User Manual - Getting Started

To be read in conjunction with the SD Series Software Reference

User Manual Version B for Software Versions 4.0.680+

DiGiCo UK Ltd

EC DECLARATION OF CONFORMITY

This is to certify that the:

SD9 DIGITAL MIXING CONSOLE WORKSURFACE

From serial number 90020

Manufactured by:

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Conforms with the protection requirements of the Council Directive's 2004/108/EC and 2006/95/EC, relating to Electromagnetic Compatibility and Low Voltage Directive by the application of the following standards:

**EN55103-1 2009 Emission standard
EN55103-2 2009 Immunity standard
EN60065 2002 A1 2006 Low voltage directive**

Signed: ....   Position: Technical Director
John Robert Stadius

Date: 12th April 2010

DiGiCo UK Ltd

EC DECLARATION OF CONFORMITY

This is to certify that the:

D-RACK AUDIO I/O INTERFACE

From serial number 980001

Manufactured by:

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Date: 12th April 2010

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Contents

1.1 Introduction

The Digico SD9 consists of a worksurface with an onboard audio engine and a range of onboard inputs and outputs. This can be connected to multiple Input/Output Rack Units by CAT5 cable or MADI links which carry all the audio input and output signals.

The console worksurface consists of 2 sections that can control 48 mono or stereo input channels, 8 VCAs, up to 24 mono or stereo busses, 12 Matrix inputs and 8 Matrix outputs, 16 onboard graphic EQs and 8 onboard stereo effects.

The left and right sections each have 12 assignable faders and 12 sets of assignable encoders and switches.

Either of these worksurface sections can be assigned to the centre touchscreen.

Multiple console setups can provide:

Front of House and Monitoring with a shared stage rack and gain tracking.

Remote control of a console from a laptop computer.

1.2 Manual Overview

This manual provides an overview of the desk, and describes some of the basic operating principles which the user will need to understand in order to run the desk.

For full details on all SD software functionality please refer to the SD Series Software Reference Manual available for download at www.digico.biz

The following typographical conventions are used in this manual:

Bold type is used to indicate that the text is an exact copy of the labelling either on a screen or on the worksurface.

An arrow bracket (>) is used to indicate a sequence of button pressing. For example, **Layout** > **Fader Banks** indicates that the **Fader Banks** button is accessed by first pressing the **Layout** button.

1.3 Before You Start

There are certain general operating principles and terms that should be understood before continuing to use this manual. Please read this chapter carefully before proceeding.

1.3.1 Worksurface Layout ....
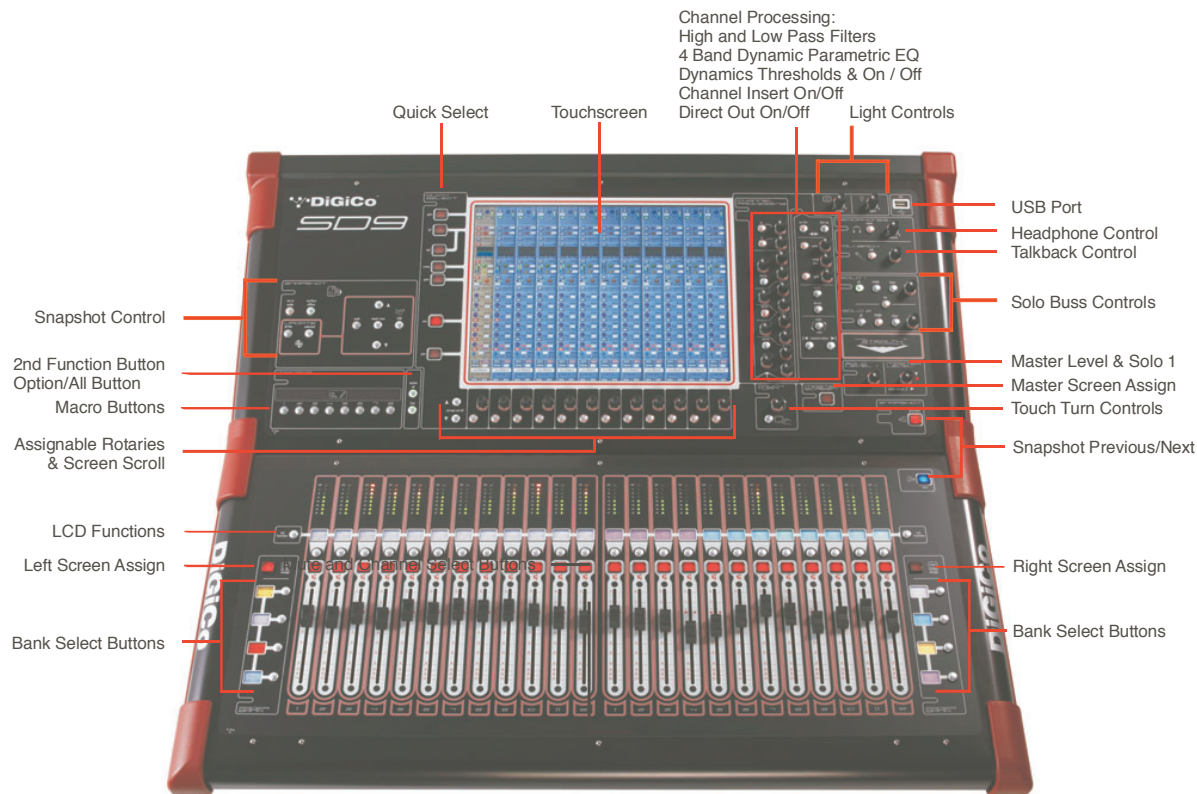
1.3.2 Screen Assignment ....

The SD9 has one central touchscreen which is used to access many of the console's functions.

There are 3 possible views that can be seen on this screen - Left section - Right section - Master screen

Each console worksurface section has its own **Screen Assign** button which, when pressed, will allow the channels in that section to be viewed on the screen and controlled by the Channel Processing controls such as EQ and Dynamics. When the button is lit, that section is assigned to the screen.

There are also a **Master** button which allows you to view the Master screen. The Master screen gives access to many setup and other functions which are not directly related to the console's channels.

1.3.3 Channel Banks ....

The SD9's worksurface is divided into Banks. Each Bank contains twelve channels, and the channels which are currently active on the control surface are defined using the **fader bank** buttons to the right and left of the faders:
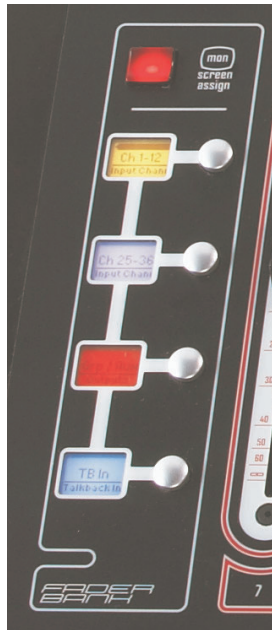
A 'bank' is a set of twelve faders, and a "section" contains up to four 'banks'. There are two sections of the desk, allowing up to 96 channels to be accessible on the worksurface.

To access a bank of faders, press the appropriate **fader bank** button. To switch both sections of the console to the same bank level, press and hold one of the **fader bank** buttons.

The position of the banks on the worksurface is defined in the **Layout** > **Fader Banks** panel. By default, the Input channels will be assigned to the first banks on the left and right sections of the console. The different output channels will be assigned to the lower banks. Control Groups and Master fader will also be assigned. These bank assignments can be customised by the user and saved in a session at any time.

1.3.4 Using the Control Surface ....

There are two main ways in which all of the functions of the SD9 are accessed:

1. The touchscreen display, which can be controlled directly using a finger, or by using the keyboard and mouse
2. The physical encoders, switches and faders.

Note that when touching the screen directly, you may find it easier to use a finer point than your finger. However, in order to prevent damage to the screen, it is important that you only use devices specifically designed for touching screens (such as a pda stylus), and that you never press down hard on the screen.

A number of functions can be accessed in different ways, allowing users to operate the console using whichever interface they prefer. This manual will describe accessing on-screen functions by touching the screen directly and not by using the mouse.

All of the physical controls found in the upper section are described in full within the relevant section of the manual and many require no further introduction. The Master screen has a row of grey buttons which are used to access a range of configuration displays. Pressing these buttons opens either a further drop-down sub-menu or a pop-up display. If a drop-down menu is opened, pressing on one of its entries will open a pop-up display. The buttons lighten to indicate that their sub-menu or pop-up display is open. A number of the buttons within each pop-up display generate further pop-ups.

The buttons within the pop-ups are coloured grey when their function is inactive, generally switching to a lighter shade of the pop-up background when their function is active. Pressing on a text box opens a numeric or QWERTY keypad which can be operated directly by pressing the screen or via the console's external keyboard.

Pop-ups are closed by pressing the box in the top right-hand corner of the pop-up, marked **CLOSE** or **CANCEL** (or by pressing **CAN** on keypad pop-ups).

To the right and below the touchscreen is a single encoder and switch marked Touch-Turn (shown below). This is used to access some of the rotary and switch controls within the Master screen. To assign the Touch-Turn encoder to a particular on-screen control, touch the pot to be assigned. You will notice that a coloured ring appears around the on-screen pot, indicating that it is assigned to the Touch-Turn encoder/switch.

1.3.5 The Assigned Channel ....

One of the channels in the Channel Strip panel is displayed in gold, indicating that it is currently the Assigned Channel. This means that it has been assigned to the worksurface controls and can be configured in detail, as described below. To Assign a channel, touch anywhere in the channel on the screen.

Once a channel is Assigned, all of the controls for that channel which are not displayed within the channel strip itself can be accessed via secondary pop-ups, displayed by touching inside the relevant area of the channel. These pop-ups include controls such as input and output routing and signal processing parameters.

A number of the physical rotary encoders on the control surface can be assigned to different on-screen pots. In order to ensure that it is clear which function is assigned to which encoder, the assigned on-screen pot will have a coloured ring around it.
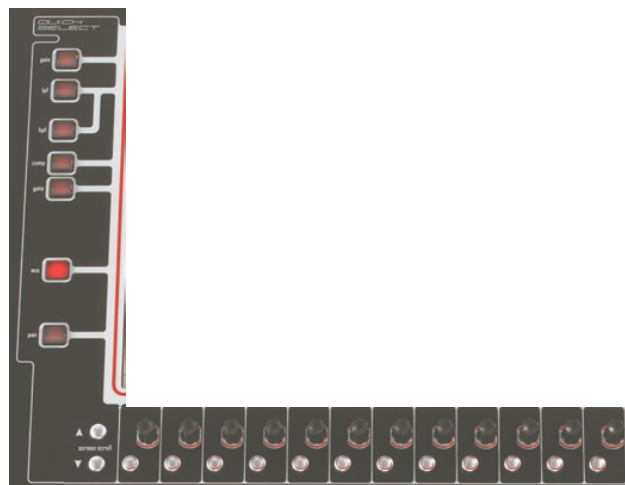
The twelve encoders and buttons immediately below the touchscreen (shown above) refer to the channels with which they are aligned.

Pressing one of the **Quick Select** buttons on the left of the screen will assign the selected function to these controls below the screen. Six aux sends can be displayed in the Channel Strip panel at any one time. If more than six aux sends have been created in the session, the scroll button outside the bottom left-hand corner of the screen can be used to scroll the display through the remaining auxiliaries.

The controls to the right of the Channel Strip panel allow the Assigned channel to be adjusted:

1.3.6 The Master Fader ....

By default, the master fader is assigned to the master group output, which is the lowest stereo group output by default. In addition, the master fader can be assigned to the Solo buss 2 rotary control using the on screen button in the **Solos** panel on the Master screen.

1.3.7 Other Controls ....

To the left of the screen are more channel controls: When pressed, the **2nd function** button allows access to different parameters:

1) Stereo Aux Pan and Pre/Post switching
2) Hard Mute of a channel
3) Fine adjustment of Delay settings on output channels

The **Option/All** button has 2 main functions:

1) When pressed and released, any channel that is a member of a gang will be temporarily isolated from that gang.
2) When pressed and held, any parameter that is adjusted on a single channel will also be adjusted in the same way on all of the channels in that bank

1.3.8 Channel Types ....

The signal flow of the SD9 is best understood in terms of the four channel types contained within it, shown below. Each channel type offers full signal processing capabilities. As a summary, the four channel types are as follows:

- Input channels bring signals into the console to be mixed and sent to aux and group busses.
- Aux channels send a variety of mixes of the Input channels to the Aux outputs, mainly for use as monitor mixes and FX sends.
- Group channels mix groups of input channels together, to feed the buss outputs or the output matrix.
- Matrix channels send the outputs of the matrix to the console's main outputs (Optionally).

The Group channels, Aux channels and Matrix channels are all referred to as output channels. While the Aux and Matrix channels are the channel types most commonly routed to outputs, all four channel types can be routed directly to outputs.

Channels are laid out in banks of 12 on the console worksurface and can be identified by their colour: Light-blue for Input channels, red for Group channels, purple for Aux channels and blue-green for Matrix channels.

By default, the Input Channels will be assigned to the top banks on the left and right sections of the console.
The output channels (Groups, Auxes and Matrices) will be assigned to the lower banks.

Control Groups will also be assigned to the lower banks. These bank assignments can be customised by the user and saved in a session at any time.
Holding any bank or layer button down for a couple of seconds will switch both worksurface sections to the same bank level.

The controls on each different type of output channel are identical but an input channel has a number of additional features.

Inputs   Groups   Auxes   Matrix

Input Module - Touch to Expand
Analogue Gain/Digital Trim
Phase - Gain Tracking
Main/Alt Input Select

HPF/LPF

Insert A Routing & On/Off

4 Band EQ
Touch To Expand

Dynamics
Touch To Expand

Insert B Routing & On/Off

Aux Sends
Touch to Assign Rows

Channel Pan
Mute & Hard Mute

Channel Label
Routing Module - Touch to Expand
Gang & Safe Indicators
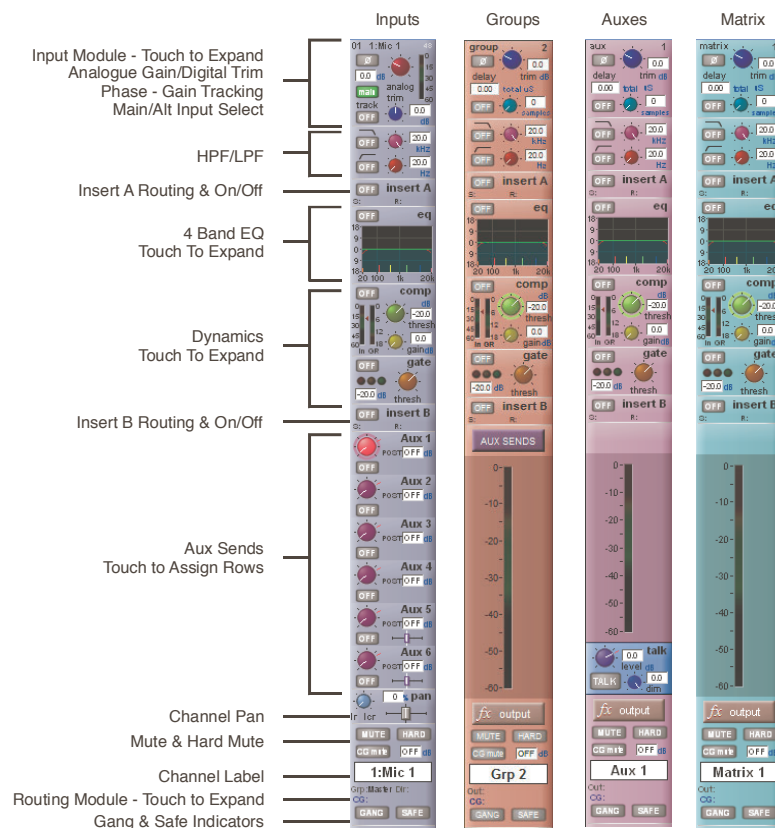
1.4 Hardware Configuration

1.4.1 Connections ....

Detailed information on the various systems of connection is provided in the relevant Appendix but the following diagram provides an overview of a single console/ rack setup.

All connections should be made before switching on the console and racks.

The console and racks may each have dual redundant power supplies and both should be switched on at all times. After switching on the console the software will be launched automatically and the state of the worksurface and settings should be the same as when it was last Shut Down.

To Shut Down the console press the **System>Shut Down** button and wait until you receive a message saying that it is safe to switch the power off.

The SD9 worksurface has 8 analogue I/O and 2 AES I/O L/R pairs on its rear panel and additional I/O is supplied in the form of a remote D-Rack which has 32 analogue inputs and 8 analogue outputs as standard. This rack is connected to the worksurface by a 75M STP CAT5e cable. Optionally, 2 D-Racks can be connected to the SD9.

If used with a DiGiCo Little Red Box the CAT5e ports can also be used to connect with BNC MADI equipped consoles.

The console also has a pair of standard BNC MADI connectors (MADI IN & OUT) which can be connected to any of the range of DiGiCo stage racks (DiGiRack, MaDiRack, MiNiRack or SD Rack) with 75Ohm coaxial cables. This MADI port could also be used to connect to a MADI equipped recorder.

From Mid 2013, new SD9 consoles can also be fitted with optional Optocore connectors providing the possibility of including an SD9 in a DiGiCo Optocore loop

The connection for the D-Rack is a single cable from the D-Rack port on the back of the console to the DiGiCo Audio Interface port on the D-Rack.

In normal operation the MADI connections on Port 3 should be as follows:

Rack MAIN MADI IN connected to the console MADI OUT

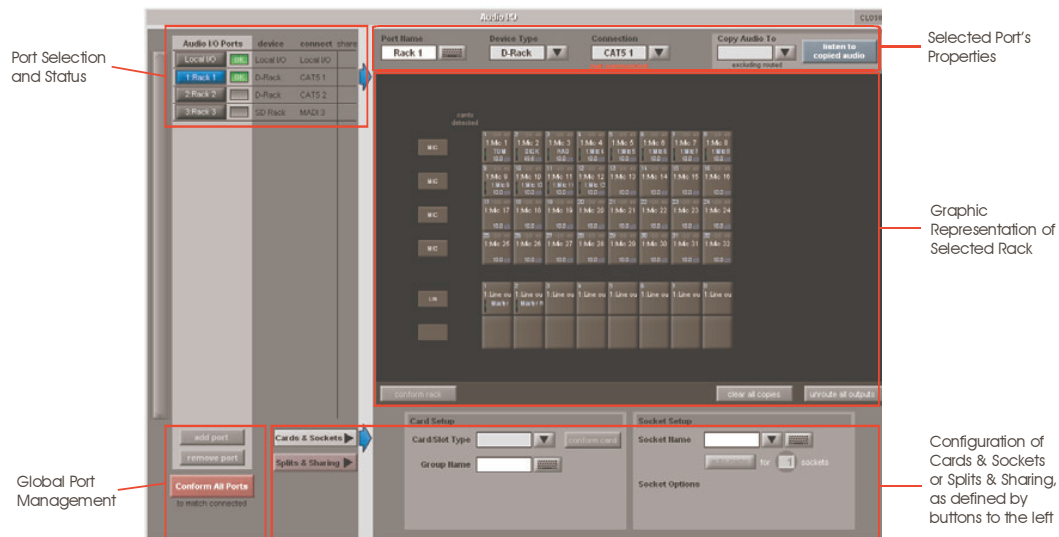Rack MAIN MADI OUT connected to the console MADI IN

PORT 3 MADI IN/OUT

DIGICO CAT5E

DIGICO CAT5E

DiGiRack
MaDiRack
MiNiRack
OR
MADI Recorder

D-Rack 2

D-Rack 1

1.4.2 Audio I/O Panel...

The Audio I/O panel is used to configure the physical I/O connected to the SD9, including configuring and naming the sockets of the cards installed in racks, and the setting of Pads and phantom power.

Local I/O : The SD9 provides local audio I/O in the rear of the console. These operate independently of connected racks..

To access the SD9 Audio I/O Setup touch **Setup>Audio I/O** on the Master Screen

The Audio I/O panel that opens is divided up into the following sections:

Port Selection and Status

Selected Port's Properties

Graphic Representation of Selected Rack

Global Port Management

Configuration of Cards & Sockets or Splits & Sharing, as defined by buttons to the left

The left side of the window shows the ports. Each port relates to an available physical audio connection (Local IO, CAT5 or MADI Port)

The section immediately to the right of this contains the controls relating to the ports. When a port is selected, this section changes to reflect the status of the selected port, and allows it's configuration to be changed as required.

The right hand section of the Audio I/O Window shows a graphical representation of the rack configuration connected to the selected port. Depending on the port selected, the graphic will change, showing the available physical I/O. Each small "square" on the image represents a single physical audio connection or socket, with these arranged in columns or rows, representing I/O cards in racks, or the local I/O on the back of the console.

The section below the graphical rack picture allows configuration of the cards or slots and sockets, including custom naming, phantom power and pad selection.

The local I/O configuration is fixed, so no hardware changes are possible. You can, however, change the Port Name, the Group Names and the Socket Names (the name of each physical connector on a card).

Rack Connections

With a Rack selected in the left hand port selection list, the window will change to look something like the image below, depending on the cards installed in the connected rack. The graphic shows the 6 available cards/slots, 4 input & 2 output.
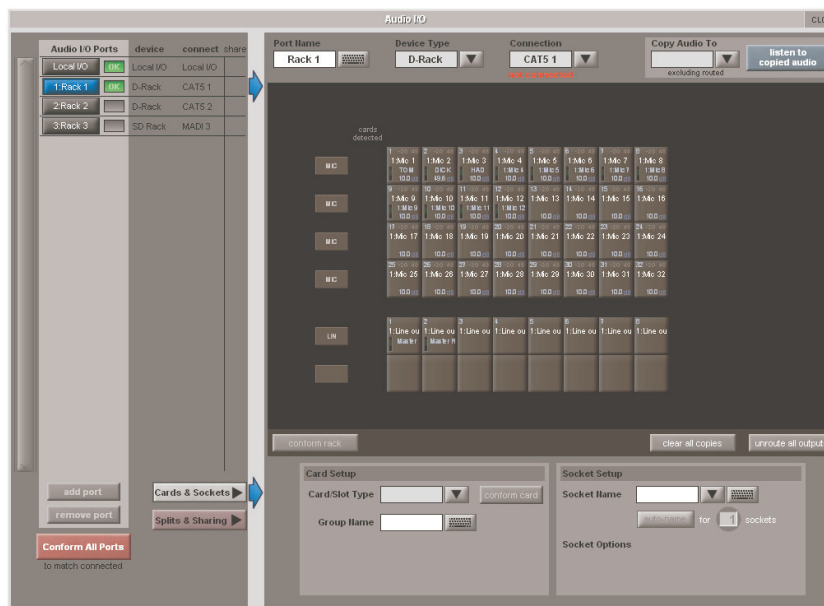
In order to use the rack, the on-screen contents of the rack must match the cards physically installed in the rack connected. There are two ways of achieving this :

Manual Conforming of Rack :

Select each card and manually select the appropriate card in the Card/Slot Type drop down menu in the lower section of the window. Once the correct card type is selected, the Label at the bottom the selected card will turn green, indicating the card type matches the card installed in the rack. If the Card Type name is Red, then there is a mismatch, and the error should be corrected by selecting the correct card type.

Automatic Conforming of Rack :

Just below the rack view section of the window is the **auto-conform all** button. Pressing this button will correctly select the correct card for each slot of the connected rack. Once complete, all of the Card Labels beneath each slot should turn green.

It is also possible to auto-conform on a card-by-card basis. With a single card selected (by touching any of the sockets on that card), press the **auto-conform** button next to the Card/Slot type button selector in the lower section of the window. This will automatically match the Card/Slot type for the connected rack.
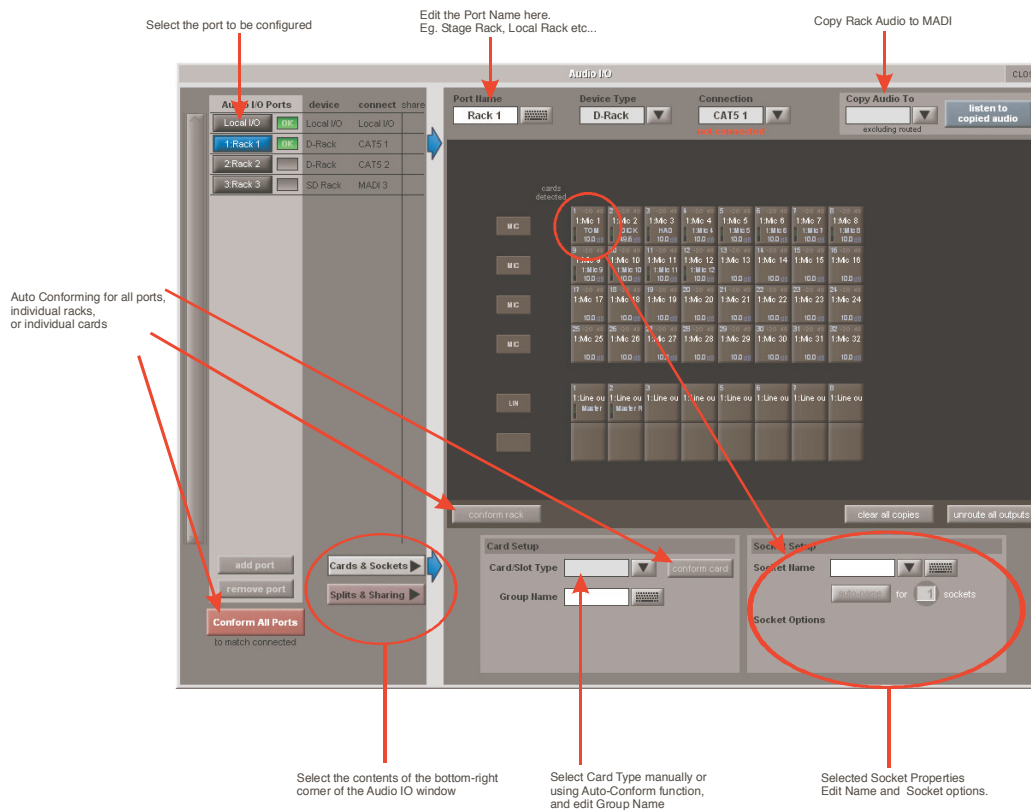
Copying Audio and Listening to Copied Audio (MADI Recorder Setup)

Audio from one or two D-Racks can be copied to the MADI Port 3 Output by selecting the incoming Port(s) in the Ports list and using the **Copy Audio To** drop down menu. For example, if you want to copy D-Rack 1 and/or D-Rack 2 Audio Inputs to a MADI equipped recorder connected on Port 3, select Rack 1 in the ports list and then select Port 3 from the **Copy Audio To** drop down menu. Then repeat the procedure for Port 2 copying this to Port 3 as well.

For 56 Ch Standard MADI,the 32 inputs on Rack 1 and the first 24 inputs on Rack 2 will be copied to Port 3 and can be recorded as necessary.

For 64 Ch Standard MADI,the 32 inputs on Rack 1 and the 32 inputs on Rack 2 will be copied to Port 3 and can be recorded as necessary.

In addition, by connecting the recorder's MADI Output to the console's MADI 3 Input, the playback can be monitored in the same channels as the original source material. Just press the **Listen To Copied Audio** button to monitor playback and press it again to return to monitoring the live sources from the rack.

Select the port to be configured

Edit the Port Name here.
Eg. Stage Rack, Local Rack etc...

Copy Rack Audio to MADI

Auto Conforming for all ports,
individual racks,
or individual cards

Select the contents of the bottom-right
corner of the Audio IO window

Select Card Type manually or
using Auto-Conform function,
and edit Group Name

Selected Socket Properties
Edit Name and Socket options.

Standard MADI Connections

If you have a standard MADI connection (not a DiGiCo Rack) to your SD9, you can set the SD9 to display the MADI with generic signal names, i.e. MADI 1, MADI 2.. etc. through to MADI 56 or 64 instead of the usual rack style names. The naming does not affect the signal, but makes routing signals easier.

STD MADI = 56 channel MADI

MADI 64 = 64 channel MADI

Console to Console routing

If two DiGiCo consoles are connected together using MADI, it is possible to route audio between them. The Port that is connected to the second console should be defined as a Standard MADI Connection.

Unrouting All Outputs

All outputs to the selected port can be unrouted at once by pressing the **unroute all outputs** button below the cards graphic and selecting **yes** in the warning pop-up which appears. "Copied" audio is not unrouted by this action.

Note that this will cancel all routing created in the channel screens and cannot be undone.

Splits & Sharing

In a multi-console system where Racks are connected with MADI and shared between two DiGiCo Consoles, only one of the consoles can take control of the rack, with respect to Gain, Phantom Power and Pads. To overcome this, it is possible to place the SD9 into one of 3 states of operation; Isolate, Receive Only or Full Control.

Sharing is configured in the bottom right-hand corner of the window when the **Splits & Sharing** button is selected:
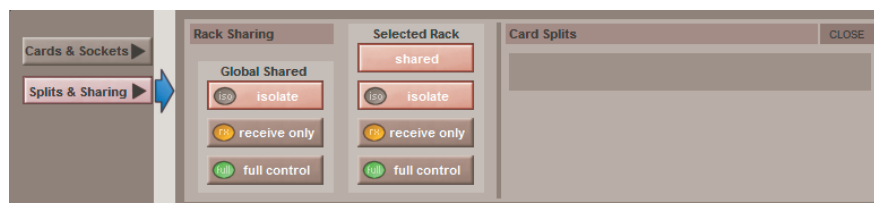
These three states can be set individually in the right column), on a per-rack basis (middle column), or globally for all shared racks (left column).

Isolate : The SD9 will not communicate with the rack and therefore any adjustment of input gain or +48V switch will have no effect on the rack settings

Receive Only : The SD9 will receive the rack's existing settings but will not be able to control the gain etc on the racks.

Full Control : The SD9 will send its settings to the racks and change them accordingly.

1.5 Configuring a Session

The SD9 has a default setup which means that the new user need not get involved in configuring the desk at this stage. However, here is a brief overview of how the different displays are used in putting together a session. Each of the master displays introduced below are described fully within the SD Series Software Reference Manual

The **Setup** > **Audio IO** display is used to configure the physical I/O connected to the SD9, including configuring and naming the sockets of the option cards installed in racks, and the setting of pads and phantom power. (See previous section)

The **File** > **Session Structure** display is used for configuring how the console's the DSP channels is to be divided between channel types, and where the format of the channels is defined.

The **Session Structure** display can be used to automatically assign the channels to the worksurface. However, channels can also be manually added to the worksurface using the **Layout** > **Channel List** display.

1.5.1 Session Structure ....

When starting a new session, it is important to decide how many of each type of buss is required. While changes to session structure can be made once a session has been started, it is best to try and set these parameters before configuring the session. The structure will set the number and type of aux and group channels and allow you to choose which parts of the new session will be cleared and reset. There is also an option to automatically route the inputs and outputs from channel types that you have opted to clear.

To adjust any of the channel allocations, touch on the associated channel count box, and either enter a number using the pop-up number keypad, or adjust using the assigned touchturn controller.

The maximum total amount of Aux and Group channels available is 16 mono or stereo. As you increase the number that you require you will see the resources available decreasing accordingly in the number display at the bottom of the panel.

> *Note - Pressing the Default All button followed by the Restucture button will automatically configure a new session with the following setup where the first 32 rack inputs are routed to input channels 1-32 and the Master Buss is routed to Local outputs 1 & 2 and also to Rack 1 outputs 1 & 2. All input channels will be routed to the Master Buss and the console headphones will be fed by the Master Buss when nothing else is soloed.*

The default configuration is :
48 Mono or Stereo input channels (Fixed)
6 Mono Aux busses & 6 Stereo Aux busses (Adjustable)
6 Mono Group busses & 6 Stereo Group busses (Adjustable)
12 Matrix Inputs and 8 Matrix Outputs (Fixed)
8 Control Groups (Fixed)
1 Stereo or LCR Master Buss
2 Mono or Stereo Solo Busses (Fixed)
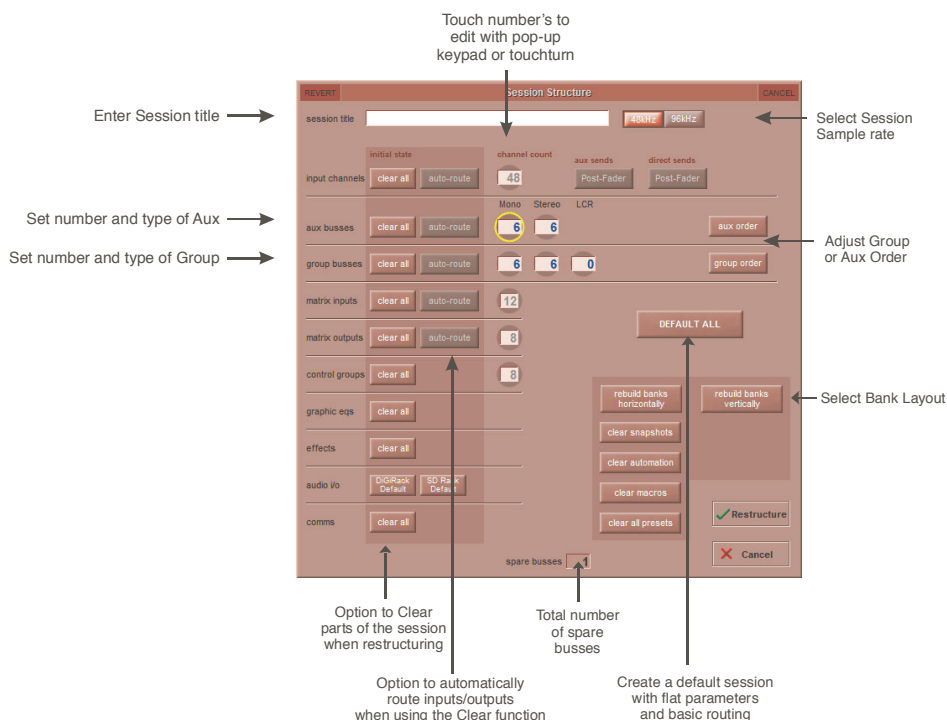
Clear All Buttons : When changing routing, you have the option of clearing any non-default routing or processing (EQ, dynamics etc) from the channels in the session. This is especially useful when restructuring an existing session to make a new session. The clear snapshots, clear automation and clear macro's perform similar operations.

Rebuild Banks : When changing the session structure, there are two possible scenarios. If you restructure the session without rebuilding banks, any additional channels you have allocated are not "placed" on the worksurface, and need to be manually assigned to faders. If however, you restructure a session with Rebuild Banks enabled, the worksurface will be built with all channels available on the worksurface.

Banks can be laid out **horizontally or vertically** according to the button selected

Aux Sends and Direct Sends : By toggling the state of the Aux Sends and Direct Sends Buttons in the Input Channels section, it is possible to change the default operation of the Aux Sends and Direct Sends. These functions toggle between "Post Fader", "Pre-Fader" and "Pre-Mute". These buttons can only be used in conjunction with the **clear all** function.

Auto-Route : The Auto-route functions automatically routes consecutive inputs for input channels, and consecutive outputs for busses. For example, auto-routing 32 inputs will route the first physical input (eg 1:Mic 1) to input channel 1, the second physical input (1:Mic 2) to input channel 2… until you either run out of inputs or channels. Auto-routes are as follows :

Input Channels auto-route with physical inputs

Aux, Group and Matrix Channels auto route to physical outputs

Matrix Inputs auto-route with group outputs

NOTE : Auto-Routing can only be used in conjunction with the "Clear All" button.

1.5.2 Assigning Faders to the Worksurface ....

If, after a Session Restructure where the Rebuild Banks button was not pressed, you find that newly created channels do not appear on the worksurface, open the **Layout**>**Channel List** panel on the Master screen and you will see a full list of all input and output channels that are present in the session.
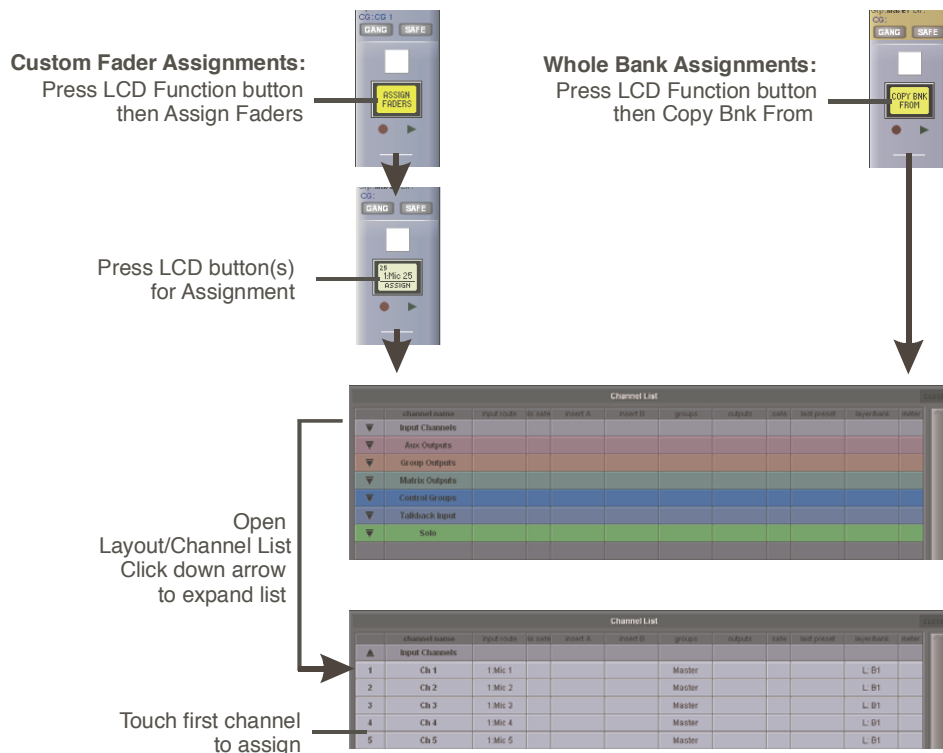
To assign channels to the worksurface, select a bank and press the **LCD Function** button.

Then press the Channel Select button below the display labelled **Copy Bank From** to enter that mode.

Now press the first channel that you wish to assign on the **Layout/Channel List** on the Master screen.

Consecutive channels will be assigned to the worksurface for each channel in the selected bank.

Now press the LCD Function button again and return to the standard mode by pressing the LCD button labelled **Solo**

Custom Fader Assignments:
Press LCD Function button
then Assign Faders

Whole Bank Assignments:
Press LCD Function button
then Copy Bnk From

Press LCD button(s)
for Assignment

Open
Layout/Channel List
Click down arrow
to expand list

Touch first channel
to assign

1.6 Saving and Loading Sessions

1.6.1 Save As New File ....

When you change the configuration of the a session you should save it to the console's flash drive under a new filename.

If the Save Session panel has not appeared automatically after a session restructure then touch the **Files** button on the Master screen and then press **Save As New File.**

Select the destination drive (Internal or Removable) and file path and then enter a new file name and description for the file - then press the **Save** button.

> *Note: If you touch a session name on the existing list, this name will automatically be selected as the new file name and touching Save will overwrite the old file.*
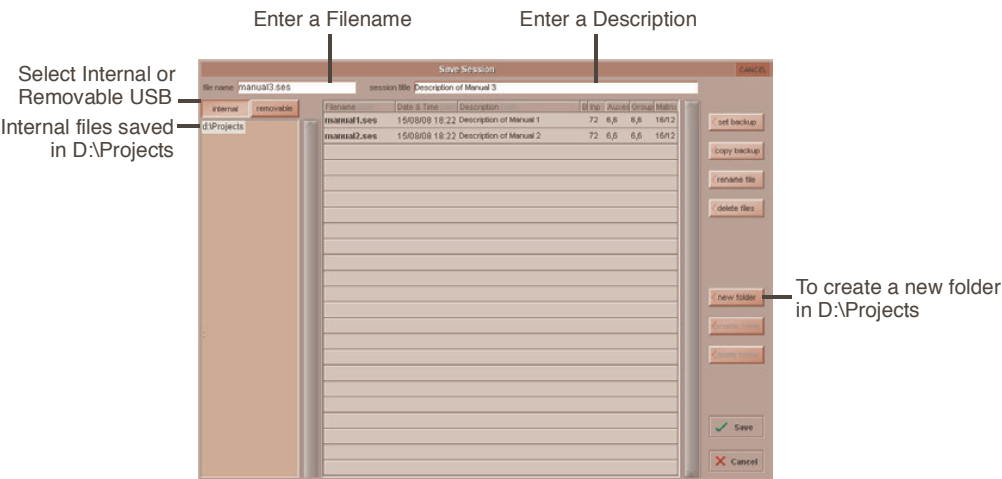

1.6.2 Save Session ....

This button which is found above the **Save As New File** button will save the existing session in the same location and under the same file name as it was previously saved or loaded from. It therefore serves as a "**Quick Save**" option to update an existing session.

Remember that this function will overwrite your last saved version.

If you wish to save the session under a new name use the **Files** menu button and select **Save As New File** (See above).

Load Session

To load a previously saved session:

Touch the **Files** button on the Master screen and then press **Load Session.**

Select the source drive (Internal or Removable) and the required file from the list - then press the **Load** button.

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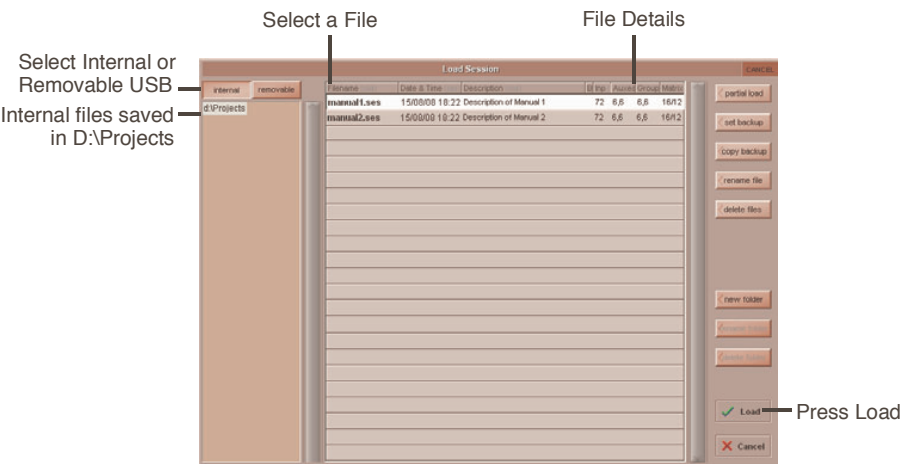
1.7 Audio Sync

The SD9 operates a Sample Rates of either 48000Hz (48kHz) or 96000Hz (96KHz).

By default, it is set to clock internally (as a Master) and the Sample rate is determined by your selection in the Session Structure panel.

Within a normal setup, the SD9 will usually remain as clock master. However, there are times when the SD9 needs to be clocked externally. The Audio Sync panel allows you to control external synchronisation.

To access the Audio Sync Panel, touch the Setup Menu button, followed by Audio Sync. The following panel will open:
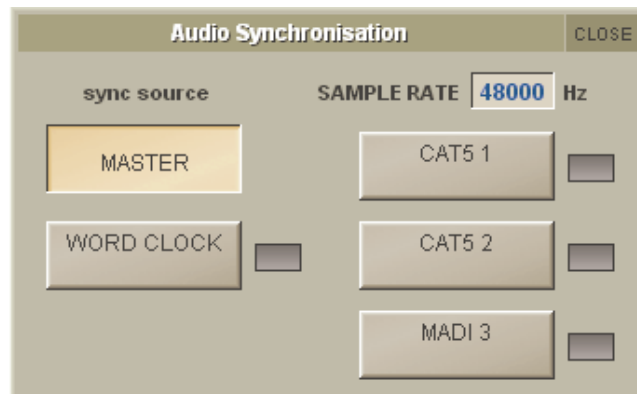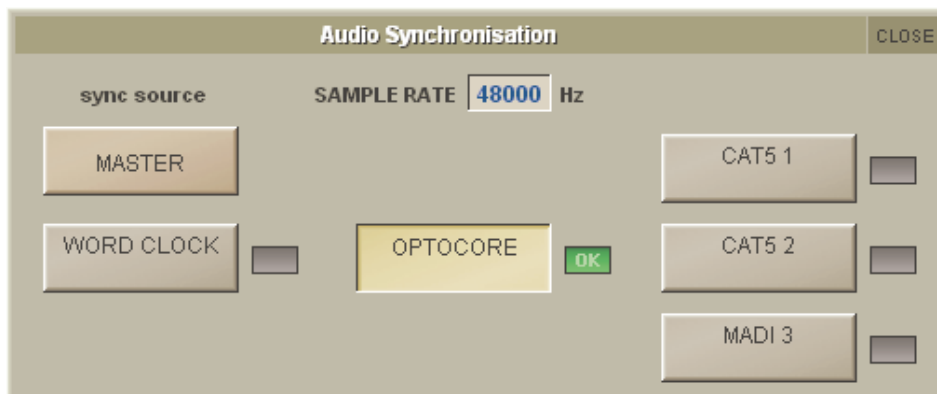
The SD9 will clock from the following sources : Word Clock, CAT5#1, CAT5#2 and MADI 3

Note : When a valid clock is detected on an external sync input, the corresponding Green OK box will light, even if that input is not selected as the clock source for the SD9.

The second picture above shows an example of External Clocking : Word Clock @ 48kHz

Note: If the console has an Optocore board fitted, an Optocore Sync option will also be available.

If the console is connected to an Optocore system then the Audio Sync should normally be set to Optocore if no external clock source is required.

1.8 Routing Basics

1.8.1 Selecting Inputs & Outputs ....

All channel input, output, insert send and insert return routing is done via routing displays, accessed via the dark grey routing buttons in the channel **Setup** and **Output** displays (shown below for an Input channel's input).

Note that multi-channel signals are routed individually, and then collected together as a "Multi Channel" as described in the SD Software Reference manual

To access Channel Input Setup, touch the top of an input channel display on the touchscreen.
To access Channel Output Setup, touch the bottom of any channel type's display on the touchscreen.
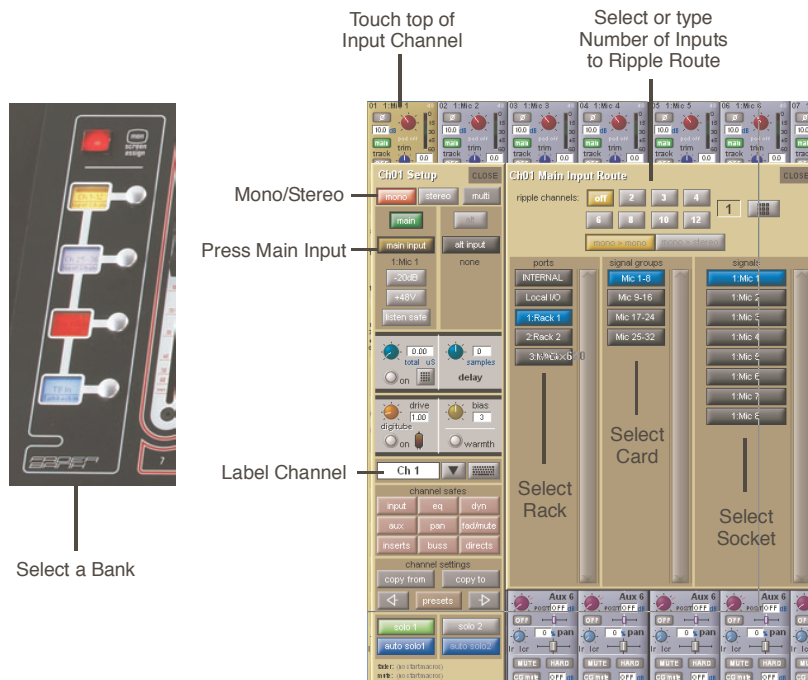
Within each display, there are three columns containing three levels of routing selection:

-   The left-hand column contains the available **ports** within which the desired input or output might be located;
-   The middle column, **signal groups**, then shows the available groups of inputs or outputs within that port;
-   The right-hand column, **signals**, then displays the individual inputs or outputs available within that signal group.

The boxes in each column are lit blue to indicate that they are currently selected. If there is already a routing assigned within the display, the **port** and **signal group** columns containing the current assignment will be half-lit.

Each output can only have one channel routed to it. The outputs that are currently in use by another channel display in blue text. If you attempt to route a different channel to an output which is already in use, a confirmation box appears, indicating which channel is already using it, and warning that continuing with the action will cause the old channel to be derouted from this output. Press **Yes** to proceed, **No** to cancel.

Note that when routing direct outs from Input channels or outputs from output channels, any number of available signals can be selected. A new route selection will therefore be added to previous selections in these cases. However, inputs, insert sends and insert returns can only route to/from one signal (in the case of mono channels) or two signals (in the case of stereo channels). A new route selection will therefore result in the previous selection being lost for inputs and insert sends and returns.

For stereo channels, left and right routes are presumed to be consecutive: When routing stereo signals, select the left route, and the next signal in the list will be automatically selected as the right route. If the last signal in a signal group or port is selected as the left route, the first signal in the following signal group or port will selected as the right route.

For input and insert return routing, the **INTERNAL** port provides the following signal groups:

Misc: The oscillator, white and pink noise generators.
Graphic EQs: The outputs of the SD9's internal graphic EQ's.
Effects: The outputs of any effects sends that have been created

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Channels:	The direct outputs from the other input channels
Groups:	The outputs of the group busses
Auxes:	The outputs of the auxiliary busses.
Matrix:	The outputs of the Matrix channels.

Note: The outputs for the channel being routed are locked out of the signal list.

Note also that the console views all routes as a single list. Therefore, if the left signal is connected to the last signal in a port, the right signal, will be automatically connected to the first signal of the next port, regardless of port type.

For output and insert send routing, the **INTERNAL** port provides access to the inputs of the SD9's Graphic EQ's, and the inputs to any effects that have been created.

The **0:Local I/O** port contains a list of the inputs or outputs found directly on the SD9's back panel.

The **Rack** ports contain all of the inputs or outputs available within the remote I/O racks, as defined in the **Audio I/O** display

Once a route has been selected, its name will appear below the routing button in the **Setup** or **Outputs** display.

Whenever a route is created, metering and additional controls are made available below the routing button. These controls are dependent on the type of route created and are described in detail in the SD Series Software Reference manual:

Local Mic input routed to an input or insert return:	**48V** button for remote control of phantom power and a -20dB input pad
D-Rack Mic routed to a mono input or insert return:	**48V** button for remote control of phantom power and a -20dB input pad
D-Rack Mic or Local Mic Input routed to a stereo input:	**48V** button, a -20dB input pad, MS decode, width, balance and L/R controls.
Mic pre-amp routed to an insert return:	**48V** button, a -20dB input pad, a phase reverse button and gain trim.
Output routed to a console output:	**-10db** pad (rack out only), **on** button for switching the send on and off, gain trim and send point selector which toggles the place within the channel from which the direct output is fed:
	pre-F Pre-fader,
	post Post-fader
	pre-M Pre-mute (and pre-fader)
Insert send routed to a console output:	**-10db** pad (rack out only), **on** button for switching the send on and off, and gain trim.
Insert send routed to a graphic EQ:	an **on** button for switching the send on and off
Output routed to a graphic EQ:	no additional control.

Buttons become ringed in either red or green to indicate that they are on.

1.8.2 Ripple Channels ....

The **ripple channels** function, located at the top of the route display, allows consecutive channel routes to follow the routing of the current display incrementally. For example, Channels 1 to 8 direct outputs can be routed to Rack 1 > Line outs 1 to 8 respectively by routing Channel 1's direct out to Rack 1 > Line out 1 and allowing the **ripple channels** function to route Channels 2-8 automatically.

The number of channels to be rippled is defined either by selecting the appropriate grey numbered button, or by selecting the keyboard button to the right of the numbered buttons, typing the required number of channels (8 in the example above) into the numeric keypad which appears, and pressing **OK**. Once you have configured the **ripple channels** function, any routing action will also effect the appropriate number of channels above the channel being routed.

The **ripple channels** function treats stereo channels as two channels. In other words, if Channel 2 in the above example is stereo, the **ripple channels** function will route Channel 1 to Line out 1, Channel 2 Left and Right to Line outs 2 and 3, Channel 3 to Line out 4 etc.

1.8.3 Channel Names...

The black and white text box in the **Setup** display is used for naming the channel. Channel names are displayed in the scribble strip at the bottom of the screen. By default, the channel is given the same name as the selected input signal.

Note that if no input signal is selected, the scribble strip simply displays the channel number, prefixed by **ch** for Input channels, and prefixed by **Aux**, **Grp** or **Matrix** in the case of output channels.

The following notes are specific to naming channels:

The **Next** button moves the entire **Setup** display to the next channel.

At the very top of the channel, the channel number and input signal name are displayed for Input channels, and the channel type and number are displayed for output channels. These labels remain unchanged, regardless of any channel naming.

For Input channels, note that if the channel input signal is changed once a channel has been manually named, the channel name will no longer follow the input signal name. To reactivate the automatic channel naming function, clear the name and re-select the channel input.

Note also that the channel Output display also provides access to this channel naming facility.

Channels can also be named directly in the **Channel List** display (in the **Layout** menu). Open the display, activate the **Edit** function below the list, and expand the required channel type list by touching its row. Touching the **channel name** column for any channel in the list will cause a keyboard pop-up to appear, where a name can be typed in the usual way.

1.9 Channel Processing

1.9.1 EQ ....

The EQ section comprises four user-configurable parametric filters and a pair of swept High-pass and Low-pass filters.

The EQ is accessed by touching the on screen display to **Assign** the channel (**the colour changes to gold**) and then using the controls on the right hand side of the screen.

When a control is adjusted the expanded view seen below appears in the input screen but this view can be seen at any time by touching the EQ response graph on the screen.

> *Note - If the expanded view does not appear when a control is adjusted open the Options panel and set the Auto Expand EQ option to Yes*

Touching the normal EQ response graph will show an expanded view in a separate panel.

The order of EQ and Dynamics in the channel signal path can be changed using the worksurface button to the right of the worksurface HPF and LPF controls.

HPF/LPF

EQ Type

4 Bands

Dynamic EQ

EQ Presets   Copy EQ Settings
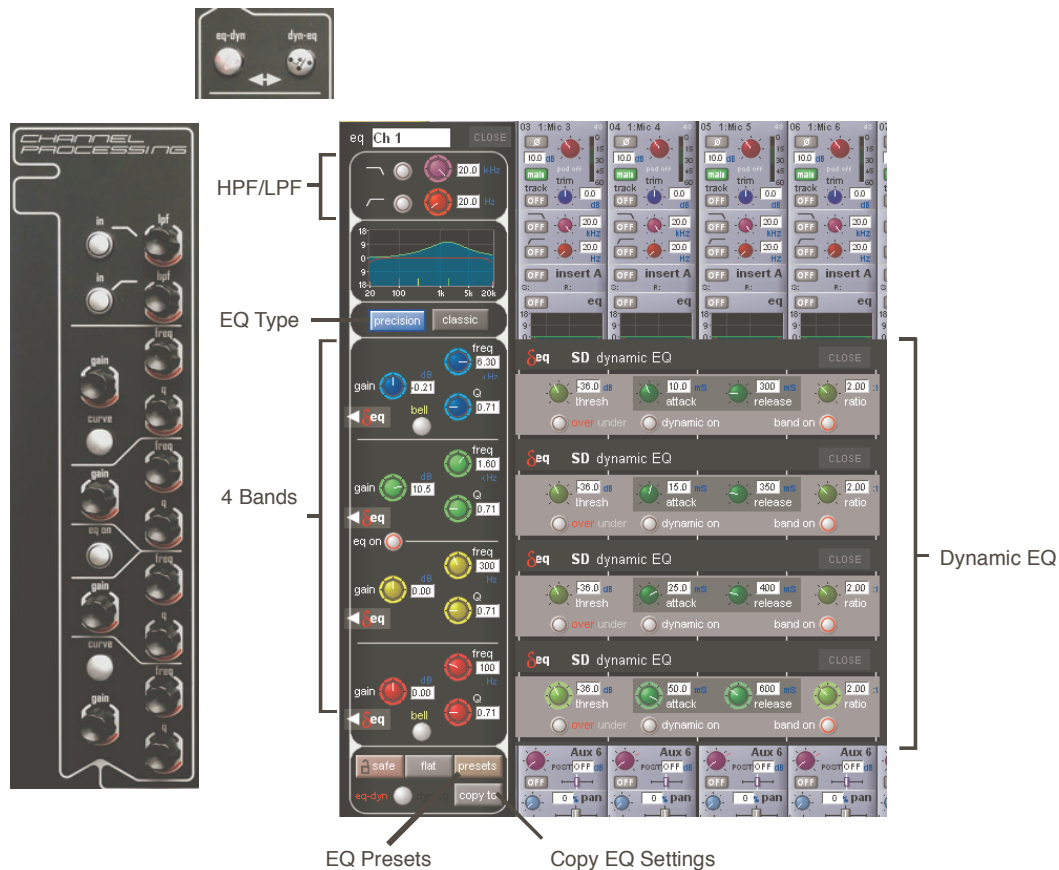
The type of filter used by the top and bottom bands can be changed by successive presses of the **Curve** button for that band.

The four parametric bands can be either **Classic (Analogue style)** or **Precision (Digital style)** type EQ.

Up to 8 Channels can have their EQ modules switched into Dynamic EQ mode by touching the red "Delta" symbol on any EQ band.

On any channel (Input or Output), open the EQ Module, and expand the dynamic controls. You can then switch on any (or all) or the dynamic controls for that EQ Module.

Only 8 Channels can have their EQ Modules placed in Dynamic mode. An warning message will appear on screen if an attempt is made to use Dynamic EQ on more than 8 channels.

See the SD Series Software Reference manual for more information on Dynamic EQ
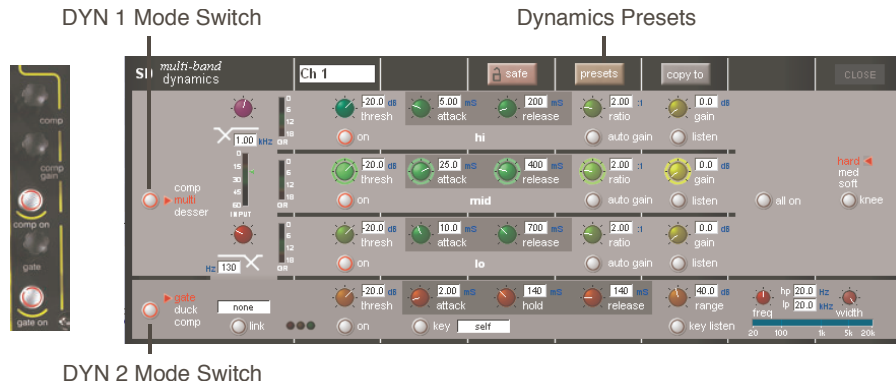
1.9.2 Dynamics ....

The dynamics are accessed by touching the words **Comp** or **Gate** just below the EQ graph on screen to open the dynamics panel.

There are two dynamics modules, the first of which can function as a simple compressor, a 3 way multiband compressor, or a de-esser, according to the **comp/multi/desser** button to its left. The second (lower) module can function as a gate, a ducker or a compressor with an external sidechain, according to the **gate/duck/comp** button to its left.

The worksurface controls beneath the screen control the various parameters. Touching the **Close** button in the top right corner of the panel will close it.

Dedicated **Threshold, Gain** controls and **In/Out** switches can be found on the right hand side of the screen. These can control the Assigned channel's dynamics whether the on screen dynamics panel is open or not.

DYN 1 Mode Switch   Dynamics Presets

DYN 2 Mode Switch

Up to 8 Channels can have their Dynamics (Compressor) modules switched into Multi-band mode
On any channel (Input or Output), open the Dynamics Module, and expand the dynamic controls using the multi-band button.
A warning message will appear on screen if an attempt is made to use Multi-band dynamics on more than 8 channels.

Each band includes all of the parameters as those found in the single band compressor. The link function remains available for the whole compressor, and is not assigned to any band. The bands can be switched on individually using the **on** buttons in the left-hand side of each band, or together using the **all on** button to the display's right.

The crossover frequency between bands is controlled using the purple and red pots to the left of the **hi** and **lo** bands. Each crossover has a range of 20Hz to 20kHz, and the crossover frequencies are displayed below each pot. Each band can be auditioned by pressing the **listen** button below each **gain** pot which solo's that band to the mix (not the solo buss), in effect temporarily switching off the other bands. Pressing **multi-band** again returns the compressor to single-band.

The channel strip's compressor threshold and gain controls adjustment all three bands' controls, maintaining any relative offsets. The individual controls are mapped to the assignable rotaries below the screen.

Note: Beyond the link function, the single and multi-band compressors have completely separate settings: No settings are copied between them, and the settings of each remain unchanged when the other is active.

1.9.3 Auxiliaries ....
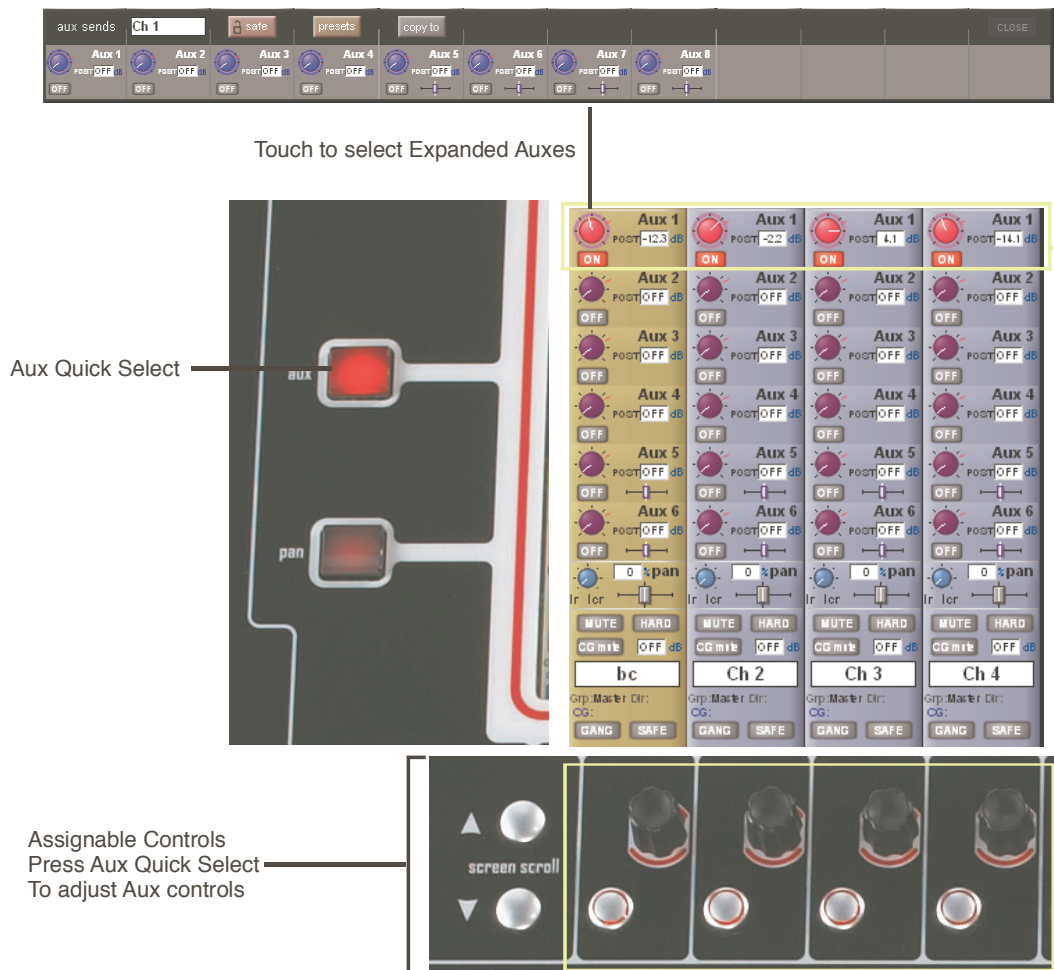
The auxiliaries can be accessed by touching the Aux Quick Select button, the auxiliary row on screen or using the **Screen Scroll** buttons.

Using either of these methods, the highlighted auxiliaries on the input screen will change. The row of rotary controls and switches beneath the screen are used as auxiliary sends, pans (with 2nd Function ON), On/Off and pre/post switches (with 2nd Function ON).

Touching the selected Aux row on the selected channel will open the Expanded Auxes panela nd the row of rotary controls beneathe the screen will be assigned to each of the Aux Sends on the selected channel.
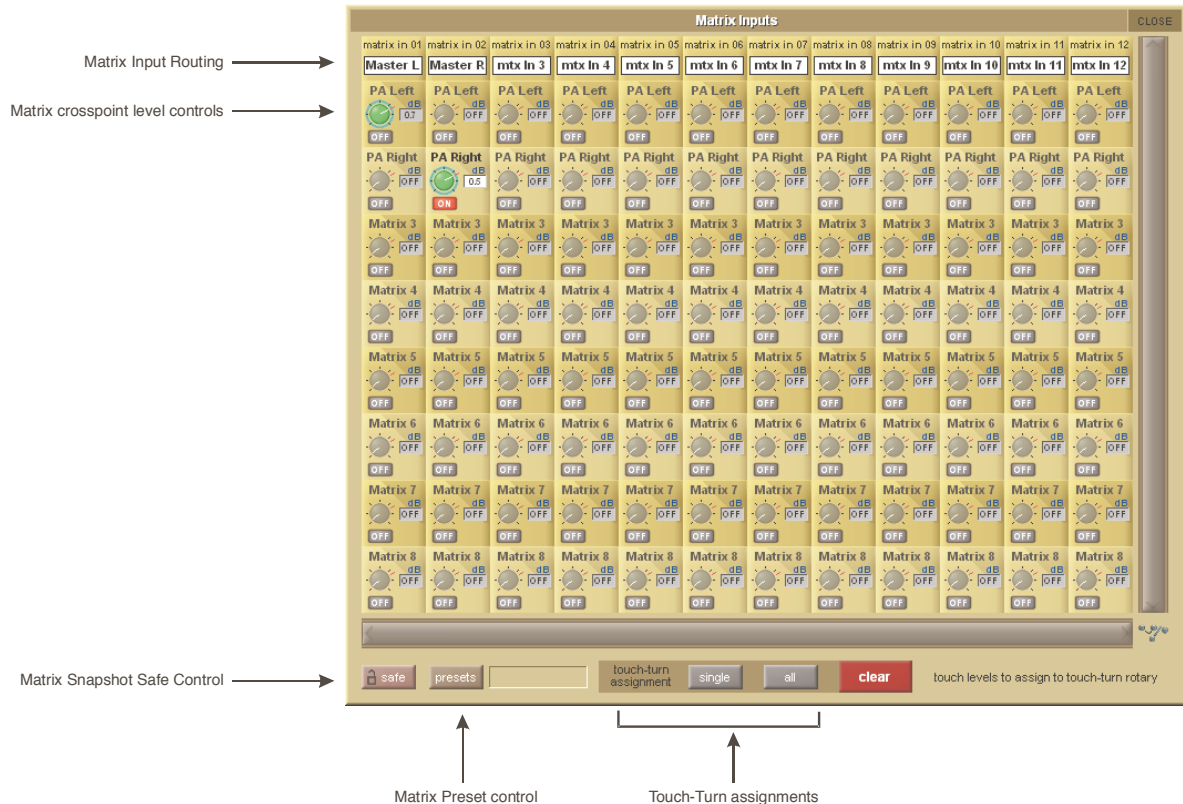
Selecting another channel with the Expanded Auxes panel open will display the Expanded Auxes panel for that channel.

Touch to select Expanded Auxes

Aux Quick Select

Assignable Controls
Press Aux Quick Select
To adjust Aux controls

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1.10 The Matrix

To open the Matrix Inputs panel, touch the Matrix button on the Master Screen Menu. The window that opens allows you to route inputs to the Matrix Output Channels, and set the Matrix crosspoint levels.

To route an input, touch the top of the appropriate Matrix column. This opens a standard SD9 input routing page with options to select any console or rack signal as a Matrix input.

Matrix Input Routing
Matrix crosspoint level controls
Matrix Snapshot Safe Control
Matrix Preset control
Touch-Turn assignments

The example above has the Master Stereo Buss routed to the inputs of Matrix 1 and Matrix 2 (Labelled as PA LEFT & PA RIGHT). By adjusting the crosspoint levels, you can change how much of each side of the Master buss is fed to these Matrix Channels.

There are three modes of level adjustment : **multi, single & all.**

Multi : Touch one or more level "knob" on screen, then adjust using the Touchturn control.

Single : Touch any level "knob" and adjust. Touching another "knob" will deselect the first.

All : All "knobs" are adjusted at the same time.

When adjusting more than one crosspoint, their relative levels are maintained.

1.11 Control Groups

Any number of input channels and output channels can be connected to one or more of the 8 Control Groups. They can then all be operated from a single worksurface channel. Changes to the Control Group fader, mute or solo or controls will affect all channels connected to the group.

There are 2 methods to set up Control Groups:

1) Press the LCD Function button on a CG fader bank

Press the JOIN CG button

Press the channel select button for the CG that you want to use

Press the channel select buttons for each of the channels that you want to make members of the CG
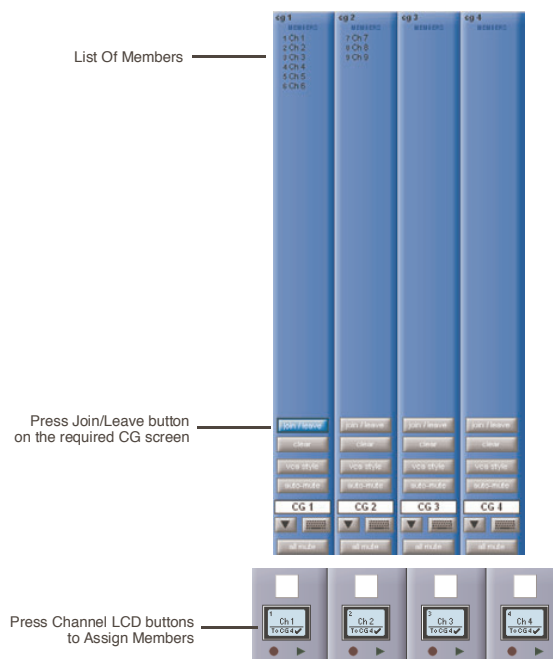
Release the JOIN CG button and return to standard Solo mode by pressing the channel select button beneath the LCD display labelled SOLO
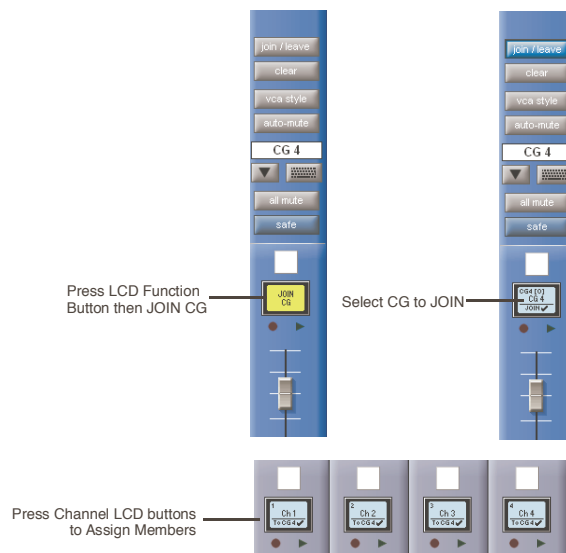
2) Press the on screen JOIN/LEAVE button for the required CG channel

Press the channel select buttons for each of the channels that you want to make members of the CG

Release the JOIN/LEAVE button

A list of all the connected channels and their names is displayed above each Control Group display.

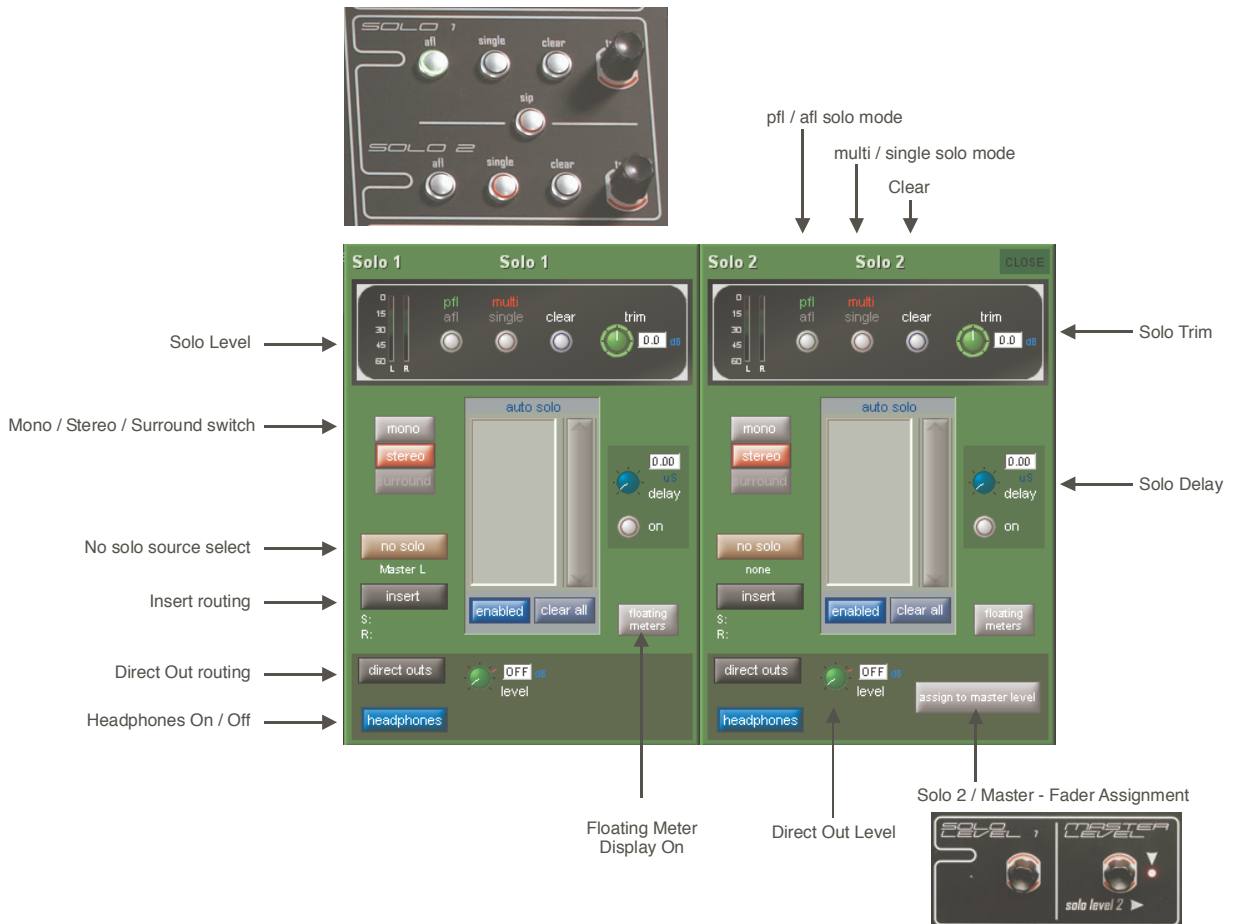You can also clear all the channels from a Control Group by pressing **Clear**.

When a channel is a member of a Control Group, its own controls can still be adjusted independently of the other Group members. Adjustments to fader levels are transmitted to the Group members as dB changes, so that a level increase of 2dB on the Control Group fader will increase all the member levels by 2dB, irrespective of the relative levels of the individual channel faders.

1.12 Solo Setup

The SD9 Solo panel is accessed from a button at the top of the Master Screen. Some of the controls on this panel are duplicated on the left worksurface section.

There are two solo busses and each channel on the consoles can be independently assigned to use Solo1, Solo2 or Solo 1+2. Therefore, if the console was being used for Stage monitors, the first solo buss could feed "In-Ear" monitors, and the second solo buss could feed a wedge.

pfl / afl solo mode

multi / single solo mode

Clear

Solo Level

Mono / Stereo / Surround switch

No solo source select

Insert routing

Direct Out routing

Headphones On / Off

Solo Trim

Solo Delay

Floating Meter
Display On

Direct Out Level

Solo 2 / Master - Fader Assignment

The following functions are available independently for each solo buss :

- Mono / Stereo/Surround Switch
- No Solo source routing
- Insert Point with both internal and external routing capability
- Direct Out routing (eg. for feeding a wedge)
- Assignment of worksurface rotary to either Solo 2 Master or Main Buss Master
- afl or pfl mode
- single or multi solo mode
- Delay
- Level Trim
- Auto solo mode
- Floating Meter

No Solo : Source for solo buss when no channel is in solo mode. No Solo source does not show on Solo meters.

Auto Solo : If a channel is set to Auto Solo, it will automatically solo when another channel is soloed. The Auto Solo function of each solo buss can be enabled and disabled as required. The solo buss must be in multi mode for the auto solo function to operate.