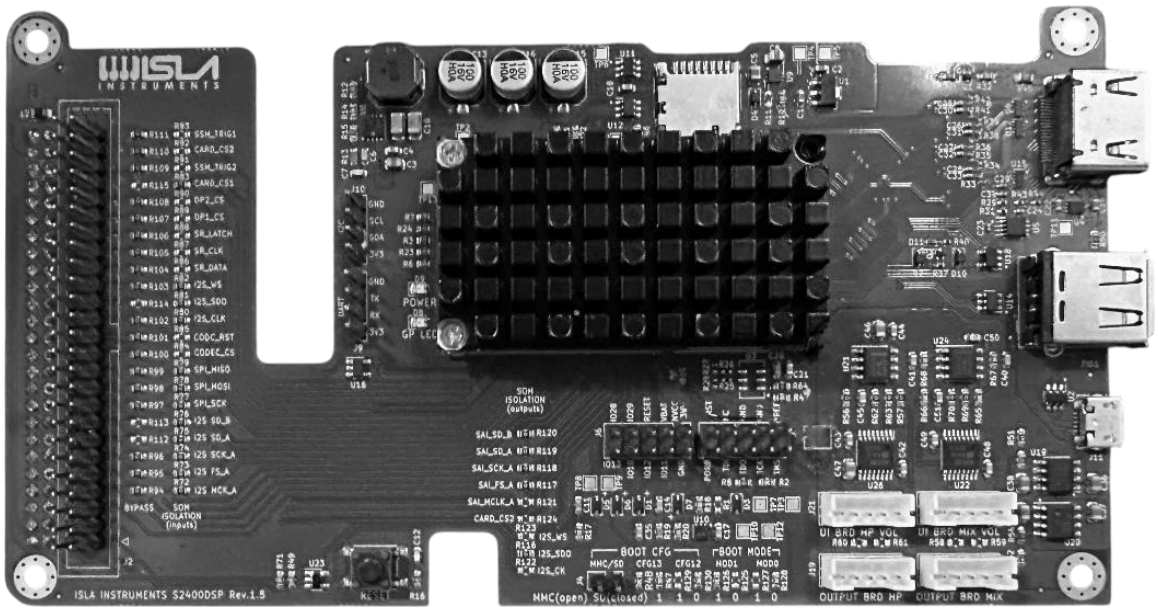
ISLA Instruments

S2400 DSP Card

User Manual



Revised March 25, 2025

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Introduction

In 2020, we introduced the **S2400 Desktop Sampler**, a modern powerhouse inspired by classic samplers. Designed for performance, the S2400 offers **32 sample tracks, live loops, MIDI sequencing, and a hands-on workflow** that has become a favorite among producers. However, in terms of **onboard DSP effects**, the original S2400 was limited to **analog and DSP filters**, leaving many users requesting additional effects like **reverb, delay, and compression**.

Initially, the S2400 shipped with **8 voices of polyphony**, which was later expanded to **16 voices**—a significant upgrade, but one that left little processing headroom for additional DSP effects. To bridge this gap, we developed the **S2400 DSP Card**, unlocking an entirely new dimension of **sound design, effects processing, and virtual instrument playback**.

What Does the DSP Card Do?

The **S2400 DSP Card** is an **expansion module** that adds a full-fledged **digital effects processor, mixer, and virtual instrument host** to the S2400. The heart of this system is a **custom-built Linux distribution**, finely tuned for **real-time audio processing**. Powered by a 64-Bit **Quad-core ARM processor**, it includes **2GB of onboard RAM** and **4GB of internal storage**.

Once installed, the **DSP Card intercepts the eight individual digital audio streams** from the S2400's processor and routes them into a **fully featured digital mixer**. This mixer functions much like a **traditional studio console**, offering:

- **Up to 8 mono group buses or 4 stereo buses**
- **Insert FX on each bus**, supporting **LV2 and VST3 plugins**
- **Two auxiliary sends for additional effects routing**
- **A new master mix bus**, which also supports plugin inserts

More Than Just Effects: Virtual Instruments & SoundFonts

Beyond enhancing the S2400's mixing and effects capabilities, the **DSP Card also introduces virtual instrument support**. Users can load and run **software synthesizers and multi-sampled instrument libraries**, controlled via the S2400's **MIDI tracks** or external MIDI gear. This feature allows the DSP Card to function as both a **sound source and an effects processor**, expanding the S2400 beyond sampling into full-fledged instrument playback.

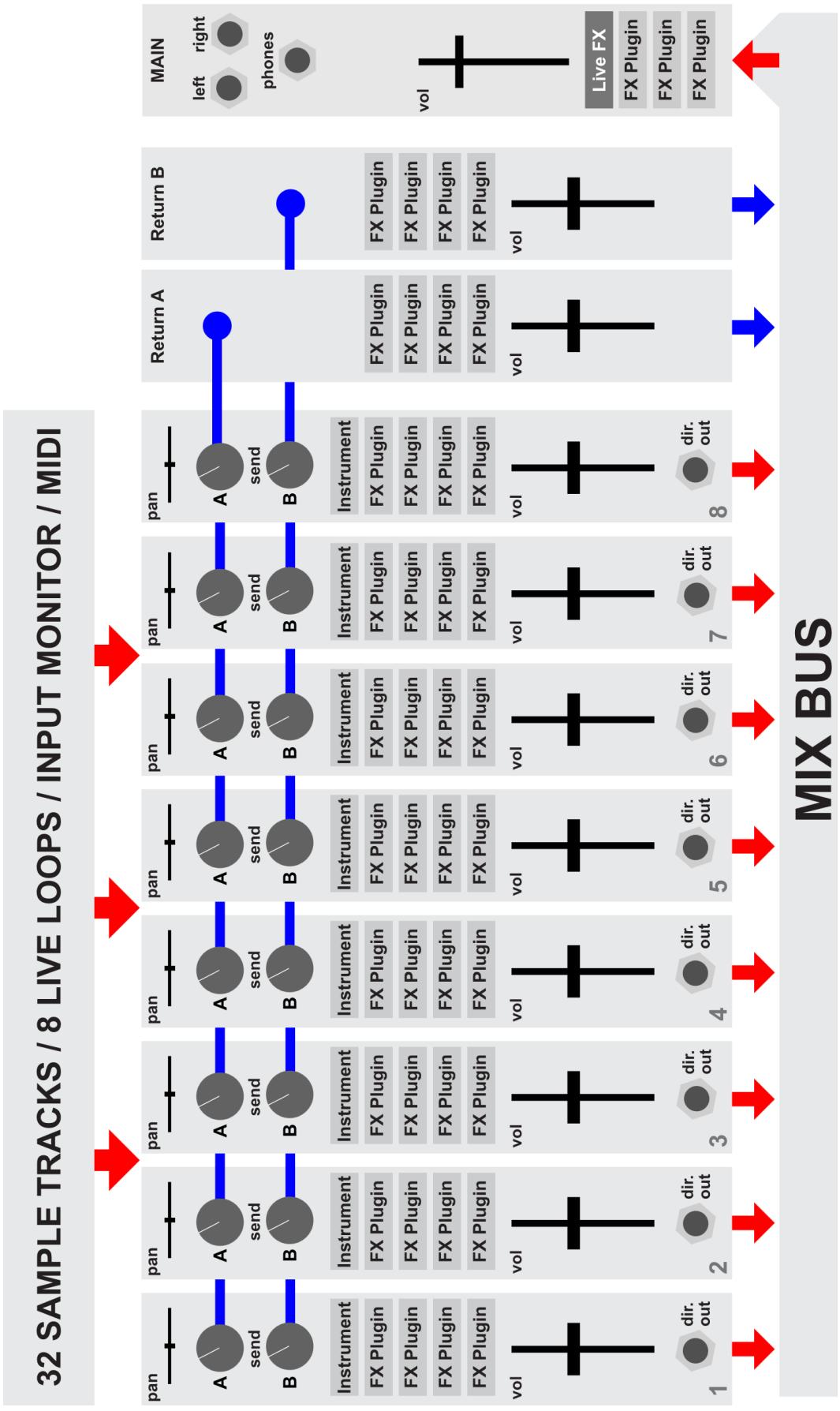
Additionally, the DSP Card supports **SoundFonts**, making it easy to integrate **multi-sampled instrument playback** directly within the S2400's workflow. Whether using **classic sample libraries or custom instrument banks**, the DSP Card adds an entirely new layer of **expressive, high-quality sound generation**.

Introducing Live FX

In addition to the expanded mixer and effects architecture, we've partnered with **renowned plugin developer Sinevibes** to bring a **dedicated performance effect suite: Live FX**. This specialized plugin provides a powerful selection of real-time, triggerable effects, designed to enhance live performance and creative sound manipulation.

A Fully Expandable Digital Audio Engine

With the **S2400 DSP Card**, the S2400 becomes a **fully expandable digital effects and instrument powerhouse**, allowing users to integrate high-quality **reverbs, delays, compressors, modulation effects, virtual instruments, and multi-sampled playback**—all within their workflow.


32 SAMPLE TRACKS / 8 LIVE LOOPS / INPUT MONITOR / MIDI
MIX BUS
MAIN
left
right
phones
vol
Live FX
FX Plugin
FX Plugin
FX Plugin
Return A
Return B
pan
A
send
B
Instrument
FX Plugin
FX Plugin
FX Plugin
FX Plugin
vol
dir. out
1
2
3
4
5
6
7
8

Effects Screen

Display the Effects screen by pressing Shift+Effects (the eighth key from the left in the top row).

DSP Card Section

This section is visible only when an Isla DSP Card is installed.

Go to DSP Screen

Displays the DSP Mixer screen, the same as pressing Bank+0.

Go to Live FX

Displays the Live FX screen, the same as pressing Bank+9.

Clear Config

Removes all plugins and resets all DSP settings to their defaults.

Save Config

Allows for saving either the DSP configuration, the Live FX configuration, or both. Both of these configuration files get saved with every project, but they can also be saved to any folder on the SD card.

Load Config

Loads the DSP or Live FX configuration from a previously saved file on the SD card.

Sync Files

Synchronizes the files in the dspcard folder on the SD card with the corresponding folders on the DSP card. This is how plugins are added or deleted from the DSP card. Each plugin with all of its files goes in a separate folder inside the dspcard/LV2 or dspcard/VST folder. VST plugins must be version 3, version 2 is not supported. Do not put zip files in the sync folders, they will not work.

Card Version

Displays the DSP card firmware version number.

DSP Main to USB

Check to send the DSP Main signal to USB audio main out. If unchecked, the USB audio main out will be dry (pre-dsp). The eight individual USB audio outputs are always dry.

Act Like Banks

Enabled: Pressing Bank or Shift+Bank will cycle through the sample and MIDI tracks then to the Live FX screen and the DSP Mixer screen as if they were banks.
Disabled: The screens act like popup windows. That is, they are displayed by pressing Bank+9 or Bank+0, and exited by pressing Back.

Live FX Catchup

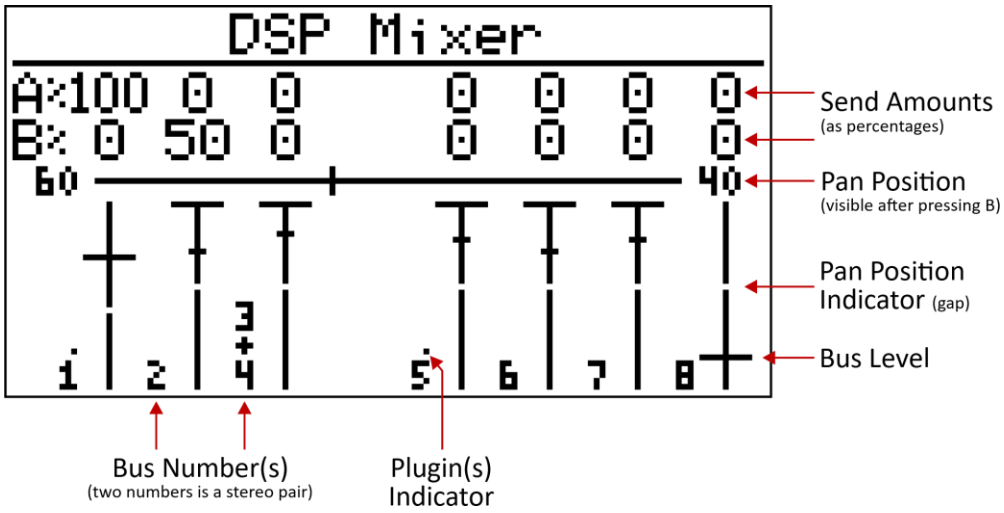
Live FX has its own setting for fader/knob catchup. It can be set to On, Off, or Gbl (global). If it is set to global, then it will always have the same value as the global fader catchup setting.

Classic Filters Section

The classic analog filters are still connected between the DSP card and the individual output jacks. However, the main output is no longer an analog sum of the individual outputs. It is digitally generated by the DSP card. So, the analog filters are not in the signal path of the main output.

DSP Mixer

Press Bank+0 or select Go to DSP Screen from the Effects menu.



The DSP Mixer screen is where you set the levels, panning, and send amounts for each of the busses. Each pair of busses (1&2, 3&4, 5&6, 7&8) can be either mono or stereo, which is set in the bus settings. Stereo pairs are shown on screen as a single fader and set of send amounts, e.g. bus 3+4 in the screen shot above.

The top two rows of the screen show the Send A and Send B amounts. There are two send busses, and two corresponding returns. Effects can be added to the return busses.

Press the B button to display the horizontal pan position bar and numbers. Turn the encoder or press the arrow keys to change the pan position. The pan position for each bus is always visible as a gap in the on-screen level fader. Panning can also be edited in the Pan screen.

DSP Mixer Returns/Main Page

The returns levels and main level are on a separate page. This page is visually much simpler because there are no sends or panning. Only the first three faders are used to adjust the levels.

DSP Mixer Keys

Fader: Adjust the bus Level.
Top Knob: Adjust the Send A Amount, expressed as a percentage 0-100.
Bottom Knob: Adjust the Send B Amount.
B Button: Edit the panning for the bus.
Shift+A/Shift+Pad: Edit the settings for the bus, including plugins.
F1/F2/F3: Go directly to a page (Output Busses, Returns/Main Bus, Parm Controller).
Bank+0/0: Go to the next page.
Shift+0/long-press 0: Help

DSP Bus Settings

The Bus Settings page is displayed when pressing Shift+A/Shift+Pad on either DSP Mixer page.

Name

The name of the bus is for your own reference. This is the only place the name is shown.

Mix

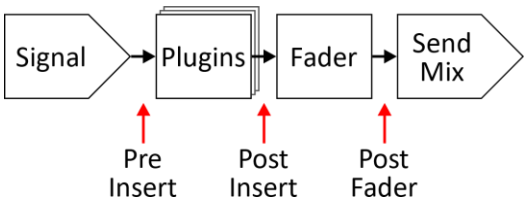
Each pair of busses (1&2, 3&4, 5&6, 7&8) can be mono, or combined into a stereo pair.

Send to Main

Check this option to send the individual bus signal to the Main bus. Without a DSP card, inserting a plug into an individual output jack mechanically removes that output from the main out. That does not happen with a DSP card installed. The Send to Main option can be checked or unchecked regardless of whether there is a plug in the individual output jack.

Send A/B

The send routing method determines how the bus signal is routed to the send mix.
Pre Insert routes the dry signal as it is before passing through any plugins or the level fader.
Post Insert routes the signal after it has passed through all plugins but before the level fader.
Post Fader routes the signal after it has passed through all plugins and the level fader.



Plugins

If there are any plugins on this bus, they will be listed here. To the left of the plugin name is a dot. If the dot is filled in, then the plugin is enabled. Plugins can be quickly enabled/disabled by pressing F1 when the plugin is highlighted. Enabled state can also be edited on the plugin parameters screen.

+Add Plugin/Preset

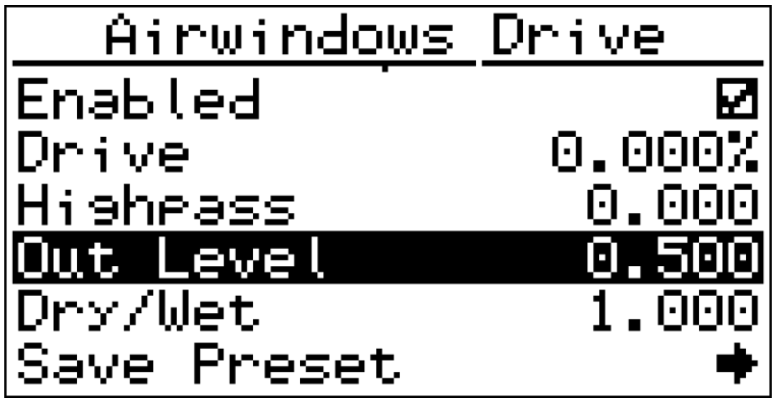
Adds a plugin to the end of the chain. After clicking on this the file browser screen is displayed. You can either select a plugin from the DSP card, or select a saved preset file from the SD card. Press F2 to insert a plugin at a specific slot in the list (before the highlighted plugin).

DSP Bus Settings Keys

Back: Exit the settings screen.
Enter/Encoder Press: Edit the parameters of the highlighted plugin.
F1: Toggle Enabled for the highlighted plugin.
F2: Insert a plugin/preset before the highlighted plugin.
F3: Delete the highlighted plugin.
F5: Move the highlighted plugin up or down in the plugin order. The enabled indicator changes to a move ↕ icon. Press Arrows/Encoder or Shift+Arrows/Shift+Encoder to move the plugin. Press any other key when done moving.

Plugin Parameter Editor

Highlight and click on a plugin on the bus settings page to edit the plugin parameters.



Enabled
Every plugin has an Enabled checkbox. A plugin can be enabled and disabled any time. It stays on the bus and its parameter values will be remembered.

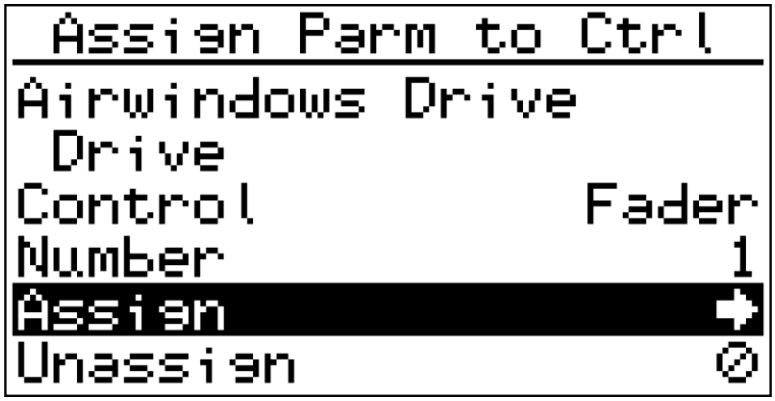
Parameters
All of the plugin's parameters are listed here. Press Enter to edit the highlighted parameter. If it is an integer, or an enumeration (several fixed, usually non-numeric, values), then the arrows/encoder click through each value. If the parameter is a decimal number (as most are), then the arrows/encoder change the value by 0.001. Arrow key autorepeat or encoder fast turn change the number by 0.010.

Save Preset
The Save Preset option is at the end of the parameter list. Select this option to save the current plugin values to a preset file on the SD card. Preset files can be loaded onto a bus just like selecting a plugin. The files can even be shared with other users.

Plugin Parameters Editor Keys

Back: Exit the Parameter Editor screen.
Enter: Edit the highlighted parameter.
F1: If Enabled or any checkbox-type parameter is highlighted, F1 toggles the value.
F1/F2/F3: Sets the value of the highlighted parameter to 25%/50%/75% of its range. This is a quick way to change the value in big jumps, much faster than using the encoder or arrow keys.
F4: Assign highlighted parameter to a control. See the Assign Parameter to Control screen.
Arrows/Encoder: Change the value being edited.
Fader 8: Change the value of the highlighted parameter. The position of the fader is indicated by a gap in the horizontal line at the top of the screen. The value of the parameter is indicated by a vertical hash mark. The parameter only needs to be highlighted to use fader 8; there is no need to press Enter first.
Shift+Fader 8: Move the fader without affecting the parameter.

Assign Parameter to Control



This screen appears after F4 is pressed on the Plugin Parameter Editor screen. The top two lines of the screen show the plugin name and the parameter name. The other fields are listed below. Once a parameter is assigned to a control, its value can be changed using a fader or knob on the DSP Parameter Controller page.

Control
The control type: Fader, Top Knob, Bottom Knob.

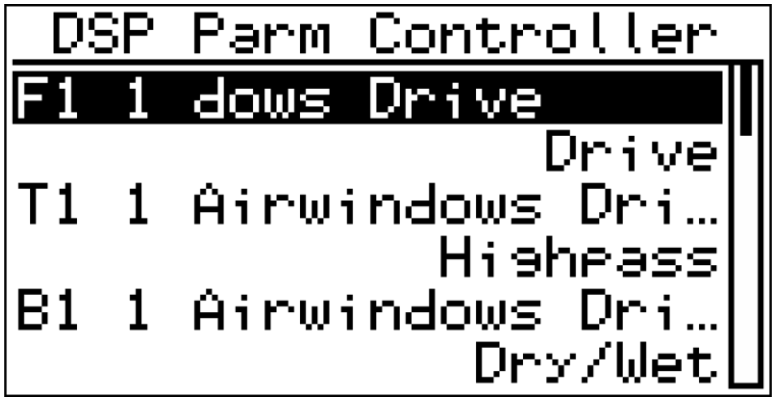
Number
The fader/knob number (1-8).

Assign
Click here to assign the parameter to the control.

Unassign
Click here to unassign the parameter. This option will only be enabled if the parameter was already assigned to a control.

Faders/Knobs
Move a fader or a knob to fill in the control and number fields and highlight the Assign action. Using this method, controls can be very quickly mapped – just press F4, move the control, and press Enter.

DSP Parameter Controller Page



The Parameter Controller is the third page on the DSP screen. Get to the page by pressing Bank+0, 0, or F3 from the DSP Mixer page.

The Parameter Controller page uses the faders and knobs to change DSP plugin parameter values. Parameters are assigned to controls by pressing F4 in the Plugin Parameter Editor.

The screen shows a list of all of the controls and what they are mapped to, if anything. Each line has the control name and number, the DSP bus number, and the name of the plugin. Below that is the name of the mapped parameter.

The control names are abbreviated F, T and B which stand for Fader, Top Knob and Bottom Knob. When a control is moved, the screen automatically scrolls to that parameter, making it easy to see what parameter is affected.

DSP Parameter Controller Keys

Fader/Top Knob/Bottom Knob: Adjust parameter value, if one is assigned.
F1/F2: Go directly to a page (Output Busses, Returns/Main Bus).
Bank+0/0: Go to the next page (Output Busses).
Shift+0/long-press 0: Help

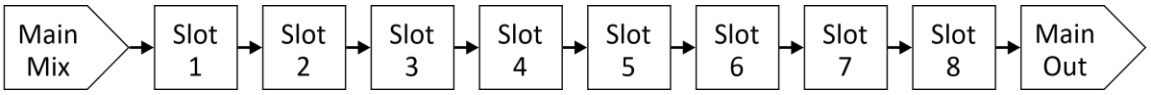
Live FX

Press Bank+9 or select Go to Live FX from the Effects menu.

Live FX is a real-time performance effect engine developed in partnership with Sinevibes. It applies DJ-style effects directly to the main output bus. It is designed for on-the-fly manipulation during performances, allowing users to instantly add movement, texture, and dynamic transformations to their sound.

A good analogy would be a guitarist's pedal board with eight stomp box pedals arranged in a row. Each pedal's output is plugged into the next pedal's input. Each pedal can affect the signal or be bypassed and pass the signal on to the next pedal.

The diagram below shows that each of the eight pads on the S2400 is an effect slot which can contain any one of the (currently) 20 algorithms.



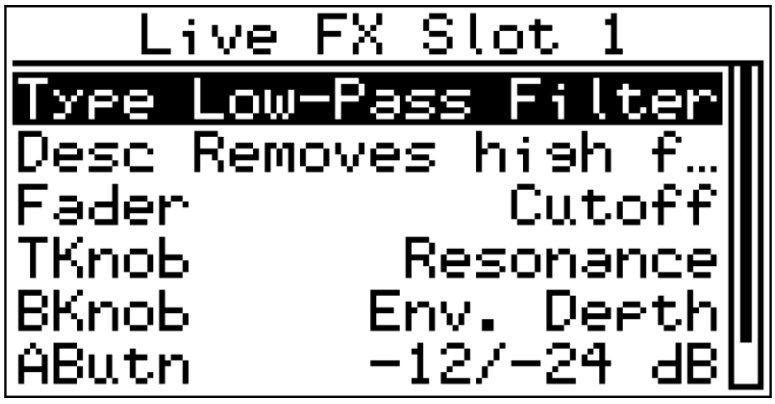
Tip: What you hear at the output when triggering multiple Live FX simultaneously can differ greatly depending on the order of the FX. Experiment with moving algorithm positions around.

Live FX is implemented as the last plugin on the main output bus. The plugin is "built-in" and cannot be added, moved or removed. The screen looks like other pattern screen fader modes.

Live FX Screen Keys

Pad: Momentarily enable the effect as long as the pad is pressed.
Mute/Solo: Toggle the effect on/off.
Shift+A/Shift+Pad: Change the slot's effect algorithm.
Erase+Pad: Quick erase the effect from the selected slot.
Copy+Pad: Select a pad to move. Continue holding Copy, then press the destination pad. The existing effects will be shifted up/down to accommodate the moved pad.

Live FX Set Algorithm Screen



The top row selects the algorithm. The screen also includes a scrolling description of the algorithm and the parameters controlled by the fader, knobs, and buttons.

Live FX Algorithm Reference

Effect Type	Fader	Top Knob	Bottom Knob	A Button	B Button
Low-Pass Filter	Removes high frequencies, allowing low frequencies to pass.				
	Cutoff	Resonance	Env. Depth	-12/-24 dB	-
High-Pass Filter	Removes low frequencies, allowing high frequencies to pass.				
	Cutoff	Resonance	Env. Depth	-12/-24 dB	-
Band-Pass Filter	Allows only a specific frequency range to pass through.				
	Cutoff	Resonance	Env. Depth	-12/-24 dB	-
Notch Filter	Removes a specific frequency band to eliminate unwanted resonance.				
	Cutoff	Resonance	Env. Depth	-12/-24 dB	-
LP-HP Filter	Combines Above filters with zero point in the middle of fader travel.				
	Cutoff	Resonance	Env. Depth	-12/-24 dB	-
Band Isolator	A multi-band equalizer for independent control of lows, mids, and highs.				
	Low	Mid	High	-	-
Flanger	Creates a swirling effect by mixing delayed signal with itself.				
	Frequency	Feedback	Mod. Depth	Stereo	Inv. Feedback
Phaser	Creates peaks and notches in the frequency spectrum for a sweeping effect.				
	Frequency	Feedback	Mod. Depth	Stereo	-
Tape	Simulates analog tape saturation, pitch instability and noise for vintage warmth.				
	Wow/Flutter	Noise	Drive	-	-
Vinyl	Adds simulated turntable artifacts such as wow, flutter, and surface noise.				
	Wow/Flutter	Noise	Drive	-	-
Delay	Repeats the input signal after a short delay, creating echoes.				
	Time	Feedback	Level	Free Time	Mix/Return
Reverb	Simulates acoustic environments, adding depth and space.				
	Decay	Damping	Level	-	Mix/Return
Lo-Fi	Reduces sample rate and bit depth to introduce digital aliasing and vintage crunch, emulating old-school samplers and degraded audio signals.				
	Sample Rate	Bit Depth	Mix	-	-
Pitch Shifter	Alters the pitch of the incoming signal up or down in real time, creating harmonized layers or extreme pitch-bending effects.				
	Pitch	Feedback	Mix	-	-
Freq Shifter	Shifts the entire frequency spectrum of a sound linearly, resulting in inharmonic, metallic, or ring-modulated textures.				
	Pitch	Stereo	Mix	-	-
Gater	Cuts the audio signal rhythmically for a stuttering effect.				
	Intensity	Speed	Slew	-	-
Repeater	Loops a section of audio to create glitchy, rhythmic effects.				
	Length	Repeats	-	-	-
Robotizer	Adds robotic modulation to the sound.				
	Length	-	-	-	-
Reverser	Reverses small sections of audio in real-time.				
	Length	-	-	-	-
Stopper	Momentarily halts playback for turntable brake style stops.				
	Length	-	-	-	-