

Solera

FLUX:: Immersive

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1 Solera

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The Solera dynamic processor is a comprehensive dynamic processor providing a compressor, expander, de-compressor and de-expander, that each may be enabled individually, all processing in parallel using one single common detector.

Each of the dynamics sections employs independent Dynamic Ratio and L.I.D. (Level Independent Detector) settings, two parameters that are kind of unique to dynamic processing, using the dynamic range content of the signal and not just the signal levels as standard dynamics processors do.

Dynamic Ratio (23) is controlling the amount of auto-ratio determined by the signal dynamics and the manual ratio setting.

L.I.D. (25) (Level Independent Detector) controls the amount of auto-threshold determined by the signal dynamics and the manual threshold value, providing processing of the audio signal independently of the sound level and instead in regards to the signal dynamic range.

1.1 Display Area

For full visual control over the processing Solera provides a comprehensive display area including:

- Resultant dynamics curve
- Parametric curve for the side-chain EQ
- Input level (VU-Meter referenced to -16 dB FS by default)
- Output level
- Resultant envelope (Compression, De-Compression, Expansion, De-Expansion & Clipper activity)
- Dynamic difference between input and output
- Level difference between input and output

1.2 MS Mode

To conform with the demands of serious audio mastering Solera features a Mid/Side (MS) encoder/decoder section encoding the signal from the stereo inputs by summing left and right channels to produce the Mid, and by phase switching the right channel from the left channel to produce the Side signal.

Processing M and S as separate components with a compressor makes it possible to achieve results that would be impossible with a regular stereo setup.

Example:

A bass drum in the stereo center with a fluctuating level surrounded by a synthesizer pad. The M channel featuring the bass drum can be processed without affecting the S channel featuring the Synthesizer pad. Changing the S gain when decoding allows controlling the stereo width using MS Width (20).

The Solera MS mode should only be used with stereo signal and it is strongly recommended to avoid this on already MS encoded signal.

1.3 Side Chain & Detector Equalizer

Solera features a three band Detector Equalizer for frequency-sensitive processing. The Detector EQ does not affect the direct audio signal, but instead it applies to the signal detection channel that drives the processing, offering the option to shape the actual processing to be performed within a certain frequency range. For further control of the processing, optional external side-chain signal feeding is provided.

Even though the Detector EQ parameters value ranges may seem extreme, with a Q-Factor up to 10, frequencies above 20 KHz and with cumulative gain, really smooth results can be achieved without deteriorating artefacts even when dealing with frequencies out of the audio spectrum. The purpose with this is to be able to use a part of the correction and include it into the audio spectrum; this is one of the secrets behind the “Air” correction often featured on vintage audio processors.

The wide range processing ensures a perfect accuracy in terms of phase and propagation time. Filtering the control signal upstream of the envelope gain generation allows for controlling the overall tonal balance by increasing or decreasing the processing of a particular part of the audio spectrum.

Reducing the gain for the low frequencies before the detection, increase the low frequencies in the processed signal if the processing settings reduce the gain according to the signal level. With this configuration, increasing the gain for the high frequencies makes the processing

more sensitive to this particular part of the audio spectrum, and turns Solera into a sibilance controller.

1.4 Delay

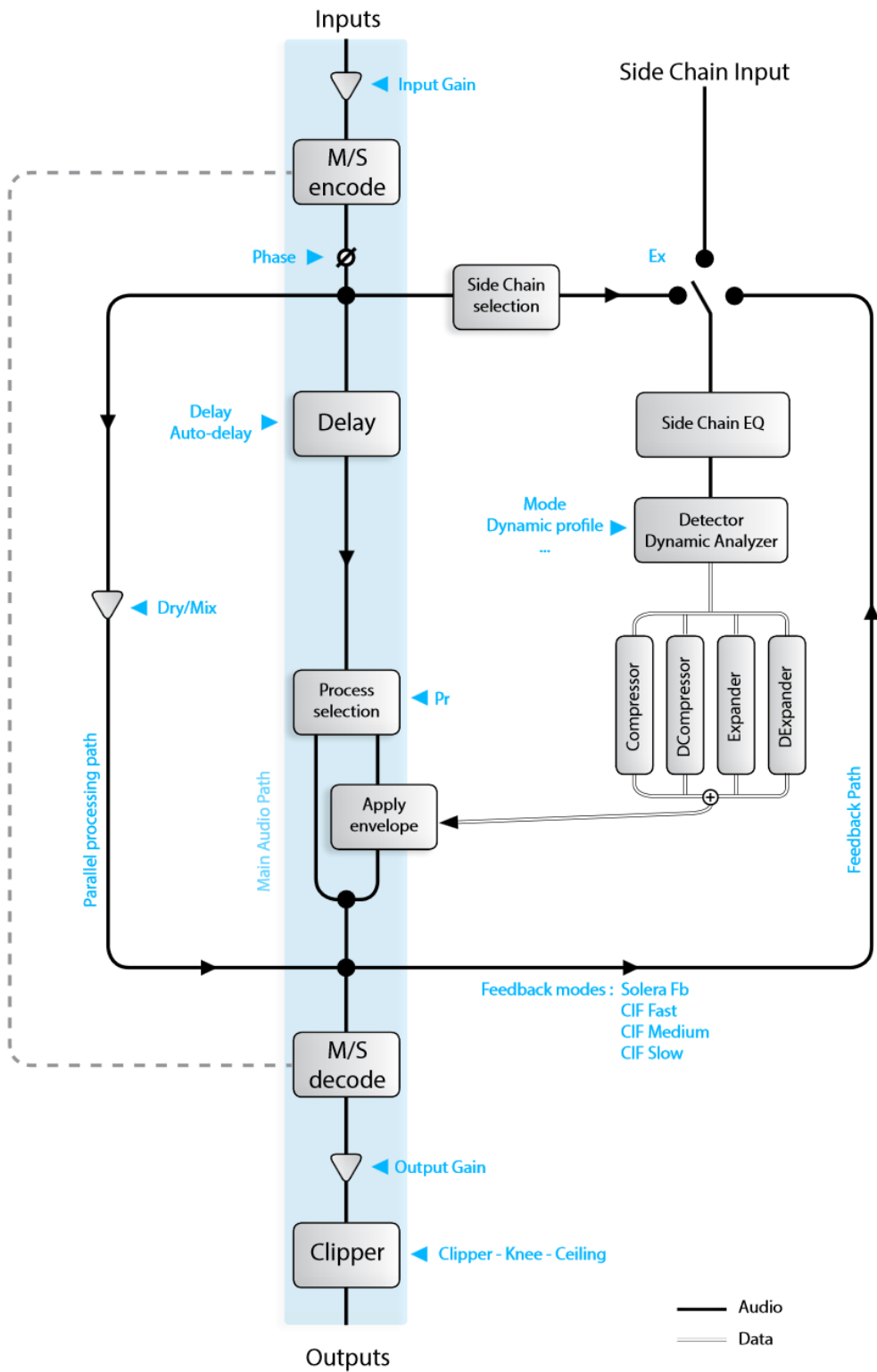
A delay line can be inserted into the processed signal with the main purpose to produce a zero/null attack time for the processing when the delay value equals the Attack time. The Auto (46) button automatically sets the delay value according to the Attack time. Setting the delay time lower than the Attack time preserves the peaks from the processing.

1.5 Dry Mix

The original dry signal can be mixed with the processed material using the Dry Mix (2) dial. The original audio peaks are kept and added to the processed sound to preserve the sensitive information of the sound attacks.

Note

Note that the Dry Mix function takes the delay that may be introduced by the processing into account. The summing is done before the clipper stage, and the displayed gain also reflects the Dry Mix setting.



2 General Settings



Input Gain (1) Adjusts the gain applied to the dynamics processing input.

Unit: dB

Value Range: -48 / +48

Step: 0.01

Default Value: 0 dB

2.1 Dry Mix (2)

Adjusts the amount of unprocessed signal mixed in with the processed signal. The mix is made before the Output Gain (3).

Default Value: -144 dB

2.2 Output Gain (3)

Adjusts the global gain applied to the dynamics processing output.

Unit: dB

Value Range: -48 / +48

Step: 0.01

Default Value: 0 dB

2.3 Invert Phase (4)

Inverts the phase of the processed signal by 180 degrees. The phase flip applies to the detector Equalizer Solo (40) as well.

Default Value: Off

2.4 Clipper Enable (5)

Enables the built in discrete peak limiter, applied at the very last stage of the processing.

Default Value: Off

2.5 Clipper Knee (6)

Adjusts the shape of the peak limiter response curve.

Unit: dB

Value Range: 0 / +6

Step: 0.01

Default Value: 1 dB

2.6 Clipper Ceiling (6)

Adjusts the peak limiter output ceiling.

Unit: dB

Value Range: -0.3 / 0

Step: 0.01

Default Value: 0 dB

2.7 Link Channels (7)

When Link Channels is enabled, by default the maximum value issued from all channels feeding the side chain is retained as the source for processing preserving the space information for the processed multi-channel signals.

When Link Channels is disabled, each channel uses its own value for individual processing.

Using this configuration in conjunction with the MS width section, which encode the signal in MS before processing and decodes it at the output, the M signal can be processed while keeping the S channel untouched.

Default: Enabled

2.8 Bypass (8)

Global bypass, when pressed the inputs are routed directly to the outputs.

Default Value: Off

2.9 Channel Processing Selector (9)

On a multi-channel bus Solera by default processes the incoming audio on all channels. Certain situations may require exclusion of some of the channels from processing. Unchecking a channel excludes the audio material from processing.

By using several instances of Solera in series this feature can be used for explicit processing of specific channels.

Default Value: On

2.10 Side-Chain & External Side-Chain Routing (10)

External side-chain is only available in mono and stereo. On a multi-channel bus Solera is by default feeding all channels to the side-chain.

When using the external side-chain feature an additional side-chain channel button presents itself consecutively after the standard side-chain channel buttons. In mono the side-chain channel is presented as channel 2, and in stereo as channel 3.

Different behaviours are exhibited for the external side-chain depending on the host and plug-in type:

- Audio Unit: The side-chain button is displayed when the host actually feeds audio to the side-chain.
- AAX: The side-chain button is only active if a side-chain bus is selected from the plug-in handler.
- VST: No side-chain feature is available.

Using Solera on a multichannel bus and route the audio in the host accordingly to achieve the same functionality, can be accomplished in most hosts.

Some situations may require for certain channels to be omitted from the side-chain feed. Unchecking a side-chain channel button omits that channel from the side-chain feed.

2.11 MS Width Control (20)

Adjusts the stereo width of the processed signal.

When set to -6 dB the stereo width decreases and increases when set to +6 dB. Extreme settings may due to the nature of the processing produce phase issues.

Unit: dB

Value Range: -6 / +6

Step: 0.01

Default Value: 0

2.12 MS Mode On/Off (21)

The stereo width of the mix is controlled using a MS encoder/decoder at the dynamic processing input/output.

When engaged, the side-chain is fed by a MS encoded signal with the M channel corresponding to the standard left channel, and the S channel corresponding to the standard right channel.

This is reflected in the metering section of the graphical display where the label L and R are being replaced by M and S.

This feature is only available when processing two channels (no more, no less).

Default Value: Off

3 Time Related Settings

3.1 Delay (47)

By introducing a delay into the signal path reflecting the attack time, a zero attack time can be produced for the dynamic processing.

Shifting the delay value from the attack time makes it possible to control the transients. A delay value inferior to the attack time value, leaves the peaks untouched by the processing.

For obvious reasons the delay introduces latency in the processing and the different delay values on every band are automatically compensated.

Note

Note that Solera cannot be used to produce delay-based special effects.

Warning

Warning: Morphing between presets with different delay values produces sound artefacts.

Unit: ms

Value Range: 0 to 50.0 ms

Default Value: 0 ms

3.2 Auto Delay (46)

Links the Delay (47) to the Attack (49).

Note

Note that the latency introduced by this equals to the attack time divided by two.

Default Value: Off

3.3 Mode (48)

In order to adapt the dynamic processing for the actual signal a detector examines the incoming signal in advance. Based on how the detection is performed different results can be achieved in the dynamic processing.

3.3.1 Solera provides eight different detection modes:

- **Solera** - The Attack setting also controls the integration time for RMS detection. With Auto Delay (46) engaged the produced attack time is zero.
- **Solera Feed Backward** - The Attack setting also controls the integration time for RMS detection, which is done on the output of the processor. This mode disables the Delay (47) feature. Note that the Solera Feed Backward prevents usage of the external side chain as the processed signal is feeding the side chain.
- **Classic Fast** - The integration time for RMS detection is 10 ms with no direct relation to the Attack setting. Though with Auto Delay (46) engaged the produced attack time is zero.
- **Classic Medium** - The integration time for RMS detection is 40 ms with no direct relation to the Attack setting. Though with Auto Delay (46) engaged the produced attack time is zero.
- **Classic Slow** - The integration time for RMS detection is 80 ms with no direct relation to the Attack setting. Though with Auto Delay (46) engaged the produced attack time is zero.
- **Classic Feed Backward Fast** - The integration time is 10 ms for RMS detection, which is done on the output of the processor. This mode disables the Delay (46) feature. Note that the Feed Backward mode prevents usage of the external side chain as the processed signal is feeding the side chain.
- **Classic Feed Backward Medium** - The integration time is 40 ms for RMS detection, which is done on the output of the processor. This mode disables the Delay (46) feature. Note that the Feed Backward mode prevents usage of the external side chain as the processed signal is feeding the side chain.
- **Classic Feed Backward Slow** - The integration time is 80 ms for RMS detection, which is done on the output of the processor. This mode disables the Delay (47) feature. Note that the Feed Backward mode prevents usage of the external side chain as the processed signal is feeding the side chain.

The Feed Backward modes have been inspired by vintage hardware architectures. They create a sort of auto regulation of the processing which produces a naturally beefy sound.

Default Value: Solera

3.4 Attack (49)

Sets the attack time of the processing envelope. It also controls the way the RMS value is computed from the incoming signal. Warning: The Attack setting also controls the integration time for the RMS detection.

Unit: ms

Value Range: 0 ms to 100 ms

Default Value: 0.0 ms

3.5 Hold (50)

This parameter is the only one in the time related settings that is independent per dynamic processor. The compressor and the expander may have different hold time. Used in the Expander section, this setting allows very precise gating of drum tracks. It can also be used for creative purpose on the other dynamic sections.

Unit: ms

Value Range: 0 ms / 500 ms.

Default Value: 0 ms

3.6 Release Mode (51)

Three release modes are available for the envelop of the dynamic processing.

- Manual - Corresponds to the value you have set.
- Auto - Enables the algorithm to generate a signal dependent value to avoid typical pumping effects.
- Advanced - Gives access to two different values for release and to the control of the velocity of the variations between the maximum and the minimum release values.

Default Value: Auto

3.7 Release (52)

Sets the manual release value and the maximum release value when in Advanced Mode.

Unit: ms

Value Range: 0.67 ms / 10000.00 ms

Default Value: 500.00 ms

3.8 Release Minimum (53)

Sets the minimum release value when in Advanced Mode.

Unit: ms

Value Range: 0.67ms / 5000.00

Step: 0.01

Default Value: 1.30 ms

3.9 Dynamic Factor (54)

Amplify or dim the extracted real time dynamic information.

Unit: x

Value Range: 0 / 3.0

Step: variable

Default Value: 1

3.10 Dynamic Velocity (55)

Sets the speed of variation on the dynamic information.

Unit: %

Value Range: 10 / 1000

Step: 1

Default Value: 50 %

4 Dynamic Section Settings

4.1 Peak Detection Amount (22)

Percentage of the instant peak value used to feed the detector section, making the dynamic processing more sensitive to audio transients. 0 % means 100 % RMS signal feeding the detector section; 100 % means only peak signal is feeding the detector section, and 50 % is fifty-fifty of each.

Unit: %

Value Range: 0 / 100

Step: 1

Default Value: 0 %

4.2 Dynamic Ratio (23)

The Dynamic Ratio setting relaxes the ratio applied to the processor section when the detected signal dynamic rises, and literally opens the sound, increases the dynamic impression and maintains some crest by adjusting the ratio of every dynamic processing section in realtime, both their current ratio settings and the signal content (mainly dynamic range).

Unit: %

Value Range: 0 / 100

Step: 1

Default Value: 0 %

Note

To start understanding this setting and easily hear it, take a full mixed drum kit or a complete mix with punchy drums, set the compression threshold and ratio to values that makes it close to a pumping or an aggressive compression. Then increase the output gain to compensate the gain lost and toggle between 0 and 100% of Dynamic Ratio. At 100 % you should hear more air in the sound, more transient and less of the compression impression, especially the attack.

4.3 Dynamic Ratio Inverter (24)

When engaged, the behaviour of the Dynamic Ratio is inverted.
The ratio value is increased depending of the detected signal dynamics.

4.4 L.I.D. (Level Independent Detector) (25)

Controls the amount of auto-threshold determined by the signal dynamics and the manual threshold value, providing processing of the audio signal independently of the sound level and instead in regards to the signal dynamic range.

Unit: %
Value Range: 0 / 100
Step: 1
Default Value: 0 %

Note

Use a full song mix. Set the ratio to 3-4 for the compression to start working and the threshold of the compressor to the max value, the compressor will stop working because the sound level will never reach the threshold. Now increase the L.I.D. and you will hear the compression working again. Next decrease or increase the input gain, the compression will continue to work equally completely independent of the sound level, only depending on Ratio, Knee and sound content.

When you have too much dynamic in the sound, going from -3, -6 dB Vu (or less) to +12 dB, and you want to compress the low levels, you will get a pumping effect when the sound reaches the high levels. The only thing to do with a standard compressor is to increase the threshold to retain the airiness in the sound. But when this is done the compressor will not work any more on the low levels and you will hear differences (in term density, live space, grain etc.) especially when the compressor starts working.

With Solera, adjust the threshold and ratio on the high levels to what you find okay, then increase the L.I.D. (from 20 to 50 %) and listen to the low levels and especially the transition between low and high levels. You can also increase the ratio for a stronger effect, and you will notice that the compression will still be present and still affect the high/loud levels (unless you set 100% L.I.D.) and make the compression very smooth with no more pumping. In addition to the Dynamic Ratio function you will be able to set a constant and very natural envelope that allows to increase low levels, low frequency and to keep the important transients.

4.5 L.I.D.. Threshold (26)

Sets the gain range of the L.I.D. parameter.

- Up: Increasing of the L.I.D. action.
- Down: Decreasing of the L.I.D. action.

Two green lines on the Dynamic Activity display reflect the current L.I.D. threshold value. For Compressor and DCompressor sections, the L.I.D. action is effective only when the orange Dynamic Activity (18) exceeds the area between the two green lines. For Expander and DExpander sections, the L.I.D. action is effective only when the orange Dynamic Activity (18) stays inside the area between the two green lines.

4.6 L.I.D. Maximum (27)

When engaged, the threshold for the processing is determined by the maximum values from RMS/peak detection OR from the signal dynamic detection. The L.I.D. Threshold is still active, but the L.I.D. mix button is disabled. This feature allows the whole process to be more reactive to the signal content, very efficient when used on drum tracks.

4.7 Threshold (28)

Sets the threshold of the specific dynamic processing section. This dB scale refers to an RMS value.

The threshold effective value is modified by the L.I.D, L.I.D. Threshold and L.I.D. Maximum settings.

Unit: dB

Value Ranges:

-32 to +16 (Compressor/DCompressor)

-80 to +16 (Expander/DExpander)

Default Value: 0

4.8 Ratio (29)

Sets the ratio of the specific dynamic processing section. The ratio effective value is modified by the Dynamic Ratio amount.

Unit: dB
Value Range: 1 to 10
Step: 0.01
Default Value: 1

4.9 Infinite (30)

Sets the ratio to its maximum possible value depending of the dynamic section.
The DCcompressor section is limited to 12 when this button is engaged

4.10 Range (31)

Sets the maximum allowed gain variation for a specific dynamic processing section.

Unit: dB
Value Range: 0 to 48/140/24/16 (Compressor/Expander/DCompressor/DExpander)
Default Value: 24/96/12/12

4.11 Knee (32)

Sets the smoothness of the transmission curve for the specific dynamic processing section. The curve is smoothed around the threshold value of the dB amount set with the knee value.

Unit: dB
Value Range: 0 / +24
Default Value: 0

4.12 Dynamic Section On/Off (33)

Activates the specific section.

4.13 Compressor Section Selector (35)

Selects the Compressor section.

4.14 DCompressor Section Selector (36)

Selects the DCompressor section.

4.15 Expander Section Selector (37)

Selects the Expander section.

4.16 DExpander Section Selector (38)

Selects the DExpander section.

4.17 Dynamic Section Activity (34)

The gain is displayed in a 12 dB scale from left to right for gain increase and from right to left for gain decrease for the corresponding dynamic section.

5 Display

5.1 Eq Display (12)

Graphical editing of the three-band Detector EQ is provided. Double click on the EQ display will expand it.

5.2 Input Level Meter (13)

Vu-meter, not peak-meter, referenced to -16 dB Fs by default, with auto scale depending of the threshold values.

When the MS Width section is engaged, the M (Mid) level is displayed on the left meter. S (Side) is displayed on the right meter. The green index reflects the threshold value.

5.3 Output Level Meter (14)

Vu-meter, not peak-meter, referenced to -16 dB Fs by default, with auto scale depending of the threshold values.

When the MS Width section is engaged, the M (Mid) level is displayed on the left meter. S (Side) is displayed on the right meter.

5.4 Resultant Envelope (15)

Vu-meter, not peak-meter, referenced to -16 dB Fs by default.

The scale is +/- 12 dB.

This is the compression, de-compression, expander and de-expander summing envelope.

5.5 Dynamic difference between in and out (16)

Vu-meter, not peak-meter, referenced to -16 dB Fs by default.
The scale is +/- 12 dB.

5.6 Level difference between in and out (17)

Vu-meter, not peak-meter, referenced to -16 dB Fs by default.
The scale is +/- 12 dB. This is the compression, de-compression, expander and de-expander summing envelop which also takes account of the input and output gains of the band.

5.7 Dynamic Activity Display (18)

No scale

Two green lines on the Dynamic Activity display reflect the current L.I.D. Threshold value. For Compressor and DCompressor sections, the L.I.D. action is effective only when the orange Dynamic Activity exceeds the area between the two green lines. For Expander and DExpander sections, the L.I.D. action is effective only when the orange Dynamic Activity () stays inside the area between the two green lines.

5.8 Instant Release Value (19)

Auto Scale depending of the release value(s)

5.9 Resulting Transfer Curve (11)

Auto Scale depending of the threshold value(s)

6 The Side Chain EQ Section

The band selection can be done with the 1, 2, 3 switches or directly from the graphic display. All band parameters can also be set using switches and knobs or from the EQ-Curve graphic display as described below. A Double-click in the graphic display area of the EQ-Curve magnifies it. A new Double-click toggles it back to standard size. From a Right-Click on this area, the behaviour of the vertical scale can be selected with: Auto, 6 dB, 12 dB and 24 dB as available choices.

6.1 In (39)

Enables the complete EQ section on detector section.

Default Value: Off

6.2 Solo (40)

The equalized detector signal can be monitored through the plug-in output when the solo button is enabled.

Default Value: Off

6.3 1-2-3 (41)

Three equalization bands are available on the detector section. Each can be selected to use the parameter knobs for settings. Note that a graphic editing is also available from the graphic curve display.

Default Value: none

6.4 Filter Type (42)

The filter type can be adjusted individually on each of the Detector EQ bands.

- 12 dB per octave high pass filter
- Low shelving
- Parametric
- High shelving
- 12 dB per octave low pass filter

Default Value: Peak

6.5 Gain (43)

Sets the gain for the selected band.

Unit: dB

Value Range: -24 / +24

Step: 0.01

Default Value: 0

6.6 Frequency (44)

Sets the centre frequency for the selected band.

Unit: Hz

Value Range: 5 / 22K

Step: variable

Default Value: 100 / 500 / 2000

6.7 Q-Factor (45)

Sets the quality factor of the selected band if the filter type is parametric.

Value Range: 1 / 100

Step: 0.22

Default Value: 10

7 Preset Management

7.1 Preset Manager Access (56)

Opens a new window accessing the built-in preset manager.

7.2 Loaded Preset Preset Display (57)

Displays the current selected preset name.

Clicking the arrow opens a new window accessing the built-in preset manager.

7.3 Save (58)

Save replaces the selected preset by a new one under the same name featuring the current settings. If you want to keep an existing preset without your new modifications, just select an empty place into the preset list, enter a new name for this modified preset featuring the current settings and press Save.

7.4 Recall (59)

Once a preset is selected from the preset list it must be explicitly loaded into section A or the section B by using the recall button. A preset is effective only after it has been recalled.

7.5 Copy A / Copy B (60)

The current parameters of a section are copied to the other one. The section A or B is re-initialized with the current values and the morphing slider is parked at 100% of the corresponding section.

7.6 Morphing Slider (61)

Morphs the parameter values of both parameter sections.

This horizontal slider has no unity or specific value display, it provides morphing of the current values from both of the parameter sections (A & B).

A double-click on one side of the slider area toggles between the two parameter sections. The actual result of the morphed parameter settings can be saved as a new preset.

7.7 Automation Control of the Morphing Slider (62)

When this button is disabled all of the plug-in parameter values are recorded when writing automation.

When reading automation, if this button is disabled, all the plug-in parameters are controlled by the host automation except for the morphing slider (61), which is then ignored.

When this button is engaged all parameters are recorded when writing automation, including the morphing slider(61), though when reading automation ONLY the morphing slider value is read and applied.

The Automation button must be engaged if the morphing slider is to be mapped on a control surface.

Default Value: Off

8 Specifications

8.1 Availability

Solera is available in:

AU / VST / VST3 / AAX Native/ *AAX AudioSuite*

** AAX Native & AAX AudioSuite in Pro Tools 11 and later*

8.2 Processing

Solera provides :

- Up to 16 channels Input/Output in VST/VST3/AU/AAX.
- 64-bits internal floating point processing.
- Sampling rate up to 384 kHz.

8.3 Hardware Requirements

A graphic card fully supporting OpenGL 2.0 is required.

- macOS : OpenGL 2.0 required – Mac Pro 1.1 & Mac Pro 2.1 are not supported.
- Windows : If your computer has an ATi or NVidia graphics card, please assure the latest graphic drivers from the ATi or NVidia website are installed.

8.4 Software License Requirements

In order to use the software an iLok.com user account is required (the iLok USB Smart Key is not required).

8.5 Compatibility

All major native formats are supported

8.5.1 Windows – 10, in 64 bits only.

- VST (2.4)
- VST3 (3.1)
- AAX Native*
- AAX AudioSuite*
- AAX DSP

8.5.2 macOS (Intel and ARM)

All versions from Sierra (10.12) to latest. (Compatible with previous versions but not supported)

- VST (2.4)
- VST3 (3.1)
- AU
- AAX Native*
- AAX AudioSuite*
- AAX DSP

* *AAX Native & AAX AudioSuite in Pro Tools 11 and later*

9 Credits

9.1 Software development

9.1.1 Project Manager and Designer:

Gaël Martinet

9.1.2 Application Development:

Gaël Martinet, Alexis Gentil, Bastien Prevosto, Anthony Belard, Maxence Grandidier, Siegfried Hand and Antoine Lorence.

9.1.3 FLUX:: DSP Design and Development:

Gaël Martinet, Maxence Grandidier and Lorcan Mc Donagh

9.1.4 Graphic design:

Nicolas Philippot

9.1.5 FLUX:: Framework development:

Gaël Martinet, Florie-Anne Lafaye, Alexis Gentil, Lorcan Mc Donagh, Bastien Prevosto, Anthony Belard, Siegfried Hand and Antoine Lorence

Additional contributions: Vincent Carlier, Jean-Loup Pecquais, Nicolas Erard, Jean Cruypenynck, Pablo Arias, Samuel Tracol

9.1.6 FLUX:: Framework graphic engine:

Emmanuel Julien (GS lib) and Gaël Martinet

9.1.7 And

thanks to all fantastic testers...

9.1.8 FLUX:: Special Thanks to:

Alain, Yves, Bruno and Claude for helping to shape our minds over the years.

9.2 FLUX::

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9.3 Additional libs

- GS lib Emmanuel Julien, Gael Martinet (Copyright 2013 Emmanuel Julien)
- ThorVG, Copyright (c) 2020 - 2023 notice for the ThorVG Project (see AUTHORS)
- r8brain free - Copyright (c) 2013-2023 Aleksey Vaneev
- LibJpeg - Copyright (c) 1991-2016, Thomas G. Lane, Guido Vollbeding
- libpng :
 - Copyright (c) 1995-2023 The PNG Reference Library Authors.
 - Copyright (c) 2018-2023 Cosmin Truta.
 - Copyright (c) 2000-2002, 2004, 2006-2018 Glenn Randers-Pehrson.
 - Copyright (c) 1996-1997 Andreas Dilger.
 - Copyright (c) 1995-1996 Guy Eric Schalnat, Group 42, Inc.
- Freetype 2 - Copyright (c) 2006-2023 by David Turner, Robert Wilhelm, and Werner Lemberg.
- Zlib - Copyright (c) 1995-2022 Jean-loup Gailly and Mark Adler
- bzip2 - Copyright (c) 1996-2010 Julian Seward jseward@bzip.org
- Boost - BSL-1.0
- ni-media - Copyright (c) 2022 Native Instruments
- pfft:
 - Copyright (c) 2004 the University Corporation for Atmospheric Research (“UCAR”)
 - Copyright (c) 2013 Julien Pommier (pommier@modartt.com)
 - Copyright (c) 2019 Hayati Ayguen (h_ayguen@web.de)
 - Copyright (c) 2020 Dario Mambro (dario.mambro@gmail.com)
- pybind11 - Copyright (c) 2016 Wenzel Jakob wenzel.jakob@epfl.ch
- rtaudio - Copyright (c) 2001-2021 Gary P. Scavone

- rtmidi - Copyright (c) 2003-2021 Gary P. Scavone
- concurrentqueue - Copyright (c) 2013-2016, Cameron Desrochers.
- readerwriterqueue - Copyright (c) 2013-2021, Cameron Desrochers.
- assimp - Copyright (c) 2006-2021, assimp team
- enet - Copyright (c) 2002-2020 Lee Salzman
- fmt - Copyright (c) 2012 - present, Victor Zverovich and {fmt} contributors
- functions (Erik Rigtorp) - Copyright (c) 2015 Erik Rigtorp erik@rigtorp.se
- inplace_function - BSL-1.0
- gtest - Copyright 2008, Google Inc.
- jsoncpp - Copyright (c) 2007-2010 Baptiste Lepilleur and The JsonCpp Authors
- libcurl - Copyright (c) 1996 - 2023, Daniel Stenberg, daniel@haxx.se, and many contributors
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- nanobench - Copyright (c) 2019-2023 Martin Leitner-Ankerl
- nlohmann_json - Copyright (c) 2013-2022 Niels Lohmann
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- openvr - Copyright (c) 2015, Valve Corporation
- poly2tri - Copyright (c) 2009-2018, Poly2Tri Contributors
- pugixml - Copyright (c) 2006-2022 Arseny Kapoulkine
- rapidjson - Copyright (c) 2015 THL A29 Limited, a Tencent company, and Milo Yip.
- shared_recursive_mutex - Copyright (c) 2019 konanM
- sentry-native - Copyright (c) 2019 Sentry (<https://sentry.io>) and individual contributors.
- sqlite3 - Public Domain License
- sqlite_orm - Copyright (c) 2012-2023 Eugene Zakharov and others
- stb - Copyright (c) 2017 Sean Barrett
- utfcpp - Copyright 2006 Nemanja Trifunovic
- unqlite - Copyright (c) 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019 Symisc Systems, S.U.A.R.L [M.I.A.G + Mrad Chems Eddine chm@symisc.net].

9.4 Open source libraries

9.4.1 RTTrPM SDK (Blacktraxx)

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9.4.2 ThorVG (replaces crossed-out libraries above) - MIT

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9.4.3 r8brain free - MIT

<https://github.com/avaneev/r8brain-free-src/blob/master/LICENSE>

9.4.4 ooura fft from lmdsp - MIT (or MIT-like)

<https://www.kurims.kyoto-u.ac.jp/~ooura/fft.html> Copyright Takuya OOURA, 1996-2001

9.4.5 LibJpeg - Custom (BSD-like)

<https://jpegclub.org/reference/> Copyright (C) 1991-2016, Thomas G. Lane, Guido Vollbeding

9.4.6 libpng - PNG Reference Library License version 2

<https://sourceforge.net/p/libpng/code/ci/master/tree/LICENSE> Copyright (c) 1995-2023 The PNG Reference Library Authors. Copyright (c) 2018-2023 Cosmin Truta. - Copyright (c) 2000-2002, 2004, 2006-2018 Glenn Randers-Pehrson. Copyright (c) 1996-1997 Andreas Dilger. Copyright (c) 1995-1996 Guy Eric Schalnat, Group 42, Inc.

9.4.7 Freetype 2 - FreeType License

<https://github.com/freetype/freetype/blob/master/LICENSE.TXT> Copyright (C) 2006-2023 by David Turner, Robert Wilhelm, and Werner Lemberg

9.4.8 Zlib - zlib

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9.4.9 bzip2 - Modified zlib

Copyright (C) 1996-2010 Julian Seward jseward@bzip.org

9.4.10 Boost - BSL-1.0

https://github.com/boostorg/boost/blob/master/LICENSE_1_0.txt

9.4.11 mimalloc - MIT

<https://github.com/microsoft/mimalloc/blob/master/LICENSE>

9.4.12 ni-media - MIT

<https://github.com/NativeInstruments/ni-media/blob/master/LICENSE>

9.4.13 pfft

<https://github.com/marton78/pfft/blob/master/LICENSE.txt>

9.4.14 pybind11

<https://github.com/pybind/pybind11/blob/master/LICENSE>

9.4.15 rtaudio

<https://github.com/thestk/rtaudio/blob/master/LICENSE>

9.4.16 rtmidi

<https://github.com/thestk/rtmidi/blob/master/LICENSE>

9.4.17 concurrentqueue - Simplified BSD

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9.4.19 assimp

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9.4.21 fmt

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9.4.22 functions (Erik Rigtorp) - MIT

<https://github.com/rigtorp/Function/blob/master/LICENSE>

9.4.23 inplace_function - BSL-1.0

9.4.24 gtest - ” BSD 3-Clause “New” or “Revised” ”

<https://github.com/google/googletest/blob/main/LICENSE>

9.4.25 jsoncpp - MIT

<https://github.com/open-source-parsers/jsoncpp/blob/master/LICENSE> Copyright (c) 2007-2010 Baptiste Lepilleur and The JsonCpp Authors

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9.4.26 libcurl - MIT like

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9.4.27 magic_enum - MIT

https://github.com/Neargye/magic_enum/blob/master/LICENSE Copyright (c) 2019 - 2024 Daniil Goncharov

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9.4.28 nanobench - MIT

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9.4.29 nlohmann_json - MIT

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9.4.30 openddl - MIT

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9.4.33 pugixml - MIT

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9.4.34 rapidjson - MIT

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9.4.35 shared_recursive_mutex - MIT

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9.4.36 sentry-native - MIT

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9.4.37 sqlite3 - Public Domain

<https://www.sqlite.org/copyright.html>

9.4.38 sqlite_orm - MIT

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9.4.39 stb - MIT

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9.4.40 utfcpp - BSL-1.0

<https://github.com/nemtrif/utfcpp/blob/master/LICENSE> “Boost Software License - Version 1.0 - August 17th, 2003

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9.4.41 unqlite - BSD 2-clause

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9.4.42 argh (Andrey Mikhaylenko) - LGPLv3

<https://pypi.org/project/argh/>

9.4.43 chardet (Mark Pilgrim, Daniel Blanchard) - LGPL v2.1

<https://github.com/chardet/chardet/blob/main/LICENSE>

9.4.44 charset_normalizer - MIT

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9.4.45 docopt (Vladimir Keleshev) - MIT

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9.4.46 dotenv - “BSD 3-Clause” “New” or “Revised”

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A Release Notes

A.1 Build 23.07.50310 - All plugins

A.1.1 New features

- Support Pro Tools new track formats

A.1.2 Bugs fixes

- All plugins - Nuendo - VST3 - crash when stereo plugins are instantiated on multichannel tracks (StereoTools, ...)
- All plugins - Pace protected plugins fail to scan on Da Vinci Resolve mac
- All plugins - Popups wrong metrics when changing screen
- All plugins - Presets not imported
- All plugins - VST3 - Nuendo - WIN (UHD360) - Wrong window size init
- All plugins - VST3 - WIN (UHD630) - REAPER - GUI refresh issue when in single window mode
- All plugins - GUI issue with AMD graphics on windows - flickering issue
- All plugins - AU - Plugins parameters are reset when bouncing in Reaper
- All plugins - VST2 - no multichannel with the plugins 23.X in Reaper
- All plugins - VST - Resizing the GUI does not update the floating window size in Nuendo on Windows with UHD630 graphics
- Bittersweet - VST3 - crashes on Pyramix on instantiation
- StereoTool / EVO Channel - VST3 - No goniometer / analyzer in Wavelab
- Elixir - Not available as 32 channels in Reaper
- EVO series - AAX - Dark Mode wrong GUI init
- EVO series - remove unused and duplicated presets
- EVO Channel - VST3 - spectrum smoothing slider crashes Studio one
- EVO Channel / EVO Eq - VST3 - Analyzer not working in Ableton Live
- EVO Channel / EVO Eq - scale eq control always reload on auto mode
- EVO Eq - weird release on meter
- EVO In - GUI refresh issue when toggling night/day mode
- EVO Touch - Zero Crossing Threshold label missing in the geek panel

- EVO Touch - frequency band selector does not always recall the good settings on session reload
- EVO Touch/ EVO Channel - Frequency range slider is hard to handle
- Pure Serie - VST3 - Attack value max 80ms
- Pure Comp - Crash when loading “Bass guitar” preset
- Pure Limiter - VST3 - advanced mode does not turn on advanced settings
- StereoTool - VST3 - vector scope not working in Ableton Live on Windows
- StereoTool - Not working in Final Cut Pro
- TRAX - Crash using oversampling with sessions set at 2FS or higher
- TRAX Tr - not usable in Protools anymore (build 50123)

A.1.3 Known issues

- All plugins - VST - GUI issue in Izotope Ozone and RX
- All plugins - AAX - Preset manager - Default preset is not applied to parameters at plugin instantiation
- Elixir - Latency not properly compensated after changing stage parameters value in VST and AudioUnit
- TRAX tr - Learn function returning wrong values
- VerbV3 - HOA 3rd order not working properly

A.2 Build 23.1.0.50251 - All plugins

A.2.1 New features

- New plugins Evo Compressor, Evo Touch and Evo EQ.
- VST3 support
- ARM support for AAX, AU and VST3
- Plugins are now resizable
- Elixir now supports 32 channels
- Alchemist, BitterSweet, Epure, Pure Compressor, Pure DCompressor, Pure Expander, Pure DExpander, PureLimiter, Solera, Syrah now support 16 channels

A.2.2 Bugs fixes

- All plugins - Preset Manager - Update user preset do not work
- All plugins - Preset manager - Crash or freeze when saving a preset
- All plugins - UI may be black on Intel UHD 630 graphical cards

- All plugins - AU/VST3 - Preset manager - Default preset is not applied to parameters at plugin instantiation
- All plugins - AAX - Crash with OSC when changing fx slot in Pro Tools
- All plugins - AU - Logic Pro - Automation of boolean/integer parameters broken
- All plugins - AU - Plugins crash in Da Vinci Resolve
- All plugins - DaVinci Resolve - VST - UI is truncated
- All plugins - Streamlabs - Plugins do not work
- All plugins - Licensing issue in DaVinci Resolve and GarageBand
- Alchemist - The range parameter works only for the 1st band
- BitterSweet - Not possible to tweak the Output gain after unlinking it
- BitterSweet - Output gain not reloaded properly when the link is disabled
- BSPro - some modes are not accessible due to GUI issue
- Epure - macOS - Bad graphic scale initialization at 2&4FS
- Evo Channel - Meter reference is not saved
- Syrah - Crash when selecting preset “Static fast compression”
- TRAX Tr - When the link is activated, the Formant slider does not have the expected audio effect
- TRAX Tr - ProTools - Issue in AudioStudio when the modulation is enabled
- VerbSession/VerbSession Studio Session and BSPro StudioSession - Pyramix - VST crash when instantiated
- Verb/Verb Studio Session - Crash when reloading session having 2 instances

A.2.3 Known issues

- All plugins - VST - GUI issue in Izotope Ozone and RX
- All plugins - AAX - Preset manager - Default preset is not applied to parameters at plugin instantiation
- Elixir - Latency not properly compensated after changing stage parameters value in VST and AudioUnit
- TRAX tr - Learn function returning wrong values
- VerbV3 - HOA 3rd order not working properly

A.3 Build 21.12.0.50123 - All plugins except TRAX and StudioSession

Bug fixes

- All plugins AudioUnit - GUI issue with Hdpi displays on macOS Monterey
- All plugins VST - Plugin scan freeze in Wavelab 11 on Mac M1 machines
- All plugins VST - Crash in Adobe Audition on macOS
- All plugins VST macOS - Fix crashes with Ableton live
- Elixir - Automation is not read for toggle parameters.
- Elixir - Crash when clicking on the settings button on Session version
- Elixir - Several fixes on the UI
- Elixir - Windows AAX - Refresh issue with two instances in ProTools
- HEar - Bypass is working in AAX
- HEar AAX - Crash when doing offline bounce on macOS
- HEar AAX - Crash when editing the matrix on macOS
- HEar AAX - Stereo - Change on Matrix are not applied until we change the preset
- HEar AudioUnit - Ableton crashes when inserting a second instance

A.4 Build 21.11.0.50107 (HEar, IRCAM Verb)

NOTE: CURRENTLY NOT COMPLIANT WITH ABLETON LIVE MACOS

Improvement

- HEar - 5.1.4 & 5.0.4 now available

Bug fixes

- HEar - Fix meters refresh issue
- HEar - No verb on some presets
- HEar - Protools crashes when doing offline bounce on macOS

A.5 FLUX:: Immersive - Plugins (including IRCAM Tools) 21.09

This release includes updates for all FLUX::Immersive plugin processing products with the exception of EVO Channel, Epure, IRCAM Trax, Studio Session.

NOTE: CURRENTLY NOT COMPLIANT WITH ABLETON LIVE MACOS

Major optimizations

- Apple computers Big Sur (new M1 chips) AU validation
- Important updates to the Ircam Verb + Session
- Overall better handling of multichannel track setups such for Atmos. (Ircam Hear, Verb and more)
- Automatic detection of track format / channel order for DAWs when possible.

A.5.1 Build 21.9.0.50083

Bug fixes

- Apple computers Big Sur (new M1 chips) AU validation failing
- Empty GUI when close/reopen plugin - Windows 10 - UHD630 graphics
- AudioUnit in Reaper - do not process audio when offline bounce
- Default preset not loaded correctly on instantiation of Verb + Verb Session
- Evo.Channel on Retina - Input and Output Sliders badly scaled
- Incompatible AudioUnit issue in Apple Final Cut Pro
- Plugins: Recall Preset Flags (e.g. “All but setup”) recall always everything
- Preset Manager - UI issue with small plugins when a preset has been created
- Ircam Verb Session reload in VST with audio interruption
- VST Plugins Session not correctly reloaded if it integrate an IO configuration change
- Verb session - Dry/wet not applied in offline render
- Verb v3 Atmos crash on AAX
- Verb: AU validation failed on Apple M1
- Verb: LFE not disabled by default on ProTools
- Verb: Recall Preset may be not correct with double click inside the preset manager
- Verb: disabled channel is not re-injected according to dry/wet parameter (100 % wet means muted)
- Verb: init issue with Nuendo
- AAX - Some plugins - Crash on Mac / No GUI on Windows
- Overall reliability / stability fixes.
- Plugin size not correct
- Potential plugins crash when opening UI

A.6 FLUX:: Immersive - Plugins (including IRCAM Tools) 20.12

This major release includes updates for all **FLUX::Immersive** products with the exception of IRCAM Spat V3 legacy product. Please refer to Spat V3 - Spat Revolution crossgrade options.

Major optimizations

- HiDPI / Retina support + display enhancements and fixes
- Page Table unification for **Avid Control**, S1, S3, S4, S6 and S6L.
- OSC Control for plugins.
- **IRCAM Verb** support for Dolby Atmos, Multichannel support up to 16 channels
- **IRCAM Hear** - Multichannel stability improvement, Now up to 10 channels. (Dolby Atmos 7.1.2)
- **IRCAM Tools** - Audio I/O Matrix and Multichannel enhancement
- Most plugins support of 8 channel.
- 16 channel support for **Bittersweet Pro**, **Evo In** and **Evo Channel**

A.6.1 Build 20.12.0.49880

Bug fixes

Core:

- BPro - Latency report issue (AAX)
- IRCAM TRAX Tr - Latency report issue
- IRCAM Verb - Wrong initialization value for Reverb density
- IRCAM Verb -Dry signal still goes out in disabled channels when wet is 100%
- All Pure Dynamics PI + Alchemist - Wrong Thresholds initialization values
- AAX “monolithic” are broken like Hear, TRAX etc...
- Almost all AAX plugins don't reload parameters from 47856 version session.
- Pure Limiter - Diff feature bypassed the input gain.
- Pure Limiter - Inverted sidechain filters.
- Any plugin except Evo Channel - Research Presets resets when click on a preset.
- Evo channel - Wrong values when reloading touch section.

UI:

- Current preset name disappear on re-opening GUI or session

A.7 Known Issues

- Wavelab “Sample rate not supported” when a plugin is inserted on a clip, track or output section.
- TRAX Tr - Learn frequencies display wrong values (AAX only).
- Hear - Internal config labels change when modify LFE input config from routing matrix.
- When using OSC on a plugin in Pro Tools, a crash will occur if you change/move FX insert slots