LIVE PERFORMANCE SYSTEM



XL8 Live Performance System

Owner's Manual

MIDAS



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Owner's Manual

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IMPORTANT SAFETY INSTRUCTIONS



The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

1 Read these instructions.

2 Keep these instructions.

3 Heed all warnings.

4 Follow all instructions.

5 Do not use this apparatus near water.

6 Clean only with a dry cloth.

7 Do not block any of the ventilation openings. Install in accordance with the manufacturer's instructions.

8 Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

9 Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

10 Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles and the point where they exit from the apparatus.

11 Only use attachments/accessories specified by the manufacturer.

12 Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.



13 Unplug this apparatus during lightning storms or when unused for long periods of time.

14 Refer all servicing to qualified personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

15 Use the mains plug to disconnect the apparatus from the mains.

16 **Warning: To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.**

17 **Warning: Do not expose this equipment to dripping or splashing and ensure that no objects filled with liquids, such as vases, are placed on the equipment.**

18 **Warning: The mains plug of the power supply cord shall remain readily operable.**

Midas

CE

EC-Declaration of Conformity

The undersigned, representing the following manufacturer

Manufacturer:

Midas Klark Teknik Ltd.

Address:

Klark Industrial Park, Walter Nash Road,
Kidderminster. Worcestershire. DY11 7HJ.

hereby declares that the following product

Product Type Number	Product Description	Nominal Voltage(s)	Current	Freq.
XL8	Control Centre	115V AC 230V AC	12A 6A	50/60Hz

is in conformity with the regulations of the following marked EC-directives and bears the CE-mark accordingly

reference number	title
2004/108/EC	EMC Directive (EMC)
2006/95/EC	Low-Voltage Directive (LVD)

The conformity of the product with EC Directives for use in environment E4 is provided by compliance with the following standards:

Standards/date:

Applied Electrical Safety test standards:

reference number	title
EN 60065:2002	Audio, video and similar electronic apparatus. Safety requirements

*Applied EMC **emission** test standards:*

ref. no.	title
EN 55103-1:1996 Class A	EN 55103-1 Annex A: Radiated magnetic disturbance, 50Hz-50kHz
	CISPR 22: Radiated disturbance, 30-1000MHz
	CISPR 22: Conducted disturbance, ac & signal ports
	CISPR 16: Discontinuous disturbance
	EN 61000-3-2:2000 Mains harmonics
	EN 61000-3-3:1995 Mains voltage flicker

*Applied EMC **immunity** test standards:*

ref. no.	title
EN 55103-2:1996 Class A	EN 61000-4-2:1995 Electrostatic discharge
	EN 61000-4-3:1996: Radiated RF disturbance, 80-1000MHz
	EN 55103-2 Annex A: Magnetic LF disturbance, 50Hz–10kHz
	EN 61000-4-4:1995: Fast transient bursts, ac & signal ports
	EN 61000-4-5:1995: Surge, ac port
	EN 61000-4-6:1996: Conducted RF field, ac & signal ports
	EN 61000-4-11:1994: Mains voltage dips and interruptions

Place, date: Kidderminster, UK
15th April 2010

General Manager
Printed name: John Oakley

AVP, Product Development
Printed name: Alex Cooper

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Precautions

Before installing, setting up or operating this equipment, make sure that you have read and fully understand all of this section and the "IMPORTANT SAFETY INSTRUCTIONS" at the front of this manual.

This equipment is supplied by a mains voltage that can cause electric shock injury!

The following must be observed in order to maintain safety and electromagnetic compatibility (EMC) performance.

Safety warnings

This equipment is fitted with two PowerCon® mains power sockets. For safety reasons the earth leads must not be disconnected.

Signal 0V is connected internally to the chassis.

To completely disconnect this equipment from the AC mains, while observing full safety precautions (see "Power" on page xiii), switch off the five bay isolator switches (rear of control centre) *one at a time* and then switch off the mains at the two mains outlets that supply the PowerCon® sockets. It is now safe to isolate the control centre by removing the two PowerCon® mains leads from rear of control centre.

To avoid electric shock, do not remove covers.

General precautions

In the event of ground loop problems, disconnect the signal screen at one end of the connecting cables. Note that this can only be done when the equipment is used within a balanced system.

Do not remove, hide or deface any warnings or cautions.

Power

The system power supplies contain LETHAL VOLTAGES greatly in excess of the mains voltage and that its rails can produce extremely large currents that could burn out equipment and wiring if shorted.

The internal power supplies are of the switch mode type that automatically sense the incoming mains voltage and will work where the nominal voltage is in the range 100VAC to 240VAC.

Each mains inlet is to be sourced from its own separate wall-mounted mains outlet socket. Otherwise, their mains sources must be suitably distributed so as to meet local safety regulations.

Two PowerCon® mains inlets are provided on the rear panel. The correct leads for connection in the area to which the unit was shipped are supplied with the unit. The equipment should only be plugged into the mains outlets using the supplied leads.

When removing the equipment's electric plugs from the outlets, always hold the plug itself and not the cable. Pulling out the plug by the cable can damage it.

Never insert or remove an electric plug with wet hands.

Do not insert or remove a PowerCon® connector into/from the rear of control centre with mains power and/or any of the bay isolator switches on. You *must* make sure all bay isolator switches are off and mains is switched off at the power outlet(s) first.

When switching the five bay isolator switches on/off, make sure it is done one at a time. It is important that you don't switch on/off two or more simultaneously.

Before switching the XL8 on/off, please make sure that all monitor loudspeaker power amplifiers are turned off or muted.

Handling the equipment

Completely isolate the equipment electrically and disconnect all cables from the equipment before moving it.

When lifting or moving the equipment, always take its size and weight into consideration. Use suitable lifting equipment or transporting gear, or sufficient additional personnel.

Do not insert your fingers or hand in any gaps or openings on the equipment, for example, vents.

Avoid inserting or dropping foreign objects, such as paper, plastic, metal etc., into any gaps or openings on the equipment, for example, vents. If this happens, immediately disconnect the equipment from the AC mains; see "Safety warnings" on page xiii. Then have the equipment inspected by the manufacturer's qualified service personnel.

Do not press or rub on the sensitive surface of the GUI screens.

If the glass of the GUI screen is broken, liquid crystals shouldn't leak through the break due to the surface tension of the thin layer and the type of construction of the LCD panel. However, in the unlikely event that you do make contact with this substance, please wash it out with soap.

Installation

Before installing the equipment:

- Make sure the equipment is correctly connected to the protective earth conductor of the mains voltage supply of the system installation through the mains leads.
- Power to the equipment must be via a fused spur(s).
- Power plugs must be inserted in socket outlets provided with protective earth contacts. The electrical supply at the socket outlets must provide appropriate over-current protection.
- Both the mains supply and the quality of earthing must be adequate for the equipment.
- Before connecting up the equipment, check that the mains power supply voltage rating corresponds with the local mains power supply. The rating of the mains power supply voltage is printed on the equipment.

Location

Ideally a cool area is preferred, away from power distribution equipment or other potential sources of interference.

Do not install the equipment in places of poor ventilation.

Do not install this equipment in a location subjected to excessive heat, dust or mechanical vibration. Allow for adequate ventilation around the equipment, making sure that its fans and vents are not obstructed. Wherever possible, keep the equipment out of direct sunlight.

Do not place the equipment in an unstable condition where it might accidentally fall over.

Make sure that the mains voltage and fuse rating information of the equipment will be visible after installation.

Audio connections

To ensure the correct and reliable operation of your equipment, only high quality balanced, screened, twisted pair audio cable should be used.

XLR connector shells should be of metal construction so that they provide a screen when connected to the console and, where appropriate, they should have Pin 1 connected to the cable screen.

Radio frequency interference — Class A device

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Electric fields

Caution:
In accordance with Part 15 of the FCC Rules & Regulations, "... changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment."

Should this product be used in an electromagnetic field that is amplitude modulated by an audio frequency signal (20Hz to 20kHz), the signal to noise ratio may be degraded. Degradation of up to 60dB at a frequency corresponding to the modulation signal may be experienced under extreme conditions (3V/m, 90% modulation).

Operation

To avoid electrical shock, never operate the equipment with the covers removed.

Safety equipment

Never remove, for example, covers, housings or any other safety guards. Do not operate the equipment or any of its parts if safety guards are ineffective or their effectiveness has been reduced.

Optional equipment

Unless advised otherwise, optional equipment must only be installed by service personnel and in accordance with the appropriate assembly and usage regulations.

Special accessories

To comply with part 15 of the FCC Rules, any special accessories (that is, items that cannot be readily obtained from multiple retail outlets) supplied with this equipment must be used with this equipment; do not use any alternatives as they may not fulfil the RF requirement.

Contents

Cover page i

Information page iii

IMPORTANT SAFETY INSTRUCTIONS v

EC-Declaration of Conformity vii

Licences ix

Precautions xiii

Contents xvii

Overview

Chapter 1 **Introduction** 1

About this manual 1
Training 3
XL8 user documentation 3
XL8 host software version 3
Optional extras 3
Warranty and registration 3
Service and support 3

Chapter 2 **XL8 Live Performance System** 5

Features 5
System components (standard supply) 8
System interconnections 9
FOH and MON 10
Mix matrix 11
Processing 11
Audio physical connections 13
Uses of the configurable audio connections 14
Surround capabilities 15
Network 15
Resilience to failure (redundancy) 16
Control software 20
GUI 20
Console linking 20
Integration of third party software 20

Chapter 3 **About The XL8 Control Centre 23**
Overview of the XL8 Control Centre 23
Bay and GUI layout 24
XL8 control surface 25
GUI 26
Front and rear connections 27
Pull-out keyboard 28
External interfaces 28

Getting Started

Chapter 4 **Setting Up The System 31**
Initial set-up procedure 31
Unpacking the equipment 31
Making up the racks 31
Wiring instructions 33
XL8 system interconnections 36
Powering the XL8 system 39
Switching the XL8 Control Centre on/off 40
Setting up the ID of the DL4n1 units 41

Basic Operation Of The XL8

Chapter 5 **Before You Start 45**
Principles of operation 45
Hints and tips 45
Saving your work 45

Chapter 6 **Working With The XL8 Control Centre 47**
About the XL8 controls 47
About GUI operation 48
Common GUI screen elements 49
Parameter values displayed on touch 50
Operating the GUI screen controls 50
Using the GUI menu 52
Text editing 53

Chapter 7 **Navigation 55**
An introduction to XL8 navigation 55
About the navigational controls 56
Location of the navigational controls 58
About GUI navigation 62
How to navigate 63

Chapter 8 **Patching 67**
Introduction 67
Terms used in XL8 patching 67
About the Patching screen 67
Patching tooltips 79
About the patching procedure 80

Configuring the devices 80
Configuring the XL8 with the snake type 82
Setting up the I/O rack devices 82
How to patch 84

Chapter 9 Basic Operation 89
Setting a mic amplifier's input gain 89
Setting the high and low pass filters 90
Input equalisation (E zone) 91
Input dynamics processing (D zone) 92
Output processing 93
Using VCA/POP groups 94
Setting up a mix 96
Fader flip 100
Setting up the effects rack 100
Simple routing to master stereo outputs 102
Automation 103
Configuring the inputs and outputs 107
Using copy and paste 108
User library (presets) 109
Surround panning 110
Two-man operation 111
Saving your show files to a USB memory stick 112
External AES50 synchronisation 113
Security (locking mode) 113

Advanced Operation And Features

Chapter 10 Stereo Linking 117
Changing the linking options 118

Chapter 11 Panning 119
Stereo panning 119
SIS™ (LCR) mode 119
Surround panning 121
Speaker placement 123

Chapter 12 Soloing 125
Solo A 125
Solo B 127
Solo hierarchy 127
Solo in place (SIP) 128

Chapter 13 Muting 129

Chapter 14 Monitors And Communications 131
Monitors (A and B) 131
Communications 131

Chapter 15 Graphic Equaliser (GEQ) 135
About the Graphic EQs screen 135
About the GEQ window 136
GEQ front panel features 138
Copying settings between GEQs 139
Controlling the GEQs remotely with a RAPIDE 139

Chapter 16 Internal Effects 143
About the Effects screen 143
About the effect window 144
Configuring an effect 145
Virtual DN780 Reverb effect 146
Delay effect 148
Flanger effect 150
Phaser effect 152
Stereo Graphic EQ effect 153
Pitch Shifter effect 154
SQ1 Dynamics effect 155
3-Band Compressor effect 156

Chapter 17 Control Groups 157
VCA/POP groups 157
Auto-mute (mute) groups 162
Talk groups 164
About the control group screens 165
Programming the groups 166
Configuring the groups 166

Chapter 18 Copy And Paste 167
Copying through channels/scenes 167

Chapter 19 Assignable Controls (I Zone) 169
About the I zone 169
Controlling a rotary control via the I zone 170
Using the I zone to control an internal effect/GEQ 173
Controlling an internal effect via the I zone 177
Controlling a GEQ via the I zone 178

Chapter 20 Scenes And Shows (Automation) 183
About automation 183
Automation screen 184
Using the right-click menu 184
Scenes 185
Scene contents 186
Point scenes 186
Numbering and navigation 186
Initial snapshot scene (scene 0) 186
Date and time 187
Scene cue list 187
Editing scene properties 189
Adding a new scene 189
Copying and deleting scenes 190

Changing the order of the scenes 190
Overriding store scope 191
Using patching in automation 191
Using zoom 191
Show files 192
Rehearsals 193
Safes 193

Chapter 21 Scope (Automation) 195
About scope 195
About the Recall Scope screen 195
Selecting scope parameter sections 196
Saving scope parameters in a scene 199
Using store scope 200

Chapter 22 Events (Automation) 201
About events 201
About the Edit Event window 202
Programming events 203

Chapter 23 Crossfades (Automation) 207
About the crossfade Edit Event window 207
How a crossfade operates 210
Crossfade groups 211
Global crossfades 212
Manually controlling a crossfade 213

Chapter 24 User Libraries (Presets) 215
About the Preset Manager screen 215
Managing user libraries 217
Deleting presets from a user library 218

Chapter 25 File Management 219
About the Files screen 219
About the Master Controller File Synchronisation window 221

Chapter 26 Using Other Devices With The XL8 223
Using multiple digital consoles 223
Using an external USB mouse 224
Using a USB keyboard 225
Using an external monitor 225
Using a three-bay extender 225

Chapter 27 Changing The User Settings 227
Setting the meter preferences 227
Configuring a virtual soundcheck 228
Restoring the XL8 defaults 228
Checking the build information 228
Setting the configuration preferences 229
Changing the user interface preferences 230
Changing the signal processing preferences 230
Configuring the channels, groups and internal units 231

Changing the default input/output names 231
Adjusting XL8 illumination 231
Setting the time and date 232

Chapter 28 Intercom 233
Using the phones button 234
Terminator 235

Chapter 29 Delay Compensation (Latency) 237
Insert compensation 237
GEQ compensation 238
GUI Delay Compensation options 238
Monitor Mode (Align with Masters) 240
Zones 241
Masters to matrix tap-off-point 242
Typical configurations 243

Description

Chapter 30 Panel Connections 249
Front panel connections 249
Rear panel connections 250

Chapter 31 Channels 255
Channel routing 257

Chapter 32 Input Bay Description 259
Input bay control surface layout 260
Input bay GUI 261
Metering 263
Stereo linking 264
Mic amp input gain 265
Channel configuration 268
Direct output 270
Dynamics (D zone) 272
Insert 279
EQ (E zone) 280
Mixes 283
Master controls, solo select and fader 286
Input channel select 289

Chapter 33 Mix Bay Description 291
Mix bay control surface layout 292
Mix bay GUI 293
Mix fast strip 295
Output channel strip 298

Chapter 34 Output Bay Description 311
Output bay control surface layout 312
Output bay GUI 313
Master channels 314

Output fast strip 316
Comms 318
Monitoring 322
Automation 330

Chapter 35 GUI Menu 333
GUI menu flowchart 333
GUI menu options 335

Appendices

Appendix A Application Notes 339
Spatial imaging system (SIS™) 339
XL8 compressor modes (dynamic) 339
XL8 input channel EQ modes 343
XL8 output channel EQ modes 344

Appendix B Functional Block Diagrams. 347
XL8 system buses 348
XL8 system diagram 349
Mic splitter signal flow 350
Mono input channel signal flow 351
Returns signal flow 352
Aux/group signal flow 353
Master signal flow 354
Mono mix signal flow 355
Monitor signal flow 356
Comms signal flow 357
Dynamics signal flow 358

Appendix C Technical Specification. 359
XL8 general statistics 359
XL8 general specifications 360
XL8 audio performance specifications 361
XL8 system inputs and outputs 364
XL8 input and output characteristics 367
XL8 main processing functions 369
XL8 status functions 371

Appendix D Klark Teknik DN370 GEQ 373
Notes 373
Using the GEQ 373
Audio signal path 375

Appendix E Klark Teknik DN780 Reverb 377
Parameter application notes 377
About the special effects programs 378
Technical specifications 381

Appendix F **Troubleshooting 383**
No audio 383
Diagnostics 383
Swapping the active network 386
Swapping the active master controller 387
Synchronising the files 387
Mapping a GUI screen to another bay 388
Reset switches 389
Troubleshooting automation 389

Appendix G **Updating The XL8 Host Software 397**
About the XL8 updater 397
About the updater screen 399
Using the XL8 updater 401

Appendix H **Documentation 405**
XL8 user documentation 405
Supplementary documentation 406
Suppliers' literature 406

Appendix I **Reference Tables 427**
Definition of the primary buses 427
Navigating to the Patching screen 428

Appendix J **Parameters Affected By Scope 431**
Introduction 431
Overview 432
Inputs 433
Returns (Aux Returns) 443
Auxes (Aux Sends) 448
Matrices 455
Masters 461
GEQ rack 468
Effects rack 470
Groups 472

Appendix K **Parameters Affected By Automate Patching 473**
Inputs 473
Auxes 474
Matrices 474
Masters 475
Effects 475
System devices 476
Monitors 476

Appendix L **Parameters Protected By Safes 477**
Overview 477
Inputs 478
Auxes (Aux Sends) 486
Returns (Aux Returns) 494

Matrices 499
Masters 507
Groups 515

Appendix M Parameters Affected By Copy And Paste 519
Overview 519
Inputs 520
Aux 526
Return 532
Matrix 535
Master 541

Appendix N Parameters Affected By Stereo Linking 547
Overview 547
Inputs 548
Aux 558
Return 567
Matrix 571
Master 578

Appendix O Parameters Copied Through Scenes 585
Inputs (input channels) 586
Aux Returns (return channels) 594
Aux Sends (aux channels) 598
Matrix (matrix channels) 605
GEQs 610
Effects 611
VCA/POP (groups) 611
Masters (master channels) 611
Misc (miscellaneous) 617

Appendix P Service Information 619
Routine maintenance 619
Cleaning the control centre 619
Cleaning a GUI screen 619
Equipment disposal 619

Glossary 621

Overview

Chapter 1: Introduction

Welcome to the XL8 Live Performance System. The XL8 Live Performance System is a very powerful and flexible audio processing system that provides a complete solution for any audio mixing and signal distribution application in a live sound environment.

The XL8 Control Centre, which forms an integral part of the XL8 Live Performance System, was conceived by Midas to offer audio professionals high-performance audio equipment, designed to provide no-compromise sonic quality with a feature set that offers all essential facilities and functions. It represents the very best of British design and engineering combined with contemporary, efficient manufacturing methods, and will give you many years of reliable service.

So, to obtain the best results with a minimum of effort, please read this Owner's Manual and, finally, enjoy your Midas XL8 Live Performance System!

About this manual

This is the Owner's Manual for the XL8 Live Performance System. Its purpose is to familiarise the user with the XL8 Live Performance System and show how to install, configure and operate the XL8 Control Centre.

This document is aimed at professionals, such as front of house (FOH) and monitor (MON) engineers, who will be using this equipment in a live performance environment. It is assumed that the reader has prior experience of using professional audio equipment and has, most likely, undergone training on this system.

Note: *The content of this Owner's Manual does not supersede any information supplied with any other item of the XL8 Live Performance System.*

Structure

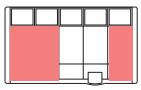
To help you find your way around the manual, it has been divided into the following main areas:

- **Overview:** This gives an overview of the XL8 Live Performance System and XL8 Control Centre and contains information about this manual.
- **Getting Started:** This shows you how to set up and power up an XL8 system.
- **Basic Operation Of The XL8:** This shows you how to use the controls of the XL8 Control Centre, how to navigate the control surface and GUI, how to route (patch) the channels and buses, and how to carry out basic operations in order to get some audio out of it.
- **Advanced Operations And Features:** This describes the advanced features of the XL8 and gives detailed operating instructions.
- **Description:** This gives a detailed description of the XL8 Control Centre hardware, and the controls and their functions on both the control surface and GUI. It provides useful reference material.
- **Appendices:** This provides reference material and technical information on the XL8, such as application notes, signal path diagrams, technical specifications, service information etc.

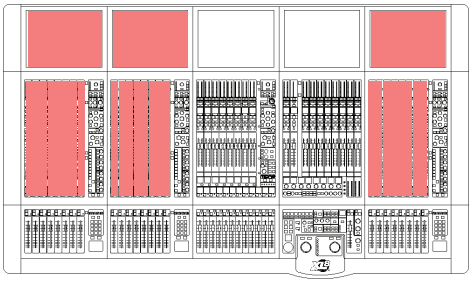
Conventions

- Hand symbols, such as, (for pushbutton, trackball, glide pad etc.) and (for control knob), are used to show the operation of the physical controls on the control surface. GUI operation is indicated by a pointer, which represents a 'click' or 'drag' operation.
- The graphics shown right are used to differentiate between diagrams of the control surface (immediate right) and GUI (far right). Generally, placement is towards the upper-right corner of the diagram.





- Outline drawings are strategically placed throughout the manual to reference information to the appropriate areas on the control surface/GUI of the XL8 Control Centre. The small version (left) indicates bay and GUI location, while the larger one (right) can pinpoint control sections. Target areas are shaded in red.



- Unless otherwise stated, illumination of a control (pushbutton, switch, control knob etc.) on the control surface/GUI of the XL8 Control Centre indicates an "on", "active" or "enabled" state. Conversely, an extinguished condition indicates the control is "off", "inactive" or "disabled".
- 'Selecting' an option on the GUI enables that option, as indicated by a symbol, such as a tick ✓ or cross X. An empty option is unselected (disabled).
- The following types of pushbutton are used on the control surface:
  - "switch" - a latching pushbutton, that is, one that changes its on/off status.
  - "button" - a non-latching pushbutton.
  - "key" - a keyboard-type pushbutton. Usually used for entering data, such as a number or character.
- Generally, control names are the same whether they are on the control surface or the GUI. However, in cases where they differ, both names will be given, separated by a forward slash "/". The control name shown on the GUI will always be last and enclosed in square brackets "[]". For example, **MENU**/[**S/C**], which is the button used for accessing the **Select Side-Chain Source** window (see "Side chain" on page 278).
- Hints and tips, which convey useful information to the user, appear where you see the drawing pin graphic (shown right).



Terminology

To clarify the understanding and use of the digital console and to discriminate between its analogue equivalent, the terminology has been chosen very carefully (see "Glossary" on page 621). For a definition of the XL8's primary buses, see "Definition of the primary buses" on page 427.

GUI diagrams

This manual contains numerous diagrams that represent the GUI screen displays. Due to the many permutations of control settings, operating status, channel configurations etc., it is inevitable that these diagrams will look slightly different to those on your control centre.

Anti-aliasing

To make the XL8's GUI as crisp, eye-catching and intelligible as possible it incorporates an anti-aliasing algorithm to ensure the utmost smoothness of straight lines and curves. Unfortunately, the process of reproducing GUI displays for this manual has resulted in an inevitable loss of quality, which in some cases has led to a certain amount of pixelation. So, unfortunately the quality of the actual GUI display on the XL8 is not truly reflected here.

Training

The XL8 Control Centre Quick Reference Guide (part number DOC04-XL8), which forms part of the XL8 user documentation, provides a useful structured training guide and has been extracted almost entirely from this manual.

XL8 user documentation

For a full list of documentation supplied with the XL8 Live Performance System, see Appendix H "Documentation" on page 405.

To check the very latest version of this and all of the other XL8-associated manuals, visit our website. You will find the address towards the front of the manual.

XL8 host software version

This manual is for an XL8 Control Centre running host software version 1.11 and later.

Optional extras

An easyglide is available for use with the XL8. For more details, see "XL8 user documentation" on page 405.

Warranty and registration

Midas has total confidence in the quality and reliability of this product. To back this up, this product comes with the standard Midas and Klark Teknik three year warranty.

Please take the time to register your product by completing and returning the registration card or by registering on our website at www.midasconsoles.com.

Service and support

The XL8 is a very hi-tech piece of equipment. We provide superb levels of support and service to give users confidence in Midas digital products.

Chapter 2: XL8 Live Performance System

The standard XL8 system offers 96 channel inputs, 51 outputs, 51 buses

(32 auxes/groups, 16 matrices and three masters), 16 on-board effects processors, PEQs (four-band on inputs and six-band on outputs), up to 48 assignable GEQs (if all stereo effects units are being used), 16 configurable stereo effects (from eight options), surround panning (5.1, LCRS and quad) and comprehensive, easy-to-use routing. XL8 automation provides up to 1,000 scenes with snapshot save/recall capability and global edit, presets and show file archiving.

The XL8 Control Centre forms the core of the XL8 Live Performance System, which also includes a number of 19" rack modules that are interconnected by a networked data system. The network carries both proprietary control data and open architecture AES50 digital audio, and uses readily available standard cabling and connectors. The XL8 uses the proven stable Linux operating system. Third party hardware and software (and plug-ins) can be easily integrated into the system.

Included with the XL8 Control Centre are four mic splitters, five I/O units, 10 DSP units, two routers and a Klark Teknik DN9331 RAPIDE that, collectively, form the standard XL8 Live Performance System configuration.

The XL8 Live Performance System is tolerant of any single failure of hardware *or software*. To achieve this the system employs dual redundancy, where a key component has an identical redundant spare that is ready to take over should it fail. Other failure scenarios are managed by the N+1 principle, where redundant components form an acceptable fraction of the system, for example, one of the DSP units in the rack is a redundant spare.

Features

Please remember, the XL8 is not just a console, it's a LIVE PERFORMANCE SYSTEM!

Concert sound

The standard XL8 system, which provides the full 96 inputs and 51 outputs, comprises:

- 1-off XL8-5BCC (flight-cased, five-bay control centre).
- 4-off XL8 stage box (DL431).
- 5-off XL8 I/O box (DL451).
- 10-off XL8 DSP units (DL471).
- 2-off XL8 router units (DL461).
- All interconnecting cables (Cat 5e and Cat 6).

Install

The XL8 is flexible and the system can be customised with the needs of the install.

Configuration

- All outputs have six-band parametric EQ and five-mode compressor styles.
- Up to 16 stereo FX units.
- Up to 48 assignable GEQs (16 if all 16 stereo FX units are being used).
    - Control from RAPIDE.

Showfiles

- USB connectors for show archiving.
- Showfiles are both forward and backward compatible.

Warranty

Three years.

Audio quality

- Three mic pre amps per input FOH, monitor and broadcast.
- Midas EQ (sound quality and 'feel').
    - Four filters.
- Midas dynamics.
    - Four styles (five on outputs).
- Midas quality input and output.
- Midas and Klark Teknik FX processing.

User interface - speed and feel

- VCA groups.
    - Console comes to you!
- POP groups.
    - Console comes to you!
- Muscle memory.
    - E-zone on channel strip.
    - D-zone on channel strip.
    - Paged controls do not change function.
- Fast zone.
- Electronic colour coding.
- Dedicated motorised output faders.
- Klark Teknik RAPIDE.

User interface - status visibility

- Daylight-visible screens.
- Metering.
  - 63 discrete 20-segment LED meters.
  - Discrete metering for dynamics and direct outputs.
  - "All the meters all of the time".
- "ST" assign switch.
- Eight channels of key data plus single channel strip per input screen.

Dual operators - perfect for festival situations

- Modular control centre with multiple input areas.
- Area A and Area B assignment.
- Discrete dual solo systems.

Automation - developed in conjunction with Broadway sound designers and engineers

- Cross-scene global edit capability.
- Showfiles on earlier and later versions of firmware.

System design and network - ground-breaking

- Integrated analogue mic splits with local control and monitoring.
- Integrated open-architecture AES50 digital audio distribution.
- Fully duplicated network for redundancy.
- Up to 100 metres of dual redundant connectivity between hardware elements (copper); up to 500 metres using optical fibre.
- Automatic integral delay management system - audio outputs time and phase coherent.
- Flexible, expandible hardware system.
- Ethernet TCP-IP and USB tunnelling for third parties.
- KVM (keyboard, video and mouse) switching on control centre.

Reliability

- Failure-tolerant of any single failure of hardware or software.
- Proven, stable Linux operating system.
- Duplicated master controllers.
- Control centre has five multiple-redundant power supplies.
- Stage box has integral dual power supplies.

Service and support

- 24/7 global telephone support.
- Service/support centres in US, UK and Singapore.

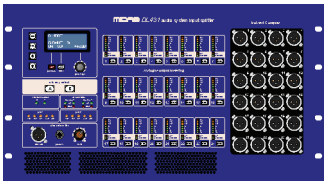
System components (standard supply)

The standard XL8 Live Performance System comprises the following equipment:

- **XL8 Control Centre (1-off):** Comprises five discrete, independent bays, each with its own power supply, surface modules, surface processor, GUI processor and GUI screen. The standard five-bay control centre has three bay types, input (3-off), mix (1-off) and output (1-off).



- **DL431 Mic Splitter (4-off):** 6U 19” rack unit that provides 24 mic/line inputs.



- **DL451 Modular I/O (5-off):** 3U 19” rack unit that provides a maximum of 24 audio inputs and 24 audio outputs.



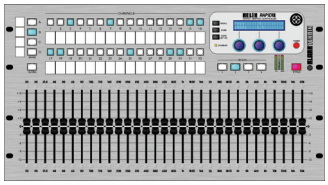
- **DL471 DSP (10-off):** 1U 19” rack unit that forms part of the modular DSP engine.



- **DL461 Router (2-off):** 3U 19” rack unit that provides the on-stage Cat 5e interconnectivity and the stage-to-FOH link via a single ‘snake’, which can be copper cable or a fibre optic link.



- **Klark Teknik DN9331 RAPIDE (1-off):** 6U 19” rack unit that is a motorised fader remote control for the onboard graphic EQs of the XL8.



- **Snakes and main cables etc.**

To provide a complete audio system, the only other equipment required are mics, amplifiers and loudspeakers.

System interconnections

Figure 1 shows basic system interconnectivity and indicates where the XL8 Control Centre (highlighted in red) sits within the system. This figure also illustrates redundancy by showing that the two halves of the system - left and right - are identical (ignoring the DN9331 RAPIDE).

The XL8 Control Centre, which forms the core of the XL8 Live Performance System, is directly connected to the local I/O units, DN9331 RAPIDE and routers (via the 'snake'). Each router acts as a hub and is connected to the mic splitters I/O units and DSPs, which are common to both halves of system. The network carries both proprietary control data and open architecture AES50 digital audio, and uses readily available standard Cat 5e, Cat6/fibre optic cabling and connectors.

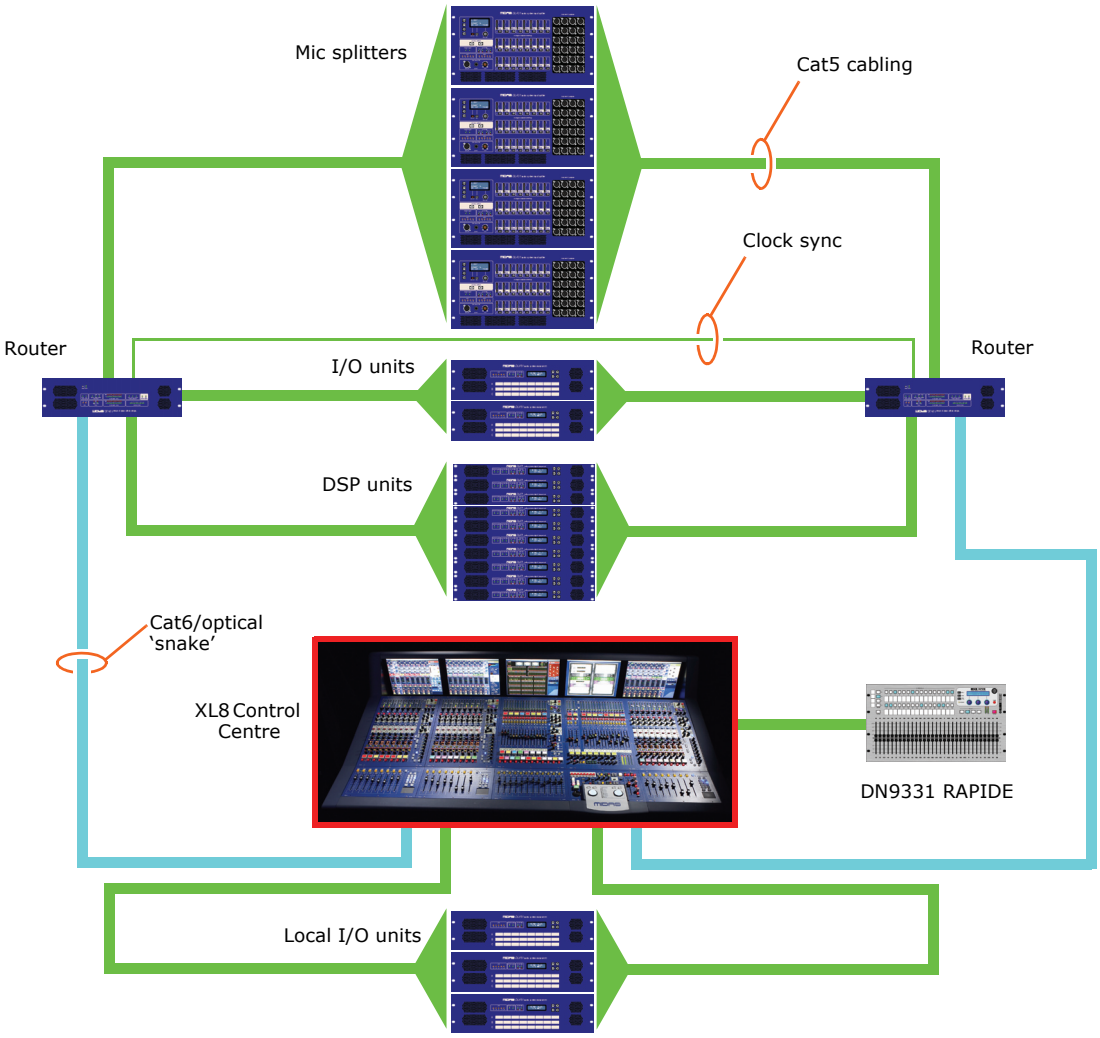


Figure 1: Basic interconnectivity of a standard XL8 Live Performance System

FOH and MON

The XL8 Live Performance System can be used as a front of house (FOH) or stage monitor (MON) system. Also, by sharing the four mic splitters, these two types of system can be used in tandem, as shown in Figure 2 on page 10.

Figure 4 on page 17 shows in more detail the interconnections between each unit in a typical XL8 Live Performance System FOH and MON set up. In particular, it shows the how the FOH and MON sections are connected up; notice that the mic splitters are shared between them.

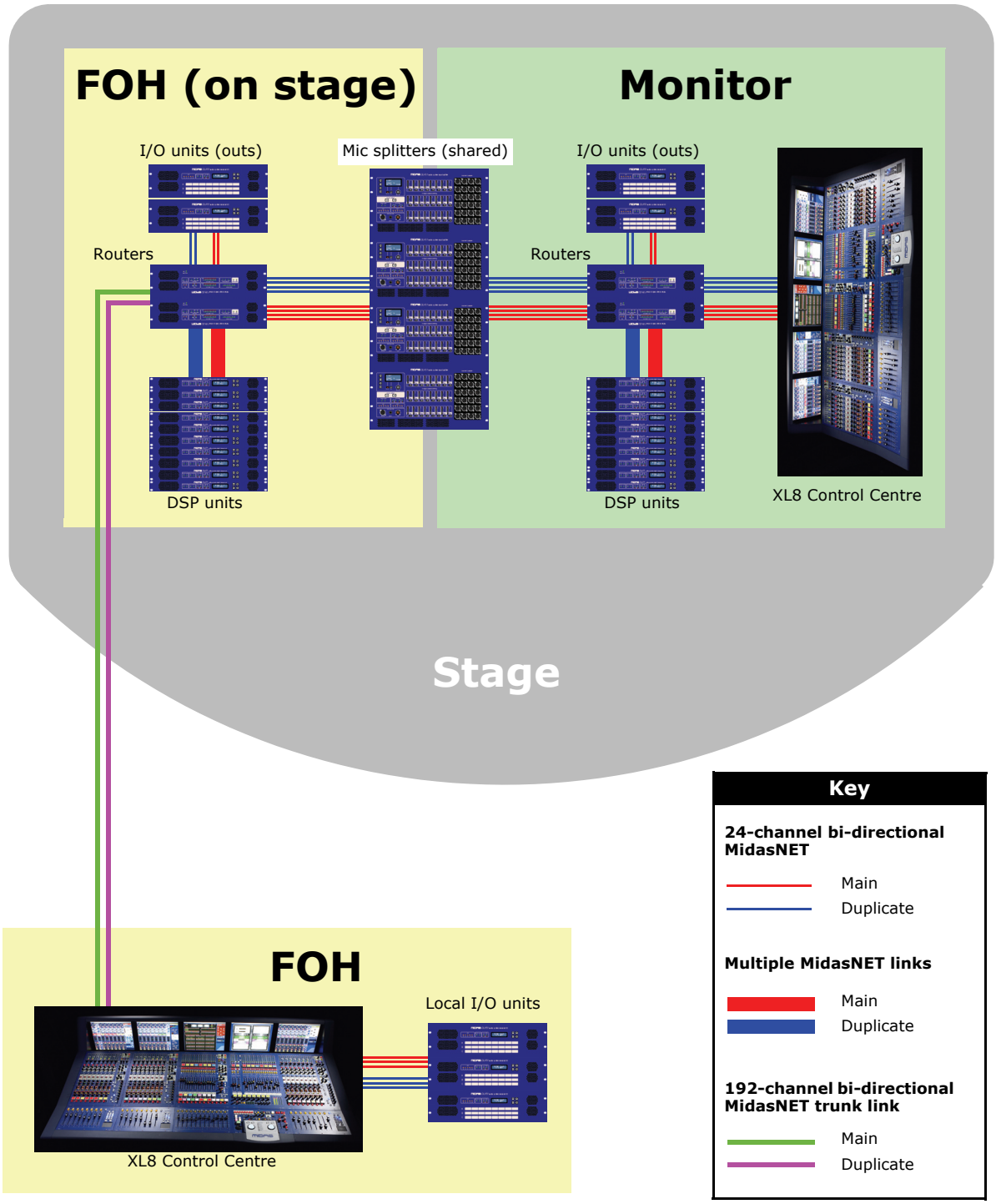
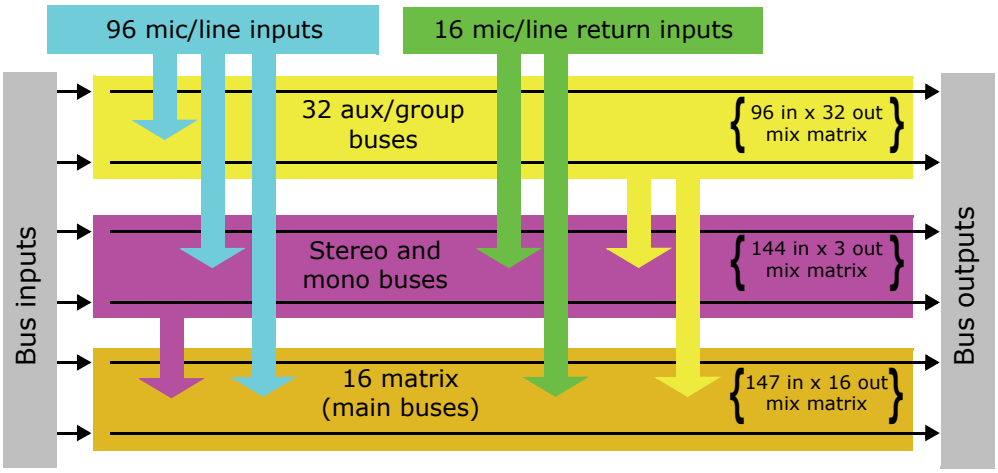


Figure 2: Typical XL8 Live Performance System FOH and MON set-up

Mix matrix

Ultimately, the mix matrix defines the XL8 Control Centre's capability. Probably the best way to imagine the mix matrix is to think of an analogue console layout, where inputs run vertically and buses run horizontally. A mix matrix is usually defined as the number of buses and the quantity of simultaneously-mixable inputs there are per bus. The following diagram illustrates the capability within the control centre.



Processing

Although the control centre system allows for considerable insertion of external processing it also embodies more than enough internal high quality processing to eliminate the need for this.

Input channel processing

Each of the 96 full-function input channels has:

- Analogue and digital gain.
- Phase reverse switch.
- Input delay.
- Swept high pass filter with choice of two filter slopes.
- Swept low pass filter with choice of two filter slopes.
- Frequency-conscious compressor with choice of four compression styles.
- Frequency-conscious noise gate with external side chain.
- Insert point.
- Treble EQ filter with choice of four filter types.
- Parametric hi-mid EQ filter.
- Parametric lo-mid EQ filter.
- Bass EQ filter with choice of four filter types.
- Routing via level controls to 48 mix buses.
- Routing via pan control to left and right master buses.
- Routing to mono master bus.
- Panpot (SIS™).
- Direct output.

Each of the 16 auxiliary inputs has:

- Input gain.
- Source from internal FX or external pool input.
- Fader.
- Panpot (SIS™).
- Routing via level controls to the 16 matrix buses.
- Routing via pan control to the left, right and mono master buses.

Mix channel processing

Each of the 32 auxiliary mix buses has:

- Subgroup, auxiliary or mix minus modes.
- Dual mono or stereo pair modes.
- Six-band PEQ.
- Optional 31-band GEQ (replaces PEQ).
- Frequency-conscious compressor with soft clip limiter and choice of five compression styles.
- Insert point.
- Routing via level controls to the 16 matrix buses.
- Routing via pan control to the left, right and mono master buses.
- Direct input.

Each of the 16 matrix buses has:

- Six-band PEQ.
- Optional 31-band GEQ (replaces PEQ).
- Five-mode frequency-conscious compressor with soft clip limiter and external side chain.
- Insert point.
- Direct input.

Output channel processing

Each of the 16 matrix buses has:

- Six-band PEQ.
- Optional 31-band GEQ (replaces PEQ).
- Five-mode frequency-conscious compressor with soft clip limiter and external side chain.
- Insert point.
- Direct input.

Each of the three master output buses has:

- Six-band PEQ.
- Optional 31-band GEQ (replaces PEQ).
- Five-mode frequency-conscious compressor with soft clip limiter and external side chain.
- Insert point.
- Direct input.

Effects processing and GEQs

The XL8 contains 16 mono Klark Teknik (KT) GEQs and 16 effects processors as standard.

The 16 effects processors can be freely chosen from:

- Delay.
- KT DN780 reverb.
- Flanger.
- Phaser.
- Stereo Graphic EQ.
- Pitch shifter.
- Square ONE Dynamics.
- 3-band compressor.

The 16 mono KT GEQs can be patched into any output. There are many patching options for the effects processors:

- Assign to any insert send/return.
- Assign to any pool, in or out.
- Assign FX out to aux return.
- Assign FX in to aux send (post-fade).
- Assign FX out to bus direct in.
- Assign FX in to channel direct out.

Every XL8 comes supplied with a KT DN9331 RAPIDE motorised fader GEQ controller. This unit provides rapid adjustments of the graphics with real hardware, and not a mouse and screen. The graphic channel is selected either by the control centre's SOLO button (solo tracking system (STS)) or by buttons on the RAPIDE itself.

Audio physical connections

The total number of audio connections, that is, the XLR count, for a standard XL8 Live Performance System is 504. This comprises of both dedicated and configurable XLR connections.

The dedicated XLR connections are on the DL431 mic splitter and comprise:

- 96-off mic/line inputs.
- 2 x 96-off analogue mic splits with variable gain.
- 96-off transformer isolated analogue 'broadcast' mic splits (fixed gain).

All of the configurable connections are on the five DL451 I/O units, which can be freely located at the FOH or on stage. Three banks of sockets (eight XLRs each) are available for:

- 8-off analogue mic/line inputs.
- 8-off analogue outputs.
- 8-off AES/EBU XLRs providing eight digital inputs and eight digital outputs per module.

Uses of the configurable audio connections

The standard XL8 Live Performance System has a total configurable audio channel count (on the DL451 I/O units) of between 120 and 240, depending on the mix of analogue and digital I/O (excluding the non-configurable 96 mic inputs on the DL431 mic splitter).

Typically, the allocation would be:

- 16-off mic/line auxiliary inputs (giving a total of 112 mic inputs as standard).
- 32-off aux/group bus outputs.
- 16-off matrix (main) outputs.
- 1-off stereo main output.
- 1-off mono main output.
- 2-off stereo local monitor outputs.

This gives a total of 71 audio connections, leaving a further 169 (with everything digital) or 49 (with everything analogue) audio connections. These can be used for insert sends, insert returns, direct outputs, bus direct inputs and side chain connections.

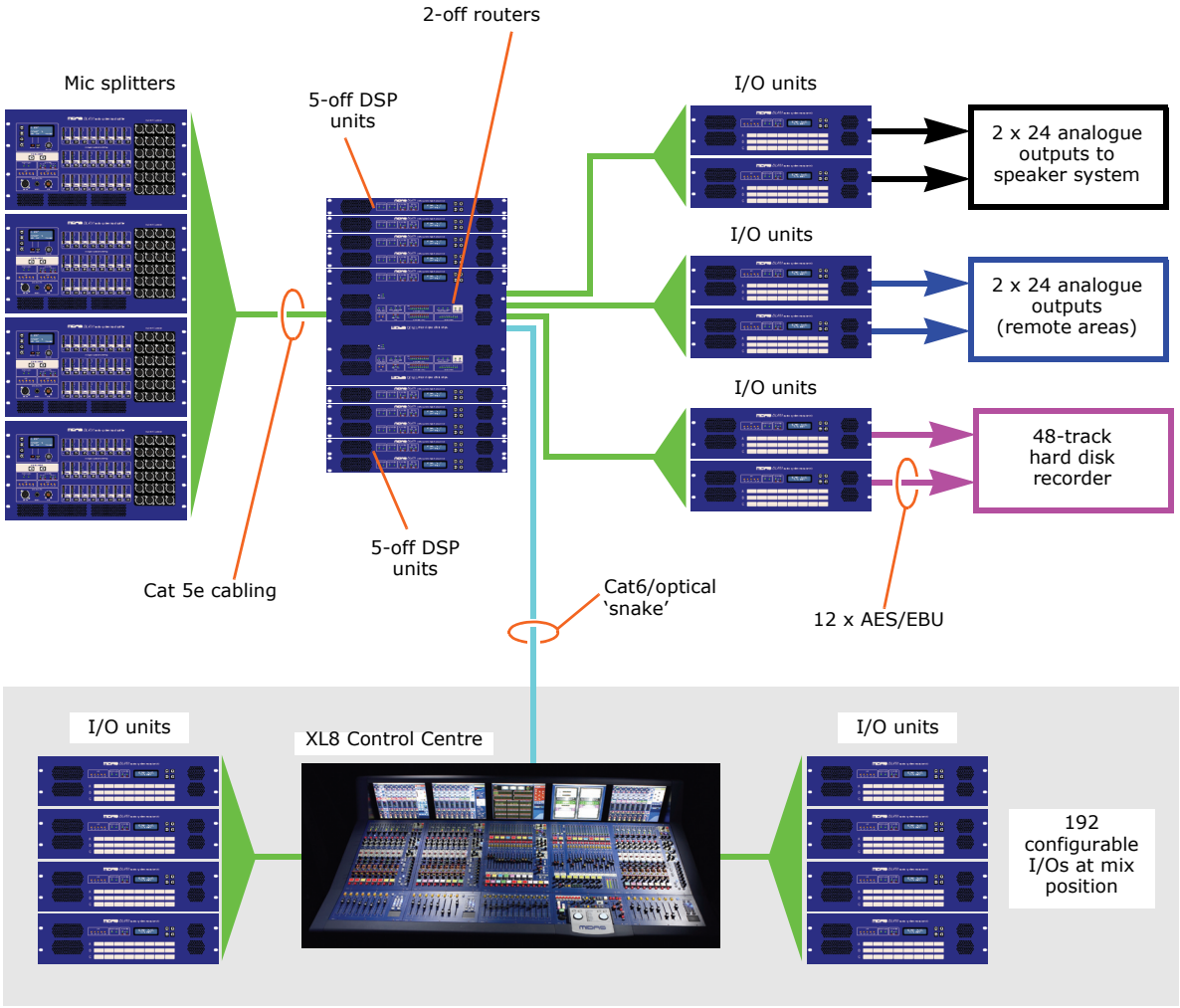


Figure 3: XL8 maximum system capacity (112 mic inputs)

The maximum count of any one type of connection is:

- 96-off input insert sends.
- 96-off input insert returns.
- 96-off input compressor external side chain connections.
- 96-off input noise gate external side chain connections.
- 96-off input direct outputs.
- 51-off mix bus insert sends.
- 51-off mix bus insert returns.
- 51-off mix bus direct inputs.
- 1-off talk mic input.

However, the XL8 can have much more than the standard connectivity by adding DL451 I/O units. As there are nine AES50 connections[1] (fully redundant) available, potentially, another 432 audio connections can be achieved (subject to other system limits). This gives a maximum XLR count of 720. Figure 3 shows a system configuration containing the extra nine DL451 I/O units, but does not show the redundant duplicated network.

All connectivity is controlled via the GUI.

Surround capabilities

Theatres and broadcast have differing requirements for surround, and both are catered for in the XL8.

Conventional stereo and SIS™ panning is assignable on a channel by channel basis (channel one can be in stereo while channel two can be in SIS™), as follows:

- Stereo left–right routing to master buses.
- SIS™ left–right–centre routing to master buses.

Three additional surround modes operate as follows:

- Quad (left, right, LS and RS).
- Surround (left, right, centre, surround).
- 5.1 surround (left, right, centre, subwoofer, LS and RS).

Network

The XL8's digital audio network utilises the physical connectivity of Ethernet (EtherCon® connectors and Cat 5e/Cat6 cable), but replaces its data protocol with AES50 protocol (implemented as SuperMAC) and the HyperMAC high capacity system, which are more suited to high quality, low latency audio distribution. The use of the AES standard allows straightforward interfacing with any third party hardware that also utilises this connection.

AES50 and HyperMAC connections carry digital audio, control data and standard Ethernet traffic bi-directionally down a single cable. Cat 5e cable is used for the 'local' (24-channel) connections and the single digital 'snake'[2] — between control centre and router — is either Cat 5e/Cat6 or fibre optic. The combination of audio, control, clock and third party Ethernet data in a single network means that the hardware interfaces on a single RJ45 connection.

1. These spare AES50 ports can also be used to directly connect any AES50 equipped units, such as a hard disk recorder.
2. The digital snake is equivalent to a 384-channel analogue multi-core cable (192 channels in each direction).

All system connections are duplicated for full dual redundancy.

Resilience to failure (redundancy)

The XL8 Live Performance System is tolerant of any single failure of hardware *or software*. To achieve this the system employs dual-redundancy, where a key component has an identical redundant spare that is ready to take over should it fail. Other failure scenarios are managed by the N+1 principle, where redundant components form an acceptable fraction of the system; for example, one of the DSP units in the rack is a redundant spare (see Figure 4 on page 17).

The control surface can tolerate multiple hardware failures without the operator losing control of the audio. Any of the five GUI screens can be used to operate the whole control centre, *even if no control surface hardware is working*.

The system includes diagnostic tools that give advance warning of any poor connectivity (high error rates), internal temperatures and voltages etc. The system instantly alerts the operator in the event of any hardware, software or connection failures, and indicates the location of the fault. The system asks the operator what action to take, but doesn't automatically reconfigure. This is so that if, for example, the band is near the end of a song and the audio is still alright, the mix engineer carry out corrective action at a more opportune time.

Figure 5 on page 18 shows that even when all of one half of the system is down (the greyed out portion) it will still function as normal. Although, in practise, it is highly unlikely that this will ever happen.

Figure 6 on page 19 illustrates what happens when a router fails. Once again, the system functions perfectly normally.

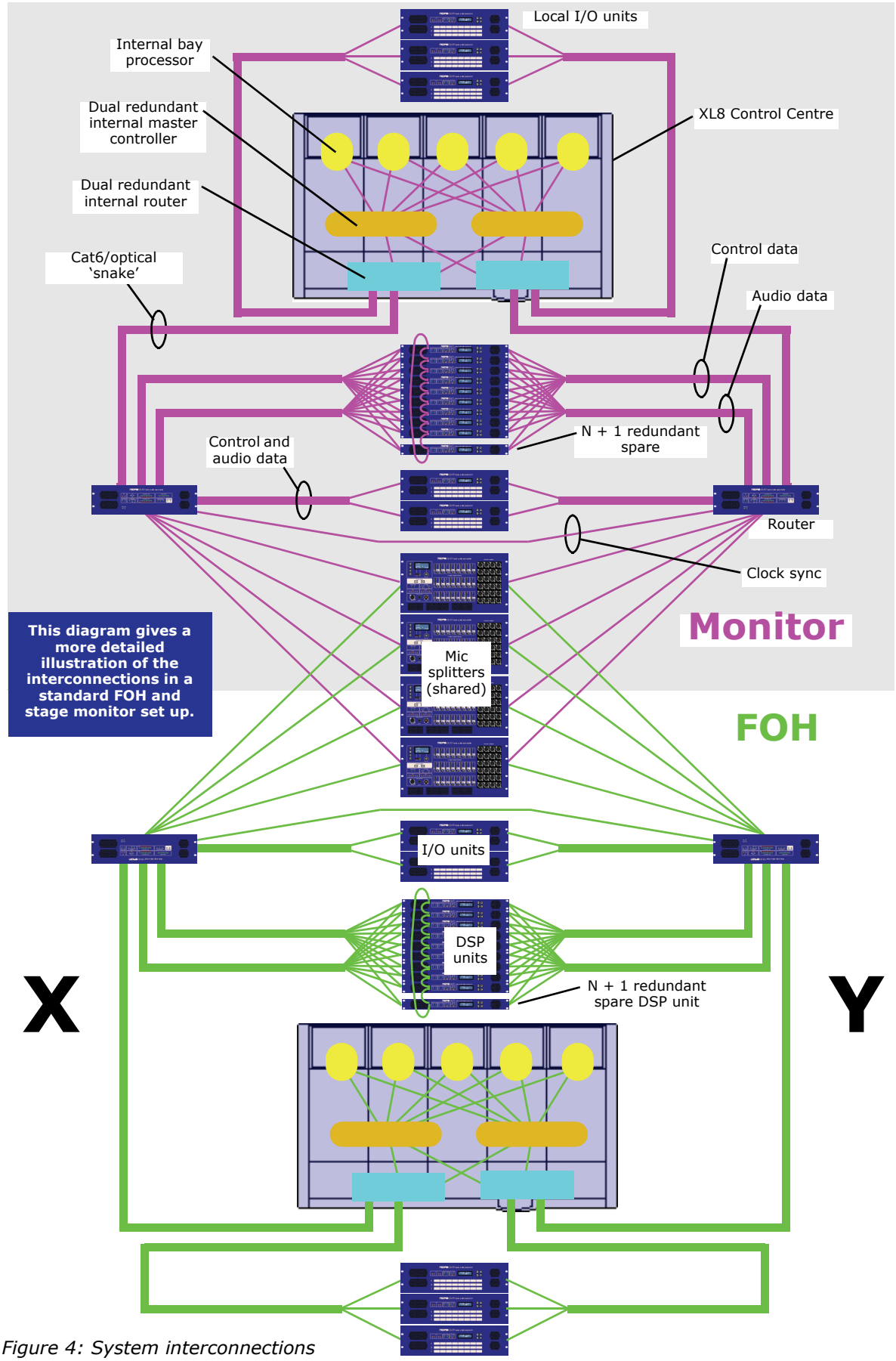


Figure 4: System interconnections

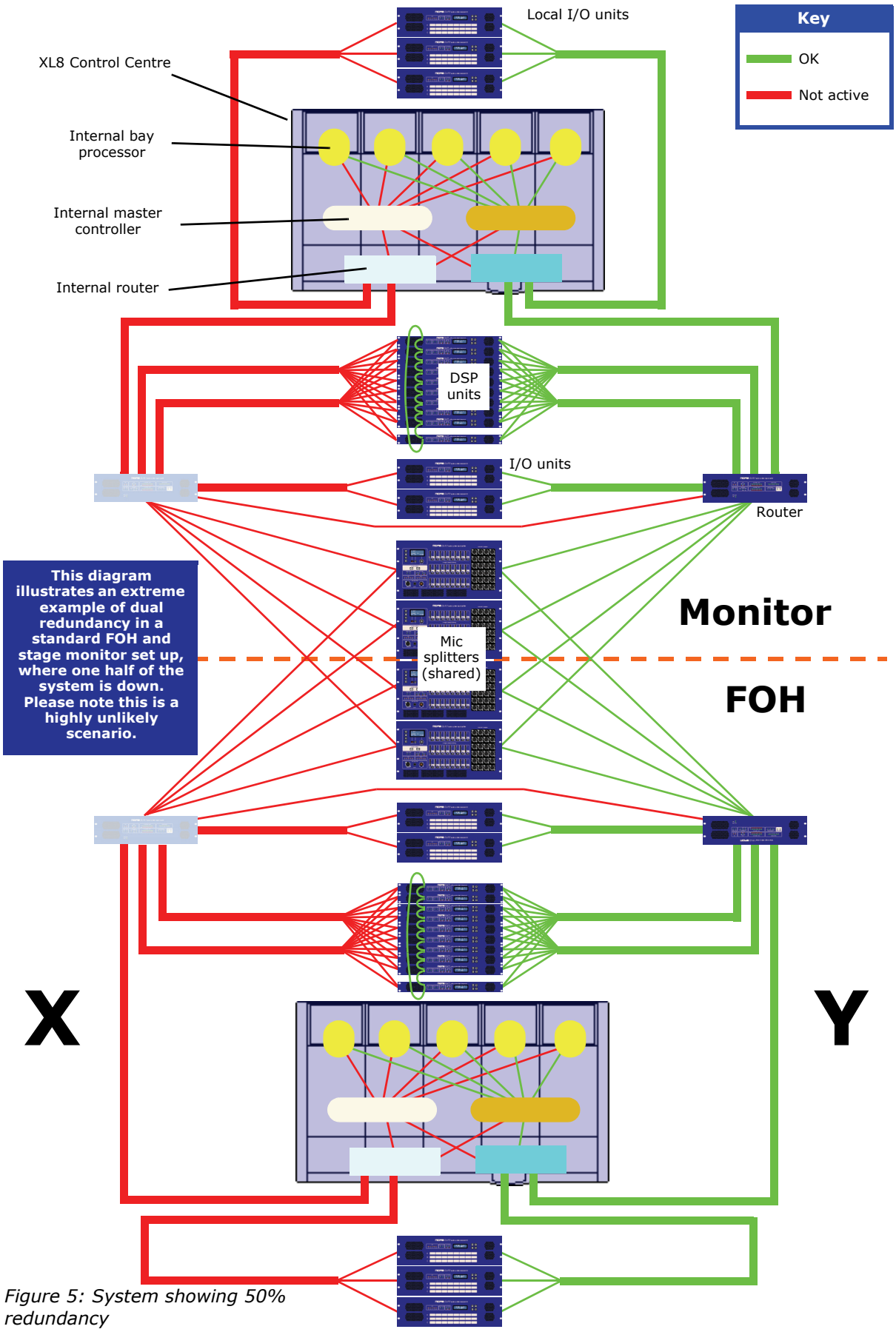


Figure 5: System showing 50% redundancy

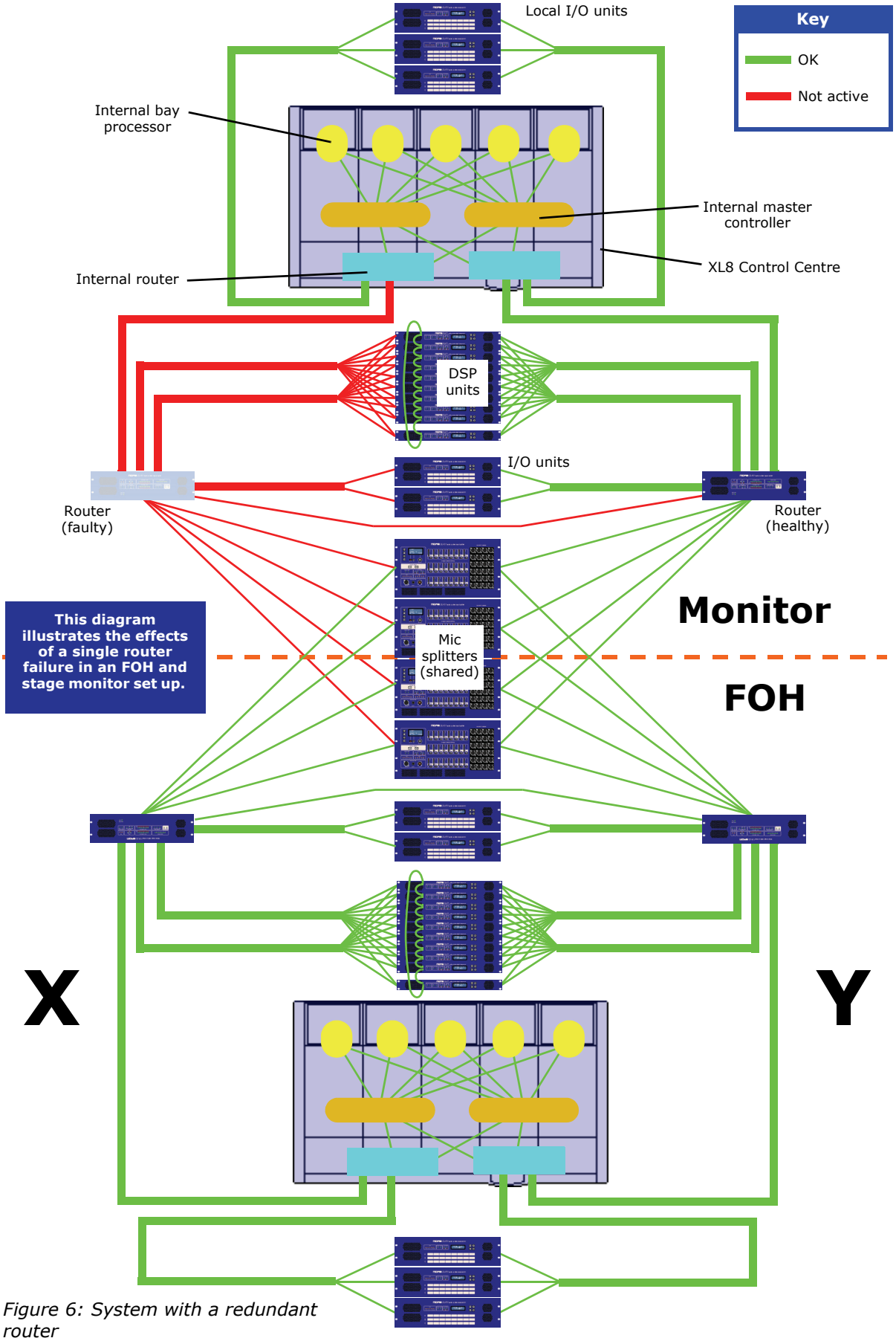


Figure 6: System with a redundant router

Control software

The XL8's operating system is Linux, which is an open-source, stable, proven operating system (OS). Linux is used in many mission-critical applications worldwide and has allowed Midas' software engineers to write a ground-up system that contains no 'hidden' or unused code. This has resulted in an efficient, compact application, which is quick in operation, quick booting and comparatively easy to debug.

Two copies of the master control software run on separate processors to provide resilience to failure.

GUI

The XL8 has five, daylight-viewable, TFT screens that provide overview and detail status indication. Any screen can display any information but, in the standard configuration, screen information relates to module location. So, the input module screens display their module's input status, the mix module screen displays the overview status screen ('all the meters all the time') and the output module screen display is used for general use, such as automation, effects, GEQs, third party screens etc. This is dependent on the current application (concerts will probably be different to theatre) and also operator preference.

The screens are controlled via the navigation zones at the front of the modules. In the output module's primary navigation zone, two trackballs control the output module (right trackball) and the mix module (left trackball). The equivalent on each input module is a dedicated glidepad. A keyboard slides out from underneath the output module to provide further control, such inserting text. USB **keyboard** input sockets at the front of the control centre (under the left and right modules) allow the input and mix screens to be controlled via an external keyboard should the output module screen fail.

Console linking

Two XL8 Control Centres can be linked together, as you can with Heritage consoles. The bus outputs from one control centre feeds the bus inputs of the other, which is done using AES50 links.

Integration of third party software

The XL8 network includes the capability to interface any third party hardware that uses AES/EBU or AES50 digital audio, or a standard analogue audio interface.

Each XL8 AES/EBU input and output has a sample rate converter. Synchronisation to external AES3 interfaces can be:

- Global - via inputs on the routers.
- Local to each input.
- Local to each output (synchronisation to adjacent local output).

Multiple local connections can be at different sample rates.

The use of the AES50 protocol for the transmission of digital audio means that any third party digital audio hardware that features this connection can be connected to the Midas network, and will transfer audio to and from the Midas hardware without any additional interfaces or converters (provided it runs in TDM 96kHz mode). This will be particularly useful as the protocol gains acceptance with recording and playback devices, loudspeaker controllers, audio networking systems, digital amplifiers etc.

PC or MAC computers can use the Ethernet tunnel in the MidasNET system, and can communicate with other computers on the network.

The XL8 Control Centre features a four-way KVM switch on the output module screen, as well as external video IN and OUT for each of the five screens. Control centre views can be routed to external monitors, and external video sources can be displayed on the control centre's screens.

The KVM switch facilitates the control of three external computers from the screen, trackball and keyboard of the control centre. This is hugely important and means that third party systems can be controlled from within the XL8 without having to move your head to look at screens placed off to one side. *It also means that there is no need to find somewhere to put multiple keyboards and mice.* Examples are:

- ProTools. Right in the middle of the XL8! Link ProTools and XL8 audio digitally and use any ProTools plug-in as an insert to the XL8!
- Netmax (AES/EBU audio link initially and Cobranet when the 48kHz I/O module is available on XL8).
- IRIS (for example, for RL amps).
- KT Elgar (via Ethernet tunnel from FOH to stage).
- Wireless mic controllers.
- Your email.
- DVD movies.

Chapter 3: About The XL8 Control Centre

This chapter introduces you to the XL8 Control Centre and provides a brief hardware description.

Overview of the XL8 Control Centre

The XL8 Control Centre comprises a combined control surface and graphical user interface (GUI) that provide an array of easy-to-use controls for the precise manipulation of audio.

The control surface has been designed to emulate the fast access of an analogue control surface by presenting things in a familiar, consistent and logical way so that experienced analogue engineers can migrate easily to the new digital surface. This is enhanced by visual representations on the GUI at the top of control surface, which also provides extra functionality.



The XL8 Control Centre is built on a robust Midas steel frame chassis similar to those used for established Midas analogue products. The frame houses five bays, each of which is a discrete hardware module that can operate independently of its neighbour. Collectively, the bays provide the primary mixing needs of the engineer.

Each bay has its own power supply, control surface modules, control surface processors, GUI processor and GUI screen. The control surface and GUI processors for each bay are separately connected to the network on duplicated Ethernet links. Also housed within each bay are dual redundant master controller processors and dual redundant high-speed network routers (eight AES50 connections each).

Multiple hardware faults are tolerated by the XL8 Control Centre without loss of audio control due to the dual redundancy and N+1 methods incorporated in the system. This is further helped by the modular nature of the bays and GUI independence. So, if a whole bay fails others can take over or be used instead, and any of the GUI screens can be used to operate the whole XL8 Control Centre, even if *none* of the control surface hardware is working.

Bay and GUI layout

The XL8 control centre has five bays, of which there are three types:

- **Input bays** — three input bays provide fast access to large numbers of faders and important input signal processing controls. The bays are numbered 1, 2 and 3, in order from left to right.
- **Mix bay** — provides fast access to large numbers of *creative* mix faders.
- **Output Bay** — provides access to the matrix/master output mixes and monitor faders, the automation central control and large quantities of complex signal processing systems.

Each bay has a GUI screen at the top and a control surface below, which is subdivided into a control area (shallow rake) and a flat (horizontal) area at the bottom that contains faders, navigational zones, automation etc.

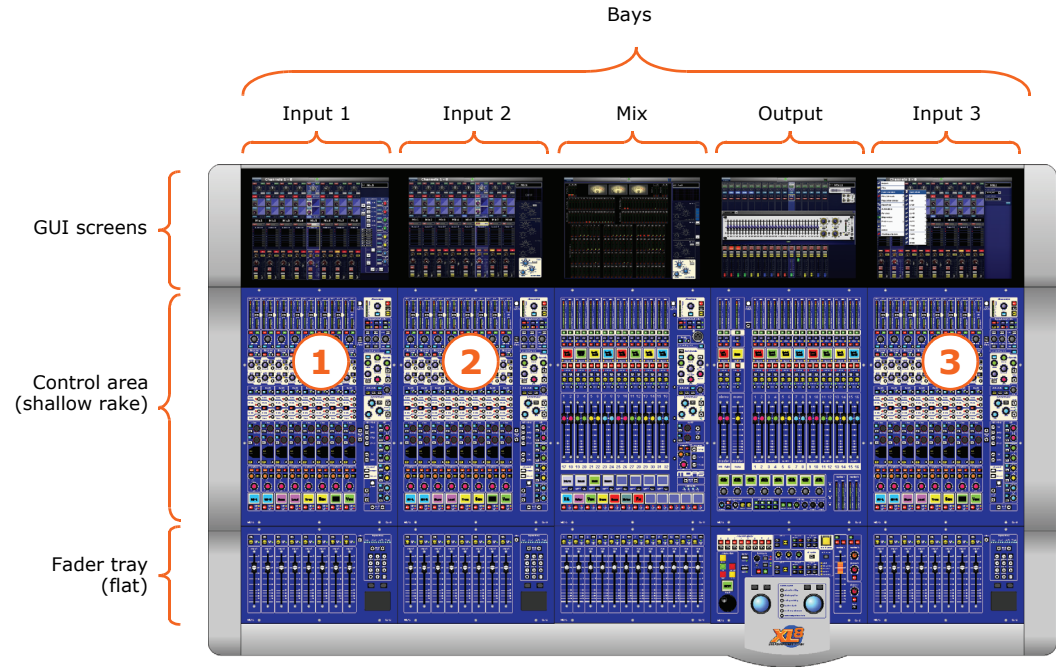
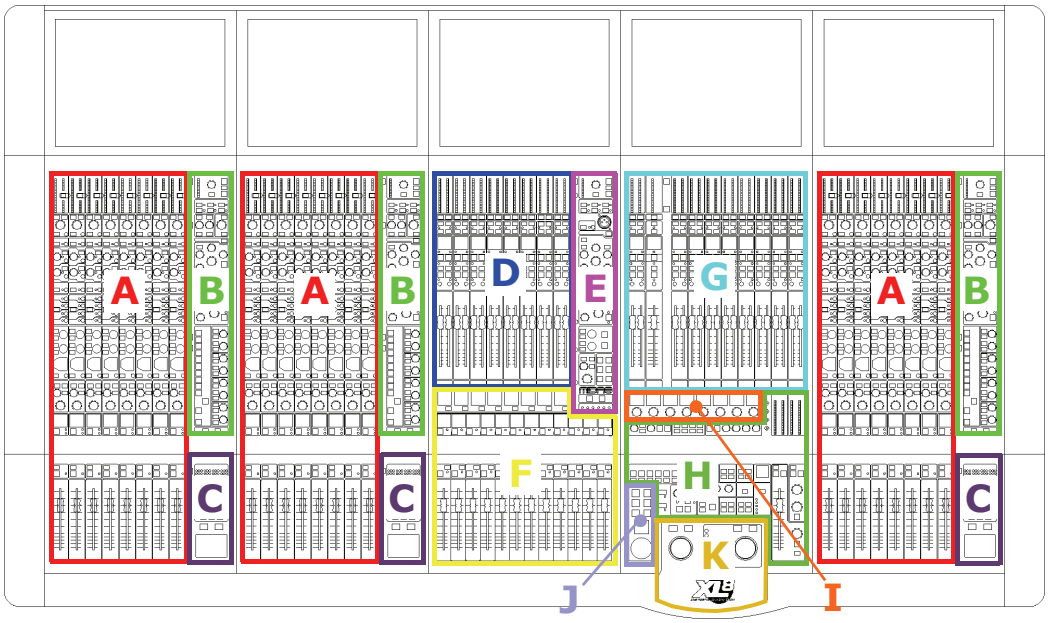


Figure 7: Bays

XL8 control surface

During show time the screen functions that require fast access are controlled by control knobs (rotary encoders), pushbutton switches, faders etc. More complex functions that do not require this fast access are controlled by glide pad/trackball and navigational keys. An integral keyboard pulls out from underneath the output bay for text entry to enable setting up and configuration on the output bay GUI screen. An external keyboard can be used on any of the other bays, as each bay has a dedicated keyboard socket on the front of the control centre.



A — **input fast zone**: contains the operator's 'must have now' controls in eight input fast strips.

B — **input channel strip**: contains detail areas, such as the D-zone (dynamic) and E-zone (EQ), that provide a more comprehensive control of an input channel and its mix buses by allowing detailed audio parameter adjustment. Also includes mix preset controls.

C — **input navigation zone**: for input GUI navigation via glide pad, and input channel selection using an array of keys.

D — **mix fast zone**: auxiliary (aux) mix masters in eight dual-channel mix fast strips.

E — **output channel strip**: has similar functionality to the input channel strip (**B**), but is used for the output channels.

F — **VCA and POP groups**: VCA/POP group select buttons and controls, including VCA faders.

G — **output fast zone**: output (matrix) mix masters in eight dual-channel output fast strips, and also master channel strips (mono and stereo left and right).

H — **monitors**: A and B signal path monitoring, communications and mute groups.

I — **I zone**: operator-assignable device controls.

J — **automation**: scene store/recall and system edit.

K — **primary navigation zone**: for mix and output bay GUI screen navigation via trackballs. Includes a **screen access** panel for direct GUI screen access.

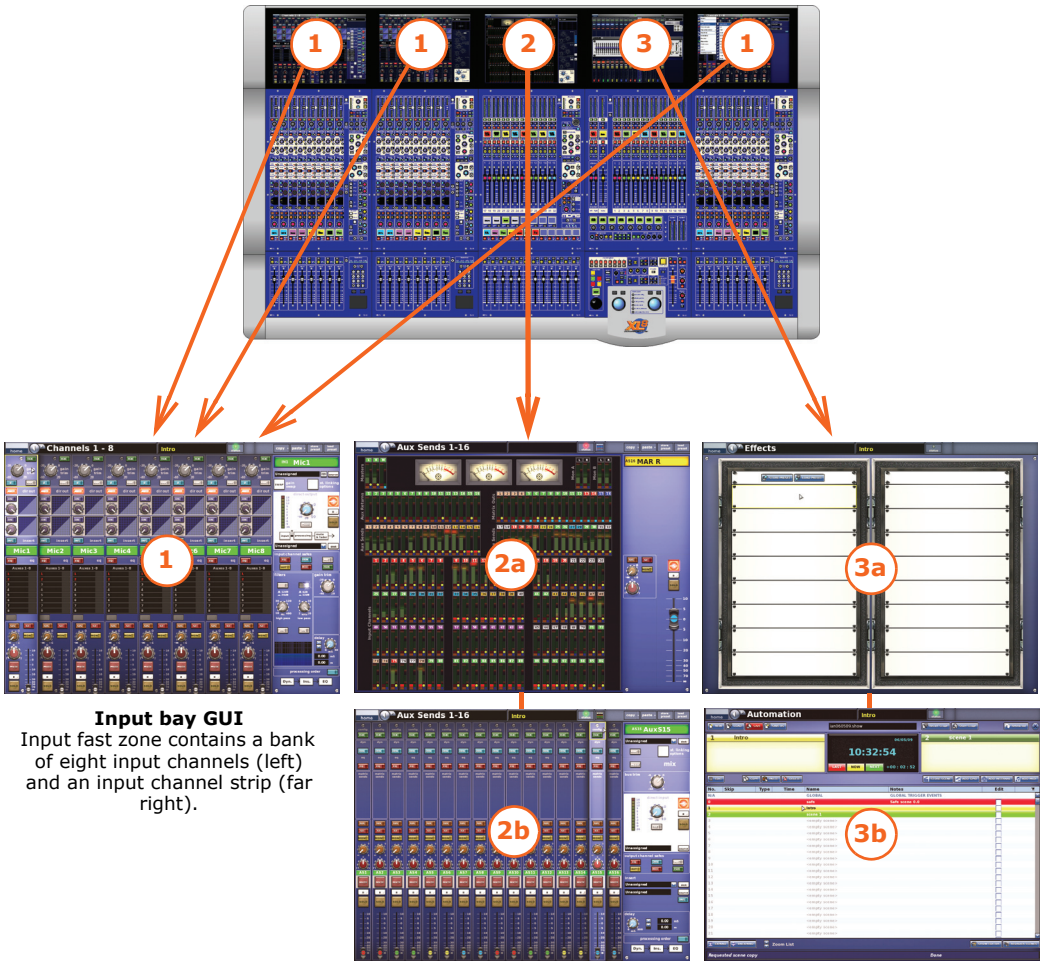
Figure 8: Main areas of control surface

The choice of controls provided by each bay type are prioritised by access time importance. A fast zone area gives instant access to specific functions across the bay. A channel strip (to the right of the input and mix bays) gives greater control of the selected fast strip.

Typically, the XL8 fast zone areas contain signal processing *and* routing levels for input bays, but *only* routing level control on the mix and output bay channel panels. GUI screen navigation tools (keys, glide pad, trackball etc.) are used to manipulate the signal processing required for these paths. This distances these functions from the mixing surface, thus allowing the operator to concentrate more on creative mixing. On analogue systems this is the equivalent of the external processing racks. The exception to this on the XL8 being the graphic EQ for monitor mixing, where fast access is once again required; this is provided by the Klark Teknik HELIX RAPIDE DN9331 Graphic Controller.

GUI

Five screens comprise the graphical user interface (GUI) of the XL8 Control Centre.



Input bay GUI
Input fast zone contains a bank of eight input channels (left) and an input channel strip (far right).

Mix bay GUIs
Option of two displays: **(2a)** dashboard screen showing all meters; **(2b)** output channel screen with, in most cases, 16 mix fast strips. Both displays have an output channel strip on the far right.

Output bay GUIs
Default display is the effects screen **(3a)**, but this can be changed to any of the GUI menu screens, such as input channels, groups, automation **(3b)**, monitors etc.

Figure 9: GUI screens

The GUI, which forms a backdrop to the control surface, represents pictorially the layout of the control surface so that its displays are easy to follow at a glance. Not only does it reflect what is happening on the control surface, but it also provides extra functionality via a GUI menu. This menu lets you access all the screens that you will require to set up, configure, manage and operate the entire XL8 Control Centre — all from a single drop-down list of easy to follow options.

Generally, the GUIs on the input and mix bays have a channel strip on the right. This is the equivalent of the channel strip on the control surface of each of those bays. It displays the selected detail area of the currently selected channel.

Front and rear connections

The XL8 has connector panels on the front and rear that house numerous types of connector, which cater for the connection of mains power leads, 19" rack units, USB memory keys, keyboards, headphones, talk mics, communications, external monitors (input and output), KVM (keyboard, video and mouse) switches, intercoms, AES3 synchronisation, word clocks (75R) and monitors.

The rear panel also houses the mains power inlet and five mains on/off switches, one for each bay. Mains power is supplied to the XL8 Control Centre via two PowerCon® sockets.

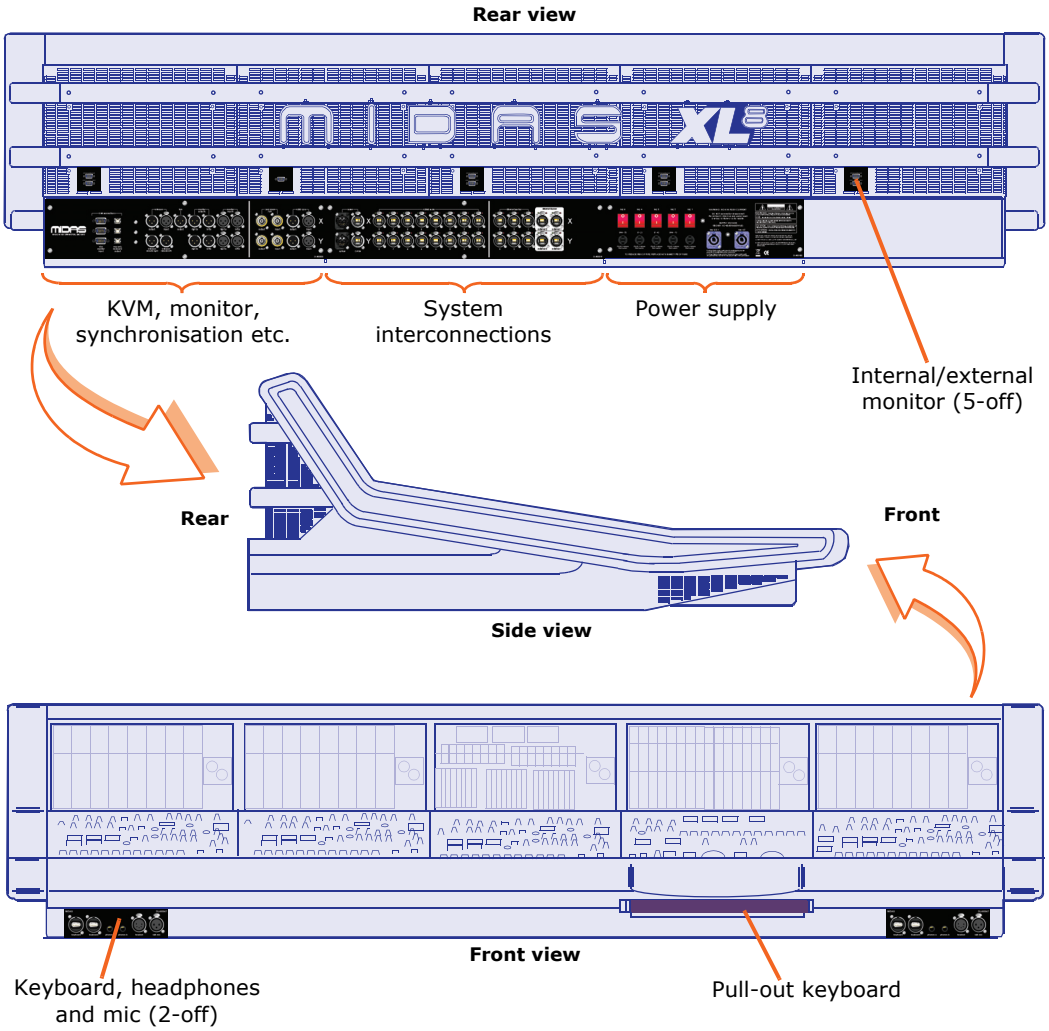


Figure 10: Front and rear connectors on XL8 Control Centre

Pull-out keyboard

The XL8 has a QWERTY keyboard that is used mainly for inputting text, such as when configuring a channel or using automation. It is fitted on a sliding tray underneath the output bay (see Figure 10 "Front and rear connectors on XL8 Control Centre" on page 27) and only operates the output bay GUI screen.

External interfaces

Various devices can be used with the XL8, such as:

- **External USB mouse:** Instead of using the input navigation zones to operate an input bay GUI screen, you can use an external USB mouse, which is plugged into the rear panel of the XL8. The USB mouse behaves in the same way as any PC mouse. For more information, see "KVM, monitor and synchronisation connector panel" on page 252.
- **External USB keyboard:** As the integral pull-out keyboard of the XL8 only operates the output bay GUI screen, you can use an external keyboard to operate any of the other four GUI screens; see "Keyboard connections and bay allocation" on page 250.
- **MIDI:** Standard 5-pin connectors are housed in the rear panel of the DL451 Modular I/O for use as MIDI in, out and through ports, and are therefore available at both the FOH and stage locations.
- **USB:** Host and slave USB ports are provided on all units and are, therefore, available at the FOH and stage locations. In addition, the XL8 provides USB host ports for keyboard/mouse (rear panel) and for removable storage (control surface) via USB memory stick.
- **VGA ports for external monitors:** The control centre has high density D-type connectors on the rear panel of the XL8 that carry VGA signals for external monitor connection. The **external monitor output** connectors let you view remotely what is shown on a GUI screen. The input and mix bays also have **external monitor input** connectors, so that you view what is displayed on the external monitor on any of their GUI screens.
- **HELIX auto solo:** Provided by means of the Ethernet connections on the routers. Solo tracking system (STS) is only available by using the Klark Teknik DN9331 RAPIDE. The console sends solo messages to the DN9331, which then pages to the console.
- **Remote GEQ operation:** The Klark Teknik DN9331 RAPIDE can be used to remotely control the GEQs of the XL8.
- **Network inter-operability:** A port on the router is for general 'rest of the world' Ethernet traffic. This port is isolated from the Ethernet traffic of the XL8 Control Centre by a routing table gateway mechanism within the router itself.
- **Extender:** The extender is an XL8 add-on unit that provides an extra three input bays, to give another 24 instantly-viewable channels. This is a customer order option.

Getting Started

Chapter 4: Setting Up The System

This chapter shows you how to set up an XL8 Live Performance System to its default configuration.

Note: *If you want to set up the XL8 Live Performance System using a configuration other than the default, please contact Midas Technical Support for details.*

Initial set-up procedure

Initial system set-up basically comprises:

- **Unpacking and checking the equipment** — see "Unpacking the equipment" below.
- **Making up the racks** — see "Making up the racks" below.
- **Connecting up the equipment** — see "Wiring instructions" on page 33 and "XL8 system interconnections" on page 36.
- **Powering the equipment** — see "Powering the XL8 system" on page 39.
- **Initial patching:**
  - **Configure the type of snake** — see "Configuring the XL8 with the snake type" on page 82. **It is important to configure the XL8 with the correct type of snake connected in the system.**
  - **Setting up the I/O rack devices** — see "Configuring the devices" on page 80.
- **Configuring the DL4n1 units** — see "Setting up the ID of the DL4n1 units" on page 41.

Unpacking the equipment

After carefully unpacking the equipment, check it against the packing list shown in "System components (standard supply)" on page 8.

Save all packing materials, as they will prove useful if you need to transport the equipment later.

Inspect the equipment carefully for any sign of damage incurred during transportation. It has undergone stringent quality control inspection and tests prior to packing and was in perfect condition when it left the factory. However, if the equipment shows any signs of damage, notify the transportation company without delay. Only you, the consignee, may institute a claim against the carrier for damage during transportation.

Making up the racks

After you have unpacked the XL8 Live Performance System and made sure everything is there, make up the racks. In the default set up there are three stage rack units and one FOH rack unit, which should be set up as shown in "XL8 system interconnections" on page 36.

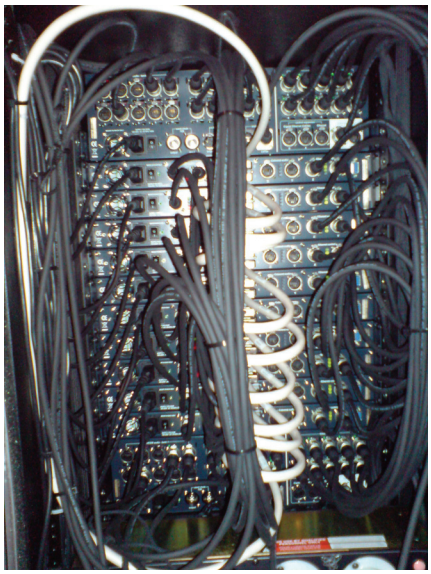
Although rack unit set-up is fairly straightforward, there are careful considerations to be addressed beforehand, which are outlined in the following subsections.

Outboard equipment racks

To ensure the correct installation and function of the outboard equipment, such as the DL4n1 units and DN9696 recorder, the racks must meet the following general requirements.

- **Shock mounting (for non-installation environments):** The racks must provide adequate shock protection of the units they house by incorporating appropriately-designed shock protection methods, for example, a foam-suspended rack or a frame suspended on anti-vibration mounts etc.
- **Ventilation:** The XL8 rack units have been designed such that their internal ventilation airflow is drawn in through the front of the unit and expelled though the rear. To facilitate this, rack design must ensure that cool air can flow freely through the rack in the same direction, that is, in through the front of the rack and out through the rear. Situations where the air flows in a circular direction around and through an XL8 unit **must** be prevented. Midas recommends that racks with fully opening front and rear doors are used.

  Note: *Never combine units in the same rack that have been designed for a ventilation air flow direction other than that for the XL8 units. To avoid this, we recommend that any non-XL8 units are housed separately.*
- **Rack mount supports:** Always secure the rear of the XL8 units to the rack via their rear rack mount support brackets. These brackets are fitted to every XL8 unit and are recommended for use in touring applications. The rack mount support fixing hole centres are at a depth of approximately 395 mm from the front panel (this dimension may differ slightly on the DN9696).
- **Handles on rack case:** You must ensure that there are sufficient external handles fitted to the rack casing to enable the rack to be manoeuvred easily and safely, and by the amount of personnel suitable for the task. Also, these handles must be fit for purpose.
- **DSP rack only:** Midas strongly recommends that the DSPs and routers are housed in a single rack, that is, stage rack 2 (see "Stage rack 2" on page 33). This rack can be either a 16U high (minimum) rack or configured as an 8U double rack.
- **Clearance at rear of units:** To ensure an adequate clearance at the rear of the units, we recommend that the rack depth, that is, the distance from the front rack strip to the rear of the rack, is a minimum of 700 mm. This is to provide sufficient free space to enable the DSP link cables to achieve their minimum bend radius.
- **Securing the cables:** We recommend that the cables at the rear of the units be tidied using lacing bars and cable ties. This should provide optimum access to the rear of the units for connecting other cables, switching the units on/off etc., and give maximum visibility of the units' LEDs for determining communication status, link status, condition of audio etc. The picture (right) shows a good example of how this can be done. For more information on cabling, refer to "Stage rack 2" on page 33.



Stage rack 2

Stage rack 2, also known as the "DL461/DL471 engine rack", contains the two routers and 10 DSP units.

Important:
In general, the physical location of the hardware units within each rack is not critical, and alternative configurations are acceptable for different packaging preferences. However, best practice is to mount the DL471 units in numerical order, which will aid quick identification and fault finding.

DL471 unit ID numbers are located on stickers on the top cover of each device and also on the carton. These must be noted prior to build-up and connected, as shown, in numerical sequence. Please note that once initially configured, the ID numbers are displayed on the *top* row of the DL471 screen and role numbers are on the *bottom* row. The role numbers are dynamic and, therefore, may change during system operation.

Wiring instructions

This section gives the system cabling details for the XL8-specific equipment and, although it is laid out in recommended order, this order is not critical.

When making the connections, please make sure they match those in "XL8 system interconnections" on page 36. Further details are shown in "Cable type and function" on page 38.

>> To connect both routers together

Important:
Without this connection system snake redundancy will be compromised.

Connect the routers via their **Ethernet** socket of the **control expansion** section on each router's rear panel (see "System interconnection panel" on page 253).

>> To connect the XL8 to the routers

Connect the 'snake' (optical or copper) from the X **snake** socket on the rear of the XL8 Control Centre to the appropriate **snake** socket on the X Router. Repeat for the Y Router using the Y socket on the XL8 Control Centre.

>> To connect the routers to the DSPs (Stage rack 2)

- In **AES50 audio - bank 0** on the X router, connect the 10 sockets to the **AES50 audio** X socket on the DSP units. Repeat for the Y router, using the equivalent Y sockets.
- In **Ethernet control** bank on the X router, connect the 10 sockets to the **Ethernet control** X socket on the DSP units. Repeat for the Y router, using the equivalent Y sockets.

>> To connect the routers to the Stage rack 1 units

- **Mic splitters:** In **AES50 audio - bank 1** on the X router, connect sockets 1 and 2 to the **AES50 audio - A** X sockets on the Mic Splitters. Repeat for Y router, using the mic splitters' Y sockets.
- **Line I/O units:** In **AES50 audio - bank 1** on the X router, connect sockets 5 and 6 to the **AES50 audio** X sockets on the line I/O units. Repeat for Y router, using the line I/O units' equivalent Y sockets.

>> To connect the routers to the Stage rack 3 units

- **Mic splitters:** In **AES50 audio - bank 1** on the X router, connect sockets 3 and 4 to the **AES50 audio - A** X sockets on the mic splitters. Repeat for the Y router, using the mic splitters' Y sockets.
- **Line I/O unit:** In **AES50 audio - bank 1** on the X router, connect socket 6 to the **AES50 audio** X socket on the line I/O unit. Repeat for the Y router, using the line I/O units' equivalent Y socket.

>> To connect the XL8 to the line I/O units (FOH rack)

Connect the **AES50 audio** X sockets on the rear of the XL8 Control Centre to the **AES50 audio** X socket on both of the line I/O units in the FOH rack. Repeat for the Y sockets.

>> To connect the XL8 to the RAPIDE

Connect one of the eight **ETHERNET** (EtherCon® XLR) sockets on the rear of the RAPIDE unit to the **Ethernet control 1** socket of the active network (X or Y) on the rear of the XL8 Control Centre (see "XL8 system interconnections" on page 36).

>> To daisy chain the DSP units

Important Note:
Do not connect a cable to like numbered sockets, that is, "0" to "0" or "1" to "1", as the DSPs will not work; socket numbers are printed to the right of each socket.

There are two default configurations available, depending on the lengths of the interconnecting DSP cables supplied, that is, 0.25 m cables or 0.5 m cables. Both options contain a long cable for connecting the top and bottom units, and the 0.25 m option has an additional long cable for connecting units AMU 2 and AMU 9.



A cable's length (cm) can be determined from a three-digit number contained within its part number (printed on a label attached to the cable). For example, in a part number of "14150-EZBB-050-0LC 060425TD" the "-050-" indicates a length of 50 cm.

Connect the DSPs together as shown in the following diagram, according to the cables supplied with your system. (In the diagram, the cables are coloured and the sockets numbered to help distinguish them.)

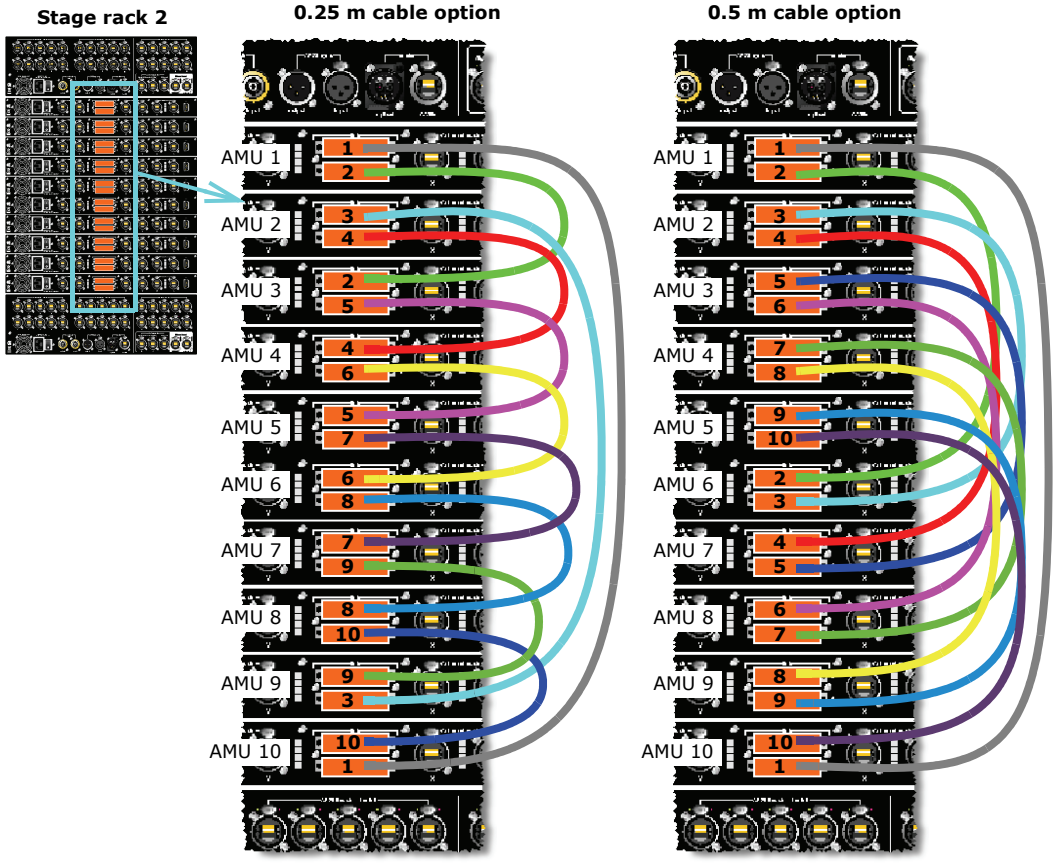
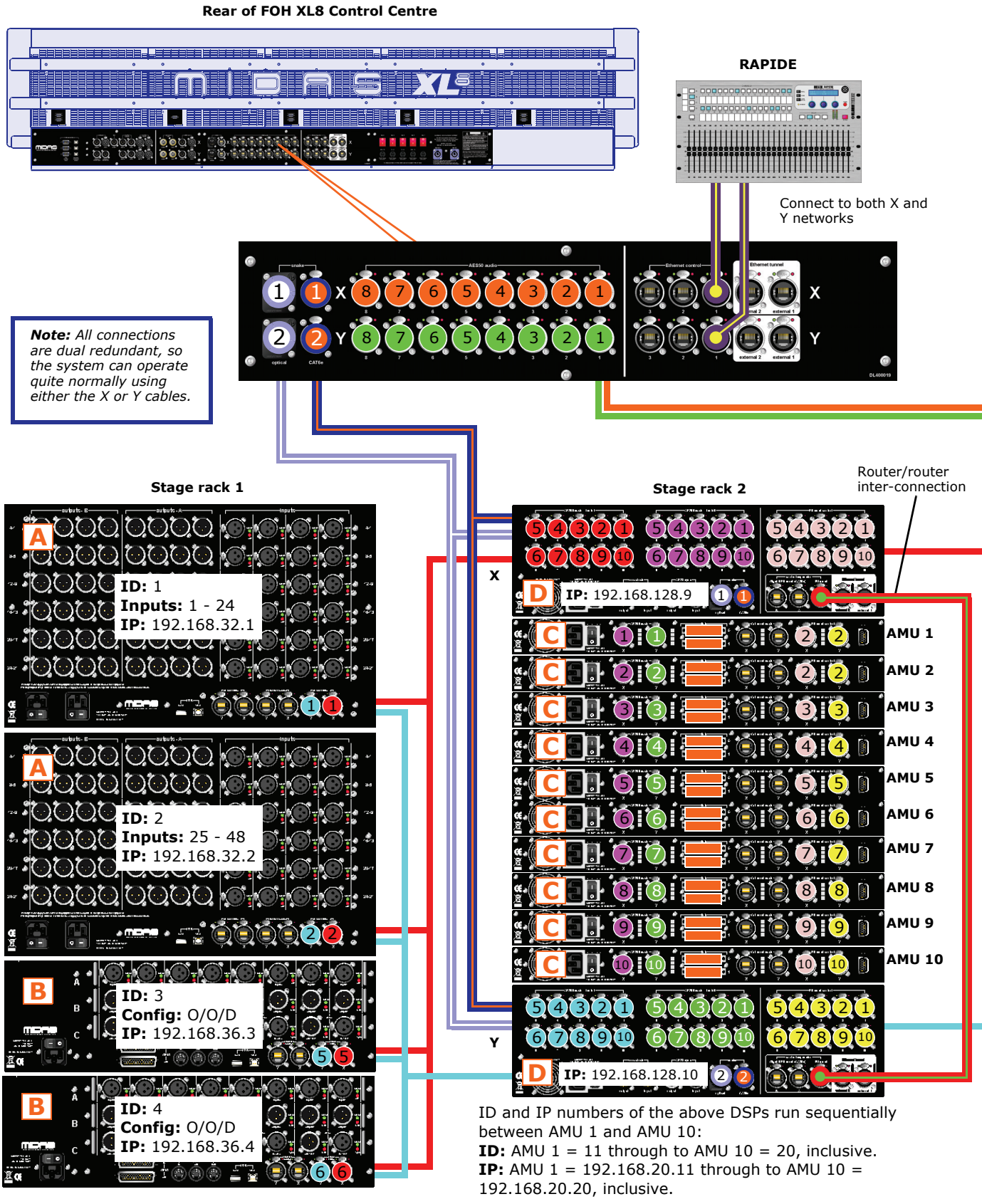


Figure 11: Stage rack 2 - DSP wiring options

XL8 system interconnections

This diagram shows the network interconnections for a typical FOH XL8 system.

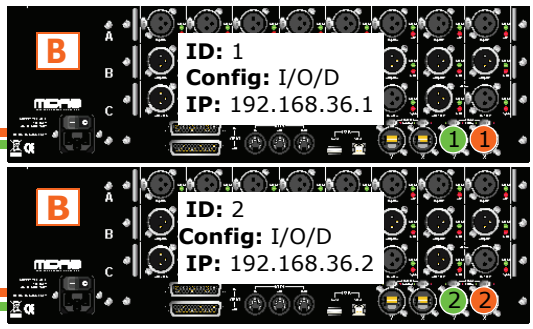


ID and IP numbers of the above DSPs run sequentially between AMU 1 and AMU 10:
ID: AMU 1 = 11 through to AMU 10 = 20, inclusive.
IP: AMU 1 = 192.168.20.11 through to AMU 10 = 192.168.20.20, inclusive.

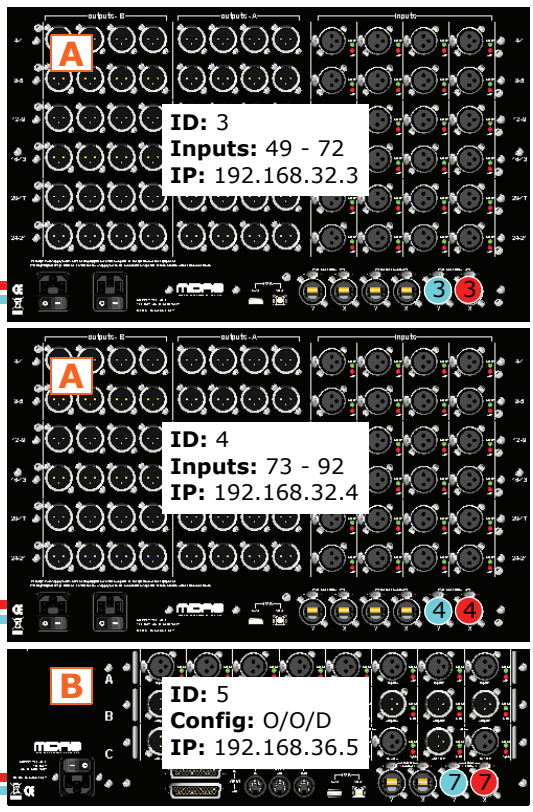
Note: *For connections specific to the 19" rack units, please refer to their respective operator manuals*

Caution!
Don't forget the interconnection between the two routers, as system snake redundancy will be compromised without it.

FOH rack



Stage rack 3



Key

RAPIDE "ETHERNET" connector to **Ethernet control 1** connector on the control centre

Router interconnection across **Ethernet** connectors (**control expansion** port). **System snake redundancy will be compromised without it!**

1 Control centre **AES50 audio** X connectors to FOH rack line I/O unit **AES50 audio** X connectors

1 Control centre **AES50 audio** Y connectors to FOH rack line I/O unit **AES50 audio** Y connectors

1 Control centre **snake/optical** X and Y connectors to appropriate X or Y router's **snake/optical** connector

1 Control centre **snake/CAT6e** X and Y connectors to appropriate X or Y router's **snake/CAT6e** connector

1 X router's **AES50 audio - bank 0** connectors to **AES50 audio** X connector on DSP units

1 Y router's **AES50 audio - bank 0** connectors to **AES50 audio** Y connector on DSP units

1 X router's **Ethernet control** connectors to **Ethernet control** X connectors on DSP units

1 Y router's **Ethernet control** connectors to **Ethernet control** Y connectors on DSP units

1 Y router's **AES50 audio - bank 1** connectors to **AES50 audio - A** Y connector on mic splitters and **AES50 audio** Y connector on line I/O boxes

1 X router's **AES50 audio - bank 1** connectors to **AES50 audio - A** X connector on mic splitters and **AES50 audio** X connector on line I/O boxes

Link DSP backbone; see "To daisy chain the DSP units" on page 34

A Mic splitter

B Line I/O box

C DSP unit

D Router (X and Y)

ID = identification number
IP = internet protocol (that is, network address)
Config = configuration
I/O/D = input/output/digital
O/O/D = output/output/digital

Note: Cable descriptions can be found in "Cable type and function" on page 38.

Cable type and function

The following table shows the type, terminations and function of the XL8 system's interconnecting cables. Please read the table in conjunction with the network interconnections diagram on page 36.

Key	*Cable*	*From*	*To*	*Description*
	Cat 5e with EtherCon® XLRs	X Router (**Ethernet** connector in **expansion port**)	Y Router (**Ethernet** connector in **expansion port**)	Carries redundancy information for the digital 'snake'.
	Cat 5e with EtherCon® XLRs	RAPIDE (**ETHERNET n** connector)	Control centre (**Ethernet control 1** connector)	Carries information on fader positions.
	Cat 5e with EtherCon® XLRs	Control centre (**AES50 audio** X connector)	I/O unit (**AES50 audio** X connector)	Carries a bi-directional combination of 24 channels of 96kHz audio plus 5Mbs of control data.
	Cat 5e with EtherCon® XLRs	Control centre (**AES50 audio** Y connector)	I/O unit (**AES50 audio** Y connector)	Carries a bi-directional combination of 24 channels of 96kHz audio plus 5Mbs of control data.
	Optical 'snake' with Neutrik OpticalCon® connectors	Control centre	X/Y Router	Carries a bi-directional combination of 192 channels of 96KHz audio plus 200Mbs of control data.
	Cat 6e 'snake' with EtherCon® XLRs	Control centre	Router	Carries a bi-directional combination of 192 channels of 96KHz audio plus 200Mbs of control data.
	Cat 5e with EtherCon® XLRs	X Router (**AES50 audio bank 1**)	DSP (X)	Carries a bi-directional combination of 24 channels of 96kHz audio plus 5Mbs of control data.
	Cat 5e with EtherCon® XLRs	Y Router (**AES50 audio bank 1**)	DSP (X)	Carries a bi-directional combination of 24 channels of 96kHz audio plus 5Mbs of control data.
	Cat 5e with EtherCon® XLRs	X Router (**Ethernet control** X)	DSP (X)	Carries standard 100bs Fast Ethernet data.
	Cat 5e with EtherCon® XLRs	Y Router (**Ethernet control** X)	DSP (Y)	Carries standard 100bs Fast Ethernet data.
	Cat 5e with EtherCon® XLRs	Y Router (**AES50 audio bank 0**)	Mic splitter (Y)	Carries a bi-directional combination of 24 channels of 96kHz audio plus 5Mbs of control data.
	Cat 5e with EtherCon® XLRs	X Router (**AES50 audio bank 0**)	Mic splitter (X)	Carries a bi-directional combination of 24 channels of 96kHz audio plus 5Mbs of control data.
	3M cable with 50-way connectors	DSP (**link 0**)	DSP (**link 0**)	Carries a proprietary data format for connecting the DSP units together to form the DSP loop.

Powering the XL8 system

The following details the recommended power up and power down procedures for the XL8 system.

>> To power up the XL8 system

Important Note:
DO NOT switch on the speaker sub-system until after the start-up of the XL8 system has been completed.

After all XL8 system interconnections have been made (see Chapter 30 "Panel Connections"), start up the XL8 system:

1. Make sure that all of the XL8 system equipment is switched off, that is, the XL8 Control Centre, speaker sub-system, DL431 mic splitters, DL451 modular line I/O units, DL461 routers and DL471 DSP units.
2. Switch on the XL8 Control Centre (see "To switch on the XL8 Control Centre" on page 40).
3. On the XL8 Control Centre, move all of the monitor and master channel faders to the minimum position and mute all of the master channels. The master channels can be found in the mix and output fast zones (see "XL8 control surface" on page 25).
4. Switch on the DL431 Mic Splitters.
5. Switch on the DL451 Modular I/O units.
6. Switch on the DL471 DSP units.
7. Switch on the DL461 Routers.
8. After the **status** LEDs (top of each GUI screen on the XL8 Control Centre) turn green, switch on the speaker sub-system.
9. Switch on the audio source and start playing the audio.
10. On the XL8 Control Centre, check that the audio inputs are routed to the master channels. Then, unmute the master channels and gradually increase their faders, while listening to the sound levels from the speakers.

If there are no sounds at all from the speakers when the faders are at maximum, move the faders to below the 0dB level and check if the audio is muted somewhere along the input paths and also check that the individual speakers are switched on. If there is still no sound from the speakers, contact Midas Technical Support.

>> To power down the XL8 system

Important Note:
BEFORE switching off any of the XL8 system components, make sure to mute the audio from the speakers and switch off the speaker sub-system.

1. Mute the audio from the speakers and switch off the speaker sub-system.
2. Switch off the DL431 Mic Splitters.
3. Switch off the DL451 Modular I/O units.
4. Switch off the DL471 DSP units.
5. Switch off the DL461 Routers.
6. Switch off the XL8 Control Centre (see "To switch off the XL8 Control Centre" on page 41).

Switching the XL8 Control Centre on/off

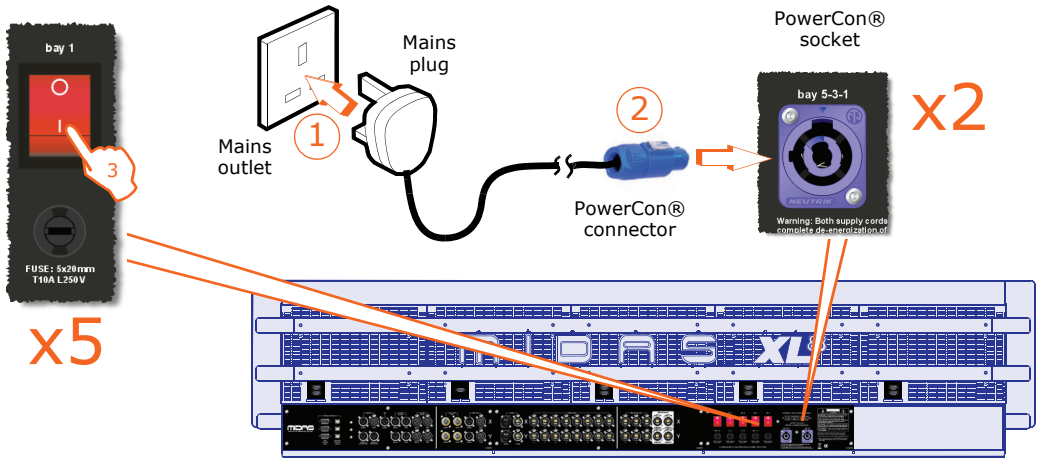
Carry out the following to switch the XL8 Control Centre on/off in a safe manner, observing all **WARNINGS** and **Cautions.**

>> To switch on the XL8 Control Centre

WARNING!
***DO NOT* INSERT OR REMOVE A POWERCON® CONNECTOR INTO/FROM REAR OF CONTROL CENTRE WITH MAINS POWER AND ANY OF THE MAINS BAY SWITCHES ON. YOU *MUST* MAKE SURE ALL MAINS BAY SWITCHES ARE OFF AND MAINS IS SWITCHED OFF AT THE POWER OUTLET(S) FIRST.**

Caution!
Before switching on, check that all monitor loudspeaker power amplifiers are turned off or muted.

After connecting up the audio cables, carry out the following:



Rear of XL8 Control Centre

1. Plug the two control centre's mains PowerCon® cables into the mains power outlets.
2. Insert the two mains PowerCon® connectors into the PowerCon® sockets on rear of control centre, observing the **WARNING!** above. Then, lock each one by twisting the PowerCon® connector about 90° (1/4 turn) clockwise; you should hear a click when it has locked in place. Check that both PowerCon® connectors are securely fitted.
3. Observing the **Caution!** above, switch on all five bay mains on/off switches, one after the other. **It is important that you don't switch on two or more switches simultaneously.**
4. The control centre will power up; the GUI will display the default screens and all the controls will be set to default. You are now ready to start using the XL8 control centre.

>> To switch off the XL8 Control Centre

1. Make sure you have saved any shows, scenes or settings you require (see "Saving your show files to a USB memory stick" on page 112).
2. At the GUI, choose **home** ▸ ***Preferences*** ▸ ***Shutdown System.***
3. At the **Shutdown ENTIRE system?** prompt, click **OK.** This initiates the shutdown down sequence.

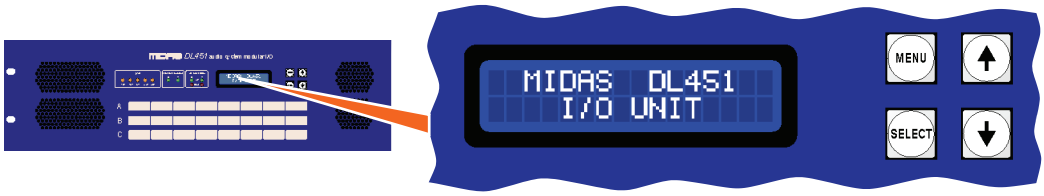
   During the shutdown sequence the GUI screens will shutdown and all of the LCD select buttons on the control surface will turn red. To inform you of the shutdown status, the LCD select buttons in the input bays and VCA/POP group sections will also display individual and contiguous text messages, respectively.

   When the shutdown sequence has finished the LCD select buttons on the control surface will turn green, and the appropriate ones will also display text messages, accordingly.

   Important:
   During the shutdown sequence, when the LCD select buttons on the control surface are red, do not switch off the mains power supply, and when they are green, it is OK to switch off the mains power supply.
4. Make sure that the shutdown sequence has finished, and then switch off the five bay mains on/off isolator switches (rear of control centre), one at a time.
5. Disconnect the two mains PowerCon® connectors from the PowerCon® sockets on rear of XL8 Control Centre. To unlock them, twist by about 90° (1/4 turn) anti-clockwise.

Setting up the ID of the DL4n1 units

After connecting up your XL8 network system, you will need to set up the ID of the DL431 Mic Splitter, DL451 Modular I/O and DL471 DSP units (if they don't already have the ID you want). This is done via the control panel of the unit — the following diagram shows the control panel of a DL451 Modular I/O. Each unit's ID number is shown on its default display.



To change the ID number there is no need to switch on the XL8 Control Centre, as the procedure can be carried out offline.

The unit ID set up procedure, which is basically the same for each type of unit, is as follows:

- Enter the main menu. (On the DL431 Mic Splitter and DL451 Modular I/O units press and hold down for approximately two seconds, and on the DL471 DSP unit press the down arrow.)
- Use the up/down arrow buttons to go the ID option and then press **SELECT.**
- Use the up/down arrow buttons to go to the ID number you want and then press **SELECT.**
- To exit the menu, pressing **MENU.**

For more information, refer to the operator manual for the particular unit.

Basic Operation Of The XL8

Chapter 5: Before You Start

This chapter provides useful background information on XL8 operation.

While this system is a complex, high-tech piece of equipment, we have made it as easy to use and as user-friendly as possible.

Principles of operation

XL8 Control Centre operation is based on the concept of colours and groups rather than 'layering' or 'paging', which is the case with most digital consoles on the market today. With so many channels available it is far easier to remember them by their user-configured individual/group colour and name rather than their channel number.

The control surface is populated with instantly recognisable controls that are logically distributed in major sections, so that all the controls you need to access most of the time are always on the control surface, while the remainder are only one action away.

Hints and tips

During operation, we recommend that you carry out the following:

- **Check what is hidden** On the XL8, unlike on an analogue control surface, some of the settings and parameters will be hidden from view (stored in the computer memory of the XL8). To make sure there are no hidden surprises, such as a reverb send left from a previous mix, view unused parameters at various times during a mix.
- **Check the Dashboard screen** It is a good idea to frequently monitor the **Dashboard** screen (default display of the master bay GUI), which provides at a glance an overview of the control centre's status and operation. It shows all the meters and the status condition of faders and some switches, such as solos and mutes. However, some things will still remain hidden.

Saving your work

We recommend that you save your work regularly while carrying out the procedures included in this chapter. Not only is this good practice during normal XL8 operation, but in this instance it may save you from losing some set-ups that could prove useful later on. To do this, create a new show (see "To create a new show" on page 104), and then continue reading through the remainder of this section, following the instructions carefully. Save your work at convenient points (see "To create a new scene using the current settings" on page 105 and "To save a show or create a new one from the current settings" on page 104).

Saving a show versus storing a scene

It is important to understand the differences between saving a show and storing a scene.

- **Storing a scene** saves the current settings of the system to the show file. Scene data is *never* updated to the show file unless you manually store a scene. The show file remains unsaved in RAM after storing a scene.

  Although the state of the control centre is copied every five seconds, it is not stored in a scene. Instead, it is placed in the NVRAM (non-volatile random access memory) of the control centre's memory, which is a type of RAM that doesn't lose its data when the power goes off. If the control centre loses power accidentally, these settings are loaded so that audio parameters are identical, thus avoiding audio level jumps. **When power is lost, the showfile loaded (if any) will not subsequently be restored, and any unsaved changes to it will be lost.**

- **Saving a show** copies the show file onto the internal solid-state disk of the XL8. This provides you with a 'permanent' copy, provided you shut down the system properly as detailed in the following section.

Shutting down the XL8 Control Centre properly

When switching off the XL8 Control Centre, we recommend that you use the shutdown option of the GUI menu (see "To switch off the XL8 Control Centre" on page 41).

By using shutdown, the cached copy of the show data, which is maintained by the system, is automatically stored. Shutdown then uses the current showfile, NVRAM data and cache files to restore the XL8 Control Centre to *exactly* the same state as at power down; even to the point of loading the unsaved show and placing you at the correct scene, with non-stored scene data at the control surface.

If you don't use the **Shutdown** option the audio parameters are still restored, but the show and show status (saved/unsaved) cannot be restored automatically. You must manually reload the show and any unsaved changes will be lost.

Chapter 6: Working With The XL8 Control Centre

This chapter is intended to familiarise you with the controls (control surface and GUI) of the XL8 Control Centre.

Although many controls on the XL8 Control Centre are similar to their equivalent analogue-type counterparts, some have been specifically designed for the XL8, particularly those for navigation and GUI operation. As you will probably have had experience on analogue consoles, you will already be familiar with most of the XL8 controls and their operation.

The GUI can be used to replicate most of the control surface functions and even has many of its own. However, the emphasis in this chapter — and throughout the manual — is on using the control surface because, generally, it is quicker and more intuitive. GUI methods will be included where they are anomalous or there is no control surface equivalent.

The navigational controls, such as quick access buttons and scroll buttons, are described in Chapter 7 "Navigation" on page 55, and the ones specifically for automation can be found in “Managing the scenes” on page 104.

For more information on the operation and function of specific controls, see Chapter 32 “Input Bay Description”, Chapter 33 “Mix Bay Description” or Chapter 34 “Output Bay Description”.

About the XL8 controls

The following table shows some of the controls that can be found on the control surface of the XL8.

Type	*Description*	*Example(s)*
Pushbutton	Generally two-state, that is, on/off or enabled/disabled, and backlit or with an integral LCD for status indication.	
Control knob	In general, the control knobs (rotary controls) are touch-sensitive, their adjustment being shown on the GUI. Some control knobs are backlit to help identify their current role and what they control.	
Fader	The high quality motorised faders are, similarly to the control knobs, touch-sensitive.	

Type	*Description*	*Example(s)*
LED	Status indication.	
Meter	All of the input, output and monitor peak level meters on the control surface are shown simultaneously on the GUI's Dashboard screen. The input fast strips also have gain reduction (compressor) and gate meters (adjacent to the peak level meter), which are replicated in their detail areas of the GUI channel strip and the Dashboard screen. Additional peak level meters are included in the direct input and direct output sections of the input bay and mix bay channel strips, respectively.	

About GUI operation

This section explains the basic procedures you can perform at the GUI screens. In general, you will control and operate the GUI by combining the operations described here.

The GUI is not just an additional feature that enhances control surface operation, it is a fully-featured tool in its own right. Not only does it show what is happening on the control surface, but all of its controls are functional. The GUI contains most of the controls found on the control surface and, in addition, has features that allow configuration of the XL8 and provide extra functionality.

The GUI is operated via the input and primary navigation zones. Operation is principally the same as using a laptop PC, although you can operate any screen (except output bay) using an external USB mouse/keyboard.

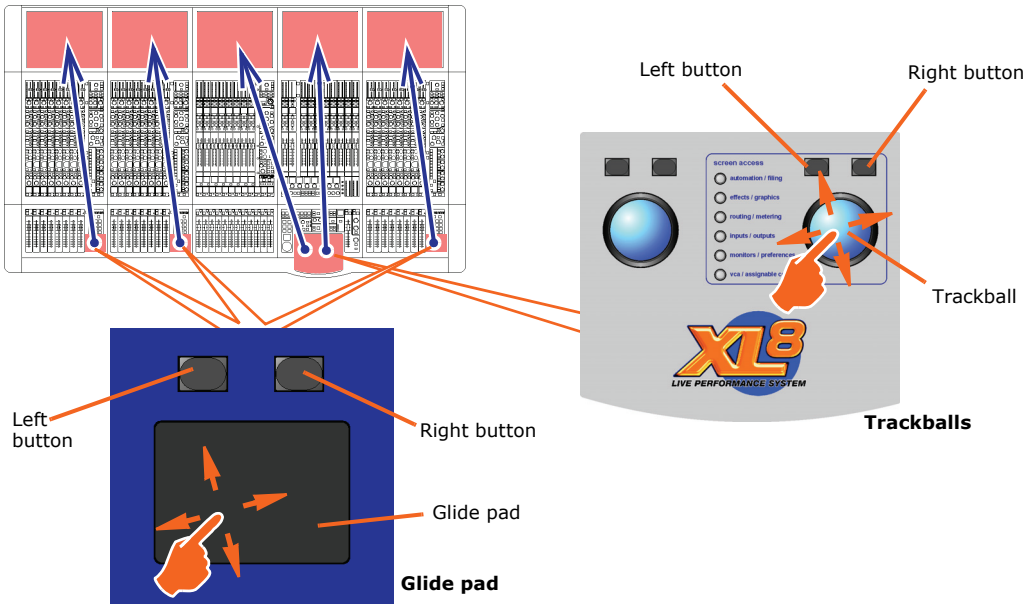


Figure 12: Controlling the GUI

In the default configuration the left and right trackballs operate the mix and output bay GUI screens, respectively, and each glide pad operates its local input bay GUI (see Figure 12 "Controlling the GUI" on page 48). Move your finger on the trackball/glide pad to operate the pointer on its associated GUI screen. The left and right buttons above each trackball/glide pad have similar functionality to those on a PC/laptop

mouse; the left button is used for click and drag operations, while the right one is generally used for editing and finer control operations.

Quickly double-tapping the glide pad has the same effect as pressing the left button.

Click

Moving the pointer to a specific point of the GUI screen and then pressing the left button is called "clicking". This is fundamental to GUI operation and forms the basis of many of its operations, such as switching a button on/off, selecting list and menu items, text editing etc. Doing the same with the right button is called "right-clicking".

Drag

Moving the pointer to a specific point of the GUI screen and then pressing the left button while moving the pointer up/down/left/right is called "dragging". Dragging is used mainly to adjust control knobs and faders, and to move sliders (attached to drop-down lists) — although it is also used to select blocks of connectors when patching (see "To select a block of patch connectors in the From section" on page 85).

Common GUI screen elements

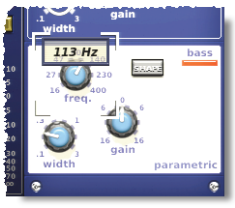
In general, you will see a banner at the top of the GUI screens that contains a number of elements. The following diagram shows a typical screen display and describes these elements.



Item	*Description*
1	**home** button, opens the GUI menu (see "GUI menu flowchart" on page 333).
2	Screen navigation buttons (see "To find a GUI screen that you recently opened" on page 62).
3	Name of current screen.
4	"Not Saved" message appears when the scene/preset library file contains changes that have not been saved.
5	Title of currently selected scene, if any.
6	**status** LED, indicates system health and status (see "About the Diagnostics screen" on page 384). Clicking this LED will open the **Diagnostics** screen.
7	Copy and paste buttons (see "Using copy and paste" on page 108).
8	User library buttons (see "User library (presets)" on page 109).

Parameter values displayed on touch

You can configure the XL8 (see "Changing the user interface preferences" on page 230) so that GUI displays the current value (and dimension) of the control being adjusted.



If you adjust an aux via the **mixes** section of an input fast strip, the current value will be shown in the aux's panel of the GUI input fast strip.



Operating the GUI screen controls

This section shows you how to operate GUI screen elements, such as buttons, control knobs, drop-down lists and sliders.

>> To switch a GUI button on/off

Click the button. If it has a status indicator, this will illuminate/extinguish to show that it is on/off, respectively.

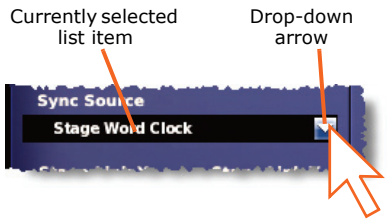
>> To adjust a GUI control knob or fader

Use a drag operation. Move the pointer up/down/left/right for adjustment.

Using drop-down lists

Certain configurable name fields, particularly the signal routing ones, have drop-down lists that offer a number of preset or context-sensitive options to choose from. Long lists — containing more options than can be displayed simultaneously — have sliders that allow you to access all of the options.

>> To select an option from a drop-down list

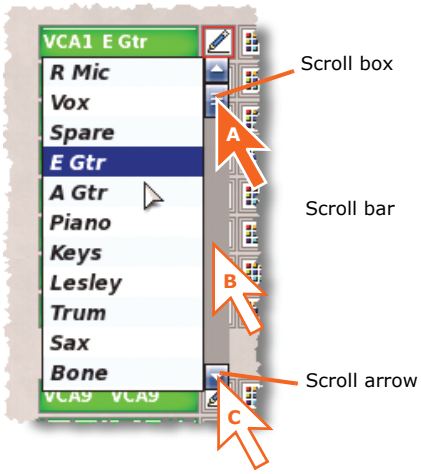


1. Click the drop-down arrow. The drop-down list will unfold to display some or all of its contents, depending on how many items it contains.
2. Do one of the following:
   - Click the option you require.
   - If necessary, scroll the list (see "To scroll a drop-down list" below) to display the option, and then click it.

>> To scroll a drop-down list

With the drop-down list displayed, do one of the following:

- **A** — Drag the scroll box.
- **B** — Click the scroll bar. The scroll box will 'jump' in the direction of the click to another position in the scroll bar.
- **C** — Click an up/down scroll arrow. The scroll box will 'jump' in the direction of the scroll arrow to another scroll bar position.



Spin buttons

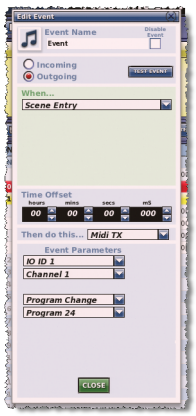
Up/down spin buttons let you increase/decrease the attribute or value of an item. For example, the amount of time a signal is delayed (the spin buttons are to the right of the control knob).



About windows

There are three main types of window you will encounter when using the GUI:

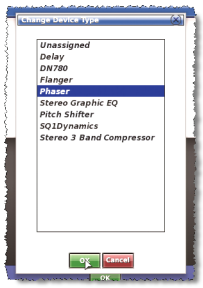
- **Properties** windows contain elements that you can select or edit, such as options, lists, tick boxes, text fields etc.
- **Message** windows contain text that can be a prompt or an error message. Generally, this type of window will contain a user-editable text field and **OK** and **CANCEL** buttons.
- **List** windows have a number of user-selectable options in the form of a list, and may include **OK** and **CANCEL** buttons.



Properties window



Message window



List window

Similar to a window found on a PC running a Windows-based operating system, the window can be moved around the screen, which is useful if you need to see what is behind it. Also, each window has a close (X) button at its upper-right corner.

>> To close a window

Do one of the following:

- To acknowledge your changes, click **OK.**
- To cancel your changes, click **CANCEL.**
- Click "(X)" at the upper-right corner of the window.

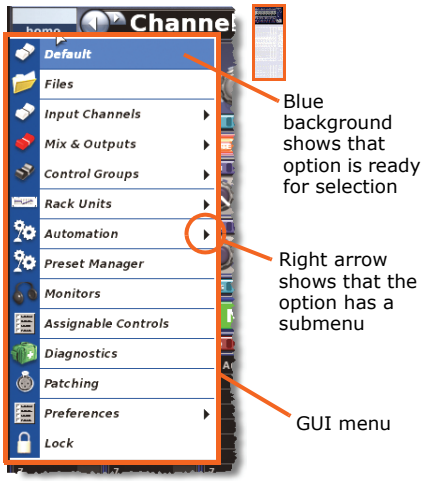
>> To move a window

Use drag, by clicking on the window's blue bar (top) and dragging the window where you want it.

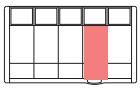
Using the GUI menu

The GUI main menu (shown right) is opened by clicking the **home** button, which is constantly displayed at the upper-left corner of all GUI screens. To select a submenu option, move the pointer over the arrow to the right of the menu option (the submenu will open automatically to the right of the arrow) and choose the option you want.

Note: *Throughout this manual, menu/submenu option selection sequences are shown in the following format:* ***home*** ***Preferences*** ***General*** *(for example, for choosing the general preferences screen).*

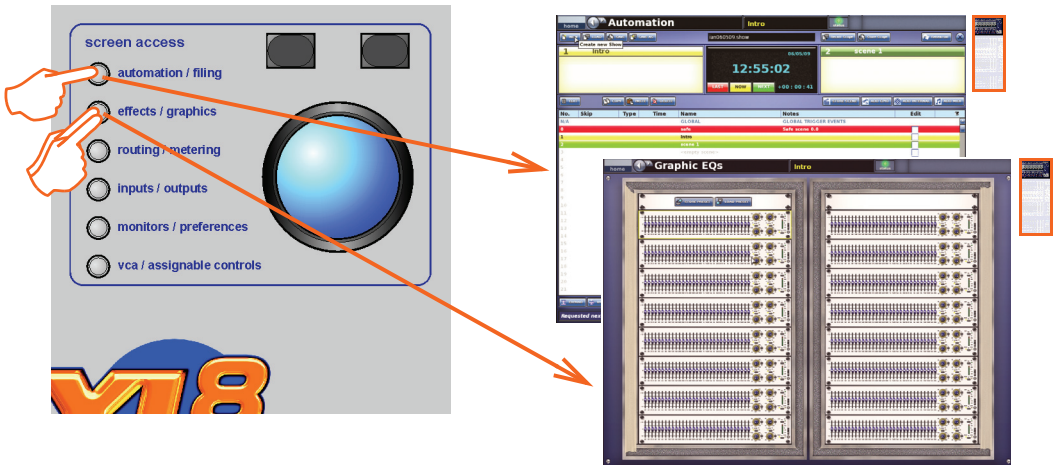


Opening a GUI menu screen via the control surface



You can open some of the GUI menu screens by using the buttons in the **screen access** section of the primary navigation zone. Each button provides direct access to two screens, as indicated by the adjacent text to its right.

Press the button to open the first screen mentioned, and press it again to open the other one. For example, press the **automation / filing** button to open the **Automation** screen or press the **effects / graphics** button twice to open the **Graphic EQs** screen (as shown in the following diagram).



Text editing

Use the pull-out keyboard (see "Pull-out keyboard" on page 28) when you want to enter/edit text on the output bay GUI screen. You can use the output bay's trackball to assist you, for example, you can highlight text using drag or use the copy and paste options in the right-click menu.

Note: *To use a keyboard on a different GUI screen, you will need to plug a USB keyboard into the appropriate front panel XL8 keyboard connector (see "Keyboard connections and bay allocation" on page 250).*

>> To pull out/put away the keyboard

To manoeuvre the keyboard to its operating position, pull it out from underneath the output bay. A catch on the right of the keyboard will close to lock it in place.

After you have finished using the keyboard, lift up the catch to open it and push the keyboard back underneath the output bay.

>> To enter/edit text via the keyboard

1. At the GUI, click within the text box. This will place an insertion point in it; the pointer will change to an I-beam shape.
2. Using the keyboard, edit/type in the new text. You can edit existing text by using the right-click menu (see "Click" on page 49).
3. On the keyboard, press ENTER to exit the text box (or click on an empty area of the GUI screen). The pointer will change back to an arrow shape.

Chapter 7: Navigation

This chapter introduces you to XL8 navigation and shows you how to use the navigational tools of the XL8 Control Centre.

For information on navigating the scenes in automation, see "Managing the scenes" on page 104, and on accessing the **Patching** screen from the GUI, see "Navigating to the Patching screen" on page 428.

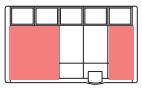
An introduction to XL8 navigation

The XL8 provides you with unique navigational controls to quickly and easily access the items, such as channels, buses, groups and detail areas, that you will require for mixing.

Navigation is an important feature of the XL8 Control Centre. One of the advantages digital consoles have over analogue ones is that their channel count is not limited by the control surface hardware. However, this means that only a certain amount of channels can be at the control surface at any time, while the others are 'hidden'. So, navigation is required to access these hidden channels whenever you need them.

Each bay has its own discrete set of channel controls, such as quick access buttons and LCD select buttons, to help you quickly navigate the channels and buses to bring the ones you need to the control surface and select them.

How the input channels are managed



Each input bay can handle a single bank of eight input channels at any time. There are a total of 12 banks that, between them, encompass the 96 inputs available. Input channels at the control surface are in ascending order from left to right.

To help you understand the operating principles of the XL8 it may be best to visualise the control surface as if it were an analogue one, that is, in two dimensions with all 96 input channels laid out side by side. In this case all input channels are visible all of the time and would look something like the one in Figure 13 (a massive beast!).

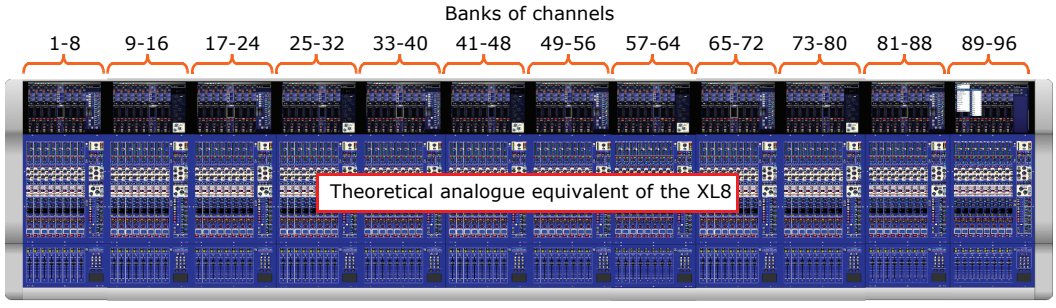
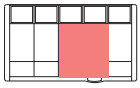


Figure 13: Theoretical analogue equivalent of the XL8 Control Centre

However, in reality the XL8 Control Centre has only five GUI screens and, in the standard configuration, only three of these are allocated to the input channels (the other two being used for the mix and output bay displays), so you can view up to 24 input channels at any time.

How the output channels are managed



All output channels, except masters, are paired and managed in banks of 16 (eight pairs per bank). The mix and output bays have eight dual-channel fast strips each. The ones in the mix bay are for auxes (32) and returns (16), and the ones in the output bay are for matrices (16). The output bay also houses the thee master channels (two stereos and a mono). Both bays use the channel strip in the mix bay.

In the standard XL8 configuration the outputs are displayed on the mix bay GUI screen, 16 at a time.

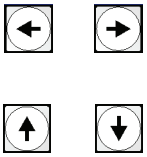
How the mix buses are managed

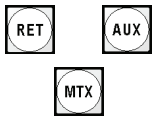
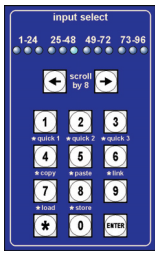
All mix buses are initially in mono pairs, but can each can be stereo linked. The mix buses on each input channel comprise 32 auxes and 16 matrices, while the output channels have 16 returns and 32 auxes each. The mix bus navigational controls are located towards the bottom of their respective channel strips.

About the navigational controls

The XL8 navigational controls can be broadly divided into two main areas: those that operate the channels currently populating the control surface (quick access buttons and LCD select buttons) and the ones that navigate channels to/from the control surface (scroll buttons and output select buttons) — although there may be some overlap.

Table 1: Description of the navigational controls

Type	*Description*	*Example(s)*
Quick access button	Quickly selects the local area, such as a channel, mix bus or detail area. The buttons, which are round and translucent, illuminate (blue) when active. The quick access buttons in fast strips select their channel and assign their local detail area to the associated channel strip. The ones in the channel strips select their local detail area, but don't affect channel selection. Generally, a second press clears selection, extinguishing the button's backlight and blanking the associated GUI channel strip. A quick access button is overridden by pressing another quick access button or operating a touch-sensitive control.	
LCD select button	Selects the local channel/mix/group. The buttons have a user-configurable backlit LCD display that provides useful feedback, such as name and type. When selected, the display changes to a 'negative' image.	
Scroll button	Grouped in pairs, these buttons scroll through the channels and mix buses, changing selection. The direction of scrolling matches the analogue convention, where channels are left/right and mixes are up/down. The scrolling action of the buttons (or the number of channels/buses scrolled per press) varies according to button location. The buttons are translucent and have a blue backlight that illuminates when pressed.	

Type	*Description*	*Example(s)*
Bank select button	Navigates its associated bank (mix bus or output channel) to the control surface. The buttons are translucent and have a blue backlight that illuminates when pressed; the backlight stays on to show you which bank is currently populating the control surface.	
input select section	Navigates a single channel to the control surface, which is generally used for rectifying a fault on a problem channel. For location, see Figure 14 "Input bay navigational controls (channel)" on page 58.	

Some of the controls, such as control knobs in the input fast strips, are sensitive to touch and will select the local channel when operated.

Location of the navigational controls

This section shows the position of the control surface navigational controls per bay.

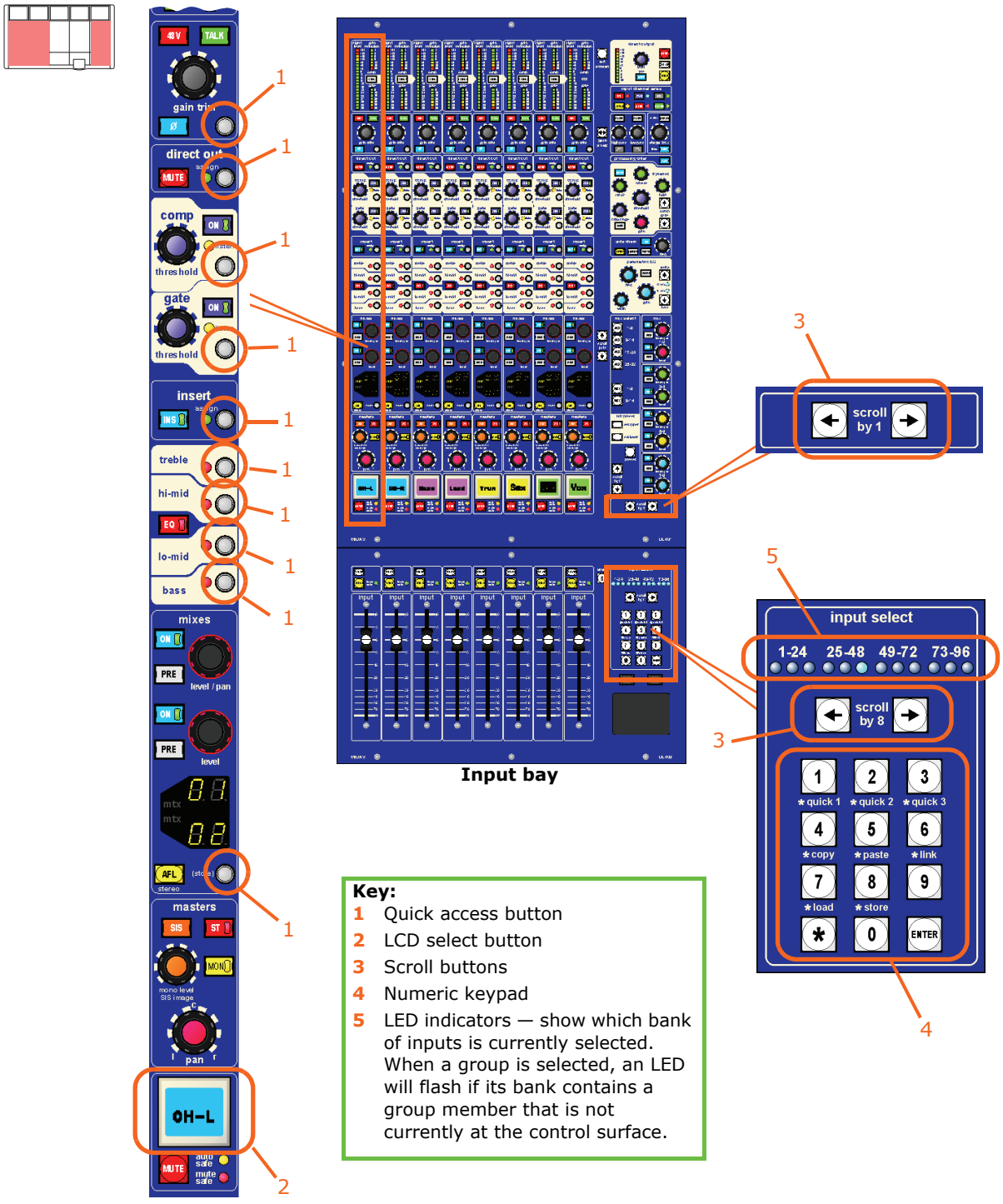
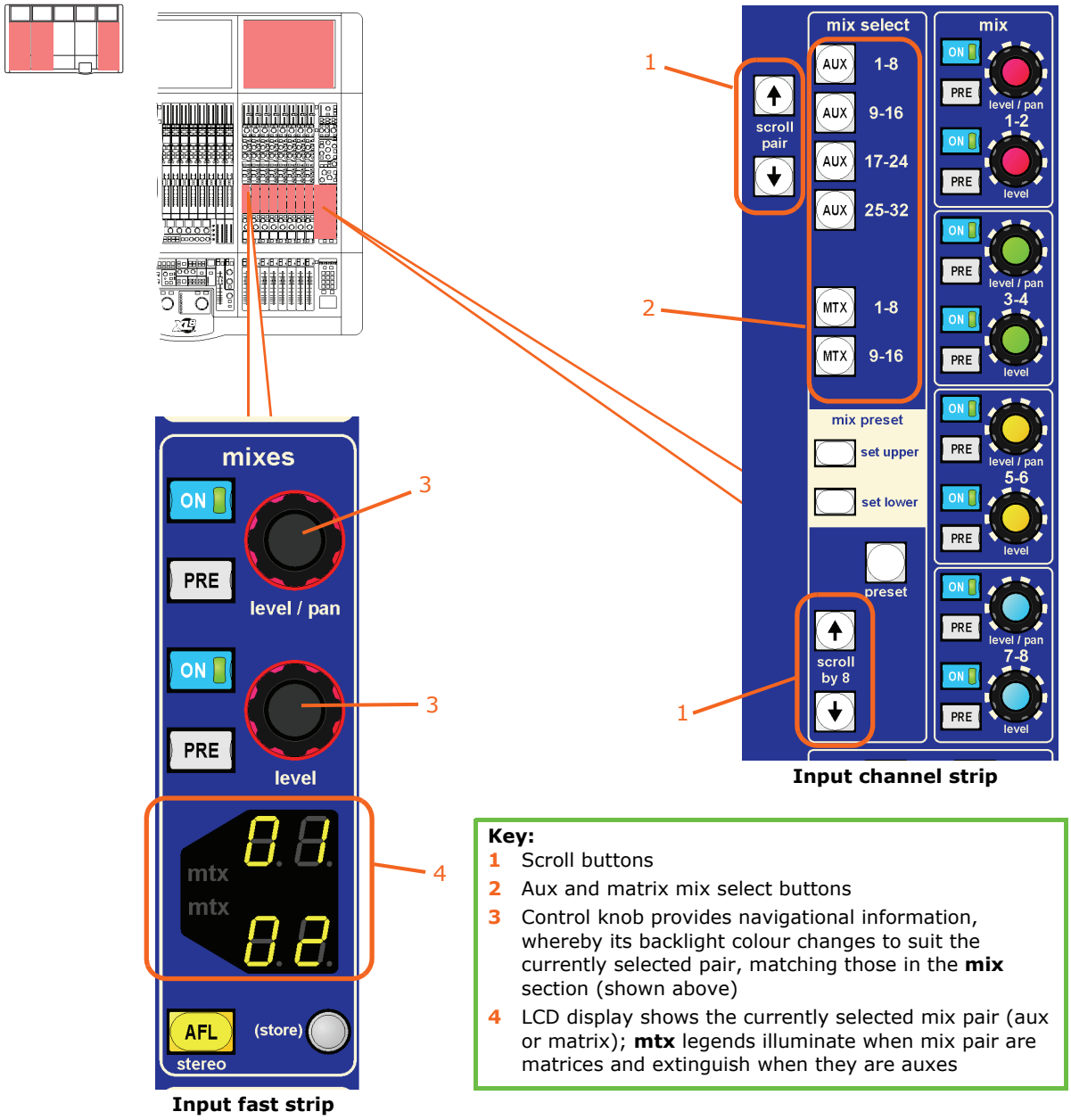


Figure 14: Input bay navigational controls (channel)



Key:

1. Scroll buttons
2. Aux and matrix mix select buttons
3. Control knob provides navigational information, whereby its backlight colour changes to suit the currently selected pair, matching those in the **mix** section (shown above)
4. LCD display shows the currently selected mix pair (aux or matrix); **mtx** legends illuminate when mix pair are matrices and extinguish when they are auxes

Figure 15: Input bay navigational controls (mix bus)

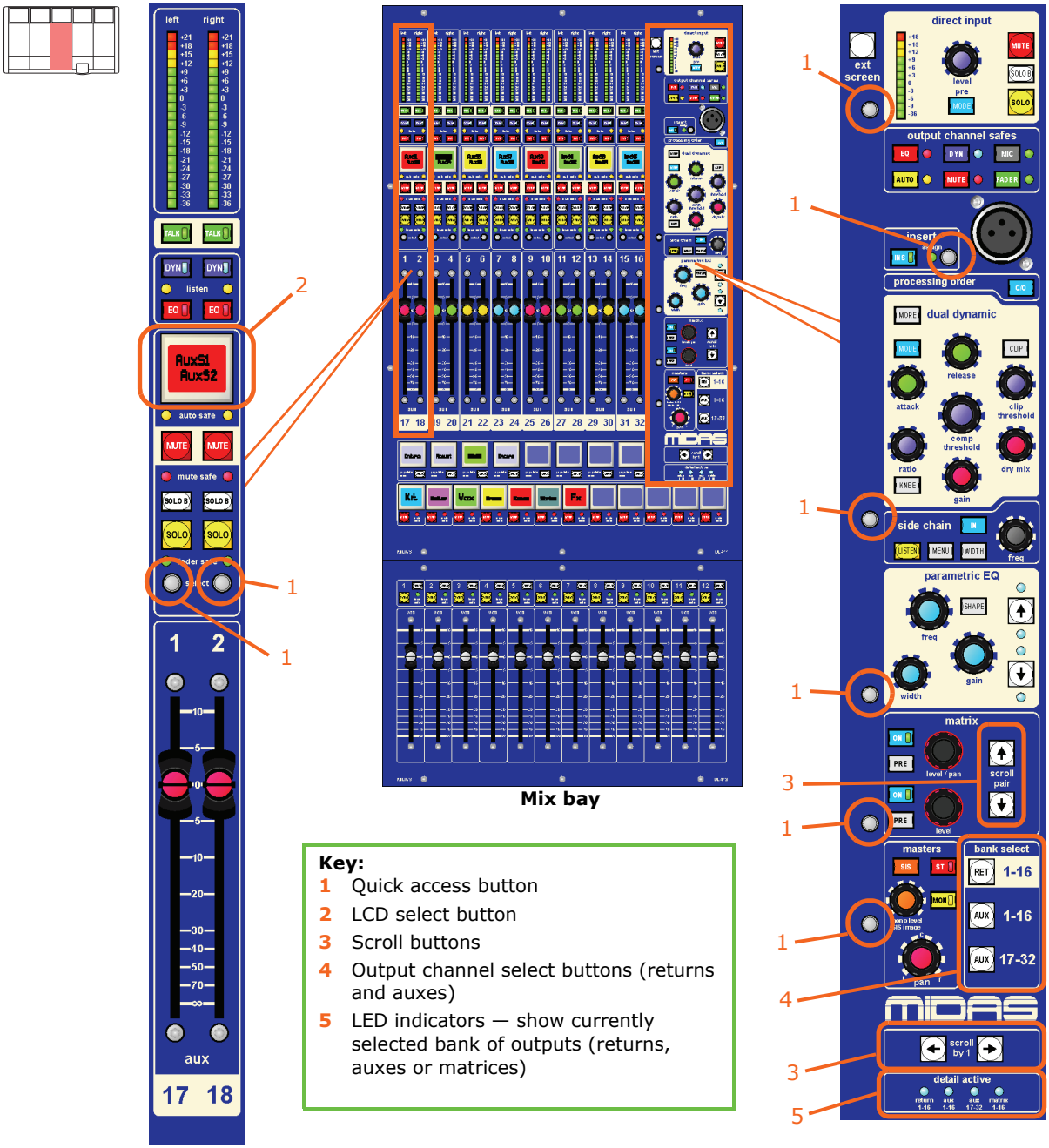


Figure 16: Mix bay navigational controls

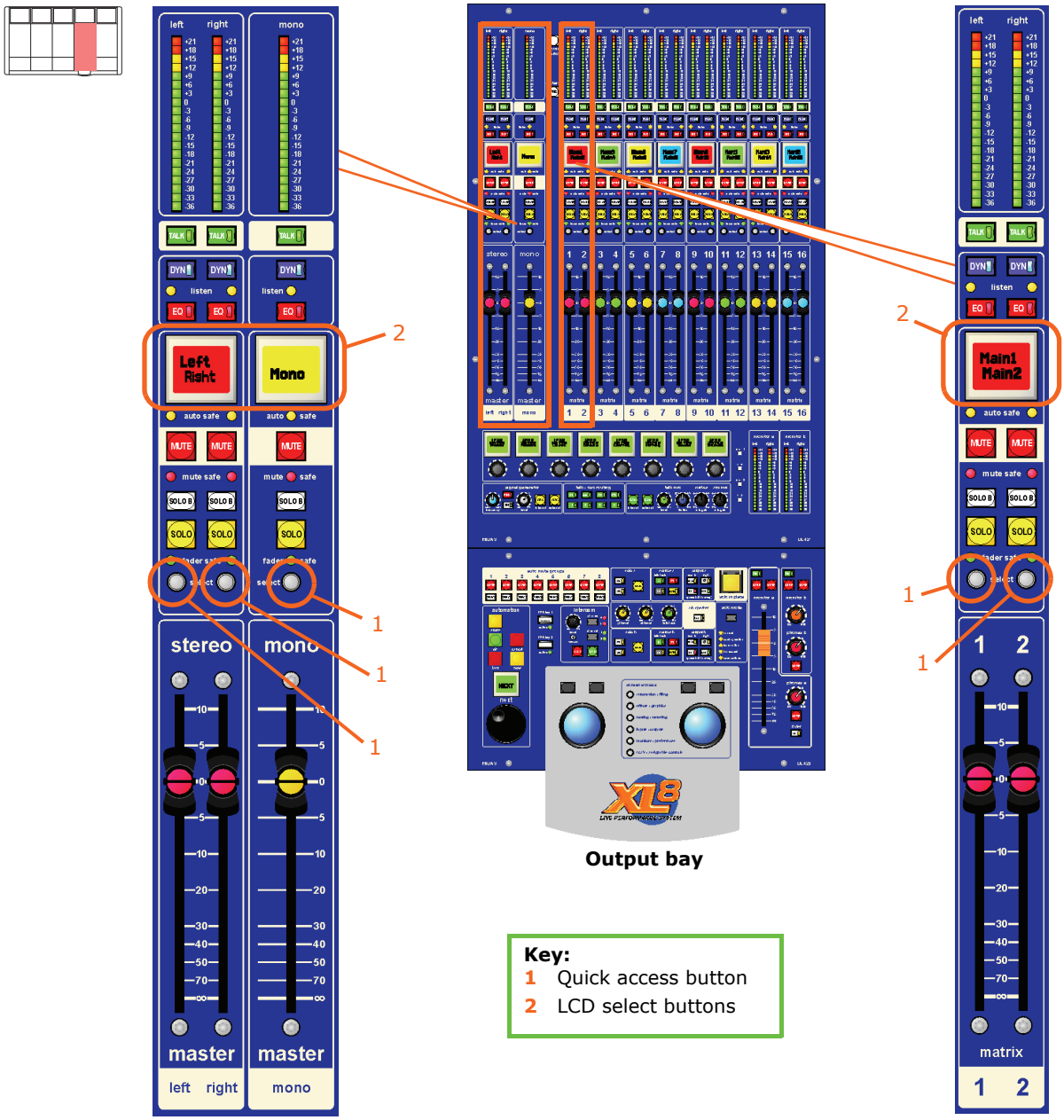


Figure 17: Output bay navigational controls

About GUI navigation

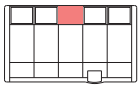
While the control surface provides instant, one-button access to many controls, the GUI provides an alternative way of navigating the XL8 and offers some unique methods of its own. The GUI menu gives you access to all of the screens that you will need and you can even navigate backwards/forwards through the screens that you have recently opened.

*Don't forget that you can access some of the GUI screens directly by using the buttons in the **screen access** panel of the primary navigation zone (see "Opening a GUI menu screen via the control surface" on page 52).*

>> To select a channel/group via the GUI

Click on a non-control area of the channel. The local detail area will be assigned to the local channel strip.

>> To quickly swap between the dashboard/output screens on the mix bay GUI



At the mix bay GUI screen, click the screen swap button ( or ) at the top of the screen.

>> To select a channel/group using the GUI menu

At the GUI, do one of the following:

- To select an input channel, choose **home** ▸ ***Input Channels.*** Then, click the bank containing the input channel you want to open, and click the input channel.
- To select an output channel, choose **home** ▸ ***Mix & Outputs.*** Then, click the bank containing the output channel you want to open, and click the output channel.
- To select a VCA/POP group, choose **home** ▸ ***Control Groups*** ▸ ***VCA Groups.*** Then, in the group you want; click a non-control area.

>> To assign a detail area to the output channel strip via the GUI

Click on one of the detail area panels in a GUI fast strip, making sure you avoid a control; see "GUI mix fast strips" on page 294.

>> To find a GUI screen that you recently opened

Use the back/forward browser buttons to do one of the following:

- To return to the GUI screen you just opened, click the back button (as shown right).
- To open one of the GUI screens you have recently visited, click the back/forward buttons. The back button will take you back through your browser history, while the forward button goes the opposite way.



The back/forward buttons, which are always to the right of the **home** button, are similar to those on standard browsers found on any PC.

How to navigate

This section shows you how to navigate the channels, mixes and groups, and select the ones you want. Refer to "Location of the navigational controls" on page 58 throughout this section.

Navigating channels and mix buses to the control surface

There are a number of ways you can navigate channels and mix buses to the control surface, particularly by using the scroll buttons.

>> To navigate a bank of channels to the control surface

Do one of the following:

- To navigate a bank of input channels to the control surface, press the **scroll by 8** left/right arrow buttons in the **input select** section (input channel strip); the banks appear to move in the opposite direction of the arrow. The illuminated LED just above the scroll buttons will show you which bank is currently at the control surface. The active input channel remains in the same relative position. You can do this in any of the input bays.
- To navigate a bank of output channels to the control surface, press a **RET** or **AUX** button in the **bank select** section of the mix bay channel strip; the illuminated LED in the **detail active** section will show you which bank is currently at the control surface.

>> To navigate a bank of mix buses (inputs only) to the control surface

Do one of the following in the **mix select** section (input channel strip):

- Press an **AUX** or **MTX** button.
- Press the **scroll by 8** up/down arrow buttons.

Indication of the currently selected bank of mix buses is shown by the illumination of one of the **AUX** or **MTX** buttons.

>> To navigate to a specific channel

Do one of the following:

- To navigate to an input channel, press the **scroll by 1** buttons (towards bottom of input bay channel strip). Although movement is restricted to the input bay you are currently operating, you can scroll through all input banks, thus encompassing all of the 96 inputs. You can do this in any of the input bays.
- To navigate to an output channel, press the **scroll by 1** buttons (bottom of mix bay channel strip). Scrolling will take you through all of the outputs, that is, the banks of returns, auxes, matrices and masters (in that order).

>> To navigate to a pair of mix buses

Do one of the following:

- In an input channel, press the **scroll pair** up/down arrow buttons (left of **mix select** section in input channel strip). The LCD display in the **mixes** section of each input fast strip will show you which pair of mixes is currently selected (also indicated by the backlight colour of the two control knobs above). There are 32 aux buses and 16 matrix buses available per input channel.
- In an output channel, press the **scroll pair** up/down arrow buttons (**matrix** section of mix bay channel strip). There are 16 matrix buses available per output channel.

For the location of the navigational controls, see Figure 16, "Mix bay navigational controls," on page 60.

Selecting channels, mix buses and groups

There are a number of ways you can select a channel/mix bus from those currently populating the control surface, particularly by using the quick access buttons and LCD buttons.

>> To select an input channel

Press its LCD select button or any of its quick access buttons.

Note: *You can also select an input channel using the* ***scroll by 1*** *buttons (bottom of channel strip).*

>> To select an output channel

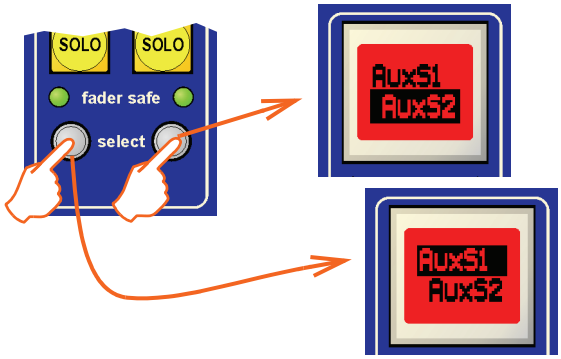
In the mix or output bay, do one of the following:

- To select the left channel of the pair, press its LCD select button. To select the right channel, press it again. For example, press the LCD select button to select aux 1 (**AuxS1**) and press it again to select aux 2 (**AuxS2**).



- Press its **select** quick access button. The left button selects the left channel (always odd numbered) and the right button selects the right one (always even numbered).

  This will also assign the channel to the channel strip and its detail area to the GUI. The **select** button also assigns the direct input detail area to the GUI output channel strip. Pressing it again deselects the detail area in the output channel strip, but leaves the channel selected.



  The exception to the above is the mono master channel, which has only one set of navigation controls.

Note: *You can also select an output channel using the* ***scroll by 1*** *buttons (towards bottom of mix bay channel strip).*

>> To select a mix bus

In the **mix** section of the input channel strip, operate the control knob of the mix bus you want. The control knobs are touch-sensitive.

>> To select a group (VCA/POP)

Press the LCD select button of the VCA/POP group you want.

Selecting a detail area

To select the detail area of a channel, press its local quick access button. This will select the channel and assign the detail area to the associated channel strip (control surface and GUI).

Fault finding a problem input channel

If you know the number of the input channel that has a problem, you can quickly navigate it to the control surface by typing in its number.

>> To navigate a channel using its number

1. In the **input select** section of the input bay, type in the channel's number. For example, press **4** and then **7** for channel 47.
2. Press **ENTER.**

The channel is selected and its channel and bank are navigated to the control surface and GUI.

Chapter 8: Patching

This chapter describes the patching function of the XL8.

Introduction

The patching function is fundamental to XL8 operation as, until the I/Os have been correctly patched, you won't get any audio. Patching is done entirely at the **Patching** screen, which is an option in the GUI menu. This screen lets you carry out all the routing requirements of the XL8 by providing an easy-to-use interface, where you can select your source and destination patching options, facilitated by a panel of function buttons. Additionally, the **Patching** screen lets you set up the units (devices). For example, you can adjust the analogue gain, select +48V phantom voltage etc., of the line I/O units connected to the system.

Terms used in XL8 patching

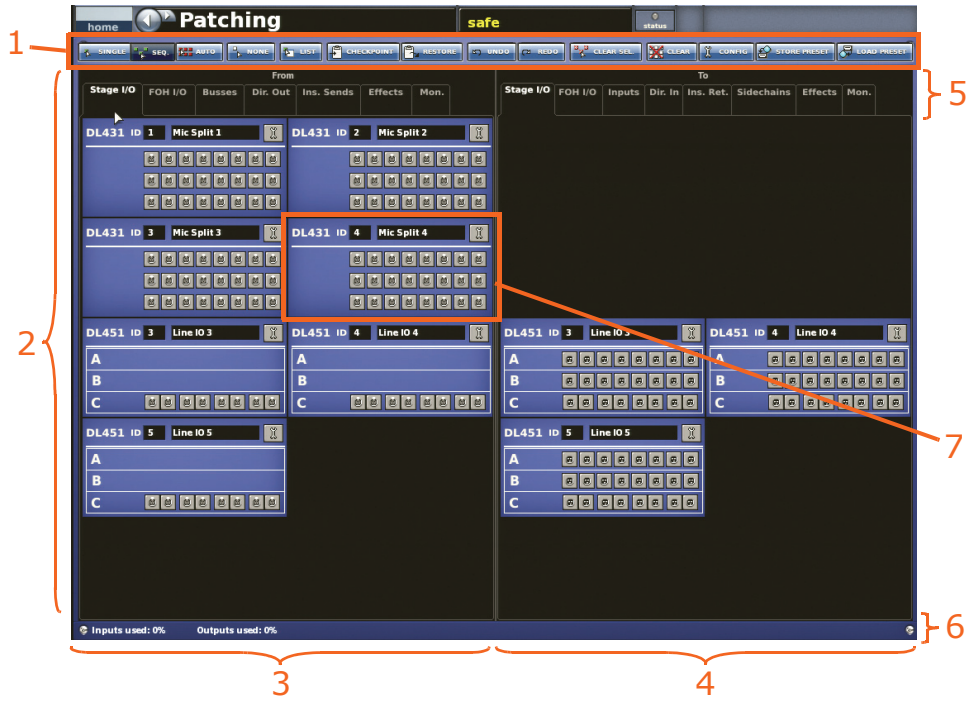
- **Checkpoint:** A patching data store point, created by clicking **CHECKPOINT**.
- **Destination:** The patch connector to which a signal is routed.
- **Device:** A diagram on an I/O tab representing a physical rack unit, such as a line I/O, mic splitter, DN9696, AES50 etc.
- **Drag:** A method of selecting a block of source patch connectors in the **From** section of the Patching screen (see "To select a block of patch connectors in the From section" on page 85).
- **From section:** The left portion of the **Patching** screen, which contains the source patch connectors.
- **Patch connector:** A tab patching point on any of the tabs, for example, an XLR connector, bus, sidechain compressor etc.
- **Patching:** The process of routing a channel/signal from a source to a destination(s).
- **Source:** The patch connector from which a signal is routed.
- **Tab:** A 'sheet' in the **From** and **To** sections that contains a specific group of patch connectors.
- **To section:** The right portion of the **Patching** screen, which contains the destination patch connectors.

About the Patching screen

The **Patching** screen has two main areas: a function button panel towards the top of the screen and a patching area below. The function buttons provide the required patching functionality and allow I/O tab devices to be set up. The patching area provides access to all the patch connectors.

The patching area is split equally into two independent sections, called **From** and **To**, which contain the source and destination patch connectors, respectively. The patch connectors are grouped on tabs according to type. Only one tab per section will be visible at any time.

The I/O tabs represent the Stage (1 and 3) and FOH racks, and contain graphical representations (devices) of the units connected in those racks.



Item	Description
1	Function button panel, contains the function buttons that enable patching and device configuration (see "Patching screen function buttons" on page 69).
2	Patching area, contains all of the patch connectors on tabs.
3	**From** section, contains a number of tabs that house all of the patch connector sources (see "About the tabs in the From and To sections" on page 70).
4	**To** section, contains a number of tabs that house all of the patch connector destinations (see "About the tabs in the From and To sections" on page 70).
5	Section titles and tab names.
6	Status bar that shows the patching status of the inputs and outputs as a percentage.
7	A pictorial representation of a physical device.

Figure 18: A typical Patching screen display

>> To open the Patching screen

Do one of the following:

- At the GUI, choose **home** ▸ ***Patching.***
- Press the **routing / metering** button in the primary navigation zone.
- At the appropriate GUI screen, click the **src** (source) or **dest** (destination) button. The **Patching** screen will open at the appropriate tab/configuration window.

Patching screen function buttons

The function panel buttons of the **Patching** screen are described in the following table. When a button is selected, its background colour changes to a lighter shade.

Legend	*Description*
SINGLE	Lets you patch a single source to a single destination or multiple destinations. See "Single patching (SINGLE)" on page 86.
SEQ.	Lets you select multiple sources and then patch them one by one to their destinations. With this method, each source can only have one destination. See "Sequence patching (SEQ.)" on page 87.
AUTO	Lets you select a block of sources and patch them all automatically in one go, simply by selecting a single destination. Any existing patches within the destination range will be replaced by the new ones. See "Automatic patching (AUTO)" on page 87.
NONE	Clears all currently selected patch connectors from all tabs in the **From** and **To** sections.
LIST	Changes the tooltip type from standard to list to help with sequence patching. This is only available when **SEQ.** is on (see "List tooltip" on page 79).
CHECKPOINT	Sets a patching store point, or snapshot, that contains the patching status at that instant. There is only one checkpoint available, so each time **CHECKPOINT** is clicked the previous checkpoint is overwritten.
RESTORE	Reverts patching status to the last checkpoint or, if no checkpoints have been created, it will revert patching status to the power up condition. All patching done in the intervening period will be lost.
UNDO	Undoes the latest single patch, even if it was part of a multiple patching operation. Repeated clicks will undo the preceding patching operations, going back to the last checkpoint, or power up if no checkpoints have been created.
REDO	Redoes an undo. This can be repeated for each undo in the previous undo operation.
CLEAR SEL.	Clears all current selections and their patches. **Important:** **Unlike the NONE button, which merely removes the current selections (highlighted in yellow), CLEAR SEL. goes a step further by removing the patch as well. This will stop any audio that may have been going through the patched signal.**
CLEAR	Clears all patching (see "To clear all current patching" on page 88). **Important:** **Exercise great caution when using this function. Observe the warning that appears after clicking this button.**
CONFIG	Opens the **AES50 Device Configuration** window, from where you can configure the device (see "The AES50 Device Configuration window" on page 83).

What the Patching screen symbols mean

The following table gives a description of all the symbols that appear on the Patching screen tabs.

Symbol	*Description*
	During patching, this triangle appears under a tab name when the tab contains a selected patch connector.
	Shown at the top of the channel patch connectors, this box aids channel identification by showing the channel's user-configured colour.
	Insert return patch connector.
	Insert send patch connector.
	Bus or channel source patch connector.
	Bus or channel destination patch connector.
	Female XLR chassis patch connector (input).
	Male XLR chassis patch connector (output).
	Jack patch connector.
	Non-functional patch connector, that is, one that cannot be patched.
	Compressor sidechain input patch connector.
	Gate input patch connector.
	DN9696 recorder patch connector.
	Set-up button, which opens the device configuration window (see "Configuring the devices" on page 80 for details).

About the tabs in the From and To sections

The **From** section (left side of **Patching** screen) contains all of the source patch connectors on tabs, and the **To** section (right side of **Patching** screen) contains all of the destination patch connectors on tabs. For details of the I/O devices fitted in the racks, see "XL8 system interconnections" on page 36.

Stage I/O tab — From

The **Stage I/O** tab contains the devices fitted in the stage racks. For a typical display, see Figure 18 "A typical Patching screen display" on page 68.

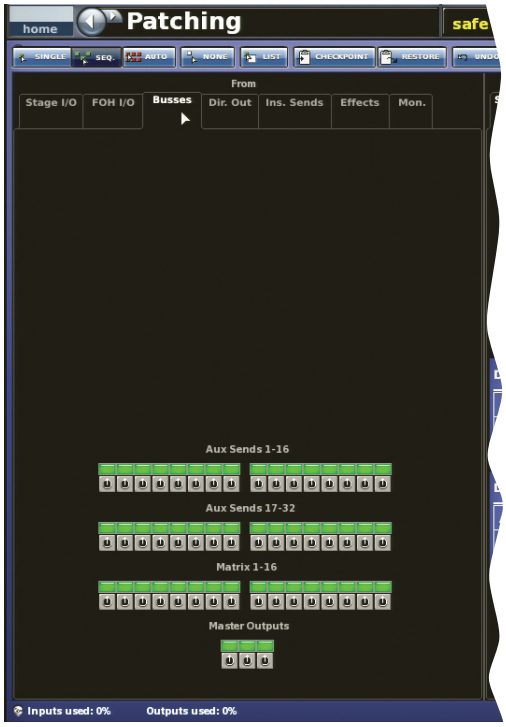
FOH I/O tab — From

The **FOH I/O** tab contains the devices fitted in the FOH rack.

Busses tab — From

The **Busses** tab allows routing from the auxes, matrices and master outputs.

This tab can also be accessed directly via the **dest** button in the **mixes** section of the input channels (see "Mixes" on page 283) and in the **direct input** section of the output channels (see "Direct input controls" on page 300).



Dir. Out (Direct Out) tab — From

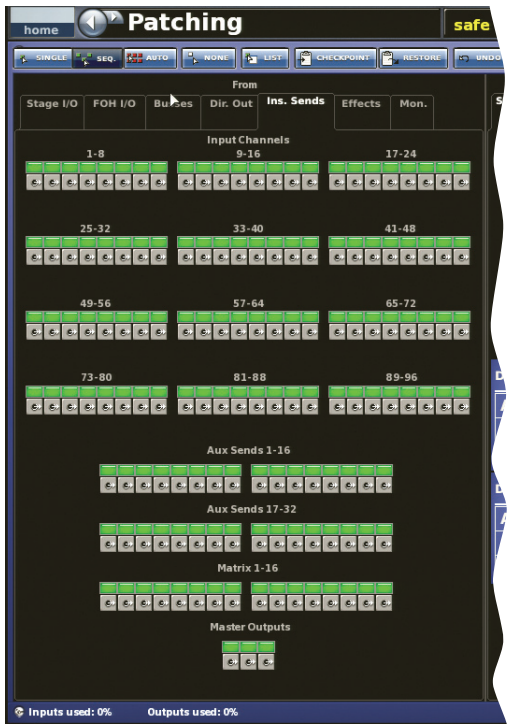
The **Dir. Out** (Direct Out) tab allows you to patch any of the 96 input channels internally. For example, to an effect or to provide a way out of the XL8 Control Centre via a line I/O unit.

This tab can also be accessed directly via the **dest** button in the **direct output** section of the input channels (see "Direct output" on page 270



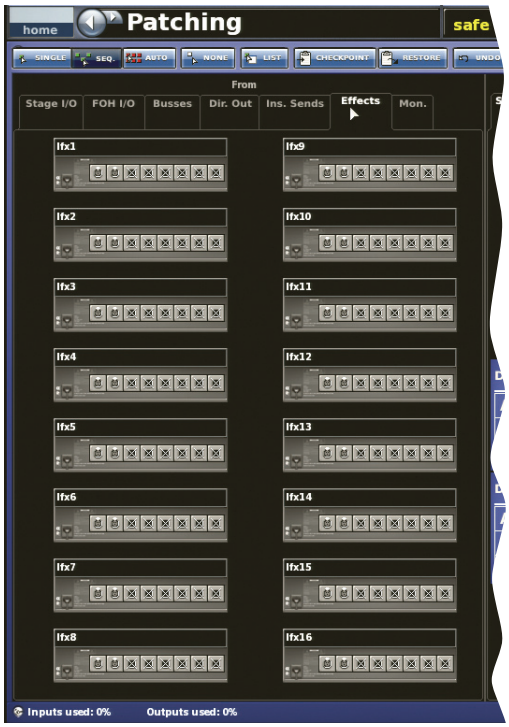
Ins. Sends (Insert Sends) tab — From

The **Ins. Sends** (Insert Sends) tab allows any of the input and output channels to be routed, primarily to an effects device. See "Insert" on page 279.



Effects tab — From

The **Effects** tab allows patching from any of the effects.



Mon. (Monitor) tab — From

The **Mon.** (Monitor) tab allows routing of the monitor outs and external talk destination.

This tab can also be accessed via the **dest** buttons on the Monitors screen (see "Monitoring" on page 322).



Mon. tab output	*Equivalent on the Monitors screen*
Monitor Out A L	**monitor A output L**
Monitor Out A R	**monitor A output R**
Monitor Out B L	**monitor B output L**
Monitor Out B R	**monitor B output R**
External Talk Destination	**external talk output ("talk mic" on page 318)**

Stage I/O tab — To

The **Stage I/O** tab in the **To** section contains the devices fitted in the stage racks (except the mic splitters).

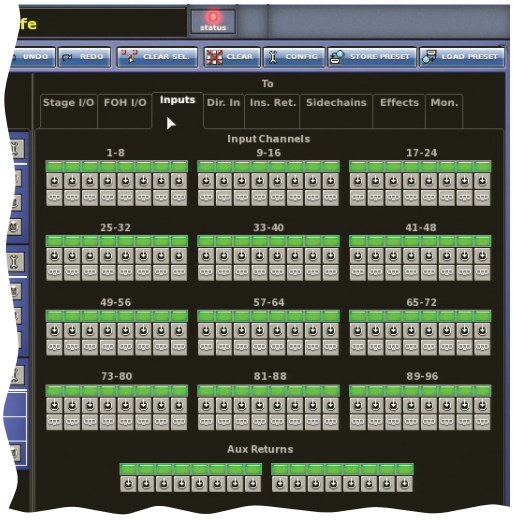
FOH I/O tab — To

The **FOH I/O** tab in the **To** section contains the devices fitted in the FOH rack.

Inputs tab — To

The **Inputs** tab allows sources to be routed to the input channels and returns.

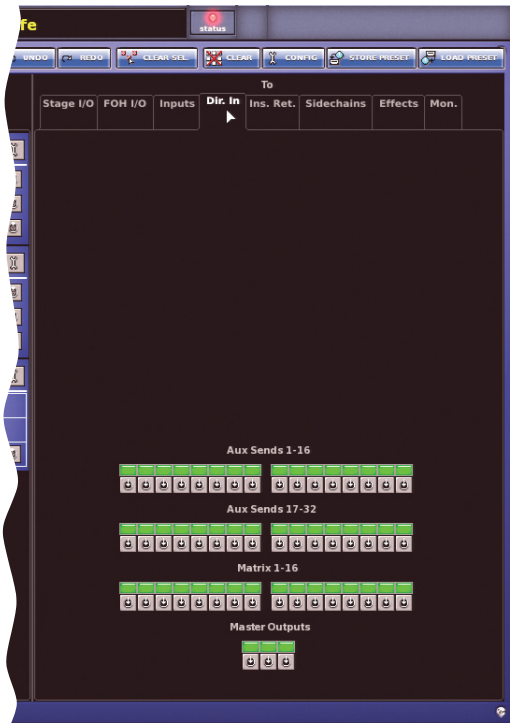
This tab is also accessed from the **src** button in the configuration section of the input channels (see "Channel configuration" on page 268).



Dir. In (Direct Input) tab — To

The **Dir. In** (Direct Input) tab allows you to patch, for example, effects to the outputs.

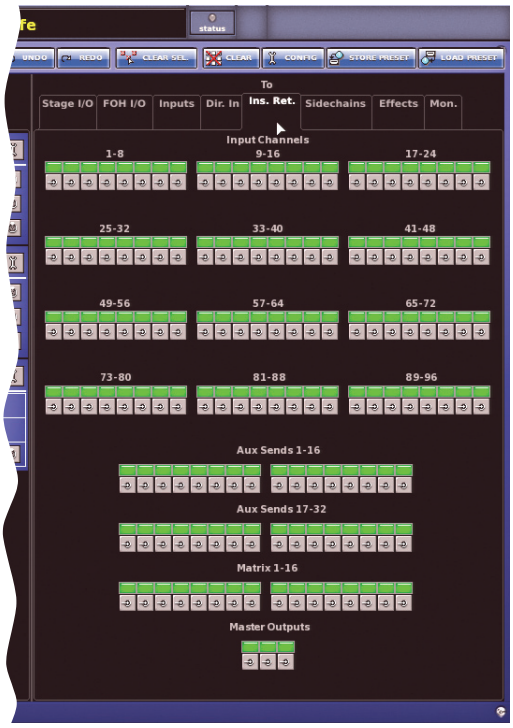
This tab is also accessed from the **src** button in the configuration section of the output channels (see "Direct input controls" on page 300).



Ins. Ret. (Insert Return) tab — To

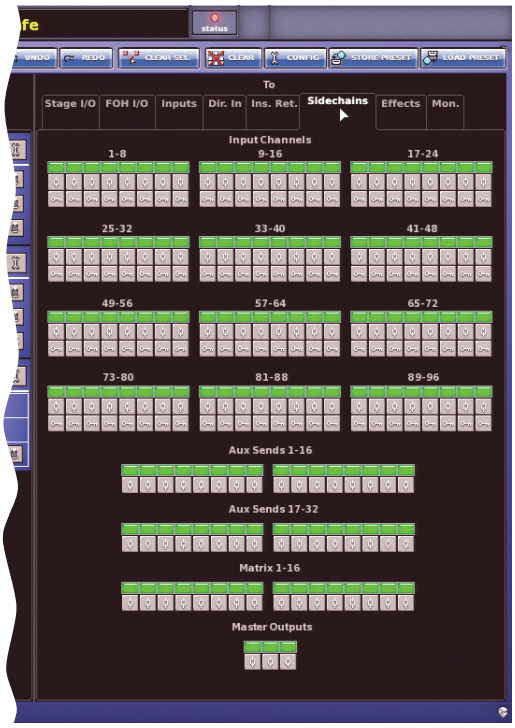
The **Ins. Ret.** (Insert Return) tab allows insert returns to be patched to any of the inputs and outputs.

This screen is also accessed directly via the **src** button in the insert section of both the input and output channels (see "Insert" on page 279 and "Insert controls and talk mic" on page 303, respectively).



Sidechains tab — To

The **Sidechains** tab allows patching to the compressor and gate of the input and output sidechains (see "Side chain" on page 278 and "Compressor and side chain" on page 301, respectively).



Effects tab — To

See "Effects tab — From" on page 72.

Mon. (Monitor) tab — To

The **Mon.** (Monitor) tab allows routing to the communications and monitors.

This tab can opened using the **src** buttons on the Monitors screen (see "Monitoring" on page 322).



Mon. tab input	*Equivalent on the Monitors screen*
Talk Input Source	**talk input**
Talkback Input Source	**talkback input**
Ext Input Source L	**external input L**
Ext Input Source R	**external input R**
PFL Direct Input Source	**pfl direct input**
AFL Direct Input Source L	**afl direct input left**
AFL Direct Input Source R	**afl direct input right**

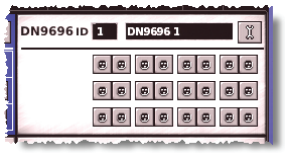
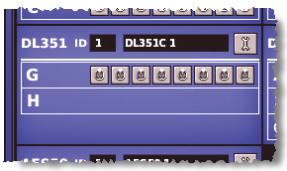
Navigating to the Patching screen

You can access the **Patching** screen from various other screens in the GUI menu, usually by clicking a **source** (source) or **dest.** (destination) button. When you click one of these buttons, not only will the **Patching** screen open, but the appropriate tab in the **From**/**To** section will be open as well. For a full list of patching routing on the XL8, see "Navigating to the Patching screen" on page 428.

About the devices on the stage and FOH I/O tabs

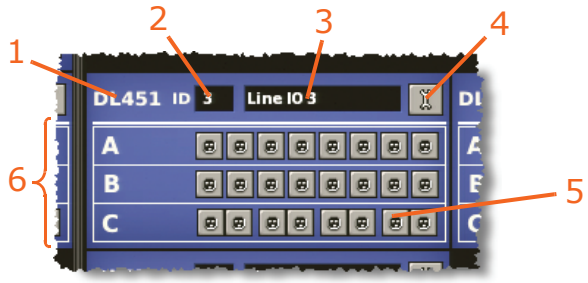
The following devices will, if selected (see "Setting up the I/O rack devices" on page 82), appear on the I/O tabs of the **From**/**To** sections of the **Patching** screen.

The device options in the following table are available for selection from the **device type** drop-down list in the **AES50 Device Configuration** window (see Figure 19 "The AES50 Device Configuration window" on page 83).

Device type	*Description*	*Diagram*
Mic Splitter	DL431 Mic Splitter.	
Line IO	DL451 Modular I/O.	
Generic AES50	Audio-only device that is used to represent the inputs and outputs of any third party AES50 device.	
DN9696	Klark Teknik DN9696 Recorder. Use up to four of these devices (with IDs 1 to 4) to represent the four AES50 ports for up to 96 channels of recording/playback. For more information, go to our website www.klarkteknik.com.	
DL351A	One of four devices that make up the DL351 Modular I/O. The others are "DL351B", "DL351C" and "Dl351D". For more information, go to our website www.midasconsoles.com.	
DL351B	See "DL351A".	
DL351C	See "DL351A".	
None-Unknown	Selects no device.	N/A
DL351D	See "DL351A". This is not displayed.	N/A

Common device features

The device images have certain common features in their layout, as highlighted in the following diagram, which shows one of the I/O devices.



Item	*Description*
1	Unit type.
2	Unit ID number.
3	Unit name and XL8-assigned unit number.
4	'Spanner' button, opens the device configuration window (see "Configuring the devices" on page 80).
5	XLR patch connector, which is male or female, depending on section location.
6	Patch connector area. (The line I/O device shows the three card slots, A, B and C.)

Patching tooltips

Patching uses two types of tooltip — standard and list — to convey useful patching information about the patch connectors. A tooltip is a transitory object, in the form of a text box, that only appears while the GUI's pointer is in the proximity of a patch connector.

Standard tooltip

The standard tooltip is the default type that appears during all patching operations. The following diagram shows, typically, the type of information provided by a standard tooltip.



Item	Description
1	Patch connector information panel, contains information on the selected patch connector, such as, name, ID, device name, device ID etc. Depending on the device type, a signal level meter appears if the channel is passing audio.
2	Routing information panel, contains patching information on the selected patch connector. (If this panel is blank, the patch connector is not patched.)
3	The patch connector that the tooltip belongs to.

List tooltip

If you are carrying out a sequence operation, you can use the list tooltip to help in selecting the destinations in the **To** section. This tooltip, which has a distinctive translucent orange background, displays a list of the sources still to be patched. The list is in order of selection, with the first in the queue being at the bottom. You can only use the list tooltip for sequence operations.



Item	Description
1	ID of the patch connector currently under the GUI pointer.
2	List of selected sources still to be patched. Contains channel and device ID information.
3	The source patch connector currently waiting to be patched. Once patched, this will disappear from the list and the one immediately above will become the next available.

>> To select the list tooltip

Press **LIST.** (Pressing **LIST** again will change the tooltip back to the standard type.)

About the patching procedure

Although patching can be thought of as routing/rerouting the console's incoming, internal and outgoing signals, in the context of the **Patching** screen, patching also encompasses the setting up and configuration of the devices. The patching procedure is initially carried out after system installation (see Chapter 4 "Setting Up The System" on page 31 of the operator manual) and comprises:

- **Device configuration:** Configure the devices by adjusting their parameters as necessary (see below).
- **Snake selection:** Configure the XL8 according to the type of 'snake' you are using for the X and Y networks (see "Configuring the XL8 with the snake type" on page 82). **This is important, as the XL8 Control Centre will not work unless the snake type is correctly configured.**
- **Setting up the I/O rack devices:** Set up the system devices, such as line I/O and mic splitter, on the I/O tabs in the **From** and **To** sections of the **Patching** screen (see "Setting up the I/O rack devices" on page 82).
- **Patching:** Carry out all of the required routing, for example, mics to input channels (see "How to patch" on page 84).

Configuring the devices

You have the option to configure the devices via the **Patching** screen. Parameters, such as gain and +48V phantom voltage, can be set via a device-specific configuration window.

These configuration settings can be independent of channel data, as (until patched) they only control the physical unit. If a device is subsequently patched to one or more channels, the channel(s) control the device, and vice-versa.

The device configuration window also allows control of audio parameters when the device is used as a direct connection to another device, for example, FOH to stage via a digital snake, instead of through the DSP. In this case the settings are also saved in the show file and can be automated, even though the signals are not routed through the control centre DSP.

As the mic splitter control conforms to the **DL431 Mic Splitter Inputs** options (**Use A Inputs** or **Use B Inputs**) in the **Configuration Preferences** section of the **Preferences** screen, it is not possible to control both the A and B settings on the mic splitter from a single console.

Device configuration procedure

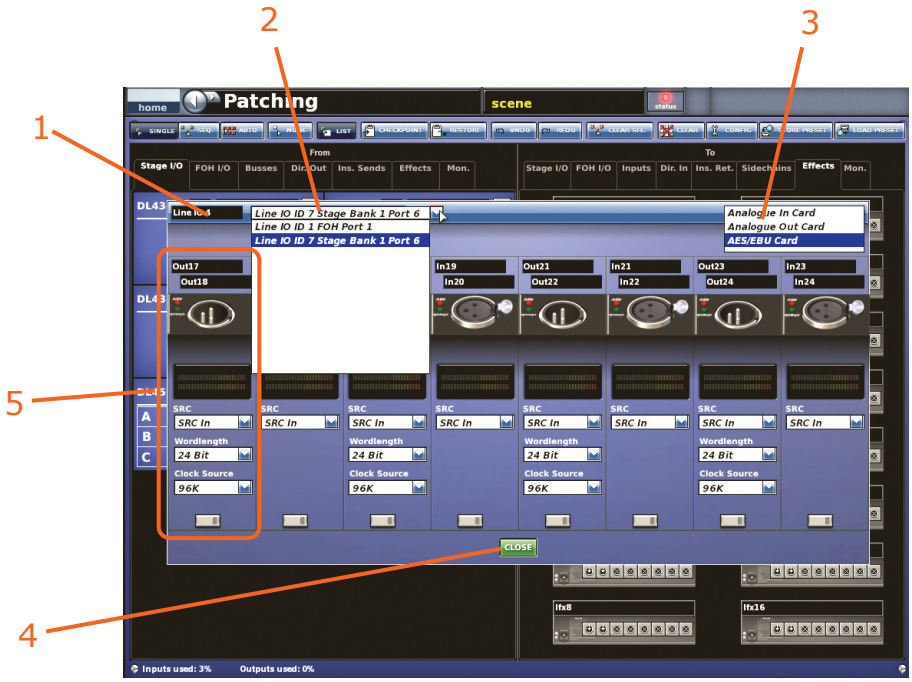
The procedure for configuring a device comprises:

- Opening the configuration window of the device.
- Selecting one of the device's cards/channel ranges and configuring the available parameters.
- Repeating for the other cards/channel ranges of the device.
- Repeating for the other devices.
- Closing the device's configuration window.

Note: *The parameters available for a device are dependent on its type.*

About the configuration window

The configuration window, which has a similar format for each device, comprises eight channel panels and drop-down lists for channel range/card selection. A typical Line I/O configuration window is used in the following diagram to show the elements that are common to each device.



Item	Description
1	Device ID field, contains the device type and number.
2	Device drop-down list, for device selection. (Diagram shows the drop-down list selected.)
3	Channel range/card selection list.
4	**OK** button, saves the changes and closes the configuration window.
5	Channel panel, contains device-specific controls and graphics.

>> To open the configuration window of a device

Click the device's spanner button  (upper right corner of device).

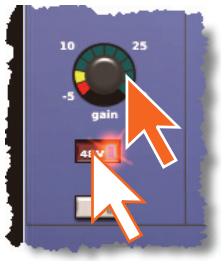
>> To set up/change the configuration of a device



1 In the device configuration window, choose the device from the drop-down list. For example, the FOH line I/O device (ID11) connected to port 2.

2 From the drop-down list at the upper-right corner of the window, choose the card/channel. For example, the "AES/EBU Card".

3 In a channel, configure its parameters. For example, in channel "In1" adjust the gain and switch on the +48V phantom voltage (shown right).



Repeat for the other channels in the card as necessary.

4 Repeat step 2 and step 3 for the other cards as necessary.

5 If necessary repeat step 1 to step 4 for any other devices of the same type.

6 Click **OK.**

Configuring the XL8 with the snake type

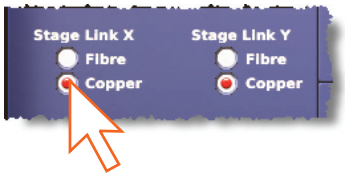
Important:
The XL8 must be configured with the correct snake type before operation. The XL8 will not pass control data or audio if the snakes are not properly configured.

The 'snake' connects the XL8 Control Centre to the DL461 Router. There are two snakes, one each for the X and Y routers, and they can be either copper or fibre-optic types. Before operation, you must configure the XL8 with the correct type, which is done via the GUI menu.

>> To configure the XL8 with the snake type information

1 At the GUI, choose **home** ▸ ***Preferences*** ▸ ***General.***

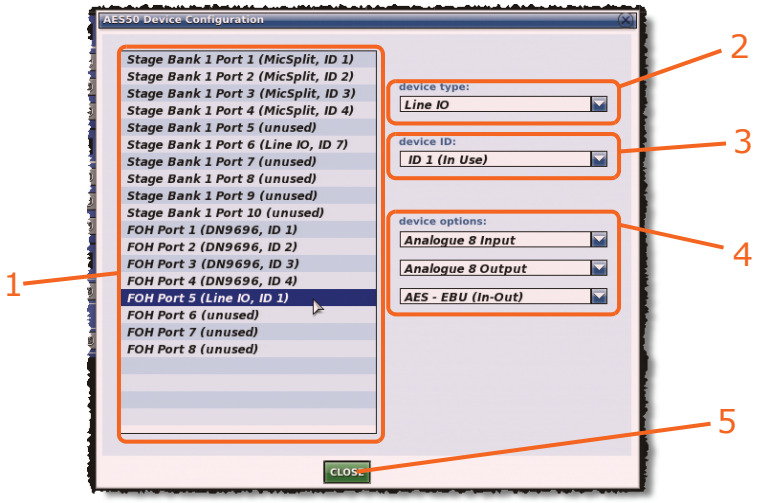
2 Under the **Stage Link X** heading in the **Configuration Preferences** section, choose the type of snake fitted to the X network. For example, click the **Copper** option (shown right). A selected option will contain a red circle.



Repeat for the Y network, under the **Stage Link Y** heading.

Setting up the I/O rack devices

You can add, remove and set up the devices, such as line I/Os, mic splitters, DN9696s etc., that are connected to the Stage I/O and FOH I/O racks. This is done via the **AES50 Device Configuration** window (see Figure 19 "The AES50 Device Configuration window" on page 83), which is opened by clicking **CONFIG.** Here, you can set up the device's ID and also the type of cards (modules) fitted in the physical unit. Some of the device fields may be blank, as they are dependent on the device type.



Item	*Description*
1	List of Stage and FOH ports with current device assignments.
2	**device type:** drop-down list, contains a list of the available devices to choose from.
3	**device ID:** drop-down list, contains a full list of IDs for the selected device type. Those already in use will be prefixed with the text "(In use)".
4	**device options:** drop-down list(s), from which you can select the card that is actually fitted in the physical unit. The positions of the drop-down lists are relative to the card positions in the physical unit.
5	**OK** button, closes the **AES50 Device Configuration** window.

*Figure 19: The **AES50 Device Configuration** window*

Device set-up procedure

The device set-up procedure comprises:

- Selecting the port (Stage or FOH) you wish to allocate the device to.
- Selecting the device type.
- Selecting an ID for the device.
- Selecting the options (if any) for the device.

>> To add a device or change its set up

1. Click **CONFIG.**
2. In the **AES50 Device Configuration** window, click the port you want to allocate the device to; these are listed in the far left of the window. For example, choose "FOH Port 3 (unused)". The text in the **device type:** field will change accordingly. Ports that don't have a device allocated to them it will have the text "unused" inside the brackets after their name.
3. In the **device type:** drop-down list, click the type of device. For example, choose "Line IO".
4. In the **device ID:** drop-down list, click the ID you want for the device. For example, choose "ID3".

5 In the **device options:** drop-down list(s), choose the type of each card fitted in the physical unit. For example, choose "Analogue 8 Input".

Repeat for any other cards.

6 Click **OK.**

>> To remove a device

Select the device from the list in the left of the **AES50 Device Configuration** window. Then, choose "None-Unknown" in the In the **device type:** drop-down list. For more information, see "To add a device or change its set up" above.

How to patch

Patching, basically, involves selecting the source patching connectors in the **From** section of the **Patching** screen and then selecting their destination(s) in the **To** section. You can select patches singly, or in multiples by using the sequence and automatic operations.

About the patch connectors

Each patch connector has three possible states, as indicated by its fill colour. The following table shows what each state signifies (the examples show XLR connectors, although it applies to any type of patch connector).

Symbol	*Description*
	Patch connector is neither selected or patched.
	Patch connector is selected, but can be in either a patched or unpatched condition.
	Patch connector is patched, but not selected.

Working with patch connectors

You can select patch connectors one at a time by clicking on them, or you can select them in blocks by using a drag operation. All of the patch connectors in both the **From** or **To** sections are on tabs so, before you can select a patch connector, its tab must be open.

>> To open a tab in the From or To sections

Click the tab title. For example, **Ins. Sends** (insert sends).

>> To select a single patch connector

Click the patch connector. The effects of clicking a patch connector are shown in the following table.

Table 2: Effects of clicking a patch connector

Click	*To do this in the From section*	*To do this in the To section*
	Select the patch the connector ( ).	Will do one of the following (provided a source patch connector(s) has been selected in the **From** section): • Select the patch connector ( ) during a single patching operation. • Patch the patch connector ( ) during either a sequence or an automatic patching operation. Otherwise, this has no effect.
	Deselect the patch connector, which then reverts to its previous state (patched or unpatched).	Remove the patch ( ).
	Select the patch connector ( ) and all the ones it is patched to in the **To** section. (A green triangle under a tab title shows that its tab contains one or more selected patch connectors.)	Remove the patch ( ).

*To quickly check the destinations of a source patch connector, click it. This will select it and all of its destinations. A green triangle will appear under the name of any tab in the **To** section that contains a destination(s).*

>> To select a block of patch connectors in the From section

Use a drag operation (see "Drag" on page 49) to create a bounding box to encompass the connections you want (shown right).



This procedure can only be done during sequence and multi-patching operations (initiated by the **SEQ.** and **AUTO** buttons, respectively).

>> To deselect all selected patch connectors

Click **NONE**.

>> To remove a single patch

In the **To** section, click the patch connector from which you want to remove the patch.

>> To remove all the patches of a single source

1. Make sure that no patch connectors are selected. If necessary, click **NONE.**
2. In the **From** section, click the source patch connector from which you want to remove all of the patches. (This will select the source patch connector and also all of its destinations.)
3. Click **CLEAR SEL**.

>> To remove the patches from all selected patch connectors

Click **CLEAR SEL**.

>> To clear a block of patch connectors

1. Click **NONE.**
2. In the **From** section, select the patch connectors you want to unpatch.
3. Click **CLEAR SEL.**
4. Click **NONE.**

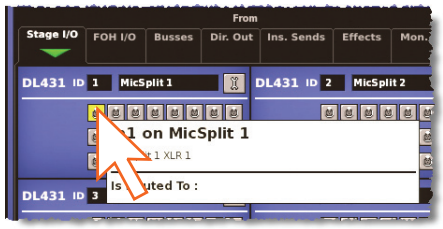
Single patching (SINGLE)

The **SINGLE** function button allows you to patch a single source to a single destination or multiple destinations.

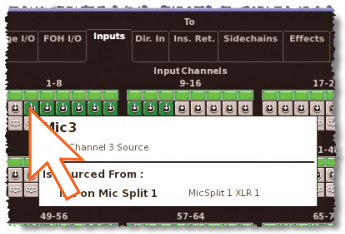
>> To patch a single source to a single destination

The following example shows you how to patch an output from a mic splitter to an input channel.

1. Click **SINGLE.**
2. In the **From** section, click the source patch connector. For example, choose the first patch connector of a mic splitter. Its background will change to yellow and a green triangle will appear under the tab title.



3. Click the destination patch connector. For example, in the **Inputs** tab of the **To** section, choose input channel 3 (Mic3). It will now be patched to the source. If the new patch is carrying a signal, this audio may be heard, depending on the settings of the XL8 Control Centre.



4. Click the source patch connector (**From** section) again to complete the patch.

   This can also be done by starting another single patch operation or by selecting another destination patch connector in the **To** section.

Note: *You can also carry out single patching operations using the* ***CLEAR SEL.*** *and* ***AUTO*** *functions.*

>> To patch a single source to multiple destinations

1. Patch the source patch connector to its first destination (see "To patch a single source to a single destination" on page 86).
2. In the **To** section, select the other destinations.

Sequence patching (SEQ.)

If you need to do a number of patches, and each has only a single destination, you can use the sequence function by pressing **SEQ.** All of the source patch connectors are selected in the **From** section before patching them, one by one, in the **To** section. This saves you having to go back to the **From** section for the start of each patch. You can change the tooltip to the list type by clicking the **LIST** button (see "Patching screen function buttons" on page 69) to help you.

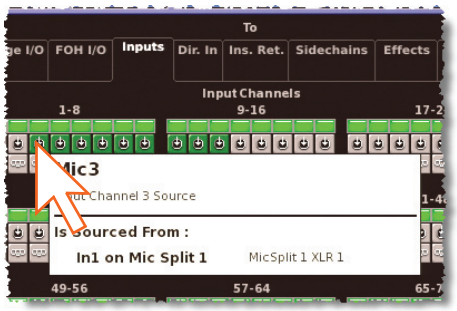
Automatic patching (AUTO)

You can patch a block of source patch connectors, just by selecting a single destination. This is called "automatic patching". When using automatic patching, note the following:

- Sources are selected in blocks (see "To select a block of patch connectors in the From section" on page 85).
- You can only select one block of sources.
- Destinations are restricted to a single type.
- The selected destination forms the start of the automatically patched range of destinations.
- Sources and destinations are automatically patched in ascending order, the lowest numbered source and the selected destination forming the first patch.
- Sources will only be patched up to the highest numbered destination of the current destination type. If there are any sources left over, automatic patching pauses. You can then patch these by selecting another destination.

>> To automatically patch a block of source channels

1. Click **AUTO.**
2. In the **From** section, select the source patch connectors (see "To select a block of patch connectors in the From section" on page 85).
3. In the **To** section, choose the destination patch connector that will form the start of the patched range. For example, input channel 3 (Mic3).
4. Click the destination patch connector. The sources will be patch in numerical sequence and in ascending order from here onwards.

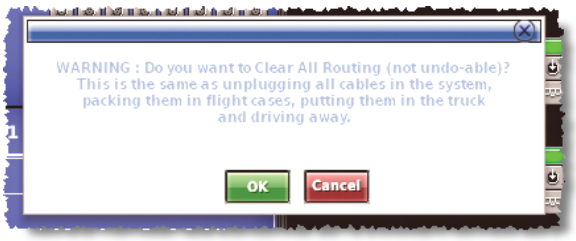


Clearing all current patching

Caution:
The CLEAR function button clears all current patching, and must be used with great caution. To alert you of the drastic nature of using this button, a WARNING appears.

>> To clear all current patching

1. Click **CLEAR.** The WARNING window (shown right) will appear.
2. Heed the warning and do one of the following:
   - If you want to clear all current patching, click **OK.**
   - To cancel the clear operation and close the WARNING, click **CANCEL.**

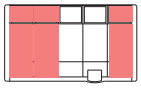


Chapter 9: Basic Operation

This chapter is intended to familiarise you with the XL8 Control Centre by showing you how to carry out some basic operations in order to get some audio out of it.

Note: *The following input bay operations can be carried out at any input bay.*

Setting a mic amplifier's input gain



The XL8 Control Centre has two input gains per channel, one is the remote gain for the analogue mic pre (stage box gain) and the other is the digital trim (console gain) (see "Mic amp input gain" on page 265). In its default state, the stage box gain is in the channel strip and the console gain is in each input fast strip. However, you can swap these sections over (by using the **gain swap**/**[SWAP]** button) to give you a more global control of the stage box gain.

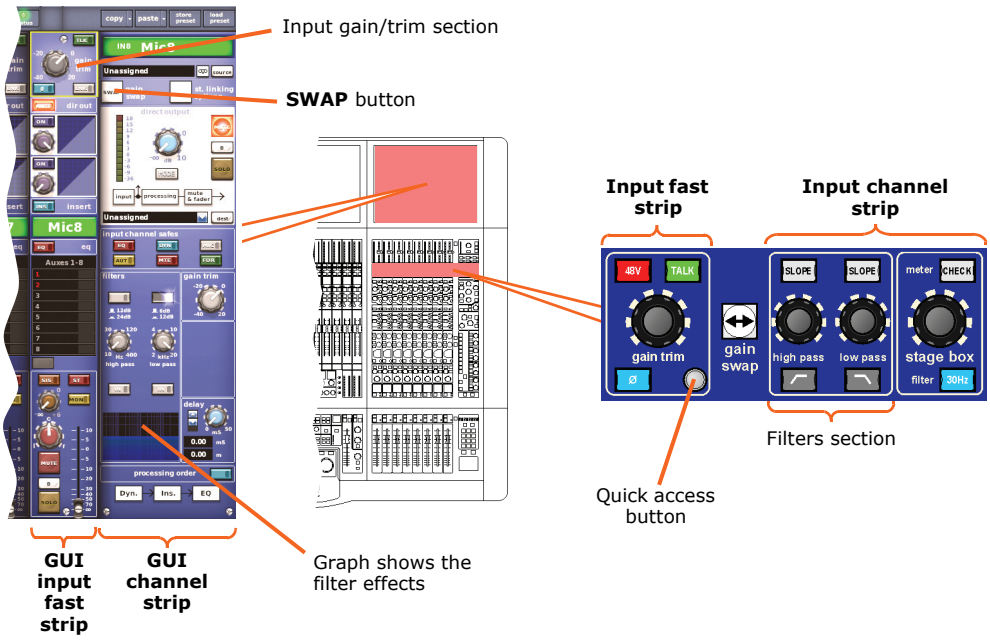


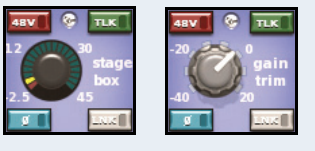
Figure 20: Gain and filters sections of the input strips

Note: *The* ***gain trim*** *control knobs in each input fast strip will adjust whatever has been 'swapped' to their respective strips. The* ***stage box*** *control knob in the input channel strip always controls the alternative 'swap' to the ones shown in the GUI input fast strips.*

>> To set the gain of the stage box/console

1 In the **gain trim** section of an input fast strip, press the quick access button. This selects the input channel and assigns its configuration detail area to the GUI channel strip (shown above), which contains the **SWAP** (gain swap) button.

2 Press the left/right arrowed **gain swap** button. This swaps console digital trim to stage box input gain (and vice versa). The diagram right shows the two types of gain that can appear in the input gain/trim section at the top of each GUI input fast strip.



3 Adjust the **gain trim** control knob to set the stage box input gain (2.5dB steps for the DL431 Mic Splitter and DL443 Analogue Jack I/O Module, and 5dB steps for the DL451 and DL351 Modular I/Os). Range is shown on the GUI.

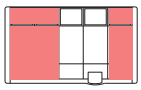
Adjust level to suit the Midas pre-amp characteristic; a suitable level could be one that only just illuminates the yellow LEDs. Drive the mic amps for that 'Midas colouration' — feel free to overdrive if you want.

4 After you have achieved the required gain state, press the left/right arrowed **gain swap** button again to swap back to console digital trim.

5 Adjust the **gain trim** control knob to set the console digital trim (gives +20dB to -40dB continuous trim) for preferred gain structure.

6 Set analogue remotes for initial set-up, then adjust digital trim for showtime.

Setting the high and low pass filters



When switched in, the high and low pass filters have two settings each, selectable via their respective **SLOPE** button. These filters can also be set via the GUI.

>> To set a filter

1 In the **gain trim** section of an input fast strip (see Figure 20, "Gain and filters sections of the input strips," on page 89), press the quick access button. This selects the input channel and assigns its configuration detail area to the GUI channel strip (shown above), which contains the **filters** section.

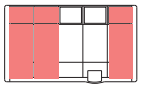
2 In the **filters** section of the input channel strip, press the filter select button (**high pass** or **low pass**) to switch the filter in.

3 If necessary press the filter's **SLOPE** button to set its slope (dB); its status is shown on the GUI. For the high pass filter, in = 24dB and out = 12dB, and for the low pass filter, in = 12dB and out = 6dB.

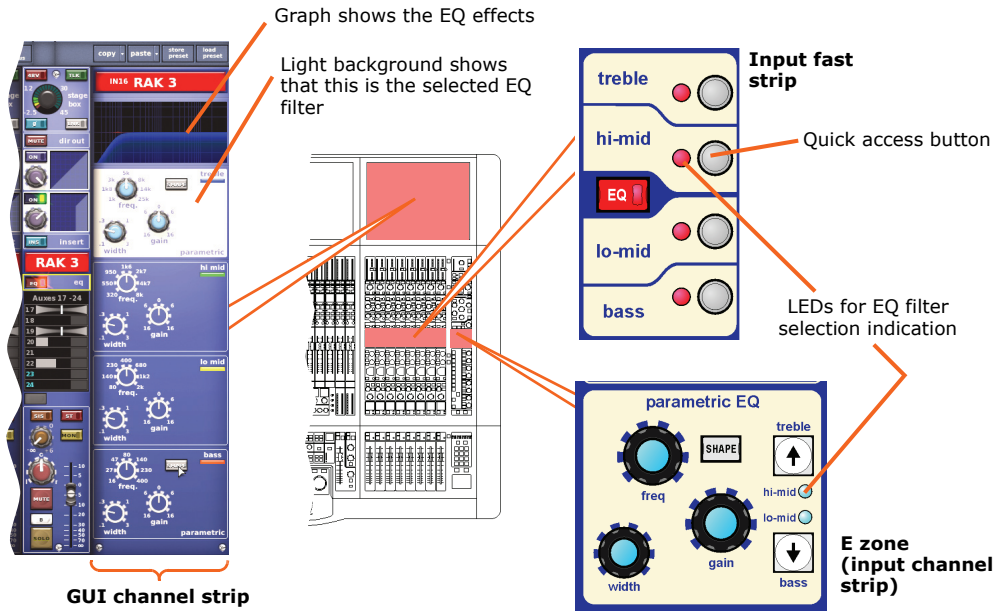
4 Adjust the **high pass**/**low pass** control knob to set filter frequency (Hz). The ranges are 10Hz to 400Hz for the high pass filter and 2kHz to 40kHz for the low pass filter.

Important:
Stage box hi pass — the remote stage box contains a 12dB/Oct 30Hz filter. It is recommended that this is used at all times for optimum A/D performance. However, it may be bypassed if extremely low frequency performance is required, for example, when testing the system.

Input equalisation (E zone)



Use EQ to equalise the input signal via the treble, hi-mid, lo-mid and bass filters, which are in the input channel strip's E zone. Treble and bass each have a parametric filter option with three specific shelving modes. Visual feedback for EQ is via GUI screen only, which also has a graphical representation of the filter.



>> To EQ the input signal

1. In the desired input fast strip, press **EQ** to switch the EQ in. This also selects the channel and assigns the EQ detail area to the GUI channel strip.

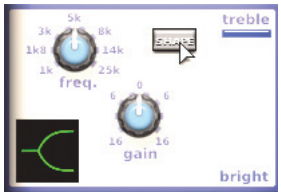
2. Do one of the following to select the EQ band:

   - In the input fast strip, press the quick access button of the desired band.
   - In the E zone, press the **treble**/**bass** up/down arrow buttons until the button/LED of the desired band is illuminated.

   On the GUI the currently selected EQ band will have a light coloured background. For example, **treble** in the above diagram.

3. In the E zone, adjust the **freq**, **width** and **gain** control knobs to apply EQ as desired.

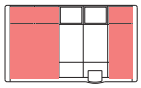
4. If you have selected **treble** or **bass,** press **SHAPE** (E zone) to cycle through the different shelving modes so that you can audition them. These are the 'minimum harmonic disruption' types (see "EQ (E zone)" on page 280), which are only available for **treble** (bright, classic and soft) and **bass** (deep, classic and warm). For example, the **bright** shelving mode of the **treble** band (shown right) as displayed on the GUI.

   Alternatively, you can click the desired **SHAPE** button in the GUI channel strip.

Note: **bright** *and* **deep** *use psychoacoustic phenomena to generate steep slopes that sound natural. These filters are called "minimum harmonic disruption filters".*

Input dynamics processing (D zone)



This section deals with assigning compressor and gate dynamics processors using the controls in the input channel strip's D zone. There are four compressors available — corrective, adaptive, creative and vintage — each with the option of hard knee, medium knee and soft knee (see "Compressor envelope modes" on page 341). Visual feedback for both compressor and gate is provided by meters in each input fast strip, the dashboard screen and just above/below the graph, which gives a representation of the compressor/gate action.

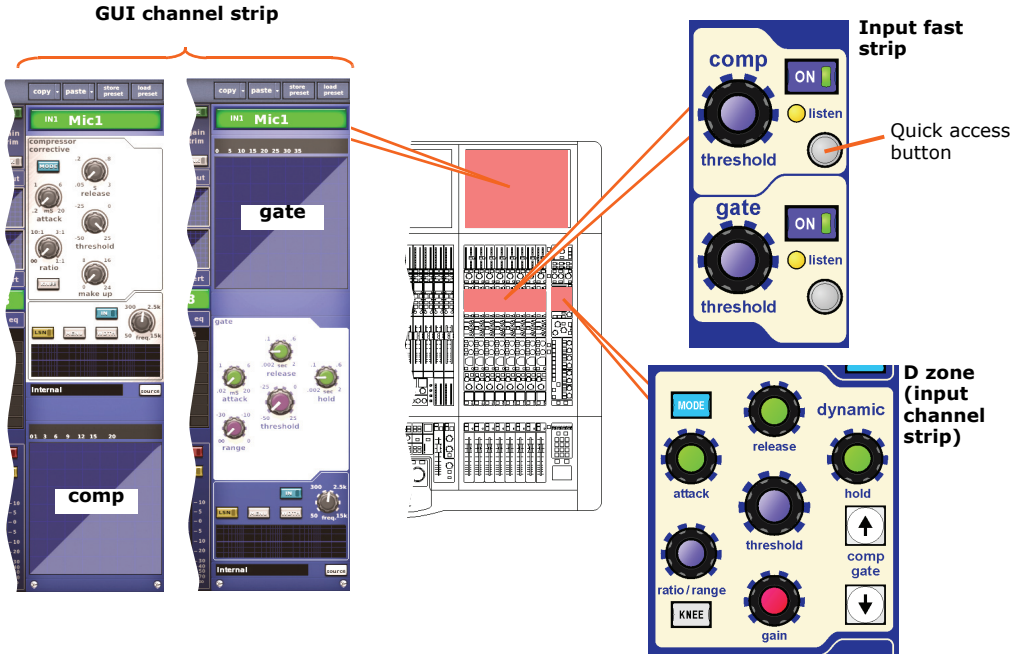
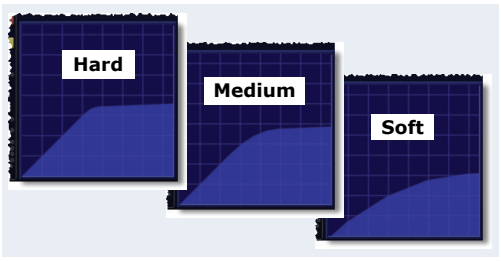


Figure 21: Compressor and gate sections of the input bays

>> To set up a compressor/limiter

1. In the desired input fast strip, press **ON** in the **comp** section to switch the compressor in.
2. Do one of the following to select the channel and assign the compressor detail area to the GUI channel strip:
   - In the **comp** section of the desired input fast strip, press the quick access button.
   - In the D zone of the input channel strip, press the up arrow (**comp**) button. The button will illuminate to show that the compressor is selected.
3. In the D-zone, operate the **attack, ratio/range** (ratio), **release, threshold** and **gain** controls to apply processing (see "Compressor" on page 272). You can set up a limiter by using a high threshold and a steep ratio (greater than 5:1).

   The **hold** control knob has no affect as it is only used for the gate.
4. Press **KNEE** to audition the different algorithms (hard knee, medium knee and soft knee as shown right).



5 Press **MODE** to try the different compressor types (**Corrective, Adaptive, Creative** and **Vintage**). For example, **Creative** shown right.



>> To set up a gate

1 In the desired input fast strip, press **ON** in the **gate** section to switch the gate in.

2 Do one of the following to select the channel and assign the gate detail area to the GUI channel strip:

- In the **gate** section of the desired input fast strip, press the quick access button.
- In the D zone of the input channel strip, press the down arrow (**gate**) button. The button will illuminate to show that the gate is selected.

3 In the D-zone, operate the **attack, ratio/range** (range), **release, threshold** and **hold** controls to apply processing (see "Gate" on page 276).

The **make up** control knob has no affect as it is only used for the compressor.

Output processing

All outputs — except for the returns — have a six-band PEQ with shelving modes on bands 1, 2 and 6, and have the option of using a GEQ (accessed via a **GEQ** button in GUI channel strip). The returns have a similar EQ to that of the inputs channels.

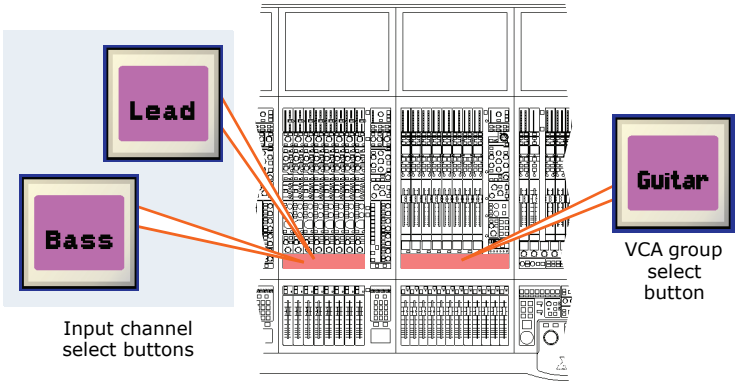
The outputs (except returns) have five compressor modes, which include all of the ones on the input channels, but with the addition of a shimmer mode. The returns have the same compressor modes as those of the input channels.

Using VCA/POP groups

VCA/POP groups allow simultaneous control over a number of channels. Being instantly recognisable, they provide a quick method of bringing particular channels to the control surface and save you having to remember their name/number.

You can choose channel group associations and also configure the colour and legend of each group's LCD select button, which is used for group member assignment and recall.

Any group can have any combination of channels (input/output) assigned to them, although in normal practice it is more likely that they will only have one or the other. Only input channel group members are unfolded to the surface (input bays). VCA groups include fader, solo and mute control, whereas POP groups merely bring a group of input channels to a desired area of the control surface for viewing or adjustment.

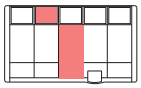


>> To assign channels to a VCA/POP group

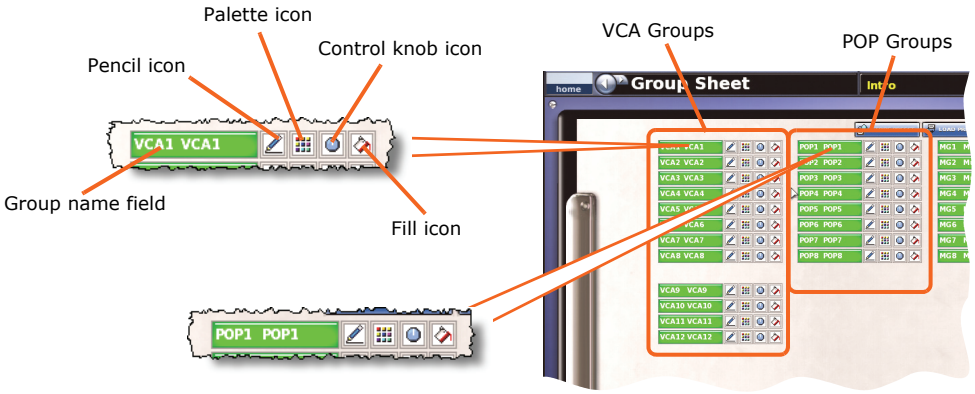
1. In the mix bay, press and hold down the desired group's LCD select button. For example, a VCA group named "Guitar". The button will start flashing when you are in group member selection mode and the inputs will jump to programme mode.
2. While still holding down the group's LCD select button, press the LCD select buttons of the channels that you want as group members. For example, "Bass" and "Lead". If necessary scroll to a new channel bank. A bank LED in the **input select** section (see Table 1 "Description of the navigational controls" on page 56) will flash if its bank contains a channel that is a member of the current group, but is not currently at the control surface.
3. Release the group's LCD select button. The group now contains the input channel members you have just chosen and the group will be selected.
4. Press the group's LCD select button again to exit the group.

*To quickly see which channels are in a particular VCA group, press its **SOLO** button on/off. Monitor this action on the dashboard screen (master bay GUI). Only the **SOLO** buttons of channels that are group members will be affected.*

Configuring VCA/POP groups



The default name and associated colour of a group, as shown on its LCD select button and on the GUI, can be configured to suit your own preference. You can also globally change the colour of a group's members to match its own colour. Configuration is done via the **Group Sheet** screen (shown below).



Note: *Clicking the control knob icon*  *opens the* ***VCA Groups*** *screen (a submenu of the* ***Control Groups*** *option), which provides group management control.*

>> To access the Group Sheet screen

Do one of the following:

- At the GUI, choose **home** ▸ ***Control Groups*** ▸ ***Group Sheet.***
- In the primary navigation zone, press the **vca / assignable controls** screen access button.

>> To set up the name of a VCA/POP group

Do one of the following:

- **Choose from a list of pre-configured names** Click the pencil icon  of the group. Then, choose the name from the drop-down list. For example, choose "E Gtr".
- **Type in a new name** Click within the name field of the group and then follow "To enter/edit text via the keyboard" on page 53.

>> To set up the colour of a VCA/POP group

1. Click the palette icon  of the group.
2. In the palette (shown right), click the colour you want. For example, choose blue.



>> To change the colour of all of a group's members to match that of its VCA/POP group

Click the fill icon  of the group. For example, if the colour of the VCA/POP is blue all of its group members will now be blue.

Setting up a mix

XL8 has 32 configurable mix buses, each of which can be aux mixes, subgroups and mix minus. The aux mixes can also be set up as stereo pairs or mono. 16 matrix outputs can also be accessed directly from input channels via level controls, which gives the XL8 the ability to provide 48 discrete mixes, plus left, right and mono. To keep the control surface manageable, access to these mixes is confined to two rows of control knobs across the input fast zone (**mixes** section of the input fast strips), which can be scrolled up and down on a 'virtual' surface.

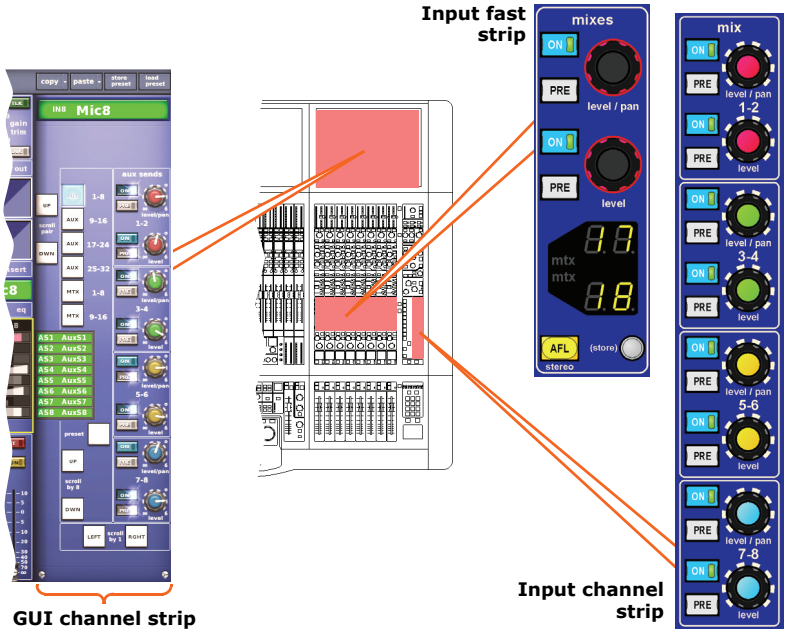


Figure 22: Mix sections in the input bays

Similarly to the inputs, outputs and groups, identification of mixes is by colour coding. The **mix** control knobs in the **mixes** section (input fast strips) and the **matrix** section (mix bay channel strip) change colour to match the currently selected mix pair. Similarly, on the GUI, the bank of mix buses in each input fast strip (see Figure 23 below) are colour matched, but also show mix bus status information.

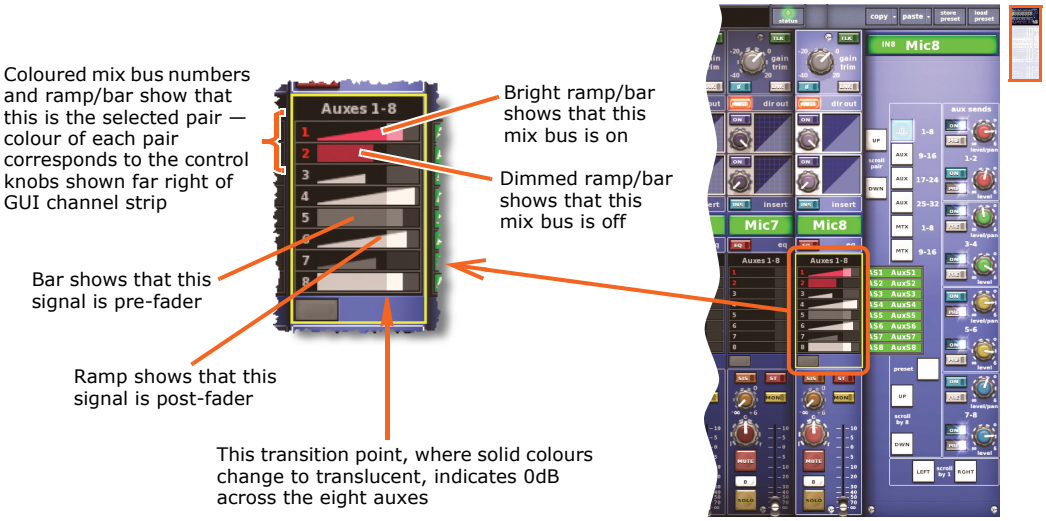


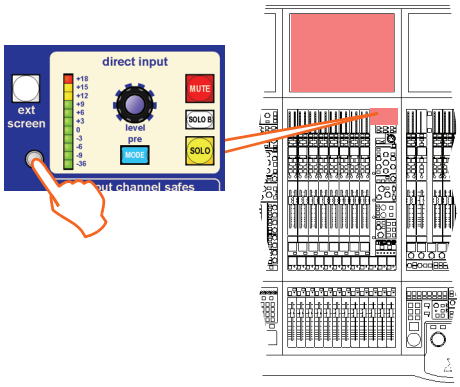
Figure 23: Typical mix section in a GUI input fast strip

Any pair of 48 mix buses can be locked onto the control surface of the input bays on an individual channel-by-channel basis, so that the two most crucial auxes for each channel (most pertinent effects auxes, main artistes' foldback, etc.) can be available at all times. For more information, see "Programming the mix preset" on page 99.

>> To select the mix bus mode

1 In the mix bay, select the aux you want. If necessary, navigate it to the control surface first (see "To navigate to a pair of mix buses" on page 63).

2 In the mix bay, press the quick access button that is adjacent to the **direct input** section of the output channel strip. This assigns the configuration detail area to the GUI channel strip, which contains the bus **MODE** button.



3 In the GUI channel strip, click **MODE** repeatedly to cycle through the mix modes (**mix**, **group** and **mix minus**) to choose the one you want. The currently selected mix mode is displayed in text to the right of the **MODE** button.

Group mode is fader only with no pre-fader. In mix minus mode all buses are initially routed — you have to switch a bus routing switch on to take it out of the mix. For information about stereo mix mode, see "Linking" on page 98.



>> To set up a mono aux mix

1 Making sure that the mix bus is not linked, select the bus mode as **mix** (see "To select the mix bus mode" above).

2 In the **mixes** section of the desired input channel (see Figure 22 "Mix sections in the input bays" on page 96), press the **(store)** quick access button. This selects the channel and assigns the mixes detail area to the GUI channel strip.

If necessary navigate the channel to the control surface first (see "How to navigate" on page 63).

3 Do the following:

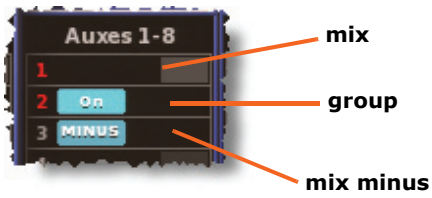
- **a** Press **PRE** to select pre-fader (on) or post-fader (off). Button status is only available on the GUI (see Figure 23 on page 96).
- **b** Press **ON** to route the aux mix from input to aux output.
- **c** Adjust the level control knob to change the signal level.

Selecting the type of mix

In addition to the mono, group and mix minus types of mix, you can also have a stereo aux mix. This is set up in the same way as for a mono aux mix, but the channels must be linked first. For information on selecting and setting up mixes, see "Setting up a mix" on page 96

How the different mixes are shown on the GUI

The input bay GUI screens indicate at a glance which type of mix is in operation. The diagram right shows an example of each mix type (with no levels set). Aux 1 has "mix" selected, aux 2 has "group" selected and aux 3 is selected as "mix minus".



Mix bus routing

You can route an aux or matrix (or even master output) to an effect or output. This is a GUI-only operation, which is done via the GUI channel strip or **Patching** screen (see Chapter 8 "Patching").

>> To route an aux or matrix to an effect or output

Select the mix bus and ensure its configuration detail area is assigned to the GUI channel strip. Then, do one of the following:

- In the GUI channel strip, open the drop-down list (shown right) and select the required mix bus destination.



- In the GUI channel strip, click **dest** (shown right). This will open the **Patching** screen and the appropriate tab. Carry out patching as required.



- Open the **Patching** screen via the GUI menu. Carry out patching as required.

Linking

You can link two mixes together, which is a GUI only feature. Pairs can only be created from adjacent mix buses of the same colour. To link a pair of mix buses, click the **LINK** button in the configuration detail area of either mix bus. For example, click **LINK** of aux 15 to link it to aux 16 (shown right).



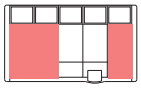
The linked parameters default to the user-configurable global default link settings, which are set via the GUI menu (choose **home** ▸ ***Preferences*** ▸ ***Linking***). However, you can override these default link settings for the pair via the **Stereo Linking Options** window (shown right), which is opened by clicking the **st. linking options** button (GUI channel strip).



In stereo mix mode the top control knob becomes pan adjust and the bottom one adjusts level. When creating a stereo mix, you can use either the odd or even output to link the two channels, but the mode of the odd channel is used on both.

For more details, see Chapter 10 "Stereo Linking" on page 117.

Programming the mix preset

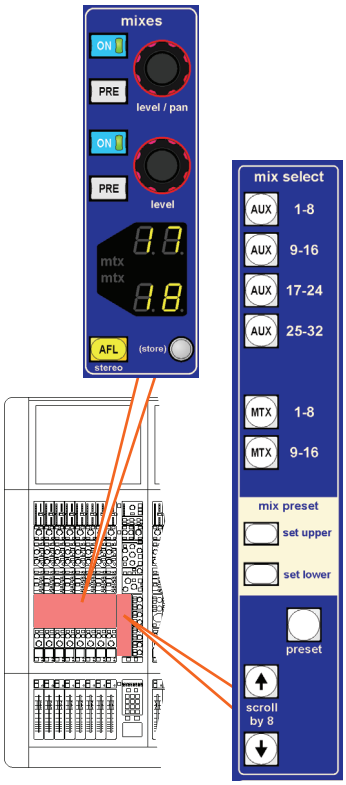


You can 'lock' the most relevant aux/matrix sends to each channel on a scene-by-scene basis, which can then be instantly recalled to the control surface. This means that you can have any two mix buses of your choice at any input channel. The mix buses are stored in a "mix preset", which is recalled using the **preset** button in the input channel strips. Programming of the mix preset is a simple process whereby individual mix buses can be added as desired.

>> To add a mix bus to the mix preset

1. Navigate the desired mix bus pair to the input fast zone (see "How to navigate" on page 32).
2. In the **mix select** section of an input channel strip, press the **preset** button.
3. In the **mix preset** section, press and hold down the **set upper**/**set lower** button and press the **(store)** quick access button in the desired input fast strip(s) (see "To set up a mono aux mix" on page 97). The **set upper** button is used for the odd numbered mix bus and the **set lower** button for the even numbered one.
4. Release the **set upper**/**set lower** button.

   If necessary repeat using the other **set upper**/**set lower** button to assign the other mix bus (odd or even) to desired input channels. For example, if you have just used the **set upper** button to assign aux 17 to desired input channels, press the **set lower** button to do the same with aux 18.



Repeat for different mix buses.

>> To activate the mix preset

Press **preset.** Any mix buses programmed in the preset are assigned to the input channels.

Fader flip

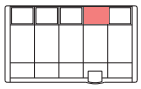
Fader flip is a GUI-only function that changes input fader control. By selecting fader flip, the input bay faders control the level of the selected aux send's contributions to the bus master, instead of controlling the input levels.

>> To switch fader flip on and off

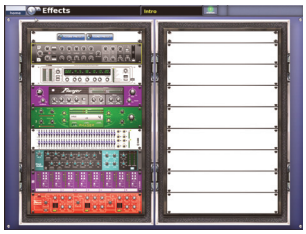
At a GUI screen, choose **home** ▸ ***Preferences*** ▸ ***General.*** Then, select the **Fader Flip** option (see "Changing the user interface preferences" on page 230).

Note: *When using fader flip to control the aux bus levels, always use the GUI to check the level. This is because the fader level markings have a maximum of +10dB, whereas the aux bus levels only go up to +6dB. On paired auxes, the faders only the control the level control knobs. The level/pan control knobs operate as normal for a stereo mix.*

Setting up the effects rack



You can set up the effects rack (in the GUI menu's **Effects** screen) to contain any of the eight available effects listed in the **Change Device Type** window, in any of the 16 rack positions. The diagram right shows the rack populated with all available effects.



The **assignable controls** (shown in the **Delay** diagram) are common to all effects, and let you control effects parameters via the I zone (output bay's control surface).

Delay — provides simple delay line-based effects. Delay times can be specified manually or you can use the 'tempo-tap' button. It has a three-mode delay algorithm:



- **Single** — one delay tap (mono or stereo processing).
- **Dual** — two delay lines (stereo insert only).
- **Ping-pong** — two delay lines with cross feedback.

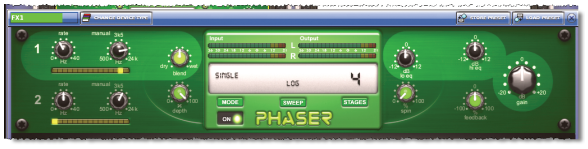
DN780 — is a reverberation device that emulates the Klark Teknik DN780 Digital Reverberator/ Processor unit and allows you to create unique acoustic environments of virtually any type.



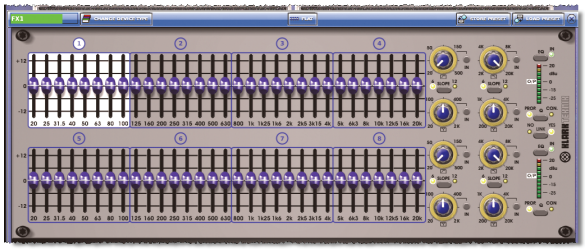
Flanger — has one or, if configured as stereo, two tap delay lines. One tap is fixed and the other tap position is modulated to provide 'thru-zero' flanging or single tap modulation when 'thru-zero' is off.



Phaser — has one, or if configured for dual operation, two stereo phasers connected in serial or parallel, according to mode setting.



Stereo Graphic EQ — basically, two versions of the internal GEQ of the XL8, but with the addition of a **LINK** switch.

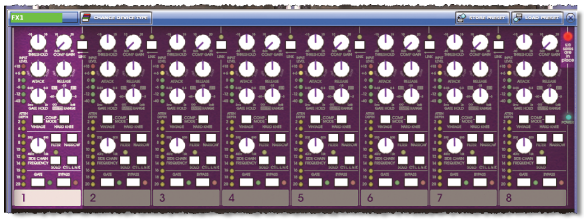


When both GEQs are linked together, their faders move a corresponding amount from the positions they were in when initially linked. So, although their adjustment will be equal, their dB values may be different. When unlinked, the GEQs are independent of each other.

Pitch Shifter — has two independent channels that can independently shift the pitch of signals up/down to correct poor pitching or generate harmonies. The pitch change can also be modulated as an effect.



SQ1 Dynamics — is an emulation of the Klark Teknik Square ONE Dynamics, which is an 8-channel analogue dynamics processor. Used for the precise manipulation of compression parameters, it also includes gating for creative and corrective applications, and channel linking for stereo/multi-channel operation.

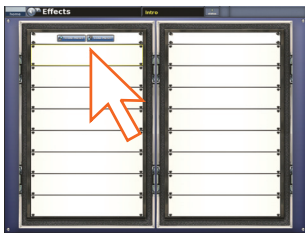


3 Band Compressor — is a minimum phase shift (analogue style) implementation that guarantees coherent band summing, even at the most extreme crossover point settings. Each band provides full control of its compressor's action, with partially adaptive time constants ensuring the most natural results from even the most variable sources.



>> To add an effect to the effects rack

1. At the output GUI screen, choose **home** ▸ ***Rack Units*** ▸ ***Effects.*** Alternatively, press the **effects / graphics** screen access button in the primary navigation zone.
2. Choose the rack position and click within it.

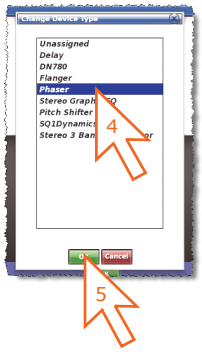


3 In the effect's (empty) window, click **Change Device Type.**



4 In the **Change Device Type** window, choose the device type. For example, "Phaser".

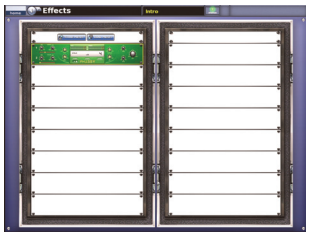
5 Click **OK.**



6 Change the parameters of the new effect device as necessary. For example, adjust control knobs, press buttons etc. You can even change the effect's name by editing its name field (upper-left corner of effect window). You can do this via the GUI or from the I zone using the output bay GUI (see Figure 8 "Main areas of control surface" on page 25).

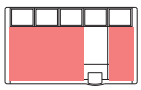


7 Click **CLOSE** to exit. The new effect will appear in the effects rack.



You can now patch the new effect, which will be on the **Effects** tabs of both the **From** and **To** sections of the **Patching** screen. For information on how to patch, see Chapter 5 "Patching" on page 23.

Simple routing to master stereo outputs

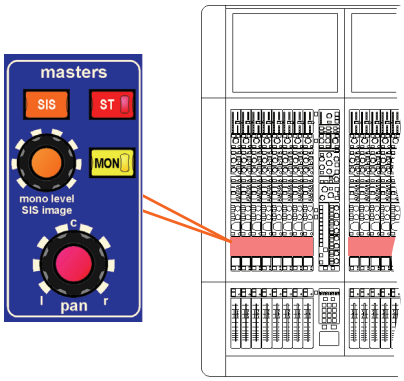


The following shows you how to obtain audio.

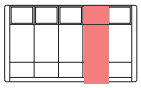
>> To obtain audio

1 Make sure nothing is muted and the master faders are up.

2 In the **masters** section of an input fast strip (or the output channel strip), press the **ST** (stereo) button. You should have audio.

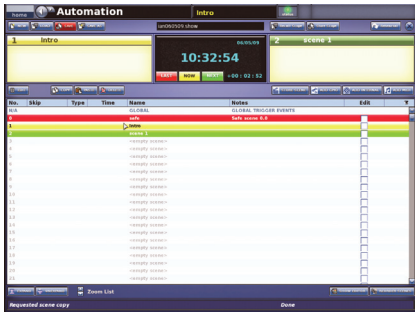


Automation



XL8 automation is managed from the **Automation** screen of the GUI menu, with support from the **automation** section of the control surface (output bay).

The **Automation** screen (a typical example is shown right) has the following functions and features:



- **Show management** — see "Managing the shows" on page 103.
- **Scene management** — see "Managing the scenes" on page 104.
- **Event management** — see "Additional control — managing events" on page 106.
- **Cue list** — shows the scenes and point scenes in performance order. The cue list includes information such as scene number, name, notes etc. You can expand and unexpand the point scenes and 'zoom' the list on/out. It also lets you reorder the scenes.
- **Scope** — the **Recall Scope** and **Store Scope** buttons open the scope screens, from which you can select the automated controls that you want to leave in/out of a scene when it is stored or recalled.
- **Rehearsal** — the **Rehearsal** button lets you carry out a rehearsal, which will 'skip' (leave out) any scenes that you choose.

Note: *With no show loaded, the* ***Automation*** *screen will be blank.*

>> To open the Automation screen

Do one of the following:

- At the GUI, choose **home** ▸ ***Automation*** ▸ ***Automation.***
- In the primary navigation zone, press the **automation / filing** screen access button.

Managing the shows

The four buttons (**NEW**, **LOAD**, **SAVE** and **SAVE AS**) towards the top of **Automation** screen let you create a new show, load an existing show, update the current show or create a new show using the current settings.

Important:
We recommend that you save your show settings regularly (see "Saving a show versus storing a scene" on page 46). The XL8 will indicate that there are show settings to be saved by changing the background colour of the SAVE button to red (shown right).



The eye icon in the **Automation** screen (just under the **ADD MIDI** button) opens the **Show** window. This window contains a number of filter options, such as empty scenes, MIDI events etc., that you can choose to exclude from your show.

>> To create a new show

1. Click **NEW.**
2. At the **Enter new show name:** message window, type your chosen name for the new show.
3. Click **OK.** You can now create and manage the scenes for your new show.



>> To save a show or create a new one from the current settings

Do one of the following:

- To update the current show with the latest settings, click **SAVE.**
- To create a new show using the current show settings, click **SAVE AS.** Then, in the **Save File** window (shown right), type in the name of the new show in the **Save this file as:** name field. Click **OK** to save the new show and close the window.
- To overwrite an existing show, click **SAVE AS.** Then, in the **Save File** window (shown right), click the show you want to overwrite to select it, click the **Overwrite existing?** box to select it this option and then click **OK.**

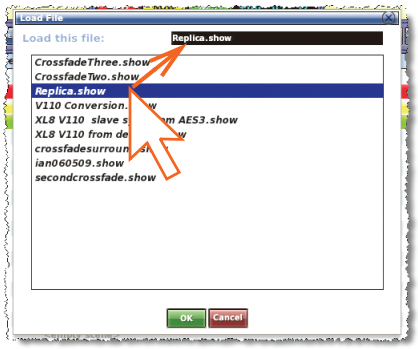


>> To load a show

1. Click **LOAD.**
2. In the **Load File** window, click the show file you want to load (shown right). For example, "Replica.show". The file name will appear in the **Load this file:** name field.

   The **Load File** window will contain a list of all the shows currently loaded. If the one you want is not there, import it (see "To load (import) a show file from a USB memory stick" on page 112).
3. Click **OK.** The file will start loading and the window will close.

   When the file has finished loading, its name will appear in the show file name field (to the right of the **SAVE AS** button).



Managing the scenes

Up to three scenes in the cue list will be highlighted to indicate your position in the show, as follows:

- 'last' (red) — the scene immediately before the most recently loaded one.
- 'now' (yellow) — the most recently loaded scene.
- 'next' (green) — the next available 'non-empty' scene.

The **automation** section in the output bay (see item J in Figure 8 "Main areas of control surface" on page 25) supports the **Automation** screen by providing controls for scene navigation, selection and management. The jogwheel is a unique automation controls, whereas the other buttons are replicated on the GUI.



>> To navigate the scenes/point scenes

Rotate the jogwheel. Individual scenes/point scenes are scrolled forwards/backwards, wrapping back to the beginning/end of the show. Scrolling includes empty scenes and doesn't affect scene selection.

When using the jogwheel, the **next** LCD button changes to yellow and tracks the 'now' scene, providing useful feedback. This button only selects non-empty 'now' scenes.

>> To recall a scene

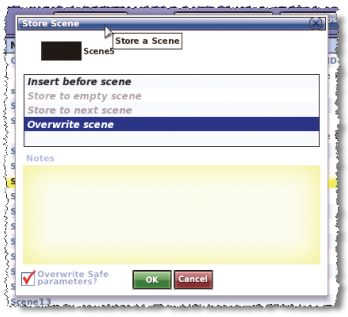
Important:
When recalling a new scene, make sure monitor output levels are low, as the new scene's settings may produce higher audio output levels than the one it is replacing. Also, recalling a scene clears any unsaved adjustments made to the previous scene.

Press **last**, **now** or **next** as desired.

>> To create a new scene using the current settings

1. Do one of the following:
   - In the automation section, press **store.**
   - In **Automation** screen on the GUI, click **STORE SCENE.**
2. In the **Store Scene** window, type in the scene name if necessary.
3. In the **Notes** panel, type in any scene notes as desired.
4. Do one of the following:
   - Click "Insert before scene" to put the new scene in between the one currently highlighted in yellow and the scene immediately before it.
   - Click "Store to empty scene" to put the new scene in the one currently highlighted in yellow, provided it is empty.
   - Click "Store to next scene" to put the new scene in the next one, provided it is empty.
   - Click "Overwrite scene" to overwrite the scene currently highlighted in yellow.

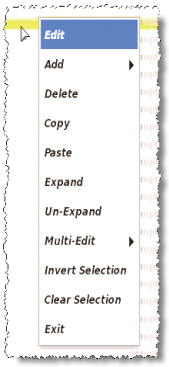
   The options are context-sensitive, so some may be greyed-out to show that they are unavailable. An **OK** button will appear at the bottom of the window when a valid store scene option has been selected.
5. Click **OK.**



Additional control — managing events

You can create crossfades and you can use the MIDI or GPIO functions of the XL8 to control the parameters of an external device (outgoing) — and conversely you can use an external device to control the XL8 (incoming). Also, by using the XL8's unique 'internal' event option, you can trigger events from within the showfile itself. All this is done by creating events in scenes/point scenes.

You can have any number and types of events in any scene/point scene; their parameters are set up and edited in an **Edit Event** window. Similarly to scenes/point scenes, you can skip events during rehearsals.



Events (and scenes/point scenes) have a right-click menu (shown right) that lets you to create, edit and copy events.

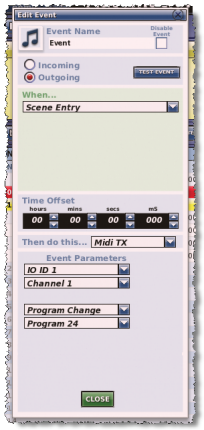
The following shows what some of the event symbols in the **Automation** screen mean: = currently selected event; = MIDI event; = GPIO event; = internal event/crossfade; = incoming event; and = outgoing event.

>> To create an event

Select the scene in which you want to create the event, and then do one of the following:

- Click the **ADD GPIO**, **ADD INTERNAL, ADD MIDI** or **ADD CROSSFADE** button as necessary.
- From the right-click menu, choose ***Add*** ▸ ***Midi Event***, ***Add*** ▸ ***Internal Event*** or ***Add*** ▸ ***GPIO Event*** as necessary.

>> To edit an event



1. Open the **Edit Event** window by doing one of the following:
   - Right-click the event you want to edit and then choose ***Edit.***
   - Select the event you want to edit and then click **EDIT.**
2. In the **Edit Event** window, choose your options as necessary. For example, you can use a program change to trigger the event.
3. At the upper-right corner of the **Edit Event** window, click "X" to close it.

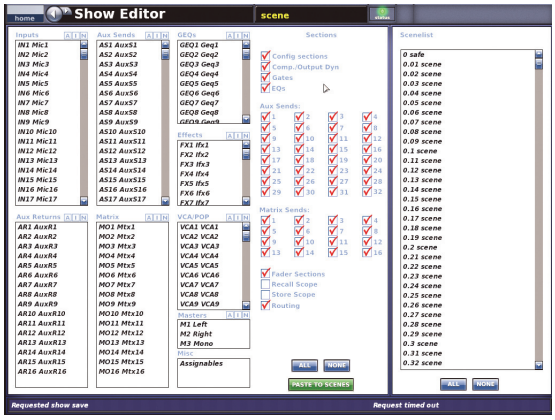
Changes in the **Edit Event** window are *live*, that is, they are immediately reflected in the show file. So you don't have to save the scene, as these are not audio parameters.

>> To copy and paste an event

1. Right-click the event you want to copy, and then choose ***Copy.***
2. Do one of the following:
   - Select the scene in which you want to paste the copied event.
   - If the scene already contains an event(s), select an event after which you want to paste the copied event.
3. Right-click to open the menu, and then choose ***Paste.***

Show editor

The show editor is a GUI-only function that allows you to very easily copy and paste settings through scenes. This is done via the **Show Editor** screen.



The **Scenelist** on the right of the screen is a cue list of the current show. Source lists (channels, GEQs, effects and groups) are to the left of the screen, from which you can copy the settings, and in the middle (**Sections**) are the areas you can copy. For details of the parameters per area, see Appendix O "Parameters Copied Through Scenes" on page 585.

>> To open the Show Editor screen

Do one of the following:

- From the GUI menu, choose **home** ▸ ***Automation*** ▸ ***Show Editor.***
- At the **Automation** screen, click **SHOW EDITOR.**

>> To copy and paste sections to a scene(s)

1. In the **Show Editor** screen, choose from the sources (far left) that contain the settings you want to copy from the lists. You can choose any combination.
2. Under the **Sections** heading, choose the sections that you want to copy. Ticked options will be copied. You can use the buttons underneath to help you, as follows:
   - Click **ALL** to select all of the sections.
   - Click **NONE** to deselect all selected sections.
3. In the **Scenelist**, click the scene(s) in which you want to paste the settings. You can use the buttons underneath the list to help you, as follows:
   - Click **ALL** to select all of the scenes in the list.
   - Click **NONE** to deselect all selected scenes.
4. Click **PASTE TO SCENES.**

Configuring the inputs and outputs

Similarly to the VCA/POP groups, you can change the name and colour of each of the inputs and outputs. This is done via the GUI at their respective sheet screens. For configuration details, see "Using VCA/POP groups" on page 94.

>> To open the Input/Output Sheet screen

Do one of the following:

- At the GUI, choose **home** ▸ ***Input Channels*** ▸ ***Input Sheet*** to open the **Input Sheet** screen, or choose **home** ▸ ***Mix & Outputs*** ▸ ***Output Sheet*** to open the **Output Sheet** screen.
- In the primary navigation zone, press the **inputs/outputs** screen access button once to open the **Input Sheet** screen or twice to open the **Output Sheet** screen.

Using copy and paste

The **copy** and **paste** buttons (upper-right corner of GUI) let you copy the parameters of a channel's detail area (EQ, compressor, gate etc.) or all of its details areas, and paste them to another channel/all channels of a similar type. Both buttons have a right-click menu.



>> To copy a detail area to a channel/all channels

1. Navigate the detail area to its local channel strip (see "Selecting a detail area" on page 65).
2. Click **copy.**
3. Do one of the following:
   - To copy the detail area to another channel, select the channel and then click **paste.** As the copied parameters are still stored, you can paste to as many channels as you want.
   - To copy the detail area to all other channels, right-click **paste** to open its menu and then choose ***Paste To All.***



>> To copy all parameters to a channel/all channels

1. Select the channel from which you want to copy all parameters.
2. Right-click **copy** and then choose ***Copy All.***
3. Do one of the following:
   - To copy all the parameters to another channel, select the channel and then click **paste.**
   - To copy all the parameters to all other channels, right-click **paste** and then choose ***Paste To All.***



Copy and paste rules and restrictions

- You can only copy and paste similar functions. For example, you can't copy the input EQ from one channel to the output EQ of another, as they are different.
- You can only copy and paste across similar channel types. For example, you can't copy from an aux and paste to a matrix.
- Copying and pasting across inputs is restricted to the input bays only.
- Channel names are not copied.
- Compressor and gate side chain listen cannot be copied.

For details of the channel parameters that are copied across, see Appendix M "Parameters Affected By Copy And Paste" on page 519.

User library (presets)



The XL8 has a user library where you can store settings, such as for the EQ or even the whole channel. For example, you may wish to store the EQ settings of a singer who may be called upon to perform during a future show. You can then easily recall these EQ settings to the appropriate channel when required.

The settings are stored as presets, which are saved in a library. The library files are managed via a **Preset Manager** screen in the GUI menu. This screen has **New**, **Load**, **SAVE** and **Save As** function buttons that let you create new libraries, load existing libraries, save the current library or give it a new name. You can also delete presets from the library.

Important:
Before you can save/load a preset, you need to create a new preset library or open an existing one.

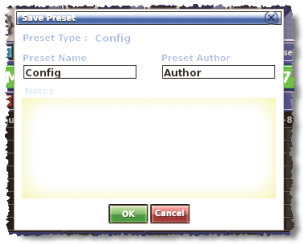
>> To create a new preset library

1. From the GUI menu, choose **home** ▸ ***Preset Manager.***
2. In the **Preset Manager** screen, click **New.**
3. In the **Enter new Library name window**, type in your chosen name for the new preset library.
4. Click **OK.**



>> To save a preset to the user library

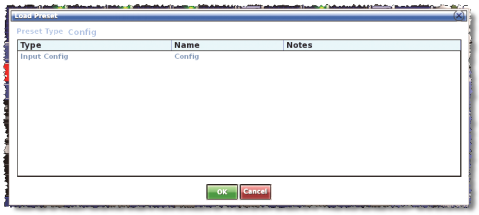
1. Navigate your chosen settings to the channel strip.
2. At the GUI, click **store preset.**
3. In the **Save Preset** window, do the following:
   - In the **Preset Name** field, choose the preset.
   - In the **Preset Author** field, type in your name.
   - In the **Notes** field, type in any notes to help you identify the contents of the preset.
4. Click **OK.**



If a message window opens containing the text "There is already an existing preset of that name Do you wish to overwrite ?", click **OK** to overwrite the existing preset. Otherwise, create a new one by clicking **Cancel**, choosing another preset name and then clicking **OK.**

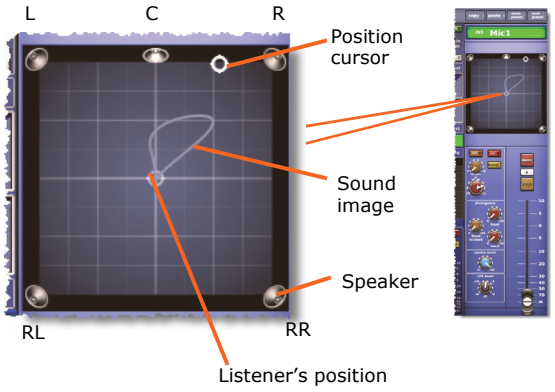
>> To load a preset

1. Select the channel in which you want to load the preset.
2. At the GUI, click **load preset.**
3. In the **Load Preset** window, choose the preset you want to load.
4. Click **OK.**



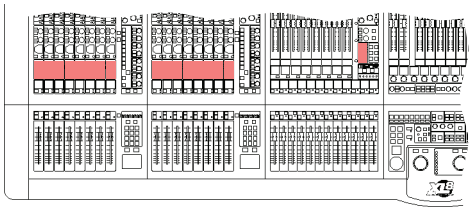
Surround panning

In addition to stereo and left-centre-right (LCR) panning, XL8 has three surround panning modes: quad; left, centre, right and surround (LCRS); and 5.1 surround. To help you visualise the surround panning envelope, the masters detail area of the GUI channel strip has a spatial diagram (shown right) that updates when you operate the panning controls.



The 5.1 panning mode uses six matrix channels, while quad mode uses four (left and right on both the front and surround). Although the LCRS mode uses five channels (front left and right, centre and surround left and right), both surround channels are the same. (In an LCRS surround panning arrangement, you can have a single surround speaker positioned directly behind the listener.)

The sound image is controlled via the **masters** sections of the input fast strips and mix channel strip (shown right). The figure below shows the recommended[1] 5.1 surround system configuration.



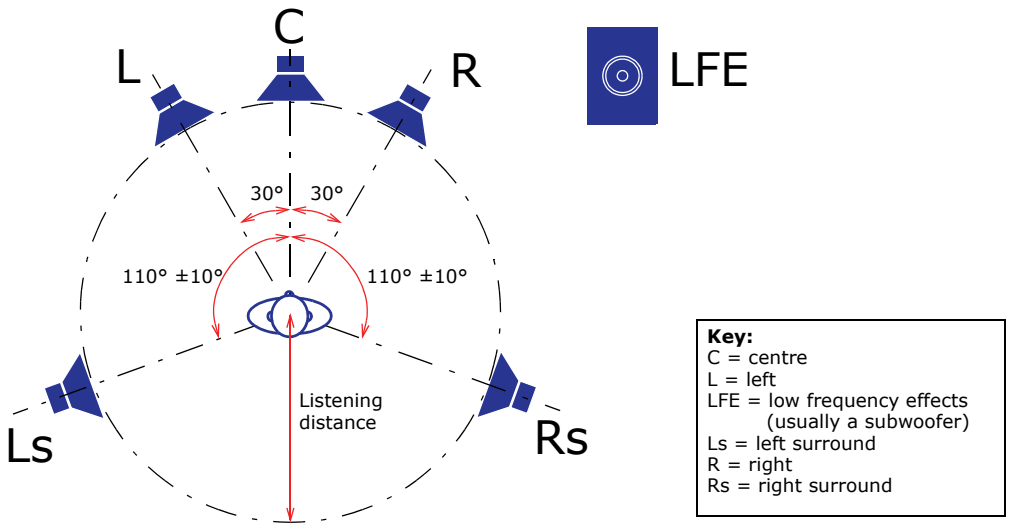
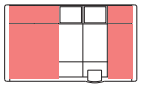


Figure 24: 5.1 surround panning loudspeaker arrangement

In surround mode, the **SIS** button routes the channel to the surround buses in much the same way that the **ST** button routes to the master buses. Surround panning mode is selected via the **Surround Mode** options of the **Preferences** screen (choose **home** ▸ ***Preferences*** ▸ ***General***).

1. Reference - ITU-R BS.775.1, 1994. *Multichannel stereophonic sound system with and without accompanying picture.* International Telecommunications Union.

Two-man operation



The XL8 Control Centre can be operated by two people simultaneously. To do this one or two of the input bays are designated as area B. Initially, all input bays are area A, but after they have been designated as area B, both areas operate independently of each other.

This feature can also be used by a single operator if they require somewhere to store important channels. In this case, area B can be used in the same way a 'channel 25' would be used on an analogue console.

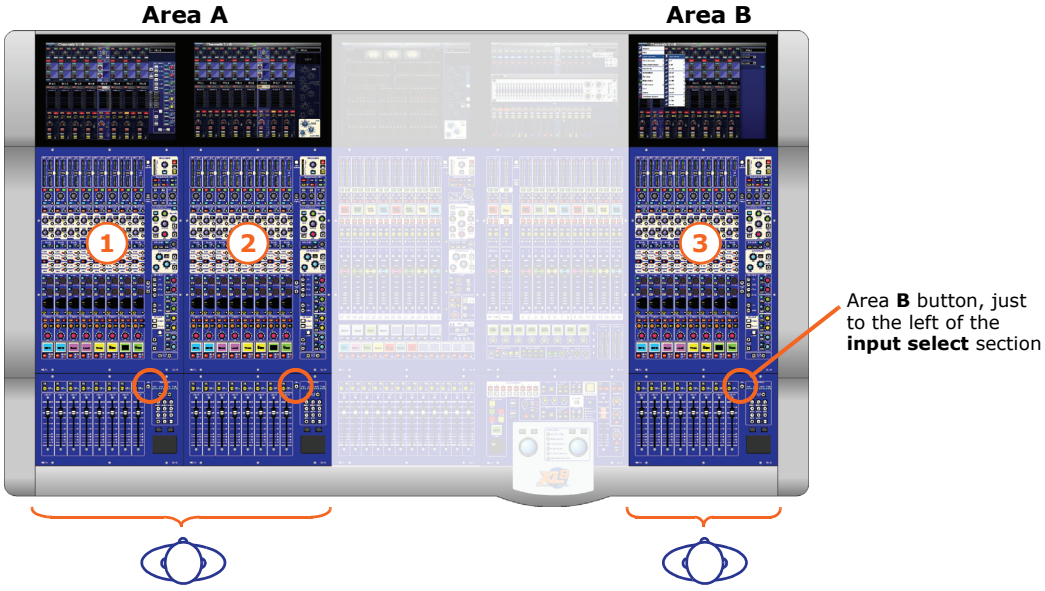
During two-man operation the mix and output bays are common to both areas. Also, you can have the same channel selected simultaneously in both areas (A and B).

VCA/POP groups can be pre-selected to populate area A or B, and a single group of inputs can have members in both areas of the control surface. An operator can then recall them to their own area to work on.

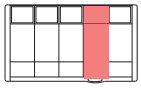
Note: *When operating in area B, remember to select the B option as necessary, particularly in the monitor section. Also note that solo B (also for talkback) is totally independent of area B, which is used for navigation only.*

>> To set up the XL8 for two-man operation

Press the **B** button (see diagram below) in the input bay(s) that you want to operate as area B. The following diagram shows a typical configuration for area A and B operation, where input bays 1 and 2 are area A and input bay 3 is area B.



Saving your show files to a USB memory stick

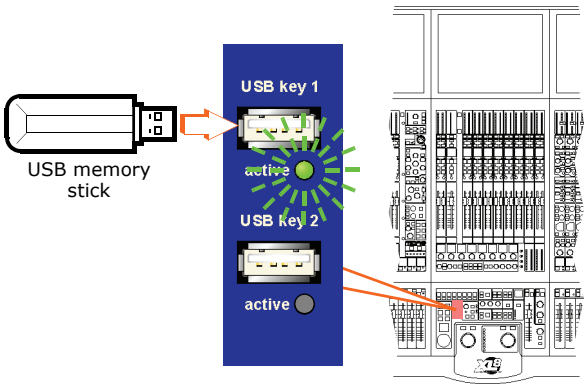


When you are satisfied that your show file is how you want it, we recommend that you save it to a removable storage device (USB memory stick). This provides a valuable back up should the show file stored in the internal memory of the XL8 be lost, for example, due to inadvertent deletion. You can also load show files onto the XL8 from the same storage device.

>> To save (export) a show file to a USB memory stick

1 If necessary close and save the show file you want to export. You can't export a show file that is open.

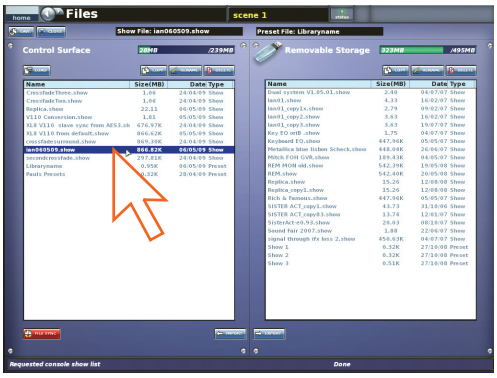
2 Insert the USB memory stick into the active USB socket, which is the one with the flashing **active** LED. For example, **USB key 1** (shown right).



3 Do one of the following:

- At the GUI, choose **home** ▸ ***Files.***
- In the primary navigation zone, press the **automation / filing** screen access button twice.

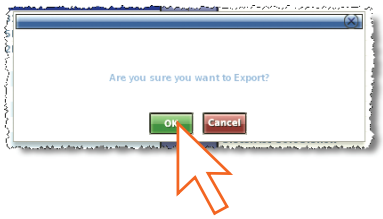
4 You may see an "Analysing..." message in the **Removable Storage** panel, which means that the Midas folder on the USB memory stick is being read. Wait for the message to clear. Then, in the **Control Surface** panel, click the show file you want to copy (shown right).



Both lists show user libraries (presets) as well as show files. If there are neither of these file types on the USB memory stick, the **Removable Storage** panel will be empty.

5 Click **EXPORT.**

6 In the **Are You Sure you Want To Export?** message window, click **OK** (shown right). The file will start copying to the USB memory stick.



7 When your show file appears in the **Removable Storage** panel, it has finished copying to the USB memory stick. Remove the USB memory stick.

>> To load (import) a show file from a USB memory stick

The procedure is similar to the export procedure, as detailed in "To save (export) a show file to a USB memory stick" above, but select the file to be imported to the XL8 from the **Removable Storage** panel and then click **IMPORT**.

External AES50 synchronisation

If you want to connect AES50 audio between two Midas digital consoles the slave console must be set to external AES50 synchronisation, irrespective of the synchronisation source of the master console.

	Console 2 sync setting			
Console 1 sync setting	***Master***	***Word clock***	***AES3***	***External AES50 from console 1***
Master	Not valid	Not valid	Not valid	Valid connection
Word clock	Not valid	Not valid	Not valid	Valid connection
AES3	Not valid	Not valid	Not valid	Valid connection
External AES50 from console 2	Valid connection	Valid connection	Valid connection	Not valid

A valid connection can be a tie line between the stage routers or the secondary port (Bx/By) of a mic splitter that has its primary port (Ax/Ay) connected to the master console.

Make sure that the DL431 Mic Splitter is set to synchronise from the master console.

Security (locking mode)

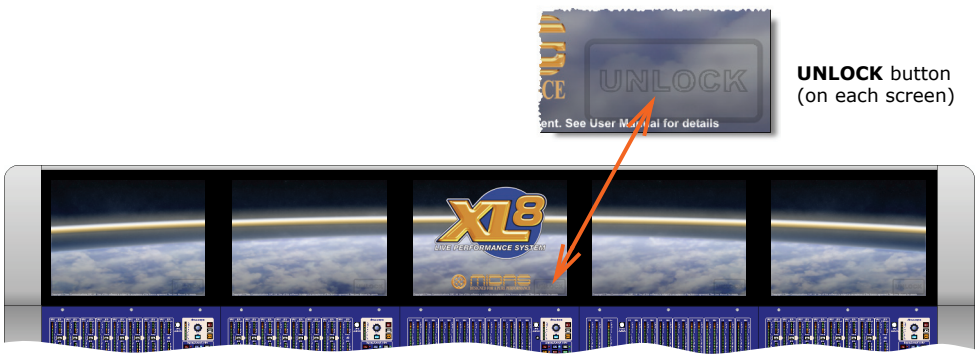
To preserve the current state of the XL8 Control Centre and to prevent unauthorised adjustment of its settings, you can lock it; this is a GUI-only function. When locked, none of the controls on the control surface will function and the XL8 Control Centre will be totally locked out.

>> To lock the XL8 Control Centre

At a GUI screen, choose **home** ▸ ***Lock.***

>> To unlock the XL8 Control Centre

At a GUI screen, click the **UNLOCK** button (shown below). The XL8 Control Centre will revert to the state it was in when it was previously locked.



Advanced Operation And Features

Chapter 10: Stereo Linking



This chapter describes stereo linking, or *channel pairing*, which lets you configure two adjacent channels as stereo. The diagram right gives an example of two linked channels (auxes 15 and 16).

By default, all channels of the XL8 are unpaired (mono). When paired, the controls for each signal path act simultaneously on both the left and right signal paths. Individual trims, for example, adjusting the mic amp gains to balance stereo mix inputs, can be applied to the left and right audio paths individually. The channels are not truly mono at this time and any settings necessary to preserve the audio prior to trimming, such as dynamics side chain linking, are maintained.

When linking previously unlinked channels, some normalisation of the prospective left and right control settings — which may be quite different — is required. The XL8 does this by automatically copying the control settings of the left (odd-numbered) channel, with the exception of the pan controls, to the right channel. The pan controls, depending on whether they are in the left or right audio paths, should be manually set to hard left or hard right, respectively.

On the input channels, linking is restricted to bank only — there is no link switch on the far right channel of each bank (input fast zone). For example, you cannot link input channel 8 with channel 9, which are in different banks.

Note: *On the GUI, although the far right channel of each bank has a* ***LINK*** *button, this does not function.*

Output channels don't have a link button on the control surface. However, there is one in the configuration detail area of the GUI channel strip (see "Configuration controls" on page 298). Only the left (odd) channels have a link button, so that they can only be linked to the adjacent (even) channel on the right.

>> To link two input channels

1. If necessary navigate the bank of inputs to the control surface.
2. In the left input channel of the two you want to pair, press the **LINK** button (top of fast strip).
3. Set the **pan** control knob in the left channel fully anti-clockwise and the one in the right channel fully clockwise.

>> To link two output channels

1. If necessary navigate the bank of outputs to the mix bay control surface. Then, select the left channel of the two you want to pair and assign its configuration detail area to the channel strip.
2. On the mix bay GUI, click the **LINK** button. Refer to the diagram of the GUI strip at the beginning of this section.

3 Set the **pan** control knob in the left channel fully anti-clockwise and the one in the right channel fully clockwise.

Changing the linking options

You can choose which control options will be linked across the channel pair. There are two ways to do this: globally and per pair. The per pair settings always override the global ones. For details of the linked parameters for each section, see Appendix N "Parameters Affected By Stereo Linking" on page 547.

>> To set the global default stereo linking options

1 At the GUI, choose **home** ▸ ***Preferences*** ▸ ***Linking.*** This will open the **Stereo Linking Default Settings** screen (shown right), which is divided into channel types.



2 In a channel section, select the desired default stereo linking options and then click the **Change Existing** button at the bottom of the section.

Repeat for the other channels that you want to change the default stereo linking options of.

Selected control options will be linked across the channel pair of the appropriate type. Unselected controls remain independent on each channel.

>> To set the stereo linking options for a channel pair

1 Make sure that one of the paired channels is selected and its configuration detail area is assigned to the GUI channel strip, and then click the **st. linking options** button in the GUI channel strip.

2 In the **Stereo Linking Options** window, select the controls that you want to be linked across the channel pair.

3 Click **CLOSE.**



Chapter 11: Panning

The XL8 has two main types of panning mode, default and surround. The default mode comprises stereo and LCR panning formats, and only uses the channels for the front loudspeakers, while the surround mode includes channels for the rear surround loudspeakers. For more information, see "Surround panning" on page 110.

The following table shows the panning formats available on the XL8.

Table 3: Panning formats

Panning mode	*No. of channels*	*Format*	*Channel types*
Default	2	Stereo	L, R
	3	LCR (SIS™)	L, C, R
Surround	4	Quad	L, R, Lr, Rr
	4	LCRS	L, C, R, S
	5	LCRS	L, C, R, Ls, Rs
	6	5.1	L, C, R, Ls, Rs, LFE

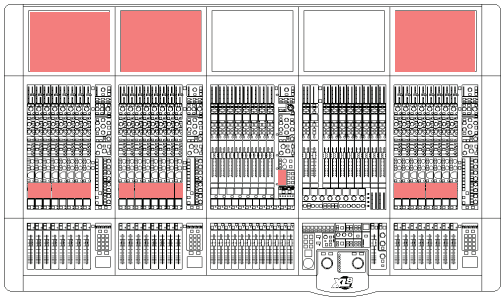
Key: L = left; R = right; C = centre; Lr = left rear; Rr = right rear; Ls = left surround; Rs = right surround; S = surround; LFE = low frequency effects (usually handled by a subwoofer)

>> To select the panning mode

At a GUI screen, open the **Preferences** and select the type of panning you want (see "Setting the configuration preferences" on page 229).

Stereo panning

The control surface controls for stereo panning are located in the **masters** sections; these are located in the output channel strip (mix bay) and in each input fast strip. The **pan** control in each **masters** section may be switched for either conventional or spatial imaging system (SIS™) stereo operation via the **ST** or **SIS** switches, respectively.



SIS™ (LCR) mode

The MIDAS SIS™, which is used for left-centre-right (LCR) loudspeaker systems, configures the channel for LCR mixing. The **SIS** switch activates the spatial imaging system, which uses the **SIS image** control knob to modify **pan** control knob operation so as to place the channel within a three-speaker system.

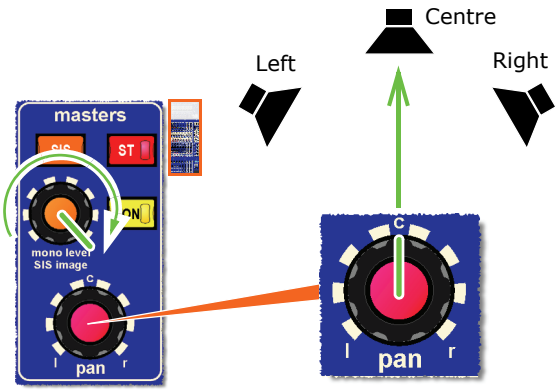
With **SIS image** control knob set fully clockwise or anti-clockwise, image is full LCR or stereo, respectively. Control knob positions in between generate a composite blend of

stereo or LCR panning systems, so that optimum degrees of centre image focus and speaker power can be obtained.

Constant power is maintained at all times so that the *image* can be adjusted during the show without a perceived change in level.

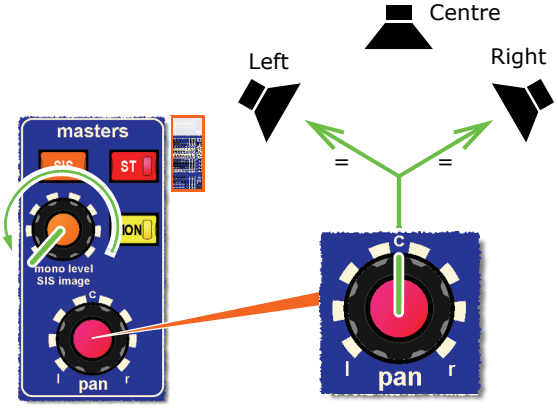
SIS image control knob fully clockwise (LCR)

With the **SIS image** control knob fully clockwise, the **pan** control knob operates in full LCR mode. A centre-panned signal, that is, with the **pan** control knob set to the **c** position, routes to the centre speaker only; there is no signal in the left and right speakers.



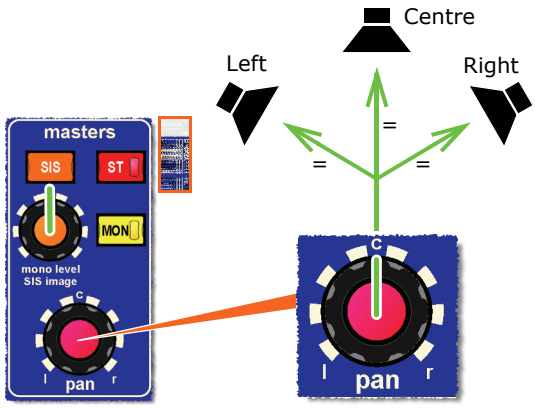
SIS image control knob fully anti-clockwise (stereo)

With the **SIS image** control knob fully anti-clockwise, the **pan** control knob operates as stereo. A centre-panned signal routes to the left and right speakers at equal power.



SIS image control knob centred (equal power)

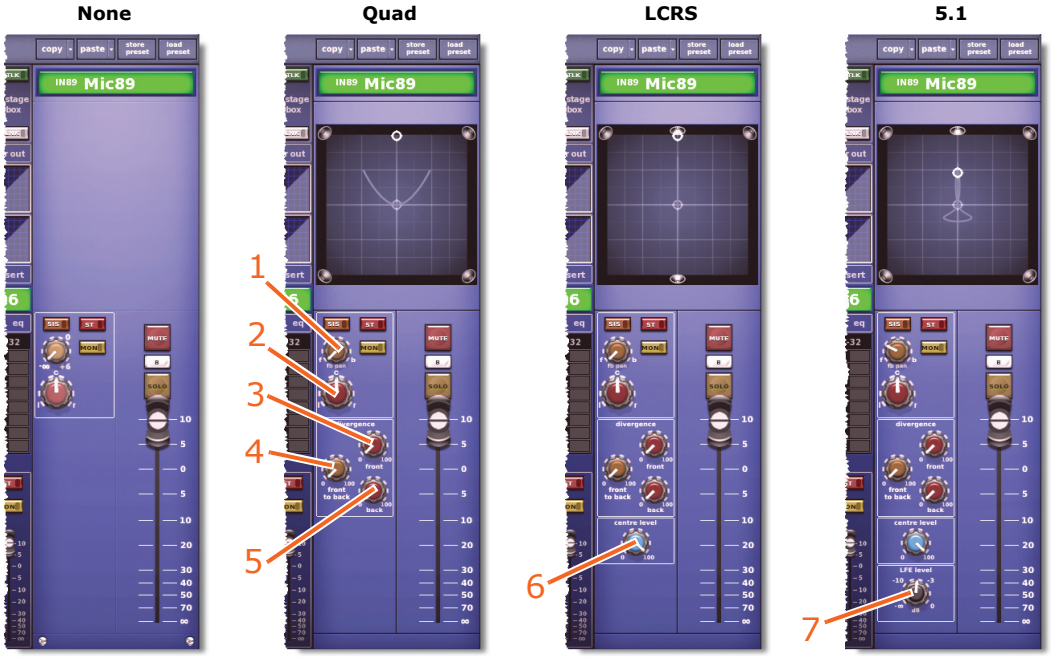
With both the **SIS image** and **pan** control knobs centred, the signal is routed to all three speakers with equal power.



Surround panning

When the XL8 is configured to operate in one of the surround panning modes, the spatial diagram that appears in the GUI channel strip gives you a visual representation of the sound image in relation to the speakers.

The following diagram shows the appearance of the GUI channel strip for each panning mode, and describes the controls.



Item	*Description*
1	**fb pan** control knob, moves position cursor in spatial diagram up/down.
2	Left-centre-right control knob, moves position cursor in spatial diagram left/right.
3	**front** control knob, adjusts the divergence of the front speakers.
4	**front to back** control knob, adjusts the divergence of the front and rear speakers.
5	**back** control knob, adjusts the divergence of the rear speakers.
6	**centre level** control knob, adjusts the divergence of the centre speaker.
7	**LFE level** control knob, adjusts the signal level of the LFE (usually a subwoofer).

Although the position cursor changes automatically according to the adjustment of the surround panning controls, you can also adjust it on the GUI using drag.

The following table shows the fader parameters with **None** selected as on/off in the **Surround Mode** section of the **Preferences** screen (see "Setting the configuration preferences" on page 229).

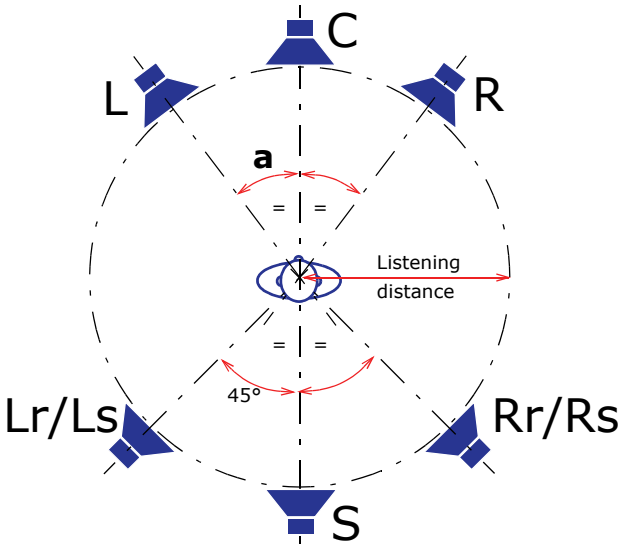
Table 4: Fader parameters with surround panning on/off

Parameter	*None mode off*	*None mode on*	*Notes*
Level (fb pan)	Yes	Yes	If left or right channel has SIS on, level is image (below). In other surround modes, it is front/back pan (below).
Image (fb pan)	Yes	Yes	See above
Pan	Yes	Yes	See above
Divergence (front to back)	Yes	N/A	N/A
Divergence (front)	Yes	N/A	N/A
Divergence (back)	Yes	N/A	N/A
Centre level	Yes	N/A	N/A
LFE level	Yes	N/A	N/A

Speaker placement

As the placement of loudspeakers is very important for accurate mix monitoring — especially for multi-channel mixing for surround sound — you should consider speaker positioning, angling and level calibration when setting up your monitor system. If necessary consult the manufacturer of your monitor system for their recommended surround formats.

The following diagram — which is to be read with Table 3 "Panning formats" on page 119 — gives you examples of loudspeaker placements for each panning mode. However, they are only an approximation and should only be used as a guide.



a = 30° for stereo (LR) and 45° for all other panning modes

Note: *LCRS has a mono surround channel, which is often fed to two rear 'satellite' speakers.*

Chapter 12: Soloing

Solo enables a signal to be monitored at a level proportional to its level in the mix, in the same stereo position in the mix and with the same reverberation as in the mix. When a solo button is pressed, all signals routed to the monitor output — except the one selected by the solo button — will be cut. Mix minus works in the opposite way. Solo allows a sound in one channel to be isolated, which is helpful in fault finding and when equalising a signal.

There are two independent solo systems in the console, solo A and solo B. Both have monitor and headphone outputs, and both can be used to PFL or AFL signals from the same sources throughout the console. This flexible solo bus configuration makes soloing of three-way monitor mixes (in-ears going to solo A and wedge going to solo B) possible and also greatly enhances the usefulness of the console for two-person operation (independent soloing).

Solo A

With solo A on, solo goes to the selected solo bus with the following conditions:

- If solo button is pressed for a short time, the soloing to the selected solo bus remains active when the button is released. If press is sustained (solo button held down) the soloing to the selected solo bus is cancelled when the button is released.
- Pre-fader audio is sent to the selected solo bus if the associated PFL control for that bus is active. Post-fader audio is sent to the selected solo bus if the associated PFL control is inactive.
- Unless multiple solo activations to the same solo bus are concurrent, the solo activation that occurred last - while the respective solo add mode (A or B) is inactive - cancels all earlier solos to the same bus before it activates.
- Solos can also be operated from a VCA master when the channel to which they belong is a member of that VCA; this is in addition to the local operation.
- Pressing the solo clear button associated with the solo bus they are sending to (A or B) will clear active solos.
- A solo hierarchy exists for each of the solo buses in the console (see "Solo hierarchy" on page 127). Activating a solo with a higher precedence in the hierarchy deactivates all solos with less precedence and inhibits them from being operated. As soon as the higher precedence solos are cleared, the stages of the inhibited solos are restored and they resume normal operation. Some modifications to this hierarchy are possible: mix buses, for example, can be used as sub-mixes (in which case the hierarchy is as described) or outputs (in which case they have equal precedence with the master outputs); returns can be used as mix buses (keeping the hierarchy as described) or additional inputs (giving them the same precedence as inputs).
- Pressing ADD (solo a/b) off cancels all solos.
- Pressing PFL (solo a/b) on overrides ADD but leaves it unaffected.
- Soloing inputs and outputs:
  - With any inputs active, outputs can't be soloed.
  - with any outputs active, pressing an input solo overrides (cancels) output. When the input solo(s) is cancelled, the output solo(s) are returned.

With solo A off there is no solo in operation.

Table 5: Solo A destination controls

Control	*Options*	*Description*
PFL direct input	-	Direct inject to solo A from linked console, active only while solo A is PFL.
AFL direct input	-	Direct inject to solo A from linked console, active only while solo A is AFL.
PFL direct output	-	Mono summed direct output from solo A for linking to another console.
AFL direct output	-	Stereo direct output from solo A for linking to another console.
Solo add	• On (additive solos) • Off (self-cancelling solos)	Disable self-cancelling solo A solos. (When self-cancelling solos are selected, that is, with solo add mode off, the solo being cancelled should be deactivated before activating a new solo.)
Solo clear	• On (some solo A solos) • Off (no solo A solos)	Single button clearing of currently active solo A solos.
Solo PFL	• PFL (solo pre-fader) • AFL (solo after-fader)	Switch all current and future solo A activations to send the solo A bus pre-fader.
Solo in place (SIP)	• On (SIP active) • Off (SIP inactive)	When active, SIP uses the console's master outputs for the solo A material. It does this by muting all input channels that are not currently soloed to the solo A bus. It is not possible to activate SIP accidentally. The SIP button has a hinged clear plastic cover that has to lifted up before the button can be operated. For SIP purposes, master outputs can be the main master bus or, if configured, a multi-channel output mix. To be eligible for SIP muting, channels must be input channels and set up to solo to the solo A bus; channels with any other combination are not subjected to SIP muting. Channels eligible for SIP muting that are currently, or subsequently, muted by a means other than SIP (that is, local button press, auto-mute or scene recall) remain muted regardless of the SIP status. On removal of the overriding mute, the mute is restored according to the current SIP status.

Solo B

With solo B on, solo goes to the B bus and with solo B off, solo goes to the A bus.

Select the solo bus for soloing to and then set the solo bus destination controls used for the solo operation (shown in the following table).

Table 6: Solo B destination controls

Control	*Options*	*Description*
Solo add	• On (additive solos) • Off (self-cancelling solos)	Disable self-cancelling solo B solos. (When self-cancelling solos are selected, that is, with solo add mode off, the solo being cancelled should be deactivated before activating a new solo.)
Solo clear	• On (some solo B solos) • Off (no solo B solos)	Single button clearing of currently active solo B solos.
Solo PFL	• PFL (solo pre-fader) • AFL (solo after-fader)	Switch all current and future solo B activations to send the solo B bus pre-fader.

Solo hierarchy

The solo system add-mode hierarchy works as follows:

- The highest level of solos will be the inputs and returns. When active, these will override and inhibit the remaining solo sources, namely auxes, matrices and masters.
- Within the constraints of the two-level solo hierarchy, only one source can be active on any channel at any instant:
  - **Input channels:** Input channel <--> Aux AFL <--> Direct out <--> Side chain listen
  - **Return channels:** Return channel <--> Direct in
  - **Aux buses:** Aux bus <--> Direct in <--> Side chain listen
  - **Matrix outputs:** Matrix bus <--> Direct in <--> Side chain listen
  - **Master outputs:** Master bus <--> Direct in <--> Side chain listen

  An additional constraint is placed on the side chain listen. This is due to the nature of the DSP, where only one side chain listen can be active on the console at any time, regardless of whatever else is active in the same solo hierarchy level.
- If an input channel solo is active via a VCA master solo, soloing the input temporarily overrides the VCA master solo. However, soloing a direct input or AFL solo on the same channel or a side chain solo on any channel cancels both the input solo on that channel and any VCA master solos to which the input channel is assigned.

Solo in place (SIP)

Operating a solo button cuts all channels from the main mix except soloed ones; this is called "solo in place" or "SIP". SIP allows you to check the contribution from soloed channels at the actual levels they occur in the mix, that is, taking into account the main fader setting. If solo buttons cut the main output (main mix) they must only be used in rehearsals. Sometimes, SIP selection buttons are disabled during recording (solo safe) or revert to AFL (only affects monitor outputs). For more information, see "Solo system" on page 324.

>> To activate SIP

1. Press the solo in place switch. A window will open containing the message "Activate SIP ?".
2. Click **OK.**

Chapter 13: Muting

Muting is generally used for backstage mics, guitar switchover etc. The channel mutes turn off outputs from the channel. See Appendix B "Functional Block Diagrams" for which outputs are affected when channel mute is active. Channel mutes can be activated by:

- Local press.
- Auto-mutes (see "Auto-mute (mute) groups" on page 162).
- VCAs (see "VCA/POP groups" on page 157).
- Scene recall (see Chapter 20 "Scenes And Shows (Automation)" on page 183).
- SIP, which uses the control centre's master outputs for solo A material by muting input channels currently soloed to the solo A bus. For SIP muting, channels must be input channels set up to solo the solo A bus.

All of the above mute activation methods, except VCAs, mute the channel outputs and update the channel mute status indicator.

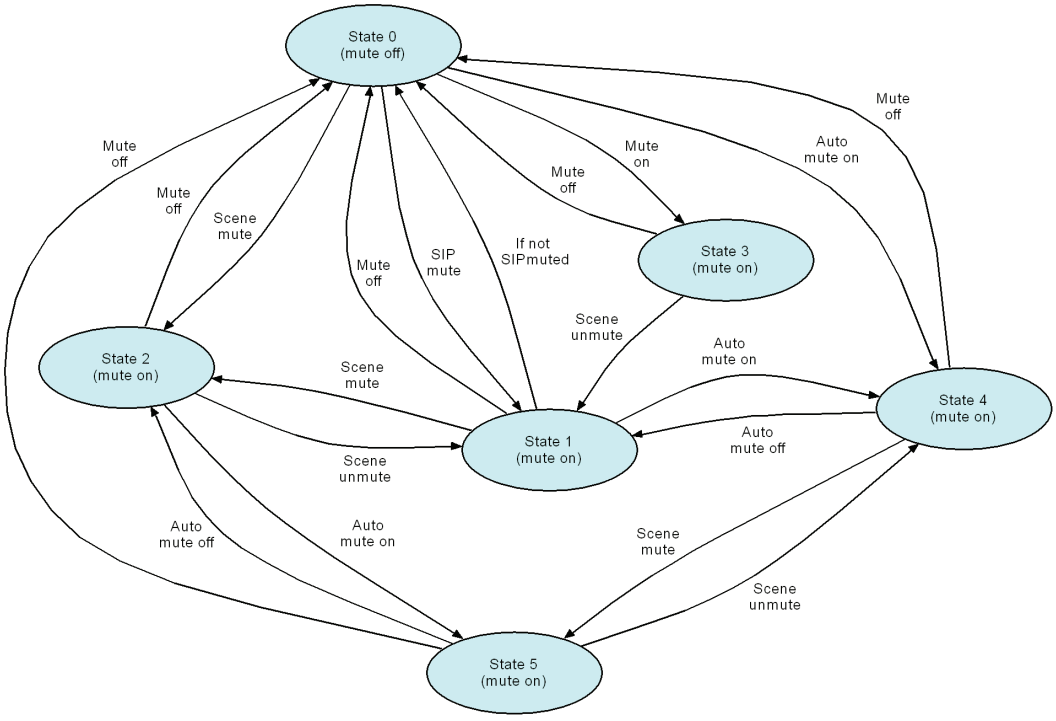


Figure 25: Control methods, interactions and corresponding state of channel mute

Note 1: *In Figure 25, all of the transitions between states, with the exception of State 1 to State 0 "If not SIP muted", are events. The "If not SIP muted" transition is not an event, it happens as soon as the indicated test condition ("If not SIP muted") is true.*

Note 2: *Also, "Mute on" and "Mute off" refer to mute activations and deactivations using the local press method (the mute button on the channel); SIP mutes only apply to input channels (the "If not SIP muted" exit condition from State 1 is always true for*

other channel types); and an "auto-mute on" and "auto-mute off" are achievable in several different ways.

Chapter 14: Monitors And Communications

This chapter describes the monitoring and communications functions of the XL8.

Monitors (A and B)

To match the two-bus solo system, there are two monitor outputs, A and B. These are controlled from the monitor section on the output bay (see "Monitoring" on page 322). Each monitor output has:

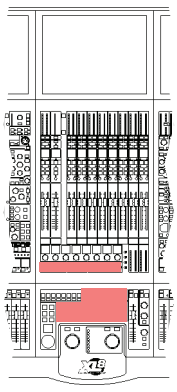
- The ability to monitor mono and stereo outputs, and an external input.
- An external talkback input.
- A local monitor output.
- A headphone output.
- 31-band GEQ.
- Delay compensation.
- Control of the solo buses.

Although the metering capabilities of both monitors are the same, monitor A is the primary output and is, therefore, better equipped. With monitor B lacking phase control, left to both control, right to both control and left/right swap control.

However, monitor B has a fader link control, which monitor A does not. With the fader link on, A and B monitor levels are linked, but with fader link off there is only control of level B.

Communications

The controls for communications are located in the output bay (see "Comms" on page 318).



Internal talk mic

The control surface has an internal talk mic that allows you to talk to external locations.

>> To select the internal talk mic

1. To switch on the internal talk mic, do one of the following:
   - In the **talk mic** section, press the **TALK** (**internal**) button.
   - In the **signal generator** section, press the **OSC** (**internal**) button.
2. To select the source, do one of the following (see "source and output (a and b)" on page 326):
   - If the internal mic source is on the monitor A, press the **A** (**talk back**) button in the **source a** section.

- If the internal mic source is on the monitor B, press the **B** (**talk back**) button in the **source b** section.

External talkback

As well as being able to talk to external locations, you can also be talked *to* from an external location. The external talkback input is a mic/line input at the stage end of the system that, when enabled in the monitor section (see "source and output (a and b)" on page 326), can mix onto the local monitor outputs.

>> To select external talkback

1. To switch on the internal talk mic, do one of the following:
   - In the **talk mic** section, press the **TALK** (**external**) button.
   - In the **signal generator** section, press the **OSC** (**external**) button.
2. To select the source, do one of the following (see "source and output (a and b)" on page 326):
   - If the internal mic source is on the monitor A, press the **EXT** button in the **source a** section.
   - If the internal mic source is on the monitor B, press the **EXT** button in the **source b** section.

Talk groups

A talk group is a control that, when operated, activates the internal talk control on all associated buses. There are eight talk group buttons in the comms section of the output bay (see "talk osc/routing" on page 321) that allow you to talk to or send test signals to any bus on the control centre and, therefore, any control centre output. This can be to a single bus or to many buses simultaneously by using the four fixed association talk buttons or the four user-assignable talk group buttons, respectively.

The user-definable buttons can be set up (via control surface or GUI) to contain any combination of aux, audio sub-group, mix or master buses. For example, they could be used for grouping announcements or for talking to groups of artists in a monitor mix.

>> To use internal talk or osc routing

Switch on one or both of the following buttons:

- **TALK** (**internal**) button in the **talk mic** section.
- **OSC** (**internal**) button in the **signal generator** section.

Note: *This also applies to generator routing. If any internal talk or osc generator routing is active when the* ***TALK/internal*** *and/or* ***OSC/internal*** *buttons are both switched off, this routing is cancelled.*

>> To activate a talk group

1. Switch on one or both of the following buttons:
   - **TALK** (**internal**) button in the **talk mic** section.
   - **OSC** (**internal**) button in the **signal generator** section.
2. In the **talk / osc routing** section, press the desired talk group button and hold it down for at least one second. The button will illuminate when active; all talk group member functions are activated.

>> To deactivate the current talk group

Do one of the following:

- Press the button of the currently active talk group.
- Give a quick press of a different talk group button. This will leave no talk groups currently active.
- Give a prolonged press of a different talk group button (more than one second). This will deactivate the current talk group, and activate the one currently pressed.
- Switch off both the **TALK (internal)** and **OSC (internal)** buttons.

>> To set up a talk group

For details, see “Talk groups” on page 164 and also refer to “talk osc/routing” on page 321.

>> To configure a talk group (GUI only)

For details, see “Configuring the groups” on page 166.

Chapter 15: Graphic Equaliser (GEQ)

The XL8 Control Centre incorporates a graphic equaliser (GEQ), which is closely based on the Klark Teknik DN370 Graphic Equaliser (see Appendix D "Klark Teknik DN370 GEQ" for details). The GEQ is a single-channel, 31-band, third octave graphic equaliser that features switched 2nd order Treble and Bass filters and two notch filters with variable frequency ranges. There are 16 of these GEQs available, which are one the GUI's **Graphic EQs** screen. Each GEQ can be remotely controlled using the Klark Teknik DN9331 RAPIDE.

The GEQ is primarily a mono process, but in the case of stereo groups or mix channel outputs, a stereo GEQ is controlled from a single set of controls.

You can operate the GEQ via the control surface, GUI or remotely as follows:

- **I zone:** Use the assignable controls in the output bay control surface (see Chapter 19 "Assignable Controls (I Zone)" on page 169).
- **GUI:** Use the GUI (see "About GUI operation" on page 48). The assignable controls are also available on the GUI, but only on the output bay.
- **Remote:** Use a Klark Teknik DN9331 RAPIDE to remotely control any GEQ (see "Controlling the GEQs remotely with a RAPIDE" on page 139).

About the Graphic EQs screen

The **Graphic EQs** screen represents a virtual 16-unit rack of user-configurable GEQs. You can configure each GEQ with a name of your choice and a source. The panels down the left and right sides show the source of the adjacent GEQ, if configured. The rack also includes **STORE PRESET** and **LOAD PRESET** user library buttons that let you copy pre-programmed GEQ settings (see Chapter 24 "User Libraries (Presets)" on page 215).

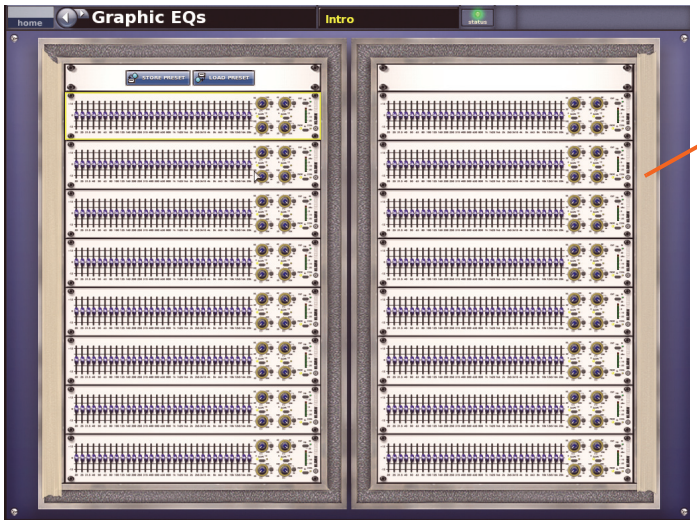


*Figure 26: **Graphic EQs** screen*

>> To open the Graphic EQs screen

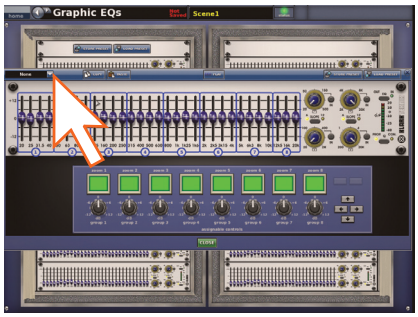
Do one of the following:

- On a GUI screen, choose **home** ▸ ***Rack Units*** ▸ ***Graphic EQs.***
- In the screen access section of the primary navigation zone, press **effects / graphics** twice.

>> To assign a source to GEQ

1. Open the Graphic EQs screen (see "To open the Graphic EQs screen" on page 136).
2. Choose the GEQ you want and click within its rack position.
3. In the GEQ window, choose its source from the drop-down list (upper-left corner of window).

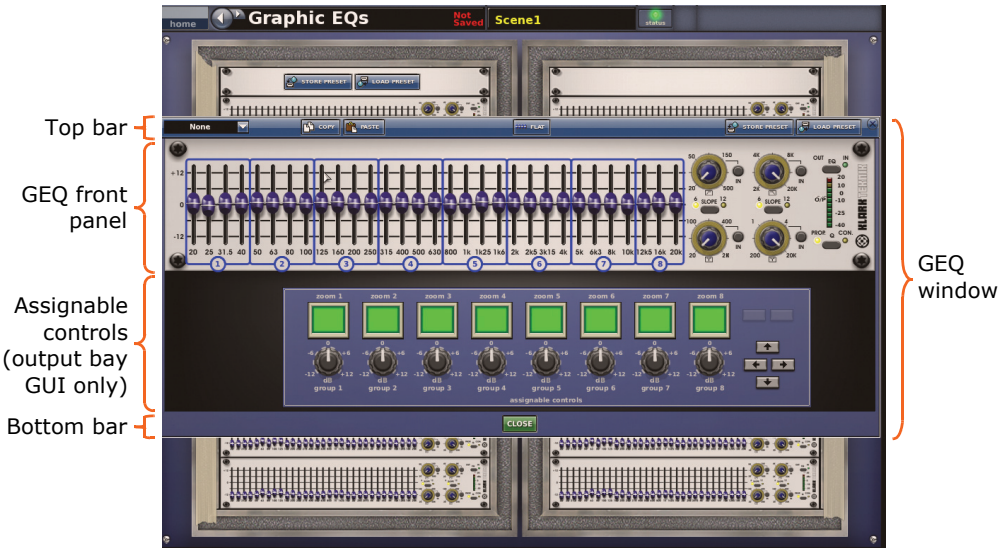
   The typical example (shown right) is taken from the output bay GUI screen, and shows the assignable controls panel in the bottom half of the GEQ window. This panel does not appear on any other GUI screen.



4. Click **OK.** The new source of the GEQ will appear next to it in the outer strip.

About the GEQ window

The **Graphic EQs** screen represents a virtual 16-unit rack of user-configurable GEQs.



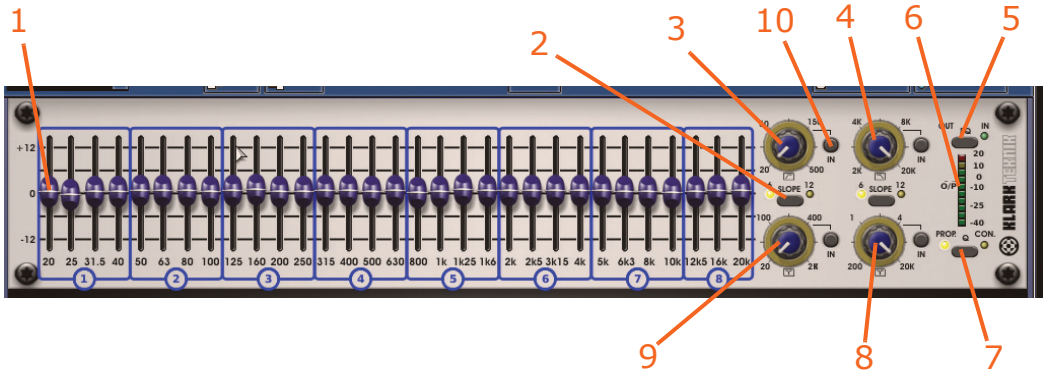
The following table describes the elements of the GEQ window.

Section	*Element*	*Description/function*
Top bar	Source drop-down list	Contains a list of GEQ sources from which to patch the GEQ.
	COPY button	Copy and paste function button (see Chapter 18 "Copy And Paste" on page 167).
	PASTE button	Copy and paste function button (see Chapter 18 "Copy And Paste" on page 167).
	FLAT button	Sets all of the GEQ's faders to 0dB.
	STORE PRESET button	User library function button (see Chapter 24 "User Libraries (Presets)" on page 215).
	LOAD PRESET button	User library function button (see Chapter 24 "User Libraries (Presets)" on page 215).
	(x) button	Close window button.
GEQ front panel	Not applicable	See "GEQ front panel features" on page 138.
Assignable controls	Not applicable	See Chapter 19 "Assignable Controls (I Zone)" on page 169.
Bottom bar	**OK** button	Closes the window.

>> To open the GEQ unit window

In the **Graphic EQs** screen, click on a non-control area of the GEQ you want.

GEQ front panel features



Item	*Description*
1	Fader (31-off).
2	**SLOPE button (2-off):** for switching the high/low pass filter between 6dB and 12dB. Has an adjacent yellow LED on either side that illuminate to indicate the active band.
3	**High pass filter:** for adjusting the cut off frequency, which is continuously variable from 2kHz to 20kHz.
4	**Low pass filter:** for adjusting the cut off frequency, which is continuously variable from 20Hz to 500Hz.
5	**EQ button:** for selecting EQ. The adjacent green **IN** LED shows the EQ is on (illuminated) or is being bypassed (extinguished).
6	**Level metering:** 10-segment meter shows the incoming signal level and is pre-EQ (but post-gain control). Clipping is post-EQ (and post-gain control), such that internal clipping due to excessive EQ, that is, if a high input level is further boosted by the use of EQ, will also be shown. The LED functions are: two red LEDs illuminate when signal has exceeded +20dBu and is being clipped; two yellow LEDs illuminate when signal level exceeds 0dB (range is between 0dB to +20dB); and the top five green LEDs encompass the signal level range of between 0dB and -40dB, while the bottom one illuminates when the signal has exceeded -40dB.
7	**Q PROP./CON. button:** for selecting proportional Q or constant Q modes.
8	**Notch filter control knob:** for adjusting the position of the notch filter within the range 200Hz to 20kHz.
9	**Notch filter control knob:** for adjusting the position of the notch filter within the range 20Hz to 2kHz.
10	**IN LED (4-off):** illuminates to show that its associated filter is on.

Graphic EQ section

Thirty one faders provide fine adjustment of each frequency band. The 31 frequency bands are spaced 1/3 octave apart on the standard ISO 266 frequency centres. All the functions of the GEQ can be bypassed via an **EQ** switch, such that the output will be the same as the input.

Filters

The GEQ has one high pass filter, one low pass filter and two variable frequency notch filters. Each filter is adjusted via a control knob on the GUI screen; see "About GUI operation" on page 48.

To audition the effect of the filters, either the **EQ** in/out switch (which will also bypass the GEQ) or the individual filter switch may be used.

Copying settings between GEQs

You can copy and paste the settings of one GEQ to another.

>> To copy and paste the settings of one GEQ to another

1. Open the GEQ window of the one you want to copy the settings from.
2. Click **COPY.**
3. Close the GEQ window and open the GEQ window of the one you want to paste the settings to.
4. Click **PASTE.**

Controlling the GEQs remotely with a RAPIDE

The 16 GEQs on the XL8 Control Centre can be controlled remotely from a Klark Teknik DN9331 RAPIDE Graphic Controller (shown below). Any of the RAPIDE's 128 channels (four banks of 32 channels) can be dedicated to any one of the GEQ units shown on the GUI. For more information, refer to the RAPIDE's operator manual (part number DOC02-DN9331).

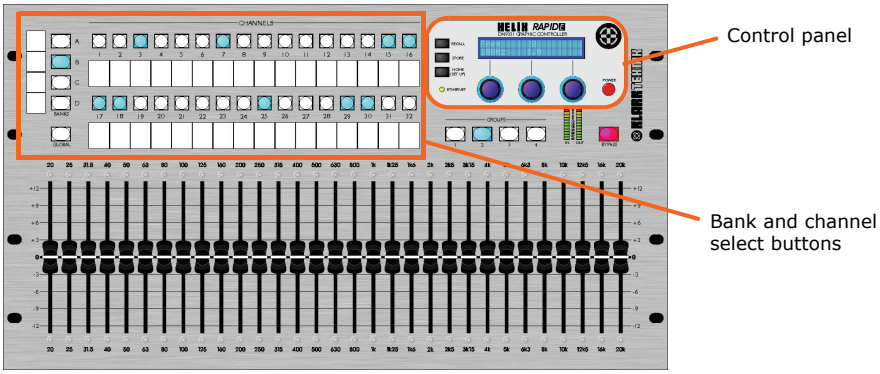
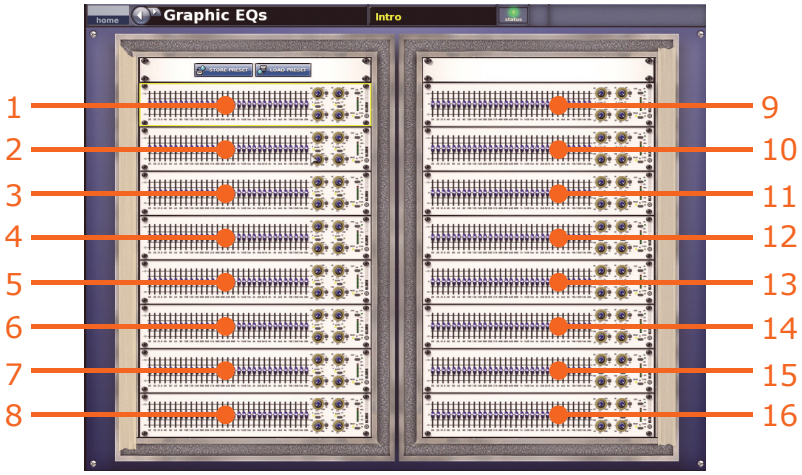


Figure 27: Front panel of the RAPIDE

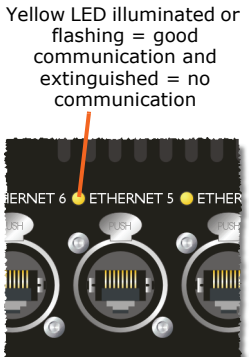
GEQ channel number allocation

Each GEQ unit in the GEQ rack (on the GUI) is allocated a channel number that is recognised by the RAPIDE unit, as shown in the following diagram.



>> To connect the XL8/RAPIDE

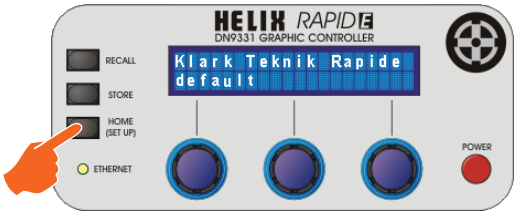
1. Plug two XL8/RAPIDE interconnecting Ethernet cables into the rear of the XL8 (see "XL8 system interconnections" on page 36), inserting one into the X network socket and the other into the Y network socket.
2. Plug the other end of the cables into any available Ethernet sockets on the rear of the RAPIDE unit.
3. Make sure that the XL8/RAPIDE communication is good by checking the LEDs at both ends of each cable. For a description of the LEDs on the XL8, see "System interconnection panel" on page 253, and for the RAPIDE see the diagram shown right.



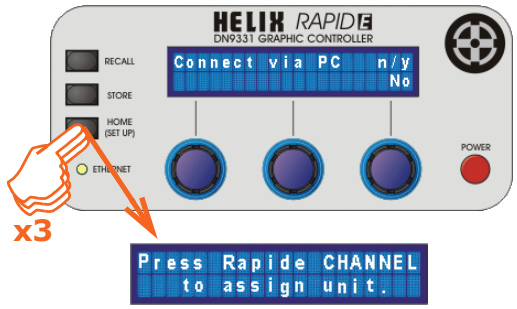
Connection between the XL8 and RAPIDE can be made with the RAPIDE and XL8 fully powered up.

>> To set up the RAPIDE

1 In the control panel of the RAPIDE (see Figure 27 on page 139), enter the set up menu by pressing and holding down the **HOME (SETUP)** button in the control panel.

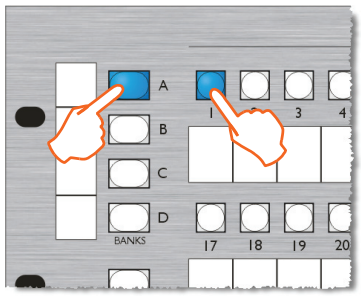


2 Press **HOME (SETUP)** repeatedly until you access the "Press RAPIDE CHANNEL ..." display.

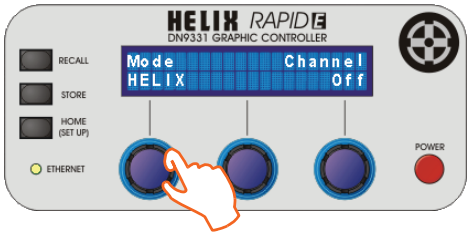


3 Assign the GEQ (on XL8) to a channel on the RAPIDE by pressing the bank button (A, B, C or D) followed by the channel number (1 to 32) on the RAPIDE. For example, to assign the GEQ to channel 1 of bank A, press **A** and then **1**. Both buttons will illuminate to show the active selection.

If a channel button is selected that is already allocated to a HELIX unit, it will flash.

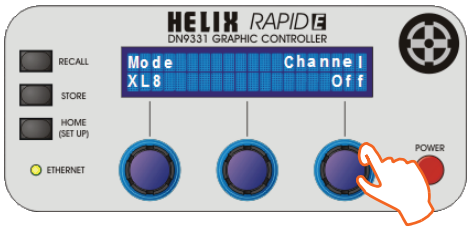


4 Turn left control knob to select "XL8" mode.

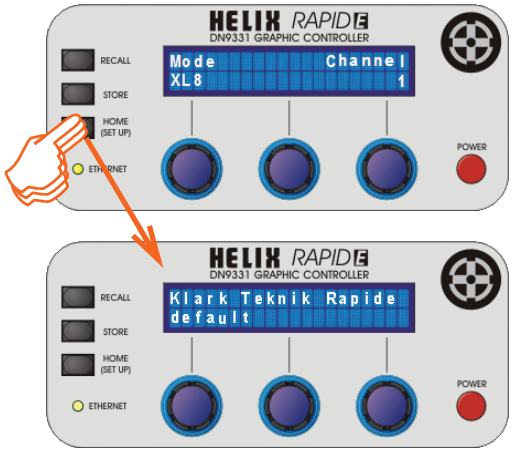


5 Turn right control knob to select the number of the required GEQ unit (see "GEQ channel number allocation" on page 140).

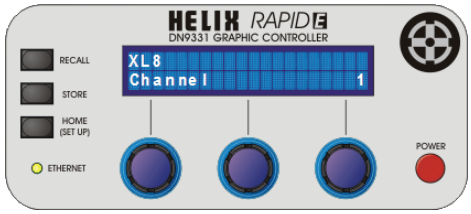
Repeat steps 3 to 5 for any other RAPIDE channels you wish to assign to the GEQ units.



6 Press **HOME (SETUP)** repeatedly to exit set up menu.



7 Check for correct channel allocation by pressing the appropriate bank and channel buttons on the RAPIDE. In this example, pressing **A** and then **1** should display the following:



Using the RAPIDE to remotely control the XL8

Remote XL8 operation via the RAPIDE is quite straightforward. Any of the 16 GEQs on the XL8 will replicate fader positions and adjustments on the RAPIDE, provided they have been configured as the source of the RAPIDE's active channel. So, for example, if the currently selected channel on the RAPIDE is allocated to GEQ 4 and you adjust a fader on the RAPIDE, the corresponding fader on the GEQ 4 unit will move accordingly on the GUI screen. Conversely, the adjustment of a GEQ unit's fader on the GUI screen will be replicated on the RAPIDE, provided the RAPIDE's active channel is configured to that GEQ. If it is not, no action will be seen on the RAPIDE, although the new fader position will be recalled if a channel configured to this GEQ is activated.

Auto solo

If a GEQ is configured for auto solo and a channel on the RAPIDE is dedicated to that GEQ, when auto solo is selected for that GEQ the dedicated channel will be activated on the RAPIDE.

Chapter 16: Internal Effects

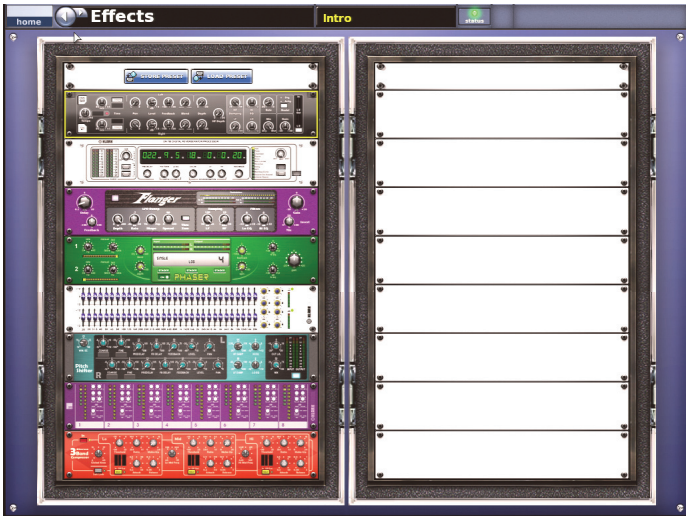
This chapter details all of the internal effects available on XL8. Initially, it describes how to use the XL8 to operate the effects and then details all of their available control functions and their use.

The internal effects are a 'bundle' of onboard creative audio effects known as the "internal effects pool". They provide onboard facilities where outboard effects units would have traditionally been required. Similarly to the GEQs, the internal effects are managed on a dedicated screen — called the "Effects" screen — that contains a virtual, user-assignable 16-unit rack. All of the points in the console's signal flow where outboard effects can be inserted, such as auxes and returns or insert points on input channels, audio subgroups, mix and master buses, can be patched to effects in the internal effects pool as well as external world XLRs. The internal effects pool consists of:

- Delay
- Virtual DN780 reverb
- Flanger
- Phaser
- Stereo graphic GEQ
- Pitch shifter
- Square ONE dynamics
- Stereo 3 band compressor

About the Effects screen

The **Effects** screen has a 16-unit rack that can be configured to contain any combination of the available internal effects. The rack also includes **STORE PRESET** and **LOAD PRESET** user library buttons that let you copy pre-programmed internal effect settings (see Chapter 24 "User Libraries (Presets)" on page 215). The following diagram shows the effects rack populated with all of the available effects devices.



Each rack position is allocated a number that is recognised by XL8, which is the same numbering system as the one for the GEQs (see "GEQ channel number allocation" on page 140).

For details of how to open the Effects screen and assign an effect to the effects rack, see "Setting up the effects rack" on page 100.

About the effect window

After selecting an effect, its device appears in a window across the middle of the screen, superimposed over the rack. Inside the window is a front panel containing the effect controls, and below this is a rear panel showing the effect's I/Os.

Common elements

All of the Effects screen elements are common to each effect, except of course for the front panel, which contains the effects controls and the assignable controls (only on the output bay GUI screen.



The following table describes the elements of the effect window.

Section	*Element*	*Description/function*
Top bar	Source drop-down list	Contains a list of GEQ sources from which to patch the GEQ.
	CHANGE DEVICE TYPE button	Opens the **Change Device Type** window that contains a list of the available internal effects, so that you can choose the one you want.
	STORE PRESET button	User library function button (see Chapter 24 "User Libraries (Presets)" on page 215).
	LOAD PRESET button	User library function button (see Chapter 24 "User Libraries (Presets)" on page 215).
	(x) button	Close window button.
Effect front panel	Not applicable	The front panel controls for each internal effect are described later on in this chapter.

Section	*Element*	*Description/function*
Assignable controls	Not applicable	See Chapter 19 "Assignable Controls (I Zone)" on page 169.
Bottom bar	**OK** button	Closes the window.

>> To open an effect window

In the **Effects** screen, click on a non-control area of the unit you want.

Configuring an effect

Similarly to the input channels, output channels, groups etc., you can change the name of an effect and the background colour of the field in which it appears on the GUI. This is done via the **Effects Sheet** screen. For more details, see "Configuring the channels, groups and internal units" on page 231.

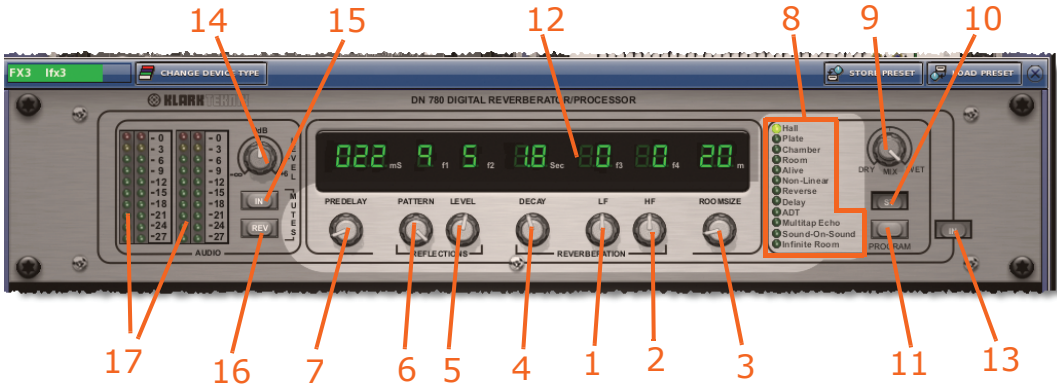
Also, the following versions are available for each effect type. The XL8 selects the appropriate one automatically, depending on the configuration of the channel into which the effect is inserted:

- **Mono in and out:** for mono auxes and returns, mono input channel, audio subgroup and mix bus inserts.
- **Stereo in and out:** for stereo auxes and returns, stereo input channel, audio subgroup and mix bus inserts.

If the mono/stereo pairing status of a channel is changed while an effect is inserted, the effect will be replaced with the correct mono/stereo implementation.

Virtual DN780 Reverb effect

The Virtual DN780 Reverb provides emulation of the vintage Klark Teknik DN780 Digital Reverberator/Processor unit. The DN780 is not just a reverberation device, it also gives the user a unique and flexible means of producing realistic acoustic simulations for environments of all types and sizes. The provision of effects programs further extends this versatility, making it a very powerful acoustic processing package. The parameter controls give accurate adjustment of all reverberation parameters and allow the engineer to create unique acoustic environments of virtually any type.



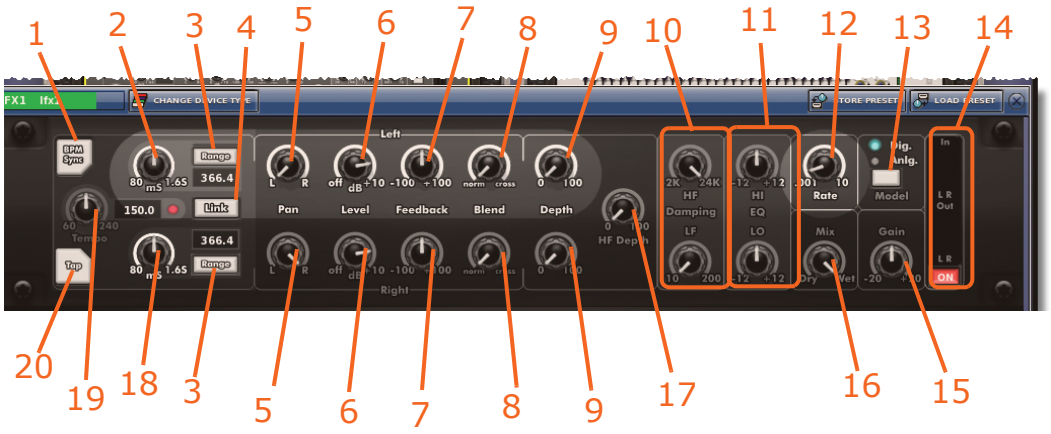
Item	*Description*
1	**LF** (low frequency) control knob, adjusts the decay time at the low end of the reverb spectrum; ranges from -7 to +7.
2	**HF** (high frequency) control knob, adjusts the decay time at the high end of the reverb spectrum, which sets the absorption characteristic of the simulated space; ranges from -7 to +7.
3	**ROOMSIZE** control knob, adjusts the average dimension of the simulated space; ranges from 8 to 90 metres. A momentary mute is implemented when this control is adjusted.
4	**DECAY** control knob, sets the overall (mid-band) reverberation decay time; ranges from 0.1 to 18 seconds, depending on room size.
5	**LEVEL** control knob, acts as a 'depth' control by altering the apparent distance between the sound source and the listener. Alternatively, adjusts the input level for Sound-On-Sound/Infinite Room. Range is from 0 to 9.
6	**PATTERN** control knob, controls the 'density' of early reflections. Selects the number and spacing of Early Reflections/ADT/Multi-tap delays; ranges from 1 to 9.
7	**PRE DELAY** control knob, for controlling the amount of delay (in milliseconds) between the initial signal and the onset of reverberation. On certain program types, pre-delay is inserted between early reflections and reverb to improve authenticity. Its range is algorithm dependent. Low level, phase-dependent 'clicks' are produced when pre-delay is altered during the program.
8	List of algorithms, which emulate the ones on the original DN780.
9	**MIX** control knob, controls the **DRY**/**WET** output mix and ranges from 0% t0 100%, respectively.
10	**ST** stereo input button, for enhancement of original algorithm to provide stereo input.
11	Algorithm select button, for selecting the required algorithm.

Item	*Description*
12	**Parameter display panel:** shows the current settings for the selected algorithm.
13	**IN** button, for switching in the Virtual DN780 Reverb effect.
14	**Input level: LEVEL** control knob, for adjusting the input level; ranges from -∞ to +6dB, with 0dB at top dead centre. This should be set to illuminate the -3dB LED on the input headroom indicator during loud program passages.
15	**Input mute: IN** button, for removing feed to the reverberation section, enabling the decay qualities of the chosen setting to be confirmed.
16	**Reverb mute: REV** button, for providing a rapid means of removing unwanted sounds.
17	**Input headroom indicator:** Two dual-column peak reading LED meters, ranging from 0dB to -27dB in 3dB steps. Each column consists of 10 coloured LEDs. The red LED illuminates at 3dB before the clipping point, which also provides an over-range warning for the arithmetical processor.

Delay effect

The delay effect provides simple delay line based effects. Delay times can be specified manually or by means of a 'tempo-tap' button. The delay has a three-mode algorithm:

- **Single** — one delay tap (mono or stereo processing).
- **Dual** — two delay lines (stereo insert only).
- **Ping-pong** — two delay lines with cross feedback.

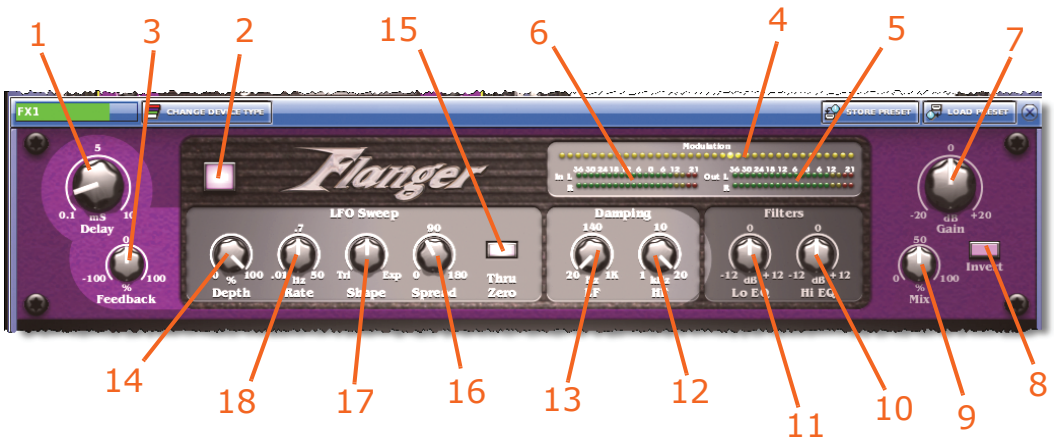


Item	*Description*
1	**BPM Sync** button, for activating BPM (TAP TEMPO) mode.
2	Left channel delay time control knob, for entering the desired delay time. Value is shown immediately below, in ms or BPM.
3	**Range** button, for selecting one of three delay time ranges (1-25ms, 10-200ms or 80-1600ms). Value is displayed immediately below.
4	**Link** button, for linking delay time of left and right channels.
5	**Pan** control knob (left and right), for panning channel between L (left) and R (right) outputs.
6	**Level** control knob (left and right), for adjusting the output level. Range is from off to +10dB.
7	**Feedback** control knob (left and right), adjusts the amount of negative/ positive feedback applied to delay. Controls the number of repeats. Range is from -100% to +100%.
8	**Blend** control knob (left and right), adjusts the feedback blend from norm to cross.
9	**Depth** control knob (left and right), adjusts depth of delay modulation. Range is from 0 to 100.
10	**Damping** section, contains a **HF** control knob that adjusts the HF attenuation of delay repeats and an **LF** control knob that adjusts the LF attenuation of delay repeats.
11	**EQ** section. **HI** control knob that adjusts the amount of HF (high EQ) cut or boost applied to the output. **LO** control knob adjusts the amount of LF (low EQ) cut or boost applied to the output. Range of both is -12 to +12, with 0 at top dead centre.
12	**Rate** control knob, adjusts rate of delay modulation. Range is between 0.001Hz and 10Hz, with 0.7Hz at top dead centre.

Item	*Description*
13	**Model** select button, selects digital or analogue delay resolution. Current selection is shown by the illumination of one of the LEDs above (**Dig.** or **Anlg.**).
14	**LR Out** section. Contains an **ON** for activating delay.
15	**Gain** control knob, adjusts the amount of gain between -20 and +20, with 0 at top dead centre.
16	**Mix** control knob, for adjusting the mix between dry (0%) wet (100%).
17	**HF Depth** control knob adjusts depth of delay modulation. Range is 0 to 100, with 50 at top dead centre.
18	Right channel Delay time control knob, for entering the desired delay time.
19	**Tempo** control knob, adjusts the tempo in tempo mode. Range is from 60 to 240 beats per minute.
20	**Tap** button, for manually tapping the tempo once the unit is in BPM Synch (TAP TEMPO) mode.

Flanger effect

The flanger effect consists of one or, if configured as stereo, two-tap delay lines. One tap is fixed and the other tap position is modulated to provide 'thru-zero' flanging or single tap modulation when 'thru-zero' is off.

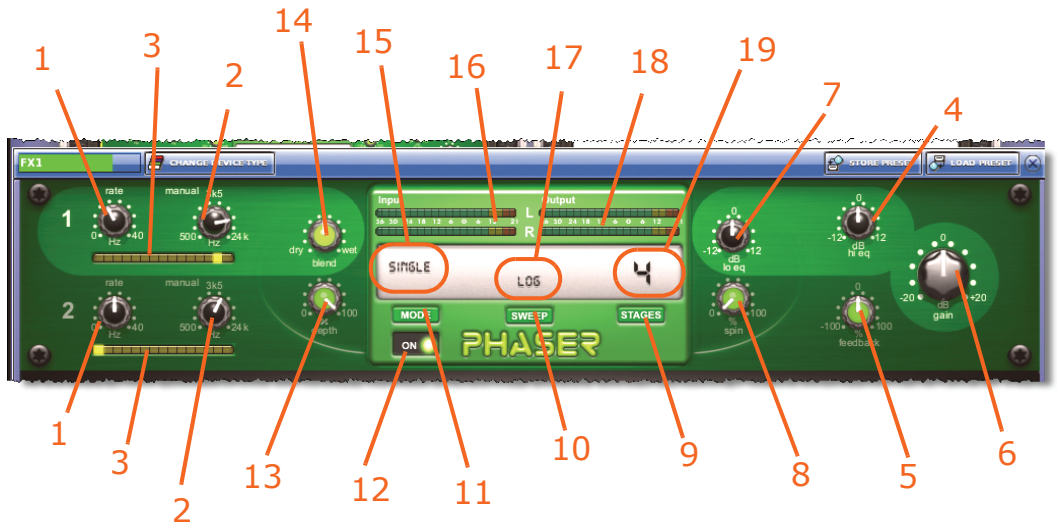


Item	*Description*
1	**Delay** control knob, adjusts length of modulated delay line (milliseconds). In 'thru-zero' mode, also sets the delay of the dry path. Range is 0.1 to 10, with 5 at top dead centre.
2	**ON** button, switches flanger effect on/off. Illuminates when power is on.
3	**Feedback** control knob, adjusts the amount of negative/positive feedback applied to the delay. Controls the number of repeats. Range is from -100% to +100%, with 0% at top dead centre.
4	37 yellow LED indicators, for modulation meter.
5	**Out** meters. Two rows of 15 green LEDs, one each for L (left) and R (right).
6	**In** meters. Two rows of 15 green LEDs, one each for L (left) and R (right).
7	**Gain** control knob, adjusts signal level (dB). Range is from -20dB to +20dB, with 0dB at top dead centre.
8	**Invert** switch, for inverting wet signal.
9	**Mix** control knob, adjusts the mix between dry (0%) wet (100%).
10	**Hi EQ** control knob in the **Filters** section, adjusts the amount of HF (high EQ) cut or boost applied to the effect output in dB. Range is -12dB to +12dB with 0dB at top dead centre.
11	**Lo EQ** control knob in the **Filters** section, adjusts the amount of LF (low EQ) cut or boost applied to the effects output in dB. Range is -12dB to +12dB with 0dB at top dead centre.
12	**HF Damping** control knob, adjusts the high frequency (kHz) tuning of flanger feedback. Range is 1kHz to 20kHz, with 10kHz at top dead centre.
13	**LF Damping** control knob, adjusts the low frequency (kHz) tuning of flanger feedback. Range is 20Hz to 1kHz, with 140Hz at top dead centre.
14	**Depth** control knob in **LFO Sweep** panel, controls the intensity of the effect by setting the depth of modulation as a percentage. Interactive with Delay, as for Chorus. Range is 0% to 100%.
15	**Thru Zero** switch in **LFO Sweep** panel, selects 'thru zero' or normal mode. Illuminates to indicate switch is on.

Item	*Description*
16	**Spread** control knob in **LFO Sweep** panel, for setting relative phase of left/right modulation. Range is 0 to 180 with 90 at top dead centre.
17	**Shape** control knob in **LFO Sweep** panel, adjusts shape of modulation waveform. Range is from Tri to Exp.
18	**Rate** control knob in **LFO Sweep** panel, adjusts rate of modulation (Hz). Range is between 0.01 and 50, with 0.7 at top dead centre.

Phaser effect

The phaser effect consists of one, or if configured for dual operation, two stereo phasers connected in serial/parallel according to mode setting.

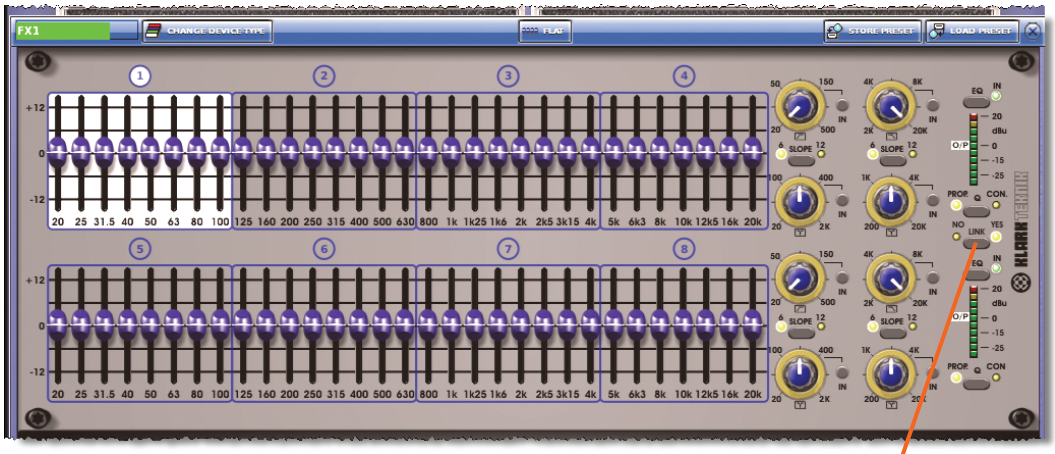


Item	*Description*
1	**rate** control knob for channels 1 and 2, controls the rate of modulation in Hz. Range is between 0Hz and 40Hz.
2	**manual** control knob, for setting sweep offset or performing manual sweep. Range is 500Hz to 24kHz, with 3k5Hz (3,500Hz) at top dead centre.
3	15 yellow rectangular LED segments for modulation meter.
4	**hi eq** control knob, adjusts the amount of HF (high EQ) cut or boost applied to the effect output in dB. Range is -12dB to +12dB with 0dB at top dead centre.
5	**lo eq** control knob, adjusts the amount of LF (low EQ) cut or boost applied to the effects output in dB. Range is -12dB to +12dB with 0dB at top dead centre.
6	**gain** control knob, adjusts signal level (dB). Range is from -20dB to +20dB, with 0dB at top dead centre.
7	**feedback** control knob, adjusts the amount of negative/positive feedback applied to the delay. Controls the number of repeats. Range is from -100% to +100%, with 0% at top dead centre.
8	**spin** control knob, adjusts the amount of relative phase of left/right modulation. Range is from 0% to 100%.
9	**STAGES** button, for selecting the number of all pass stages, which sets the number of notches in the frequency response.
10	**SWEEP** button, for setting the modulation waveform shape.
11	**MODE** button, for selecting operating mode: single; dual series; dual parallel; linked series; and linked parallel. When linked, modulation of phasers 1 and 2 are linked.
12	**ON** button, for switching phaser effect on and off. Illuminates to indicate effect is on.

Item	Description
13	**Depth** control knob, controls the intensity of the effect by setting the depth of phasing filters. Range is 0% to 100%.
14	**Blend** control knob, for adjusting the mix between dry (0%) wet (100%).
15	Displays the mode, selected by the **MODE** switch.
16	**Input** meters. Two rows of 15 green LEDs, one row each for L (left) and R (right).
17	Displays the sweep, selected by the **SWEEP** button.
18	**Output** meters. Two rows of 15 green LEDs, one row each for L (left) and R (right).
19	Displays the number of all pass stages, selected by the **STAGES** button.

Stereo Graphic EQ effect

The stereo GEQ effect is basically two versions of the internal GEQ of the XL8, but with the addition of a **LINK** switch that allows the GEQs to be linked or unlinked. For operation of the controls, see "GEQ front panel features" on page 138.

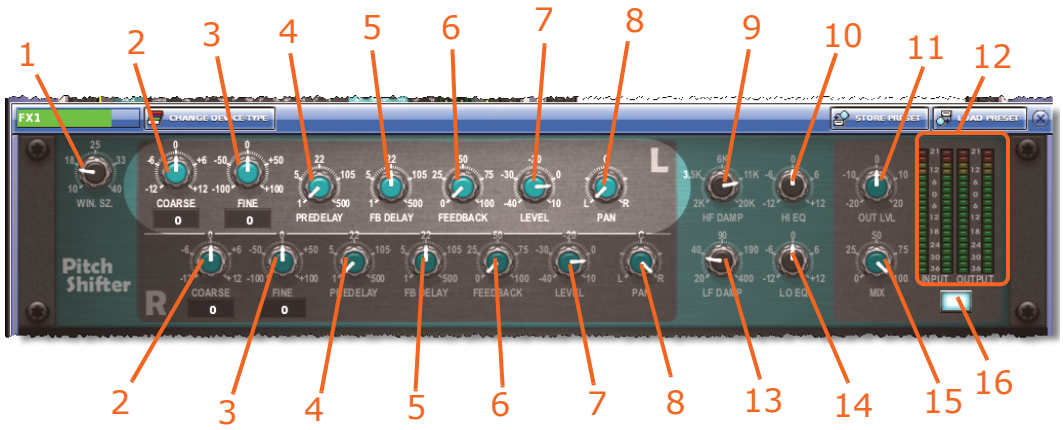


When unlinked, both GEQs operate entirely independently of each other. However, when they are linked, the faders on each GEQ move a corresponding amount from their initial positions, that is, from when they were first linked. So, although their adjustment will be equal, their dB values may be different, depending on what they were when the **LINK** button was switched on.

The diagram of the stereo GEQ (below) shows the position of the **LINK** button. One of the yellow **NO** and **YES** LEDs either side will illuminate to show whether the GEQs are unlinked or linked, respectively.

Pitch Shifter effect

The Pitch Shifter effect is a sound processing device for changing the pitch of an audio signal without changing its duration.



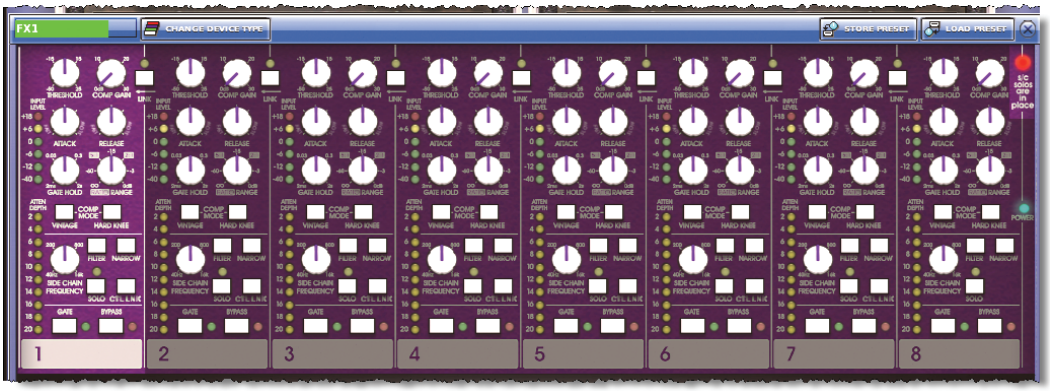
Item	*Description*
1	**WIN. SZ.** control knob.
2	**COARSE** control knob, adjusts the pitch shifting amount in whole tones.
3	**FINE** control knob, fine tunes the pitch shifting in 1% increments of a whole tone.
4	**PREDELAY** control knob, for setting the delay time before the pitch shift.
5	**FB DELAY** control knob, for setting the delay time on the feedback loop.
6	**FEEDBACK** control knob, determines the amount of feedback (output fed back to input) in %. For more details, see "Feedback" on page 154.
7	**LEVEL** control knob, for setting the output level of the individual channel.
8	**PAN** control knob, adjusts the position of the individual channel signal in the unit's stereo output.
9	**HF DAMP** control knob, for adjusting the HF attenuation of delay repeats.
10	**HI EQ** control knob, for boosting/attenuating high frequencies.
11	**OUT LVL** control knob, for setting the overall output level.
12	**INPUT** and **OUTPUT** meters.
13	**LF DAMP** control knob, for adjusting the LF attenuation of delay repeats.
14	**LO EQ** control knob, for boosting/attenuating low frequencies.
15	**MIX** control knob, for controlling the balance between dry signal and effect.
16	**ON** switch.

Feedback

The pitch shifter accepts the input signal and then delays it and plays it back at a different speed. So that its output is delayed and pitch shifted. When this output is fed back into the pitch shifter, further delays and more pitch shifting occur. This can lead to some strange effects, such as feedback.

SQ1 Dynamics effect

For information on the Klark Teknik Square One Dynamics, refer to its Operator Manual (part number DOC02-SQ1DYNAMIC).



3-Band Compressor effect

The 3-Band Compressor effect is for applying different compression profiles to different areas of the audio spectrum.



Item	*Description*
1	**In** button, switches the stereo 3-band compressor in/out. It has an adjacent LED (yellow) for in/out indication.
2	**Threshold** control knob (**Lo**, **Mid** and **Hi** sections), for setting the threshold at which compression begins. Range is -50dB to +25dB.
3	**Ratio** control knob (**Lo**, **Mid** and **Hi** sections), for setting the compression ratio. Range is 25:1 to 1:1.
4	**Make-Up** control knob (**Lo**, **Mid** and **Hi** sections), for boosting the output level of the compressed signal. Range is 0dB to +24dB.
5	**Release** control knob (**Lo**, **Mid** and **Hi** sections), for setting the release time of the compressor. Range is 0.05sec to 3sec.
6	**Attack** control knob (**Lo**, **Mid** and **Hi** sections), for setting the speed of the onset of compression once the threshold has been exceeded. Range is 0.2ms to 50ms.
7	**SOLO** button (**Lo**, **Mid** and **Hi** sections), for listening to the compressor's sidechain filter. It has an adjacent LED (yellow) for on/off indication.
8	Three-section meter, has individual meter elements for input (**In**), gain reduction (**GR**) and output (**Out**).
9	**Soft Link** button, for linking the left and right channels. It has an adjacent LED (yellow) for on/off indication.
10	**Global Knee** control knob, for setting the rate of transition across the threshold.
11	**Lo Mid Freq** control knob, for setting the crossover point between the Lo and Mid compressors. Range is 40Hz to 1kHz.
12	**Hi Mid Freq** control knob, for setting the crossover point between the Mid and Hi compressors. Range is 640Hz to 16kHz.

Chapter 17: Control Groups

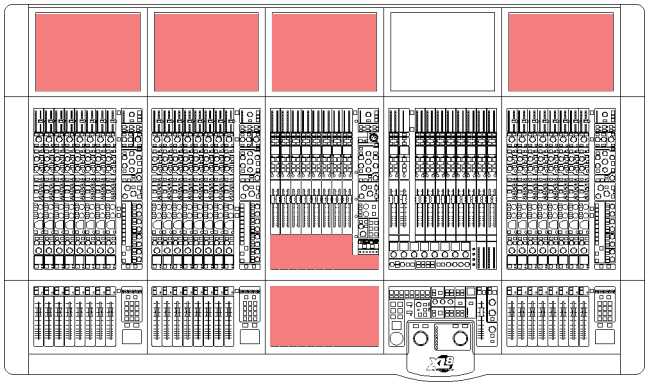
This chapter explains the functions of each XL8 control group and shows you the areas on the control surface and GUI that are used for their operation and management.

XL8 control groups comprise:

- VCA/POP groups (see "VCA/POP groups" below).
- Auto-mute groups (see "Auto-mute (mute) groups" on page 162).
- Talk groups (see "Talk groups" on page 164).

Many of the control group functions can be operated at either the control surface or GUI. Each control group type has its own area on the control surface from where its groups can be set up and recalled. There is also a main option in the GUI menu (**Control Groups**) from which you can open the **Groups Sheet** screen and the group-specific screens; using these screens, you can configure and operate the groups, and also manage group membership.

VCA/POP groups



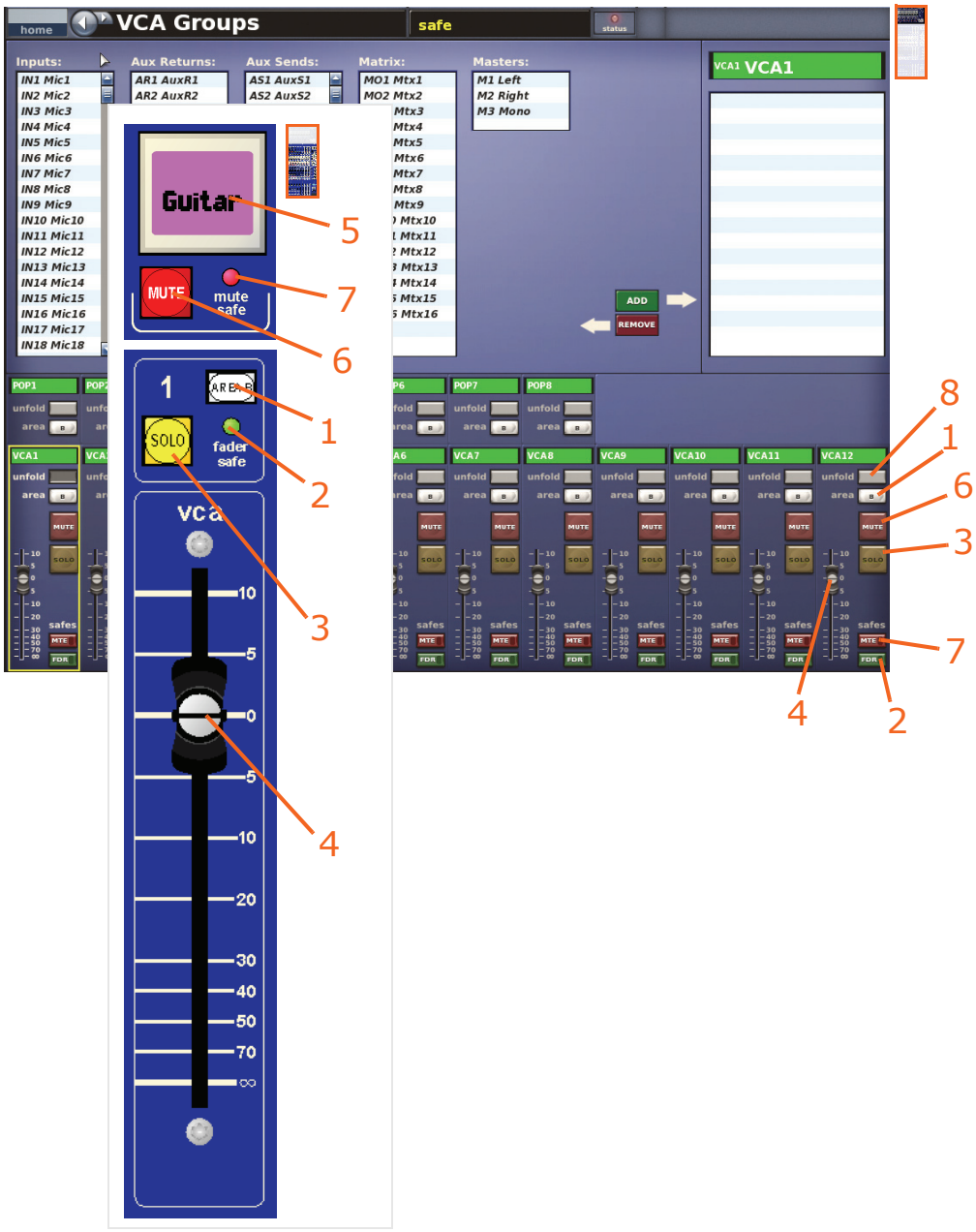
Using the VCA/POP group controls, you can bring selected channels to the control surface for joint control. The VCA/POP group sections are situated at the bottom of the mix bay. When a VCA/POP is selected, its members are unfolded to the input bays. For full details of VCA/POP group operation, see "Using VCA/POP groups" on page 94.

The GUI provides full support for the hardware controls detailed here. This area of the GUI also provides VCA/POP group configuration and management functions.

Each VCA/POP group can have a combination of channel types as members, although it is usual to have only either inputs or outputs. Only the input channels are unfolded to the control surface (in the input bays).

VCA groups

The VCA groups section contains 12 VCA strips. Each strip contains a VCA group selection and management section at the top, with a solo routing section underneath and VCA fader at the bottom. The solo routing section activates solo routing and selects which monitor section (A or B) signals are routed to.



Item	Description
1	**AREA B** button, changes input channel selection from default (area A) to those input channels set to area B mode, in bays configured to present input channels to the user.
2	**fader safe** LED, illuminates if the VCA control group fader has been removed from scene recall.

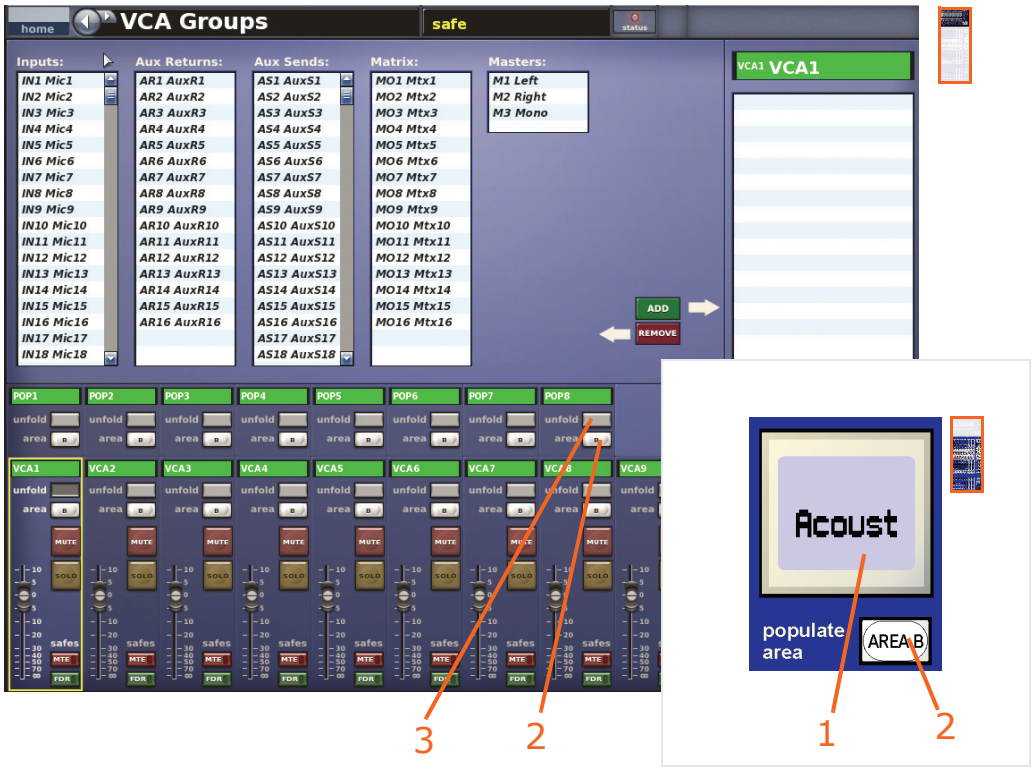
Item	*Description*
3	**SOLO** button, activates signal routing from all assigned channels to the Monitor A section of the console. It is used to monitor the VCA master faders by creating a mix on solo buses, which consists of all input channels and audio mix groups that are assigned to control from corresponding VCA masters.
4	**vca** control group fader, adds its level control on top of the local channel fader controls that it is assigned to.
5	Backlit LCD VCA group select button, for selecting VCA group and managing group membership. Presents user-configurable name and backlight colour to aid group member selection and VCA group identification.
6	**MUTE** switch is, technically, not a mute but a fader minus infinity (-∞) switch that overrides the VCA group master (without moving its physical position). The VCA group mutes can be stored and recalled as part of the scene automation. When on, it mutes all post-fader signals from channels that have been assigned to the VCA group master (regardless of local press, scene mute and SIP mute, which affect only the mute status indicator while channel is muted by VCA). However, it does not update the mute status indicator on the channel (only channel outputs). On removal of the VCA mute, the channel outputs are updated to the current state of the channel mute status indicator.
7	**mute safe** LED, illuminates if the VCA control group mute has been removed from scene recall and auto-mute action. When mute safe becomes active (see Chapter 13 "Muting" on page 129), all channel mute activation methods, other than by local press, are ignored. On removal of the mute safe condition, the current status of the auto-mute and SIP mute is re-evaluated and applied.
8	**unfold** button (GUI only), similarly to the LCD select button, selects the group and unfolds its members to the control surface.



You can allocate the two VCA buttons on the right (underneath the output channel strip) to the two most important items you wish to control, as they are the most easily identifiable of the 12.

POP groups

The POP groups have limited functionality, but operate in a similar way to those in the VCA groups (see "VCA groups" on page 158).



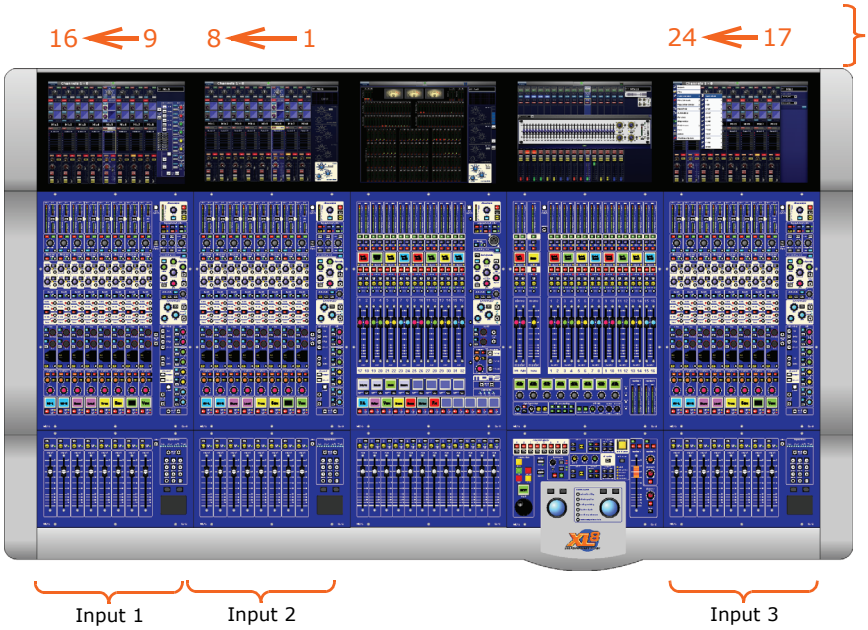
Item	Description
1	Backlit LCD POP group select button for selecting POP group and managing group membership. Presents user-configurable name and backlight colour to aid group member selection and POP group identification (see "Using VCA/POP groups" on page 94).
2	**AREA B**/[**B**] button changes input channel selection from default (area A) to those input channels set to area B mode, in bays configured to present input channels to the user.
3	**unfold** button (GUI only), similarly to the LCD select button, selects the group and unfolds its members to the control surface.

>> To open the VCA Groups screen

At the GUI, choose **home** ▸ ***Control Groups*** ▸ ***VCA Groups.***

Working with VCA/POP groups

When you recall a group, its input channel members are unfolded to the control surface. Population starts at the right of input bay 2 and, when this is full, continues in input bay 1 and then input bay 3, as illustrated in the following diagram. Group members are displayed in ascending order from right to left in each input bay.



These numbers represent the number of input channels in a group and are intended to show how they populate the input bays when their group is selected, where "1" is the lowest numbered input channel in the group. They are not to be confused with actual channel numbers.

If there are more 24 input channels in a group these will be hidden, but you can still navigate them to the control surface (see "To select a group (VCA/POP)" on page 64).

If any channel bank LEDs in the **input select** sections flash while the VCA/POP group's LCD select button is held down, it means that they contain hidden members.

When you deselect a VCA/POP group, its settings revert to those that were current when the group select button was last pressed. Recalling another VCA/POP group deselects the one currently selected.

For information on group selection and navigation, see Chapter 6 "Working With The XL8 Control Centre" on page 47 and Chapter 7 "Navigation" on page 55.

For details of VCA/POP group configuration and operation, see "Using VCA/POP groups" on page 94.

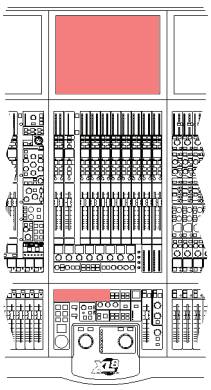
>> To select another group

With a group already selected, select another group by pressing the LCD select button of the group you want. This will replace the currently selected group.

>> To clear group selection

Press the LCD select button of the currently selected group.

Auto-mute (mute) groups

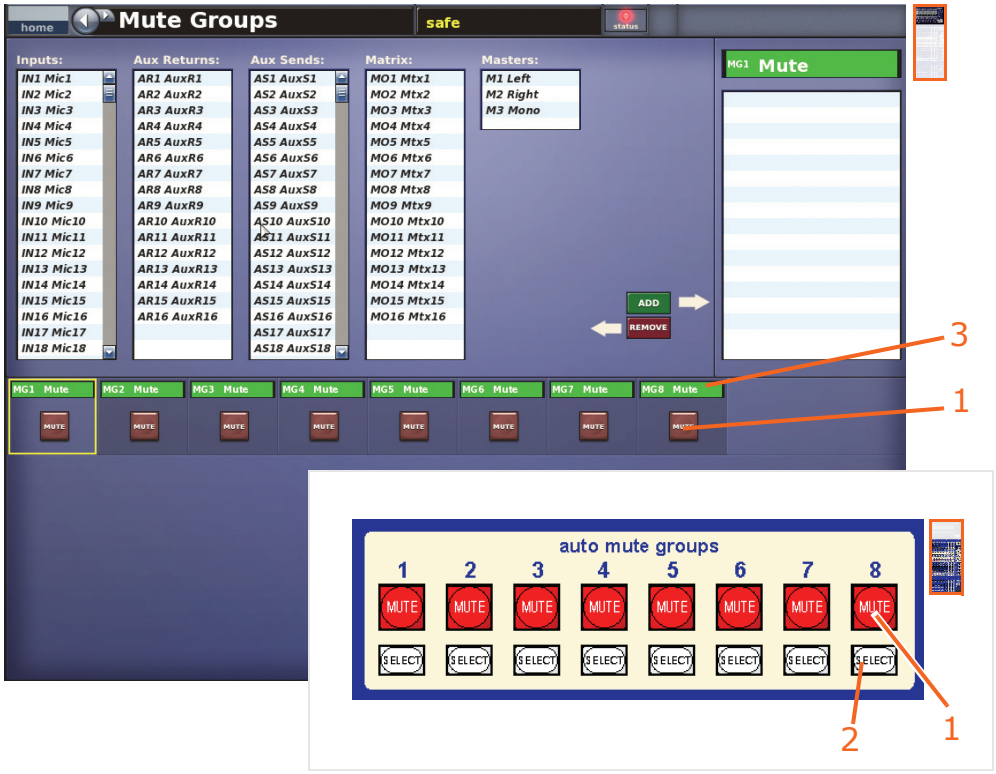


Auto-mute groups let you simultaneously mute any channels that you want.

The **auto-mute groups** section on the control surface has eight sets of auto-mute masters that allow you to create mute groups. Configuration is carried out via the GUI menu (see "Configuring the groups" on page 166).

Any number of channels — inputs or outputs — can be assigned to an auto-mute group.

Auto-mute groups are managed via the **Mute Groups** screen of the GUI menu, from where you can assign channels to any of the groups. You can configure the name and background colour of a mute group at the Groups Sheet screen (see "Configuring the groups" on page 166).



Item	*Description*
1	**MUTE** switch, mutes/unmutes all assigned channels. Also, the same channel can be assigned to more than one auto-mute group - the channel should be auto-muted while any of the mute groups to which it is assigned are muted.
2	**SELECT** switch, for programming the auto-mute channel assignment. When press, shows current mute group members and lets you change them.
3	Name field.

What initiates an auto-mute on/off?

An auto-mute on can happen because of:

- Activating an assigned auto-mute.
- Assigning an already active auto-mute.
- Recalling a scene that assigns an already active auto-mute.

An auto-mute off can happen because of:

- Deactivating all of the assigned auto-mutes.
- Unassigning all of the active auto-mutes.
- Recalling a scene that de-assigns all of the active auto-mutes.

Assigning channels to a mute group

There are two ways of assigning channels to an auto-mute group, as follows:

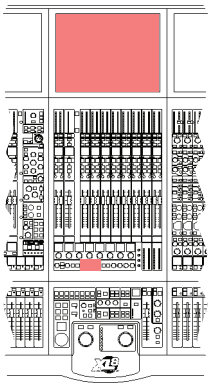
- **Group-view mode** — lets you select a particular mute group, or combination of mute groups, and view and edit the channels assigned to the groups.
- **Channel-view mode** — lets you select a particular channel and view and edit the mute groups to which it is assigned.

>> To open the Mute Groups screen

At the GUI, choose **home** ▸ ***Control Groups*** ▸ ***Mute Groups.***

Talk groups

home ▸ *Control Groups* ▸ *Talk Groups*



The **Talk Groups** screen manages the members of the talk groups. Each talk group section shares control with the talk osc/routing section on control surface (see "talk osc/routing" on page 321).

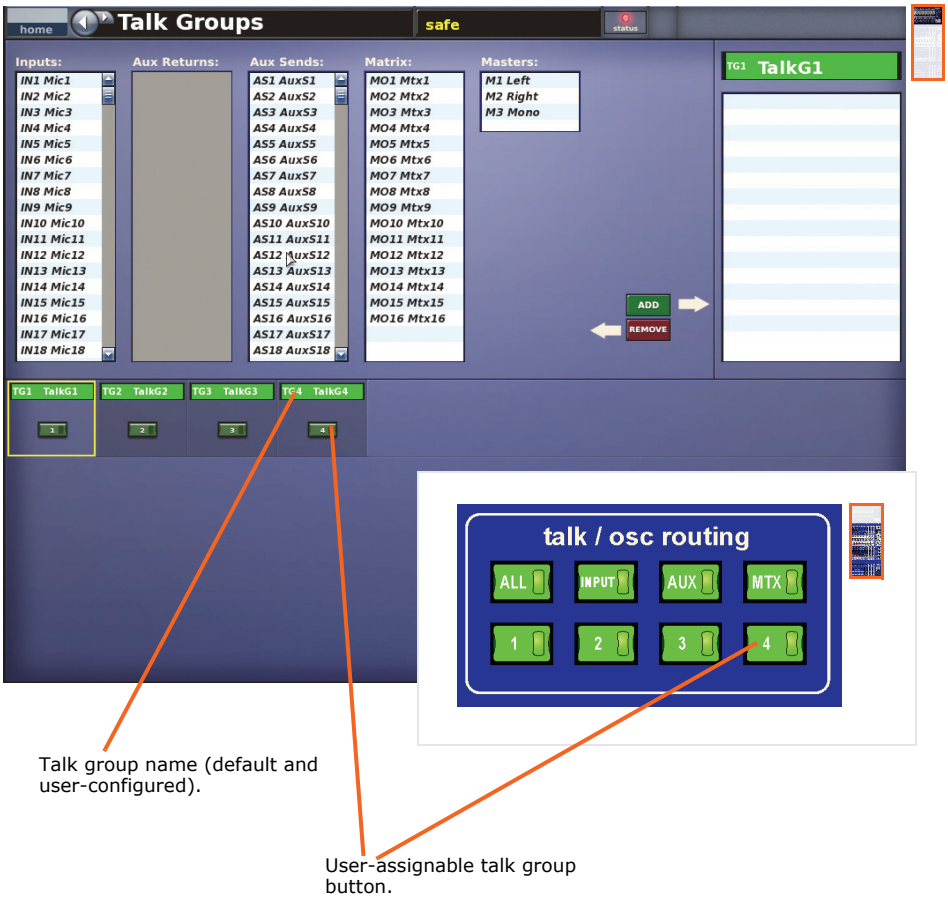
>> To open the Talk Groups screen

At the GUI, choose **home ▸ *Control Groups* ▸ *Talk Groups.***

>> To deactivate a talk group

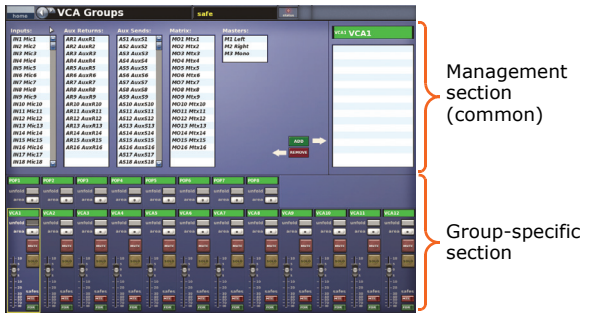
Do one of the following:

- Press the button of the talk group that is currently active.
- Quickly press a talk group button other than the one currently active.
- Press and hold down (for more than one second) a talk group button other than the one currently active. This will activate the talk group whose button you are pressing.
- Switch off both the **TALK** (**internal**) and **OSC** (**internal**) buttons.



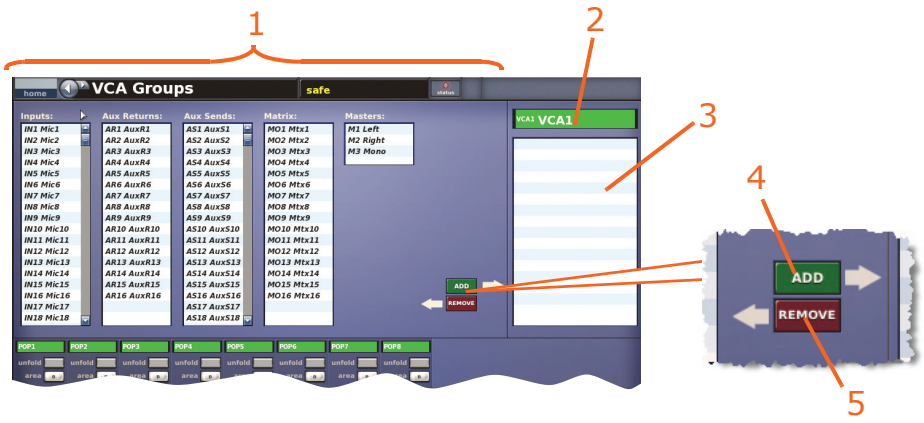
About the control group screens

Each type of control group screen has two main areas (shown right). The management section towards the top allows you to choose the group members, and is common to all control group types, while the bottom section contains the controls and sections specific to each type, which are described later on in this chapter.



Management section

The group management section of each control group screen has two panels. The left panel has five group-dependent lists of channels/mixes from which you can choose group members. The right panel contains the current group members (the example below shows a VCA group). Group members are transferred between the two main panels using the **ADD** and **REMOVE** buttons.



Item	*Description*
1	Group-dependent lists. Contains inputs, returns, auxes, matrices and masters from which to add members to the selected group. Some may be blanked out, as they are dependent on group type. Use the slider on the right of a panel, where appropriate, to access all non-members.
2	Name of selected group.
3	Group member panel, shows the current group members.
4	**ADD** button, adds the selected non-members to the group member panel and, therefore, to the group.
5	**REMOVE** button, moves members from the group member panel to their respective lists; they are no longer members of the group.

Programming the groups

In general, you can use either the control surface or GUI to create, manage and recall the groups. However, you might find it easier to use the GUI, as all of the channels are available simultaneously on the screen.

>> To program a VCA/POP group at the control surface

See "Using VCA/POP groups" on page 94.

>> To program mute group at the control surface

1. In the **auto mute groups** section (master bay), press and hold the **SELECT** button of your chosen auto-mute group.
2. Do one of the following:
   - To add inputs to the group, press the LCD select button of each input channel you want in the group. If necessary navigate the input channels you want to the control surface.
   - To add outputs to the group, press the quick access button (bottom of each output fast strip) of each output you want in the group. If necessary navigate the output channels you want to the control surface.

>> To program a VCA/POP, auto-mute or talk group at the GUI

1. At the GUI, open the screen of the type of control group that you want to program. For example, for a VCA group open the **VCA Groups** screen.
2. Click the group. For example, **VCA1.**
3. Click the channels that you want to add to the group.
4. Click **ADD.** The channels will be moved to the group member panel.

If you want to remove any members from the group, click the channels that you want to remove from the group (group member panel) and click **REMOVE.** The channels are moved back to their respective lists.

Configuring the groups

Similarly to the **Input Sheet** screen (see "Configuring the channels, groups and internal units" on page 231), the **Group Sheet** screen allows you to change the name and background colour of each group as they appear on the GUI screen and LCD select switch (see "Configuring the inputs and outputs" on page 107). Additionally, you can change the colour of all the current members of the group to match the group colour by clicking the fill button .



>> To open the Group Sheet screen

At the GUI, choose **home** ▸ ***Control Groups*** ▸ ***Group Sheet.***

Chapter 18: Copy And Paste

The XL8 has a number of copy and paste features that make it easy to copy useful settings to other areas. You can copy and paste the following:

- Detail areas across channels — see "Using copy and paste" on page 108 and "Input channel select" on page 289.
- Parameters across GEQs — see "Copying settings between GEQs" on page 139.
- Parameters through scenes — see "Show editor" on page 107.
- Scenes — see "Copying and deleting scenes" on page 190 and "To copy and paste sections to a scene(s)" on page 107.
- Shows — see "To copy and paste an event" on page 106.
- Events — see "To save a show or create a new one from the current settings" on page 104.
- Presets — see "To create a new preset library from the current one" on page 217.

For details of the copy and paste, see the Appendices.

Copying through channels/scenes

The fundamental difference between copying through channels and copying through scenes is that the former is location-based, while the latter can be thought of as being time-based, although the areas (parameters) that are copied across are similar.

Chapter 19: Assignable Controls (I Zone)

This chapter describes the assignable controls (I zone) of the output bay and shows you how to use them to operate the internal effects and GEQs of the XL8, or as an alternative way of operating chosen rotaries on the control surface.

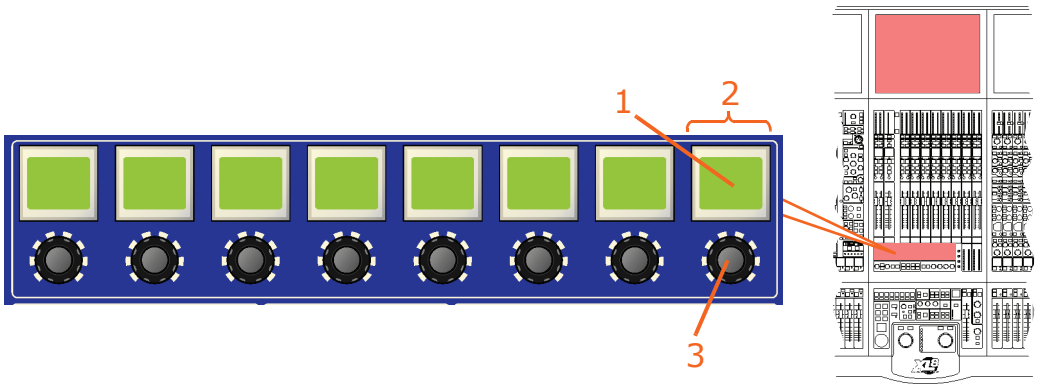
About the I zone

The assignable controls section on the control surface — or "I zone" — has full GUI support and operates in one of two ways:

- **Controlling any rotary on the control surface** You can assign any of the control knobs (rotaries) on the control surface — and also any belonging to the internal effects — to any control knob in the I zone.
- **Operating an internal rack unit of the XL8** You can adjust the critical controls of an internal effect or GEQ rack unit via the I zone.

Although you can switch back and forth easily between the two methods, the I zone gives precedence to the rack unit assignments.

The following diagram shows the eight sets of controls in the I zone.



Item	*Description*
1	Backlit, operator assignable LCD button.
2	Single set of I zone controls.
3	Control knob.

Note: *Pressing an LCD button in the I zone locks out the controls on the control surface.*

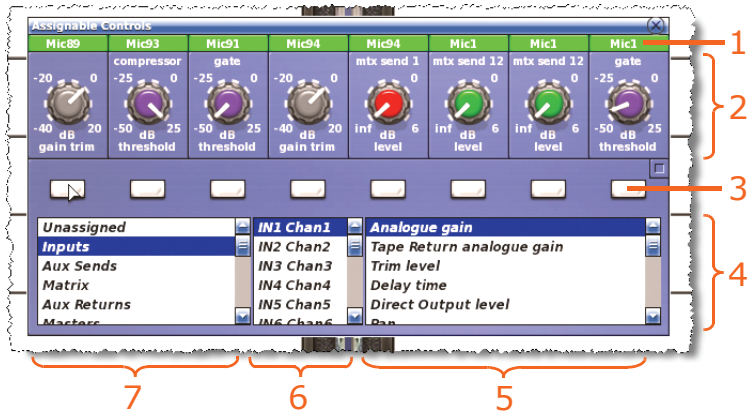
Controlling a rotary control via the I zone

This is an important function of the I zone, which lets you control any of the control knob functions on the control surface, such as **gain trim** (input fast strips), compressor/gate **threshold** (channel strip) and **level** (output fast strips), and even the internal effects. This means you can have quick access to the controls that are currently the most useful to you.

Additionally, you can assign the tap function of the Delay effect to an LCD button in the I zone, which lets you set a delay time manually. For details, see "To assign a Delay time parameter of the Delay effect to an LCD button" on page 172.

About the Assignable Controls window

The **Assignable Controls** window lets you choose which controls you can operate from the I zone. It shows the current assignment and status of each assigned control.



Item	*Description*
1	Channel name, with background colour to match the default/user-defined channel colour.
2	User-assigned controls.
3	Assign/unassign button.
4	Control selection panels. These offer you all the available rotary control assignment options.
5	Available control options for the selected channel/effect.
6	Available channels/effects for the selected channel type/effect.
7	Available channel types/effect. The options are: ***Unassigned; Inputs; Aux Sends; Matrix; Aux Returns; Masters;*** and ***Effects.***

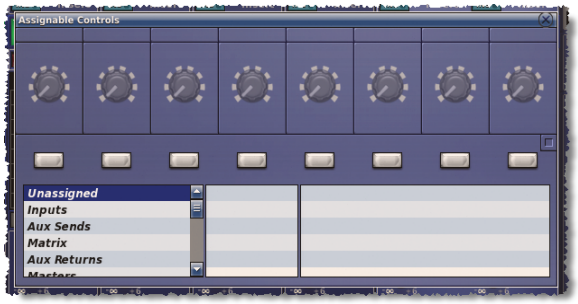
The following are some useful points to know about controlling a rotary control and the **Assignable Controls** window:

- The only way to open the **Assignable Controls** window is by selecting **home** ▸ ***Assignable Controls*** from the GUI menu.
- You can open the **Assignable Controls** window at any GUI screen provided the screen is not displaying the window of a GEQ. However, in the case of the output bay GUI screen, either the **Graphic EQs** or **Effects** screen must not be displayed.
- You can assign any of the internal effects' rotaries to the **Assignable Controls** window.
- You can't use the **Assignable Controls** window with the GEQs.

- You can assign a control to the I zone via the control surface or the GUI.

>> To open the Assignable Controls window

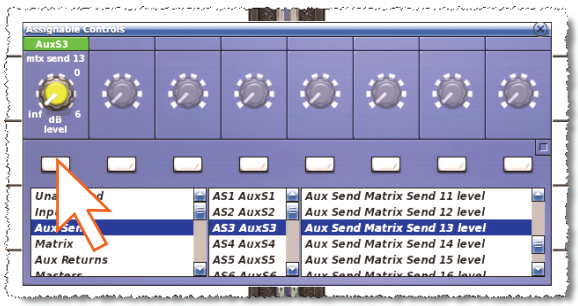
At a GUI screen, choose **home ▸ *Assignable Controls.*** If no controls have been assigned to the I zone, the window will look similar to the one shown right.



>> To assign a control to the I zone

Open the **Assignable Controls** window and do one of the following:

- On the control surface, press and hold down an I zone LCD button. Then select the channel and detail area of the control you want, so that the control is displayed in the channel detail area on the GUI. Operate the control to assign it.
- At a GUI screen, open the **Assignable Controls** window and choose the control you want to assign from the panels at the bottom of the window (see "About the Assignable Controls window" on page 170). For example, choose matrix send 13 of aux channel 3. Then click an assign/unassign button (as shown right).



- An alternative method is to press and hold down an I zone LCD button. Then, on the GUI, click the desired control.

The LCD assignable control button in the I zone (control surface) will show the new assignment by displaying the channel type and number or effect number. For example, "AuxS3" (shown right) or "IfX1" for an effect.



>> To unassign a control in the I zone

In the **Assignable Controls** window, select ***Unassigned*** in the left panel and click the desired assign/unassign button.

>> To assign a Delay time parameter of the Delay effect to an LCD button

1. At the output bay GUI screen, make sure that the **Effects** screen or **Graphic EQs** screen is not currently displayed. Then, at any GUI screen, open the **Assignable Controls** window.
2. In the control selection panels at the bottom of the **Assignable Controls** window, do the following:
   - In the left panel, select ***Effects.***
   - In the middle panel, select the desired Delay effect.
   - In the right panel, select the **Delay time L**/**Delay time R** parameter.
3. Assign the delay time parameter to a control in the I zone by doing one of the following:
   - In the I zone, press the desired LCD button.
   - In the **Assignable Controls** window on the GUI, click the desired assign/unassign button.

The XL8 measures the interval between taps. It uses the most recent taps to calculate the average tap time, which is constantly updated accordingly. This value is displayed in the appropriate **Range** field and indicated by the control knob immediately left.



Using the I zone to control an internal effect/GEQ

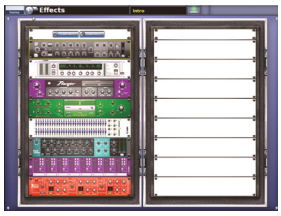
As the internal effects and GEQs of the XL8 are GUI-only features, control surface support is provided by the I zone, which lets you operate their parameters using physical controls.

With an internal rack unit selected at the output bay GUI, a set of its parameter controls will be automatically assigned to the I zone. Each individual set of I zone controls will have its own single control assignment. To encompass all of a rack unit's parameter controls they are bundled into sets — known as pages for effects and groups for GEQs — which are navigated to the I zone using a Shift function.

Rack and unit control navigation using the I zone's Shift function

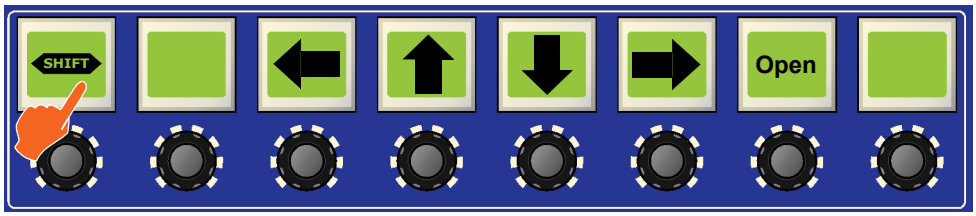
The Shift function is a navigational tool that lets you select a rack unit on the GUI and choose which of its page/group of controls are assigned to the I zone. The Shift function is operated using the LCD buttons in the I zone.

Don't forget that you can operate the selected effect/GEQ in the rack unit view (immediate right) or with its window open (far right). Although both examples show the effects, this also applies equally to the GEQs.





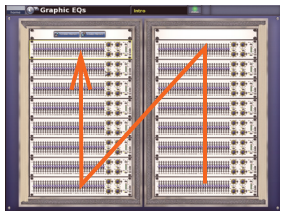
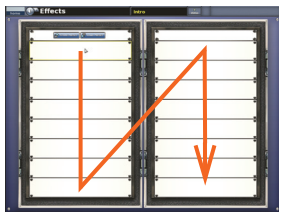
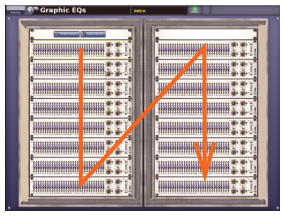
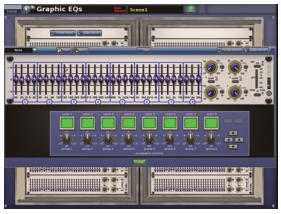
The following diagram shows the I zone when using the Shift function.



Note: *In the internal rack unit's window on the GUI, the four arrow buttons to the right of the* ***assignable controls*** *panel (shown right) have the same function as the equivalent Shift function buttons in the I zone.*



Table 7: I zone button functions when using the Shift function

Control	*Action (Effect)*	*Action (Graphic EQ)*
SHIFT + ⬅	Scrolls through the 'pages' of the selected internal effect in descending order. This has no affect if you are already at the first page or there is no effect selected.	In zoom view, scrolls through the zoom displays. This has no affect if you are already at 'zoom 1' display. This has no affect in overview display.
SHIFT + ⬆	Scrolls up the effects rack, changing unit selection accordingly. Stops at the first rack position (upper-left). 	Scrolls up the GEQ rack, changing unit selection accordingly. Stops at the first rack position (upper-left). 
SHIFT + ⬇	Scrolls down the effects rack, changing unit selection accordingly. Stops at the last rack position (lower-right). 	Scrolls down the GEQ rack, changing unit selection accordingly. Stops at the last rack position (lower-right). 
SHIFT + ➡	Scrolls through the 'pages' of the selected internal effect in ascending order. This has no affect if you are already at the last page or there is no effect selected.	In zoom view, scrolls through the zoom displays. This has no affect if you are already at 'zoom 8' display. This has no affect in overview display.
SHIFT + **Open**	Opens the window of the currently selected effect (for example, phaser). If there is no effect assigned to the current rack position the effect window will be empty. If the device window is already open, pressing this button combination will close it. 	Opens the window of the currently selected GEQ or closes it if it is already open. 

>> To access the Shift function and select an option

1 In the I zone, press and hold down the **SHIFT** button. The I zone's LCD buttons revert to Shift mode.

2 To select an option, press the desired I zone LCD button (see Table 7 "I zone button functions when using the Shift function" on page 174) while still holding down **SHIFT.**

>> To exit the Shift function

Release **SHIFT.**

>> To assign an internal effect/GEQ to the I zone

1 At the output bay GUI screen, do one of the following:

- To control one of the internal effects (for example, a phaser) using the I zone, open the **Effects** screen.
- To control one of the GEQs using the I zone, open the **Graphic EQs** screen.

2 Select the desired rack unit by doing one of the following:

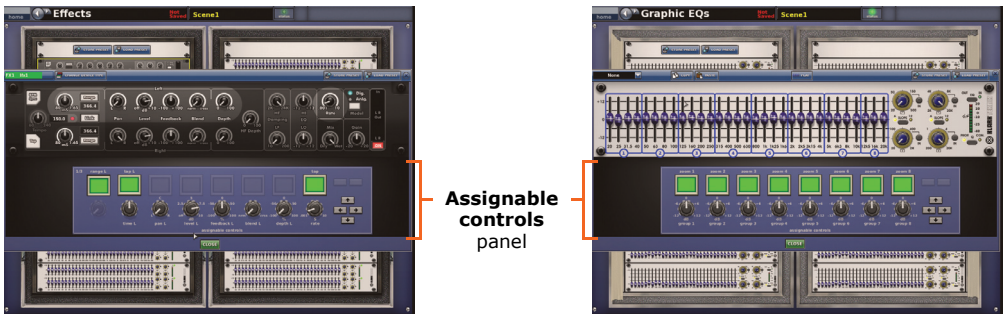
- In the I zone, use the up and down arrow buttons of the Shift function to navigate to the desired rack unit. Select the unit by pressing **SHIFT** + **open.**
- At the output bay GUI, click the desired rack unit.

The window of the rack unit will open, containing the **assignable controls** panel at the bottom. A page/group of parameters will be automatically assigned to the **assignable controls** panel and the I zone.

You can now control the rack unit using the I zone.

About the assignable controls panel on the GUI

The **assignable controls** panel is displayed on at the bottom of the effect/GEQ window (output bay GUI only). It gives a pictorial representation of the I zone and displays additional information, such as button and control knob assignments, current 'page' number etc. This panel also provides an alternative method of operating the I zone controls.



The following diagram explains the elements of the **assignable controls** panel. It uses the one for the effects as a example, but this also applies to the GEQs.



Item	*Description*
1	**Effects only:** Shows which 'page' of parameters is currently selected to the I zone, in the format: [page number]/[total number of pages]. For example, the diagram above is displaying page 1 of 3 pages.
2	Single set of I zone controls (LCD select button and control knob).
3	LCD select button.
4	**Effects only:** Description of the effect's button currently assigned to the LCD button. **GEQ only:** Will show either the text "zoom n" (where n is number from 1 to 8) or "overview" to indicate which display you are in, that is, overview or zoom, respectively.
5	Navigation buttons, which replicate the arrow buttons in the I zone when using the Shift function (see Table 7 "I zone button functions when using the Shift function" on page 174).
6	Parameter description of the assignment of the control knob above.
7	Control knob. Includes gradations and dimensions applicable to the assigned parameter.
8	When an I zone control is unassigned, it is displayed as a 'ghost' image.

>> To operate the assignable controls panel at the output bay GUI

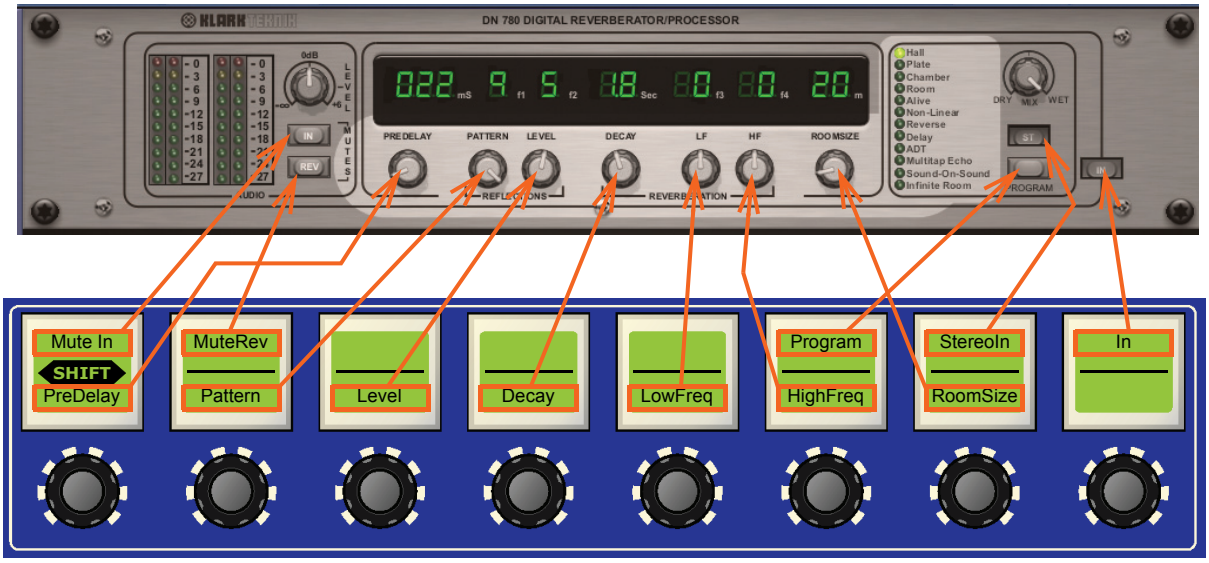
You can use the GUI to operate the effect/GEQ assigned to the I zone by doing any of the following:

To	*Do this in the assignable controls panel*
Select a different effect/GEQ	Click the up/down arrow buttons
Change the I zone control assignments	Click the left/right arrow buttons to navigate to a different page (effects) or zoom display (GEQs)

To	*Do this in the assignable controls panel*
Operate a button on the front panel of an effect/GEQ	Click the desired LCD button
Operate a control knob on the front panel of an effect/GEQ	Use drag on the desired control knob

Controlling an internal effect via the I zone

When controlling an effect, the text at the top and bottom of each I zone LCD button shows you which button and control knob, respectively, it is assigned to on the front panel of the effect. The following diagram shows a typical example of the I zone assignments immediately after selecting a DN780 effect.



>> To operate a button of an effect

1 Make sure that the effect's button you want to operate is assigned to the I zone. If necessary navigate the effects page containing your desired button to the I zone. (The text at the top of the LCD button indicates its assignment.)

2 Press the desired button. For example, press the "MuteRev" LCD button in the I zone to operate the **REV** button on the DN780 effect.

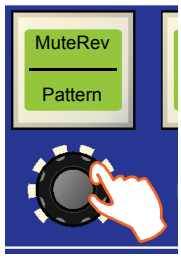


Note: *The I zone's* ***SHIFT*** *LCD button operates in the same way as any other I zone button. It is only by holding it down that it accesses the Shift function.*

>> To operate a control knob of an effect

1. Make sure that the effect's control knob you want to operate is assigned to the I zone. If necessary navigate the effects page containing your desired button to the I zone. (The text at the bottom of the LCD button indicates its assignment.)

2. Adjust the desired control knob. For example, adjust the "Pattern" control knob in the I zone to operate the **PATTERN** control knob on the DN780 effect.



Controlling a GEQ via the I zone

You can use the I zone to adjust the faders and controls, such as the high/low pass filters, notch filters, slope etc., of an internal GEQ. For information on opening the **Graphic EQs** screen and selecting a GEQ, see Chapter 15, "Graphic Equaliser (GEQ)".

Similarly to the internal effects, there is an **assignable controls** panel on the GUI (see "About the Assignable Controls window" on page 170). However, to accommodate the faders there are, effectively, two levels of display, known as "overview" and "zoom".

The overview display appears initially when you open the window of the GEQ, and lets you adjust a group of GEQ faders simultaneously. Each LCD button in the I zone is assigned to a group of faders. For identification, the groups are numbered, as shown in the following diagram.

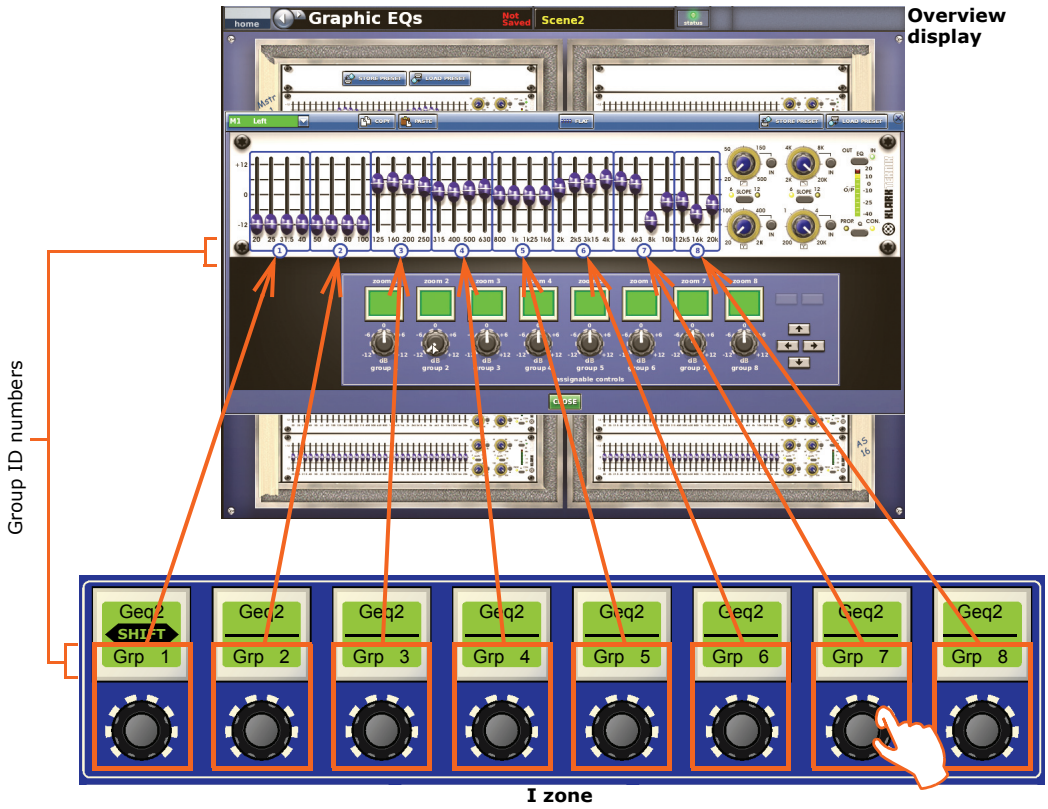


Figure 28: I zone control knob assignments in the overview display

The zoom display comprises a number of screens, which are accessed via the LCD buttons of the overview display. The following diagram shows all of the available zoom displays and includes a typical example of what the assignable controls (control surface and GUI) will look like just after a GEQ has been selected.

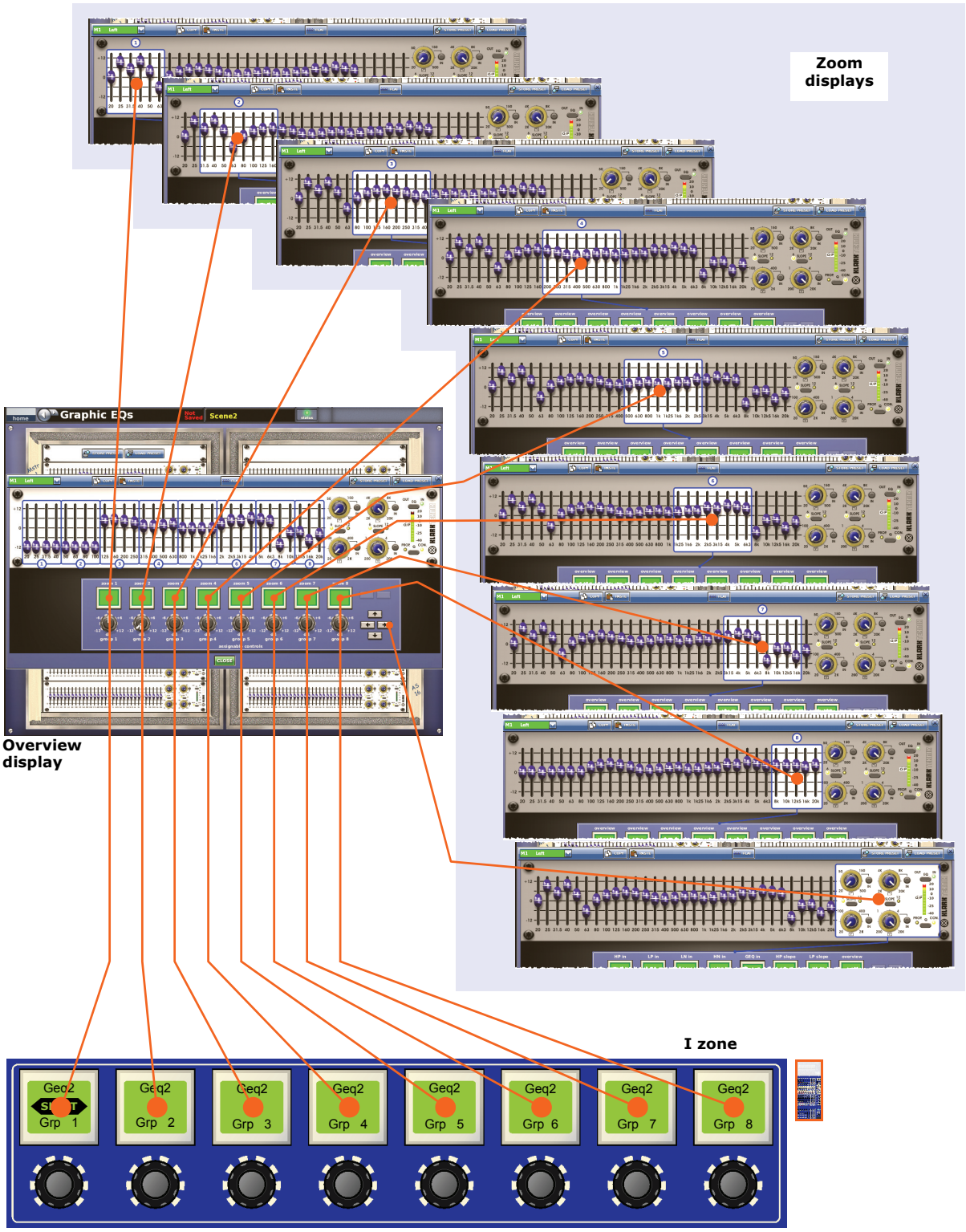


Figure 29: I zone LCD button assignments in the overview display

>> To switch between the overview and zoom displays

Do one of the following:

- To open the overview display from one of the zoom displays, press any of the LCD buttons in the I zone.
- To open a zoom display from the overview display, press the desired LCD button in the I zone.

>> To navigate the zoom displays

If you are at a zoom display and you want to go to another one, for example, to adjust a fader or front panel control, use the left and right arrow buttons of the Shift function ("Rack and unit control navigation using the I zone's Shift function" on page 173). For diagrams of the available zoom displays, see Figure 29 "I zone LCD button assignments in the overview display" on page 179.

>> To adjust a group of faders simultaneously in the overview display

Make sure the overview display is shown on the GUI and adjust the appropriate control knob in the I zone. The group number applicable to each set of I zone controls is shown at the bottom of the LCD buttons. The following diagram shows the effects of adjusting a group of faders via the I zone (and GUI); note how continual adjustment will eventually take all of the group's faders to the maximum or minimum extent.

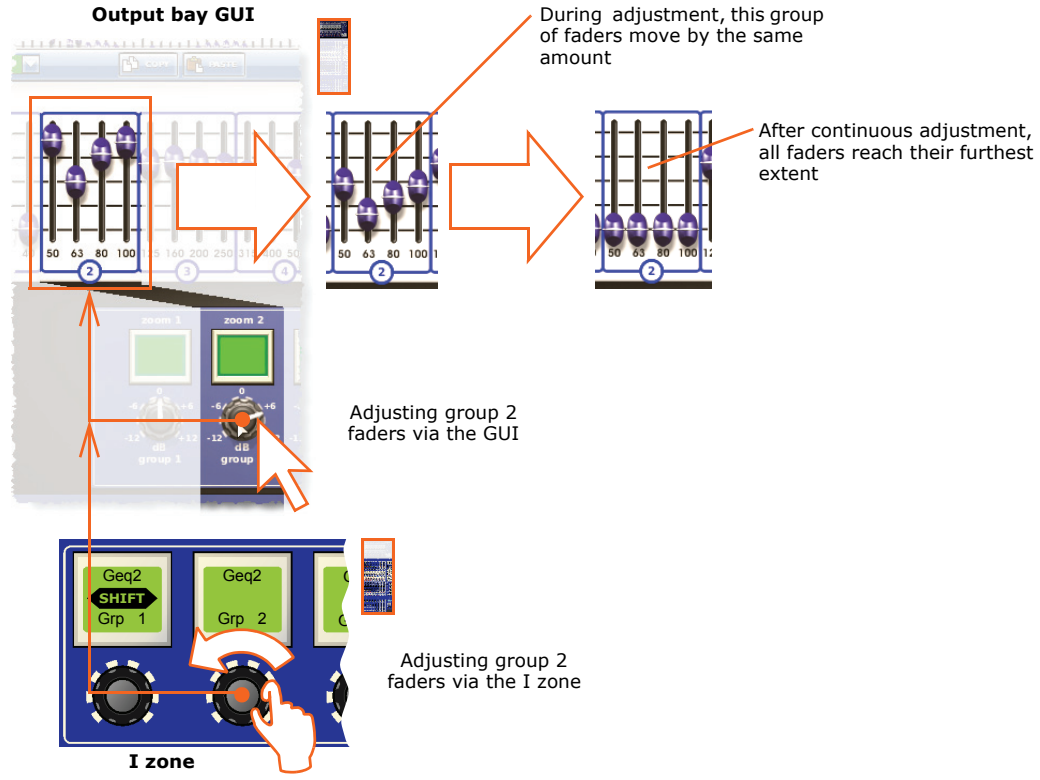


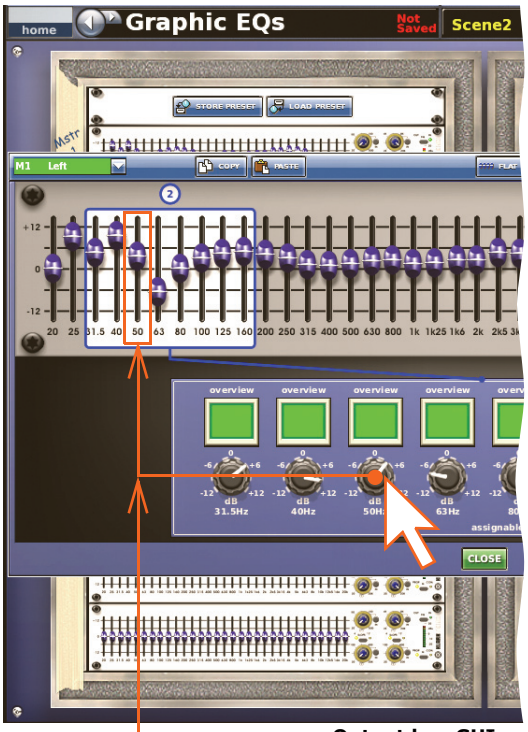
Figure 30: Group fader adjustment (via the I zone/GUI) in the overview

>> To adjust a single fader in a zoom display

If necessary navigate the desired zoom display (containing the fader you want to change) to the GEQ window. In the I zone, adjust the desired control knob.

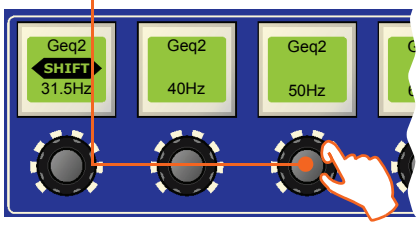
The diagram right shows you how to adjust a single fader via the I zone (and GUI). The example shows adjustment of the 50Hz fader, which is in the zoom 2 display.

Note: *You can also adjust a single fader in the overview display using drag, or in the rack view (with the GEQ window closed).*



Output bay GUI

I zone



>> To operate a button or control knob of a GEQ

For details, see "To operate a button of an effect" on page 177 and "To operate a control knob of an effect" on page 178.

Chapter 20: Scenes And Shows (Automation)

This chapter shows you how to use scenes and shows, which are part of the XL8's automation.

About automation

Automation is predominantly a GUI-only function that allows complex editing of scenes and the creation of show files via the GUI menu. The control surface provides limited control via the **automation** section, which facilitates fast store/recall operation during show time and rehearsals.

The automation system of the XL8 can store and recall up to 1000 scenes, each one being a snapshot of the control centre's settings at the instant the scene was created. By recalling scenes, users can — with certain exceptions — restore the control centre to the state that existed at that time the scenes were stored. This makes it ideal for multi-act tours by providing quick and accurate access of settings for the band with a minimum of sound check time, as well as for theatre productions, where each act requires reconfiguration of audio I/O.

All of the scenes for a show are contained within a show file. Show files are stored in the XL8, so that they can be loaded when required, and they can also be transferred to/from external USB storage devices.

Events provide an additional scene control by which you can use the MIDI, GPIO and 'internal' functions to trigger events on internal and external devices from within the show file, and carry out crossfades.

For theatre applications, channel settings can be recalled (across all scenes) from the user library (see Chapter 24 "User Libraries (Presets)" on page 215) so that one generic show can cope with different performers on a night-by-night basis, which is common in theatres.

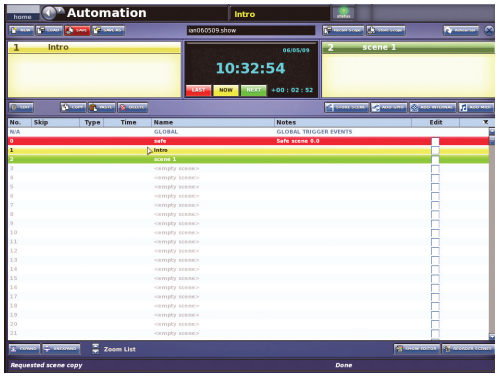
You can copy certain parameters through scenes by using the **Show Editor** screen. For more information on the **Show Editor** screen and for details on how to use it for copying and pasting throughout scenes, see "Show editor" on page 107. For details of the parameters that can be copied through the scenes, see Appendix M "Parameters Affected By Copy And Paste" on page 519.

Throughout this chapter, wherever scenes are mentioned this also applies to point scenes, unless otherwise stated.

For details of the control surface automation controls, see "Automation" on page 330.

Automation screen

The **Automation** screen (shown right) can be broadly divided into the following main functional areas:



- Scenes — see "Scenes" on page 185.
- Shows — see "Show files" on page 192.
- Scope — see Chapter 21 "Scope (Automation)" on page 195.
- Events — see Chapter 23 "Crossfades (Automation)" on page 207.

For details of how to open the Automation screen, see "To open the Automation screen" on page 103.

Using the right-click menu

You can access some of the functions of the function buttons and also additional functions by right-clicking the desired scene. This opens a menu that has the following options:

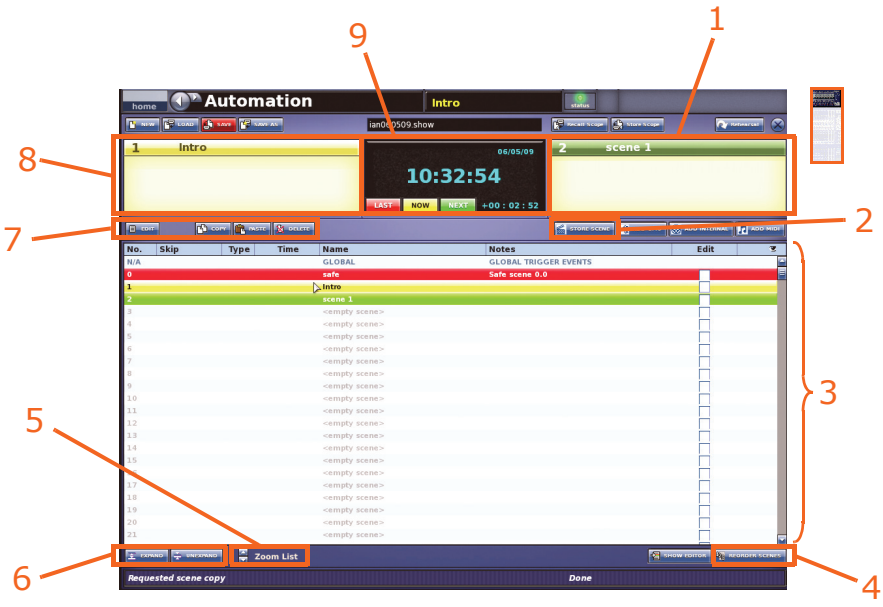


- ***Edit:*** Opens the **Edit Scene Properties** window.
- ***Add:*** Opens a submenu with the following options:
  - ***Overwrite Scene:*** Overstores the scene with any changes made. For example, if you are working on scene 2, and you have made changes to it, right-click on scene 3 and then select **Add** > **Overwrite Scene,** and scene 3 will be overstored with the changes made to scene 2.
  - ***Insert Scene:*** Inserts the scene you have just copied immediately before this one.
  - ***Midi Event:*** Creates a MIDI event in the scene.
  - ***Internal Event:*** Creates an internal event in the scene.
  - ***GPIO Event:*** Creates a GPIO event in the scene.
- ***Delete:*** Deletes the selected scene (see "Copying and deleting scenes" on page 190).
- ***Copy:*** Copies the selected scene (see "Copying and deleting scenes" on page 190).
- ***Paste:*** Pastes the scene you have just copied.
- ***Expand:*** Expands the scene/point scene (see "To expand a scene/point scene" on page 188.
- ***Un-Expand:*** Closes the point scenes of the scene/point scene (see "To expand a scene/point scene" on page 188).
- ***Multi-Edit:*** Opens a submenu with the following options:
  - ***Set List:*** Opens the **Set List** window.
  - ***Show Editor:*** Opens the **Show Editor** window.
- ***Invert Selection:*** Any scenes that have been 'checked' (that is, their check box in the **Edit** column contains an "X") become unchecked, and vice versa.

- ***Clear Selection:*** Unchecks any scenes that have been checked.
- ***Exit:*** Closes the right-click menu.

Scenes

The scene management areas of the **Automation** screen are is intended for fast operation during show time and rehearsals. They let you edit, copy, delete, store and recall scenes, and can be broadly subdivided into the following areas.



Item	*Description*
1	Next scene panel, contains scene number, title and notes pertaining to the next scene.
2	**STORE SCENE** button (see "Automation" on page 330).
3	Scene cue list (see "Scene cue list" on page 187).
4	**REORDER SCENES** button (see "Changing the order of the scenes" on page 190).
5	**Zoom List** spin buttons (see "Using zoom" on page 191).
6	**EXPAND** and **UNEXPAND** buttons (see "To expand a scene/point scene" on page 188 and "To close the point scenes of a scene/point scene" on page 188).
7	**EDIT**, **COPY**, **PASTE** and **DELETE** buttons (see "Editing scene properties" on page 189 and "Copying and deleting scenes" on page 190).
8	Now scene panel, contains scene number, title and notes pertaining to the 'now' scene.
9	Title of current show, date and time details (see "Date and time" on page 187) and automation control buttons (see "Automation" on page 330).

For details of how to navigate the scenes with the jogwheel, recall a scene and create a new scene from the currently selected one, see "Managing the scenes" on page 104.

Scene contents

A scene contains all of the control centre settings that existed at the point of creation, except:

- Anything that is explicitly taken out of store or recall using the automation scope controls.
- All solo, monitor and comms section controls.
- All surface selection or navigational control settings.

Additionally, each scene can contain:

- Scene information, including name and notes.
- Event (MIDI/GPIO/internal).

Point scenes

For every scene there are 10 point scenes available, and each point scene has another 10 point scenes. Point scenes are the same as scenes. They allow each scene to be divided into smaller sections.

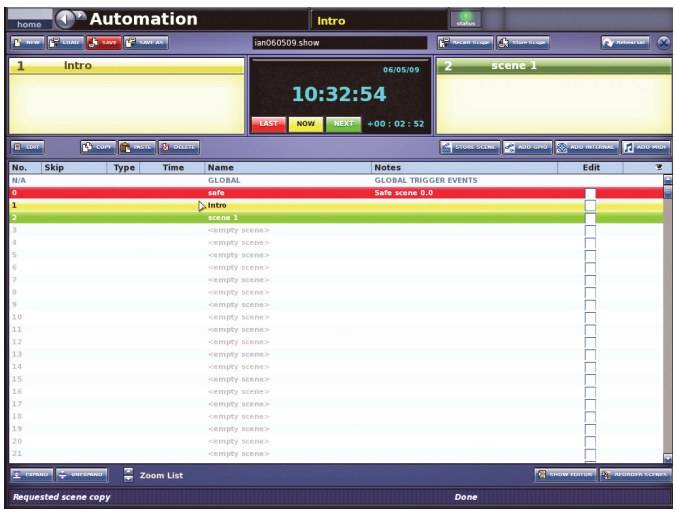
Numbering and navigation

As scenes need to be recalled in sequence, each scene requires a sequential number. So, although there is a maximum of 1000 scenes, the range of scene numbers is much greater to allow for gaps to be left for adding scenes without having to renumber the subsequent scenes — a major requirement in scripted shows. To facilitate this, each scene has an associated four-digit, two-decimal place scene number, giving a possible 99 point scenes per main scene. The scene number locates the scene in the sequence of stored scenes and is the basis of scene navigation.

To navigate the scenes, the jogwheel on the control surface goes beyond the scope of the one-step automation buttons (**last**, **now** and **next**) by allowing you to scroll quickly from one scene to the next. Identification of current scene position is shown by the yellow background strip. The next and previous scenes are similarly highlighted, but by green and red, respectively.

Initial snapshot scene (scene 0)

All scene numbers are available for storing scenes except scene 0, which is called the "safe" scene. This scene is the control centre's initial snapshot scene, and is created by the control centre and cannot be overwritten by the user. It is the only snapshot existing when the show is stopped or when the user subsequently clears the control centre down. A typical safe screen is shown in the following diagram.



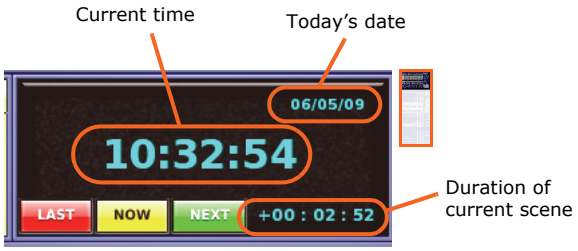
When recalled, it sets the control centre — regardless of scope settings — to a safe state in which it is not passing any audio.

The settings include:

- All mutes off.
- Gains are set to 0dB.
- All levels are at minus infinity (-∞) dB.
- All faders are at minus infinity (-∞) dB — except VCA faders, which remain at 0dB.

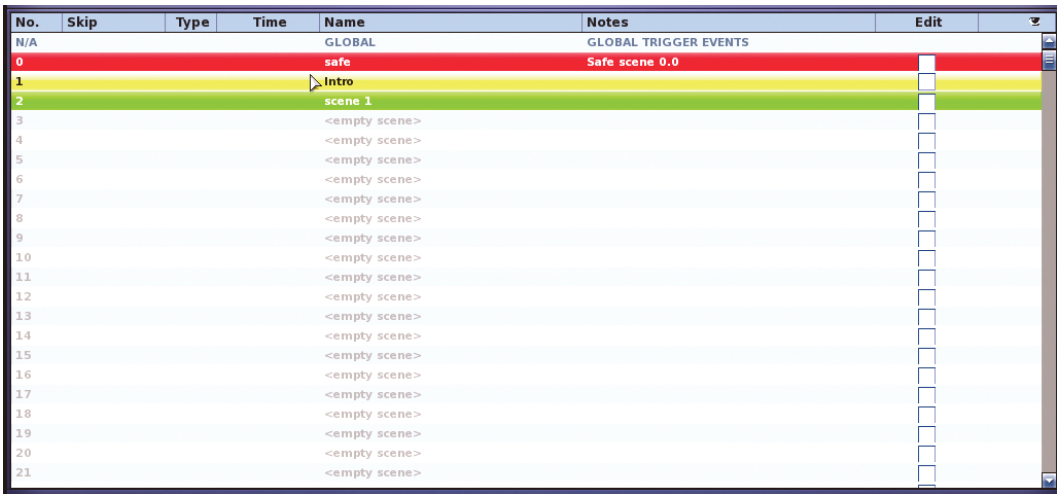
Date and time

The current date and time, and the duration of the current scene are displayed towards the top of the **Automation** screen.



Scene cue list

The scene cue list provides you with an overview of the show. It tells you at a glance where you are in the performance and provides scene information, such as scene number and title. Other features let you alter settings, 'skip' scenes, edit scene properties and choose what to leave out of the cue list.



Column title	*Function*
No.	Number column shows the scene number and point scene number.
Skip	Skip column. When you see the symbol of a curved arrows in this column it means that this scene will be missed out during a rehearsal. For example, during rehearsal you may need to skip scene 3 by going straight from scene 2 to scene 4 (auto status). Also, indicates event selection when it contains a yellow circle.
Type	Events contained in scene.
Time	Displays the time before an event, such as MIDI, internal etc., is triggered. A blue countdown time bar shows how long remains.

Column title	*Function*
Name	Title of scene.
Notes	Scene notes.
Edit	Edit column contains a tick box per scene/event, which is used for selection purposes when reordering scenes, see "Changing the order of the scenes" on page 190.
Eye symbol	Opens the **Show** window (see "Configuring the scene cue list view" on page 188).

>> To select a scene/point scene

The 'now' scene is the currently selected scene (highlighted in yellow).

Do one of the following:

- At the GUI, click the scene/point scene in the **Automation** screen.
- At the GUI, click the **LAST**/**NOW**/**NEXT** button in the **Automation** screen as necessary.
- In the **automation** section (control surface), press the **last**/**now**/**next** buttons as necessary.
- In the **automation** section (control surface), operate the jogwheel to go to the scene/point scene. Then press **now.**

When recalling a scene, you can avoid replacing the current settings by using scope masks, see Chapter 21 "Scope (Automation)" on page 195.

>> To expand a scene/point scene

Select the scene/point scene and do one of the following:

- Click **EXPAND.**
- Right-click the scene to open the right-click menu. Then, choose **Expand.**

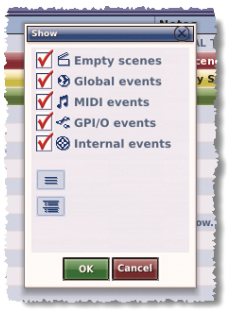
>> To close the point scenes of a scene/point scene

Select the scene/point scene and do one of the following:

- Click **UNEXPAND.**
- Right-click the scene to open the right-click menu. Then, choose **Un-Expand.**

Configuring the scene cue list view

You can exclude certain elements from the scene cue list (see "Scene cue list" on page 187), such as events and empty scenes. This is done via the **Show** window (shown right). The following is a description of the options:



- **Empty scenes** — excludes all empty scenes from the show.
- **Global events** — excludes all events from the show.
- **MIDI events** — excludes all MIDI events from the show.
- **GPI/O events** — excludes all GPIO events from the show.
- **Internal events** — excludes all internal events from the show.

>> To configure the scene cue list view

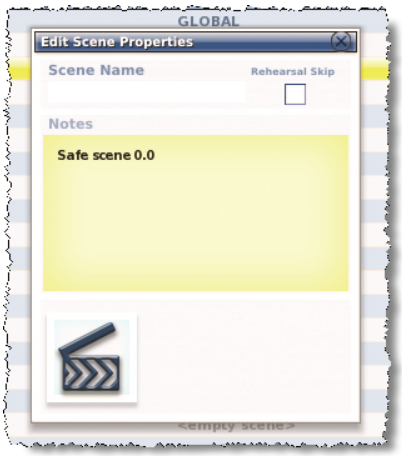
1 Click the eye symbol (right of the cue list title bar) to open the **Show** window.

2 In the **Show** window, select the desired options.

3 Click **OK.**

Editing scene properties

You can change the name of a scene, add/edit its notes (also editable in the **Store** window when storing a scene) and choose to skip the scene during a rehearsal. This is all done via the **Edit Scene Properties** window (shown right).



The **Scene Name** and **Notes** sections are edited just as you would any other text field.

>> To open the Edit Scene Properties window

Do one of the following:

- Select the scene and then click **EDIT.**
- Right-click on the scene and then choose **Edit** from the right-click menu.

>> To skip a scene during rehearsal

Click the **Rehearsal Skip** box to place a red cross inside it. After you close the window, a skip arrow symbol will appear in the scene's **Skip** column.

Adding a new scene

You can add a new scene anywhere in the cue list. The new scene can be inserted in the cue list or you can overwrite an existing scene, which replaces it with the new one.

>> To insert a new scene

1 Right-click the scene before which you want to insert the new one.

2 From the right-click menu, choose **Insert Scene.**

>> To overwrite an existing scene with a new one

1 Right-click the scene you want to overwrite.

2 From the right-click menu, choose **Overwrite Scene.**

Copying and deleting scenes

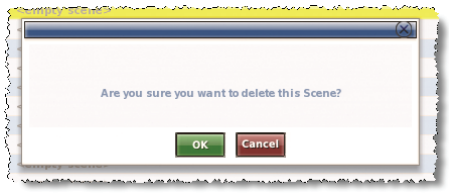
You can copy and delete single scenes/point scenes from the cue list.

>> To copy a scene

1. Do one of the following:
   - Select the scene you want and click **COPY.**
   - Right-click the scene and then choose **Copy** from the right-click menu.
2. In the cue list, select the scene/point scene before which you want to paste the copied scene. Then, click **PASTE.**

>> To delete a scene

1. Do one of the following:
   - Select the scene and then click **DELETE.**
   - Right-click on the scene and then choose **Delete** from the right-click menu.
2. In the message window (shown right), click **OK**.



Changing the order of the scenes

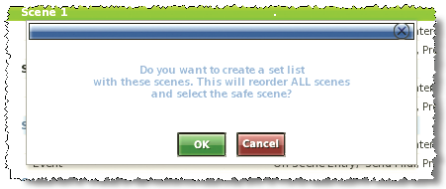
You can change the order of the scenes in the cue list. This is done using **REORDER SCENES** button. You can reorder as many scenes as you want by selecting them in the order you want them to appear in the reordered list.

>> To reorder the scenes

1. In the Automation screen, click **REORDER SCENES.** The grey double arrowhead symbol will appear in each box in the **Edit** column.
2. In the cue list, click the box of the first scene you to reorder (as shown right). A "1" will appear in the **Edit** column, signifying that it will be the first of the reordered scenes, and the scenes will be reordered from this point on in the cue list.



3. Repeat for the next scene you want to reorder. This will be labelled "2" in the **Edit** column.
4. Repeat for the remaining scenes/point scenes.
5. Click **REORDER SCENES.** The message window (shown right) will open.
6. Click **OK.**



Overriding store scope

You can choose to ignore the parameters selected at the **Store Scope** screen, so that these 'safed' parameters *will* be stored in the scene. This is selectable as a global option (for all scenes) in the **Preferences** screen and also on a per scene basis in the **Store Scene** window.

Note: *This feature does not affect scene recall.*

>> To override the safe parameters (selected in store scope) for a single scene

Open the **Store Scene** window (see "To create a new scene using the current settings" on page 105) and select the **Overwrite Safe parameters?** option.

>> To override the safed parameters (selected in store scope) for every scene

At a GUI screen, choose **home** ▸ **Preferences** ▸ **General** to open the **Preferences** screen, and select the **Overwrite Safed parameters** option in the **User Interfaces Preferences** section.

Using patching in automation

Caution:
The Automate Patching option switches on per-scene automatic routing, and must be used with caution. To alert you to the drastic consequences of using this option, a WARNING window appears.

You can change the patching of certain sources and destinations on a per-scene basis. For example, you have an input channel's compressor side chain patched from one source in one scene and from a different source in another scene.

For details of the parameters that can be patched per scene, see Appendix K "Parameters Affected By Automate Patching" on page 473.

>> To use patching in automation

At a GUI screen, choose **home** ▸ **Preferences** ▸ **General** to open the **Preferences** screen, and select the **Automate Patching** option in the **Configuration Preferences** section.

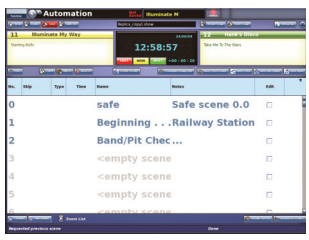
Using zoom

You can enlarge the cue list to zoom in on certain scenes or make the scenes in the cue list smaller so that you can view more scenes simultaneously. This is done using the **Zoom List** spin buttons.



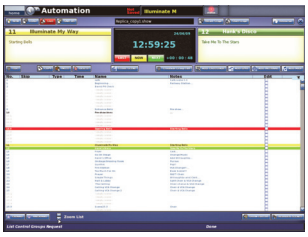
>> To enlarge the scene view (zoom in)

In the **Automation** screen, click the up (top) **Zoom List** spin button. The diagram right shows a typical **Automation** screen at maximum zoom.



>> To reduce the scene view (zoom out)

In the **Automation** screen, click the down (bottom) **Zoom List** spin button. The diagram right shows a typical **Automation** screen at minimum zoom.



Show files

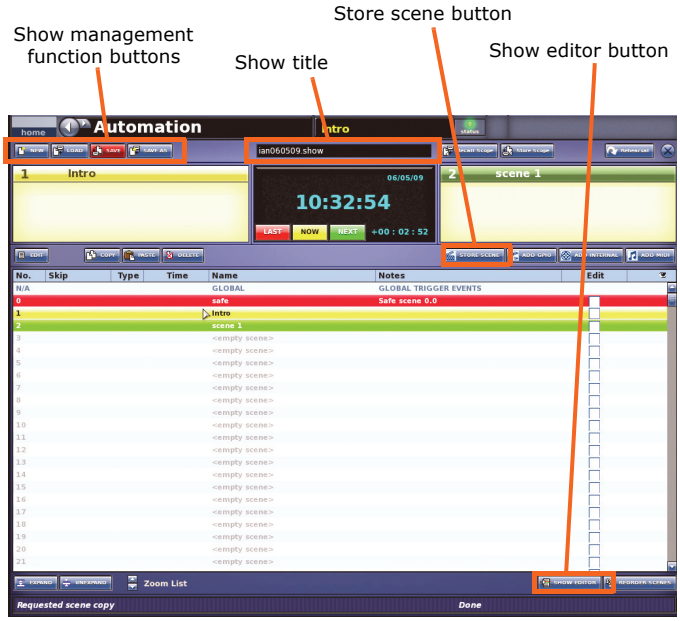
Show files are only handled via the GUI, using the **Automation** and **Files** screens of the GUI menu.

Managing show files

The **Automation** screen lets you create new shows, load existing ones and update the current show file with the latest settings.

For details of how to use the show function buttons to create a new show, save a show, create a new show from the current settings and load a show, see "Managing the shows" on page 103.

The following table gives a description of each function button on the **Automation** screen that is used for the show files.



Legend	*Description*
NEW	For creating a new show (see "To create a new show" on page 104).
LOAD	For loading a stored show by restoring all stored snapshots and associated automation data from the selected show file (see "To load a show" on page 104).
SAVE	For backing up all stored snapshots and associated automation data to the selected/current show file (see "To save a show or create a new one from the current settings" on page 104). This button changes to red to show that there are show settings to be saved. We recommend that you save your show at regular intervals.
SAVE AS	Create a new show using the settings of the current one (see "To save a show or create a new one from the current settings" on page 104).

Legend	*Description*
STORE SCENE	For details, see "To create a new scene using the current settings" on page 105.
SHOW EDITOR	For details, see "Show editor" on page 107.

Managing show files on the Files screen

Show files can be transferred between the XL8 and an external USB device, such as a USB memory stick. This allows you to backup and archive your show files, so none will be lost, and also transfer them to other XL8s. You can even create templates for new shows, so that you don't have to start from scratch, or modify existing show files. All this is done via the Files screen (see "About the Files screen" on page 219).

For details of how to back up/export your files and also how to import them from an external source, see "Saving your show files to a USB memory stick" on page 112.

Rehearsals

Rehearsal mode allows you to skip scenes/point scenes to match the arbitrary nature of the performance sequence during rehearsals.

>> To select a scene to 'skip' and to 'unskip' a scene

See "Editing scene properties" on page 189.

>> To carry out a rehearsal

1. Click **REHEARSAL.**
2. Carry out the rehearsal as necessary. (Note how the scenes selected as 'skipped' are missed out during the show's rehearsal, as you use the last, now and next buttons.)
3. To end the rehearsal, click **REHEARSAL.**

Safes

Important:
Safes are intended for emergency use only and are not to be confused with scope (see Chapter 21 "Scope (Automation)" on page 195).

Safes are incorporated into the XL8 to prevent certain controls from being recalled with a scene. Safe activation and status are provided on both the control surface and the GUI.

There are six types of channel safe: EQ, dynamic, mic, auto, mute and fader. Although some types of safe are channel-specific, any channel can be made safe from off-channel mute, fader and automation control. Also, solo (for monitor areas A and B) is always out of scene on any channel.

All of the channel safe areas, except **MIC** safe, have local LED status indication on the control surface.

In/out safe status is provided in each channel/group fast strip and in the safes sections of the detail areas of the GUI channel strip.

VCA groups only have mute and fader safes, and these can only be only switched on/off via the GUI; see "VCA/POP groups" on page 157. Mute safe status indication is provided both on the control surface (VCA/POP group section of master bay) an in the GUI channel strip.

For details of the channel and group parameters for each safe, see Appendix L "Parameters Protected By Safes" on page 477.

>> To switch in a channel safe

In the GUI channel strip, do one of the following:

- In the overview display, click the LED of the safe(s) you want.
- In the detail area, click the button of each safe you want.

Chapter 21: Scope (Automation)

This chapter shows you how to use the scope feature of the XL8's automation to include/exclude specific parameters on scene store/recall.

Although scope has two functions, recall and store, the emphasis in this chapter is on recall scope, which will be the most commonly used of them both. Store scope will only be required in certain circumstances, and even then it must only be used with caution (see "Using store scope" on page 200).

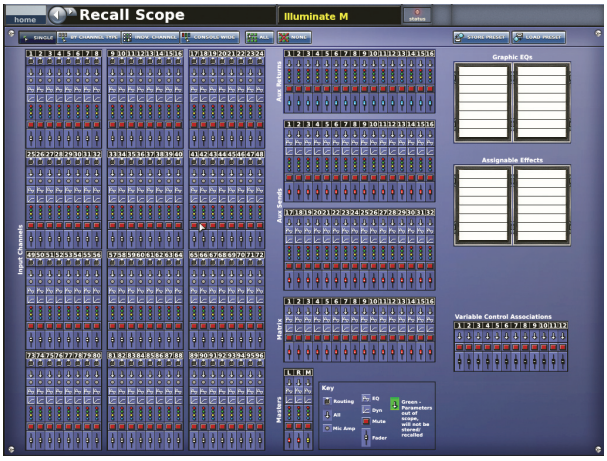
About scope

Scope lets you define the extent of the automated controls for all channels, buses, groups, assignable effects and GEQs. To do this it has a **Recall Scope** screen from which you can select the controls that are excluded from the screen when it is recalled and you can also view the current scope status.

About the Recall Scope screen

The **Recall Scope** screen has a number of type-specific areas, each of which contain user-selectable parameter sections that you can make 'out of scene' on scene recall. A **Key** area at the bottom of the screen shows what the parameter section symbols represent.

The following table describes each scope screen area.



Scope screen area	*Description*
Input Channels	96 input channels.
Aux Returns	16 returns.
Aux Sends	32 auxes.
Matrix	16 matrices.
Masters	Three masters (left, right and mono).
Variable Control Associations	12 VCA groups.
Assignable Effects	Up to 16 assignable internal effects. The whole effect can be 'out of scene'.
Graphic EQs	Up to 16 GEQs. The whole GEQ can be 'out of scene'.

The **Recall Scope** screen has a section for each of the following.

Parameter section	*Input Channels*	*Aux Returns (returns)*	*Aux Sends (auxes)*	*Matrix (matrices)*	*Masters*	*Variable Control Associations (VCA and POP groups)*	*Assignable Effects (internal effects) and Graphic EQs*	*Symbol*
Routing	Yes	Yes	No	No	No	No	N/A	
All	Yes	Yes	Yes	Yes	Yes	Yes	N/A	
Mic Amp	Yes	Yes	No	No	No	No	N/A	
EQ	Yes	Yes	Yes	Yes	Yes	No	N/A	
Dyn	Yes	No	Yes	Yes	Yes	No	N/A	
Busses	Yes	Yes	Yes	No	Yes	No	N/A	
Mute	Yes	Yes	Yes	Yes	Yes	Yes	N/A	
Fader	Yes	Yes	Yes	Yes	Yes	Yes	N/A	
Assignable Effect/Graphic EQ	N/A	N/A	N/A	N/A	N/A	N/A	Yes	

>> To open the Recall Scope screen

At any GUI screen, choose **home** ▸ ***Automation*** ▸ ***Recall Scope.***

Selecting scope parameter sections

There are a number of ways to select the scope parameter sections. For example, you can select them singly, by channel type, control centre wide etc.

When a parameter section is selected, it changes from blue  to green .

Selection is cumulative, so you can combine any of the selection/deselection functions until all the parameter sections you want have been selected. When you have finished the selection process, just go to the next screen you require; you don't have to save your selection, as it remains stored in the current condition until you alter it again.

The scope function buttons are used both for parameter selection and deselection.

The "Assignable Effects" panel allows you to choose which effects are 'out of scene' on scene recall.

For details of the parameters affected by scope, see Appendix J "Parameters Affected By Scope" on page 431.

>> To select a single parameter section

1 Click **SINGLE.**

2 Click the desired parameter section.

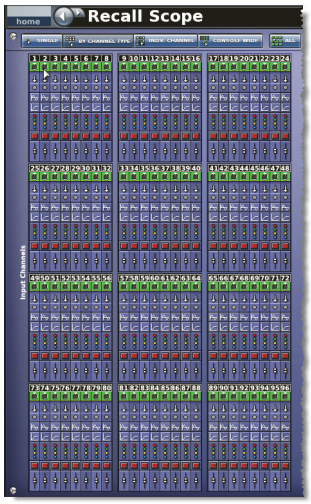
In some cases more than one parameter section may be selected. This may occur if:

- The parameter section belongs to a channel that is stereo linked. The equivalent parameter section of the other paired channel will also be selected.
- Other channels are patched to the same source as the channel in which you are making your selection. This only applies to the **All** and **Mic Amp** parameter sections.

>> To select a parameter section in all channels of a single type

1 Click **BY CHANNEL TYPE.**

2 Click the desired parameter section in any of the channels of the type you want. For example, click the routing parameter section of input channel 2. The routing parameter section of all the input channels is selected (as shown right).



>> To select all of the parameter sections of a single channel

1 Click **INDV. CHANNEL.**

2 Click any of the parameter sections in the channel you want. For example, click the **All** parameter section of input channel 5. All the parameter sections in channel 5 are selected (as shown right).

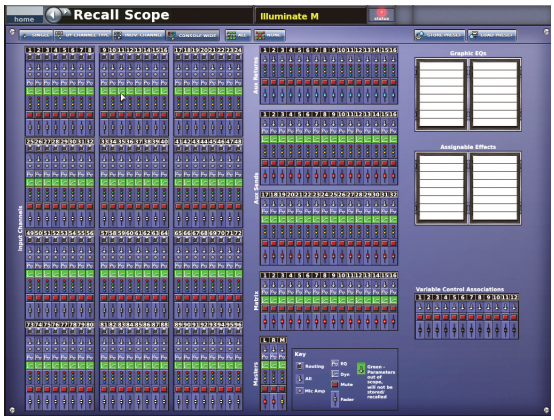


If the channel is stereo linked, all of the parameter sections in its paired channel will also be selected.

>> To select a single parameter section console wide

1 Click **CONSOLE WIDE.**

2 In any area of the screen, click the desired parameter section. For example, click the dynamics parameter section of input channel 11. Every dynamics parameter section on the screen is selected (as shown right).



>> To select every parameter section on the console

Click **ALL.** All parameter sections are selected (as shown right).



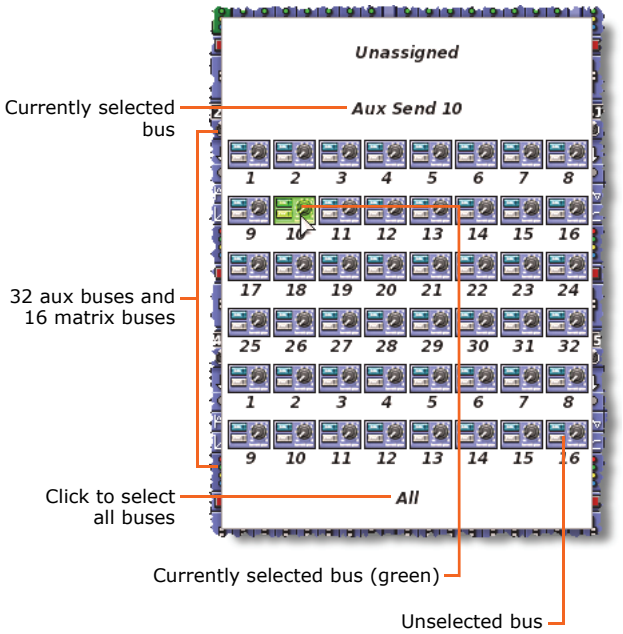
>> To deselect a parameter section(s)

Follow the procedures for selecting parameter sections, but only click ones that are already selected.

Selecting the bus parameters

On the **Recall Scope** screen, the bus parameter is unique in that when you click on it a bus select window will open containing 48 icons, which represent the 32 aux sends and 16 matrix sends. This window lets you select the bus(es) that you want out of scene.

The background colour of each channel's bus parameter on the **Recall Scope** screen indicates the selection status of its respective 48 buses, as shown in the following table.



Bus selection status	*Symbol*
None of the 48 buses are selected	
One or more, but not all, of the 48 buses are selected	
All of the 48 buses are selected	

>> To select/deselect buses

Do one of the following:

- To select/deselect a single bus, click on it.
- To select/deselect all buses, click ***All.***

Saving scope parameters in a scene

Scope parameters have to be saved in a scene.

>> To save your selected scope parameters in a scene

1. Save the parameter sections you want into a scene (see "To create a new scene using the current settings" on page 105).
2. Select the store/recall scope parameters you want (see "Selecting scope parameter sections" on page 196).
3. Overwrite the scene by storing the scene, clicking the "Overwrite scene" option (see "To create a new scene using the current settings" on page 105).

Using store scope



Caution!
Although store scope is sometimes useful in very specific situations, it must always be used with care. This is because it is possible that control settings will not be stored at all and will consequently be lost. Therefore, it is much safer to use recall store and aways store everything.

Please use store scope with great care and observe the **Caution** above. All of the methods of recall scope operation, as detailed in this chapter, apply equally to store scope.

Chapter 22: Events (Automation)

This chapter shows you how to use the events of the XL8's automation.

About events

There are four types of event — MIDI, GPIO, internal and crossfade — that you can have in a scene, and you can have any combination of each. You can choose whether the event is triggered on the XL8 or on an external device.

For more information on events and also how to create, edit and copy/paste an event, see "Additional control — managing events" on page 106.

MIDI

MIDI performs two functions on the XL8. It allows the XL8 to trigger external MIDI-equipped equipment on each scene change and it also allows external MIDI equipment to trigger a XL8 scene change.

MIDI output from the XL8 can include a globally-enabled outgoing message that contains the recalled scene number and is sent out for all recalled scenes. Also, up to eight messages with user-selectable content are stored per scene and sent out whenever the scene is recalled.

MIDI input can be globally set up to cause scenes to be recalled when specific incoming MIDI messages are encountered.

GPIO

The general purpose input and output (GPIO) on the XL8 is used to control/respond to various devices. You can use GPIO inputs to control XL8 parameters from an external device, for example, you can use an external switch to switch the XL8's talkback on/off or you can use an external switch or joystick to control the XL8's parameters. You can also use the XL8's keys and faders to send control signals to an external device.

Internal

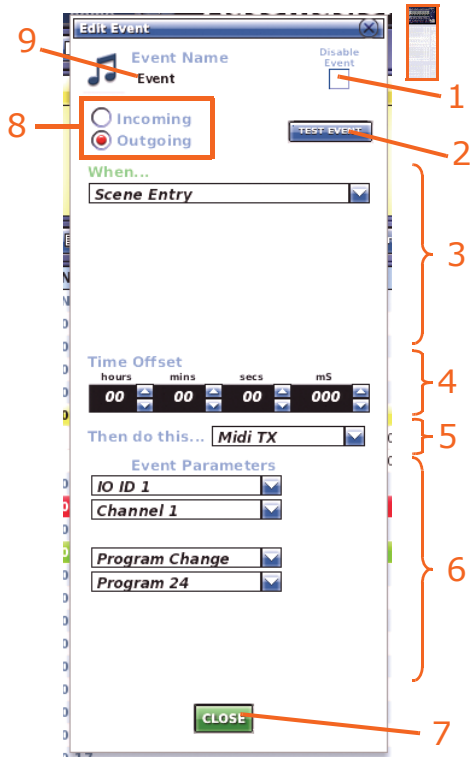
You can create an event on the XL8 without using an external device; this type of event is called an "internal" event. This means that an event is triggered and carried entirely on the XL8.

Crossfades

For information on crossfades, see Chapter 23 "Crossfades (Automation)" on page 207.

About the Edit Event window

You can edit the parameters of an event in the **Edit Event** window.



Item	*Description*
1	**Disable Event** tick box, for choosing whether the event is missed out (skipped) during a rehearsal.
2	**TEST EVENT** button, for executing the selected outgoing MIDI or GPIO event using the current event parameters.
3	**When...** section for selecting the parameters that trigger the event. Displays either one or three drop-down lists, depending on the whether the event is selected as **Outgoing** or **Incoming,** respectively.
4	**Time Offset** section, for setting the period of time that the event happens after it has been triggered. Zero = no offset.
5	**Then do this...** section, for choosing the type of event that you want.
6	**Event Parameters** section (see the "Programming events" on page 203).
7	**CLOSE** button, for closing the **Edit Event** window.
8	Incoming/outgoing selection section, for selecting whether the event is triggered on the XL8 or on an external device.
9	Text field, for displaying the user-configured event name.

Figure 31: Edit Event window

>> To open/close the Edit Event window

For details of how to open the **Edit Event** window, see "To edit an event" on page 106. Click **CLOSE** to close the window.

Programming events

Each type of event is programmed in a similar way, regardless of whether it is an incoming/outgoing MIDI or GPIO event, or an internal event. However, the options in the **Edit Event** window may vary depending on the chosen event.

>> To program an event

1. Open the **Edit Event** window (see "To edit an event" on page 106).
2. In the **Event Name** section, type in the event name. If you want to skip this event during a rehearsal, select the **Disable Event** option.
3. To select whether the event occurs on the XL8 or an external device, click **Incoming** or **Outgoing**, respectively. (This is not applicable to internal events.)
4. Select the desired parameters in the **When..., Then do this...** and **Event Parameters** sections. To help you, refer to Table 8 "Outgoing event options" (below), Table 9 "Incoming event options" on page 204 and Table 10 "Description of all event option parameters" on page 204.
5. If you want to incorporate a time delay between the event being triggered and the event itself, select a time in the **Time Offset** section (click the up/down spin buttons).
6. Click **CLOSE.**

Table 8: Outgoing event options

When ...	*Then do this...*	*Event Parameters (from top list downwards)*			
Scene Exit, Scene Recall, Scene Entry And Recall, Scene Entry And Exit, Scene Entry, Exit And Recall	***Midi TX***	***IO ID1*** to ***IO ID 17, FOH MIDI PORT***	***Channel 1*** to ***Channel 16***	***Program Change, Control Change, Pressure, Aftertouch, Note On, Note Off***	***Program 1*** to ***Program 128***
	GPIO TX	***IO ID1*** to ***IO ID 17, FOH MIDI PORT***	***Static Low, Static High***	***Closure 1*** to ***Closure 8***	N/A
	Last	N/A	N/A	N/A	N/A
	Next	N/A	N/A	N/A	N/A
	Now	N/A	N/A	N/A	N/A
	Jump	List of scene titles	N/A	N/A	N/A
	Notes Event	**Event Parameters** section changes to a **Notes** window, where you can enter event notes			

Table 9: Incoming event options

When … (from top list downwards)			***Then do this…***	***Event Parameters (from top list downwards)***			
Any IO Box, ***IO ID1*** to ***IO ID 17, FOH MIDI PORT***	***Any MIDI Channel,*** ***Channel 1*** to ***Channel 16***	***Note Off, Note On, After-touch, Pressure, Control Change, Program Change, Pitch Wheel***	***Midi TX***	***IO ID1*** to ***IO ID 17, FOH MIDI PORT***	***Channel 1*** to ***Channel 16***	***Program Change, Control Change, Pressure, After-touch, Note On, Note Off***	***Program 1*** to ***Program 128***
			GPIO TX	***IO ID1*** to ***IO ID 17, FOH MIDI PORT***	***Static Low, Static High***	***Closure 1*** to ***Closure 8***	N/A
			Last	N/A	N/A	N/A	N/A
			Next	N/A	N/A	N/A	N/A
			Now	N/A	N/A	N/A	N/A
			Jump	List of scene titles	N/A	N/A	N/A
			Notes Event	**Event Parameters** section changes to **Notes** window, where you can enter event notes			

Table 10: Description of all event option parameters

Parameter	***Description***
Aftertouch	How hard a key is pressed after it has been touched, that is, it changes the pressure after the note has been hit. Typically, aftertouch is useful for adding tremolo or vibrato effects to a sound, just as a violin can add volume or pitch changes to a sustained note using finger vibrato or addition bowing intensity. Parameters for **Aftertouch** are notes A0 to C7, with each having a possible pressure of between 0 and 127. You can also choose between **Enable MIDI Byte 1** and **Enable MIDI Byte 2.**
Any IO Box	The trigger can be on any IO port of any IO box.
Any MIDI Channel	Any of the MIDI channels.
Channel *n*	One of the 16 MIDI channels.
Closure *n*	Provides a contact closure that can be programmed to open or close in response to a MIDI event.

Parameter	*Description*
Control Change	Select the control changes that can be applied to a note in progress. For example, by altering the volume (not velocity) or adding sustain to a note (holding it for longer). Parameters are **All Notes Off** and **Reset All.** You can also choose between **Enable MIDI Byte 1** and **Enable MIDI Byte 2.**
FOH MIDI PORT	The trigger is via the MIDI port of the FOH XL8 Control Centre.
GPIO TX	Selects a GPIO event.
IO ID*n*	The trigger is via a specific IO port.
Jump	Opens a specified scene on the XL8.
Last	Opens the last (previous) scene on the XL8. This scene is the same one that would be opened if you pressed the **last** button.
MIDI TX	Selects a MIDI event.
Next	Opens the next scene on the XL8. This scene is the same one that would be opened if you pressed the **next** button.
Now	Opens the 'now' scene on the XL8. This scene is the same one that would be opened if you pressed the **now** button.
Note Off	Informs the instrument to stop playing a note at a specified pitch and velocity. Parameters for **Note Off** are notes A0 to C7, with each having a possible velocity of between 0 and 127. You can also choose between **Enable MIDI Byte 1** and **Enable MIDI Byte 2.**
Note On	Informs the instrument to start playing a note at a specified pitch and velocity. Parameters for **Note On** are notes A0 to C7, with each having a possible velocity of between 0 and 127. You can also choose between **Enable MIDI Byte 1** and **Enable MIDI Byte 2.**
Notes Event	Using this option, you can displays notes that may useful at a certain point in the scene.
Pitch Wheel	Use the pitch wheel to trigger the event. The pitch wheel is a wheel type device, normally found to the left of a synthesizer keyboard, that manipulates the pitch of a played note(s).
Pressure	Pressure applied to the key that is being pressed. This affects, for example, the vibrato of the note being played. Parameters are between 0 and 127. You can also choose between **Enable MIDI Byte 1** and **Enable MIDI Byte 2.**
Program *n*	One of the 128 programs.
Program Change	Changes the device to a particular patch/voice/preset etc. Parameter are 0 to 127. You can also choose between **Enable MIDI Byte 1** and **Enable MIDI Byte 2.**

Parameter	*Description*
Scene Entry	Triggers the event when a scene is opened.
Scene Exit	Triggers the event when a scene is closed.
Scene Recall	Triggers the event when the 'now' scene is reloaded, but not jogged to.
Scene Entry And Exit	Triggers the event when a scene is opened or closed.
Scene Entry And Recall	Triggers the event when a scene is opened or the 'now' scene is reloaded (but not jogged to).
Scene Entry, Exit And Recall	Triggers the event when a scene is opened, closed or the 'now' scene is reloaded (but not jogged to).
Static High	External device is closed/switched off.
Static Low	External device is opened/switched on.

Chapter 23: Crossfades (Automation)

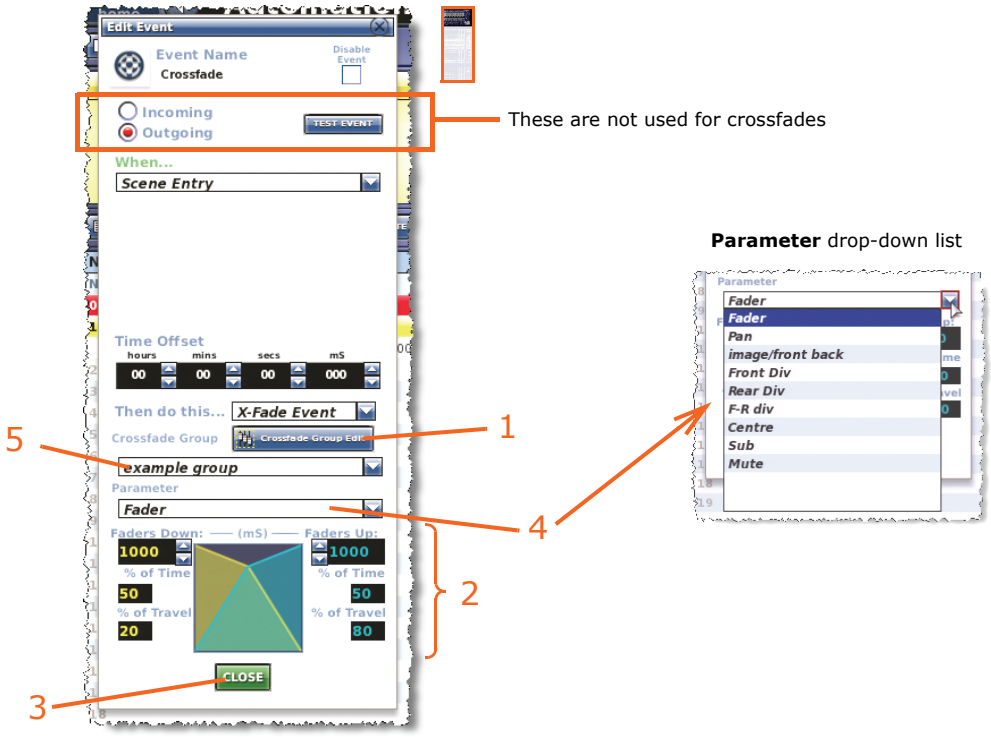
This chapter shows you how to use crossfades.

Crossfades are events that are triggered using the standard event mechanism, and are managed via the **Automation** screen. A crossfade event is managed in a similar way to any other event, such as GPIO and MIDI, and is detailed later on in this section.

A crossfade event is a trigger to change the value of a control — most often but not always a fader — between two levels, that of the current control position and that of the position in another scene, over time. If the level in the next scene is higher than the current level, the crossfade uses the 'fade up' time; if it is lower, it uses the 'fade down' time.

About the crossfade Edit Event window

You can edit the parameters of a crossfade event in the **Edit Event** window. As this window is event-specific, only the crossfade-specific elements are shown here.



Item	*Description*
1	**Crossfade Group Edit** button, opens the **Crossfade Groups** screen (see "Crossfade groups" on page 211).
2	Crossfade set up section (see "Crossfade set up section in the Edit Event window" on page 209).
3	**CLOSE** button, closes the window.

Item	*Description*
4	**Parameter** drop-down list (as shown above), for choosing the level control that you want the crossfade to operate on. For details of level control/parameter associations, see "About the crossfade parameters" on page 208.
5	**Crossfade Group** drop-down list, contains all of the available user-configured crossfade groups. Also, includes the **example group**, which is the XL8's default group and contains all possible crossfade sources.

About the crossfade parameters

The following diagram shows the XL8 configured for 5.1 surround mode, which utilises each available parameter option. The presence of the **divergence**, **centre level** and **LFE level** sections are dependent on the currently selected surround mode.

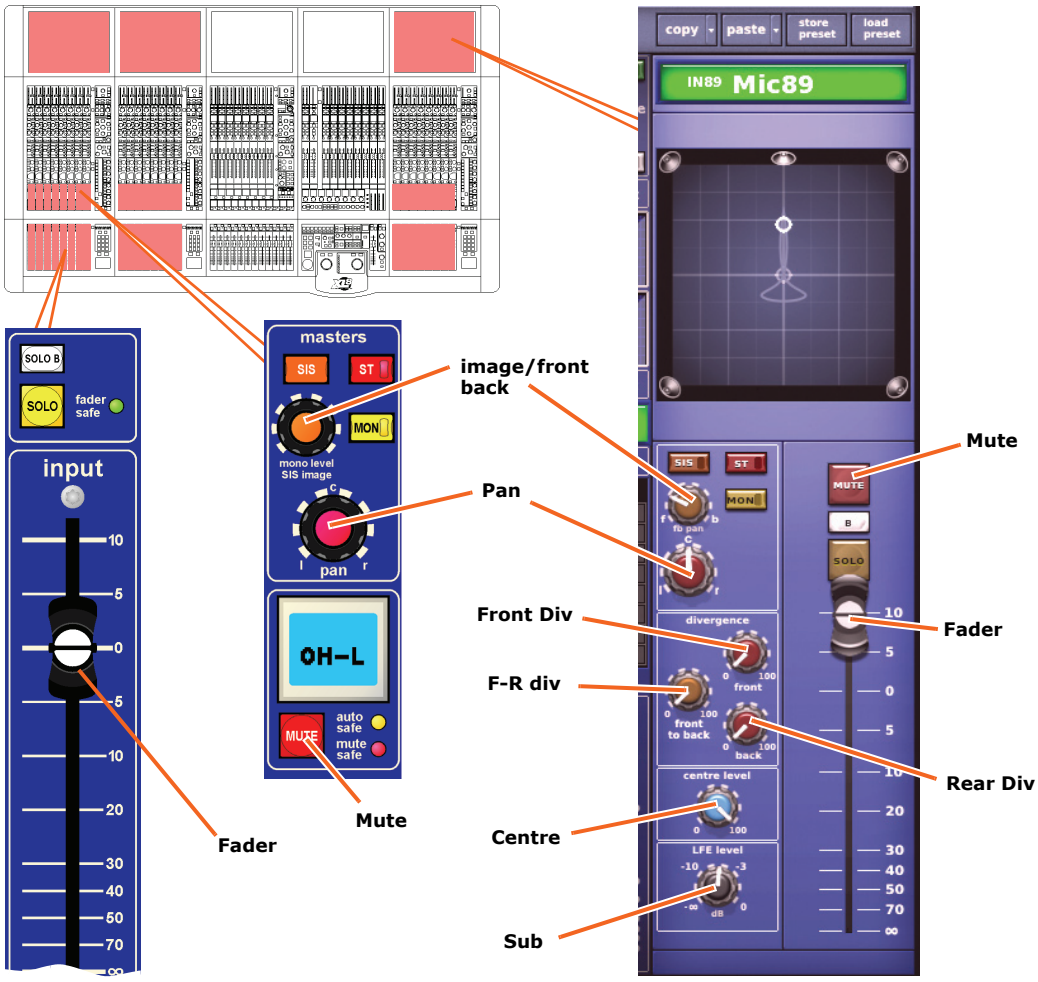


*Figure 32: **Parameter** assignments*

Using a crossfade mute

The **Mute** option of the **Parameters** list lets you initiate a mute at the end of a crossfade down operation. For example, if you set a crossfade of two seconds, the mute will turn on after this time has expired (provided it was off). If the crossfade is a 'crossfade up', the mute will turn off during the crossfade up time (provided it was on).

Crossfade set up section in the Edit Event window

The crossfade set up section, which is at the bottom of the **Edit Event** window, is where you set up how the crossfade operates. Here you can set up the duration of the crossfade and the rate at which it occurs. You can configure two crossfade rates per crossfade or keep its rate constant throughout.

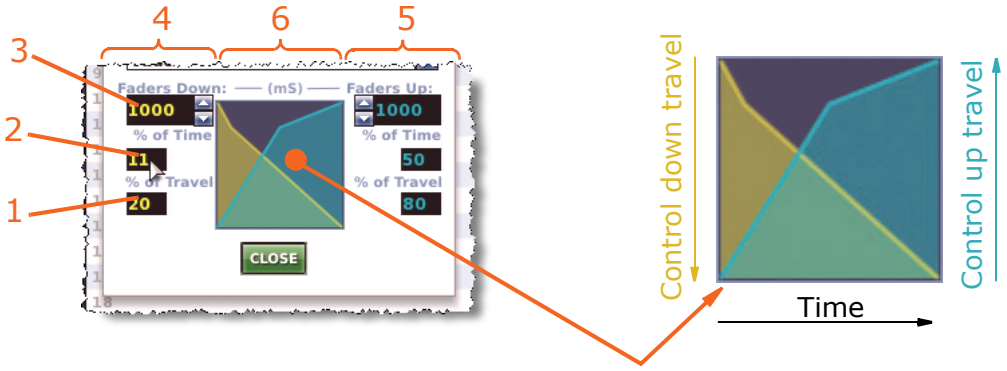


Figure 33: Crossfade set up section

Item	*Description*
1	**% of Travel** field, sets the initial travel distance of the control as a percentage of the total distance of travel.
2	**% of Time** field, sets the time for the initial travel of the control as a percentage of the overall time.
3	**Faders Down** field, sets the time taken for the total travel (milliseconds) of the control for a 'fader down' (or whichever control is used) crossfade event. For the **Faders Up** field, this sets the time taken for the total travel (milliseconds) of the control for a 'fader up' crossfade event.
4	Section for setting the crossfade down parameters.
5	Section for setting the crossfade up parameters.
6	Graph of up/down crossfade.

>> To quickly adjust the time and travel of the faders up/down

You can quickly adjust the **% of Time** and **% of Travel** parameters by dragging the graph. Click anywhere on the line of the graph in the **Edit Event** window and drag to where the parameters are as desired. Clicking while pressing the left button adjusts the up travel, and doing the same with the right button adjusts the down travel.

>> To create a crossfade event

1. Open the **Edit Event** window.
2. If you want to disable this event, select the **Disable Event** option.
3. In the **When...** section, select the parameters that will trigger the event.
4. If you want to incorporate a time offset delay between the event being triggered and the start of the event, set a time in the **Time Offset** section.
5. In the **Then do this...** drop-down list, select the **X-Fade Event** option.

6 Do one of the following:

- Select a crossfade group from the **Crossfade Group** drop-down list.
- Create a new crossfade group. Click the **Crossfade Group Edit** button to open the **Crossfade Groups** screen and then follow the instructions in the "Crossfade groups" on page A-211.

7 In the **Parameters** section, select the level control on which you want the crossfade event to occur (see Figure 32 "Parameter assignments" on page A-208). For example, a fader.

8 In the crossfade set up section (see Figure 33 "Crossfade set up section" on page A-209), set up the crossfade parameters, such as time, % of travel etc.

9 Click **CLOSE.**

To set up a crossfade to have a constant rate across its full travel, set both the **% of Time** and **% of Travel** fields to 50%.

How a crossfade operates

When the crossfade event is triggered, the time offset (if configured) will start. Its progress is shown by a blue bar underneath the event's time offset value (in cue list) as shown in the following diagram.



After the time offset has finished, the crossfade will start; this will be either a down or up crossfade, depending on the current control level. During the crossfade, the control level will alter at the configured rate, shown on both the control surface and GUI. Progress is shown in real time on the **Automation** screen (typically as shown right). The blue vertical bar in the crossfade graph will travel from left to right according to the time elapsed and at the configured crossfade rate.

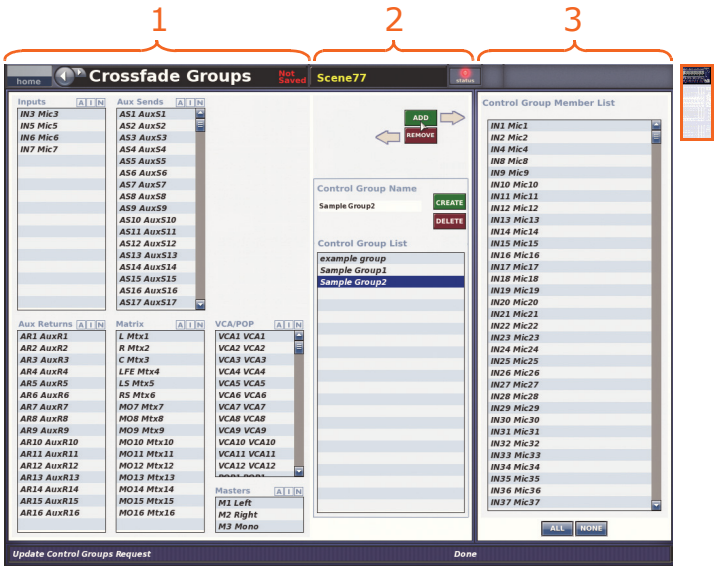


Note: *The graph display shows the current longest crossfade in progress. So, if a delayed crossfade starts during the current one, and it is longer than the current one, the graph will change to show the new crossfade.*

You can manually override the crossfade using the controls in the automation section of the output bay (see "Manually controlling a crossfade" on page 213).

Crossfade groups

Crossfade groups let you choose which channels/buses/groups will contain the crossfade. These groups are managed at the GUI's **Crossfade Groups** screen.



Item	*Description*
1	Crossfade source panel, contains lists of channels, buses and groups from where you select the sources for your crossfade group. To aid source selection, each list has **A**, **I** and **N** buttons that select all members in the list, inverts the current list selection and deselects all members in the list, respectively.
2	Crossfade group management section, where you can create new crossfade groups or delete existing ones, add/remove members to/from the currently selected group, and select the desired group from the **Control Group List.**
3	Shows the members of the currently selected crossfade group in the **Control Group Member List.** The **ALL** and **NONE** buttons underneath the list aid group member selection by selecting/deselecting all list members, respectively.

>> To open the Crossfade Groups screen

At the GUI menu's **Automation** screen, click **Crossfade Group Edit.**

>> To set up a new crossfade group

1. At the **Crossfade Group** screen, enter your chosen name for the new crossfade group in the **Control Group Name** field.
2. Click **CREATE.** The new group will appear in the **Control Group List.** By default, your new group will contain "IN1Mic1" as a member, as shown in the **Control Group Member List.**
3. Select your new members from the lists of inputs, auxes, returns, matrices, masters and groups at the left of the screen.
4. Click **ADD.** The selected items will be moved to the **Control Group Member List.**

>> To delete a crossfade group

At the **Crossfade Group** screen, select the unused/empty control group (in the **Control Group List**) that you want to delete, and then click **DELETE.**

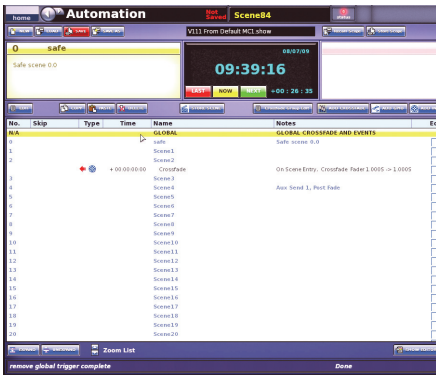
>> To edit a crossfade group

Select the crossfade group. Then, at the **Crossfade Group** screen, do one of the following:

- To add members to the crossfade group, select the members from the lists at the left of the screen and then click **ADD.**
- To remove members from the crossfade group, select them from the **Control Group Member List** and then click **REMOVE.**

Global crossfades

The **GLOBAL CROSSFADE AND EVENTS** scene, at the top of the cue list in the **Automation** screen, lets you have the same crossfade in every scene. You can have more that one global crossfade event. Any scene-based crossfade(s) will override the global one(s) if both are present.



>> To set up a global crossfade

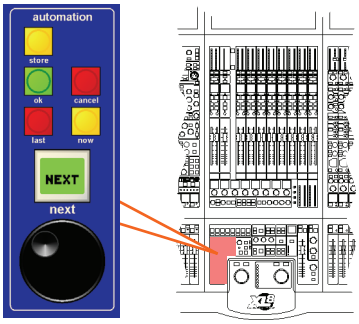
Select the **GLOBAL CROSSFADE AND EVENTS** scene and do one of the following:

- Click **ADD CROSSFADE.**
- From the right-click menu, choose ***Add ▸ Crossfade Event.*** The crossfade will appear in the **GLOBAL CROSSFADE AND EVENTS** scene, as shown in the following diagram.



Manually controlling a crossfade

The controls in the **automation** section of the output bay let you manually override the crossfade, as described in the following table.



Control	*Function during crossfade*
cancel button	Pauses the crossfade. Pressing the **cancel** button again, while the crossfade is paused, cancels the crossfade. ***Note:*** *The level of the control on which the crossfade is operating will remain at the point at which it was paused. If you restart the crossfade the control will travel over the full crossfade period, that is, if you stop (rather than pause) a five-second crossfade at two seconds and restart it, it will take the control five seconds to move to the final position, and not three seconds.*
now button	Pressing this button while the crossfade is paused (by pressing the **cancel** button), continues the crossfade.
ok button	Jumps to the end of the crossfade, effectively cancelling the remaining time to the end of the crossfade.
Jogwheel	Rotate the jogwheel to slow down/speed up the rate of crossfade. The speed of rotation will determine the rate of crossfade. Rotating the jogwheel quickly in a clockwise direction will speed up the crossfade and rotating it an anti-clockwise direction slows it down.

Chapter 24: User Libraries (Presets)

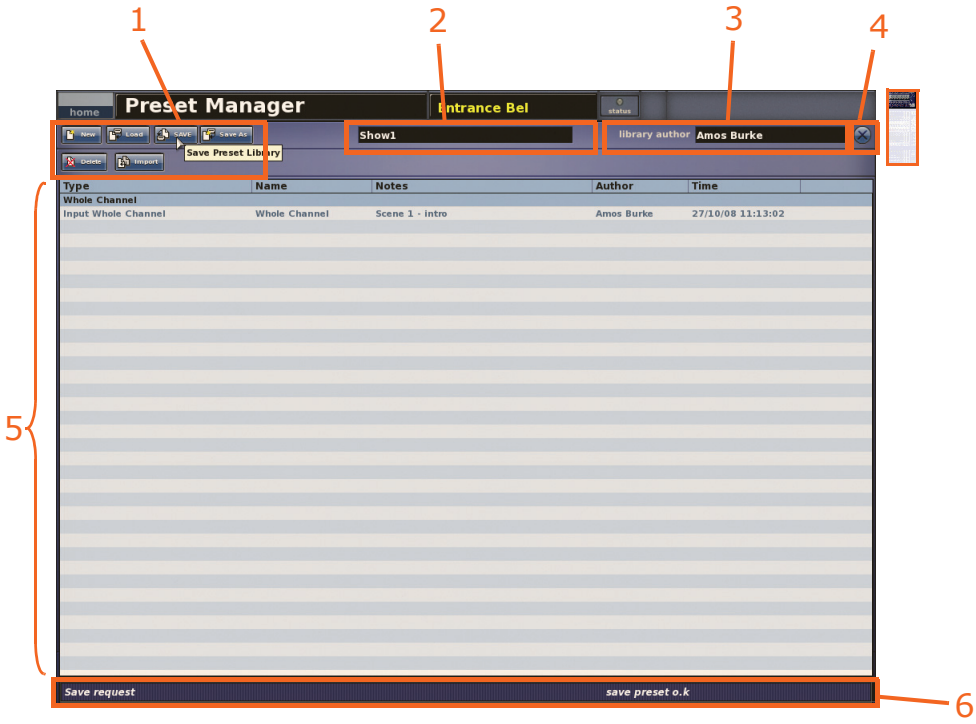
User libraries is a GUI only feature that provides a method of handling presets. The GUI menu has an option that opens the **Preset Manager** screen.

For more information on presets, including details of how to save and load a preset, see "User library (presets)" on page 109.

About the Preset Manager screen

Using the **Preset Manager** screen, you can create new user libraries, load existing ones or save the current one. You can create a new user library from scratch or save the current one under a new name. Similarly to show files, you can import libraries from external storage devices (USB memory sticks).

The **Preset Manager** screen also allows you to delete presets from the currently loaded library.



Item	*Description*
1	**Preset Manager** screen function buttons for creating/loading/saving/ importing user libraries. For a description of each button, see Table 11 "Description of Preset Manager screen function buttons" on page 216.
2	User library name.
3	**library author** field, displays the name of user library author/creator.
4	Close button, closes the **Preset Manager** screen.

Item	*Description*
5	List of presets in the user library. For a description of the column titles, see Table 12 "Description of preset list titles" on page 216.
6	Operation status information.

Table 11: Description of Preset Manager screen function buttons

Button	*Use to*
New	Create a new preset library.
Load	Load a preset library.
SAVE	Save any unsaved changes that have been made to the currently loaded preset library.
Save As	Create a new preset library from the current one.
Delete	Delete the currently selected preset.
Import	Import all presets from a preset library into the one currently loaded.

Table 12: Description of preset list titles

Title	*Description*
Type	Preset type.
Name	User-entered preset name.
Notes	User-entered preset notes.
Author	User-entered name of preset author/creator.
Time	Time that preset was created.

>> To open/close the Preset Manager screen

To open the Preset Manager screen, at the GUI choose **home** ▸ ***Preset Manager.*** To close it, Click **X** at the upper-right corner of screen.

Managing user libraries

The background of the **SAVE** button in the **Preset Manager** screen changes to red when changes have been made to the current user library, but they haven't yet been saved. We recommend that you save these changes regularly.

>> To create a new preset library

1 In the **Preset Manager** screen, click **New.**

2 In the "Enter new Library name:" message window (shown right), do the following:



- Type in the name of the new preset library in the text field containing the text "Libraryname".
- Type in your name in the text field containing the text "Author".

You can also replace an existing preset library. To do this, type in its exact name in the "Libraryname" text field and then click the **Overwrite existing?** box to tick it.

3 Click **OK.** A new **Preset Manager** screen will open.

*Don't forget that you can use the right-click **Cut**, **Copy** and **Paste** options when editing the text fields.*

>> To load a preset library

1 In the **Preset Manager** screen, click **Load.**

2 In the **Load File** window, click the preset library you want to load. Its name will appear in the "Load this file:" text field.

3 Click **OK.**

>> To save changes to the currently selected preset library

At the **Preset Manager** screen, click **SAVE.**

If the **SAVE** button is red (shown right), there are unsaved changes; this button changes back to blue after the library has been saved (updated).



>> To create a new preset library from the current one

1 In the **Preset Manager** screen, click **Save As.**

2 In the **Save File** window, type your chosen name for the new preset library in the "Save this file as:" text field.

You have the option to overwrite one of the existing preset libraries. Do this by clicking it in the **Save File** window and then ticking the **Overwrite existing?** option.

3 Click **OK.** The new preset library will be selected.

>> To import a preset library into the one currently selected

1. In the **Preset Manager** screen, click **Import.**
2. In the **Load File** window, click the preset library whose contents you want to import.
3. Click **OK.**

   If the currently selected preset library has unsaved changes, the window message "The Preset Library has not been saved Do you wish to continue?" will appear. To continue importing, click **OK.**

If you want, you can save the changes by clicking **SAVE.**

Deleting presets from a user library

In addition to storing and loading presets (see "User library (presets)" on page 109), you can delete presets from a preset library.

>> To delete a preset from a user library

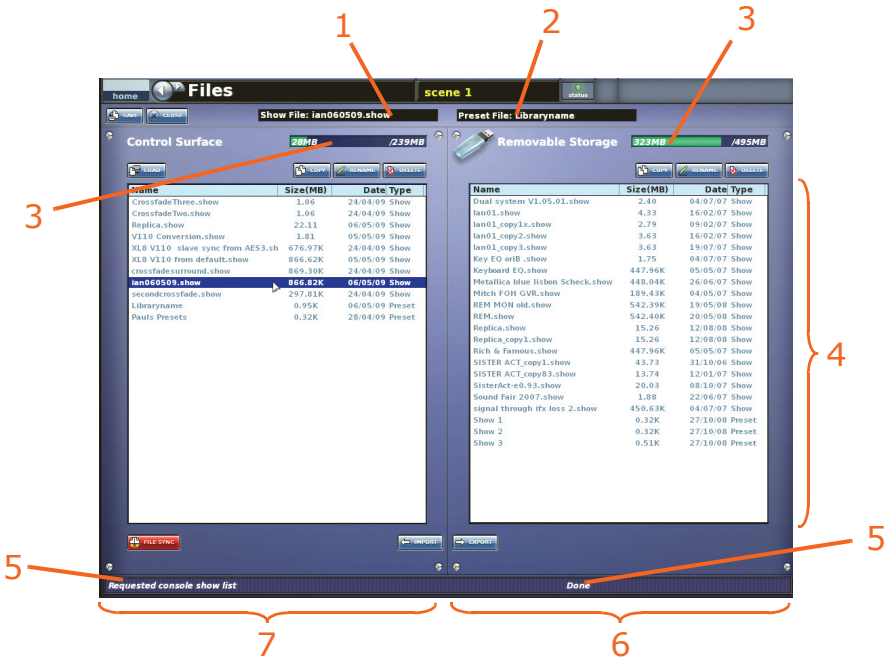
1. In the **Preset Manager** screen, click the preset you want to delete.
2. Click **Delete.**
3. In the "Are you sure you want to delete this preset?" message window, click **OK.**

Chapter 25: File Management

This chapter shows you how to import/export your show and preset files.

About the Files screen

The **Files** screen manages files on the control centre (**Control Surface** panel) and any removable storage device (**Removable Storage** panel) that is currently plugged into one of the USB ports (see "Front panel connections" on page 249). Each panel lists the files contained on its own storage media. The files can be imported/exported across the panels, and can also be copied, renamed or deleted within their own panel.



Item	*Description*
1	Title of show file currently loaded, if any.
2	Title of user library preset file currently loaded, if any.
3	Memory usage panel. The number on the right shows the total amount of storage space (in MB), or memory, there is on its respective storage media. The green bar on the left shows how much memory has been used.
4	File lists, display the files on their respective storage media. Each list shows the name, size, creation date and type (for example, show and preset) of each file.
5	Information panels give feedback on file management status.

Item	*Description*
6	**Removable Storage** panel, shows the files currently stored on the storage media (typically, a USB memory key) that is plugged into the active USB socket on the control centre (see "Front panel connections" on page 249). This panel only appears when the storage media is connected to the control centre, otherwise it is blank. Immediately after plugging in the storage media, you will probably see the message "Analysing...", while its contents are being read.
7	**Control Surface** panel, shows the files stored on the control centre's SSD.

The following table describes all of the buttons on the **Files** screen.

Button	*Function*
SAVE	Saves the currently loaded show in its current state. Turns red when there are changes to be saved.
LOAD	Loads the selected show file.
COPY	Copies selected file to its local section, appending "_copy1" to its name. Subsequent copies of the same will file will increment the 'copy' number by one, that is, "_copy2", "_copy3" etc.
RENAME	Lets you to rename the selected file in its local section.
DELETE	Deletes the selected file in its local section.
EXPORT	Copies file selected in **Control Surface** section to the **Removable Storage** section, effectively copying it onto the removable device. This provides a useful backup facility.
IMPORT	Copies the file selected in the **Removable Storage** section to the **Control Surface** section (XL8).
FILE SYNC	Opens the Master Controller File Synchronisation window (see "About the Master Controller File Synchronisation window" below). Although normally blue, this button changes to red when the master controllers are not in sync.

About the Master Controller File Synchronisation window

The Master Controller File Synchronisation window manages the synchronisation between the two master controllers.



The following table describes all of the buttons in the **Master controller File Synchronisation** window.

Button	*Function*
MAKE ACTIVE	Activates its local MC.
COPY TO MCn	Copies selected files on its local MC to the other MC.
DELETE	Deletes selected file(s) in its local MC.
COPY ALL TO MCn	Copies all files on its local MC to the other MC.
OK	Closes the **Master controller File Synchronisation** window.

Chapter 26: Using Other Devices With The XL8

This chapter explains how to use other external devices with the XL8.

Using multiple digital consoles

WARNING!
CHANGING THE SYNCHRONISATION CAN RESULT IN LOUD NOISES FROM THE SYSTEM. ALWAYS MUTE THE PA AT THE AMPLIFIER/SPEAKER BEFORE CHANGING THE SYNCHRONISATION SOURCE OR MASTER/SLAVE STATUS.

You can use an XL8 together with one or more digital consoles, which can be other Midas digital consoles or indeed any digital console. For example, you can use two XL8s together in a dual FOH and MON system. To do this the digital consoles must be synchronised. The synchronisation method can be via AES50, AES3 or wordclock. You can even use the splitters themselves via their AES50 connections.

Synchronising the consoles

Before you start, choose which Midas digital console you want as master.

For information on external AES50 synchronisation between two Midas digital consoles, see "External AES50 synchronisation" on page 113.

>> To configure system synchronisation at the consoles

1. Mute the PA at the amplifier/speaker. Refer to the **WARNING** at the beginning of this section.
2. On the master Midas digital console, configure it by choosing **home** ▸ ***Preferences*** ▸ ***General*** at the GUI and then clicking the "Master" option (shown right).



3. Configure a slave Midas digital console by choosing **home** ▸ ***Preferences*** ▸ ***General*** at the GUI and then selecting the following options:
   - Under the **Master/Slave Status** heading, click the "Slave" option.
   - Open the **Sync Source** drop-down list and select the synchronisation source you want, that is, "Stage Word Clock" or "AES3". If you want to sync using AES50, choose one of the eight AES50 ports as necessary, for example, "AES50 Port 2".

   Repeat for any other Midas digital consoles. Configure any non-Midas digital consoles as appropriate.

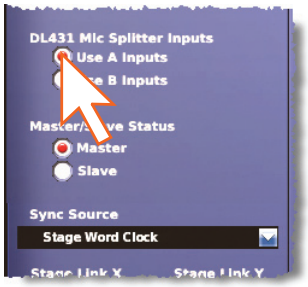
Sharing the A and B inputs of the mic splitter

If you are using two Midas digital consoles, you must configure them to use the A or B inputs of the mic splitters. Although it doesn't matter which inputs each console uses, they can't use the same ones. Also, both consoles must be synchronised.

>> To configure two XL8s for use with the mic splitters

In a dual FOH and MON system it may be easier and more convenient to always set the FOH control centre to master, and to use the mic splitter A inputs for FOH and the B inputs for MON. Also, although the sync method doesn't matter in this case, it is easier to sync the two consoles using the DL431 Mic Splitters, as described below.

1. Mute the PA at the amplifier/speaker. Refer to the **WARNING** at the beginning of this section.
2. Configure the **AES50 Sync** option of the DL431 Mic Splitter's main menu to **Cable Sync A.**
3. On the FOH control centre, configure it by choosing **home** ▸ ***Preferences*** ▸ ***General*** at the GUI and then selecting the following options:
   - Choose the "Use A Inputs" option (shown right).
   - Under the **Master/Slave Status** heading, choose the "Master" option.



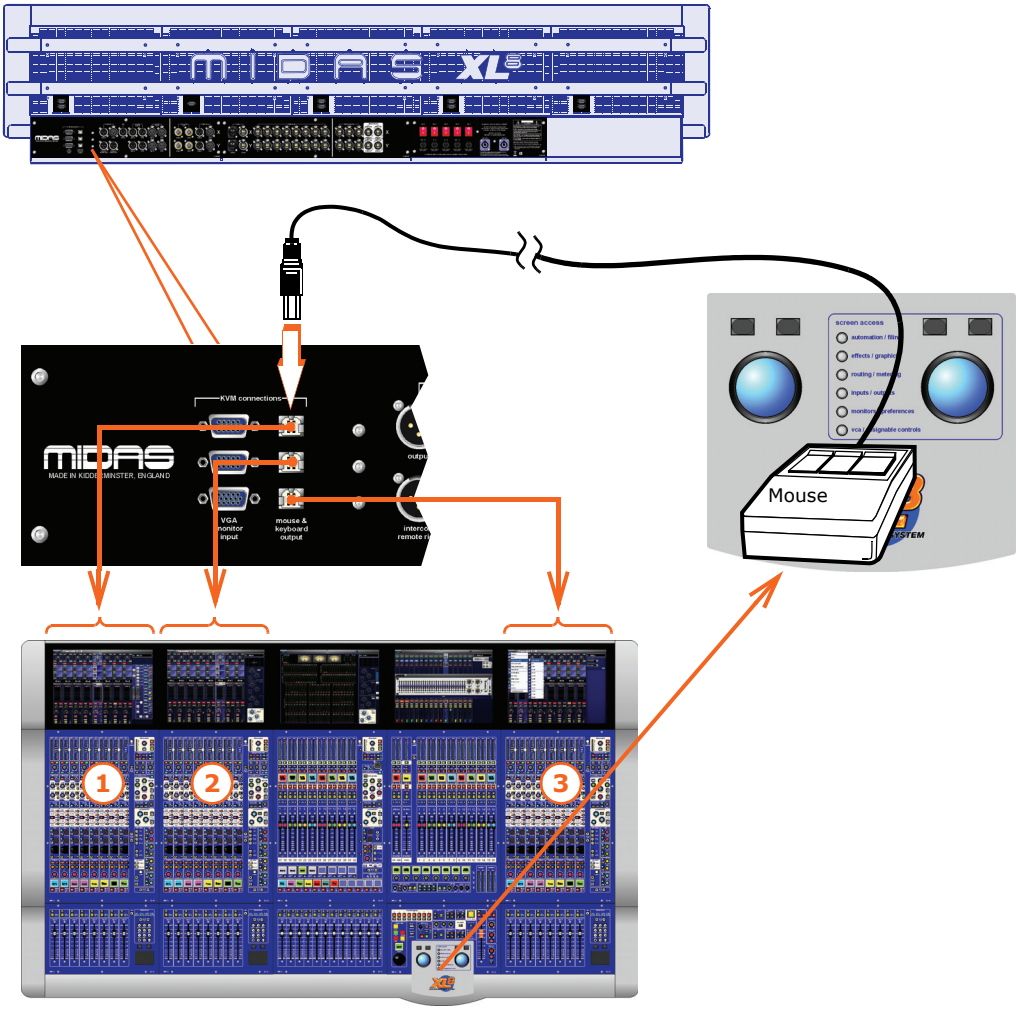
4. On the MON control centre, configure the port for the DL431 Mic Splitter (see "Device set-up procedure" on page 83).
5. Configure the MON control centre by choosing **home** ▸ ***Preferences*** ▸ ***General*** at the GUI, and then selecting the following options:
   - Under the **DL431 Mic Splitter Inputs** heading, choose the "Use B Inputs" option.
   - Under the **Master/Slave Status** heading, choose the "Slave" option.
   - In the **Sync Source** drop-down list, choose the port that you configured for the DL431 Mic Splitter in the previous step.

Using an external USB mouse

You can operate a GUI screen using an external USB mouse instead of its trackball/glide pad. You can rest/operate the mouse in the primary navigation zone.

>> To connect and operate an external mouse on the XL8

Plug the mouse into the appropriate **mouse output** socket (USB type B) in the **KVM connections** section on the rear panel; each socket is allocated to a specific input bay GUI screen. Operate the mouse just as if were connected to a PC; you can use the lower portion of the primary navigation zone as a mouse mat.



Using a USB keyboard

You can use a USB keyboard on any GUI screen, except the output bay one. Use one of the USB **keyboard** sockets at the front of the XL8 (see "Keyboard connections and bay allocation" on page 250).

Using an external monitor

You can use an external monitor for viewing what is displayed on any GUI screen and, conversely, you can view an external monitor's display on the GUI (see "Monitor connector panels" on page 251).

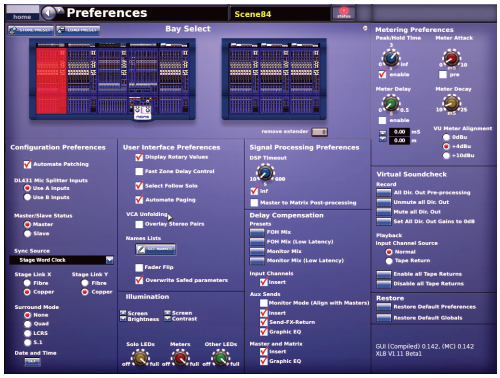
Using a three-bay extender

If you are using a three-bay extender with the XL8, configure the console by opening the **Preferences** screen at the GUI and clicking the **add extender** button in the **Bay Select** section.

Chapter 27: Changing The User Settings

This chapter shows you how to change the user settings of the XL8 to suit your own preferences and the current working environment.

The user settings are changed via the GUI menu, mainly from the **Preferences** screen (shown right) and the 'Sheet' screens.



>> To open the Preferences screen

At a GUI screen, choose
home ▸ Preferences ▸ General.

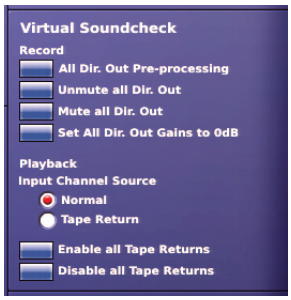
Setting the meter preferences



The **Metering Preferences** section of the **Preferences** screen provides global parameter adjustment of all of the meters on the control centre.

- **Peak/Hold Time** control knob, sets the time (seconds) the peak LED stays on for, in the range 0 (no peak hold) to infinity (peak always on). This only affects the meters on the GUI. Click the **enable** tick box below to switch on this function.
- **Meter Attack** control knob, adjusts the time it takes the meters to rise, in the range 0 (no delay) to 10 milliseconds. Select the **pre** option to switch the output channel meters to pre-fader.
- **Meter Delay** control knob, adjusts the meter delay time, in the range 0 to 0.5 seconds. For example, if the control centre is FOH, this function allows you to synchronise the meters with what you are hearing. This is because the sound from the performers on the stage will take a certain amount of time to reach you, whereas the meters pick up that sound at source. Click the **enable** tick box below to select this function. You can adjust the meter delay by using the spin buttons underneath, which display the delay time in milliseconds (ms) and distance in metres (m).
- **Meter Decay** control knob, adjusts the time it takes the meters to fall, in the range 10 to 25 milliseconds.
- **VU Meter Alignment** options for setting the zero point of the VU meters. For example, selecting **+4dBu** will set the zero point of the VU meters to +4dB.

Configuring a virtual soundcheck



The **Virtual Soundcheck** option of the **Preferences** screen lets you set the record and playback options for a virtual soundcheck.

- In the **Record** section:
  - **All Dir. Out Pre-processing** — switches all the direct outputs to pre-processing.
  - **Unmute all Dir. Out** — unmutes all direct outputs.
  - **Mute all Dir. Out** — mutes all direct outputs.
  - **Set All Dir. Out Gains to 0dB** — sets the gain of all direct outputs to 0dB.
- In the **Playback** section:
  - **Input Channel Source** — lets you select the input channel source as **Normal** or **Tape Return**.
  - **Enable all Tape Returns** — enables all tape returns.
  - **Disable all Tape Returns** — disables all tape returns.

Restoring the XL8 defaults

Caution:
The Restore Default Preferences button will reset all console preferences, and must be used with great caution. To alert you of the drastic consequences of operating this button, a WARNING window appears.

Caution:
The Restore Default Globals button resets all console defaults, including patching and I/O set-up, and must be used with great caution. To alert you to the drastic consequences of operating this button, a WARNING window appears.



You can restore console defaults by using the options in the **Restore** section of the **Preferences** screen. However, these options must be used with care.

>> To reset console preferences to default

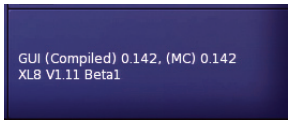
Open the **Preferences** screen and click **Restore Default Preferences.** Acknowledge the warning window (see **Cautions** above).

>> To reset all console settings to default

Open the **Preferences** screen and click **Restore Default Globals.** Acknowledge the warning window (see **Cautions** above).

Checking the build information

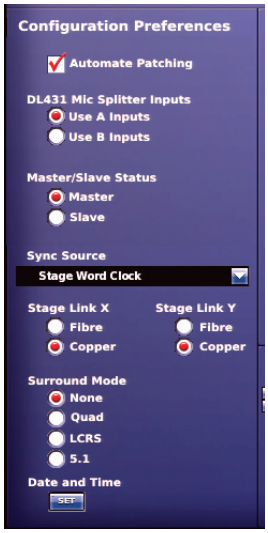
This section of the **Preferences** screen is predominantly a service-only feature, and shows the current build and host software versions of the XL8 Control Centre.



Setting the configuration preferences

WARNING!
CHANGING THE SYNCHRONISATION CAN RESULT IN LOUD NOISES FROM THE SYSTEM. ALWAYS MUTE THE PA AT THE AMPLIFIER/SPEAKER BEFORE CHANGING THE SYNCHRONISATION SOURCE OR MASTER/SLAVE STATUS.

Caution:
The Automate Patching option switches on per-scene automatic routing, and must be used with caution. To alert you to the drastic consequences of using this option, a WARNING window appears.



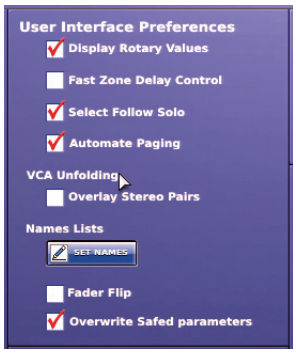
The **Configuration Preferences** section of the **Preferences** screen lets you configure the system as follows:

- **Automate Patching** — see "Using patching in automation" on page 191. Before selecting this option, see the **Caution** above.
- **DL431 Mic Splitter Inputs** — if you are linking two XL8 Control Centres (for example, for FOH and MON operation) this option lets you select the type of inputs (A or B) you want for this XL8. The other XL8 must be set with the alternate option. For example, if you choose **Use B Inputs** at this control centre, the other one will have to be set for **Use A Inputs**.
- **Master/Slave Status** — selects the synchronisation source of the XL8's digital audio (internal or external). For configuration details about connecting two XL8's, see "Using multiple digital consoles" on page 223.

  If you choose **Master** (internal), all system units must be configured for external sync source.

  If you want an external sync source, choose **Slave.** Then, select the sync source from the **Sync Source** drop-down list below. On the sync source itself, for example, a line I/O or mic splitter, configure its sync source as internal.
- **Sync Source** — drop-down list for selecting the synchronisation source.
- **Stage Link X** and **Stage Link Y** — select the snake type for each network. **This must be done before operating the XL8, otherwise it will not work.**
- **Surround Mode** — select the type of surround mode you want. Otherwise, select **None** for the default modes of stereo and LCR.
- **Date and Time** — click the **SET** button to set the date and time (see "Setting the time and date" on page 232).

Changing the user interface preferences



The **User Interface Preferences** section of the **Preferences** screen lets you set some of the XL8's operating parameters to suit your own preferences.

- **Display Rotary Values** — the current value of a control knob can be displayed as a numerical value on the GUI (see "Parameter values displayed on touch" on page 50).
- **Fast Zone Delay Control** — selecting this option means that you place the delay control for the inputs onto the surface controls. To do this you have to cycle the gain swap switch (see "Mic amp input gain" on page 265) through digital gain, analogue gain and then delay. Without selecting this option, the inputs delay control is a GUI only feature.
- **Select Follow Solo** — when you solo an aux or matrix output, the channel is automatically selected, thus bringing the output controls to the surface detail area. This option only works in fader flip mode.
- **Automate Paging** — select this option to store channel paging in automation. So that, on scene recall, the control surface (channels assigned to it) will revert to the state it was when the scene was last saved. When unselected, scene recall does not affect channel paging.
- **VCA Unfolding** — select **Overlay Stereo Pairs** to unfold only left channels of channel pairs when a VCA group is selected; use the **scroll by 1** navigation buttons to display any right channel you want.
- **Names Lists** — see "Changing the default input/output names" on page 231.
- **Fader Flip** — see "Fader flip" on page 100.
- **Overwrite Safed parameters** — see "Overriding store scope" on page 191.

Changing the signal processing preferences



The **Signal Processing Preferences** section of the **Preferences** screen lets you set up your DSP preferences.

- **DSP Timeout** — control knob for adjusting the amount of time (between 10 and 600 seconds) the DSPs will continue to run after an update is received from the control surface, before the audio is muted.
- **inf** — tick box for selecting infinity, which will allow audio to continue indefinitely if power to the control surface is lost.
- **Master to Matrix Post-processing** — tick box for selecting whether the tap-off point is either a pre- or post-master channel processed signal that is sent to the matrix channels (see "Masters to matrix tap-off-point" on page 242), and determines whether the signal is sent without or with processing, respectively. This is used in combination with the **Delay Compensation** section underneath (see "GUI Delay Compensation options" on page 238).

Configuring the channels, groups and internal units

You can change the default name and colour of the input and output channels, groups, internal rack units and GEQs of the XL8 that appear on the control surface (LCD select buttons) and GUI. This is done via the 'Sheet' screen of each item, which is accessible via the GUI menu.

The procedure for configuring the VCA/POP groups is shown in "Configuring VCA/POP groups" on page 95, and this is principally the same for each of the above items.

Changing the default input/output names

You can change the names that appear in the lists on the **Input Sheet** and **Output Sheet.** These lists provide you with a number of default names from which you can choose when naming your inputs and outputs in the GUI menu.

>> To change the set names in the Input/Output Sheets

1 At the GUI, choose **home** ▸ ***Preferences*** ▸ ***General.***

2 In the **Names Lists** section of **User Interface Preferences**, click **SET NAMES.**

3 In the **Set Name Lists** window (shown right), click within the field containing the name you want to change. Enter the new name (see "Text editing" on page 53).

Repeat for any other names you want to change.

4 Click **CLOSE.**



Adjusting XL8 illumination

The **Illumination** section of the **Preferences** screen lets you adjust the brightness and contrast of each GUI screen individually to suit the operating conditions. You can also adjust the brightness of the LEDs (including meters) on the control surface.



>> To adjust the GUI screen brightness and contrast

1 At the desired GUI screen, choose **home** ▸ ***Preferences*** ▸ ***General.***

2 In the **Illumination** section, do the following:

- To increase/decrease GUI screen brightness, click the up/down **Screen Brightness** spin buttons.
- To increase/decrease GUI screen contrast, click the up/down **Screen Contrast** spin buttons.

>> To adjust the brightness of the LEDs/meters

To increase/decrease the brightness of the solo LEDs, meter LEDs or the other LEDs on the control surface, use drag to adjust the appropriate control knob (from off to full).

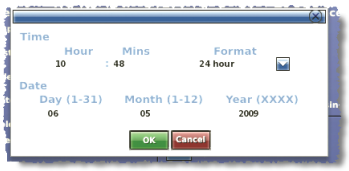
Setting the time and date

You can change the XL8's time and date.

>> To set the time and date of the XL8

1. At a GUI screen, choose **home** ▸ ***Preferences*** ▸ ***General.***
2. In the **Date and Time** section of **Configuration Preferences**, click **SET.**
3. In the time and date window, enter the time (hours and minutes) and date.

   Make sure you choose the correct time format, that is, 12-hour (a.m. or p.m.) or 24-hour, and enter the time accordingly.



4. Click **OK.**

Chapter 28: Intercom

The intercom of the XL8 Control Centre, which is Telex RTS-compatible, is a twin wire (TW) system. This means that two bi-directional intercom audio channels can be carried on a single 3-pin XLR screened lead. The cable also carries the call signals and power for the belt packs on one of the two audio channels. Please refer to Appendix H, "Documentation", which contains manuals for the equipment used with the XL8's intercom system, such as a power supply unit (PSU), headset and portable programmable user station.

The intercom line is similar to a mix bus in that many belt packs or intercom units can be added in a daisy-chain configuration, so that any of them can add audio to the bus and any number of them can listen simultaneously.

Important:
Please be aware that, due to the unusual signal/power configuration of the intercom line, it is not compatible with any conventional balanced/unbalanced audio system on a 3-pin XLR. So, for example, you can't plug it into a test set.

The headphone pods also contain 5-pin XLRs for the RTS headset. Only one headset should be connected to the console at a time. Two parallel sockets are provided (see "Front panel connections" on page 249), so you can choose which side of the console to connect to. The headset has stereo headphones and a mono dynamic mic for two-way communications. The console is also equipped with two balanced intercom speaker outputs that replicate the headset audio, and the intercom mic amp is fully balanced and powered from bi-polar rails.

Unlike a typical belt pack intercom, the console intercom is powered from the console's PSU and therefore doesn't need an external PSU for it to operate. Also, the console doesn't supply direct current (DC) to the intercom line. This means that an external RTS power pack must be used for any RTS-compatible intercom that is not self-powered.

An XL8 intercom can be directly linked to another XL8 intercom without an external PSU. However, if an external PSU is not used a terminator (3-pin XLR) is required (see "Terminator" on page 235).

Note 1: *As the intercom system in the XL8 Control Centre is a Telex RTS system (compatible with any TW system), the belt packs will require an RTS power supply. If you are using non-Telex RTS components you will need adaptors.*

Note 2: *Although the intercom system in the XL8 is self-powered, it doesn't provide power for the intercom line; external power supplies are required for any devices connected to the intercom. Also, as the line requires a termination, when not using an RTS PSU - which has an in-built termination - a separate termination will be required. For example, when connecting one XL8 to another without an RTS PSU. Contact Midas Technical Support for further details.*

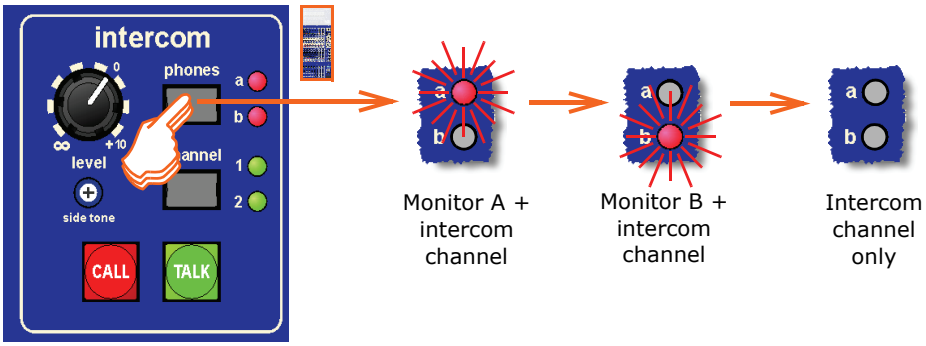
Using the phones button

Caution:
Before switching to monitor A or B using the phones button, make sure the level of the one you are switching to is not too high.

The **phones** button allows you to select monitor A or B for simultaneous broadcast over the headset with the selected intercom channel. By pressing this button quickly you can cycle through the three listening options in order to select the one you want. Or, by using a longer press, you can skip the next monitor option.

>> To select a monitor/intercom channel listening option

Press the **phones** button quickly to go to the next listening option. Repeated presses will cycle through the three options, in the following order.



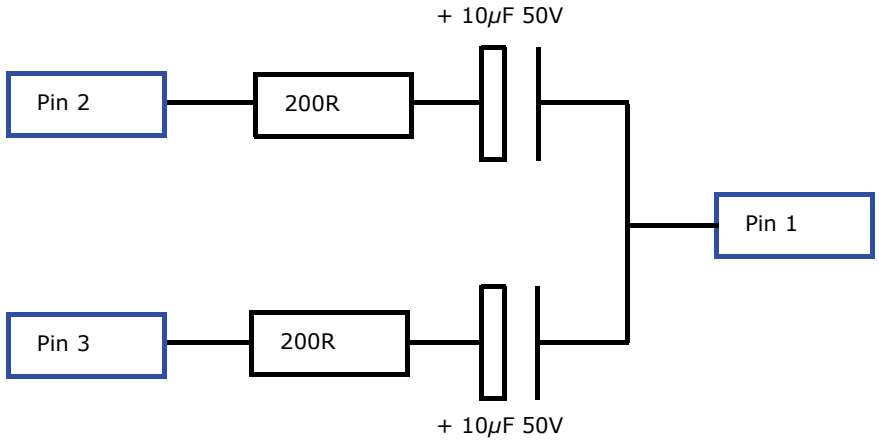
>> To skip a monitor (A or B) option

Go straight from the monitor A + intercom channel option to the intercom channel only option, skipping monitor B, by pressing the **phones** button and holding it down briefly. Do the same at the intercom only option to skip the monitor A + intercom channel option and go straight to the monitor B one.

Terminator

Caution:
Always use the XLR terminator for all intercom line tests, unless an external PSU is present. If a terminator or PSU is not used, the intercom gain is drastically increased and feedback may occur in the headset.

The terminator in constructed using a 3-pin male XLR (to match the PSU) and comprises two identical serial networks, one for each intercom channel. Each network comprises a resistor in series with a capacitor. The following diagram shows the connection details.



Parts required

To make the terminator you will need:

- A 3-pin male XLR.
- Two 200R resistors.
- Two 10µF 50V electrolytic capacitors.

>> To make the terminator

Construct the first serial network by connecting one resistor and one capacitor in series, making sure the positive capacitor terminal is facing the resistor. Connect the resistor to Pin 2 of the XLR.

Repeat for the second serial network, but connect the resistor to Pin 3 of the XLR.

On both serial networks, connect the negative terminals of the capacitors to Pin 1 of the XLR.

Chapter 29: Delay Compensation (Latency)

A time delay is induced in a channel's signal by placing, for example, an insert or GEQ in its path. This delay affects system latency and can also produce undesirable audio effects. To overcome this the XL8 incorporates a system of user-configurable delay compensation parameters. These are presented to the user in the form of button-selectable options on the GUI and can be switched on or off to suit the current application.

Insert compensation

If a channel insert is active, it takes a finite amount of time for the signal to be sent through an internal or external effect and returned to the channel. Therefore, with no insert compensation, channels with inserts assigned are delayed more than channels that don't have an insert assigned to them. If two correlated signals with different delays are mixed together, this can produce comb filtering.

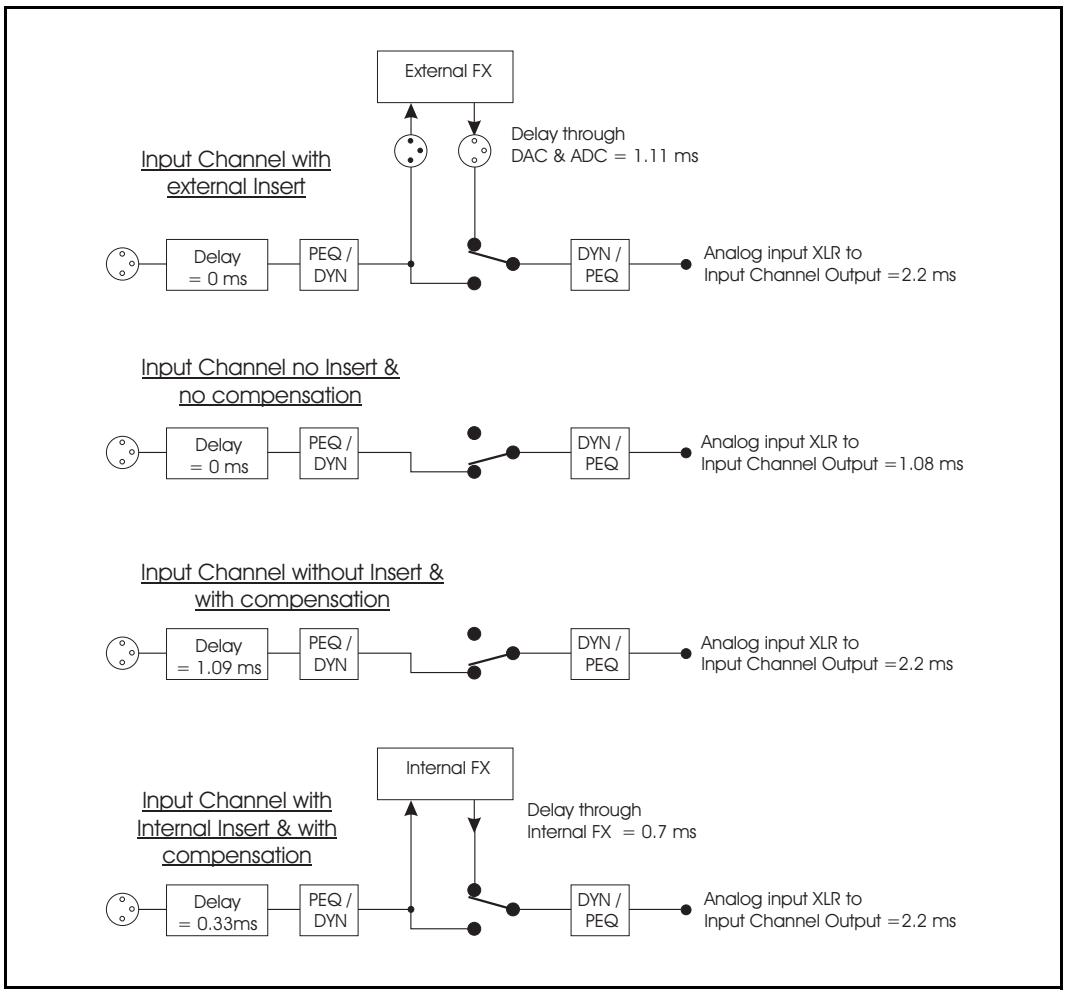


Figure 34: Input channel insert compensation

To avoid the comb filtering effect, the XL8 insert compensation works by delaying all channels except the ones that have inserts assigned. In practice, the actual delay used for compensation depends on the type of insert (internal/external) and its location (stage/FOH). Each channel type or layer within the console, such as, input, aux, master or matrix, has its own parameter controlling the delay compensation for that layer. This provides the user with the maximum flexibility and allows the console to be configured for the lowest latency for a given application.

GEQ compensation

Output bus channels have the ability to have a GEQ inserted into them, which incurs an additional delay in their signal path. With GEQ compensation active, a delay is inserted into the output buses, which is removed when a GEQ becomes active. This ensures that all bus outputs of the same type are aligned regardless of whether they use a GEQ or not.

GUI Delay Compensation options

XL8 delay compensation (latency) is configured in the **Delay Compensation** section (shown right) of GUI menu's **Preferences** screen.



For a description of the delay compensation options and details of when best to use them, see Table 13 (below). In this table the ***Description*** column explains what happens when the delay compensation option is selected (switched on) and the ***Latency (ms)*** column shows the value that the overall system latency is increased by.

>> To access the delay compensation options

At the GUI, choose **home** ▸ ***Preferences*** ▸ ***General.***

Table 13: Delay compensation options

Section	*Option*	*Description*	*Recommendations*	*Latency (ms)*
Input Channels	Insert	Time-aligns the output of all input channels, regardless of whether or not they have an active insert. When this option is switched off, any input channels with inserts will be delayed relative to those input channels that do not have inserts.	If no inserts are used in the input channel layer, switch this option off to reduce the overall system latency. If there is an insert on any input channel, switch this option on.	1.11
Aux Sends	Monitor Mode (Align with Masters)	See "Monitor Mode (Align with Masters)" on page 240.	N/A	N/A

Section	*Option*	*Description*	*Recommendations*	*Latency (ms)*
Aux Sends	Insert	Compensates for inserts placed in aux buses. To do this it modifies the delay that sits between the input channel outputs and master/matrix channel inputs, so that signals fed from inputs to masters will line up with signals fed from inputs through auxes to masters.	If there are no inserts on any aux channels, switch this option off to reduce overall system latency. If any aux channel has an insert, switch this option on. If the **Monitor Mode (Align with Masters)** option is selected, switch this option off.	1.11
Aux Sends	Send-FX-Return	This option compensates the inputs to master and matrix paths for the signal path between an aux through an effect, and back through a return to the master and matrix channels.	If no effects are used between the aux and return channels, switch this option off to reduce overall system latency. If any effects are used between any auxes and returns, switch this option on. If the **Monitor Mode (Align with Masters)** option is selected, switch this option off.	1.11
Aux Sends	Graphic EQ	This setting controls the delay compensation aligning aux bus outputs for channels that use GEQ with those that do not.	If no aux buses use GEQ, switch this option off to reduce overall system latency. If any aux bus has a GEQ inserted, switch this option on to ensure all aux bus outputs are time-aligned.	0.5
Master and Matrix	Insert	Time-aligns the output of all the master and matrix channels, regardless of whether or not they have an active insert. With this option switched off, the outputs of any master or matrix channels using inserts will be delayed relative to the equivalent channels not using them.	If no inserts are used in the master/matrix channel layer, switch this option off to reduce overall system latency. If Inserts are used in any master/matrix channels, switch this option on.	1.11
Master and Matrix	Graphic EQ	This option controls the delay compensation that aligns master and matrix bus outputs for channels using GEQ with those that do not.	If no master or matrix buses are using GEQ, switch this option off to reduce overall system latency. If any master or matrix buses have a GEQ inserted, switch this option on to time-align all master and matrix bus outputs.	0.5

Monitor Mode (Align with Masters)

The default console bus structure is organised such that inputs can be routed to masters, and also simultaneously routed to masters and matrix channels via aux buses (see Figure 36 "Routing via aux buses") or via aux and return buses (see Figure 35 "Routing via aux and return buses"), while maintaining the same overall input to output latency in both paths.

This may not be the desired structure if auxes and matrix outputs are both being used for monitor mixes, where it is desirable for auxes, masters and matrix outputs to be time-aligned with the minimum possible latency.

With this option switched off, the delay element that is used to delay the paths from input channels to master/matrix channels is removed. With all insert and GEQ delay compensation switched off, the latency between a system input XLR and a system output XLR is being fed by an aux, master or matrix channel is 1.84ms (see Figure 37 "Latency for input to aux, master and matrix outputs").

If using this option, it is advisable to use the same GEQ and insert compensation settings for aux and master/matrix channels to maintain their identical output latency.

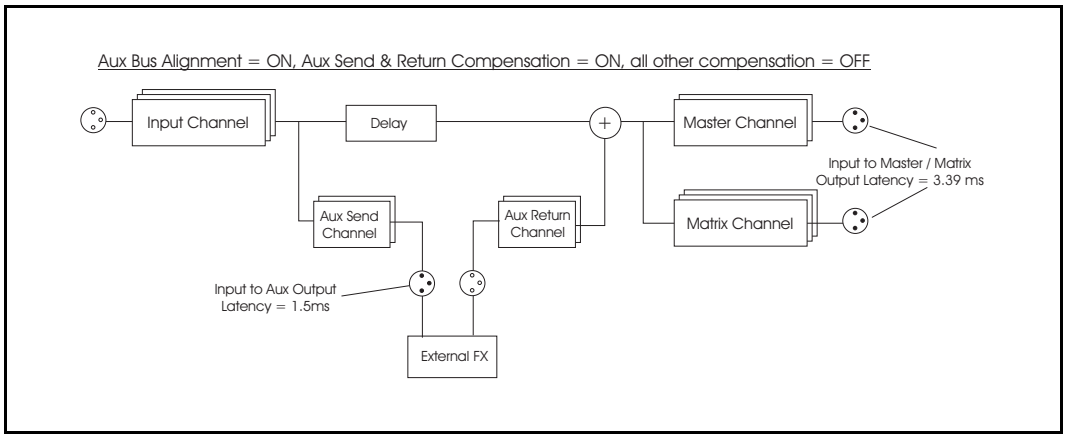


Figure 35: Routing via aux and return buses

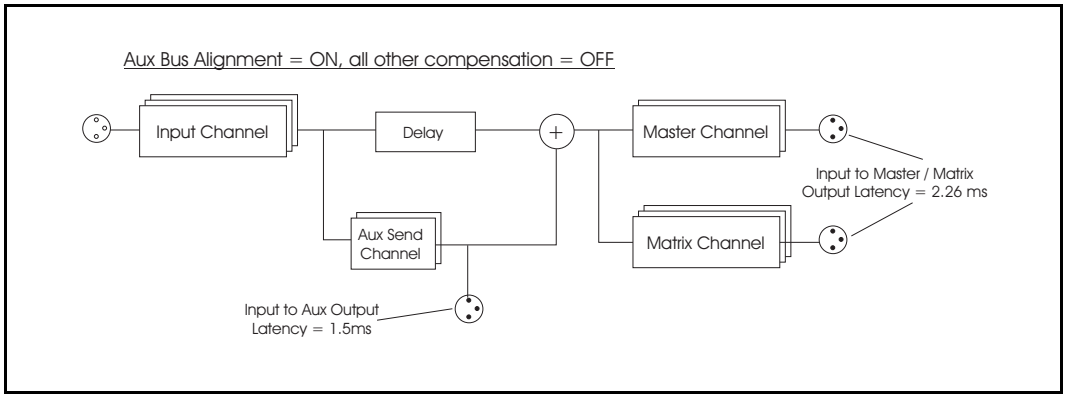


Figure 36: Routing via aux buses

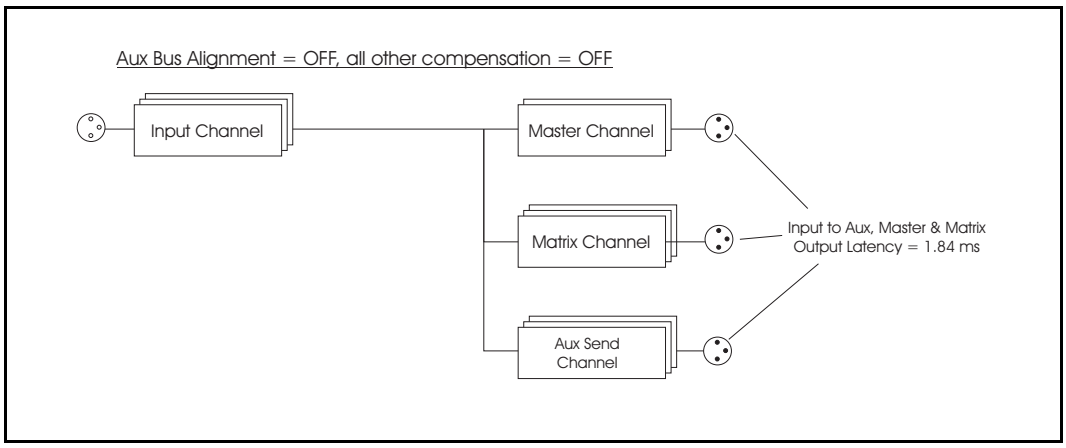


Figure 37: Latency for input to aux, master and matrix outputs

Zones

The XL8 system can be divided into conceptual 'zones', as follows:

- **System Input Zone:** DL431 Mic Splitter or DL451 Line/AES3 inputs, which are normally routed to Input channels. These inputs are *primary* system inputs and the console output latency is measured relative to these inputs.
- **Mix Zone:** Aux outputs, return inputs and master/matrix direct inputs, which can be freely patched to and from internal or external effects, while maintaining output signal alignment.
- **Output Zone:** System outputs, that is, master and matrix outputs when **Monitor Mode (Align with Masters)** compensation is switched off, or aux, master and matrix outputs when **Monitor Mode (Align with Masters)** compensation is switched on.

Aux direct inputs are fixed to the System Input Zone so that DL431/DL451 inputs routed to an aux direct input will automatically line up with inputs routed to auxes via input channels.

Return inputs and master and matrix direct inputs can be configured to operate in either the System Input Zone (for example, as additional console inputs) or the Mix Zone (for example, as effect returns) and are configurable on a per channel basis.

Examples of patches using the Mix Zone that are all fully compensated when the **Send-FX-Return** option of the **Aux Sends** section of the delay compensation is switched on are:

- Aux -> Internal/External Effect -> Return
- Aux -> Internal/External Effect -> Master Direct Input
- Aux -> Internal/External Effect -> Matrix Direct Input
- Aux with Insert -> Internal/External Effect -> Return

For all system inputs, including insert return points, the actual location of the input XLR is automatically compensated for, so an insert using I/O at the stage location will produce the same latency as an insert at FOH.

Input channel direct outputs are simply a copy of the input channel output or mic input signal, depending on the direct output mode for a particular channel. It is not possible to delay these signals to line-up with the main system outputs or aux outputs, so patching from a direct output to an effect and back in to a return, master direct input etc., cannot be fully compensated for.

The input to direct output latency depends on the direct output mode and the **Inserts** option of the **Input Channel insert** delay compensation status according to the following table.

Direct Output mode	***Input channel insert compensation (ms)***	
	Off	***On***
Pre-processing	0.76	0.76
Post-processing	1.083	2.198

Masters to matrix tap-off-point

The signal path that feeds master bus signals onto matrix channels is fully compensated for so that signals fed direct to matrix channels or indirectly to matrix channels via master channels will always line up at the outputs, as will signals sent only to masters or only to matrix channels.

The user is given the choice of tap-off point, so they may choose to send either a pre-master or post-master channel processed signal to the matrix channels. This is a global setting and affects all master -> matrix contributions, as shown in the following diagram.

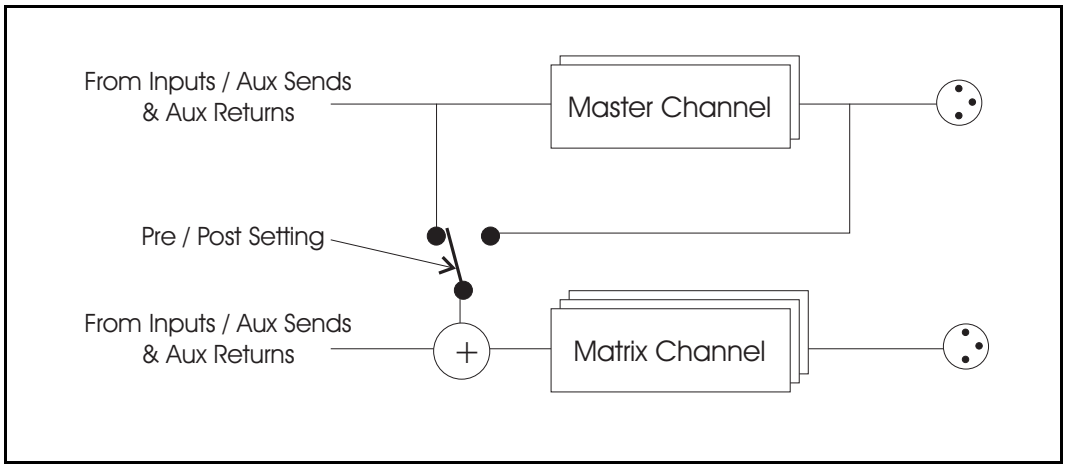


Figure 38: Master and matrix tap-off points

Sending pre-processed master bus signals to matrix channels reduces the overall system latency. If post-processed tap-off points are used, the system must compensate for both the latency of the matrix and master channels, and if insert and GEQ compensation are both required on master and matrix channels, this can push the maximum system latency up to 9.52 ms. With no other insert or GEQ compensation switched on, using post-processed tap-off points produces a system latency of 2.45 ms, as opposed to pre-processing tap-off points, which would produce a latency of 2.27 ms. When **Monitor Mode (Align with Masters)** is switched on, these figures are 1.84 ms and 2.02 ms, respectively.

Typical configurations

Here are some actual examples of typical configurations to illustrate the effects of delay compensation. Please note the following:

- All XLRs are located at stage end, unless FOH is stated.
- INS can mean an internal effect or an external effect with analogue, or AES3 I/O at either FOH or stage position.
- Abbreviations are: IP = input channel; AS = aux (send) channel, AR = (aux) return channel; AR (Input) = (aux) return channel set to input mode; MAST = master channel; MTX = matrix channel; DI (mix) = direct input set to Mix Zone (DI can be either pre- or post-); and DI (input) = direct input set to System Input Zone (DI can be either pre- or post-).

FOH Mix Setup

The following table shows the delay compensation settings for this mix.

Option	*On/off status*
Master to Matrix Post-processing	Off
Input Channels	
Insert	On
Aux Sends	
Monitor Mode (Align with Masters)	Off
Insert	On
Send-FX-Return	On
Graphic EQ	On
Master and Matrix	
Insert	On
Graphic EQ	On

The following example signal paths all measure the same latency of 742 samples @ 96kHz = 7.73ms:

- FOH XLR – IP – MAST – XLR
- XLR – IP – MAST – XLR
- XLR – IP – MTX – XLR
- XLR – IP – AS - MAST – XLR
- XLR – IP – AS – INS – MAST – XLR
- XLR – IP (With INS) – AS (With INS) – INS – AR – MAST (With INS) - XLR
- XLR – IP (With INS) – AS (With INS + GEQ) – INS – AR – MAST (With INS + GEQ) - XLR
- XLR – IP – AS – INS – MAST DI (Mix)
- XLR – IP – AS – INS – MTX DI (Mix)
- XLR – MAST DI (Input)
- XLR – MTX DI (Input)
- XLR – AS DI – MAST – XLR
- XLR – AR (Input) – MAST – XLR
- XLR – IP – MAST – MTX
- XLR – IP – AS (With GEQ) – MAST (With GEQ)

- XLR – IP – AS (With GEQ) – MTX (With GEQ)

FOH Mix Low Latency

The following table shows the delay compensation settings for this mix.

Option	*On/off status*
Master to Matrix Post-processing	Off
Input Channels	
Insert	Off
Aux Sends	
Monitor Mode (Align with Masters)	Off
Insert	Off
Send-FX-Return	On
Graphic EQ	Off
Master and Matrix	
Insert	Off
Graphic EQ	On

The following example signal paths all measure the same latency of 373 samples @ 96kHz = 3.88ms:

- FOH XLR – IP – MAST – XLR
- XLR – IP – MAST – XLR
- XLR – IP – MTX – XLR
- XLR – IP – AS - MAST – XLR
- XLR – IP – AS – INS – MAST – XLR
- XLR – IP – AS – INS – MAST (With GEQ) – XLR
- XLR – IP – AS – INS – MAST DI (Mix)
- XLR – IP – AS – INS – MTX DI (Mix)
- XLR – MAST DI (Input)
- XLR – MTX DI (Input)
- XLR – AS DI – MAST – XLR
- XLR – AR (Input) – MAST – XLR
- XLR – IP – MAST – MTX
- XLR – IP – AS – MAST (With GEQ)
- XLR – IP – AS – MTX (With GEQ)

Monitor Mix

The following table shows the delay compensation settings for this mix.

Option	*On/off status*
Master to Matrix Post-processing	Off
Input Channels	
Insert	Off
Aux Sends	
Monitor Mode (Align with Masters)	On
Insert	On
Send-FX-Return	Off
Graphic EQ	On
Master and Matrix	
Insert	On
Graphic EQ	On

The following example signal paths all measure the same latency of 225 samples @ 96kHz = 2.34ms[1]:

- FOH XLR – IP – MAST – XLR
- XLR – IP – MAST – XLR
- XLR – IP – MTX – XLR
- XLR – IP – MAST- MTX – XLR
- XLR – IP – AS – XLR
- XLR – IP – AS (With GEQ) – XLR
- XLR – AS DI – AS – XLR
- XLR – AS DI – AS (With GEQ) – XLR
- XLR – AR (Input) – MAST – XLR
- XLR – AR (Input) – MAST (With GEQ) – XLR
- XLR – AR (Input) – MTX (With GEQ) – XLR
- XLR – AR (Input) – MAST - MTX - XLR
- XLR – AR (Input) – MAST - MTX (With GEQ) - XLR

1. This value does apply if you have aux and master/matrix inserts on for additional GEQs.

Monitor Mix (Low Latency)

The following table shows the delay compensation settings for this mix.

Option	*On/off status*
Master to Matrix Post-processing	Off
Input Channels	
Insert	Off
Aux Sends	
Monitor Mode (Align with Masters)	On
Insert	Off
Send-FX-Return	Off
Graphic EQ	Off
Master and Matrix	
Insert	Off
Graphic EQ	Off

Input Ch Insert (OFF)

Aux Insert (OFF)

Aux Send & Return (OFF)

Aux GEQ (OFF)

Masters / Matrix Insert (OFF)

Masters / Matrix GEQ (OFF)

Master to Matrix tap-off = pre-processing.

Aux alignment (OFF)

The following example signal paths all measure the same latency of 177 samples @ 96kHz = 1.84 ms:

- FOH XLR – IP – MAST – XLR
- XLR – IP – MAST – XLR
- XLR – IP – MTX – XLR
- XLR – IP – MAST- MTX – XLR
- XLR – IP – AS – XLR
- XLR – AS DI – AS – XLR
- XLR – AR (Input) – MAST – XLR
- XLR – AR (Input) – MAST - MTX - XLR

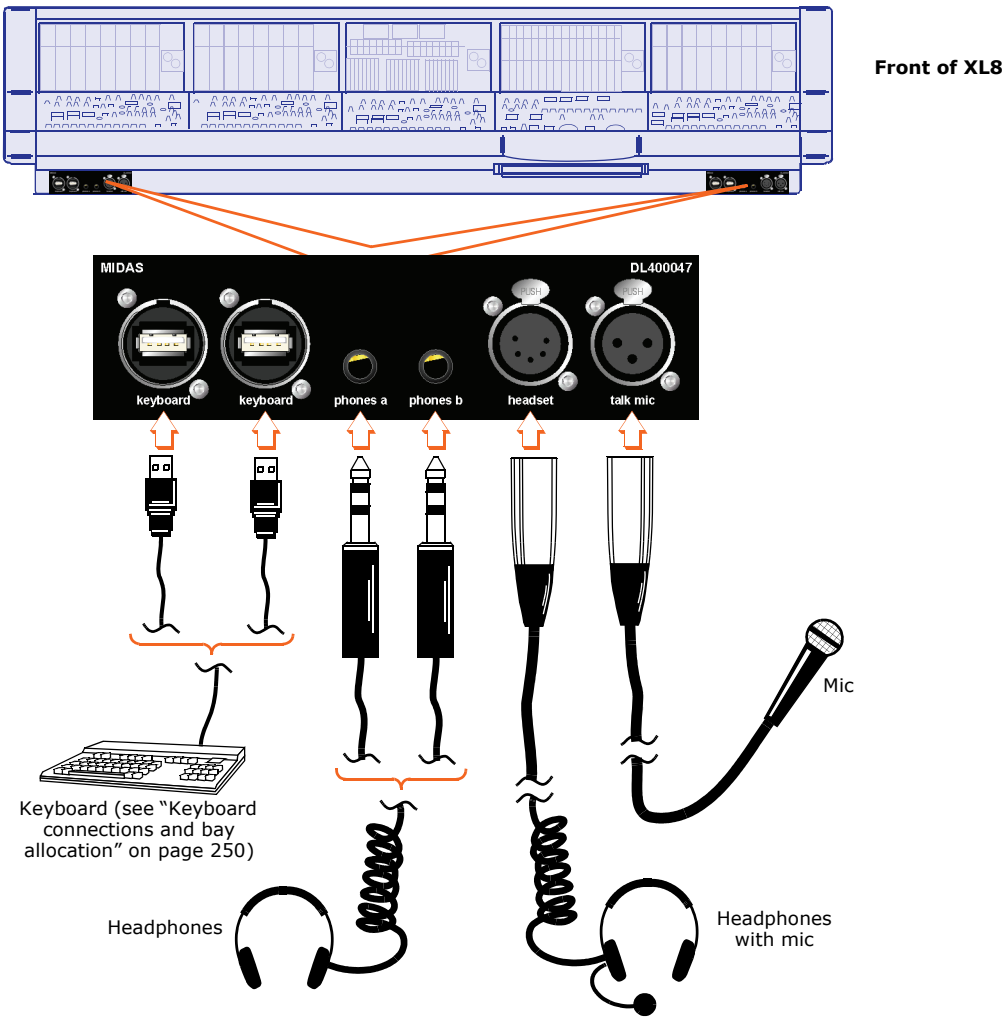
Description

Chapter 30: Panel Connections

This chapter describes the front and rear panels of the XL8.

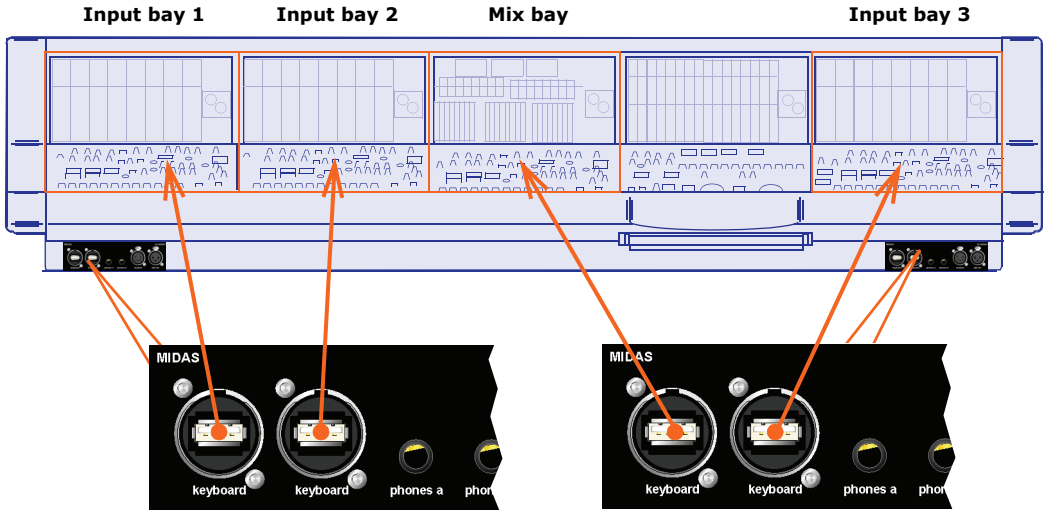
Front panel connections

There are two similar connector panels at the front of the XL8 Control Centre, which are situated at either end under the armrest as shown in the following diagram.



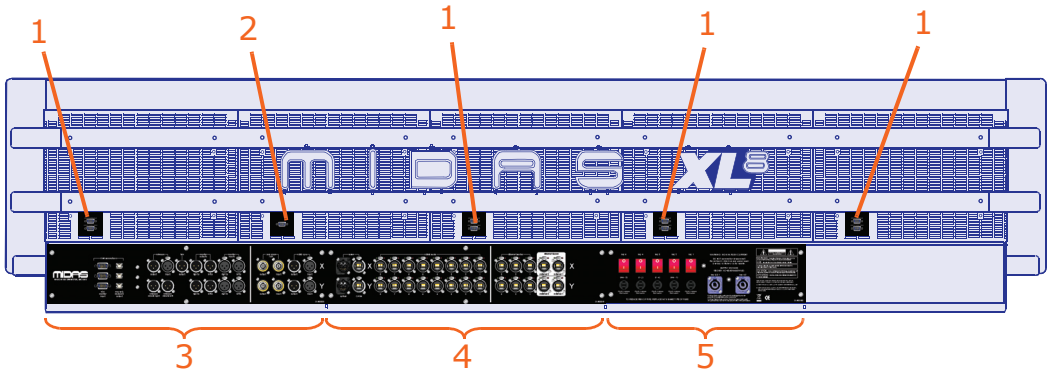
Keyboard connections and bay allocation

You can use an external USB keyboard with the input and mix bays. As this is a 'plug and play' connection, just plug the keyboard into the USB socket of the required bay and it is ready for use. The following diagram shows which bay each socket is linked to.



Rear panel connections

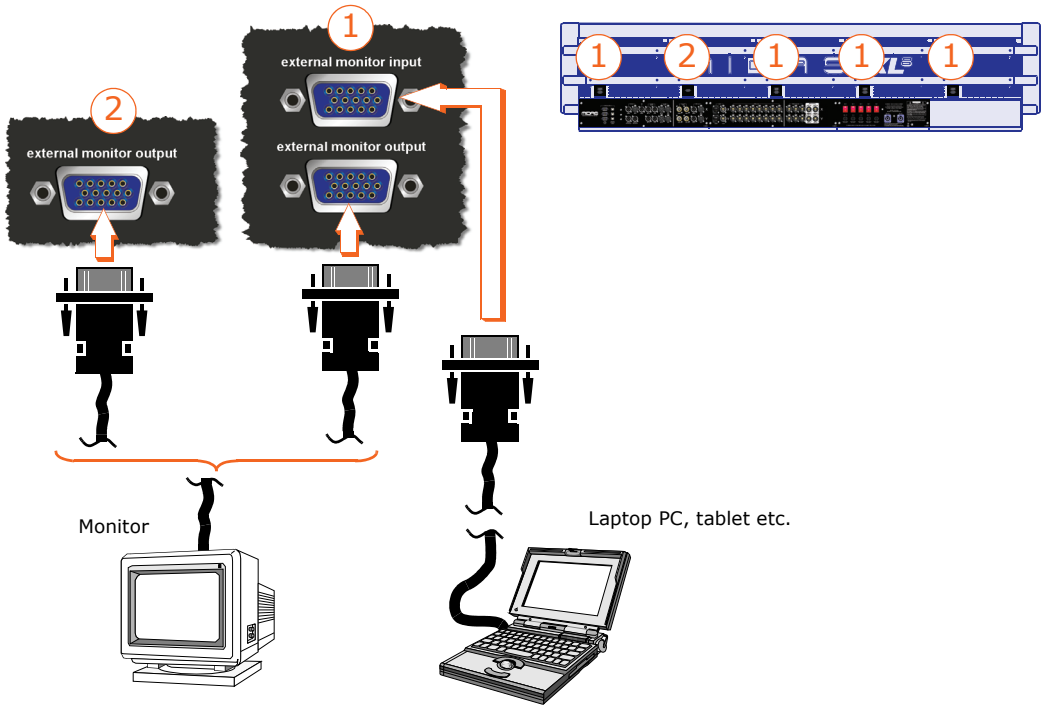
The rear of the XL8 Control Centre contains the following connector panels.



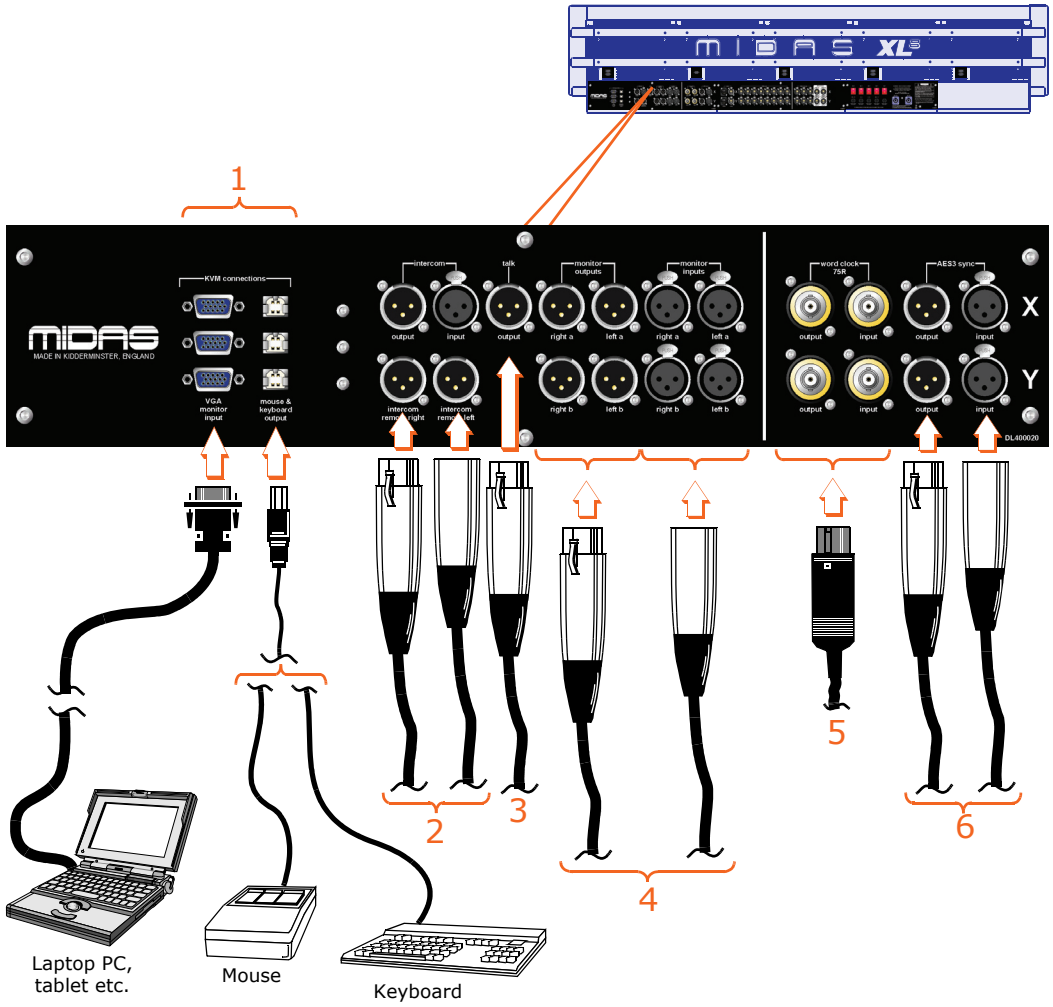
Item	*Description*
1	See "Monitor connector panels" on page 251.
2	See "Monitor connector panels" on page 251.
3	See "KVM, monitor and synchronisation connector panel" on page 252.
4	See "System interconnection panel" on page 253.
5	See "Power supply panel" on page 254.

Monitor connector panels

Five connector panels on the rear of the control centre allow you to plug in an external monitor, so you can view on a large screen exactly what is shown on a particular GUI screen. The connectors are 15-way D-types. Each panel has an **external monitor output** connector for connecting an external monitor. Except for the output bay, each has an **external monitor input** connector for connecting a laptop PC/tablet.

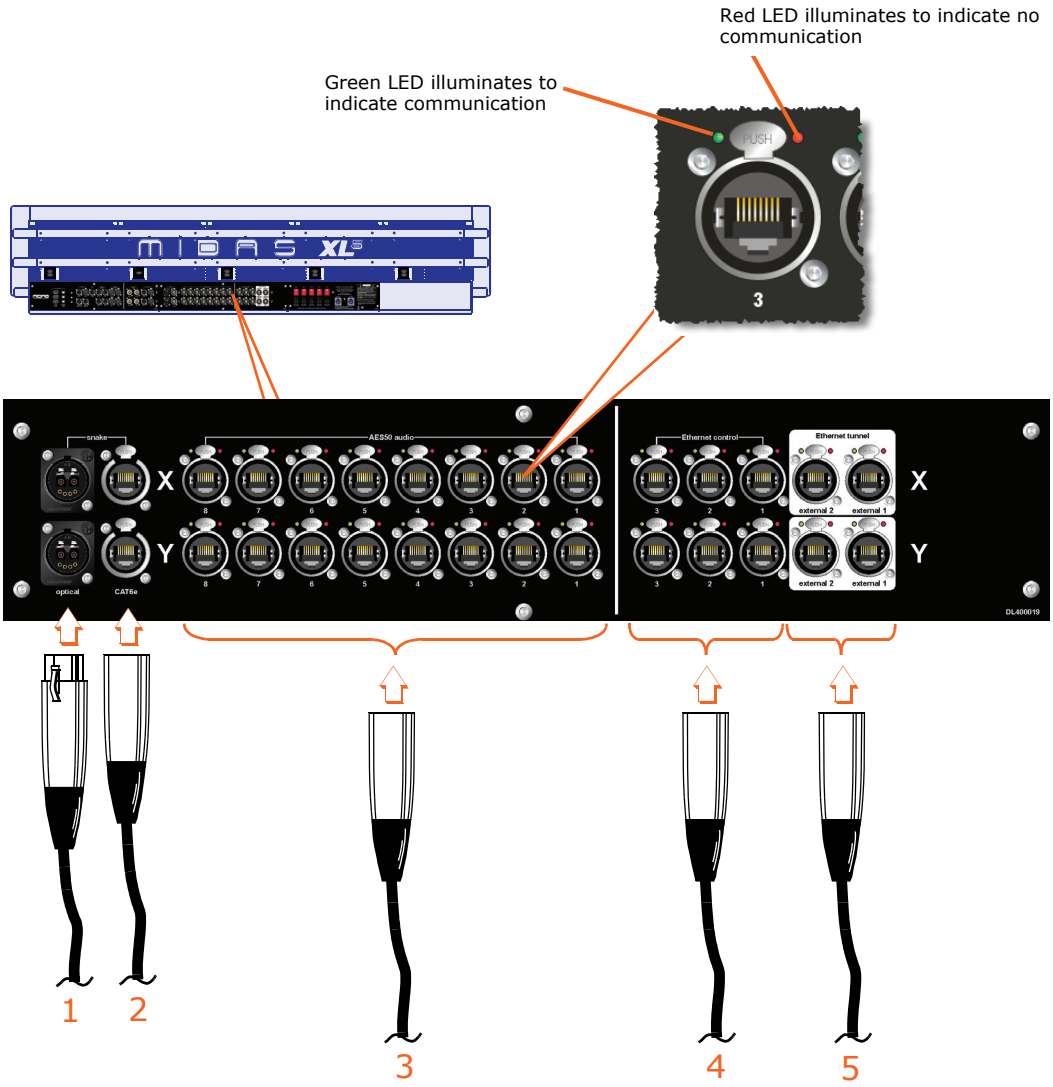


KVM, monitor and synchronisation connector panel



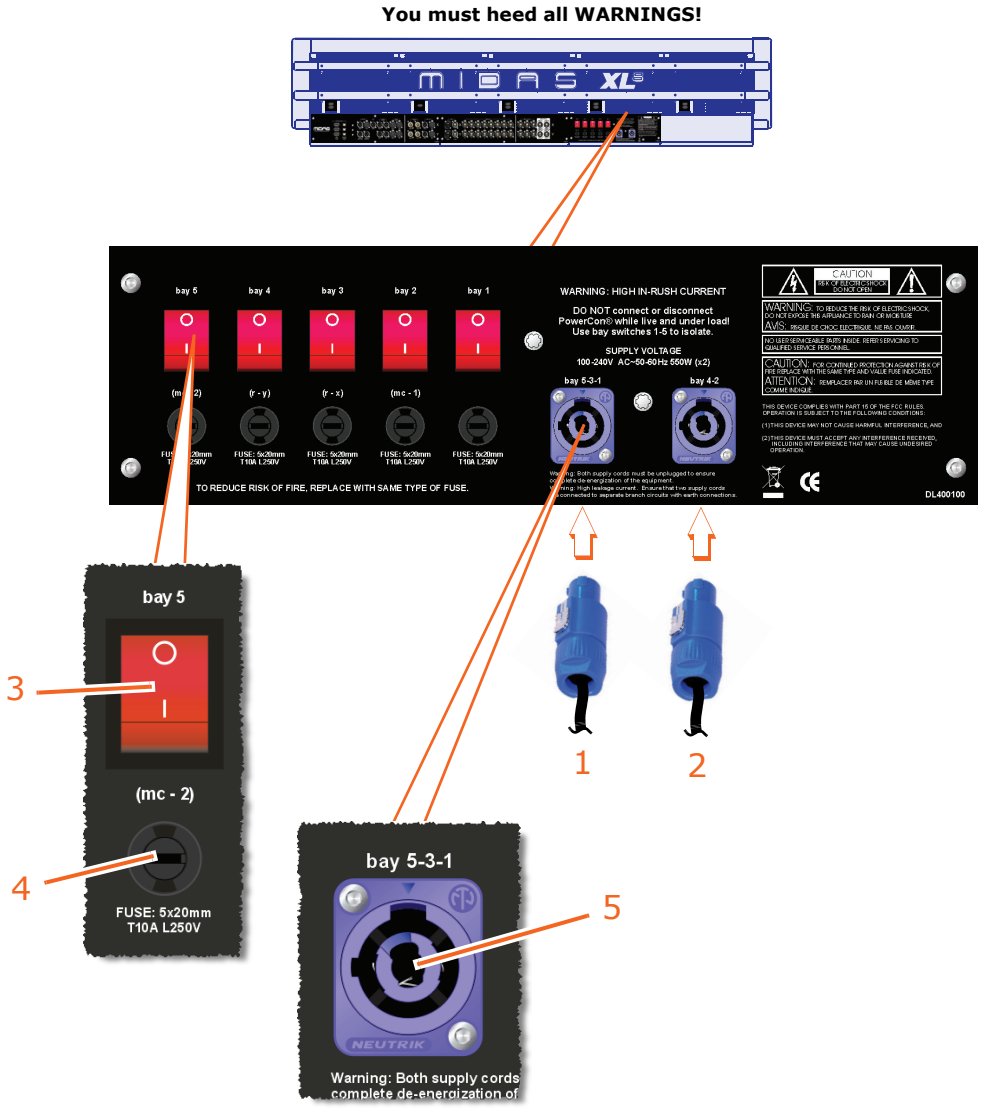
Item	*Description*
1	Three sets of **KVM connections** allow three PCs to be connected to the control centre. Each set comprises a VGA **monitor input** (15-way, D-type socket) and a **mouse & keyboard output** (USB type B) socket, which can be used for connection of a mouse or keyboard. See "Output fast strip" on page 316.
2	Four **intercom** sockets comprising an **output** (male XLR) and an **input** (female XLR) socket, and left and right intercom remote (male XLR) sockets.
3	**talk** section has a male XLR **output** socket.
4	**monitor outputs** (male XLR) and **monitor inputs** (female XLR) sections each comprise **left a** and **left b**, and **right a** and **right b** connections. See "Monitoring" on page 322.
5	**word clock 75R** section comprises X and Y **input** and **output** BNC cable sockets for synchronisation with routers.
6	**AES3 sync** section comprising X and Y **input** (female) and **output** (male) XLR sockets.

System interconnection panel



Item	*Description*
1	**optical** X and Y OpticalCon® connectors for connection of routers via optical 'snake'.
2	**CAT6e** X and Y EtherCon® XLR connectors for connection of routers via Cat6 cable.
3	Eight-off each **AES50 audio** X and Y EtherCon® XLR connectors.
4	Three-off each **Ethernet control** X and Y EtherCon® XLR connectors.
5	**external 1** and **external 2** X and Y **Ethernet tunnel** EtherCon® XLR connectors. (X connector **external 2** is used for connecting a Klark Teknik DN9331 RAPIDE.)

Power supply panel



Item	*Description*
1	PowerCon® connector for bays 1, 3 and 5.
2	PowerCon® connector for bays 2 and 4.
3	Bay ON/OFF isolator switch, one for each bay.
4	Mains fuse, one for each bay. The fuse's specification is printed underneath.
5	PowerCon® mains socket.

Chapter 31: Channels

The XL8's control surface and GUI are designed such that the fast strips enable quick navigation, selection and control of banks of channels, whereas the channel strips provide detailed parameter control over a single channel. The hardware layout of the strips has been arranged to closely match the channel signal paths.

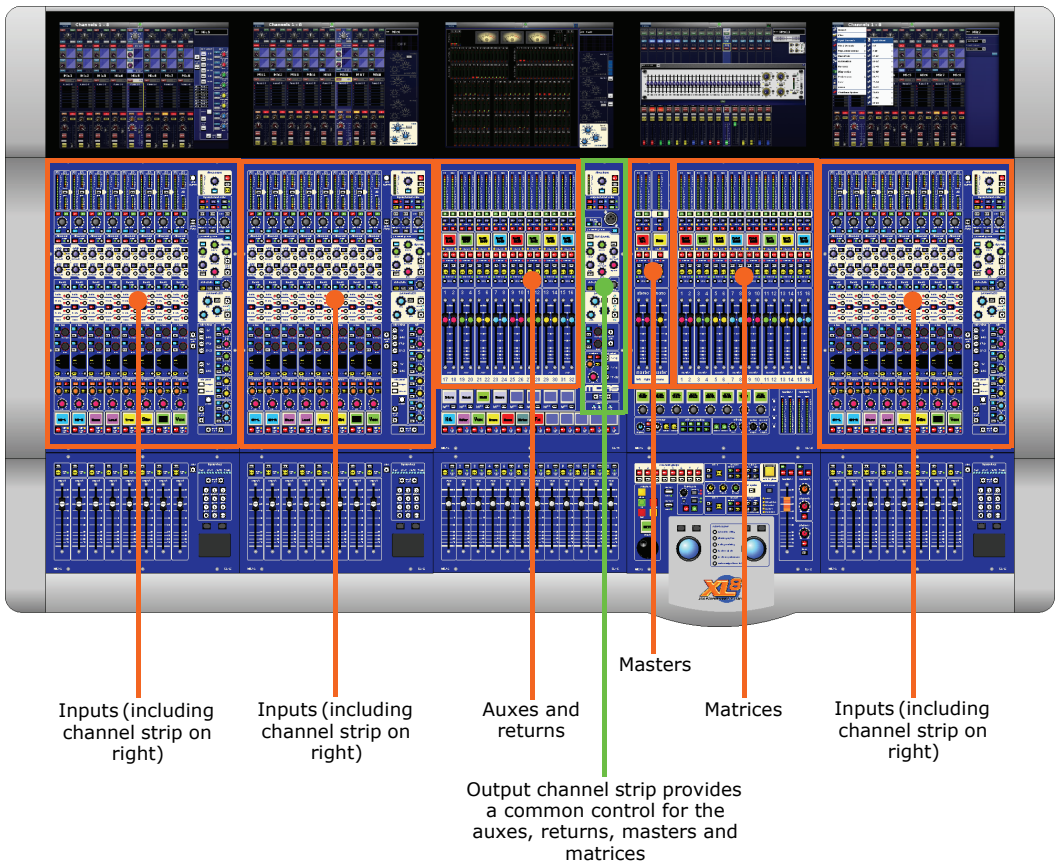
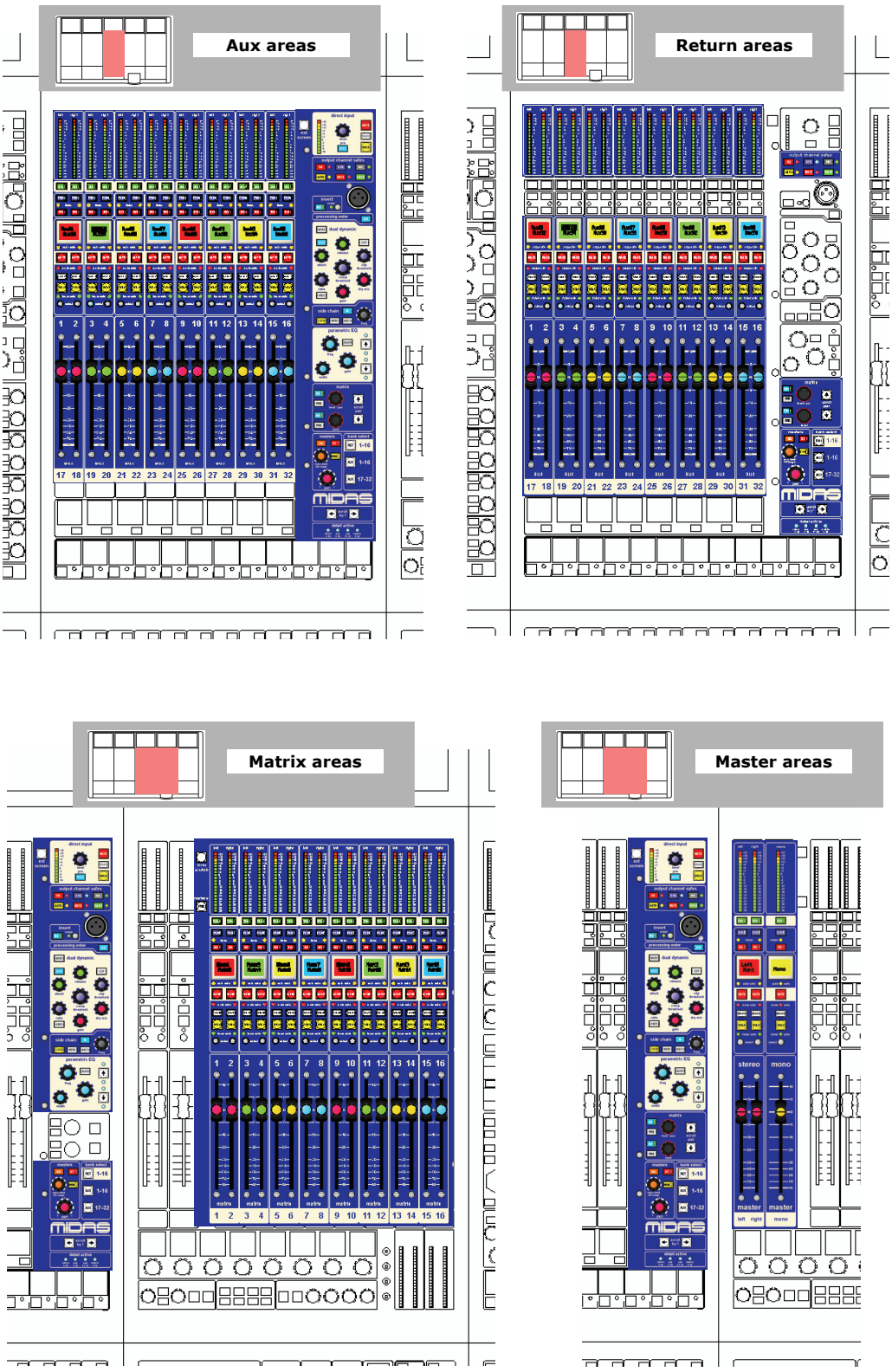


Figure 39: Control surface channel control areas

Although the input bays have exclusive control of the input channels, the mix and output bays cater for more than one type of output channel (see Figure 39). This means that the same control surface hardware in both of the these bays is used for channels with differing control requirements. This is where the GUI comes into its own. While redundant detail areas on the control sections are disabled when a particular channel type is selected, the GUI is far more flexible; it brings up a specific display for that channel type, which contains only the controls pertinent to it.

The following diagram shows the control surface areas used for the aux, return, matrix and master channels.



Channel routing

In this section we will look at each channel's control sections, which can be broadly divided into the areas listed in the "Channel Controls" column in the following table. The input channels have extra controls that provide functions such as gain control and input channel source routing selection. The table shows typical signal paths for each channel. To do this its shows, in order, each channel's controls and where they are located. However, it does not necessarily show the linear order of processing of the channel signals, as this is variable via a number of options.

Table 14: Channel controls (in signal path order)

Channel Controls	Channel Type				
	Input	Aux	Return	Master	Matrix
Mic splitter remote controls	Input bay; see page 265	-	-	-	-
Configuration	Input bay; see page 268	Mix bay; see page 298	Mix bay; see page 298	Mix** and output bays; see page 298	Mix** and output bays; see page 298
Gain and filter	Input bay; see page 265	-	-		
Direct input/output	Input bay (direct output); see page 270	Mix bay (direct input); see page 300	-	Mix** and output bays (direct input); see page 300	Mix** and output bays (direct input); see page 300
***#Dynamics (standard compressor and gate or dual compressor)**	Input bay (standard compressor and gate); see page 272 and page 280	Mix bay (dual compressor); see page 301	-	Mix** and output bays (dual compressor); see page 301	Mix** and output bays (dual compressor); see page 301
Insert	Input bay; see page 279	Mix bay; see page 303	-	Mix** and output bays; see page 303	Mix** and output bays; see page 303
***EQ (4-band or 6-band)**	Input bay (4-band); see page 280	Mix bay (6-band); see page 305	-	Mix** and output bays (6-band); see page 305	Mix** and output bays (6-band); see page 305
Mixes	Input bay (auxes and matrices); see page 283	Mix bay (matrices); see page 307	Mix bay; see page 307	-	-
Master controls, solo select and fader	Input bay; see page 286	Mix bay; see page 309	-	Mix** and output bays; see page 309	Mix** and output bays; see page 309

* Order can be swapped by pressing the **C/O** button in the **processing order** section.

** Mix bay's output channel strip.

Includes side chain section.

Configuration

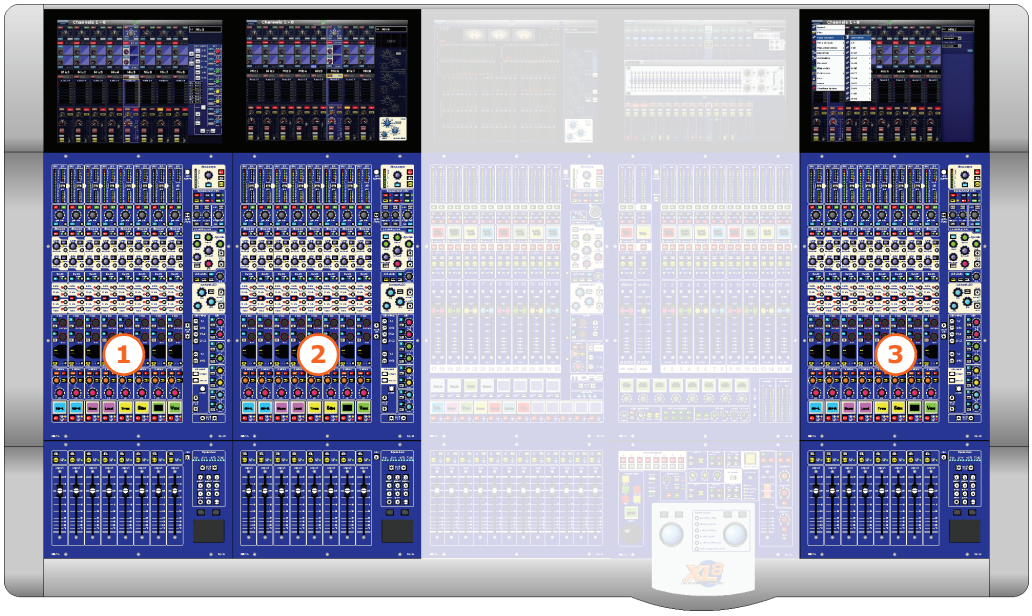
The following table shows the configuration controls for each channel. All of the input channel's configuration controls are located in the input channel strip, while the equivalent for the other four channels are in the output channel strip (mix bay). The table approximately follows the order in which they appear in the GUI channel strips.

Table 15: Configuration controls (in signal path order)

Configuration Controls	Channel Type				
	Input	Aux	Return	Master	Matrix
***Channel identification (name and colour of name field are configurable)**	See page 268	See page 298	See page 298	See page 298	See page 298
***Channel source/ destination**	See page 268	See page 298	See page 298	See page 298	See page 298
***Gain swap**	See page 265	-	-	-	-
Stereo linking	See page 264	See page 298	See page 298	See page 298	See page 298
***Matrix bus copying (copy from) and fader linking (link fader)**	-	See page 298	-	-	-
***Bus trim**	-	See page 298	See page 298	See page 298	See page 298
Direct input/output	Direct output; see page 270	Direct input; see page 300	-	Direct input; see page 300	Direct input; see page 300
Channel safes (see Appendix L "Parameters Protected By Safes" on page 477)	See page 268	See page 298	See page 298	See page 298	See page 298
Gain and filter	See page 265	-	-	-	-
Inserts	-	See page 303	-	See page 303	See page 303
***Channel delay**	See page 269	See page 298	-	See page 298	See page 298
Processing order	See page 269	See page 298	-	See page 298	See page 298

* Control is predominantly via the GUI or is GUI only.

Chapter 32: Input Bay Description

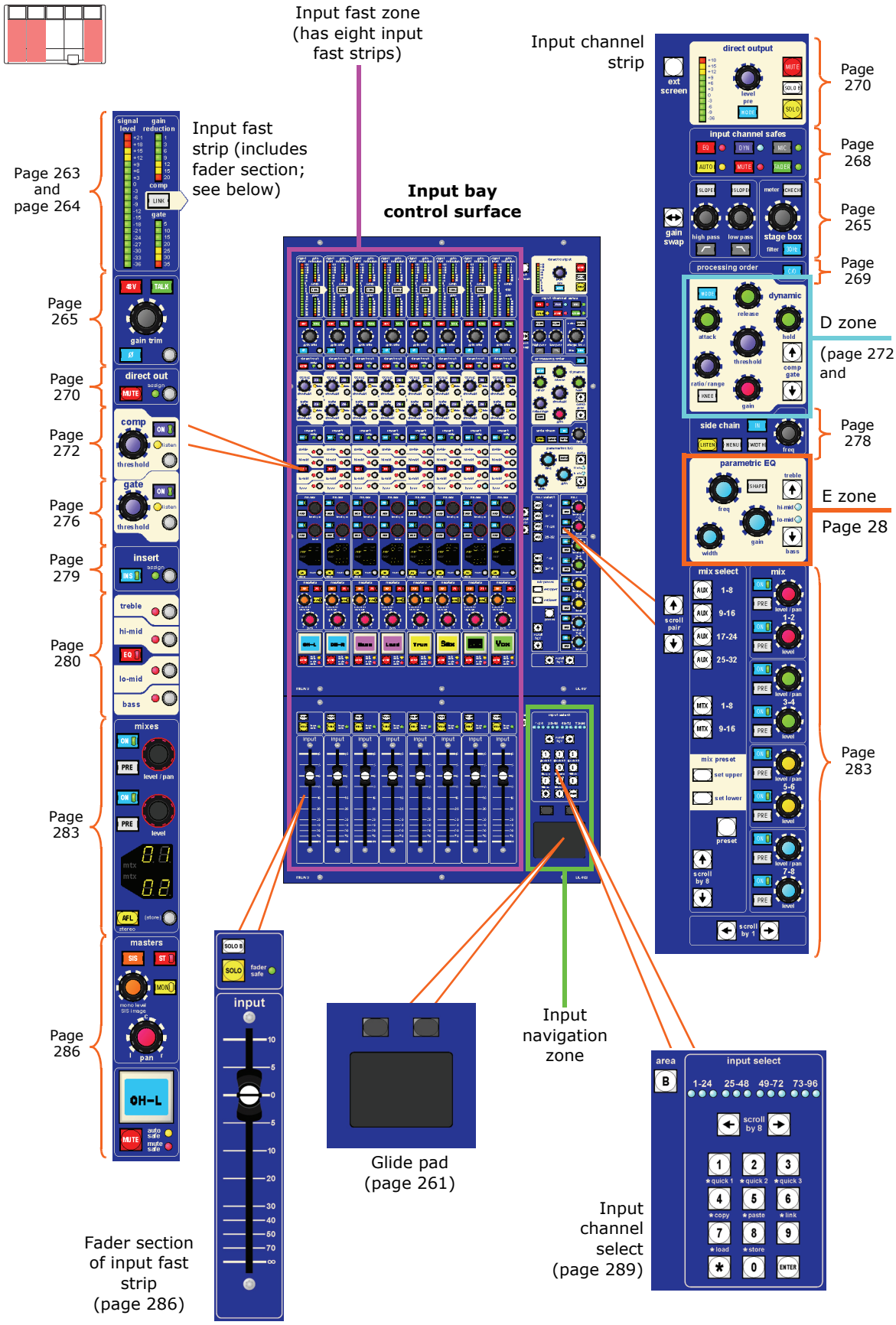


There are three identical input bays, two on the left and one on the right of the control centre; each one comprising a control surface and GUI screen.

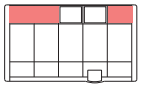
The control surface has the following main areas (see "Input bay control surface layout" on page 260):

- **Input fast zone:** deals with the input channel signals and contains eight input fast strips that provide the 'must have now' controls, such as compressor, gate, mix and fader sections.
- **Input channel strip:** includes D and E zones to provide a more comprehensive control of the inputs, with the controls configured in a logical signal path sequence. The channel strip is used to make detailed adjustments to a single channel's audio parameters, which is supported by visual feedback from the GUI.
- **Input navigation zone:** bay GUI screen control via glide pad, input channel selection and channel detail area copy and paste.

Input bay control surface layout



Input bay GUI



Each input bay GUI represents the actual input bay control surface layout by displaying a bank of eight input channel fast strips and an input channel strip on the right. A banner at the top of the screen is common to all input bay GUIs (see "Common screen elements" on page 251).

The GUI input fast strips give a constant display of the status of all your critical channel controls. The fast strip of the selected channel — or channels if linked — will have a lighter background than the others, and the selected detail area is highlighted by a yellow border.

The GUI channel strip shows the status of the controls in the selected detail area of the selected fast strip.

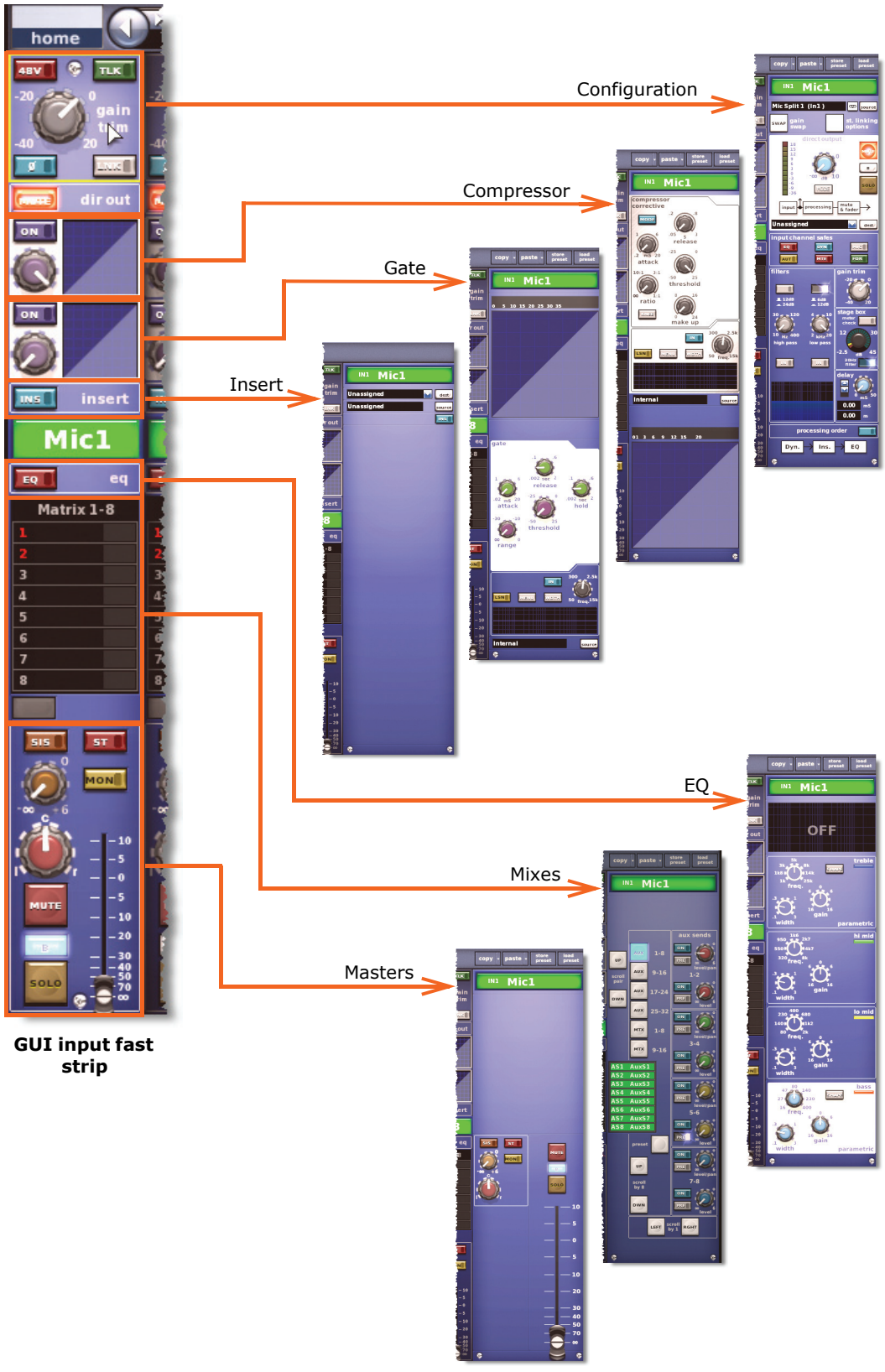
GUI operation is via its local glide pad (see "About GUI operation" on page 48).



Detail areas in the input GUI channel strip

The input GUI channel strip can display a number of detail areas (see Figure 40 "All input GUI channel strip detail areas" on page 262), which are accessible from the input fast strips. These encompass all of the controls in the input fast zones of the control surface, and more besides.

To open a detail area in the GUI channel strip, use the quick access buttons in the input fast strips (control surface) or use the GUI by clicking on a non-control area within the detail area you want.



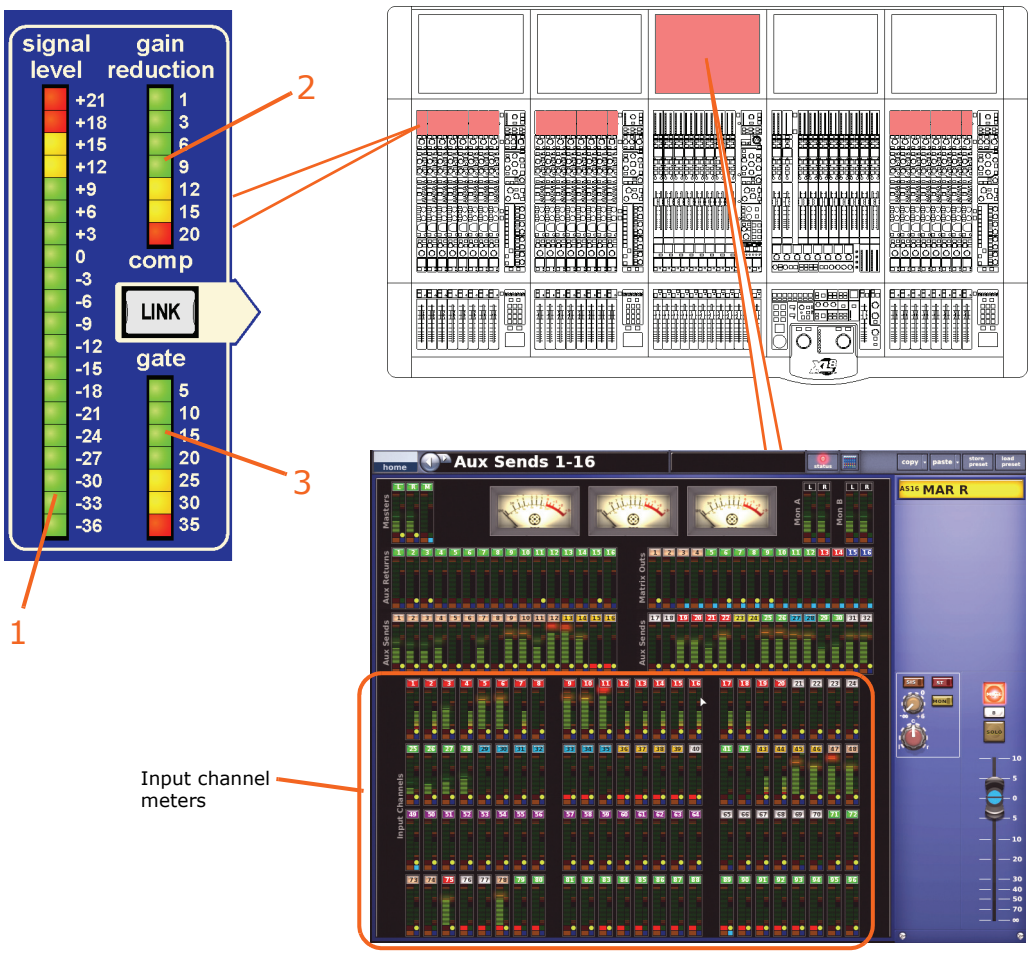
GUI input fast strip

Figure 40: All input GUI channel strip detail areas

Metering

The dashboard display (default on the mix bay GUI) shows all of the meters all of the time; in the diagram below, all of the input meters are highlighted.

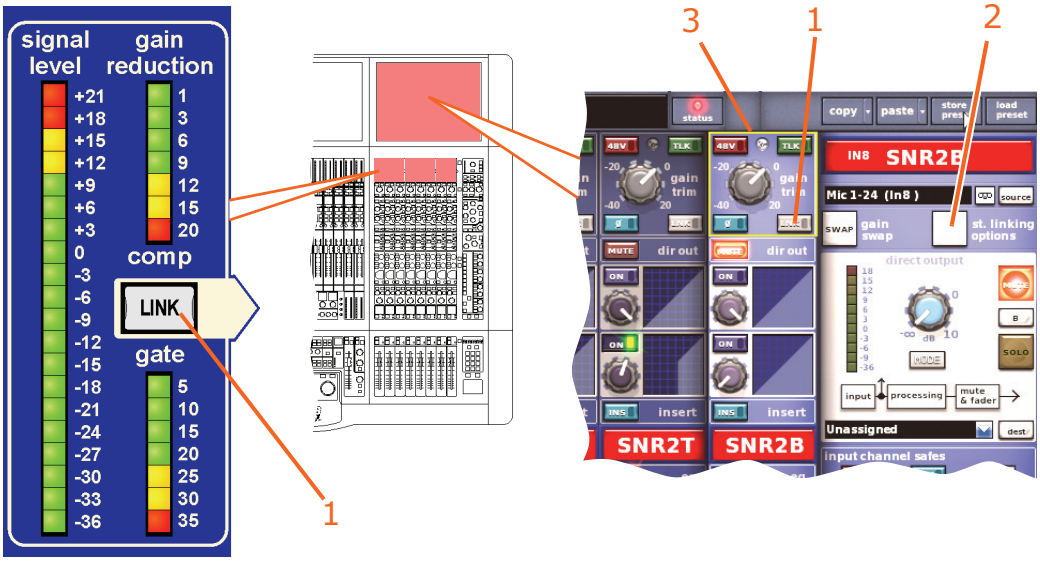
Meters can be switched under global command — via the **meters PRE** switch in the output bay (see "Master channels" on page 314) — from the main output bay area to monitor the raw A/D input point, and are also individually switchable using the meter **CHECK** button in the mic input section (see "Mic amp input gain" on page 265).



Item	*Description*
1	**signal level** 20-segment LED meter (defaults to monitor pre-fader signal level).
2	Compressor **gain reduction** seven-segment LED meter, monitors the amount of gain reduction when using a compressor.
3	**gate** gain reduction seven-segment meter, monitors the amount of gain reduction when using a gate.

Stereo linking

LINK switches in the input fast strips (control surface and GUI) pair adjacent channels for stereo operation. Linking options and their global default settings are editable (see "Changing the linking options" on page 118).



Item	*Description*
1	**LINK** switch for linking channel to the adjacent one on the right.
2	**st. linking options** button for opening the **Stereo Linking Options** window, from which you can choose the controls/parameters that are linked across the pair.
3	Yellow border shows that this detail area is selected.

Note: *The **LINK** button in the far right input fast strip on the GUI has no function.*

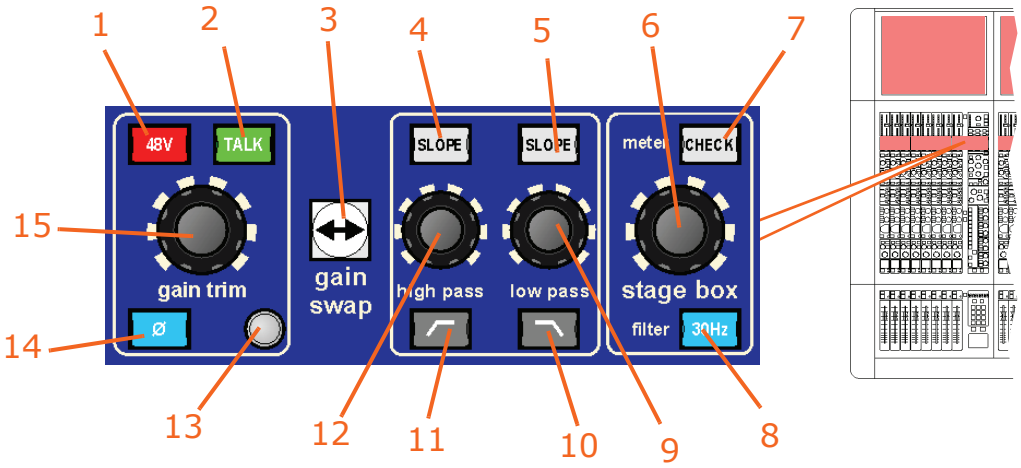
Mic amp input gain

There are two types of mic input channel controls: digital and remote. Most of the controls are digital, which directly affect the parameters stored within the DSP. However, a few controls can also be thought of as remote controls, which control the physical components of the mic splitters and even components that are in the signal path before it enters the digital domain.

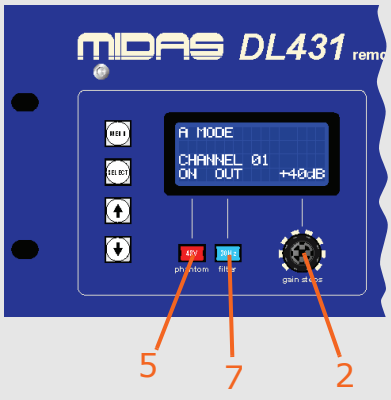
The remote controls comprise a **48V** (phantom power) switch, **30Hz** filter switch and analogue step gain control knob. These can be adjusted from the control centre, the GUI channel strip and also from the front of the mic splitter itself (see below).

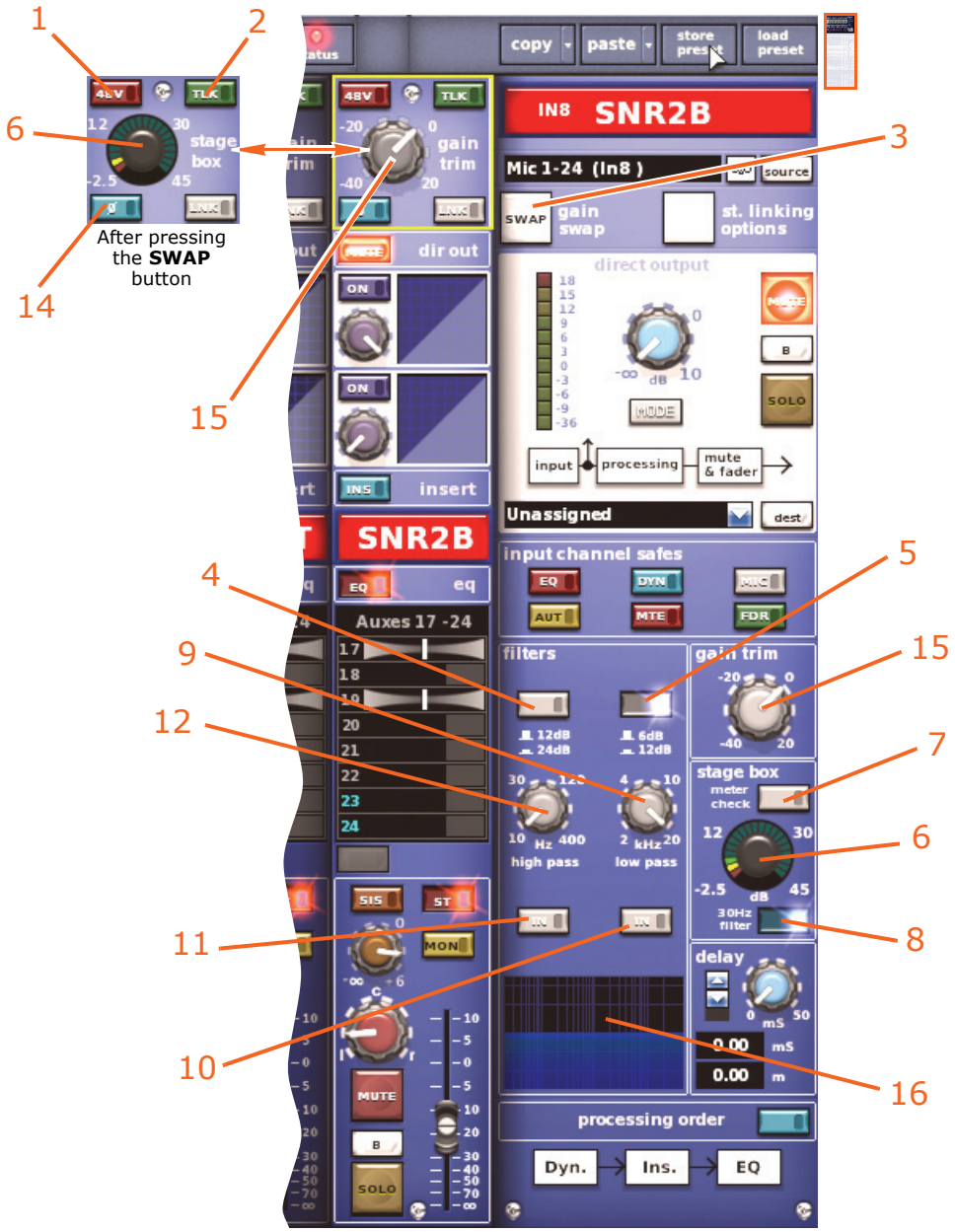
The mic input area covers preliminary input processing (filters) and stage box.

By default, console digital trim is adjusted by the **gain trim** control knob in each input fast strip and the remote gain control is adjusted by the **stage box** control knob in the input channel strip. However, by pressing the **gain swap** button these functions are swapped over, so that the **gain trim** control knob now controls the remote gain and the **stage box** control knob controls the digital trim. Pressing **gain swap** again reverts them to default. As the legends of these two control knobs on the control surface are permanently fixed, their current 'swap' status is obtained from the GUI.



DL431 Mic Splitter control panel

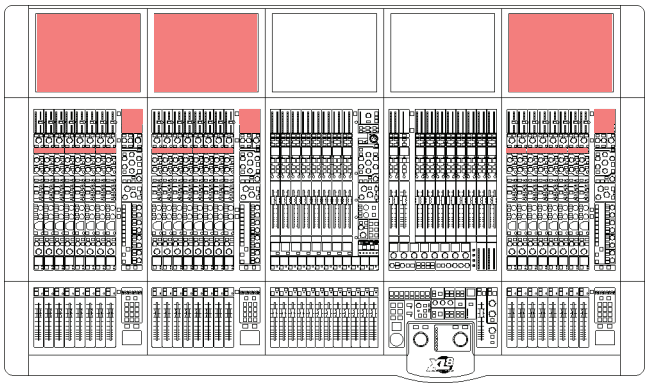




Item	*Description*
1	48V switch (stage box only), connects 48 volts of phantom power to both XLR mic input channel connectors. Suitable for a condenser microphone or DI box.
2	**TALK** switch, connects talk mic and/or tone and noise generators to the input channel.
3	**gain swap** button, swaps function of **stage box** (input fast strip) and **digital trim** (input channel strip) control knobs. Check GUI for 'swap' status. Button is blue when functions are swapped.
4	**SLOPE** selection switch (digital trim only), for **high pass** filter. Switch on = 24dB slope and switch off = 12dB slope. Switch on/off status indication is via GUI only, where switch illuminated = on.

Item	*Description*
5	**SLOPE** selection switch (digital trim only), for **low pass** filter. Switch on = 12dB slope and switch off = 6dB slope. Switch on/off status indication is via GUI only, where switch illuminated = on.
6	**stage box** control knob, adjusts input gain of remote amplifier in 2.5dB steps, ranging from -2.5dB to +45dB. Note that the **stage box** control knob on the control surface will only adjust the gain (stage box or digital trim) currently selected to the GUI input channel strip.
7	**CHECK** switch (stage box only), monitors the mic amp input after 30Hz filter, but before any further processing.
8	**30Hz** (stage box only) subsonic filter switch, acts on remote amplifier (mic splitter) to remove very low frequencies in the audio signal (usually caused by noise on stage). This avoids wasting valuable headroom trying to digitise it.
9	**low pass** control knob (digital trim only), for adjusting frequency of low pass filter in the range 2kHz to 20kHz.
10	 **low pass** filter switch (digital trim only), activates low pass filter in the input channel signal path before the insert points and EQ.
11	 **high pass** filter switch (digital trim only), activates high pass filter in the input channel signal path before the insert points and EQ.
12	**high pass** control knob (digital trim only), for adjusting frequency of high pass filter in the range 20Hz to 400Hz.
13	Quick access button, selects channel and assigns the channel's mic amp section to input channel strip.
14	⌀ phase switch, applies a 180° inversion of the input signal polarity within the input amplifier, such that channel signal will have opposite polarity to the input signal. This is used to correct input signal phase problems when trying to sum signals that are 180° out of phase. For example, where two mics are facing each other when using a mic on both the top and bottom of a snare drum. Ordinarily, the two mics would be out of phase — causing cancellation when the console sums the two signals into the output. Reversing the phase of one signal causes the mics to have the same phase, thus avoiding cancellation
15	**gain trim**/[**digital trim**] control knob, applies continuous trim adjustment of the input signal level from –40dB to +20dB. Gives a further 40dB of fine adjustment (DSP) on top of the remote amplifier gain setting. Note that the **gain trim** control knob on the control surface will only adjust the gain (stage box or digital trim) currently selected to its GUI input fast strip.
16	Graph showing the effects of currently applied filter.

Channel configuration



The next group of input channel controls are loosely termed 'channel configuration' controls, which consist of:

- **Input channel source (GUI only):** physical location that the input channel is notionally getting its audio from (see below).
- **Input channel direct output:** routes signal path from a selected point to an I/O (see "Direct output" on page 270).
- **Input channel safes:** various groups of input channel controls that can be isolated from changes instigated by the automation system.
- **Input channel delay (GUI only):** user-defined delay to be added to the input signal processing.
- **Input channel processing order:** swaps the order of the dynamics and EQ sections in the input channel signal path.

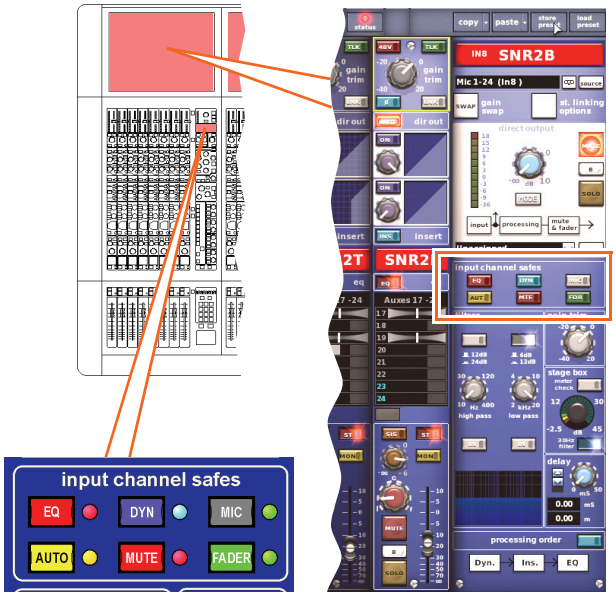
Input channel source (GUI only)

The input channel source is selected by clicking the source button, which opens the **Patching** screen.



Input channel safes

The **input channel safes** section in the input channel strip has six 'safe' switches that protect specific controls from being changed by the automation system (see Appendix L "Parameters Protected By Safes" on page 477), including the safe areas protected by each button.



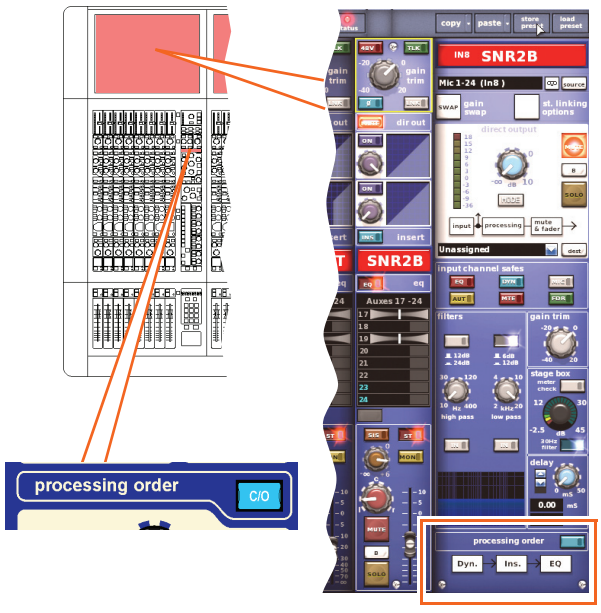
Input channel delay (GUI only)

The input channel delay, which can only be changed from the GUI, takes the form of an on-screen control knob towards the bottom of the GUI input channel strip. Input channel delay incorporates a time delay on an input channel, which is used mainly for mic placements and time aligning to reduce comb filtering. For example, on a drum kit mic set up you may have a mic close to a snare drum and a couple of overhead mics. In this case, setting an input channel delay on the snare drum — to bring it more in line with the overheads — will probably produce a better sound.



Processing order

This section has a **C/O** switch that changes order of processing from EQ/INS/DYN (default) to DYN/INS/EQ and vice versa, which is shown in the GUI channel strip.

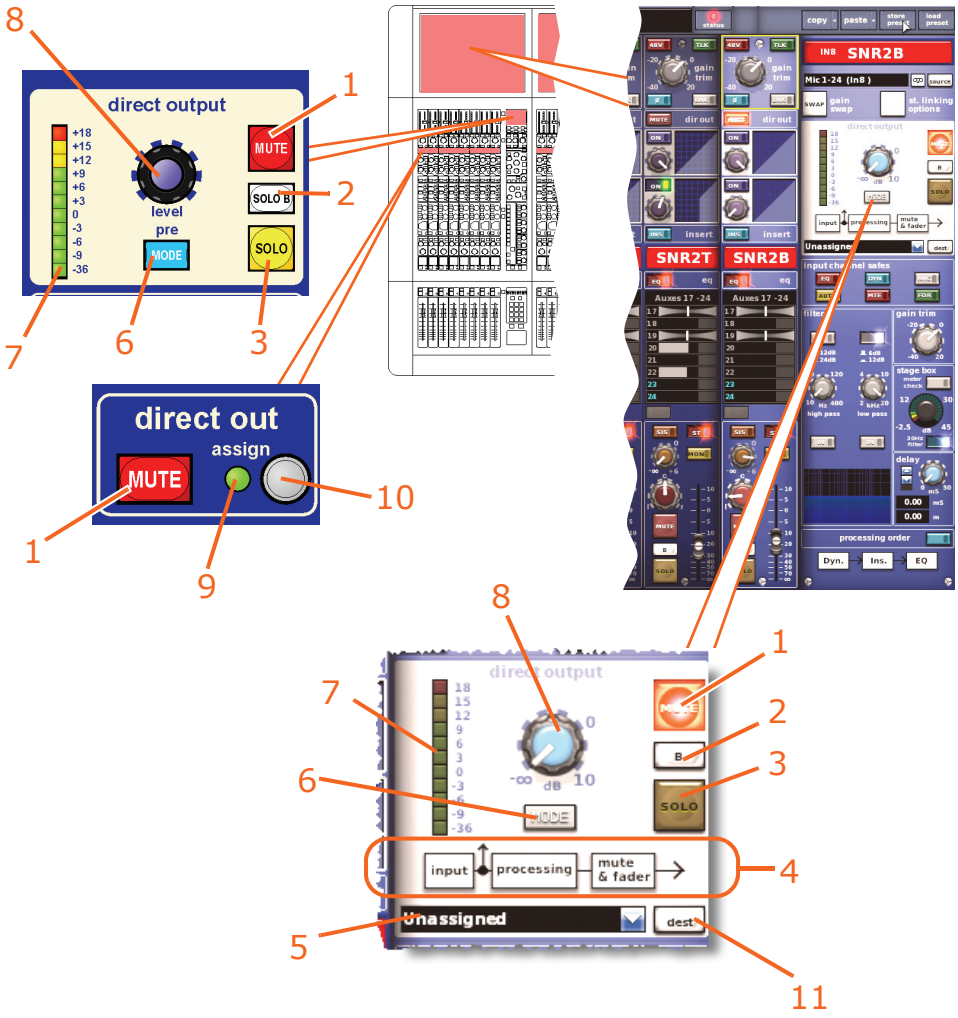


Direct output

The direct out section provides an internal connection to effects etc. or a way of leaving the control centre via a line I/O box. It allows you to take a signal directly out of a defined point in the input channel's signal path and route it to either an internal assignable effect or a physical connection at one of the line I/O boxes. This function is optional and assigned on a channel-by-channel basis.

This section is deliberately distanced from main channel panel controls because it is a limited resource and unused on many channels.

Selection of signal path position (item 4) and destination (item 5) can only be carried out via the GUI.



Item	*Description*
1	**MUTE** switch mutes any assigned direct output by removing the signal from the output, but will not operate (will remain illuminated) if nothing is assigned. It is included in the scene recall system but is not affected by the channel mute safe or the auto-mute masters (unless the source tap-off point is after the main channel mute).
2	Solo B switch, changes the operation of the **SOLO** switch so that it routes signals to the Monitor B section of the console.
3	**SOLO** switch, activates signal routing to the monitor A section of the console.

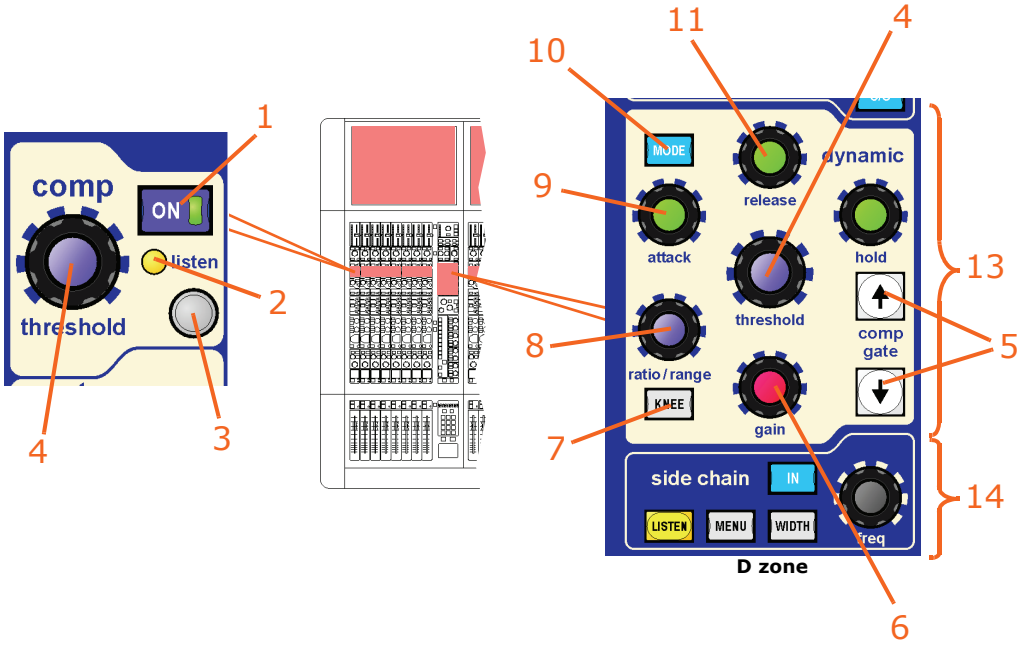
Item	*Description*
4	This GUI-only function allows you to select the tap-off point of the direct output in the signal path from one of three options: "**post-fade & mute**"; "**pre-mute, post-processing**"; or "**pre-mute pre-processing**". Current selection is indicated by the illumination of adjacent LCD; the above diagram shows that the latter option is selected. This function is not used if the direct output is not assigned to the channel.
5	Destination drop-down list (GUI only), lets you select the destination of the direct output.
6	**MODE** (**pre**) button, changes the source tap-off point for the signal.
7	10-LED meter, monitors the direct output level within the range +18dB to -36dB.
8	Output level is adjusted via the **level** control knob.
9	**assign** LED, illuminates to show that a direct output is in use.
10	Quick access button, assigns the **direct output** section to the GUI input channel strip.
11	**dest** button, for selecting the direct output's destination. Opens the **Patching** screen.

Dynamics (D zone)

The **dynamics** section, or D zone, controls two dynamic devices present in the input channel signal path: compressor and gate. Most D zone controls are shared, while some are device-specific. The GUI treats both devices independently, the one currently displayed in the channel strip being the one currently assigned to the D zone. Swapping between the two dynamic devices can be done via the D zone or GUI (see "To assign a detail area to the output channel strip via the GUI" on page 62). Pressing the dynamic device's **ON** button activates the device, but also affects the audio.

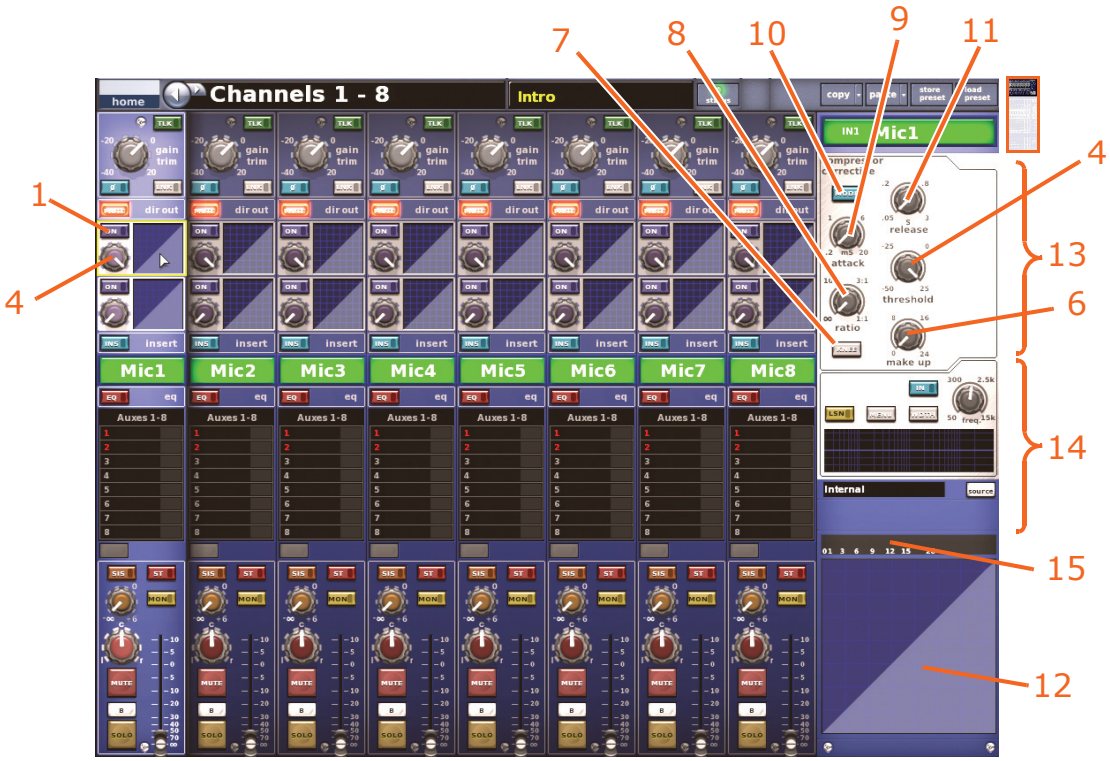
Compressor

The input channel compressor has four styles — corrective, adaptive, creative and vintage — selectable via the **MODE** button. The appearance of the compressor in the GUI detail area depends on which of its styles is currently selected. While the **dynamic** section is addressing the compressor, all of its controls are enabled except the **hold** control knob. For more details on the compressor, see "XL8 compressor modes (dynamic)" on page 339.



Item	*Description*
1	**ON** switch, enables the compressor in signal path. When disabled (switch extinguished), compressor is bypassed. (**comp** and **gate** switches can both be enabled at any one time.)
2	To aid set up, the compressor has a side chain listen that sends the side chain onto a solo bus. This side chain **listen** LED indicator illuminates to warn you that soloed material is from the side chain and not the main channel.
3	Quick access button, selects the channel currently in that fast strip and assigns the compressor detail area to the input channel strip for near instant access.
4	**threshold** control knob, sets the signal level above which gain reduction starts to be applied.
5	**comp**/**gate** up and down select buttons, allow you to swap **dynamic** section control from compressor to gate, and vice versa.

Item	Description
6	Compressor make up **gain** control knob, used to compensate for the reduced *loudness* of a compressed signal.
7	Compressor **KNEE** switch, controls how compressor starts to apply gain as signal goes through the threshold; see "Compressor graph" on page 274. Options are: Hard Knee, where compressor immediately applies gain reduction at selected ratio once attack time has elapsed; Medium Knee; and Soft Knee, where compressor (starting from slightly before threshold) gradually makes the transition to applying gain reduction at selected ratio.
8	Compressor ratio control knob, adjusts amount of compression (**ratio**) applied to signals above threshold.
9	Compressor **attack** control knob, adjusts time for compressor to respond after an over-threshold signal.
10	**MODE** switch, for selecting type of compressor mode. There are four compressor types available: **corrective**, **adaptive**, **creative** and **vintage**. See "XL8 compressor modes (dynamic)" on page 339 for details.
11	Compressor **release** control knob, adjusts time for compressor to recover after programme material falls back below threshold.
12	Compressor graph display (see "Compressor graph" on page 274).
13	Dynamic section for adjusting the compressor's parameters. For illustrations of the different modes, see "Input dynamics processing (D zone)" on page 92.
14	**side chain** section (see "Side chain" on page 278).
15	Compressor 'gain reduction' meter mimics the one at the top of the active input channel's fast strip (see "Metering" on page 263).



Compressor graph

This section explains the compressor graph. In the following diagrams:

- Graph **A** shows point of threshold and gradients of preceding and following signal.
- Graph **B** shows an uncompressed signal.
- Graph **C** shows the effects of threshold adjustment.
- Graph **D** shows the effects of changing knee type. Note that hard knee has hardly any curve at all, while the knee becomes noticeably more rounded in soft knee mode.
- Graph **E** shows three levels of compression: uncompressed; within knee area; and at full compression. With signal running through the compressor, a coloured line follows the contour of the shaded graph area. The line colour depends on signal level.

1 **Input level** = 'x-axis' of graph.

2 **Output level** = 'y-axis' of graph.

3 This portion of graph is pre-threshold and is unaffected by compression, that is, with a gradient of 1:1.

4 This portion of graph is post-threshold and shows the effects of compression. The gradient is the same as the compression ratio.

5 **Threshold:** The point where the gradient changes and where compression starts to be be applied.

6 Graph with no ratio applied, that is, 1:1 gradient. (What you put into the compressor, you get out.)

7 A threshold reduction will move threshold point to left, as shown in the example in graph **C** (**green** line). Less signal is passed 1:1.

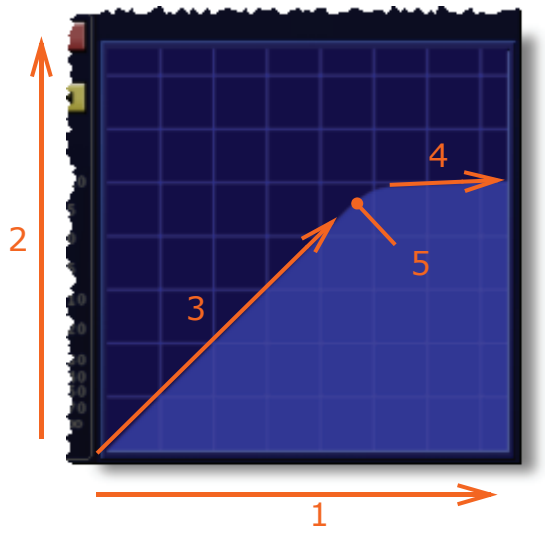
8 A threshold increase will move threshold point to right, as shown in the example in graph **C** (**yellow** line). More signal is passed 1:1.

9 **Uncompressed:** If signal doesn't reach threshold (point where gradient changes), line is **green**. As the threshold is not exceeded, the signal is uncompressed.

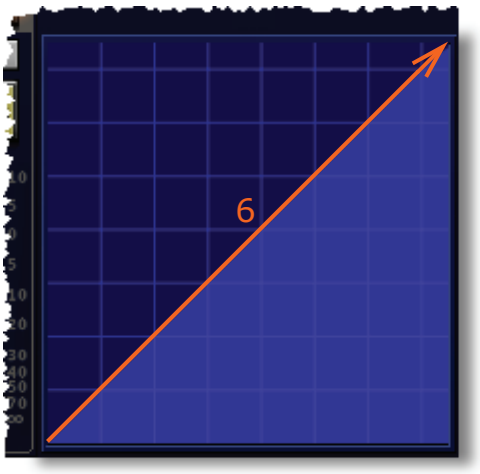
10 **Within knee area:** If signal goes into the knee area to point where gradient changes (more obvious with medium and soft knees), compression starts to be applied and line colour changes to **yellow**.

11 **Fully compressed:** If signal reaches the point where gradient changes (over-threshold), full compression at selected ratio is applied and line colour changes to **red**.

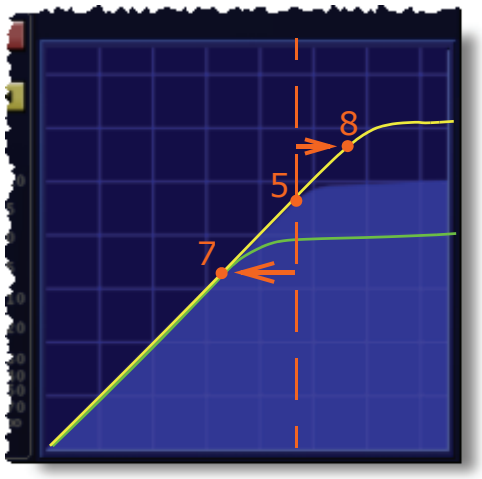
A **Graph with ratio applied**



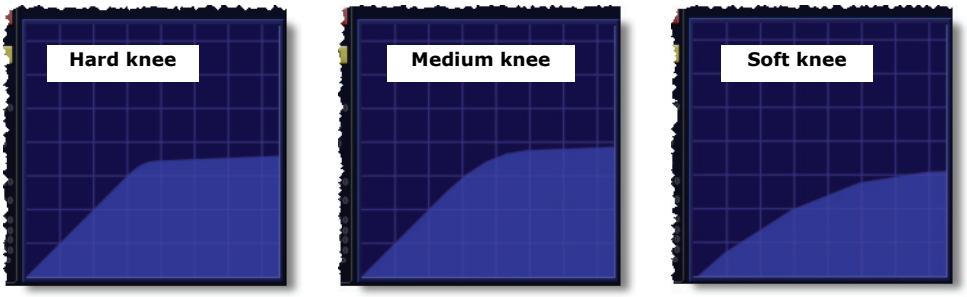
B **Graph with no ratio applied**



C **Graph showing effects of threshold adjustment**



D **Graphs showing knee types**

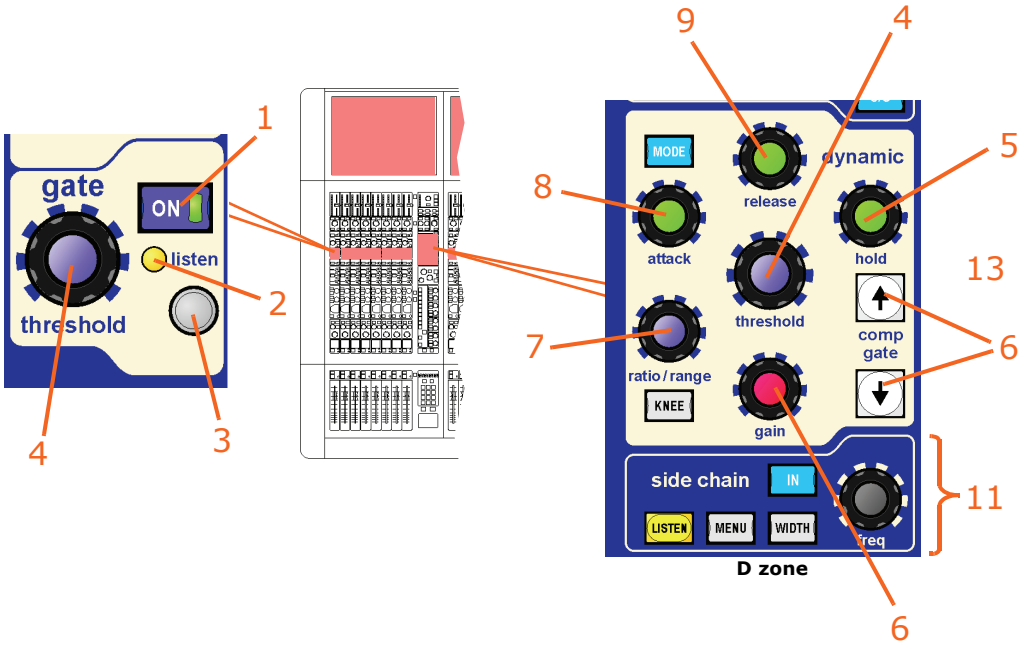


E **Graphs showing compressive display types**



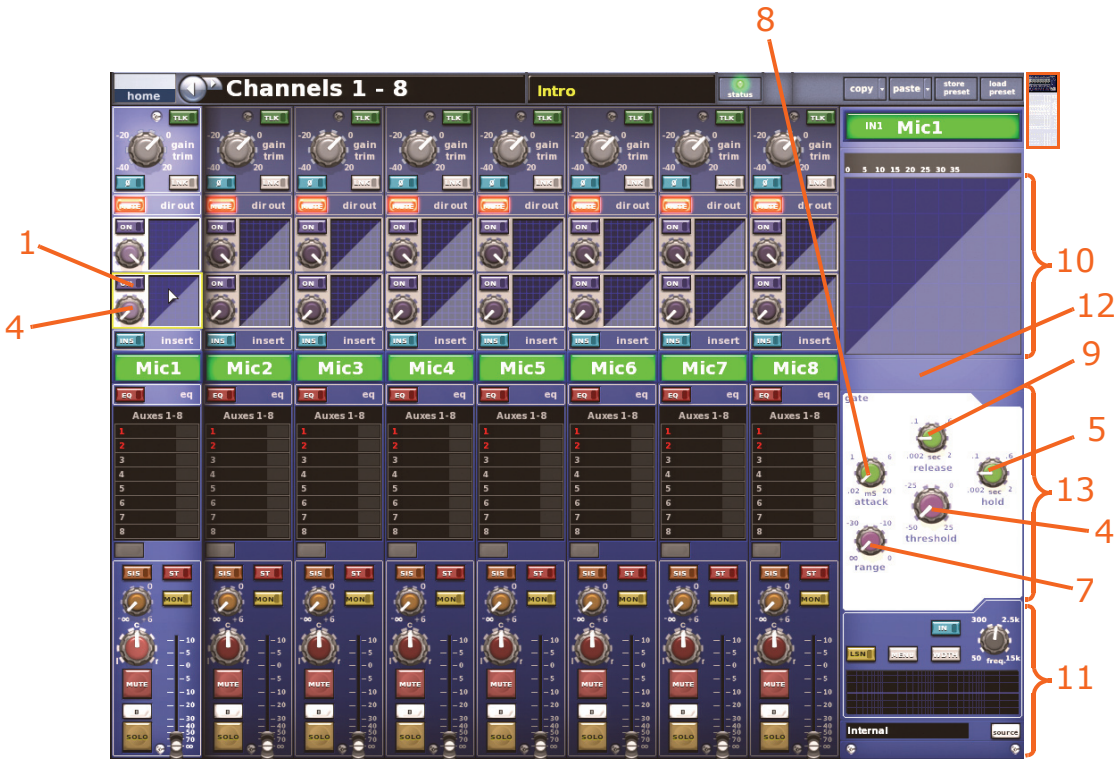
Gate

In gate mode the **dynamic** section addresses the gate, and all of its controls are enabled except the **gain** control knob and the **MODE** and **KNEE** buttons.



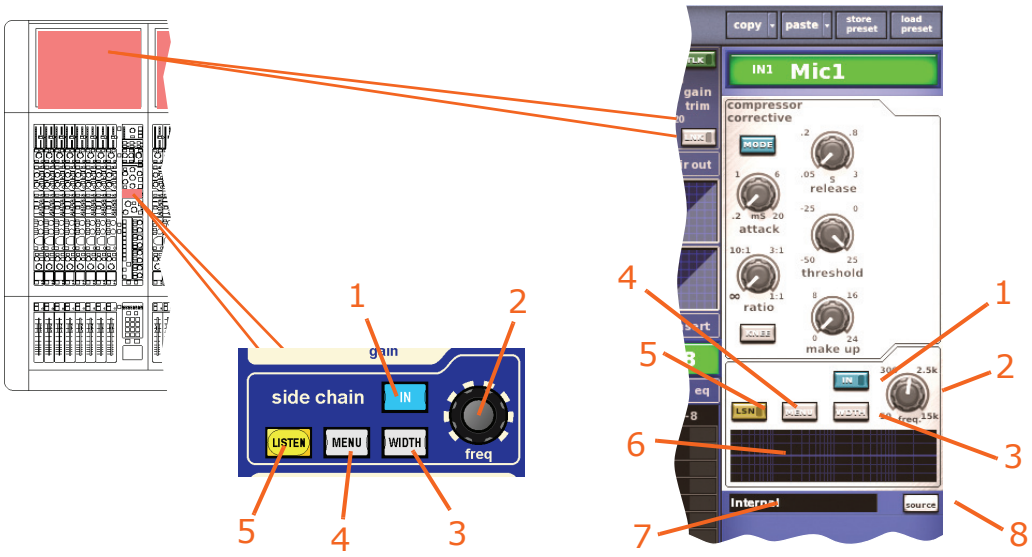
Item	*Description*
1	**ON** switch, enables gate in the signal path. When disabled (switch extinguished), gate is bypassed. (Both comp and gate switches can both be enabled at any one time.)
2	To aid set up, gate has a side chain listen facility that sends the side chain onto the solo bus. This side chain **listen** indicator illuminates to warn you that the soloed material is from the side chain and not the main channel.
3	Quick access button, selects the channel currently in that fast strip and selects all of the gate controls to the input channel strip for near instant access.
4	**threshold** control knob, adjusts signal level at which gate opens.
5	**hold** control knob, minimises chattering in conjunction with internal hysteresis. Once signal is detected as below threshold, this defines a waiting period before the gate starts to close.
6	**comp**/**gate** up and down select buttons, allow you to swap **dynamic** section control from compressor to gate, and vice versa.
7	Range control knob, adjusts amount of gain reduction applied to signal below threshold.
8	**attack** control knob, adjusts time taken for gate to open after an over-threshold signal.
9	**release** control knob, adjusts time taken for gate to close after programme material falls back below threshold.
10	Gate graph display.
11	**side chain** section (see “Side chain” on page 278).

Item	Description
12	'gate' meter mimics the one at the top of the active input channel's fast strip (see "Metering" on page 263).
13	Dynamic section, for adjusting the gate's parameters.



Side chain

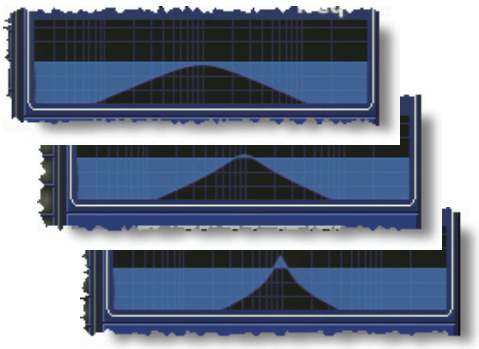
The **side chain** section allows manipulation of the side chain filter, which operates in the same manner for both compressor and gate.



Item	*Description*
1	Side chain filter **IN** switch, switches on the side chain filter.
2	**freq** control knob, adjusts the side chain filter frequency within the range 50Hz to 15kHz. (Visually, this moves the envelope on the graph left or right.)
3	Side chain filter **WIDTH** button, changes the filter Q. There are three options and the effects of each is shown in the side chain graph (see above). Only enabled when the side chain filter is switched on.
4	**MENU** button, opens the Patching screen at the GUI.
5	Side chain listen (**LISTEN**/[**LSTN**]) switch, places the side chain pushbutton onto the channel filter bus, allowing the audio signal to be monitored via headphones.
6	Side chain graph (see "Side chain graph" below).
7	Side chain source field shows pick-off point.
8	**source** button, for selecting the side chain's pick-off point. Opens the **Patching** screen.

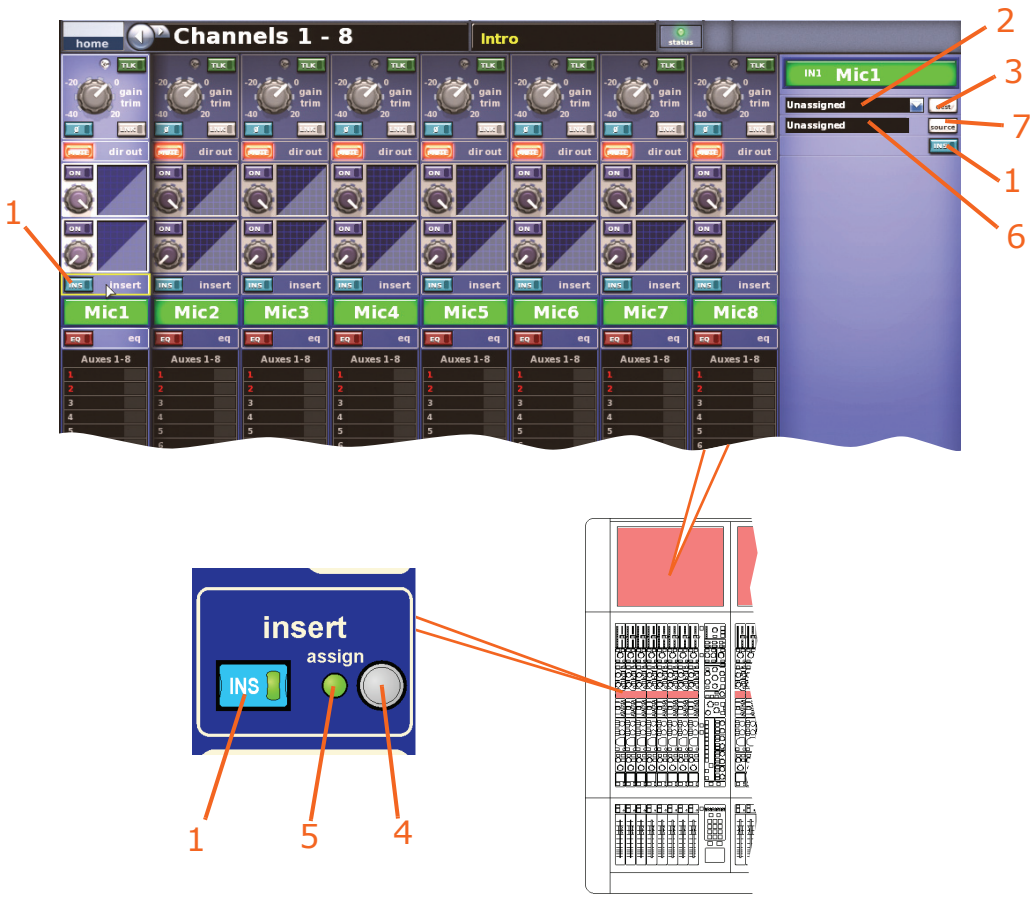
Side chain graph

The side chain graph shows the effects of the side chain filter on the signal. There are three filter Q options, selectable via the **WIDTH** button, which affect the signal as shown right.



Insert

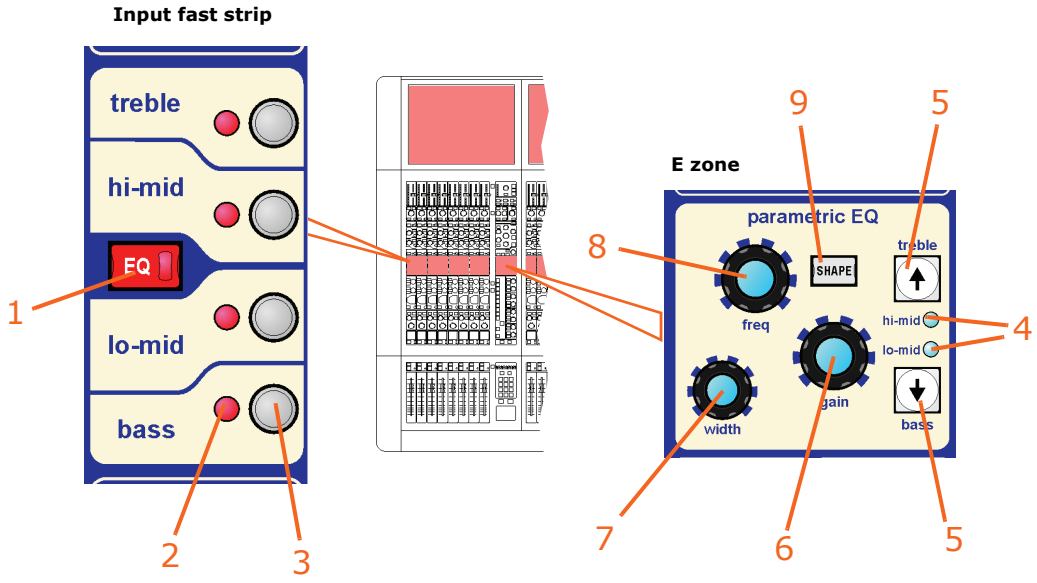
Input channel **insert** section provides a send and return out of the signal path, primarily so that an effects device can be added to the signal's processing. The send destination and return source can only be set from the GUI screen. This section is optional and assigned on a channel-by-channel basis.



Item	*Description*
1	**INS** switch connects (inserts) returned programme material to the channel signal path, provided both the insert send and insert return points have been assigned.
2	**insert return** field, lets you select the source of the insert return.
3	**dest** button, opens the **Patching** screen so that you can select the destination of the insert.
4	**insert send** field, lets you select the destination of the insert send from a drop-down list, selectable from the ▼ to right of the name field. Options are: 64 pool inputs and 16 left and right FX outputs (32 in total).
5	Quick access button selects the insert section to the GUI input channel strip.
6	Green **assign** LED illuminates to show that an insert is enabled.
7	**source** button, opens the **Patching** screen so that you can select the source of the insert.

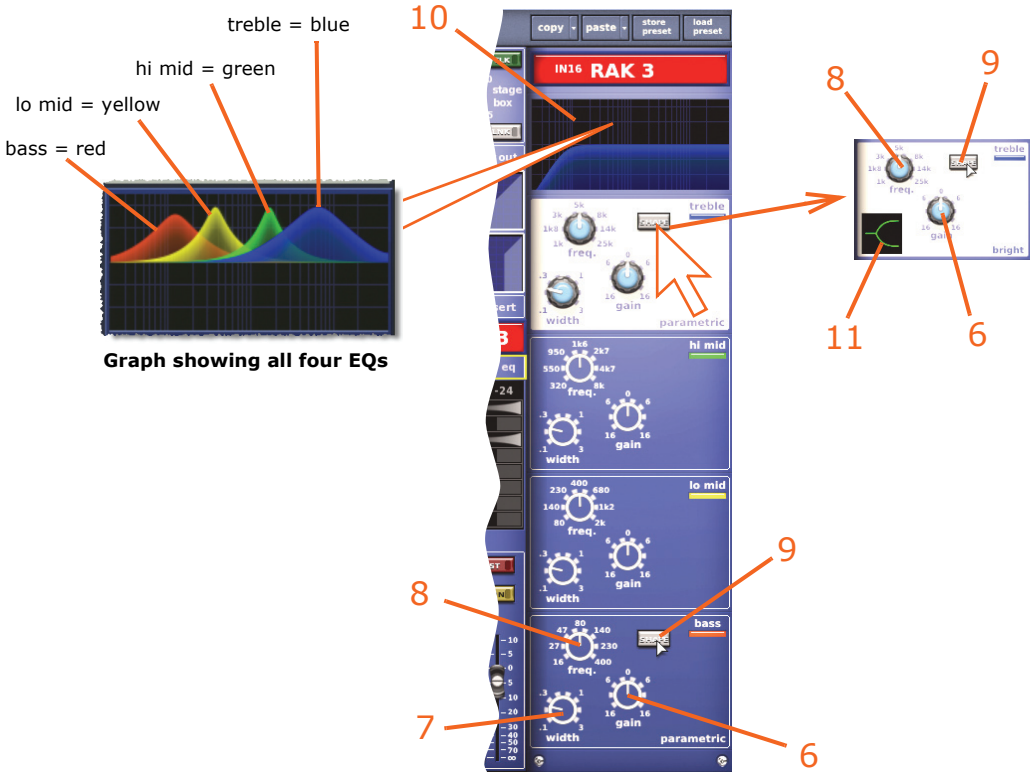
EQ (E zone)

The input channel equaliser (EQ) is a four-band sweep parametric EQ (PEQ) that allows tonal control of the input signal via the **parametric EQ** section, or E zone, in the input channel strip. The four bands are treble, hi-mid, lo-mid and bass, with an additional three shelving modes available for treble and bass. Any combination of the four bands can be used to control the signal, although only one band can be adjusted in the E zone at any time.



Item	*Description*
1	**EQ** on/off switch.
2	Each EQ band select switch has a red LED status indicator to show which EQ bands are contributing to the EQ'd sound.
3	Four quick access buttons, one for each band, select their respective band to the E zone. They also select their respective input fast strip to the input channel strip, if no already selected there.
4	**hi-mid** and **lo-mid** LED indicators illuminate to show whether hi-mid or lo-mid is selected, respectively.
5	Up and down band select buttons, change the band currently selected to the E zone. Button illumination shows that its respective band is selected to the E zone.
6	**gain** control knob adjusts signal gain in the range ±16. On the GUI, causes the envelope to move up/down, inverting as it passes the origin.)
7	**width** control knob adjusts the signal bandwidth in the range 0.1 to 3.0. On the GUI, causes the base of the envelope to widen. Only available on treble and bass.
8	**freq** control knob adjusts signal frequency in the range 80Hz to 2kHz. On the GUI, causes the envelope to move left/right.
9	**SHAPE** button changes shelving mode on treble and bass bands. There are three modes available per band. For more details, see "Input equalisation (E zone)" on page 91. For application notes, see "XL8 input channel EQ modes" on page 343.

Item	Description
10	Graph showing the EQ envelope; see "EQ graph" on page 282. Any combination of EQs can be displayed and each one has a different coloured envelope, as shown in their respective sections. When the EQ is switched off the graph will display the text "OFF".
11	Icon representing the shape of the signal's envelope. Note how the treble modes point to the left and the bass ones to the right.

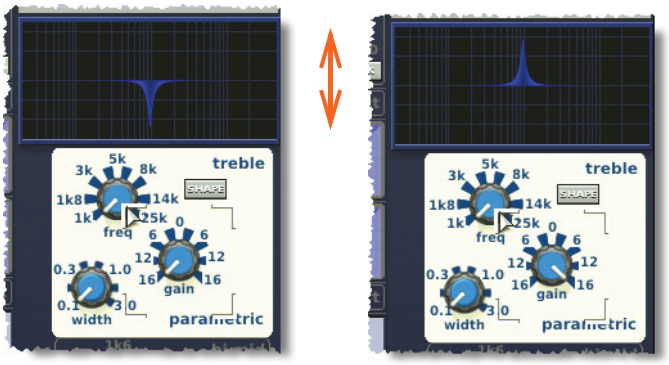


Graph showing all four EQs

EQ graph

The following graphs illustrate the use of the EQ **freq**, **gain** and **width** control knobs:

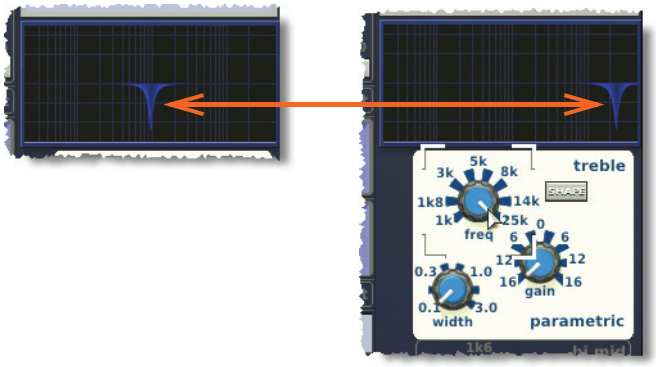
A **Graphs showing gain adjustment - changes height of envelope**



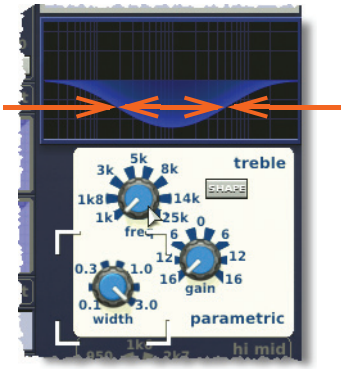
Negative adjustment

Positive adjustment

B **Graphs showing frequency adjustment - changes horizontal position of envelope**



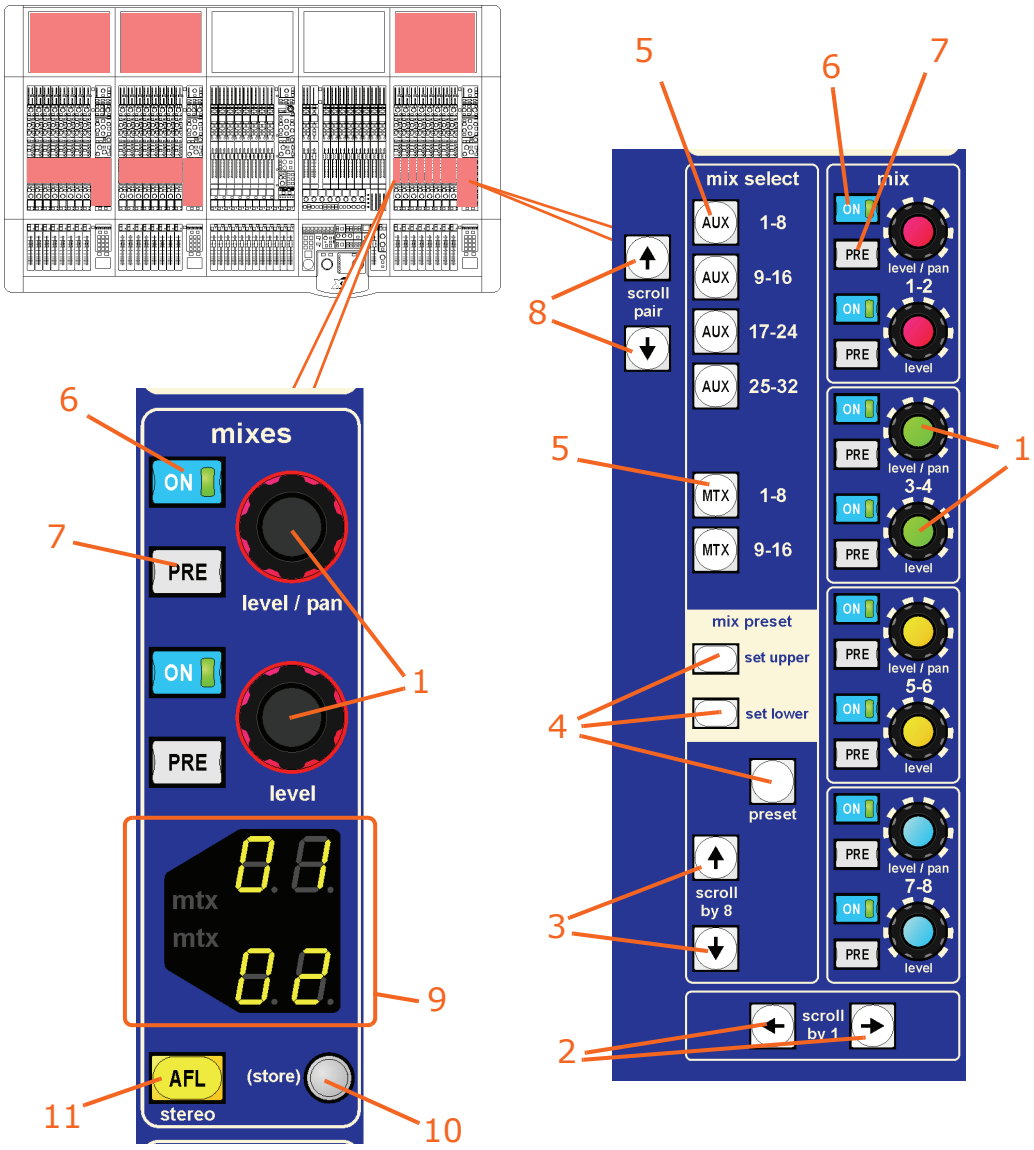
C **Graph showing width adjustment - changes width of envelope**



Mixes

Each input channel can send a variable contribution to each of the 32 aux buses (aux sends) and 16 matrix buses. The buses are controlled in pairs via mix controls that give continuous adjustment (in the range +6dB to off) of sub group levels sent to matrix mixes. The mix controls include **level/pan** and **level** control knobs, the former changing its function from 'level' (mono) to 'pan', when the bus pair are stereo linked. Each control knob has an on/off and pre-/post-fader pushbutton. When a bus pair is stereo linked, the **AFL** button in each input fast strip (**mixes** section) is enabled.

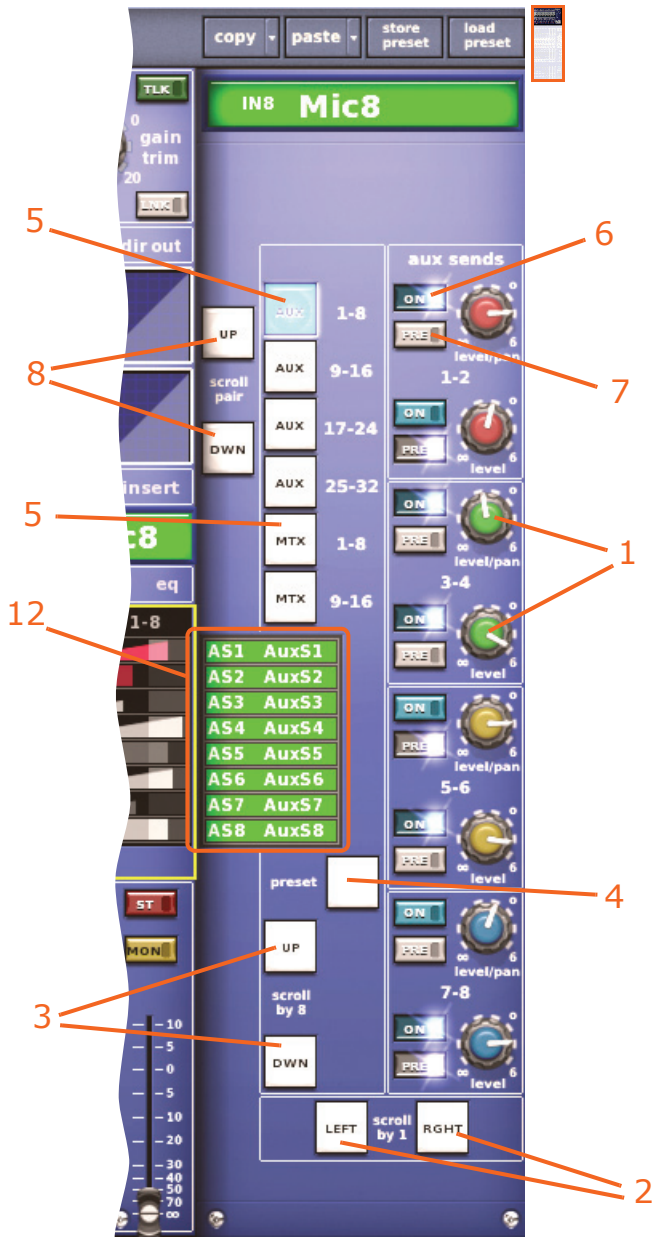
The buses on the control surface they are split into banks of eight: four banks of auxes and two banks of matrices. The input channel strip provides control over a whole bank of buses (**mix** section), while each input fast strip only controls an integral pair. Bus navigation is provided by the **mix select** section (bank navigation) in the channel strip and the two buttons to the left (pair navigation).



The GUI provides additional feedback as to the current state of the send setting. In the GUI input fast strip, display is expanded to show levels sent to all eight of the current bank of sends. These levels can be edited by clicking and dragging the bargraph display, the shape of which also shows whether the send level is pre-fader (solid bar) or post-fader (ramp style). When send is off, the bar display dims.

The pair of auxes/matrices currently assigned to the input fast strip have their numbers highlighted in the control surface colour code of that pair. Otherwise, their numbers are greyed out, as shown below.

For details of how the aux mixes are displayed in each input fast strip on the GUI, see "How the different mixes are shown on the GUI" on page 98.



Item	Description
1	After the bus mix controls have been selected to a mix pair, **level/pan** and **level** control knobs offer control of relative contribution levels onto the active buses. **level/pan** operates odd numbered controls, while **level** operates the even numbered ones. Table 16 "Function of mix control knobs" shows their combined operation.
2	Left/right **scroll by 1** buttons, change active input channel to the one immediately left or right.

Item	Description
3	Up/down **scroll by 8** buttons, change active bus bank — selected to the **mix** section of the input channel strip — to previous or next bank of eight. Scrolls sequentially through the **AUX** and **MTX** buttons, from auxes 1-8 to matrixes 9-16, and back. This also affects all input channels configured to operate in the same area (A or B).
4	Preset buttons, are used to programme, store and recall a user-definable selection of aux/matrix bus controls. For more details, see "Programming the mix preset" on page 99.
5	**AUX** and **MTX** buttons, select a bus bank to the **mix** section of the input channel strip. Illuminated button shows which bank is currently selected.
6	**ON** buttons, enable bus assignment.
7	**PRE** fader buttons, change signals sent to group buses from post-fader to pre-fader. When button is on (GUI indication only), signal is pre-fader.
8	Up/down **scroll pair** buttons, change selected bus pair. The scrolling will span banks, but will not 'wrap' around from the last matrix pair (31 and 32) to the first aux pair (1 and 2), and vice versa; you will have to 'scroll pair' back in the opposite direction.
9	LCD display containing two pairs of seven-segment digits and "mtx" legends. The digits show which control pair is acting on the active bus. The "mtx" legends illuminate to show that the active bus is a matrix type, otherwise it is aux.
10	**(store)** quick access button, navigates the GUI screen support for the input fast strip directly to the **mix** section, so that multiple sends can be adjusted in the GUI input channel strip.
11	**AFL** (after-fade listen) stereo switch, only operates on the stereo pan and level style buses and allows the user to accurately place the stereo image on individual input channels.
12	Names of the eight mix buses currently at the control surface.

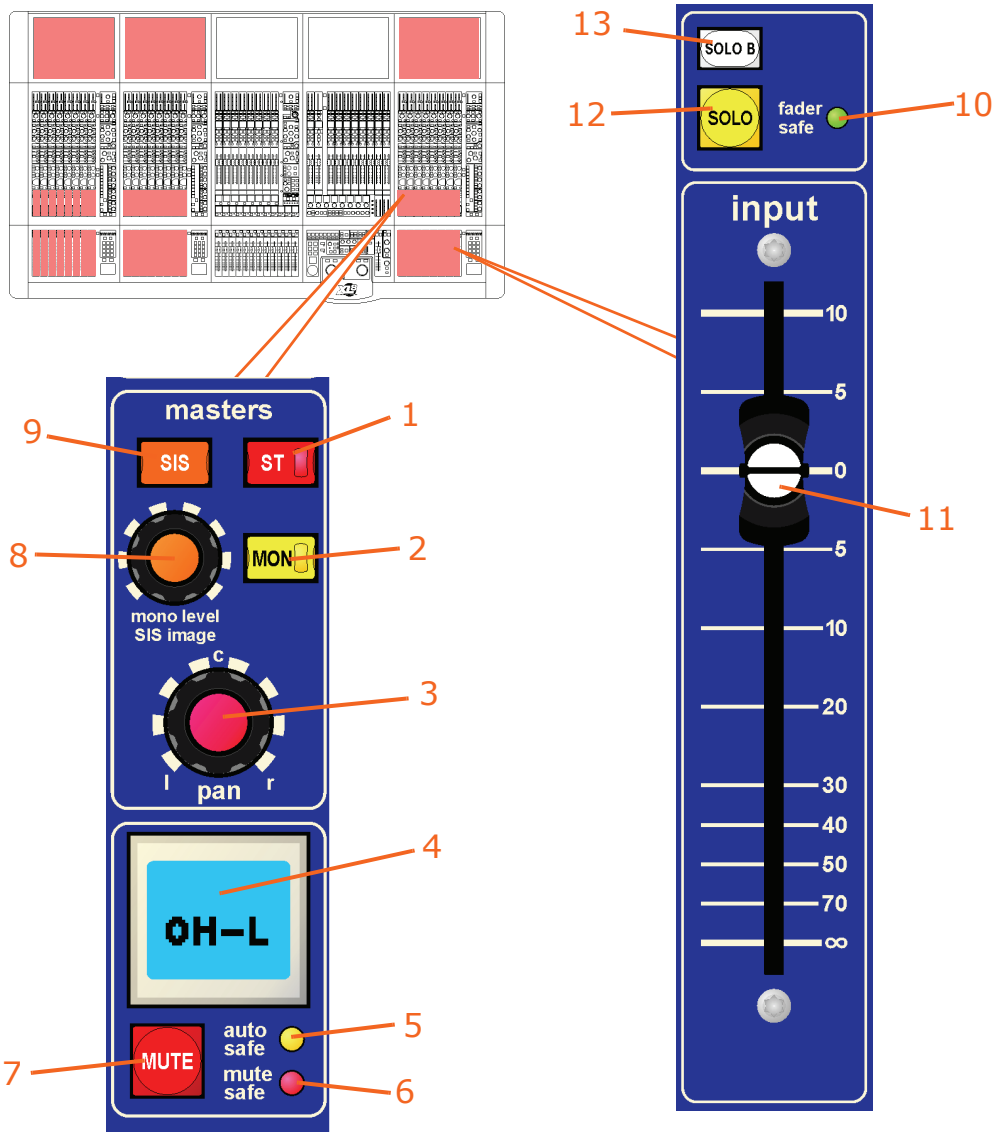
Table 16: Function of mix control knobs

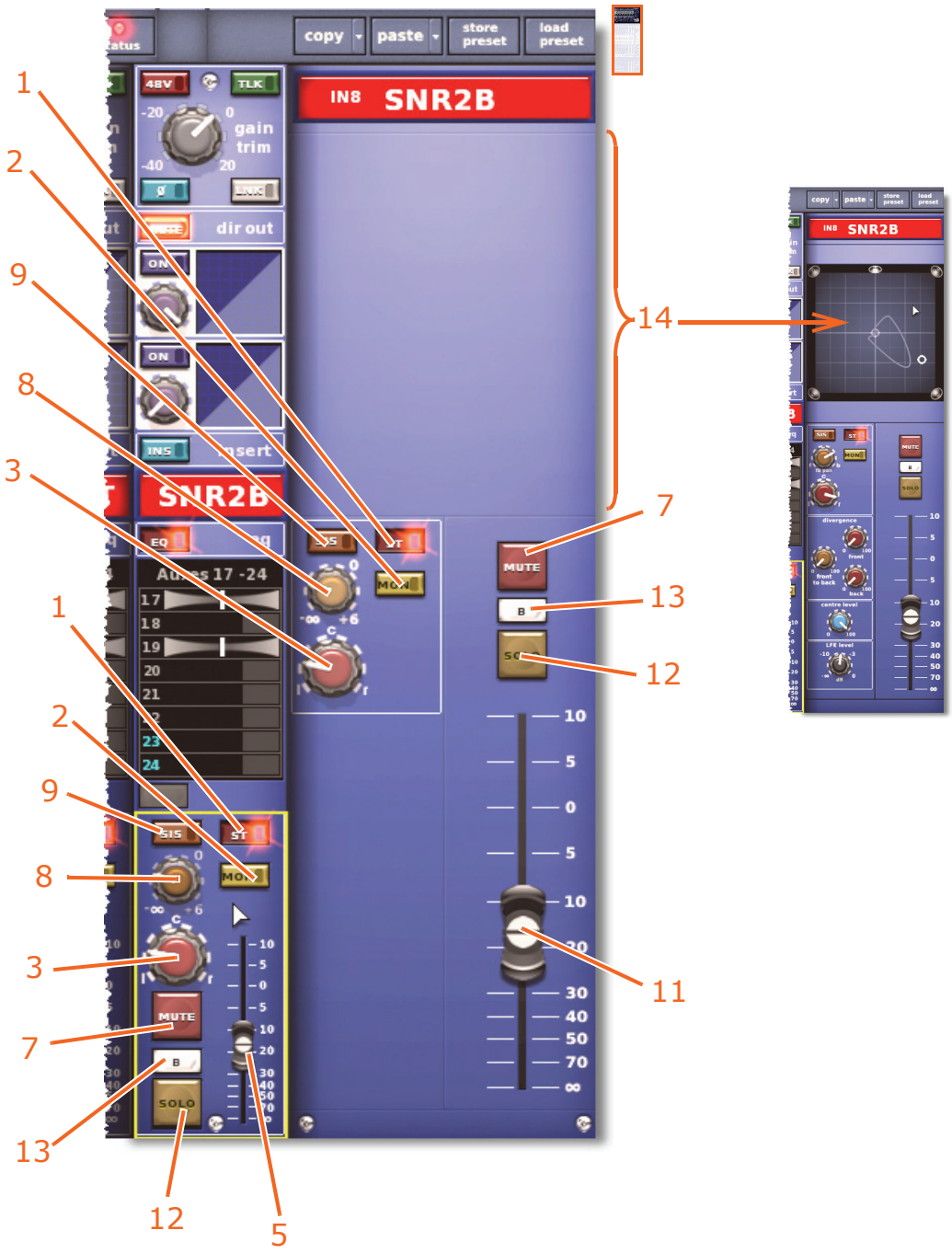
	Function of control knob		
Bus type	**level/pan**	**level**	**Description**
Mono aux	level	level	Independent left and right level adjustments (both +6dB to OFF).
Stereo auxes	pan	level	Pan adjustment is constant power law at -3dB. Level adjustment is continuous (+6dB to OFF).
Subgroup	N/A	N/A	Both levels are disabled. 0dB only for group buses, mix and main buses.

Master controls, solo select and fader

The **masters** section provides three routing switches to the master buses with pan control. Pan provides master panning as three-way or two-way and also provides two-way panning for any stereo mix groups. (When used for monitor applications, aux, mix and main buses are controlled from the channel master pan and fader. AFL solos also operate as a default from the main solo switch.) For more details, see Chapter 11 "Panning" on page 119 and "Spatial imaging system (SIS™)" on page 339.

The solo routing section (above fader) activates solo routing and selects which monitor section (A or B) the signals are routed to.





Note: *You cannot select the masters from the control surface. This can only be done via the GUI by clicking on a non-control area in the masters section of the required input fast strip.*

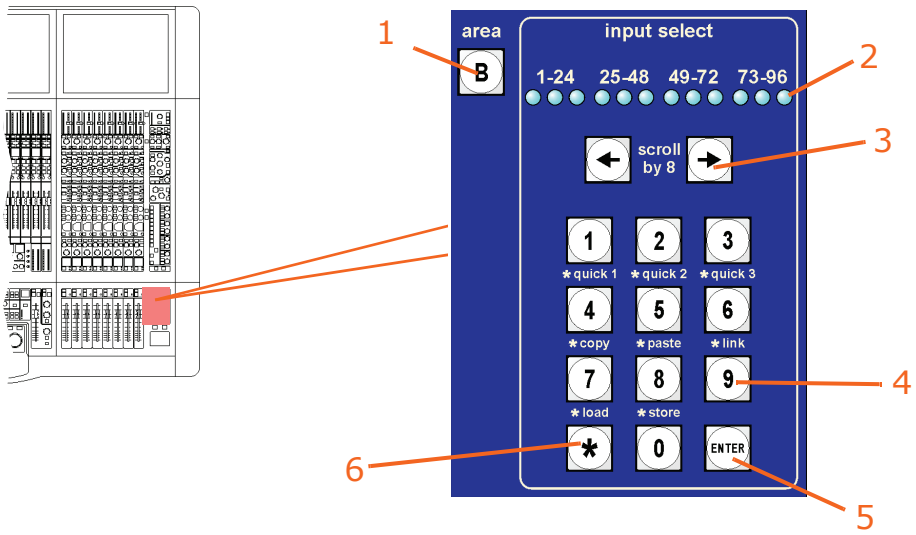
Item	*Description*
1	**ST** (stereo) switch, connects post-fader channel signal to master stereo bus via pan control.
2	**MON** (mono) switch, connects post-fader channel signal to mono master bus.

Item	*Description*
3	**pan** control knob, adjusts the relative levels sent to a left-right bus pair or the master left-centre-right (LCR) buses. In SIS mode, it can also control the 'image' to give a constant power crossfade from LCR to stereo.
4	LCD select button, used for channel selection and identification, and also when grouping. An important feature of the XL8 is in the way its channels, particularly the inputs, are easily identifiable and accessible. The LCD select buttons help this by being colour-configurable, that is, their backlight colour can be selected to match any other channels you want to associate it with. Grouping, in the form of VCA and POP groups, takes this feature to another level. Channel identification is further aided by the button's LCD panel, which can display the input channel's number and name, which is also user-configurable.
5	**auto safe** LED, illuminates to indicate channel has been removed from scene recall (this does not affect the action of auto-mutes and VCA control groups).
6	**mute safe** LED, illuminates when mute has been removed from scene recall and auto-mute action.
7	**MUTE** switch, mutes all post-processing signals exiting the channel. In addition to scene recall, it can also be remotely muted from the auto-mute masters.
8	**mono level/SIS image** dual-function control knob. In mono mode, it acts as a **mono level** control knob to adjust the mono signal level. In SIS™ mode, it becomes a SIS image control knob that modifies **pan** control knob operation to place channel within a three-speaker system (see Chapter 11 "Panning" on page 119).
9	**SIS** (spatial imaging system) switch, enables SIS™ mode, which operates with **pan** and **mono level SIS image** control knobs. It acts as an LCR master bus enable, overriding stereo and mono master bus assignments. However, their status remains in memory so that when **SIS** is disengaged, the **MONO** and **STEREO** settings can return. Pressing the **SIS** switch alters the gradations of the **mono level/SIS image** control knob on the GUI.
10	**fader safe** LED, illuminates if the fader has been removed from scene recall and control from VCA control group faders.
11	Motorised **input** fader, controls channel signal level and provides instant feedback of level settings.
12	**SOLO** switch, activates signal routing to the Monitor A section of the console by sending input channel signal to PFL mono and AFL stereo buses. Solo system is auto-cancelling, so that each new solo cancels the last one. Input solos override any active VCA solos.
13	**SOLO B**/[**B**] switch, changes the operation of the **SOLO** switch so that it routes signals to the Monitor B section of the console. This switch also determines which of the two sets of monitor sections (A or B) solo mode controls, which affects switch operation. Mode controls are PFL/AFL, solo-add-mode and solo-clear. Pressing this button extinguishes the **SOLO** button, if illuminated.
14	This area is used to display the surround controls, if configured. For more information, see Chapter 11 "Panning" on page 119.

Input channel select

The **input select** section is used for selecting input channels to its local input bay control surface. Also, by using the * button you can access the 'scratchpad' keys[1], which allow you to copy a detail area's parameter settings from one input channel to one or more selected input channels.

An **area B** button (left of **input select** section) changes its bay operation to area B, effectively isolating it from any input bays operating as area A and allowing it to operate independently. This provides the facility for two-man or split-surface operation (see "Two-man operation" on page 111). This function is also supported by the solo system, with solo B.



Item	*Description*
1	**B** button, for changing its local input bay operation from area A (default) to area B. Areas A and B operate independently from each other. This button illuminates while its bay is operating as area B.
2	Active bank indication LEDs. One of these LEDs illuminates to show which bank of eight input channels is currently selected to its bay. When using VCA/POP groups, a flashing LED indicates that its bank contains one or more hidden group members.
3	**scroll by 8** left/right arrow keys, scroll to the adjacent bank of eight input channels in direction of arrow.
4	Numeric keys **0** to **9** are used for typing in the number of the input channel you wish to select.
5	**ENTER** key accepts the input channel number that you have just typed in. Also, when used with copy and paste keys (*), this key completes the copy or paste operation.
6	After pressing the * key, keys **4** and **5** change their function to copy and paste.

1. Currently, only the copy and paste scratchpad keys are functional.

Chapter 33: Mix Bay Description



The centre section of the console is housed in two bays: mix and output (see Chapter 34 "Output Bay Description"). The upper areas of both bays tend to operate as an integral unit, providing audio control for mix and outputs. However, their lower areas are more independent and encompass automation, auto-mutes, control groups, VCA and POP groups, communications, primary navigation zone and mouse area, and signal monitoring.

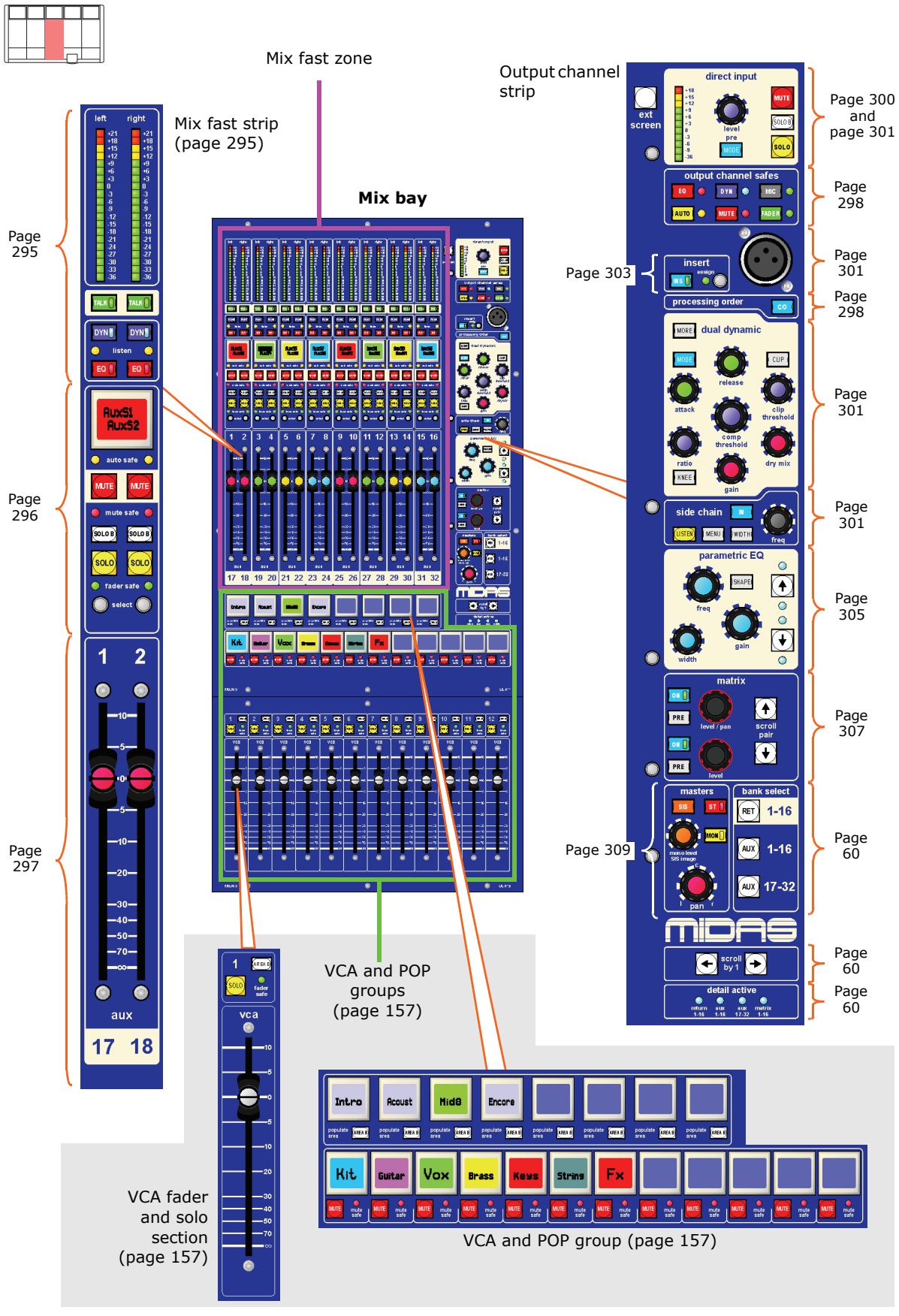
The upper areas of the mix and output bays contain the mix and output fast zones, which contain the auxiliary mix masters and main matrix (mix) masters, respectively. Full screen support for these sections is available, but will not normally be required because the hardware provides most of the necessary control feedback. This allows the screens to be used more productively. The mix bay GUI screen provides a dashboard or output channel display and the output GUI screen provides automation and signal processing views.

Nestled in between the two fast zones, to the right of the mix bay, is the output channel strip, covering both mix and matrix output signal routing.

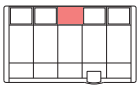
The mix bay's lower control area is concerned with grouping and contains the VCA and POP group LCD buttons and the VCA faders.

As the operation of the channels on the mix and output bays is intrinsically linked, this chapter will also contain the output bay's channels.

Mix bay control surface layout



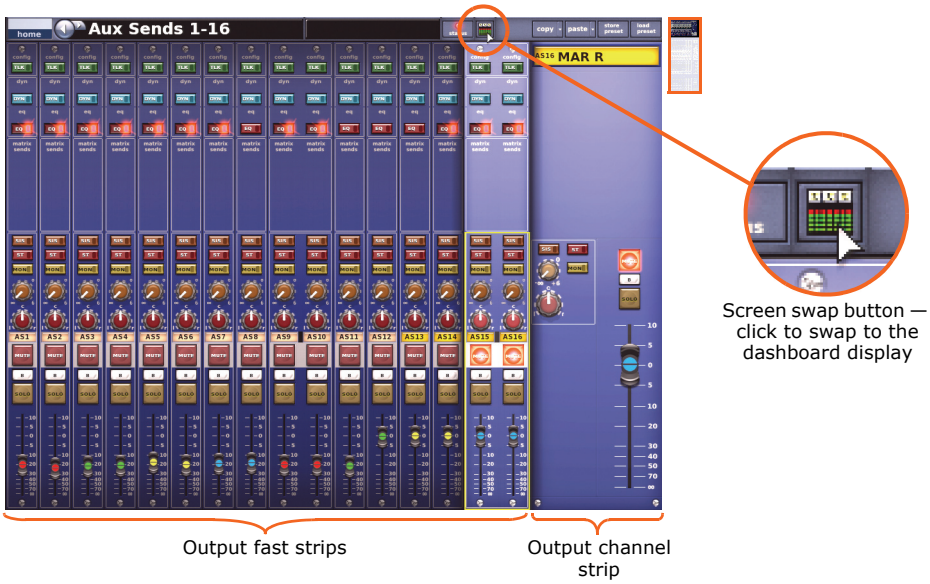
Mix bay GUI



The mix bay GUI screen is controlled from the left trackball in the primary navigation zone (see "About GUI operation" on page 48). There are two displays associated with the mix bay GUI — dashboard (default) and output channel — as detailed in the following sections.

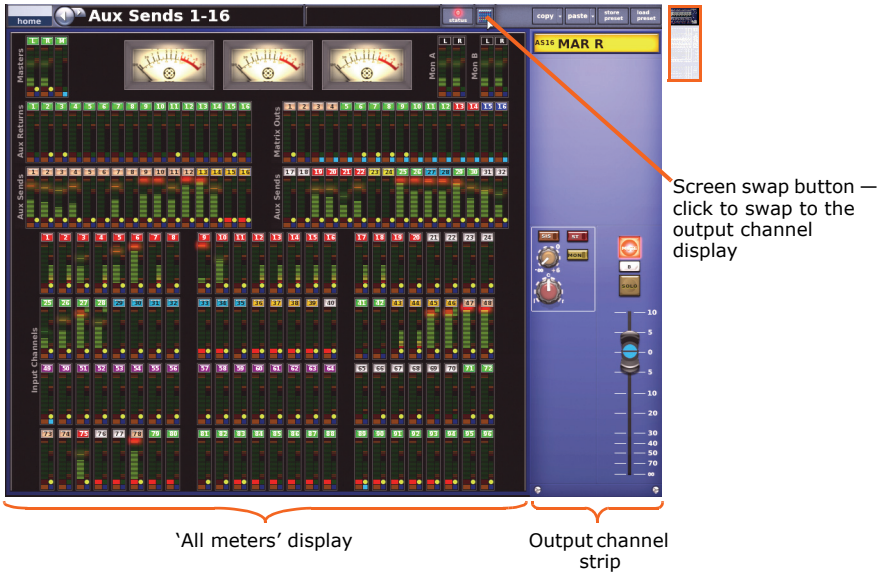
Output channel display

Similarly to the displays on the input bay GUI screens, the output channel display (auxes, returns, matrices and masters) represents the mix and output bay fast zones.

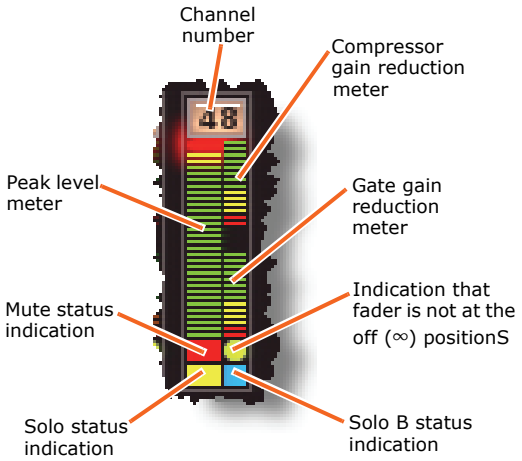


Dashboard display

The dashboard display shows all channel meters and also fader, solo (A and B) and mute status.

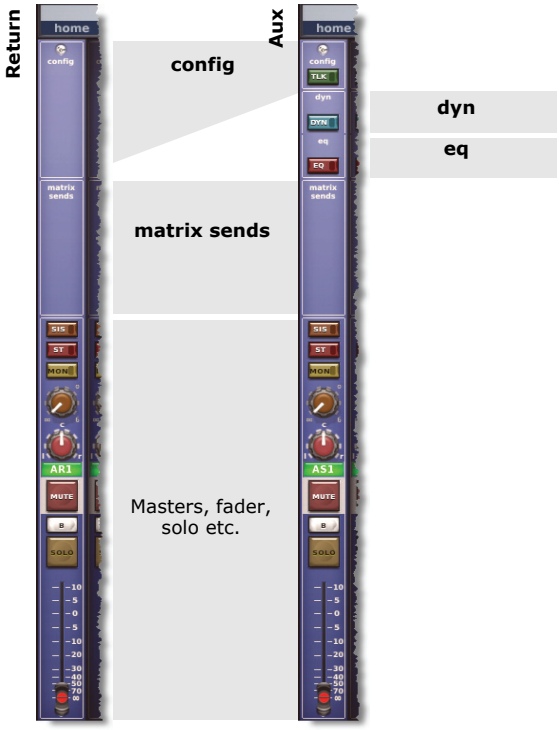


Each meter section comprises the elements shown in the diagram right.



GUI mix fast strips

The GUI displays two types of mix fast strip, depending on channel selection (right). Clicking within the panel of a fast strip, for example, **conf.** or **mtx**, opens its detail area in the output channel strip; this is the same as pressing the equivalent quick access button (adjacent to the output channel strip). The following table gives a description of each available detail area.



Legend	*Description*	*Reference*
conf.	Configuration detail area	See "Configuration controls" on page 298
dyn	Dynamics detail area	See "Compressor and side chain" on page 301
eq	EQ detail area	See "EQ" on page 305
matrix sends	Matrix detail area	See "Matrix outputs" on page 307
N/A	Masters, fader, solo etc.	See "Masters, solo and faders" on page 309

GUI output channel strip

The GUI displays showing the channel strip applicable to each detail area are shown in "Output channel strip" on page 298.

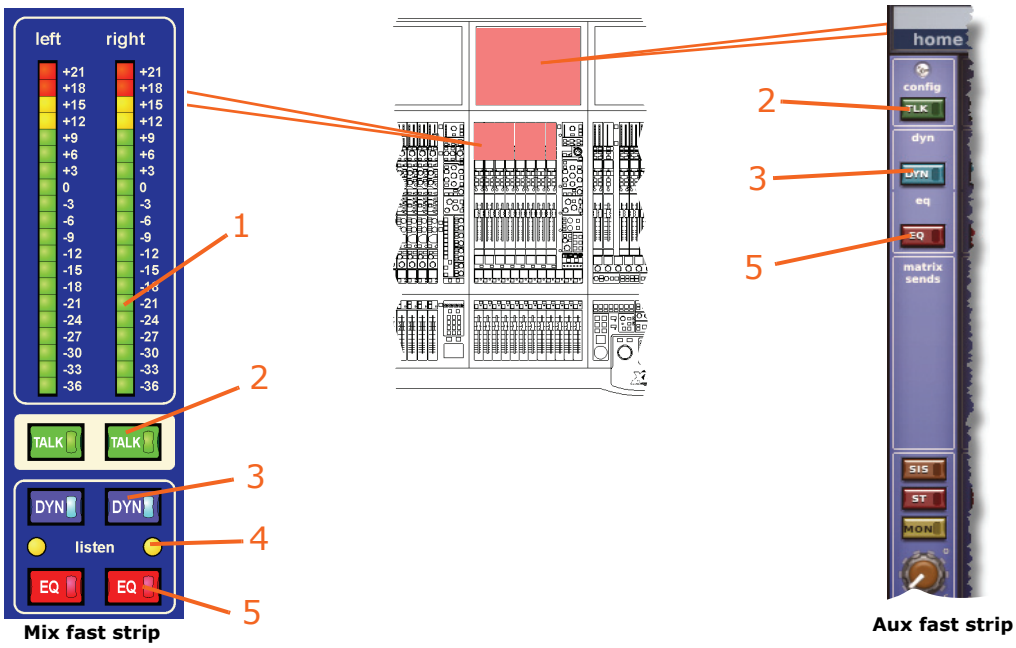
Mix fast strip

This sections details the controls found in the mix bay's eight dual channel fast strips. It includes the equivalent GUI screen displays that support the aux and return channels.

Meters, talk and dynamic/EQ

The GUI supports the talk, dynamic and EQ sections of the auxes (the returns do not have these controls).

Note: *Meters can be switched, under global command, from the main output bay area to monitor the raw A/D input point and are also individually switchable via the channel panel.*



Mix fast strip

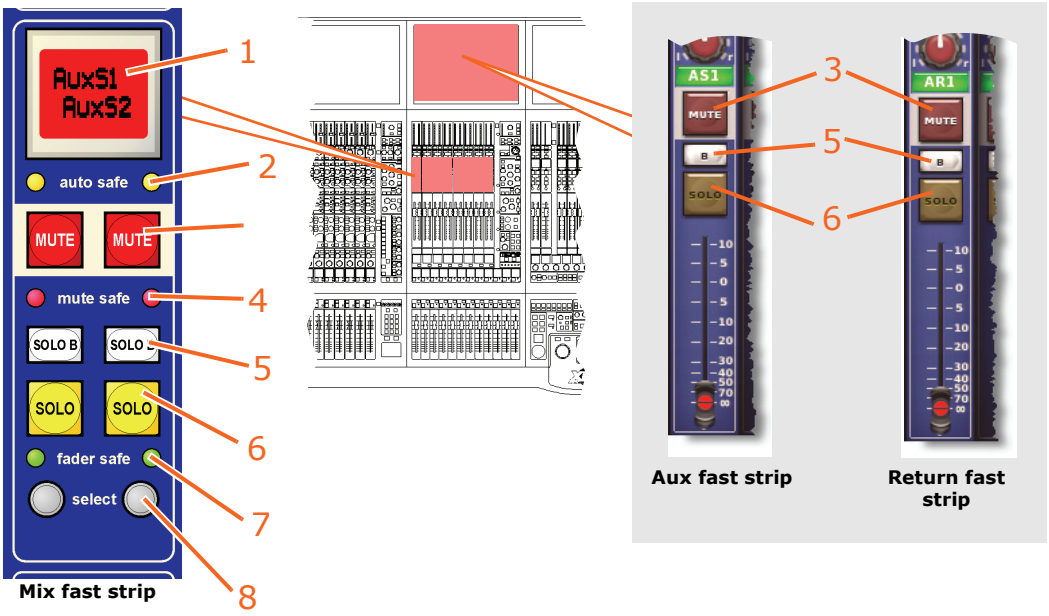
Aux fast strip

Item	*Description*
1	Two 20-segment **left** and **right** level meters, for the left and right channels. Mix channel level meters default to monitor post-fader signal level. The meters can be switched, so that they show the level at the summing bus input point. This is done under global command via the **meters PRE** changeover switch, located just to the right of the mono master channel on output bay (see "Master channels" on page 314). Mix channels can be paired for stereo use as necessary.
2	**TALK** switch (see "Comms" on page 318). If the **TALK/internal** switch in the **talk mic** section is active, these will illuminate (integral LED) to prompt the operator to select a bus that the talk signals should be routed to. These are also used to set up a talk group after pressing one of the **talk/osc routing** panel buttons.
3	**DYN** switch, switch the dynamics on/off.

Item	Description
4	**listen** LED, indicates when listen is active in output detail area.
5	**EQ** switch, switches the EQ on/off.

Channel select, mute and solo select

This section contains channel selection and navigation controls, and mute and solo select buttons. The GUI supports mute and solo selection on both the aux and return channels.

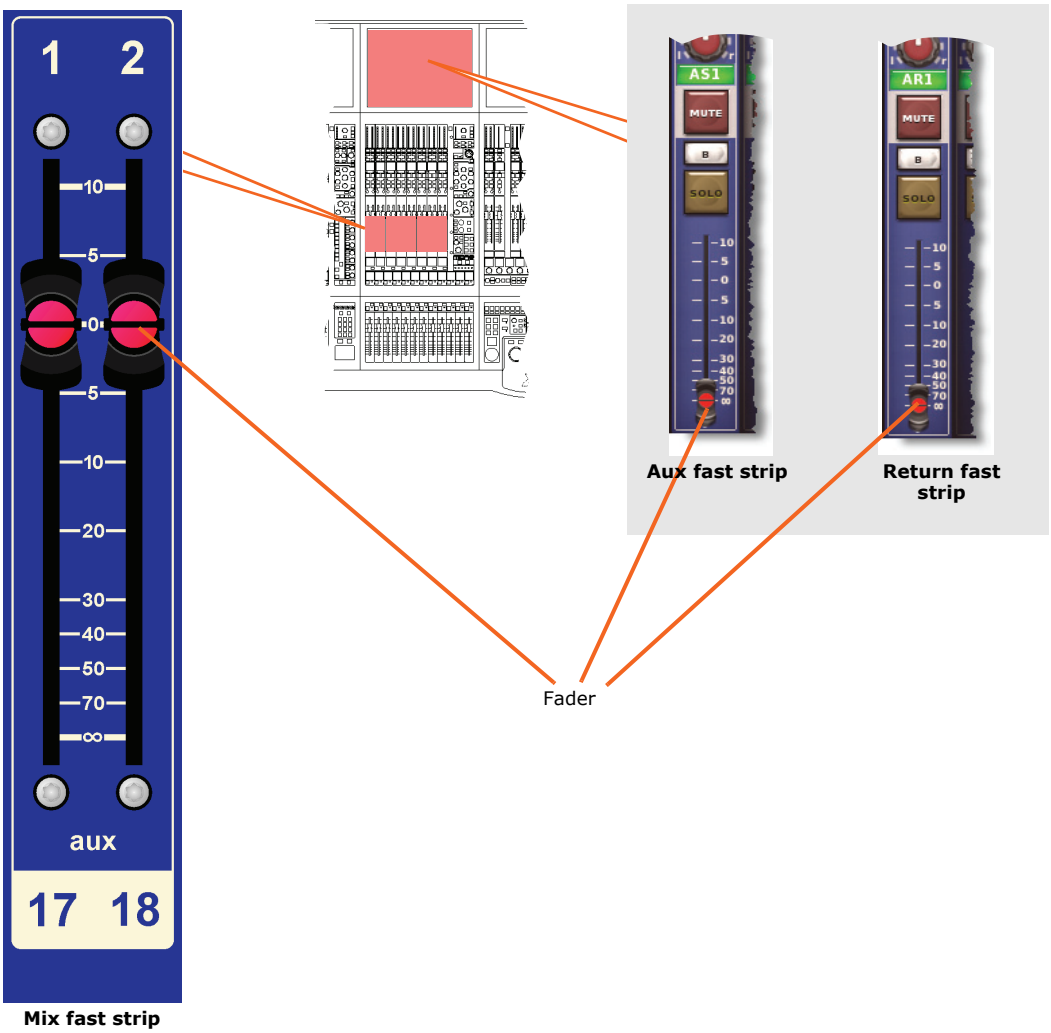


Item	Description
1	LCD channel select button, for selecting a single output channel or left and right output channel pair, for example, for VCA routing functions. Also 'follow selects' stereo aux mixes onto the bus area of input fast zone. Button displays user-configurable channel name and has a backlight, the colour of which can be configured to suit.
2	**auto safe** LED, illuminates if the channel has been removed from scene recall (this does not affect action of auto-mutes and VCA control groups).
3	**MUTE** switch, mutes all post-processing signals leaving the channel. They have their own illumination to confirm this action. In addition to scene recall, muting can be remote from auto-mute masters.
4	**mute safe** LED, illuminates if mute has been removed from the scene recall and auto-mute action.
5	**SOLO B** switch, changes the operation of the **SOLO** switch so that it routes signals to the Monitor B section of the console; see "monitor a and b outputs" on page 329.
6	**SOLO** switch, activates signal routing to the Monitor A section of the console; see "monitor a and b outputs" on page 329.

Item	Description
7	**fader safe** LED, illuminates if the fader has been removed from scene recall and control from VCA control group faders.
8	Quick access **select** button, assigns its channel's mix section to the mix bay output channel strip. With both channels linked for stereo, both buttons operate on the pair.

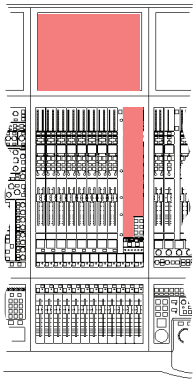
Faders

The GUI provides fader support for both the aux and return channels. The fader controls the mix channel signal level and is motorised to provide instant feedback of level settings. Faders are colour coded for ease of identification.



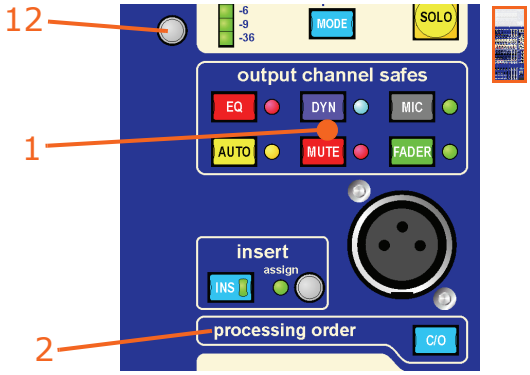
Output channel strip

The output channel strip (see "Mix bay control surface layout" on page 292) contains the channel-dependent detail areas that control the parameters of the aux, return, master and matrix channels.



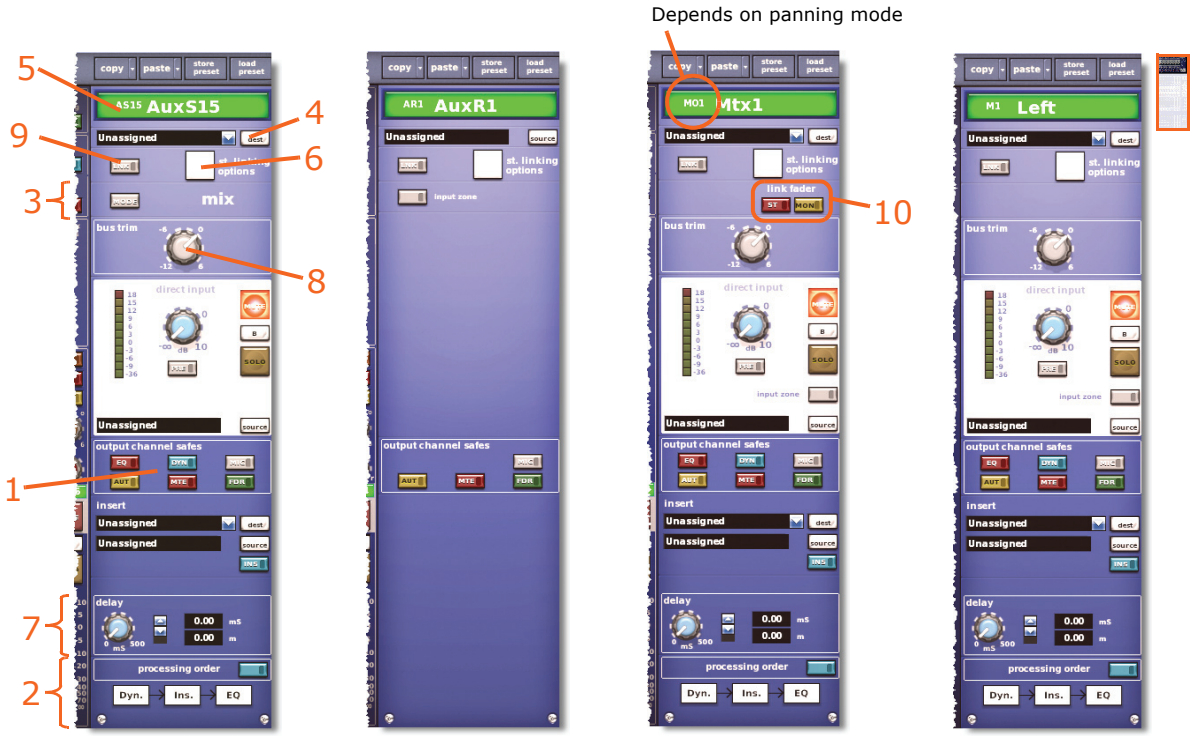
Configuration controls

Except for the **output channel safes** and **processing order** sections, these configuration controls are predominantly GUI only functions.



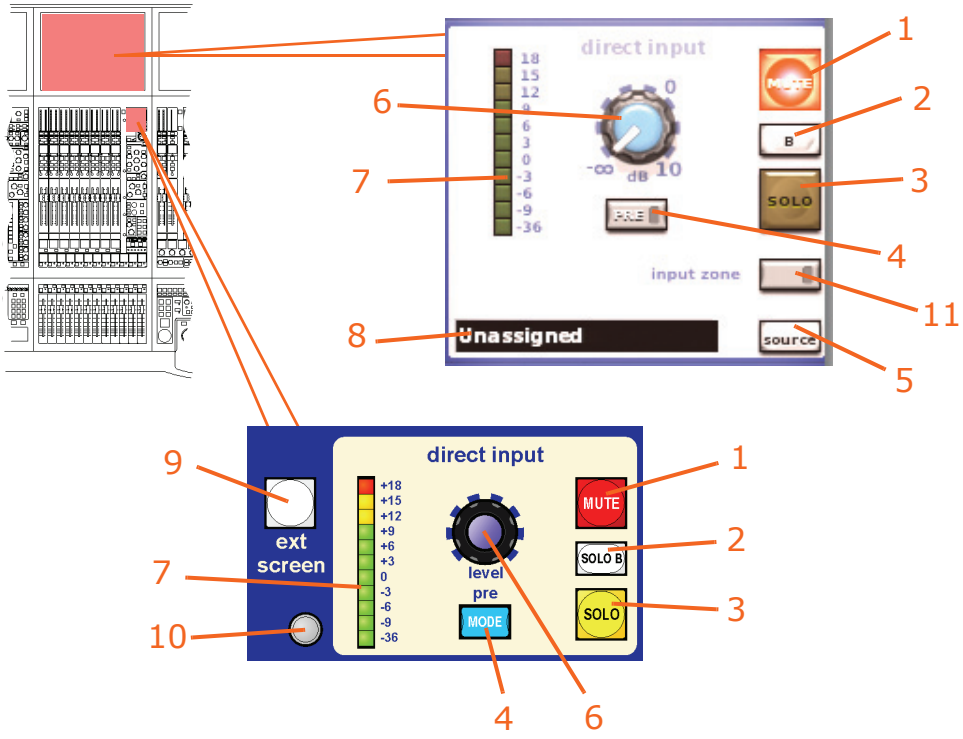
Item	*Description*
1	**output channel safes** section, comprising the **EQ, DYN, AUTO, MUTE** and **FADER**/[**FDR**] output channel safe switches (see "Safes" on page 193).
2	**processing order** section, with **C/O** switch that swaps the channel's order of processing between DYN/INS/EQ (default) and EQ/INS/DYN.
3	Aux bus section, with **BUS** mode switch and current bus mode indication. Takes a snapshot of current routing controls (level, pan etc.) and duplicates them onto the copied output. Thereafter, all controls on the output operate independently. Available bus modes are: **mix** — mono mix mode routes to master mono channel on output bay (if channels are linked, routing is to master stereo channels); **group** — fader only with no pre-fader; and **mix minus** — mute only with all buses initially muted.
4	Channel source selection drop-down list.
5	Channel name field.
6	**st. linking options** button, opens the **Stereo Linking Options** window (see Chapter 10 "Stereo Linking" on page 117).
7	**delay** section, use control knob or up/down spin buttons to adjust the time delay (in milliseconds) on the aux, masters and matrix channels. Delay value is shown in milliseconds (ms) and metres (m). A setting of "0" gives no delay.

Item	Description
8	**bus trim** control knob (GUI only), provides fine adjustment for gain in the range -12dB to +6dB on the aux, masters and matrix channels.
9	**LINK** button, switches linking (with adjacent channel on right) on/off.
10	**link fader** section (matrix channel only), with **ST** and **MON** buttons for linking matrix channel's fader to stereo or mono master faders, respectively. Control of stereo master faders reverts to highest fader.
11	**copy from** section (matrix channel only), with **ST** and **MON** buttons for copying all matrix buses (all channels) that are routed to the stereo and mono masters, respectively, to the matrix channel. Will only route those channels that have stereo or mono selected as on. Copying is dynamic until buttons are switched off.
12	Quick access button, assigns the **output channel safes** and **processing order** sections to the GUI output channel strip.



Direct input controls

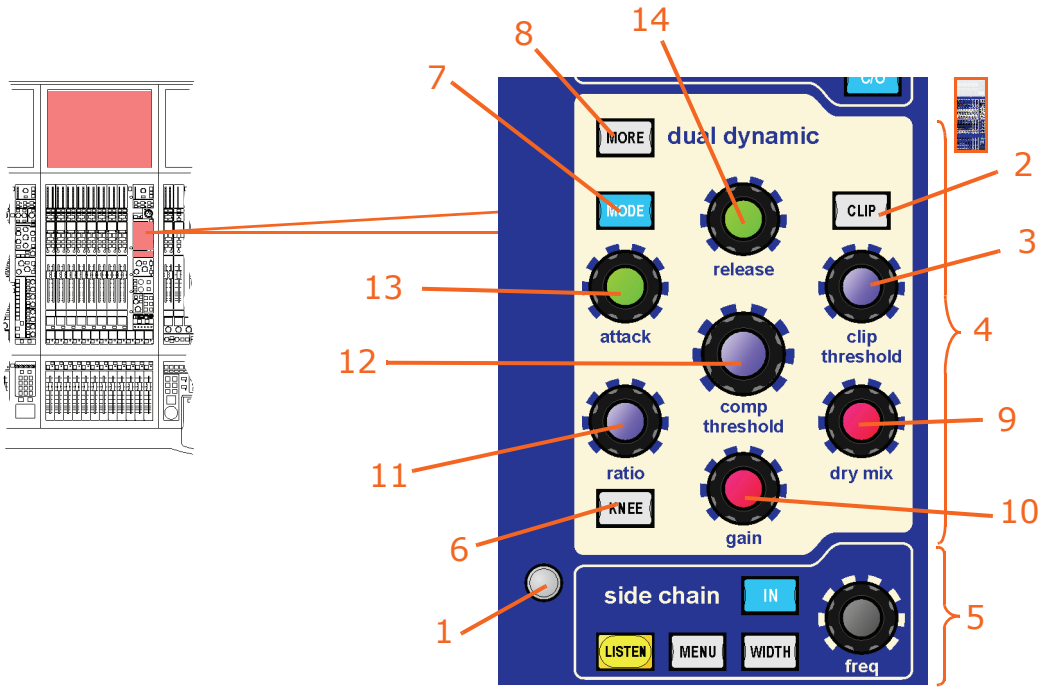
The **direct input** section (aux, masters and matrices only) is deliberately distanced from main channel panel controls because it is a limited resource and unused on many channels.



Item	*Description*
1	**MUTE** switch, mutes the direct input. Although included in the scene recall system, it is unaffected by the channel mute safe or auto-mute masters.
2	**SOLO B**/[**B**] switch, changes operation of the **SOLO** switch so that it routes signals to the Monitor B section of the console.
3	**SOLO** switch, activates signal routing to the Monitor A section of the console.
4	**MODE**/[**PRE**] button, changes the input point for the signal.
5	**source** button, opens the **Patching** screen, so that you can select the source of the direct input.
6	Level control knob, adjusts the channel's direct input level within the range of -∞ to +10.
7	Direct input 10-LED meter, monitors pre-fader level.
8	Direct input source.
9	**ext screen** button, changes screen view to an external source (connector on rear of control centre).
10	Quick access button, assigns the **direct input** section to the output channel strip.
11	**input zone** button. Switch button on to time align the direct input with the input channels. With button off, direct input is time aligned with the return channel inputs.

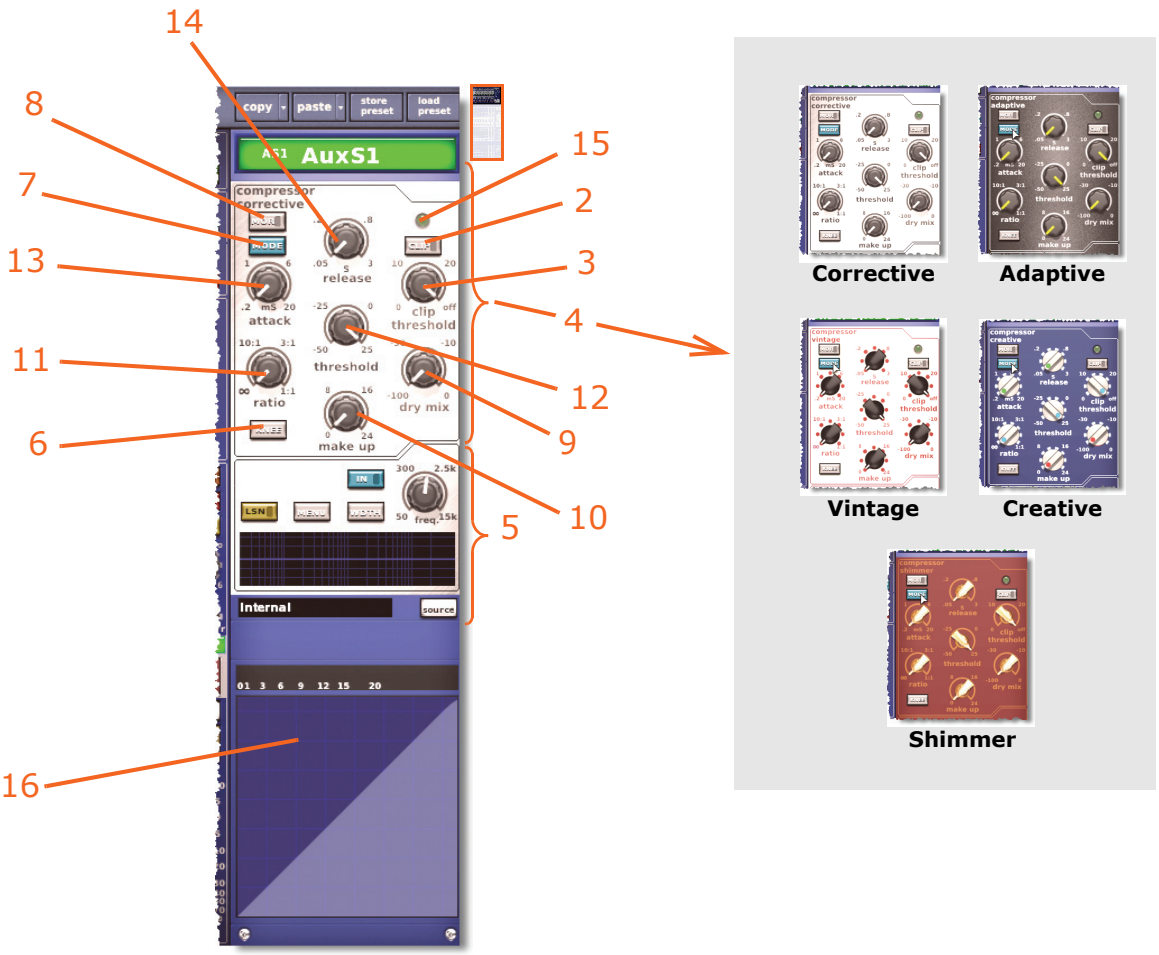
Compressor and side chain

In addition to the compressors found on the input channels, the aux, master and matrix channels have a fifth mode, called shimmer. The **MORE** button is used to add more character to the compressor algorithm. For more details on the compressors and types, see "Compressor" on page 272 and "XL8 compressor modes (dynamic)" on page 339.



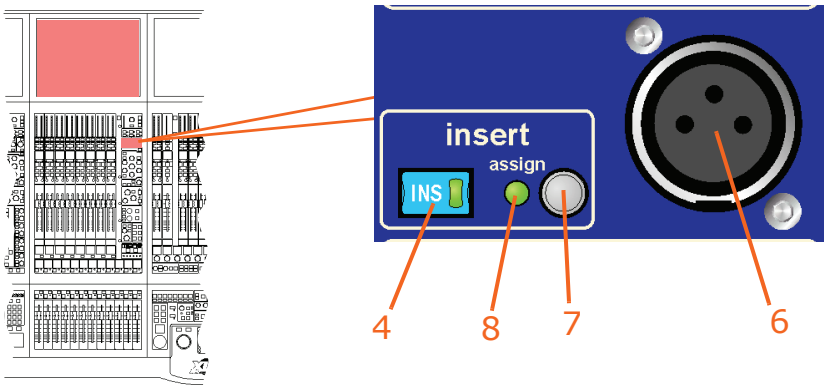
Item	*Description*
1	Quick access button, assigns the compressor **dual dynamic** section to the output channel strip.
2	**CLIP** switch, switches clipping in/out.
3	**clip threshold** control knob, sets the signal level over which the programme will be "soft clipped".
4	**dual dynamic** section, adjusts the active compressor.
5	**side chain** section, allows manipulation of the side chain filter.
6	**KNEE** button, selects knee type (hard, medium or soft).
7	**MODE** switch, selects compressor mode from **corrective**, **adaptive**, **creative**, **vintage** or **shimmer.** For more information, see "XL8 compressor modes (dynamic)" on page 339.
8	**MORE** switch, enables/disables the compressor's algorithms (see "More (output compressors only)" on page 340).
9	**dry mix** control knob, gradually mixes in an amount of uncompressed signal to the post-make-up compressed signal.
10	**gain**/[**make up**] control knob, adjusts amount of compressor gain, so that the level of the outgoing compressed signal can be matched to the incoming uncompressed signal.
11	**ratio** control knob, adjusts amount of compression applied to signals below threshold.

Item	Description
12	**threshold**/[**comp threshold**] control knob, adjusts operating point of compressor.
13	**attack** control knob, adjusts the time it takes for compressor to respond after an over-threshold signal.
14	**release** control knob, adjusts the time it takes for compressor to recover after programme material falls back below threshold.
15	Clipping LED (GUI-only), indicates when signal is being clipped, provided **CLIP** is switched on.
16	Compressor graph (see "Compressor graph" on page 274).



Insert controls and talk mic

The **insert** section allows configuration of the aux, master and matrix channels' send and return points when an insert is used. This section is optional and assigned on a channel-by-channel basis. The talk mic socket, adjacent to the **insert** section, allows you to plug in a talk mic headset.



Item	*Description*
1	Channel's **insert send** destination, selectable from drop-down list.
2	**dest** button, for selecting the insert send destination. Opens the **Patching** screen.
3	**source** button, for selecting the insert return destination. Opens the **Patching** screen.
4	**INS** switch connects (inserts) returned programme material to the channel signal path, provided an insert point has been assigned.
5	Channel's **insert return** source, selectable from drop-down list.
6	**Talk mic** socket, accepts 150-ohm microphone signals.
7	Quick access button, assigns insert section to output channel strip to allow configuration of insert send and return points.
8	**assign** LED, illuminates when an insert is in use.



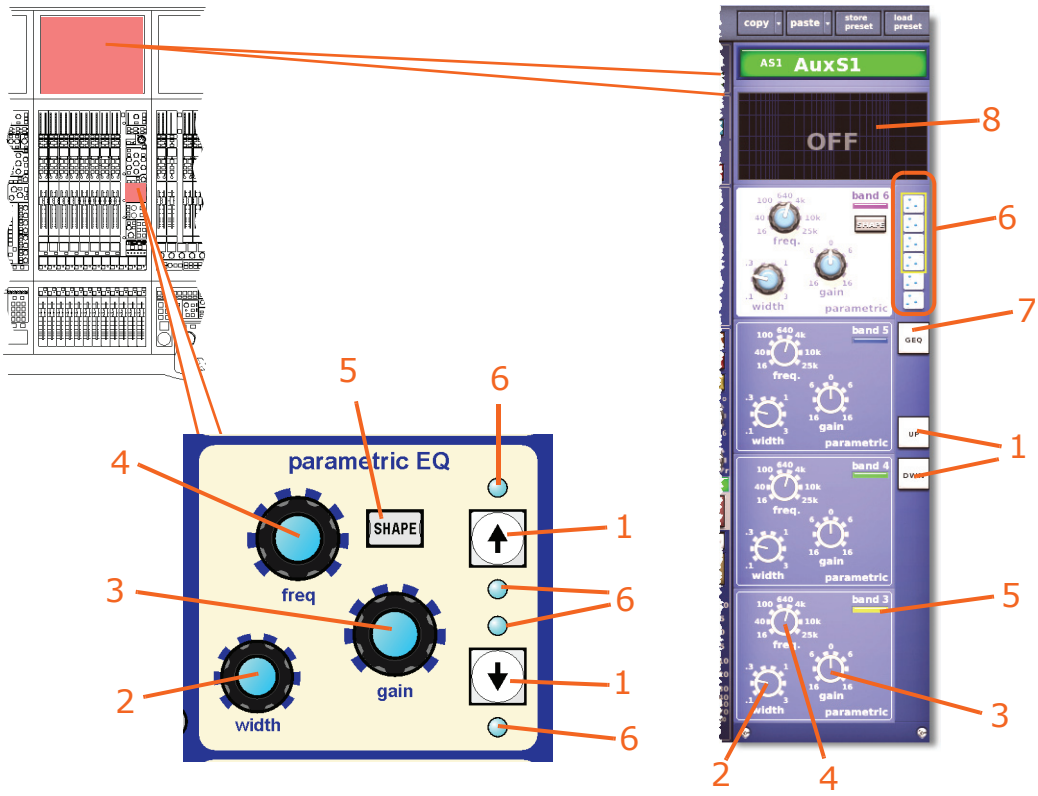
Aux Matrix Master

EQ

For tonal control of the aux, master or matrix channels' output signal, the output channel EQ has the option of a six-band sweep parametric EQ (PEQ) or an assignable graphic EQ (GEQ).

PEQ

Similarly to the E zone, the **parametric EQ** section contains frequency, gain and width control knobs, along with band selection buttons and a shelving mode selection button (**SHAPE**). However, this PEQ has two additional bands, making six altogether. Additional shelving modes are available on bands 1, 2 and 6.



Item	*Description*
1	Up/down band selection buttons.
2	**width** control knob, adjusts signal bandwidth.
3	**gain** control knob, adjusts signal gain.
4	**freq** control knob, adjusts signal frequency.
5	**SHAPE** button, selects shelving mode (see Figure 41 "PEQ shelving modes" on page 306).
6	Active band indicator, shows which four bands are displayed in the GUI channel strip.
7	**GEQ** button selects a GEQ rack to the GUI output channel strip.
8	Graph showing effects of parametric EQ.

The band with the light coloured background shown on the GUI is the one currently selected.

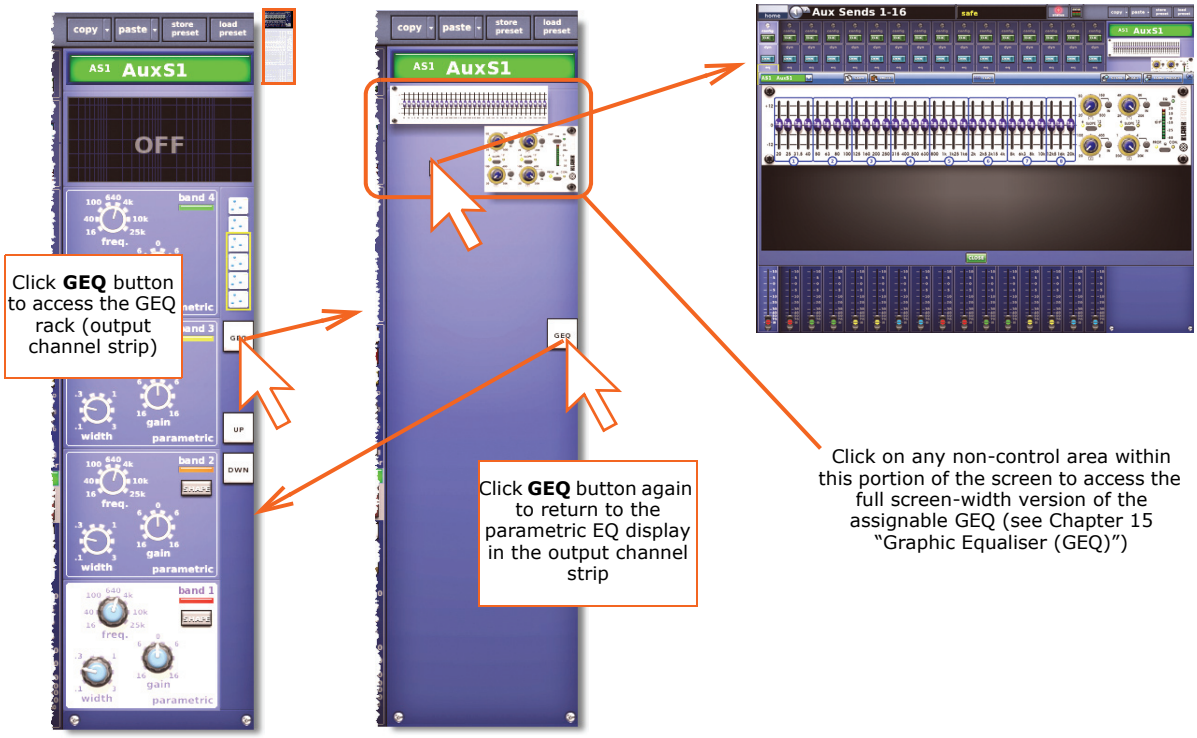
The following diagram shows the shelving modes for bands 1, 2 and 6, which are selected via the **SHAPE** button (see "XL8 output channel EQ modes" on page 344).



Figure 41: PEQ shelving modes

GEQ

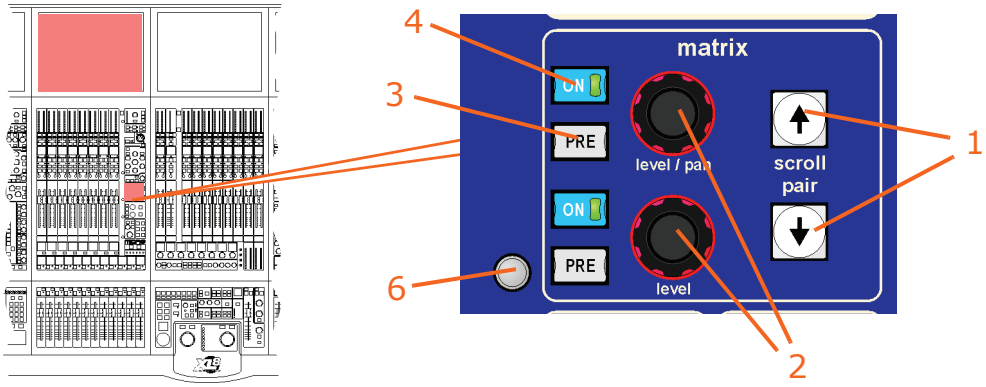
The GEQ is only accessed by clicking the **GEQ** button on the GUI, which assigns a GEQ panel to the GUI's channel strip. Although the GEQ can be edited here it is far easier to edit a full screen-width version, after clicking on the GEQ image.



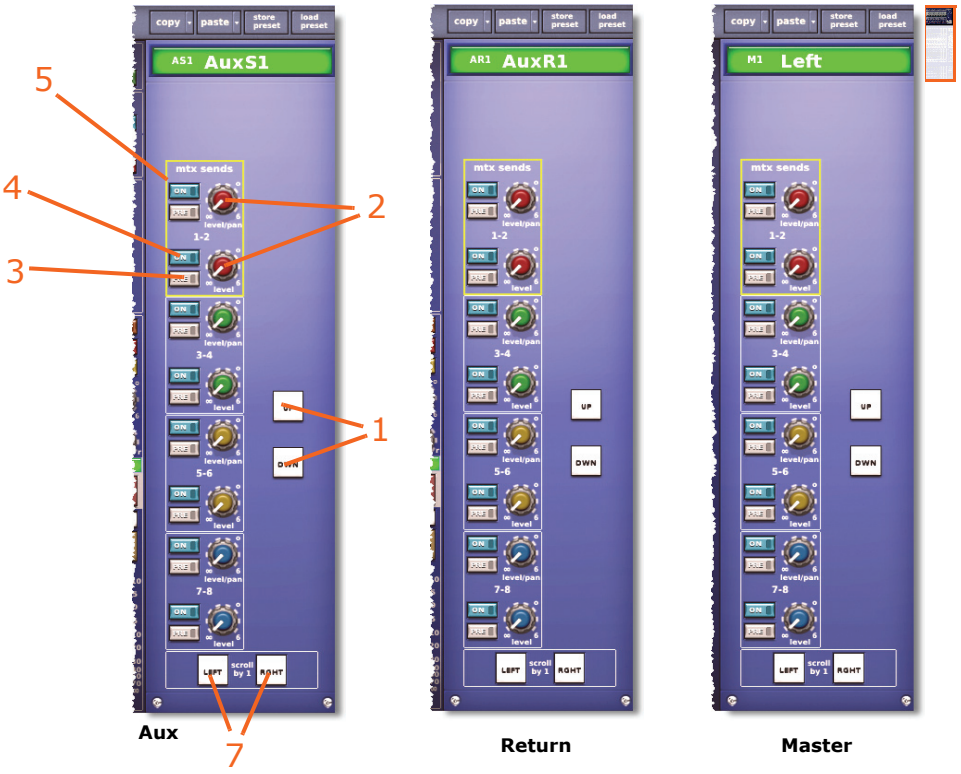
Matrix outputs

Each aux and return can make a contribution of its signal to any of the 16 matrix channels in the output bay. The matrices are arranged in pairs, with each matrix output having **ON** and **PRE** switches and a level or level/pan control knob. **ON** and **PRE** switches on odd numbered channels do not operate when the buses are in stereo mix mode.

The output channel strip on the control surface can only address two of the 16 matrix sends at any one time, which is done via the **matrix** section, while the GUI displays eight of the 16 matrix sends at a time and also identifies which two are being addressed by the control surface. Matrix navigation is provided by scroll buttons.

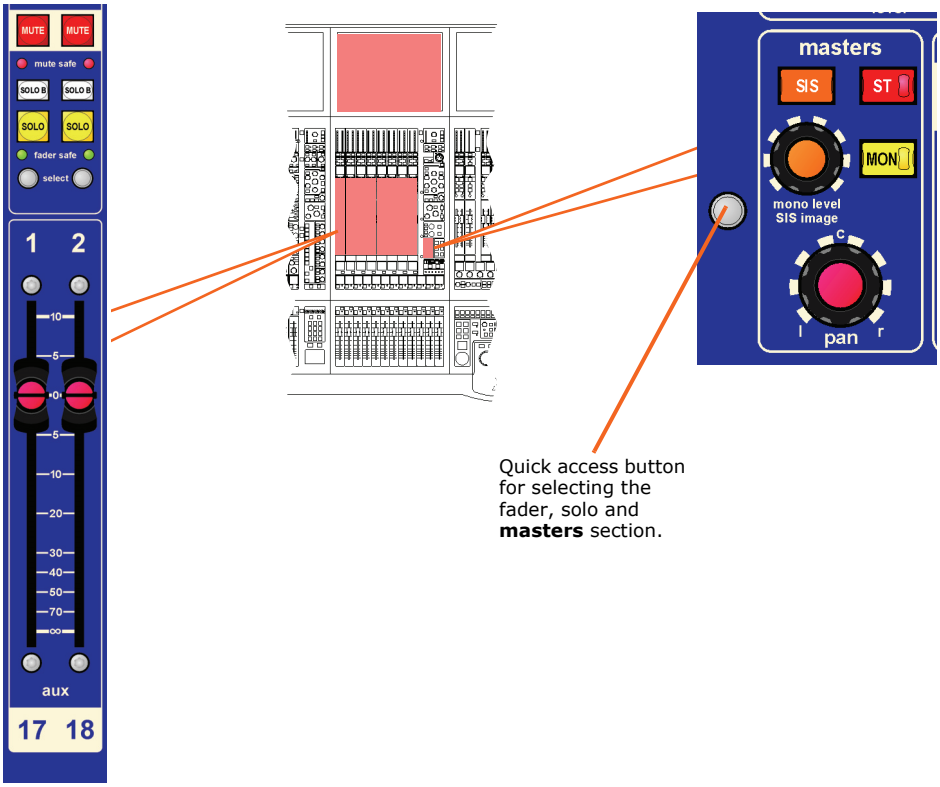


Item	*Description*
1	Up/down **scroll pair** buttons, scroll through the 16 matrices, pair by pair, changing selection accordingly. Scrolling stops at the extreme pairs; press the other **scroll pair** button to go back in the opposite direction.
2	**level/pan** and **level** control knobs, send relative mix contribution levels to multiple main mix bus destinations, sourced from the selected sub mix. They operate as level-and-level for mono buses and pan-and-level for stereo buses.
3	**PRE** button, switches its **level** or **level/pan** matrix control to pre-fader. Button status is via GUI only.
4	**ON** switch, switches its **level** or **level/pan** matrix control on.
5	Yellow box indicates active matrix pair.
6	Quick access button, for selecting the **matrix** section to the matrix detail area.
7	Left/right **scroll by 1** buttons, scroll across the output channels. These have hardware support (see "How the mix buses are managed" on page 56). Please note that these GUI buttons are only available on the aux and return channels, so they cannot be used on the matrices and masters.


5
4
3
2
1
7
copy
paste
store preset
load preset
AS1 AuxS1
AR1 AuxR1
M1 Left
mtx sends
ON
level/pan
level
1-2
3-4
5-6
7-8
UP
DWN
LEFT
scroll by 1
RGHT
Aux
Return
Master

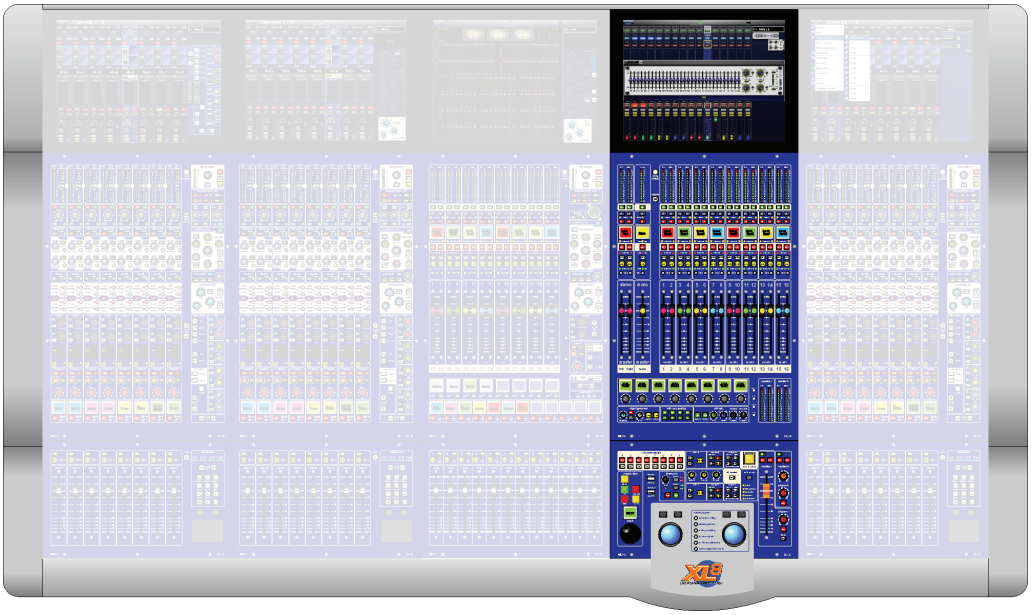
Masters, solo and faders

The operating principles and functions of the faders, **masters** section and solos for the aux, master and matrix channels are basically the same as those for the inputs. For more information, see "Master controls, solo select and fader" on page 286.





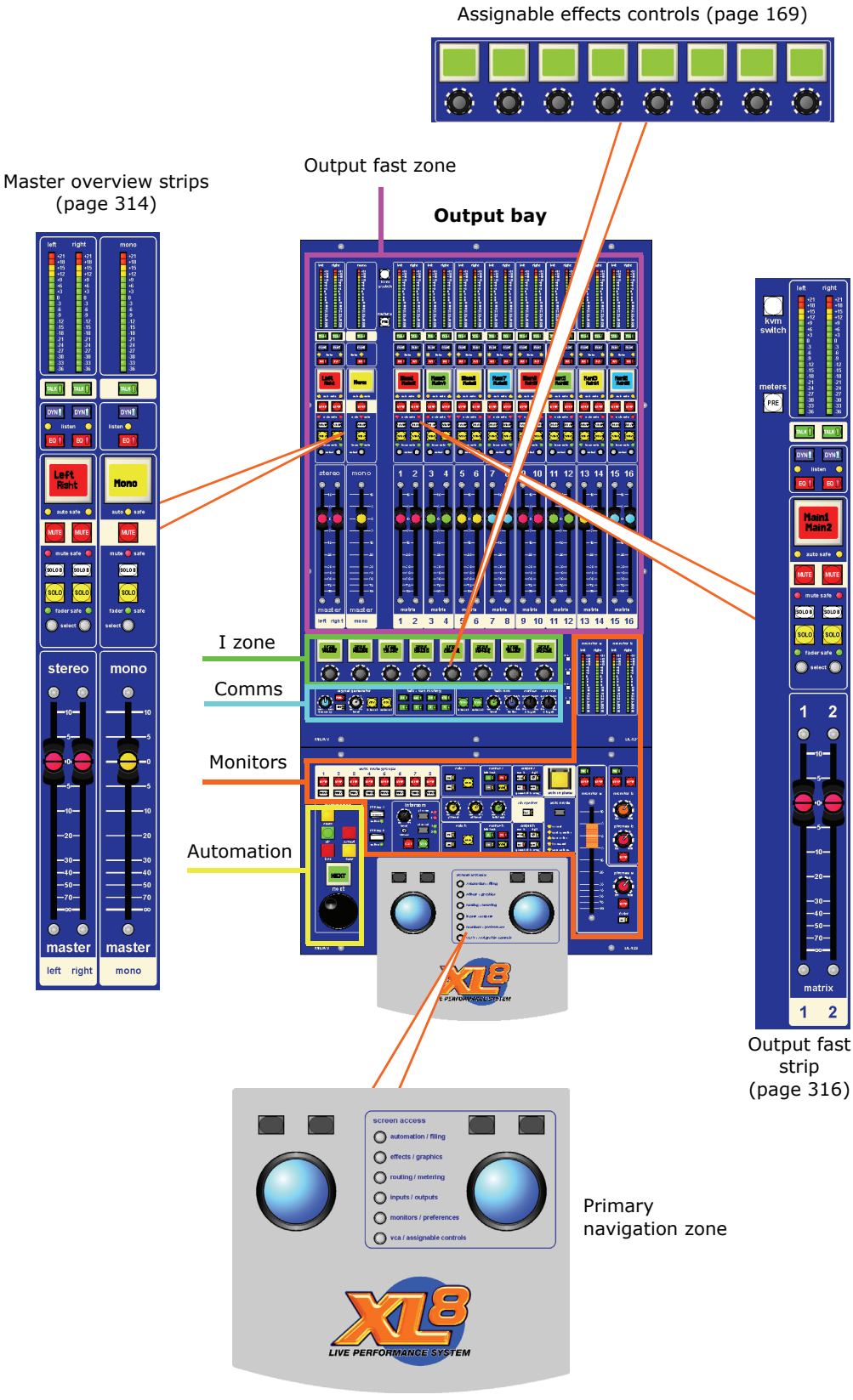
Chapter 34: Output Bay Description

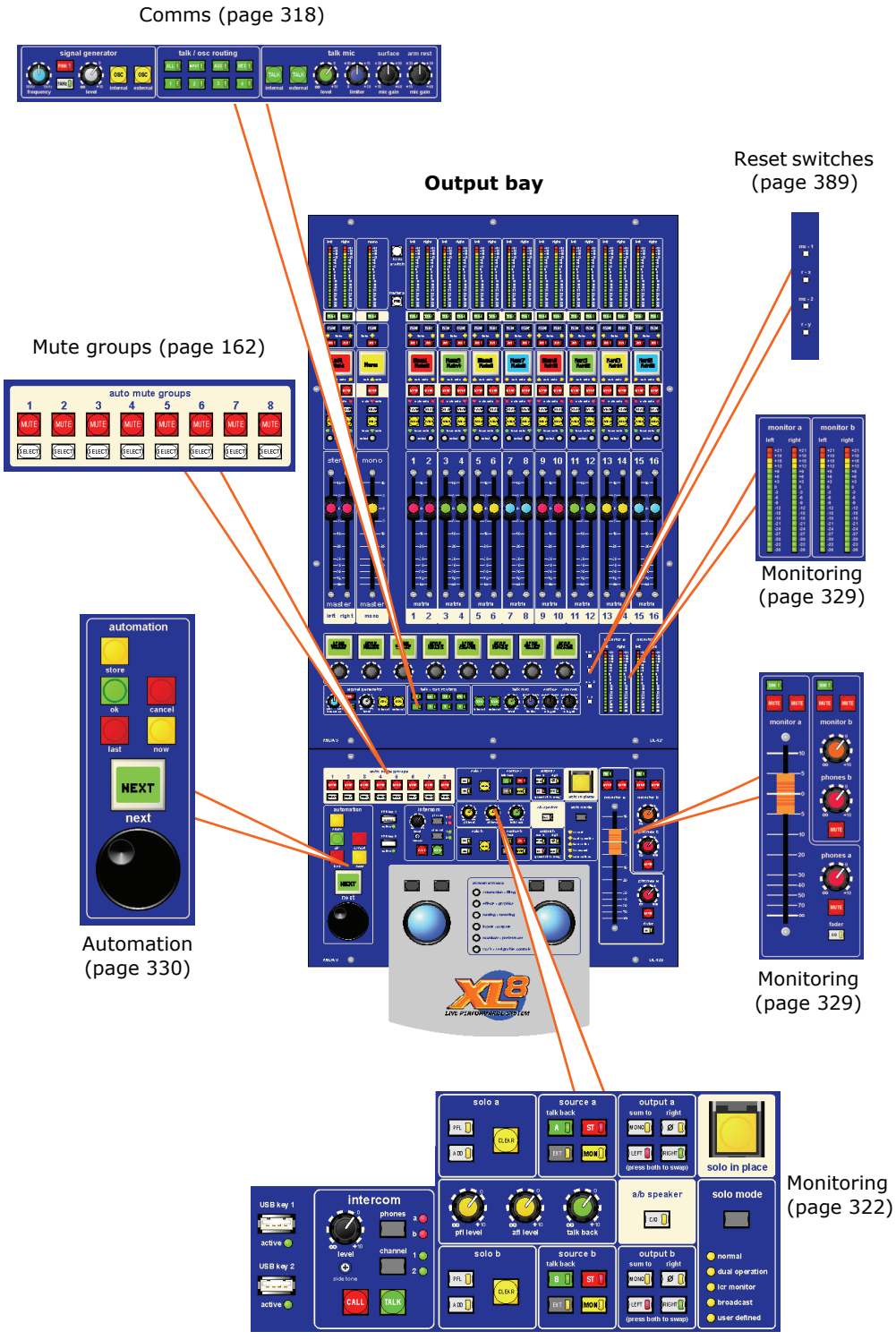


The output fast zone, in the upper area of the output bay's control surface, operates in combination with the mix bay's upper area (see page 291). Consequently, GUI support for this area is solely from the mix bay GUI screen, which is operated via the mix bay's trackball in the primary navigation zone.

The lower output bay area contains independent control areas, such as the I zone (operator assignable effects rack controls), monitors, automation and primary navigation zone. These are operated at the output bay GUI screen using the right-hand trackball in the primary navigation zone. While having full GUI support, some of these areas, the I zone and automation in particular, merely assist with their GUI-intensive functions.

Output bay control surface layout



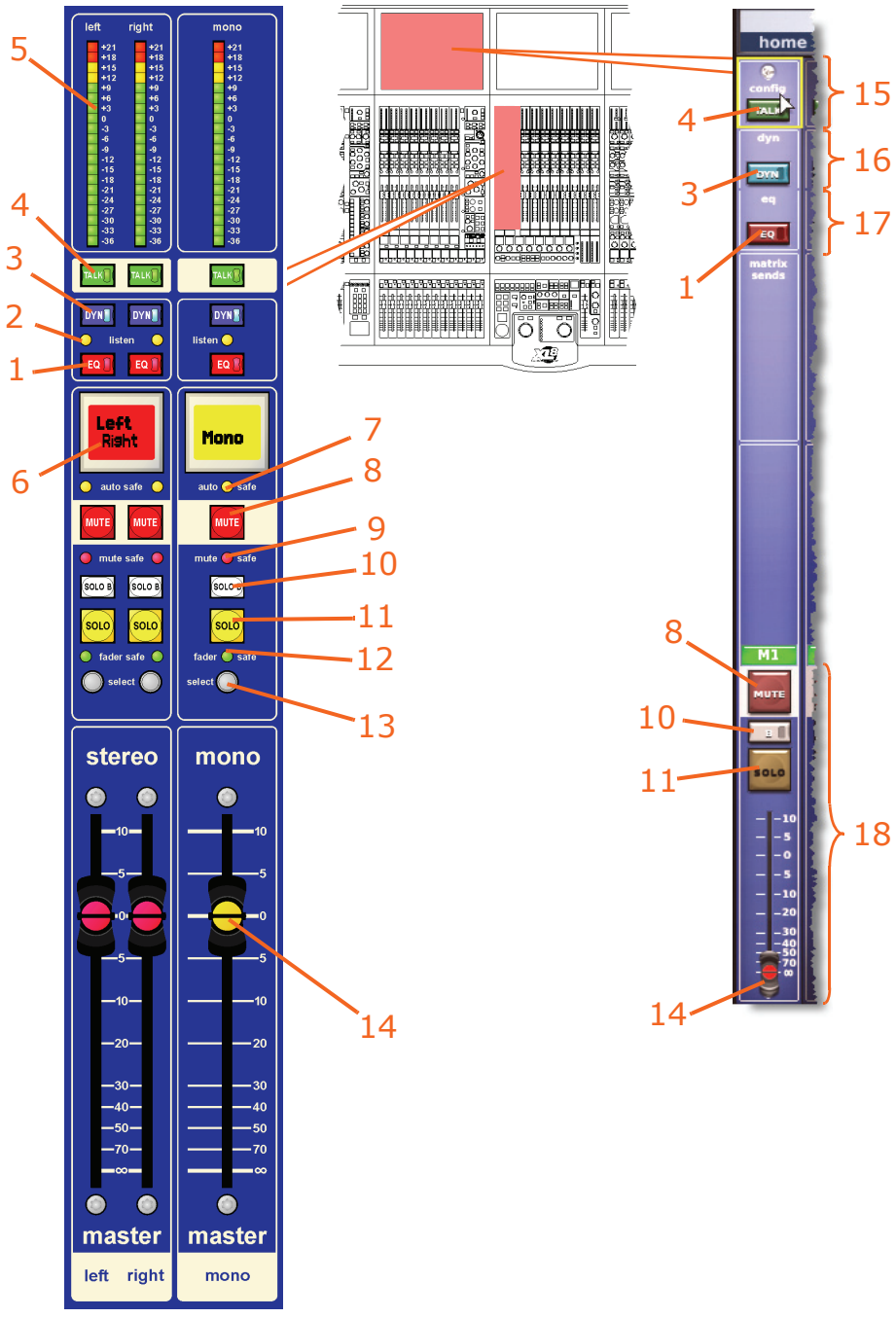


Output bay GUI

The output bay GUI screen does not have any specific screens to display, as such. It is most usefully employed for displaying and managing the GUI menu options (see Chapter 35 “GUI Menu”). For information on how to use the output bay GUI screen, see Chapter 6 "Working With The XL8 Control Centre" on page 47.

Master channels

The two master fast strips contain the stereo (dual channel) and mono (single channel) master channels.



The GUI master fast strips, that is, left (“M1”), right (“M2”) and mono (“M3”), are shown above.

Item	*Description*
1	**EQ** switch, switches the channel’s EQ on/off.
2	**listen** LED, illuminates when listen is active in the output detail area.

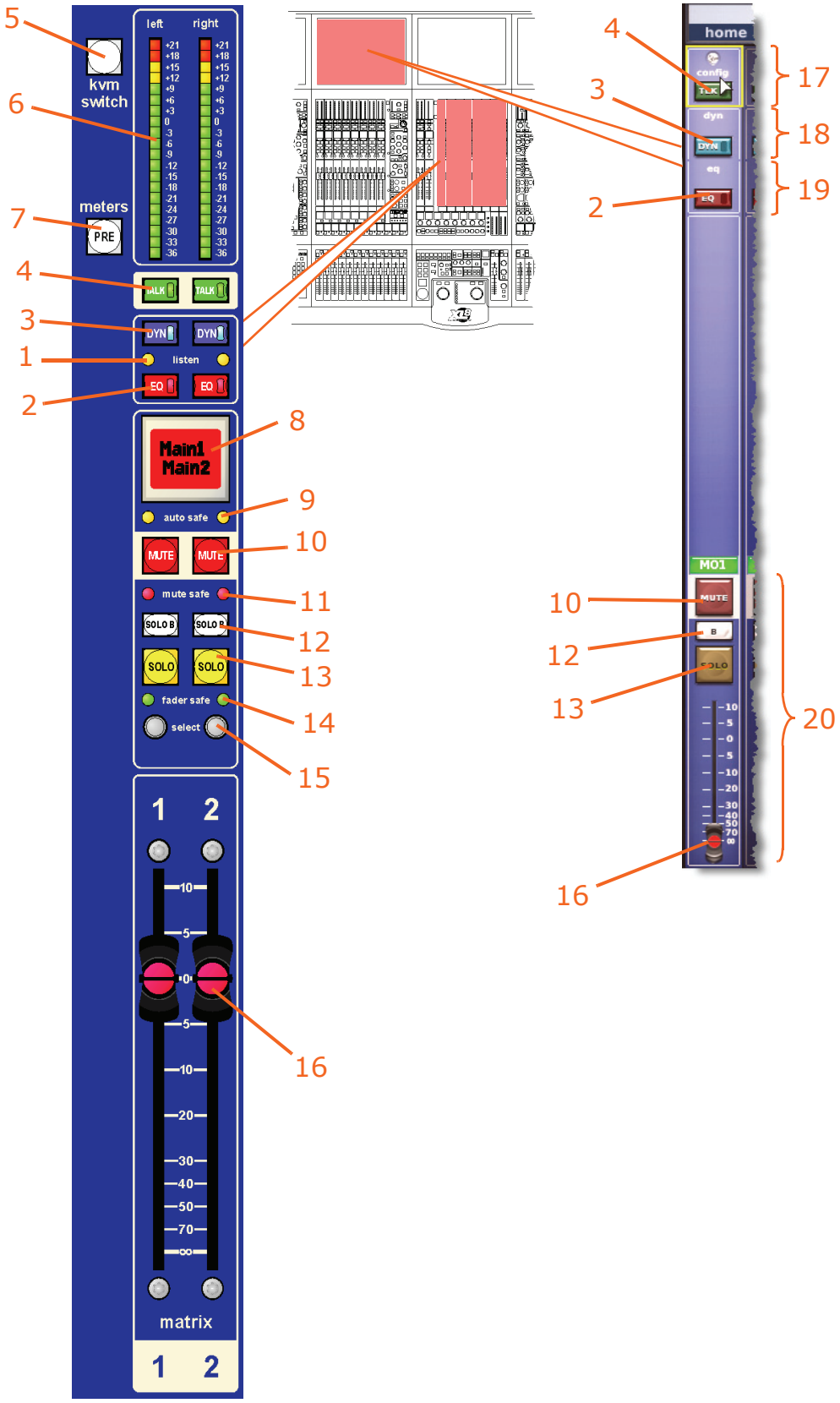
Item	Description
3	**DYN** switch, switches the dyanmics on/off.
4	**TALK** button, illuminates if the **TALK/internal** in **talk mic** section is on, to prompt the operator to select a bus that the talk signals should be routed to.
5	**Meters:** Each master channel has a 20-segment level meter, defaulting to monitor post-fader signal level.
6	LCD master channel select buttons for the main output pairs. Select left/right output channel pairs, for example, for VCA routing functions or to have stereo aux mixes 'follow select' onto the bus area of the input channel strip. Both the backlight colour of the LCD and the channel name displayed on the front are user-configurable. On the stereo button, the left channel name is always on top.
7	**auto safe** LED, illuminates if the output channel has been removed from scene recall (this does not affect the action of auto-mutes and VCA Control Groups).
8	**MUTE** switch, mutes all post-processing signals leaving the output channel. Illuminates to confirm this action. In addition to scene recall, it can also be remotely muted from the auto-mute masters.
9	**mute safe** LED, illuminates if the mute has been removed from scene recall and auto-mute action.
10	**SOLO B** switch, changes the operation of the **SOLO** switch so that it routes signals to the Monitor B section of the console.
11	**SOLO** switch, activates signal routing to the Monitor A section of the console.
12	**fader safe** LED, illuminates if the fader has been removed from scene recall and control from VCA control group faders.
13	Quick access **select** button, selects the channel's fast strip to the control surface.
14	Faders, give continuous adjustment of master output levels from +10dB to off (∞).
15	**conf.** section, assigns the configuration detail area to the GUI channel strip and also to the output channel strip on the control surface (see "Configuration controls" on page 298).
16	**dyn** section, selects the dynamics detail area to the GUI channel strip and also to the output channel strip on the control surface (see "Compressor and side chain" on page 301).
17	**eq** section, selects the EQ detail area to the GUI channel strip and also to the output channel strip on the control surface (see "EQ" on page 305).
18	Clicking anywhere within this section, provided it is not on a control, selects the mute, solo select and fader detail area to the GUI channel strip and also to the output channel strip on the control surface (see "Masters, solo and faders" on page 309).

GUI master channel strip

For the GUI displays showing the channel strip applicable to each master channel detail area, see "Output channel strip" on page 298.

Output fast strip

There are eight dual-channel output fast strips in the output bay's fast zone, which contain the output matrix mix masters.



Item	Description
1	**listen** LED, provides on/off indication (illuminated/extinguished) when listen is active in output detail area.
2	**EQ** switch, switches the EQ on/off.
3	**DYN** switch, switches the dyanmics on/off.
4	**TALK** switch (see "Comms" on page 318). If the **TALK/internal** switch in the **talk mic** section is on, these will illuminate (integral LED) to prompt the operator to select a bus that the talk signals should be routed to. These are also used to set up a talk group after pressing one of the **talk/osc routing** panel buttons.
5	**kvm switch** button, selects the screen, keyboard and mouse to one of the three sets of external KVM connections (see "Rear panel connections" on page 250). To operate this button, press it to switch it on (button illuminates) and, to switch it off, press it and hold down until its backlight extinguishes.
6	20-segment level meter, defaulting to monitor post-fader signal level.
7	**meters PRE** changeover switch, switches meters under global command, so that they show the level at the summing bus input point. This can also be carried out via the **pre** button in the **Meter Preferences** section of the GUI menu; see "Setting the meter preferences" on page 227.
8	Output channel LCD select button, selects left/right output channels, for example, for VCA routing functions or to have stereo aux mixes 'follow select' onto the bus area of the input channel strip. LCD backlight colour and panel text (output channel name) are user-configurable. Left channel name is always on top.
9	Yellow **auto safe** LED, illuminates to indicate that auto safe is on and channel has been removed from snapshot automation.
10	**MUTE** switch, mutes all post-processing signals leaving the output channel. Illuminates to confirm this action. In addition to scene recall it can also be remotely muted from auto-mute masters.
11	**mute safe** LED, illuminates if the mute has been removed from scene recall and auto-mute action.
12	**SOLO B** switch, changes the operation of the **SOLO** switch so that it routes signals to the Monitor B section of the console.
13	**SOLO** switch, activates signal routing to the Monitor A section of the console.
14	**fader safe** LED, illuminate if the fader has been removed from scene recall and control from VCA control group faders.
15	Quick access **select** button, selects the channel to the control surface (output fast zone).
16	Fader, gives continuous adjustment of output levels from +10dB to off (∞).
17	**conf.** section, assigns the configuration detail area to the GUI channel strip and also to the output channel strip on the control surface (see "Configuration controls" on page 298).
18	**dyn** section, selects the dynamics detail area to the GUI channel strip and also to the output channel strip on the control surface (see "Compressor and side chain" on page 301).

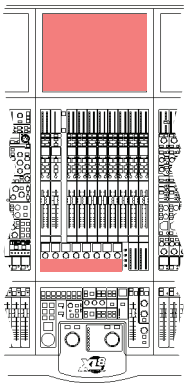
Item	Description
19	**eq** section, selects the EQ detail area to the GUI channel strip and also to the output channel strip on the control surface (see "EQ" on page 305).
20	Clicking anywhere within this section, provided it is not on a control, selects the mute, solo select and fader detail area to the GUI channel strip and also to the output channel strip on the control surface (see "Masters, solo and faders" on page 309).

GUI output channel strip

For the GUI displays showing the channel strip applicable to each matrix channel detail area, see "Output channel strip" on page 298.

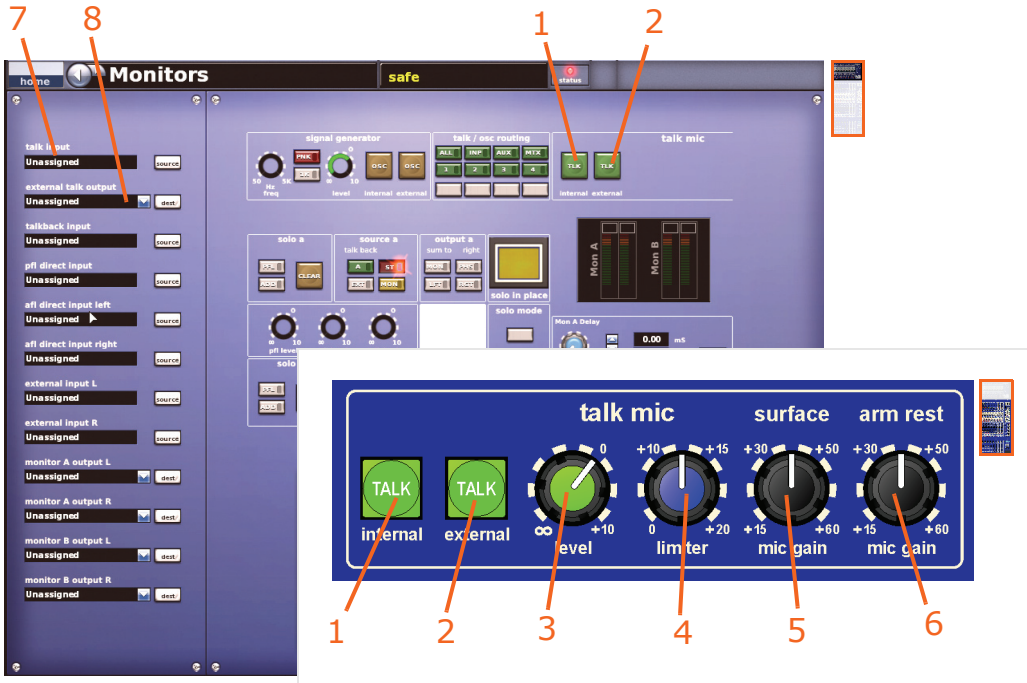
Comms

The comms section of the output bay deals with communications, or talk, and comprises: a **signal generator** section (containing a sinusoidal oscillator and pink noise generator); a **talk mic** section for control of a control surface-located talkback microphone; and a **talk/osc routing** section for sending signal generator signals and talk mic signals to buses within the console. The controls in this area are not affected by automation.



talk mic

The **talk mic** section contains the controls for both the internal talk mic and external talkback functions. Both functions utilise the compressor (limiter), which is in the microphone signal path, immediately before the talk level control.

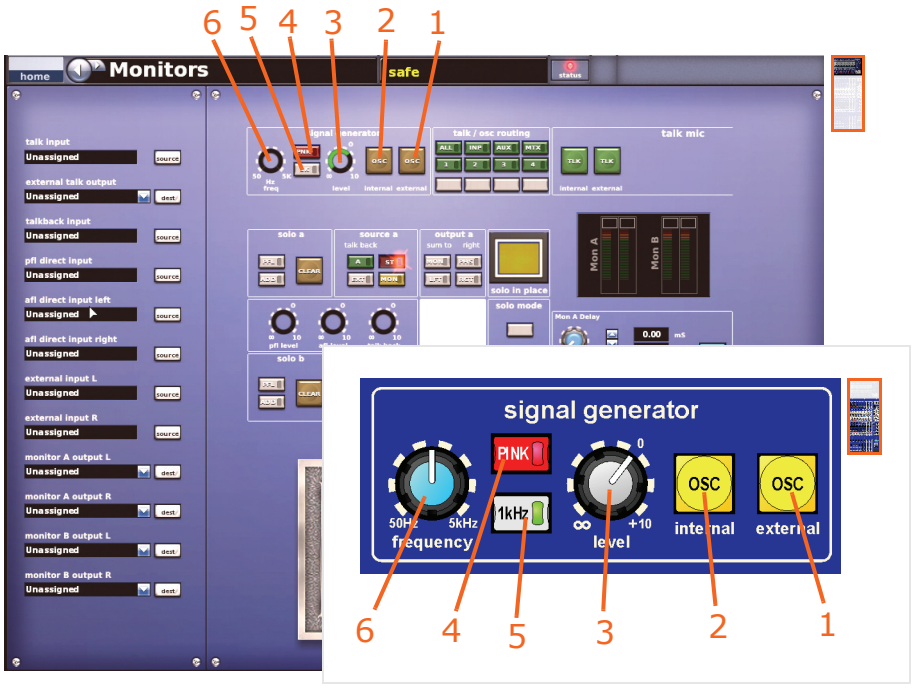


Item	*Description*
1	**TALK** (internal) switch, connects talk mic output to the control centre's internal talk system, while simultaneously dimming all local outputs by 20dB to prevent 'howl round'. The internal talk bus can then be mixed onto any of the control centre's buses by pressing the associated internal talk switches, or mixed onto a group of buses by activating an internal talk group (see "talk osc/routing" on page 321).
2	**TALK** (external) switch, connects talk mic output to talk external output XLR.
3	**level** control knob, gives continuous adjustment to the post-limiter signal from +10dB to off (∞).
4	**limiter** control knob, gives continuous adjustment of the peak limiter value from 0dB to +20dB.
5	**surface** (mic gain) control knob, provides continuous mic amplifier gain adjustment of the mic connected to the mix bay control surface (see "Insert controls and talk mic" on page 303). Range is +15dB to +60dB. Operates in conjunction with the peak limiter.
6	**arm rest** (mic gain) control knob, provides continuous mic amplifier gain adjustment of the mic connected to either of the front panel talk mic connectors (see "Front panel connections" on page 249). Range is +15dB to +60dB. Operates in conjunction with the peak limiter.
7	**talk input** field for displaying the talk internal source, which is selected using the adjacent **source** button.
8	**external talk output** field displaying the talk external destination, which is selected using the adjacent **dest** button.

The ouputs from the internal mic can be connected to the internal talk bus and/or the talk external XLR output (see "Comms signal flow" on page 357).

signal generator

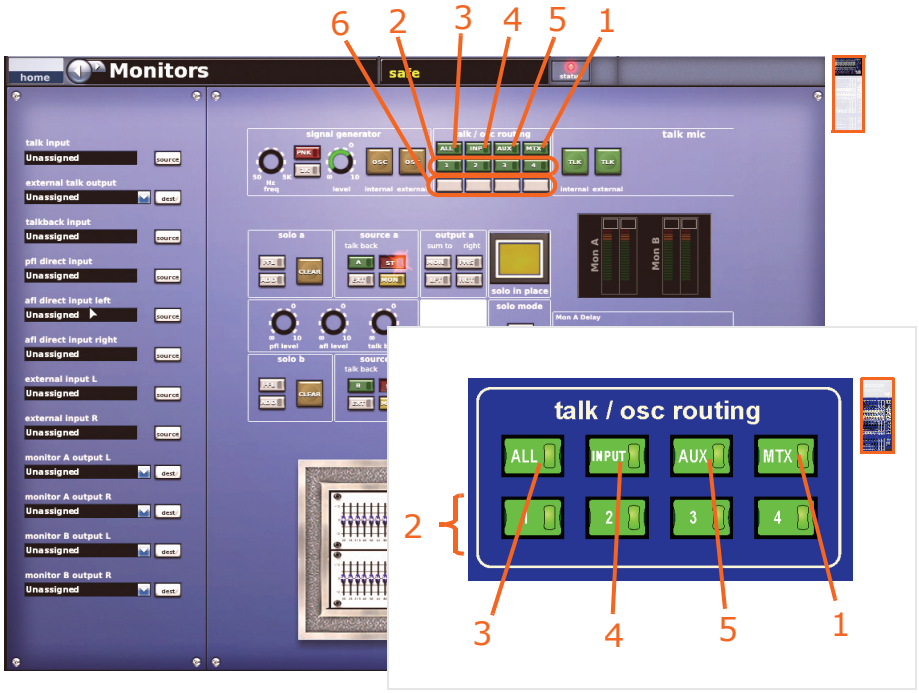
The **signal generator** section can output to pink noise or sine wave tone, and connect to the internal and external talk buses.



Item	*Description*
1	**OSC** (external) switch, connects signal generator output to talk external output XLR.
2	**OSC** (internal) switch, connects signal generator output to the control centre's internal talk and talk select buses. The internal talk bus can then be mixed onto any of the control centre's buses by pressing the associated internal talk switches, or mixed onto a group of buses by activating an internal talk group (see "talk osc/routing" on page 321).
3	**level** control knob, gives continuous adjustment of signal generator peak output signals from +10dB to off (∞).
4	**PINK** switch, overrides sinusoidal oscillator and converts output to pink noise.
5	**1kHz** switch, overrides the swept frequency control (**freq** control knob) and provides a fixed 1kHz tone.
6	**freq** control knob, gives continuous adjustment of the sinusoidal oscillator frequency from 50Hz to 5kHz.

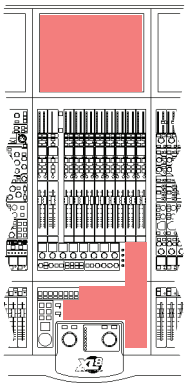
talk osc/routing

The **talk / osc routing**, or 'internal talk groups' section, contains eight talk group switches used for selecting the destination of the talk and OSC internal signals. Talk groups are configured in the GUI menu (see "Talk groups" on page 164).



Item	Description
1	**MTX** (matrix) switch, routes the talk/OSC internal signal to all matrices.
2	Four user-assignable talk group buttons (**1** to **4**). For details of how to program a talk group, see "Programming the groups" on page 166.
3	**ALL** switch, routes the talk/OSC internal signal to all outputs.
4	**INPUT** switch, routes the talk/OSC internal signal to the input section.
5	**AUX** switch, routes the talk/OSC internal signal to all auxes.
6	Four switches (GUI only) for quick access to the "Talk groups" on page 164.

Monitoring



To match the two-bus solo system, there are two monitor outputs, A and B. The monitor output controls *do not* have support from the screens and *are not affected by automation*. Monitor paths A and B are virtually identical in operation except that monitor A has a few additional features, for example, a fader level control. For more details, see "Monitors (A and B)" on page 131.

Analogue section of monitor has four balanced XLR inputs: Mon AL, AR, BL and BR (rear of XL8). These feed the four speaker XLRs and two headphone sets (see "KVM, monitor and synchronisation connector panel" on page 252). Monitor inputs are fed from line I/O module that contains digital solo source signals etc. converted to analogue, as selected on the control surface.

intercom

For more information on the intercom and for details of how to use the **phones** button, see Chapter 28 "Intercom".



Item	*Description*
1	The phones section allows console monitor audio (A or B) to be applied to the intercom headset in stereo. Although not part of the intercom system, this function is very useful if you want to listen to the intercom and console simultaneously, and does not affect intercom use. The **phones** button is used to select the monitor area you want to listen to and the two adjacent red LEDs **a** and **b** indicate this source; use this button with caution (see "Using the phones button" on page 234). Monitor level is controlled from either the **phones a** or **phones b** control knobs, as appropriate (see "monitor a and b outputs" on page 329).
2	The channel section allows selection of either intercom channel 1 or 2 for listening to, talking on or calling on. The **channel** button toggles between channels, as you can only select one channel at a time. LED indicators **1** or **2** illuminate to show which headphone channel is active.
3	**TALK** button is a dual operation, backlit button for switching talk on/off. A quick press will switch it on or off and a prolonged press will keep it switched on until it is released. This button enables the headset mic so that you can speak to other users on the intercom system. The mic amp has a limiter to control mic level.

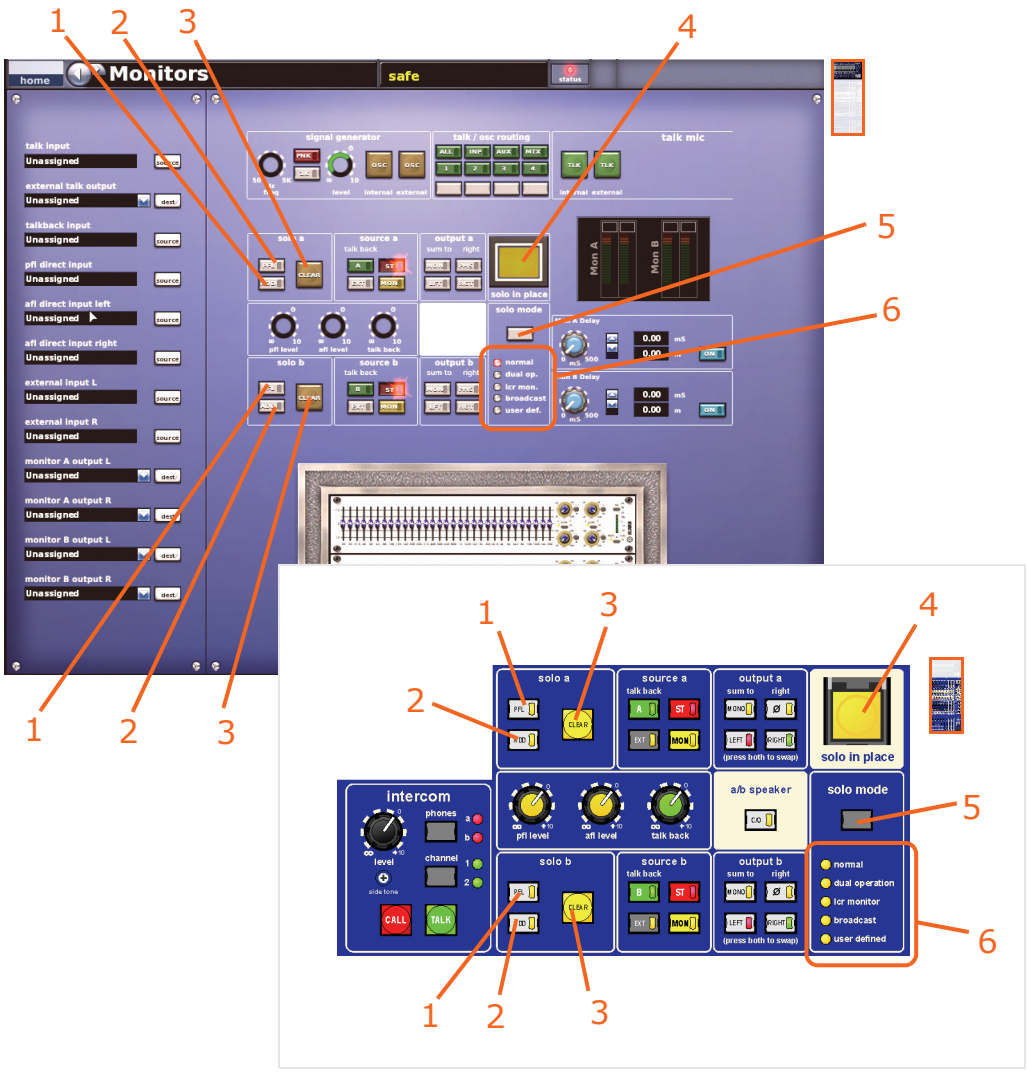
Item	*Description*
4	Press the **CALL** button when you want to speak to someone on the intercom. It sends a signal down the intercom line of the selected channel, which causes a red lamp, for example, on a belt pack, to flash. The **CALL** button transmits a 20kHz tone and, when other belt packs or another XL8 receive its call signal, its integral LED flashes at approximately 3Hz to 5Hz.
5	**side tone** control, for adjusting the amount of your voice you want to hear through your headset, as sometimes it is hard to talk with headphones on if you cannot hear yourself to some extent. The side tone's preset allows variation between 0dB and -30dB and does not affect the level of other users talking to you.
6	**level** control knob, adjusts level of signal being received by the intercom, which sets the audio level for the intercom headphones, but doesn't control the outgoing level to other users.

Solo system

solo a and **solo b** system sections allow solo signals to be selected independently for each monitor system (A and B). These can be selected as AFL (**PFL** extinguished), PFL (**PFL** illuminated), additive (**ADD** enabled) or interlock cancelling.

The monitor outputs can be configured for different uses (see Table 17 "Solo mode options" on page 325). Each of these modes changes the interleaving logic between differing areas of the monitor output. A solo mode select button scrolls through the possible options.

Additionally, there is a **solo in place** switch for activating the SIP function.



Item	*Description*
1	**PFL** switch, sends mono pre-fader listen (PFL) solo bus signals to headphones and local monitor outputs. With **PFL** switch disabled (LED extinguished), stereo AFL solo bus signals are sent to headphones and local monitor outputs. PFL and AFL levels are adjustable via the **pfl level** and **afl level** control knobs (see "afl, pfl and talk back" on page 328).
2	**ADD** switch, allows multiple channel access to solo buses. When solo add mode is off, pressing a solo switch cancels any currently active solos. Multiple solos, for example, stereo left and right signals, can be monitored in this mode, provided solo switches are pressed at approximately the same time. When solo add mode is on, auto-cancelling is defeated, which allows multiple channel or output soloing. In this mode, input solos have priority over output solos and VCA solos, and will temporarily override them. When input solo is cancelled, output solo or VCA solos will return.
3	**CLEAR** switch, illuminates when a solo switch is active in its monitor section and, when pressed, clears any solo switches in that section.
4	**solo in place** switch, used for setting the control centre to solo in place mode, where an input **SOLO** button press activates a mute of all other channels by temporarily overriding the primary source selection, assuming it is set to the appropriate monitor, A or B; the talk back remains unaffected. (The **MUTE** safe switch on each input channel - see page 268 - can be used to protect channels from this function, if required.)
5	Solo mode select button, for selecting the solo option. LED illuminates to left of option to show that it is selected.
6	**solo mode** section, for selecting one of the solo options (see following table).

Table 17: Solo mode options

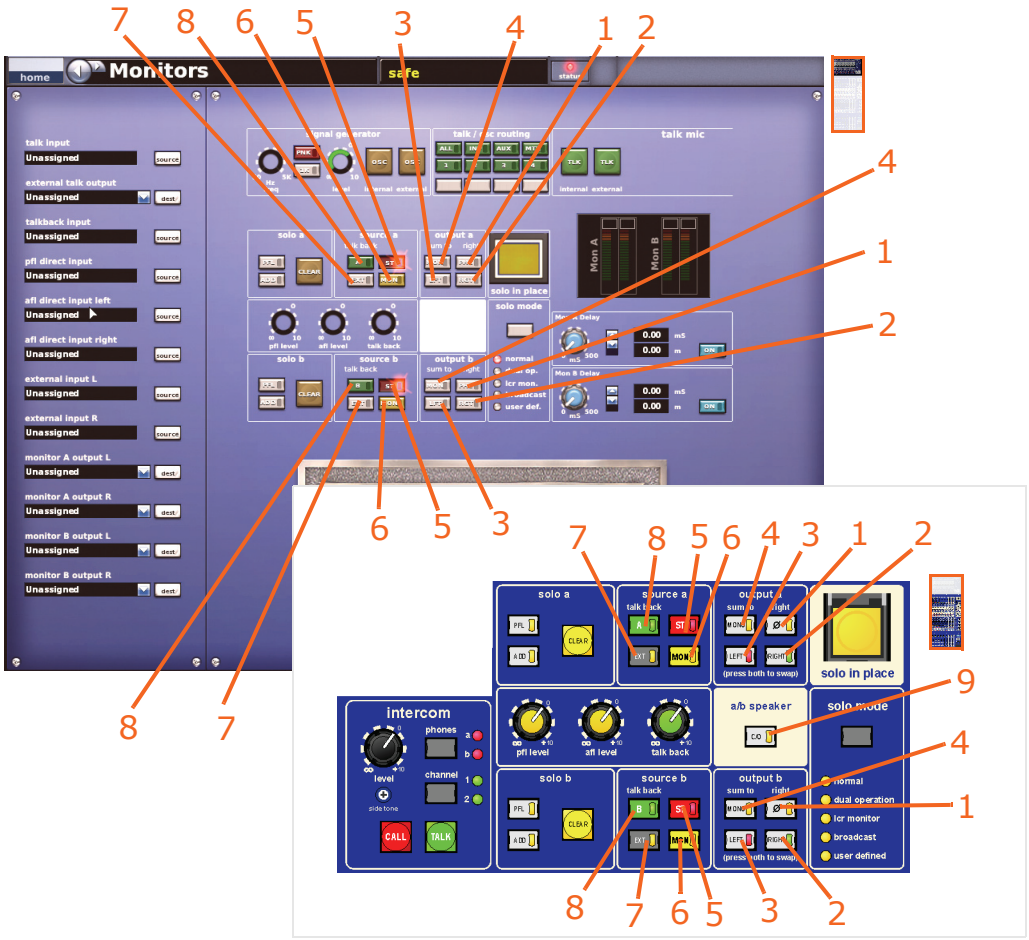
Option	*Description*
normal	Both solo systems, A and B, are active and behave as a single solo system. The **SOLO** and **SOLO B** buttons, when pressed, determine which monitoring system the soloed material is routed to.
dual operation	In dual operator mode, both solo systems, A and B, are totally independent of each other. The **SOLO B** button, in addition to routing the soloed material to monitoring system B, determines which set of PFL, ADD and CLEAR controls are applied to the solo.
lcr monitor	Left-centre-right monitor mode is similar to normal mode, but when nothing is being soloed the left and right masters are routed to the monitor A output and the mono master is routed to the monitor B output.

Option	*Description*
broadcast	Routes stereo masters to the monitor A output and activates all the solo B controls so that soloed material is routed to the monitor B outputs. This allows the master outputs to be continually broadcast (probably the on-air program), while the other material is soloed.
user defined	Allows the user to set up the monitoring system. These settings are recalled on return to this mode after using one of the other solo modes, for example, normal mode or broadcast mode. (User defined monitor settings are not stored in scenes or show files.)

source and output (a and b)

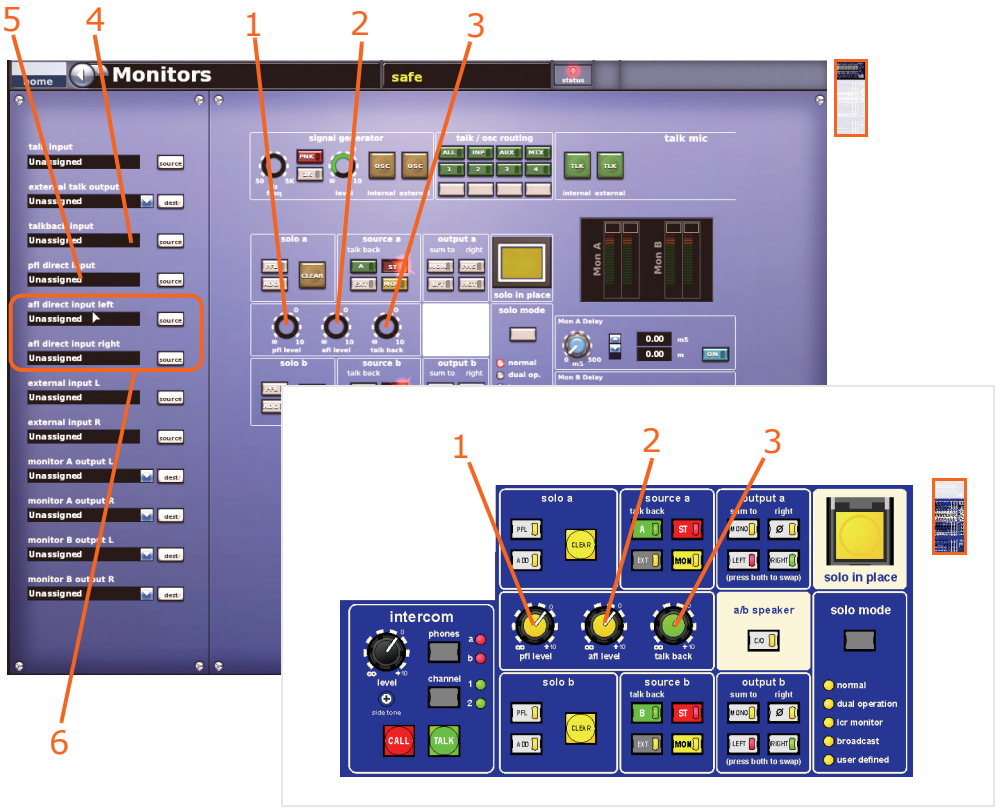
source a and **source b** sections contain monitor input selector switches. On both A and B systems, these define the source for the monitor section from the possible 'primary' choice of stereo master (**ST**), mono master (**MONO**) or external (**EXT**). Additionally, there are **talk back A** and **B** switches.

The monitor outputs, **output a** and **output b**, have some common control types for A and B (see "Monitors (A and B)" on page 131).



Item	*Description*
1	**Ø**/[**PHASE**] phase reverse switch, reverses phase of left or right monitor signals, selected using the **LEFT** and **RIGHT** switches below. On control surface, each has an integral LED that illuminates to show that switch is on.
2	**RIGHT** switch, routes the right monitor signal to both the left and right monitor speaker outputs.
3	**LEFT** switch, routes left monitor signal to both the left and right monitor speaker outputs.
4	**MONO** switch, sums left and right signals with 4.5dB loss.
5	**ST** switch, routes post-fader stereo master mix to stereo local monitor outputs.
6	**MON** switch, routes post-fader mono masters mix to stereo local monitor outputs.
7	**EXT** switch, routes stereo external input (two-track return etc.) to stereo local monitor outputs.
8	**A** and **B** switches, sum the talk back signals to the solo bus. The **talk mic** section (see "talk mic" on page 318) has a **level** control knob that is shared between the two monitor paths.
9	**a/b speaker** section has a **C/O** switch (control surface only) that switches between the A and B sets of speakers.

afl, pfl and talk back



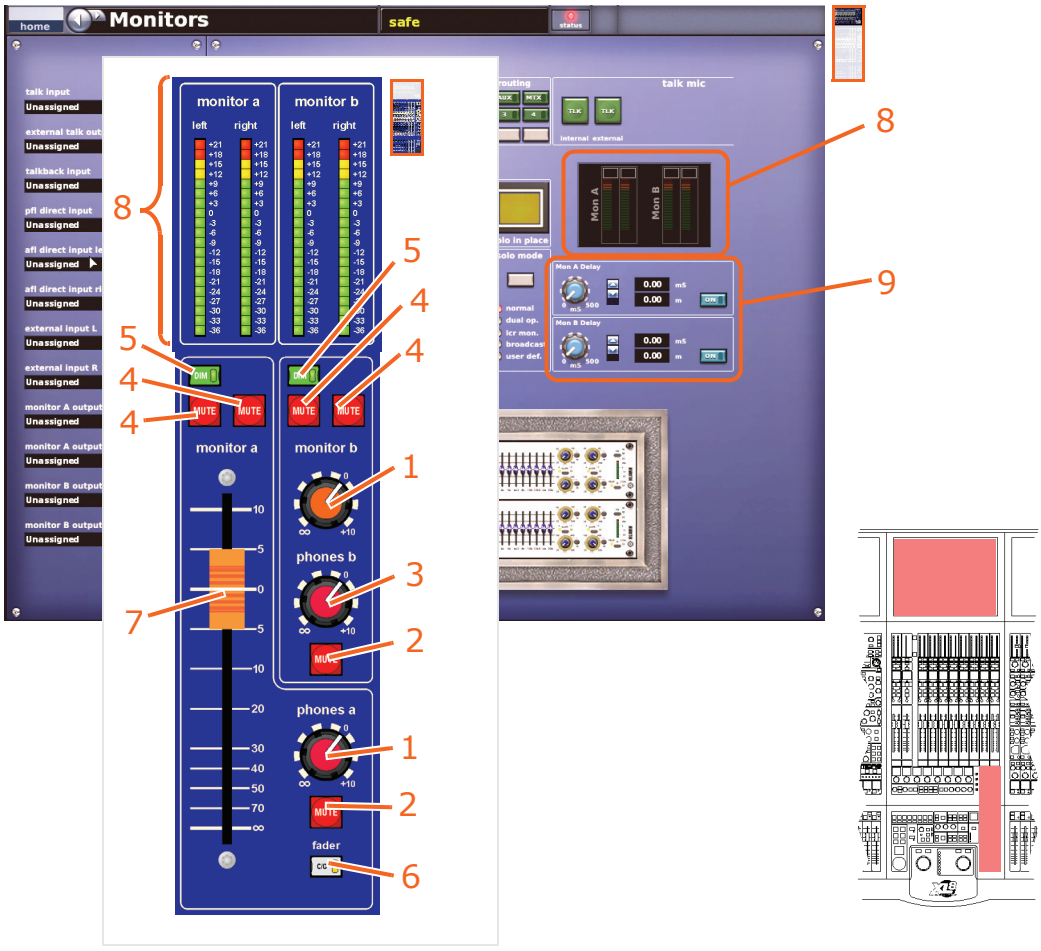
Item	*Description*
1	**pfl level** control knob. PFL audio bus may accept injected external signals. This control knob adjusts the pre-fader level in the range infinity (∞) to +10dB.
2	**afl level** control knob. AFL audio bus may accept injected external signals. This control knob adjusts the after-fader level in the range infinity (∞) to +10dB.
3	**talk back** control knob, adjusts the talk back level. Ranges from infinity (∞) to +10dB.
4	**talkback input source** selection field. The **source** button to the right opens the **Patching** screen.
5	**pfl direct input source** selection field. The **source** button to the right opens the **Patching** screen.
6	**afl direct input left** and **afl direct input right** selection fields. The **source** buttons to the right open the **Patching** screen.

monitor a and b outputs

The monitor output panel has two monitor paths, A and B, that control the output levels in their respective sections. The controls in this area do not have GUI support and are unaffected by automation.

monitor a and **monitor b** meters monitor the peak signal levels of stereo left and right for both monitor paths. The metering capabilities of both monitors are the same.

The GUI includes a delay section for each monitor output.

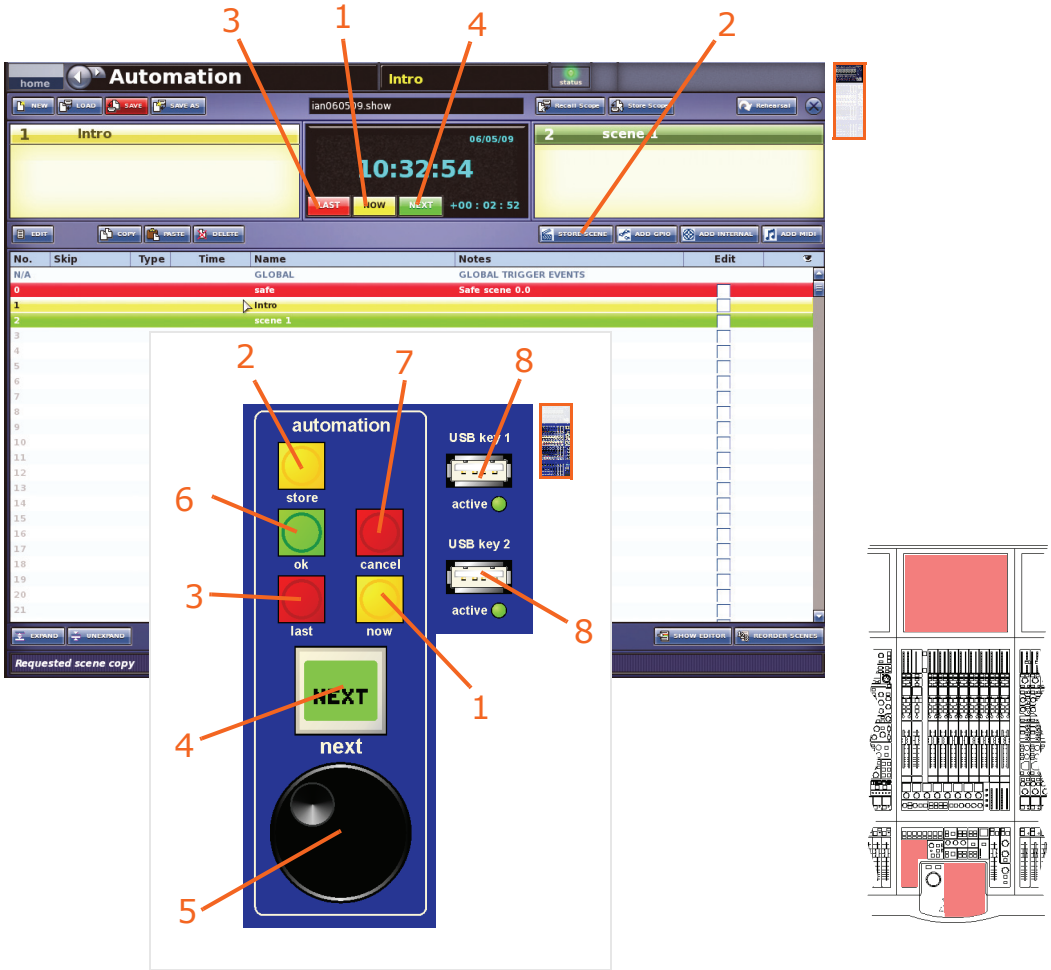


Item	*Description*
1	Control knob, for adjusting **monitor b** speaker level (equivalent to fader in **monitor a** section). Signal adjustment is from +10 to -∞.
2	Headphones **MUTE** button, mutes the headphone jack and monitor to intercom signal.
3	Control knob, for adjusting headphone level. Range is from +10 to -∞. Headphones A and B are both stereo with each having stereo **MUTE** buttons.
4	Left and right monitor output **MUTE** buttons, mute the respective monitor out signal paths.
5	**DIM** button, dims output level by 20dB on monitor speakers and headphones simultaneously.

Item	Description
6	**C/O fader** switch for switching control output of headphones to fader on **monitor a** section to allow fader control of headphones and also swaps **MUTE** buttons over for ease of use. Integral LED is illuminated when fader control is on and extinguished when fader control is off.
7	Non-automated fader for control of monitor A speaker level from +10 to -∞.
8	Stereo **left** and **right** peak level meters.
9	Monitor A and B delay sections to set the delay in their respective monitor output signal path. **ON** button switches delay on for that signal path and the amount of delay is adjusted by the control knob or spin buttons. The amount of delay is displayed in milliseconds (ms) and metres (m).

Automation

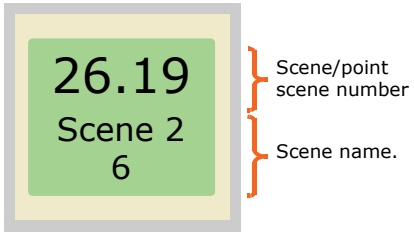
Automation is predominantly a GUI-only function that allows complex editing of scenes and the creation of show files via the GUI menu. The control surface provides limited control via the automation section, which facilitates fast store/recall operation during show time and rehearsals. The buttons in this section are context-sensitive and illuminate when enabled. For full automation details, see Chapter 20 "Scenes And Shows (Automation)".



Item	Description
1	**now**/[**NOW**] button, recalls the currently highlighted scene in the cue list, clearing any unsaved adjustments.
2	**store**/[**STORE SCENE**] button, opens the **Store Scene** window (see "To create a new scene using the current settings" on page 105), which lets you store the current settings to the currently selected scene.
3	**last**/[**LAST**] button changes scene selection to previous scene (highlighted in red) in the cue list.
4	See "next LCD button" on page 331.
5	Jog wheel quickly dials the scene numbers beyond the capability of the **last**/[**LAST**] and **next**/[**NEXT**] buttons by scrolling the 'now' scene through the cue list one scene/point scene at a time.
6	**ok** button confirms an action (illuminates to prompt when this is necessary).
7	**cancel** button cancels a store operation and closes the "Store" window (illuminates to prompt when this button is active).
8	**USB key 1** and **USB key 2** sockets, mainly for inserting USB memory sticks to facilitate the import/export of show files and presets, and for upgrading the system.

next LCD button

The **next** LCD button in the **automation** section has two modes of operation—as a 'next' button and, when using the jogwheel, as a 'now' button. As a 'next' button it will display "NEXT" when there is another scene in the cue list — of higher value — that you can move to. When "End" is displayed the current scene is the last in the cue list. However, when using the jog wheel the **next** button's display changes to provide scene/point scene information (as shown right).



Chapter 35: GUI Menu

The GUI is a very powerful multi-functional tool that forms the core of the XL8 Control Centre. It gives you total control and monitoring of the operating environment, enhances control surface operation (you can even operate the XL8 by GUI-only) and allows the use of internal and external devices. To facilitate this the GUI incorporates a simple-to-use GUI menu.

The GUI menu presents you with a list of options from which to choose, depending on your requirement. The following lists some of the functions that the GUI menu provides:

- **Configuration** Configure the routing, associations and the names and colours of channels, groups, graphic EQs and internal effects, set up for multi-console operation, set up the connected devices etc.
- **Navigation** Select the channels, buses and groups you want, go quickly to a GUI screen display, go to recently opened screens, move through the scenes in a show and go to the patching screens you want.
- **Management** Manage show files (internal and external), automation and the monitoring system.
- **User and operating preferences** Adjust GUI screen brightness and contrast, select delay compensation, select fader flip etc.
- **Information** View current software information.
- **Overcoming a faulty GUI screen** Should a GUI a screen fail you can re-map any of the others to a different bay.
- **Diagnostics** Check at-a-glance how your system is performing.
- **Security** Lock the screens to prevent unauthorised access.
- **Shutdown sequence** Shut down the control centre properly.
- **Upgrade the software** Install the very latest version (or any previous version) of XL8 software.

For details of how to access the GUI menu, see "Using the GUI menu" on page 52.

GUI menu flowchart

The GUI menu and all of its available submenus are shown in Figure 42 "GUI menu flowchart" on page 334.

Icons to the left of the options help to identify the option type and aid navigation. A black triangle to the right of a menu option shows that it has a submenu.

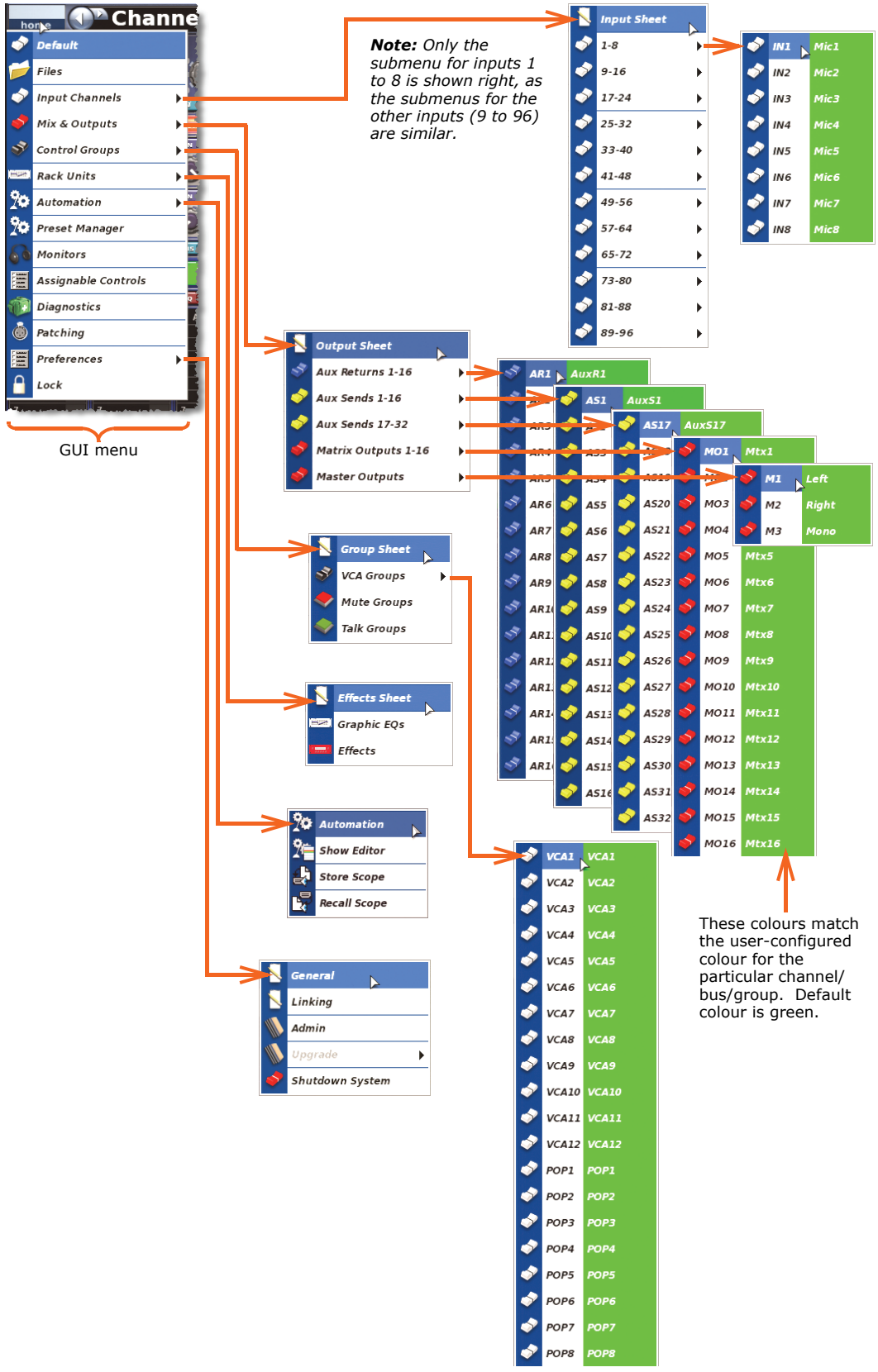


Figure 42: GUI menu flowchart

GUI menu options

The GUI menu (see "GUI menu flowchart" on page 333) can be accessed from any GUI screen. On opening the GUI menu, you are presented with a main list of options that open specific screens or submenus, as shown in the following table.

You can access some of the screens directly from the primary navigation zone (see "Opening a GUI menu screen via the control surface" on page 52).

Option	*Description/function*
Default	Opens the default display for the GUI screen you are operating (see "GUI" on page 26). If the GUI screen has been mapped to the other bay, its default screen will match that bay (see "Mapping a GUI screen to another bay" on page 388).
Files	Opens the **Files** screen (see "Managing show files on the Files screen" on page 193).
Input Channels	Input channel option, which opens a submenu with the following options: • ***Input Sheet*** — lets you configure the 96 input channels (see "Configuring the channels, groups and internal units" on page 231). • ***1-8*** through to ***89-96*** — click one to open the associated bank of inputs, or open the submenu. Each submenu contains the eight single inputs belonging to its bank; click on one to select its channel.
Mix & Outputs	Output channel option, which opens a submenu with the following options: • ***Output Sheet*** — lets you configure the output channels (see "Configuring the channels, groups and internal units" on page 231). • Output channel options — click one to open the associated bank of outputs (returns, auxes, matrices or masters), or open the submenu. Each submenu contains the 16 single outputs (only three for masters) belonging to its bank; click on one to select its channel.
Control Groups	Control groups (VCA/POP, auto-mute and talk) option, which opens a submenu with the following options: • ***Group Sheet*** — lets you configure each group (see "Configuring the channels, groups and internal units" on page 231). • ***VCA Groups*** — click to open the VCA Groups screen, or open the submenu, which contains an option each for the 12 VCA groups and eight POP groups; click on one to select its group. See "VCA/POP groups" on page 157. • ***Mute Groups*** — click to open the **Mute Groups** screen (see "Auto-mute (mute) groups" on page 162). • ***Talk Groups*** — click to open the **Talk Groups** screen (see "Talk groups" on page 164).

Option	*Description/function*
Rack Units	Control groups (VCA/POP, auto-mute and talk) option, which opens a submenu with the following options: • ***Effects Sheet*** — lets you configure each of the 16 GEQ and 16 internal effect 'virtual' rack units (see "Configuring the channels, groups and internal units" on page 231). • ***Graphic EQs*** — opens the **Graphic EQs** screen (see "About the Graphic EQs screen" on page 135). • ***Effects*** — opens the **Effects** screen (see "About the Effects screen" on page 143).
Automation	Automation option, which opens a submenu with the following options: • ***Automation*** — opens the **Automation** screen (see Chapter 20 "Scenes And Shows (Automation)" on page 183). • ***Show Editor*** — opens the **Show Editor** screen (see "Show editor" on page 107). • ***Store Scope*** — opens the **Store Scope** screen (see "About the Recall Scope screen" on page 195). • ***Recall Scope*** — opens the **Recall Scope** screen (see "About the Recall Scope screen" on page 195).
Preset Manager	Opens the **Preset Manager** screen (see Chapter 24 "User Libraries (Presets)" on page 215).
Monitors	Opens the **Monitors** screen (see "Monitoring" on page 322).
Assignable Controls	Opens the **Assignable Controls** window (see Chapter 19 "Assignable Controls (I Zone)" on page 169).
Diagnostics	Opens the **Diagnostics** screen (see "About the Diagnostics screen" on page 384).
Patching	Opens the **Patching** screen (see Chapter 8 "Patching" on page 67).
Preferences	Preferences option, which opens a submenu with the following options: • ***General*** — opens the **Preferences** screen (see Chapter 27 "Changing The User Settings" on page 227). • ***Linking*** — opens the **Store Scope** screen (see "To set the global default stereo linking options" on page 118). • ***Admin*** — opens the administrator's window. This is a supervisor-only function, which is accessed by typing in a password. • ***Upgrade*** — opens a list of TAR files from which to choose when updating the XL8's software (see "Updating your system" on page 402). • ***Shutdown System*** — opens the shutdown message window, which initiates an expedient shutdown of the XL8 (see "To switch off the XL8 Control Centre" on page 41).
Lock	Locks the GUI (see "Security (locking mode)" on page 113).

Appendices

Appendix A: Application Notes

This chapter provides more in-depth information on certain areas and function of the XL8.

Spatial imaging system (SIS™)

Although conventional consoles can be used for three channel mixing, the methods for doing so are complicated and unorthodox. This forces the engineer to work in unaccustomed ways, limiting creative flexibility, and making use by visiting operators impractical. The spatial imaging system (SIS™) has been developed to overcome this.

Backing vocalists can be panned slightly towards the centre cluster to improve intelligibility, while keeping the featured vocal 'front and centre'.

Musical instruments can be placed in a conventional mix then easily switched to the centre for solos.

In theatrical productions, SIS™ allows you to pan an actor's voice across three channels following their on stage movements. In stereo-only productions, the centre output can be used to provide a mono-to-mix-base feed activating a single 'left + right to centre' switch.

The ability of SIS™ to feed centre-panned signals equally to both left and right outputs, as well as the centre, is particularly useful for distributing the load of high energy, centre-panned sounds across all FOH loudspeaker arrays.

XL8 compressor modes (dynamic)

This section aims to provide an understanding of the compressor modes contained within the XL8 Control Centre.

Description

The XL8 compressors have five primary operating modes (only four on inputs). These change the signature (or shape) of the attack and release envelope curves, interactions and timings. Before dealing with this in detail, some of the generic terms are defined and explained:

Threshold

The threshold adjusts the operating point of the compressor. Signals that go over this point, or *over-threshold*, will be affected by compressor action. Signals that stay below threshold will not trigger any compression although they may still be affected by compression releases from previous over threshold signals.

Ratio

The compression ratio control provides control of the amount of compression that is applied to over-threshold signals. This is expressed as a ratio of signal level changes from input to output. For example, when the compressor is set to 2:1, every 2dB input level change will only generate a 1dB output level change (assuming the signal levels are over threshold).

Attack

The attack control adjusts the time taken for the compressor to respond to an over-threshold signal. The shape of the attack can be selected from one of the five mode combinations mentioned above, making the compressor easily adaptable for a wide number of creative and corrective applications.

Release

The release control adjusts the time the compressor takes to recover after the programme material falls back below threshold. Both attack and release also respond to changes in programme level that remain over-threshold. For example, a signal that reduces in level but remains above threshold will still trigger a release, but in this case it will only be a partial release - because the compressor will still be required to generate gain reduction, but now, as appropriate for the new lower signal level.

Knee

Most compression sounds more natural in soft knee mode. Soft knee compression blurs the distinction between over-threshold and under-threshold signals, such that signals that are a long way below threshold remain unaffected by compression, and signals that near the threshold get compressed, but at greatly reduced ratios. When signals are just over-threshold the compressor ratios are still somewhat reduced; it is only when signals go well over threshold that the full ratio compression is applied. When using a harder knee setting the compressors operate in a more clinical way with a more defined transition between under-threshold and over-threshold; this is better suited to limiting style compression.

More (output compressors only)

The compressors are capable of producing very subtle and natural sounding compression primarily because of special, sonically developed, algorithms. The **MORE** switch disables these, in order to generate aggressive compression artefacts for effects purposes.

Gain

The gain control provides adjustment of the *make up* gain so that the level of the outgoing compressed signal can be matched to the incoming uncompressed signal. It can also be used to drive the *clipper* hard (see "Soft clip level" on page 340) to produce more pronounced effects.

Side chain filter

A band pass filter is provided that acts on the side chain signals. This can be used to make the compression frequency selective. The controls for this are frequency, adjustable from 40Hz to 16KHz, and bandwidth selectable as wide medium or narrow. Additionally, there is a listen function that places the filtered side chain onto the solo bus and a side chain filter in to activate or eliminate the filter action.

Soft clip level

When compression is used creatively with slower attack times, it is possible to generate very large peak signals that can eat up headroom. When *soft clip* is activated the compressor output (post make up gain) is fed through a final fast acting soft clipper circuit. This adds progressive gain reduction to any signals that exceed a threshold set by the clip *level* control. When set sparingly this can recover 3dB to 6dB of headroom without introducing any undesirable audio artefacts. (In the past, limiters have been employed for this function but their time constants are invariably intrusive on the programme.) The high-speed nature of the soft clipping introduces no time related artefacts. This is because it only acts during the transient peaks, when it produces predominantly third harmonic distortion, which is very musical in nature.

Compressor envelope modes

The five envelope *modes*, or *signatures*, are the key to the sonic character of the XL8 compressors, and they allow adjustment far beyond the normal capabilities of simple attack and release settings. They largely fall into two application types:

1. Compressors that are good at capturing and controlling dynamic transients: corrective mode and vintage mode.
2. Compressors that emphasise dynamic transients and provide creative control of levels within a mix: adaptive, creative and shimmer modes.

The Vintage and Adaptive compressors tend to morph a little between these two categories depending on threshold control settings. This makes them easy to use intuitively with minimal fine-tuning of the envelope control settings.

Further refinement and enhancement of the envelope modes is provided by combination settings of the three-position **KNEE** switch and the **MORE** switch. It is best to understand the operation of these two functions in more depth before looking at the detail of the compressor signature switching.

Knee

The soft knee curves behave in a traditional way to blend the compression ratio around the threshold setting (as described above), but more importantly they also have a significant effect on the attack envelope shapes. The soft knee typically slows down attack speed on signals in the knee area, which is desirable for natural sounding compression because it compliments the reduced ratio effect of the soft knee. This produces very gentle compression in the knee region.

The **KNEE** switch has three settings: hard (4dB); medium (12dB): and soft (40dB). In hard setting the compressor still retains some soft knee characteristics. This is because the implementation of an extremely hard knee produces undesirable sounding distortion on low frequency programme material.

More

As a default (and even though they are different) all the compressor signatures have been designed to sound as pure and natural as possible. To achieve this, many of the undesirable artefacts that are commonplace amongst analogue compressors have been eliminated; most notably the negative effects of soft knee and/or high signal amplitude. Both of these can artificially speed up release times in a way that is difficult to correct by envelope adjustment because it only occurs on specific parts of the programme. This can normally be heard as pumping or distortion, depending on the setting of the envelope controls.

There are circumstances when this correction process is not desirable and the **MORE** switch can be used as an override to get greater *character* from the compressor signatures. This tends to accentuate the differences between them and emphasises transients as well as increasing pumping and distortion. This can notably change the sound of the programme as well as providing dynamic control.

Corrective mode (exponential peak - fast)

This is a peak sensing compressor (like many older designs) with exponential attack and release. It produces aggressive compression that gives good fast control and/or limiting of dynamic material. It can be used to add colour to low frequency signals (especially if used in conjunction with **MORE**) making it ideal for controlling extremely dynamic instruments like the bass guitar. The compressor tends to sound best with fast attack time settings that capture transients and with release adjusted to taste to either emphasise or minimise distortion and pumping effects.

Adaptive mode (exponential RMS - accurate)

This is a root-mean-square (RMS) sensing compressor with exponential attack and release. The RMS averaging process interacts with the attack and release to produce a very adaptive envelope character. This allows faster attacks on large (over-threshold) signal changes and produces slower attacks on small signal changes, regardless of attack time setting. The attack control is still active, allowing some user intervention although the adaptive nature makes envelope control setting fairly non-critical. The compressor is therefore very fast and simple to set up on most programme material. It is also sonically accurate and works well for both compression and limiting of vocals and many other sources. The most natural sounding compression is normally achieved with *soft knee* settings.

Creative mode (linear peak - slow)

This is a peak sensing compressor with linear (dB rate) attack and second order release. The compressor is very transparent, providing some dynamic control but without unduly affecting the intentional dynamic content of the source material. The linear attack provides a constant rate of attack, such that large changes in programme signal level take longer to become compressed than smaller changes. Adding *soft knee* noticeably delays these attacks, which can be particularly useful on drums where compression can be applied to emphasise transients giving more punch while retaining a good deal of artistic dynamic from the drummer.

The compressor normally sounds best with slower attack time settings, when it can be used on difficult instruments, such as the acoustic guitar, with relatively fast release to keep equal perceived loudness within a mix without producing excessive flutter or distortion.

Vintage mode (adaptive peak - bright)

This is a peak sensing compressor with a partially adaptive nature. It produces extremely subtle attack and release curves during the onset of compression that are largely independent of the envelope control settings. However, as it is driven harder, that is, signals are further over-threshold, the attack and release times become more aggressive and gradually return to manual control so the operator can optimise the capture (or otherwise) of larger transients etc. The peak sensing algorithm intentionally increases harmonic overtones during compression, which adds a *valve-like* brightness and sparkle to the programme, producing extremely natural and lively sounding compression of acoustic instruments.

Shimmer mode (overshoot peak - slow) - output only

This is a peak sensing compressor with an exponential release and unusual second order attack character that tends to *overshoot*. When used in conjunction with **MORE**, the overshoot is significantly extended and the compressor has a tendency to bounce in and out of compression.

If used sparingly, the compressor sounds very soft and natural and can provide additional control of material that already has a fairly low dynamic content. It can sound very transparent on vocals where it retains a good degree of life in the performance.

If used at higher ratios with slow attack and fast release times, the compressor can produce a very soft bouncy sound character. Addition of the **MORE** switch accentuates this, producing shimmering effects and giving dynamic content (and punch) back to overly compressed instruments, such as a heavily distorted electric guitar.

XL8 input channel EQ modes

This section aims to provide an understanding of the input channel EQ modes contained within the XL8 control centre.

Basic specification

The XL8 input EQ comprises four bands: treble; hi mid; lo mid; and bass. The default operation for all four sections is full parametric sweep (peak), with the following controls:

- **Gain:** continuous adjustment of boost and cut from + 16dB to - 16dB with a 0dB centre detent.
- **Width:** continuous adjustment f bandwidth from 0.1 to 3.0 octaves (this only operates in bell mode for Bass and Treble).
- **Treble:** continuous adjustment of the frequency range that the treble equaliser acts on from 1kHz to 25kHz.
- **Hi mid and lo mid:** hi mid frequency control gives continuous adjustment of the frequency range that the hi mid equaliser acts on from 320Hz to 8kHz. Lo mid frequency control gives continuous adjustment of the frequency range that the lo mid equaliser acts on from 80Hz to 2kHz.
- **Bass:** continuous adjustment of the frequency range that the bass equaliser acts on from 16Hz to 400Hz.

The treble EQ band can be switched from bell to any of three other shelving modes: Soft; Classic; and Bright.

The bass EQ band can be switched from bell to any of three other shelving modes: Warm; Classic; and Deep.

Description

The difference between the shelf filters is subtle and, if you do not have time to experiment, it is probably best to use classic because this is the best all round filter. However, when you do have time to experiment you may find the other types each have their uses. The minimum harmonic types, and in particular the bass, can sound very natural, even with very aggressive EQ, but the psycho-acoustic principles that they operate on do not always work so well on multiple source or pre-mixed material.

Soft treble

The soft treble response provides a very gentle gradient between EQ'd and non-EQ'd frequency areas. This produces the absolute minimum of phase shift but does not provide much differentiation, thus frequencies outside the area of interest are often unintentionally EQ'd. This is best used to provide gentle shaping of pre-mixed material.

Classic treble

The classic treble response provides a much steeper gradient between EQ'd and non-EQ'd frequency areas, as made famous by previous Midas consoles like the XL4. This provides better differentiation and minimal phase shift, but there is some undershoot error, that is, when boosting the treble, the mids are slightly cut and vice versa. This is the best all round EQ and especially effective when microphones are covering multiple sources.

Bright treble

The bright treble response provides a slightly steeper gradient than the classic and it is uniquely shaped to provide minimum harmonic disruption to the EQ'd material. As for the classic EQ, this provides better differentiation and minimal phase shift, but now there is no undershoot error corrupting the mids. This is best used on single source material and especially good for acoustic performances.

Warm bass

The warm bass response provides a very gentle gradient between EQ'd and non-EQ'd frequency areas. This produces the absolute minimum of phase shift, but does not provide much differentiation, thus frequencies outside the area of interest are often unintentionally EQ'd. This is best used to provide gentle shaping of pre mixed material.

Classic bass

The classic bass response provides a much steeper gradient between EQ'd and non-EQ'd frequency areas and is modelled on the XL4. This provides better differentiation and minimal phase shift, but there is some undershoot error, that is, when boosting the bass, the mids are slightly cut and vice versa. This is often desirable on bass EQ and it is the best all round, general purpose EQ curvature.

Deep bass

The deep bass response provides a slightly steeper gradient than the classic and it is uniquely shaped to provide minimum harmonic disruption to the EQ'd material. As for the classic EQ, this provides better differentiation and minimal phase shift, but there is no undershoot error. Powerful boost/cut can be used that still sounds very natural and does not corrupt the mids. This is best used on single source material.

XL8 output channel EQ modes

This section aims to provide an understanding of the output channel EQ modes contained within the XL8 control centre.

Basic specification

The XL8 output EQ comprises six bands strategically positioned at certain frequencies ranging from the low end (bass) to the high (treble) of the frequency band. The default operation for all six sections is full parametric sweep (peak), with the following controls:

- **Gain:** continuous adjustment of boost and cut from + 16dB to - 16dB with a 0dB centre detent.
- **Width:** continuous adjustment of bandwidth from 0.1 to 3.0 octaves.
- **Frequency:** continuous adjustment of the frequency range that the band EQ acts on from 16Hz to 25kHz.

Band 1 can be switched from bell to any of three shelving modes: warm; high pass filter 6dB; and high pass filter 12dB.

Band 2 can be switched from bell to high pass filter 24dB shelving mode.

Band 6 can be switched from bell to any of three shelving modes: soft; lo pass filter 6dB; and lo pass filter 12dB.

Description

Soft (treble)

The soft treble response provides a very gentle gradient between EQ'd and non-EQ'd frequency areas. This produces the absolute minimum of phase shift but does not provide much differentiation, thus frequencies outside the area of interest are often unintentionally EQ'd. This is best used to provide gentle shaping of pre-mixed material.

Warm (bass)

The warm bass response provides a very gentle gradient between EQ'd and non-EQ'd frequency areas. This produces the absolute minimum of phase shift, but does not provide much differentiation, thus frequencies outside the area of interest are often unintentionally EQ'd. This is best used to provide gentle shaping of pre mixed material.

High pass filter (HPF)

The HPF attenuates (not boosts) all frequencies below a certain level (cut-off frequency) while allowing all those above it to pass through. The harshness or smoothness with which the sound is removed beyond this point is determined by the dB/octave, with 6dB being the most common. The HPF is generally used to take rumble or hum out of any sound source, but may also produce a sound effect by manipulation of the controls.

The XL8's high pass filters have gain roll off before the corner frequency, which is variable.

Lo pass filter (LPF)

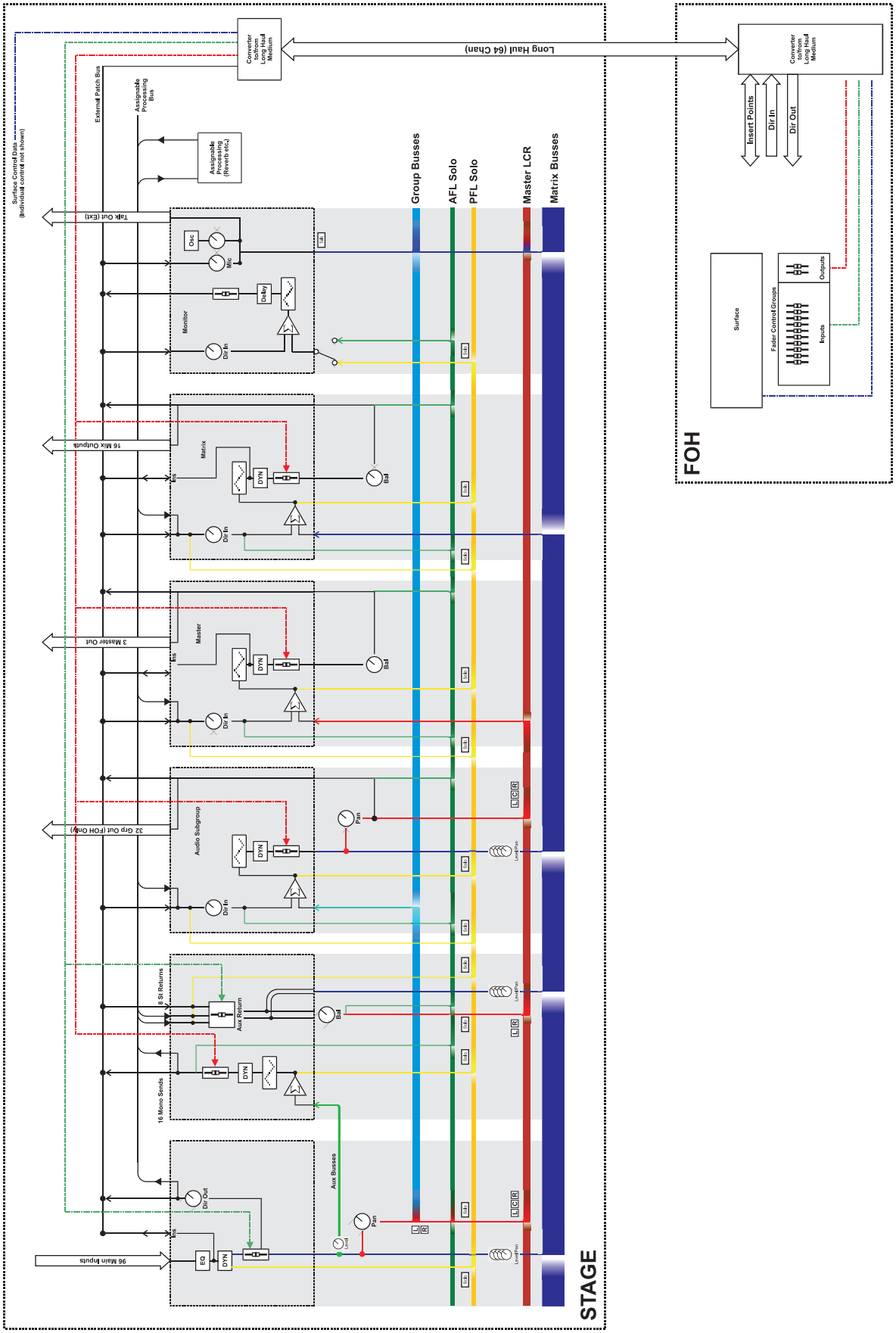
The LPF attenuates (not boosts) all frequencies above a certain level (cut-off frequency) while allowing all those below it to pass through. The harshness or smoothness with which the sound is removed beyond this point is determined by the dB/octave, with 6dB being the most common. The LPF is generally used to reduce noise in quiet passages or to take the *fizz* off any source with excessively high frequencies, but may also produce a sound effect by manipulation of the controls.

The XL8's low pass filters have gain roll off after the corner frequency, which is variable.

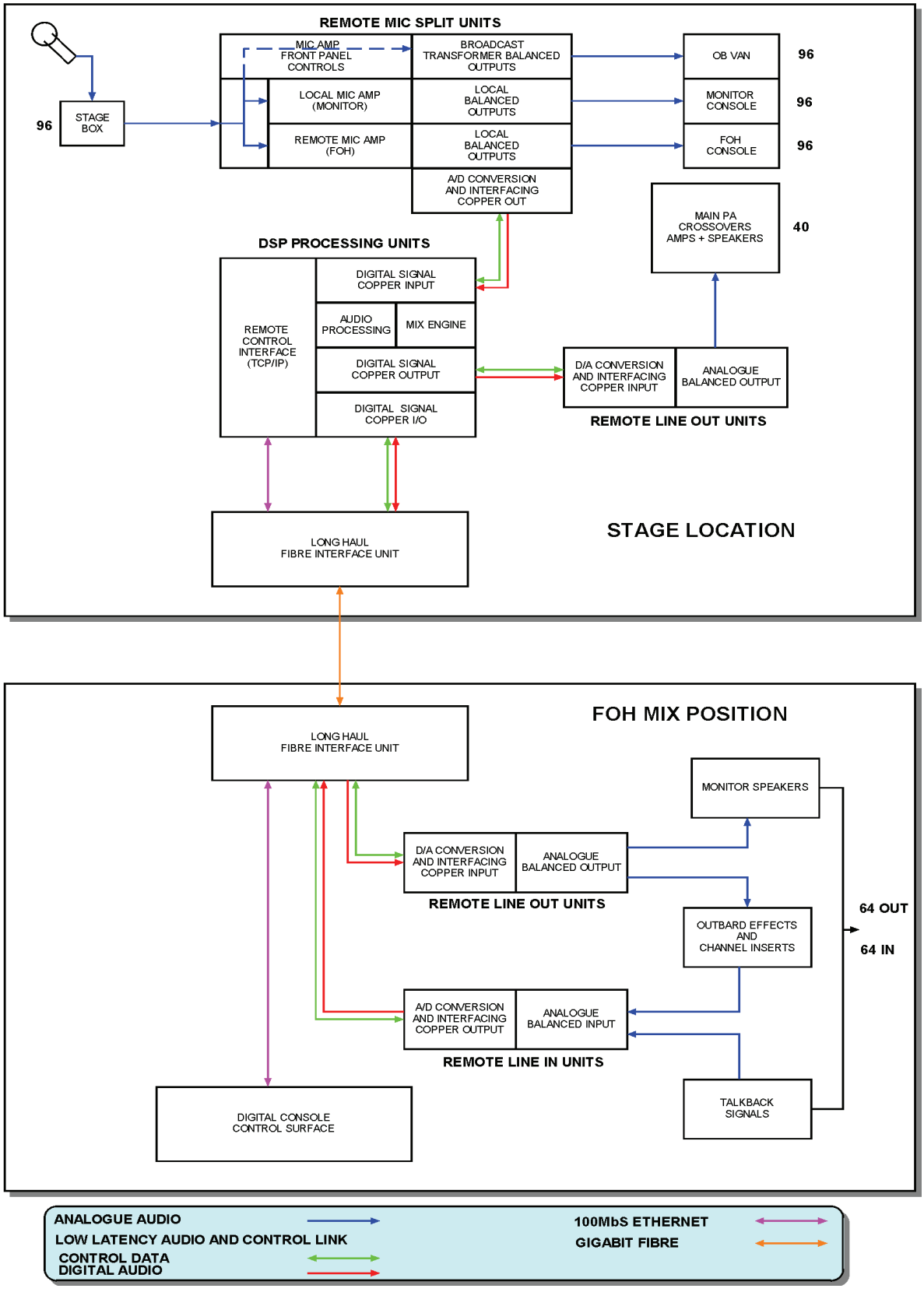
Appendix B: Functional Block Diagrams

This chapter contains the XL8 signal path diagrams.

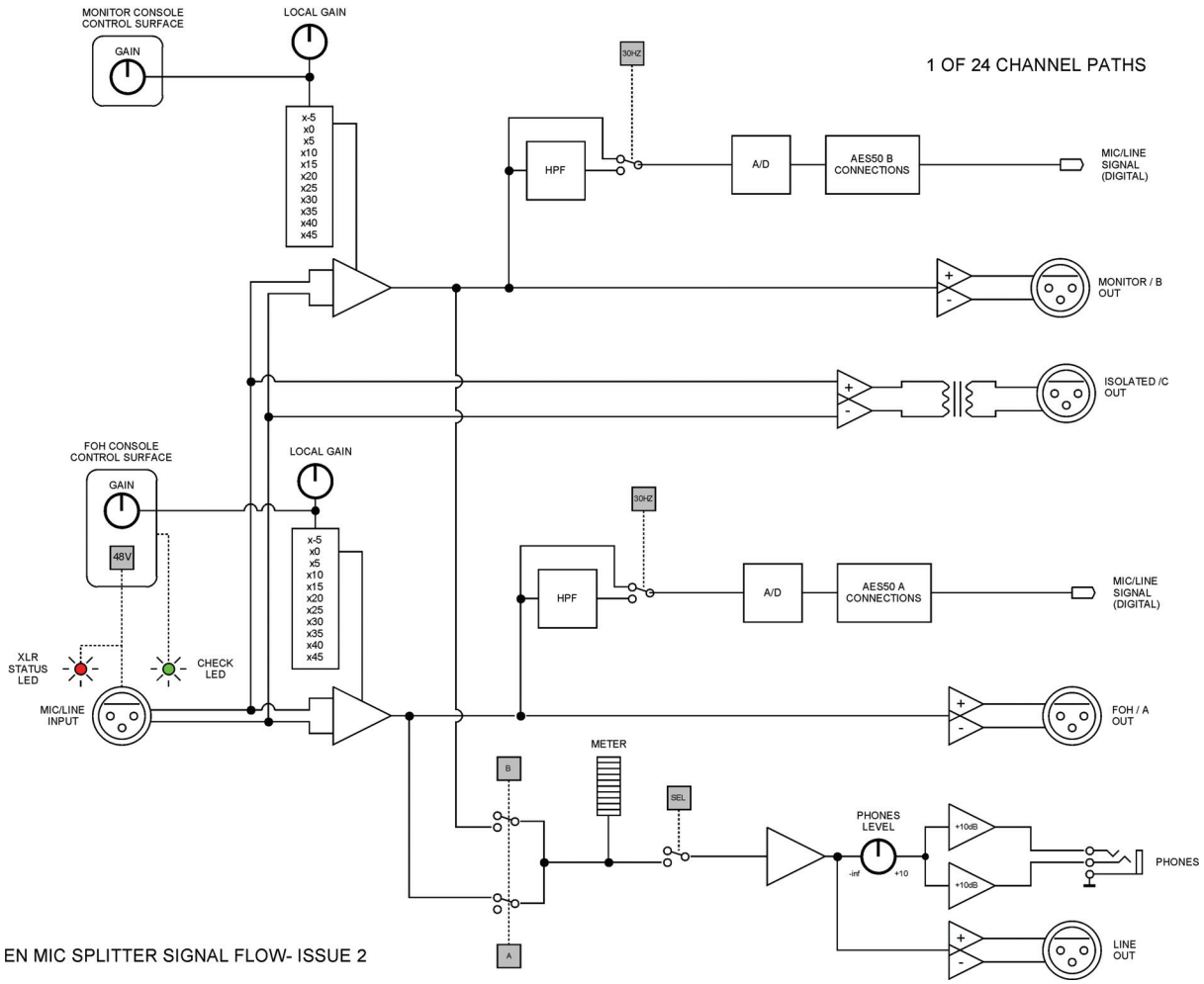
XL8 system buses



XL8 system diagram

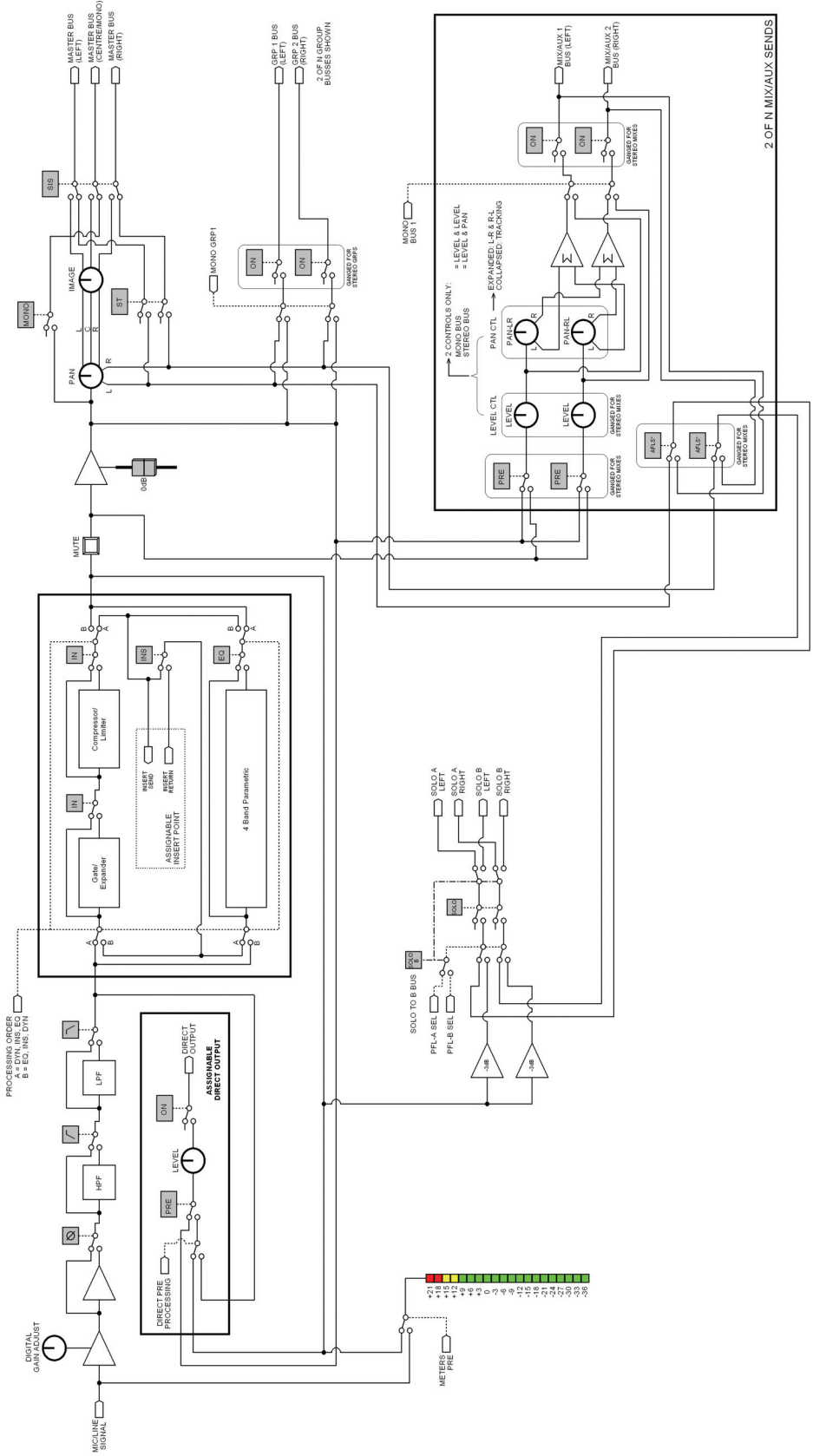


Mic splitter signal flow

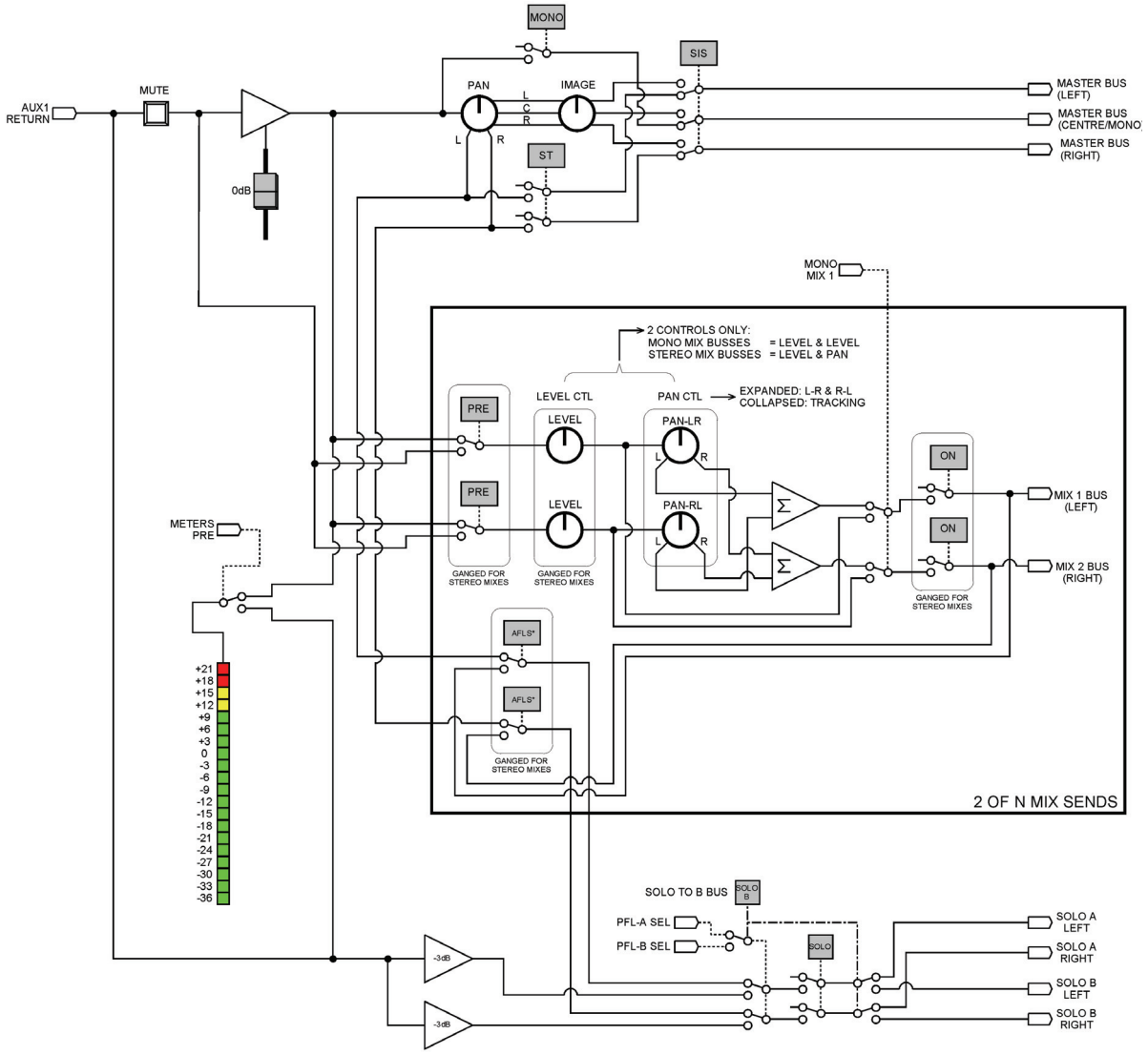


EN MIC SPLITTER SIGNAL FLOW- ISSUE 2

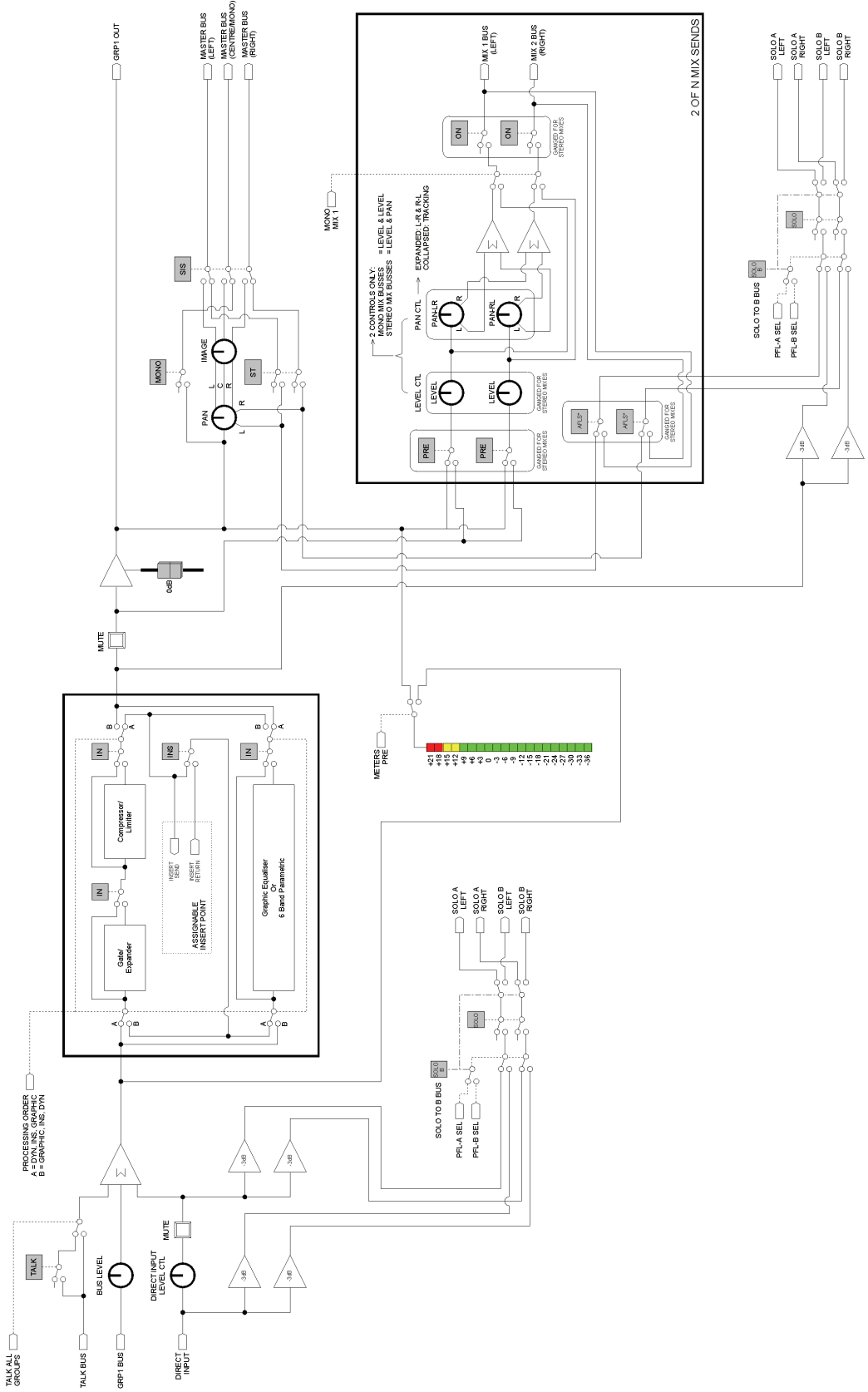
Mono input channel signal flow



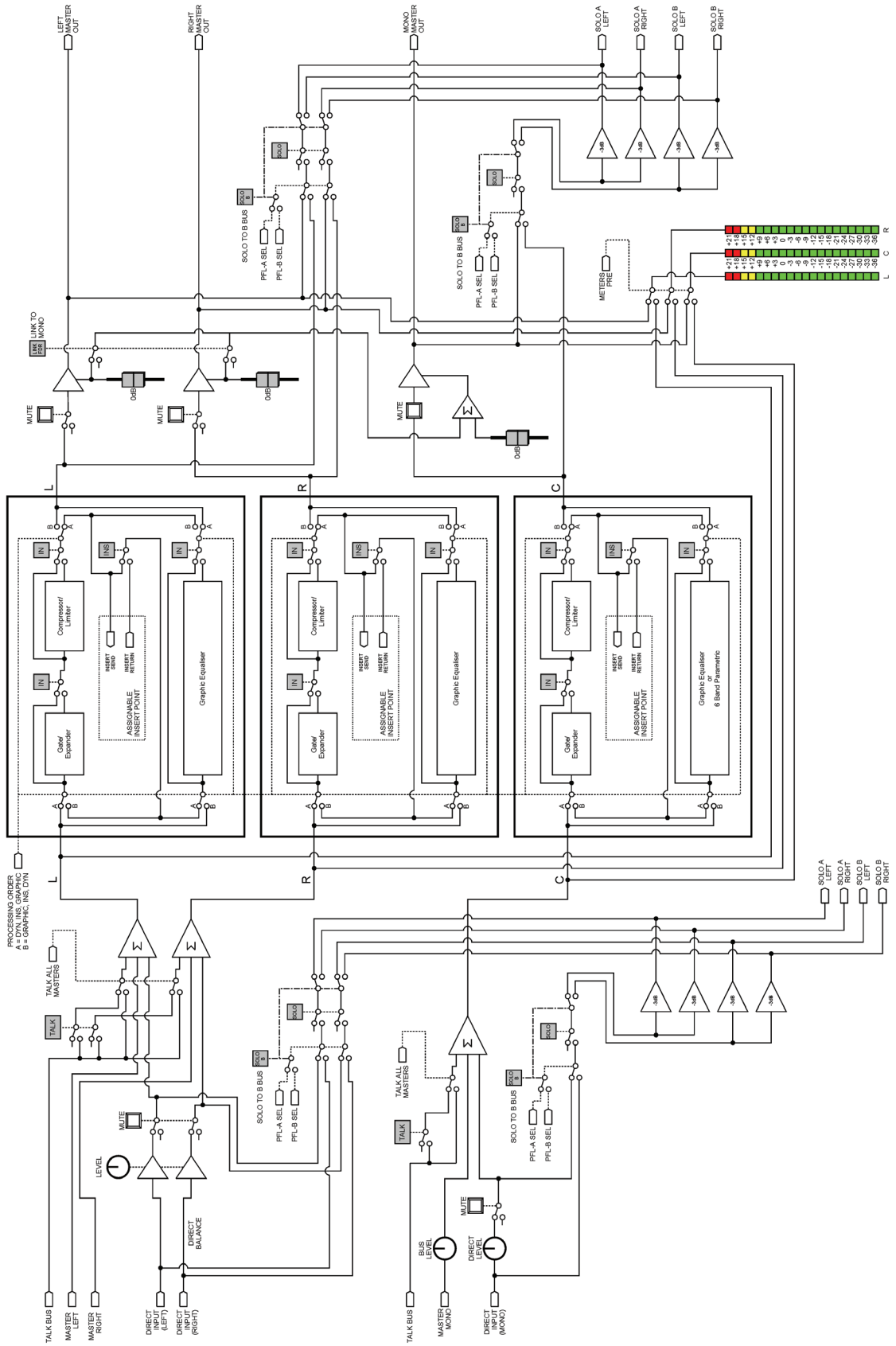
Returns signal flow



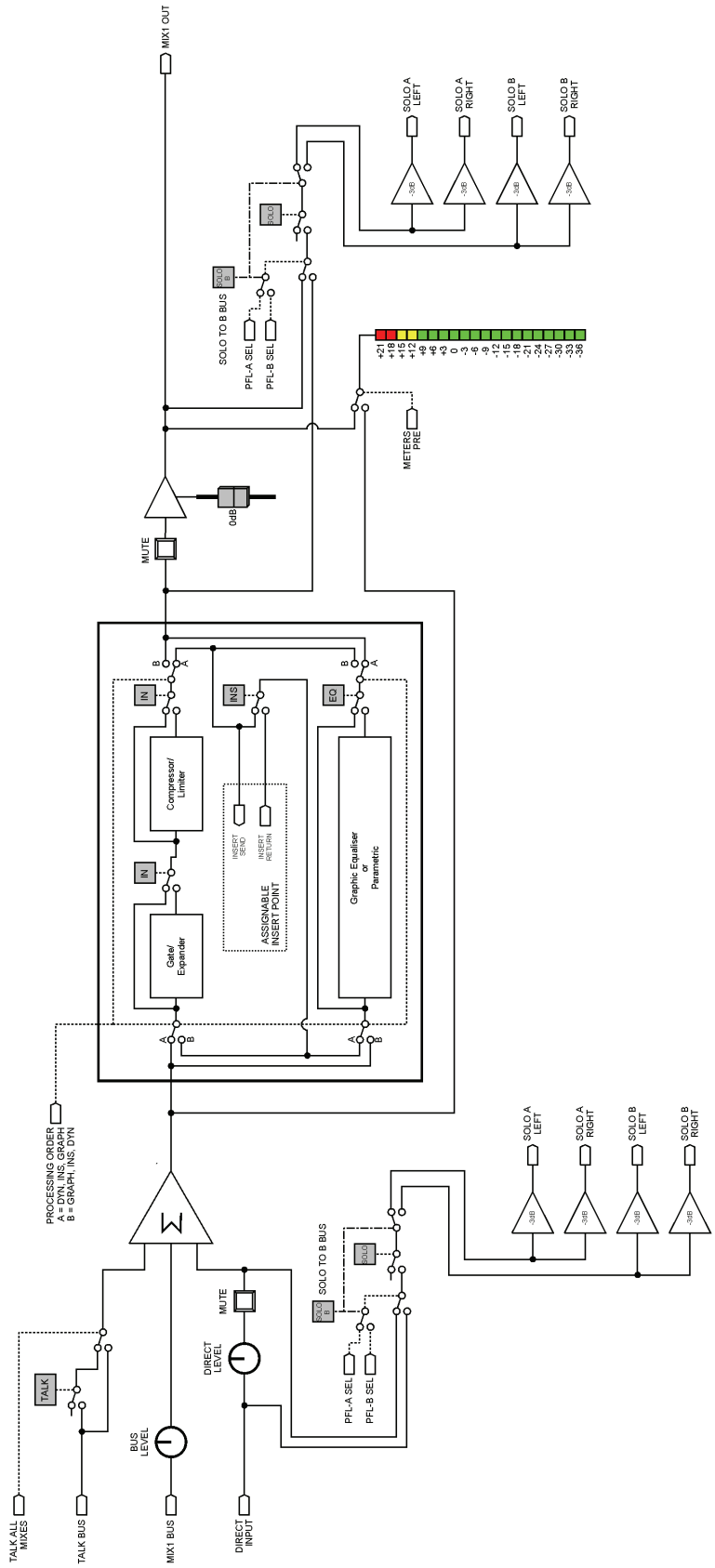
Aux/group signal flow



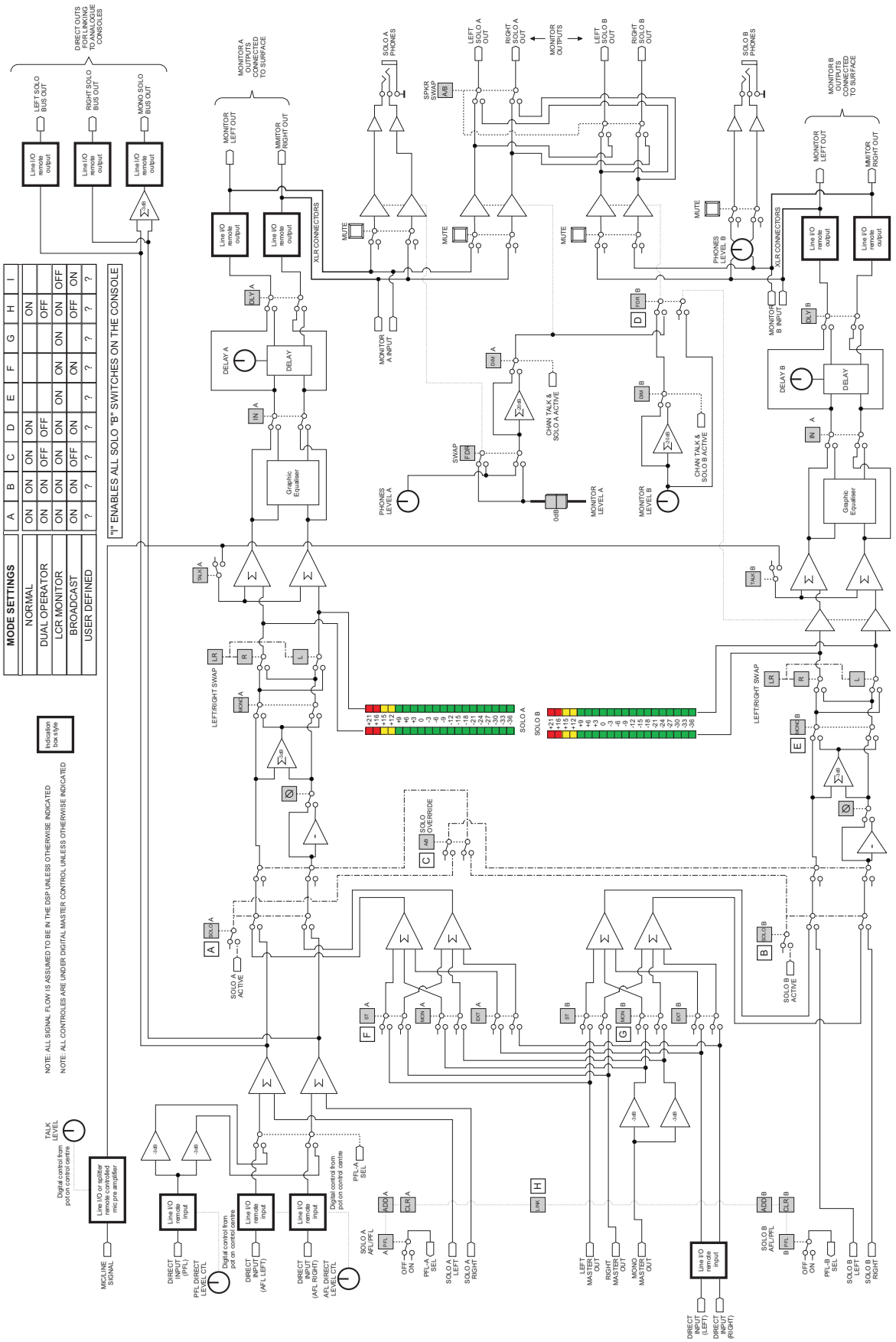
Master signal flow



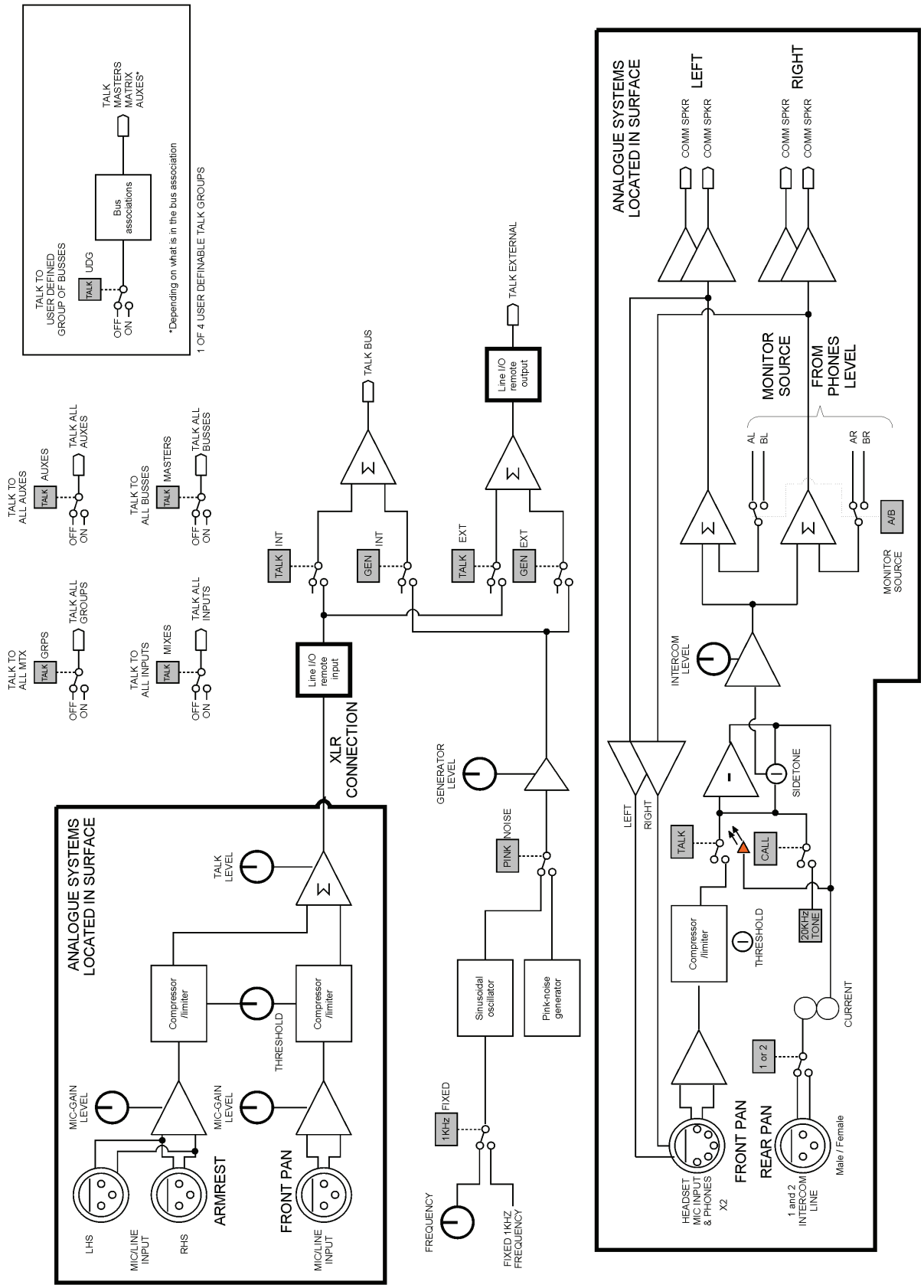
Mono mix signal flow



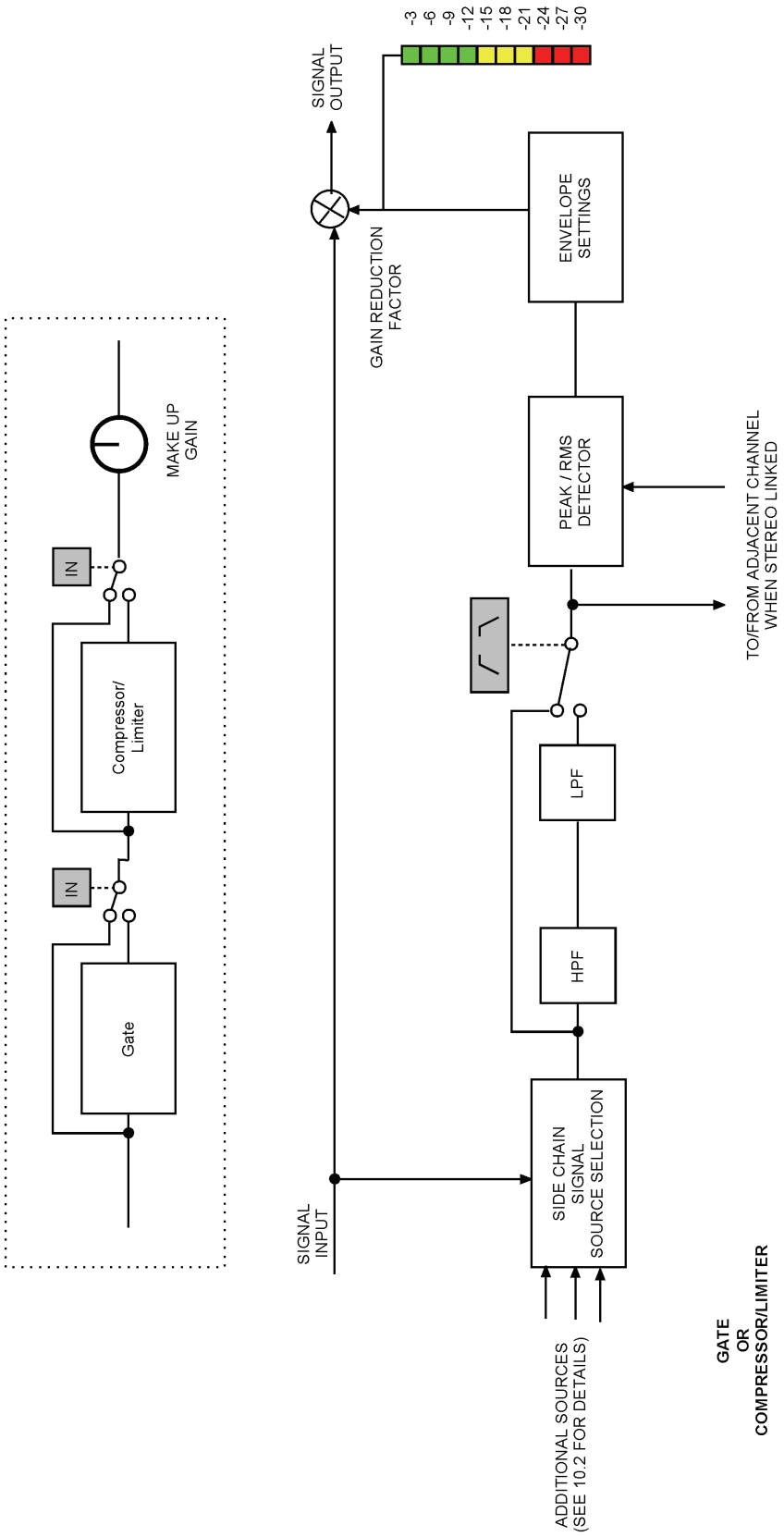
Monitor signal flow



Comms signal flow



Dynamics signal flow



Appendix C: Technical Specification

This appendix provides the full technical specification for the XL8 Live Performance System, which includes the DL431 mic splitter, DL451 line I/O unit, DL461 router and DL471 DSP.

Due to a policy of continual improvement, the Klark Teknik Group reserves the right to alter the function or specification at any time without notice.

XL8 general statistics

Dedicated XLR connections	4 x 6U rack splitters house: • 96 x splitter mic/line inputs • 2 x 96 splitter outputs • 1 x 96 transformer isolated splitter outputs
Configurable XLR connections	5 x 3U rack configurable line I/O boxes house 120 x I/O slots in 15 x 8 wide blocks of: • 8 x mic/line inputs or • 8 x line outputs or • 4 x (stereo) AES3 in and 4 x (stereo) AES3 out
Typical configuration (assuming all analogue I/O)	96 x mic/line inputs with splits 16 x mic/line auxiliary inputs (total mic input count of 112) 32 x aux/group outputs 16 x matrix outputs 1 x stereo master output 1 x mono master output 2 x stereo local monitor outputs 49 x assignable I/Os
Input audio processing	96 x dual slope high and low pass filters 96 x 4-band parametric EQs with 3 shelf modes 96 x 4-mode creative input compressors 96 x input gates
Mix/output audio processing	51 x out 6-band parametric EQs with shelf and multiple high and low pass modes 51 x 5-mode creative output dynamics 16 x assignable Klark Teknik output GEQs
Assignable audio processing	16 x assignable stereo effects (that can be set as additional stereo GEQs)
Mixing control assistance	8 x auto-mutes 8 x surface population groups 12 x VCA faders 12 x VCA associated population groups 1000-scene snapshot automation
Resilience	N+1 and fault tolerant modular system with dual redundant system interconnections

XL8 general specifications

Sampling frequency	96kHz
Latency delay	<2ms input to master (no compensation)
Dynamic range	110dB, 22Hz to 22kHz (no pre-emphasis)
Maximum voltage gain	85dB inputs to subgroups and masters 91dB inputs to aux and matrix
Crosstalk at 1kHz	-100dB physically adjacent input channels
Crosstalk at 10kHz	-100dB physically adjacent input channels
Fader/pan cut off at 1kHz	-100dB
Fader/pan cut off at 10kHz	-100dB
Display screens	5 x 15” daylight-viewable colour screens
LCD switch	70 x RGB colour
Motorised faders	71 x touch-sensitive (+31 on GEQ RAPIDE)
Fader resolution	1024 steps
Encoders	258 touch-sensitive
Encoder resolution	512 steps
Dimensions	XL8 control centre: 1875 x 1054 x 421 mm DL431 splitter: 6U x 410 mm deep DL451 line I/O: 3U x 410 mm deep DL461 router: 3U x 410 mm deep DL471 DSP: 1U x 410 mm deep
Net weight (standard install)	Control centre: 160 kg 4 x DL431: 86 kg 5 x DL451: 63 kg 2 x DL461: 23 kg 10 x DL471: 67 kg Total: 399 kg
Power requirements	100V to 240V, 50 to 60Hz
Operating temperature range	+5°C to +40°C
Storage temperature range	-20°C to +60°C

XL8 audio performance specifications

Frequency response

Input	Output	Gain	20Hz	20kHz
DL431 splitter	DL431 splitter A out	0dB	0dB to -0.5dB	0dB to -0.5dB
DL431 splitter	DL431 splitter A out	40dB	0dB to -0.5dB	0dB to -0.5dB
DL431 splitter	DL431 splitter B out	0dB	0dB to -0.5dB	0dB to -0.5dB
DL431 splitter	DL431 splitter B out	40dB	0dB to -0.5dB	0dB to -0.5dB
DL431 splitter	DL431 splitter C out	-6dB	0dB to -1.0dB	0dB to -1.0dB
DL431 splitter	DL451 line I/O	0dB	0dB to -1.0dB	0dB to -1.0dB
DL431 splitter	DL451 line I/O	40dB	0dB to -1.0dB	0dB to -1.0dB
DL451 line I/O	DL451 line I/O	0dB	0dB to -1.0dB	0dB to -1.0dB
DL451 line I/O	DL451 line I/O	40dB	0dB to -1.0dB	0dB to -1.0dB

Gain error at 1kHz

Input	Output	Gain	Maximum	Minimum
DL431 splitter	DL431 splitter A out	0dB	+0.5dB	+0.5dB
DL431 splitter	DL431 splitter A out	40dB	+0.5dB	+0.5dB
DL431 splitter	DL431 splitter B out	0dB	+0.5dB	+0.5dB
DL431 splitter	DL431 splitter B out	40dB	+0.5dB	+0.5dB
DL431 splitter	DL431 splitter C out	-6dB	+1.0dB	+1.0dB
DL431 splitter	DL451 line I/O	0dB	+1.0dB	+1.0dB
DL431 splitter	DL451 line I/O	40dB	+1.0dB	+1.0dB
DL451 line I/O	DL451 line I/O	0dB	+1.0dB	+1.0dB
DL451 line I/O	DL451 line I/O	40dB	+1.0dB	+1.0dB

Input CMRR

Input	Output	Gain	100Hz	1kHz
DL431 splitter	DL431 splitter A out	0dB	80dB	80dB
DL431 splitter	DL431 splitter A out	40dB	90dB	90dB
DL431 splitter	DL431 splitter B out	0dB	80dB	80dB
DL431 splitter	DL431 splitter B out	40dB	90dB	90dB
DL431 splitter	DL431 splitter C out	-6dB	110dB	90dB
DL431 splitter	DL451 line I/O	0dB	80dB	80dB
DL431 splitter	DL451 line I/O	40dB	90dB	90dB
DL451 line I/O	DL451 line I/O	0dB	80dB	80dB
DL451 line I/O	DL451 line I/O	40dB	90dB	90dB

Distortion at 0dBu

Input	Output	Gain	1kHz	10kHz
DL431 splitter	DL431 splitter A out	0dB	0.01%	0.01%
DL431 splitter	DL431 splitter A out	40dB	0.03%	0.03%
DL431 splitter	DL431 splitter B out	0dB	0.01%	0.01%
DL431 splitter	DL431 splitter B out	40dB	0.03%	0.03%
DL431 splitter	DL431 splitter C out	-6dB	0.01%	0.01%
DL431 splitter	DL451 line I/O	0dB	0.01%	0.01%
DL431 splitter	DL451 line I/O	40dB	0.03%	0.03%
DL451 line I/O	DL451 line I/O	0dB	0.01%	0.01%
DL451 line I/O	DL451 line I/O	40dB	0.03%	0.03%

Distortion at +20dBu

Input	Output	Gain	1kHz	10kHz
DL431 splitter	DL431 splitter A out	0dB	0.03%	0.03%
DL431 splitter	DL431 splitter A out	40dB	0.03%	0.03%
DL431 splitter	DL431 splitter B out	0dB	0.03%	0.03%
DL431 splitter	DL431 splitter B out	40dB	0.03%	0.03%
DL431 splitter	DL431 splitter C out	-6dB	0.03%	0.03%
DL431 splitter	DL451 line I/O	0dB	0.03%	0.03%
DL431 splitter	DL451 line I/O	40dB	0.03%	0.03%
DL451 line I/O	DL451 line I/O	0dB	0.03%	0.03%
DL451 line I/O	DL451 line I/O	40dB	0.03%	0.03%

Mixing noise (all bus types) 22Hz to 22kHz unweighted

No. of Inputs	Gain	Fader Position	Pan	Output Noise
12	0dB	-infinity (-∞)	Central	-91dBu
12	0dB	0dB	Central	-84dBu
24	0dB	-infinity (-∞)	Central	-91dBu
24	0dB	0dB	Central	-81dBu
48	0dB	-infinity (-∞)	Central	-91dBu
48	0dB	0dB	Central	-78dBu
96	0dB	-infinity (-∞)	Central	-91dBu
96	0dB	0dB	Central	-75dBu

Signal path noise 22Hz to 22kHz unweighted

Inputs 150R terminated.

Input	Output	Gain	Output Noise	EIN
DL431 splitter	DL431 splitter A out	0dB	-98dBu	-98dBu
DL431 splitter	DL431 splitter A out	40dB	-88dBu	-128dBu
DL431 splitter	DL431 splitter B out	0dB	-98dBu	-98dBu
DL431 splitter	DL431 splitter B out	40dB	-88dBu	-128dBu
DL431 splitter	DL431 splitter C out	-6dB	-123dBu	-117dBu
DL431 splitter	DL451 line I/O	0dB	-89dBu	-89dBu
DL431 splitter	DL451 line I/O	40dB	-87dBu	-127dBu
DL451 line I/O	DL451 line I/O	0dB	-89dBu	-89dBu
DL451 line I/O	DL451 line I/O	40dB	-87dBu	-127dBu

Dynamic range 22Hz to 22kHz unweighted

Input	Output	Gain	Maximum Output	Dynamic Range
DL431 splitter	DL431 splitter A out	0dB	+26dBu	124dBu
DL431 splitter	DL431 splitter A out	40dB	+26dBu	114dBu
DL431 splitter	DL431 splitter B out	0dB	+26dBu	124dBu
DL431 splitter	DL431 splitter B out	40dB	+26dBu	114dBu
DL431 splitter	DL431 splitter C out	-6dB	+21dBu	144dBu
DL431 splitter	DL451 line I/O	0dB	+21dBu	110dBu
DL431 splitter	DL451 line I/O	40dB	+21dBu	108dBu
DL451 line I/O	DL451 line I/O	0dB	+21dBu	110dBu
DL451 line I/O	DL451 line I/O	40dB	+21dBu	108dBu

XL8 system inputs and outputs

DL431 splitter - analogue inputs

Connector	3-pin XLR balanced
Phantom power	48-volt with local switch and remote control from XL8 control centre
Gain control A	-2.5dB to +45dB analogue gain in 2.5dB steps with local and remote control; plus a further ±20dB of hi resolution interpolated DSP trim
Gain control B	Independent second channel identical to above
Filter A	30Hz high pass with local defeat switch and remote control from XL8 control centre
Filter B	Independent second channel identical to above
Meter (24-off)	7-segment, -18dBu to +24dBu
Meter A/B	Meters can be switched to monitor A or B pre-amplifiers
A/D converter A	24-bit, 96k and 128 times over sampling
A/D converter B	Independent second channel identical to above

DL431 splitter - analogue outputs

Connector A	3-pin XLR balanced
Connector B	Independent second channel identical to above
Connector C	Independent third channel on front-mounted 3-pin XLR, balanced and transformer isolated (with fixed gain of -6dB)
Headphone connector	1/4” jack
Audio monitor	3-pin XLR balanced

DL431 splitter - digital (system) outputs

System connector A	AES50 (24 channels of digital audio) on EtherCon® XLR
System connector B	Independent second channel identical to above
Duplicate connector A	AES50 (24 channels of digital audio) on EtherCon® XLR providing dual redundant back up of A channels
Duplicate connector B	AES50 (24 channels of digital audio) on EtherCon® XLR providing dual redundant back up of B channels

DL451 line I/O - analogue inputs

Connector	3-pin XLR balanced
A/D converter	24-bit, 96k and 128 times over sampling

DL451 line I/O - analogue outputs

Connector	3-pin XLR balanced
D/A converter	24-bit, 96k and 128 times over sampling

DL451 line I/O - digital inputs

Connector	AES3 (two channels of digital audio) on 3-pin XLR
Sample rates	Accepts any frequency between 32k to 96k
Bypass	Sample rate converter can be bypassed

DL451 line I/O - digital outputs

Connector	AES3 (two channels of digital audio) on 3-pin XLR
Sample rates	48k, 96k or auto tracking to inputs
Bypass	Sample rate converter can be bypassed
Word length	16-, 20- or 24-bit

DL451 line I/O - MIDI and GPIO

MIDI connector	In, out and through on 5-pin DIN
GPIO IN connector	25-pin D-type (opto isolated)
GPIO OUT connector	25-pin D-type (opto isolated)

DL451 line I/O - digital system inputs and outputs

System connector	AES50 (24 channels of bi-directional digital audio) on EtherCon® XLR
Duplicate connector	AES50 (24 channels of bi-directional digital audio) on EtherCon® XLR providing dual redundant back up of channels

DL461 router - digital audio system inputs and outputs

System connector	AES50 (24 channels of bi-directional digital audio) on EtherCon® XLR
Duplicate connector	AES50 (24 channels of bi-directional digital audio) on EtherCon® XLR providing dual redundant back up of channels
Snake connector (copper)	HyperMac (192 channels of bi-directional digital audio) on EtherCon® XLR
Snake connector (fibre)	HyperMac (192 channels of bi-directional digital audio) on OpticalCon® XLR

DL461 router - control data system inputs and outputs

System connector	EtherCon® XLR
Duplicate connector	EtherCon® XLR providing dual redundant back up

DL461 router - miscellaneous inputs and outputs

Word clock IN connector	BNC
Word clock OUT connector	BNC
AES3 sync IN connector	3-pin XLR
AES3 sync OUT connector	3-pin XLR
Ethernet tunnel 1 connector	EtherCon® XLR
Ethernet tunnel 2 connector	EtherCon® XLR
Expansion Ethernet connector	EtherCon® XLR
Expansion Gigabit connector	EtherCon® XLR

XL8 control centre - analogue audio system inputs

Monitor connector	3-pin XLR balanced
Intercom connector	3-pin XLR dual channel (bi-directional) RTS
Talk connector	3-pin XLR balanced with 48V phantom
Meters (24-off)	20-segment, -36dBu to +21dBu

XL8 control centre - analogue audio system outputs

Monitor connector	3-pin XLR balanced
Talk connector	3-pin XLR balanced
Intercom connector	3-pin XLR balanced
Headset connector	5-pin XLR (stereo)
Headphone connector	1/4” jack (stereo)
Meters (39-off)	20-segment -36dBu to +21dBu

XL8 control centre - digital audio system inputs and outputs

System connector	AES50 (24 channels of bi-directional digital audio) on EtherCon® XLR
Duplicate connector	AES50 (24 channels of bi-directional digital audio) on EtherCon® XLR providing dual redundant back up of channels
Snake connector (copper)	HyperMac (192 channels of bi-directional digital audio) on EtherCon® XLR
Snake connector (fibre)	HyperMac (192 channels of bi-directional digital audio) on OpticalCon® XLR

XL8 control centre - control data system inputs and outputs

System connector	EtherCon® XLR
Duplicate connector	EtherCon® XLR providing dual redundant back up

XL8 control centre - miscellaneous inputs and outputs

Word clock IN connector	BNC
Word clock OUT connector	BNC
Duplicate word clock IN	BNC providing dual redundant back up
Duplicate word clock OUT	BNC providing dual redundant back up
AES3 sync IN connector	3-pin XLR
AES3 sync OUT connector	3-pin XLR
Duplicate AES3 sync IN	3-pin XLR providing dual redundant back up
Duplicate AES3 sync OUT	3-pin XLR providing dual redundant back up
Ethernet tunnel 1 connector	EtherCon® XLR
Ethernet tunnel 2 connector	EtherCon® XLR
Duplicate Ethernet tunnel 1	EtherCon® XLR providing dual redundant back up
Duplicate Ethernet tunnel 2	EtherCon® XLR providing dual redundant back up
Monitor input connector	3-row 15-pin D-type - analogue VGA
KVM input connection	Screen 3-row 15-pin D-type (analogue VGA) and USB keyboard/mouse
USB host connection Line I/O and mic splitter	USB 2.0 full speed (12.0Mbs) 500mA maximum load
USB slave connection Line I/O and mic splitter	USB 2.0 full speed (12.0Mbs)
USB host connection Surface	USB 2.0 full speed (12.0Mbs) 1A maximum load

XL8 input and output characteristics

Analogue input characteristics

Input Type	Load Z	Gain	Max. Level	Connector
DL431 splitter	5K	-22.5dB to +65dB	+24dBu	XLR
DL451 line I/O	10K	-25dB to +60dB	+26dBu	XLR
Talk mic	600R	+15dB to +60dB	+6dBu	XLR
Headset mic	375R	+60dB	0dBu	XLR (5-pin)
Monitor	10K	0dB	+24dBu	XLR

Analogue output characteristics

Output Type	Source Z	Gain	Max. Level	Connector
DL431 splitter Main	150R	0dB	+24dBu	XLR
DL431 splitter Isolated	75R	-6dB	+18dBu	XLR
DL451 line I/O	50R	0dB	+21dBu	XLR
Talk	50R	0dB	+24dBu	XLR
Monitor	50R	0dB	+24dBu	XLR
Headphones	10R	+10dB	750mW	1/4” jack
Headset	10R	+10dB	750mW	XLR (5-pin)

Digital I/O characteristics

Type	Chan.	Data Length	I/O	Description Notes	Conn.
AES3	2	24-bit	Input	Conforms to AES3 - 2003	XLR
AES3	2	24-bit	Output	Conforms to AES3 - 2003	XLR
AES50	24	24-bit	Bi-directional	Conform s to AES50 -2006	EtherCon® XLR
HyperMac	192	24-bit	Bi-directional	Cat6, Gigabit Ethernet physical layer	EtherCon® XLR
HyperMac	192	24-bit	Bi-directional	850 nm, laser module 1.25Gb/s 1000 base-SX physical layer on 50/125 multimode fibre	Optical-Con® XLR

Miscellaneous digital characteristics

Type	I/O	Description Notes	Connector
Word clock	IN	Accepts TTL level, 96kHz square wave; impedance 75 Ohms	BNC
Word clock	OUT	Provides a TTL level, 96kHz square wave	BNC
AES sync	IN	Accepts a 96kHz digital audio signal con-forming to AES3 - 2003	XLR
AES sync	OUT	Provides a 96kHz grade II reference signal conforming to AES3 - 2003	XLR
Ethernet tunnel	-	Car5, Auto MDIX, 00Mbs Fast Ethernet physical layer	EtherCon® XLR

XL8 main processing functions

Input channel functions

Input channel hi pass	30Hz, 12dB/Oct in analogue domain
Input channel hi pass	10Hz to 400Hz swept in digital domain Slope selectable 12dB/Oct or 24dB/Oct
Input channel lo pass	1kHz to 20kHz swept in digital domain Slope selectable 6dB/Oct or 12dB/Oct
Input channel treble	Parametric operation Frequency 1kHz to 25kHz swept Gain +16dB to -16dB BW 0.1 Oct to 3 Oct Shelf operation Frequency 1kHz to 25kHz swept Gain +16dB to -16dB Soft, classic or bright (minimum harmonic disruption) curves
Input channel hi mid	Parametric operation Frequency 320Hz to 8kHz swept Gain +16dB to -16dB BW 0.1 Oct to 3 Oct
Input channel lo mid	Parametric operation Frequency 80Hz to 2kHz swept Gain +16dB to -16dB BW 0.1 Oct to 3 Oct
Input channel bass	Parametric operation Frequency 16Hz to 400Hz swept Gain +16dB to -16dB BW 0.1 Oct to 3 Oct Shelf operation Frequency 16Hz to 400Hz swept Gain +16dB to -16dB Warm, classic or deep (minimum harmonic disruption) curves
Input channel compressor	Peak, linear, RMS and vintage modes Threshold -50dBu to +20dBu Attack 200µs to 20ms Release 50ms to 3s Ratio 25:1 to 1:1 Knee 4dB, 12dB or 40dB Gain 0dB to +24dB Side chain source selectable + filter Frequency 50Hz to 15kHz swept Bandwidth 1/3, 1 or 2 Oct
Input channel gate	Peak mode Threshold -50dBu to +20dBu Attack 10µs to 20ms Hold 2ms to 2s Release 2ms to 2s Range 100dB to 0dB Side chain source selectable + filter Frequency 50Hz to 15kHz swept Bandwidth 1/3, 1 or 2 Oct

Output channel functions

Output channel band 6	Parametric operation Frequency 16Hz to 25kHz swept Gain +16dB to -16dB BW 0.1 Oct to 3 Oct Lo pass operation Frequency 16Hz to 25kHz swept Slope 6dB/Oct or 12dB/Oct Shelf operation Frequency 16Hz to 25kHz swept Gain +16dB to -16dB Mode soft curve
Output channel bands 3, 4 and 5	Parametric operation Frequency 16Hz to 25kHz swept Gain +16dB to -16dB BW 0.1 Oct to 3 Oct
Output channel band 2	Parametric operation Frequency 16Hz to 25kHz swept Gain +16dB to -16dB BW 0.1 Oct to 3 Oct Hi pass operation Frequency 16Hz to 25kHz swept Slope 24dB/Oct
Output channel band 1	Parametric operation Frequency 16Hz to 25kHz swept Gain +16dB to -16dB BW 0.1 Oct to 3 Oct Hi pass operation Frequency 16Hz to 25kHz swept Slope 6dB/Oct or 12dB/Oct Shelf operation Frequency 16Hz to 25kHz swept Gain +16dB to -16dB Mode soft curve
Output channel GEQ	16 available in place of PEQ (above) 31 bands, 1/3 Oct, proportional Q Lo pass frequency 2kHz to 20kHz swept Slope 6dB/Oct or 12dB/Oct Hi pass frequency 20Hz to 500Hz swept Slope 6dB/Oct or 12dB/Oct
Output channel dynamic	Peak, linear, RMS, vintage and shimmer modes Threshold -50dBu to +20dBu Attack 200µs to 20ms Release 50ms to 3s Ratio 25:1 to 1:1 Knee 4dB, 12dB or 40dB Gain 0dB to +24dB Dry mix 0% to 100% Side chain source selectable + filter Frequency 50Hz to 15kHz swept Bandwidth 1/3, 1 or 2 Oct Output clipper Threshold 0dBu to +20dBu

Effects channel functions

Stereo effects channel	16 available configurable as Stereo or mono in, stereo out Modulated delay effects Complex delay, reverbs Advanced dynamics RTA and advanced measurements
Effects channel stereo GEQ	16 available in place of effects (above) 31 band, 1/3 Oct., proportional Q Lo pass frequency 2kHz to 20kHz swept Slope 6dB/Oct or 12dB/Oct Hi pass frequency 20Hz to 500Hz swept Slope 6dB/Oct or 12dB/Oct

XL8 status functions

Meters

Splitter meters	96 x 7-LED from -18dBu to +24dBu
Control centre meters	39 x output 20-LED -36dBu to +21dBu 24 x input 20-LED -36dBu to +21dBu 48 x gain reduction 7-LED 4 x direct level meter 7-LED
Screen metering	135 x 20-segment signal level meters 192 x 7-segment gain reduction

Screens

Quantity	5 x full-colour daylight-viewable screens
Size	15” (diagonal)
Resolution	1024 x 768 pixels
External screen	5 x output connectors for remote screens

Screen functions

Source	Each screen can be switched to source either the local console or an external input
KVM	Screen 4 can be switched to operate up to three external computers utilising the console trackball and keyboard
Internal GUI	Advanced interpolated graphics support all console functions

LCD switches

Quantity	70 x RGB colour display switches
Size	18 mm x 12 mm display area
Resolution	36 x 24 pixels

Appendix D: Klark Teknik DN370 GEQ

This appendix contains information on the Klark Teknik DN370 GEQ unit that is pertinent to the XL8.

Notes

When reading the Klark Teknik DN370 GEQ operator manual in relation to the XL8, take the following into consideration:

- **Constant-Q versus Symmetrical-Q:** In the manual, Constant-Q is referred to as Symmetrical-Q. There is a note in the manual to say that Symmetrical-Q is inaccurately referred to as Constant-Q.
- For "DN370" in manual, read "GEQ".
- SPL = sound pressure level.
- Although the manual refers to a physical unit, this can still apply to the XL8's virtual GEQ equivalent. For example, the pushbuttons in the units on the **Graphic EQs** screen have the same functions as the ones on the physical unit, and the on-screen faders represent the unit's long-throw ones etc.
- The XL8's GEQ has 31 bands, as compared to 30 on the DN370. The extra band is at a frequency centre of 20Hz, and is adjusted by the leftmost fader.

Using the GEQ

This 31-band, third octave graphic equaliser provides a high degree of accuracy and control. Graphic equalisers may be used for corrective or creative purposes, depending upon whether they are used live (MON or FOH) or in the studio (broadcast or recording).

Studio and creative use

In the control room, a graphic equaliser may be used to remove problem frequencies and improve deficiencies in room acoustics. This is commonly achieved with the use of a real time analyser (RTA). As the frequency centres of the XL8 Control Centre conform to ISO standards, corrections can be made by sight directly from the RTA to the graphic.

There are many creative and corrective uses for the GEQ. For example, by using the 31 equaliser bands and the high and low pass filters you can achieve the effect of someone speaking on the telephone. When used in conjunction with a compressor, you can create a de-esser. The GEQ can also be used for tonal correction of instruments or vocals.

Live use (MON)

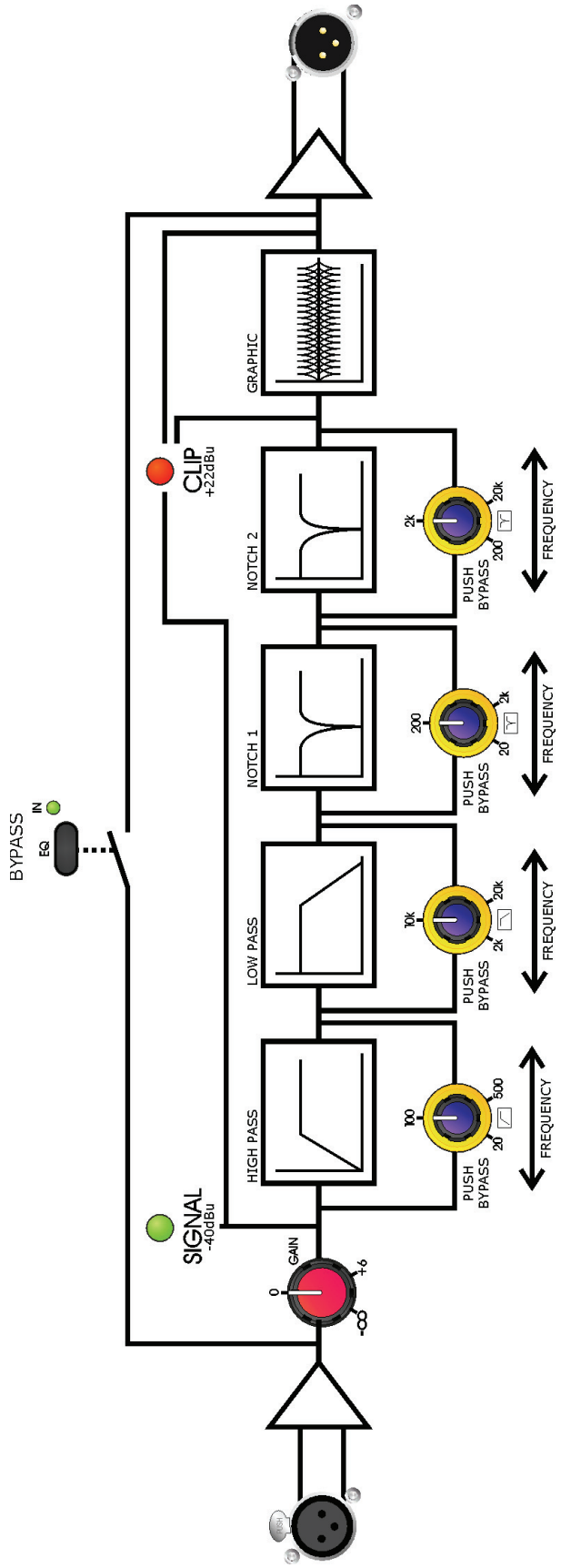
A monitor engineer may use an RTA to detect these peaks but, more often than not, monitor engineers have a developed sense of hearing that enables them to remove these frequencies by ear. The GEQ's 31 bands allow a majority of feedback to be removed from the monitors. High and low pass filters are provided that can be used to remove high frequency feedback and bass rumble or over-excursion of bass drivers (the GEQ on the XL8 has no variable notch filters). It may also be undesirable to have large amounts of bass in the on-stage monitors. In vocal monitors, bass does not assist projection of vocals and can make the stage sound unbearable, hence, the bass element can be rolled off at the desired frequency. The fundamentals of vocals are transmitted in a narrow audible range and will appear unaffected.

Bypassing the EQ

It may be desirable to hear the effect of the graphic equaliser settings, for example, during a sound check. To do this, press the EQ in/out switch so that it is set to out (the red out LED is illuminated); this bypasses the EQ (and gain) settings of the GEQ, allowing the user to hear the original audio without adjusting any fader or control.

Placing the fader of any band at the extreme upwards position will apply 12dB gain to frequencies in that band. Placing the fader of any band at the extreme downwards position will apply 12dB of attenuation, depending upon the **RANGE** switch's setting, to the frequencies in that band.

Audio signal path



Appendix E: Klark Teknik DN780 Reverb

This appendix contains parameter application notes for the DN780 reverb internal effect on the XL8. This is followed by information on the special effects program and technical specifications of the XL8's DN780.

Parameter application notes

This section provides application notes on the parameters of the DN780 Reverb effect.

Pre-delay

0 to 990 milliseconds (ms) of pre-delay is available allowing a very wide range of control. Delays of less than 30ms closely integrate the direct and reverberant sounds; often a desirable feature on percussive sounds. Delays of 50ms or more cause the direct and reverberant sounds to separate and convey a feeling of depth and distance to the simulated environment. Delays above 2300ms are used for creating special effects.

Pattern

The pattern control alters the 'density' of the early reflections. It is adjustable from 0 to 9 as shown on display f1, with 0 giving a low density or 'grainy' character to the early reflections and 9 producing a high density effect.

Level

The level control functions convincingly as a 'depth' control, altering the apparent distance between the sound source and the listener. It is adjustable from 0 to 9 as shown on display f2, with 0 being relatively distant and 9 bringing the sound source closer.

Decay

The reverberation decay time is adjustable from 0.1 to 18 seconds, depending on room size, changing the reverberant field from a virtually dead sound to a totally surreal effect. Short decay times, under one second, are essential for authentic small room simulation and also extremely useful for ambience applications where classic reverberation is not wanted. Reverb times of 1 to 4 seconds cover the majority of normal applications where classic reverberation is required. Longer decay times are available for special effect applications.

LF key

LF is adjustable to ±7, depending on room size and decay time, as shown on display f3. An increase in LF decay time is generally desirable on simulations of large halls, since low frequency sounds suffer less than higher frequencies from absorption in air. Very small spaces usually need the 'thin' sound created by reducing LF decay.

HF key

HF is adjustable to ±7, as shown on display f4. The HF decay control sets the absorption characteristic of the simulated space. In reality, large environments feature considerably reduced high frequency decay times due to air absorption. A smaller room will feature greater HF decay time if the walls are tiled and the room is empty than if the room contains soft furnishings and curtains. The wide range of control provided will allow a suitable setting to be chosen to enhance realism in most applications.

Room size

Room size is adjustable from 8 to 90 linear metres, representing a wide range of volumes. Since the acoustic character of a given environment depends not only on the reverberation time and construction of the room, but also to a great extent on its volume. The room size control is, in fact, essential if authentic simulation of a range of different sized environments is required. Small room sizes give a confined, 'box-like' sound. Medium room sizes suggest a room or small hall, whereas large room sizes suggest a large hall or cathedral. Again, there is no substitute for experimentation.

About the special effects programs

This section gives details of the effects programs available on the DN780 Reverb effect.

Direct signal

Effects such as 'ADT' and 'Echo' rely on a suitable level of direct (dry) signal being added on the mixing console. Since this is largely a question of taste, no precise instructions are included here. It is recommended that, as a general principle, direct signal is initially set at a normal operation level without any effect present. The effect is then increased in level as required.

"Delay" effect

PRE DELAY control knob adjusts the delay time within the range 0 to 2.0 seconds.

REV button mutes the effect.

Preset parameters: On selecting this effect program, delay is set to 200ms.

Stereo mix: The signals at left and right outputs are both delayed by the same amount as set using the PRE DELAY control, that is, they are essentially monophonic.

Application Notes:

- Use this program to accurately balance echo return levels on the mixing console.
- In normal use, only one output should be used.

"ADT" effect

PRE DELAY control knob adjusts the delay time before the second voice is heard. Delay is adjustable within the range 0 to 127ms.

PATTERN control knob selects the number and spacing of the second voices. Selection is from Pattern 1 (two voices) to Pattern 5 (eight voices).

REV button mutes the effect.

Preset parameters: On selecting this effect program, delay is set to 40ms and pattern is Pattern 5 (a wide multi-voiced effect).

Stereo mix: Left and right output signals use different delay taps to achieve a stereo effect. Using only one output halves the number of 'voices', that is, Pattern 1 (one voice) to Pattern 5 (four voices).

Application Notes:

- Try delays from 25 to 50ms. Short delays reduce the effect, long delays produce echo.
- Direct signal must be added at a suitable level on the mixing console. Try 50/50 direct/effect mix on Pattern 1, must less direct on Pattern 5.
- For conventional ADT, try 'Delay' of 40ms, Pattern 1, and use one output only, panned, say, fully right. Pan direct signal fully left and use a 50/50 direct/effect mix.

"Multi-Tap Echo" effect

PRE DELAY control knob adjusts the time delay interval between the direct signal and the first repeat. Delay is adjustable from 0 to 990ms.

PATTERN control knob selects the number and spacing of the repeats. Pattern 1 (two repeats) to Pattern 9 (eight repeats).

DECAY control knob sets the feedback (regeneration) level for repeat echoes.

HF control knob allows the high frequency filtering to be applied to the regenerated signal.

REV button mutes the effect.

Preset parameters: On selecting this effect program: delay is set to 196ms; pattern is Pattern 4; decay is 73; and HF is 0. These settings give an effect similar to a typical multi-head tape echo, but with full stereo image.

Stereo mix: Different delay taps are used for left and right outputs to achieve a stereo effect. Using only one output halves the number of taps, that is, Pattern 1 (one tap), Pattern 9 (four taps).

Application Notes:

- Set delay time as required, generally fairly short for multi-echoes (higher pattern numbers), and longer for repeat echo. 'Fine tune' delay setting to set exact musical timing for single tap repeat echoes.
- Direct signal must be added at a suitable level on the mixing console.
- For single tap repeat echo, start with Pattern 1, with 'Delay', 'HF' and 'Decay' all set at maximum. Reduce parameters as required. Use one output only.

"Sound-On-Sound" effect

PRE DELAY control knob sets the 'loop length' and hence the timing of the effect between 0 and 2.0 seconds.

LEVEL control knob provides 10 level increments of signal input to the 'digital loop'. Return level to '0' after use to avoid noise build-up.

DECAY control knob sets the 'erasure' of the loop from '0' (100% erasure) to '99' (zero erasure).

REV button clears memory of unwanted effect.

Preset parameters: On selecting this effect program: pre-delay is set to 2.0s; level is 0; and decay is 99. These settings represent maximum loop length with zero erasure. Please note that no sound will be heard until 'level' is increased.

Stereo mix: Outputs left and right are essentially identical. However, to avoid the possibility of slight phase cancellations, it is recommended that only one output is used on this program.

Application Notes:

- Since the 'level' inside the signal processor increases as fresh input is added, input level must be lower than that recommended for normal use; try -15dB on the

headroom indicator. Digital overload will be indicated by the red LED illuminating on the headroom indicator.

- Correct pre-delay ('loop length') should be set before creating the effect as attempts to alter this later will usually destroy part of the recorded sound.
- Remember to return level to '0' immediately after used to avoid noise build-up.

"Infinite Room" effect

LEVEL control knob provides 10 level increments of signal input to the 'infinite room'. Return level to '0' after use to avoid noise build-up.

REV button clears memory of unwanted effect.

Preset parameters: On selecting this effect program, level is 0. Please note that no sound will be heard until 'level' is increased.

Stereo mix: Infinite room is a spacious, full stereo effect.

Application Notes:

- Since the 'level' inside the signal processor increases as fresh input is added, input level must be less than that recommended for normal use; try -15dB on the headroom indicator. Digital overload will be indicated by the red LED illuminating on the headroom indicator.
- Remember to return level to '0' immediately after used to avoid noise build-up.

"Alive", "Non-Linear" and "Reverse" effects

PRE DELAY control knob sets the delay between the direct signal and the onset of the effect. Maximum pre-delay is 990ms.

PATTERN control knob changes the density of the reflections, with 0 giving a low density or 'grainy' character and 9 producing a high density effect.

DECAY control knob sets the length of the effect, from '1' (short) to '12' (long). The display simply shows these increment numbers and is not calibrated in seconds.

LF control knob adjusts the low frequency content of the effect.

HF control knob adjusts the high frequency content of the effect.

REV button clears memory of unwanted effect.

Preset parameters:

- "Alive" - on selecting this effect program: pre-delay is 0s; pattern is 9; decay is 8; LF is +1; and HF is +3.
- "Non-Linear" - on selecting this effect program: pre-delay is 0s; pattern is 4; decay is 5; LF is 0; and HF is 0.
- "Reverse" - on selecting this effect program: pre-delay is 0s; pattern is 4; decay is 12; LF is 0; and HF is +2.

Stereo mix: All these effects are in full stereo and are completely mono-compatible.

Application Notes:

- These three effects will find instant application in any recording studio engaged in contemporary music production, as they allow pronounced acoustical enhancement without the 'muddying' effect of longer, conventional decay envelopes. This makes possible a bright and 'punchy' mix. These effects work well on most instruments, but try "Non-Linear" for explosive snare sounds and "Reverse" on vocals.
- The "Alive" program produces a more natural, live ambience, which is less coloured than the other two effects and has wide-ranging applications.

Technical specifications

Audio

Frequency response	+1, -2dB (20Hz to 12kHz)

Digital

Arithmetic processor	32-bit
Reverberation	Hall, Plate, Chamber and Room, with five variations of each
Effects	Alive, Non-Linear, Reverse, Delay, ADT, Multitap Echo, Sound-On-Sound and Infinite Room

Parameters

Pre-delay	0 to 990ms
Pattern (density)	Adjustable 0 to 9 increments (Grainy to Dense)
Level (depth)	Adjustable 0 to 9 increments (Distant to Close)
Decay time	0.1 to 18 seconds
Room size	8 to 90 metres linear dimension
LF decay	Adjustable ±7 increments ref. 1kHz decay time
HF decay	Adjustable ±7 increments ref. 1kHz decay time

Since the above reverberation parameters are optimised to ensure authentic acoustical simulation, they are by necessity program-dependent.

Controls

Input mute	Removes audio feed from reverberation section.
Reverb mute	Clears unwanted reverberant signal.
Input level control	From 6dB gain to infinite attenuation.
Headroom indicator	10-point LED display, 0dB to -27dB.
Display	Simultaneous display of all parameter information. Parameter selection and store functions are verified by individual LEDs.

Appendix F: Troubleshooting

This appendix gives details of XL8 Control Centre problem diagnosis and rectification, and also testing.

To help guarantee system robustness and reliability — probably the fundamental requirements for live performance consoles — it is imperative to be able to test and diagnose problems with any part of the system easily. The software of the XL8 has built-in tests to cater for this, but there are also external diagnostic facilities available when these tests cannot be carried out.

No audio

If you have set up the XL8 and followed all of the instructions for obtaining audio, but you are not hearing anything through the speakers, check the following:

- Make sure the appropriate **ST** buttons in the channel fast strips are on.
- Make sure the appropriate **ST** buttons in the **source a**/**b** panels (monitors section of the output bay) are on.
- Make sure nothing is muted.
- Make sure no faders are set to minimum.
- Check that the VCA group and master faders are at unity gain.
- Use solo at selected points in the signal path to try and pinpoint where the signal is being lost.
- Check the **Preferences** screen for correct signal routing by making sure channel sources/destinations are correctly assigned.

If you still don't have any audio, contact Midas Technical Support.

Diagnostics

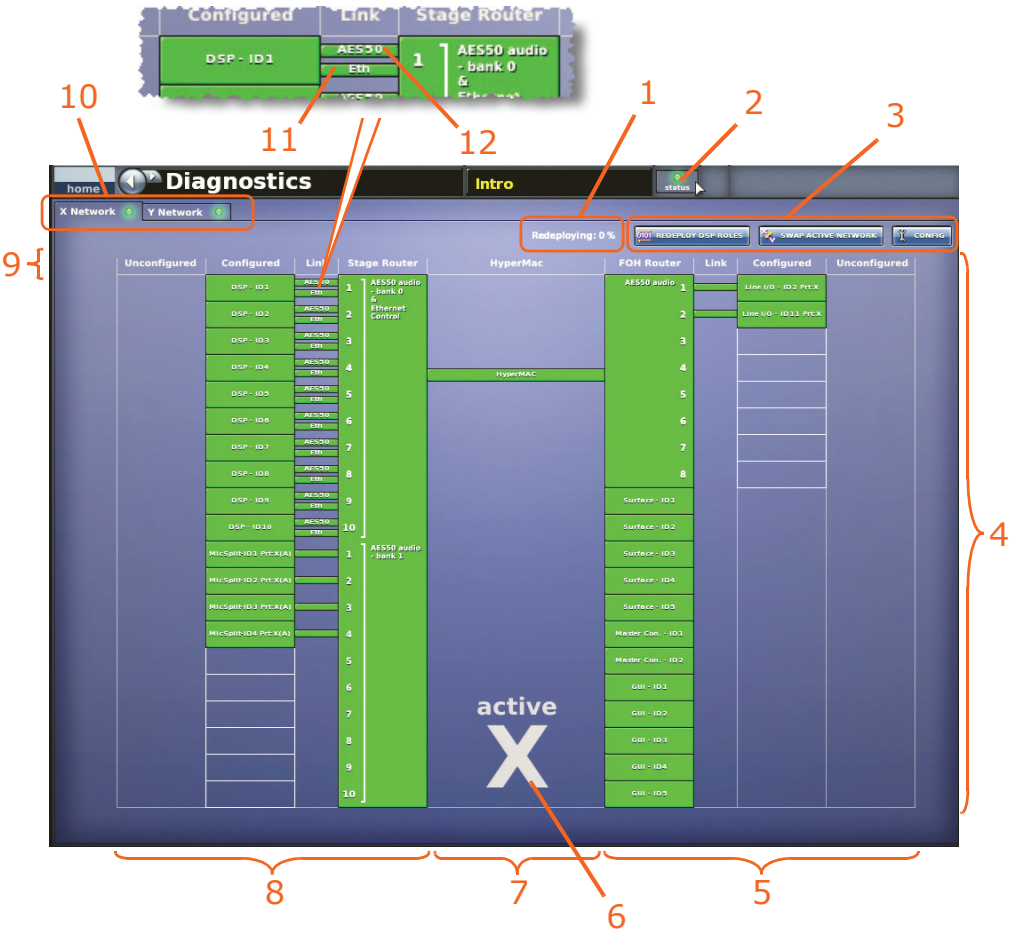
You can view the **Diagnostics** screen to get an overview of the current health and status of the system. The **Diagnostics** screen shows real-time connectivity of the system, the health of connected nodes and whether a device is configured or not.

Each DSP has two connections per unit to show a loss of AES synchronisation and cable failure.

The **status** LED at the top of the screen, which is constantly displayed while the XL8 is switched on, is linked to the status of individual items on the **Diagnostics** screen. You can click on it to see what is causing the error. The X and Y network tabs have similar LEDs that show the status of their respective networks.

About the Diagnostics screen

This section describes the various elements on the **Diagnostics** screen.



Item	*Description*
1	Shows the progress (as a percentage) of DSP redeployment.
2	The **status** LED is constantly displayed on the each GUI screen, and indicates the health/status of the system. Clicking this LED will open the **Diagnostics** screen.
3	Three function buttons: • **REDEPLOY DSP ROLES** — copies all files to all DSPs. Usually done after a software upgrade. • **SWAP ACTIVE NETWORK** — swaps the active network (X/Y). • **CONFIG** — opens the **AES50 Device Configuration** window (see Figure 19 "The AES50 Device Configuration window" on page 83).
4	System devices panel.
5	FOH devices.
6	Shows whether this network is currently active or on standby.
7	HyperMac.
8	Stage devices.

Item	Description
9	Section headings as follows: • **Unconfigured** — contains devices that have not been configured. • **Configured** — contains the configured devices. • **Link** — shows the interconnections from the router to the devices. • **Stage Router** — AES50 audio and Ethernet control connections to the stage router from devices connected in the stage racks. • **FOH Router** — I/O connections to the FOH router from devices connected in the FOH rack. Also includes each bay processor and GUI, and the two master controllers.
10	X and Y network tab sheets. Show the health of their respective networks. The LEDs next to the title of each tab sheet have a similar functionality to the **status** LED at the top of the GUI screen, but only apply to their respective networks.
11	**Eth** link, indicates cable failure.
12	**AES50** link, indicates a loss of AES synchronisation.

>> To open the Diagnostics screen

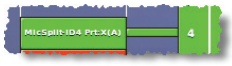
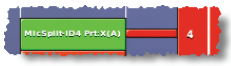
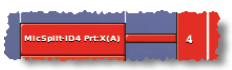
At a GUI screen, choose **home** ▸ ***Diagnostics.***

>> To open the X or Y network tab sheets

In the **Diagnostics** screen, click the tab title (**X Network** or **Y Network**) of the network you want.

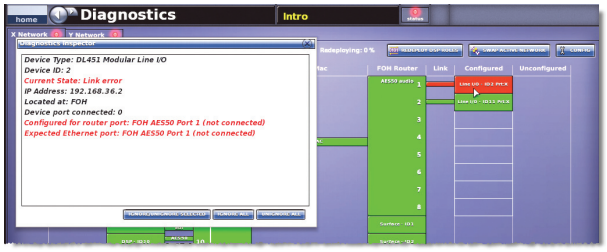
What the device and link colours mean

The colour of each device and associated link indicates their current status, as follows:

State	Description	Unit status	Connection of active link	Connection of inactive link
	Both the unit and link are green	Good	Good	Good
	Unit is green and the link is red	Good	Bad	Not known
	Unit is red and the link is green	Malfunction	Good	Not known
	Both the unit and link are red	Not known	Bad	Bad

Viewing the status of the master controllers is particularly important, especially when you need to swap the active master controller (see "Swapping the active master controller" on page 387), as it shows you which master controller is currently controlling the network.

About the Diagnostics Inspector window



Clicking an item will open its **Diagnostics Inspector** window (shown right), which provides you with detailed information, particularly if it has an error condition.

The 'ignore' buttons at the bottom of the window let you configure the XL8 to ignore errors on selected/all items. This is an important feature because there may be times when you are quite happy to work with a known error(s), but will want to know when a new error occurs. For example, if you only need 48 channels on an XL8 you will probably only have two mic splitters fitted in the network system, instead of the standard four. The XL8 will detect that there are two missing mic splitters and inform you of this 'error'. By choosing to ignore this, if a new error does occur you will be able to detect it in the usual way.

Note: Diagnostics Inspector *windows are primarily non-user items for use by Midas service and software engineers. By providing useful information, such as device health and status, they aid fault diagnosis and rectification and may help solve any problems that may arise. Apart from using the 'ignore' buttons, it is unlikely that operators of the XL8 Control Centre will ever need to use this function.*

Swapping the active network

In the highly unlikely event that the active network (X or Y) develops a malfunction, you can swap over to the standby network, making this the active one.

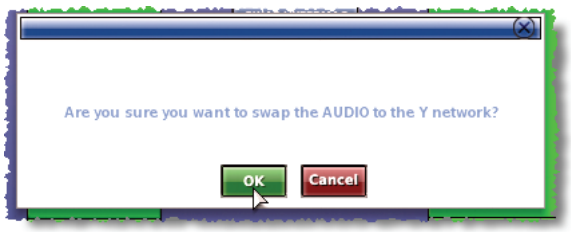
Note: *The swap function does not swap control data, as this non-audio data finds its own way through the network. This allows the router to swap to the inactive link, even if the active link is broken or removed.*

>> To check the health of the active network

At the **Diagnostics** screen, check the status of the active HyperMac link. If it is green the link is good, and if it is red there is a problem and you should swap to the standby HyperMac link.

>> To swap the networks

1. At the **Diagnostics** screen, click **SWAP ACTIVE NETWORK.**
2. In the prompt window (shown right), click **OK.** The active and standby networks will swap over.



Swapping the active master controller

Although it is highly unlikely that the active master controller (MC) will develop a malfunction, should it ever happen you will need to activate the standby MC.

>> To swap the active master controller

1. At the GUI, choose **home** ▸ ***Files.***
2. Click **FILE SYNC.**
3. In the **Master Controller File Synchronisation** window, click the **MAKE ACTIVE** button of the standby MC, as indicated to the left of the button.



Synchronising the files

In exceptional circumstances the files may be out of synchronisation. For example, after a new MC has been fitted and the system cannot determine which MC to use. In this case you can choose which files you want synchronised.

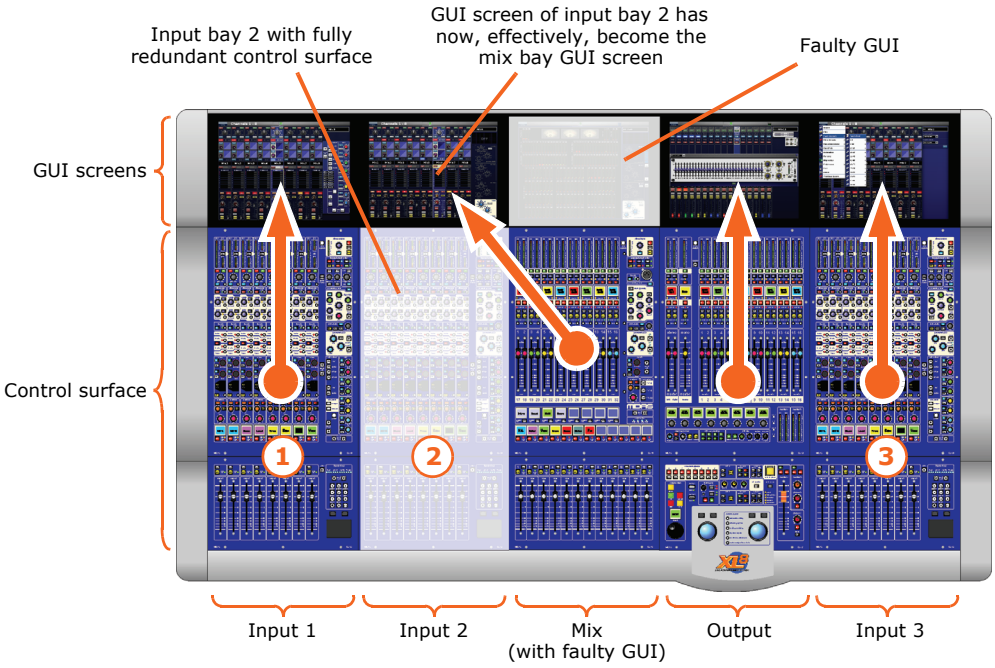
>> To choose which file(s) you want synchronised

1. At the GUI, choose **home** ▸ ***Files.***
2. Click **FILE SYNC.**
3. In the **Master Controller File Synchronisation** window, click the **MAKE ACTIVE** button of the MC containing the file(s) you want synchronised.

Mapping a GUI screen to another bay

You can map any GUI screen to any bay's control surface, which is an important redundancy feature of the XL8. For example, in the unlikely event that a GUI screen should fail, any of the other GUI screens can be configured to take its place. This operation is done at the **Preferences** screen.

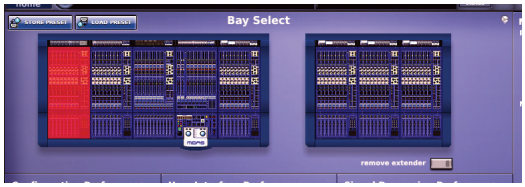
The following diagram shows the control surface/GUI screen association after the GUI screen of input bay 2 has been re-mapped to the mix bay. This would be a logical fix should the mix bay GUI screen fail.



Important:
We do not recommend that you map an input bay's control surface to the GUI screen of another input bay, as it will not reflect what is going on in its own bay's control surface and will in effect be controlled 'blind'. This is because the flexibility and independence of the GUI screens do not apply to the bay control surfaces, as each is hard-wired and tailored for its own specific task — even the input bays know their own place. So, once an input bay 2, always an input bay 2!

>> To re-map a GUI screen

1 At the GUI screen you want to re-map, choose **home ▸ *Preferences* ▸ *General.*** In the **Bay Select** section, the red translucent rectangle in the console diagram will show, which bay the GUI screen is currently mapped to. For example, the GUI screen is mapped to input bay 2 in the adjacent diagram.



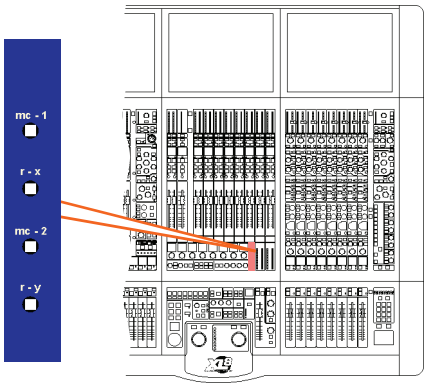
2 In the console diagram, click within the bay you want to re-map the GUI screen to. The red translucent rectangle should now appear in this bay.

3 Choose **home ▸ *Default.***

Reset switches

Caution!
Do not operate any of these switches during normal operation, as they are for fault correction purposes only.

There are four reset switches, which are for service use only. They are used for resetting the X and Y master controllers, scan processor and router.



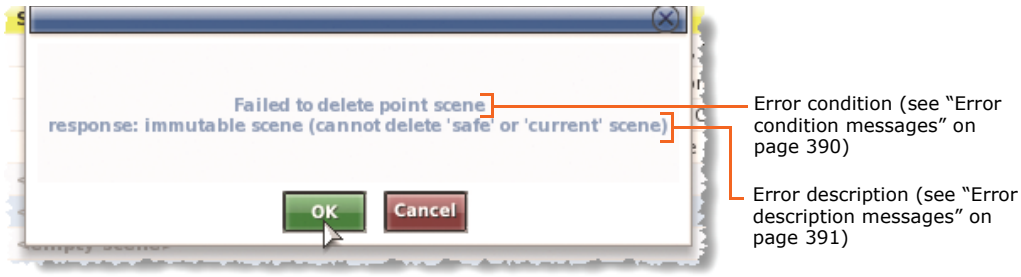
Troubleshooting automation

This section explains the error messages that you may see when using XL8 automation.

Error messages

Error messages, which can appear when you are accessing the **Files** or **Automation** screens, provide useful information on the condition that triggered them. Due to the way the filing and automation systems interact with the internal processing system of the XL8, not all error messages are indicative of a problem; some may appear due to the current state of the system and just require a retry of the operation.

Error messages comprise two components — a first line of text containing the error condition, followed on the next line by a description of the error (prefixed by the text "response:"). The error condition text indicates the operation that may have triggered the error message, while the error description text explains the reason for failure and, in some cases, also provides information that may be useful to service engineers. The following diagram shows a typical error message.



>> To proceed after an error message appears

1. Heed the error message.
2. Click **OK**.
3. Take the appropriate action for that particular error. Refer to Table 18 "List of error condition messages" on page 390 and Table 19 "List of error description messages" on page 391.

Automation error messages

An automation error message may be generated by any of the following:

- An attempt to perform a copy and paste is ignored.
- Attempting to assign notes to a scene. The text "There was an error setting the scene note" will be displayed.
- An attempt to assign MIDI data to a scene is ignored.
- An attempt to set the navigation mode, that is, switching rehearsal mode on or off, is ignored.
- An attempt to skip/unskip a scene or point scene; see "Rehearsals" on page 193.
- An attempt to assign the default store option is ignored.
- An attempt to assign the rehearsal mode state for all scenes is ignored. (This functionality is not available to the user.)
- An attempt to set the MIDI navigation mode is ignored. (This functionality is not available to the user.)
- An attempt to modify the scene list mode is ignored.

Error condition messages

The following table contains the possible error condition messages for both the file and automation systems. These messages comprise the first line of the error message as they appear on the GUI.

Table 18: List of error condition messages

System Type	*Error Message*	*Fault Condition*
File	Failed to copy file	Attempting to copy a file.
File	Failed to delete file	Attempting to delete a file.
File	Failed to rename file	Attempting to rename a file.
Automation	Failed to copy point scene to point scene	Attempting to copy one point scene to another.
Automation	Failed to create a new show	Attempting to create a new show.
Automation	Failed to delete point scene	Attempting to delete a point scene.
Automation	Failed to expand point scene range	Attempting to expand point scene range, that is, by inserting an extra 10 point scenes, for example, expanding scene 10.00 will add point scenes 10.10, 10.20 etc., up to 10.90.
Automation	Failed to initiate point scene storage	Attempting to initiate point scene storage, that is, when clicking **Store** on the GUI. (A successful outcome is to display the 'Store' window.)
Automation	Failed to insert point scene	Attempting to complete point scene storage by clicking **OK** after selecting "Insert before scene".
Automation	Failed to load show	Attempting to load a show file.
Automation	Failed to recall last scene	Attempting to recall the previous scene to the control surface.
Automation	Failed to recall Next scene	Attempting to recall the next scene to the control surface.

System Type	Error Message	Fault Condition
Automation	Failed to recall Now scene	Attempting to reload the current scene or the current jog scene (if any) to the control surface.
Automation	Failed to rename point scene	Attempting to rename a point scene.
Automation	Failed to save file	Attempting to save a currently loaded file.
Automation	Failed to save file to new name	Attempting to save a currently loaded show file to another file name, that is, by using the **Save As** button.
Automation	Failed to store point scene	Attempting to complete point scene storage by clicking **OK** after selecting "Store to empty scene", "Overwrite scene" or "Store to empty scene".
Automation	Failed to unexpand point scene range	Attempting to unexpand point scene range. This is the opposite of expanding the point scene range (immediately above) and can only be carried out if the 10 point scenes to be unexpanded are empty.

Error description messages

The following table contains the possible error description messages for both the file and automation systems, which will start on the second line of the error message. The "Error Message" column in the table contains the error message text that immediately follows the "response:" text. For ease of reference the table lists the error messages in alphabetical order.

Table 19: List of error description messages

Error Message	System(s)	Problem	Solution
hexadecimal number			
<error code in hexadecimal> unknown error code	File and Automation	Indication of a possible system error.	Note down the hexadecimal value of the error code and contact Midas Technical Support, giving them this value.
a			
artefact clone policy violation	File and Automation	The cloning of this artefact (file type) is not allowed.	Avoid using this type of operation.
artefact creation policy violation	File and Automation	The creation of this file type is not allowed.	Avoid using this type of operation.
artefact deletion policy violation	File and Automation	The deleting of this file type is not allowed.	Avoid using this type of operation.
artefact import violation	File and Automation	The importing of this file type is not allowed.	Avoid using this type of operation.
artefact load policy violation	File and Automation	The loading of this file type is not allowed.	Avoid using this type of operation.

Error Message	*System(s)*	*Problem*	*Solution*
artefact rename policy violation	File and Automation	The renaming of this file type is not allowed.	Avoid using this type of operation.
artefact replication policy violation	File and Automation	The replication of this file type is not allowed.	Avoid using this type of operation.
artefact save policy violation	File and Automation	The saving of this file type is not allowed.	Avoid using this type of operation.
attempt to overwrite existing data (overwrite not enabled)	File and Automation	The operation to save or copy to the existing file is not allowed, as files cannot be overwritten.	Avoid using this type of operation.
b			
bad device	File and Automation	Operation could not be carried out because the device, that is, the internal compact flash of the XL8 or USB memory stick (if connected), does not contain the required directory structure.	• If the device is the internal compact flash of the XL8, this could be an indication of a serious problem. Contact Midas Technical Support. • If the device is the USB memory stick, check that the device has not been disconnected from the control surface.
bad device ID	File and Automation	The device identifier has not been recognised.	If you are exporting a file to a USB memory stick, check that it has not been disconnected from the control surface.
bad directory	File and Automation	The file system path does not terminate in a directory.	This is highly unlikely to occur in practice, but is an indication of a serious error. Contact Midas Technical Support.
bad file	File and Automation	The file system path does not terminate in a file.	This is highly unlikely to occur in practice, but is an indication of a serious error. Contact Midas Technical Support.
bad file artefact	File and Automation	The file has been detected as not valid. Preferences, preset library and show files are validated by comparing their actual attributes against the corresponding fields stored in the header of the file, such as, file size, checksum etc.	Try again. If still unsuccessful, and if the file is a show file, try a backup file, if one is available.
bad file version	File and Automation	The preferences, preset library or show file could not be opened because its file header version field was not valid.	Try again. If still unsuccessful, and if the file is a show file, try a backup file, if one is available.
bad path	File and Automation	A file or directory is missing.	This is an indication of a serious error. Contact Midas Technical Support.

Error Message	*System(s)*	*Problem*	*Solution*
bad point scene ID	File and Automation	The scene's point scene ID cannot be found.	Try again.
c			
c-lib file error	File and Automation	Critical internal error.	This is an indication of a serious error. Contact Midas Technical Support.
c-lib error	File and Automation	Critical internal error.	This is an indication of a serious error. Contact Midas Technical Support.
c-lib process error	File and Automation	Critical internal error.	This is an indication of a serious error. Contact Midas Technical Support.
d			
device utilisation policy violation	File and Automation	The device is full.	If necessary, backup some files and delete them from the device to free up some memory.
e			
empty point scene index	File and Automation	An attempt was made to navigate an empty point scene index.	Try again. If unsuccessful, and if the file is a show file, try a backup file, if one is available.
event is already active	Automation	Critical internal error.	This is an indication of a serious error. Contact Midas Technical Support.
f			
failed to add to lock list	File	A device or file could not be 'locked' to prevent another task accessing it while it is in use.	Although, in practice, it is highly unlikely to occur, this error may indicate a serious system failure. Contact Midas Technical Support.
failed to add scene	File and Automation	The scene could not be added.	Try again.
failed to allocate memory	Automation	The MC was unable to allocate sufficient memory (RAM) to complete the task.	Switch off the XL8 Control Centre and switch it back on again. If the problem persists, it could be an indication of a serious error. Contact Midas Technical Support.
failed to configure scope mask	Automation	The 'copy and paste through scenes' operation failed.	Try again. If repeated attempts fail, contact Midas Technical Support.
failed to create show	Automation	A new show could not be created.	Try again. If repeated attempts fail, contact Midas Technical Support.
failed to deschedule event	Automation	Critical internal error.	This is an indication of a serious error. Contact Midas Technical Support.

Error Message	*System(s)*	*Problem*	*Solution*
failed to schedule event	Automation	Critical internal error.	This is an indication of a serious error. Contact Midas Technical Support.
i			
immutable scene (cannot delete 'safe' or 'current' scene)	File and Automation	The operation on the current or safe scene is not allowed. The safe scene cannot be edited or deleted and you cannot store to it. Also, you cannot delete the scene last recalled to the control surface. (Precludes the use of the **Now** button.)	Avoid using these types of operation.
j			
jog position is empty	Automation	The current scene is empty.	Avoid this type of operation on an empty scene.
m			
missing file	File and Automation	The required file cannot be found.	Try again.
missing navigation state	Automation	Critical internal error.	This is an indication of a serious error. Contact Midas Technical Support.
mtools lookup	File and Automation	Critical internal error.	This is an indication of a serious error. Contact Midas Technical Support.
n			
no CBMA access	Automation	Automation manager does not have access to the current control surface settings.	Try again or try switching off the XL8 Control Centre and then switching it back on again. If the problem persists, contact Midas Technical Support.
no next scene	Automation	There is no next scene relative to the current position in the scene list. This is generated by recalling the next scene when the current scene is the last in the scene list.	Avoid this operation on the last scene in the cue list.
no previous scene	Automation	There is no previous scene relative to the current position in the scene list. This is generated by recall the last scene when the current scene is 00.00, that is, the safe scene.	Avoid this operation on the safe scene.
no scene data	Automation	The scene contains no scene notes or MIDI data.	Only carry out this type of operation on a scene that contains scene notes or MIDI data.

Error Message	*System(s)*	*Problem*	*Solution*
no show loaded	Automation	There is no show loaded.	Only carry out this type of operation with a show loaded.
not in storing state	Automation	The Automation System was momentarily unable to store a scene.	Try again. If repeated attempts fail, contact Midas Technical Support.
null pointer	File and Automation	Critical internal error.	This is an indication of a serious error. Contact Midas Technical Support.
p			
persistent storage error	File and Automation	The GUI or one of its subsystems is out of date and cannot interpret the new failure modes.	Update the GUI and its subsystems. If the problem persists, contact Midas Technical Support.
point scene index continuity error	File and Automation	The show file being modified is damaged.	This is an indication of a serious error. Contact Midas Technical Support.
point scene index integrity error	File and Automation	The show file being modified is damaged.	This is an indication of a serious error. Contact Midas Technical Support.
point scene insert error	File and Automation	Failed to insert a point scene.	This is highly unlikely to occur in practice, but is an indication of a serious error. Contact Midas Technical Support.
portable scene format conversion error	Automation	The attempt to load a show, which was last saved by an MC built with a different enum version, failed during the scene conversion stage of the loading process.	Try again. If repeated attempts fail, contact Midas Technical Support.
r			
required device has files that are in use	File and Automation	Another task is currently accessing file(s) on the device, that is, the internal compact flash of the XL8 or USB memory stick (if connected).	Try again.
required device is locked	File and Automation	Another task is currently accessing the device, that is, the internal compact flash of the XL8 or USB memory stick (if connected).	Try again.
s			
scene capacity violation	File and Automation	The scene cannot be stored to the show file, as it already contains the maximum number of scenes allowed.	If necessary, delete one or more of the other scenes. The maximum capacity for a show file is 500 scenes for a 512MB master controller (MC) and 1000 scenes for a 1GB MC.

Error Message	*System(s)*	*Problem*	*Solution*
scene UID error	File and Automation	The file being modified is damaged.	This is an indication of a serious error. Contact Midas Technical Support.
shell command error	File and Automation	This is a critical internal error.	This is an indication of a serious error. Contact Midas Technical Support.
source point scene is empty	Automation	Specified source scene is an empty 'slot'.	Only carry out this type of operation on a scene that is not empty.
specified file is already locked	File and Automation	Another task is currently accessing the file	Try again.
specified file was not found	File and Automation	The file could not be found on the specified device, that is, the internal compact flash of the XL8 or USB memory stick (if connected).	• If the device is the internal compact flash of the XL8, this could be an indication of a serious problem. Contact Midas Technical Support. • If the device is the USB memory stick, check that the device has not been disconnected from the control surface.
stdio stream error	File and Automation	This is a critical internal error.	This is an indication of a serious error. Contact Midas Technical Support.
stdio stream open error	File and Automation	This is a critical internal error.	This is an indication of a serious error. Contact Midas Technical Support.
stdio stream seek error	File and Automation	This is a critical internal error.	This is an indication of a serious error. Contact Midas Technical Support.
storage policy violation	File and Automation	There has been a 'storage policy' violation. (This is not necessarily a critical error.)	Ensure that all software components are up to date. If the problem persists Contact Midas Technical Support.
t			
the <file/ automation> manager is not registered	File and Automation	The System Manager is momentarily unavailable.	Try again.
u			
unknown parameter enum value	Automation	A parameter with a value that was not valid was supplied to the MC.	Try again. If this occurs again, contact Midas Technical Support.

Appendix G: Updating The XL8 Host Software

This appendix shows you how to update the host software of the XL8 and also its associated networked devices.

About the XL8 updater



Caution!
You must not use this update method on XL8s running host software versions previous to V1.07. XL8s must be running at least V1.07 before they can be updated to V1.10 and later.

The XL8 has an update facility that provides an easy and straightforward method of updating your system by letting you install the latest version of host software on the XL8 Control Centre and also any networked DLnnn units.

Basically, all you have to do is insert a memory stick containing a file of the latest version of host software and then start the updater. The updater then installs the latest host software on the control centre and any DLnnn units connected in the system, displaying the progress on the updater screen. When the updater has finished, simply power the system off and then on again for the upgrade to take effect. Your system should now be fully up to date.

By using the updater, you can install an earlier version of the host software on your system if you should ever need to.

XL8 host software versions

The version of host software that your XL8 is currently running will determine which method you should use to update your system, as shown in the following table.

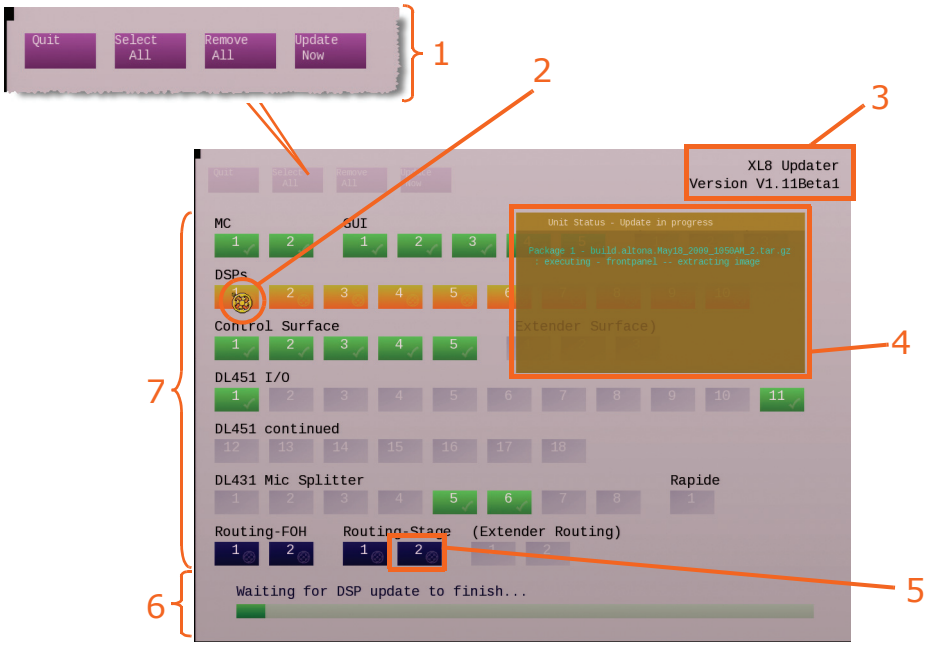
Table 20: Version-specific update information

XL8 host software version	*Update method*
Pre-V1.07	Your console must be at least at version 1.07 to update to V1.01. Update your console to V1.07 first using traditional methods. If necessary contact Midas Technical Support. **Important:** **DO NOT attempt to update to the latest version directly from V1.06.03.**

XL8 host software version	***Update method***
V1.07 to pre-V1.10	Updates from V1.07 or later can only be performed using the new system updater. For updates from V1.07 you must trigger the update by manually typing commands into the console (see "To update an XL8 running V1.07 or later" on page 404). ***Note:*** *FPGA updates are available from V1.07 (same as those needed for V1.10.) and should be applied to the console to allow the use of tie lines, synchronisation between consoles and AES50 mute on loss of synchronisation. These FPGA files are: rt_router_1v32.mcs, rt_hmac_1v20.mcs, rt_router_smac_hmac_1v26.mcs and rt_octal_smac_1v23.mcs.*
V1.10 onwards	V1.10 users can simply insert the USB key to start the update (see "To update an XL8 running V1.10 or later" on page 402). **Important:** **You must apply the FPGA updates.**

About the updater screen

During installation the updater screen will appear. This screen lets you select the system devices you want to upgrade, start the update procedure and also shows you how the procedure is progressing.



Item	*Description*
1	Updater menu (see "Updater menu" on page 400).
2	Pointer, which has two possible icons (both translucent yellow), depending on the update status. The pointer changes to an arrowhead icon when the updater is ready for you to select the devices that you want to update. The pointer becomes a roundel icon during the update procedure; it rotates to show that the update is in progress.
3	XL8 host software version that the system will be updated to.
4	**Unit Status** window (see "Unit Status window" on page 400).
5	Device block (see "Device blocks" on page 400).
6	Update status bar with informative text. The green bar shows the progress of the update procedure, whether it is for the device currently being updated or for the whole procedure itself. The text immediately above shows what status the green bar is representing.
7	Device area, shows you which devices are connected to the system.

Figure 43: A typical updater display

Updater menu

The following table gives a description of the updater menu commands.

Command	*Function*
Quit	Exits the updater. Returns the control centre to the operating condition it was in when the updater command was selected from the GUI menu.
Select All	Selects all Midas devices connected (and detected) in the XL8 Live Performance System.
Remove All	Deselects all Midas devices connected (and detected) in the XL8 Live Performance System.
Update Now	Starts the update procedure.

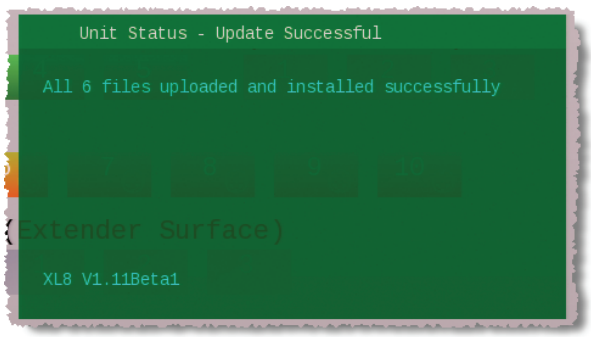
Device blocks

Each device block represents a possible or actual device connected in the system. The device block number is referenced to the device's ID. The colour of each device block indicates the update status of the device, which is shown in the following table.

State	*Description*
	Grey background — appears during the updater's 'triggering upgrade client' procedure. If its appearance doesn't change throughout the update procedure, either there is no device connected in this position or one has not been detected.
	Blue background without roundel — appears after the updater's 'triggering upgrade client' procedure has finished to show you that there is a device connected in this position.
	Blue background with roundel — appears after this device has been selected for update.
	Gold background with roundel — this device is currently being updated.
	Green background with tick — this device has successfully been updated.
	Red background with cross — this device's update has failed.

Unit Status window

You can get more detailed information on the update progress of a device by moving the pointer over it. A translucent window (a typical one is shown right) will open towards the upper-right corner of the screen. The window has a title bar at the top and a panel below that contains textual information.



The colour of the window matches the colour of its associated device block, which gives an indication of its update status, as described in the previous section.

Using the XL8 updater

This section shows you how to update your XL8 Live Performance System. However, before you begin there are a few things you will need and some things you must do.

What you will need

Before you begin, check that you have the following:

- **USB memory stick** The USB memory stick (flash drive) must have enough available memory to store any shows that you will need to backup, plus an additional 150MB of memory for the update package (that is, the file with a .tar extension). It should also preferably be of USB 2.0 specification.
- **Stable mains supply** If the power drops at a critical point during the update, it is possible — although unlikely — that this could cause some of the system components not to function. A warning window opens before you start the update procedure to remind you of this.
- **XL8 version 1.07 or later** Your XL8 must be running software V1.07 or later. For details, see Table 20 "Version-specific update information" on page 397.

Preparation

Before you begin, do the following:

- **Backup your shows** It is likely that any shows will be erased when you power cycle the XL8 following an update. We therefore recommend that you backup your shows onto the USB memory stick (see "Saving your show files to a USB memory stick" on page 112), and then copy them onto a PC.
- **Unplug the router/router interconnection cable** This cable is not used on XL8s running V1.10 and later software.
- **Check that everything is connected** Make sure that everything on the system is correctly connected, configured and functioning properly. Do this by checking the **Diagnostics** screen (see "Diagnostics" on page 383). Both snakes must be in use, otherwise one of the stage routers will not be detected.
- **Switch off speakers** During the update procedure the DSP and AES routing may perform a number of resets during which the audio may not be in a controlled state. We therefore recommend that you switch off any speakers connected to the system.
- **Make sure you have enough time** The update procedure may take quite a while to complete, so make sure you have at least 45 minutes free before you start. **We do not recommend carrying out an update just before a performance!**
- **Configure the USB memory stick** Create a folder at the top level (root directory) of your USB memory stick called "XL8upgrades". Then, copy the latest update file (XL8xxx.tar) into it.

Notes on updating from V1.07 to V1.10

- The way units are allowed to connect to the system is different in V1.10. Therefore, it is vital that all units are detected and included in the update, as it will be difficult to update them later using this upgrade method.
- The automatic backing up of shows by the updater is in Beta test. Currently, only the shows from Master Controller 1 (MC1) will be backed up, or from MC2 if MC1 was not detected. As show synchronisation was not fully supported before V1.10, it is possible that any shows saved on your USB drive could be overwritten with out of date copies from an out of date MC. Therefore, we recommend that you back up your shows to a different USB drive or make a safe copy on your PC before the update.

- Following an update to V1.10, it is no longer necessary to keep one of the MCs in reset. Connect the router/router interconnecting cable and the RAPIDE in their new positions (see "XL8 system interconnections" on page 36).
- As the DSPs have an extra package for installation in this version, the update time is much longer than indicated.

Updating your system

WARNING!
UPGRADING YOUR SYSTEM WILL CAUSE THE CONTROL CENTRE TO LOSE SYNCHRONISATION, WHICH CAN RESULT IN LOUD NOISES FROM THE SYSTEM. ALWAYS MUTE THE PA AT THE AMPLIFIER/ SPEAKER BEFORE UPDATING YOUR SYSTEM.

Caution!
Do not switch off the power to any of the system devices while the XL8 is carrying out the installation of the host software.

The installation process is carried out with the XL8 Control Centre fully powered up and operational.

If the control centre is running version 1.07, some additional steps are needed to launch the updater. In later versions this will be done automatically from the GUI.

>> To update an XL8 running V1.10 or later

1 Mute the PA at the amplifier/speaker. Refer to the **WARNING** at the beginning of this section.

2 Plug the USB memory stick containing the .tar file in the input bay 1 keyboard socket on the front panel of the XL8 (see "Keyboard connections and bay allocation" on page 250). The "Run upgrade utility?" window will open automatically.



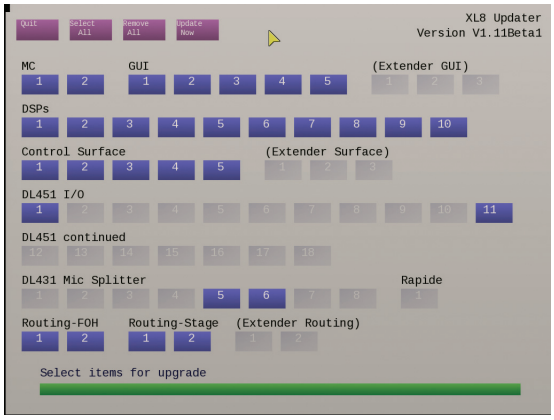
3 As the XL8 can detect how many .tar files are on the USB memory stick, do one of the following:

- If there is only one .tar file on the USB memory stick, start the updater by clicking **OK.**
- If there is more than one .tar file on the USB memory stick, click **Cancel** to close the window. Then, start the updater at the master bay GUI by choosing **home** ▸ ***Preferences*** ▸ ***Upgrade*** and clicking on the latest host software file from the .tar files listed in the submenu.

The following is the update procedure:

4 The "PREPARING UPDATER" screen will open, and the status text (lower-left corner) will inform you of the updater progress, for example, by displaying "Verifying distribution components", "Joining network" etc. After this the GUI changes to a white screen, the other GUI screens may drop back to show text or even go blank, which is quite normal.

The updater makes an integrity check of all the files included in



the update before launching fully. It then detects all units in the system, ending with the DSPs.

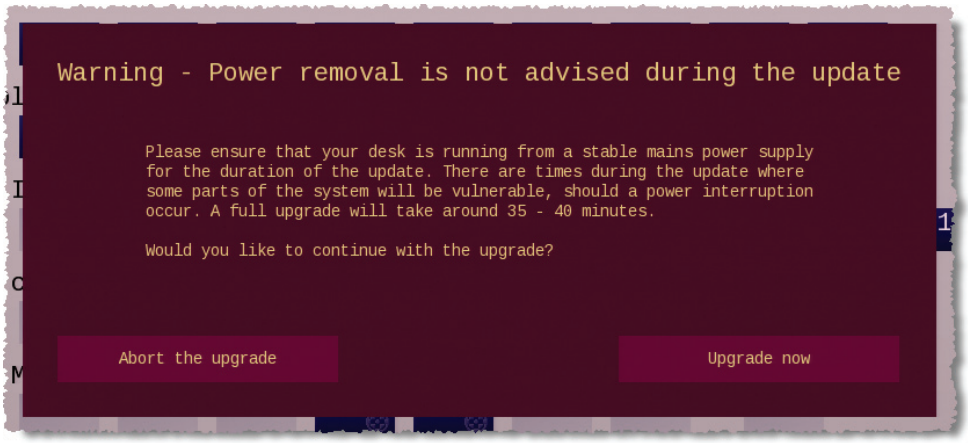
After the updater preparation has finished, the updater screen opens. It automatically goes through a startup up sequence during which the updater menu is unavailable. When it has finished, the text just above the green bar (shown right) will show "Select items for upgrade" and the devices available for upgrade will be coloured blue (see "Device blocks" on page 400).

Note: *If, at this stage, something on your system was not detected, you can still quit and check your connections using the diagnostics page in the GUI.*

Select the devices you want to update. It is most likely that you will want to select all of the devices, so click **Select All.** However, if you want to edit the selections, click on the device blocks to select/deselect individual ones. You can also click **Remove All** to deselect all of the ones selected. Selected units will show the Midas roundel in their device block.

5 When you have selected the devices you want, click **Update Now.**

6 A warning window will open (see below). To start the update procedure, click **Upgrade now.**



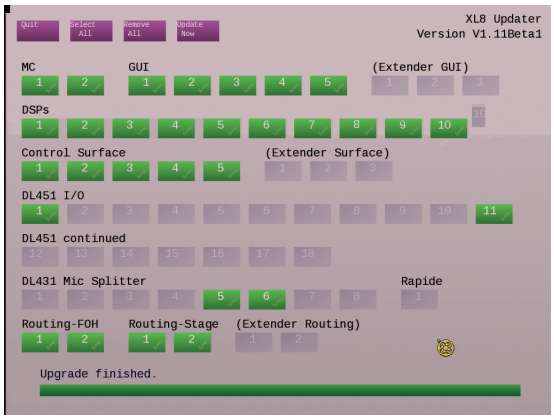
After you start the installation, leave all of the system devices switched on throughout the update procedure (see the **Caution** at the start of this section).

During the update procedure the device blocks will change colour according to their update status (see "Device blocks" on page 400). The green bar at the bottom will show the progress of the current action. A typical screen display during the update procedure is shown in Figure 43 "A typical updater display" on page 399.

7 When the update procedure has finished, click **Quit.** The XL8 and all of the system's units will return to normal operating mode.

However, if any units have failed to update (see "Device blocks" on page 400), instead of clicking **Quit** you can select them and start the update procedure again.

The diagram right shows a typical screen display of a successful upgrade, where the device blocks of all of the connected devices are green.



8 Power cycle the system (including all I/O boxes) to fully install the new software. Do this by powering the system down and then powering it up again (see "Powering the XL8 system" on page 39).

9 To update the DSPs, do the following: At the GUI, open the **Diagnostics** screen by choosing **home** ▸ ***Diagnostics*** and click **REDEPLOY DSP ROLES.** Then, click **OK** in the "Audio will be stopped for several minutes, are you sure" message window.

>> To update an XL8 running V1.07 or later

1 Mute the PA at the amplifier/speaker. Refer to the **WARNING** at the beginning of this section.

2 At the output bay GUI, choose **home** ▸ ***Preferences*** ▸ ***Admin.***

3 In the message window, type **violet** using the pull-out keyboard and then click **OK.** Some text will appear at the top of the GUI screen.

4 To end the GUI application, press ESC.

The following will trigger the update on the input bay 1 GUI.

5 Press CTRL+ALT+F6.

6 At the output bay GUI login prompt, type **root** and then press ENTER.

7 At the password prompt, type **donkey.** If the password prompt did not appear, try pressing CTRL+ALT+F5 instead.

8 At the "bash-3.00#" prompt, type **ssh GUI-1.** If you are prompted for a password, type **donkey** followed by:

/opt/midas/bin/launchupdate XL8xxxx.tar

where "XL8xxxx.tar" is the name of your .tar file.

Ignore any error messages except for "Error: could not find XL8xxxx.tar on the key", which will probably be due to a mistake when typing in the name of the .tar file.

The updater should run. For further instructions, see "To update an XL8 running V1.10 or later" on page 402.

>> To update your XL8 Control Centre with a previous version of host software

You can update your XL8 system with a previous version of host software instead of the most recent one. The procedure is just the same, but select the older file version you need from the **home** ▸ ***Preferences*** ▸ ***Upgrade*** submenu, which must be on the USB memory stick.

Appendix H: Documentation

This chapter contains details on the XL8 user and supplementary documentation, and the suppliers' documentation that accompanies the XL8's peripheral equipment, such as the intercoms.

XL8 user documentation

The following table shows the full suite of Midas XL8 Live Performance System documentation.

Document Name	***Description***	***Part Number***
XL8 Control Centre Quick Reference Guide	Quick set-up and operation instructions for the XL8 Live Performance System and XL8 Control Centre.	DOC04-XL8
XL8 Live Performance System Owner's Manual (this document)	Full user instructions for the XL8 Control Centre and XL8 Live Performance System.	DOC02-XL8
DL431 Mic Splitter Operator Manual	Full user instructions for the DL431 Mic Splitter.	DOC02-DL431
DL451 Modular I/O Operator Manual	Full user instructions for the DL451 Modular I/O.	DOC02-DL451
DL461 Router Operator Manual	Full user instructions for the DL461 Router.	DOC02-DL461
DL471 DSP Operator Manual	Full user instructions for the DL471 DSP.	DOC02-DL471
GNU General Public License (GPL) Booklet	Licensing information for Midas Digital Equipment.	DOC04-GPL
HELIX DN9331 RAPIDE Graphic Controller Operator Manual	Full user instructions for the RAPIDE.	DOC02-DN9331
Fitting An Easyglide To The XL8 Control Centre Instruction Note	Fitting instructions.	DOC04-EASYGLIDE

Supplementary documentation

This section lists all of the available supplementary documentation available for the XL8 Live Performance System, which comprises manuals from the standard Midas and Klark Teknik range of products. These documents are included as reference material to accompany the XL8 user documentation, particularly for the GEQs and internal effects.

- Klark Teknik DN370 Graphic Equaliser Operator Manual, part number DOC02-DN370C.
- Klark Teknik DN780 Digital Reverberator/Processor Operator Manual.
- Klark Teknik Square ONE Dynamics Processor Operator Manual, part number DOC02-SQ1DYNAMIC.
- Klark Teknik Square ONE Dynamics Processor Operator Manual, part number DOC02-SQ1DYNAMIC.

Suppliers' literature

The following pages contain the suppliers' literature listed immediately below:

- *PS-15 System Power Supply. RTS™ Two Wire Intercom Series. 1 amp power supply for 15 stations. Catalogue Number: 9000678600. Form Number: 38110501, August, 2005.*
- *Description and Wiring Diagrams. TELEX® Model HR-1 & HR-2 Headset (300534 Series). 38109-682 Rev D. 02/2005.*
- *User Manual. BP-319 / BP-351. RTS™ Portable Programmable User Station. 9350-7753-000, 04/2004.*

RTS™ Two Wire Intercom Series

innovating the future of communications



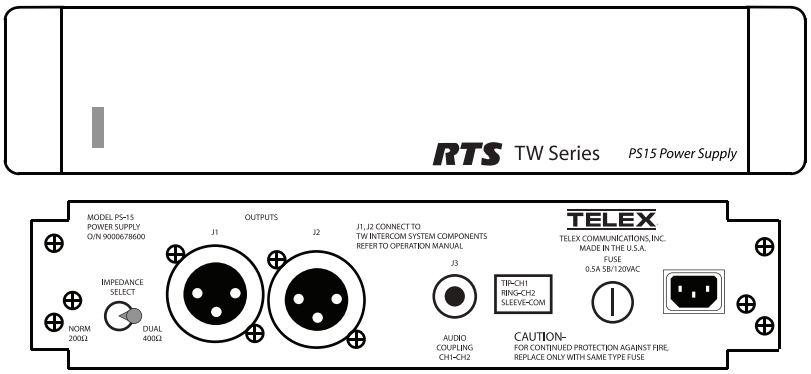
PS-15

System Power Supply

Features

The Model PS-15 Power Supply is designed to work within the TW Intercom System. The PS-15 is suitable for small to medium sized TW Intercom Systems.
The unit is self-contained and features two-channel operation: one "wet" channel with 24 to 32 volts DC and one "dry" channel without voltage potential. Each channel provides an audio termination impedance of 200 or 400 ohms (switch selectable).
This power supply allows speech signals and DC to exist on the same wire (Channel I). The power supply's outputs are protected against short circuit conditions with recovery being automatic and instantaneous.
A single PS-15 Power Supply can power 6 to 30 user stations (depending on model and combination -see specifications).
If still more user stations are needed, two PS-15 Power Supplies can be coupled together to double the powering capability: a 1/4-inch 3-circuit phone jack is available on each power supply for this purpose. This connector can also be used as a one-way output port when monitoring or recording the intercom audio signals.
When two PS-15 supplies are combined. toggling a rear panel switch on each supply will keep the audio level constant. Two PS-15s can power as many stations as a PS-31 (with DC load evenly distributed between the two supplies). Since the PS-31 supplies more voltage than the PS-15 under full load, the PS-31 is better suited to power a large system spread over a large area.
There are two XLR-type 3-pin male connectors mounted on the rear panel for output interconnection to the user stations.
The PS-15 has been designed to meet UL 1419 specifications (professional Audio and Video Equipment).
The PS-15 Power Supply may be used in portable applications (use optional MCP-8 channels) or in standard EIA equipment racks (use optional MCP-1 or MCP-2 rack mounting kits).
The PS-15 is one rack unit high and one-half rack wide. A single PS-15 may be rack -mounted singly or two PS-15s may be mounted side-by-side.

Line Drawings



PS-15 Specifications

Outputs
One powered channel, CH1, (audio + DC + 200 ohm/400 ohm 10% termination}, and one passive channel, CH2, (audio + 200/400 ohm 20% termination).

Output Voltage
No Load: 32.0 +2.0. -1.0 volts
Full Load: 24.0 volts. nominal

Output Impedance
200 or 400 ohms 20%. switchable. On powered channel. 200 ohms. nominal. is maintained from 18.0 to 33.0 volts.

Output Current
Standard Option: .9 ampere at 21/+4-2 volts. DC
*P Option (234V): .9 ampere at 21/+4-2 volts. DC
#D Option (100V): .9 ampere at 21/+4-2 volts. DC
Fault Current: 1.5 amperes at 0.0 volts. DC

Signal Level
Nominal: 2.0 volts peak to peak
Maximum: 5.0 volts peak to peak

Frequency Response
100 hertz to 20 kilohertz +1, -5 dB

Signal-to-Noise Ratio
Reference 2.0 volts. peak to peak: 60 dB nominal

Mains Voltage
Standard: 117 volts :t10%. 50 -60 hertz
*P Option: 234 volts :t10% 50-60 hertz
#D Option: 100 volts +10%. -5%.50-60 hertz

Mains Amperes
0.40 at 117 volts :t10%, 50-60 hertz
0.20 at 234 volts :t10%, 50-60 hertz
0.40 at 100 volts +10%, -5%,50-60 hertz

Environmental
Temperature
Operating: 0° to 50°C
Storage: -40° to 70°C
Humidity: 0 to 95%, non-condensing

Dimensions
1.72” (44 mm) high, 8.186 inches (207.9 mm) wide, 8.33 inches (211.6 mm) deep

Weight
4.68 pounds 2.12 kg)

Finish
Thermoplastic front panel. aluminum case. light gray finish

Contact Information

Telex® Communications, Inc.
12000 Portland Avenue South
Burnsville, MN 55337
Telephone: (800) 392-3497
Fax: (800) 323-0498

Form Number: 38110501
August, 2005

Ordering Information

PS-15
1 amp power supply for 15 stations
Catalog Number: 9000678600

This specifications information is preliminary and is subject to change without notification.
Brand names mentioned are the property of their respective companies.

TELEX COMMUNICATIONS

Description and Wiring Diagrams

Model HR-1 & HR-2 Headset (300534 Series)



General Description

The Telex HR-1 & HR-2 are medium-weight, noise reduction headsets with dynamic microphones. They both have a noise reduction rating of 21dB, and are suitable for use in moderately noisy environments. All models feature a unique, soft moleskin-covered headband design that distributes ear cushion pressure evenly over the entire ear with no pressure points, unlike conventional designs which apply more pressure on the bottom of the ear than on the top. An added advantage of this design is the headset folds into an extremely compact shape.

Design Features

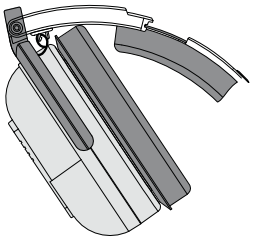
Comfortable foam-filled, mole-skin covered headband pad and ear cushions. The headband pad evenly distributes the headset weight, with no pressure points, for maximum wearer comfort. The ear cushions combine comfort and light weight with excellent acoustic seal. Gel-filled ear cushions are also available for this headset for users who prefer this type. All cushions are field-replaceable.

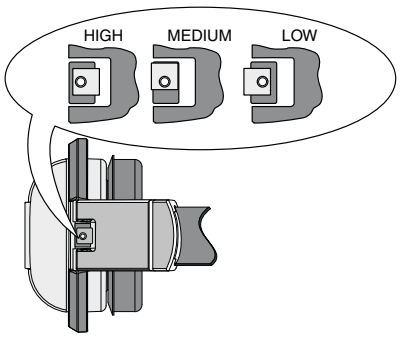
Boom Microphone

The boom arm features a sealed ball-and-socket joint and flexible boom for precise microphone placement on any head size. The boom rotates overhead for microphone placement on either side of the head. The microphone cartridge is a dynamic element. The cartridge removes for replacement by loosening two screws and unsoldering the cartridge.

Cordage

The microphone cordage is protected inside the boom arm. Sheilded wire throughout the headset protects against RFI and EMI. Strain-reliefs on all cords provide maximum durability.

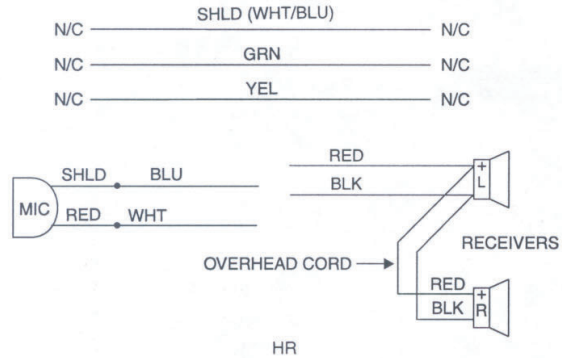


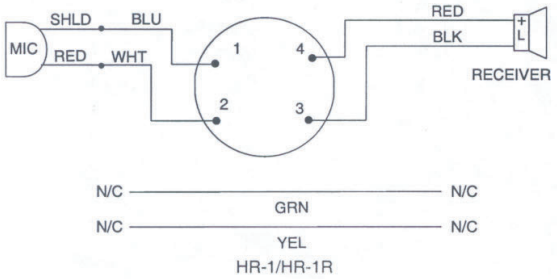


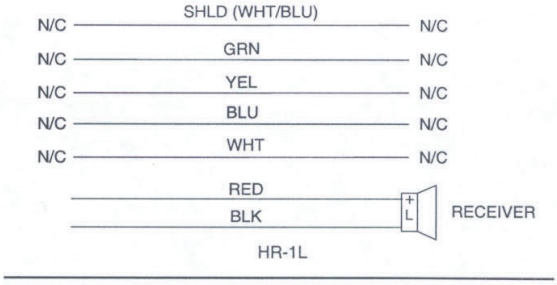
Operation

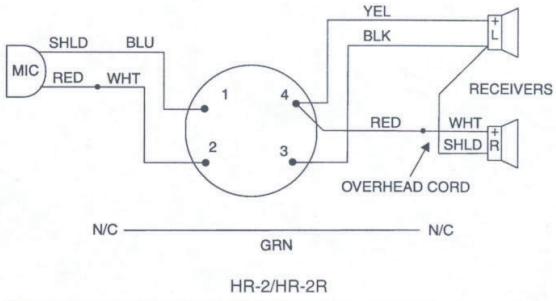
Headband Pressure Adjustments

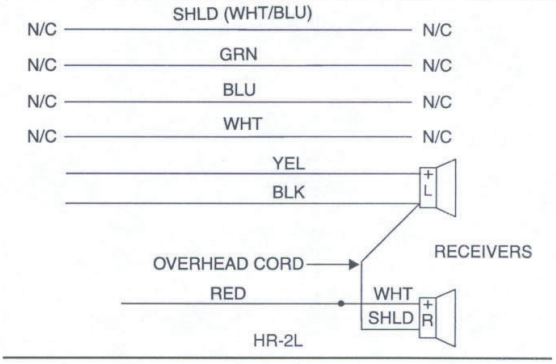
There are three pressure settings. Increasing the pressure will improve the seal between the earcup and the head for greater noise reduction. To change the pressure setting, remove the headset and fold the earcup inward as shown, then rotate the adjustment knob to the desired setting. Repeat for both earcups. Both sides of the headband should be set to the same pressure setting to keep the headband properly centered on the head.

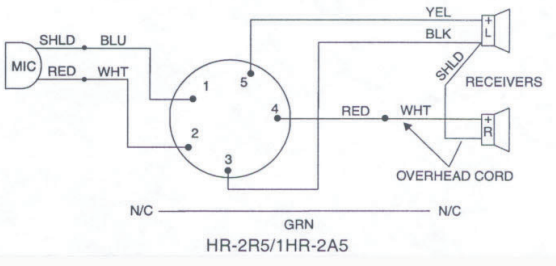












SPECIFICATIONS

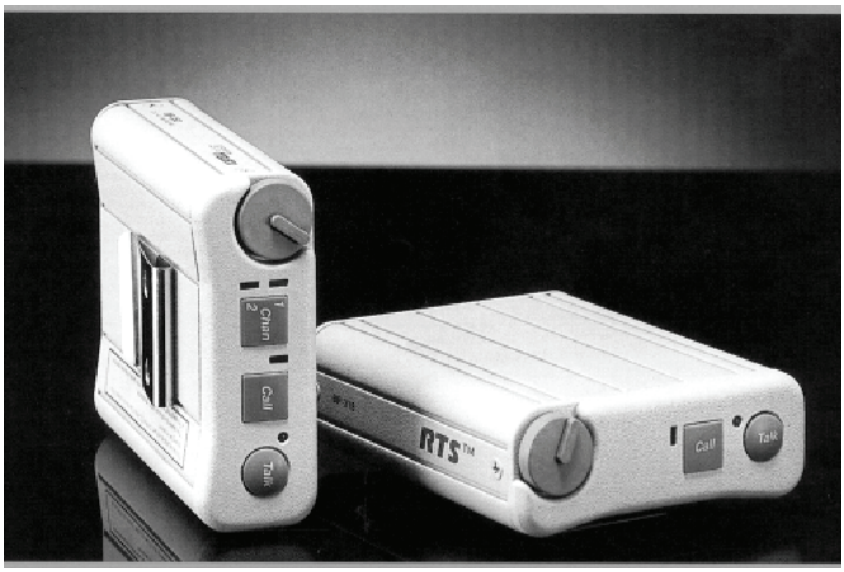
Receivers:
Type: Dynamic
Frequency Response: 50 Hz - 15 kHz
Sensitivity: 100 5 dB SPL (1 kHz, 1 mW input)
Impedance (at 1 kHz): 150 ohms (receivers wired in parallel)
Microphone and Amplifier:
Element Type: Noise-canceling dynamic
Frequency Response: 100 Hz - 8 kHz
Sensitivity: -53 +2/-1 dB (ref: 1 V/bar at 1 kHz with 12 Vdc supply voltage and 100-ohm load)
Matching Impendance: 50-600 ohms
Cordage:
HR-1 & HR-2: Straight cord, 5 ft. (1.5 m)
Connectors:
4 pin XLR male or female, 5pin XLR male or female.
Weight:
Gross Weight: Approx 16 oz. (454 g)
Effective Head Weight: Approx 14.2 oz. (403 g)
Color: Black

Ordering Information		
HR-2	Double sided w/boom, 4 pin female connector	Catalog No. 300534-000
HR-2R	Double sided w/boom, 4 pin male connector	Catalog No. 300534-001
HR-2R5	Double sided w/boom, 5 pin male connector	Catalog No. 300534-002
HR-2A5	Double sided w/boom, 5 pin female connector	Catalog No. 300534-010
HR- 2PT	Double sided w/boom, no connector	Catalog No. 300534-003
HR-2L	Double sided, listen only, no connector	Catalog No. 300534-004
HR-1L	Single sided, listn only, no connector	Catalog No. 300534-005
HR-1PT	Single sided, w/boom, no connector	Catalog No. 300534-006
HR-1	Single sided, w/boom, 4 pin female connector	Catalog No. 300534-007
HR-1R	Single sided, w/boom, 4 pin male connector	Catalog No. 300534-008
HR1-R5	Single sided, w/boom, 5 pin male connector	Catalog No. 300534-009

User Manual

BP-319 / BP-351

Portable Programmable User Station



RTS™

9350-7753-000 04/2004

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UNPACKING AND INSPECTION
Immediately upon receipt of the equipment, inspect the shipping container and the contents carefully for any discrepancies or damage. Should there be any, notify the freight company and the dealer at once.

WARRANTY INFORMATION
RTS products are warranted by Telex Communications, Inc. to be free from defects in materials and workmanship for a period of three years from the date of sale.
The sole obligation of Telex during the warranty period is to provide, without charge, parts and labor necessary to remedy covered defects appearing in products returned prepaid to Telex. This warranty does not cover any defect, malfunction or failure caused beyond the control of Telex, including unreasonable or negligent operation, abuse, accident, failure to follow instructions in the Service Manual or the User Manual, defective or improper associated equipment, attempts at modification and repair not authorized by Telex, and shipping damage. Products with their serial numbers removed or effaced are not covered by this warranty.
To obtain warranty service, follow the procedures entitled “Procedure For Returns” and “Shipping to Manufacturer for Repair or Adjustment”.
This warranty is the sole and exclusive express warranty given with respect to RTS products. It is the responsibility of the user to determine before purchase that this product is suitable for the user’s intended purpose.
ANY AND ALL IMPLIED WARRANTIES, INCLUDING THE IMPLIED WARRANTY OF MERCHANTABILITY ARE LIMITED TO THE DURATION OF THIS EXPRESS LIMITED WARRANTY.
NEITHER TELEX NOR THE DEALER WHO SELLS RTS PRODUCTS IS LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND.
CUSTOMER SUPPORT

Technical questions should be directed to:

Customer Service Department
RTS/Telex
12000 Portland Avenue South
Burnsville, MN 55337 U.S.A.
Telephone: (800) 392-3497
Fax: (800) 323-0498

RETURN SHIPPING INSTRUCTIONS
PROCEDURE FOR RETURNS
If a repair is necessary, contact the dealer where this unit was purchased.
If repair through the dealer is not possible, obtain a RETURN AUTHORIZATION from:

Customer Service Department
Telex Communications, Inc.
Telephone: (877) 392-3497
Fax: (800) 323-0498

DO NOT RETURN ANY EQUIPMENT DIRECTLY TO THE FACTORY WITHOUT FIRST OBTAINING A RETURN AUTHORIZATION.
Be prepared to provide the company name, address, phone number, a person to contact regarding the repair, the type and quantity of equipment, a description of the problem and the serial number(s).

SHIPPING TO MANUFACTURER FOR REPAIR OR ADJUSTMENT
All shipments of RTS products should be made via United Parcel Service or the best available shipper, prepaid. The equipment should be shipped in the original packing carton; if that is not available, use any suitable container that is rigid and of adequate size. If a substitute container is used, the equipment should be wrapped in paper and surrounded with at least four inches of excelsior or similar shock-absorbing material. All shipments must be sent to the following address and must include the Return Authorization.

Factory Service Department
Telex Communications, Incorporated
West 1st Street
Blue Earth, MN 56013 U.S.A.

Upon completion of any repair the equipment will be returned via United Parcel Service or specified shipper collect.

End-User License Agreement for Telex® Software

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Contents

Proprietary Notice 2
Copyright Notice 2
UNPACKING AND INSPECTION 2
WARRANTY INFORMATION 2
RETURN SHIPPING INSTRUCTIONS 2
PROCEDURE FOR RETURNS 2
SHIPPING TO MANUFACTURER FOR REPAIR OR ADJUSTMENT 2
End-User License Agreement for Telex® Software 3
SECTION 1: DESCRIPTION AND SPECIFICATIONS 6
- DESCRIPTION 6
- GENERAL 6
- FEATURES 6
- CONNECTIONS & CONTROLS 6
- SPECIFICATIONS 6
- GENERAL 6
- INTERFACE REQUIREMENTS 6
- RTS Intercom Channel: 6
- HEADPHONE AMPLIFIER 6
- DYNAMIC MICROPHONE AMPLIFIER: 6
- ELECTRET MICROPHONE AMPLIFIER: 7
- CONNECTOR PIN CONFIGURATIONS 7

SECTION 2: OPERATION EXTERNAL 8
- CONNECTIONS & CONTROLS 8
- BP-319/351 OPERATING MODES 8
- Changing Modes of Operation: 9
- INTERNAL SWITCHES, JUMPERS AND ADJUSTMENTS 9
- Side Tone Adjustment (R145) 9

SECTION 3. REPLACEMENT PARTS 10
- WHERE TO OBTAIN PARTS 10
- MECHANICAL PARTS 10

SECTION 4. DIAGRAMS 11

SECTION 1: DESCRIPTION AND SPECIFICATIONS

DESCRIPTION

GENERAL
The BP-319/351 is a portable user station for use with RTS 2-wire intercom systems. The BP-319 is a microprocessor controlled one-channel intercom where the BP-351 is a microprocessor controlled two-channel select intercom belt pack. Both have connections for headset/earset microphones (Dynamic or Electret). The factory setting is for Dynamic.

FEATURES
Features of the BP-319/351 include:

- Call function that allows the user to send or receive call signals to other devices on the intercom channel, including Audible Call Alert on the listen side.
- Microprocessor controlled Microphone Kill Detect.
- Powered externally, via the intercom system power supply on channel one.
- Headset/earset 4 or 5-pin XLR connection set for intercom operation.

CONNECTIONS & CONTROLS
The BP-319/351 has the following connections and controls:

- Intercom volume control.
- Headset connectors that accept an XLR type 4 or 5-pin male connector.
- Line connector that accepts an XLR type 3-pin male connector for intercom line and power input.
- A loop through connection connects several belt packs in a chain. Since this is often the preferred method of connection, a line loop connector has been added to new units (See figure 2.1).

SPECIFICATIONS
GENERAL

Channel Supplied Power Requirements:
30 VDC nominal (standard RTS line), 45 to 70 mA

Environmental Requirements:
Storage: -20°C to 80°C; 0% to 95% humidity, non-condensing
Operating:0°C to 50°C; 0% to 95% humidity, non-condensing

Dimensions:
4.75" (120.7 mm) H x 3.75" (95.3 mm) W x 1.6" (40.6 mm) D

Weight:
Approximately 13 oz (364 g)

INTERFACE REQUIREMENTS
Headset/Earset:
50 to 200 dynamic microphone
50 to 600 headphones

RTS Intercom Channel:
Output Level: 0.775 Vrms (0 dBu) nominal
Input Level: 200 ±5%
Bridging Impedance: greater than 10,000
Call Signalling:
Send: 20 kHz ±100 Hz, 240 mVrms ±10%
Receive: 20 kHz ±800 Hz, 100 mVrms
Mic-Off Frequency Detect:
24 kHz ±800 Hz, 100 mVrms

Noise Contribution: less than -60 db on the line

HEADPHONE AMPLIFIER
Voltage Gain:
18 ±3 dB from the line

Maximum Output:
60 mW into 150

Frequency Response:
200 Hz to 8 kHz +1/-4db nominal

Audible Alert:
1 kHz, at the headset/earset

Total Harmonic Distortion:
Less than 0.2% nominal at 50 mW from the line

Sidetone:
20 dB minimum range, adjustable

DYNAMIC MICROPHONE AMPLIFIER:
Voltage Gain:
Mic to Channel; 45 ±3 dB, before limiting
Mic to Headphone; adjustable, 65 dB ±10% range into 150

Frequency Response:
200 Hz to 8 kHz +1/-4db nominal

Total Harmonic Distortion:
Less than 0.2% nominal at Channel output

ELECTRET MICROPHONE AMPLIFIER:

Voltage Gain:
Mic to Channel; 27 ±3 dB, before limiting
Mic to Headphone; adjustable, 45 dB ±10% into 150

Frequency Response:
200 Hz to 8 kHz +1/-4db nominal

Total Harmonic Distortion:
Less than 0.2% nominal at Channel output

CONNECTOR PIN CONFIGURATIONS

Intercom Channel Connector
XLR-3 M/F

Loop thru	**BP-319**	**BP-351**
Pin 1	Common	Common
Pin 2	+30 VDC In	+30 In/Syst Chan 1
Pin 3	Syst Chan 2	Syst Chan 2

Headset Connector
Type: XLR-4F
Pin 1 Headset Microphone low
Pin 2 Headset Microphone high
Pin 3 Headphone Common
Pin 4 Headphone Chan 1 or Chan1 and Chan 2 audio

Type: XLR-5F
Pin 1 Headset microphone low
Pin 2 Headset microphone high
Pin 3 Headphone low
Pin 4 Headphone high
Pin 5 No Connection

* Sometimes pin 4 and 5 connect together when using a dual-sided headset.

SECTION 2: OPERATION EXTERNAL CONNECTIONS & CONTROLS

NOTE: The numbers refer to the callouts in Figure 2-1.

1 Volume Control: Use this control to adjust the headset/earset listen level.

2 Chan SelectButton (BP-351 Only): The Chan button allows the user to select which intercom channel is active. The yellow indicator next to 1 or 2 lights to show the active channel. Press the Chan button to change the channel selection, the yellow indicator for that channel will light.

3 Call Button and Indicator: The Call function allows the user to send or receive signals to other devices on the intercom channel selected. The Call button operates in two ways:

Call receive:
When there is an incoming call signal, the indicator is red. (If Audible Call Alert is enabled, incoming calls will cause beeps in the headset.)
Call send:
To send a call signal to all stations on a selected channel, press and hold the Call button until a verbal response is received. The indicator will glow red.

4 Talk Button and Indicator: The Talk button activates the headset microphone and operates in two ways:

Latched Mode:
Tap the button once to talk. The indicator will glow green. Tap the button again when finished with a conversation.
Momentary Mode:
Press and hold the button to talk momentarily. Release the button when finished talking.

5 Sidetone Control: When using a headset, this control adjusts your own voice level heard in the earphones. To adjust the level, tap the Talk button once to turn on the headset microphone. Then, use a small flat-blade screwdriver to increase or decrease your voice level while talking into the microphone. (This control is accessible by removing one screw of belt clip.)

6 Headset Connector: This connector accepts an RTS boom-microphone headset.

7 Intercom Channel Connector: The BP-319/351 intercom channel is connected via a 3-pin female connector with a 3-pin male loop through connector. The BP-319/351 is powered from the intercom system power supply.

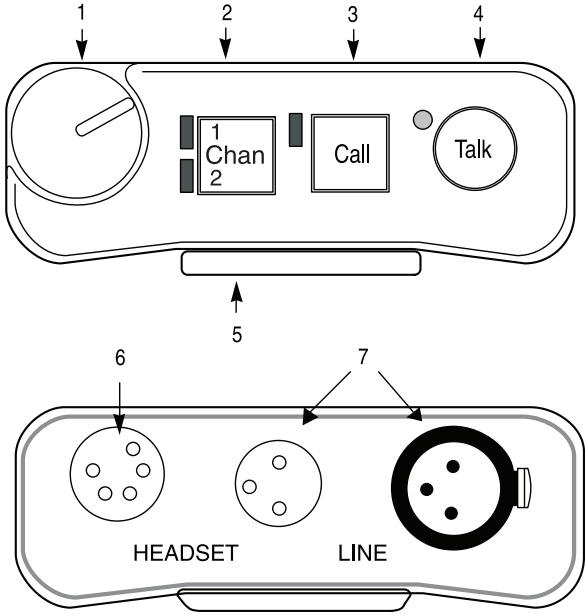


Figure 2-1. Connections and Controls, BP-319 and BP-351

Setting Modes of Operation:
Perform the following steps to change the BP-319/351 mode of operation.

1. Both the *Talk* and *Call* indicators should be off.

2. Press and hold both the *Talk* and *Call* keys, then release both keys. The Call indicator should now glow red. (The number of beeps heard in the headset indicates the current mode of operation.)

3. Press the *Call* key to change to the next mode of operation. Each press of the *Call* key causes theBP-319/351 to change to the next mode of operation.

4. When the desired mode is reached, press the *Talk* key to select the mode and exit.

NOTE: Each time the intercom system power is turned on, the BP-319/351 will reset to the default mode of operation (Mode 2, see table 2-1).

Mode (# of Beeps)	Mic Kill	Audible Call Alert
1	Disabled	Disabled
2 (Default)	Enabled	Disabled
3	Disabled	Enabled
4	Enabled	Enabled

Table 2-1. Operating Modes

BP-319/351 OPERATION PROGRAMMING

The BP-319/351 uses four modes of operation to control the Microphone Kill and Audible Call Alert features. These features are in Table 2.1.

Microphone Kill Feature:
When this feature is enabled and a Mic Kill signal is received from the intercom channel, the BP-319/351 microphone will be turned off the Mic Kill signal will have no affect on microphones attached to the BP-319/351.

Audible Call Alert Feature:
When this feature is enabled, an audible beep is heard in the headset whenever there is an incoming call from the same intercom channel.

When this feature is disabled, no audible beep is heard for incoming calls.

INTERNAL SWITCHES, JUMPERS AND ADJUSTMENTS

There are several internal switches, jumpers and adjustments that affect operation. These are described below. To gain access to the switches, jumpers and adjustment, disconnect all power and line connections. Remove two screws from the top of each side of the case and two screws from the bottom of each side of the case. The jumper and switch locations are shown in Figure 2-2.

Side Tone Adjustment (R145)
The side tone adjustment is accessible either internally (see Figure 2-2) or by removing the belt clip mounting screw shown in Figure 2-1.

To adjust the level of your own voice heard in the earphones, tap the Talk button once to turn on the headset microphone. Then, use a small flat-blade screwdriver to increase or decrease your voice level while talking into the microphone.

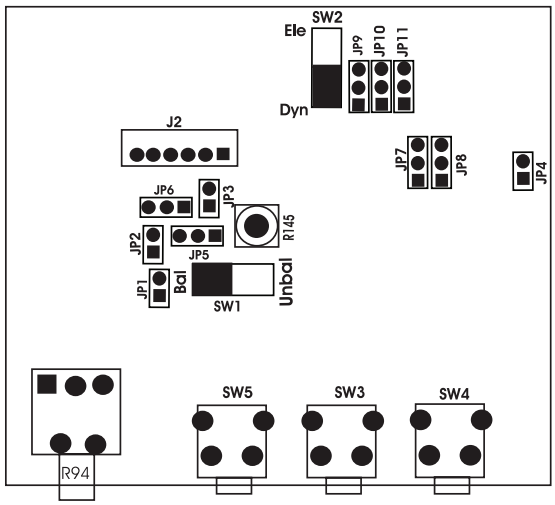


Figure 2-2. Internal Jumpers and Switches

JUMPER SWITCH NUMBER	JUMPER OR SWITCH FUNCTION	DEFAULT SETTING
JP6	Power Source Selection Pins 1&2 shorted: no connection Pins 2&3 Shorted: channel 1 power source	Pins 2&3 shorted
JP9	Differential, single-ended, dynamic mic Single-ended Mic: Pins1&2 shorted Differential Mic: Pins 2&3 shorted	Pins 1&2 shorted

Table 2-2. Internal Jumpers

SECTION 3. REPLACEMENT PARTS
WHERE TO OBTAIN PARTS

Parts may be obtained directly from Telex at:

Telex/RTS Systems
12000 Portland Ave. S.
Burnsville, MN 55337
877-863-4169
Fax: 800-323-0498

MECHANICAL PARTS

Final Assembly (BP-319)
(Refer to 4-1 for Item No. locations)

Item No.	Description	Part No.
1	Case, BP-319	90607374-016
2	Top Plate	90707374-007
3	Not Used	
4	Circuit Board Assembly	90307740-100
5	Knob, Nylon Body	91605636-01
6	Knob, Boot	91605636-02
7	Screw. 4-40 x 0.25, Flat Head	800124-001
8	Belt Clip	9107600-000
9	Screw. 4-40 x 0.25, Pan Head	51845-038
10	Keypad	19067374-001
11	Plate	91107374-001
12	Pushnut	51900-002
13	Screw. 6-32 x 3/16, Pan Head	51845-073
14	Washer, Lock, Split, #6	50086-001

Connector Plate Assembly
(BP-319)
(Refer to Figure 4-2 for Item No. locations)

Item No.	Description	Part No.
1	Connector Plate	90807486-000
2	Connector, XLR-4F	40055-10
3	Connector XLR-5F	40055-15
5	Connector, 6-pin	59958-006
6	Connector, 4-pin	59958-004
7	Contact, Connector	59958-200

Final Assembly (BP-351)
(Refer to 4-4 for Item No. locations)

Item No.	Description	Part No.
1	Case, BP-351	90607374-017
2	Top Plate	90707374-006
3	Circuit Board Assembly	90307740-200
4	Keypad	19067374-001
5	Plate	91107374-001
6	Knob, Nylon Body	91605636-01
7	Knob, Boot	91605636-02
8	Belt Clip	9107600-000
9	Connector Plate (5-pin)	90207486-003
10	Connector Plate (4-pin)	90207486-013
11	Screw. 4-40 x 0.25, Flat Head	800124-001
12	Screw. 4-40 x 0.25, Pan Head	51845-038
13	Pushnut	51900-002
14	Washer, Split, #6	50086-001
15	Screw. 6-32 x 3/16, Pan Head	51845-073

SECTION 4. DIAGRAMS

Drawing Number	Title
9010-7486-000	Figure 4-1. Final Assembly, Model BP-319
9020-7486-000	Figure 4-2. Connector Plate Assembly, Model BP-319
9030-7486-000	Figure 4-3. PC Board Assembly, Model BP-319 and BP-351
9010-7754-000	Figure 4-4. Final Assembly, Model BP-351
9020-7486-000	Figure 4-5. Connector Plate Assembly, Model BP-351

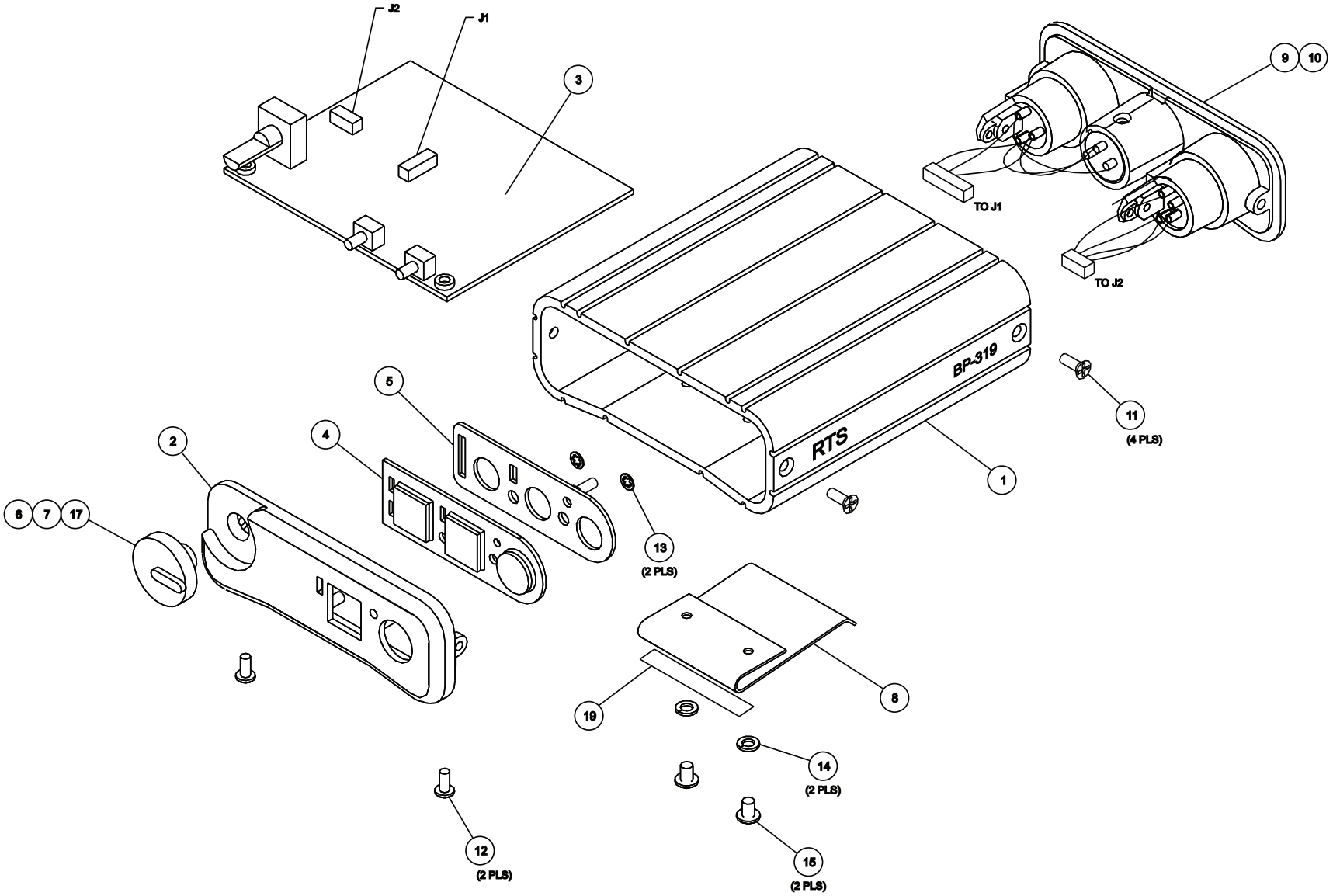


Figure 4-1. Final Assembly, BP-319
9010-7753-000

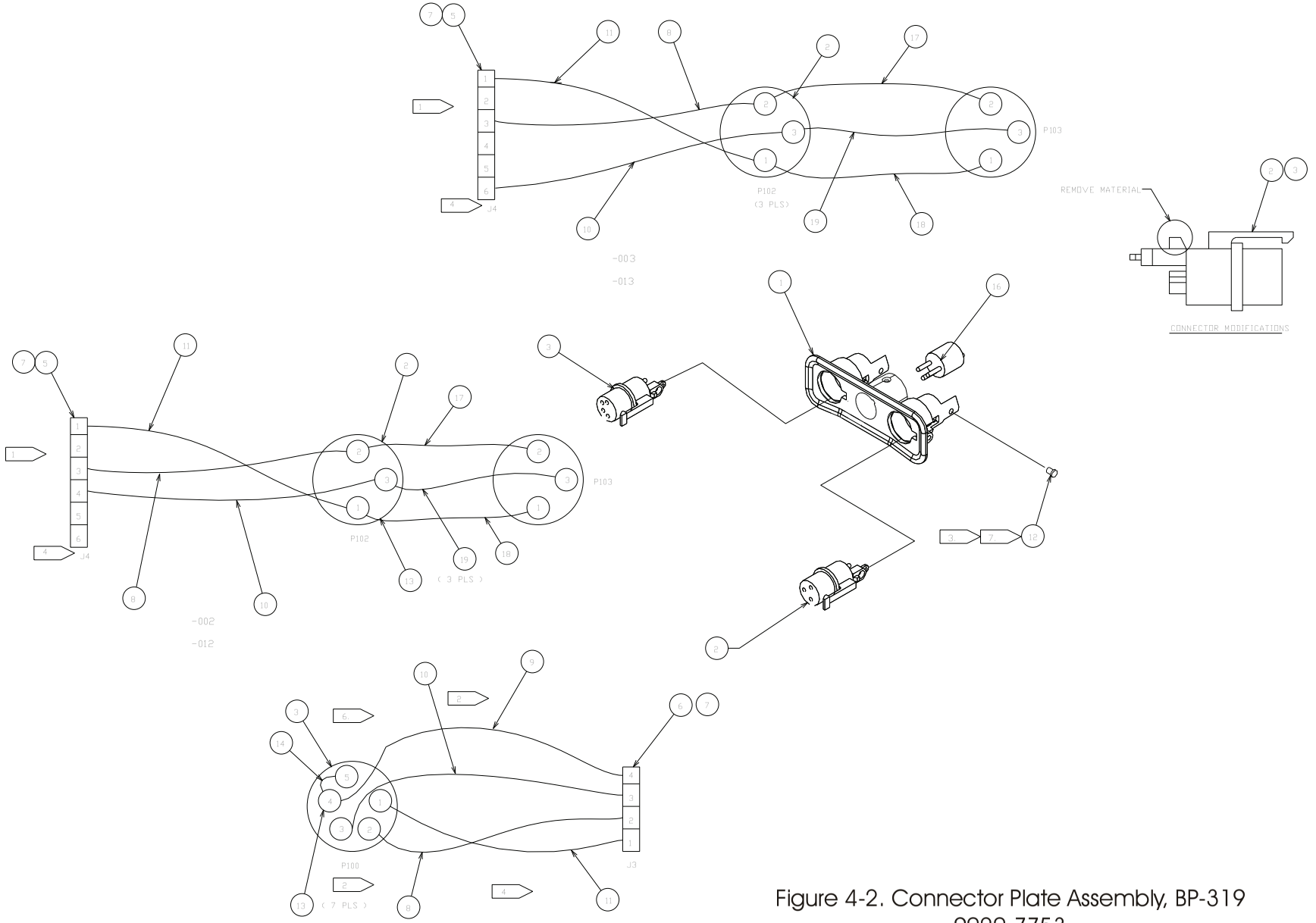
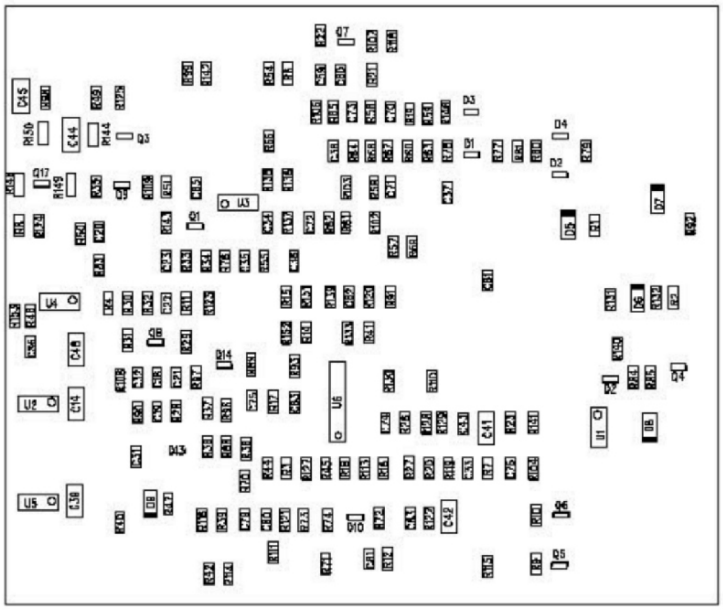
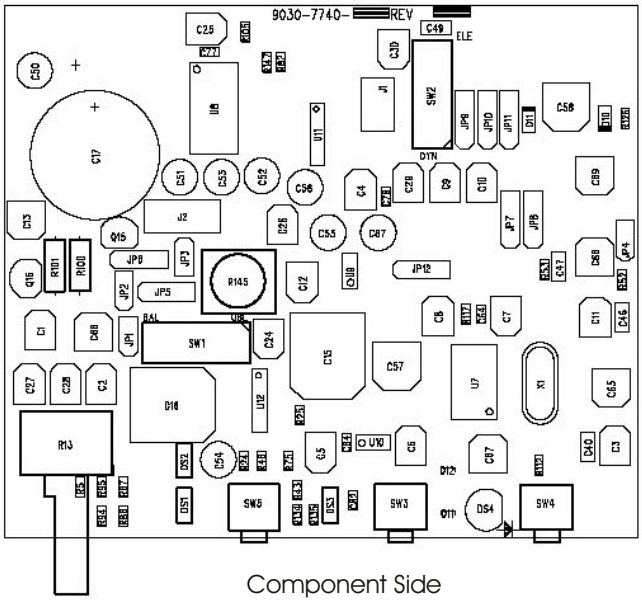


Figure 4-2. Connector Plate Assembly, BP-319
9020-7753



Foil Side



Component Side

Figure 4-3. PC Board Assembly Model BP-319 and BP-351

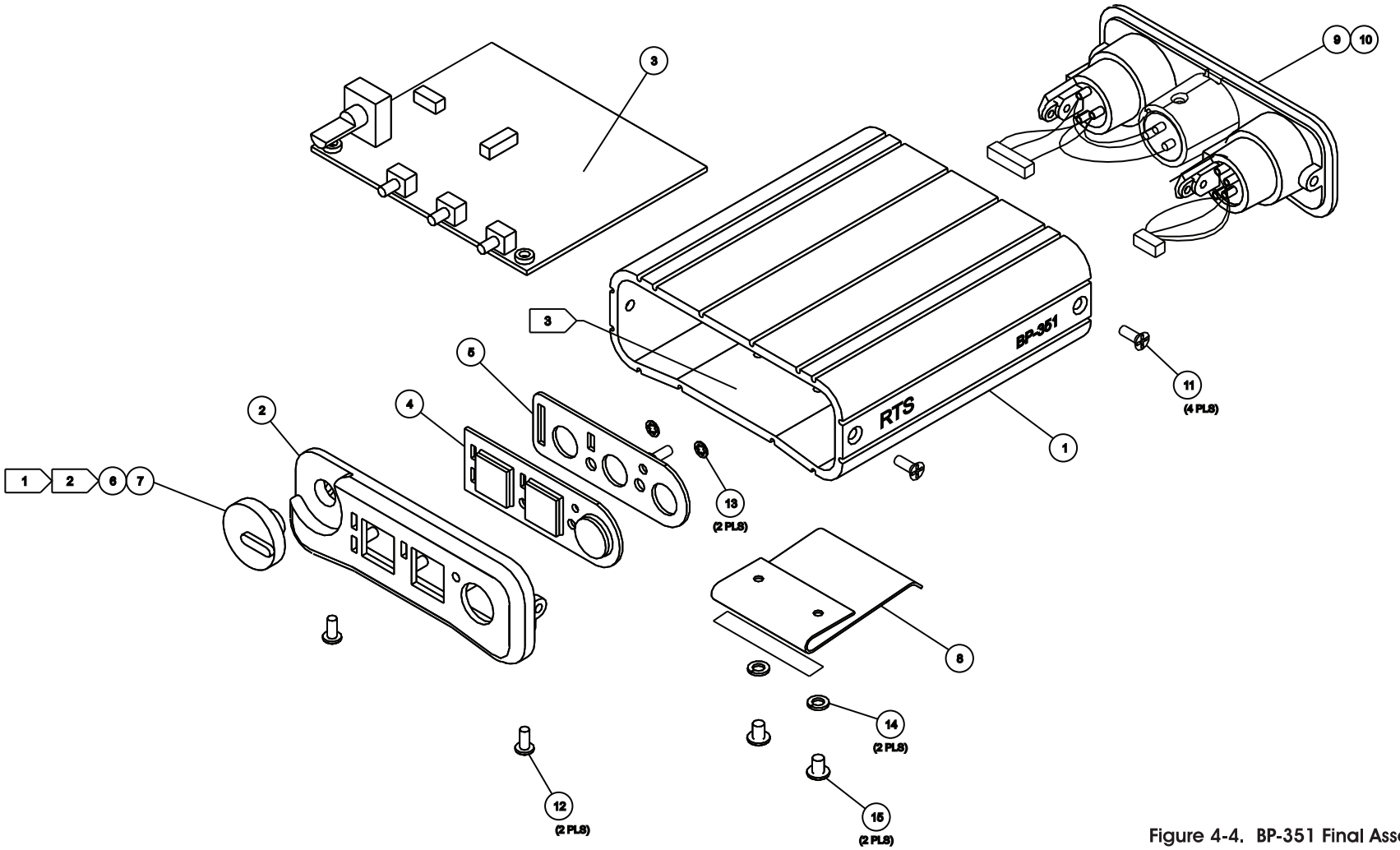


Figure 4-4. BP-351 Final Assembly
9010-7754-000

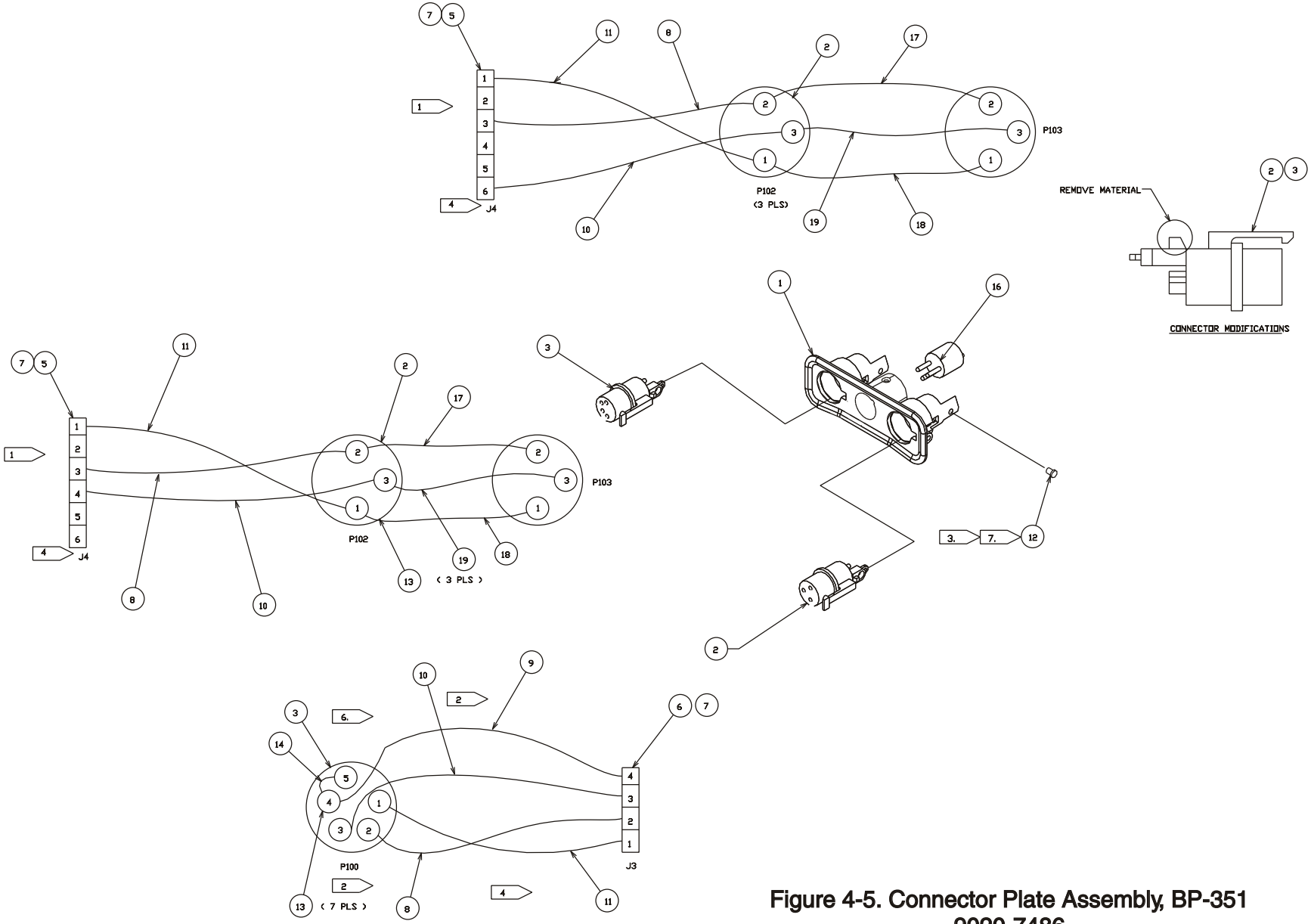


Figure 4-5. Connector Plate Assembly, BP-351
9020-7486

Appendix I: Reference Tables

This appendix contains tables that may provide a useful reference.

Definition of the primary buses

The primary buses of the XL8 are shown in the following table.

Bus	***Description and options***	***Source and destination***
Aux pairs	2 x mono auxes (contributions taken pre-/post-fader) 1 x stereo aux (contributions taken pre-/post-fader with own level and pan) 2 x mono mix groups (contributions taken post-fader) 1 x stereo mix group (contribution taken post-fader and pan) 2 x mono mix minus (contributions taken post-fader) 1 x stereo mix minus (contributions taken post-fader and pan)	From inputs to aux buses in the mix area
Matrix pair	2 x mono matrix (contributions taken pre-/post-fader with own level controls) 1 x stereo matrix (contributions taken pre-/post-fader with own level and pan)	From inputs and aux and master buses to matrix outputs
Master	Mono master (contribution has own level control) Stereo master (contributions taken post-fader and pan) If sending to masters in SIS, contribution is taken post-pan image control, and the centre goes to the mono master	From inputs and aux buses to master outputs
Stereo solo bus (A or B)	PFL stereo (or spread centre-panned mono) AFL stereo (or spread centre-panned mono)	From anywhere to the monitor outputs

Navigating to the Patching screen

The following table shows you how to access the Patching screen from various other GUI screen locations.

Channel or signal type	*Location on GUI screen area*	*Button legend*	*Page ref.*	*Opens the tab sheet in the*	
				From section	*To section*
Input channel	Compressor detail area - side chain section	**MENU**	278	N/A	**Sidechains**
Input channel	Compressor detail area	**source**	278	N/A	**Sidechains**
Input channel	Gate detail area - side chain section	**MENU**	278	N/A	**Sidechains**
Input channel	Gate detail area	**source**	278	N/A	**Sidechains**
Input channel	Insert detail area	**dest**	279	**Ins. Sends**	N/A
Input channel	Insert detail area	**source**	279	N/A	**Ins. Ret.**
Input channel	Configuration detail area	**source**	268	N/A	**Inputs**
Input channel	Configuration detail area - **direct output** section	**dest**	270	**Dir. Out**	N/A
Return channel	Configuration detail area	**source**	298	N/A	**Inputs**
Aux channel	Compressor detail area - side chain section	**MENU**	301	N/A	**Sidechains**
Aux channel	Compressor detail area	**source**	301	N/A	**Sidechains**
Aux channel	Configuration detail area	**dest**	298	**Busses**	N/A
Aux channel	Configuration detail area - **direct input** section	**source**	300	N/A	**Dir. In**
Aux channel	Configuration detail area - **insert** section	**dest**	303	**Ins. Sends**	N/A
Aux channel	Configuration detail area - **insert** section	**source**	303	N/A	**Ins. Ret.**
Matrix output channel	Compressor detail area - side chain section	**MENU**	301	N/A	**Sidechains**
Matrix output channel	Compressor detail area	**source**	301	N/A	**Sidechains**
Matrix output channel	Configuration detail area	**dest**	298	**Busses**	N/A
Matrix output channel	Configuration detail area - **direct input** section	**source**	300	N/A	**Dir. In**
Matrix output channel	Configuration detail area - **insert** section	**dest**	303	**Ins. Sends**	N/A
Matrix output channel	Configuration detail area - **insert** section	**source**	303	N/A	**Ins. Ret.**
Master output channel	Compressor detail area - side chain section	**MENU**	301	N/A	**Sidechains**
Master output channel	Compressor detail area	**source**	301	N/A	**Sidechains**
Master output channel	Configuration detail area	**dest**	298	**Busses**	N/A

Channel or signal type	*Location on GUI screen area*	*Button legend*	*Page ref.*	*Opens the tab sheet in the*	
				From section	*To section*
Master output channel	Configuration detail area - **direct input** section	**source**	300	N/A	**Dir. In**
Master output channel	Configuration detail area - **insert** section	**dest**	303	**Ins. Sends**	N/A
Master output channel	Configuration detail area - **insert** section	**source**	303	N/A	**Ins. Ret.**
Monitors	**Monitors** screen - **talk input** section	**source**	318	N/A	**Mon.**
Monitors	**Monitors** screen - **external talk output** section	**dest**	318	**Mon.**	N/A
Monitors	**Monitors** screen - **talkback input** section	**source**	328	N/A	**Mon.**
Monitors	**Monitors** screen - **pfl direct input** section	**source**	328	N/A	**Mon.**
Monitors	**Monitors** screen - **afl direct input left** section	**source**	328	N/A	**Mon.**
Monitors	**Monitors** screen - **afl direct input right** section	**source**	328	N/A	**Mon.**
Monitors	**Monitors** screen - **external input L** section	**source**	328	N/A	**Mon.**
Monitors	**Monitors** screen - **external input R** section	**source**	328	N/A	**Mon.**
Monitors	**Monitors** screen - **monitor A output L** section	**dest**	328	**Mon.**	N/A
Monitors	**Monitors** screen - **monitor A output R** section	**dest**	328	**Mon.**	N/A
Monitors	**Monitors** screen - **monitor B output L** section	**dest**	328	**Mon.**	N/A
Monitors	**Monitors** screen - **monitor B output R** section	**dest**	328	**Mon.**	N/A

Appendix J: Parameters Affected By Scope

This appendix shows the parameters that are affected by scope.

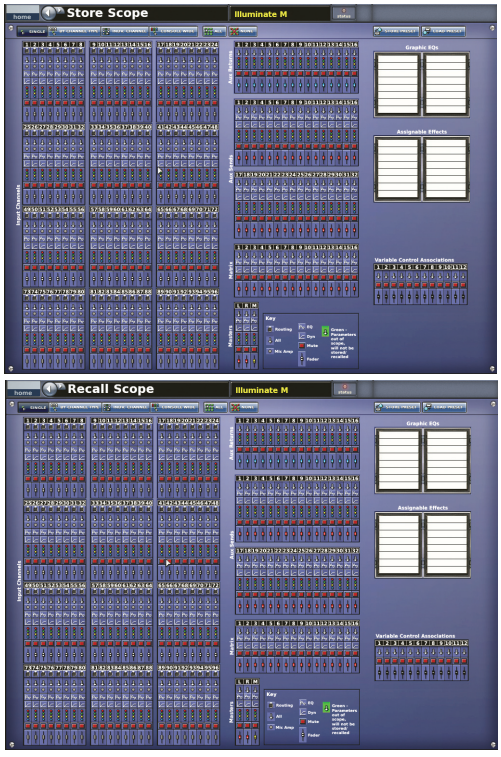
Note: *The parameter areas for the scopes (store and recall) and the safes are basically the same. However, the way they are presented in their respective appendix is different. This may provide you with a useful alternative when referring to this material, should you prefer one more than the other (see Appendix L "Parameters Protected By Safes" on page 477).*

Introduction

This appendix shows you which parameters are or are not scoped when you select the parameter sections in the channels, buses, groups, effects and GEQs on the **Store Scope** and **Recall Scope** screens.

There is a section for each area (channel, bus, group, effect and GEQ) on the scope screen, and these sections are then subdivided according to the detail areas in the fast/channel strips on the control surface and GUI.

The following diagram shows the **Store Scope** and **Recall Scope** screens (with no parameter sections selected), and the table to the right shows what the symbols in each section mean. In the table the orange letters in the **Ref.** column are used in the tables throughout this appendix to quickly identify the parameter sections.



Ref.	*Parameter section*	*Symbol*
A	**Routing**	
B	**All**	
C	**Mic Amp**	
D	**EQ**	
E	**Dyn**	
F	**Busses**	
G	**Mute**	
H	**Fader**	

The following is the key to the tables in this appendix: **Yes** = scoped, **No** = not scoped and N/A = not applicable.

Overview

The following table shows the page references (in this chapter) of the control areas for the channels, GEQs, effects and VCA groups.

Table 21: Reference to scope areas

Control area	*Input Channels*	*Aux Returns (Returns)*	*Aux Sends (Auxes)*	*Matrix (Matrices)*	*Masters*	*Graphic EQs*	*Assignable Effects*	*Variable Control Associations (VCAs)*
Patching	Page 433	Page 443	Page 448	Page 455	Page 461	Page 468	Page 470	N/A
Configura-tion	Page 434	Page 444	Page 449	Page 456	Page 462	N/A	N/A	N/A
Dynamics	Page 436	N/A	Page 450	Page 457	Page 463	N/A	N/A	N/A
Insert	Page 437	N/A	Page 451	Page 458	Page 464	N/A	N/A	N/A
EQ	Page 438	N/A	Page 452	Page 459	Page 465	N/A	N/A	N/A
Aux send	Page 439	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Aux preset	Page 440	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Matrix send	Page 441	Page 446	Page 453	N/A	Page 466	N/A	N/A	N/A
Fader	Page 442	Page 447	Page 454	Page 460	Page 467	N/A	N/A	N/A
GEQ	N/A	N/A	N/A	N/A	N/A	Page 469	N/A	N/A
Effects	N/A	N/A	N/A	N/A	N/A	N/A	Page 471	N/A
Groups	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Page 472

Inputs

Each scope screen has 96 input channels in the **Input Channels** section.

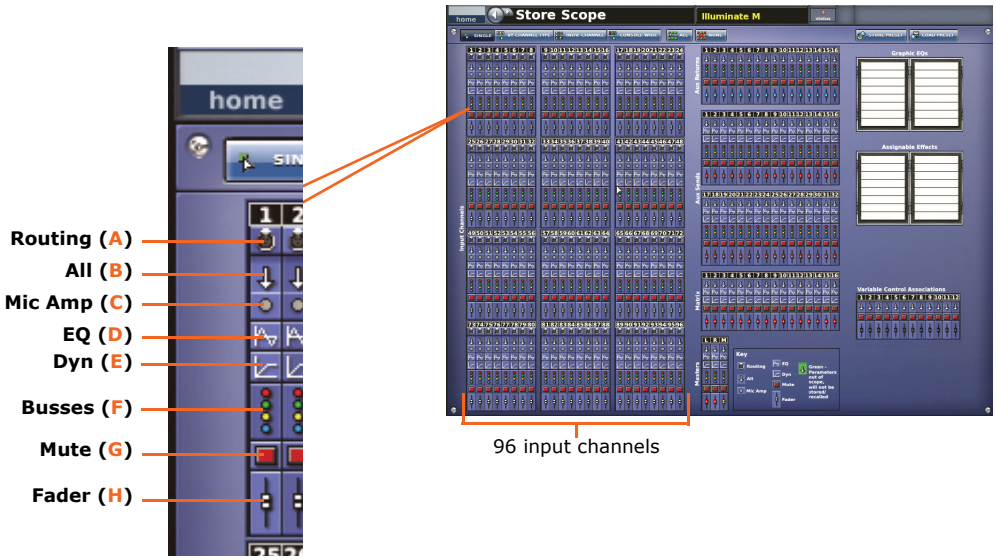
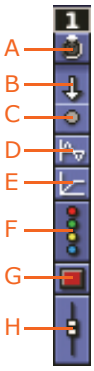
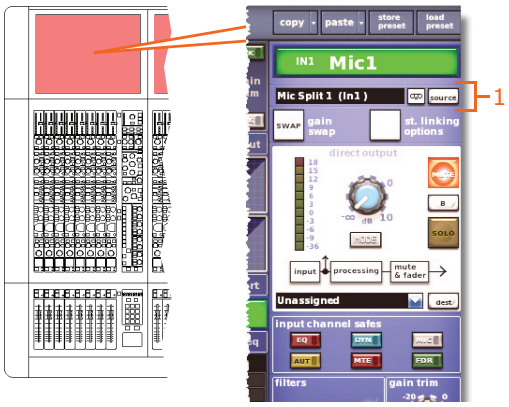


Figure 44: Parameter sections per input channel

Patching



The following diagram details the scoped patching parameters of the input channels, and shows the configuration detail area in the GUI channel strip.

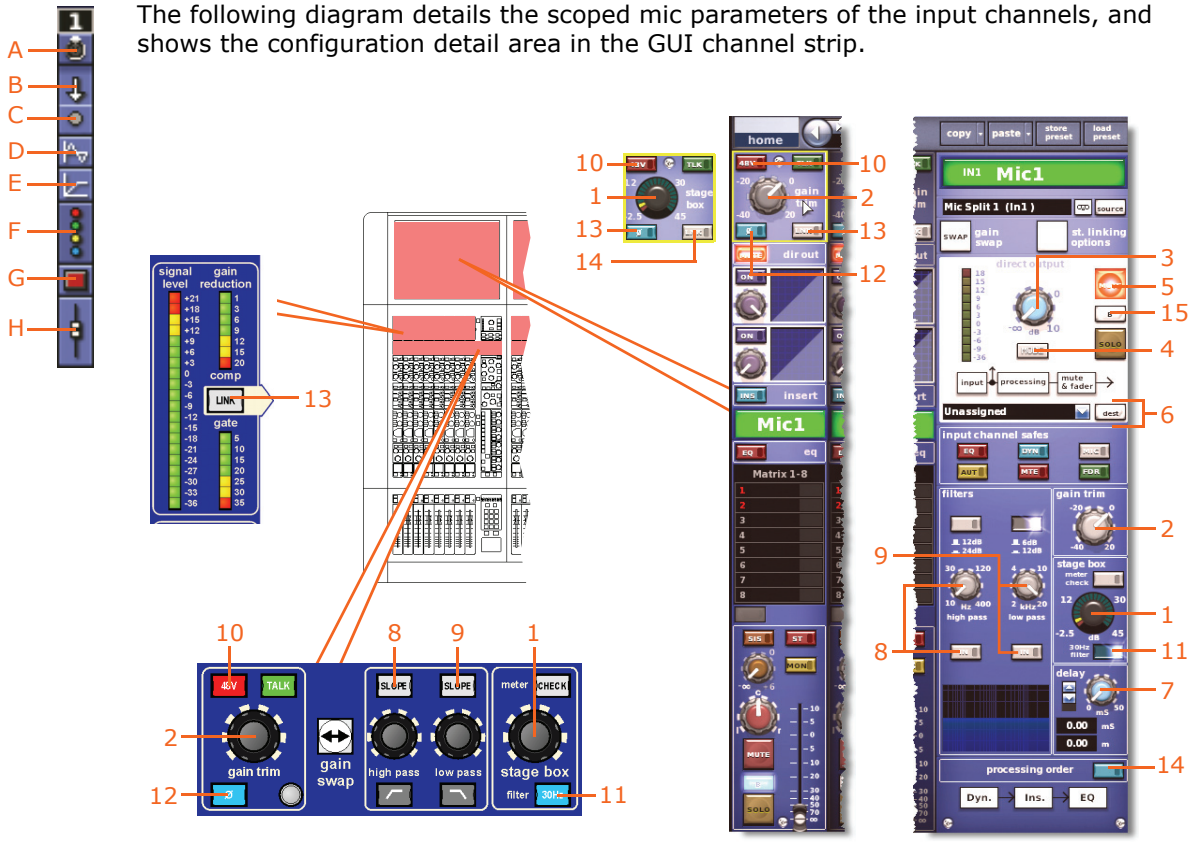


Item	Parameter	A	B	C	D	E	F	G	H
1	Input patching source	Yes*	Yes*	No	N/A	N/A	N/A	N/A	N/A

* Includes tape return and primary input sources.

Configuration

The following diagram details the scoped mic parameters of the input channels, and shows the configuration detail area in the GUI channel strip.

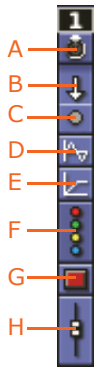


Item	Parameter	A	B	C	D	E	F	G	H
1	Mic gain*	N/A	Yes	Yes	N/A	N/A	N/A	N/A	N/A
2	Digital trim*	N/A	Yes	Yes	N/A	N/A	N/A	N/A	N/A
3	Direct output level	N/A	Yes	Yes	N/A	N/A	N/A	N/A	N/A
4	Direct output tap-off point	N/A	Yes	Yes	N/A	N/A	N/A	N/A	N/A
5	Direct output mute	N/A	Yes	No	N/A	N/A	N/A	Yes	N/A
6	Direct output patch destination	N/A	No	No	N/A	N/A	N/A	N/A	N/A
7	Input delay	N/A	Yes	Yes	N/A	N/A	N/A	N/A	N/A
8	Hi pass filter: slope in/out and rotary control	N/A	Yes	No	Yes	N/A	N/A	N/A	N/A
9	Low pass filter: slope in/out and rotary control	N/A	Yes	No	Yes	N/A	N/A	N/A	N/A
10	48V	N/A	Yes	Yes	N/A	N/A	N/A	N/A	N/A
11	30Hz filter	N/A	Yes	Yes	N/A	N/A	N/A	N/A	N/A
12	Input phase	N/A	Yes	Yes	N/A	N/A	N/A	N/A	N/A

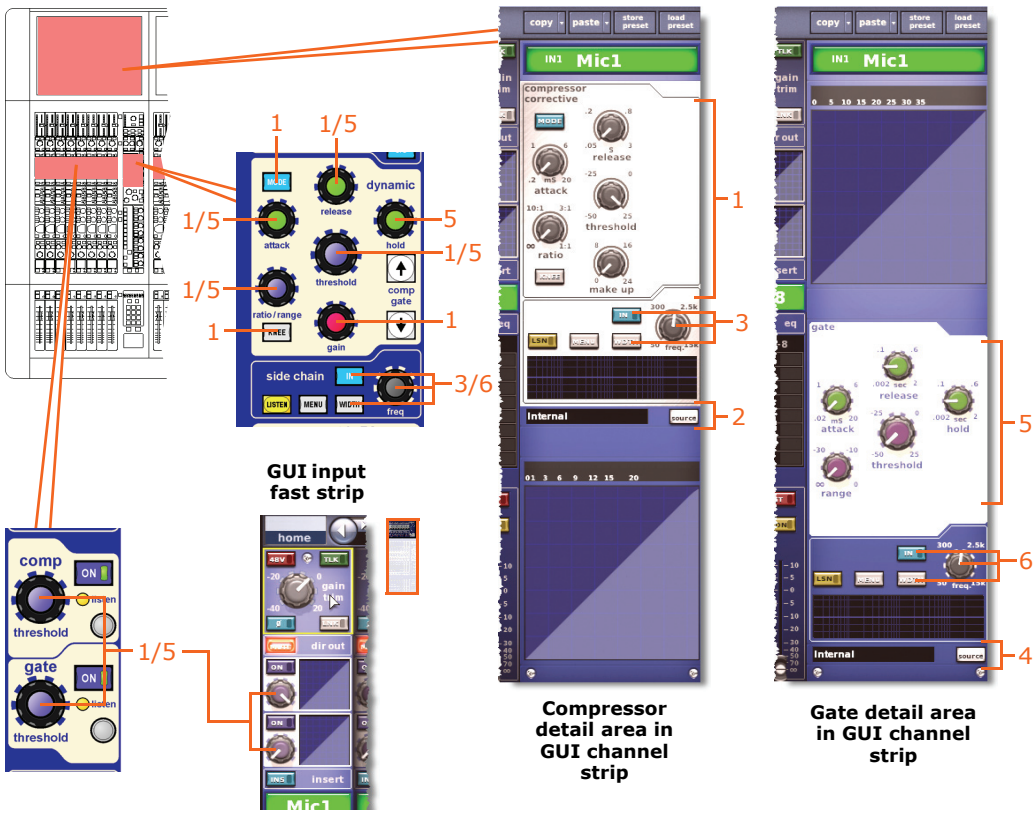
Item	Parameter	A	B	C	D	E	F	G	H
13	Link	N/A	No	No	No	No	No	No	No
14	Processing order	N/A	Yes	N/A	Yes	N/A	N/A	N/A	N/A
15	Direct output solo B assignment	N/A	No	No	No	No	No	No	No

* Depends on swap status.

Dynamics

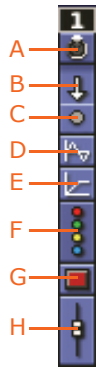


The following diagram details the scoped compressor and gate parameters of the input channels, and shows the compressor and gate detail areas of the GUI channel strip. Although it only shows the corrective compressor, it also applies to the adaptive, creative and vintage compressors.

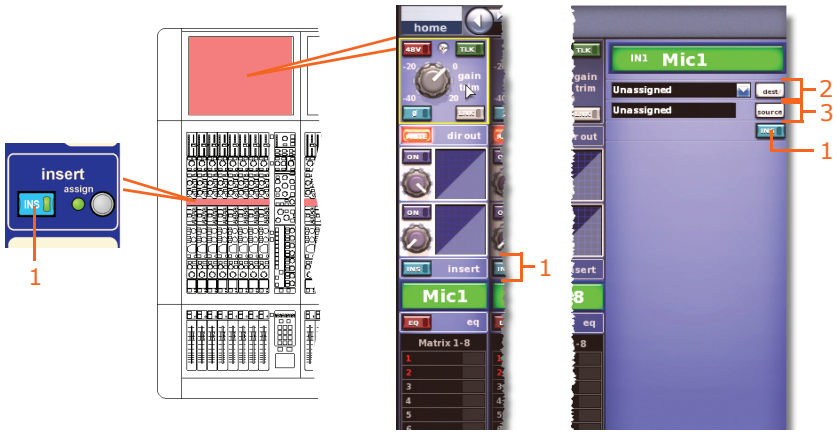


Item	Parameter	A	B	C	D	E	F	G	H
1	Compressor: **attack, release, threshold, ratio/range**/[**ratio**], **gain** (make up), **KNEE**, **MODE**	N/A	**Yes**	N/A	N/A	**Yes**	N/A	N/A	N/A
2	Compressor sidechain source	**No**	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3	Compressor sidechain: **IN, freq,** and **WIDTH**	N/A	**Yes**	N/A	N/A	**Yes**	N/A	N/A	N/A
4	Gate key in source	**No**	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5	Gate: **attack, release, hold, threshold, ratio/range**/[**range**]	N/A	**Yes**	N/A	N/A	**Yes**	N/A	N/A	N/A
6	Gate sidechain: **IN, freq,** and **WIDTH**	N/A	**Yes**	N/A	N/A	**Yes**	N/A	N/A	N/A

Insert

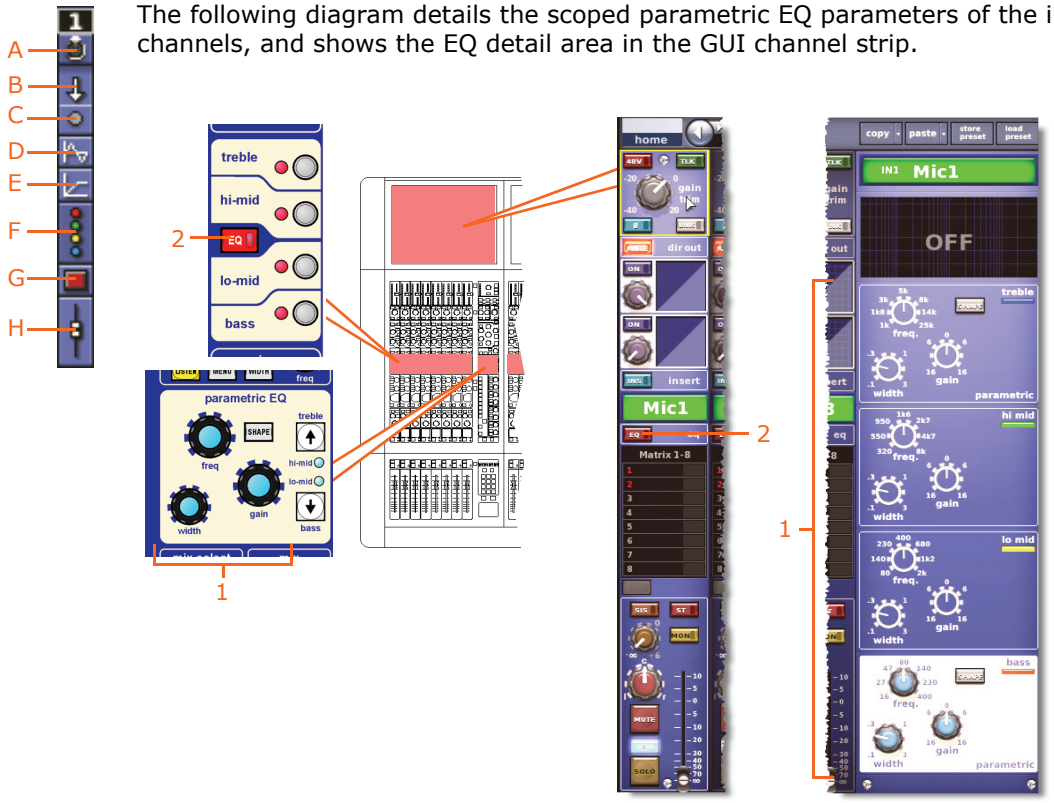


The following diagram details the scoped insert parameters of the input channels, and shows the insert detail area in the GUI channel strip.



Item	Parameter	A	B	C	D	E	F	G	H
1	In/out	Yes	Yes	N/A	N/A	N/A	N/A	N/A	N/A
2	Insert send destination	N/A	No	N/A	N/A	N/A	N/A	N/A	N/A
3	Insert return source	N/A	No	N/A	N/A	N/A	N/A	N/A	N/A

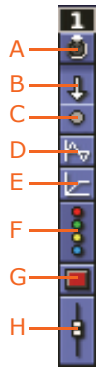
EQ



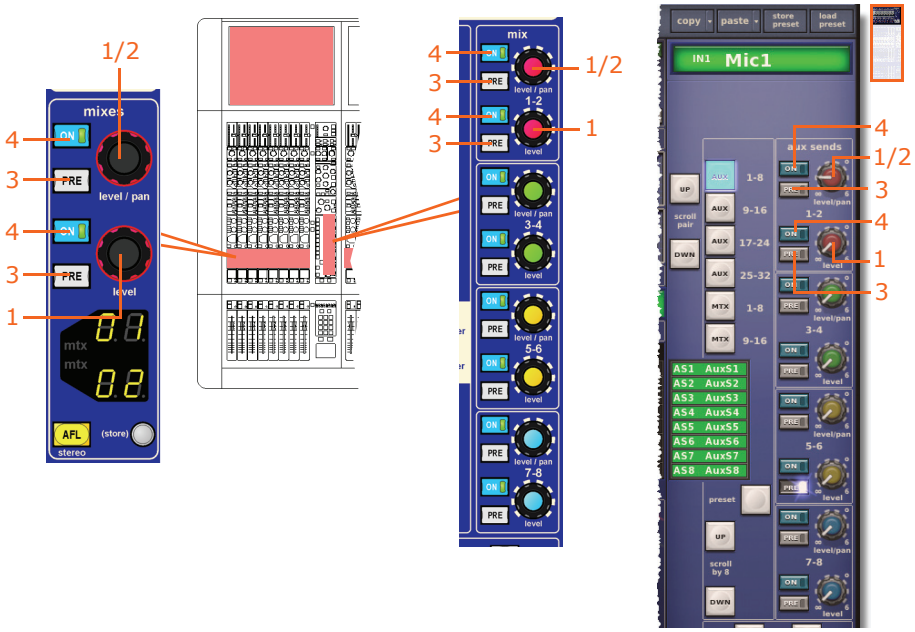
The following diagram details the scoped parametric EQ parameters of the input channels, and shows the EQ detail area in the GUI channel strip.

Item	Parameter	A	B	C	D	E	F	G	H
1	All filters: **freq, gain, width, SHAPE**	N/A	**Yes**	N/A	**Yes**	N/A	N/A	N/A	N/A
2	EQ in/out	N/A	**Yes**	N/A	**Yes**	N/A	N/A	N/A	N/A

Aux send



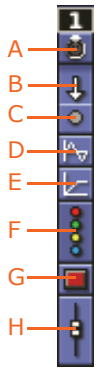
The following diagram details the scoped aux send **mix** section parameters of the input channels, and shows the mix detail area in the GUI channel strip. Although it only shows aux buses 1 to 8, it also applies to aux buses 9 to 32.



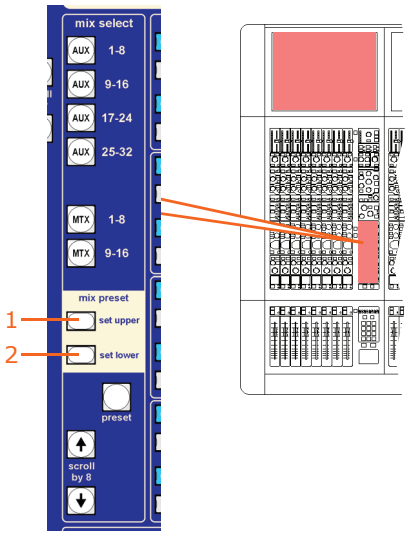
Item	Parameter	A	B	C	D	E	F	G	H
1	Send level	N/A	Yes	N/A	N/A	N/A	Yes	N/A	N/A
2	Send pan	N/A	Yes	N/A	N/A	N/A	Yes	N/A	N/A
3	Send pre-fader on/off	N/A	Yes	N/A	N/A	N/A	Yes	N/A	N/A
4	Send on/off	N/A	Yes	N/A	N/A	N/A	Yes	N/A	N/A

You can scope individual bus sends. In column **B** (**All**), all sends are affected, and in column **F** (**Busses**), individual sends can be scoped.

Mix preset

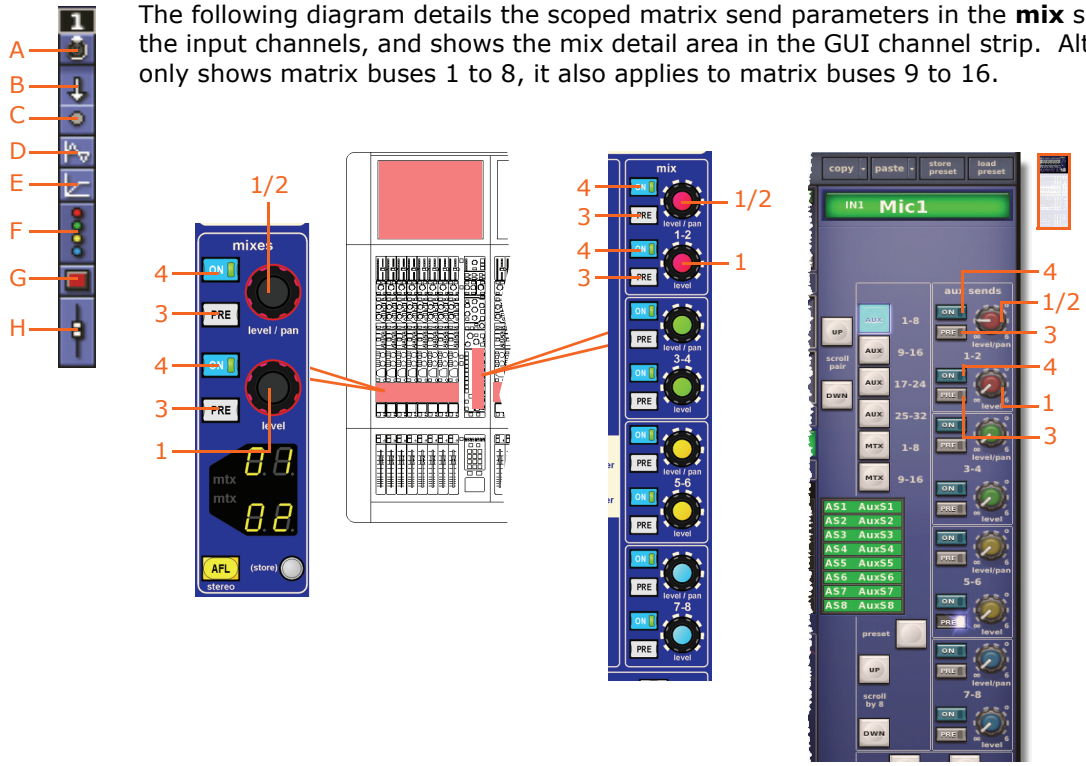


The following diagram details the scoped parameters in the **mix preset** section of the input channels, and shows the mix detail area in the GUI channel strip.



Item	*Parameter*	A	B	C	D	E	F	G	H
1	Aux preset upper	N/A	Yes	N/A	N/A	N/A	No	N/A	Yes
2	Aux preset lower	N/A	Yes	N/A	N/A	N/A	No	N/A	Yes

Matrix send



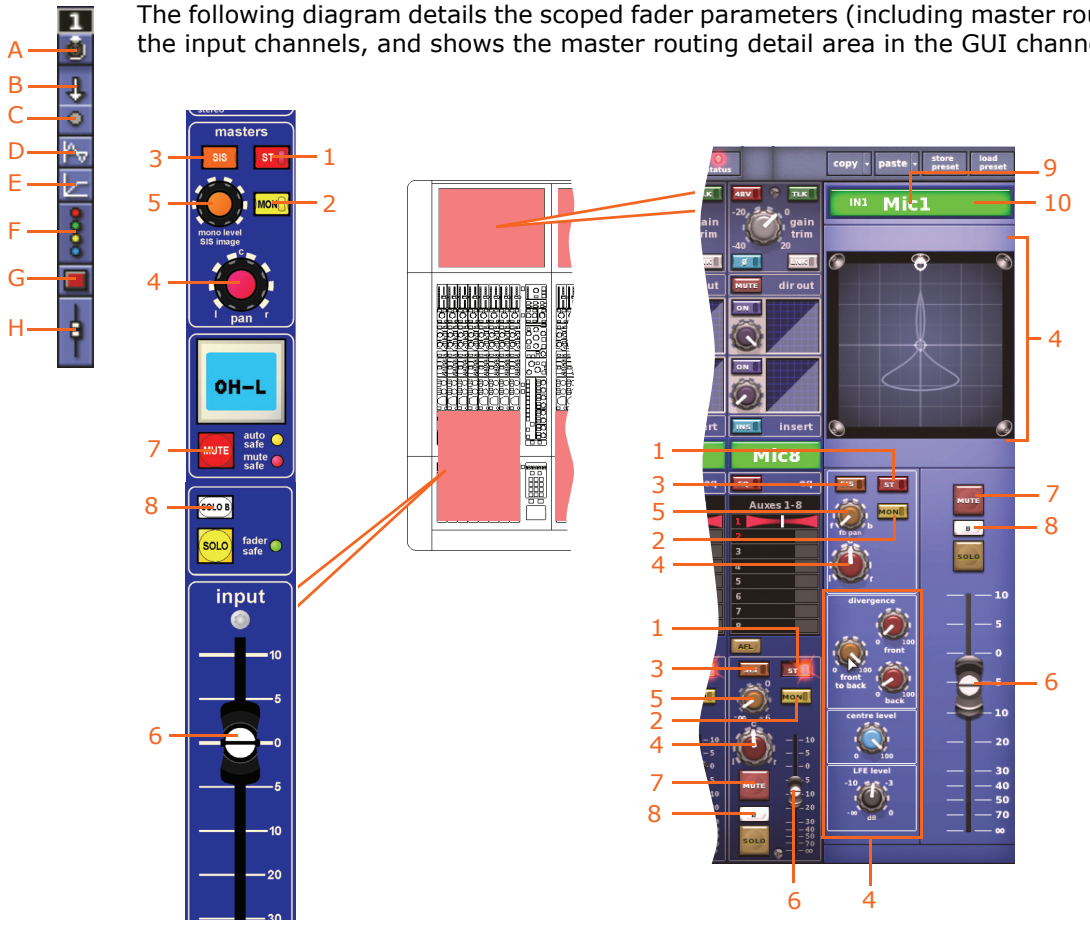
The following diagram details the scoped matrix send parameters in the **mix** section of the input channels, and shows the mix detail area in the GUI channel strip. Although it only shows matrix buses 1 to 8, it also applies to matrix buses 9 to 16.

Item	*Parameter*	A	B	C	E	D	F	G	H
1	Send level	N/A	Yes	N/A	N/A	N/A	Yes	N/A	N/A
2	Send pan	N/A	Yes	N/A	N/A	N/A	Yes	N/A	N/A
3	Send pre-fader on/off	N/A	Yes	N/A	N/A	N/A	Yes	N/A	N/A
4	Send on/off	N/A	Yes	N/A	N/A	N/A	Yes	N/A	N/A

You can scope individual bus sends. In column **B** (**All**), all sends are affected, and in column **F** (**Busses**), individual sends can be scoped.

Fader

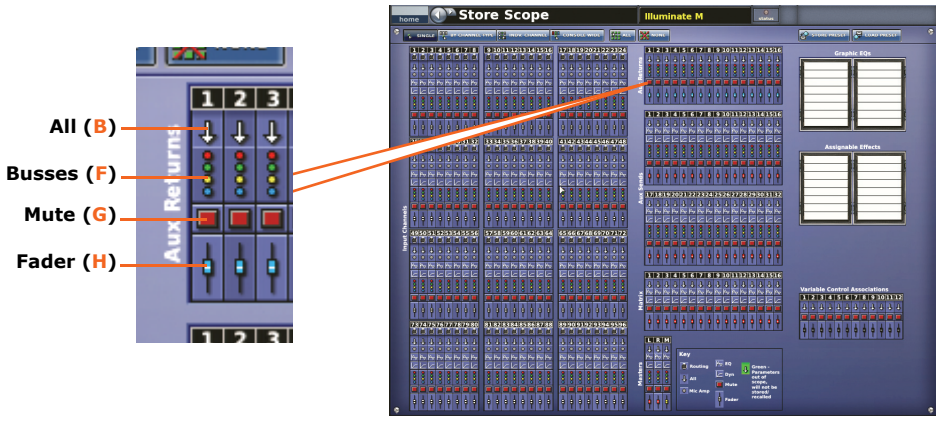
The following diagram details the scoped fader parameters (including master routing) of the input channels, and shows the master routing detail area in the GUI channel strip.



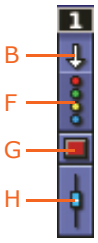
Item	Parameter	A	B	C	D	E	F	G	H
1	Stereo routing	N/A	Yes	N/A	N/A	N/A	N/A	N/A	Yes
2	Mono routing	N/A	Yes	N/A	N/A	N/A	N/A	N/A	Yes
3	SIS select (required for surround panning)	N/A	Yes	N/A	N/A	N/A	N/A	N/A	Yes
4	Pan (includes all surround sound parameters)	N/A	Yes	N/A	N/A	N/A	N/A	N/A	Yes
5	Mono level/SIS pan	N/A	Yes	N/A	N/A	N/A	N/A	N/A	Yes
6	Fader position	N/A	Yes	N/A	N/A	N/A	N/A	N/A	Yes
7	Channel mute	N/A	Yes	N/A	N/A	N/A	N/A	Yes	No
8	Solo B assignment	N/A	No	N/A	N/A	N/A	N/A	N/A	No
9	Channel name	N/A	Yes	N/A	N/A	N/A	N/A	N/A	No
10	Channel colour	N/A	Yes	N/A	N/A	N/A	N/A	N/A	No

Returns (Aux Returns)

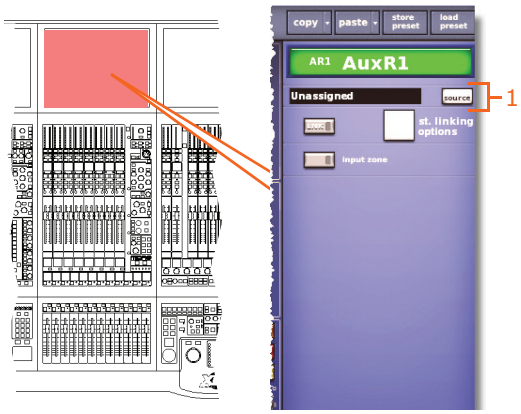
Each scope screen has 16 returns in the **Aux Returns** section.



Patching



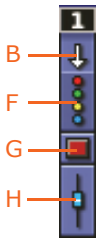
The following diagram details the scoped patching parameters of the return channels, and shows the configuration detail area in the GUI channel strip.



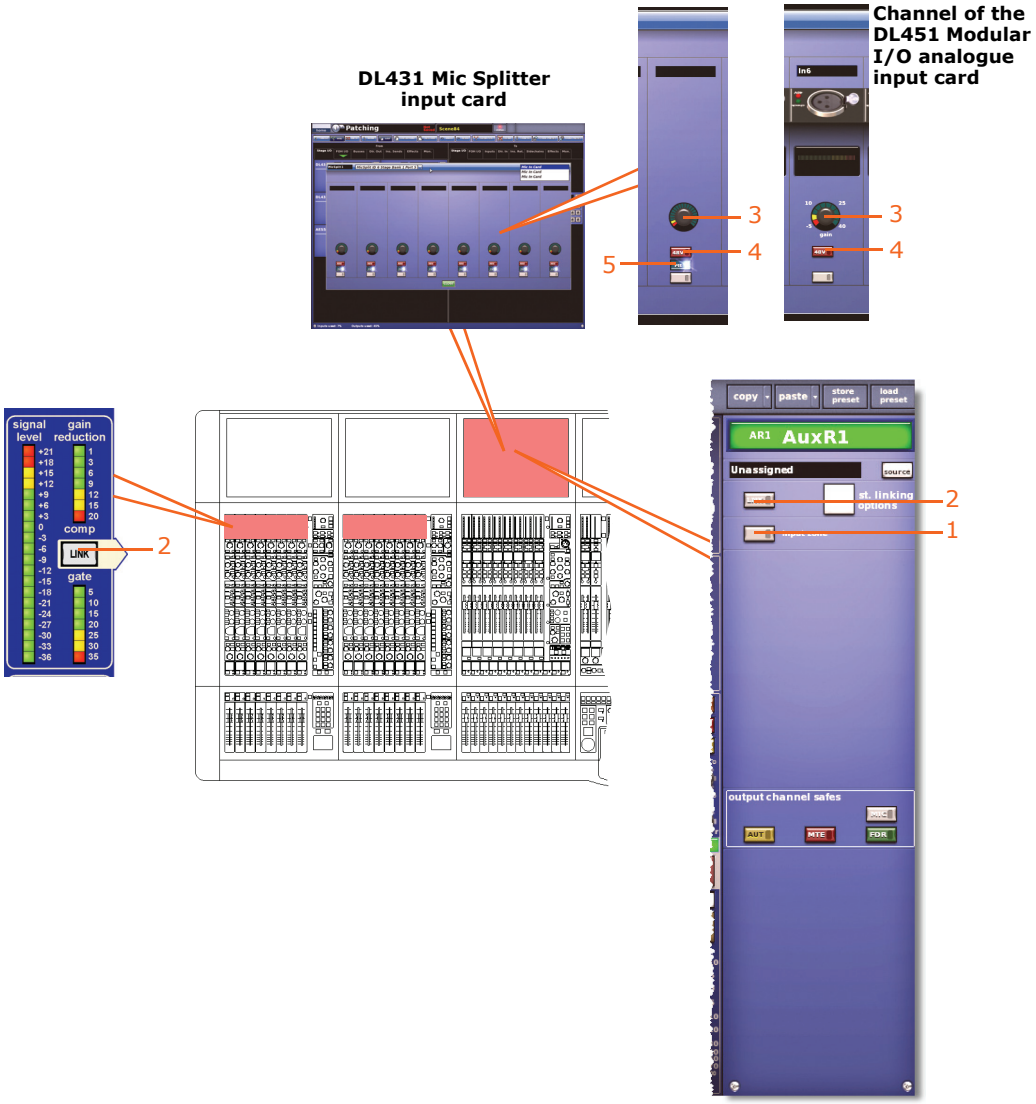
Item	Parameter	A	B	C	D	E	F	G	H
1	Input patching source	N/A	Yes[1]	N/A	N/A	N/A	N/A	N/A	N/A

1. Includes tape return and primary input sources.

Configuration



The following diagram details the scoped areas of the mic section in the return channels, and shows the configuration detail area in the GUI channel strip.



Item	Parameter	A	B	C	D	E	F	G	H
1	Input zone	N/A	Yes	Yes	N/A	N/A	N/A	N/A	N/A
2	Link	N/A	No	No	No	No	No	No	No
3	Gain of remote amplifier	N/A	Yes	Yes	N/A	N/A	N/A	N/A	N/A
4	48V phantom gain	N/A	Yes	Yes	N/A	N/A	N/A	N/A	N/A
3	30Hz filter	N/A	Yes	Yes	N/A	N/A	N/A	N/A	N/A

Dynamics

Not applicable.

Insert

Not applicable.

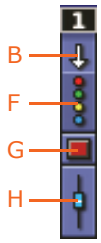
EQ

Not applicable.

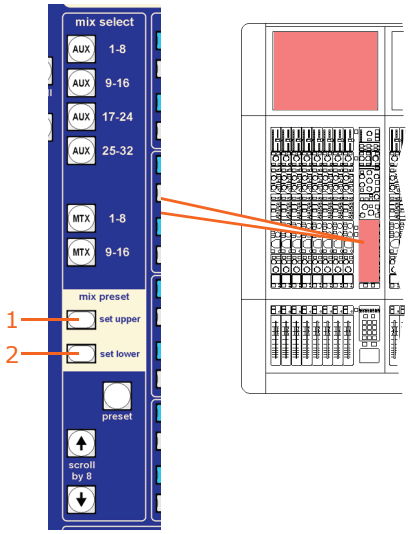
Aux send

Not applicable.

Mix preset

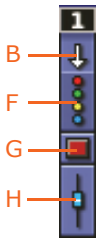


The following diagram details the scoped parameters in the **mix preset** section of the return channels, and shows the mix detail area in the GUI channel strip.

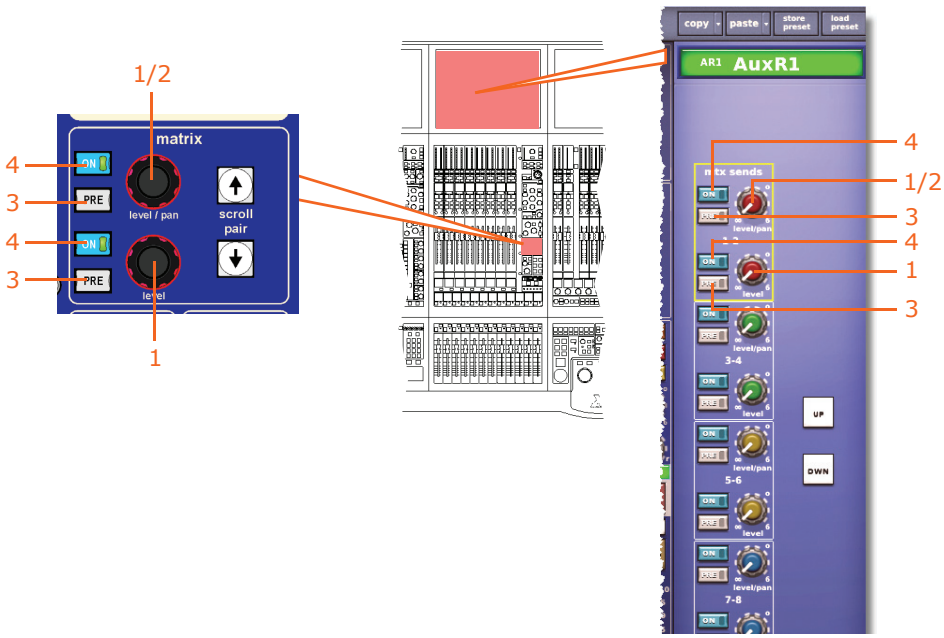


Item	Parameter	A	B	C	D	E	F	G	H
1	Aux preset upper	N/A	Yes	N/A	N/A	N/A	N/A	N/A	Yes
2	Aux preset lower	N/A	Yes	N/A	N/A	N/A	N/A	N/A	Yes

Matrix send

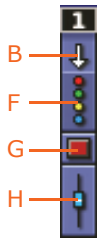


The following diagram details the scoped parameters in the **matrix** section of the return channels, and shows the matrix mix buses (mix detail area) in the GUI channel strip. This applies to each of the 16 matrix buses.

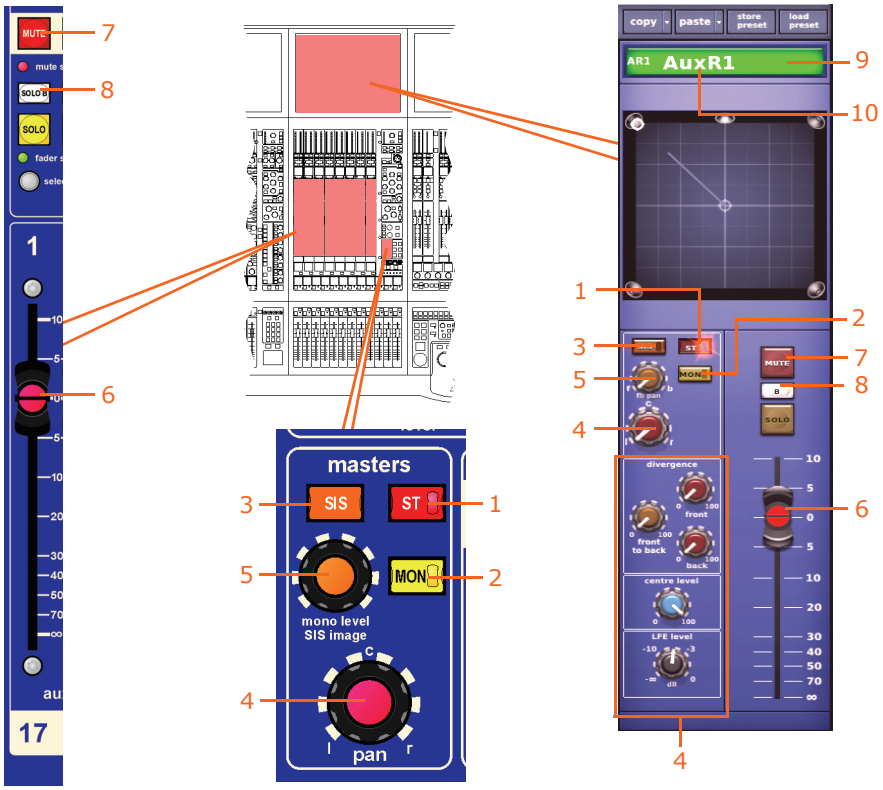


Item	Parameter	A	B	C	D	E	F	G	H
1	Send level	N/A	Yes	N/A	N/A	N/A	Yes	N/A	N/A
2	Send pan	N/A	Yes	N/A	N/A	N/A	Yes	N/A	N/A
3	Send pre-fader on/off	N/A	Yes	N/A	N/A	N/A	Yes	N/A	N/A
4	Send on/off	N/A	Yes	N/A	N/A	N/A	Yes	N/A	N/A

Fader



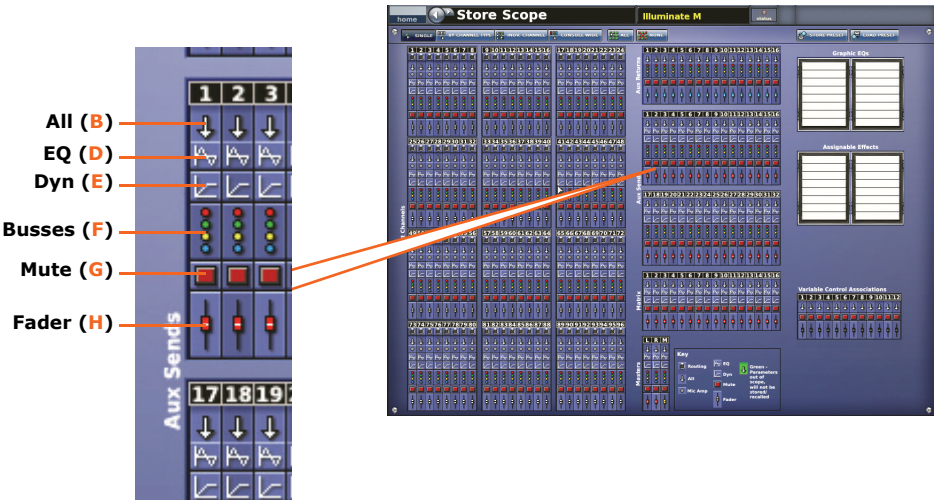
The following diagram details the scoped fader (including master routing) parameters of the return channels, and shows the master routing detail area in the GUI channel strip.



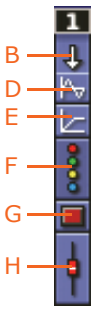
Item	Parameter	A	B	C	D	E	F	G	H
1	Stereo routing	N/A	Yes	N/A	N/A	N/A	N/A	N/A	Yes
2	Mono routing	N/A	Yes	N/A	N/A	N/A	N/A	N/A	Yes
3	SIS select (required for surround panning)	N/A	Yes	N/A	N/A	N/A	N/A	N/A	Yes
4	Pan (includes all surround sound parameters)	N/A	Yes	N/A	N/A	N/A	N/A	N/A	Yes
5	Mono level/SIS pan	N/A	Yes	N/A	N/A	N/A	N/A	N/A	Yes
6	Fader position	N/A	Yes	N/A	N/A	N/A	N/A	N/A	Yes
7	Channel mute	N/A	Yes	N/A	N/A	N/A	N/A	Yes	N/A
8	Solo B assignment	N/A	No	N/A	N/A	N/A	N/A	N/A	N/A
9	Channel name	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A
10	Channel colour	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A

Auxes (Aux Sends)

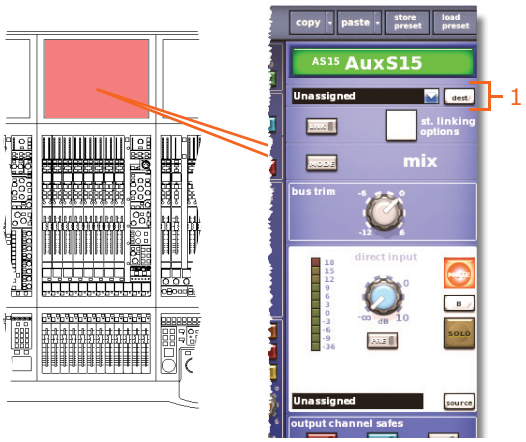
Each scope screen has 32 auxes in the **Aux Sends** section.



Patching

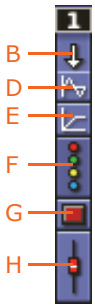


The following diagram details the scoped patching parameters of the aux channels, and shows the configuration detail area in the GUI channel strip.

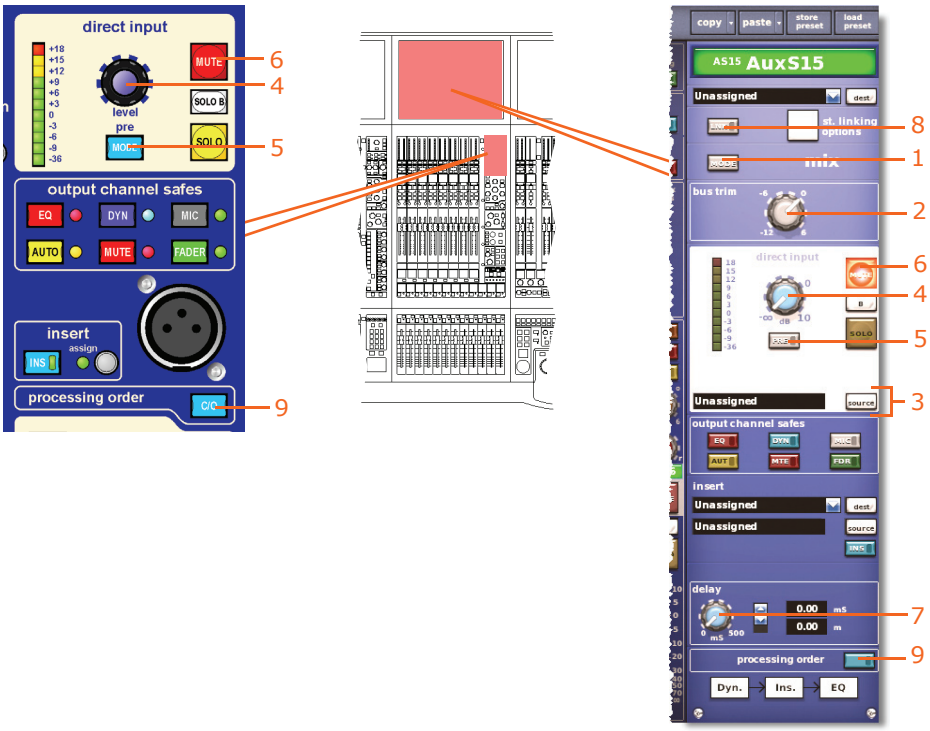


Item	Parameter	A	B	C	D	E	F	G	H
1	Output patching	N/A	No	N/A	N/A	N/A	N/A	N/A	N/A

Configuration



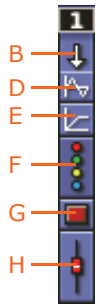
The following diagram details the scoped configuration and direct input parameters of the aux channels, and shows the configuration detail area in the GUI channel strip.



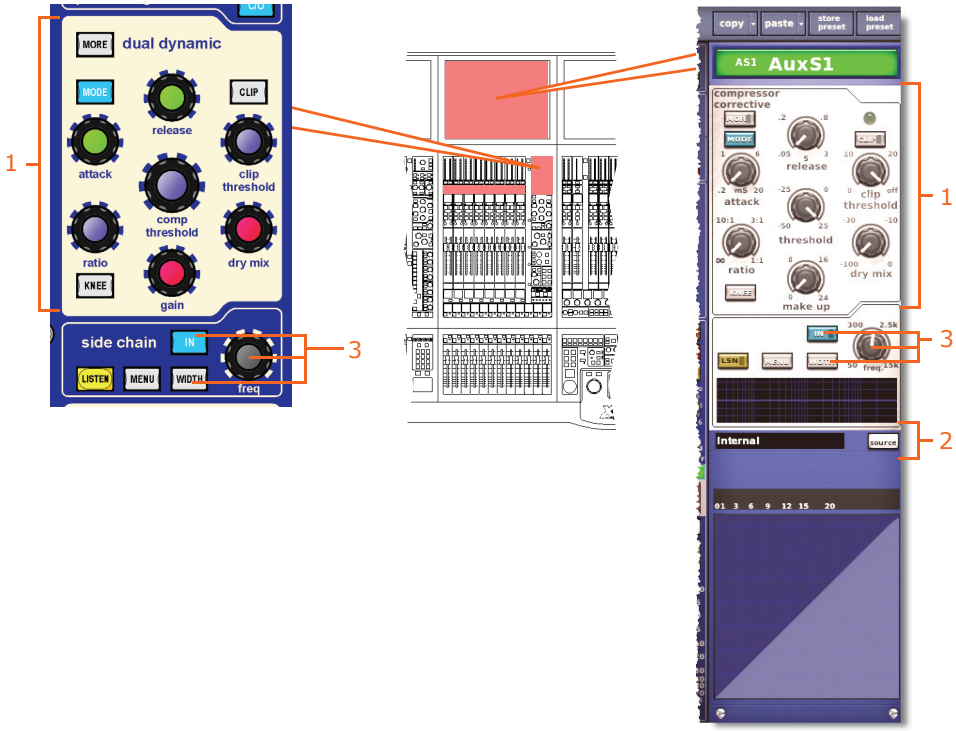
Item	Parameter	A	B	C	D	E	F	G	H
1	Bus mode	N/A	Yes	N/A	N/A	N/A	N/A	N/A	Yes
2	Bus trim	N/A	Yes	N/A	N/A	N/A	N/A	N/A	Yes
3	Direct input source	N/A	Yes[1]	N/A	N/A	N/A	N/A	N/A	N/A
4	Direct input level	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A
5	Direct input pre-/post-	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A
6	Direct input mute	N/A	Yes	N/A	N/A	N/A	N/A	Yes	N/A
7	Delay	N/A	Yes	N/A	N/A	N/A	N/A	N/A	Yes
8	Link	N/A	No	N/A	No	No	No	No	No
9	Process order	N/A	Yes	N/A	Yes	N/A	N/A	N/A	N/A

1. Only when automate patching is on.

Dynamics

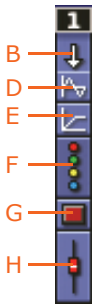


The following diagram details the scoped compressor parameters of the aux channels, and shows the compressor detail area in the GUI channel strip. Although only the corrective compressor is shown below, this is typically the same for the other compressor modes (adaptive, creative, vintage and shimmer).

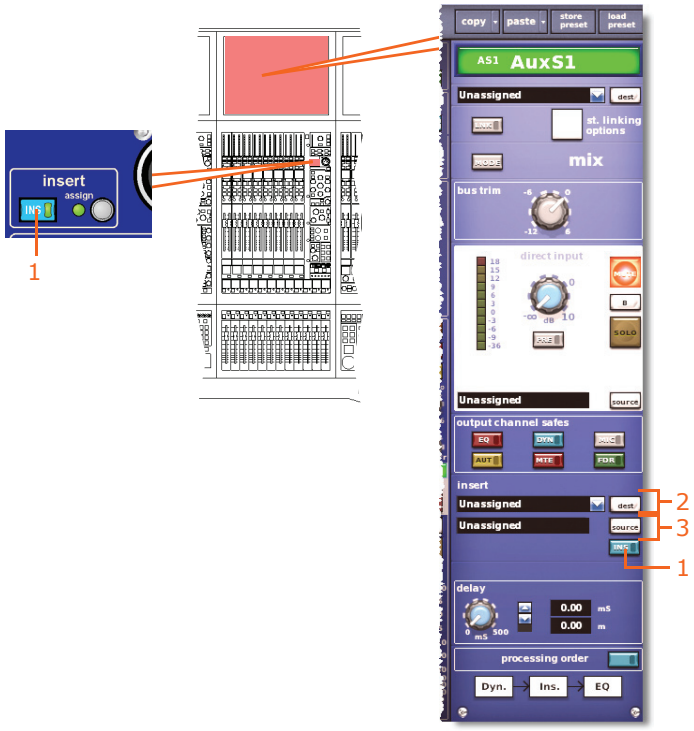


Item	Parameter	A	B	C	D	E	F	G	H
1	Compressor: **attack, release, comp threshold**/[**threshold**], **ratio, gain**/[**make up**], **KNEE, MODE, MORE, dry mix** (wet and dry), **clip threshold, CLIP**	N/A	**Yes**	N/A	N/A	**Yes**	N/A	N/A	N/A
2	Sidechain source	N/A	N/A	N/A	N/A	**No**	N/A	N/A	N/A
3	Compressor sidechain: **IN**, **freq,** and **WIDTH**	N/A	**Yes**	N/A	N/A	**Yes**	N/A	N/A	N/A

Insert

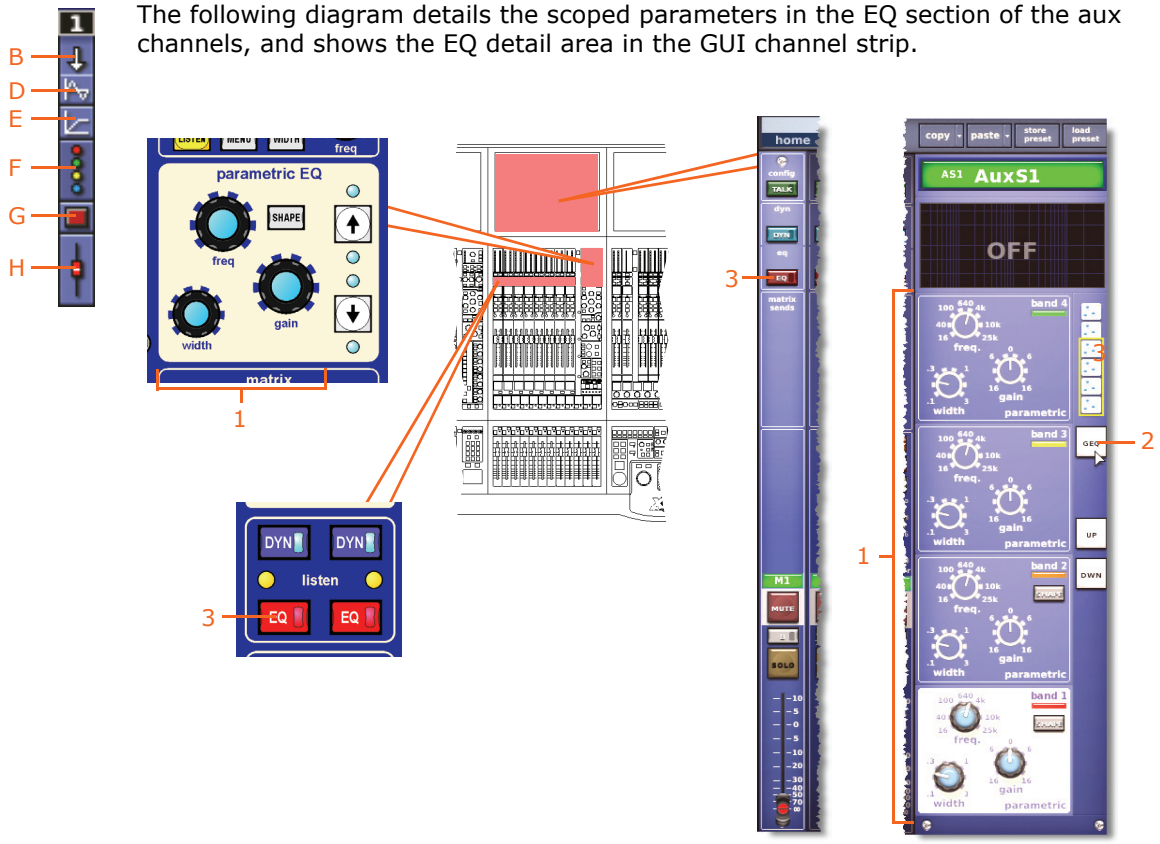


The following diagram details the scoped insert parameters of the aux channels, and shows the configuration detail area in the GUI channel strip.



Item	Parameter	A	B	C	D	E	F	G	H
1	In/out	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A
2	Insert send destination	N/A	No	N/A	N/A	N/A	N/A	N/A	N/A
3	Insert return source	N/A	No	N/A	N/A	N/A	N/A	N/A	N/A

EQ



The following diagram details the scoped parameters in the EQ section of the aux channels, and shows the EQ detail area in the GUI channel strip.

Item	Parameter	A	B	C	D	E	F	G	H
1	All PEQ filters (all six bands): **freq, gain, width, SHAPE** (as necessary)	N/A	**Yes**	N/A	**Yes**	N/A	N/A	N/A	N/A
2	Parametric/Graphic type	N/A	**No**	N/A	**No**	N/A	N/A	N/A	N/A
3	EQ in/out	N/A	**Yes**	N/A	**Yes**	N/A	N/A	N/A	N/A

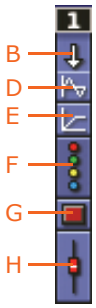
Aux send

Not applicable.

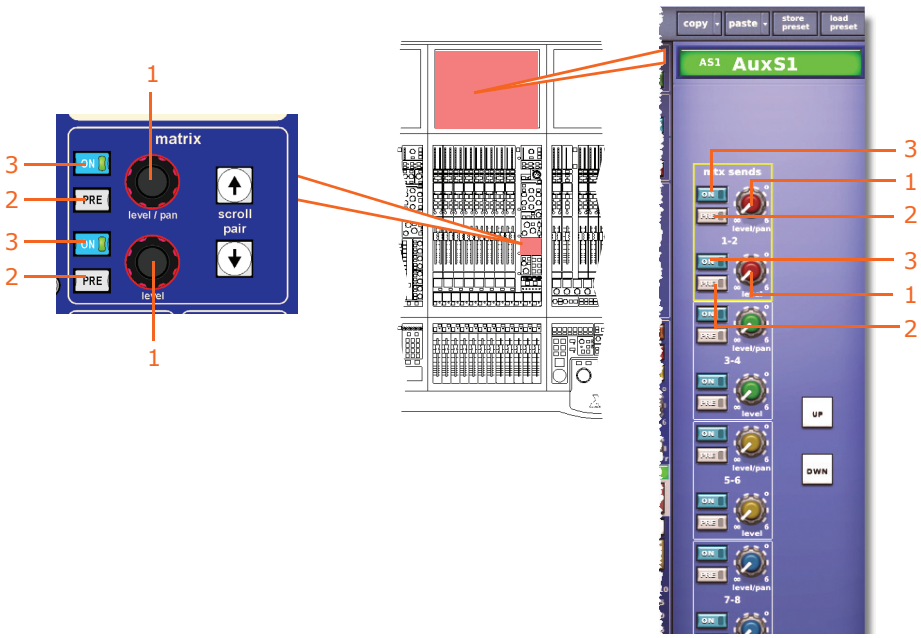
Aux preset

Not applicable.

Matrix send



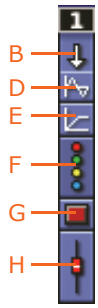
The following diagram details the scoped parameters in the **matrix** section of the aux channels, and shows the mix detail area in the GUI channel strip. Although only matrices 1 to 8 are shown below, this also applies to matrices 9 to 16.



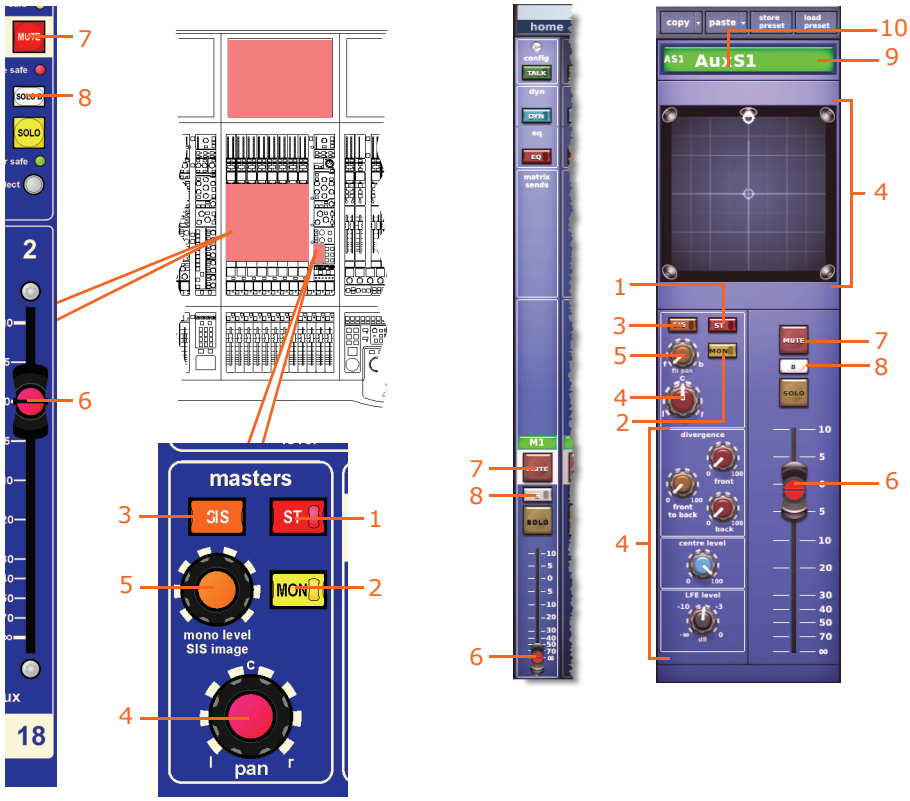
Item	Parameter	A	B	C	D	E	F	G	H
1	Send level	N/A	Yes	N/A	N/A	N/A	Yes	N/A	N/A
2	Send pre-fader on/off	N/A	Yes	N/A	N/A	N/A	Yes	N/A	N/A
3	Send on/off	N/A	Yes	N/A	N/A	N/A	Yes	N/A	N/A

You can scope individual bus sends. In column **B** (**All**), all sends are affected, and in column **F** (**Busses**), individual sends can be scoped.

Fader



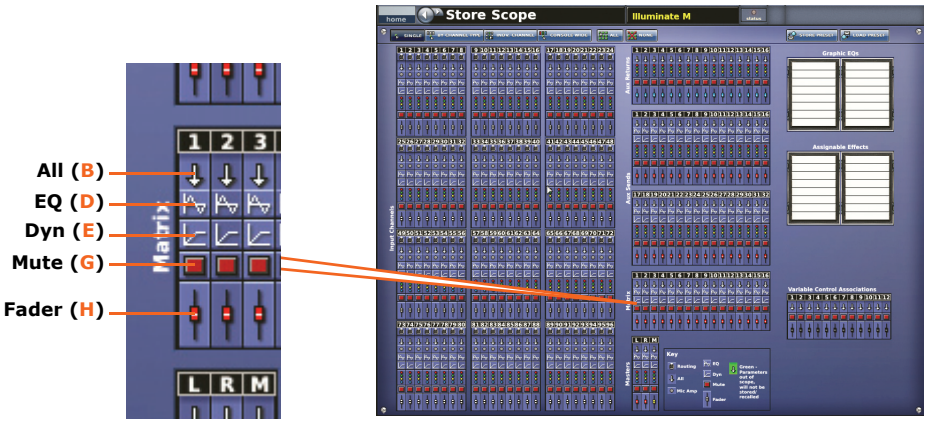
The following diagram details the scoped fader and master routing parameters of the aux channels, and shows the master routing detail area in the GUI channel strip.



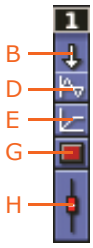
Item	Parameter	A	B	C	D	E	F	G	H
1	Stereo routing	N/A	Yes	N/A	N/A	N/A	N/A	N/A	Yes
2	Mono routing	N/A	Yes	N/A	N/A	N/A	N/A	N/A	Yes
3	SIS select (required for surround panning)	N/A	Yes	N/A	N/A	N/A	N/A	N/A	Yes
4	Pan (includes ALL surround sound parameters)	N/A	Yes	N/A	N/A	N/A	N/A	N/A	Yes
5	Mono level/SIS pan	N/A	Yes	N/A	N/A	N/A	N/A	N/A	Yes
6	Fader position	N/A	Yes	N/A	N/A	N/A	N/A	N/A	Yes
7	Channel mute	N/A	Yes	N/A	N/A	N/A	N/A	Yes	No
8	Solo B assignment	N/A	No	N/A	N/A	N/A	N/A	N/A	No
9	Channel name	N/A	Yes	N/A	N/A	N/A	N/A	N/A	No
10	Channel colour	N/A	Yes	N/A	N/A	N/A	N/A	N/A	No

Matrices

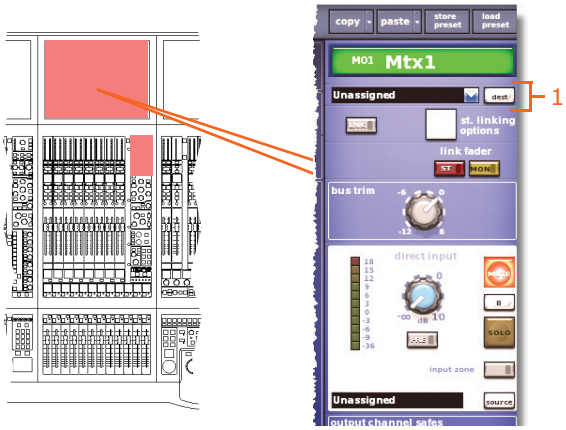
Each scope screen has 16 matrices in the **Matrix** section.



Patching

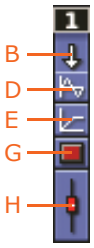


The following diagram details the scoped patching parameters of the matrix channels, and shows the configuration detail area in the GUI channel strip.

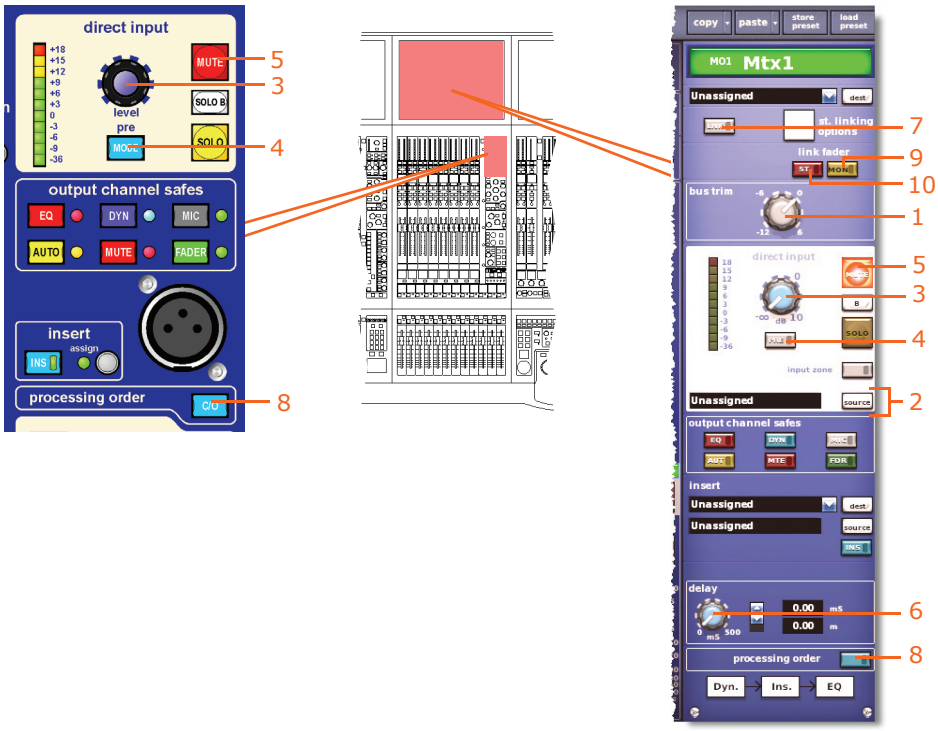


Item	Parameter	A	B	C	D	E	F	G	H
1	Output patching	N/A	No	N/A	N/A	N/A	N/A	N/A	N/A

Configuration



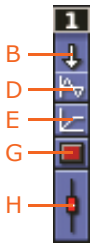
The following diagram details the scoped parameters of the configuration and direct input sections of the matrices channels, and shows the configuration detail area in the GUI channel strip.



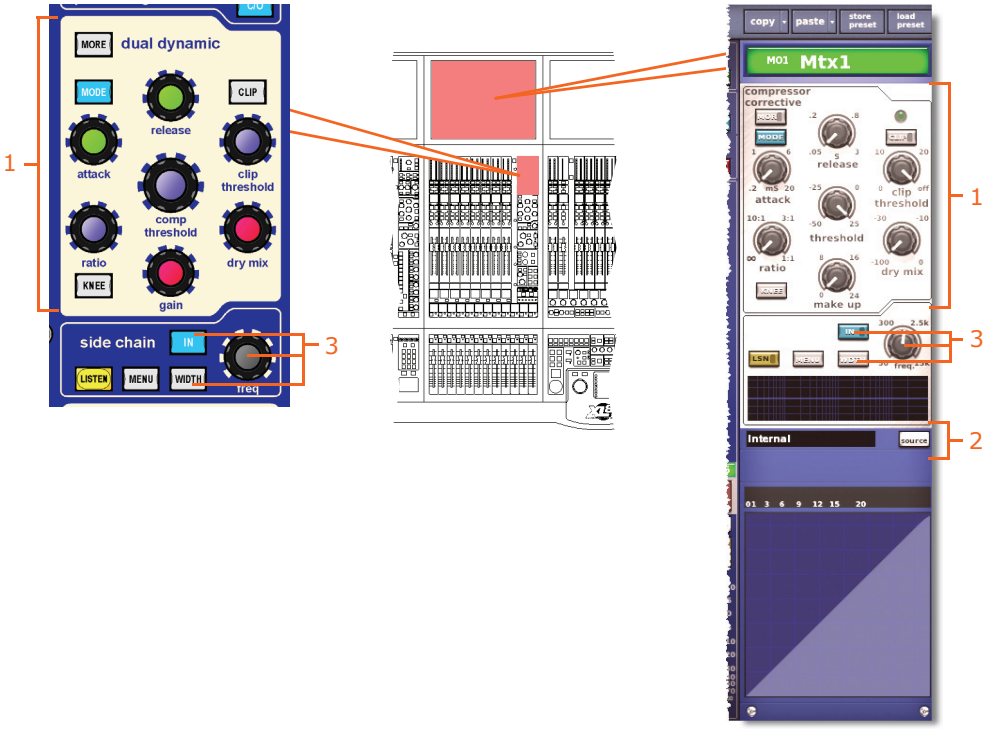
Item	Parameter	A	B	C	D	E	F	G	H
1	Bus trim	N/A	Yes	N/A	N/A	N/A	N/A	N/A	Yes
2	Direct input source	N/A	Yes[1]	N/A	N/A	N/A	N/A	N/A	N/A
3	Direct input level	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A
4	Direct input pre-/post-	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A
5	Direct input mute	N/A	Yes	N/A	N/A	N/A	N/A	Yes	N/A
6	Delay	N/A	Yes	N/A	N/A	N/A	N/A	N/A	Yes
7	Link	N/A	No	N/A	No	No	No	No	No
8	Process order	N/A	Yes	N/A	Yes	N/A	N/A	N/A	N/A
9	Link fader mono	N/A	Yes	N/A	N/A	N/A	N/A	N/A	Yes
10	Link fader stereo	N/A	Yes	N/A	N/A	N/A	N/A	N/A	Yes

1. Only when automate patching is on.

Dynamics

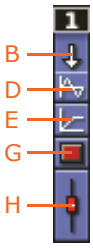


The following diagram details the scoped compressor parameters of the matrix channels, and shows the compressor detail area in the GUI channel strip. Although only the corrective compressor is shown below, this is typically the same for the other compressor modes (adaptive, creative, vintage and shimmer).

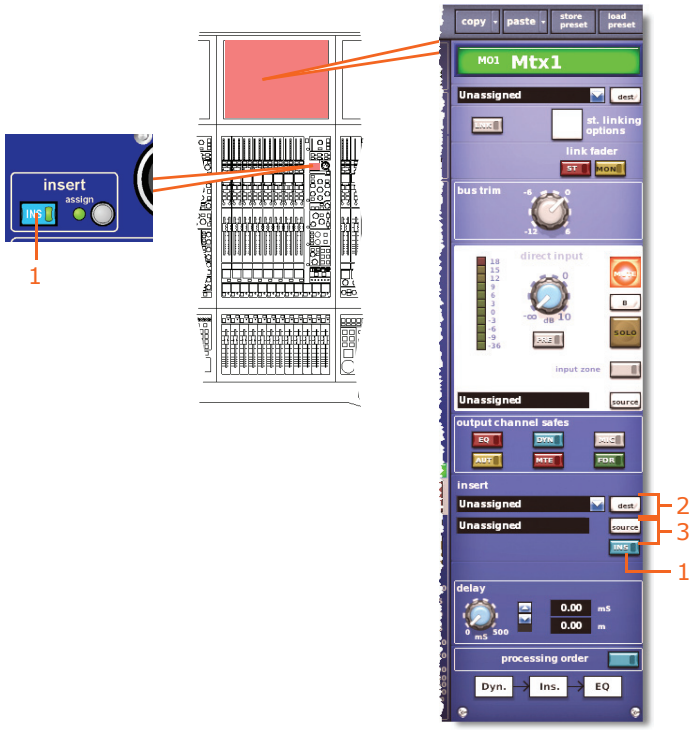


Item	Parameter	A	B	C	D	E	F	G	H
1	Compressor: **attack, release, comp threshold**/[**threshold**], **ratio, gain**/[**make up**], **KNEE, MODE, MORE, dry mix** (wet and dry), **clip threshold, CLIP**	N/A	**Yes**	N/A	N/A	**Yes**	N/A	N/A	N/A
2	Sidechain source	N/A	**No**	N/A	N/A	**No**	N/A	N/A	N/A
3	Compressor sidechain: **IN**, **freq,** and **WIDTH**	N/A	**Yes**	N/A	N/A	**Yes**	N/A	N/A	N/A

Insert

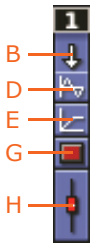


The following diagram details the scoped parameters in the insert section of the matrix channels, and shows the configuration detail area in the GUI channel strip.

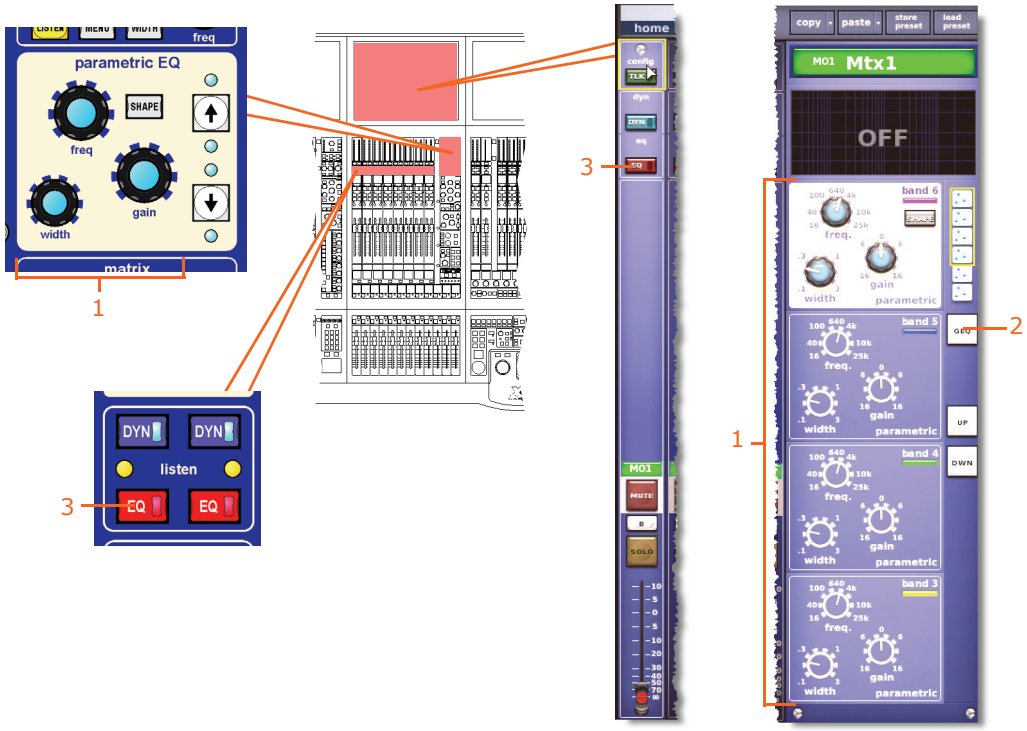


Item	Parameter	A	B	C	D	E	F	G	H
1	In/out	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A
2	Insert send destination	N/A	No	N/A	N/A	N/A	N/A	N/A	N/A
3	Insert return source	N/A	No	N/A	N/A	N/A	N/A	N/A	N/A

EQ



The following diagram details the scoped EQ parameters of the matrix channels, and shows the EQ detail area in the GUI channel strip.



Item	Parameter	A	B	C	D	E	F	G	H
1	All PEQ filters (all six bands): **freq, gain, width, SHAPE** (as necessary)	N/A	**Yes**	N/A	**Yes**	N/A	N/A	N/A	N/A
2	Parametric/Graphic type	N/A	**No**	N/A	**No**	N/A	N/A	N/A	N/A
3	EQ in/out	N/A	**Yes**	N/A	**Yes**	N/A	N/A	N/A	N/A

Aux send

Not applicable.

Aux preset

Not applicable.

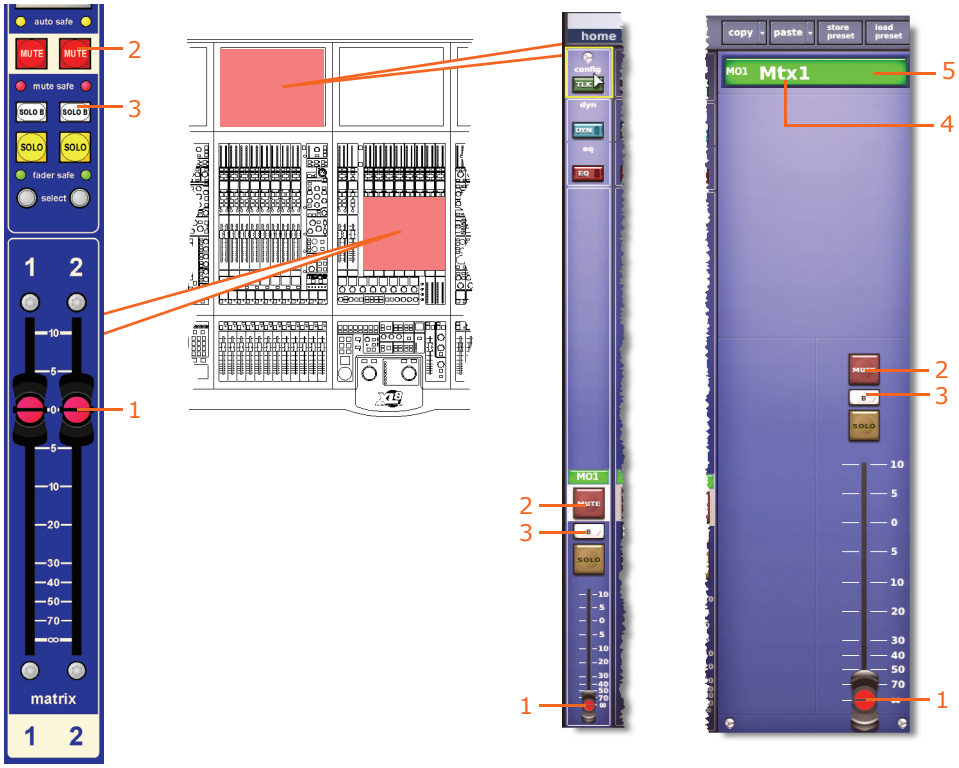
Matrix send

Not applicable.

Fader



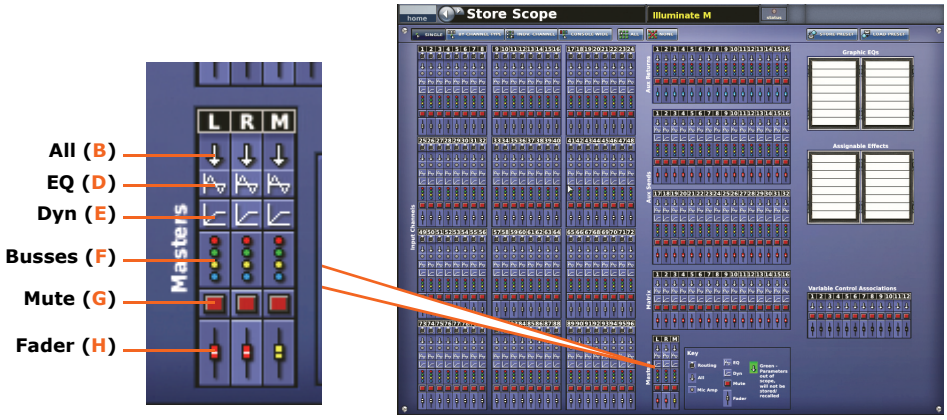
The following diagram details the scoped fader parameters of the matrix channels, and shows the fader detail area.



Item	Parameter	A	B	C	D	E	F	G	H
1	Fader position	N/A	Yes	N/A	N/A	N/A	N/A	N/A	Yes
2	Channel mute	N/A	Yes	N/A	N/A	N/A	N/A	Yes	No
3	Solo B assignment	N/A	No	N/A	N/A	N/A	N/A	N/A	No
4	Channel name	N/A	Yes	N/A	N/A	N/A	N/A	N/A	No
5	Channel colour	N/A	Yes	N/A	N/A	N/A	N/A	N/A	No

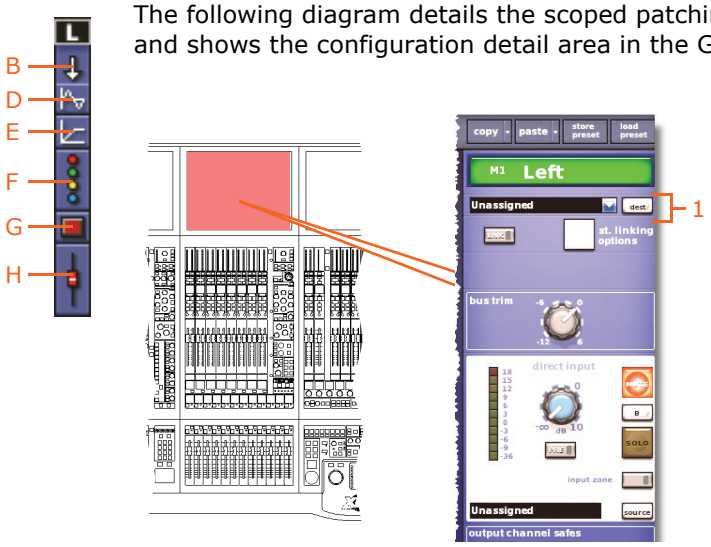
Masters

Each scope screen has three master channels (stereo left and right, and mono) in the **masters** section.



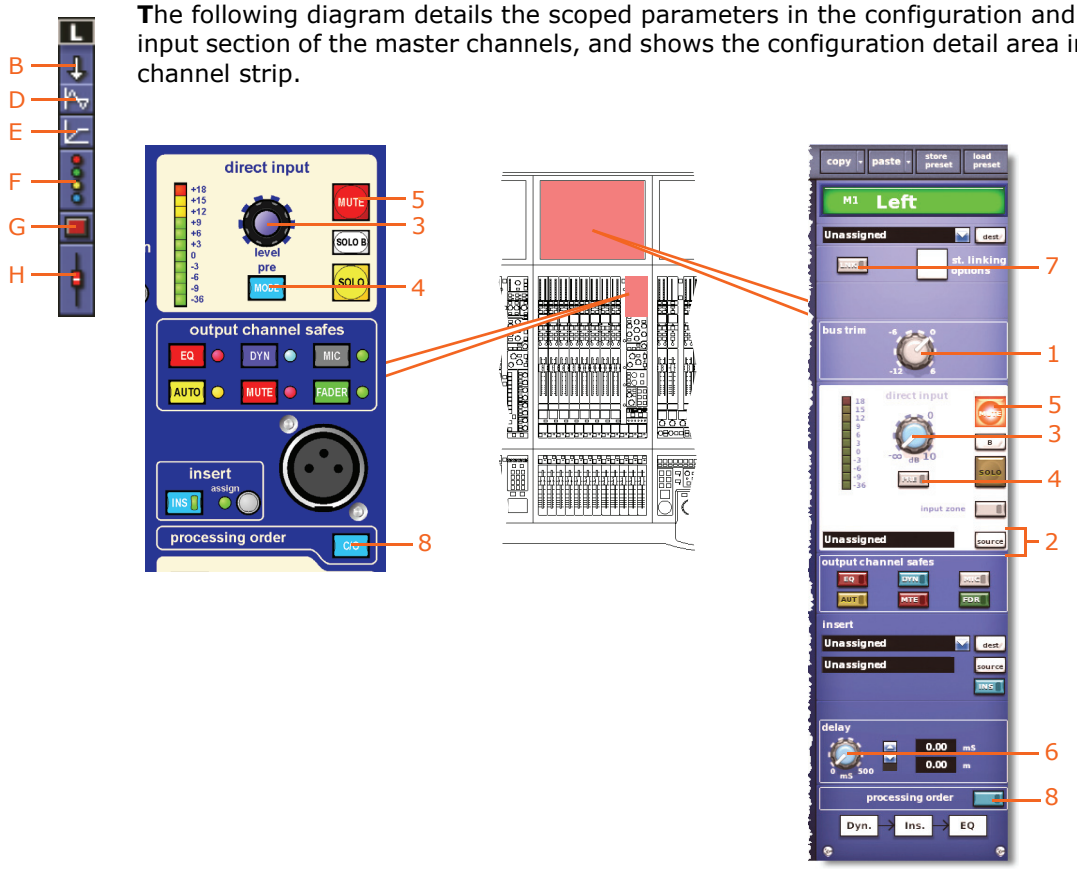
Patching

The following diagram details the scoped patching parameters of the master channels, and shows the configuration detail area in the GUI channel strip.



Item	Parameter	A	B	C	D	E	F	G	H
1	Output patching	N/A	No	N/A	N/A	N/A	N/A	N/A	N/A

Configuration

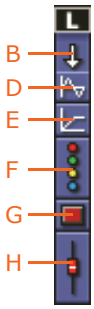


The following diagram details the scoped parameters in the configuration and direct input section of the master channels, and shows the configuration detail area in the GUI channel strip.

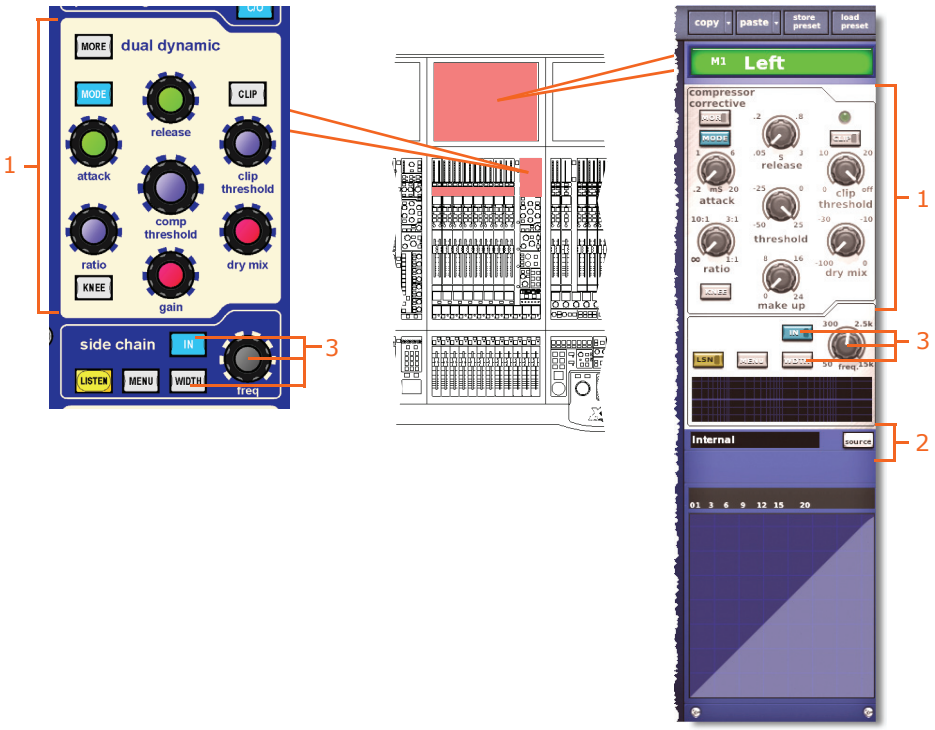
Item	*Parameter*	A	B	C	D	E	F	G	H
1	Bus trim	N/A	**Yes**	N/A	N/A	N/A	N/A	N/A	**Yes**
2	Direct input source	N/A	**Yes**[1]	N/A	N/A	N/A	N/A	N/A	N/A
3	Direct input level	N/A	**Yes**	N/A	N/A	N/A	N/A	N/A	N/A
4	Direct input pre-/post-	N/A	**Yes**	N/A	N/A	N/A	N/A	N/A	N/A
5	Direct input mute	N/A	**Yes**	N/A	N/A	N/A	N/A	**Yes**	N/A
6	Delay	N/A	**Yes**	N/A	N/A	N/A	N/A	N/A	**Yes**
7	Link	N/A	**No**	N/A	**No**	**No**	**No**	**No**	**No**
8	Process order	N/A	**Yes**	N/A	**Yes**	N/A	N/A	N/A	N/A

1. Only when automate patching is on.

Dynamics



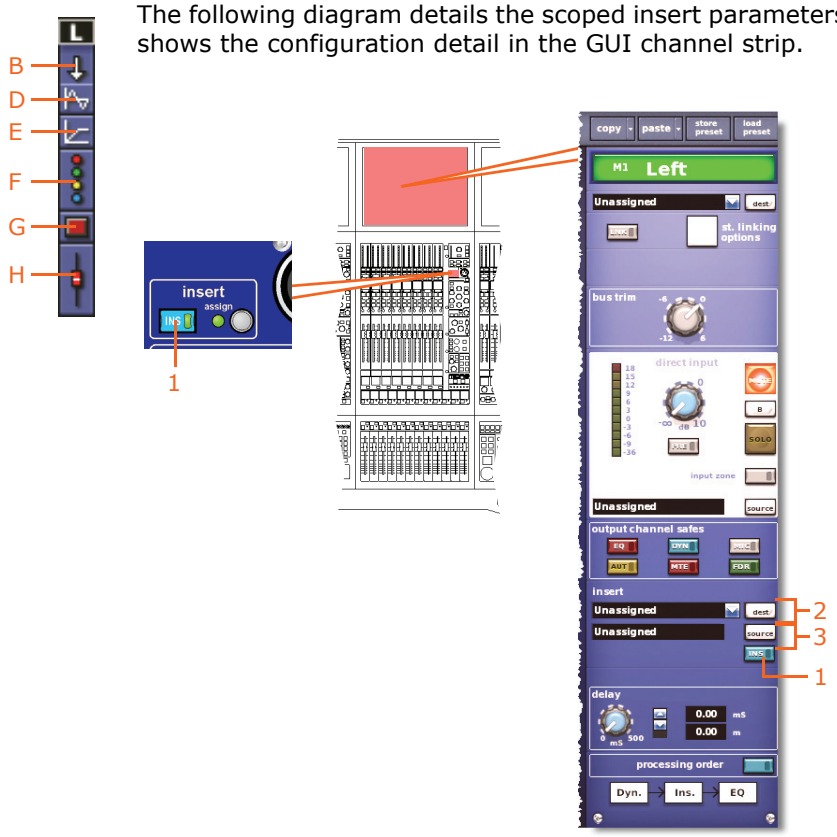
The following diagram details the scoped compressor parameters of the master channels, and shows the compressor detail area in the GUI channel strip. Although only the corrective compressor is shown below, this is typically the same for the other compressor modes (adaptive, creative, vintage and shimmer).



Item	Parameter	A	B	C	D	E	F	G	H
1	Compressor: **attack, release, threshold, ratio, make up** (gain), **KNEE, MODE, MORE, dry mix** (wet and dry), **clip threshold, CLIP**	N/A	**Yes**	N/A	N/A	**Yes**	N/A	N/A	N/A
2	Sidechain source	N/A	N/A	N/A	N/A	**No**	N/A	N/A	N/A
3	Compressor sidechain: **IN, freq,** and **WIDTH**	N/A	**Yes**	N/A	N/A	**Yes**	N/A	N/A	N/A

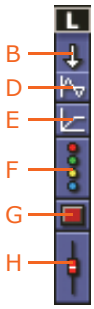
Insert

The following diagram details the scoped insert parameters of the master channels, and shows the configuration detail in the GUI channel strip.

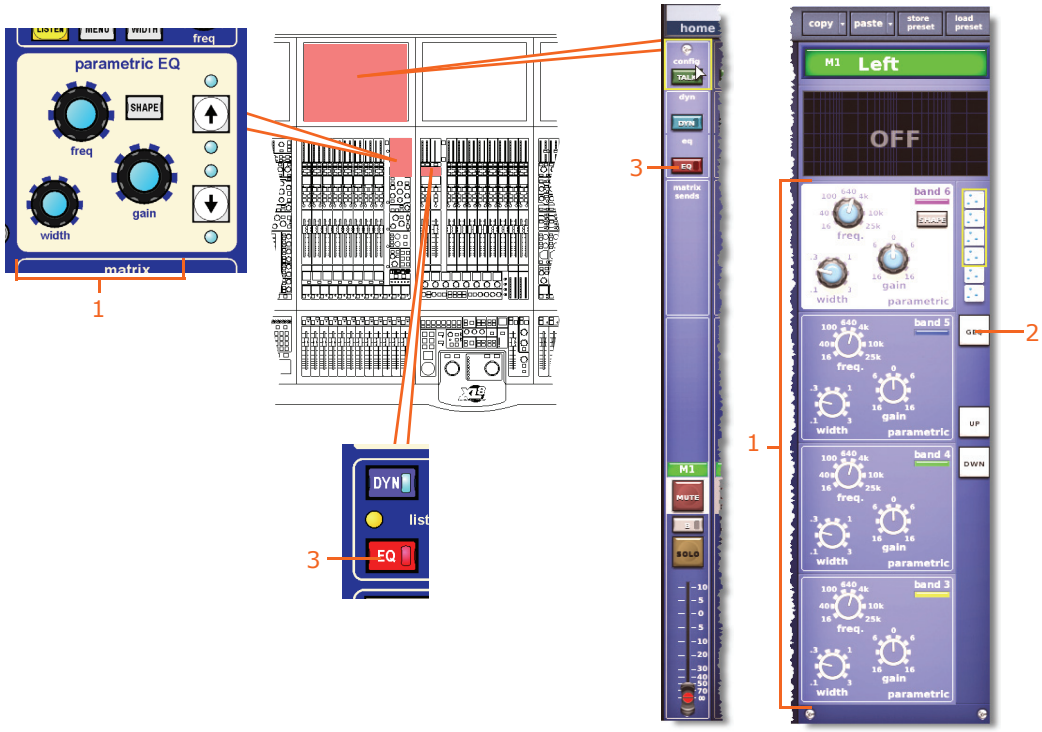


Item	Parameter	A	B	C	D	E	F	G	H
1	In/out	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A
2	Insert send destination	N/A	No	N/A	N/A	N/A	N/A	N/A	N/A
3	Insert return source	N/A	No	N/A	N/A	N/A	N/A	N/A	N/A

EQ



The following diagram details the scoped EQ parameters of the master channels, and shows the EQ detail area in the GUI channel strip.



Item	Parameter	A	B	C	D	E	F	G	H
1	All PEQ filters (all six bands): **freq, gain, width, SHAPE** (as necessary)	N/A	**Yes**	N/A	**Yes**	N/A	N/A	N/A	N/A
2	Parametric/Graphic type	N/A	**No**	N/A	**No**	N/A	N/A	N/A	N/A
3	EQ in/out	N/A	**Yes**	N/A	**Yes**	N/A	N/A	N/A	N/A

Aux send

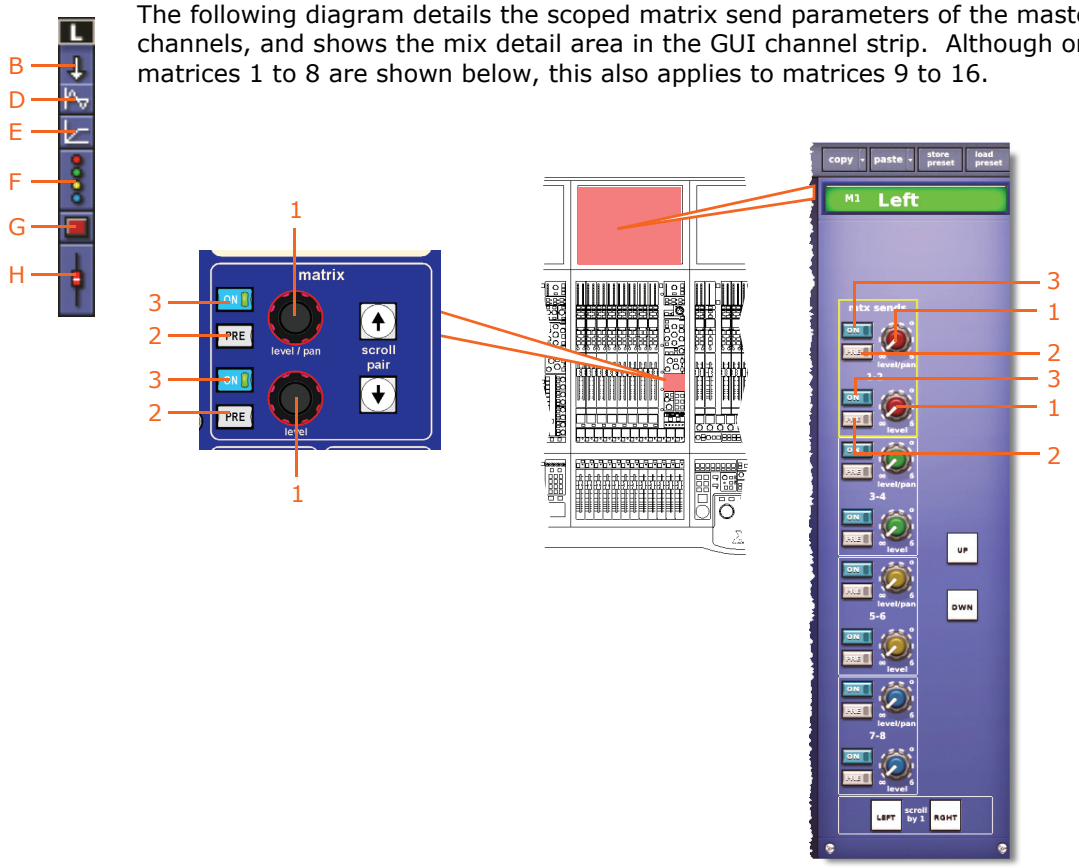
Not applicable

Aux preset

Not applicable

Matrix send

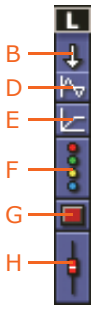
The following diagram details the scoped matrix send parameters of the master channels, and shows the mix detail area in the GUI channel strip. Although only matrices 1 to 8 are shown below, this also applies to matrices 9 to 16.



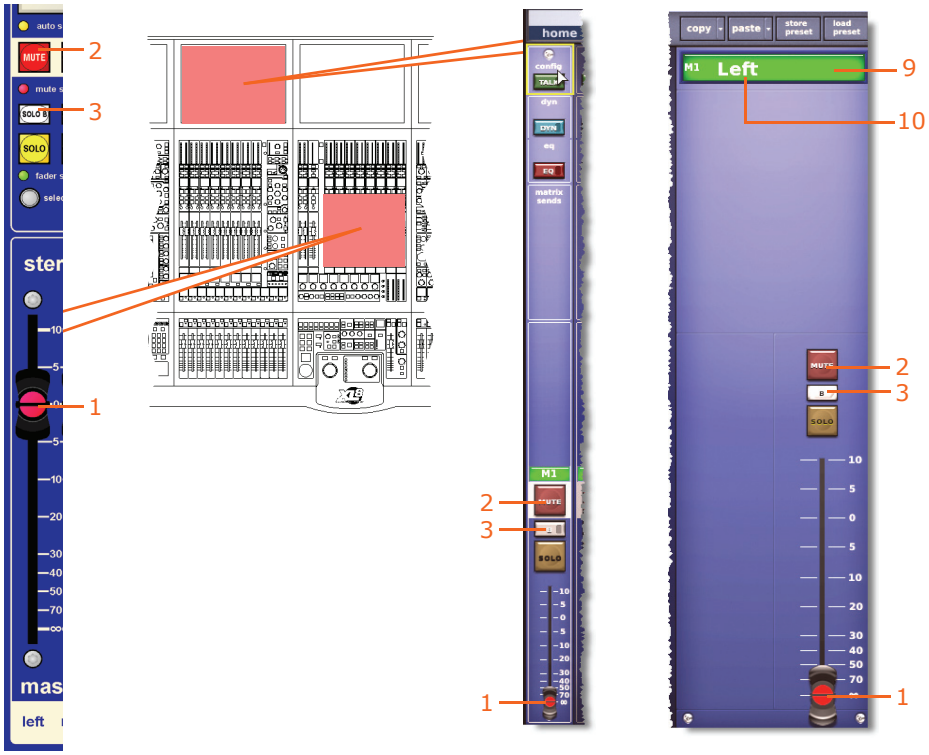
Item	Parameter	A	B	C	D	E	F	G	H
1	Send level	N/A	Yes	N/A	N/A	N/A	Yes	N/A	N/A
2	Send pre-fader on/off	N/A	Yes	N/A	N/A	N/A	Yes	N/A	N/A
3	Send on/off	N/A	Yes	N/A	N/A	N/A	Yes	N/A	N/A

You can scope individual bus sends. In column **B** (**All**), all sends are affected, and in column **F** (**Busses**), individual sends can be scoped.

Fader



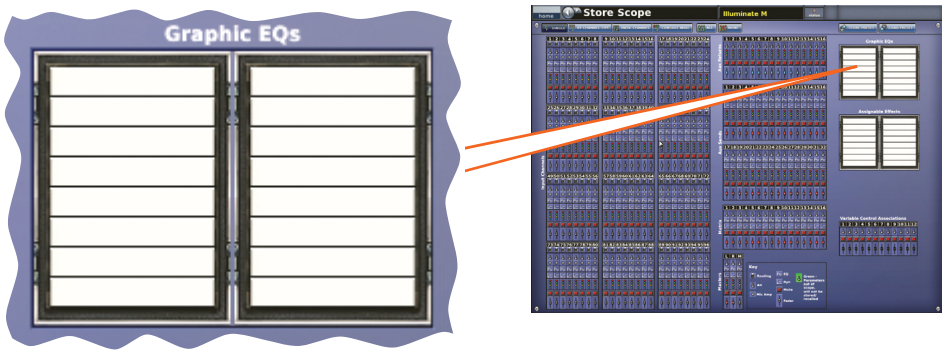
The following diagram details the scoped fader parameters in the masters section of master channels, and shows the fader detail area in the GUI channel strip.



Item	Parameter	A	B	C	D	E	F	G	H
1	Fader position	N/A	Yes	N/A	N/A	N/A	N/A	N/A	Yes
2	Channel mute	N/A	Yes	N/A	N/A	N/A	N/A	Yes	No
3	Solo B assignment	N/A	No	N/A	N/A	N/A	N/A	N/A	No
4	Channel name	N/A	Yes	N/A	N/A	N/A	N/A	N/A	No
5	Channel colour	N/A	Yes	N/A	N/A	N/A	N/A	N/A	No

GEQ rack

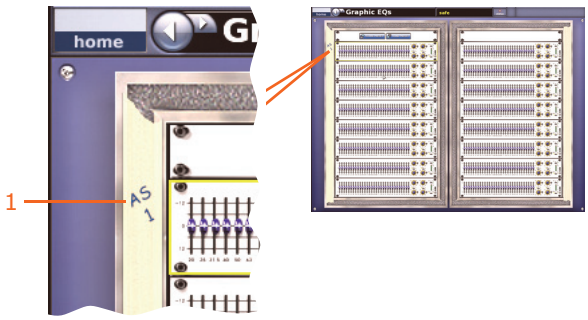
Each scope screen has a rack of 16 GEQs in the **Graphic EQs** section.



Note: *A rack slot in the* **Graphic EQs** *section in equivalent to a the* **All**  *scope area.*

Patching

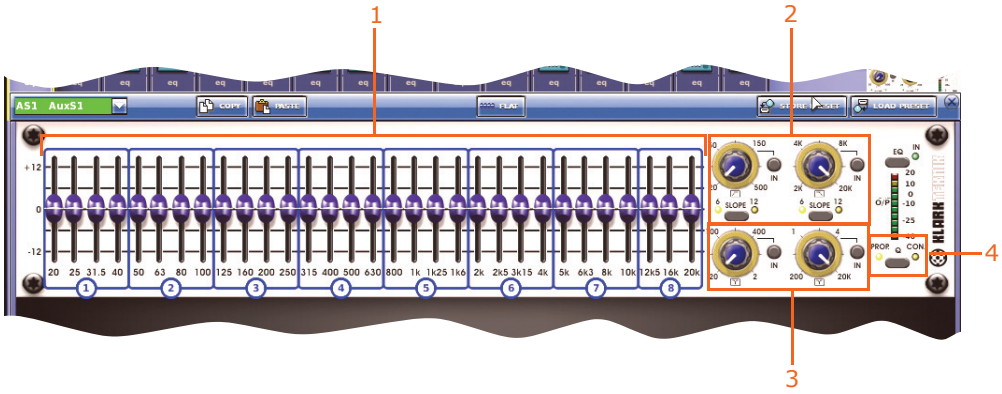
The following diagram details the scoped patching parameters of the GEQs, which are shown on the **Graphic GEQs** screen (below).



Item	*Parameter*	A	B	C	D	E	F	G	H
1	Bus assignment/type	N/A	No	N/A	N/A	N/A	N/A	N/A	N/A

GEQ

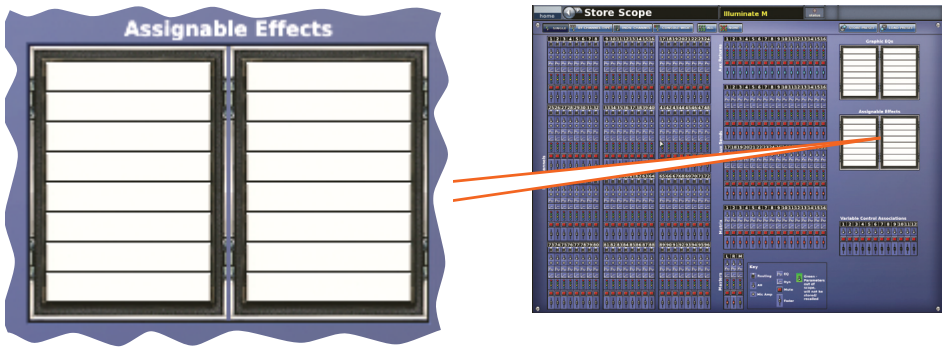
The following diagram details the scoped parameters of the GEQs, and shows the GEQ window on the GUI screen.



Item	Parameter	A	B	C	D	E	F	G	H
1	EQ band gains	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A
2	HPF and LPF	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A
3	Notch filters	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A
4	GEQ mode (proportional/ constant Q)	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A

Effects rack

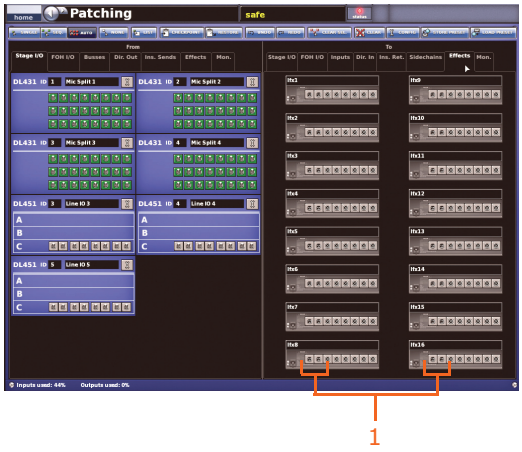
Each scope screen has a rack of 16 effects in the **Assignable Effects** section.



Note: *A rack slot in the* **Assignable Effects** *section is equivalent to the* **All**  *scope area.*

Patching

The diagram right shows the scoped patching parameters of the effects, which are on the **Effects** tab of the **To** section of the **Patching** screen.



		A	B	C	D	E	F	G	H
Item	***Parameter***								
1	Input patching	N/A	No	N/A	N/A	N/A	N/A	N/A	N/A

Effects

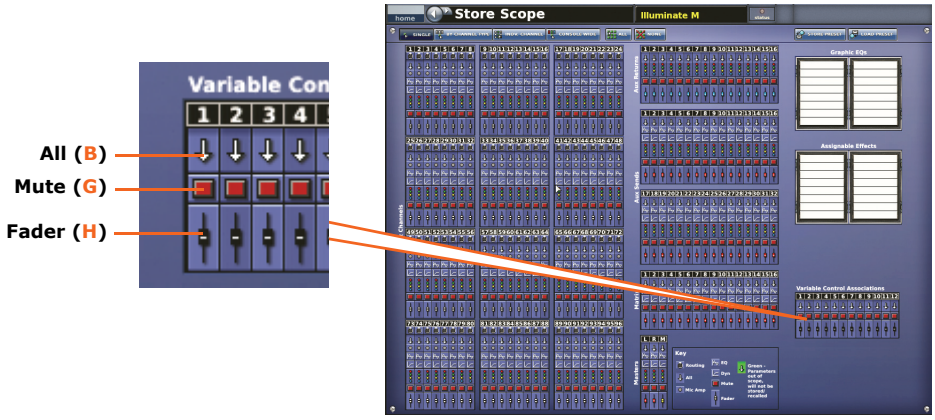
The following diagram details the scoped parameters of the effects, and shows the effect window on the GUI screen.

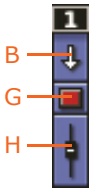


Item	Parameter	A	B	C	D	E	F	G	H
1	Effect name	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A
2	Effect colour	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A
3	Effect type	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A
4	All effect parameters	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A

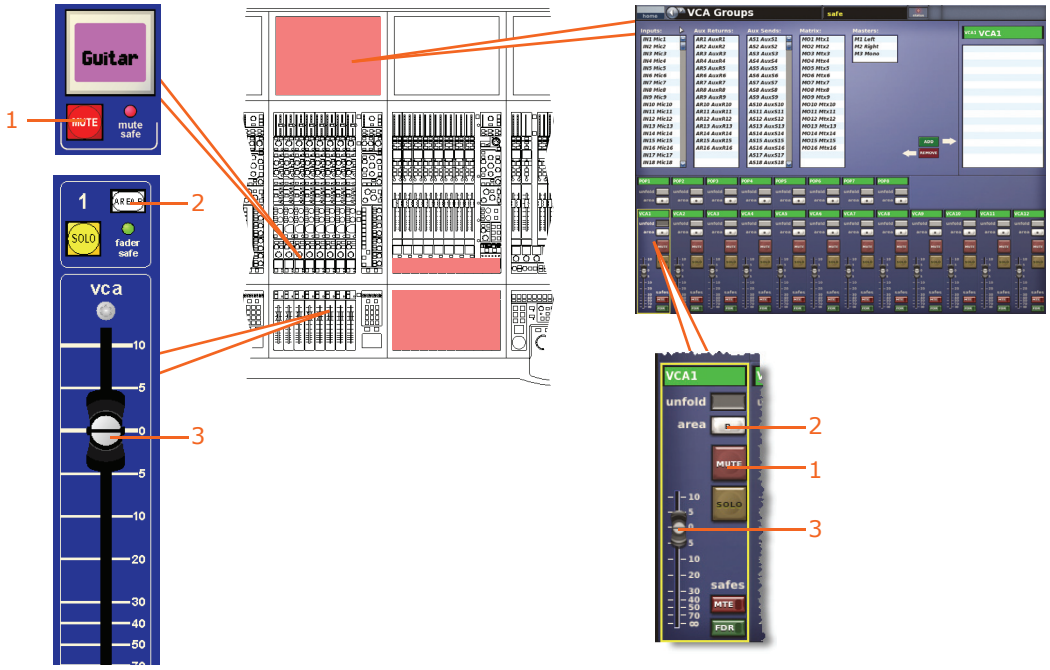
Groups

Each scope screen contains 12 VCA channels in the **Variable Control Associates** section.





The following diagram shows the scoped parameters of the VCA group channels, and shows the **VCA Groups** screen on the GUI. This is a GUI only function.



Item	Parameter	A	B	C	D	E	F	G	H
1	VCA mute	N/A	Yes	N/A	N/A	N/A	N/A	Yes	N/A
2	VCA area A/B	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A
3	VCA fader level (required for surround panning)	N/A	Yes	N/A	N/A	N/A	N/A	N/A	Yes

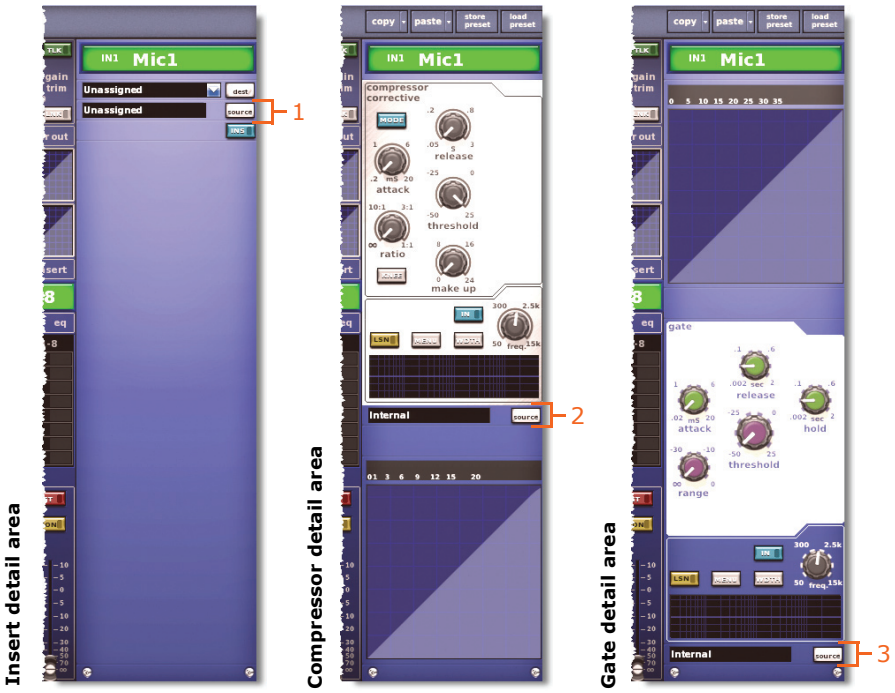
Appendix K: Parameters Affected By Automate Patching

This appendix shows the patching parameters (sources) that can be changed on a per-scene basis in automation. These are only selectable when the **Automate Patching** option of the **Preferences** scene is selected (see "Using patching in automation" on page 191).

Note: *Automate patching is not applicable to returns.*

Inputs

The following input channel sources can be changed per scene.



Item	*Parameter*
1	Insert return source
2	Compressor side chain source
3	Gate key source

Although the mic input and tape input sources are automutable, that is, they can be changed per scene, they are controlled by the input patching recall scope area switch (see Figure 44, "Parameter sections per input channel," on page 433). They are not affected by the **Automate Patching** function.



Auxes

The source of each aux channel can be changed per scene.

Item	Parameter
1	Insert return source
2	Direct in source
3	Compressor side chain source



Configuration detail area



Compressor detail area

Matrices

The destinations/sources of each matrix channel can be changed per scene.

Item	Parameter
1	Insert return source
2	Direct in source
3	Compressor side chain source



Configuration detail area

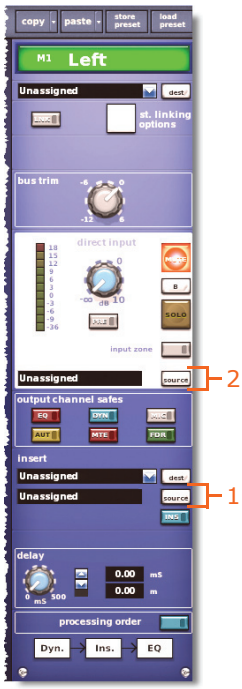


Compressor detail area

Masters

The destinations/sources of each master channel can be changed per scene.

Item	*Parameter*
1	Insert return source
2	Direct in source
3	Compressor side chain source



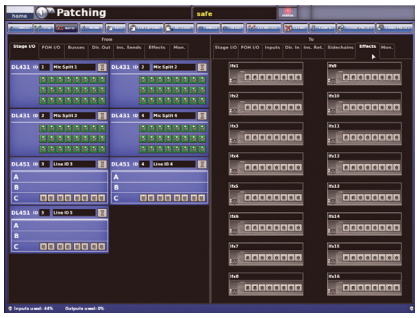
Configuration detail area



Compressor detail area

Effects

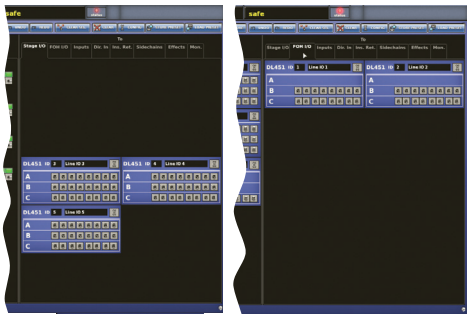
Effect input sources can be changed per scene. These are located on the **Effects** tab of the **To** section of the **Patching** screen (shown right).



System devices

Sources for the outputs of external devices, such as the DL451 Modular I/O and DN9696 Recorder, etc., can be changed per scene. The sources are selectable via the **Stage I/O** and **FOH I/O** tabs in **To** section of the **Patching** screen.

However, this does not include the I/O card configuration.



Monitors

The following monitor sources can be changed per scene.



Item	*Parameter*
1	Talk input source
2	Taklback input source
3	PFL direct input source
4	AFL direct input left source
5	AFL direct input right source
6	External monitor input left source
7	External monitor input right source

Appendix L: Parameters Protected By Safes

This appendix shows the parameters affected/unaffected by each of the safe types (**EQ, DYN, MIC, AUTO, MUTE** and **FADER**).

Note: *The parameter areas for the scopes (store and recall) and the safes are, basically the same. However, the way they are presented in their respective appendix is different. This may provide you with a useful alternative when referring to this material, should you prefer one more than the other (see Appendix J "Parameters Affected By Scope" on page 431).*

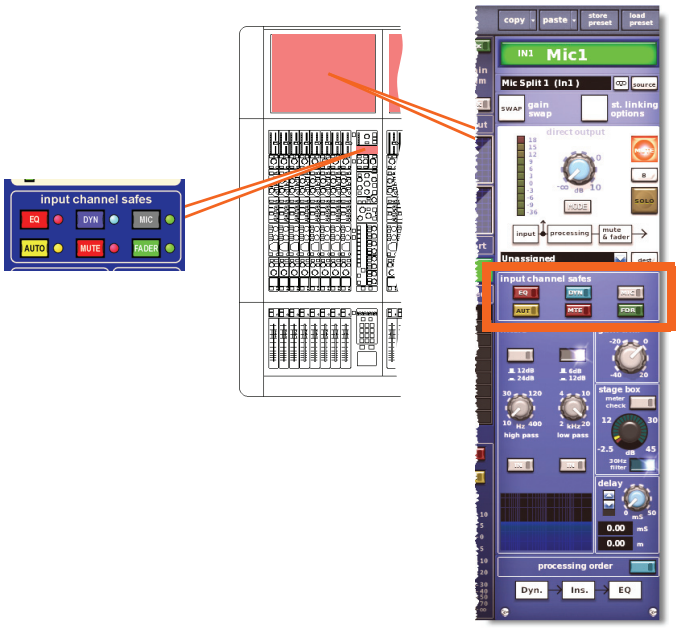
Overview

The following table provides a quick reference for finding the channel/group safe areas in this appendix.

Channel or Group	*EQ safe*	*DYN safe*	*MIC safe*	*AUTO safe*	*MUTE safe*	*FADER safe*
Input channel	"EQ safe" on page 480	"DYN (dynamic) safe" on page 481	"MIC safe" on page 482	"AUTO (automation) safe" on page 483	"MUTE safe" on page 484	"FADER safe" on page 485
Aux	"EQ safe" on page 488	"DYN (dynamic) safe" on page 490	"MIC safe" on page 491	"AUTO (automation) safe" on page 491	"MUTE safe" on page 492	"FADER safe" on page 493
Return	N/A	N/A	"MIC safe" on page 496	"AUTO (automation) safe" on page 497	"MUTE safe" on page 497	"FADER safe" on page 498
Matrix	"EQ safe" on page 501	"DYN (dynamic) safe" on page 503	"MIC safe" on page 504	"AUTO (automation) safe" on page 504	"MUTE safe" on page 505	"FADER safe" on page 506
Master	"EQ safe" on page 509	"DYN (dynamic) safe" on page 511	"MIC safe" on page 512	"AUTO (automation) safe" on page 512	"MUTE safe" on page 513	"FADER safe" on page 514
VCA group	N/A	N/A	N/A	"Automation safe" on page 516	"Mute (MTE) safe" on page 517	"Fader (FDR) safe" on page 517

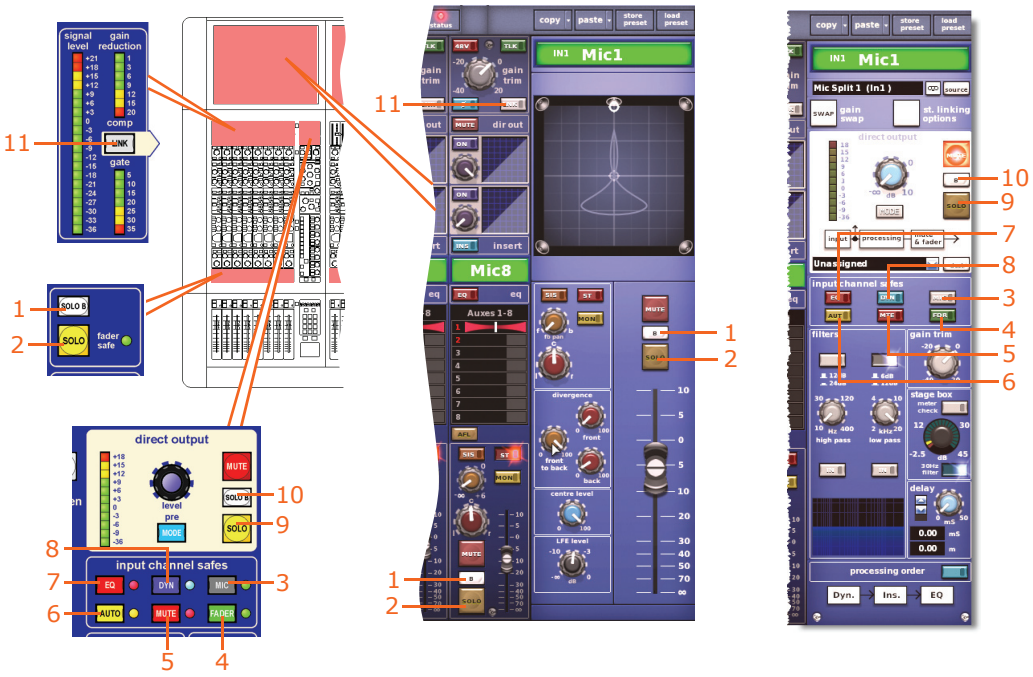
Inputs

The input safes are selected via the **input channel safes** section of the input channel strip in each input bay (control surface) or the configuration detail area of the GUI channel strip.



Input parameters not affected by the safes

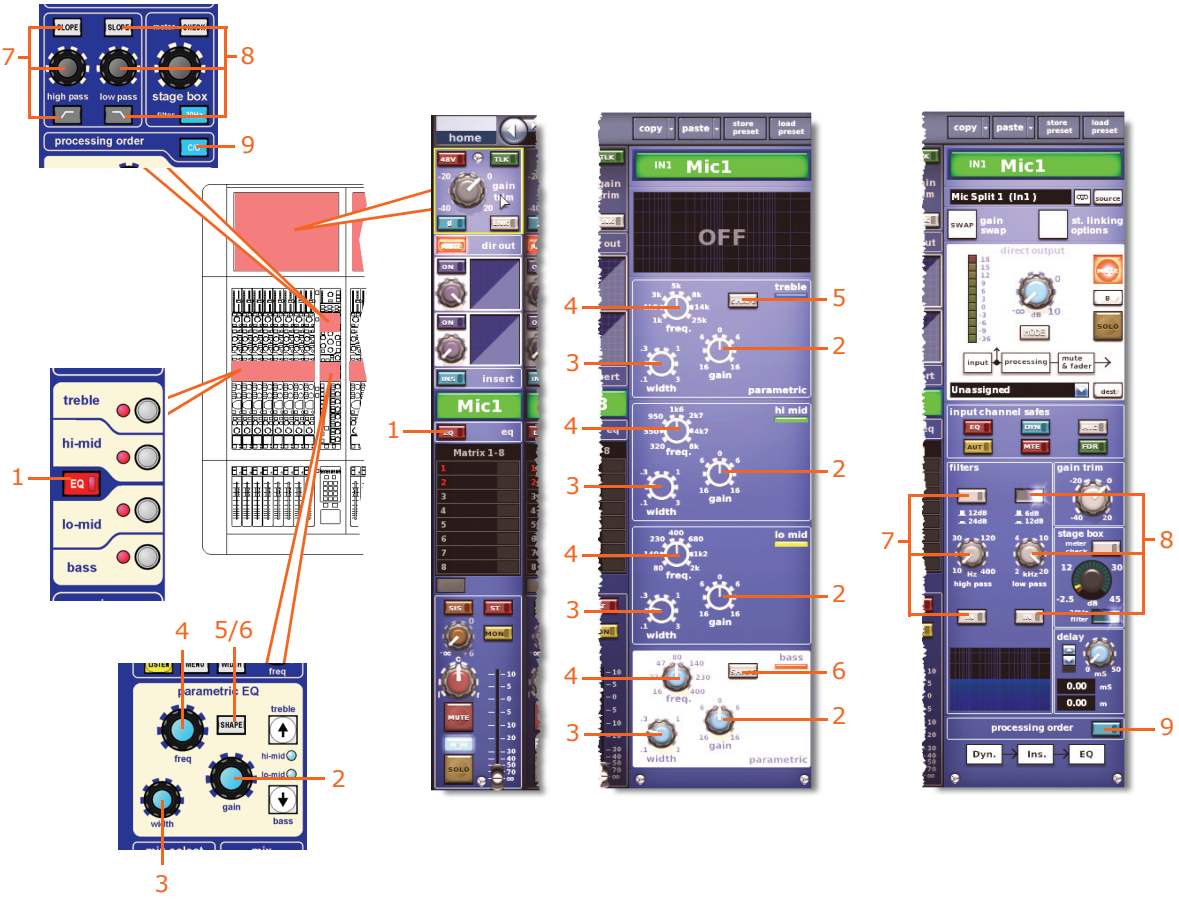
The following input channel parameters are *not* affected by any of the safes.



Item	*Control*	*Parameter*
1	**SOLO B**/[**B**] switch	Solo B on/off
2	**SOLO** switch	Solo on/off
3	**MIC** switch	Mic safe on/off
4	**FADER**/[**FDR**] switch	Fader safe on/off
5	**MUTE**/[**MTE**] switch	Mute safe on/off
6	**AUTO**/[**AUT**] switch	Automation safe on/off
7	**EQ** switch	EQ safe on/off
8	**DYN** switch	Dynamic safe on/off
9	**SOLO** switch	Direct output solo on/off
10	**SOLO B**/[**B**] switch	Direct output solo B on/off
11	**LINK** switch	Stereo linking on/off

EQ safe

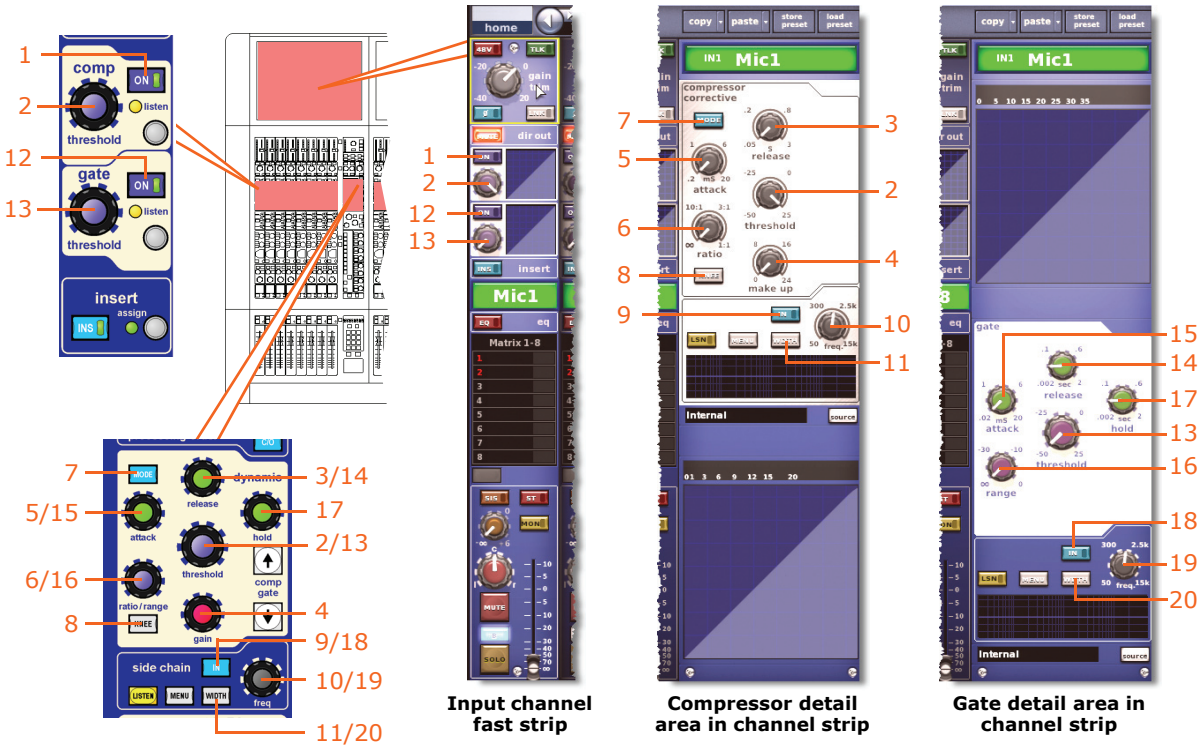
The following diagram details the parameters in the inputs affected by the **EQ** safe, and shows the EQ detail area in the GUI channel strip.



Item	*Control(s)*	*Parameter*
1	**EQ** switch	EQ on/off
2	**gain** control knob	EQ gain level
3	**width** control knob	EQ width
4	**freq** control knob	EQ frequency
5	**SHAPE** switch	Selects treble shelving mode: peaking, bright, classic or soft
6	**SHAPE** switch	Selects bass shelving mode: peaking, deep, classic or warm
7	**SLOPE** switch, **high pass** control knob, /[**IN**] switch	High pass filter
8	**SLOPE** switch, **low pass** control knob, /[**IN**] switch	Low pass filter
9	**C/O** switch	Order of processing: **Dyn.**→**Ins.**→**EQ** or **EQ**→**Ins.**→**Dyn.**

DYN (dynamic) safe

The following diagram details the parameters in the inputs protected by **DYN** safe.



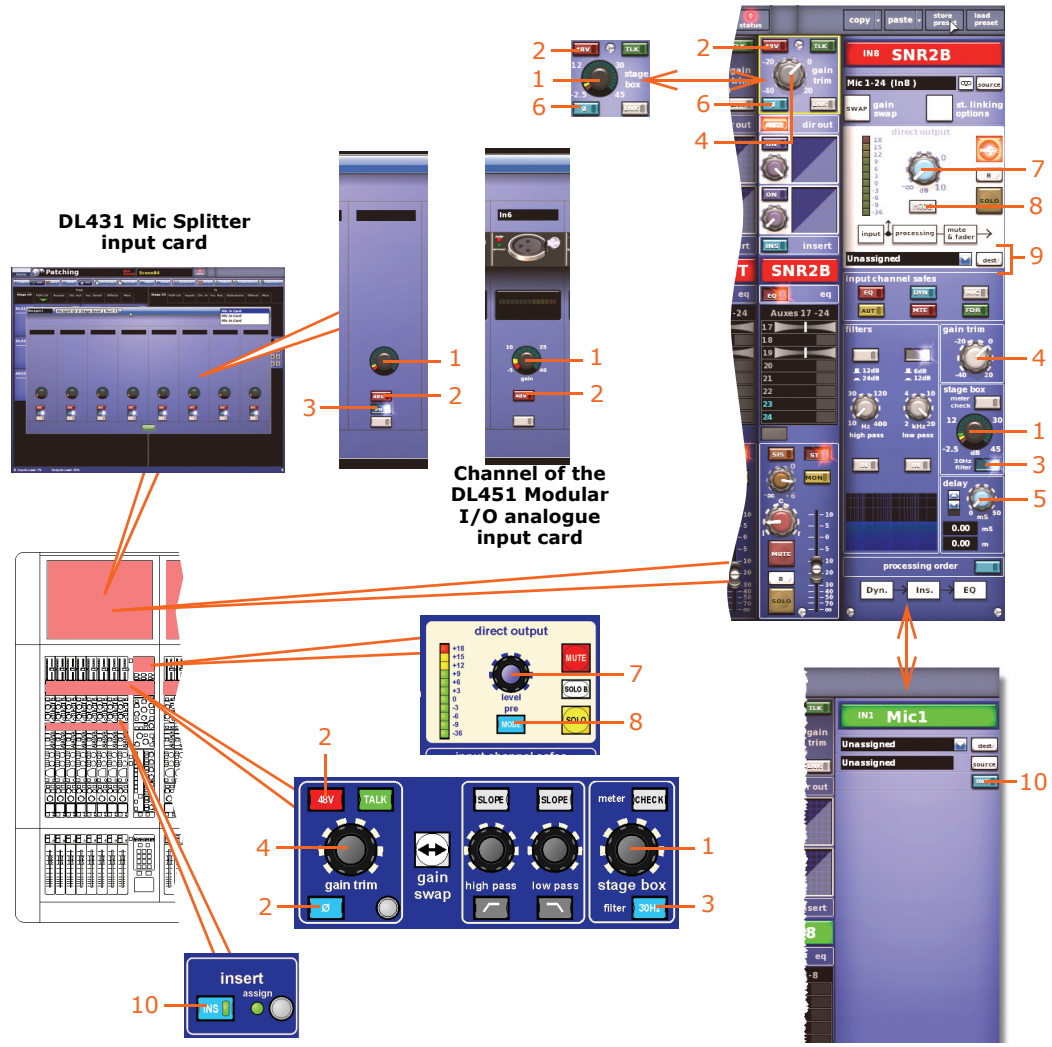
Note: *Only the corrective compressor is shown above, but this is typically the same for the other compressor modes (adaptive, creative and vintage).*

Item	*Control*	*Parameter*
1	**ON** switch	Compressor on/off
2	**threshold** control knob	Compressor threshold
3	**release** control knob	Compressor release
4	**gain**/[**make up**] control knob	Compressor make up gain
5	**attack** control knob	Compressor attack
6	**ratio/range**/[**ratio**] control knob	Compressor ratio
7	**MODE** pushbutton	Compressor mode: corrective (shown above), adaptive, creative or vintage
8	**KNEE** pushbutton	Compressor knee: hard, medium or soft
9	**IN** switch	Compressor sidechain in/out
10	**freq** control knob	Compressor sidechain frequency
11	**WIDTH** pushbutton	Compressor sidechain width: 2 Oct, 1 Oct or 0.3 Oct

Item	Control	Parameter
12	**ON** switch	Gate on/off
13	**threshold** control knob	Gate threshold
14	**release** control knob	Gate release
15	**attack** control knob	Gate attack
16	**ratio/range**/[**range**] control knob	Gate range
17	**hold** control knob	Gate hold
18	**IN** switch	Gate sidechain in/out
19	**freq** control knob	Gate sidechain frequency
20	**WIDTH** pushbutton	Gate sidechain width: 2 Oct, 1 Oct or 0.3 Oct

MIC safe

The following diagram details the parameters in the inputs protected by **MIC** safe.



Item	*Control*	*Parameter*
1	**stage box** control knob*	Gain of remote amplifier
2	**48V** switch	48V phantom gain
3	**30Hz** switch	30Hz filter
4	**gain trim** control knob*	Digital input trim
5	Delay control knob	Delay time
6	**Ø** switch	Input phase invert on/off
7	Level control knob	Direct output level
8	**MODE** switch	Direct output tap-off point: "Post-fade and mute", "Pre-mute, pre-processing" or "Pre-mute, post-processing"
9	**dest** button, text field	Direct output tap-off point
10	**INS** switch	Insert in/out

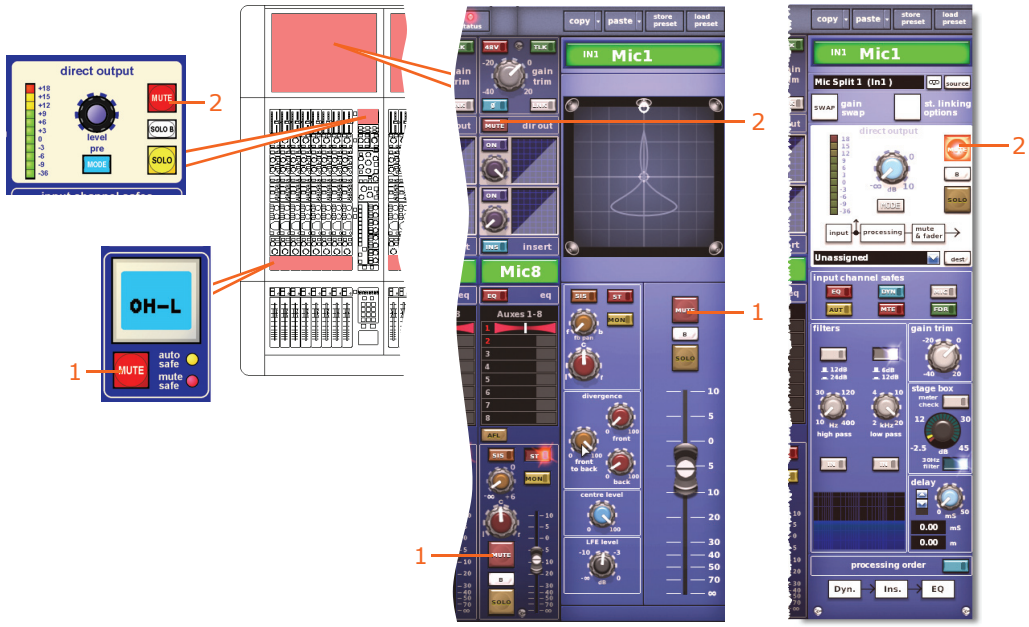
* Depends on swap status.

AUTO (automation) safe

All of the input channel parameters are protected by the **AUTO** safe — except, of course, for the ones unaffected by the safes (see "Input parameters not affected by the safes" on page 479).

MUTE safe

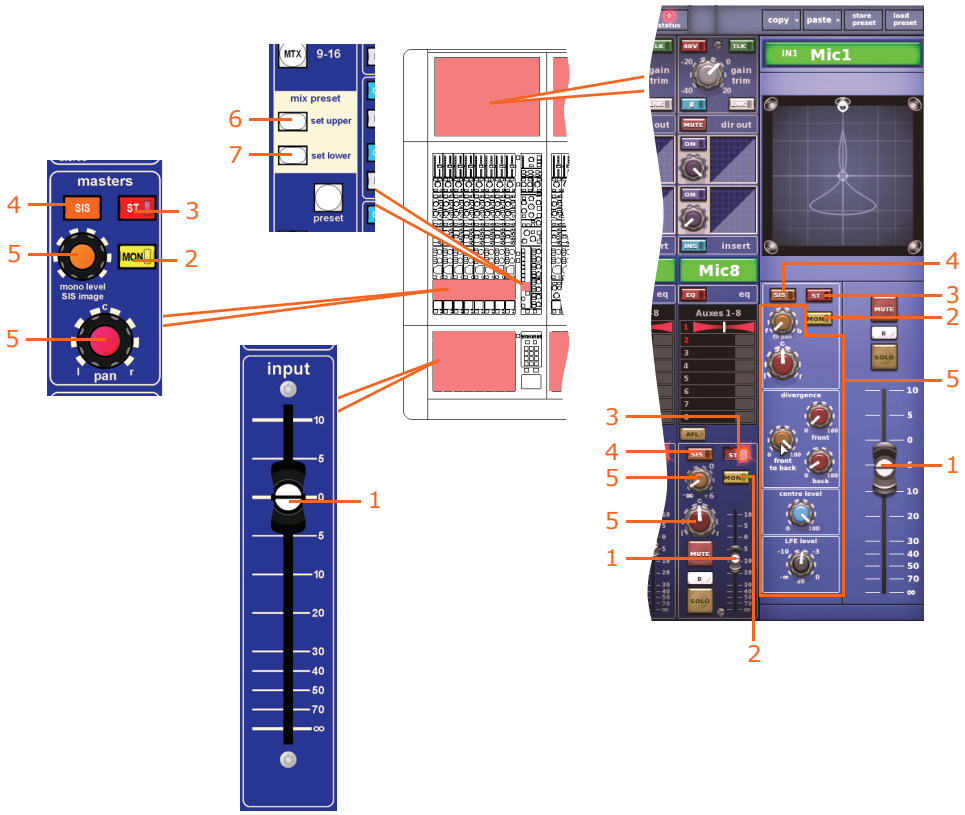
The following diagram details the parameters in the inputs protected by **MUTE** safe, and shows the master routing detail area in the GUI channel strip.



Item	*Control*	*Parameter*
1	**MUTE** switch	Mute on/off
2	**MUTE** switch	Direct output mute on/off

FADER safe

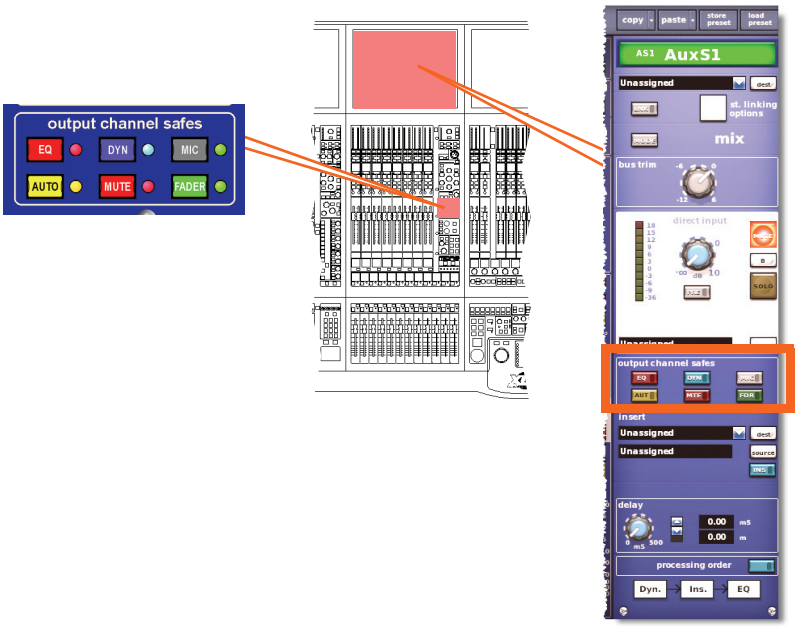
The following diagram details the parameters in the inputs protected by **FADER** safe, and shows the master routing detail area in the GUI channel strip.



Item	*Control(s)*	*Parameter*
1	Fader	Fader level
2	**MON** switch	Mono routing on/off
3	**ST** switch	Stereo routing on/off
4	**SIS** switch	Spatial imaging system on/off
5	Panning control knobs	Surround panning (includes all surround sound parameters)
6	**set upper** button	Mix preset upper select button
7	**set lower** button	Mix preset lower select button

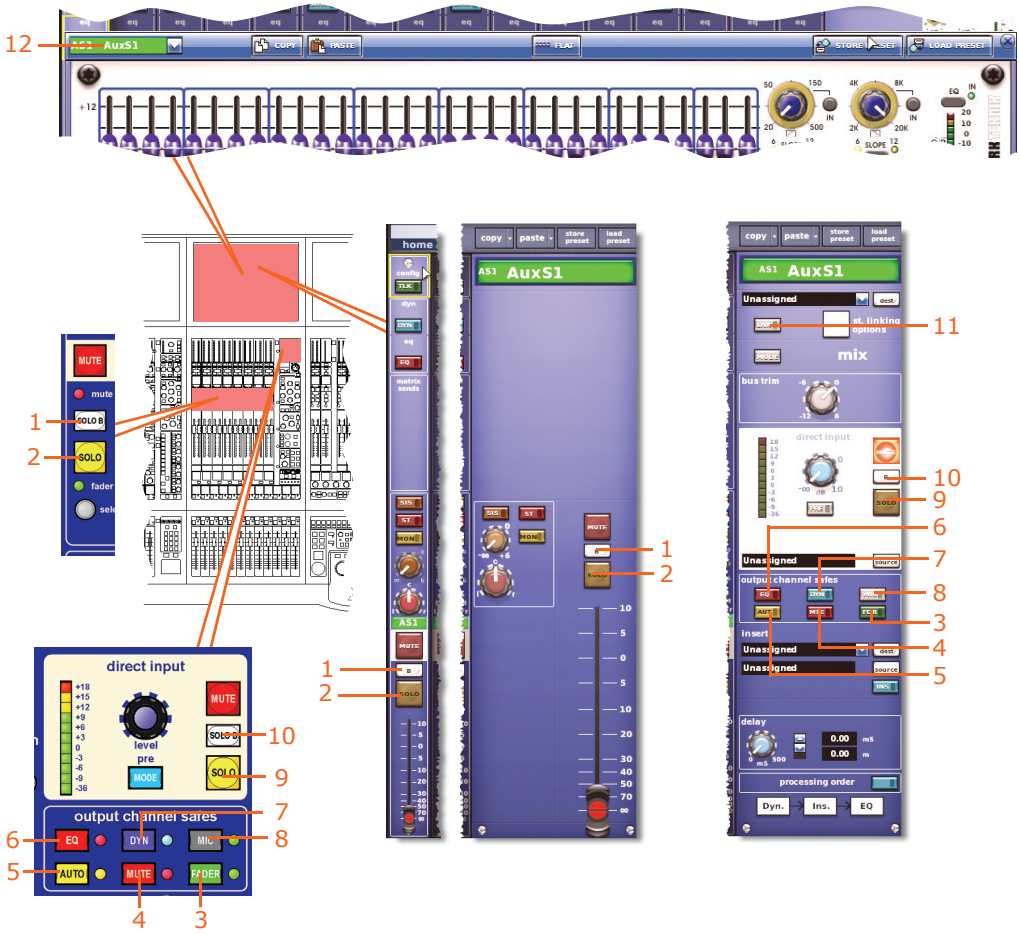
Auxes (Aux Sends)

The aux safes are selected via the **output channel safes** section of the output channel strip in the mix bay (control surface) and the configuration detail area of the GUI channel strip.



Aux parameters not affected by the safes

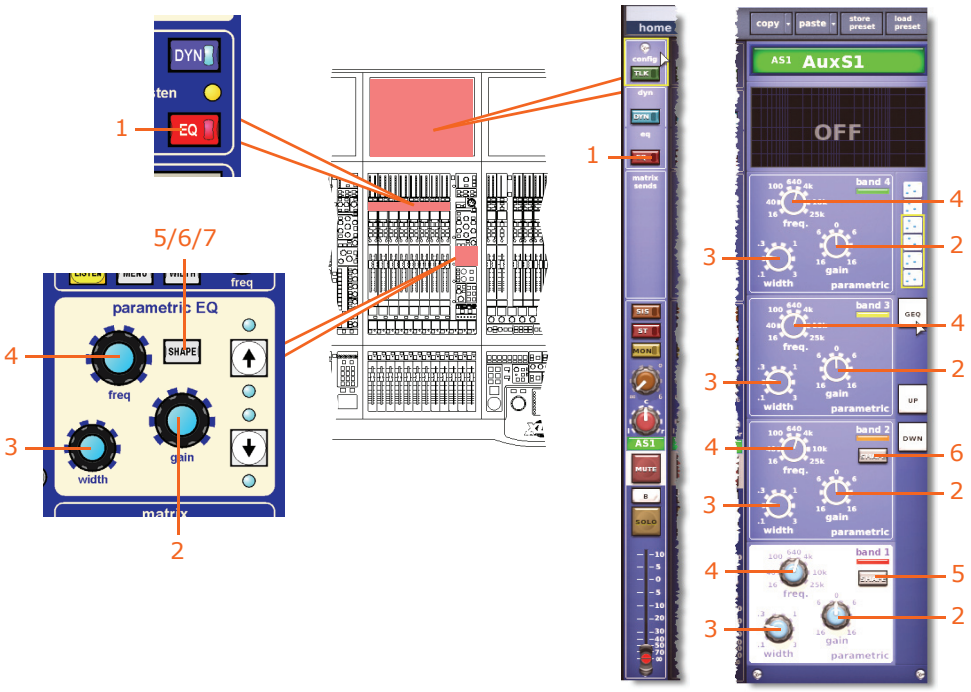
The following shows you which parameters are *not* affected by each safe.



Item	*Control*	*Parameter*
1	**SOLO B**/[**B**] switch	Solo B on/off
2	**SOLO** switch	Solo on/off
3	**FADER**/[**FDR**] switch	Fader safe on/off
4	**MUTE**/[**MTE**] switch	Mute safe on/off
5	**AUTO**/[**AUT**] switch	Automation safe on/off
6	**EQ** switch	EQ safe on/off
7	**DYN** switch	Dynamic safe on/off
8	**MIC** switch	Mic safe on/off
9	**SOLO** switch	Direct input solo on/off
10	**SOLO B**/[**B**] switch	Direct input solo B on/off
11	**LINK** switch	Stereo linking on/off
12	Field	GEQ assignment

EQ safe

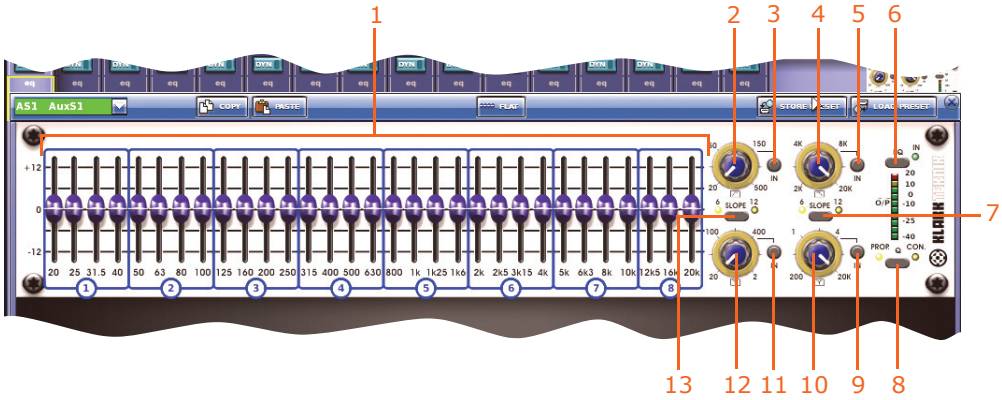
The following diagram details the parameters in the auxes protected by the **EQ** safe, and shows the EQ detail area in the GUI channel strip and the GEQ window on the GUI screen.



Item	*Control*	*Parameter*
1	**EQ** switch	EQ on/off
2	**gain** control knob	EQ gain level
3	**width** control knob	EQ width
4	**freq** control knob	EQ frequency
5	**SHAPE** switch	Band 1 shelving mode: bell, warm, high pass 6dB or high pass 12dB
6	**SHAPE** switch	Band 2 shelving mode: bell or high pass 24dB
7*	**SHAPE** switch	Band 6 shelving mode: bell, soft, low pass 6dB or low pass 12dB

* Not shown in diagram.

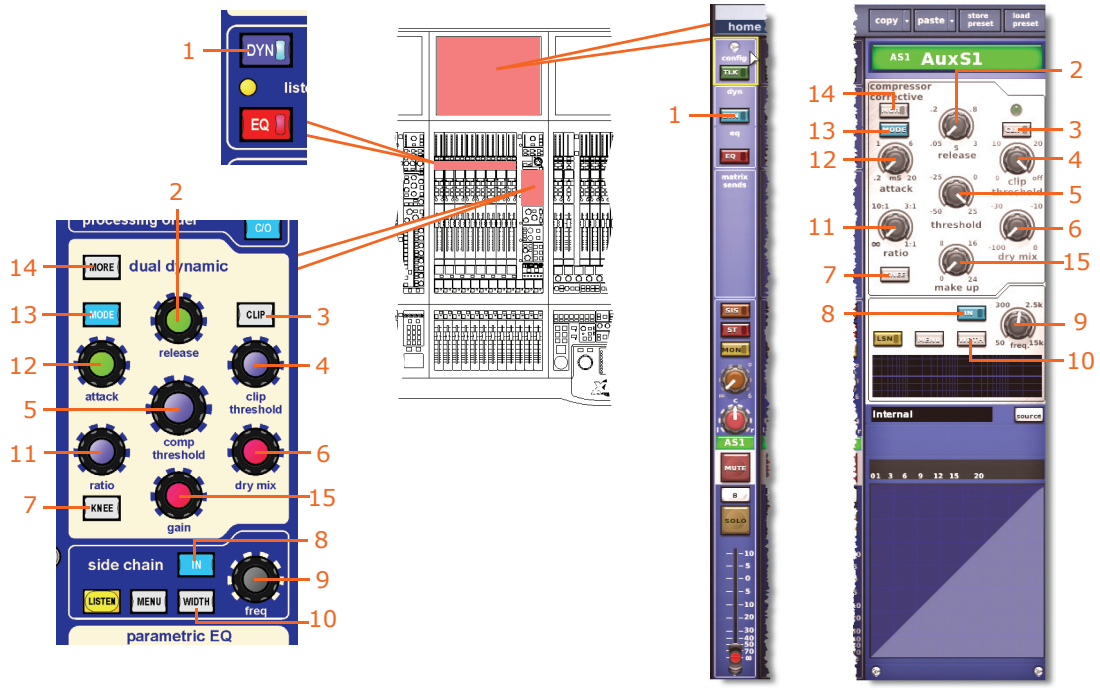
Note: *Although bands 5 and 6 are not shown above, the items in the table also apply. Both bands have items 2, 3 and 4, and band 6 also has item 7.*



Item	*Control*	*Parameter*
1	31 faders	Fader positions
2	High pass filter control knob	High pass filter cut off frequency
3	**IN** switch	High pass filter in/out
4	Low pass filter control knob	Low pass filter cut off frequency
5	**IN** switch	Low pass filter in/out
6	**EQ** switch	EQ in/out
7	**SLOPE** switch	Selects low pass filter as 6dB or 12dB
8	**Q** switch	Selects Q mode as proportional (**PROP.**) or constant (**CON.**)
9	**IN** switch	Switches 200Hz - 20kHz notch filter in/out
10	Notch filter control knob	200Hz - 20kHz notch filter frequency
11	**IN** switch	Switches 20Hz - 2kHz notch filter in/out
12	Notch filter control knob	20Hz - 2kHz notch filter frequency
13	**SLOPE** switch	Selects high pass filter as 6dB or 12dB

DYN (dynamic) safe

The following diagram details the parameters in the auxes protected by the **DYN** safe, and shows the compressor detail area in the GUI channel strip. Only the corrective compressor is shown, but this is typically the same for the other compressor modes (adaptive, creative, vintage and shimmer).

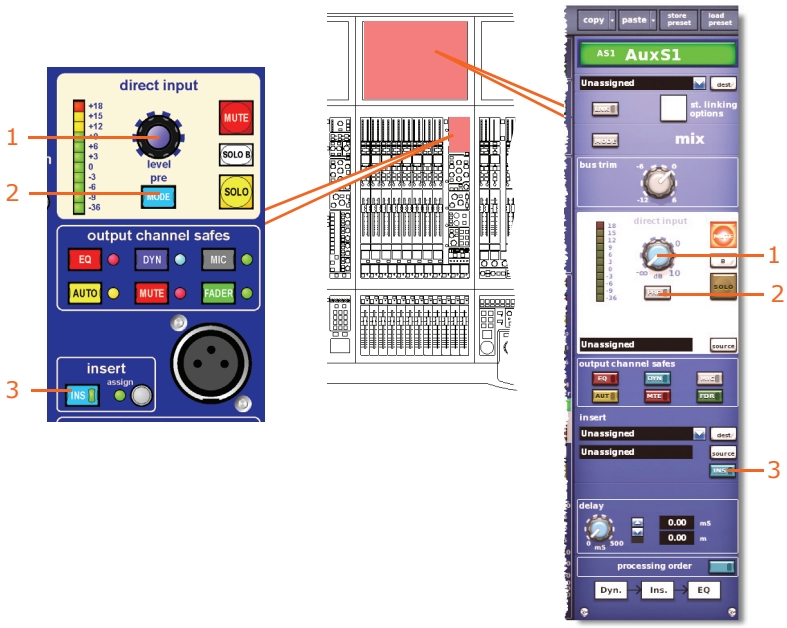


Item	*Control*	*Parameter*
1	**DYN** switch	Compressor on/off
2	**release** control knob	Compressor release
3	**CLIP** switch	Compressor clip on/off
4	**clip threshold** control knob	Compressor clip threshold
5	**comp threshold**/ [**threshold**] control knob	Compressor threshold
6	**dry mix** control knob	Dry mix level
7	**KNEE** pushbutton	Compressor knee selector: hard, medium and soft
8	**IN** switch	Compressor sidechain in/out
9	**freq** control knob	Compressor sidechain frequency
10	**WIDTH** pushbutton	Compressor sidechain width (unlabelled): 2 Oct, 1 Oct or 0.3 Oct
11	**ratio** control knob	Compressor ratio
12	**attack** control knob	Compressor attack
13	**MODE** pushbutton	Compressor mode — corrective, adaptive, creative, vintage or shimmer

Item	Control	Parameter
14	**MORE**/[**MOR**] pushbutton	Increases the colouration produced by the compressor
15	**gain**/[**make up**] control knob	Compressor gain

MIC safe

The following diagram details the parameters in the auxes protected by **MIC** safe, and shows the configuration detail area in the GUI channel strip.



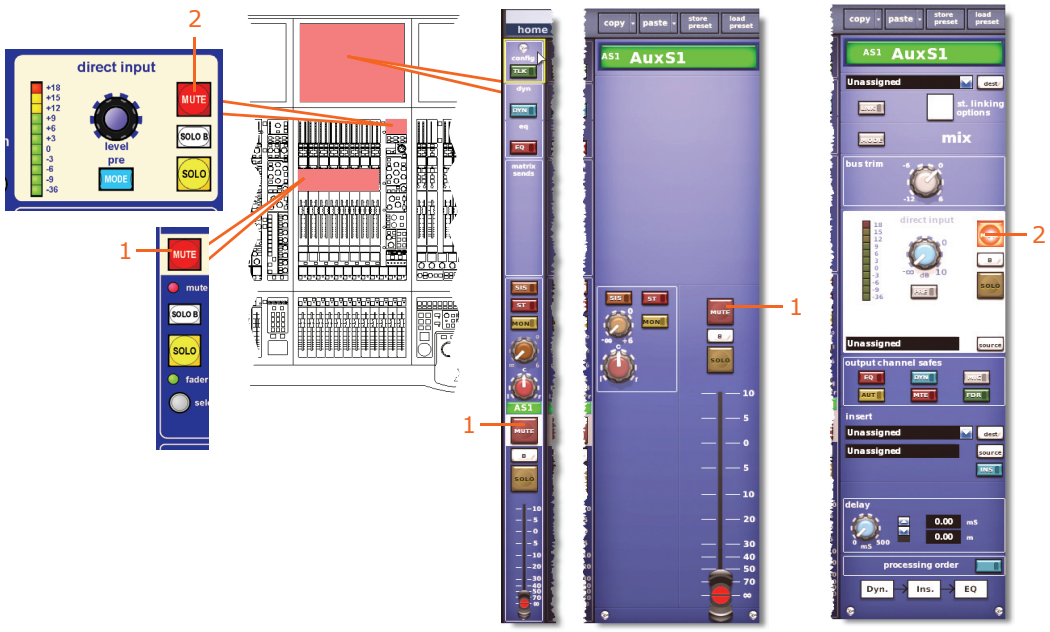
Item	Control	Parameter
1	**level** control knob	Direct input level
2	**MODE**/[**PRE**] switch	Direct input pre- in/out
3	**INS** switch	Insert in/out

AUTO (automation) safe

All of the aux channel parameters are protected by the **AUTO** (automation) safe — except, of course, for the ones unaffected by the safes (see "Aux parameters not affected by the safes" on page 487).

MUTE safe

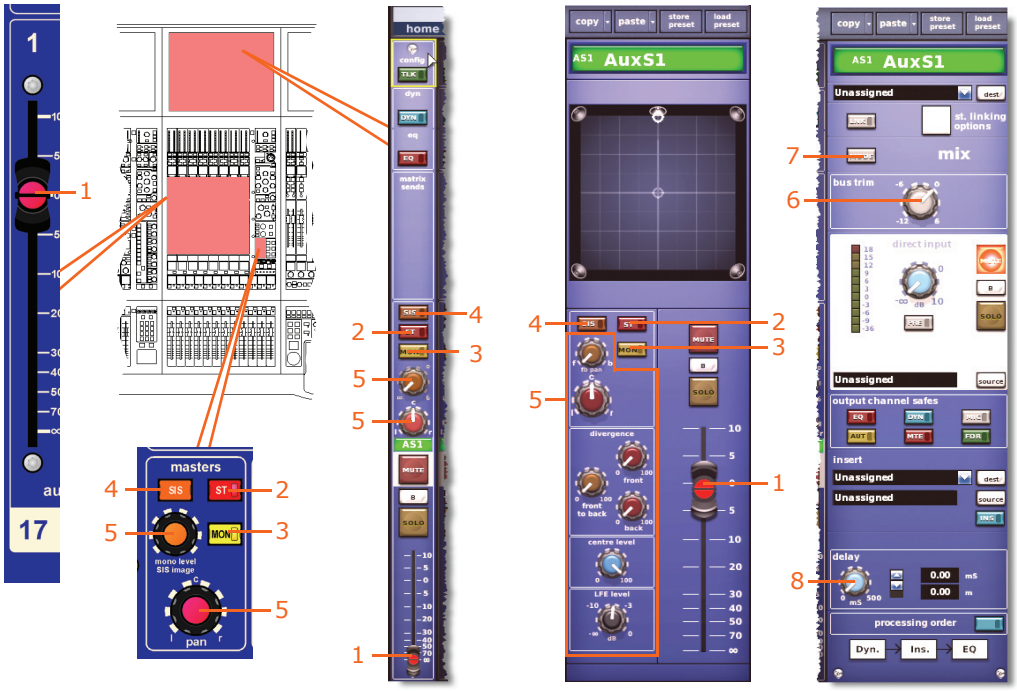
The following diagram details the parameters of the auxes protected by **MUTE** safe, and shows the master routing detail area in the GUI channel strip.



Item	*Control*	*Parameter*
1	**MUTE** switch	Mute on/off
2	**MUTE** switch	Direct input mute on/off

FADER safe

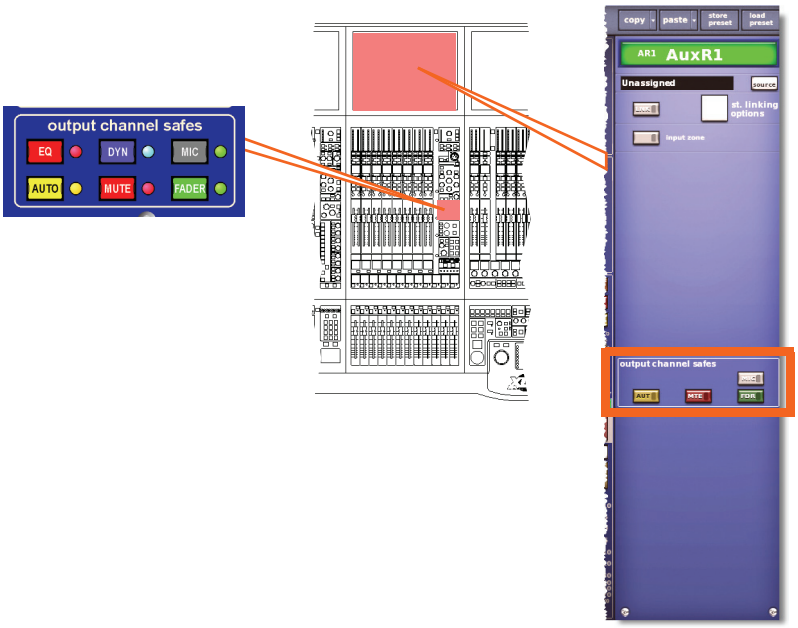
The following diagram details the parameters of the auxes protected by **FADER** safe, and shows the configuration detail area and master routing detail area in the GUI channel strip.



Item	*Control*	*Parameter*
1	Fader	Fader level
2	**ST** switch	Stereo routing
3	**MON** switch	Mono routing
4	**SIS** switch	Spatial imaging system in/out
5	Panning control knobs	Surround sound panning (includes all surround parameters)
6	**bus trim** control knob	Bus trim level
7	**MODE** switch	Bus mode
8	**delay** control knob	Delay time

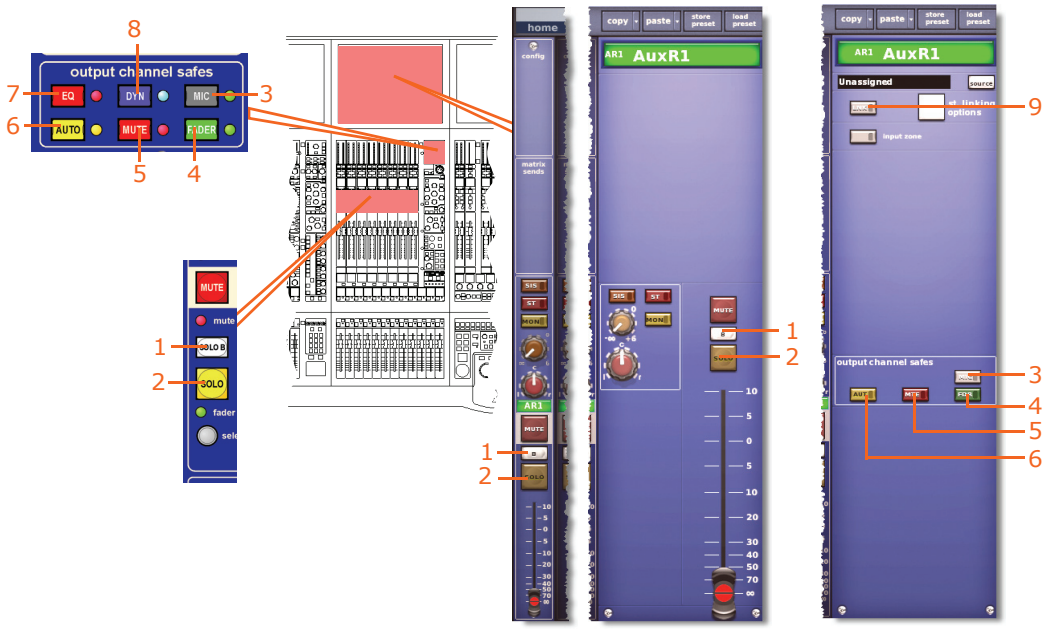
Returns (Aux Returns)

The return safes are selected via the **output channel safes** section of the output channel strip in the mix bay (control surface) and the configuration detail area of the GUI channel strip.



Return parameters not affected by the safes

The following shows you which parameters are *not* affected by each safe.



Item	*Control*	*Parameter*
1	**SOLO B**/[**B**] switch	Solo B on/off
2	**SOLO** switch	Solo on/off
3	**MIC** switch	Mic safe on/off
4	**FADER**/[**FDR**] switch	Fader safe on/off
5	**MUTE**/[**MTE**] switch	Mute safe on/off
6	**AUTO**/[**AUT**] switch	Automation safe on/off
7	**EQ** switch	EQ safe on/off
8	**DYN** switch	Dynamic safe on/off
9	**LINK** switch	Stereo linking on/off

EQ safe

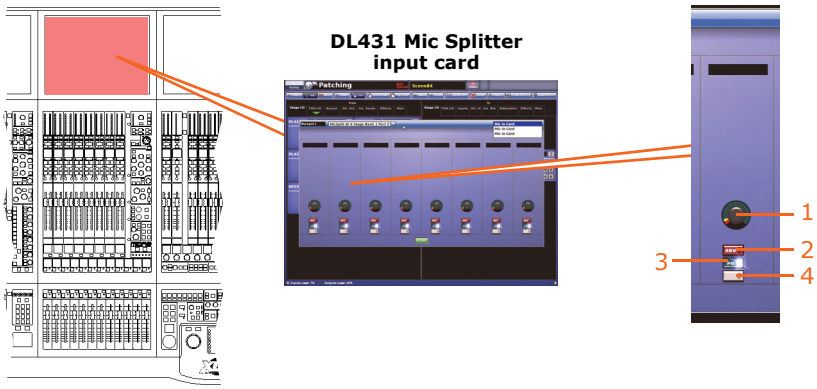
Not applicable.

DYN (dynamic) safe

Not applicable.

MIC safe

The following diagram details the parameters in the returns protected by **MIC** safe, which are accessible via the DL431 Mic Splitter configuration (see "Configuring the devices" on page 80).



Item	*Control*	*Parameter*
1	Stage box control knob	Mic gain
2	**48V** switch	48V phantom gain in/out
3	**Flt** switch	30Hz filter[1] in/out
4	Input zone switch	Input zone in/out

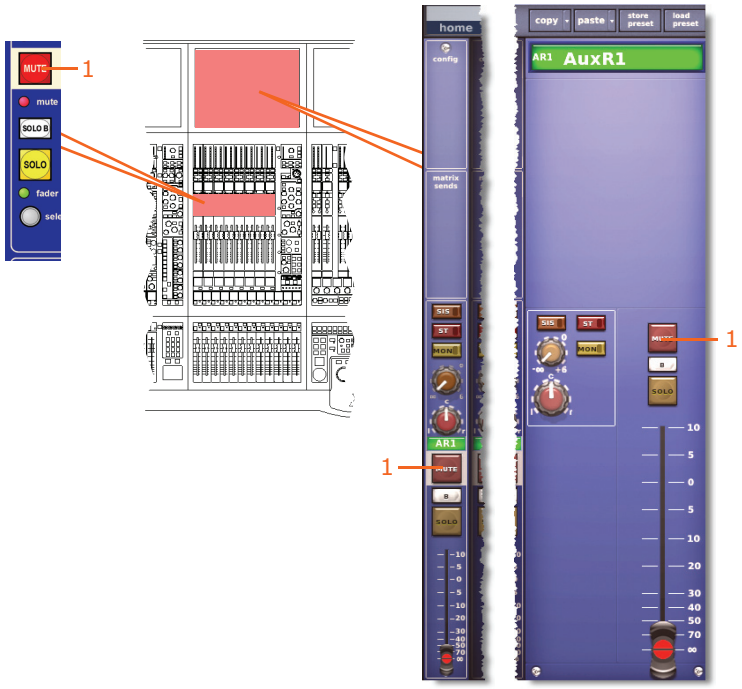
1. Applies to tape and primary inputs.

AUTO (automation) safe

All of the return channel parameters are protected by **AUTO** (automation) safe — except, of course, for the ones unaffected by the safes (see "Return parameters not affected by the safes" on page 495).

MUTE safe

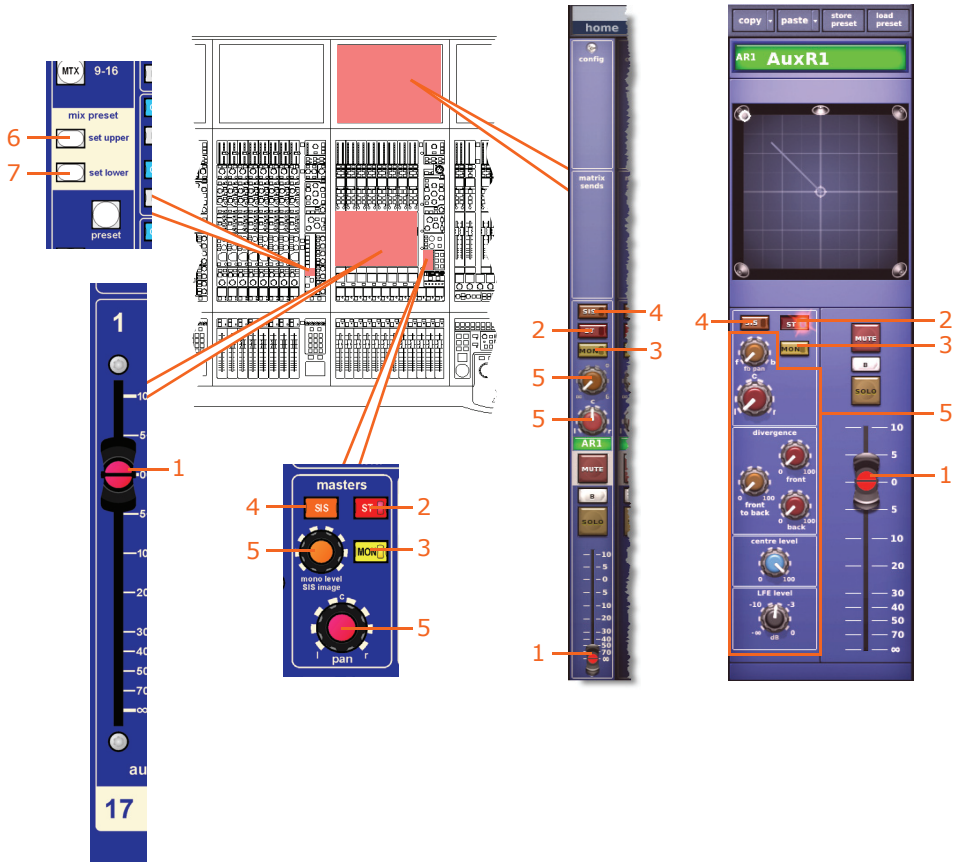
The following diagram details the parameters of the returns protected by **MUTE** safe, and shows the master routing detail area in the GUI channel strip.



Item	*Control*	*Parameter*
1	**MUTE** switch	Mute on/off

FADER safe

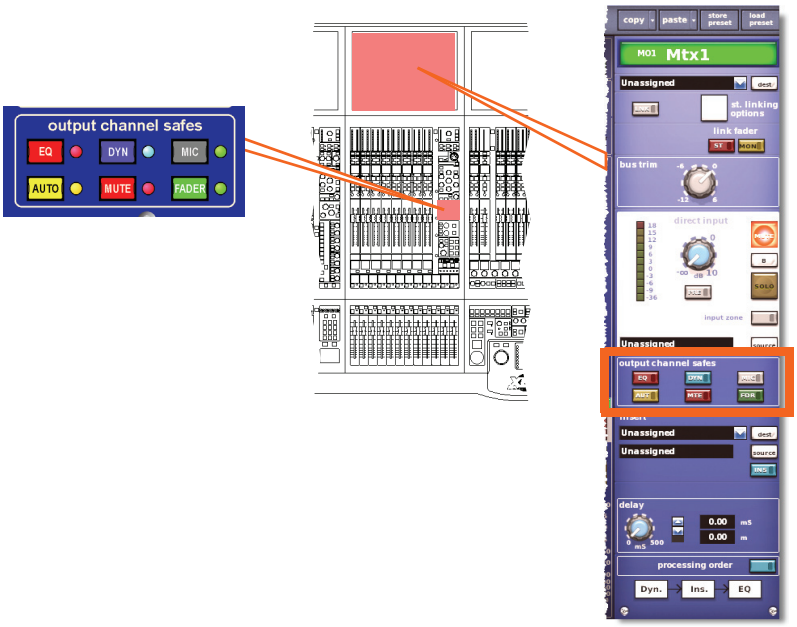
The following diagram details the parameters of the returns protected by **FADER** safe, and shows the master routing detail area in the GUI channel strip.



Item	*Control*	*Parameter*
1	Fader	Fader level
2	**ST** switch	Stereo routing
3	**MON** switch	Mono routing
4	**SIS** switch	Spatial imaging system in/out
5	Panning control knobs	Surround panning (includes all surround sound parameters)
6	**set upper** button	Mix preset upper select button
7	**set lower** button	Mix preset lower select button

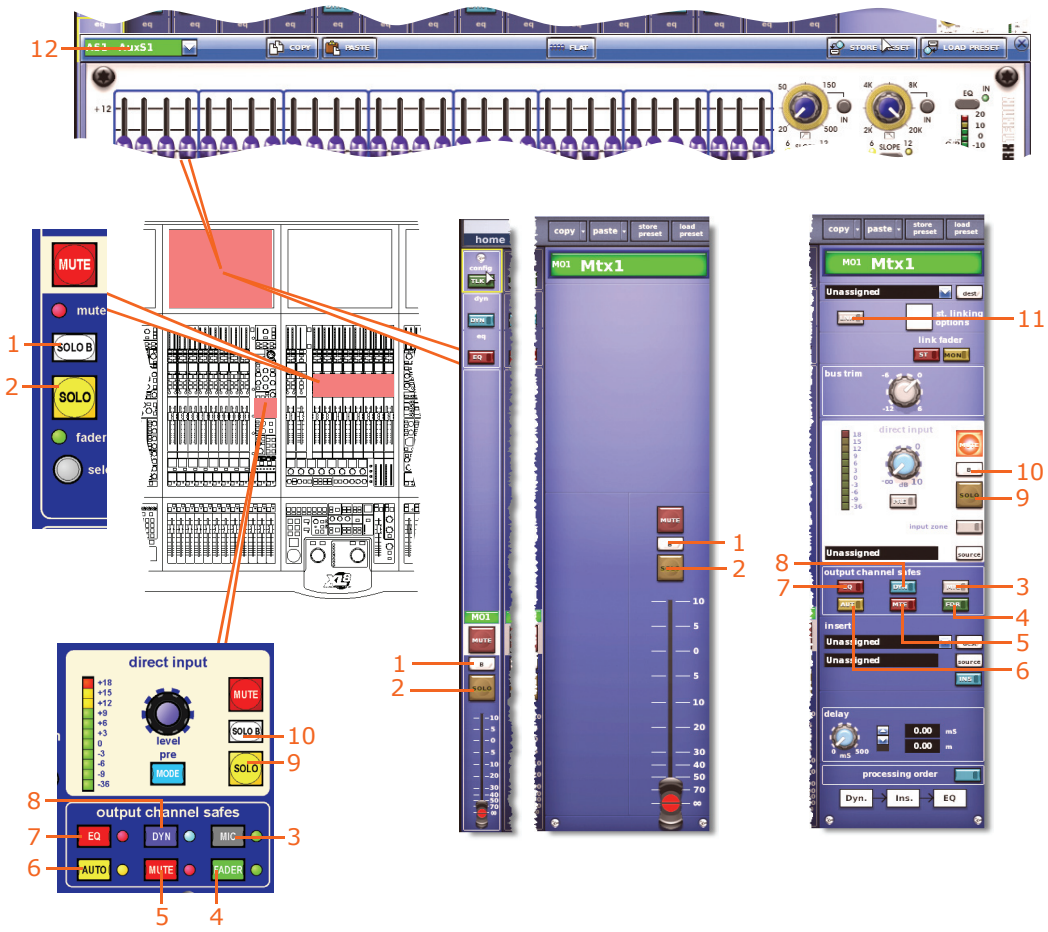
Matrices

The matrix safes are selected via the **output channel safes** section of the output channel strip in the mix bay (control surface) and the configuration detail area of the GUI channel strip.



Matrix parameters not affected by the safes

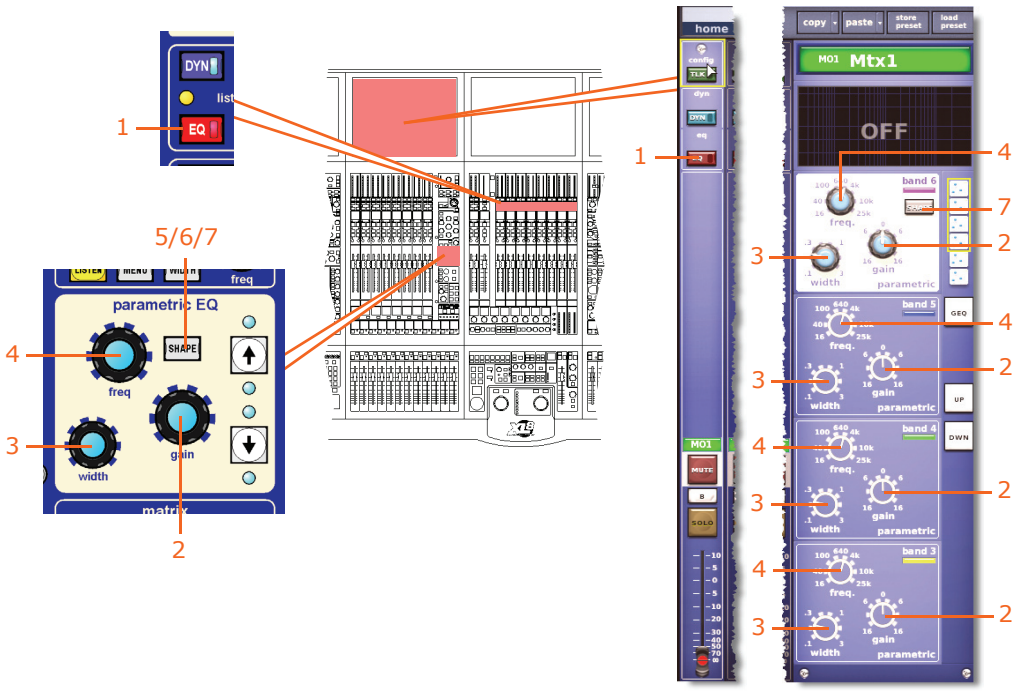
The following shows you which parameters are *not* affected by each safe.



Item	*Control*	*Parameter*
1	**SOLO B**/[**B**] switch	Solo B on/off
2	**SOLO** switch	Solo on/off
3	**MIC** switch	Mic safe on/off
4	**FADER**/[**FDR**] switch	Fader safe on/off
5	**MUTE**/[**MTE**] switch	Mute safe on/off
6	**AUTO**/[**AUT**] switch	Automation safe on/off
7	**EQ** switch	EQ safe on/off
8	**DYN** switch	Dynamic safe on/off
9	**SOLO** switch	Direct input solo on/off
10	**SOLO B**/[**B**] switch	Direct input solo B on/off
11	**LINK** switch	Stereo linking on/off
12	Field	GEQ assignment

EQ safe

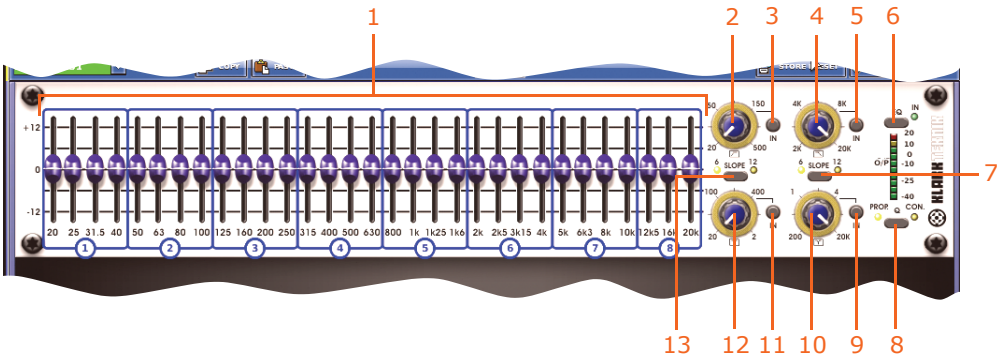
The following diagram details the parameters in the matrices protected by the **EQ** safe, and shows the EQ detail area in the GUI channel strip and the GEQ window on the GUI screen.



Item	*Control*	*Parameter*
1	**EQ** switch	EQ on/off
2	**gain** control knob	EQ gain level
3	**width** control knob	EQ width
4	**freq** control knob	EQ frequency
5*	**SHAPE** switch	Selects band 1 shelving modes: bell, warm, high pass 6dB or high pass 12dB
6*	**SHAPE** switch	Selects band 2 shelving modes: bell or high pass 24dB
7	**SHAPE** switch	Selects band 6 shelving modes: bell, soft, low pass 6dB or low pass 12dB

* Not shown in diagram.

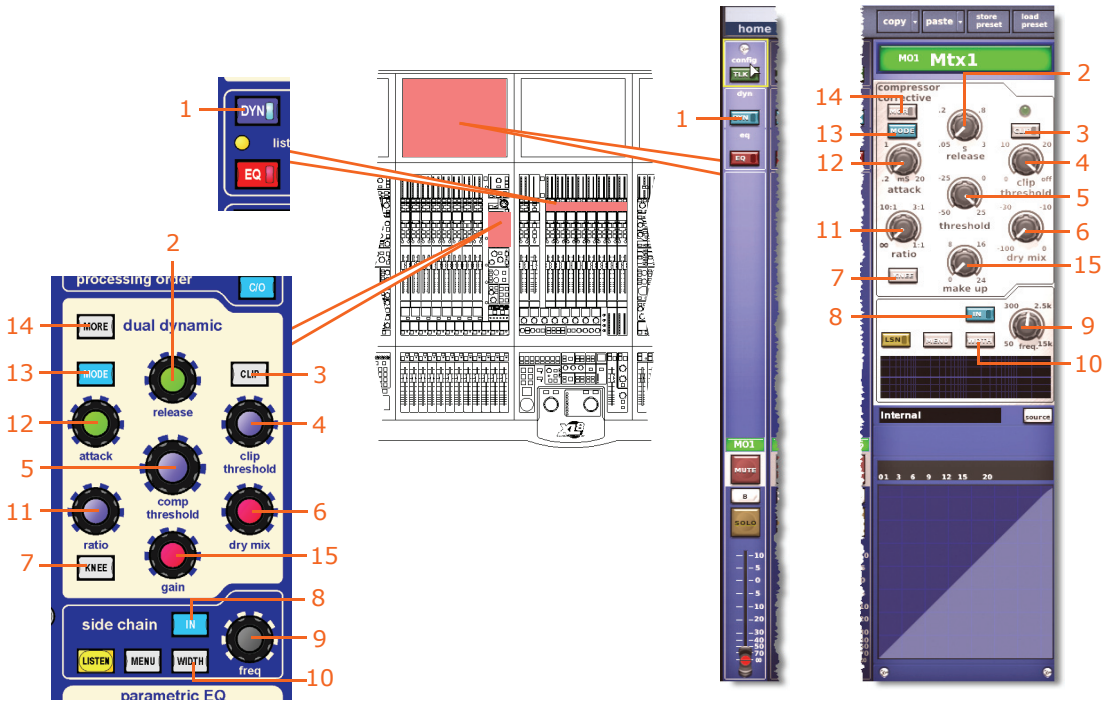
Note: *Although bands 1 and 2 are not shown above, the items in the table also apply. Both bands have items 2, 3 and 4. Additionally, band 1 also has item 7, and band 2 also has item 6.*



Item	*Control*	*Parameter*
1	31 faders	Fader positions
2	High pass filter control knob	High pass filter cut off frequency
3	**IN** switch	High pass filter in/out
4	Low pass filter control knob	Low pass filter cut off frequency
5	**IN** switch	Low pass filter in/out
6	**EQ** switch	EQ in/out
7	**SLOPE** switch	Selects low pass filter as 6dB or 12dB
8	**Q** switch	Selects Q mode as proportional (**PROP.**) or constant (**CON.**)
9	**IN** switch	Switches 200Hz - 20kHz notch filter in/out
10	Notch filter control knob	200Hz - 20kHz notch filter frequency
11	**IN** switch	Switches 20Hz - 2kHz notch filter in/out
12	Notch filter control knob	20Hz - 2kHz notch filter frequency
13	**SLOPE** switch	Selects high pass filter as 6dB or 12dB

DYN (dynamic) safe

The following diagram details the parameters in the matrices protected by the **DYN** safe, and shows the compressor detail area in the GUI channel strip. Only the corrective compressor is shown, but this is typically the same for the other compressor modes (adaptive, creative, vintage and shimmer).

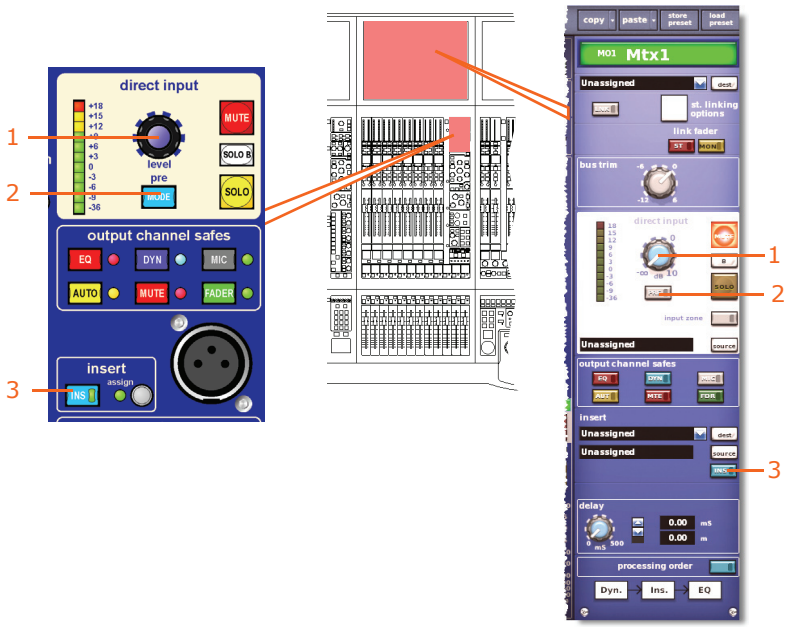


Item	*Control*	*Parameter*
1	**DYN** switch	Compressor on/off
2	**release** control knob	Compressor release
3	**CLIP** switch	Compressor clip on/off
4	**clip threshold** control knob	Compressor clip
5	**comp threshold**/ [**threshold**] control knob	Compressor threshold
6	**dry mix** control knob	Compressor dry mix
7	**KNEE** pushbutton	Compressor knee (unlabelled) selector: hard, medium and soft
8	**IN** switch	Compressor sidechain in/out
9	**freq.** control knob	Compressor sidechain frequency
10	**WIDTH** pushbutton	Compressor sidechain width selector: 2 Oct, 1 Oct and 0.3 Oct
11	**ratio** control knob	Compressor ratio
12	**attack** control knob	Compressor attack
13	**MODE** pushbutton	Compressor mode selector — corrective, adaptive, creative, vintage or shimmer

Item	Control	Parameter
14	**MORE**/[**MOR**] pushbutton	Increases the colouration produced by the compressor
15	**gain**/[**make up**] control knob	Compressor gain

MIC safe

The following diagram details the parameters in the matrices protected by **MIC** safe, and shows the configuration detail area in the GUI channel strip.



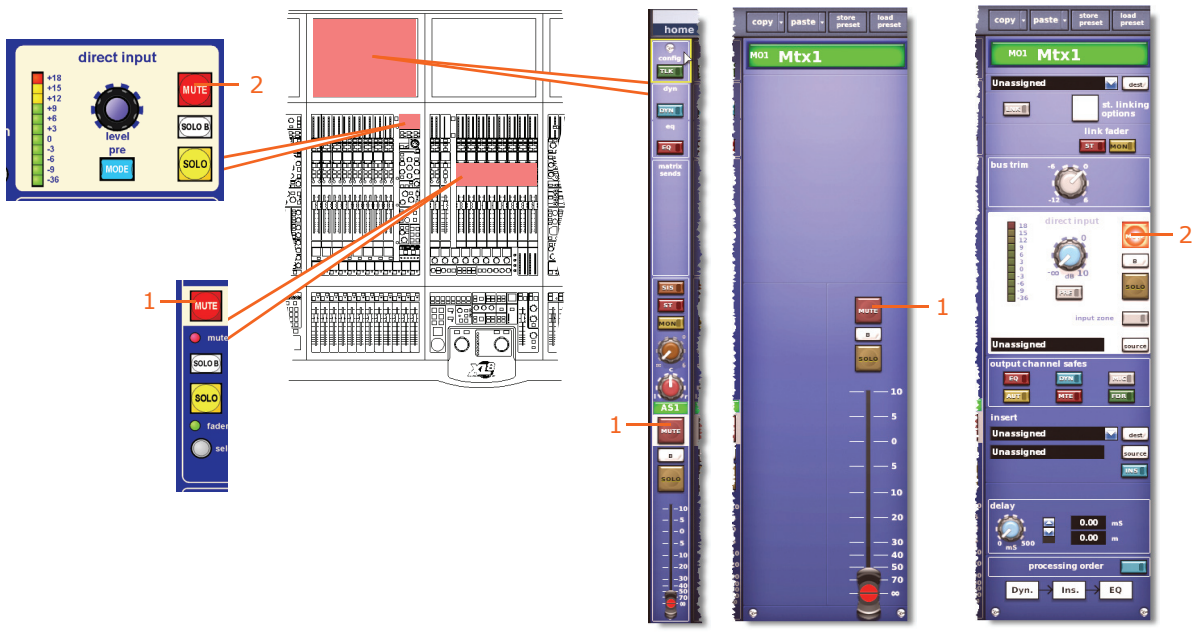
Item	Control	Parameter
1	**level** control knob	Direct input level
2	**MODE**/[**PRE**] switch	Direct input pre- in/out
3	**INS** switch	Insert in/out

AUTO (automation) safe

All of the matrix channel parameters are protected by **AUTO** (automation) safe — except, of course, for the ones unaffected by the safes (see “Matrix parameters not affected by the safes” on page 500).

MUTE safe

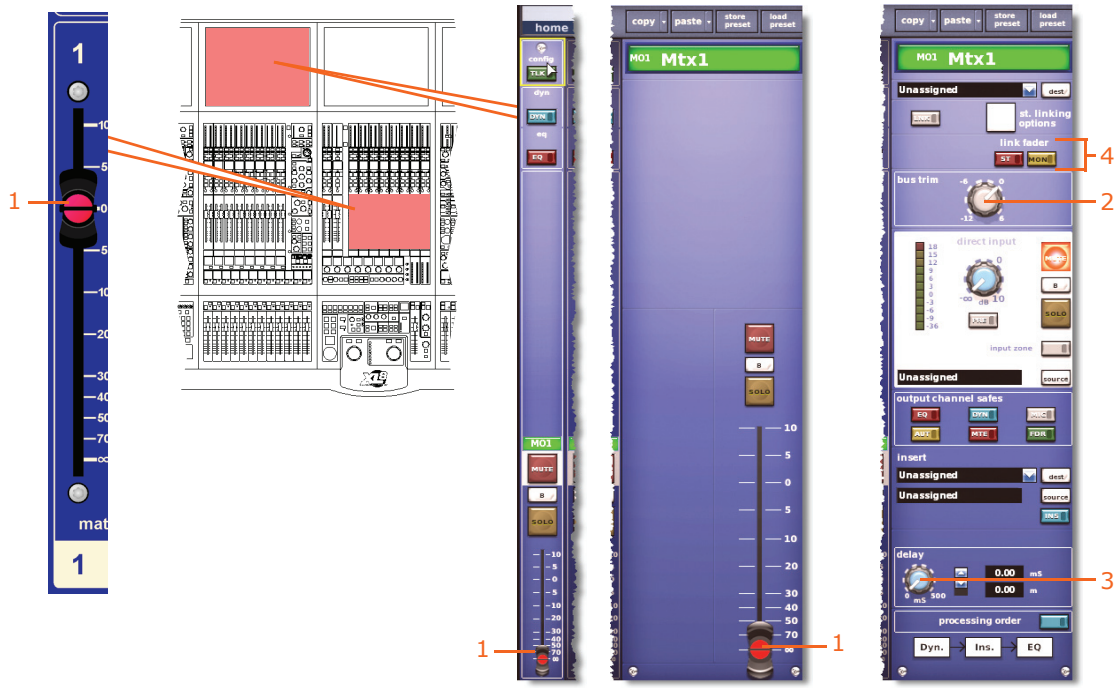
The following diagram details the parameters of the matrices protected by **MUTE** safe, and shows the master routing detail area in the GUI channel strip.



Item	*Control*	*Parameter*
1	**MUTE** switch	Mute on/off
2	**MUTE** switch	Direct input mute on/off

FADER safe

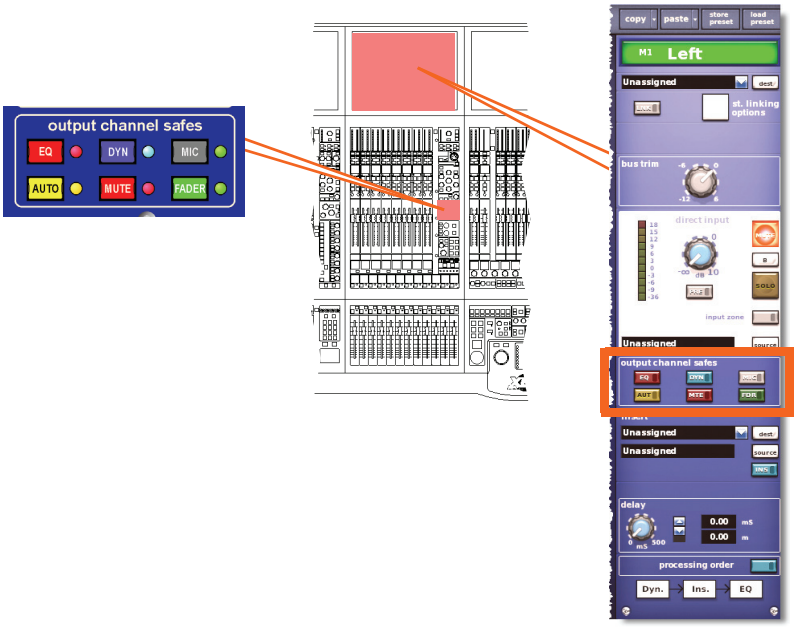
The following diagram details the parameters of the matrices protected by **FADER** safe, and shows the master routing detail area in the GUI channel strip.



Item	*Control(s)*	*Parameter*
1	Fader	Fader level
2	**bus trim** control knob	Bus trim level
3	**delay** control knob	Delay time
4	**ST** switch, **MON** switch	Linking to stereo/mono master fader switch

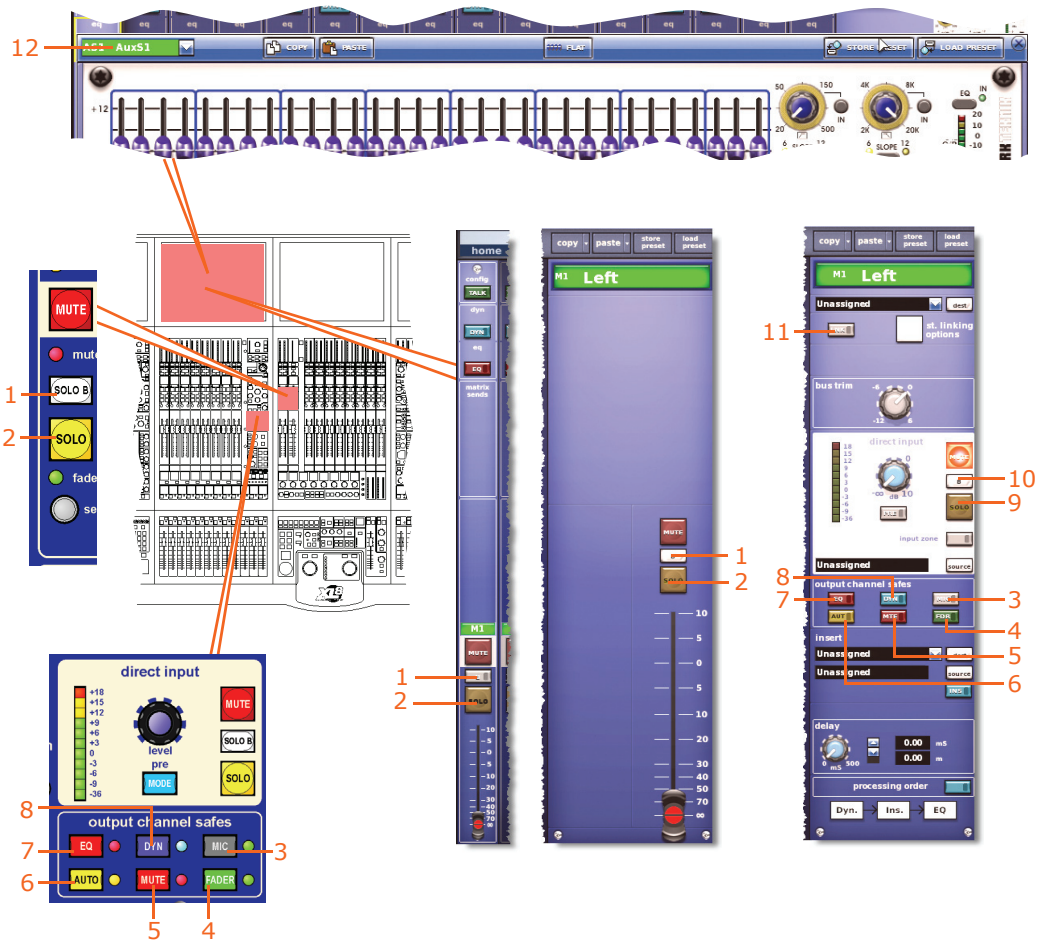
Masters

The master safes are selected via the **output channel safes** section of the output channel strip in the mix bay (control surface) and the configuration detail area of the GUI channel strip.



Master parameters not affected by the safes

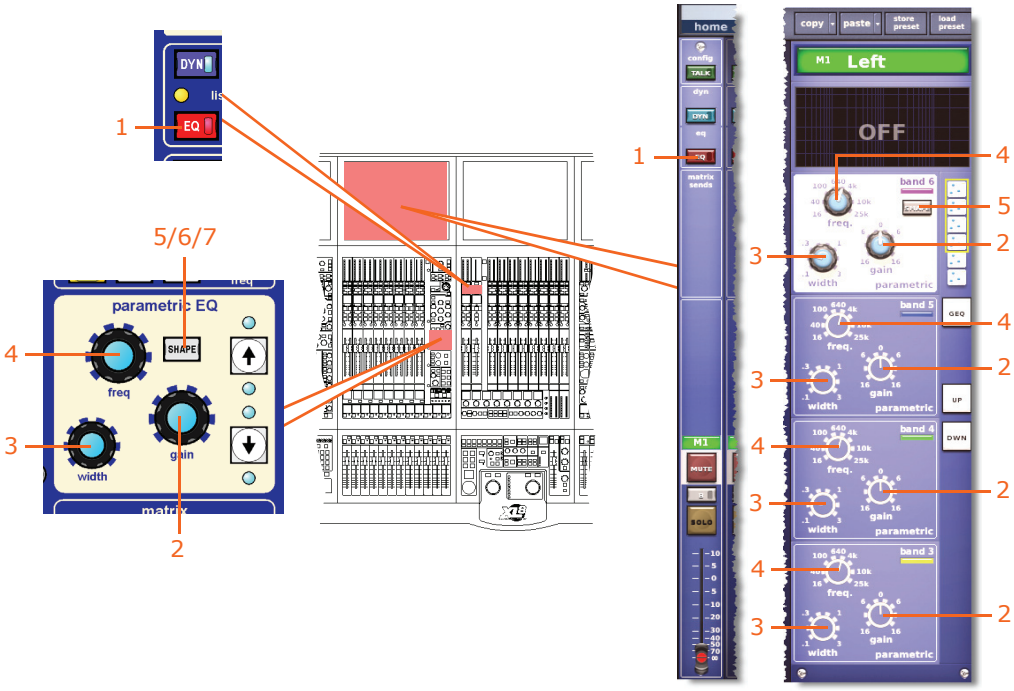
The following shows you which parameters are *not* affected by each safe.



Item	*Control*	*Parameter*
1	**SOLO B**/[**B**] switch	Solo B on/off
2	**SOLO** switch	Solo on/off
3	**MIC** switch	Mic safe on/off
4	**FADER**/[**FDR**] switch	Fader safe on/off
5	**MUTE**/[**MTE**] switch	Mute safe on/off
6	**AUTO**/[**AUT**] switch	Automation safe on/off
7	**EQ** switch	EQ safe on/off
8	**DYN** switch	Dynamic safe on/off
9	**SOLO** switch	Direct input solo on/off
10	**SOLO B**/[**B**] switch	Direct input solo B on/off
11	**LINK** switch	Stereo linking
12	Field	GEQ assignment

EQ safe

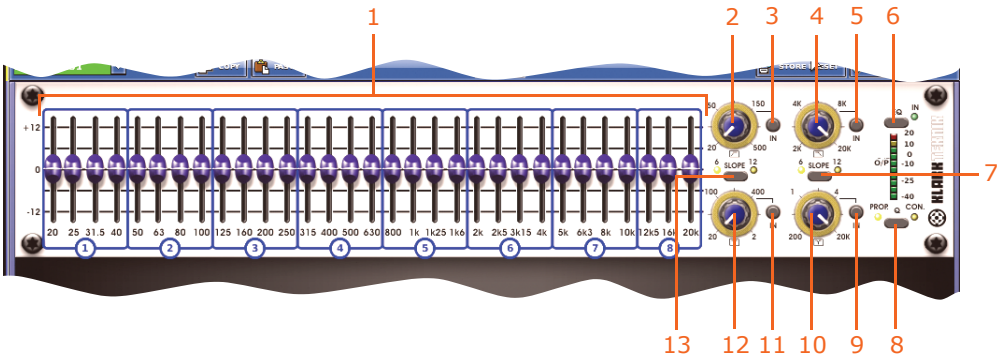
The following diagram details the EQ parameters protected by the **EQ** safe, and shows the EQ detail area in the GUI channel strip and the GEQ window on the GUI screen.



Item	*Control*	*Parameter*
1	**EQ** switch	EQ on/off
2	**gain** control knob	EQ gain level
3	**width** control knob	EQ width
4	**freq** control knob	EQ frequency
5	**SHAPE** switch	Selects band 6 shelving modes: bell, soft, low pass 6dB or low pass 12dB
6*	**SHAPE** switch	Selects band 1 shelving modes: bell, warm, high pass 6dB or high pass 12dB
7*	**SHAPE** switch	Selects band 2 shelving modes: bell or high pass 24dB

* Not shown in diagram.

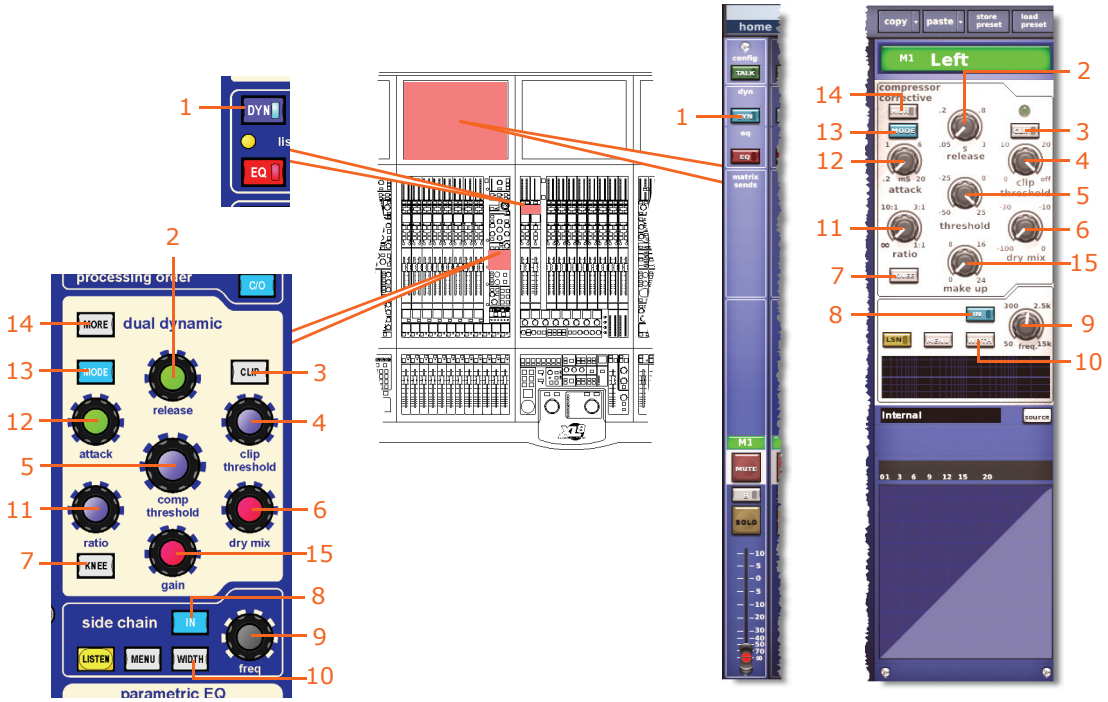
Note: *Although bands 1 and 2 are not shown above, the items in the table also apply. Both bands have items 2, 3 and 4. Additionally, band 1 has item 6, and band 2 has item 7.*



Item	*Control*	*Parameter*
1	31 faders	Fader positions
2	High pass filter control knob	High pass filter cut off frequency
3	**IN** switch	High pass filter in/out
4	Low pass filter control knob	Low pass filter cut off frequency
5	**IN** switch	Low pass filter in/out
6	**EQ** switch	EQ in/out
7	**SLOPE** switch	Selects low pass filter as 6dB or 12dB
8	**Q** switch	Selects Q mode as proportional (**PROP.**) or constant (**CON.**)
9	**IN** switch	Switches 200Hz - 20kHz notch filter in/out
10	Notch filter control knob	200Hz - 20kHz notch filter frequency
11	**IN** switch	Switches 20Hz - 2kHz notch filter in/out
12	Notch filter control knob	20Hz - 2kHz notch filter frequency
13	**SLOPE** switch	Selects high pass filter as 6dB or 12dB

DYN (dynamic) safe

The following diagram details the parameters in the masters protected by the **DYN** safe, and shows the compressor detail area in the GUI channel strip. Only the corrective compressor is shown, but this is typically the same for the other compressor modes (adaptive, creative, vintage and shimmer).

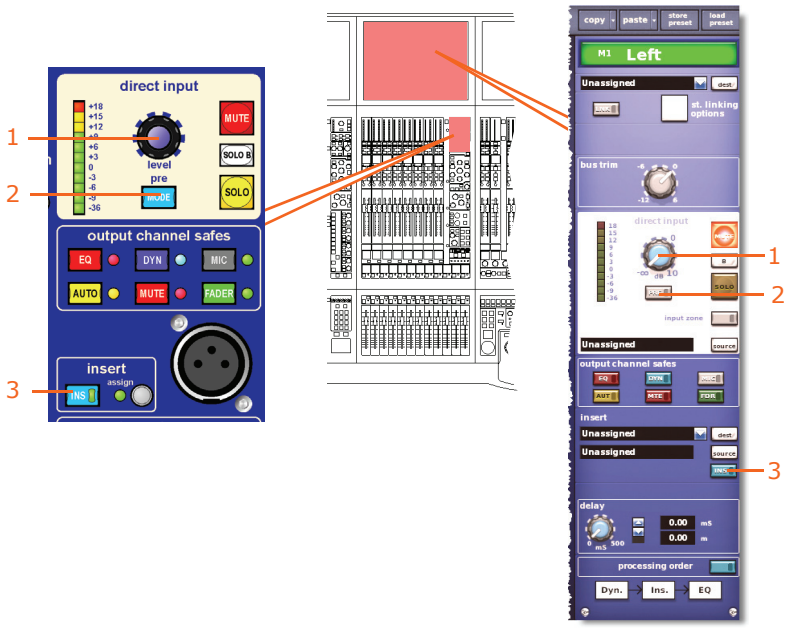


Item	*Control*	*Parameter*
1	**DYN** switch	Compressor on/off
2	**release** control knob	Compressor release
3	**CLIP** switch	Compressor clip on/off
4	**clip threshold** control knob	Compressor clip
5	**comp threshold**/ [**threshold**] control knob	Compressor threshold
6	**dry mix** control knob	Compressor mode selector: corrective (shown above), adaptive, creative and vintage
7	**KNEE** pushbutton	Compressor knee selector: hard, medium and soft
8	**IN** switch	Compressor sidechain in/out
9	**freq** control knob	Compressor sidechain frequency
10	**WIDTH** pushbutton	Compressor sidechain width: 2 Oct, 1 Oct or 0.3 Oct
11	**ratio** control knob	Compressor ratio
12	**attack** control knob	Compressor attack
13	**MODE** pushbutton	Compressor mode — corrective, adaptive, creative, vintage or shimmer

Item	Control	Parameter
14	**MORE**/[**MOR**] pushbutton	Increases the colouration produced by the compressor
15	**gain**/[**make up**] control knob	Compressor gain

MIC safe

The following diagram details the parameters in the masters protected by **MIC** safe, and shows the configuration detail area in the GUI channel strip.



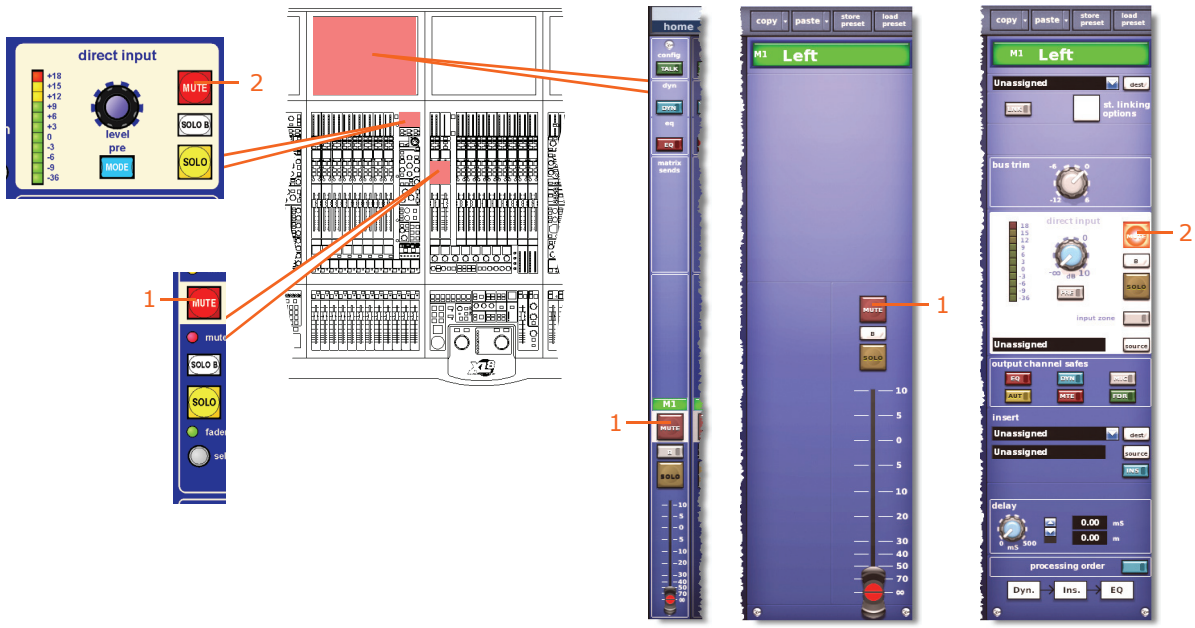
Item	Control	Parameter
1	**level** control knob	Direct input level
2	**MODE**/[**PRE**] switch	Direct input pre- in/out
3	**INS** switch	Insert in/out

AUTO (automation) safe

All of the master channel parameters are protected by **AUTO** (automation) safe — except, of course, for the ones unaffected by the safes (see “Aux parameters not affected by the safes” on page 487).

MUTE safe

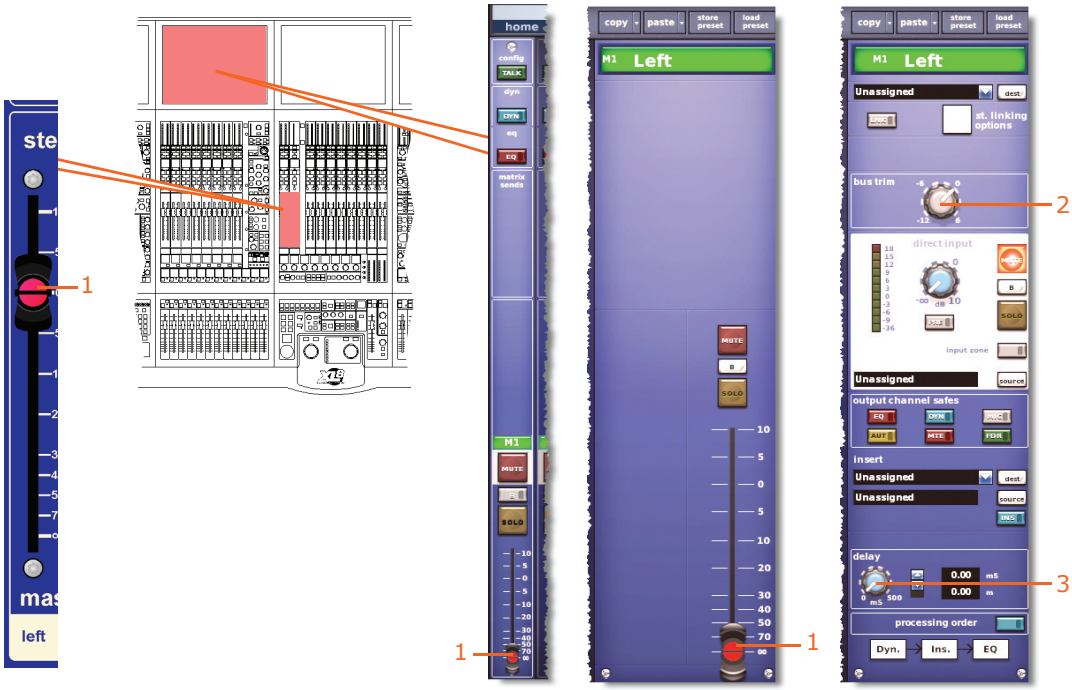
The following diagram details the parameters of the masters protected by **MUTE** safe, and shows the master routing detail area in the GUI channel strip.



Item	*Control*	*Parameter*
1	**MUTE** switch	Mute on/off
2	**MUTE** switch	Direct input mute on/off

FADER safe

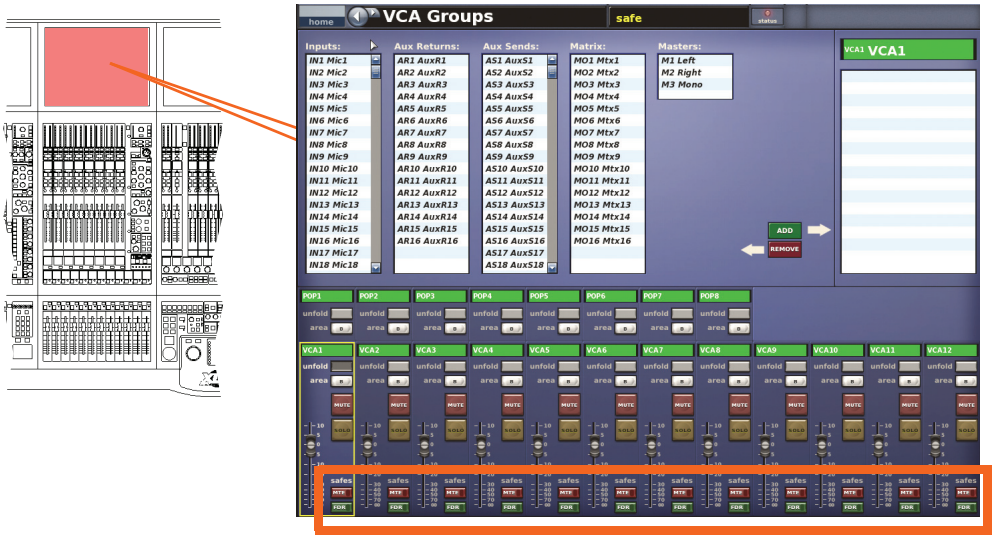
The following diagram details the parameters of the masters protected by **FADER** safe, and shows the master routing detail area in the GUI channel strip.



Item	*Control*	*Parameter*
1	Fader	Fader level
2	**bus trim** control knob	Bus trim level
3	**delay** control knob	Delay time

Groups

The group safes — mute and fader — are selected via the **VCA Groups** screen of the GUI (shown below).



EQ safe

Not applicable.

Dynamic safe

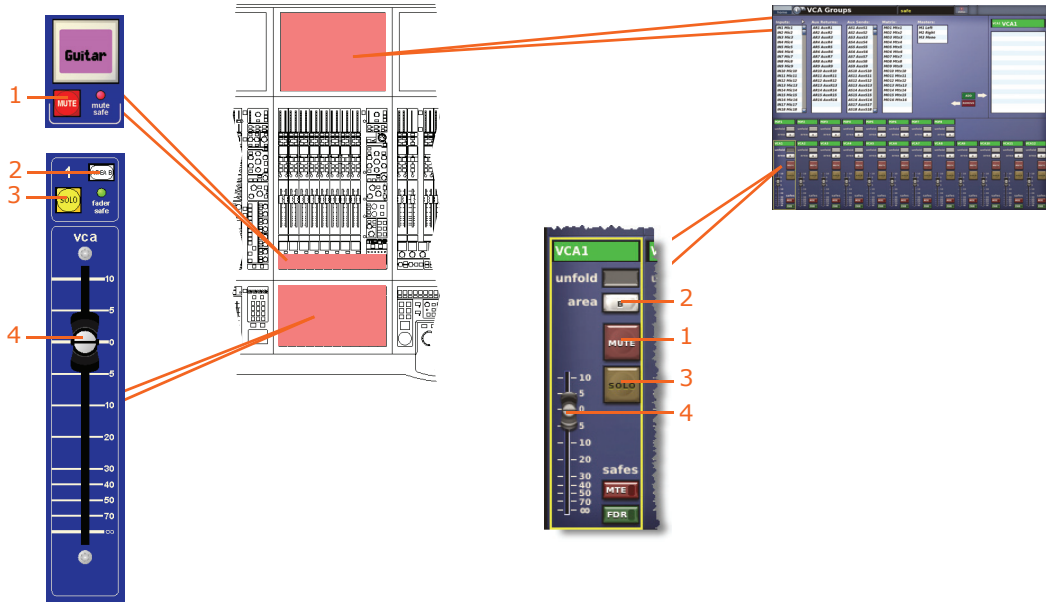
Not applicable.

Mic safe

Not applicable.

Automation safe

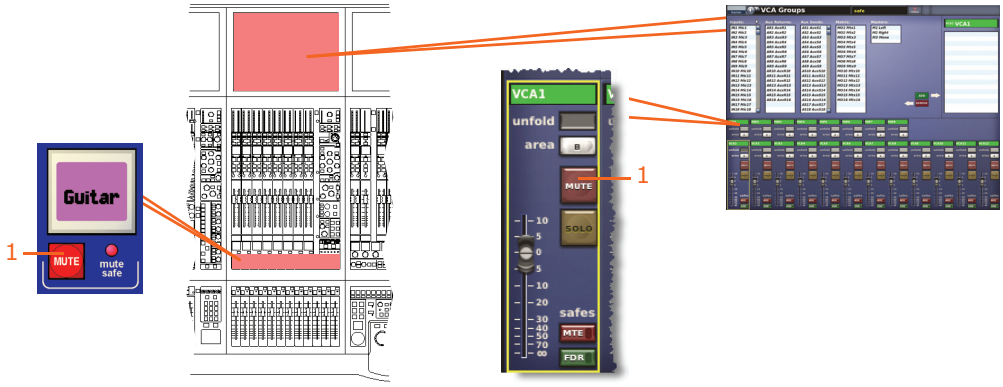
The following diagram shows the parameters of the VCA groups protected by the **AUT** (auto) safe.



Item	*Control*	*Parameter*
1	**MUTE** switch	Mute on/off
2	**SOLO B**/[**B**] switch	Solo B on/off
3	**SOLO** switch	Solo on/off
4	Fader	Fader level

Mute (MTE) safe

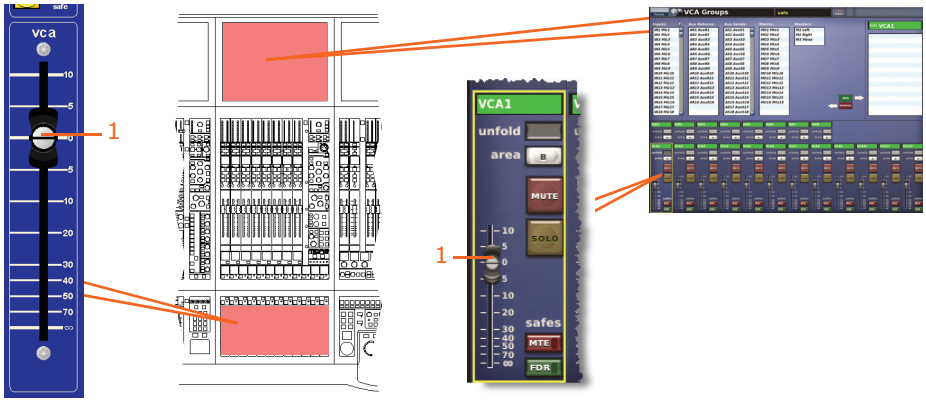
The following diagram shows the parameters of the VCA groups protected by the **MTE** (mute) safe.



Item	*Control*	*Parameter*
1	**MUTE** switch	Mute on/off

Fader (FDR) safe

The following diagram shows the parameters of the VCA groups protected by **FDR** (fader) safe.



Item	*Control*	*Parameter*
1	Fader	Fader level

Appendix M: Parameters Affected By Copy And Paste

This appendix shows the input and output channel parameters affected by copy and paste operations, which are selected via the copy and paste buttons on the GUI (see "Using copy and paste" on page 108).

The structure of this appendix is intended to follow the way that copy and paste operates, that is, by channel or detail area.

Overview

The following table provides a quick reference for finding the copy and paste parameters per channel in this appendix.

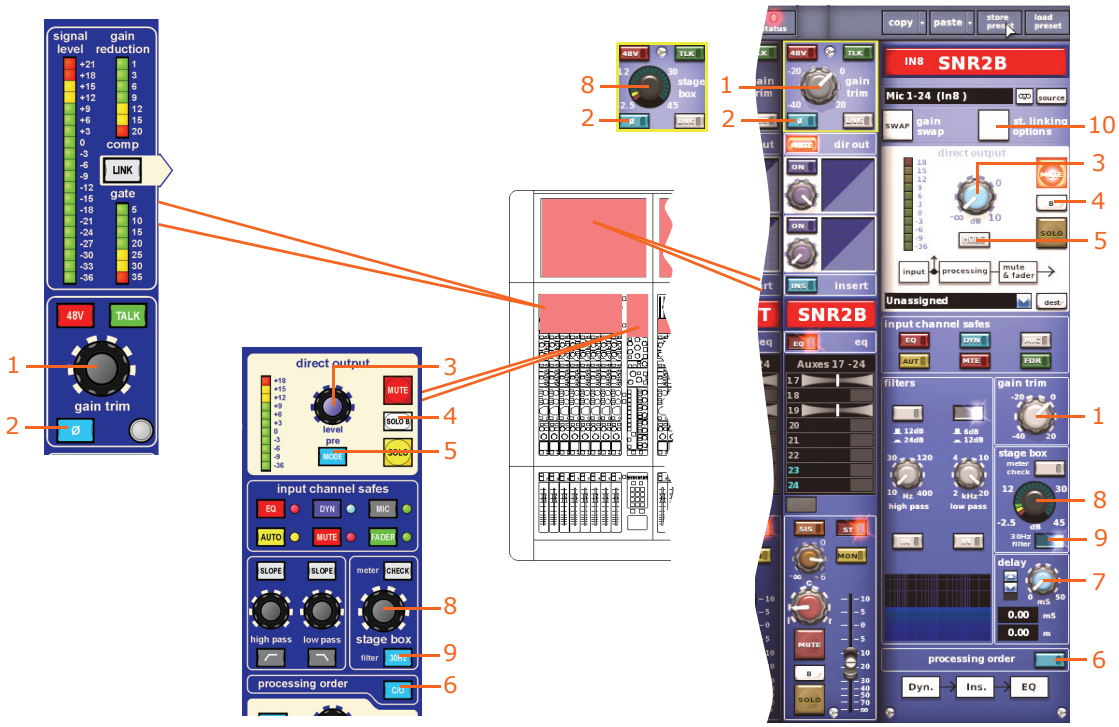
Control area	*Inputs*	*Auxes*	*Returns*	*Matrices*	*Masters*
Config-uration	"Configuration " on page 520	"Configuration " on page 526	"Configuration " on page 532	"Configuration " on page 535	"Configuration " on page 541
Comp-ressor	"Compressor" on page 521	"Compressor" on page 527	N/A	"Compressor" on page 536	"Compressor" on page 542
Gate	"Gate" on page 522	N/A	N/A	N/A	N/A
EQ (GEQ)	"EQ" on page 523	"EQ (GEQ)" on page 528	N/A	"EQ (GEQ)" on page 538	"EQ (GEQ)" on page 544
Bus sends	"Bus sends" on page 524	"Bus sends" on page 530	"Bus sends" on page 533	N/A	N/A
Master routing /fader section	"Master routing" on page 525	"Master routing" on page 531	"Master routing" on page 534	"Fader section" on page 540	"Master routing" on page 546

Inputs

This section shows you which input channel parameters are affected by copy and paste.

Configuration

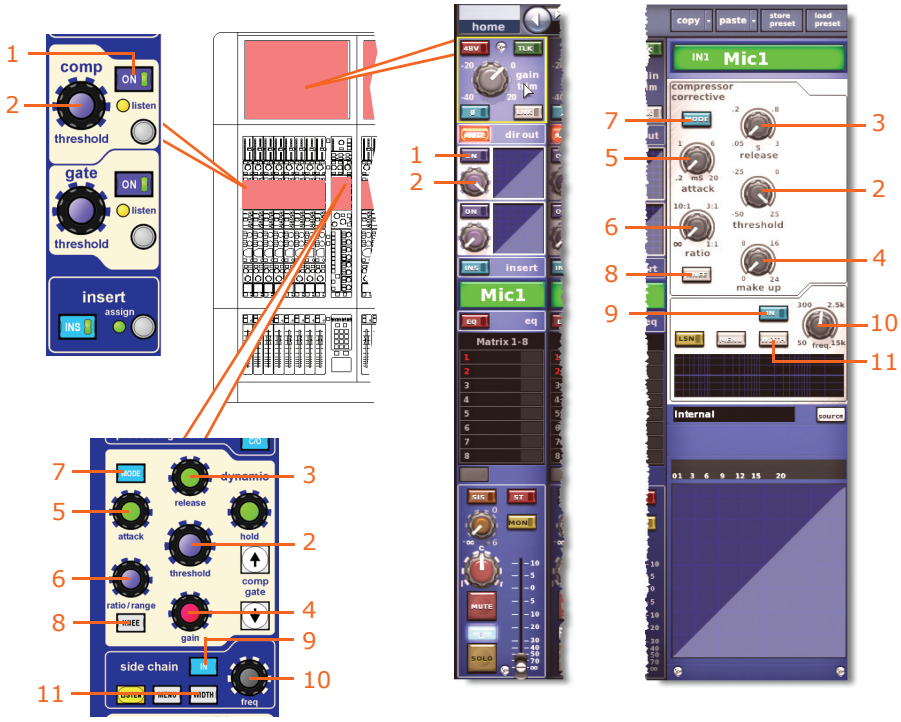
The following diagram shows the parameters of the configuration detail area affected by copy and paste.



Item	*Control*	*Parameter*
1	**gain trim** control knob	Digital trim
2	**Ø** switch	Phase invert on/off switch
3	**level** control knob	Direct output level
4	**SOLO B**/[**B**] switch	Direct output solo B on/off
5	**MODE** switch	Direct output tap-off point: “Post-fade and mute”, “Pre-mute, pre-processing” and “Pre-mute, post-processing”
6	**C/O** switch	Order of processing: **Dyn.→Ins.→EQ** or **EQ→Ins.→Dyn.**
7	**delay** control knob	Delay time
8	**stage box** control knob	Gain of remote amplifier
9	**30Hz** filter switch	30Hz filter in/out
10	**st. link options** pushbutton	Stereo linking options

Compressor

This section shows the compression parameters of the dynamics section affected by copy and paste.

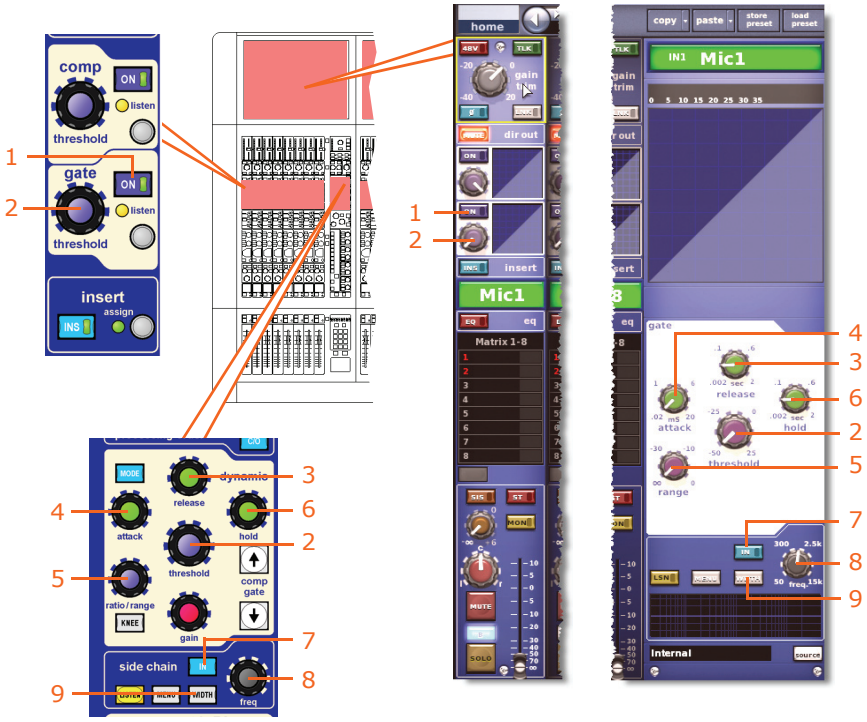


Note: *Only the corrective compressor is shown above, but this is typically the same for the other compressor modes (adaptive, creative and vintage).*

Item	*Control*	*Parameter*
1	**ON** switch	Compressor on/off
2	**threshold** control knob	Compressor threshold
3	**release** control knob	Compressor release
4	**gain**/[**make up**] control knob	Compressor make up gain
5	**attack** control knob	Compressor attack
6	**ratio/range**/[**ratio**] control knob	Compressor ratio
7	**MODE** pushbutton	Compressor mode selector: corrective (shown above), adaptive, creative and vintage
8	**KNEE** pushbutton	Compressor knee: hard, medium or soft
9	**IN** switch	Compressor sidechain in/out
10	**freq** control knob	Compressor sidechain frequency
11	**WIDTH** pushbutton	Compressor sidechain width: 2 Oct, 1 Oct or 0.3 Oct

Gate

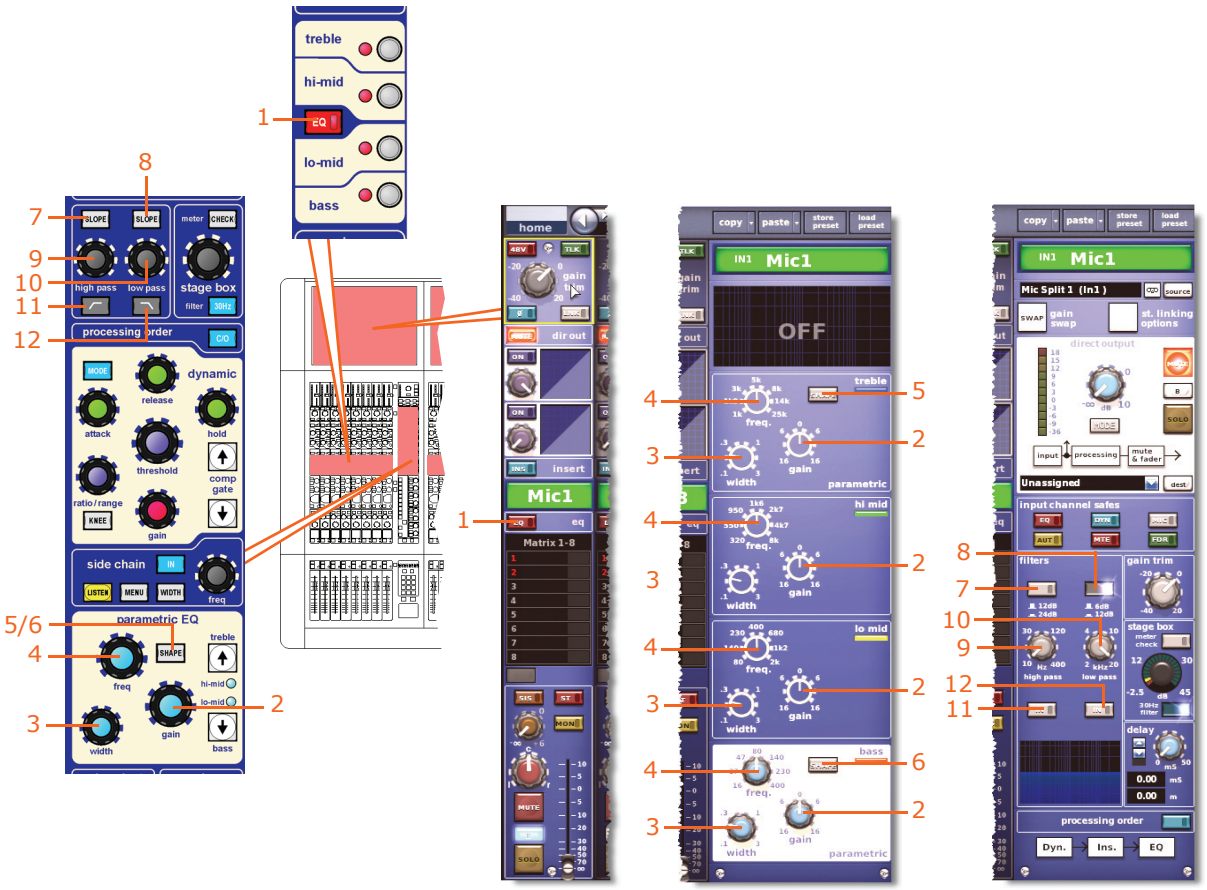
This section shows the gate parameters of the dynamics section affected by copy and paste.



Item	*Control*	*Parameter*
1	**ON** switch	Gate on/off
2	**threshold** control knob	Gate threshold
3	**release** control knob	Gate release
4	**attack** control knob	Gate attack
5	**ratio/range**/[**range**] control knob	Gate range
6	**hold** control knob	Gate hold
7	**IN** switch	Gate sidechain in/out
8	**freq** control knob	Gate sidechain frequency
9	**WIDTH** pushbutton	Gate sidechain width: 2 Oct, 1 Oct or 0.3 Oct

EQ

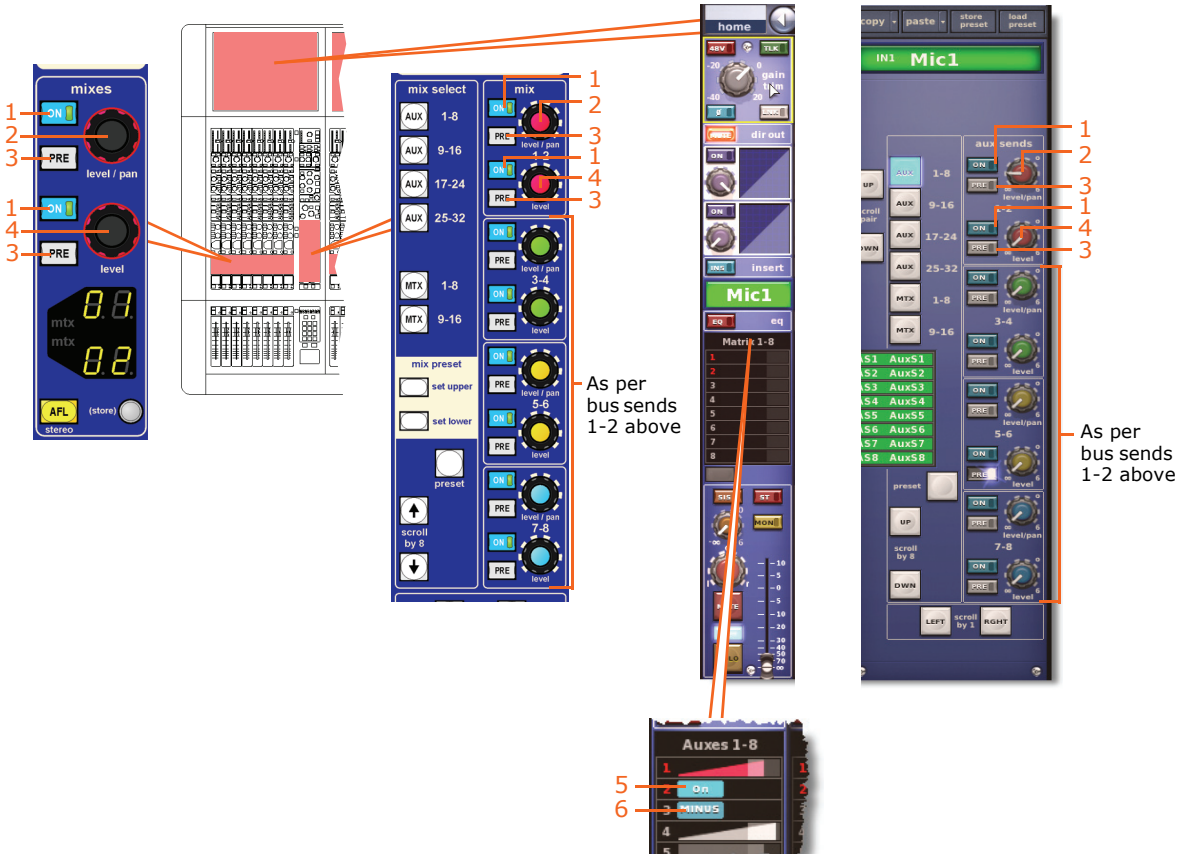
This section shows all the parameters of the EQ section affected by copy and paste.



Item	*Control*	*Parameter*
1	**EQ** switch	EQ on/off
2	**gain** control knob	EQ gain level
3	**width** control knob	EQ width
4	**freq** control knob	EQ frequency
5	**SHAPE** switch	Treble shelving mode: peaking, bright, classic or soft
6	**SHAPE** switch	Bass shelving mode: peaking, deep, classic or warm
7	**SLOPE** pushbutton	High pass filter slope 12dB or 24dB
8	**SLOPE** pushbutton	Low pass filter slope 6dB or 12dB
9	**high pass** control knob	High pass filter frequency
10	**low pass** control knob	Low pass filter frequency
11	/[**IN**] switch	High pass filter in/out
12	/[**IN**] switch	Low pass filter in/out

Bus sends

This section shows the parameters of the mix sections affected by copy and paste.

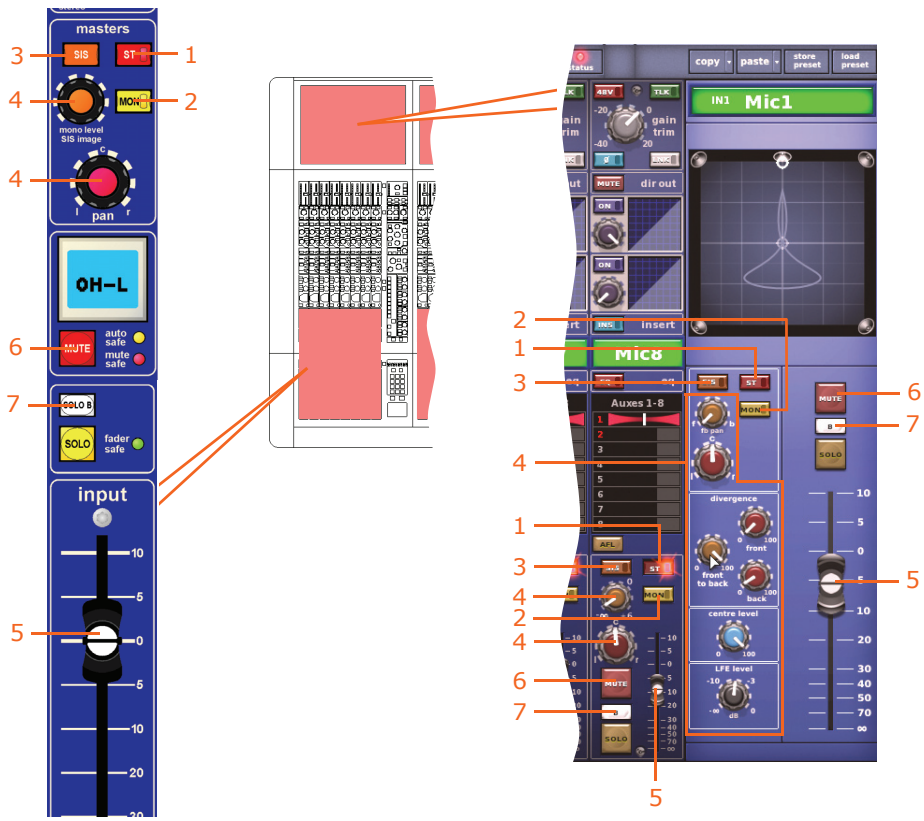


Note: *Only matrix sends 1 to 8 are shown above, but a copy/paste operation affects all aux and matrix sends.*

Item	*Control*	*Parameter*
1	**ON** switch	Bus send on/off
2	**level/pan** control knob	Bus level, or pan when bus is linked
3	**PRE** switch	Pre-fader on/off
4	**level** control knob	Bus level
5	**On** switch	Aux bus send on/off — only available when aux bus is in group mode
6	**MINUS** switch	Aux bus send mute on/off — only available when aux bus is in mix minus mode

Master routing

This section shows all the parameters of the master routing affected by copy and paste.



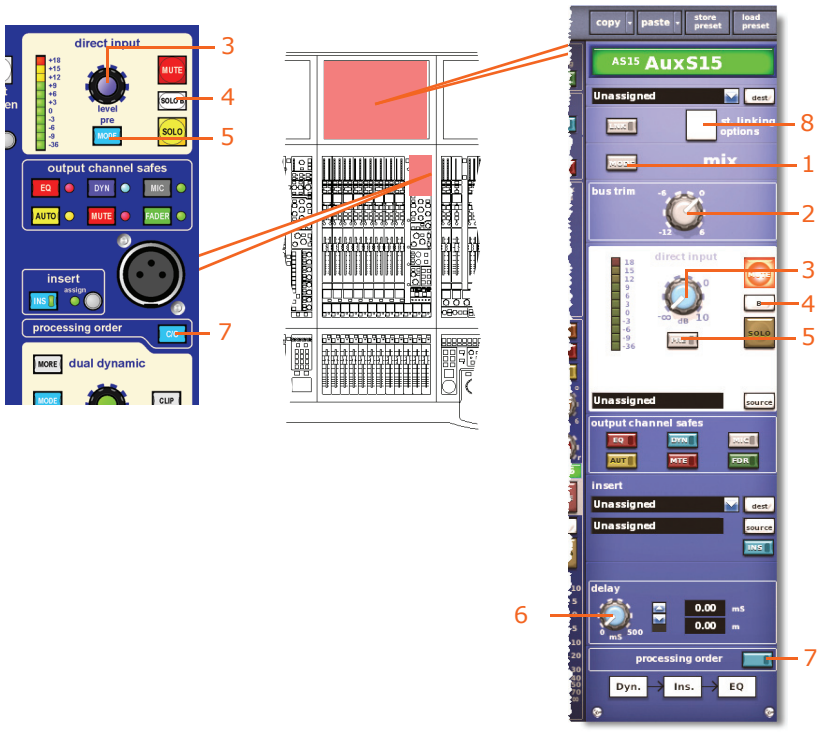
Item	*Control*	*Parameter*
1	**ST** switch	Stereo on/off
2	**MON** switch	Mono on/off
3	**SIS** switch	Spatial imaging system on/off
4	Panning control knobs	Surround panning (includes all surround sound parameters)
5	Fader	Level
6	**MUTE** switch	Mute on/off
7	**SOLO B**/[**B**] switch	Solo B on/off

Aux

This section shows you which aux channel parameters are affected by copy and paste.

Configuration

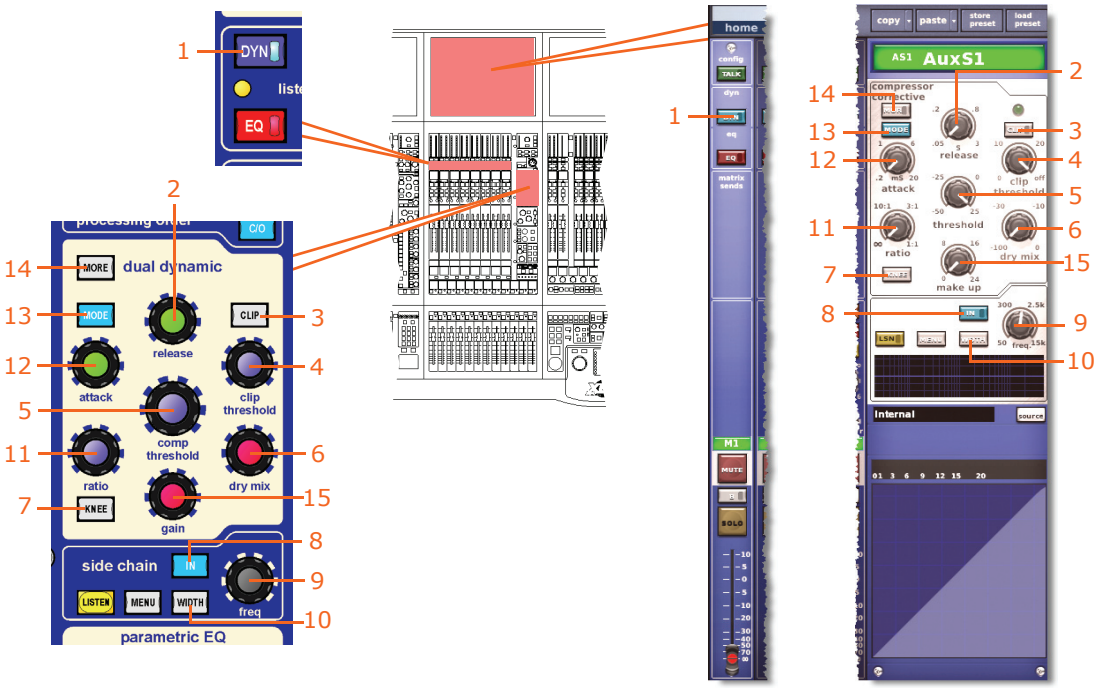
The following diagrams show the configuration parameters affected by copy and paste.



Item	*Control*	*Parameter*
1	**MODE** pushbutton	Bus mode: mix, group or mix minus
2	**bus trim** control knob	Bus trim level
3	**level** control knob	Direct input level
4	**SOLO B**/[**B**] switch	Direct input solo B on/off
5	**MODE**/[**PRE**] switch	Direct input pre- in/out
6	**delay** control knob	Delay time
7	**C/O** switch	Order of processing: **Dyn.→Ins.→EQ** or **EQ→Ins.→Dyn.**
8	**st. linking options** button	Stereo linking options

Compressor

This section shows all the compression parameters of the dynamics section affected by copy and paste. Only corrective compressor shown below, but this is typically the same for the other compressor modes.



Item	*Control*	*Parameter*
1	**DYN** switch	Compressor on/off
2	**release** control knob	Compressor release
3	**CLIP** switch	Compressor clip on/off
4	**clip threshold** control knob	Compressor clip threshold
5	**comp threshold**/ [**threshold**] control knob	Compressor threshold
6	**dry mix** control knob	Compressor dry mix level
7	**KNEE** pushbutton	Compressor knee: hard, medium or soft
8	**IN** switch	Compressor sidechain in/out
9	**freq** control knob	Compressor sidechain frequency
10	**WIDTH** pushbutton	Compressor sidechain: 2 Oct, 1 Oct or 0.3 Oct
11	**ratio** control knob	Compressor ratio
12	**attack** control knob	Compressor attack
13	**MODE** pushbutton	Compressor mode: corrective, adaptive, creative, vintage or shimmer

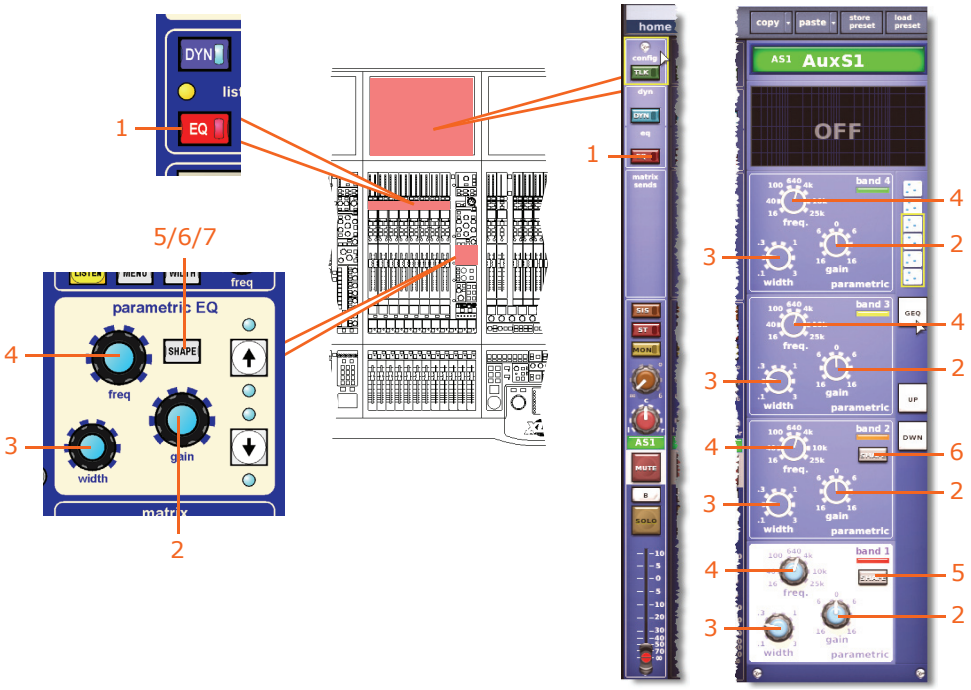
Item	Control	Parameter
14	**MORE**/[**MOR**] pushbutton	Increases the colouration produced by the compressor
15	**gain**/[**make up**] control knob	Compressor gain

Gate

Not applicable.

EQ (GEQ)

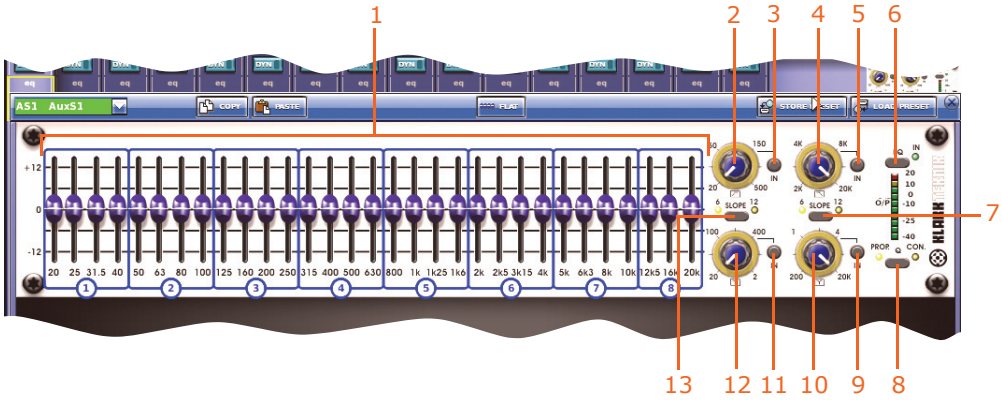
This section shows all the parameters of the EQ section, including the GEQ, affected by copy and paste.



Item	Control	Parameter
1	**EQ** switch	EQ on/off
2	**gain** control knob	EQ gain level
3	**width** control knob	EQ width
4	**freq** control knob	EQ frequency
5	**SHAPE** switch	Band 1 shelving mode: bell, warm, high pass 6dB or high pass 12dB
6	**SHAPE** switch	Band 2 shelving mode: bell or high pass 24dB
7*	**SHAPE** switch	Band 6 shelving mode: bell, soft, low pass 6dB or low pass 12dB

* Not shown in diagram.

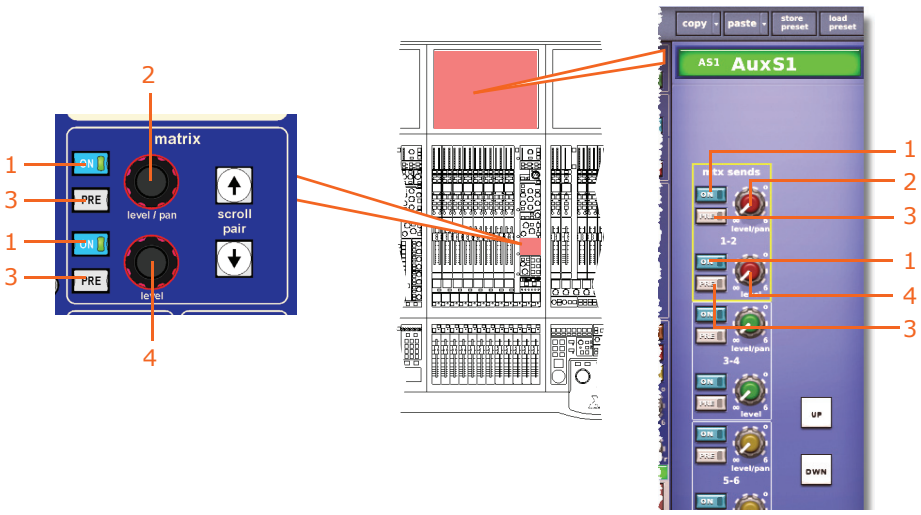
Note: *Although bands 5 and 6 are not shown above, the items in the table also apply. Both bands have items 2, 3 and 4, and band 6 also has item 7.*



Item	*Control*	*Parameter*
1	31 faders	Fader positions
2	High pass filter control knob	High pass filter cut off frequency
3	**IN** switch	High pass filter in/out
4	Low pass filter control knob	Low pass filter cut off frequency
5	**IN** switch	Low pass filter in/out
6	**EQ** switch	EQ in/out
7	**SLOPE** switch	Low pass filter: 6dB or 12dB
8	**Q** switch	Q mode as proportional (**PROP.**) or constant (**CON.**)
9	**IN** switch	200Hz - 20kHz notch filter in/out
10	Notch filter control knob	200Hz - 20kHz notch filter frequency
11	**IN** switch	20Hz - 2kHz notch filter in/out
12	Notch filter control knob	20Hz - 2kHz notch filter frequency
13	**SLOPE** switch	High pass filter: 6dB or 12dB

Bus sends

This section shows the parameters of the mix buses affected by copy and paste.

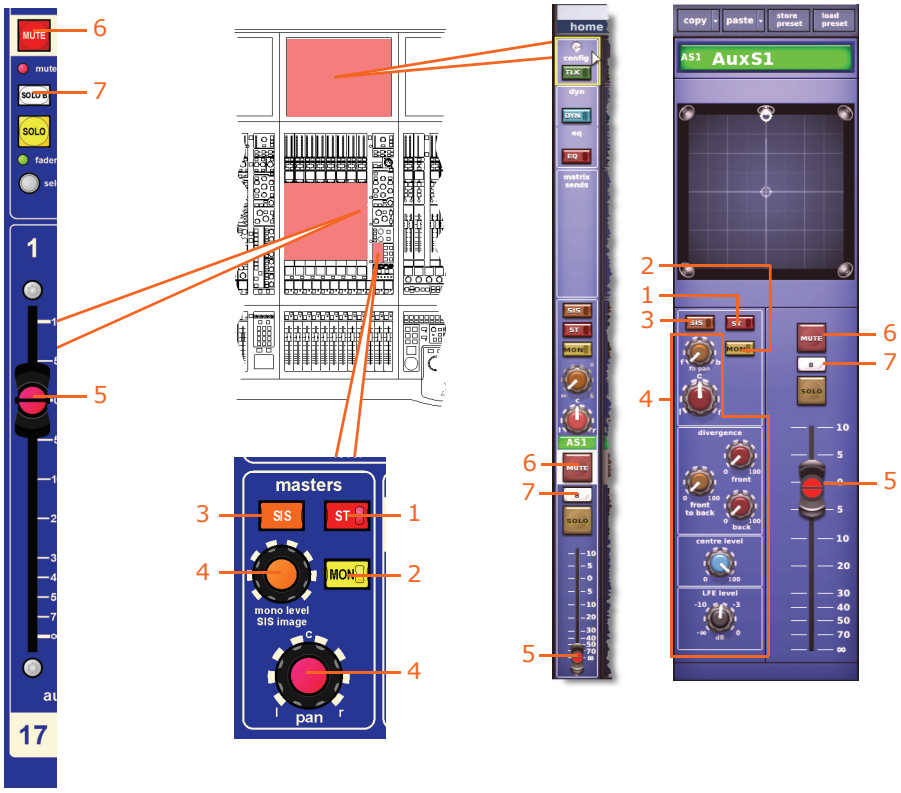


Note: *Although only matrix sends 1-2 are referenced above, this also applies to all 16 matrix sends.*

Item	*Control*	*Parameter*
1	**ON** switch	Matrix bus send on/off
2	**level/pan** control knob	Bus level, or pan when bus is linked
3	**PRE** switch	Pre-fader on/off
4	**level** control knob	Bus level

Master routing

This section shows all the parameters of the master routing section affected by copy and paste.



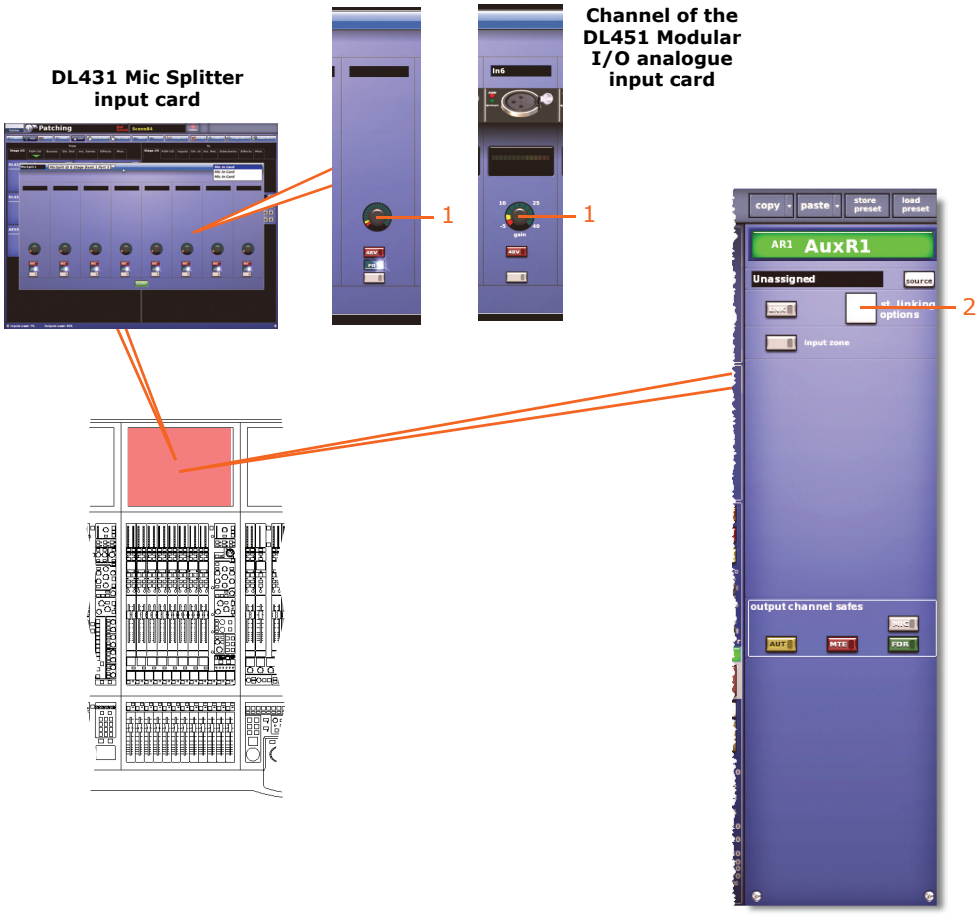
Item	*Control*	*Parameter*
1	**ST** switch	Stereo on/off
2	**MON** switch	Mono on/off
3	**SIS** switch	Spatial imaging system on/off
4	Panning control knobs	Surround panning (includes all surround sound parameters)
5	Fader	Level
6	**MUTE** switch	Mute on/off
7	**SOLO B**/[**B**] switch	Solo B on/off

Return

This section shows you which return channel parameters are affected by copy and paste.

Configuration

The following diagrams show the configuration parameters affected by copy and paste.



Item	*Control*	*Parameter*
1	Stage box control knob	Gain of remote amplifier
2	**st. linking options** button	Stereo linking options

Compressor

Not applicable.

Gate

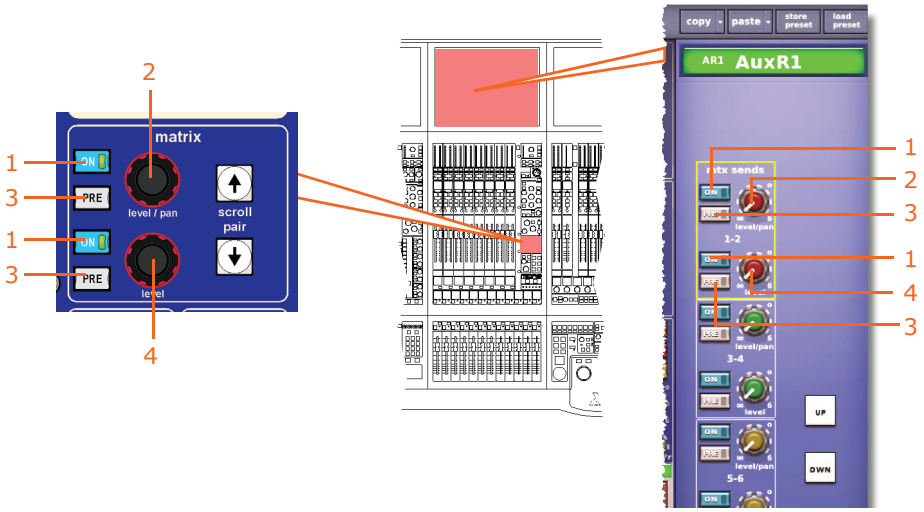
Not applicable.

EQ

Not applicable.

Bus sends

This section shows the return parameters of the mix sections affected by copy and paste.

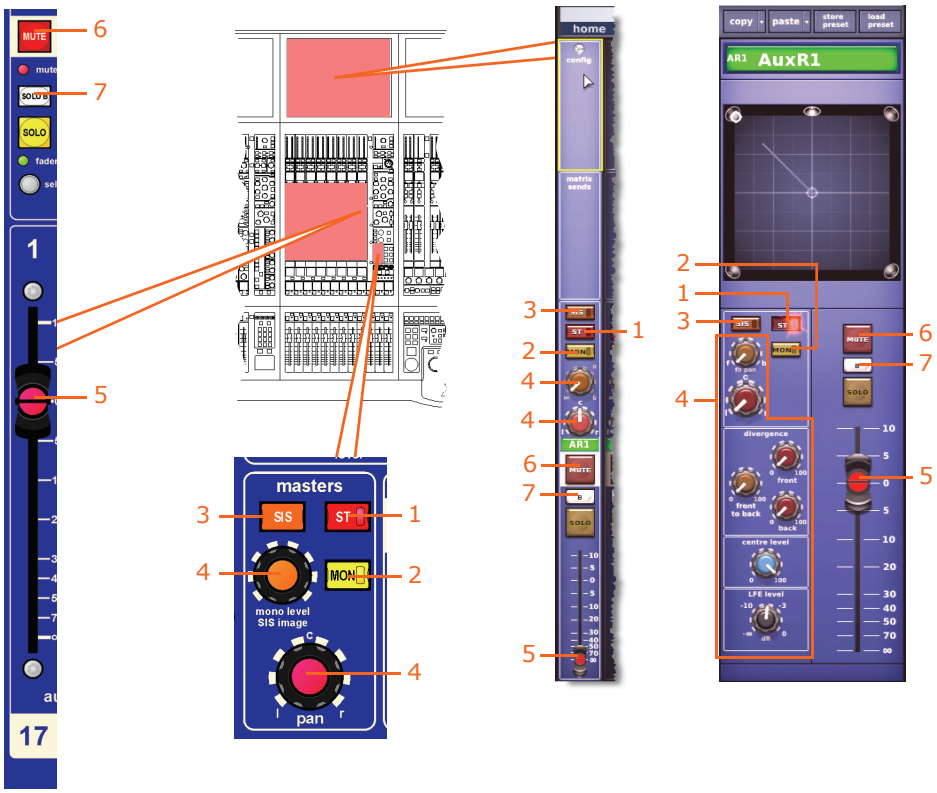


Note: *Although only matrix sends 1-2 are referenced above, this applies to all 16 matrix sends.*

Item	*Control*	*Parameter*
1	**ON** switch	Matrix bus send on/off
2	**level/pan** control knob	Bus level, or pan when bus is linked
3	**PRE** switch	Pre-fader on/off
4	**level** control knob	Bus level

Master routing

This section shows all the parameters of the master routing affected by copy and paste.



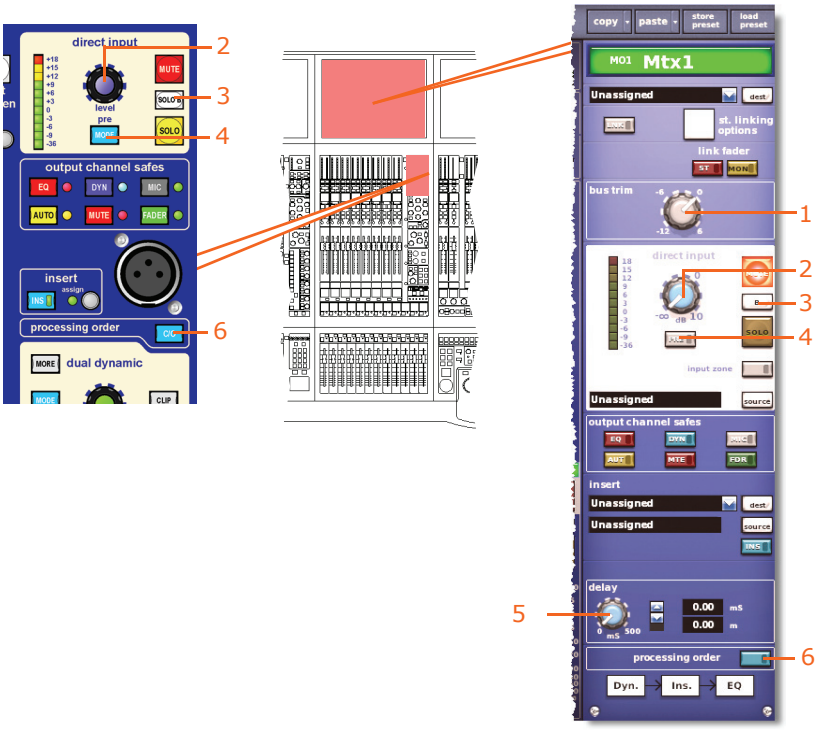
Item	*Control*	*Parameter*
1	**ST** switch	Stereo on/off
2	**MON** switch	Mono on/off
3	**SIS** switch	Spatial imaging system on/off
4	Panning control knobs	Surround panning (includes all surround sound parameters)
5	Fader	Level
6	**MUTE** switch	Mute on/off
7	**SOLO B**/[**B**] switch	Solo B on/off

Matrix

This section shows you which matrix channel parameters are affected by copy and paste.

Configuration

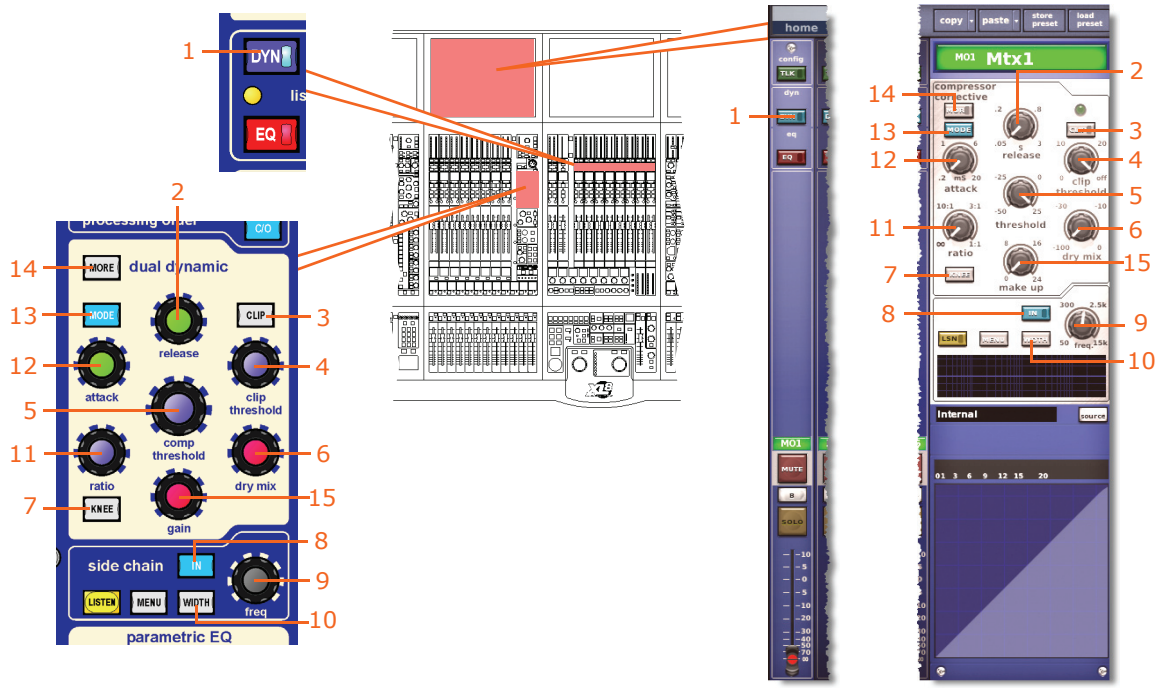
The following diagram shows the configuration parameters affected by copy and paste.



Item	*Control*	*Parameter*
1	**bus trim** control knob	Bus trim level
2	**level** control knob	Direct input level
3	**SOLO B**/[**B**] switch	Direct input solo B on/off
4	**MODE**/[**PRE**] switch	Direct input pre- in/out
5	**delay** control knob	Delay time
6	**C/O** switch	Order of processing: **Dyn.→Ins.→EQ** or **EQ→Ins.→Dyn.**

Compressor

This section shows all the compression parameters of the dynamics section affected by copy and paste. Only corrective compressor shown below, but this is typically the same for the other compressor modes.



Item	*Control*	*Parameter*
1	**DYN** switch	Compressor on/off
2	**release** control knob	Compressor release
3	**CLIP** switch	Compressor clip on/off
4	**clip threshold** control knob	Compressor clip
5	**comp threshold**/ [**threshold**] control knob	Compressor threshold
6	**dry mix** control knob	Compressor dry mix level
7	**KNEE** pushbutton	Compressor knee: hard, medium or soft
8	**IN** switch	Compressor sidechain in/out
9	**freq** control knob	Compressor sidechain frequency
10	**WIDTH** pushbutton	Compressor sidechain width: 2 Oct, 1 Oct or 0.3 Oct
11	**ratio** control knob	Compressor ratio
12	**attack** control knob	Compressor attack
13	**MODE** pushbutton	Compressor mode: corrective, adaptive, creative, vintage or shimmer

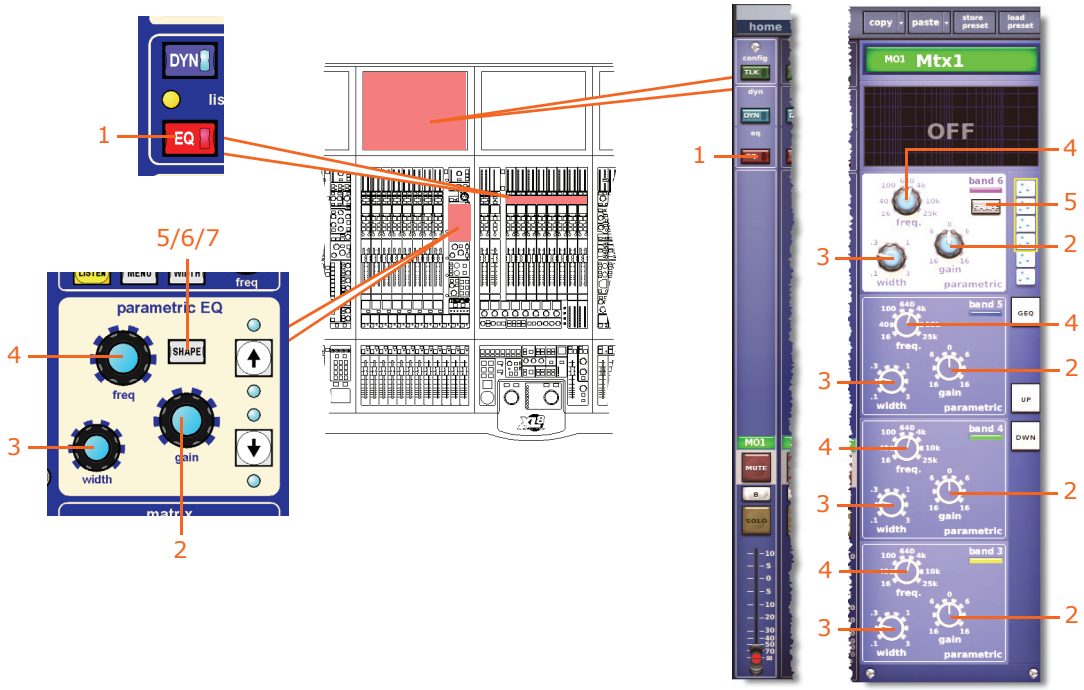
Item	*Control*	*Parameter*
14	**MORE**/[**MOR**] pushbutton	Increases the colouration produced by the compressor
15	**gain**/[**make up**] control knob	Compressor gain

Gate

Not applicable.

EQ (GEQ)

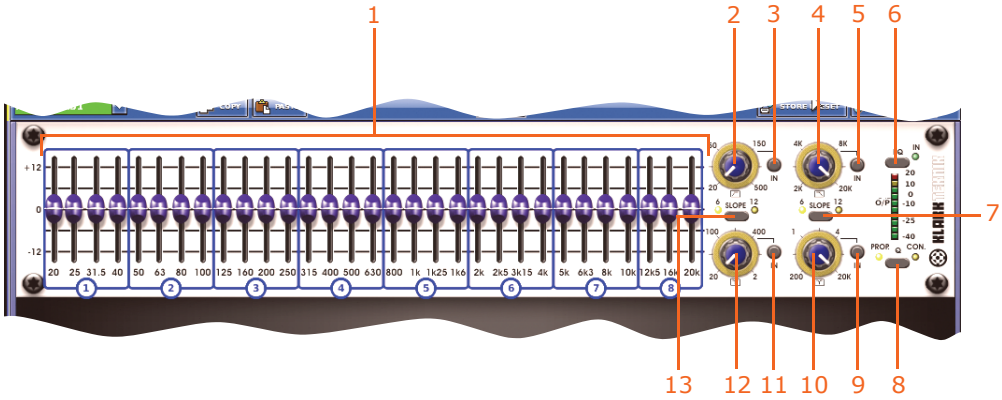
This section shows all the parameters of the EQ section (including the GEQ where appropriate) affected by copy and paste.



Item	*Control*	*Parameter*
1	**EQ** switch	EQ on/off
2	**gain** control knob	EQ gain level
3	**width** control knob	EQ width
4	**freq** control knob	EQ frequency
5	**SHAPE** switch	Band 6 shelving mode: bell, soft, low pass 6dB or low pass 12dB
6*	**SHAPE** switch	Band 2 shelving mode: bell or high pass 24dB
7*	**SHAPE** switch	Band 1 shelving mode: bell, warm, high pass 6dB or high pass 12dB

* Not shown in diagram.

Note: *Although bands 1 and 2 are not shown above, the items in the table also apply. Both bands have items 2, 3 and 4. Band 1 also has item 7, and band 2 also has item 6.*



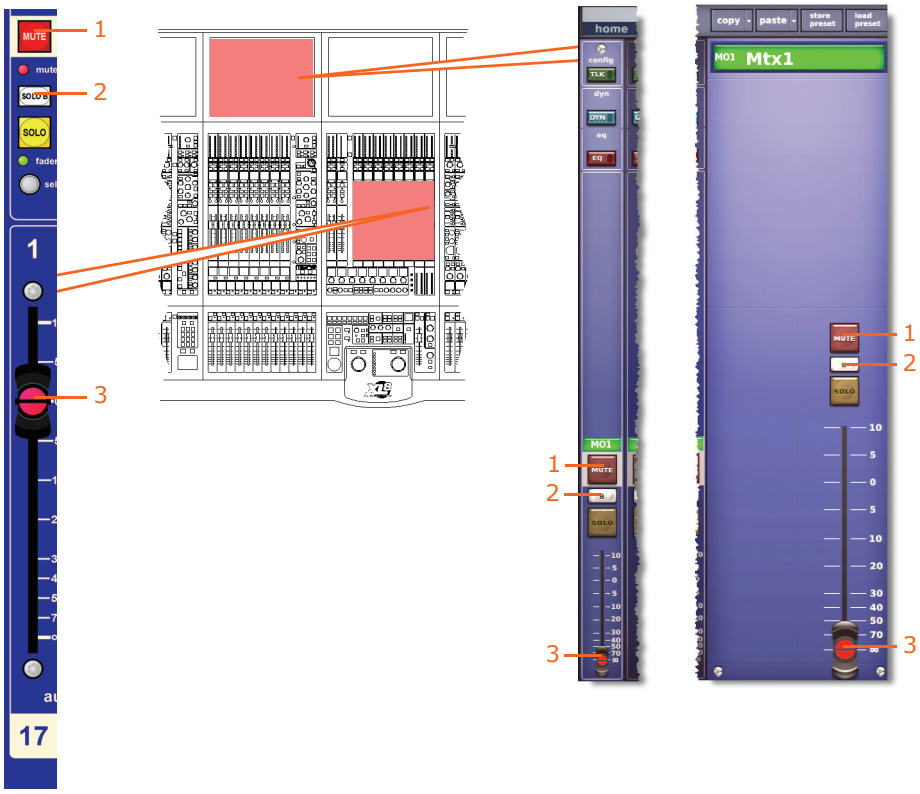
Item	*Control*	*Parameter*
1	31 faders	Fader positions
2	High pass filter control knob	High pass filter cut off frequency
3	**IN** switch	High pass filter in/out
4	Low pass filter control knob	Low pass filter cut off frequency
5	**IN** switch	Low pass filter in/out
6	**EQ** switch	EQ in/out
7	**SLOPE** switch	Low pass filter: 6dB or 12dB
8	**Q** switch	Q mode as proportional (**PROP.**) or constant (**CON.**)
9	**IN** switch	200Hz - 20kHz notch filter in/out
10	Notch filter control knob	200Hz - 20kHz notch filter frequency
11	**IN** switch	20Hz - 2kHz notch filter in/out
12	Notch filter control knob	20Hz - 2kHz notch filter frequency
13	**SLOPE** switch	High pass filter: 6dB or 12dB

Bus sends

Not applicable.

Fader section

This section shows all the parameters of the master routing affected by copy and paste.



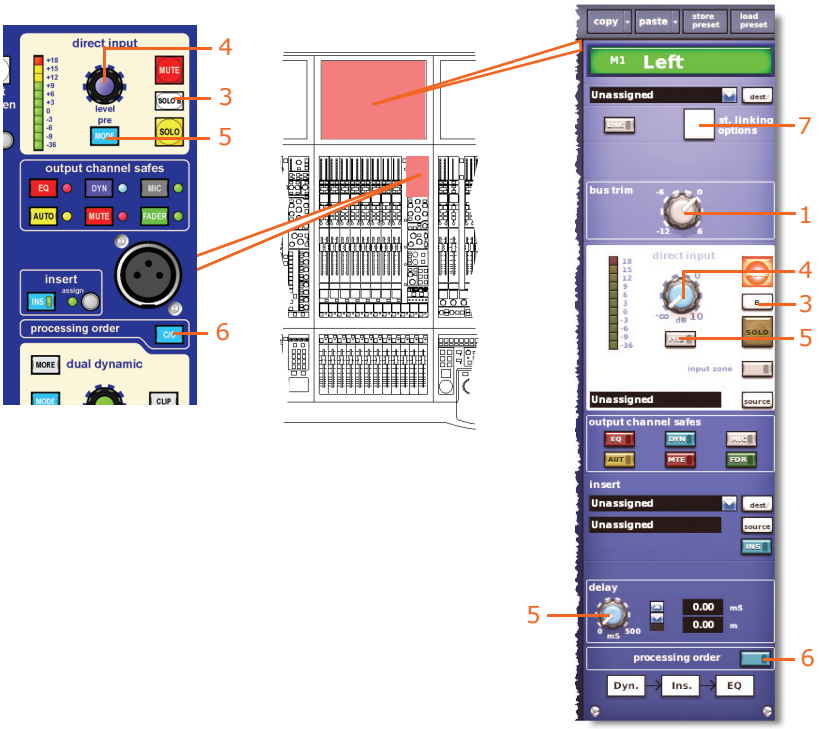
Item	*Control*	*Parameter*
1	**MUTE** switch	Mute on/off
2	**SOLO B**/[**B**] switch	Solo B on/off
3	Fader	Level

Master

This section shows you which master channel parameters are affected by copy and paste.

Configuration

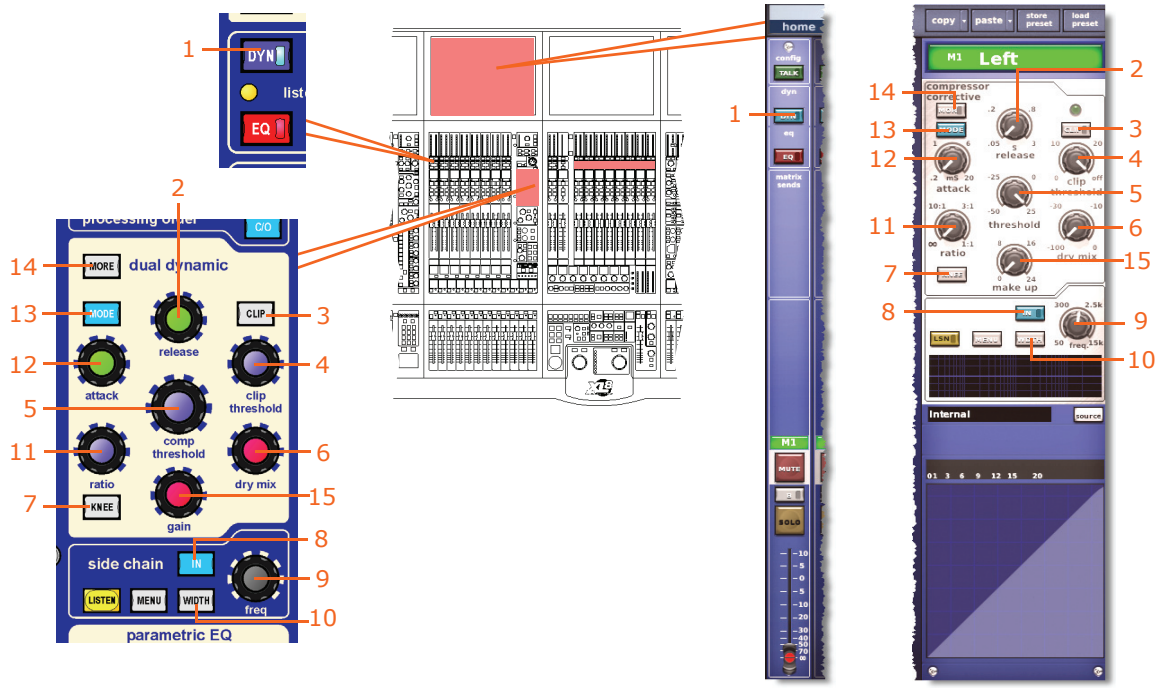
The following diagrams show the configuration parameters affected by copy and paste.



Item	*Control*	*Parameter*
1	**bus trim** control knob	Bus trim level
2	**level** control knob	Direct input level
3	**SOLO B**/[**B**] switch	Direct input solo B on/off
4	**MODE**/[**PRE**] switch	Direct input pre- in/out
5	**delay** control knob	Delay level
6	**C/O** switch	Order of processing: **Dyn.→Ins.→EQ** or **EQ→Ins.→Dyn.**
7	**st. linking options** button	Stereo linking options

Compressor

This section shows the compression parameters of the dynamics section affected by copy and paste. Only corrective compressor shown below, but typically the same for the other compressor modes.



Item	*Control*	*Parameter*
1	**DYN** switch	Compressor on/off
2	**release** control knob	Compressor release
3	**CLIP** switch	Compressor clip on/off
4	**clip threshold** control knob	Compressor clip
5	**comp threshold**/ [**threshold**] control knob	Compressor threshold
6	**dry mix** control knob	Compressor dry mix level
7	**KNEE** pushbutton	Compressor knee: hard, medium or soft
8	**IN** switch	Compressor sidechain in/out
9	**freq** control knob	Compressor sidechain frequency
10	**WIDTH** pushbutton	Compressor sidechain width: 2 Oct, 1 Oct or 0.3 Oct
11	**ratio** control knob	Compressor ratio
12	**attack** control knob	Compressor attack
13	**MODE** pushbutton	Compressor mode: corrective, adaptive, creative, vintage or shimmer

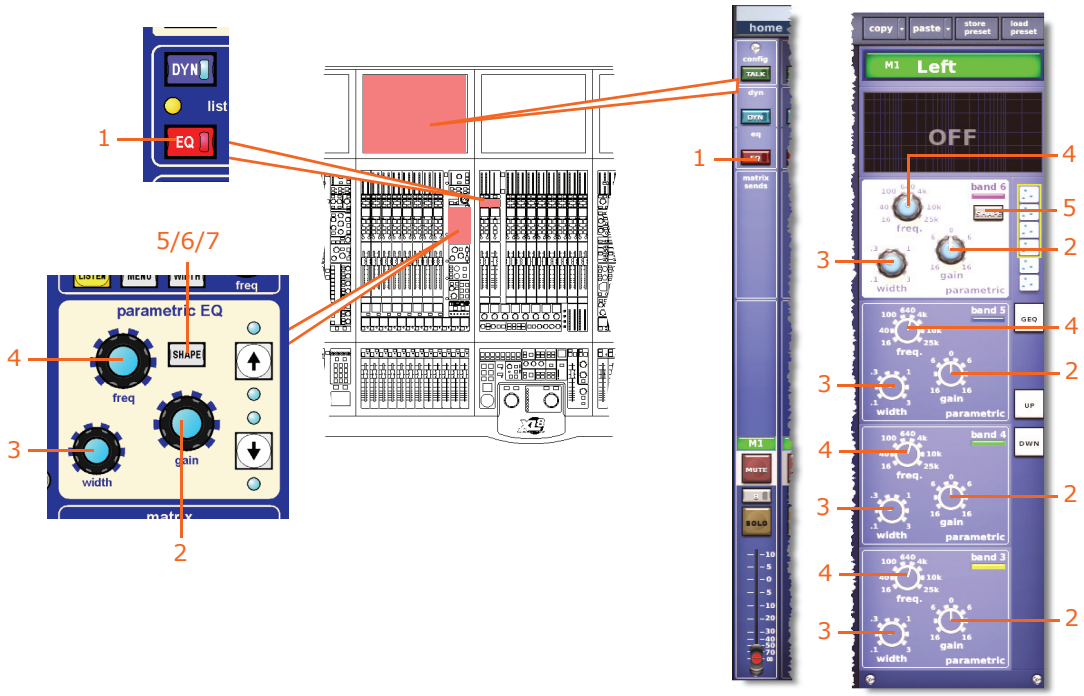
Item	*Control*	*Parameter*
14	**MORE**/[**MOR**] pushbutton	Increases the colouration produced by the compressor
15	**gain**/[**make up**] control knob	Compressor gain

Gate

Not applicable.

EQ (GEQ)

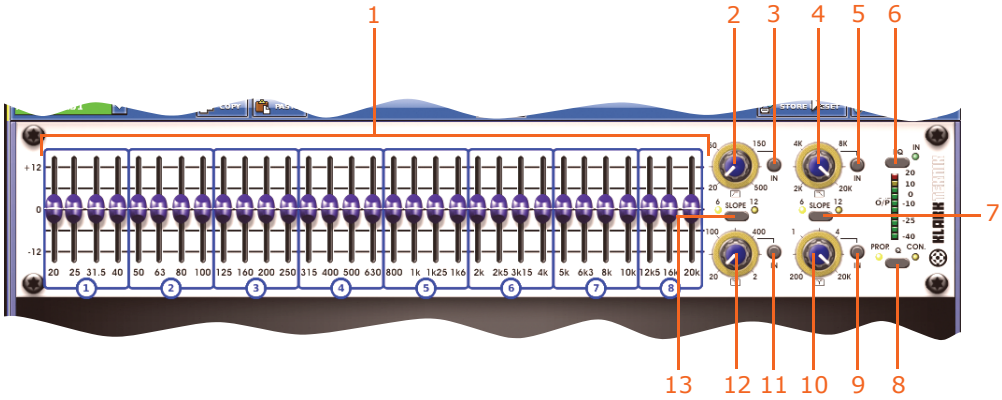
This section shows all the parameters of the EQ section (including the GEQ where appropriate) affected by copy and paste.



Item	*Control*	*Parameter*
1	**EQ** switch	EQ on/off
2	**gain** control knob	EQ gain level
3	**width** control knob	EQ width
4	**freq** control knob	EQ frequency
5	**SHAPE** switch	Band 6 shelving mode: bell, soft, low pass 6dB or low pass 12dB
6*	**SHAPE** switch	Band 2 shelving mode: bell or high pass 24dB
7*	**SHAPE** switch	Band 1 shelving mode: bell, warm, high pass 6dB or high pass 12dB

* Not shown in diagram.

Note: *Although bands 1 and 2 are not shown above, the items in the table also apply. Both bands have items 2, 3 and 4. Band 1 also has item 7, and band 2 also has item 6.*



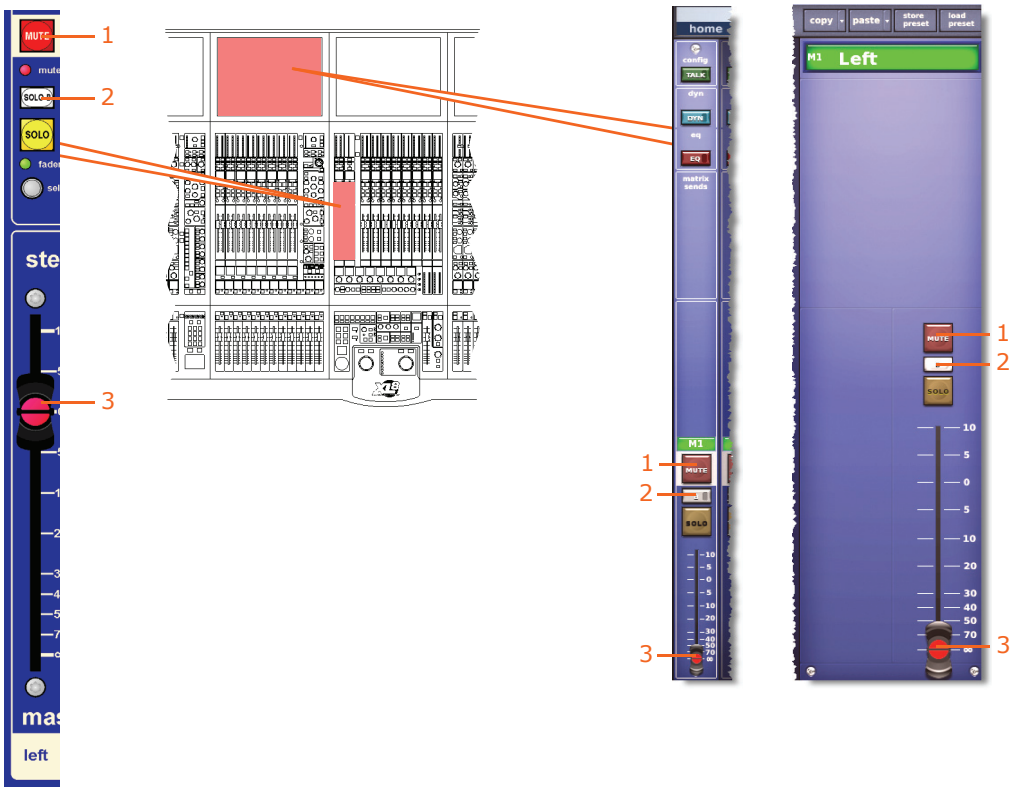
Item	*Control*	*Parameter*
1	31 faders	Fader positions
2	High pass filter control knob	High pass filter cut off frequency
3	**IN** switch	High pass filter in/out
4	Low pass filter control knob	Low pass filter cut off frequency
5	**IN** switch	Low pass filter in/out
6	**EQ** switch	EQ in/out
7	**SLOPE** switch	Low pass filter: 6dB or 12dB
8	**Q** switch	Q mode as proportional (**PROP.**) or constant (**CON.**)
9	**IN** switch	200Hz - 20kHz notch filter in/out
10	Notch filter control knob	200Hz - 20kHz notch filter frequency
11	**IN** switch	20Hz - 2kHz notch filter in/out
12	Notch filter control knob	20Hz - 2kHz notch filter frequency
13	**SLOPE** switch	High pass filter: 6dB or 12dB

Bus sends

Not applicable.

Master routing

This section shows all the parameters of the master routing affected by copy and paste.



Item	*Control*	*Parameter*
1	**MUTE** switch	Mute on/off
2	**SOLO B**/[**B**] switch	Solo B on/off
3	Fader	Level

Appendix N: Parameters Affected By Stereo Linking

This appendix shows the parameters that are linked per option (selectable globally and per pair).

Overview

The following table shows which parameters are copied across the channels per control area.

Table 22: Reference to stereo linking sections

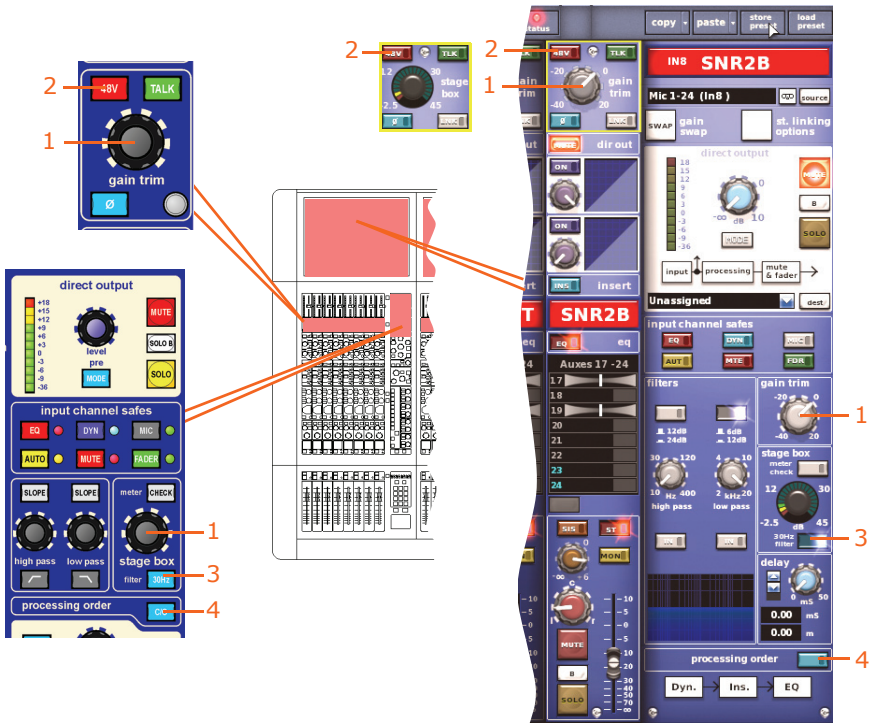
Control area	*Input Channels*	*Aux Sends (Auxes)*	*Aux Returns (Returns)*	*Matrix (Matrices)*	*Masters*
Input Controls	See page 548	See page 558	See page 567	See page 571	See page 578
Direct Output	See page 549	N/A	N/A	N/A	N/A
Direct Input	See page 549	See page 559	N/A	See page 572	See page 579
Filters	See page 550	N/A	N/A	N/A	N/A
Dynamics	See page 551	See page 560	N/A	See page 573	See page 580
Insert	See page 552	See page 561	N/A	See page 574	See page 581
EQ	See page 553	See page 562	N/A	See page 575	See page 582
Bus Sends	See page 554	See page 563	See page 568	N/A	N/A
Master Routing	See page 555	See page 564	See page 569	N/A	N/A
Fader	See page 556	See page 565	See page 570	See page 576	See page 583
Delay	See page 557	See page 566	N/A	See page 577	See page 584

Inputs

This section shows the linked parameters of the input channels.

Input controls

The following diagram shows the input control parameters that are linked across the channel pair.

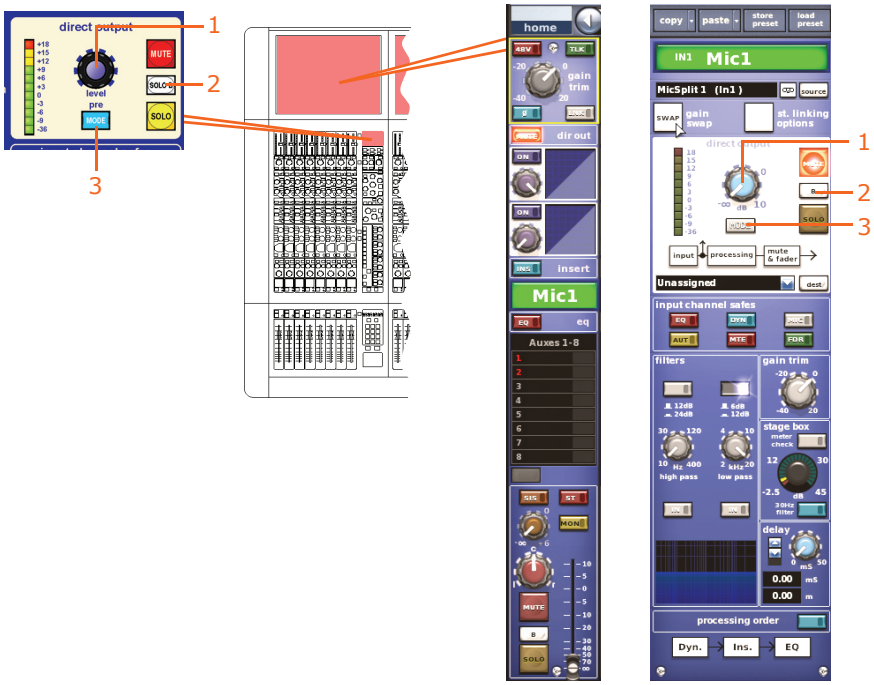


Item	*Control*	*Parameter*
1	**gain trim** control knob	Digital trim level
2	**48V** switch*	48V phantom voltage on/off
3	**30Hz** switch	30Hz filter in/out
4	**C/O** switch*	Order of processing: **Dyn.→Ins.→EQ** or **EQ→Ins.→Dyn.**

* Apply to tape and primary inputs.

Direct output

The following diagram shows the direct output control parameters that are linked across the channel pair.



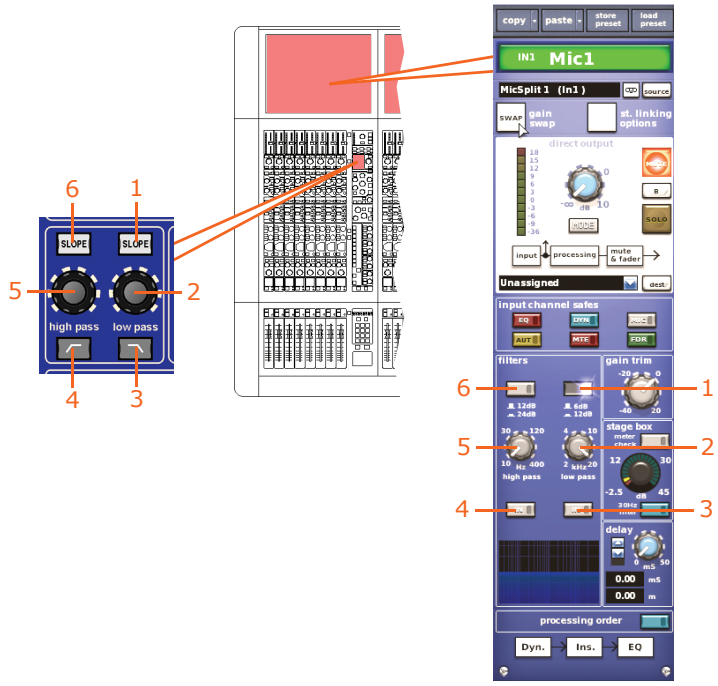
Item	*Control*	*Parameter*
1	**level** control knob	Direct output level
2	**SOLO B**/[**B**] control knob	Direct output solo B in/out
3	**MODE** pushbutton	Direct output tap-off point: “Post-fade and mute”, “Pre-mute, pre-processing” or “Pre-mute, post-processing”

Direct input

Not applicable.

Filters

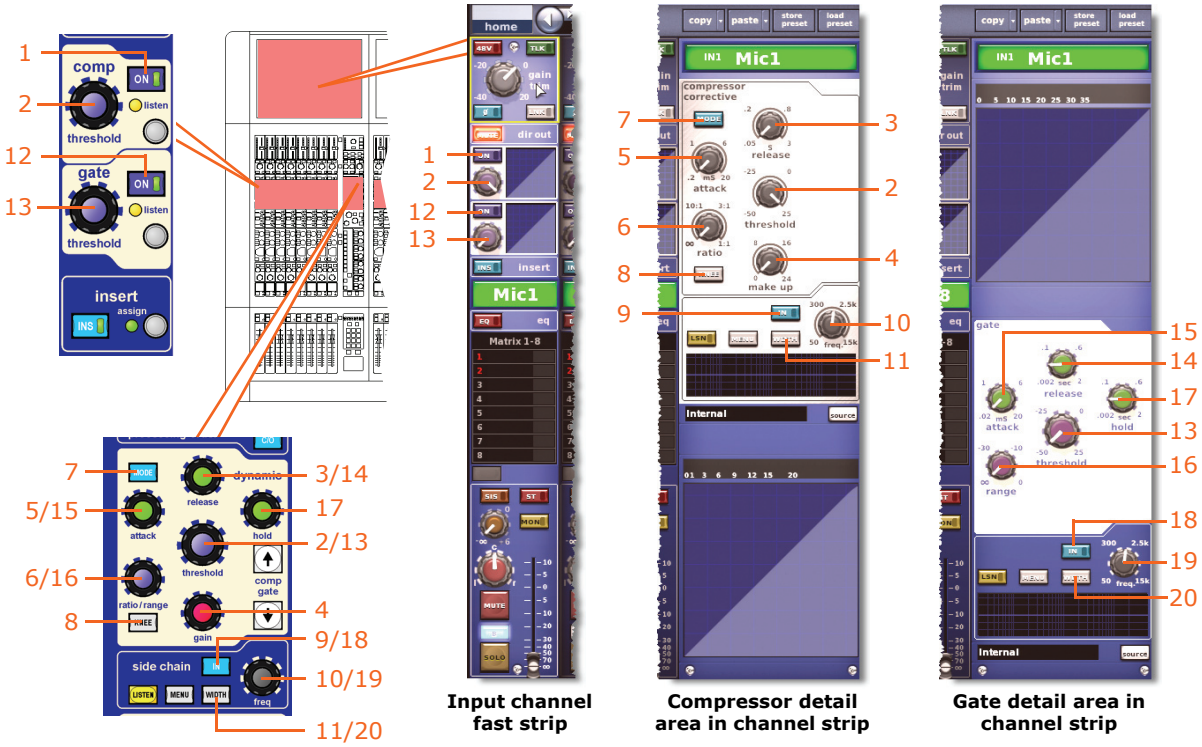
This section shows the parameters of the filters section affected by stereo linking.



Item	*Control*	*Parameter*
1	**SLOPE** pushbutton	Low pass filter slope 6dB or 12dB
2	**low pass** control knob	Low pass filter frequency
3	/[**IN**] switch	Low pass filter in/out
4	/[**IN**] switch	High pass filter in/out
5	**high pass** control knob	High pass filter frequency
6	**SLOPE** pushbutton	High pass filter slope 12dB or 24dB

Dynamics

This section shows the compressor and gate parameters of the dynamics section affected by stereo linking.



Note: *Only the corrective compressor is shown above, but this is typically the same for the other compressor modes (adaptive, creative and vintage).*

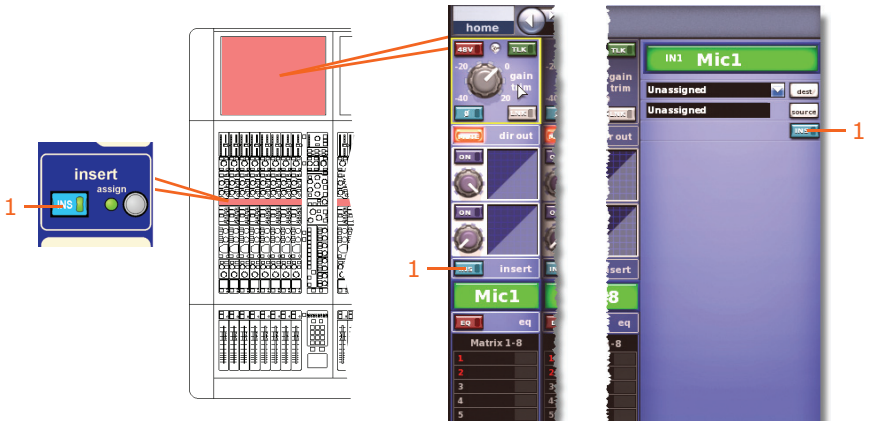
Item	*Control*	*Parameter*
1	**ON** switch	Compressor on/off
2	**threshold** control knob	Compressor threshold
3	**release** control knob	Compressor release
4	**gain**/[**make up**] control knob	Compressor make up gain
5	**attack** control knob	Compressor attack
6	**ratio/range**/[**ratio**] control knob	Compressor ratio
7	**MODE** pushbutton	Compressor mode: corrective, adaptive, creative or vintage
8	**KNEE** pushbutton	Compressor knee: hard, medium or soft
9	**IN** switch	Compressor sidechain in/out
10	**freq** control knob	Compressor sidechain frequency
11	**WIDTH** pushbutton	Compressor sidechain width: 2 Oct, 1 Oct or 0.3 Oct

Item	*Control*	*Parameter*
12	**ON** switch	Gate on/off
13	**threshold** control knob	Gate threshold
14	**release** control knob	Gate release
15	**attack** control knob	Gate attack
16	**ratio/range**/[**range**] control knob	Gate range
17	**hold** control knob	Gate hold
18	**IN** switch	Gate sidechain in/out
19	**freq** control knob	Gate sidechain frequency
20	**WIDTH** pushbutton	Gate sidechain width (unlabelled) selector: 2 Oct, 1 Oct and 0.3 Oct

Note: *The compressor and gate sidechains of stereo paired channels are always linked such that they ensure the same amount of gain reduction is applied to both channels.*

Insert

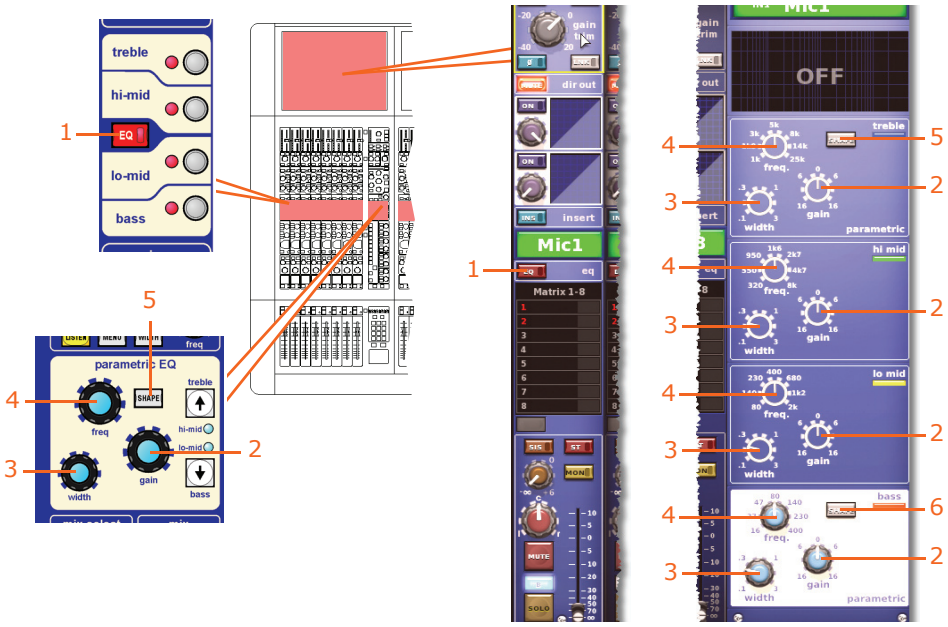
This section shows the parameters of the insert section affected by stereo linking.



Item	*Control*	*Parameter*
1	**INS** switch	Insert in/out

EQ

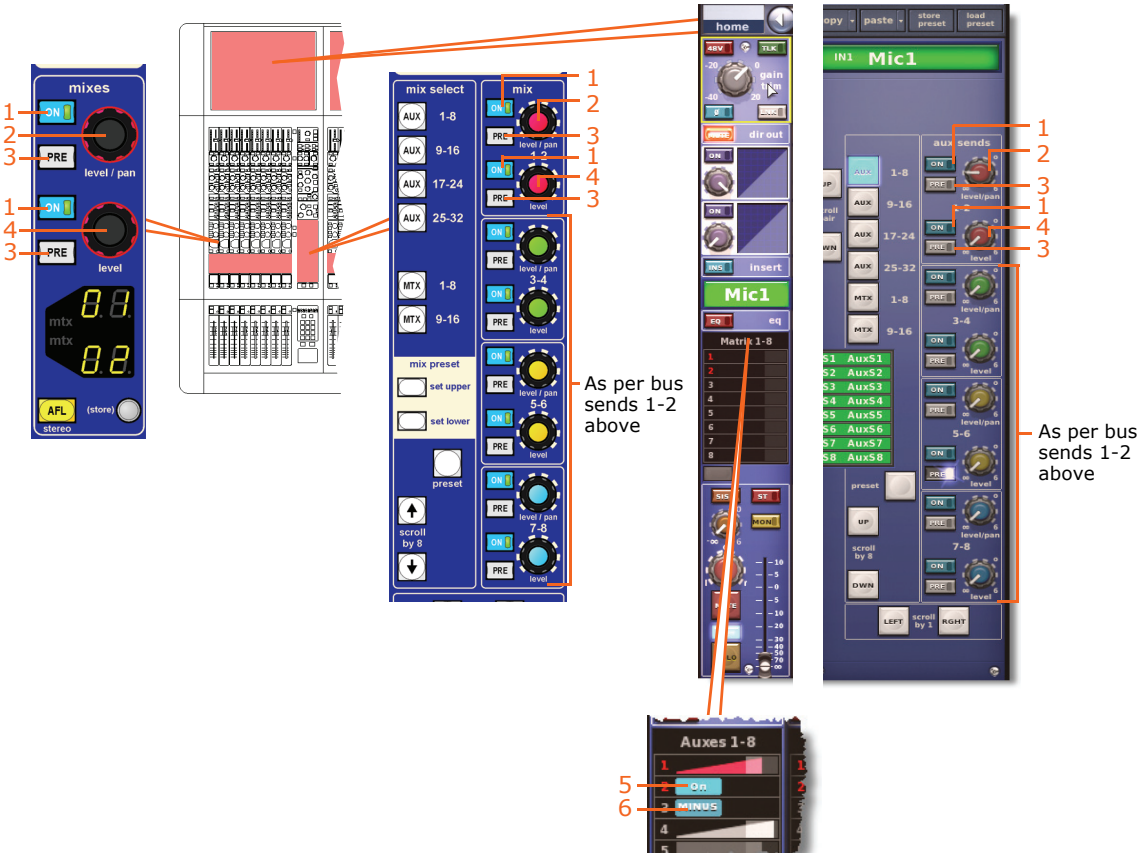
The following diagram shows the EQ parameters affected by stereo linking.



Item	*Control*	*Parameter*
1	**EQ** switch	EQ on/off
2	**gain** control knob	EQ gain level
3	**width** control knob	EQ width
4	**freq** control knob	EQ frequency
5	**SHAPE** switch	Treble shelving mode: peaking, bright, classic or soft
6	**SHAPE** switch	Bass shelving mode: peaking, deep, classic or warm

Bus sends

The following diagram shows the input bus sends affected by stereo linking, and applies to the 32 auxes and 16 matrices.

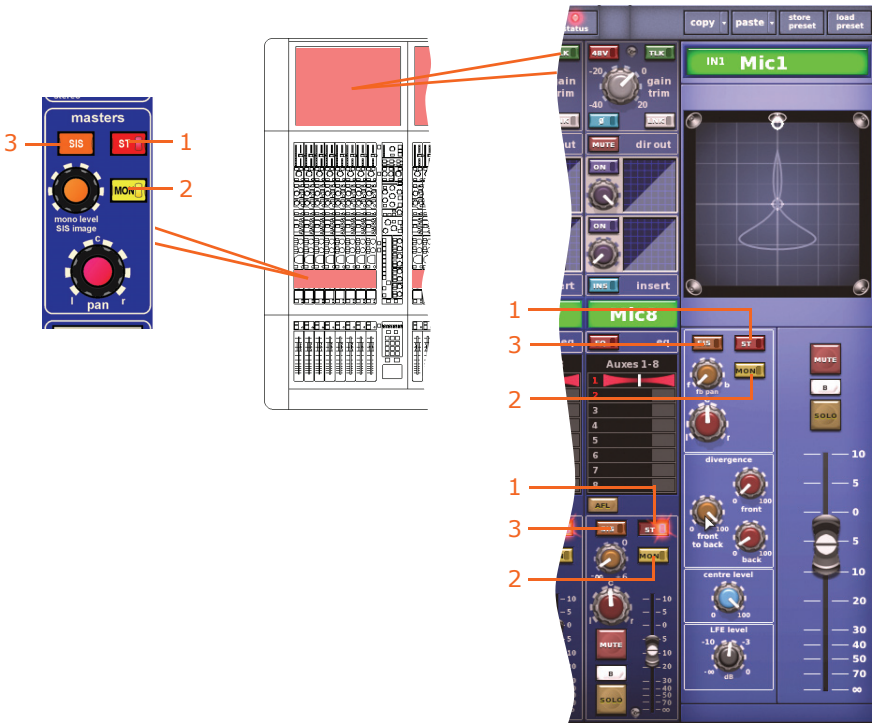


Note: *Only matrix sends 1 to 8 are shown above, but this is typically the same for all of the bus sends (16 matrices and 32 auxes).*

Item	*Control*	*Parameter*
1	**ON** switch	Bus send on/off
2	**level/pan** control knob	Bus level, or pan when bus is linked. (When sending onto a stereo bus the send pan controls are not linked.)
3	**PRE** switch	Pre-fader on/off
4	**level** control knob	Bus level
5	**On** switch	Aux bus send on/off — only available when aux bus is in group mode
6	**MINUS** switch	Aux bus send mute on/off — only available when aux bus is in mix minus mode

Master routing

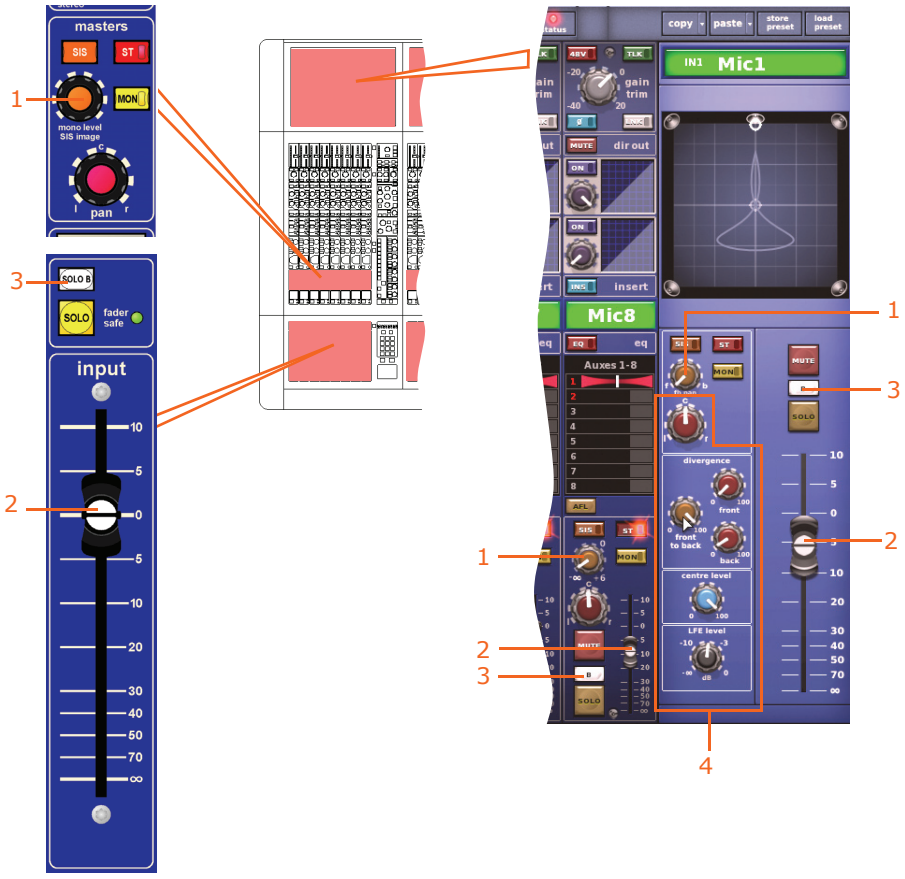
This section shows the parameters of the master routing affected by stereo linking.



Item	*Control*	*Parameter*
1	**ST** switch	Stereo on/off
2	**MON** switch	Mono on/off
3	**SIS** switch	Spatial imaging system on/off

Fader

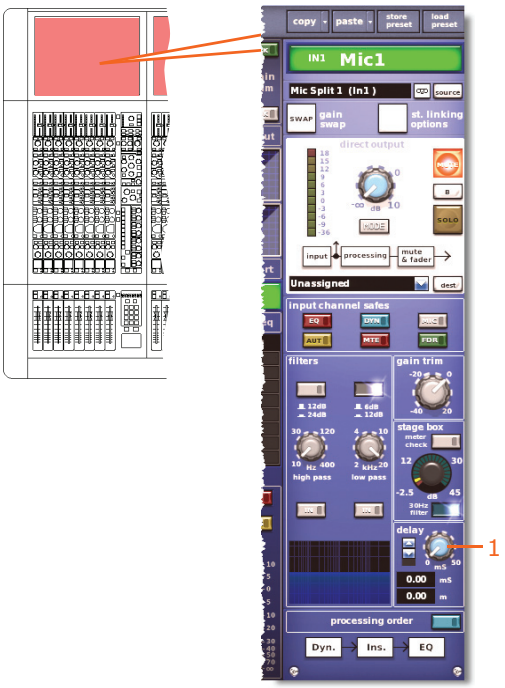
This section shows the fader parameters affected by stereo linking.



Item	*Control*	*Parameter*
1	**mono level/SIS image** control knob	Mono send level. (Only linked when SIS is out on both channels and surround mode is not selected.)
2	Fader	Fader level
3	**SOLO B**/[**B**] control knob	Solo B in/out
4	Panning control knobs	Surround panning (includes all surround sound parameters)

Delay

The following diagram shows the delay parameters affected by stereo linking.



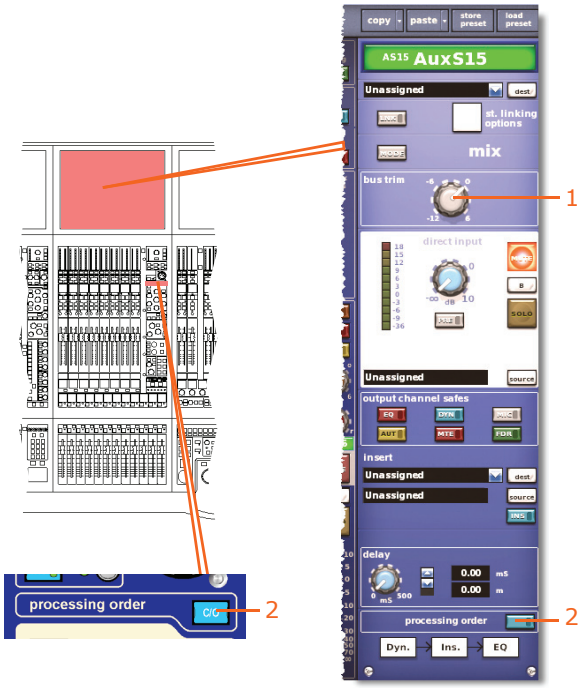
Item	*Control*	*Parameter*
1	**delay** control knob	Delay time

Aux

This section shows the linked parameters of the aux channels.

Input controls

The following diagram shows the input control parameters that are linked across the channel pair.



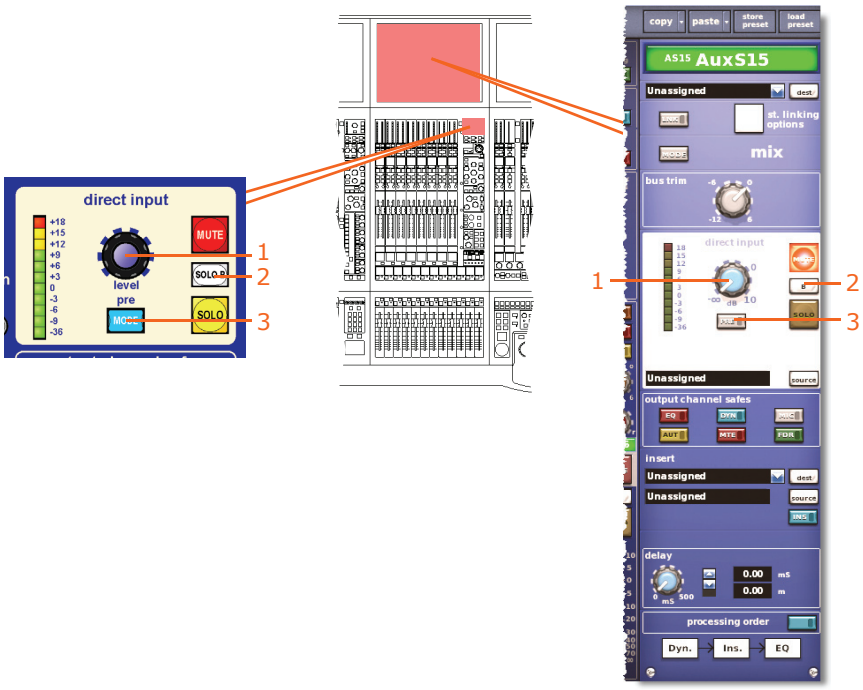
Item	*Control*	*Parameter*
1	**bus trim** control knob	Bus trim level
2	**C/O** switch	Order of processing: **Dyn.→Ins.→EQ** or **EQ→Ins.→Dyn.**

Direct output

Not applicable.

Direct input

The following diagram shows the direct output control parameters that are linked across the aux channel pair.



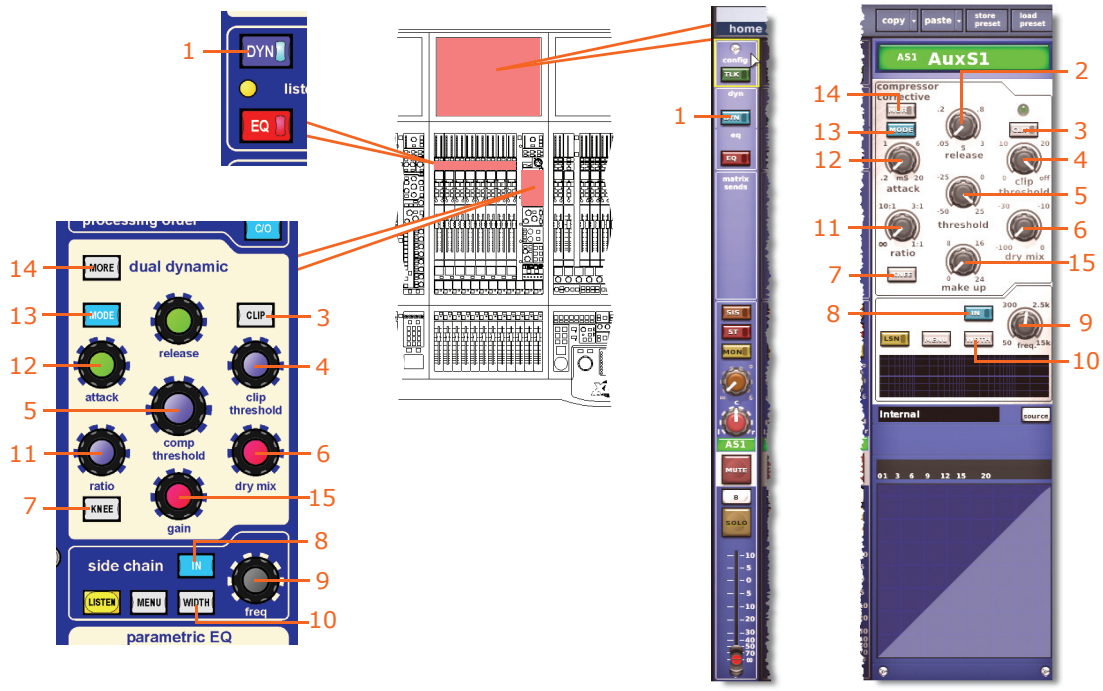
Item	*Control*	*Parameter*
1	**level** control knob	Direct input level
2	**SOLO B**/[**B**] switch	Direct input solo B on/off
3	**MODE**/[**PRE**] switch	Direct input pre- in/out

Filters

Not applicable.

Dynamics

This section shows the compression parameters of the dynamics section affected by stereo linking. Only corrective compressor shown below, but this is typically the same for the other compressor modes.

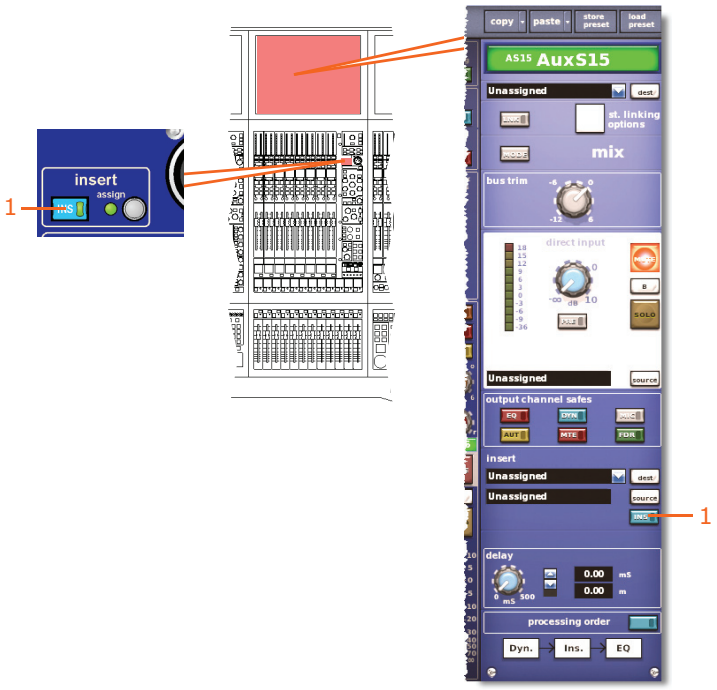


Item	*Control*	*Parameter*
1	**DYN** switch	Compressor on/off
2	**release** control knob	Compressor release
3	**CLIP** switch	Compressor clip on/off
4	**clip** control knob	Compressor clip
5	**comp threshold**/ [**threshold**] control knob	Compressor threshold
6	**dry mix** control knob	Dry mix level
7	**KNEE** pushbutton	Compressor knee: hard, medium or soft
8	**IN** switch	Compressor sidechain in/out
9	**freq.** control knob	Compressor sidechain frequency
10	**WIDTH** pushbutton	Compressor sidechain width: 2 Oct, 1 Oct or 0.3 Oct
11	**ratio** control knob	Compressor ratio
12	**attack** control knob	Compressor attack
13	**MODE** pushbutton	Compressor mode: corrective, adaptive, creative, vintage or shimmer

Item	Control	Parameter
14	**MORE**/[**MOR**] pushbutton	Increases the colouration produced by the compressor
15	**gain**/[**make up**] control knob	Compressor gain

Insert

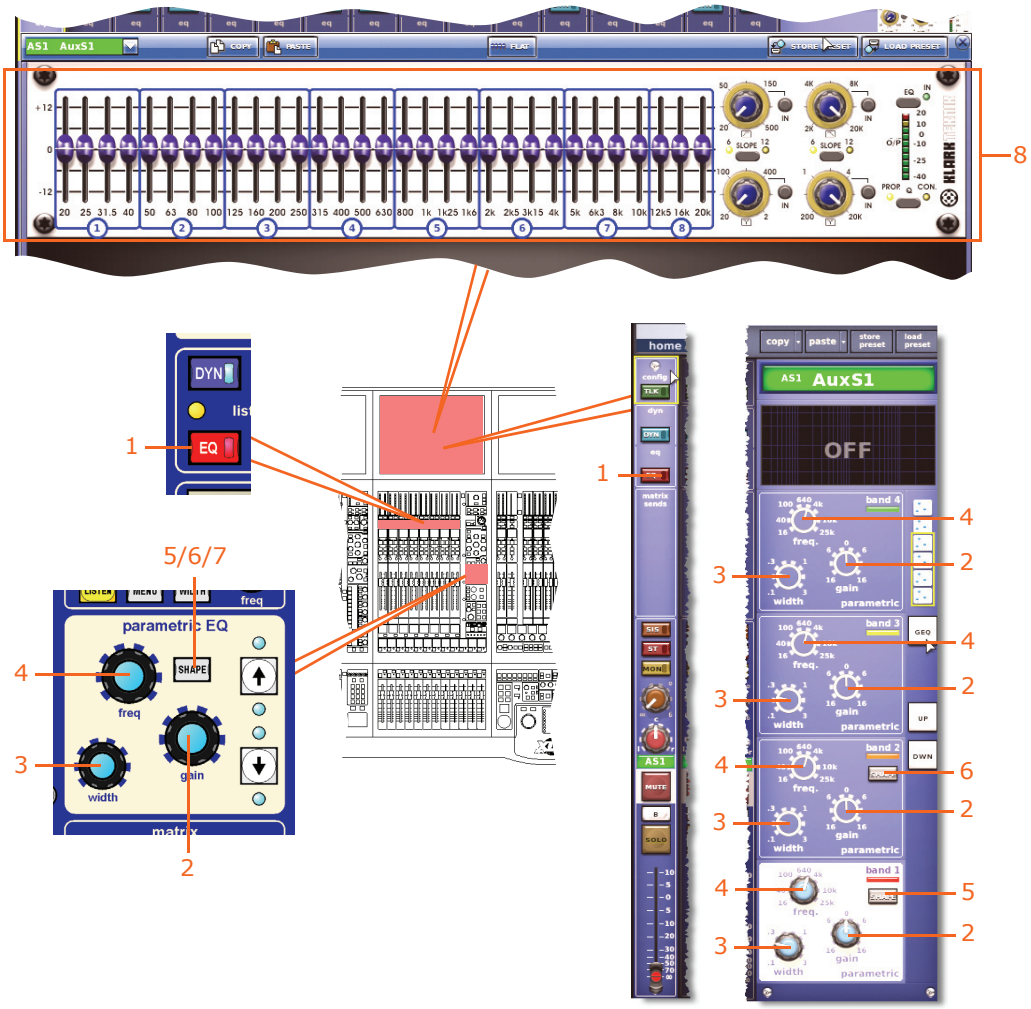
This section shows the parameters of the insert section affected by stereo linking.



Item	Control	Parameter
1	**INS** switch	Insert in/out

EQ

This section shows the EQ and GEQ parameters affected by stereo linking.



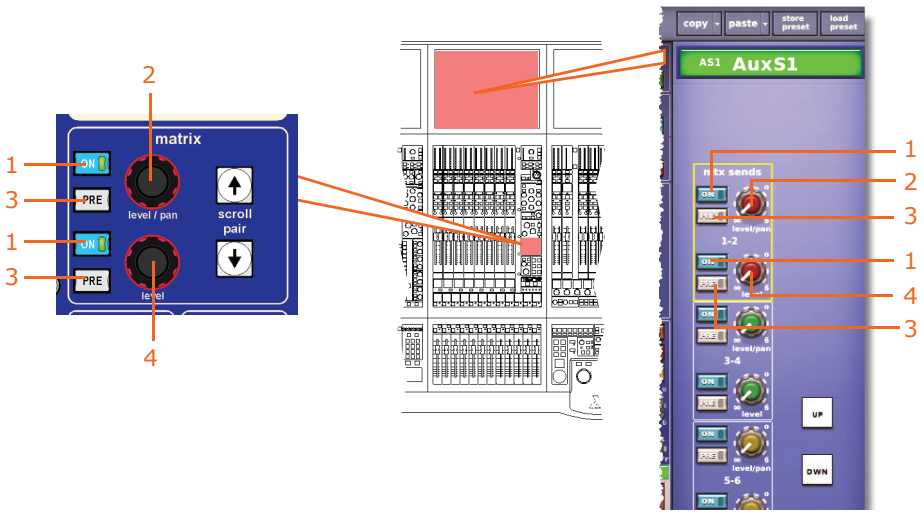
Item	*Control*	*Parameter*
1	**EQ** switch	EQ on/off
2	**gain** control knob	EQ gain level
3	**width** control knob	EQ width
4	**freq** control knob	EQ frequency
5	**SHAPE** switch	Band 1 shelving mode: bell, warm, high pass 6dB or high pass 12dB
6	**SHAPE** switch	Band 2 shelving mode: bell or high pass 24dB
7*	**SHAPE** switch	Band 6 shelving modes: bell, soft, low pass 6dB or low pass 12dB
8	GEQ	All GEQ parameters. (GEQ parameters linked when both linked channels have a GEQ assigned to them.)

* Not shown in diagram.

Note: *Although bands 5 and 6 are not shown above, the items in the table also apply. Both bands have items 2, 3 and 4, and band 6 also has item 7.*

Bus sends

The following diagram shows the bus sends affected by stereo linking.

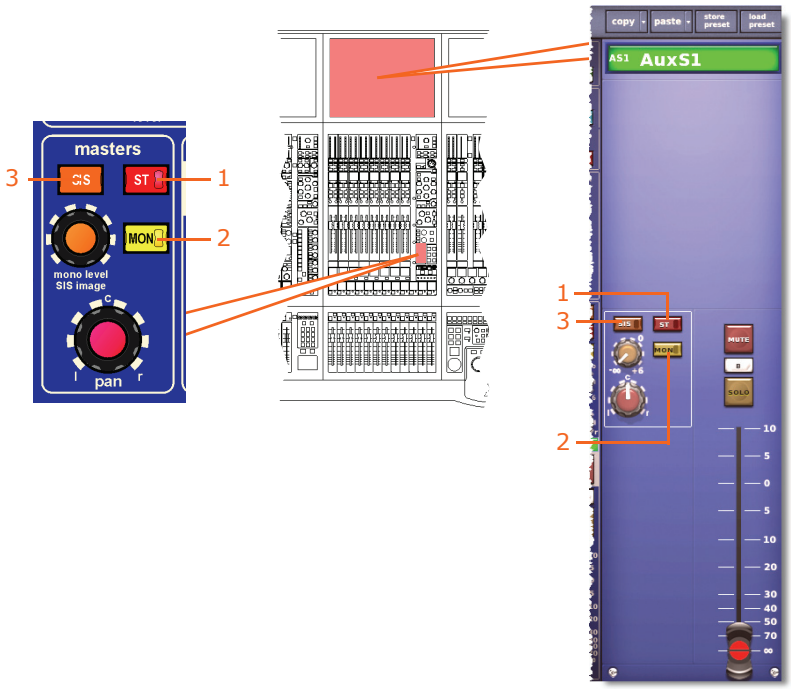


Note: *Although only matrix sends 1-2 are referenced above, this also applies to all 16 matrix sends.*

Item	*Control*	*Parameter*
1	**ON** switch	Matrix bus send on/off
2	**level/pan** control knob	Bus level, or pan when bus is linked. (The pans are not linked, only the sends levels are linked.)
3	**PRE** switch	Pre-fader on/off
4	**level** control knob	Bus level

Master routing

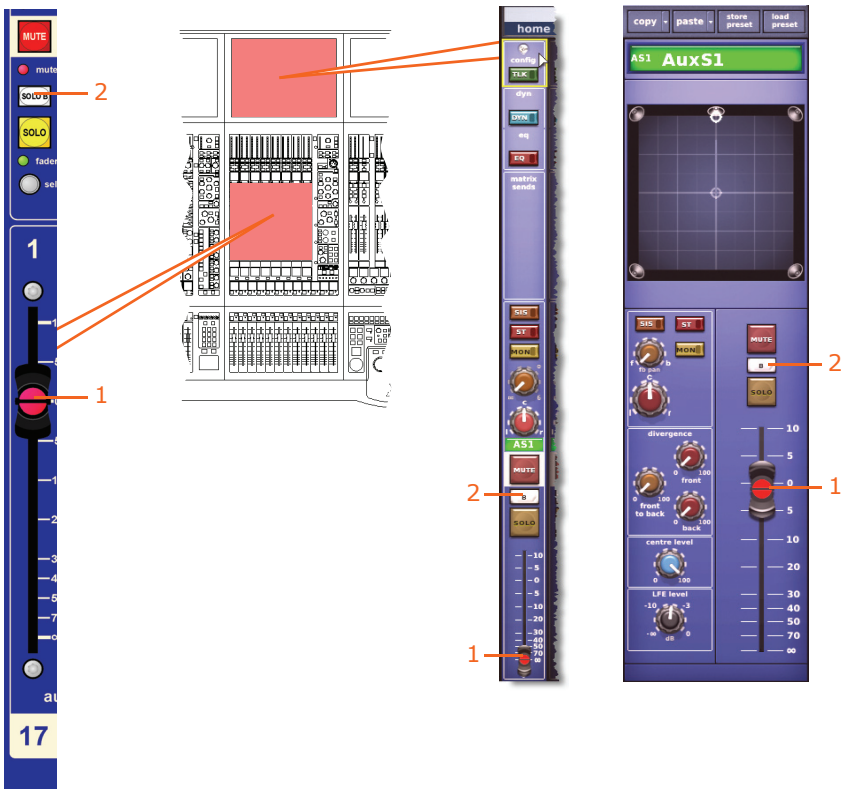
This section shows the master routing parameters affected by stereo linking.



Item	*Control*	*Parameter*
1	**ST** switch	Stereo on/off
2	**MON** switch	Mono on/off
3	**SIS** switch	Spatial imaging system on/off

Fader

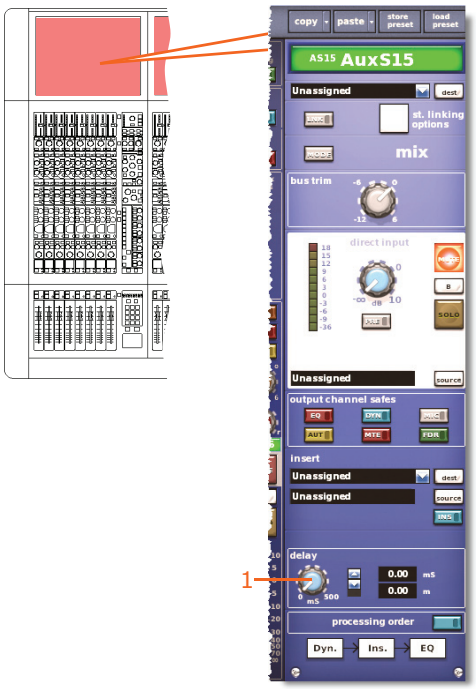
This section shows the fader parameters affected by stereo linking.



Item	*Control*	*Parameter*
1	Fader	Level
2	**SOLO B**/[**B**]	Solo B on/off

Delay

The following diagram shows the delay parameters affected by stereo linking.



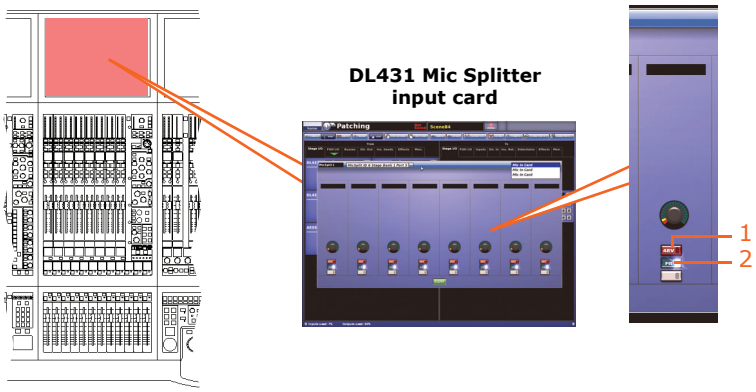
Item	*Control*	*Parameter*
1	**delay** control knob	Delay time

Return

This section shows the linked parameters of the return channels.

Input controls

This section shows the parameters of the input controls affected by stereo linking.



Item	*Control*	*Parameter*
1	**48V** switch*	48V phantom voltage in/out
2	**Flt** switch*	30Hz filter in/out

* Applies to tape and primary inputs.

Direct output

Not applicable.

Direct input

Not applicable.

Filters

Not applicable.

Dynamics

Not applicable.

Insert

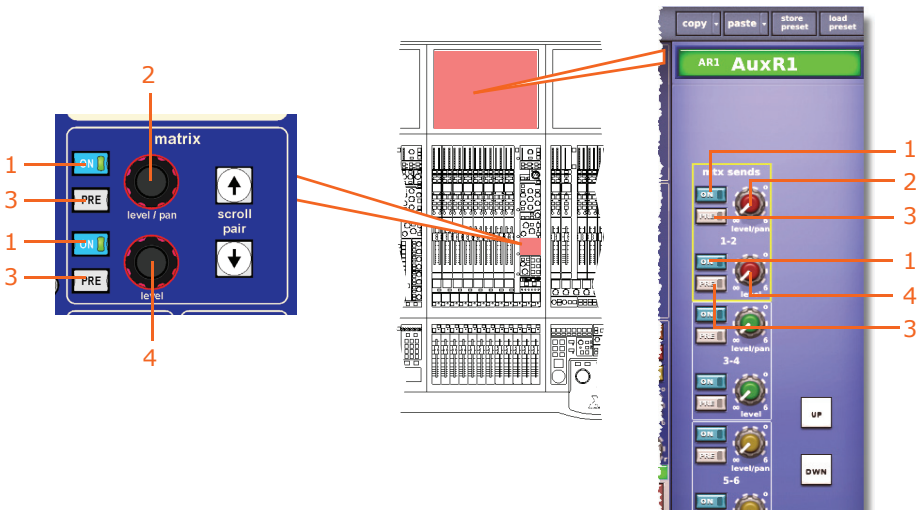
Not applicable.

EQ

Not applicable.

Bus sends

The following diagram shows the bus sends affected by stereo linking.

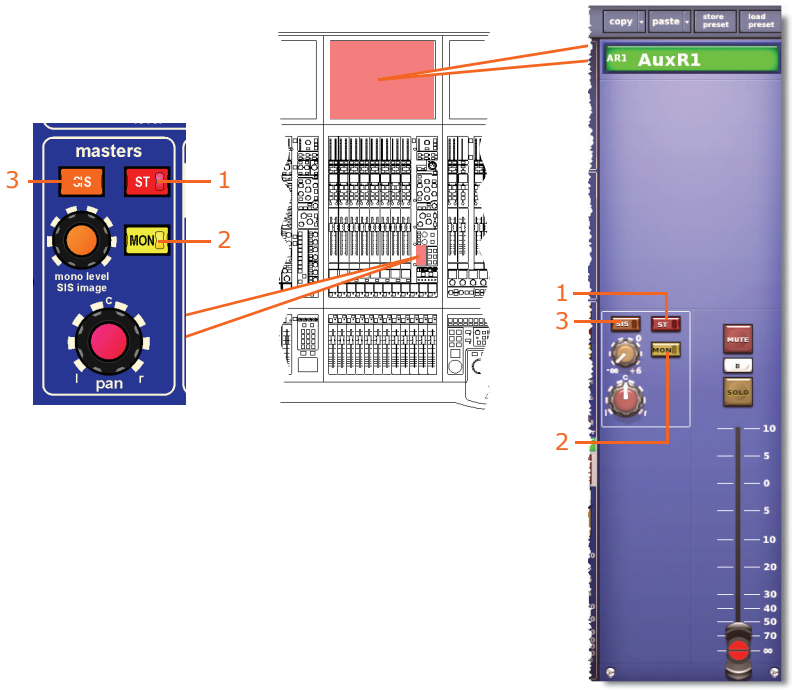


Note: *Although only matrix sends 1-2 are referenced above, this also applies to all 16 matrix sends.*

Item	*Control*	*Parameter*
1	**ON** switch	Matrix bus send on/off
2	**level/pan** control knob	Bus level, or pan when bus is linked. (The pans are not linked, only the sends levels are linked.)
3	**PRE** switch	Pre-fader on/off
4	**level** control knob	Bus level

Master routing

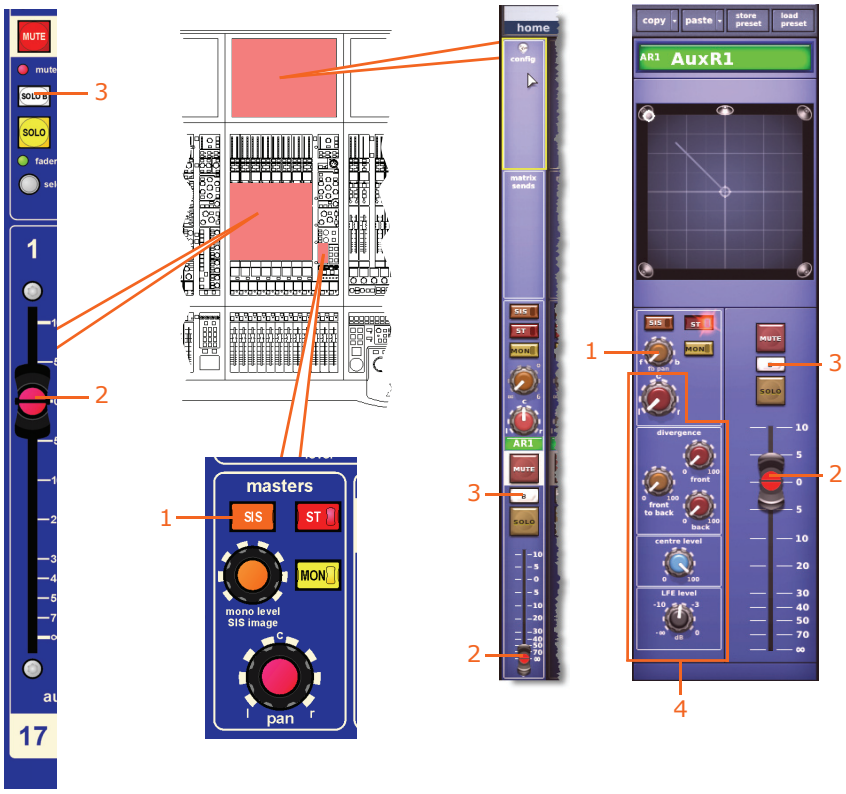
This section shows the parameters of the master routing affected by stereo linking.



Item	*Control*	*Parameter*
1	**ST** switch	Stereo on/off
2	**MON** switch	Mono on/off
3	**SIS** switch	Spatial imaging system on/off

Fader

This section shows the fader parameters affected by stereo linking.



Item	*Control*	*Parameter*
1	**mono level/SIS image** control knob	Mono send level. (Only linked when **SIS** is out on both channels and surround mode is off.)
2	Fader	Level
3	**SOLO B**/[**B**]	Solo B on/off
4	Surround control knobs	Surround panning levels

Delay

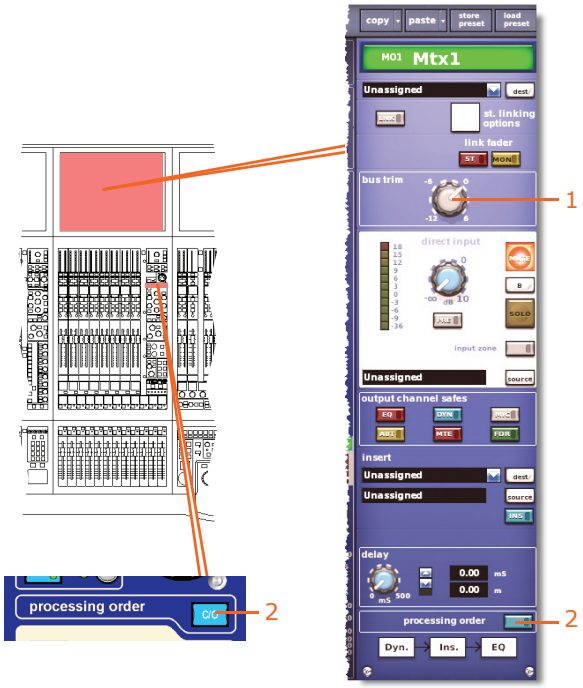
Not applicable.

Matrix

This section shows the linked parameters of the matrix channels.

Input controls

The following diagram shows the input control parameters that are linked across the matrix channel pair.



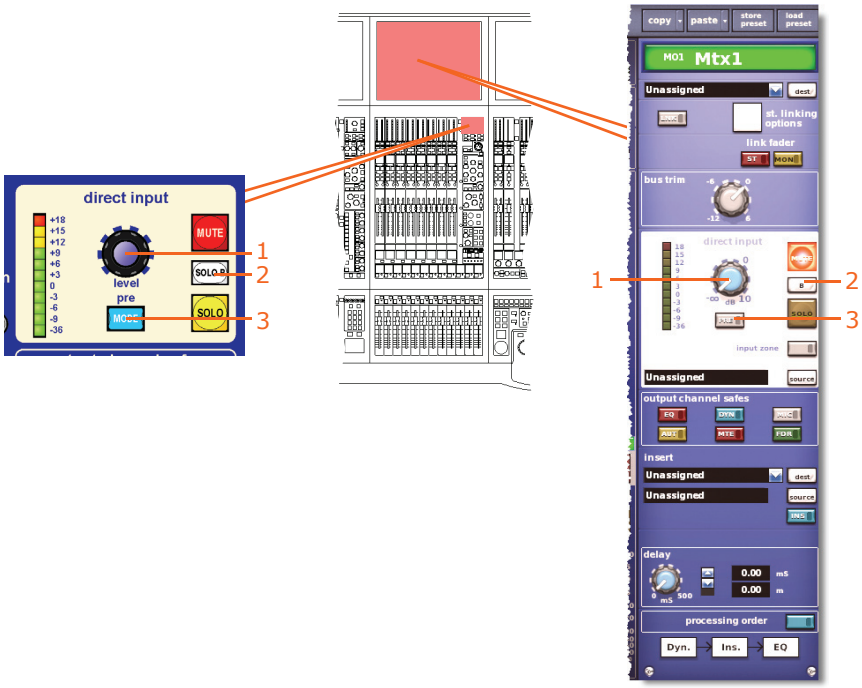
Item	*Control*	*Parameter*
1	Control knob	Bus trim level
2	**C/O** switch	Order of processing: **Dyn.→Ins.→EQ** or **EQ→Ins.→Dyn.**

Direct output

Not applicable.

Direct input

The following diagram shows the direct input control parameters that are linked across the matrix channel pair.



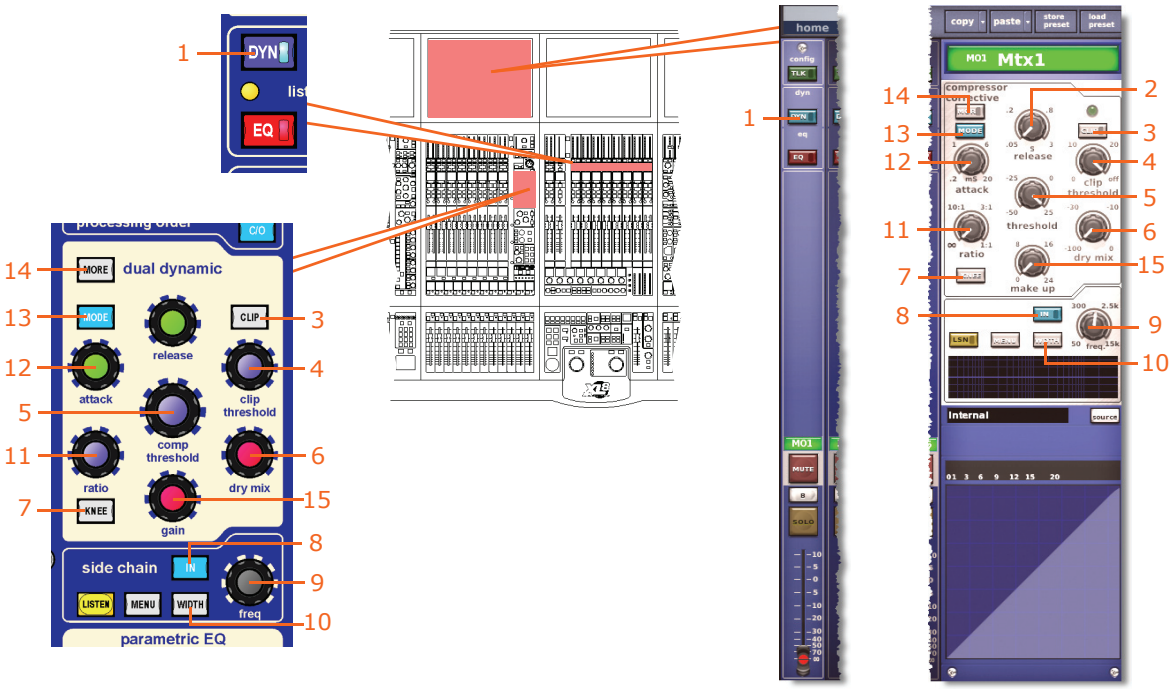
Item	*Control*	*Parameter*
1	**level** control knob	Direct input level
2	**SOLO B**/[**B**] switch	Direct input solo B on/off
3	**MODE**/[**PRE**] switch	Direct input pre- in/out

Filters

Not applicable.

Dynamics

This section shows the compressor parameters affected by stereo linking. Only corrective compressor shown below, but this is typically the same for the other compressor modes.

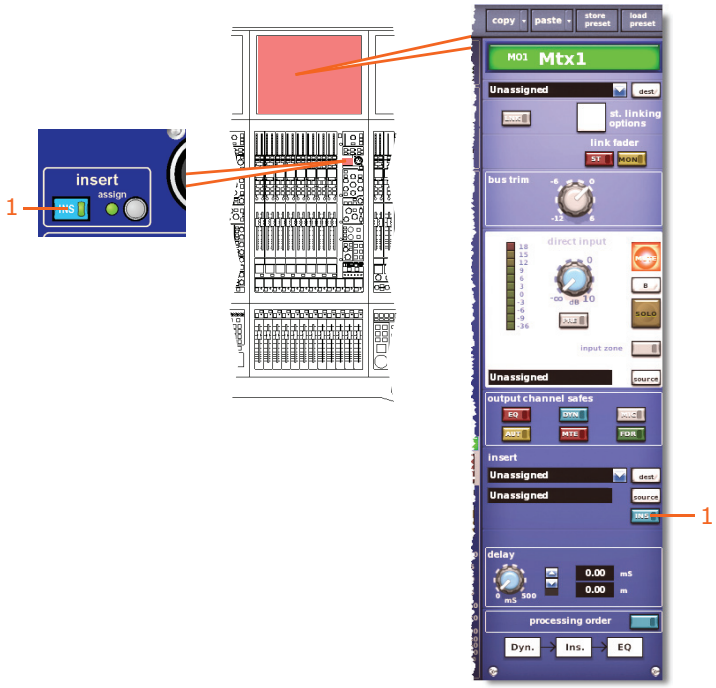


Item	*Control*	*Parameter*
1	**DYN** switch	Compressor on/off
2	**release** control knob	Compressor release
3	**CLIP** switch	Compressor clip on/off
4	**clip** control knob	Compressor clip
5	**comp threshold**/ [**threshold**] control knob	Compressor threshold
6	**dry mix** control knob	Dry mix level
7	**KNEE** pushbutton	Compressor knee: hard, medium or soft
8	**IN** switch	Compressor sidechain in/out
9	**freq.** control knob	Compressor sidechain frequency
10	**WIDTH** pushbutton	Compressor sidechain width: 2 Oct, 1 Oct or 0.3 Oct
11	**ratio** control knob	Compressor ratio
12	**attack** control knob	Compressor attack
13	**MODE** pushbutton	Compressor mode: corrective, adaptive, creative, vintage or shimmer

Item	Control	Parameter
14	**MORE**/[**MOR**] pushbutton	Increases the colouration produced by the compressor
15	**gain**/[**make up**] control knob	Compressor gain

Insert

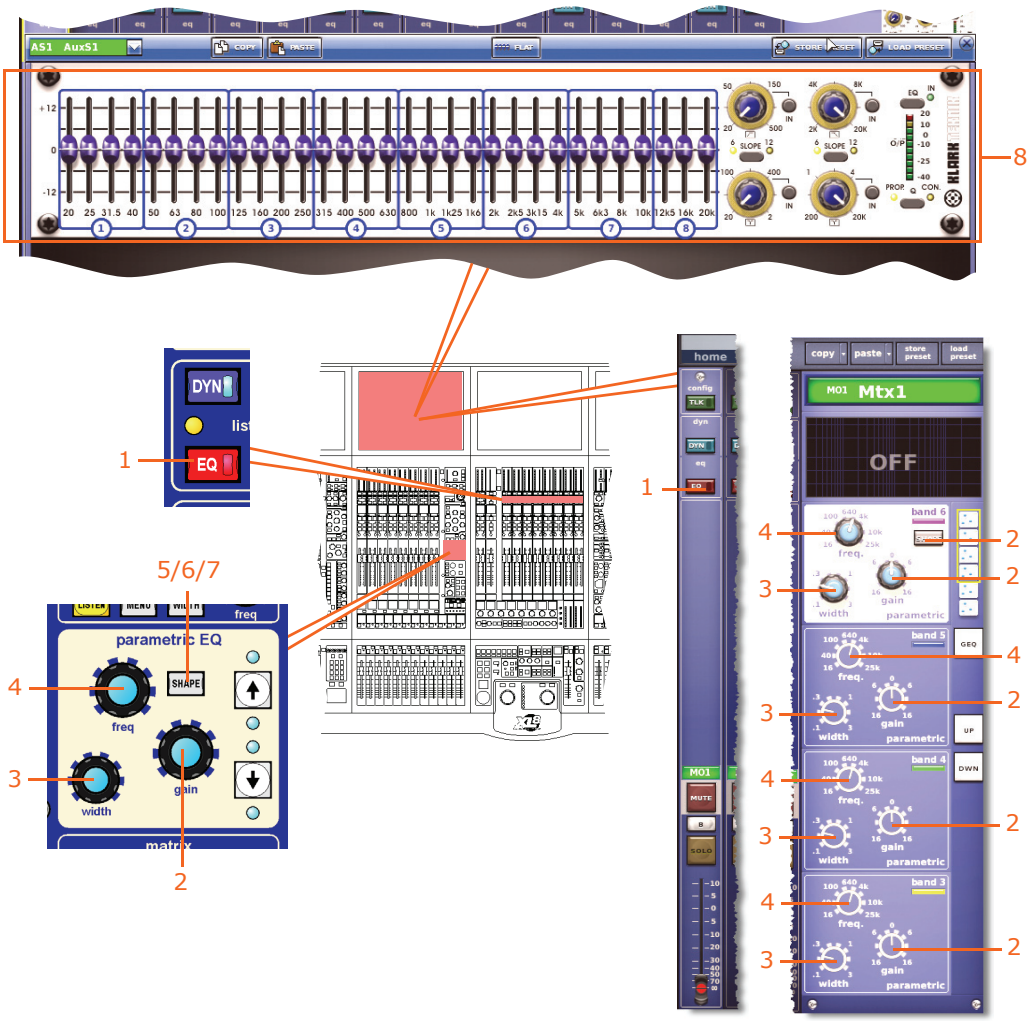
This section shows the parameters of the insert section affected by stereo linking.



Item	Control	Parameter
1	**INS** switch	Insert in/out

EQ

This section shows the parameters of the EQ section affected by stereo linking.



Item	*Control*	*Parameter*
1	**EQ** switch	EQ on/off
2	**gain** control knob	EQ gain level
3	**width** control knob	EQ width
4	**freq.** control knob	EQ frequency
5	**SHAPE** switch	Band 6 shelving mode: bell, soft, low pass 6dB or low pass 12dB
6*	**SHAPE** switch	Band 2 shelving mode: bell or high pass 24dB
7*	**SHAPE** switch	Band 1 shelving mode: bell, warm, high pass 6dB or high pass 12dB
8	GEQ	All GEQ parameters. (GEQ parameters linked when both linked channels have a GEQ assigned to them.)

* Not shown in diagram.

Note: *Although bands 1 and 2 are not shown above, the items in the table also apply. Both bands have items 2, 3 and 4. Band 1 also has item 7, and band 2 also has item 6.*

Bus sends

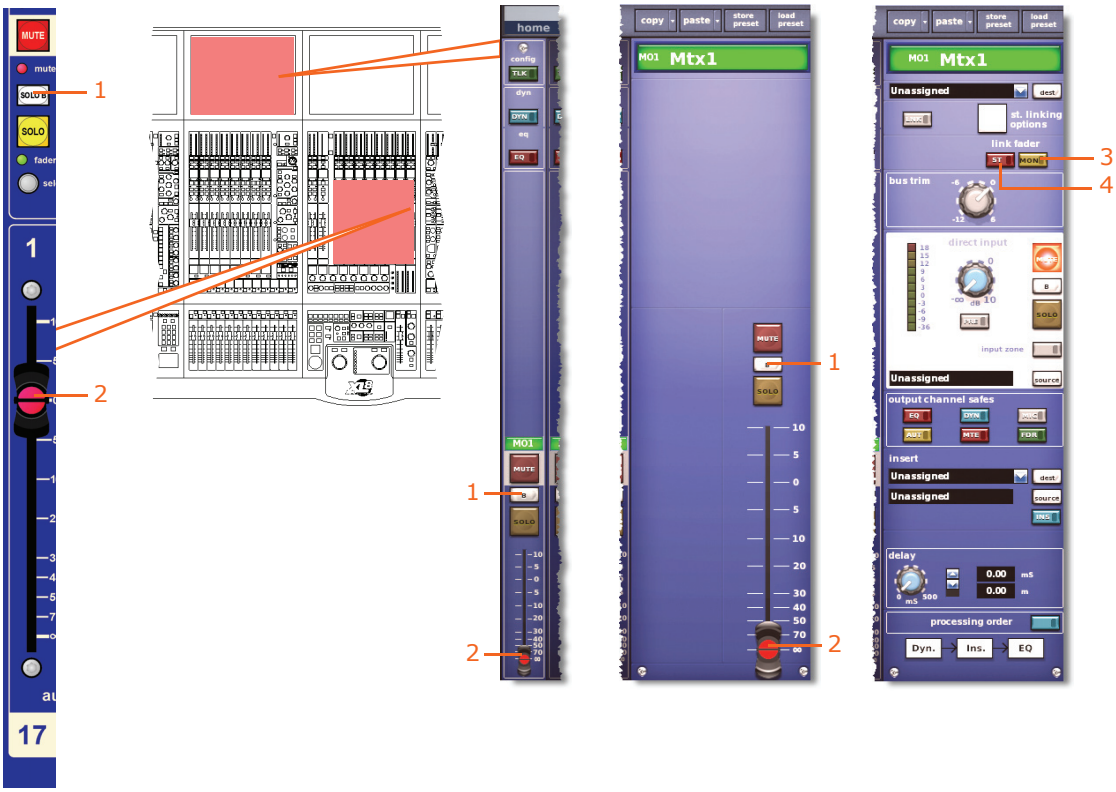
Not applicable.

Master routing

Not applicable.

Fader

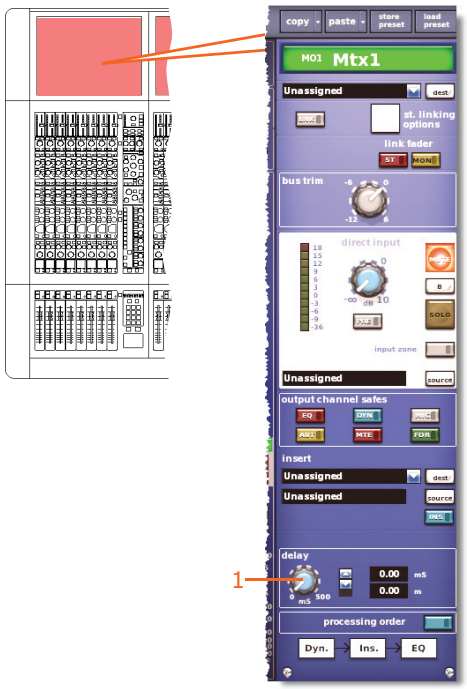
This section shows the fader parameters affected by stereo linking.



Item	*Control*	*Parameter*
1	**SOLO B**/[**B**]	Solo B on/off
2	Fader	Level
3	**MON** switch	Link to mono master fader
4	**ST** switch	Link to stereo master fader

Delay

The following diagram shows the delay parameters affected by stereo linking.



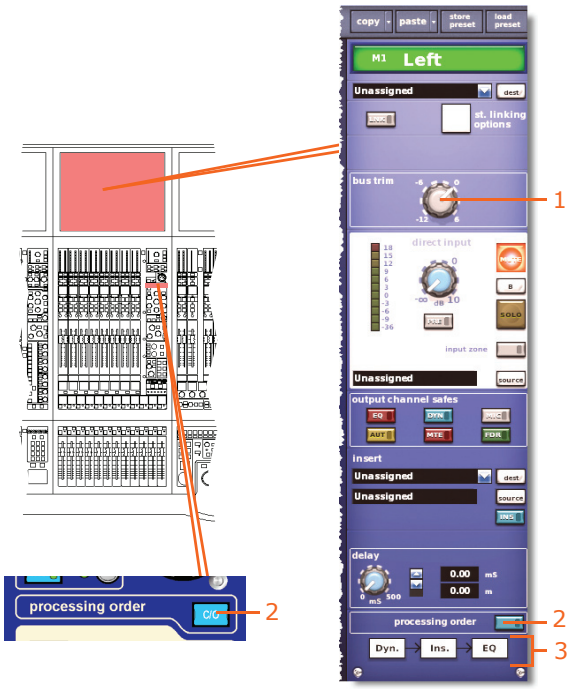
Item	*Control*	*Parameter*
1	**delay** control knob	Delay time

Master

This section shows the linked parameters of the master channels.

Input controls

The following diagram shows the input control parameters that are linked across the master channel pair.



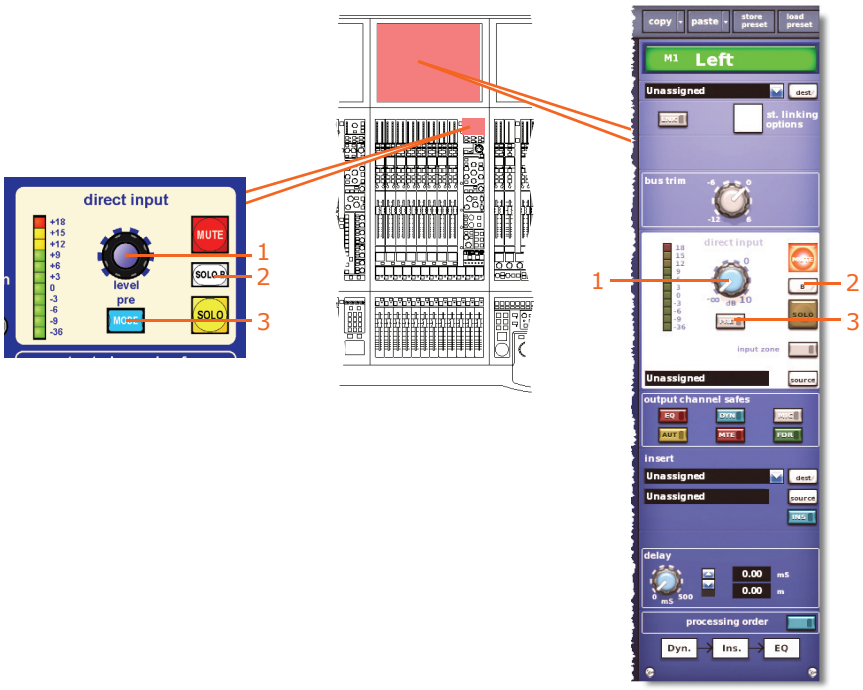
Item	*Control*	*Parameter*
1	Control knob	Bus trim level
2	**C/O** switch	Order of processing: **Dyn.→Ins.→EQ** or **EQ→Ins.→Dyn.**
3	Graphic	Order of processing

Direct output

Not applicable.

Direct input

The following diagram shows the direct output control parameters that are linked across the master channel pair.



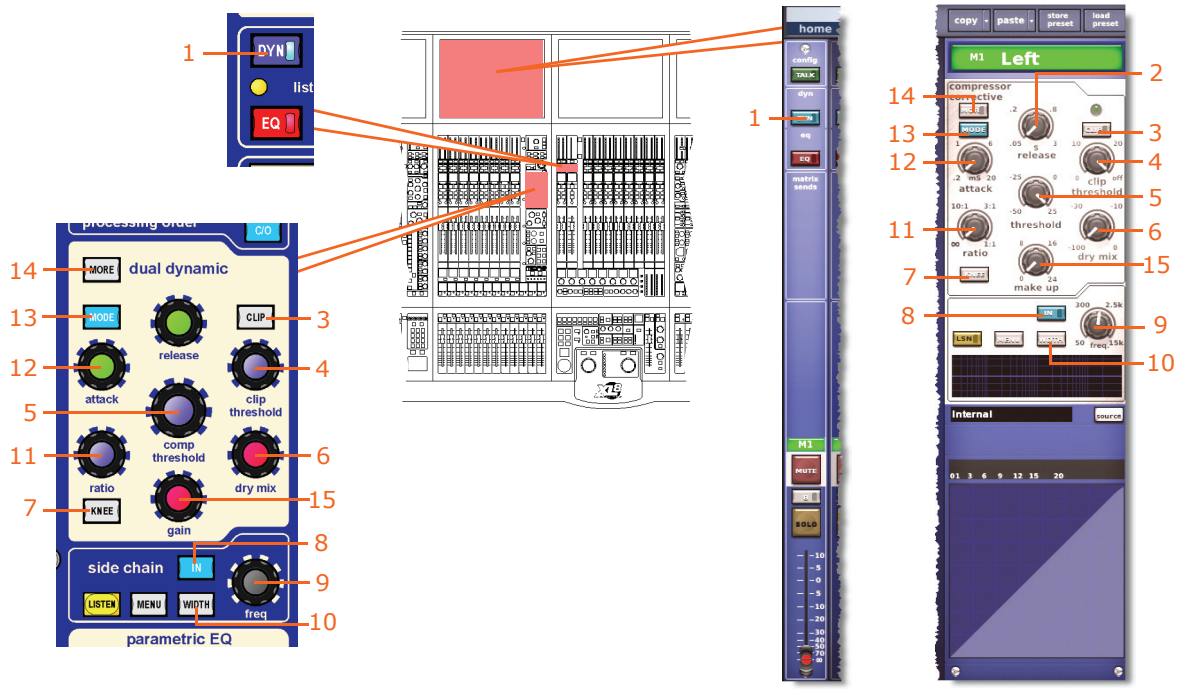
Item	*Control*	*Parameter*
1	**level** control knob	Direct input level
2	**SOLO B**/[**B**] switch	Direct input solo B on/off
3	**MODE**/[**PRE**] switch	Direct input pre- in/out

Filters

Not applicable.

Dynamics

This section shows all the compression parameters of the dynamics section affected by stereo linking. Only corrective compressor shown below, but typically the same for the other compressor modes.

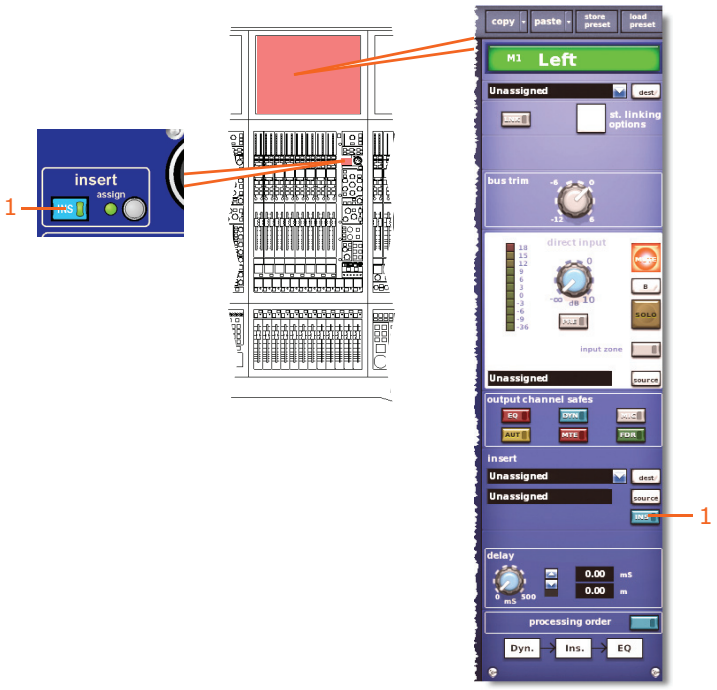


Item	Control	Parameter
1	**DYN** switch	Compressor on/off
2	**release** control knob	Compressor release
3	**CLIP** switch	Compressor clip on/off
4	**clip** control knob	Compressor clip
5	**comp threshold**/ [**threshold**] control knob	Compressor threshold
6	**dry mix** control knob	Dry mix level
7	**KNEE** pushbutton	Compressor knee: hard, medium or soft
8	**IN** switch	Compressor sidechain in/out
9	**freq.** control knob	Compressor sidechain frequency
10	**WIDTH** pushbutton	Compressor sidechain width: 2 Oct, 1 Oct or 0.3 Oct
11	**ratio** control knob	Compressor ratio
12	**attack** control knob	Compressor attack
13	**MODE** pushbutton	Compressor mode: corrective, adaptive, creative, vintage or shimmer

Item	Control	Parameter
14	**MORE**/[**MOR**] pushbutton	Increases the colouration produced by the compressor
15	**gain**/[**make up**] control knob	Compressor gain

Insert

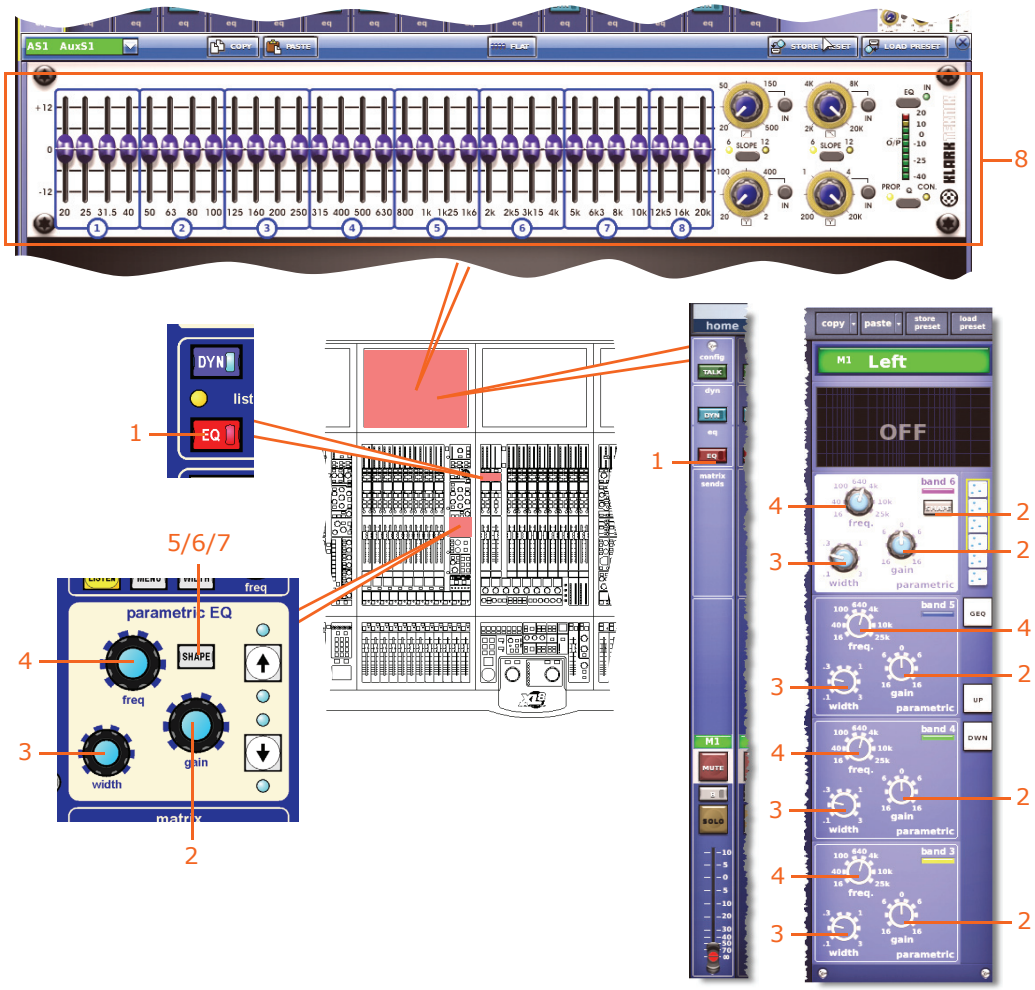
This section shows the parameters of the insert section affected by stereo linking.



Item	Control	Parameter
1	**INS** switch	Insert in/out

EQ

This section shows the parameters of the EQ section affected by stereo linking.



Item	*Control*	*Parameter*
1	**EQ** switch	EQ on/off
2	**gain** control knob	EQ gain level
3	**width** control knob	EQ width
4	**freq.** control knob	EQ frequency
5	**SHAPE** switch	Band 6 shelving mode: bell, soft, low pass 6dB or low pass 12dB
6*	**SHAPE** switch	Band 2 shelving mode: bell or high pass 24dB
7*	**SHAPE** switch	Band 1 shelving mode: bell, warm, high pass 6dB or high pass 12dB
8	GEQ	All GEQ parameters. (GEQ parameters linked when both linked channels have a GEQ assigned to them.)

* Not shown in diagram.

Note: *Although bands 1 and 2 are not shown above, the items in the table also apply. Both bands have items 2, 3 and 4. Band 1 also has item 7, and band 2 also has item 6.*

Bus sends

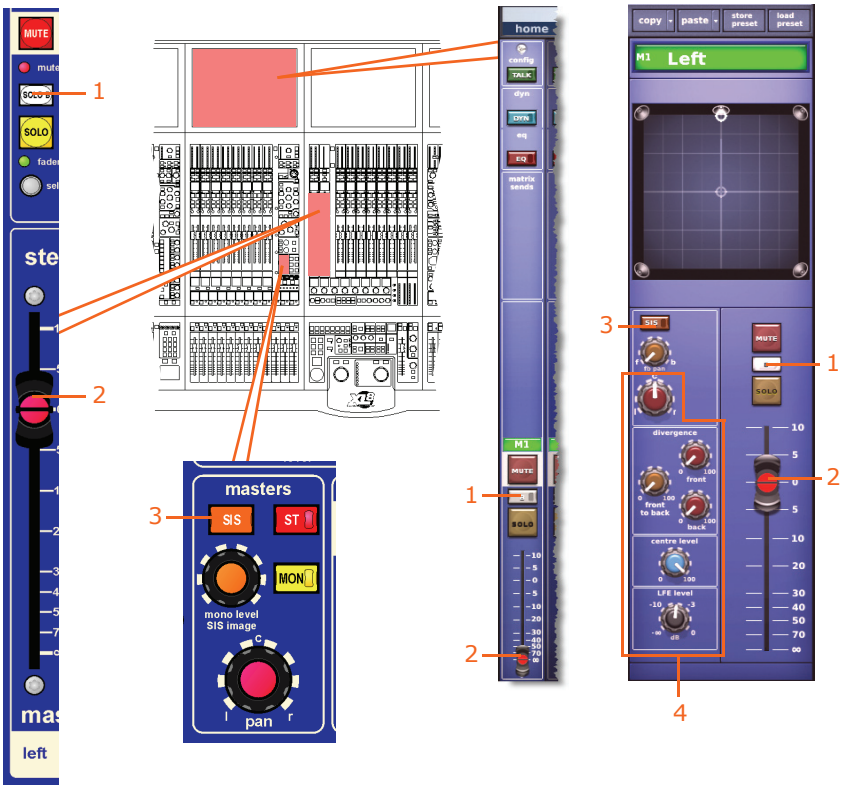
Not applicable.

Master routing

Not applicable.

Fader

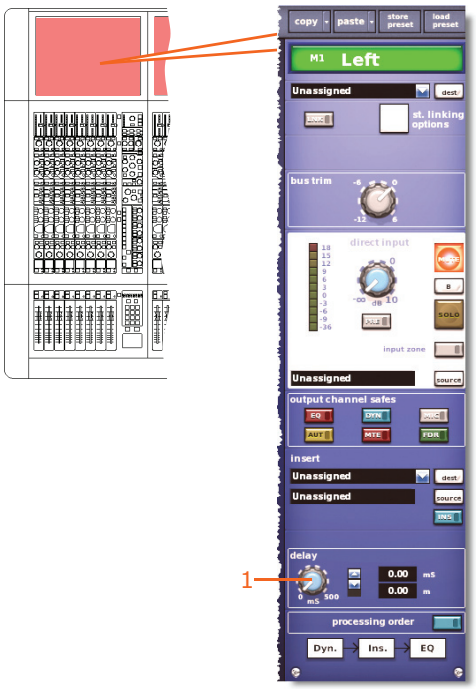
This section shows the fader parameters affected by stereo linking.



Item	*Control*	*Parameter*
1	**SOLO B**/[**B**]	Solo B on/off
2	Fader	Level
3	**SIS** switch	Route to surround on/off
4	Surround control knobs	Surround panning levels

Delay

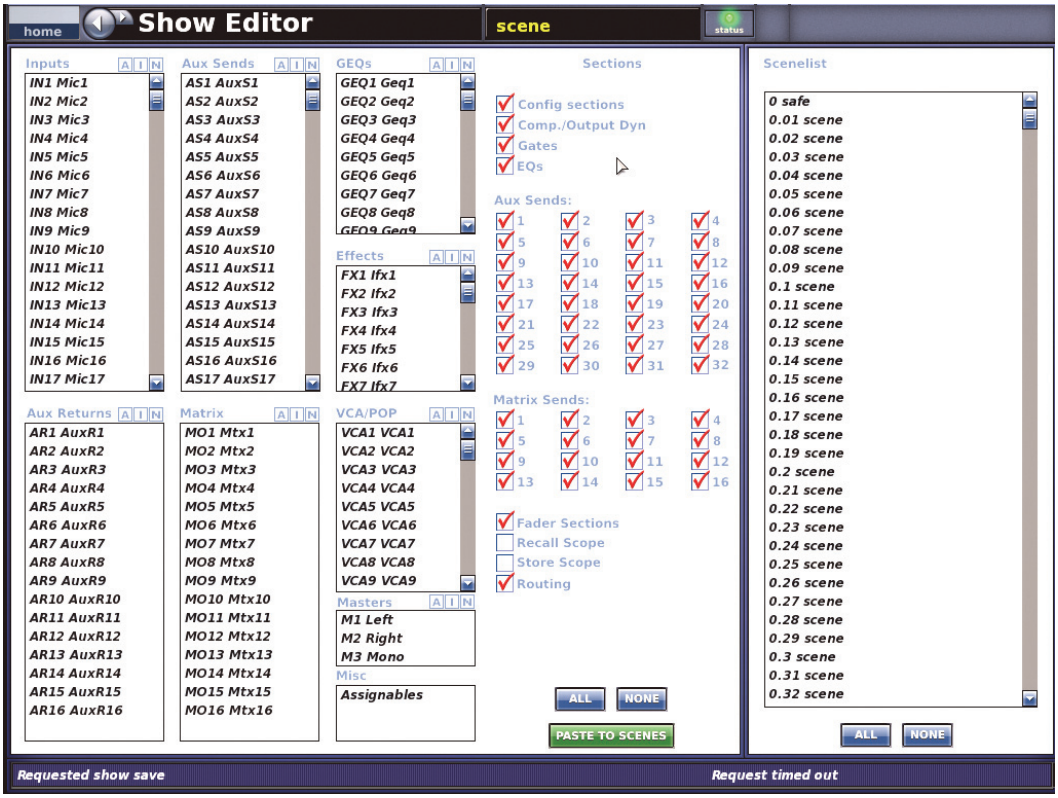
The following diagram shows the delay parameters affected by stereo linking.



Item	*Control*	*Parameter*
1	**delay** control knob	Delay time

Appendix O: Parameters Copied Through Scenes

This appendix shows the parameters per section — selected from the **Sections** panel in the **Show Editor** screen (shown below) — that can be copied through scenes.

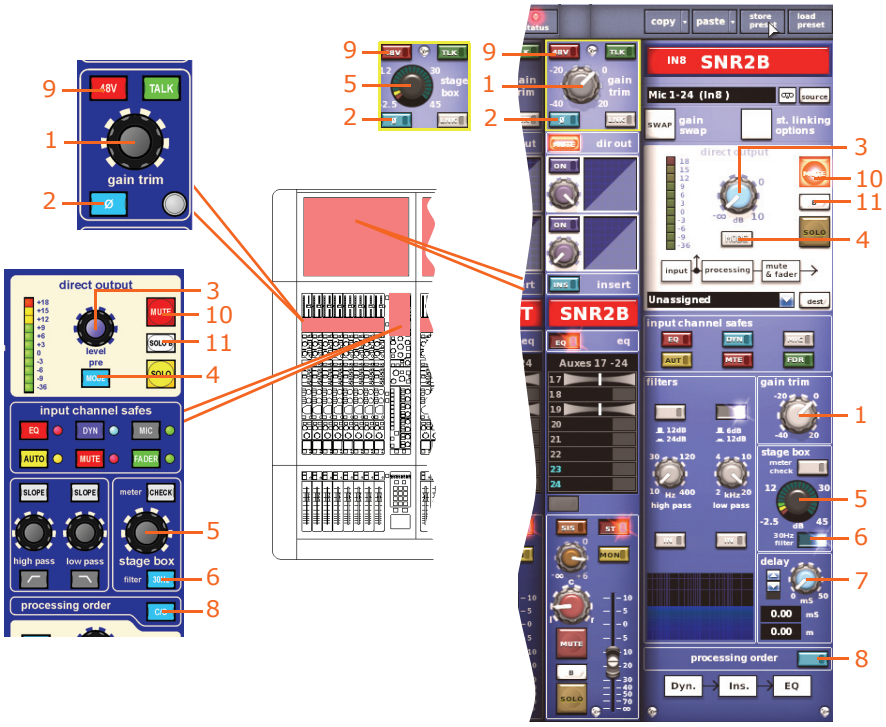


Inputs (input channels)

This section shows you which parameters for each of the 96 input channels are affected by copy through scenes.

Config sections

The following diagram shows the parameters of the input channel configuration detail area copied through scenes.

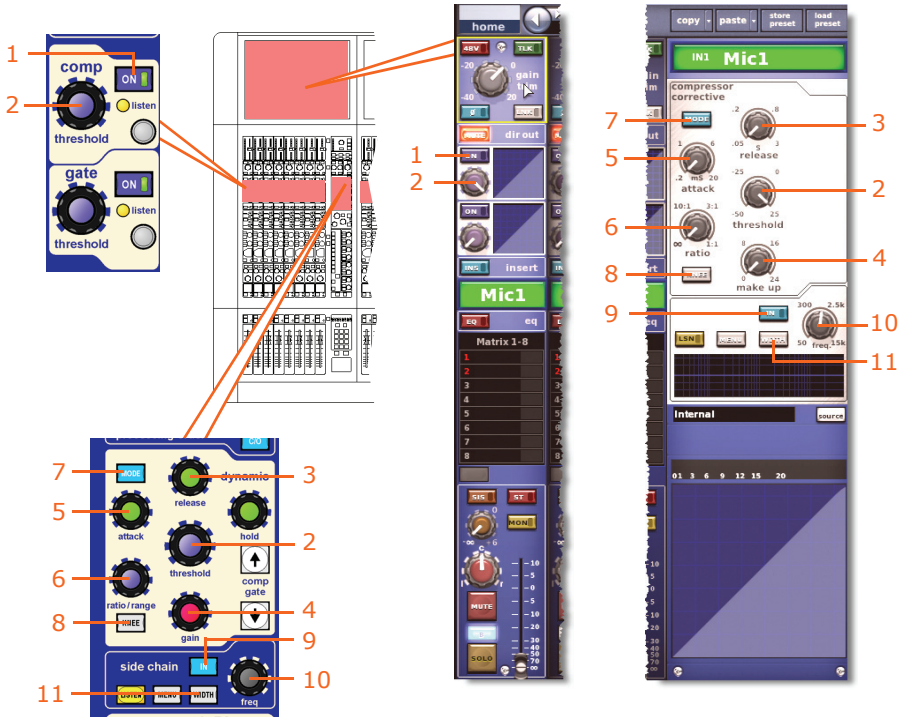


Item	*Control*	*Parameter*
1	**gain trim** control knob	Digital trim level
2	**Ø** switch	Phase on/off switch
3	**level** control knob	Direct output level
4	**MODE** switch	Direct output tap-off point: “Post-fade and mute”, “Pre-mute, pre-processing” and “Pre-mute, post-processing”
5	**stage box** control knob*	Remote amplifier level
6	**30Hz** switch*	30Hz filter on/off
7	**delay** control knob	Delay time
8	**C/O** switch	Order of processing: **Dyn.→Ins.→EQ** or **EQ→Ins.→Dyn.**
9	**48V** switch*	48V phantom voltage on/off
10	**MUTE** switch	Direct output mute on/off
11	**SOLO B**/[**B**] switch	Direct output solo B on/off

* Applies to primary and tape inputs.

Comp./Output Dyn

The following diagram shows the input channel compressor parameters copied through scenes.

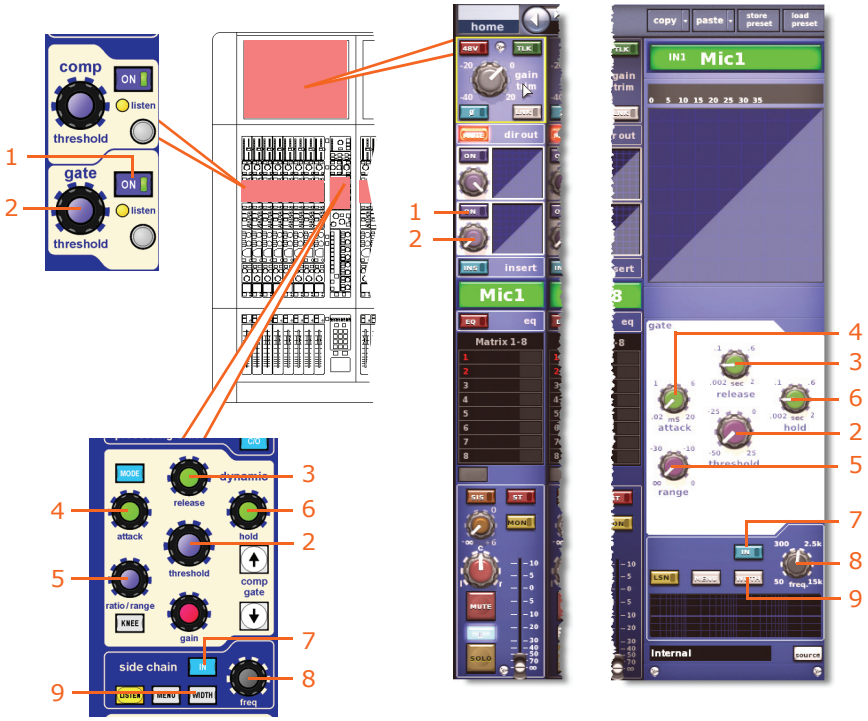


Note: *Only the corrective compressor is shown above, but this is typically the same for the other compressor modes (adaptive, creative and vintage).*

Item	*Control*	*Parameter*
1	**ON** switch	Compressor on/off
2	**threshold** control knob	Compressor threshold
3	**release** control knob	Compressor release
4	**gain**/[**make up**] control knob	Compressor make up gain
5	**attack** control knob	Compressor attack
6	**ratio/range**/[**ratio**] control knob	Compressor ratio
7	**MODE** pushbutton	Compressor mode: corrective, adaptive, creative or vintage
8	**KNEE** pushbutton	Compressor knee: hard, medium or soft
9	**IN** switch	Compressor sidechain in/out
10	**freq** control knob	Compressor sidechain frequency
11	**WIDTH** pushbutton	Compressor sidechain: 2 Oct, 1 Oct or 0.3 Oct

Gates

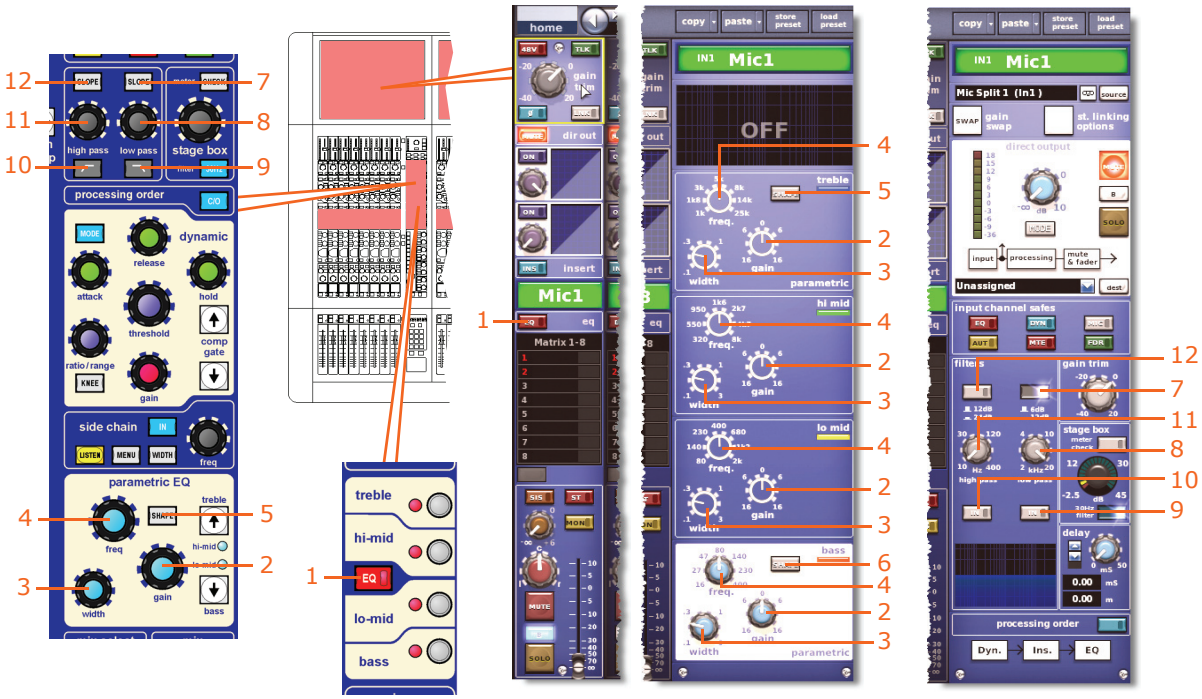
The following diagram shows the input channel gate parameters copied through scenes.



Item	*Control*	*Parameter*
1	**ON** switch	Gate on/off
2	**threshold** control knob	Gate threshold
3	**release** control knob	Gate release
4	**attack** control knob	Gate attack
5	**ratio/range**/[**range**] control knob	Gate range
6	**hold** control knob	Gate hold
7	**IN** switch	Gate sidechain in/out
8	**freq** control knob	Gate sidechain frequency
9	**WIDTH** pushbutton	Gate sidechain width: 2 Oct, 1 Oct or 0.3 Oct

EQs

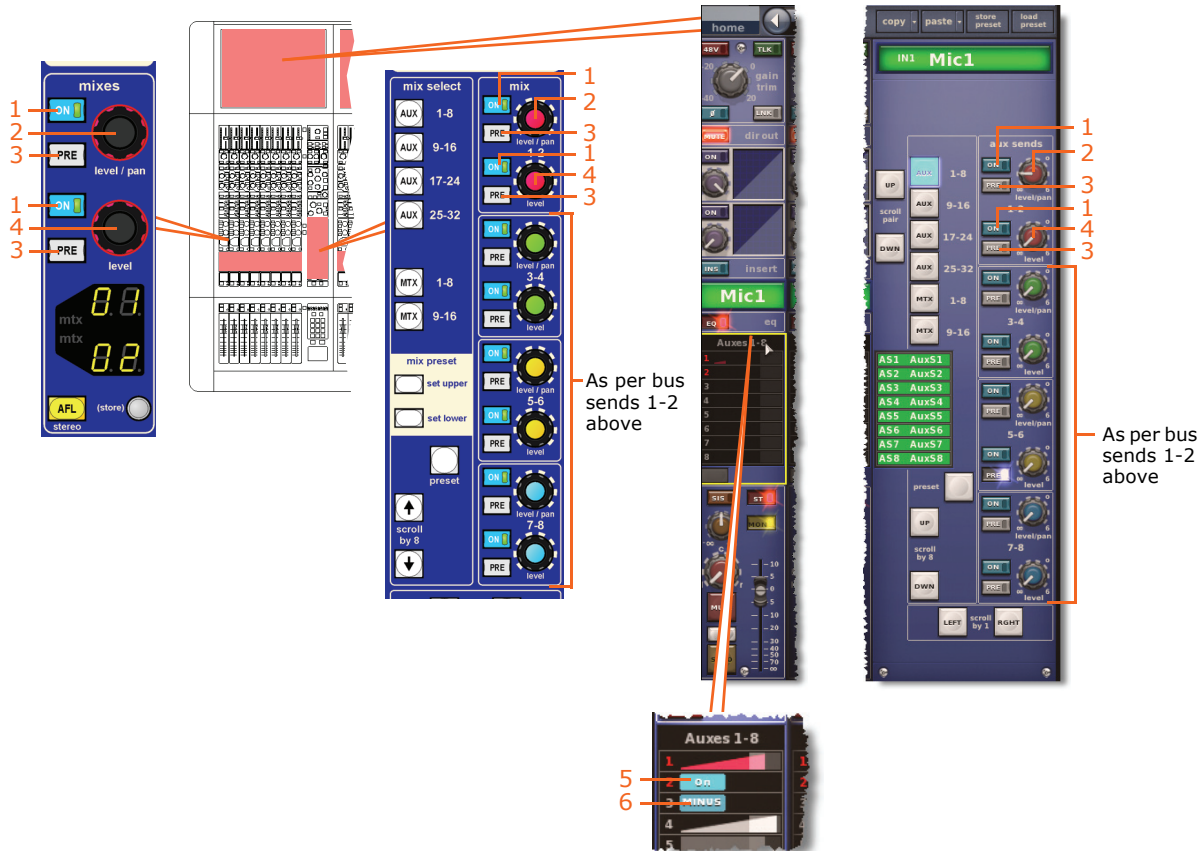
The following diagram shows the EQ parameters copied through scenes.



Item	*Control*	*Parameter*
1	**EQ** switch	EQ on/off
2	**gain** control knob	EQ gain level
3	**width** control knob	EQ width
4	**freq** control knob	EQ frequency
5	**SHAPE** switch	Treble shelving mode: peaking, bright, classic or soft
6	**SHAPE** switch	Bass shelving mode: peaking, deep, classic or warm
7	**SLOPE** pushbutton	Low pass filter slope 6dB or 12dB
8	**low pass** control knob	Low pass filter frequency
9	/[**IN**] switch	Low pass filter in/out
10	/[**IN**] switch	High pass filter in/out
11	**high pass** control knob	High pass filter frequency
12	**SLOPE** pushbutton	High pass filter slope 12dB or 24dB

Aux Sends (1 to 32)

This section shows the parameters of the mix sections copied through scenes.

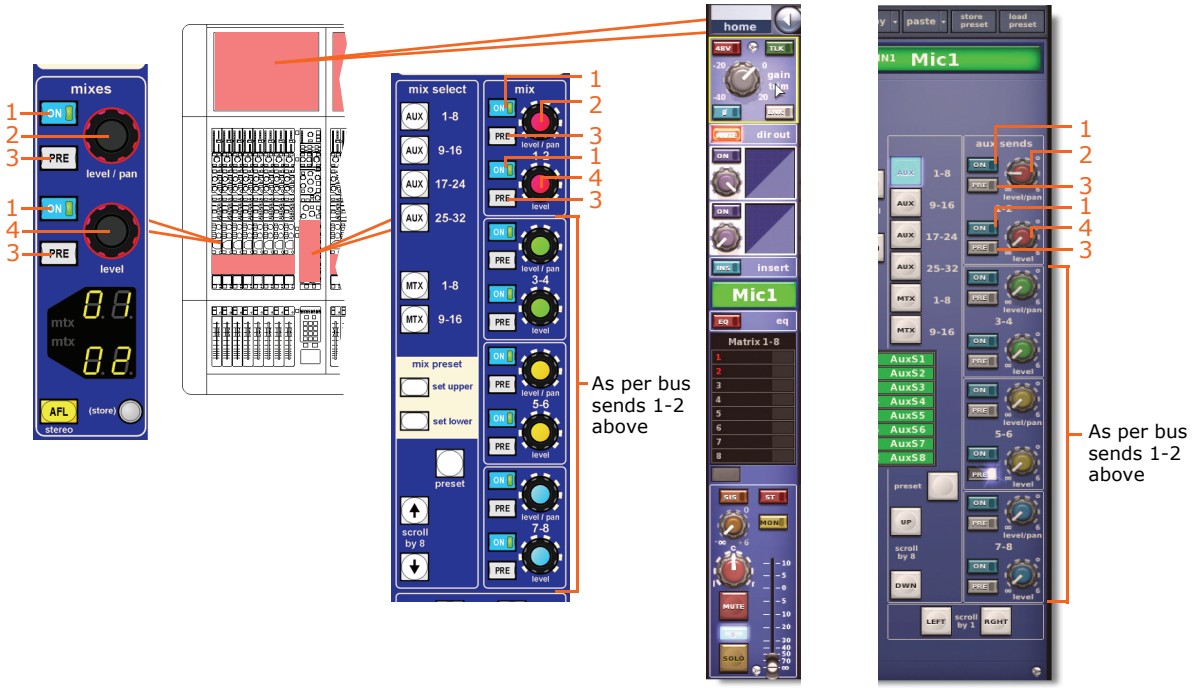


Note: *Only aux sends 1 to 8 are shown above, but this is typically the same for all of the 32 aux sends.*

Item	*Control*	*Parameter*
1	**ON** switch	Bus send on/off
2	**level/pan** control knob	Bus level, or pan when bus is linked
3	**PRE** switch	Pre-fader on/off
4	**level** control knob	Bus level
5	**On** switch	Aux bus send on/off — only available when aux bus is in group mode
6	**MUTE** switch	Aux bus send mute on/off — only available when aux bus is in mix minus mode

Matrix Sends (1 to 16)

This section shows the parameters of the mix sections copied through scenes.

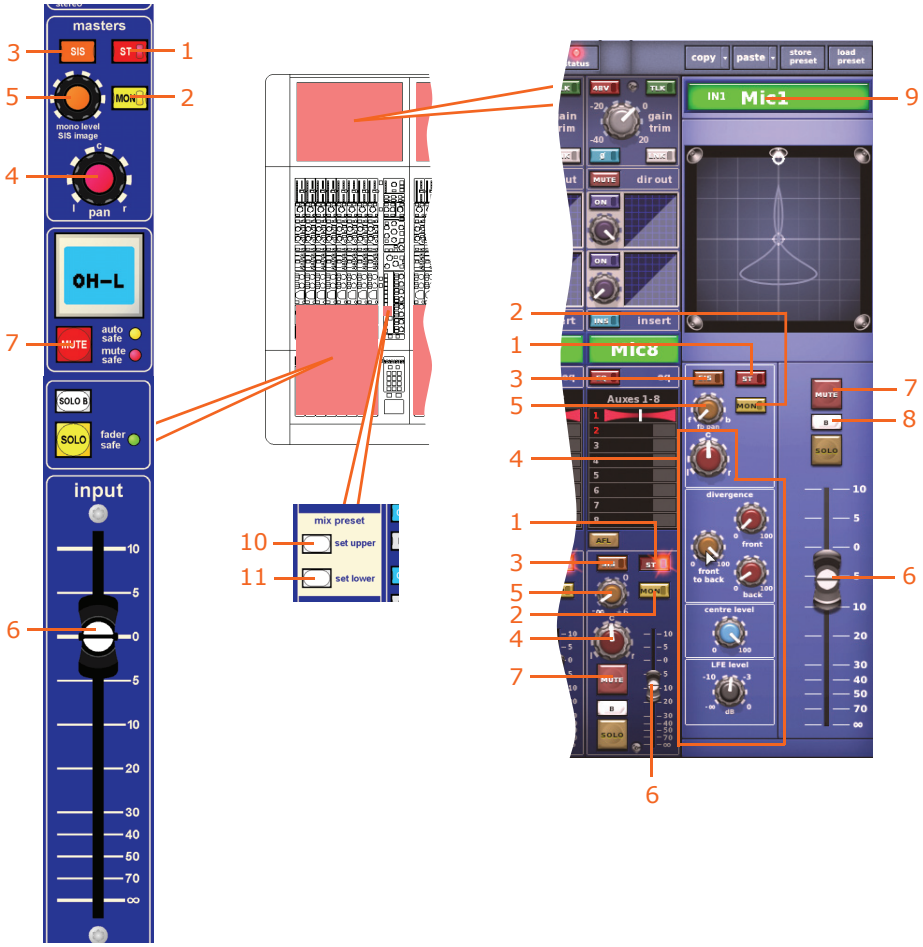


Note: *Only matrix sends 1 to 8 are shown above, but this is typically the same for all of the 16 matrix sends.*

Item	*Control*	*Parameter*
1	**ON** switch	Bus send on/off
2	**level/pan** control knob	Bus level, or pan when bus is linked
3	**PRE** switch	Pre-fader on/off
4	**level** control knob	Bus level

Fader Sections

This section shows all the parameters of the master routing that are copied through scenes.



Item	*Control*	*Parameter*
1	**ST** switch	Stereo on/off
2	**MON** switch	Mono on/off
3	**SIS** switch	Spatial imaging system on/off
4	Panning control knobs	Surround panning (includes all surround sound parameters)
5	**mono level/SIS image** control knob	Mono level (SIS off) or SIS image (SIS on)
6	Fader	Level
7	**MUTE** switch	Mute on/off
8	**SOLO B**/[**B**] control knob	Solo B in/out
9	Field	Channel name
10	**set upper** button	Mix preset upper select
11	**set lower** button	Mix preset lower select

Recall Scope

For details, see “Inputs” on page 433.

Store Scope

For details, see “Inputs” on page 433.

Routing

The following diagram shows the input channel routing parameters copied through scenes.



Item	*Control*	*Parameter*
1	**INS** switch	Insert in/out
2	Field	Primary input source
3	Field	Tape input source
4	Field	Compressor sidechain source*
5	Field	Gate key source*
6	Field	Insert return source*

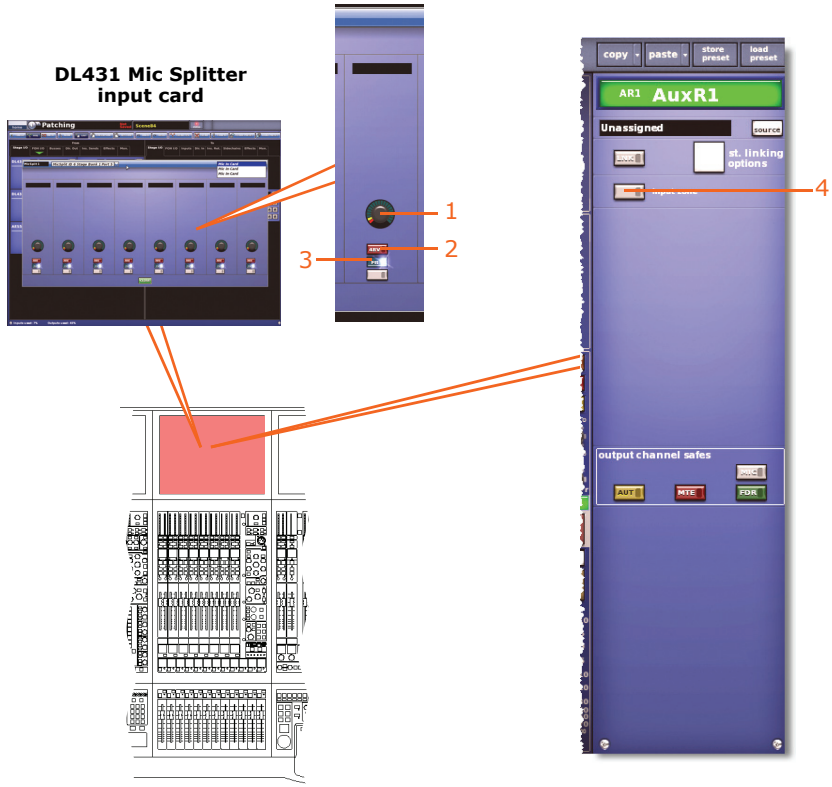
* Only automated when automate patching is on.

Aux Returns (return channels)

This section shows you which parameters for each of the 16 return channels are affected by copy through scenes.

Config sections

The following diagram shows the parameters of the configuration detail area copied through scenes.



Item	*Control*	*Parameter*
1	Stage box control knob	Remote amplifier level*
2	**48V** switch	48V phantom voltage on/off*
3	**Flt** switch	30Hz filter in/out*
3	**input zone** switch	Input zone in/out

Comp./Output Dyn

Not applicable.

Gates

Not applicable.

EQs

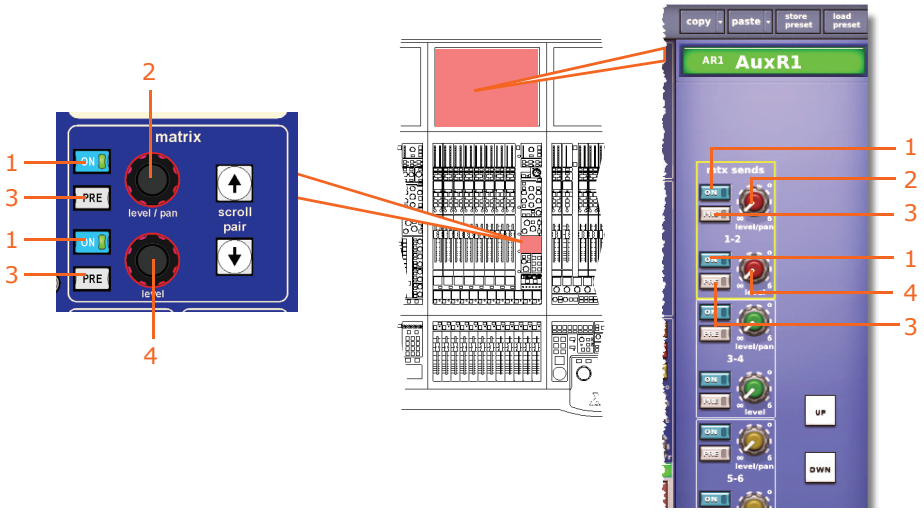
Not applicable.

Aux Sends (1 to 32)

Not applicable.

Matrix Sends (1 to 16)

The following diagram shows the parameters of the mix detail area copied through scenes.

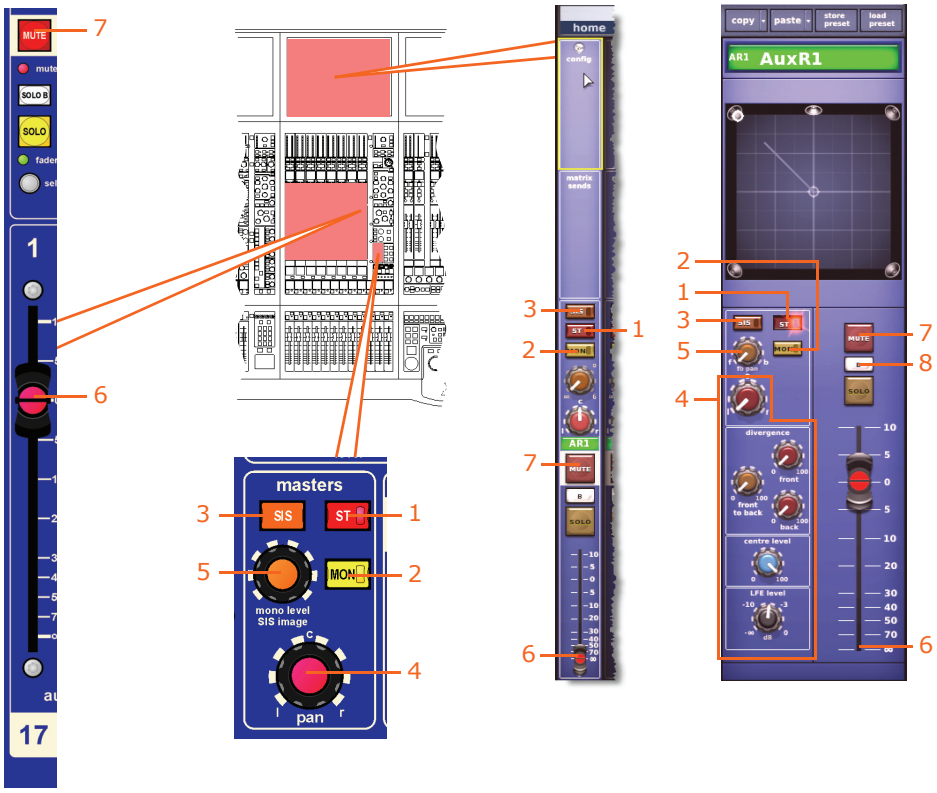


Note: *Although only matrix sends 1-2 are referenced above, this also applies to all 16 matrix sends.*

Item	*Control*	*Parameter*
1	**ON** switch	Matrix bus send on/off
2	**level/pan** control knob	Bus level, or pan when bus is linked
3	**PRE** switch	Pre-fader on/off
4	**level** control knob	Bus level

Fader Sections

The following diagram shows the parameters of the master routing detail area copied through scenes.



Item	*Control*	*Parameter*
1	**ST** switch	Stereo on/off
2	**MON** switch	Mono on/off
3	**SIS** switch	Spatial imaging system on/off
4	Panning control knobs	Surround panning (includes all surround sound parameters)
5	**mono level/SIS image** control knob	Mono level (SIS off) or SIS image (SIS on)
6	Fader	Level
7	**MUTE** switch	Mute on/off
8	**SOLO B**/[**B**] switch	Solo B in/out

Recall Scope

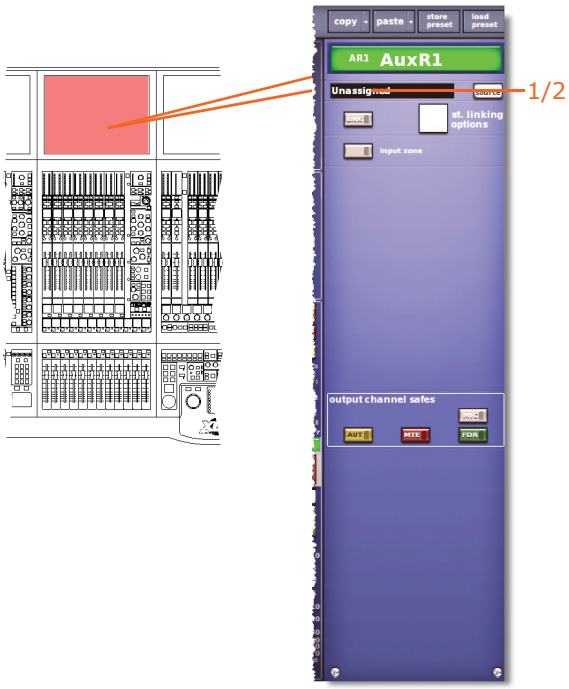
For details, see “Returns (Aux Returns)” on page 443.

Store Scope

For details, see “Returns (Aux Returns)” on page 443.

Routing

The following diagram shows the return channel routing parameters copied through scenes.



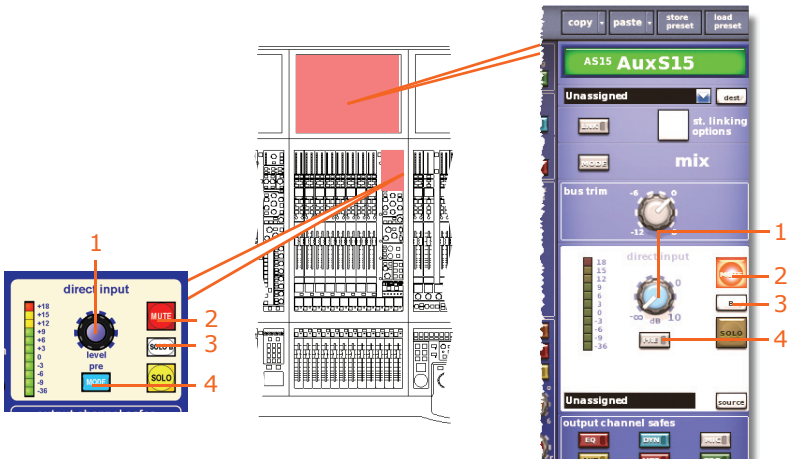
Item	Control	Parameter
1	Field	Primary input source
2	Field	Tape input source

Aux Sends (aux channels)

This section shows you which parameters for each of the 32 aux channels are affected by copy through scenes.

Config sections

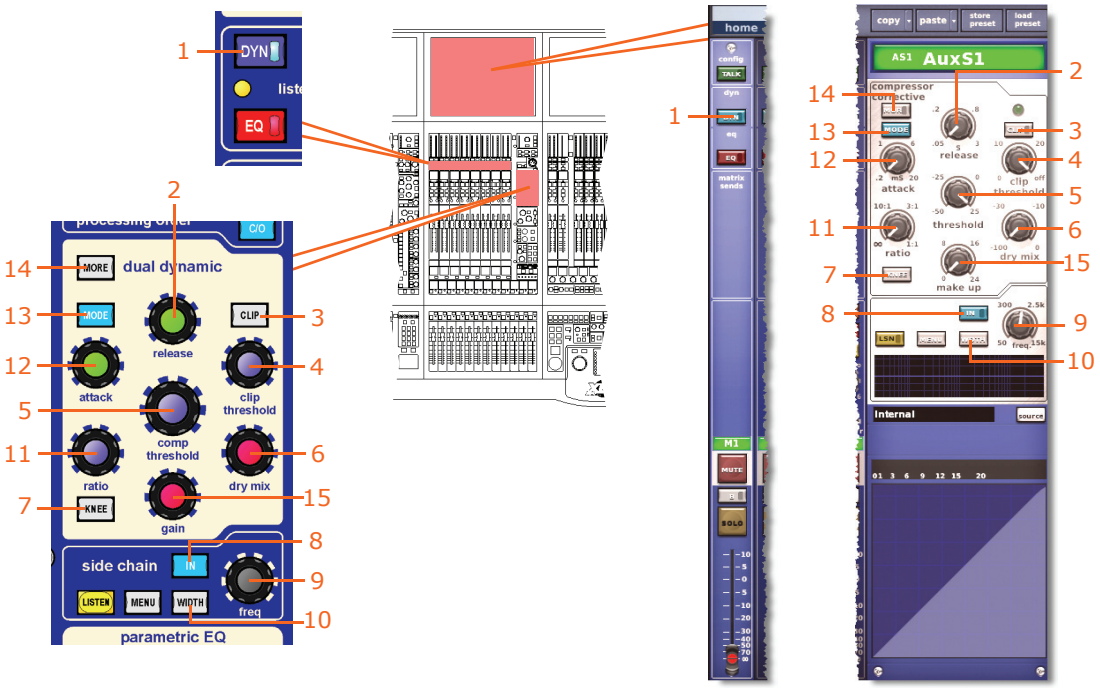
The following diagram shows the parameters of the configuration detail area copied through scenes.



Item	*Control*	*Parameter*
1	**level** control knob	Direct input level
2	**MUTE** switch	Direct input mute on/off
3	SOLO B/[B] switch	Direct input solo B in/out
4	**MODE**/[**PRE**] switch	Direct input pre- in/out

Comp./Output Dyn

The following diagram shows the parameters of the compressor detail area copied through scenes. Only corrective compressor shown below, but typically the same for the other compressor modes.



Item	*Control*	*Parameter*
1	**DYN** switch	Compressor on/off
2	**release** control knob	Compressor release
3	**CLIP** switch	Compressor clip on/off
4	**clip threshold** control knob	Compressor clip
5	**comp threshold**/ [**threshold**] control knob	Compressor threshold
6	**dry mix** control knob	Compressor dry mix level
7	**KNEE** pushbutton	Compressor knee: hard, medium or soft
8	**IN** switch	Compressor sidechain in/out
9	**freq** control knob	Compressor sidechain frequency
10	**WIDTH** pushbutton	Compressor sidechain width: 2 Oct, 1 Oct or 0.3 Oct
11	**ratio** control knob	Compressor ratio
12	**attack** control knob	Compressor attack
13	**MODE** pushbutton	Compressor mode: corrective, adaptive, creative, vintage or shimmer

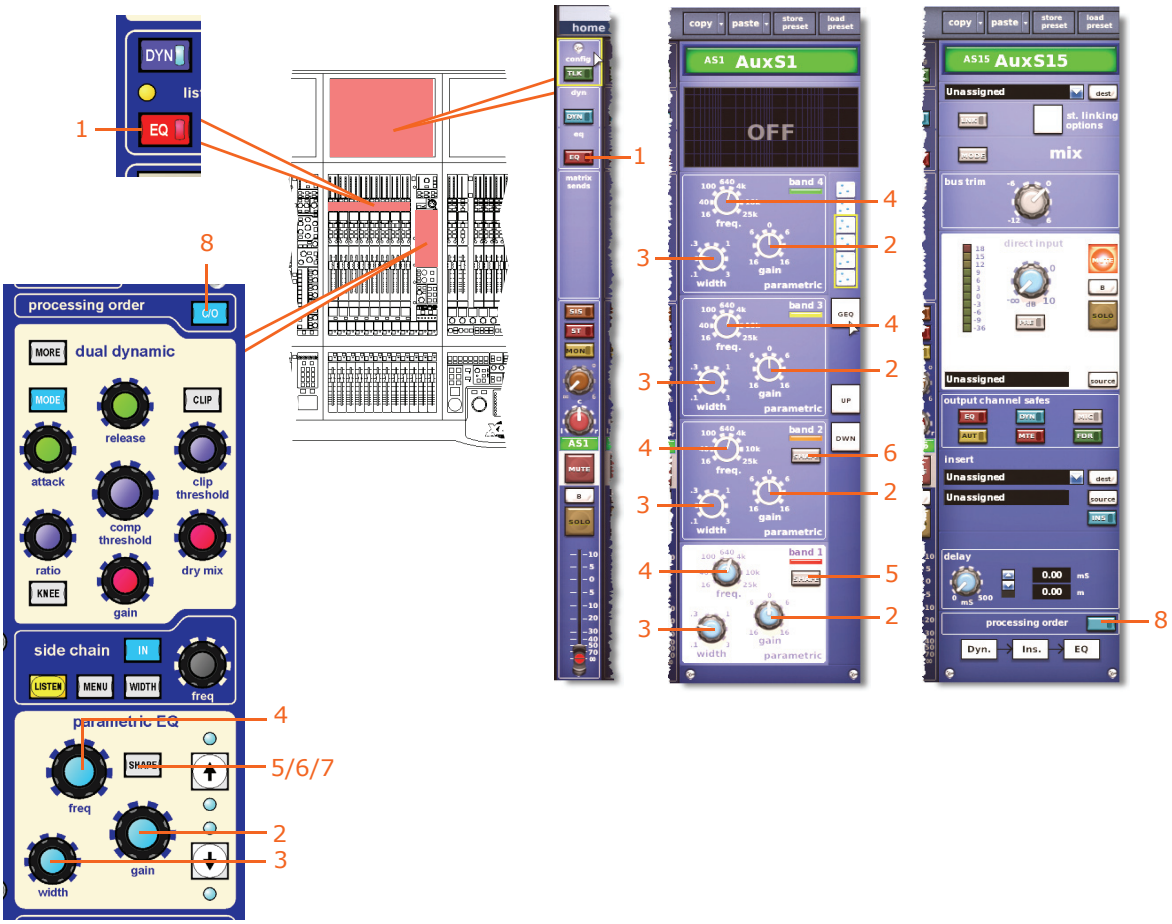
Item	*Control*	*Parameter*
14	**MORE**/[**MOR**] pushbutton	Increases the colouration produced by the compressor
15	**gain**/[**make up**] control knob	Compressor gain

Gates

Not applicable.

EQs

The following diagram shows the EQ parameters copied through scenes.



Item	*Control*	*Parameter*
1	**EQ** switch	EQ on/off
2	**gain** control knob	EQ gain level
3	**width** control knob	EQ width
4	**freq** control knob	EQ frequency
5	**SHAPE** switch	Band 1 shelving mode: bell, warm, high pass 6dB or high pass 12dB
6	**SHAPE** switch	Band 2 shelving mode: bell or high pass 24dB
7*	**SHAPE** switch	Band 6 shelving mode: bell, soft, low pass 6dB or low pass 12dB
8	**C/O** switch	Order of processing: **Dyn.→Ins.→EQ** or **EQ→Ins.→Dyn.**

* Not shown in diagram.

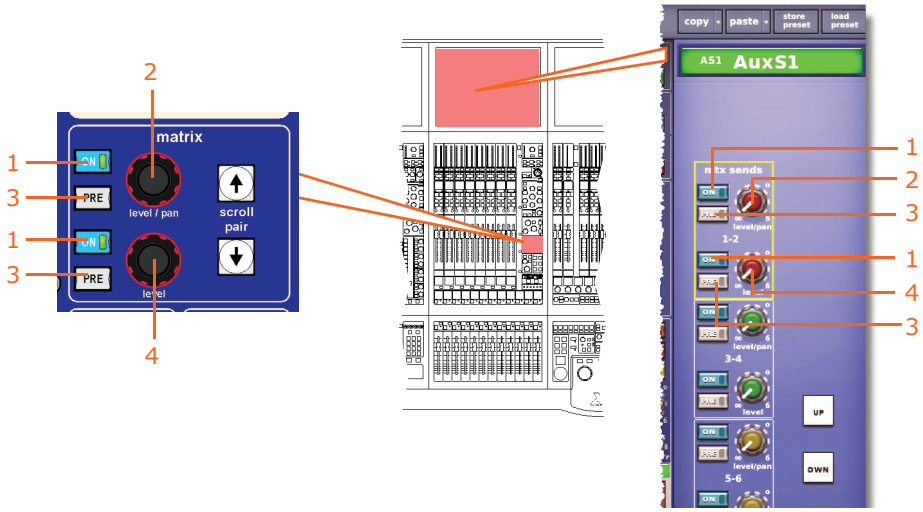
Note: *Although bands 5 and 6 are not shown above, the items in the table also apply. Both bands have items 2, 3 and 4, and band 6 also has item 7.*

Aux Sends (1 to 32)

Not applicable.

Matrix Sends (1 to 16)

The following diagram shows the parameters of the mix detail area copied through scenes.

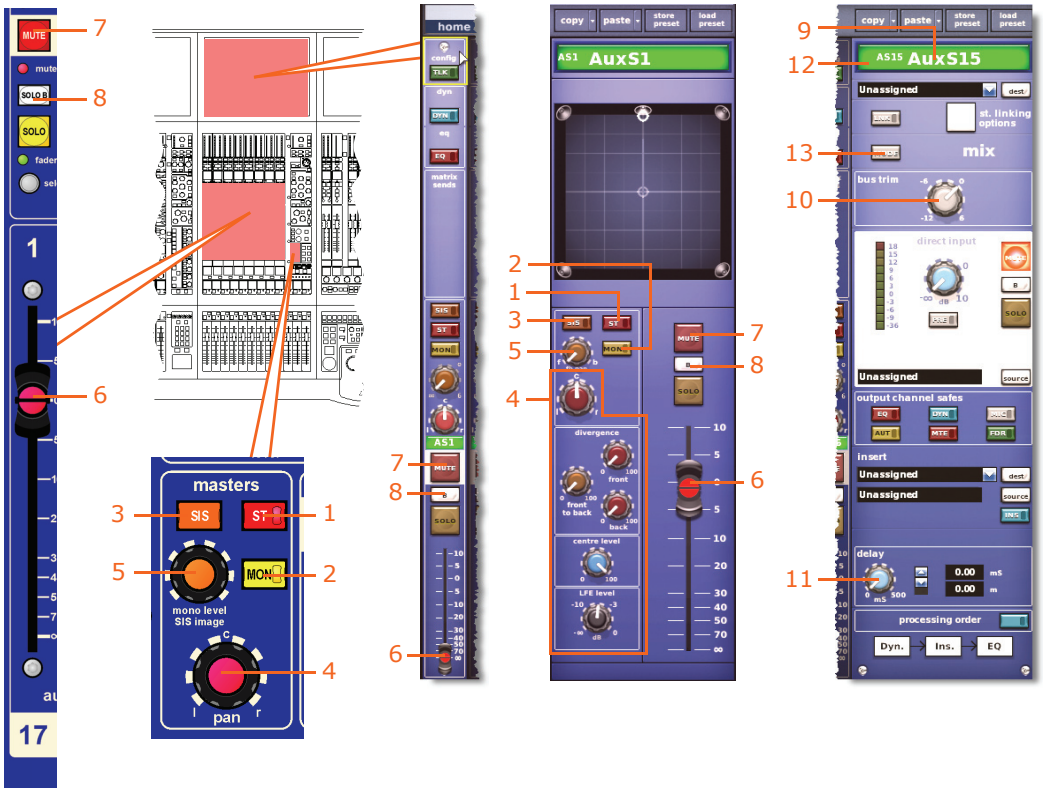


Note: *Although only matrix sends 1-2 are referenced above, this also applies to all 16 matrix sends.*

Item	*Control*	*Parameter*
1	**ON** switch	Matrix bus send on/off
2	**level/pan** control knob	Bus level, or pan when bus is linked
3	**PRE** switch	Pre-fader on/off
4	**level** control knob	Bus level

Fader Sections

The following diagram shows the parameters of the master routing detail area copied through scenes.



Item	*Control*	*Parameter*
1	**ST** switch	Stereo on/off
2	**MON** switch	Mono on/off
3	**SIS** switch	Spatial imaging system on/off
4	Panning control knobs	Surround panning (includes all surround sound parameters)
5	**mono level/SIS image** control knob	Mono level (SIS off) or SIS image (SIS on)
6	Fader	Level
7	**MUTE** switch	Mute on/off
8	**SOLO B**/[**B**] switch	Solo B in/out
9	Field	Channel name
10	**bus trim** control knob	Bus trim level
11	**delay** control knob	Delay time
12	Field	Channel colour
13	**MODE** button	Bus mode

Recall Scope

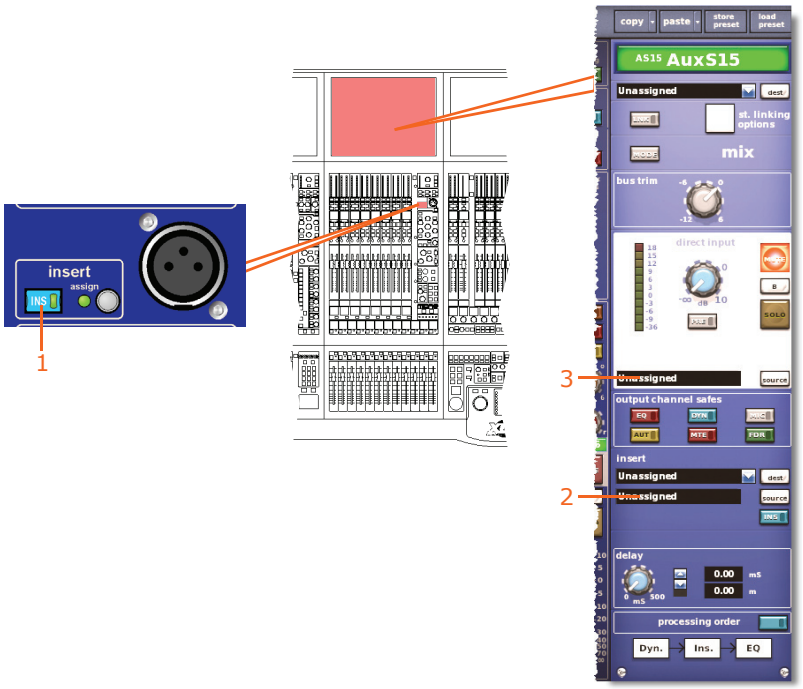
For details, see “Auxes (Aux Sends)” on page 448.

Store Scope

For details, see “Auxes (Aux Sends)” on page 448.

Routing

The following diagram shows the aux channel routing parameters copied through scenes.



Item	*Control*	*Parameter*
1	**INS** switch	Insert in/out
2	Field	Insert return source*
3	Field	Direct input source*

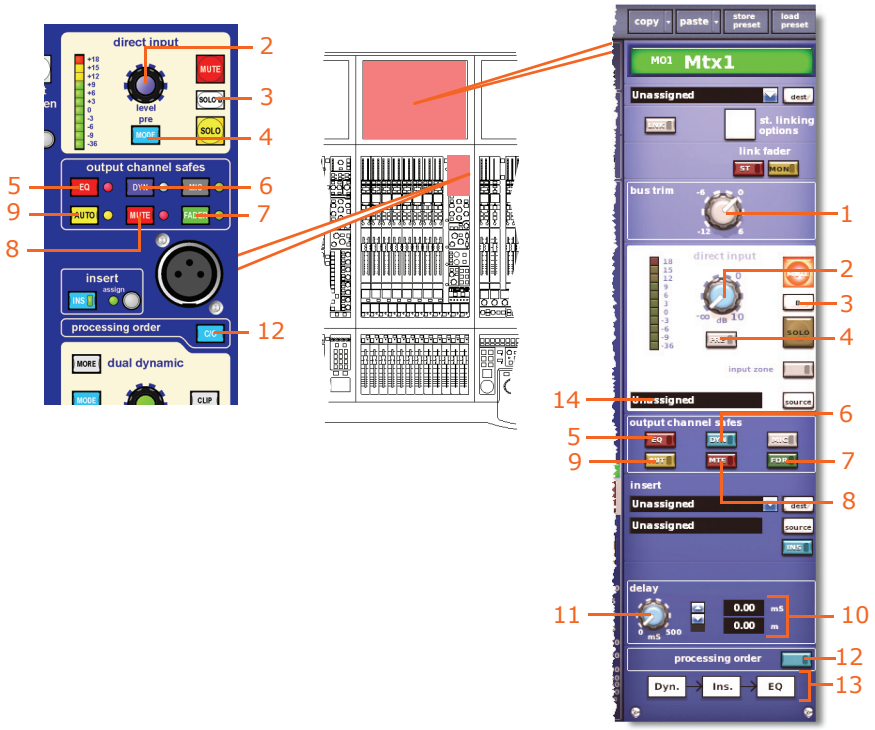
* Only automated when automate patching is on.

Matrix (matrix channels)

This section shows you which parameters for each of the 16 matrix channels are affected by copy through scenes.

Config sections

The following diagram shows the parameters of the configuration detail area copied through scenes.

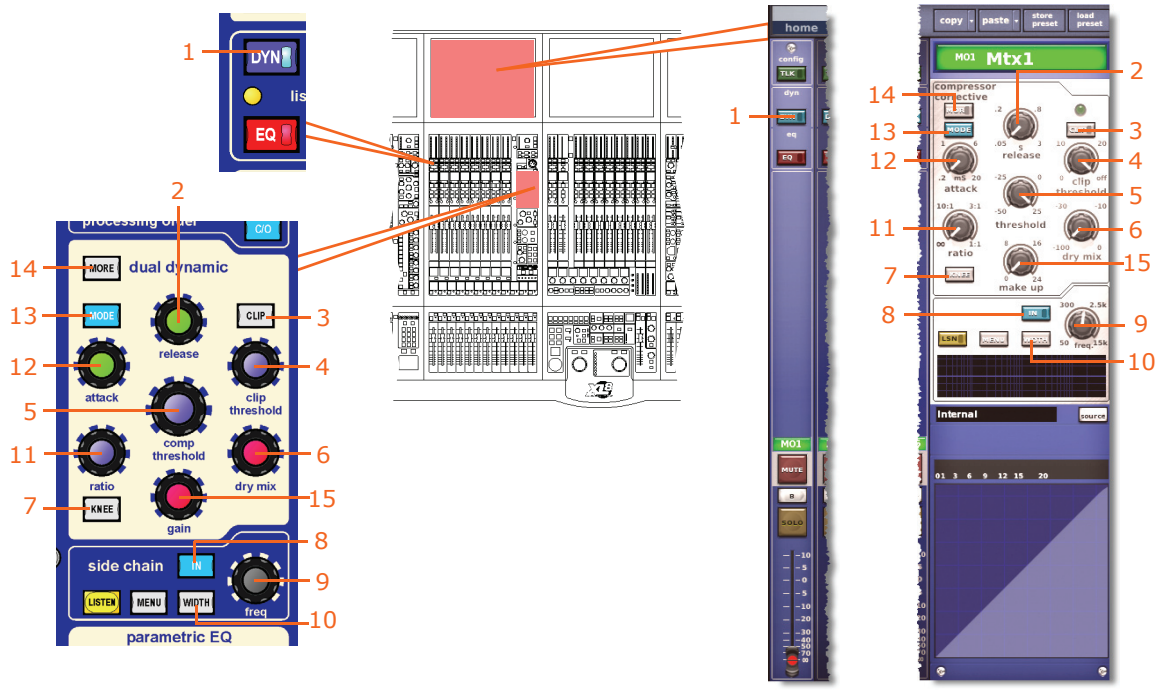


Item	*Control*	*Parameter*
1	**bus trim** control knob	Bus trim level
2	**level** control knob	Direct input level
3	**SOLO B**/[**B**] switch	Direct input solo B on/off
4	**MODE**/[**PRE**] switch	Direct input pre- in/out
5	**EQ** pushbutton	EQ safe on/off
6	**DYN** pushbutton	Dynamic safe on/off
7	**FADER**/[**FDR**] switch	Fader safe on/off
8	**MUTE**/[**MTE**] switch	Mute safe on/off
9	**AUTO**/[**AUT**] switch	Auto safe on/off
10	Delay field	Delay in milliseconds (ms) and metres (m)
11	**delay** control knob	Delay level
12	**C/O** switch	Order of processing: **Dyn.→Ins.→EQ** or **EQ→Ins.→Dyn.**

Item	Control	Parameter
13	Graphic	Order of processing
14	Field	Direct input source

Comp./Output Dyn

The following diagram shows the parameters of the compressor detail area copied through scenes. Only corrective compressor shown below, but typically the same for the other compressor modes.



Item	Control	Parameter
1	**DYN** switch	Compressor on/off
2	**release** control knob	Compressor release
3	**CLIP** switch	Compressor clip on/off
4	**clip threshold** control knob	Compressor clip
5	**comp threshold**/ [**threshold**] control knob	Compressor threshold
6	**dry mix** control knob	Compressor dry mix level
7	**KNEE** pushbutton	Compressor knee: hard, medium or soft
8	**IN** switch	Compressor sidechain in/out
9	**freq** control knob	Compressor sidechain frequency
10	**WIDTH** pushbutton	Compressor sidechain width: 2 Oct, 1 Oct or 0.3 Oct

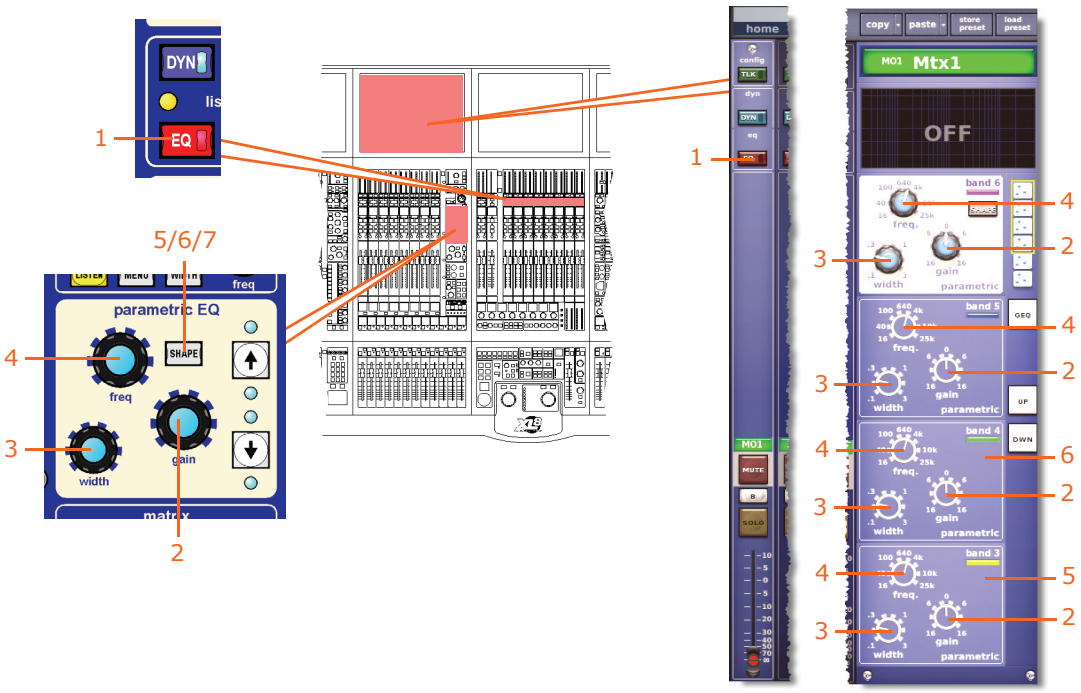
Item	*Control*	*Parameter*
11	**ratio** control knob	Compressor ratio
12	**attack** control knob	Compressor attack
13	**MODE** pushbutton	Compressor mode: corrective, adaptive, creative, vintage or shimmer
14	**MORE**/[**MOR**] pushbutton	Increases the colouration produced by the compressor
15	**gain**/[**make up**] control knob	Compressor gain

Gates

Not applicable.

EQs

The following diagram shows the parameters of the EQ detail area copied through scenes.



Item	*Control*	*Parameter*
1	**EQ** switch	EQ on/off
2	**gain** control knob	EQ gain level
3	**width** control knob	EQ width
4	**freq** control knob	EQ frequency
5	**SHAPE** switch	Band 1 shelving mode: bell, warm, high pass 6dB or high pass 12dB
6	**SHAPE** switch	Band 2 shelving mode: bell or high pass 24dB
7*	**SHAPE** switch	Band 6 shelving mode: bell, soft, low pass 6dB or low pass 12dB

* Not shown in diagram.

Note: *Although bands 5 and 6 are not shown above, the items in the table also apply. Both bands have items 2, 3 and 4, and band 6 also has item 7.*

Aux Sends (1 to 32)

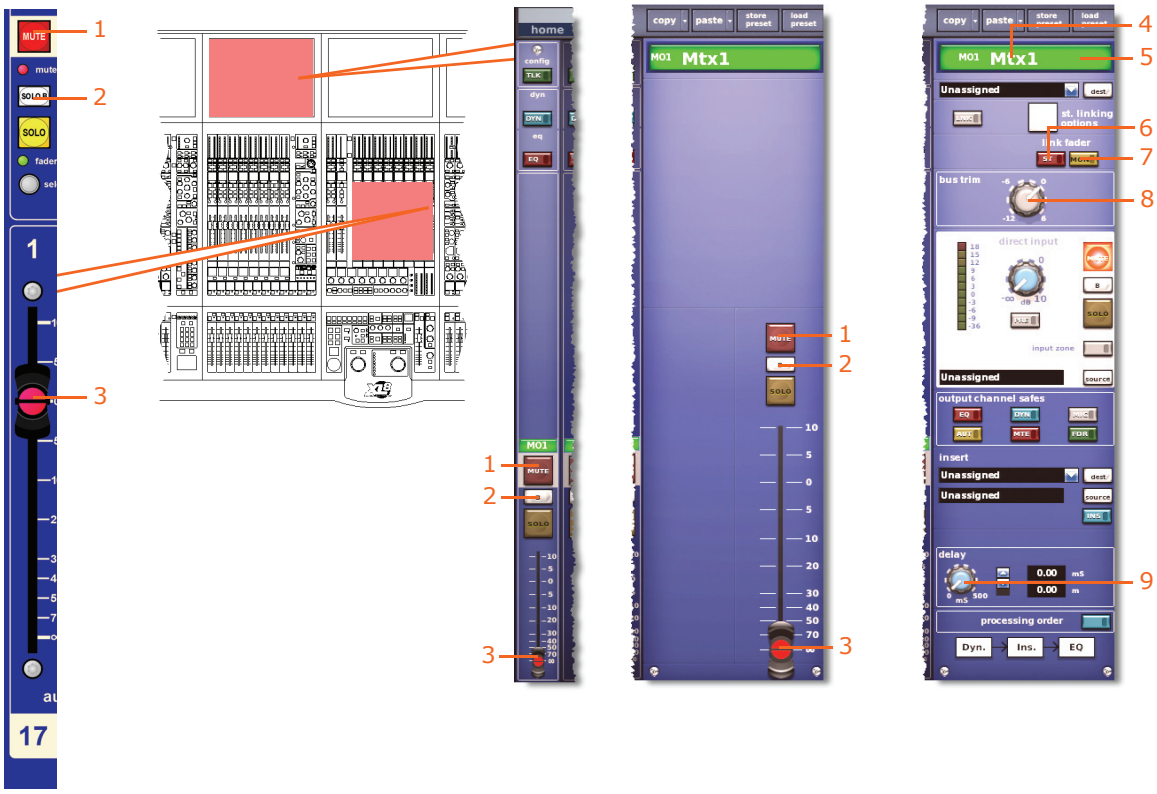
Not applicable.

Matrix Sends (1 to 16)

Not applicable.

Fader Sections

The following diagram shows the parameters of the master routing detail area copied through scenes.



Item	*Control*	*Parameter*
1	**MUTE** switch	Mute on/off
2	**SOLO B**/[**B**] switch	Solo B in/out
3	Fader	Level
4	Field	Channel name
5	Field	Channel colour
6	**ST** switch	Link to stereo master fader
7	**MON** switch	Link to mono master fader
8	**bus trim** control knob	Bus trim level
9	**delay** control knob	Delay time

Recall Scope

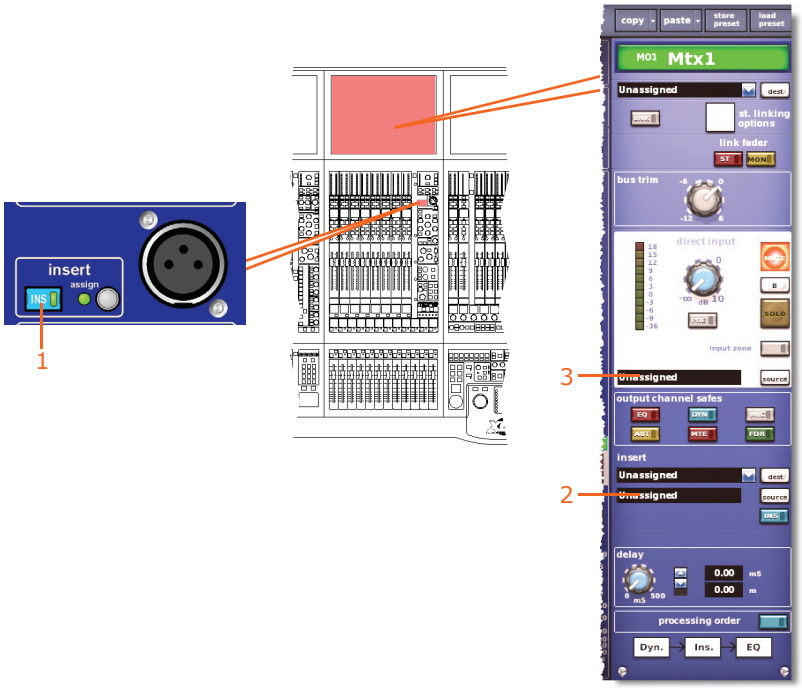
For details, see “Matrices” on page 455.

Store Scope

For details, see “Matrices” on page 455.

Routing

The following diagram shows the matrix channel routing parameters copied through scenes.



Item	*Control*	*Parameter*
1	**INS** switch	Insert in/out
2	Field	Insert return source*
3	Field	Direct input source*

* Only automated when automate patching is on.

GEQs

You can copy the assignments of the 16 internal GEQs through scenes.

Only the **Recall Scope** and **Store Scope** options in the **Sections** area are applicable to this option.



Effects



You can copy the assignments of the 16 internal Effects through scenes.

Only the **Recall Scope** and **Store Scope** options in the **Sections** area are applicable to this option.

VCA/POP (groups)

You can copy the group membership allocation of the VCA and Groups through scenes.

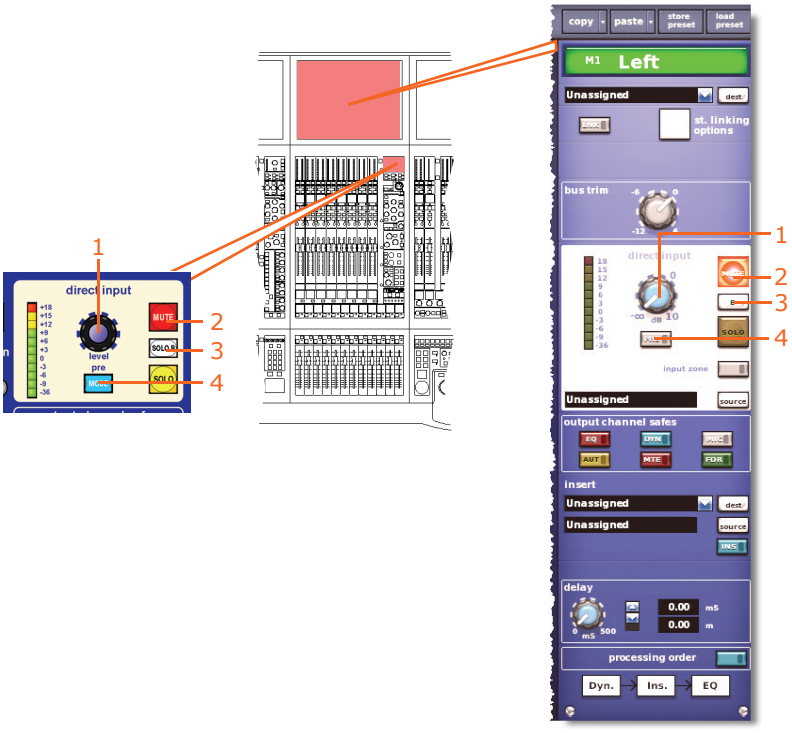
None of the options in the **Sections** area are applicable to this option.

Masters (master channels)

This section shows you which parameters for each of the three master channels (mono and stereo left and stereo right) are affected by copy through scenes.

Config sections

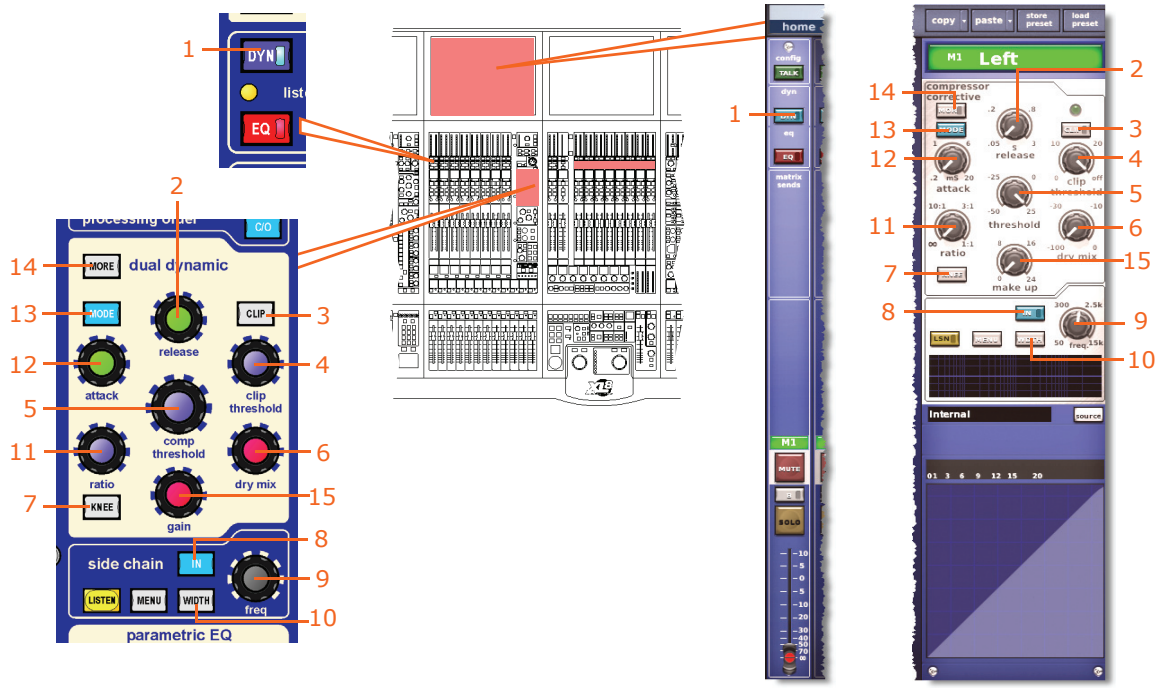
The following diagram shows the parameters of the configuration detail area copied through scenes.



Item	*Control*	*Parameter*
1	**level** control knob	Direct input level
2	**MUTE** switch	Direct input mute on/off
3	**SOLO B**/[**B**] switch	Direct input solo B on/off
4	**MODE**/[**PRE**] switch	Direct input pre- in/out

Comp./Output Dyn

The following diagram shows the parameters of the compressor detail area copied through scenes. Only corrective compressor shown below, but typically the same for the other compressor modes.



Item	*Control*	*Parameter*
1	**DYN** switch	Compressor on/off
2	**release** control knob	Compressor release
3	**CLIP** switch	Compressor clip on/off
4	**clip threshold** control knob	Compressor clip
5	**comp threshold**/ [**threshold**] control knob	Compressor threshold
6	**dry mix** control knob	Compressor dry mix level
7	**KNEE** pushbutton	Compressor knee: hard, medium or soft
8	**IN** switch	Compressor sidechain in/out
9	**freq** control knob	Compressor sidechain frequency
10	**WIDTH** pushbutton	Compressor sidechain width: 2 Oct, 1 Oct or 0.3 Oct
11	**ratio** control knob	Compressor ratio
12	**attack** control knob	Compressor attack
13	**MODE** pushbutton	Compressor mode: corrective, adaptive, creative, vintage or shimmer

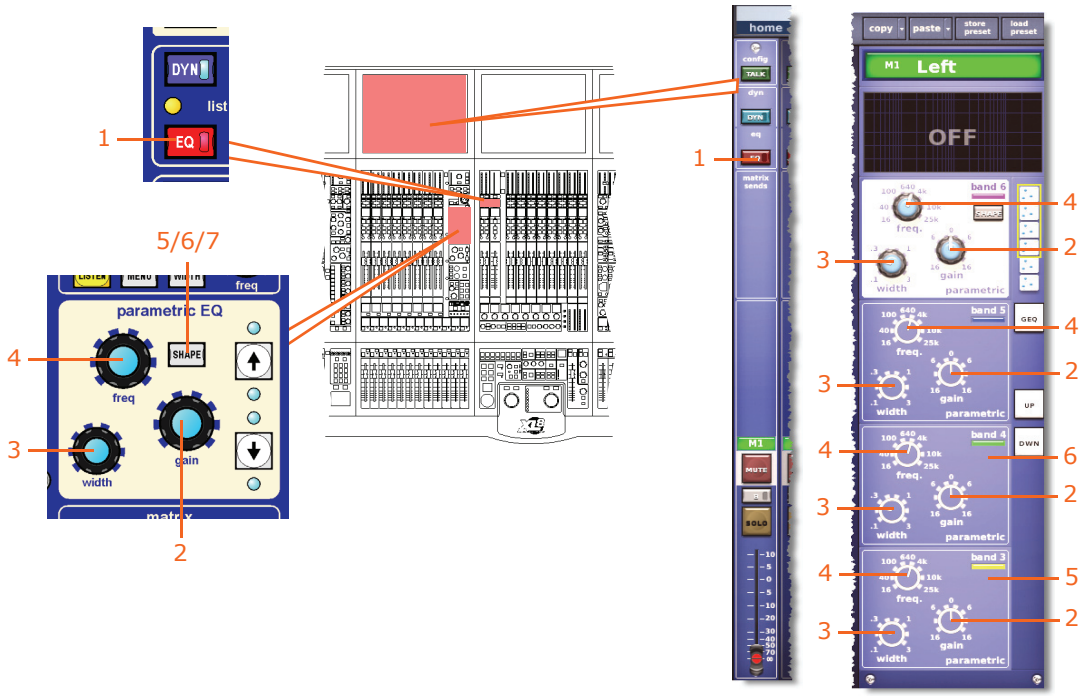
Item	*Control*	*Parameter*
14	**MORE**/[**MOR**] pushbutton	Increases the colouration produced by the compressor
15	**gain**/[**make up**] control knob	Compressor gain

Gates

Not applicable.

EQs

The following diagram shows the parameters of the EQ detail area copied through scenes.



Item	*Control*	*Parameter*
1	**EQ** switch	EQ on/off
2	**gain** control knob	EQ gain level
3	**width** control knob	EQ width
4	**freq** control knob	EQ frequency
5	**SHAPE** switch	Band 1 shelving mode: bell, warm, high pass 6dB or high pass 12dB
6	**SHAPE** switch	Band 2 shelving mode: bell or high pass 24dB
7*	**SHAPE** switch	Band 6 shelving mode: bell, soft, low pass 6dB or low pass 12dB

* Not shown in diagram.

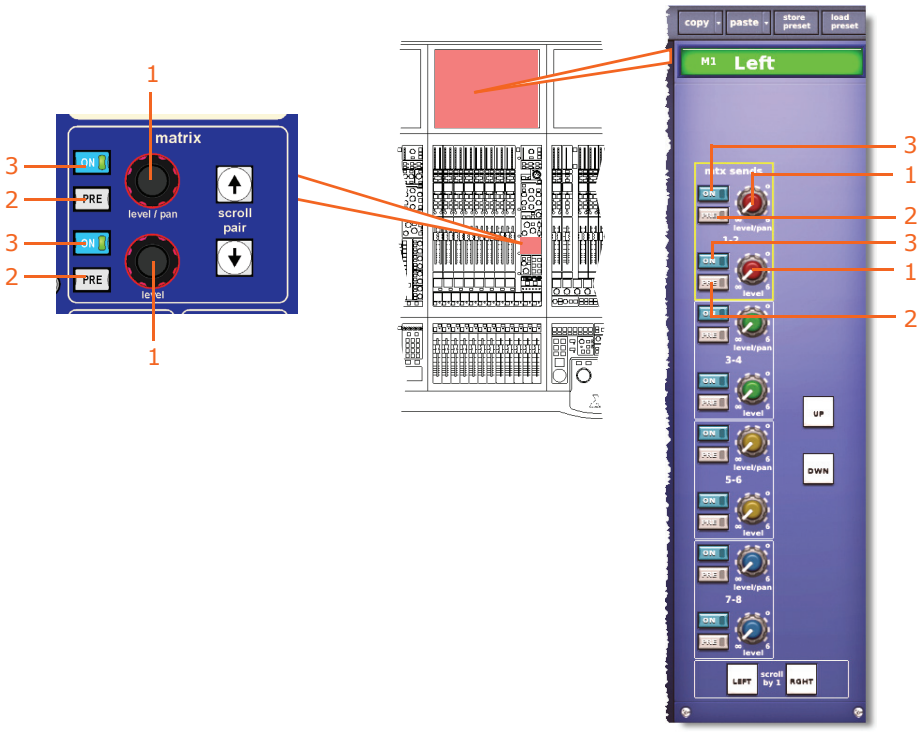
Note: *Although bands 5 and 6 are not shown above, the items in the table also apply. Both bands have items 2, 3 and 4, and band 6 also has item 7.*

Aux Sends (1 to 32)

Not applicable.

Matrix Sends (1 to 16)

The following diagram shows the parameters of the mix detail area copied through scenes.

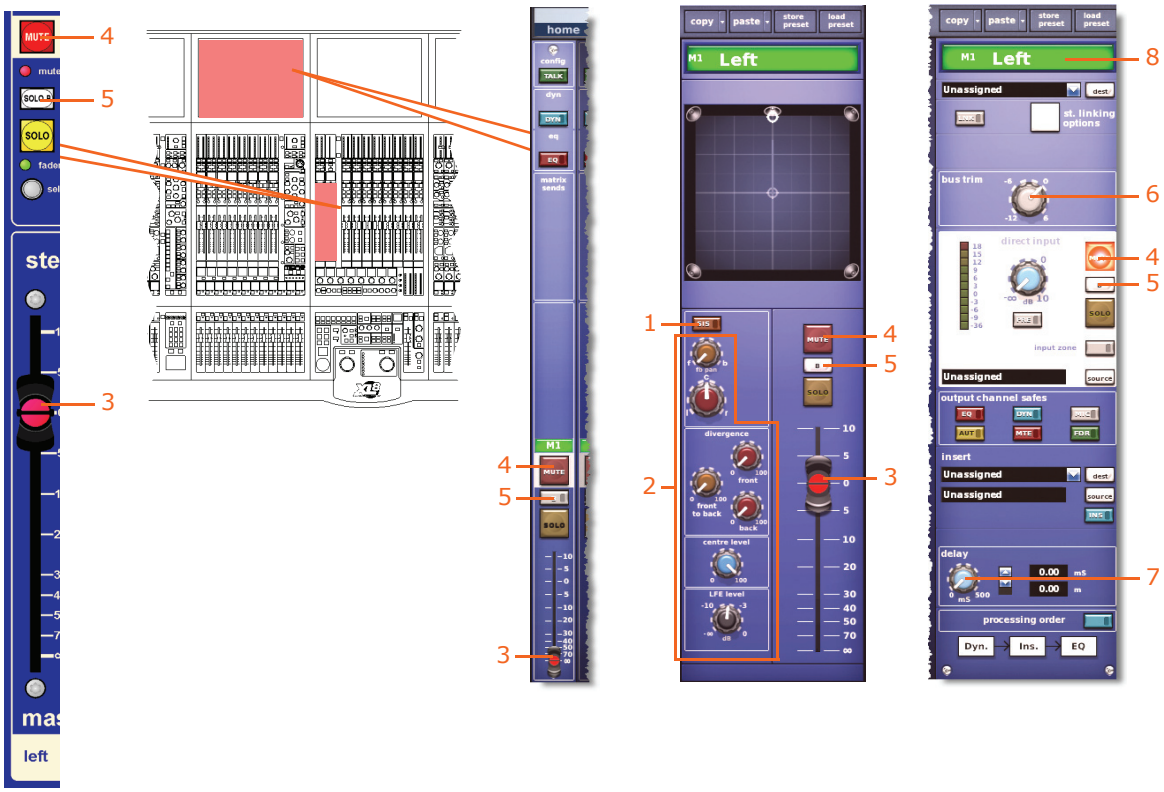


Item	*Control*	*Parameter*
1	**ON** switch	Matrix bus send on/off
2	**level/pan** control knob	Bus level, or pan when bus is linked
3	**PRE** switch	Pre-fader on/off
4	**level** control knob	Bus level

Note: *Although only matrix sends 1-2 are referenced above, this also applies to all 16 matrix sends.*

Fader Sections

The following diagram shows the parameters of the master routing detail area copied through scenes.



Item	*Control*	*Parameter*
1	**SIS** switch	Spatial imaging system on/off
2	Panning control knobs	Surround panning (includes all surround sound parameters)
3	Fader	Level
4	**MUTE** switch	Mute on/off
5	**SOLO B**/[**B**] switch	Solo B in/out
6	**bus trim** control knob	Bus trim level
7	**delay** control knob	Delay time
8	Field	Channel colour

Recall Scope

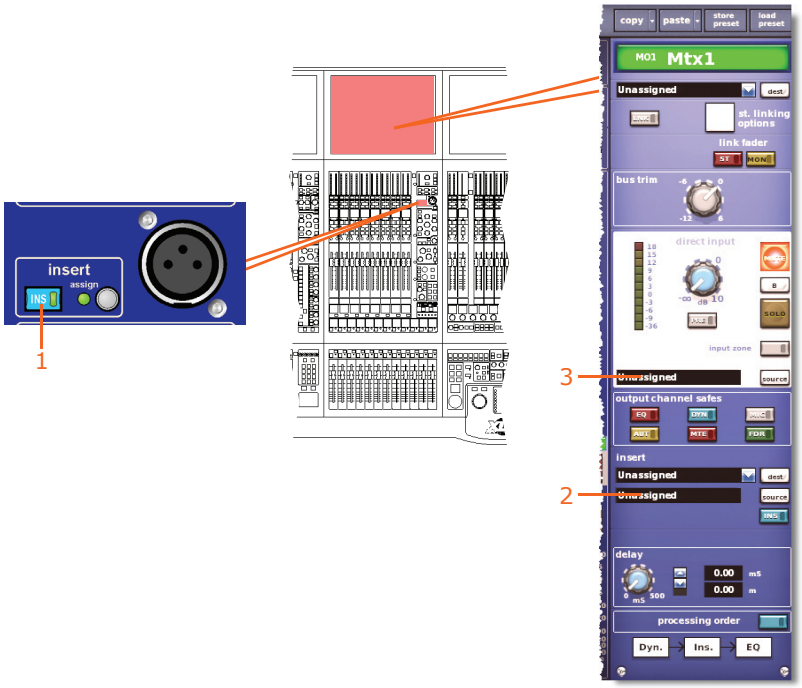
For details, see “Masters” on page 461.

Store Scope

For details, see “Masters” on page 461.

Routing

The following diagram shows the master channel routing parameters copied through scenes.



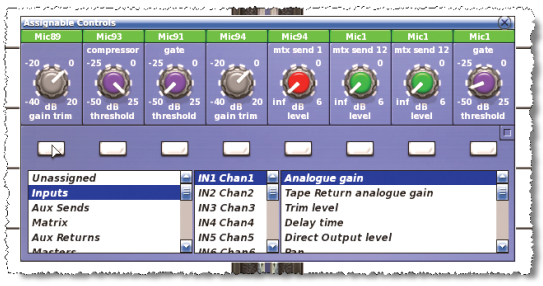
Item	*Control*	*Parameter*
1	**INS** switch	Insert in/out
2	Field	Insert return source*
3	Field	Direct input source*

* Only automated when automate patching is on.

Misc (miscellaneous)

The **Misc** section has an **Assignables** option, which lets you copy the current control assignments of the **Assignable Controls** window through scenes. (The levels are not copied.)

None of the options in the **Sections** area are applicable to this option.



For more information on assignable controls, see Chapter 19 "Assignable Controls (I Zone)" on page 169.

Appendix P: Service Information

The service manual for this equipment is available for purchase. Please contact your local distributor for details.

Routine maintenance

To help keep your XL8 Control Centre unit in good working order and to make sure it gives you optimum performance, we recommend that you carry out the following about once every month.

- Clean the control centre, as detailed in "Cleaning the control centre" below.
- Check controls for freedom of operation. As the controls are 'self-cleaning', this operation will help to prevent them from sticking.
- Check functionality of all controls, that is, control knobs, faders, pushbuttons, LEDs etc.
- Check functionality of equipment.

Cleaning the control centre

Switch off the control centre and electrically isolate it from the mains before cleaning.

Clean the control centre using a dry, lint-free cloth. Do not use harsh abrasives or solvents. When cleaning the unit, take great care not to damage faders, pushbuttons etc.

Cleaning a GUI screen

Switch off the control centre and electrically isolate it from the mains before cleaning.

Carefully wipe the surface of the GUI screen with a soft, lint-free cloth or screen wipe specially designed for the purpose. When cleaning the GUI screen please take the following precautions:

- Avoid putting pressure on the screen.
- Don't use harsh abrasives, for example, paper towels.
- Don't apply liquids directly to the screen.
- Don't use ammonia-based cleaners and solvents, such as acetone.

If you are in doubt have any queries about cleaning the GUI screens, please don't hesitate to contact us.

Equipment disposal

When this equipment has come to the end of it useful life, its disposal may come under the DIRECTIVE 2002/96/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 January 2003 on waste electrical and electronic equipment (WEEE).

Hazardous substances in WEEE contaminate water, soil and air and ultimately put at risk our environment and health. The directive aims to minimize the impacts of WEEE on the environment during their life times and when they become waste.

The WEEE directive addresses the disposal of products when they have reached the end of their life and contributes to the reduction of wasteful consumption of natural resources. This will help to reduce pollution, and protect the environment and ourselves.



If this equipment carries a 'crossed-out wheelie bin' (shown left), please do not dispose of WEEE as unsorted municipal waste but collect and dispose of in accordance with local WEEE legislation. The horizontal bar underneath indicates that the product was placed on the EU market after 13th August 2005.

For WEEE disposal; see our website at www.midasconsoles.com for information.

Glossary

This section provides an explanation of some of the symbols, terms and abbreviations used in this manual.

5.1 surround: A surround sound system created from six channels that form a discrete signal, which is played back over a speaker system comprising five speakers (three front and two rear) and a subwoofer (which is the ".1" or LFE channel). See *LFE.*

µ: Micro- prefix symbol that represents 10^{-6} or one millionth.

A

A/D: Abbreviation for "analogue to digital". The conversion of a continuous signal into a numeric discrete sample sequence.

AC: Abbreviation for "alternating current".

Acoustic feedback: A sound loop existing between an audio input and audio output that is amplified on each cycle. For example, a mic input signal is amplified and passed to a loudspeaker. The output from the loudspeaker is picked up by the mic, which amplifies it again and passes it back to the loudspeaker, and so on.

AES/EBU: Abbreviation for "Audio Engineering Society/European Broadcasting Union"; see *AES3*.

AES3: Also known as "AES/EBU", this is a serial interface for transferring digital audio between devices.

AES50: AES digital audio engineering standard. AES50 is a high resolution, multi-channel audio interconnection (HRMAI). Rather than a network, it is a high-performance, point-to-point audio interconnection, although the auxiliary data may operate as a true network, independently of the audio. HRMAI provides a professional multi-channel audio interconnection that uses Cat 5e data cable and is compatible with Ethernet networks.

AFL: Abbreviation for "after fader listen". A function that allows the signal to be monitored post-fader, that is, after it has been acted upon by the fader.

Algorithm: In computing, a set of instructions for accomplishing a specific task.

amp (A): Abbreviation for "ampere". A unit of current.

Anti-aliasing: When referring to digital images, a technique that avoids poor pixelation.

Area A: Primary input control area.

Area B: Secondary input control area.

Assignable controls: Any controls, such as select buttons (LCD switches), that can be set up by the user to control any function required.

Auto safe: Prevents channel from accepting scene recall.

Auto-mute: A function that automatically mutes the channel's signal under certain conditions.

Auto-mute group: A function that automatically mutes a number of selected channels under certain conditions.

Automation: 1. Memorization and playback of changes made to mixer settings. 2. An area on the output bay that controls these.

Aux: Abbreviation for "auxiliary send" or "aux send". A designation for extra buses, typically used for sending signal to effects, headphone amps and other destinations. See *Bus*.

Aux send: See *Aux*.

B

Balanced audio: A type of audio connection that uses the three leads in a cable, connector and jack as part of a phase-cancelling arrangement to boost the signal and reduce noise.

Band: In EQ, a range of frequencies.

Bandwidth: In EQ, the width of a band, that is, the number of frequencies that will be boosted/cut above and below a centre frequency.

Bank: A fixed number of channels.

Bass: Lower frequencies in a signal.

Bay: One of the five main control centre modules, which contains a control surface and a GUI screen.

Bus: A pathway down which one or more signals can travel.

C

Cat 5e: A specification for a type of cable used typically for Ethernet computer networks.

Channel: Single path taken by an audio signal (input or output) through the control centre.

Channel strip: Row of controls in traditional analogue layout used for the shaping of a signal.

Checkpoint: A patching data store point, created by clicking **CHECKPOINT**. See *Patching.*

Click: A method of GUI operation, mainly for button operation and selection purposes.

CMR: Abbreviation for "common mode rejection". A measure of how well a differential amplifier rejects a signal that appears simultaneously and in-phase at both input terminals. CMR is usually stated as a dB ratio at a given frequency.

Comb filtering: Removal of signal components at a number of regularly spaced frequencies.

Compressor: A dynamics processor that reduces the level of any signal exceeding a specified threshold volume.

Condenser microphone: A high quality mic that uses a capacitor to detect changes in the ambient air pressure, which it then converts into an electrical signal. This type of mic requires power from a battery or external source.

Control centre: The console of the XL8, comprising control surface and GUI.

Control surface: Area on the control centre that houses all of the user's hardware controls, such as pushbuttons, control knobs, switches etc.

Crossfade: To combine signals such that one channel or source fades out while another fades in, but maintaining an essentially constant programme volume. Also known as "X-fade" or "xfade".

Cursor: Generally, used to describe the "I"-shaped pointer on the GUI that indicates a text insertion point. See *Pointer.*

D

D zone: Section in the input channel strip for controlling dynamic parameters.

D/A: Abbreviation for "digital to analogue". The conversion of digital data to analogue audio.

DARS: Abbreviation for "digital audio reference signal".

Dashboard: A standard GUI screen display - usually on the output bay - that shows all channel meters (inputs, auxes, returns, masters etc.) all of the time.

dB: Symbol for "decibel". A unit of measurement of the loudness of sound. See *dBu*.

dBu: A unit of measurement of sound used in professional audio. Derived from the decibel, where the "u" stands for unloaded, this unit is an RMS measurement of voltage based on $0.775V_{RMS}$, which is the voltage at which you get 1mV of power in a 600 ohm resistor. This used to be the standard impedance in most professional audio circuits.

DC: Abbreviation for "direct current".

Delay: An effect by which a reproduction of a signal is played back later then its original.

Destination: In patching, the patch connector to which a signal is routed. See *Patching.*

Detail area: a control section in the channel strips.

Device: A diagram(s) on the I/O tabs (GUI patching) representing a physical rack unit, such as a line I/O, mic splitter, DN9696, AES50 etc. See *Patching.*

DI: Abbreviation for "direct inject" or "direct injection". Signal is plugged directly into the audio chain without using a microphone.

DI box: Device for matching the signal level impedance of a source to mixer input.

Divergence: The spreading of sound waves from a source in a free field environment, that is, one with no reflections. Causes the sound pressure levels in the far field of the source to decrease as the distance from it increases.

Drag: A method of GUI operation, mainly for control adjustment. Also used for selecting blocks of patch connectors during patching.

DSP: Abbreviation for "digital signal processing" or "digital signal processor". Any signal processing done after an analogue audio signal has been converted into digital audio. Can be used to create, for example, compression, equalization etc., of a digital signal. A digital

signal processor is a piece of equipment specifically designed for carrying out signal processing.

E

E zone: Section in the input channel strip for controlling EQ parameters.

Effect: One of a number of audio processes that can be applied to a signal to modify it, such as reverb, flanging, phasing, delay etc.

Effects rack: On the XL8 GUI, a virtual rack of internal processors. See *Virtual rack*.

Envelope: 1. How a sound or audio signal varies in intensity over time. 2. The visual representation of such, usually shown on a graph in a GUI channel strip.

EQ: Abbreviation for "equaliser" or "equalisation".

Equalisation: Adjusting the frequency response so that the levels of all frequencies are equal or the same. Bass and treble controls are equalization controls.

EtherCon®: A cable connector for data transfer interconnections, which is more robust than the basic RJ45.

F

Fader: Slider-type device for precise adjustment of signal level or volume of a channel.

Fast strip: A channel strip in one of the fast zones. See *Fast zone*.

Fast zone: An area on a bay that contains quick controls. See *Fast strip*.

FB: Abbreviation for "front-back". A term used in surround panning.

Feedback: See *Acoustic feedback*.

Filter: A device for removing frequencies above or below certain levels.

FOH: Abbreviation for "front of house". The area in a theatre used by the public. Used to describe a console/control centre being used to control the sound that the audience will hear (and not the performers' monitor system).

Frequency: The number of times that a sound wave's cycle repeats within one second.

Fricative: A consonant, such as "f" or "s", produced by the forcing of breath through a constricted passage.

From section: The leftmost area of the patching screen that contains the source patch connectors. See *Patching.*

FX: Abbreviation for "sound effects".

G

Gain: Another term for signal level.

Gain reduction (compressor): Decrease in gain when input signal is above threshold. See *Gain.*

GEQ: Abbreviation for "graphic equaliser". See *Graphic EQ*.

GEQ rack: A virtual rack of GEQs. See *Virtual rack*.

Glide pad: Device for controlling the GUI. See *Navigation zone*, *Touchpad* and *Trackball*.

Granularity: A measure of the size of components or a description of the components comprising a system.

Graphic EQ: A form of EQ that has a number of faders for controlling the gain of the audio signal. The faders are set at frequency bands that are evenly-spaced according to octaves.

GUI: Abbreviation for "graphical user interface".

GUI channel strip: Rightmost section of a GUI screen that represents the detail area of the input or output channel strip selected to the control surface.

GUI menu: A menu selectable at either GUI screen by clicking the **home** button (upper-left corner).

GUI screen: One of the XL8's five screens, which comprise the GUI.

H

HPF: Abbreviation for "high pass filter". A filter that removes lower frequencies from a signal, leaving the higher frequencies unaffected.

Hum: Undesirable low frequency tone present in a signal due to grounding problems or proximity to a power source.

Hz: Symbol for "Hertz". A unit of frequency equal to one cycle of a sound wave per second.

I

I zone: Area on the output bay that contains the operator-assignable controls.

I/O: Abbreviation for "input/output".

ID: Abbreviation for "identification".

Ident: Scale marking, or gradation, around a control knob to help indicate the current setting and to assist in accurate adjustment.

Impedance (Z): Opposition to the flow of alternating current in a circuit, measured in ohms.

Input: 1. The signal being received by a device. 2. The physical location of where a device receives a signal. 3. Concerning the input bays on the XL8 control surface.

K

k: Kilo- prefix symbol that represents 10^3 or one thousand, for example, kHz (one thousand Hz) or km (one thousand metres).

Kernel: For computers, the kernel is the central component of most operating systems.

L

LCD: Abbreviation for "liquid crystal display".

LCR: Abbreviation for "left-centre-right", referring to speakers.

LED: Abbreviation for "light emitting diode".

Level: General term for volume or amplitude.

LF: Abbreviation for "low frequency".

LFE: Abbreviation for "low frequency effects". A discrete channel intended for playback through a subwoofer speaker, although it can be fed to any speaker that can handle low frequency signals. LFE is generally used to enhance sound effects in films and is, typically, the ".1" in "5.1 surround". LFE is not full bandwidth (range). Examples of LFEs are: thunder, explosions and other bass effects.

LHS: Abbreviation for "left-hand side".

Limiter: An extreme form of compressor that only affects signals above a selected threshold level (dB).

Linux: Also known as "Linux kernel". Operating system kernel used by a family of Unix-like operating systems. See *kernel.*

LPF: Abbreviation for "low pass filter". A filter that removes higher frequencies from a signal, leaving the lower frequencies unaffected.

LS: Abbreviation for "left surround". The left rear speaker in a 5.1 surround system.

M

m: 1. Prefix symbol for "metre(s)", for example, as in "200 m" (200 metres); please note the intermediate space. 2. Prefix symbol for milli-, which represents 10^{-3} or one thousandth, for example, as in "2ms" (2 milliseconds); there is no intermediate space.

MADI: Abbreviation for "multi-channel audio digital interface". An AES standard for digital interconnection between multi-track recorders and mixing consoles.

Main bus: A type of bus; see *Bus*.

Masters: The three master channels (mono and stereo left and right) in the output bay.

MB: Abbreviation for "megabyte".

MC: Abbreviation for "master controller".

Meter: Visual device to indicate the level of a signal.

Mic: Abbreviation for "microphone".

Microphone: Device for converting sound waves into audio signals.

MIDI: Acronym for "musical instrument digital interface". A digital signal system standard that facilitates integration of musical instruments, such as synthesizers and guitars, with computers.

Mix: 1. A signal that contains a combination of signals, such as a pair of stereo signals with numerous effects. 2. The act of creating such a combination. 3. A type of bus (see *Bus*). 4. Concerning the mix bay on the XL8 control surface.

Mixer: 1. A console or other device that blends input signals into composite signals for output. 2. An engineer/technician who carries this out, especially during a live performance.

mm: Symbol for "millimetre" (one thousandth of a metre).

MON: Abbreviation for "monitor", used to describe a console/control centre being used to mix the signals sent to the stage monitor speakers.

Monitor: 1. Speaker(s) used for listening to a mix or live audio. 2. The act of listening to a mix or live audio. 3. Concerning the primary or secondary monitor bus system, A or B respectively.

Monitors: Control area on the master bay for monitoring the A and B signal paths.

Mono: A single signal.

Mute: Function that allows a channel's signal to be silenced.

Mute safe: Function that means a mute cannot be controlled by scene recall or auto-mutes.

N

N/A: Abbreviation for "not applicable".

Navigation: The act of directing channels or buses to the control surface for selection, mixing, processing etc.

Navigation zone: Area on the control surface concerning navigation.

nm: Symbol for nanometre (one billionth of a metre).

Normalisation: An automatic process whereby the gain of all program material is adjusted so that the peak level will just arrive at 0dB.

Normalise: To boost the amplitude of a digital sound so that it is as high as it can be without clipping (0dB).

Normalised connection: Also known as "normalled connection". A connection that allows a signal to pass through it when no plug is inserted in it, but breaks the connection when a plug is inserted.

Normalising: The process of making audio files the same volume.

NVRAM: Abbreviation for "Non-volatile random access memory". this is the general name used to describe any type of RAM that retains its information when power is switched off. For example, flash memory.

O

O/B: Abbreviation for "outside broadcast".

Oct: Abbreviation for "octave".

Octave: A difference in pitch where one tone has a frequency that is double or half of the frequency of another tone.

ohm (Ω): Unit of electrical resistance.

OpticalCon®: A cable connector for fibre optic cables.

OS: Abbreviation for "operating system".

OSC: Abbreviation for "oscillator" or "oscillation".

Out of phase: 1. A signal, being similar to another in amplitude, frequency and wave shape, but offset in time by part of a cycle. 2. 180° out of phase or having opposite polarity. See *Phase*.

Outboard: External, as in an "external device".

Outboard equipment: External equipment used with the XL8 Control Centre, but that is not part of it.

Output: 1. The signal put out by a device. 2. The physical location of where a device sends out a signal. 3. Concerning the output bay on the XL8 control surface.

Overload: A condition where the signal level is too high.

P

Pan: To move from one side to another or up and down.

Panning: The left/right positioning of a signal across a stereo image.

Parameter: A setting whose value can be altered by the user.

Parametric EQ: A type of EQ that allows all of the parameters of equalisation to be changed, including centre frequency, boost/cut in gain, and bandwidth.

Patch: A temporary connection (physical or virtual) made between two audio devices or inside one.

Patch connector: Any tab patching point, for example, an XLR connector, bus, sidechain compressor etc. See *Patching.*

Patching: Also known as "soft patching". The process of routing a channel/signal from a source to a destination(s).

PCB: Abbreviation for "printed circuit board".

PEQ: Abbreviation for "parametric equaliser". See *Parametric*.

PFL: Abbreviation for "pre-fade listen". A function that allows the signal to be monitored pre-fader, that is, before it reaches the fader.

Phantom power: The power required for the operation of a condenser microphone when it is not supplied by internal batteries or a separate power supply. This is supplied by the XL8 Control Centre itself.

Phase: A measurement (in degrees) of the time difference between two waveforms.

Pitch: A continuous frequency over time. Musical interpretation of an audio frequency.

Pitch shift: Alteration of pitch or frequency, but without adjusting tempo.

Point scene: Subdivision of a scene. See *Scene*.

Pointer: 1. On the GUI, the pointer is the arrow-shaped object on the screen that moves when the user moves the trackball or external mouse. 2. On a control knob, it is the marking that, when used in conjunction with the ident around edge of control knob, helps to indicate the setting.

POP: Abbreviation for "population".

POP group: A number of channels assigned to a group that has unfold and area B controls. Provides an easy and quick method of manipulating and controlling the numerous channels available on the XL8 Control Centre.

Post-: The point for accessing audio just after it leaves a specific channel component, for example, "post-fader", where the audio is tapped from just after it leaves the channel's main level control.

Pre-: The point for accessing audio just before it reaches a specific module, for example, "pre-EQ", where the audio is tapped from just before it gets to a channel strip's EQ.

Pschycoacoustic noise: Noise that affects the physiology of the listener.

PSU: Abbreviation for "power supply unit".

Psychoacoustics: The study of the perception of sound, that is, how we listen, our psychological responses and the physiological effects on the human nervous system.

Q

Quick access button: Button for quickly selecting its associated strip section.

R

RAM: Abbreviation for "Random access memory".

Return: Auxiliary return or aux return. An extra input used for receiving a signal from the output of an internal or external effect processor. See *Bus*.

Reverb: An effect where the ambience of a physical space is simulated. This is done by copying a signal and replaying at regular intervals at ever decreasing levels. The intervals are so close that each copy is not heard individually.

RHS: Abbreviation for "right-hand side".

RMS: Abbreviation for "root-mean-square". The square root of the mean of the sum of the squares. Commonly used as the effective value of measuring a sine wave's electrical power. A standard in amplifier measurements. The effective average value of an AC waveform.

RS: Abbreviation for "right surround". The right-hand rear speaker in a 5.1 surround system.

S

s: Symbol for "second"; a unit of time.

Scene: In automation, a set of mix settings for a particular part of a play or song.

Sibilance: Energy from a voice, centred around 7kHz, caused by pronouncing "s", "sh" or "ch" sounds.

Side chain: A special circuit that diverts a proportion of the main signal so that it can be processed, as required. Compressors use the side chain to derive their control signals.

Signal flow: The path of a signal from one place to another.

SIP™: Abbreviation for "solo in place".

SIS: Abbreviation for "spatial imaging system". Combines a central loudspeaker cluster with a left-right system to form three discrete sound channels.

Snapshot: A captured group of mixer settings that reflect the state of the mixer at a particular moment within a performance. This snapshot can then be recalled at the required moment in the performance/playback.

Solo: During monitoring, the isolation of one signal by silencing all other signals.

Source: The patch connector from which a signal is patched. See *Patching.*

SPL: Abbreviation for "sound pressure level". Given in decibels (dB), SPL is an expression of loudness or volume.

Splash screens: The GUI display during power up.

SRC: Abbreviation for "sample rate converter".

SSD: Abbreviation for "solid-state disk". Data storage device that uses non-volatile memory to store data. Quicker than the conventional hard disk and less susceptible to the failures associated with hard disk drives.

Status indicator: A device specifically designed to show the condition of something. For example, an LED that shows whether a pushbutton is on or off, or a meter showing the level of a signal.

Stereo: Two separate channels, left and right, used to give the listener the perception of where the noise is coming from. Usually used with music to give a fuller, more natural sound.

Stereo image: The perception of the different sound sources coming from far left, far right or anywhere in between.

Surround: Audio that has more than two speaker locations and, therefore, more than two channels. Also commonly termed "surround sound".

Sync: Abbreviation for "synchronisation".

Synchronisation: Coordination of timing between devices.

T

Tab: A 'sheet' in the **From** and **To** sections of the **Patching** screen (GUI) that contains a specific group of patch connectors. See *Patching.*

Talk output panel: Routing system for talking out from the console.

TFT: Abbreviation for "thin film transistor".

Threshold: Level at which dynamics processing will begin to operate.

Tie line: A dedicated connection between two systems, typically between FOH and MON positions.

To section: The rightmost area of the Patching screen that contains the destination patch connectors. See *Patching.*

Tooltip: The information box that appears next to the cursor on some GUI screens when it is on or near certain items, such as the channels on the **Dashboard** screen or patch connectors on the **Patching** screen.

Touchpad: Also known as "trackpad". An input device on a laptop PC for controlling the on-screen pointer. See *Glide pad* and *Trackball*.

Track: Single stream of recorded audio data.

Trackball: Device for controlling the GUI. See *Navigation zone*, *Glide pad* and *Trackball*.

Treble: Higher frequencies in a signal.

Tunnelling Ethernet: Mechanism by which to transport a foreign protocol across a network that normally wouldn't support it.

TW: Abbreviation for "twin wire".

U

Unbalanced audio: A type of audio connection that utilises only two of the leads of a cable, connector and jack.

Unfold: Navigates the input channels of a group to the input bays.

USB: Abbreviation for "universal serial bus". A 'plug and play' interface that provides a fast connection between a computer and peripherals, such as keyboards, printers, scanners, digital cameras etc.

V

VCA: Abbreviation for "variable control association", as in VCA group (also "voltage controlled amplifier").

VCA fader: The fader control of a VCA group.

VCA group: A group of channels that are controlled globally, such as via their group's fader and other controls. Provides an easy and quick method of manipulating and controlling the numerous channels available on the XL8 Control Centre. See *VCA.*

VGA: Abbreviation for "video graphics array". A graphics display system for PCs developed by IBM.

Virtual rack: A traditional 19" rack, represented on the GUI. A virtual rack will, typically, contain internal devices, such as effects and GEQs.

volt (V): A unit of electrical potential differential or electromotive force.

Volume: General term for a signal's loudness.

VU meter: Abbreviation for "volume unit meter".

W

Window: A small self-contained panel that appears on the GUI, usually after selection of a specific control. Typically, contains a number of user-selectable options or information in the form of a message or prompt.

X

X-fade: Abbreviation for "crossfade".

X-over: Abbreviation for "crossover".

XLR connector: High-quality three-pin audio connector, which is also used for AES/EBU digital audio connections.

Thank you for reading through this Owner's Manual.
We hope you found it useful.

Please feel free to send us your comments. Our contact details and website address can be found at the front of this document.

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DESIGNED FOR A PURE PERFORMANCE

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