

STM 16 S

Introduction

- Interface
- Connections
 - Inputs
 - Outputs

Controls

- General
 - VU Meter
- Panel
 - Master Channel
 - Channel Strip
 - Aux Page
 - Aux Returns
- Signal Flow
- Headroom



Version 3.1

Introduction

The STM 16 S is a 24 channel surround mixer with 4 auxiliary channels. It provides 16 input channels that can be linked as stereo pairs. The eight auxiliary returns can serve as additional inputs if desired.

The mixer operates dynamically and is therefore very economical to use. Input and aux channels use DSP only if they are actually in use (connected).



Interface

The mixer comprises three pages: Page 1-8 for the first eight channels, Page 9-16 for the second eight, and Page-Aux for the auxiliary returns. All additional controls are located to the right of these pages.

To move the panel, "grab" the outer frame with the mouse and drag it to the desired location.



Channel Page



Aux Page

Connections

To provide the greatest amount of flexibility the mixer offers a large number of inputs and outputs.

The connections in detail:

Inputs

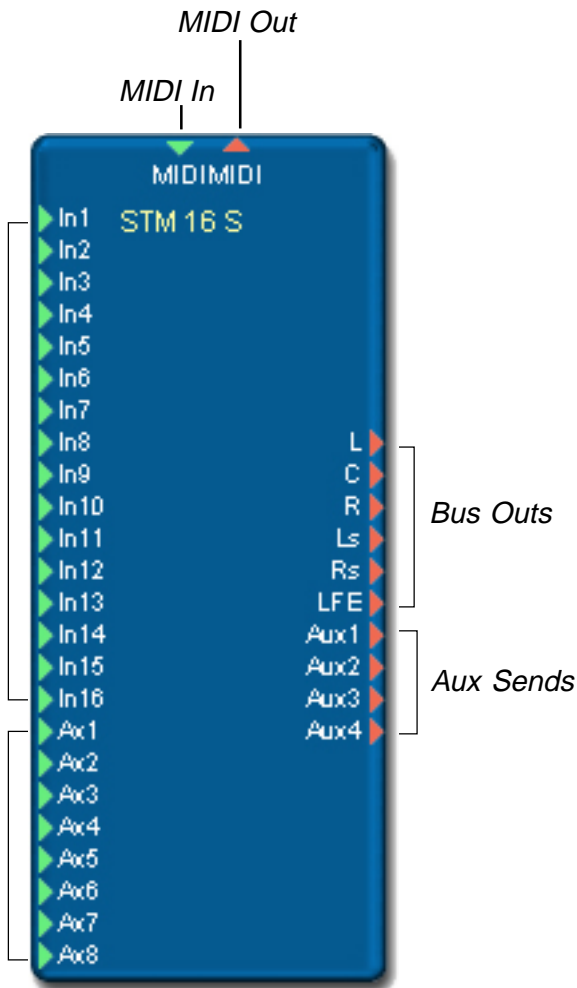
MIDI In: **MIDI** input (green)

Mono channels: **In1** to **In16**

Aux Returns: **Ax1** to **Ax8**

*Channels
(Inputs)*

*Aux
Returns*



Outputs

MIDI Out: **MIDI** output (red)

Left Output: **L**

Center Output: **C**

Right Output: **R**

Left Surround: **Ls**

Right Surround: **Rs**

Aux Sends: **Aux1** to **Aux4**

Controls

General

VU Meter

The level meters operate as peak meters whereby they display the maximum signal levels (as opposed to averaged levels). A *peak hold* function holds the signal peaks in the display for a brief period of time. A *margin* display lies beneath each meter. This indicates the highest peak level reached so far. A margin reset function clears (resets) all margin displays.

Each 'LED' is associated with a specific signal level and shines when that level is reached or exceeded.

Red LED: The red LED indicates a level of -0.01dB. Strictly speaking this is not an *over* condition, but it does indicate a very high signal level. To be safe you don't allow analog input signals to exceed -3.0dB.

With digital signals, such as those from a wave player, you can let the red LED flash more frequently. This does not indicate overs, just a high signal level. If the digital input signal has been compressed and normalized this LED will light up quite often.

1. Yellow LED: -0.5dB

2. Yellow LED: -3.0dB

3. Yellow LED: -4.0dB

4. Yellow LED: -6.0dB

5. Yellow LED: -8.0dB

6. Yellow LED: -9.0dB



Green LEDs (1-14):

- 10.0dB,
- 12.0dB,
- 18.0dB,
- 20.0dB,
- 24.0dB,
- 28.0dB,
- 30.0dB,
- 36.0dB,
- 40.0dB,
- 45.0dB,
- 50.0dB,
- 55.0dB,
- 60.0dB,

Signal LED: -96.0dB

It is normal for the *Signal LED* to remain lit when an analog source is connected to the respective input. This is because most analog devices have a signal-to-noise ratio of less than 96dB.

Panel

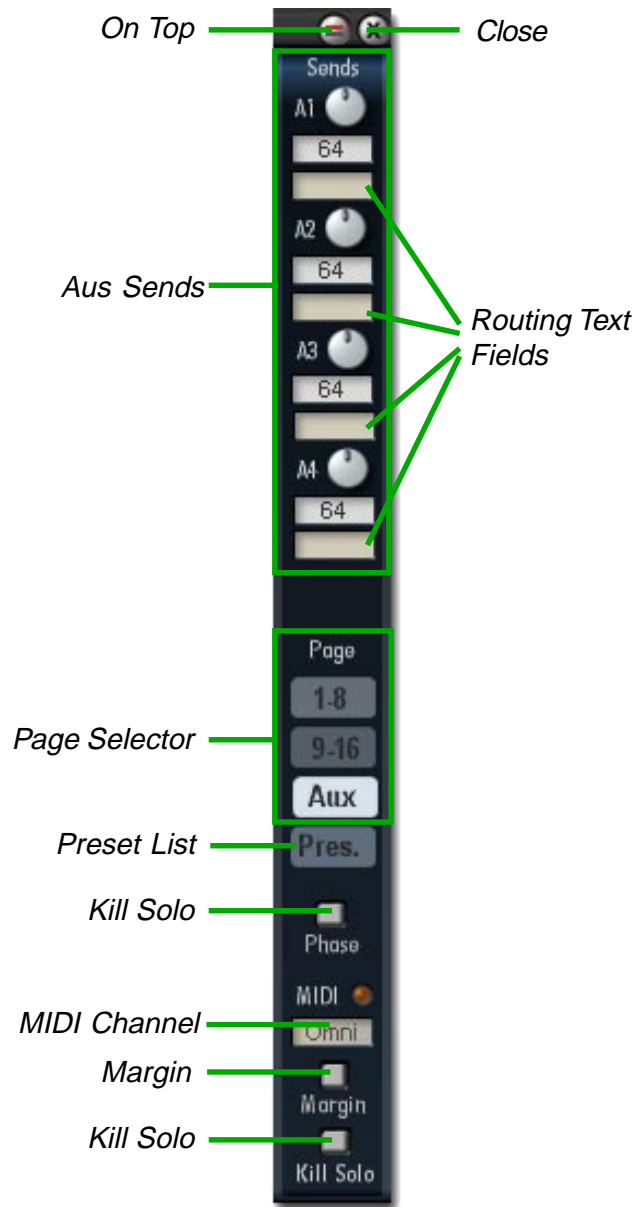
On Top: When enabled, this function prevents other windows from being drawn over the mixer panel - the mixer therefore remains "on top" of any other windows. When not enabled, other windows can obscure the mixer.

Close: The Close button removes the mixer panel from the display. To open it again, double click on the mixer module representation in the Routing Window or on the minimized mixer graphic in the Live Bar.

Aux Sends: The Aux Sends control the level of the combined aux signals for the respective aux channels.

Routing Text Field: Not only displays the connections, but also lets you connect any loaded device through its menu. Double-click to delete a connection.

Page Selector: The mixer panel displays channels 1-8, 9-16, or the Aux returns. Use the page selector to choose the desired view.



Pres.: Opens/closes the mixer's global presets dialog.

Kill Solo: Switches any solo-enabled channels out of solo mode.

MIDI Channel: The mixer's MIDI channel.

Margin Reset: Sets all the mixer's margin displays to null.

Phase Compensation:

In the STM 16S all channels operate in phase. Use phase compensation to adjust for phase differences that arise outside the mixer.

The switchable phase compensation feature permits phase-aligned operation of all mixer input channels. It makes no difference whether the input signal comes from an internal device (synthesizer, sampler etc.) or via an I/O module. Thus, external signals can also be handled in the mixer in a phase-accurate manner, as long as they arrive phase-aligned at the hardware inputs.

Phase compensation of all inputs is not always necessary. Activation of this feature imposes an additional demand upon DSP computing capacity and should therefore be enabled only when it is truly useful.

Compensation balances short delays on the order of a few samples. These delays are significant only under certain conditions. For example, uncorrelated signals such as a piano and a separately recorded voice can be shifted by a handful of samples relative to one another with no real audible effect. These differences are too small to be perceived as timing shifts.

When, on the other hand, a piano has been recorded simultaneously via multiple microphones, the spatial image will be correctly reproduced only if all of these highly-correlated signals are processed without delays relative to one another. Thus, the use of phase compensation is advisable when mixing recordings of a single sound source or image made with multiple microphones. The less correlated the signals are, the less critical is the maintenance of proper phase alignment. A delay of a few samples in one signal corresponds to a distance difference of a few centimeters. Thus, the effects of phase shifts in this range are greatest with close micing.

Master Channel

The Master channels control the overall level of the respective mix.

Fader Text field: Shows the current amplification level. You can also enter precise values into this field. Select the field, enter the value, and then press <Return> to confirm. Allowable values are from -186.6 dB (equivalent of null) to +12 dB.

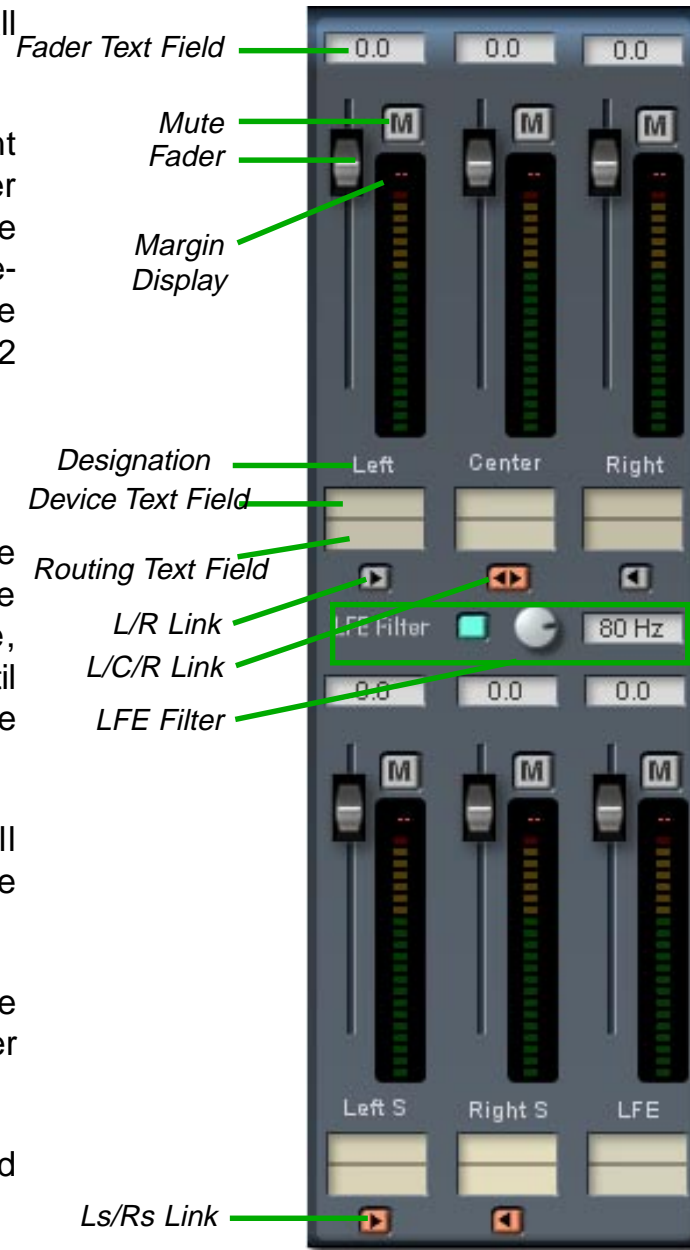
Mute: Silences the Master channel.

Margin: The margin display shows the highest peak levels reached so far in the respective channels. This value, expressed in dB, remains unchanged until a higher level is detected or until the margin is reset.

Master Fader: Controls the overall volume levels of the Surround buses. The maximum amplification is 12dB.

VU Meters: The VU Meters indicate the overall level of the buses. Use the fader to reduce the level if it is too hot.

Designation: Names of the designated buses.



Device Text Field: Use this field to connect devices loaded into the project to the mixer's master mix outputs. You can also disconnect a device here. Double-click to open the connected device's control panel. Use the field's menu to access all other functions.

This field displays the name of the connected device. The actual connections are indicated in the Routing text field.

Routing Text Field: Not only displays the connections, but also lets you connect any loaded device through its menu. Double-click to delete a connection.

Link: Use these to link master faders together (for example, L/R, L/C/R, Ls/Rs).

LFE Filter: Enables or disables the LFE filter. Adjust the cutoff frequency with the associated control.

Channel Strip

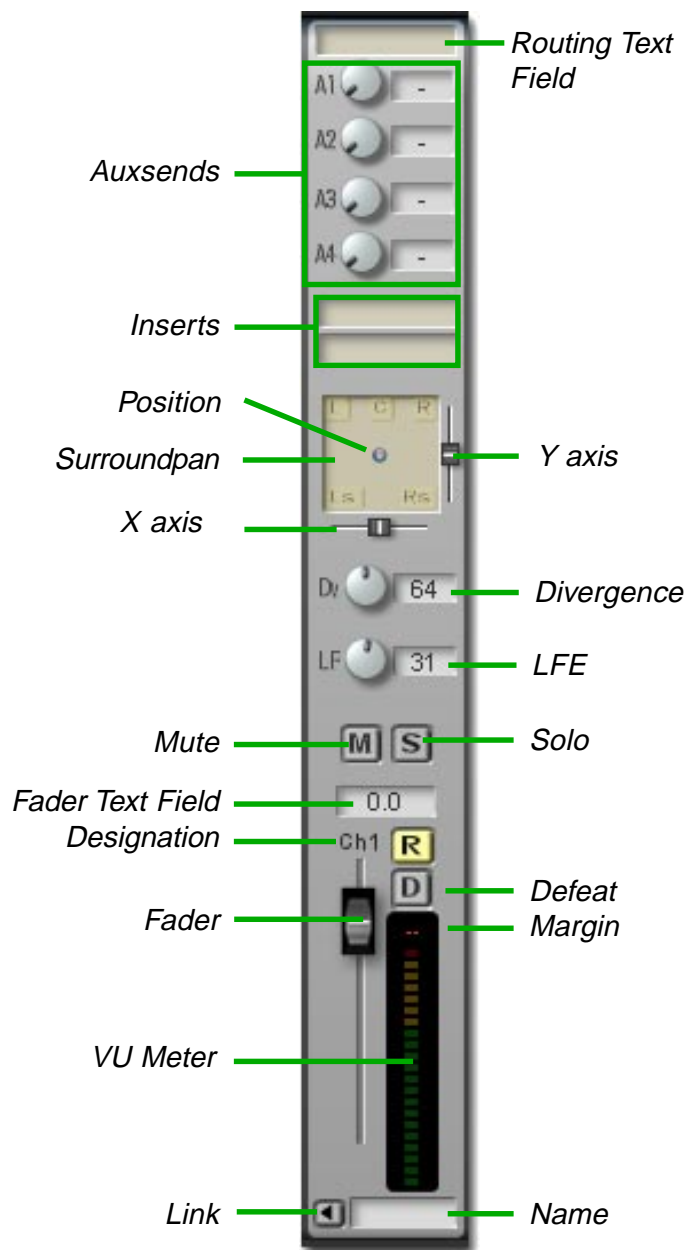
The following describes the channel strip for a single input.

Routing Text Fields: These fields indicate the connections, and through their context menus are also used to connect any devices loaded into the Routing window. Double-clicking on a field deletes a connection.

Aux Sends: The Aux Sends control the level of the combined aux signals for the respective aux channels.

Inserts: Two Insert slots are available for each channel. A slot is empty when its text field is blank. To load an effect into a slot, use drag and drop to pull the effect from the file browser into the slot. The effect is then loaded, and its name appears in the slot. To enable the effect, click on the insert on/off button next to the slot.

You can also load the inserts by selecting an effect from the context menu. Double-click on the insert name to open its control panel.



Surroundpan: Each channel contains a surround panner. The graphic field shows a silver ball to indicate the position, and five buttons in the background representing the surround buses. Use the buttons to select which buses to enable for the channel. When you click one of these buttons, all the buttons come into the foreground. When you finish selecting the buses, click the silver ball to put the buttons into the background again.

To adjust the position, click the silver ball in the graphic area and drag it while pressing the mouse button. You can also use the faders to adjust the position along the X or Y axis. Faders are also required to control the Surround Pan through MIDI.

Divergence: Controls the level relationship between the L/R speakers and the center channel speaker. When set to *Center*, only the center speaker is enabled. When set to *L/R*, only the left and right speakers are enabled. The front/rear balance is not affected by this setting.

LFE Control: Adjusts the channel's contribution to the LFE bus independent of the surround buses.

Mute: The Mute button (**M**) removes the signal from the mix.

Solo: This button puts the channel in solo mode.

Fader Text Field: Shows the current amplification level. You can also enter precise values into this field. Select the field, enter the value, and then press <Return> to confirm. Allowable values are from -186.6 dB (equivalent of null) to +12 dB.

Designation: The channel designation.

Room Button: The yellow room button switches the surround buses (L, C, R, Ls, Rs) on or off.

Solo Defeat: The solo defeat button (**D**) protects the signal from being removed from the mix when another channel is in solo. When enabled, the channel ignores solo activity of other channels.

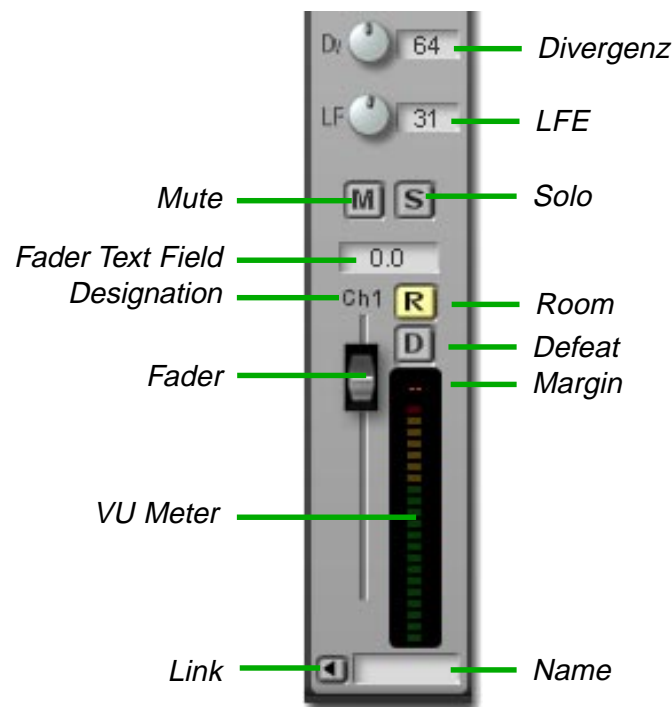
Margin: The margin display shows the highest level reached so far in the left and right channels. This value, expressed in dB, remains unchanged until a higher level is detected or until the margin is reset.

Fader: The fader controls the level of the channel's output. The associated text field above indicates the output level. You can also type a value into the text field to set the level. The amplification range extends from **inf.** (no signal at all) to +12dB.

VU-Meter: Depending on the meter mode, the meter displays the input signal level.

Name: Here you can enter any name you choose to identify the channel (for example, "Bass").

Link: Use link to combine two mono channels for stereo operation. When linking two channels, the insert slots of the left channel are disabled and the right channel slots take over as stereo inserts. When two channels are linked, the aux sends, divergence, LFE, mute, solo, defeat controls, and the faders, are connected for simultaneous operation.



Aux Page

This page contains the channel strips for the Aux Returns.

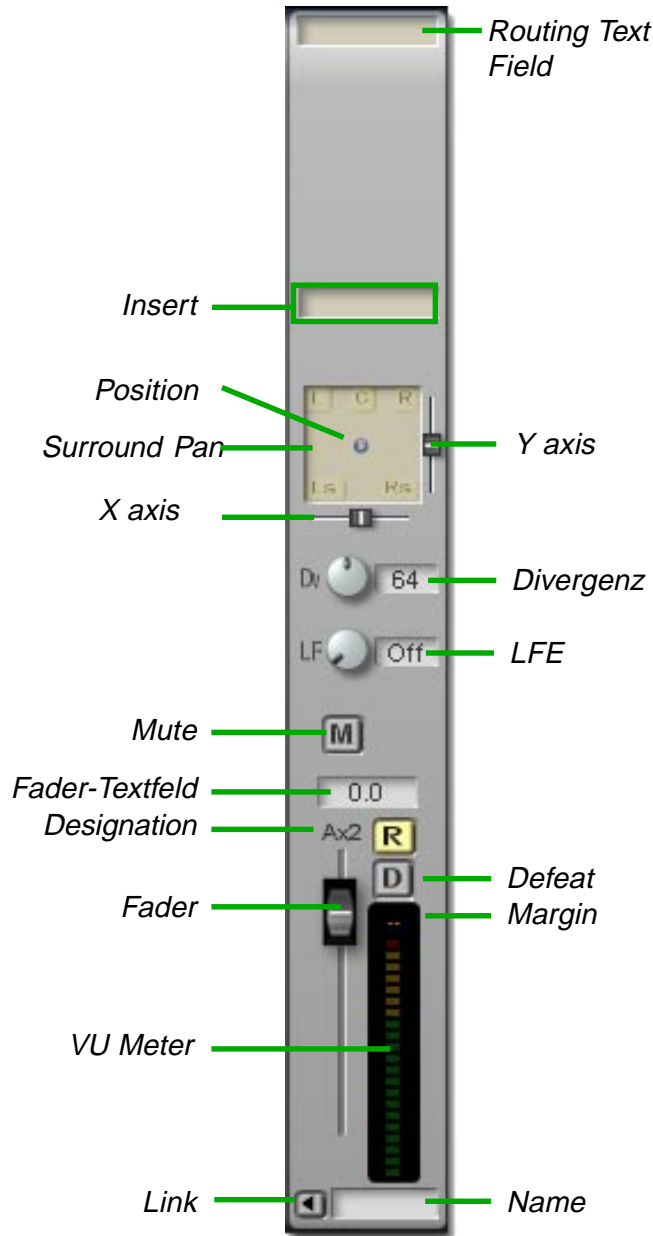
Aux Returns

The aux returns are implemented in stereo, and provide most of the features of a stereo channel strip. It is through the aux returns that the signals from the effects devices driven by the aux send signals arrive back into the mix. Because of the special characteristics of the aux returns, there are some limitations on their use.

Routing Text Field: This field indicates the connections, and through its context menu is also used to connect any device loaded into the Routing window. Double-clicking on a field deletes a connection.

Insert: One Insert slot is available for each channel. The slot is empty when its text field is blank. To load an effect into a slot, use drag and drop to pull the effect from the file browser into the slot.

The effect is then loaded, and its name appears in the slot.



You can also load the inserts by selecting an effect from the context menu. Double-click on the insert name to open its control panel.

You can also use the insert slot as another effect (for example, a Gate).

You can also use the aux return as an additional basic input channel. When used as an aux return, keep the dry portion of the effect signal set to minimum as otherwise the dry signal will again be added to the mix.

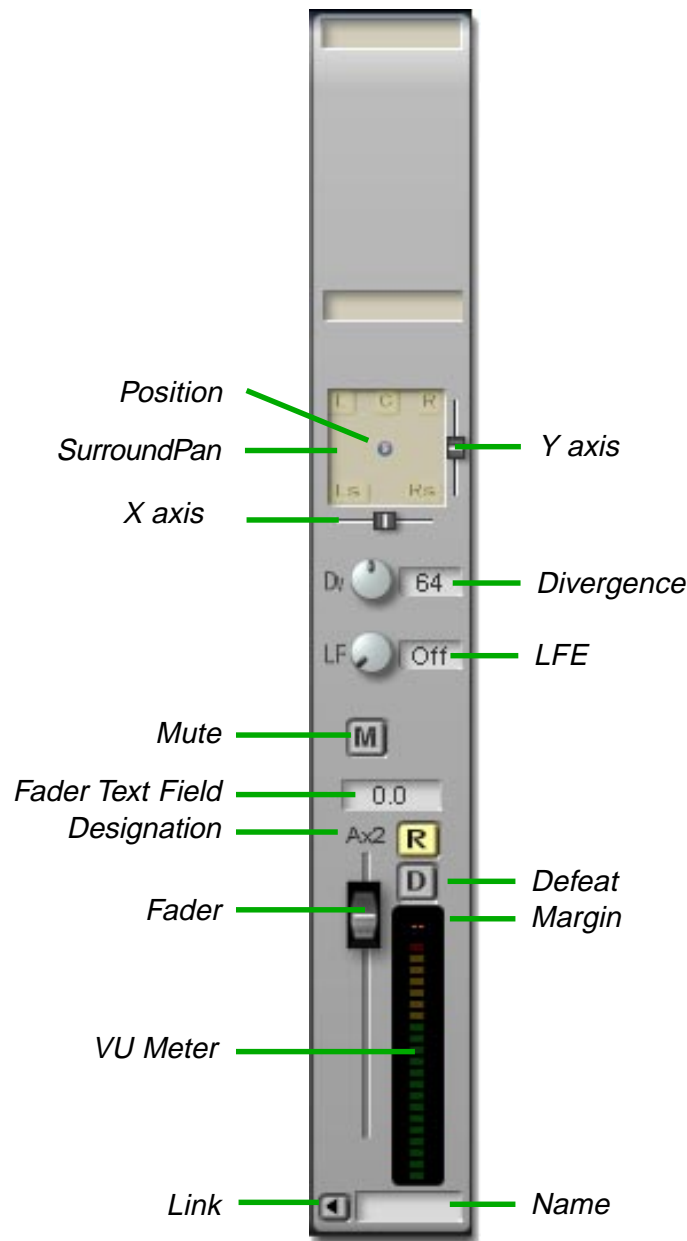
Surroundpan: Each channel contains a surround panner. The graphic field shows a silver ball to indicate the position, and five buttons in the background representing the surround buses. Use the buttons to select which buses to enable for the channel. When you click one of these buttons, all the buttons come into the foreground.

When you finish selecting the buses, click the silver ball to put the buttons into the background again.

To adjust the position, click the silver ball in the graphic area and drag it while pressing the mouse button. You can also use the faders to adjust the position along the X or Y axis. Faders are also required to control the Surround Pan through MIDI.

Divergence: Controls the level relationship between the L/R speakers and the center channel speaker. When set to *Center*, only the center speaker is enabled. When set to *L/R*, only the left and right speakers are enabled. The front/rear balance is not affected by this setting.

LFE Control: Adjusts the channel's contribution to the LFE bus independent of the surround buses.



Mute: Removes the channel from the mix.

Designation: The channel's designation.

Fader text field: Shows the current amplification level. You can also enter precise values into this field. Select the field, enter the value, and then press <Return> to confirm. Allowable values are from -186.6 dB (equivalent of null) to +12 dB.

Solo Defeat: The Solo Defeat button (D) protects an aux return from solo mode. If another channel is solo'd, the return will not be affected (i.e. silenced).

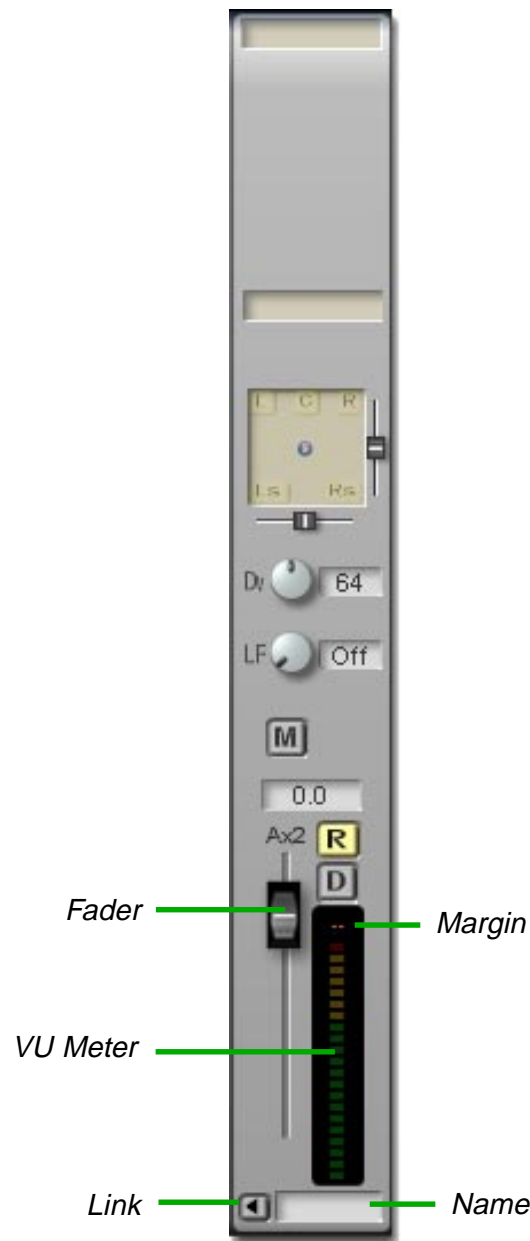
Fader: The fader controls the level of the aux return signal. The associated text field above indicates the output level. You can also type a value into the text field to set the level. The amplification range extends from inf. (no signal at all) to 12dB.

Margin: The margin displays show the highest level reached. This value, expressed in dB, remains unchanged until a higher level is measured, or until the margin is reset.

VU Meter: Displays the current input level.

Link: Combines two mono channels for stereo operation. When linking two channels, the insert slots of the left channel are disabled and the right channel slots take over as stereo inserts. When two channels are linked, the divergence, LFE, mute, and defeat controls, and the faders, are connected for simultaneous operation.

Name: You can type in any identifying name you like here.



Signal Flow

To better understand how your mixer works it is helpful to visualize the signal flow. The illustration at right shows the signal path for a single mono channel.

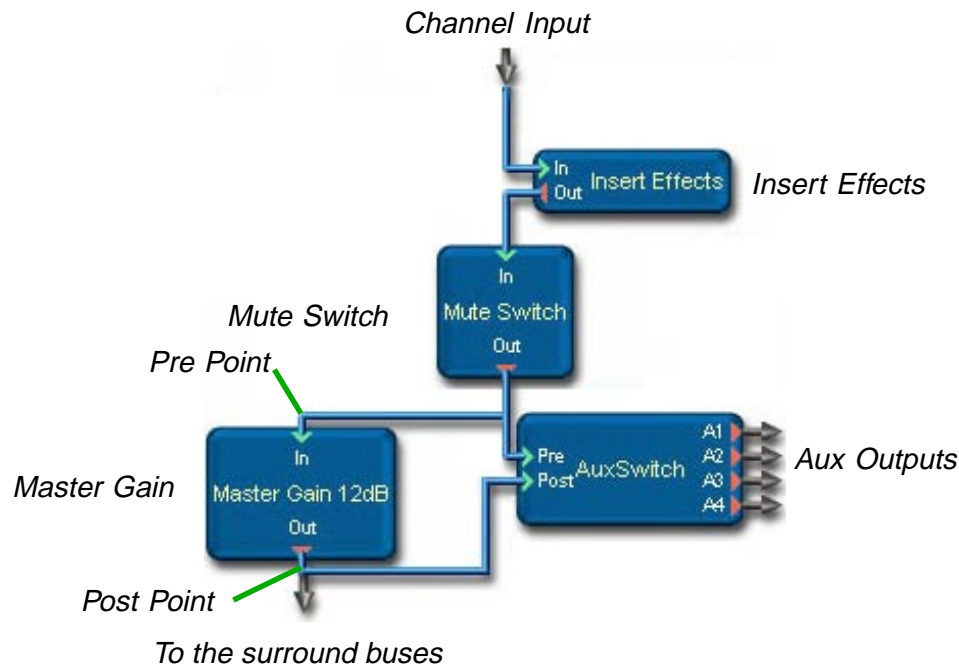
Inserts: If a slot is enabled, but no effect is loaded into it, the signal is blocked as if Mute were switched on.

After passing through four insert slots, the signal branches again. The main signal goes to the Mute module, and the other branches across the Pre switch to the Pre point.

Mute Switch: The second module in the signal path is the mute switch. When the mute switch is on, the signal is effectively blocked at this point.

Aux Switches: The Aux switches determine which aux channels will receive a proportion of the channel signal.

Pre Point: The upstream point from which the aux signals branch (Pre on).



Master Gain: This module contains the Master Fader and therefore controls the overall output level of the channel.

Post Point: The downstream point from which the aux signals branch (Pre off).

Headroom

All buses operate with 24dB of headroom. This means that you can process up to 15 phase-aligned signals peaking at 0dB without risk of internal overs. Since this never happens with real-world music signals you can use all channels without encountering any distortion.

Internally, SFP operates at a 186dB dynamic range (32 bit) so that even 24dB of headroom is not audible, as 162dB of internal range is still available.

Index

A

Aux Page 11
Aux Returns 4, 11
Aux Sends 4, 6, 9
Aux Switches 14

C

Center Output 4
Channel Strip 8, 9
Close 6
Connections 4
Connectors 4
Controls 5

D

Device Text Field 8

F

Fader 13

G

Green LED 5

H

Headroom 15

I

Inputs 4
Insert 11
Inserts 9, 14
Interface 3
Introduction 2

K

Kill Solo 6

L

Left Output 4
Left Surround 4

M

Margin 10, 13
Margin Reset 6
Master Channel 8
Master Fader 8
Master Gain 14
MIDI Channel 6
MIDI In 4
MIDI Out 4
Mono channels 4
Mute 8, 10, 12
Mute Switch 14

O

On Top 6
Outputs 4

P

Panel 6
Phase Compensation 6
Post Point 14
Pre Point 14
Pres. 6

R

Red LED 5
Right Output 4
Right Surround 4
Routing Text Field 6, 8, 11
Routing Text Fields 9

S

Show Channels 6
Signal Flow 14
Signal LED 5
Signal-LED 5
Solo 9, 10, 11
Solo Defeat 10, 12
Surround 4

V

VU Meter 5
VU Meters 8

Y

Yellow LED 5