	68	2D	68	2E	68	2F	68	30	68	31	68	32	68	33
lp17	68	34	68	35	68	36	68	37	68	38	68	39	68	3A	68	3B	68	3C	68	3D	68	3E	68	3F
lp18	68	40	68	41	68	42	68	43	68	44	68	45	68	46	68	47	68	48	68	49	68	4A	68	4B
lp19	68	4C	68	4D	68	4E	68	4F	68	50	68	51	68	52	68	53	68	54	68	55	68	56	68	57
lp20	68	58	68	59	68	5A	68	5B	68	5C	68	5D	68	5E	68	5F	68	60	68	61	68	62	68	63
lp21	68	64	68	65	68	66	68	67	68	68	68	69	68	6A	68	6B	68	6C	68	6D	68	6E	68	6F
lp22	68	70	68	71	68	72	68	73	68	74	68	75	68	76	68	77	68	78	68	79	68	7A	68	7B
lp23	68	7C	68	7D	68	7E	68	7F	68	80	69	01	69	02	69	03	69	04	69	05	69	06	69	07
lp24	69	08	69	09	69	0A	69	0B	69	0C	69	0D	69	0E	69	0F	69	10	69	11	69	12	69	13
lp25	69	14	69	15	69	16	69	17	69	18	69	19	69	1A	69	1B	69	1C	69	1D	69	1E	69	1F
lp26	69	20	69	21	69	22	69	23	69	24	69	25	69	26	69	27	69	28	69	29	69	2A	69	2B
lp27	69	2C	69	2D	69	2E	69	2F	69	30	69	31	69	32	69	33	69	34	69	35	69	36	69	37
lp28	69	38	69	39	69	3A	69	3B	69	3C	69	3D	69	3E	69	3F	69	40	69	41	69	42	69	43
lp29	69	44	69	45	69	46	69	47	69	48	69	49	69	4A	69	4B	69	4C	69	4D	69	4E	69	4F
lp30	69	50	69	51	69	52	69	53	69	54	69	55	69	56	69	57	69	58	69	59	69	5A	69	5B
lp31	69	5C	69	5D	69	5E	69	5F	69	60	69	61	69	62	69	63	69	64	69	65	69	66	69	67
lp32	69	68	69	69	69	6A	69	6B	69	6C	69	6D	69	6E	69	6F	69	70	69	71	69	72	69	73
lp33	69	74	69	75	69	76	69	77	69	78	69	79	69	7A	69	7B	69	7C	69	7D	69	7E	69	7F
lp34	6A	00	6A	01	6A	02	6A	03	6A	04	6A	05	6A	06	6A	07	6A	08	6A	09	6A	0A	6A	0B
lp35	6A	0C	6A	0D	6A	0E	6A	0F	6A	10	6A	11	6A	12	6A	13	6A	14	6A	15	6A	16	6A	17
lp36	6A	18	6A	19	6A	1A	6A	1B	6A	1C	6A	1D	6A	1E	6A	1F	6A	20	6A	21	6A	22	6A	23
lp37	6A	24	6A	25	6A	26	6A	27	6A	28	6A	29	6A	2A	6A	2B	6A	2C	6A	2D	6A	2E	6A	2F
lp38	6A	30	6A	31	6A	32	6A	33	6A	34	6A	35	6A	36	6A	37	6A	38	6A	39	6A	3A	6A	3B
lp39	6A	3C	6A	3D	6A	3E	6A	3F	6A	40	6A	41	6A	42	6A	43	6A	44	6A	45	6A	46	6A	47
lp40	6A	48	6A	49	6A	4A	6A	4B	6A	4C	6A	4D	6A	4E	6A	4F	6A	50	6A	51	6A	52	6A	53
lp41	6A	54	6A	55	6A	56	6A	57	6A	58	6A	59	6A	5A	6A	5B	6A	5C	6A	5D	6A	5E	6A	5F
lp42	6A	60	6A	61	6A	62	6A	63	6A	64	6A	65	6A	66	6A	67	6A	68	6A	69	6A	6A	6A	6B
lp43	6A	6C	6A	6D	6A	6E	6A	6F	6A	70	6A	71	6A	72	6A	73	6A	74	6A	75	6A	76	6A	77
lp44	6A	78	6A	79	6A	7A	6A	7B	6A	7C	6A	7D	6A	7E	6A	7F	6B	00	6B	01	6B	02	6B	03
lp45	6B	04	6B	05	6B	06	6B	07	6B	08	6B	09	6B	0A	6B	0B	6B	0C	6B	0D	6B	0E	6B	0F
lp46	6B	10	6B	11	6B	12	6B	13	6B	14	6B	15	6B	16	6B	17	6B	18	6B	19	6B	1A	6B	1B
lp47	6B	1C	6B	1D	6B	1E	6B	1F	6B	20	6B	21	6B	22	6B	23	6B	24	6B	25	6B	26	6B	27
lp48	6B	28	6B	29	6B	2A	6B	2B	6B	2C	6B	2D	6B	2E	6B	2F	6B	30	6B	31	6B	32	6B	33

Assignment Parameter Numbers – Groups to LR/Aux (MB/LB)

	LR		Aux1		Aux2		Aux3		Aux4		Aux5		Aux6		Aux7		Aux8		Aux9		Aux10		Aux11		Aux12	
	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB
Grp1	60	30	65	04	65	05	65	06	65	07	65	08	65	09	65	0A	65	0B	65	0C	65	0D	65	0E	-	-
Grp2	60	31	65	10	65	11	65	12	65	13	65	14	65	15	65	16	65	17	65	18	65	19	-	-	-	-
Grp3	60	32	65	1C	65	1D	65	1E	65	1F	65	20	65	21	65	22	65	23	65	24	-	-	-	-	-	-
Grp4	60	33	65	28	65	29	65	2A	65	2B	65	2C	65	2D	65	2E	65	2F	-	-	-	-	-	-	-	-
Grp5	60	34	65	34	65	35	65	36	65	37	65	38	65	39	65	3A	-	-	-	-	-	-	-	-	-	-
Grp6	60	35	65	40	65	41	65	42	65	43	65	44	65	45	-	-	-	-	-	-	-	-	-	-	-	-
Grp7	60	36	65	4C	65	4D	65	4E	65	4F	65	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Grp8	60	37	65	58	65	59	65	5A	65	5B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Grp9	60	38	65	64	65	65	65	66	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Grp10	60	39	65	70	65	71	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Grp11	60	3A	65	7C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Grp12	60	3B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Assignment Parameter Numbers – FX Returns to LR/Aux (MB/LB)

	LR		Aux1		Aux2		Aux3		Aux4		Aux5		Aux6		Aux7		Aux8		Aux9		Aux10		Aux11		Aux12	
	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB
FX1Rtn	60	3C	66	14	66	15	66	16	66	17	66	18	66	19	66	1A	66	1B	66	1C	66	1D	66	1E	66	1F
FX2Rtn	60	3D	66	20	66	21	66	22	66	23	66	24	66	25	66	26	66	27	66	28	66	29	66	2A	66	2B
FX3Rtn	60	3E	66	2C	66	2D	66	2E	66	2F	66	30	66	31	66	32	66	33	66	34	66	35	66	36	66	37
FX4Rtn	60	3F	66	38	66	39	66	3A	66	3B	66	3C	66	3D	66	3E	66	3F	66	40	66	41	66	42	66	43
FX5Rtn	60	40	66	44	66	45	66	46	66	47	66	48	66	49	66	4A	66	4B	66	4C	66	4D	66	4E	66	4F
FX6Rtn	60	41	66	50	66	51	66	52	66	53	66	54	66	55	66	56	66	57	66	58	66	59	66	5A	66	5B
FX7Rtn	60	42	66	5C	66	5D	66	5E	66	5F	66	60	66	61	66	62	66	63	66	64	66	65	66	66	66	67
FX8Rtn	60	43	66	68	66	69	66	6A	66	6B	66	6C	66	6D	66	6E	66	6F	66	70	66	71	66	72	66	73

Assignment Parameter Numbers – FX Returns to Groups (MB/LB)

	Grp1		Grp2		Grp3		Grp4		Grp5		Grp6		Grp7		Grp8		Grp9		Grp10		Grp11		Grp12	
	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB
FX1Rtn	6B	34	6B	35	6B	36	6B	37	6B	38	6B	39	6B	3A	6B	3B	6B	3C	6B	3D	6B	3E	6B	3F
FX2Rtn	6B	40	6B	41	6B	42	6B	43	6B	44	6B	45	6B	46	6B	47	6B	48	6B	49	6B	4A	6B	4B
FX3Rtn	6B	4C	6B	4D	6B	4E	6B	4F	6B	50	6B	51	6B	52	6B	53	6B	54	6B	55	6B	56	6B	57
FX4Rtn	6B	58	6B	59	6B	5A	6B	5B	6B	5C	6B	5D	6B	5E	6B	5F	6B	60	6B	61	6B	62	6B	63
FX5Rtn	6B	64	6B	65	6B	66	6B	67	6B	68	6B	69	6B	6A	6B	6B	6B	6C	6B	6D	6B	6E	6B	6F
FX6Rtn	6B	70	6B	71	6B	72	6B	73	6B	74	6B	75	6B	76	6B	77	6B	78	6B	79	6B	7A	6B	7B
FX7Rtn	6B	7C	6B	7D	6B	7E	6B	7F	6C	00	6C	01	6C	02	6C	03	6C	04	6C	05	6C	06	6C	07
FX8Rtn	6C	08	6C	09	6C	0A	6C	0B	6C	0C	6C	0D	6C	0E	6C	0F	6C	10	6C	11	6C	12	6C	13

Assignment Parameter Numbers – FX Sends (MB/LB)

	FX1Snd		FX2Snd		FX3Snd		FX4Snd	
	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB
lp1	6C	14	6C	15	6C	16	6C	17
lp2	6C	18	6C	19	6C	1A	6C	1B
lp3	6C	1C	6C	1D	6C	1E	6C	1F
lp4	6C	20	6C	21	6C	22	6C	23
lp5	6C	24	6C	25	6C	26	6C	27
lp6	6C	28	6C	29	6C	2A	6C	2B
lp7	6C	2C	6C	2D	6C	2E	6C	2F
lp8	6C	30	6C	31	6C	32	6C	33
lp9	6C	34	6C	35	6C	36	6C	37
lp10	6C	38	6C	39	6C	3A	6C	3B
lp11	6C	3C	6C	3D	6C	3E	6C	3F
lp12	6C	40	6C	41	6C	42	6C	43
lp13	6C	44	6C	45	6C	46	6C	47
lp14	6C	48	6C	49	6C	4A	6C	4B
lp15	6C	4C	6C	4D	6C	4E	6C	4F
lp16	6C	50	6C	51	6C	52	6C	53
lp17	6C	54	6C	55	6C	56	6C	57
lp18	6C	58	6C	59	6C	5A	6C	5B
lp19	6C	5C	6C	5D	6C	5E	6C	5F
lp20	6C	60	6C	61	6C	62	6C	63
lp21	6C	64	6C	65	6C	66	6C	67
lp22	6C	68	6C	69	6C	6A	6C	6B
lp23	6C	6C	6C	6D	6C	6E	6C	6F
lp24	6C	70	6C	71	6C	72	6C	73

	FX1Snd		FX2Snd		FX3Snd		FX4Snd	
	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB
lp25	6C	74	6C	75	6C	76	6C	77
lp26	6C	78	6C	79	6C	7A	6C	7B
lp27	6C	7C	6C	7D	6C	7E	6C	7F
lp28	6D	00	6D	01	6D	02	6D	03
lp29	6D	04	6D	05	6D	06	6D	07
lp30	6D	08	6D	09	6D	0A	6D	0B
lp31	6D	0C	6D	0D	6D	0E	6D	0F
lp32	6D	10	6D	11	6D	12	6D	13
lp33	6D	14	6D	15	6D	16	6D	17
lp34	6D	18	6D	19	6D	1A	6D	1B
lp35	6D	1C	6D	1D	6D	1E	6D	1F
lp36	6D	20	6D	21	6D	22	6D	23
lp37	6D	24	6D	25	6D	26	6D	27
lp38	6D	28	6D	29	6D	2A	6D	2B
lp39	6D	2C	6D	2D	6D	2E	6D	2F
lp40	6D	30	6D	31	6D	32	6D	33
lp41	6D	34	6D	35	6D	36	6D	37
lp42	6D	38	6D	39	6D	3A	6D	3B
lp43	6D	3C	6D	3D	6D	3E	6D	3F
lp44	6D	40	6D	41	6D	42	6D	43
lp45	6D	44	6D	45	6D	46	6D	47
lp46	6D	48	6D	49	6D	4A	6D	4B
lp47	6D	4C	6D	4D	6D	4E	6D	4F
lp48	6D	50	6D	51	6D	52	6D	53

	FX1Snd		FX2Snd		FX3Snd		FX4Snd	
	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB
Grp1	6D	54	6D	55	6D	56	6D	57
Grp2	6D	58	6D	59	6D	5A	6D	5B
Grp3	6D	5C	6D	5D	6D	5E	6D	5F
Grp4	6D	60	6D	61	6D	62	6D	63
Grp5	6D	64	6D	65	6D	66	6D	67
Grp6	6D	68	6D	69	6D	6A	6D	6B
Grp7	6D	6C	6D	6D	6D	6E	6D	6F
Grp8	6D	70	6D	71	6D	72	6D	73
Grp9	6D	74	6D	75	6D	76	6D	77
Grp10	6D	78	6D	79	6D	7A	6D	7B
Grp11	6D	7C	6D	7D	6D	7E	6D	7F
Grp12	6E	00	6E	01	6E	02	6E	03

	FX1Snd		FX2Snd		FX3Snd		FX4Snd	
	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB
FX1Rtn	6E	04	6E	05	6E	06	6E	07
FX2Rtn	6E	08	6E	09	6E	0A	6E	0B
FX3Rtn	6E	0C	6E	0D	6E	0E	6E	0F
FX4Rtn	6E	10	6E	11	6E	12	6E	13
FX5Rtn	6E	14	6E	15	6E	16	6E	17
FX6Rtn	6E	18	6E	19	6E	1A	6E	1B
FX7Rtn	6E	1C	6E	1D	6E	1E	6E	1F
FX8Rtn	6E	20	6E	21	6E	22	6E	23

Assignment Parameter Numbers – Matrix Sends (MB/LB)

	Mtx1		Mtx2		Mtx3	
	MSB	LSB	MSB	LSB	MSB	LSB
LR	6E	24	6E	25	6E	26
Aux1	6E	27	6E	28	6E	29
Aux2	6E	2A	6E	2B	6E	2C
Aux3	6E	2D	6E	2E	6E	2F
Aux4	6E	30	6E	31	6E	32
Aux5	6E	33	6E	34	6E	35
Aux6	6E	36	6E	37	6E	38
Aux7	6E	39	6E	3A	6E	3B
Aux8	6E	3C	6E	3D	6E	3E
Aux9	6E	3F	6E	40	6E	41
Aux10	6E	42	6E	43	6E	44
Aux11	6E	45	6E	46	6E	47
Aux12	6E	48	6E	49	6E	4A

	Mtx1		Mtx2		Mtx3	
	MSB	LSB	MSB	LSB	MSB	LSB
Grp1	6E	4B	6E	4C	6E	4D
Grp2	6E	4E	6E	4F	6E	50
Grp3	6E	51	6E	52	6E	53
Grp4	6E	54	6E	55	6E	56
Grp5	6E	57	6E	58	6E	59
Grp6	6E	5A	6E	5B	6E	5C
Grp7	6E	5D	6E	5E	6E	5F
Grp8	6E	60	6E	61	6E	62
Grp9	6E	63	6E	64	6E	65
Grp10	6E	66	6E	67	6E	68
Grp11	6E	69	6E	6A	6E	6B
Grp12	6E	6C	6E	6D	6E	6E