

# STM 1632

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Version 3.1

# Introduction

The STM 1632 is a 40 channel, 4 Aux channel mixer. Each of it's 16 inputs can be configured in mono or stereo. In External mode, the four stereo Aux returns can be used as additional inputs.

This mixer operates very efficiently by dynamically allocating DSP resources only when input or Aux channels are actually in use. It is therefore suitable for use as a submixer in larger projects.

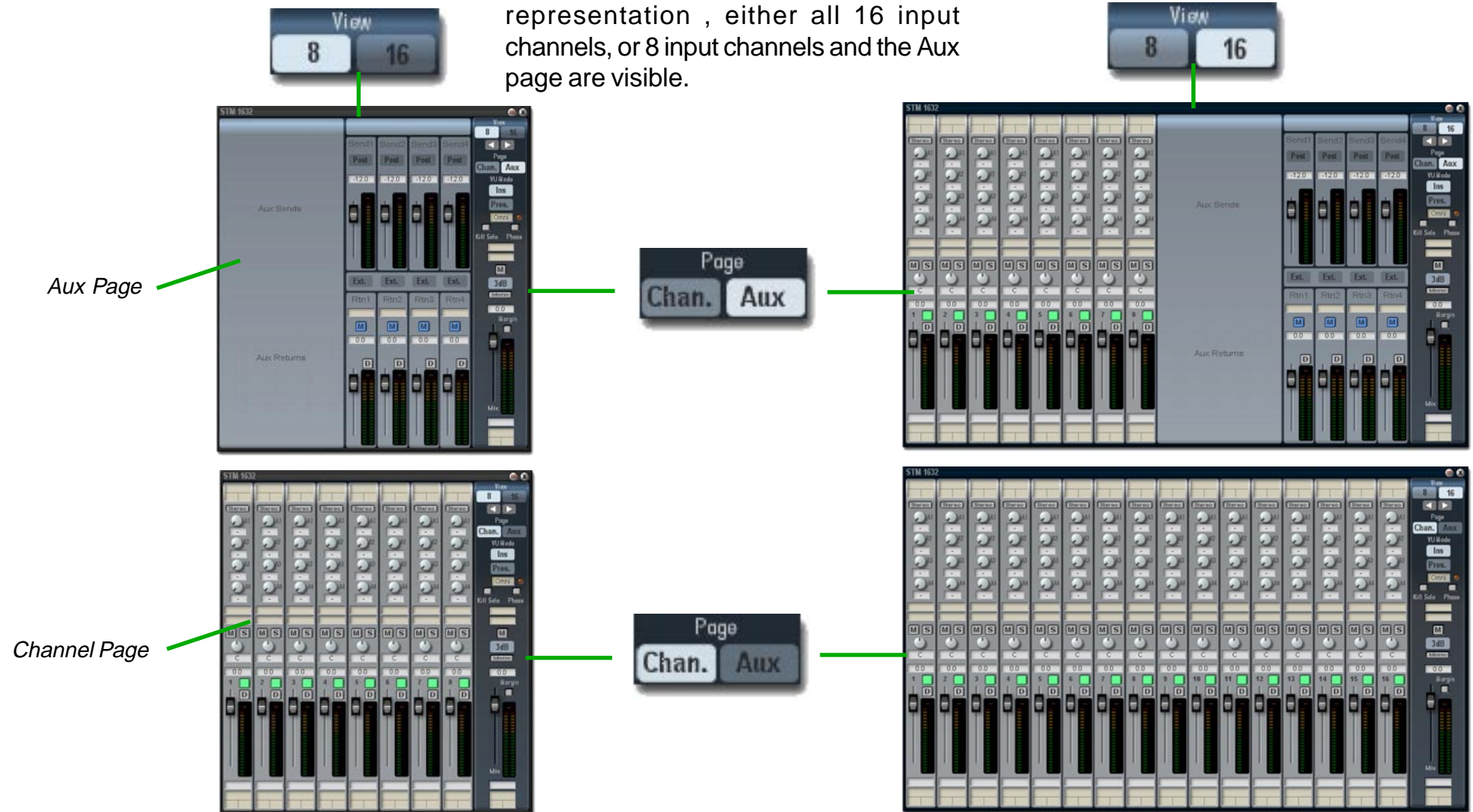


# Interface

The mixer surface adapts to different screen resolutions.

You can easily enlarge or reduce the size of the mixer surface with simple mouse clicks. In the smaller representation, only 8 channels are shown. In the larger representation, either all 16 input channels, or 8 input channels and the Aux page are visible.

To move the mixer surface, drag it by grabbing the edge of the frame with the mouse.





# Connections

For maximum flexibility, the mixer provides a variety of inputs and outputs.

The individual inputs in detail:

## Inputs

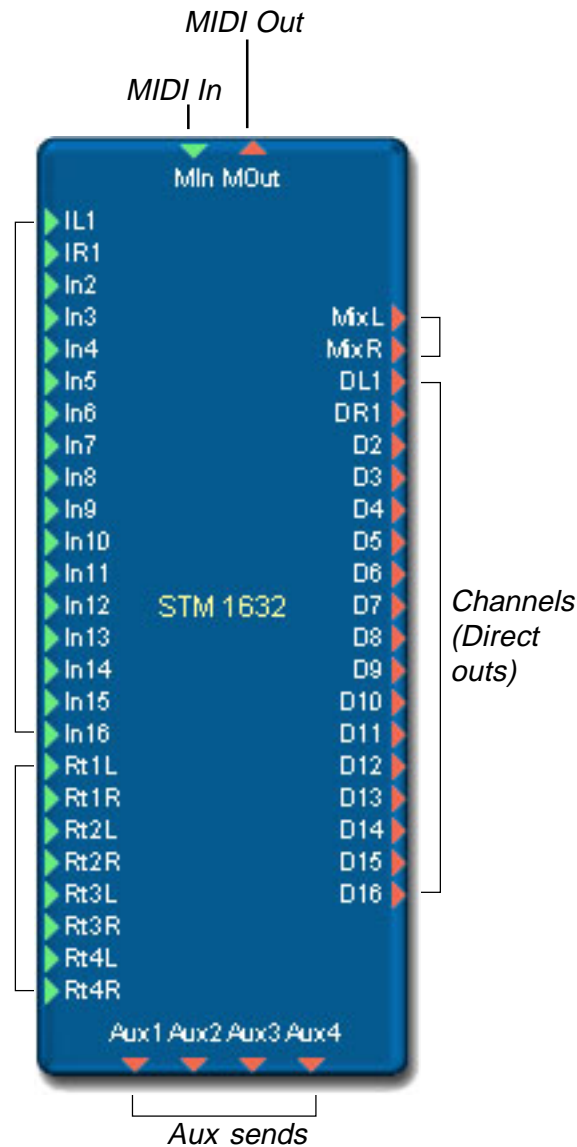
MIDI In: **MIDI** input (green)

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

Stereo channels: **I1L/R** to **I16L/R**

Aux returns: **Rt1L/R** to **Rt4L/R**

*Channels  
(Inputs)*



## Outputs

MIDI Out: **MIDI** outputs (red)

Mix: **MixL, MixR**

Mono channels: **D1** to **D16**  
(Direct outs)

Stereo channels: **D1L/R** to **D16L/R**  
(Direct outs)

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 temporarily. A *margin* display lies beneath each meter. This indicates the highest peak level reached. 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 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 flash more 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.

## Panels

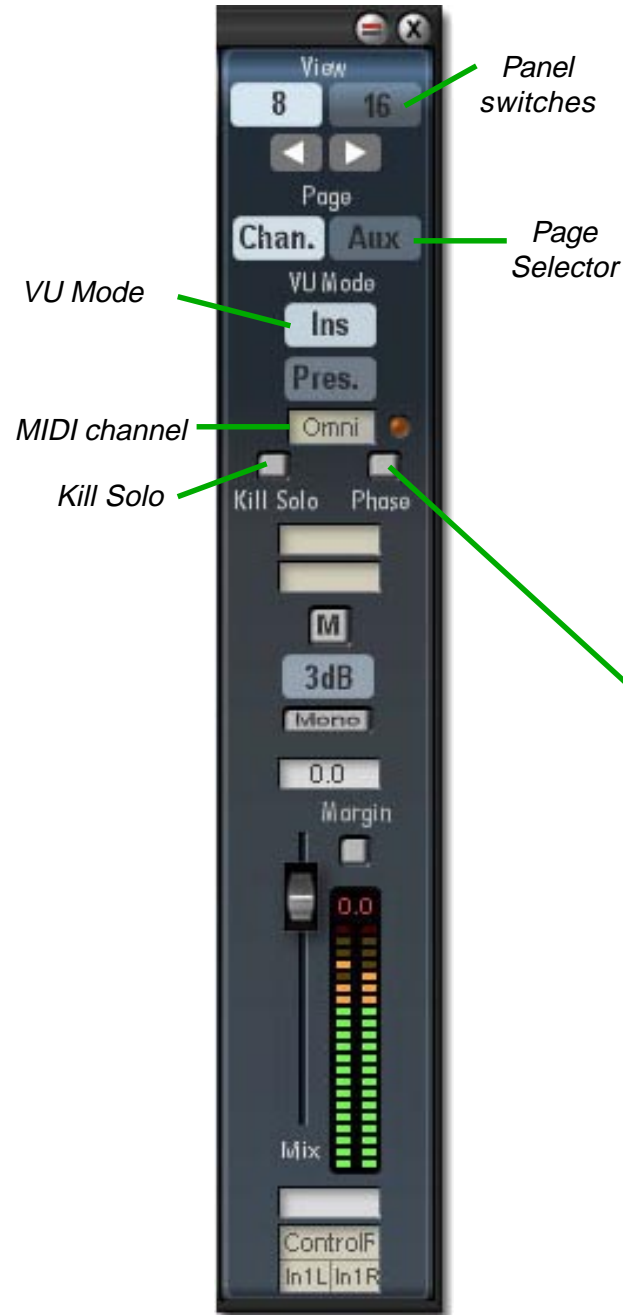
In the upper portion of the Master channel you'll find the options for controlling the panel views.

**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.

**View:** Switches to adjust the size of the view to show either 8 or 16 channels.

**Page Selector:** Let's you choose whether to show input channels or Aux sends and returns on the panel.



**VU Mode:** You can switch the VU meters to display either the input level or the output level for any channel. If a direct out is not in use, it consumes no DSP power, and of course will show no signal activity.

**Pres.:** Opens or closes the mixer's preset list.

**MIDI Channel:** Sets the mixer's MIDI channel.

**Kill Solo:** Switches any channels currently in solo mode, out of solo.

### Phase Compensation:

All channels in the STM 1632 mixer are inherently phase-aligned. Use phase compensation to correct phase problems that occur 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 when using close microphone placement.

Note that precise phase alignment is often achieved without explicitly activating phase compensation, since the channels are internally phase-aligned with one another.

## Master Channel

All the signals that comprise the overall mix are combined in the Master Channel.

**Master Inserts:** For final signal processing, two inserts are available ahead of the master fader.

**Mute:** Silences the Master channel.

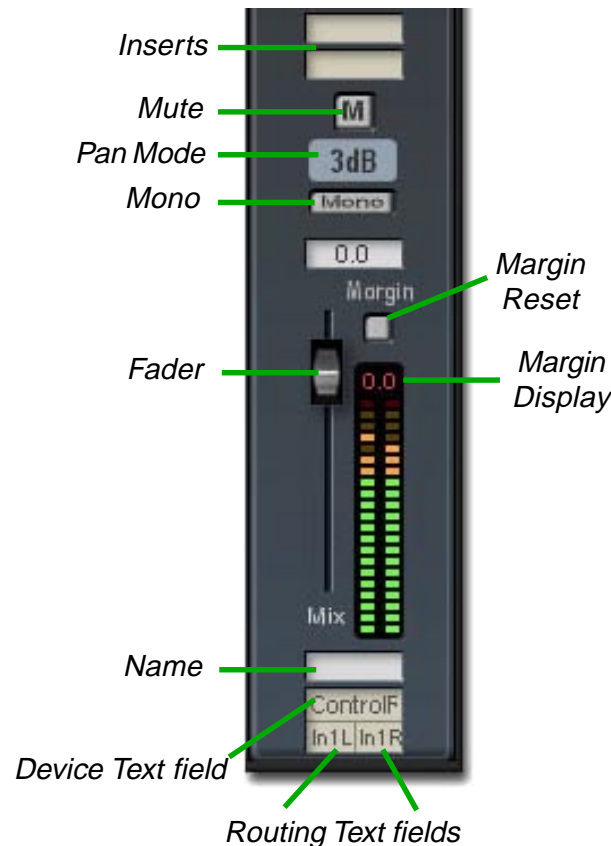
**Pan Mode:** Two pan modes are available: Crossfade pan (**3dB**) and linear pan (**6dB**). This setting applies to all mono channels and subgroup channels.

**Mono:** Use the Mono button to check the mix for mono compatibility.

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

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

**Master Fader:** Controls the overall volume level of the mix. The maximum amplification is 12dB.



**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.

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

**Name:** When you are using this mixer as a submixer, you can identify the mixer output by giving it a name here.

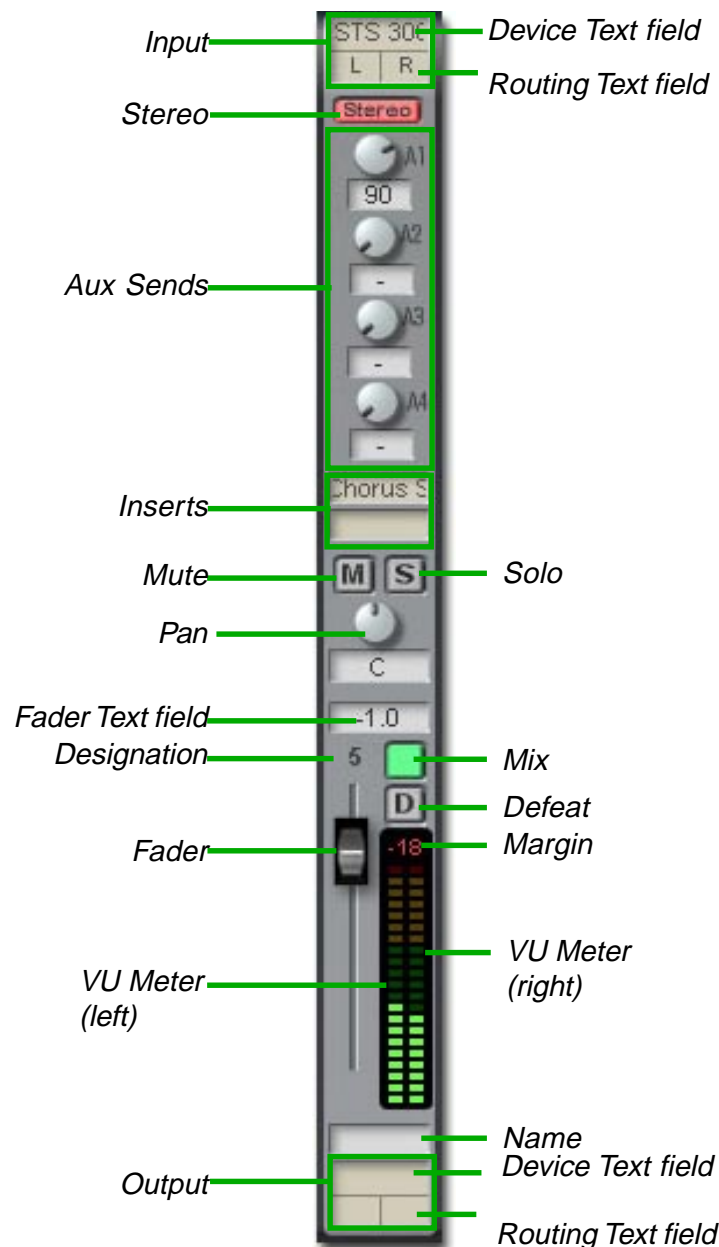


## Channel Strip

The individual channel strips are described below. The routing fields oversee the input and output usage. Only a connected channel uses DSP.

**Device Loader:** With this text field you can load a new device to connect to the channel, or connect a device already loaded into the project. You can also use it to delete a device and its connections. Double-clicking on the field opens the device's control panel. Other functions are available in the context menu.

**Routing Text Fields:** Not only display the connections, but also let you connect any loaded device through their menus. Double-click to delete a connection.



**Stereo:** Enables this channel as a stereo channel. Any channel can operate either as a stereo or mono channel. Mono channels use only the left level meter, the left Inv button, and the left peak/signal display. When you switch from stereo to mono mode any connections to the right channel are lost. For example, when switching to mono, the left input for channel 1 is renamed from IL1 to In1 and IR1 disappears. The inserts automatically switch from stereo to mono, and any stereo insert effects present are removed.

**Aux Sends:** The rotary controls adjust the proportion of the channel signal passed to the respective aux bus.

**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.

You can also load insert effects using the context menu. Double-click on the effect name to open its control surface.

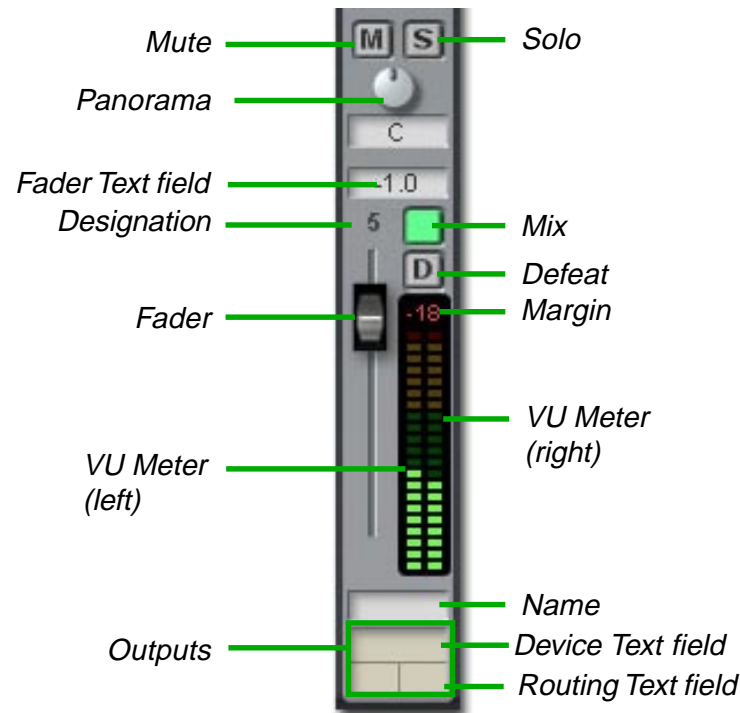
**Mute:** The Mute button (**M**) removes the signal from the mix or restores it.

**Solo:** This button puts the channel in solo mode.

**Panorama:** Controls the proportion of the signal sent to the left and right master buses. This setting determines the virtual position of the sound in the stereo field. When pan is adjusted to full left (Left) the signal passes only to the left master bus. In the central position (Center) both sides receive an equal proportion of the signal, and the signal is attenuated by 3 dB (crossfade mode).

At the full right (Right) position, the signal is fed only to the right master bus. In the case of stereo channels, the left channel is pre-assigned to the left master bus and the right channel to the right master bus. Therefore there is no cross fading between channels.

When a channel is in stereo mode, the pan control acts as a balance control. In the center position, the input signal is passed through unattenuated and independent of the channel strip's selected pan mode. If the control is turned gradually from center to full left, the right channel signal will be gradually faded down until it is no longer audible, while the level of the left channel signal remains unchanged.



**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 designated channel number.

**Mix:** With the green mix button you can include or remove the channel from the mix (independent of the Aux sends).

**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.

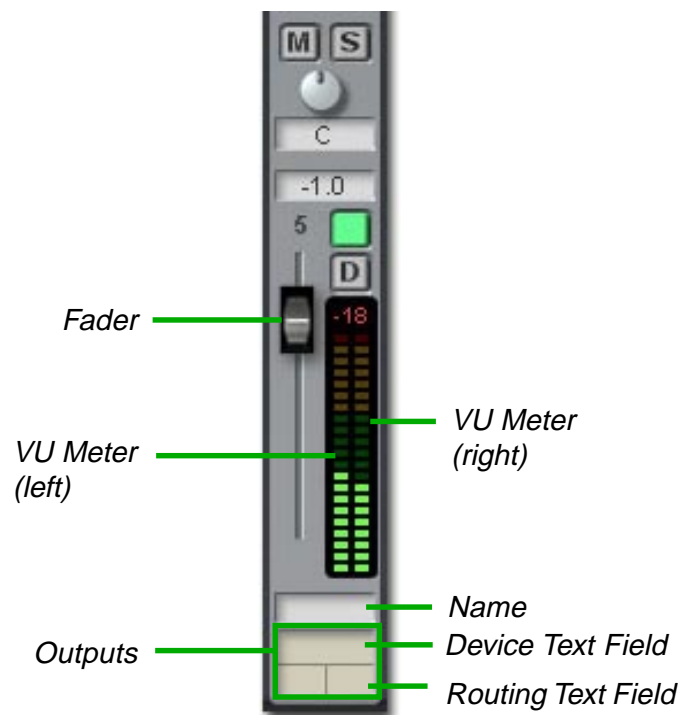
**Margin:** The margin display shows the highest level reached so far in the left and right channels. This value, expressed in dB, remains unchanged until a higher level is detected or until the margin is reset.

**Fader:** The fader controls a channel's output level. The text field above the fader indicates the current signal amplification. You can enter values into this field. The range is from no signal (inf.) to about +12dB of amplification.

**VU Meters:** Depending on the meter mode, the meters indicate the channel's signal input or output signal level. If the channel is set to Mono, only the left meter is used.

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

**Device Text Field:** With this text field you can connect a device already loaded into the project to the channel. You can also use it to delete a device and its connections. Double-clicking on the field opens the device's control panel. Other functions are available in the context menu.



The name of the device appears in the text field, and its connections in the associated routing text fields.

When the device is loaded the channel automatically switches to mono or stereo as required, and any loaded inserts are removed. If a device has more than two outputs, only the first two will be connected.

**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 Page

This page contains the channel strips for the Aux sends and returns.

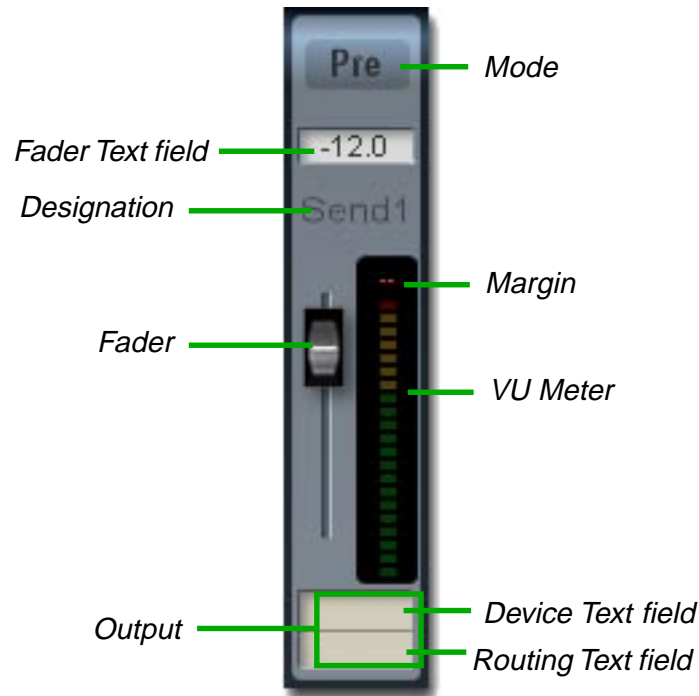
### Aux Sends

The Aux send channels control the level of the respective auxiliary send bus.

**Mode:** Each of the four auxiliary buses can be set to either Pre Fader or Post Fader. For use as an auxiliary channel, post fader is the usual setting as the send signal is then dependent on the fader position. For use as a monitor channel, pre fader is more appropriate, as the monitor balance will not change when the when the channel's level in the mix changes.

**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 designated channel number.



**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.

**VU Meter:** Shows the current signal level.

**Fader:** The fader controls the level of the overall aux send signal. The associated text field 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) to 0dB.

**Device Text Field:** With this text field you can connect a device already loaded into the project to the aux send. You can also use it to delete a device and its connections. Double-clicking on the field opens the device's control panel. Other functions are available in the context menu.

The name of the device appears in the text field, and its connections in the associated routing text field.

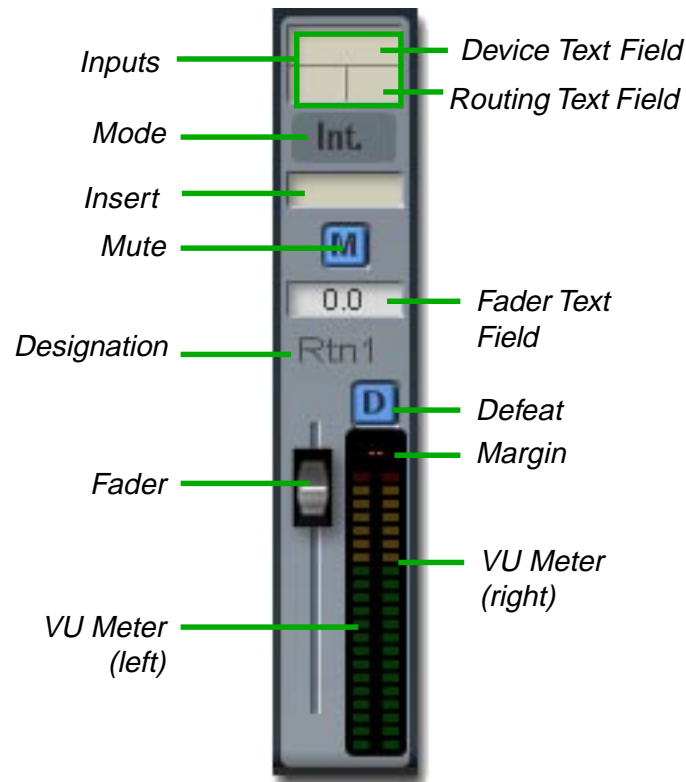
**Routing Text Field:** This field indicates the connection, and through the context menu is also used to connect any devices loaded into the routing window. Double-clicking on the field deletes a connection.

## 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 returns, however, their use is not limited to this.

**Device Loader:** With this text field you can load a new device to connect to the channel, or connect a device already loaded into the routing window. You can also use it to delete a device and its connections. Double-clicking on the field opens the device's control panel. Other functions are available in the context menu.

**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.



**Mode:** The aux return path provides two modes of operation.

In external mode, the aux send and return connections are visible and can be freely connected. You can include an additional effect (such as a gate) in the return's insert slot.

In external mode 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.

In Internal mode (**Int**) the connections for the sends and returns are hidden, and connected internally. In this case, the loaded effect becomes an Aux effect. This setting helps provide a clean overview in the routing window.

**Inserts:** Each return includes an Insert slot. A slot is empty when its text field is blank. To load an effect into a slot, use drag and drop to pull an effect into the slot. The effect is then loaded, and its name appears in the slot.

You can also load insert effects using the context menu. Double-click on the effect name to open its control surface.



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

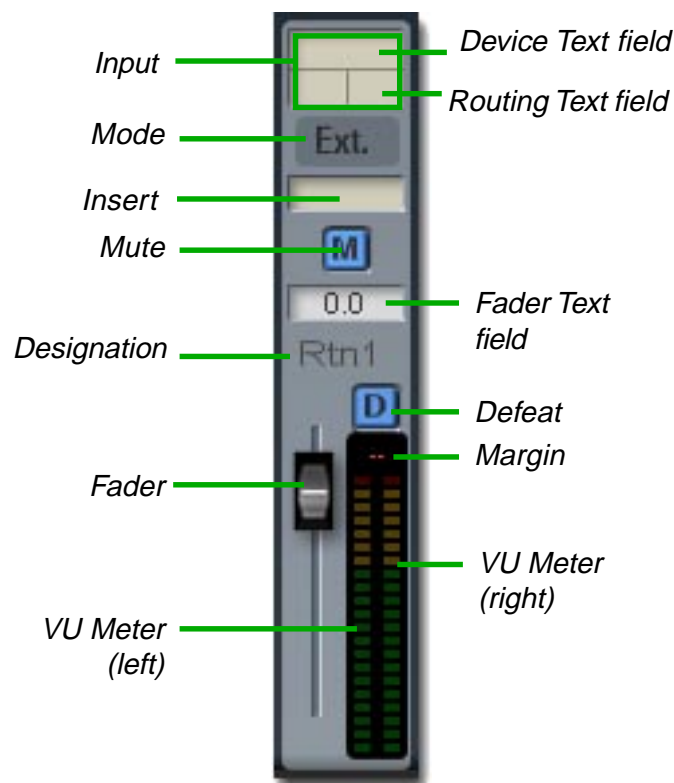
**Designation:** The designated name for the return.

**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 the aux 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.

**VU Meter:** Displays the current level of the signal.



**Fader:** The fader controls the return's level in the mix. The text field above the fader indicates the current signal amplification. You can enter values into this field. The range is from no signal (inf.) to about +12dB of amplification.

## 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.

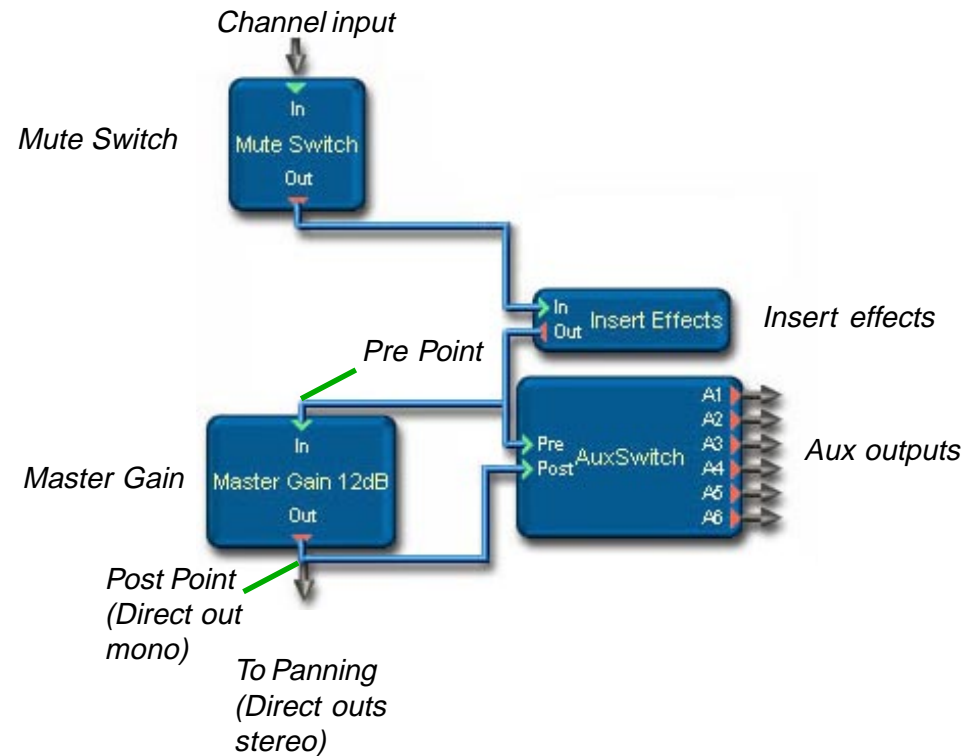
**Mute Switch:** The first module in the signal path is the mute switch. When the mute switch is on, the signal is effectively blocked at this point.

**Inserts:** The insert slots lie immediately downstream from the mute switch. 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 insert slots, the signal branches. The main signal goes to the Master Gain module, and the other branches across the Pre switch to the Pre 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 uses the Master Fader and 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.

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