

This protocol is for use with the Qu-16,24,32 and Qu-Pac loaded with firmware version V1.82 or later.

Note Firmware V1.82 added new MIDI messages for:

- dSNAKE socket to input channel patching which allows control and display of the correct AudioRack preamp by the connected device when the mapping is not default one-to-one.
- Group 'Mode' which allows control of the routing, stereo send levels, pan and pre/post when a group is set to 'mix mode', or just the routing when set to 'group mode'.

For more information on these features please refer to the Qu Reference Guide V1.8 AP9372 which can be downloaded from www.allen-heath.com.

Note For firmware V1.5 onwards the MIDI channel numbers and NRPN ID previously used by Mute Groups were re-allocated to the added DCA Groups to be consistent with other Allen & Heath mixers. Mute Groups channel numbers were changed and are as detailed in this specification.

Qu transmits MIDI messages when its controls are operated. It also responds to parameter changes it receives via MIDI, for example from a computer or an external MIDI controller.

MIDI communicates via:

USB – Rear panel USB B port for direct connection to Apple Mac computers running OSX 10.6 or later. This is the recommended connection for DAW control.

Note USB MIDI is supported natively by Apple Mac computers so no driver is needed. A driver for Windows computers can be downloaded from the [Allen & Heath web site](http://www.allen-heath.com).

TCP – Rear panel network port for use with a computer, a touch panel or other remote controller with configurable MIDI over a TCP/IP port.

Note TCP MIDI requires a driver for the data to be seen as a MIDI port. An Allen & Heath TCP MIDI driver for Apple Mac computers can be downloaded from the iLive Software web page. A driver is not available for Windows computers.

Note Qu currently allows only one TCP MIDI connection at a time over its Network port.

The following Qu functions can be controlled via MIDI:

- Mutes
- Faders and Pan
- Mix and FX sends - Level, Pan, Assign, Pre/Post
- Matrix sends (not Qu-16) – Level, Pan, Assign, Pre/Post
- Audio Groups (not Qu-16) – Assign, (plus Level, Pan, Pre/Post if in Mix mode)
- Mute Groups – Assign, Master Mute
- DCA Groups – Assign, Master Level, Master Mute
- PAFL select
- Input Channel source
- Preamp (local and dSNAKE) – Gain, Pad, 48V
- Insert In/Out
- Input Channel processing – Trim, Polarity, Gate, PEQ, Compressor, Delay
- Mix processing - PEQ, GEQ, Compressor, Delay
- Group and Matrix processing – PEQ, GEQ, Compressor, Delay (not Qu-16)
- Channel Names
- Scene Recall
- FX Tap Tempo
- MMC Transport Control

DAW Control for Mac computers:

MIDI fader strips can be assigned to the Custom Layer to work with a DAW (Digital Audio Workstation). These send/receive CC and note on/off messages using a different MIDI channel to that used for the Qu functions described above. The MIDI fader strip sends/receives messages relating to:

- Fader position
- Mute key / indicator
- Sel key / indicator
- PAFL key /indicator
- DAW Bank Up/Down

You can work directly with these messages or use the Allen & Heath DAW Control driver to convert them into either of the following popular protocols:

- HUI
- Mackie Control

Note DAW Control is available for Mac computers only. A driver for Windows computers is not available.

Go to the [Allen & Heath web site](#) to download the DAW Control driver for Mac and for further information in the DAW Control Setup Notes.

Reference

Refer to the table at the end of this document for value listings.

All MIDI message numbers shown in blue in this document are **Hexadecimal**

- Key**
- Blue** Hexadecimal number, eg, **F0**
 - Green** Variable referred to in table or note, eg, **VA** = parameter value
 - Red** NRPN **ID** number for parameter type, eg. Polarity = **6A**
 - Orange** NRPN Index to specify a second value, eg, **VX**

MIDI channel number **N** (see table)

MIDI channel 1 to 16 = **0** to **F**

Qu functions use MIDI channel = **N**

MIDI strips (DAW controls) use MIDI channel = **N+1**

Channel numbers **CH** (see table)

FX Send 1 to 4 = **00** to **03**

FX Return 1 to 4 = **08** to **0B**

DCA Groups 1 to 4 = **10** to **13** **Note** Introduced in V1.5 firmware

Input 1 to 32 = **20** to **3F**

Stereo Channels = **40** to **42**

Mute Groups 1 to 4 = **50** to **53** **Note** This is a change introduced in V1.5 firmware

Group 1-2 to 7-8 = **68** to **6B** (not Qu-16)

Mix 1 to 10 = **60** to **66**

Main LR = **67**

Matrix 1-2, 3-4 = **6C** , **6D** (not Qu-16)

Active Sensing

Qu supports MIDI Active Sensing over its TCP/IP Ethernet connection to detect connection status. Qu will send an initial Active Sense byte (**FE**) once an Ethernet connection is established, and then once every 300ms or so during any period of inactivity.

Qu also responds to Active Sense. If it receives an Active Sense byte it will expect to receive regular MIDI data from that point onwards (either valid control data, or more Active Sense bytes during any period of inactivity). If it does not receive any data for 12 seconds, it will close the Ethernet connection.

DAW control

MIDI strips assigned to the Custom Layer can provide DAW control.

DAW messages can be translated into HUI or Mackie Control protocol using the Allen & Heath **DAW Control** driver which can be downloaded from the [Allen & Heath web site](#).

Note DAW Control is available for Mac computers only. A driver for Windows computers is not available.

DAW messages use a different MIDI channel to other Qu MIDI messages:

Qu MIDI channel = **N**

DAW MIDI channel = **N+1**

MIDI strip controls send and respond to the following messages:

Strip Fader

Control Change message:

B(N+1), FD, VA

Where **FD** = Strip fader **00** to **1F** (see table)

VA = Fader min to max position = **00** to **7F**

Strip keys

The strip keys use **NOTE ON** followed by **NOTE OFF** messages.

Pressing keys send messages.

Key LED indicators respond to received messages.

9(N+1), KY, 7F, 9(N+1), KY, 00

Where **KY** = **Mute** Strip 1-32 = **00** to **1F** (see table)

Sel Strip 1-32 = **20** to **3F**

PAFL Strip 1-32 = **40** to **5F**

Bank Up/Down

Qu SoftKeys can be assigned as DAW Bank Up or Bank Down keys.

These use **NOTE ON** followed by **NOTE OFF** messages which are converted by DAW Control to become the Bank Up/Down control.

Bank Up **9(N+1), 7E, 7F, 9(N+1), 7E, 00**

Bank Down **9(N+1), 7F, 7F, 9(N+1), 7F, 00**

MMC (Transport Control)

Sysex message **F0, 7F, 7F, 06, TC, F7**

Where **TC** transport control:

01 = Stop

02 = Play

04 = Fast Forward

05 = Rewind

06 = Record Strobe

09 = Pause

Mute control

Mute on NOTE ON with velocity > or = 40 followed by NOTE OFF

9N, CH, 7F, 9N, CH, 00

Mute off NOTE ON with velocity < 40 followed by NOTE OFF

9N, CH, 3F, 9N, CH, 00

Received Mute messages

Velocity 00 and NOTE OFF messages are ignored

Velocity 01 to 3F = Mute off

Velocity 40 to 7F = Mute on

NRPN Parameter control

Qu mixer parameters are transmitted and received as MIDI NRPN (Non-Registered Parameter Number) messages. The MSB (most significant byte) selects the mixer channel (CH), and the LSB (least significant byte) selects the parameter number (ID). The data entry MSB sets the parameter value (VA) and LSB sets the index value for its range (VX) where needed.

(NRPN MSB)	(NRPN LSB)	(Data MSB)	(Data LSB)
BN, 63, CH,	BN, 62, ID,	BN, 06, VA	BN, 26, VX

Group Mode BN, 63, CH, BN, 62, 5E, BN, 06, VA BN, 26, 00

Where VA Group mode = 00, Mix mode = 01

Note This is unidirectional – Sent from mixer but not received

Fader BN, 63, CH, BN, 62, 17, BN, 06, VA BN, 26, 07

Where VA –inf to +10dB = 00 to 7F, 0dB = 6B (see table)

Pan BN, 63, CH, BN, 62, 16, BN, 06, VA BN, 26, VX

Where VA Full Left = 00 to Centre = 25 to Full Right = 4A

VX 04, 05, 06, 07 = Mix 5-6, 7-8, 9-10, LR

VX 08, 09, 0A, 0B = Grp 1-2, 3-4, 5-6, 7-8 (in Mix mode)

VX 0C, 0D = MTX1-2, 3-4 (not Qu-16)

LR Assign BN, 63, CH, BN, 62, 18, BN, 06, VA BN, 26, 07

Where VA Off = 00, On = 01

Mix Assign BN, 63, CH, BN, 62, 55, BN, 06, VA BN, 26, VX

Where VA Off = 00, On = 01

VX 00 to 0B = Mix1 to 9-10, LR

VX 10 to 13 = FX send 1-4 (Qu-16 FX1,2 only)

VX 08, 09, 0A, 0B, 0C, 0D = Grp1-2 to 7-8, MTX1-2 to 3-4

Mute Grp Assign BN, 63, CH, BN, 62, 5C, BN, 06, VA BN, 26, 07

Where VA Off Mute Grp 1-4 = 00 to 03,

On Mute Grp 1-4 = 40 to 43

DCA Grp Assign	BN, 63, CH, BN, 62, 40, BN, 06, VA BN, 26, 07 Where VA Off Mute Grp 1-4 = 00 to 03 , On Mute Grp 1-4 = 40 to 43
Mix Pre/Post	BN, 63, CH, BN, 62, 50, BN, 06, VA BN, 26, VX Where VA Post = 00 , Pre = 01 VX 00 to 06 = Mix1 to 9-10 VX 08 to 0B = Grp1-2 to 7-8 (in Mix mode) VX 10 to 13 = FX send 1-4 (Qu-16 FX1,2 only) VX 0C, 0D = MTX1-2, 3-4 (not Qu-16)
Send Level	BN, 63, CH, BN, 62, 20, BN, 06, VA BN, 26, VX Where VA -inf to +10dB = 00 to 7F (see table) VX 00 to 06 = Mix1 to 9-10 VX 08 to 0B = Grp1-2 to 7-8 (in Mix mode) VX 10 to 13 = FX send 1-4 (Qu-16 FX1,2 only) VX 0C, 0D = MTX1-2, 3-4 (not Qu-16)
PAFL select	BN, 63, CH, BN, 62, 51, BN, 06, VA BN, 26, 07 Where VA Off = 00 , On = 01
Ch USB Source	Switches between channel current Preamp and current USB source BN, 63, CH, BN, 62, 12, BN, 06, VA BN, 26, 00 Where VA Off (Preamp) = 00 , On (USB) = 01
Ch Preamp Source	Switches between mixer rear panel and remote AR rack input source BN, 63, CH, BN, 62, 57, BN, 06, VA BN, 26, 00 Where VA Off (Local) = 00 , On (dSNAKE) = 01
dSNAKE Patch	BN, 63, CH, BN, 62, 5D, BN, 06, VA BN, 26, 00 Where VA = dSNAKE input socket index 00 to 27 Note This is unidirectional – Sent from mixer but not received
Local Preamp	Applies to rear panel local inputs only BN, 63, CH, BN, 62, ID, BN, 06, VA BN, 26, 07 Where Gain ID = 19 VA Gain -5dB to +60dB = 00 to 7F (see table) 48V PP ID = 69 VA Off = 00 , On = 01
dSNAKE Preamp	Applies to remote AR rack inputs only BN, 63, CH, BN, 62, ID, BN, 06, VA BN, 26, VX Where Gain ID = 58 VA Gain +5dB to +60dB = 00 to 7F (see table) Pad ID = 59 VA Out = 00 , In = 01 48V PP ID = 5A VA Off = 00 , On = 01 VX = dSNAKE socket index (00 to 27) (dSNAKE input patch)

Digital Trim

Applies to USB source to channel only

BN, 63, CH, **BN, 62, 52,** **BN, 06, VA** **BN, 26, 07**

Where **VA** Trim -24 to +24dB = **00** to **7F** 0dB = **40**

Stereo Trim

Applies to local ST1, ST2 and ST3 inputs only

BN, 63, CH, **BN, 62, 54,** **BN, 06, VA** **BN, 26, 07**

Where **VA** Trim -24 to +24dB = **00** to **7F** 0dB = **40**

Polarity

BN, 63, CH, **BN, 62, 6A,** **BN, 06, VA** **BN, 26, 07**

Where **VA** Off (normal) = **00**, On (reversed) = **01**

Insert In/Out

BN, 63, CH, **BN, 62, 6B,** **BN, 06, VA** **BN, 26, 07**

Where **VA** Out = **00**, In = **01**

PEQ

BN, 63, CH, **BN, 62, ID,** **BN, 06, VA** **BN, 26, 07**

Where

LF Gain **ID = 01** **VA** -12 to +12dB = **00** to **7F** 0dB = **40**

LF Freq **ID = 02** **VA** 20Hz to 20 kHz = **00** to **7F**

LF Width **ID = 03** **VA** 1.5 to 1/9 Oct = **00** to **7F**

LF Type **ID = 04** **VA** Bell = **00**, Shelf = **06**

LM Gain **ID = 05** **VA** -12 to +12dB = **00** to **7F** 0dB = **40**

LM Freq **ID = 06** **VA** 20Hz to 20 kHz = **00** to **7F**

LM Width **ID = 07** **VA** 1.5 to 1/9 Oct = **00** to **7F**

HM Gain **ID = 09** **VA** -12 to +12dB = **00** to **7F** 0dB = **40**

HM Freq **ID = 0A** **VA** 20Hz to 20 kHz = **00** to **7F**

HM Width **ID = 0B** **VA** 1.5 to 1/9 Oct = **00** to **7F**

HF Gain **ID = 0D** **VA** -12 to +12dB = **00** to **7F** 0dB = **40**

HF Freq **ID = 0E** **VA** 20Hz to 20 kHz = **00** to **7F**

HF Width **ID = 0F** **VA** 1.5 to 1/9 Oct = **00** to **7F**

HF Type **ID = 10** **VA** Bell = **00**, Shelf = **06**

PEQ In/Out

BN, 63, CH, **BN, 62, 11,** **BN, 06, VA** **BN, 26, 00**

Where **VA** Out = **00**, In = **01**

HPF Freq

BN, 63, CH, **BN, 62, 13,** **BN, 06, VA** **BN, 26, 07**

Where **VA** 20Hz to 20kHz = **00** to **7F**

HPF In/Out

BN, 63, CH, **BN, 62, 14,** **BN, 06, VA** **BN, 26, 00**

Where **VA** Out = **00**, In = **01**

GEQ Gain

BN, 63, CH, **BN, 62, 70,** **BN, 06, VA** **BN, 26, VX**

Where **VA** Gain -12 to +12dB = **00** to **7F**

VX **00** to **1B** = Each of 28 bands (see table)

GEQ In/Out

BN, 63, CH, **BN, 62, 71,** **BN, 06, VA** **BN, 26, 00**

Where **VA** Out = **00**, In = **01**

Gate		BN, 63, CH,	BN, 62, ID,	BN, 06, VA	BN, 26, 07
	Where				
	Attack	ID = 41	VA	50us to 300ms = 00 to 7F	
	Release	ID = 42	VA	10ms to 1s = 00 to 7F	
	Hold	ID = 43	VA	10ms to 5s = 00 to 7F	
	Threshold	ID = 44	VA	-72 to +18dB = 00 to 7F	
	Depth	ID = 45	VA	0 to 60dB = 00 to 7F	
Gate	In/Out	BN, 63, CH,	BN, 62, 46,	BN, 06, VA	BN, 26, 00
	Where	VA	Out = 00, In = 01		
Comp		BN, 63, CH,	BN, 62, ID,	BN, 06, VA	BN, 26, 07
	Where				
	Type	ID = 61	VA	4 types = 00, 01, 02, 03	
	Attack	ID = 62	VA	300us to 300ms = 00 to 7F	
	Release	ID = 63	VA	100ms to 2s = 00 to 7F	
	Knee	ID = 64	VA	Hard knee = 00, Soft knee = 01	
	Ratio	ID = 65	VA	1:1 to inf = 00 to 7F, 2.6:1 = 50	
	Threshold	ID = 66	VA	-46 to +18dB = 00 to 7F	
	Gain	ID = 67	VA	0 +18dB = 00 to 7F	
Comp	In/Out	BN, 63, CH,	BN, 62, 68,	BN, 06, VA	BN, 26, 00
	Where	VA	Out = 00, In = 01		
Delay	Time	BN, 63, CH,	BN, 62, 6C,	BN, 06, VA	BN, 26, 07
	Where	VA	Input 0 to 85ms = 00 to 40 (linear)		
		VA	Mix 0 to 170ms = 00 to 7F (linear)		
		VA	Group 0 to 170ms = 00 to 7F (linear)		
		VA	Matrix 0 to 170ms = 00 to 7F (linear)		
Delay	In/Out	BN, 63, CH,	BN, 62, 6D,	BN, 06, VA	BN, 26, 00
	Where	VA	Out = 00, In = 01		

FX Parameter Control

Delay FX Time

To set delay time. Can be used for Tap Tempo.
 Can use one or two NRPN messages:
 Use MSB message only for course time value resolution.
 Use LSB followed by MSB message for fine resolution.

LSB: **BN, 63, CH,** **BN, 62, 49,** **BN, 06, VAf** **BN, 26, VX**

MSB: **BN, 63, CH,** **BN, 62, 48,** **BN, 06, VAc** **BN, 26, VX**

Where **VAf** Fine resolution time value = **00** to **7F**
VAc Course resolution time value = **00** to **7F**
VX Delay parameter **05** = Left tap
 07 = Right tap
 (See table for examples of time value)

Delay FX Link

To link or unlink the Left and Right tap time.

BN, 63, CH, **BN, 62, 48,** **BN, 06, VA** **BN, 26, 06**

Where **VA** Off (unlinked) = **00**
 On (linked) = **7F**

Scene Recall

Qu uses **Bank Select** and **Program Change** messages for Scene recall. Only Bank 1 is used.

Transmitted Scene message

Qu transmits this message when a Scene is recalled using the touch screen or a SoftKey:

(Bank1 MSB)	(Bank1 LSB)	Recall Scene
BN, 00, 00,	BN, 20, 00,	CN, SS

Where **SS** = Scene1 to 100 = **00** to **63** (see table)

Received Scene message

Qu responds to the following message if Bank1 is currently selected:

Recall Scene
CN, SS

Where **SS** = Scene1 to 100 = **00** to **63** (see table)

To set Bank1

Qu will ignore Scene change messages if the Bank is not set to 1.

(Bank1 MSB)	(Bank1 LSB)
BN, 00, 00,	BN, 20, 00

Device Connection

Note Qu currently allows only one TCP MIDI connection at a time over its Network port.

TCP Client Configuration

Clients should be configured to use TCP port 51325

Active Sensing

Qu supports MIDI Active Sensing over its TCP/IP Ethernet connection to detect connection status. Qu will send an initial Active Sense byte (**FE**) once an Ethernet connection is established, and then once every 300ms or so during any period of inactivity.

Qu also responds to Active Sense. If it receives an Active Sense byte it will expect to receive regular MIDI data from that point onwards (either valid control data, or more Active Sense bytes during any period of inactivity). If it does not receive any data for 12 seconds, it will close the Ethernet connection.

Qu uses Sysex messages to communicate much of its data.

Sysex Header

Sysex Header

	A&H ID	Qu mixer	Major/Minor version	MIDI channel
F0 ,	00, 00, 1A,	50, 11,	01, 00,	0N

Get System State

An external controller such as an iPad running the Qu-Pad app can use MIDI **Sysex** messages to request and receive the current parameter state of the Qu mixer.

Note On request, the mixer MIDI channel (**N**) is not known therefore an 'All Call' Sysex Header is sent. The reply returns the MIDI channel number. This number should be used in subsequent messages.

REQUEST: **Sysex Header (All Call), 10 <iPadFlag>, F7**

Where **Sysex Header (All Call)** = **F0, 00, 00, 1A, 50, 11, 01, 00, 7F**

And **<iPadFlag>** = **1** identifies the incoming connection as Qu-pad.

REPLY: **Sysex Header, 11, <BoxID>, <Version>, F7**

Where **<BoxID>** identifies the outgoing connection Qu mixer model

Where: **1** = Qu-16

2 = Qu-24

3 = Qu-32

4 = Qu-Pac

<Version> = **<Major>, <Minor>** = Qu firmware version (7bit data)

Subsequent push of NRPN messages to update current state.

Subsequent End Sync Response:

Sysex Header, 14, F7

If **<iPadFlag>** is set in the initial request the Qu mixer will expect to receive an Active Sense byte within 5 seconds. If not, it will close the Ethernet connection. This is how the lost communication mechanism is enforced for Qu-Pad.

Channel Naming

Get Name from Qu

REQUEST: Sysex Header, 01, CH, F7

REPLY: Sysex Header, 02, CH, <Name>, F7

Where <Name> = string of hex ascii characters

Set Name Sysex Header, 03, CH, <Name>, F7

Where <Name> = string of hex ascii characters

Get Meter Data

An external controller such as an iPad running the Qu-Pad app can use MIDI Sysex messages to request and receive the current meter data from the Qu mixer.

REQUEST:

Sysex Header, 12, < MeterOnOff > , F7

REPLY:

Sysex Header, 13, < MeterData > , F7

Where < MeterData> = Push of all meter data (Described below).

Where < MeterOnOff> = 0 (meters Off), 1 (meters On)

Meter values are signed dB values, coded as fixed point 7Q8 offset 8000 format, stored as unsigned 16 bit numbers, (transmitted in "7-bit-ized" format in the Sysex).

Encoding of meter data:

The 8-bit file data needs to be converted to 7-bit form, with the result that every 7 bytes of file data translates to 8 bytes in the MIDI stream.

For each group of 7 bytes of file data, the top bit from each is used to construct an eighth byte, which is sent first. For example:

AAAAaaaa BBBBbbbb CCCccccc DDDDdddd EEEEeeee FFFFffff GGGGgggg

becomes :

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

The final group may have less than 7 bytes, and is coded as follows (example with 2 bytes in the final group):

0AB00000 0AAAAaaa 0BBBBbbb

Example:	7-bit-ized binary	00100000 01111100 00000000
	Unpacks to 8-bit-ized binary	01111100 10000000
	Equivalent to hexadecimal	7C80
	Remove the offset:	(int16_t) 7C80 – (int16_t) 8000 = FC80
	Float and scale:	(float) FC80 / 256.0f = -3.5dB

Transmission of meter data:

The meter data is transmitted in blocks of data in the following order:

Qu-16

16 Mono Input blocks
80 unused meters
3 Stereo Input blocks
20 unused meters
4 Mono Mix blocks
4 Stereo Mix blocks
1 Stereo Monitor block
4 Stereo FX blocks

Qu-24

24 Mono Input blocks
3 Stereo Input blocks
180 unused meters
4 Mono Mix blocks
4 Stereo Mix blocks
2 Stereo Group blocks
2 Stereo Matrix blocks
1 Stereo Monitor block
4 Stereo FX blocks

Qu-32, Qu-Pac

24 Mono Input blocks (CH1-24)
3 Stereo Input blocks
20 unused meters
8 Mono Input blocks (CH25-32)
4 Mono Mix blocks
4 Stereo Mix blocks
4 Stereo Group blocks
2 Stereo Matrix blocks
1 Stereo Monitor block
4 Stereo FX blocks

Note Stereo Mix blocks include Mix 5-6, 7-8, 9-10, LR

The meter blocks transmit the following meter data:

Mono Input block

Post Preamp
Post PEQ
Post Compressor
Post Delay
Gate Side Chain
Compressor Side Chain
Direct Out
Gate Gain reduction
Compressor Gain Reduction
Ducker Gain Reduction

Stereo Input block

Post Preamp L
Post PEQ L
Post Compressor L
Post Delay L
Gate Side Chain L
Compressor Side Chain L
Direct Out L
Gate Gain reduction L
Compressor Gain Reduction L
Ducker Gain Reduction L
Post Preamp R
Post PEQ R
Post Compressor R
Post Delay R
Gate Side Chain R
Compressor Side Chain R
Direct Out R
Gate Gain reduction R
Compressor Gain Reduction R
Ducker Gain Reduction R

Mono Mix block

TB/SigGen
Pre-Insert
Post-PEQ
Post-GEQ
Post Compressor
Post Fader
Post insert
Compressor Side Chain
Compressor Gain Reduction
Ducker Gain Reduction

Stereo Mix / Group / Matrix block

TB/SigGen L
Pre-Insert L
Post PEQ L
Post GEQ L
Post Compressor L
Post Fader L
Post Insert L
Compressor Side Chain L
Compressor Gain Reduction L
Ducker Gain Reduction L
TB/SigGen R
Pre-Insert R
Post PEQ R
Post GEQ R
Post Compressor R
Post Fader R
Post Insert R
Compressor Side Chain R
Compressor Gain Reduction R
Ducker Gain Reduction R

Stereo Monitor block

PAFL L
PAFL R
PAFL Mono sum
Talkback
Signal Generator
Main Pre Fader L
Main Pre Fader R
Main Post Fader L
Main Post Fader R
Main Mono Sum Pre Fader
Main Mono Sum Post Fader
USB A Record Out L
USB A Record Out R
3 Unused Meters
RTA 31 bands L
RTA 31 bands R

Stereo FX block

Send L (at FX device input)

Send R (“)

Send Mono sum

Pre PEQ L

Pre PEQ R

Tap Tempo L

Tap Tempo R

Post PEQ L

Post PEQ R

9 unused meters

MIDI channel

N

Qu

Hex

N +1

DAW

Hex

10

9

11

A

12

B

13

C

14

D

15

E

16

F

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5

4

6

5

7

6

8

7

9

8

10

9

11

0A

12

0B

13

0C

14

0D

15

0E

16

0F

1

00

DAW

MIDI Strip

MS

Strip

Hex

1

00

2

01

3

02

4

03

5

04

6

05

7

06

8

07

9

08

10

09

11

0A

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0B

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0C

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0F

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25

18

26

19

27

1A

28

1B

29

1C

30

1D

31

1E

32

1F

Mute Sel PAFL

KY

Strip

Hex

Hex

Hex

1

00

20

40

2

01

21

41

3

02

22

42

4

03

23

43

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04

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4A

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0B

2B

4B

13

0C

2C

4C

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1A

3A

5A

28

1B

3B

5B

29

1C

3C

5C

30

1D

3D

5D

31

1E

3E

5E

32

1F

3F

5F

Scene number

SS

Scene

Hex

1

00

2

01

3

02

4

03

5

04

6

05

7

06

8

07

9

08

10

09

11

0A

12

0B

13

0C

14

0D

15

0E

16

0F

17

10

18

11

19

12

20

13

21

14

22

15

23

16

24

17

25

18

26

19

27

1A

28

1B

29

1C

30

1D

31

1E

32

1F

33

20

34

21

35

22

36

23

37

24

38

25

39

26

40

27

41

28

42

29

43

2A

44

2B

45

2C

46

2D

47

2E

48

2F

49

30

50

31

51

32

52

33

53

34

54

35

55

36

56

37

57

38

58

39

59

3A

60

3B

61

3C

62

3D

63

3E

64

3F

SS

Scene

Hex

65

40

66

41

67

42

68

43

69

44

70

45

71

46

72

47

73

48

74

49

75

4A

76

4B

77

4C

78

4D

79

4E

80

4F

81

50

82

51

83

52

84

53

85

54

86

55

87

56

88

57

89

58

90

59

91

5A

92

5B

93

5C

94

5D

95

5E

96

5F

97

60

98

61

99

62

100

63

Input Channel

CH

CH

Hex

1

20

2

21

3

22

4

23

5

24

6

25

7

26

8

27

9

28

10

29

11

2A

12

2B

13

2C

14

2D

15

2E

16

2F

17

30

18

31

19

32

20

33

21

34

22

35

23

36

24

37

25

38

26

39

27

3A

28

3B

29

3C

30

3D

31

3E

32

3F

ST1

40

ST2

41

ST3

42

FX Ret

CH

CH

Hex

1

08

2

09

3

0A

4

0B

FX Send

CH

CH

Hex

VX

Hex

1

00

10

2

01

11

3

02

12

4

03

13

Mix

CH

CH

Hex

VX

Hex

1

60

00

2

61

01

3

62

02

4

63

03

5-6

64

04

7-8

65

05

9-10

66

06

LR

67

07

Grp1-2

68

08

Grp3-4

69

09

Grp5-6

6A

0A

Grp7-8

6B

0B

MTX1-2

6C

0C

MTX3-4

6D

0D

Local Gain value

19

VA

dB

Hex

+60

7F

+50

6B

+40

57

+30

44

+20

30

+10

1D

+5

13

0

0A

-5

00

dSNAKE Gain value

58

VA

dB

Hex

+60

7F

+50

67

+40

50

+35

45

+30

39

+25

2E

+20

22

+10

0B

+5

00

Fader/Send value

VA

dBu

Hex

+10

7F

+5

74

0

6B

-5

61

-10

57

-15

4D

-20

43

-25

39

-30

2F

-35

25

-40

1B

-45

11

-inf

00

Delay FX time

VAc

VAF

Time

Hex

Hex

5ms

00

00

100ms

44

31

200ms

54

22

400ms

63

77

800ms

73

68

1.36sec

7F

7F

Compressor Type

61

VA

Type

Hex

Manual Peak

00

Manual RMS

01

Auto Slow Opto

02

Auto Punchbag

03

Mute Group

CH

MG

Hex

1

50

2

51

3

52

4

53

Mute Grp Assign

VA

MG

off

on

1

00

40

2

01

41

3

02

42

4

03

43

DCA Group

CH

MG

Hex

1

10

2

11

3

12

4

13

DCA Grp Assign

VA

MG

off

on

1

00

40

2

01

41

3

02

42

4

03

43