



X-Verb 1.0 for SSL DUENDE V3

The worlds first High-End Studio Reverb delivered as a Plug-In. Exclusively for SSL DUENDE V3.

Reference Guide V1.0

X-Verb for Duende V3. This is SSL.

Solid State Logic
SOUND || VISION

Table of Contents

1. About this manual	3
1.1 How to use this manual	3
1.2 Reading conventions	4
1.3 Safety and Installation Considerations	4
1.4 Disclaimer	5
1.5 Trademarks	5
1.6 Website	5
2. Introduction	6
2.1 The X-Verb Story	6
Digital Studio Reverb	6
Studio Reverbs and Convolution Reverb Plug-Ins	6
SSL X-Verb HiD Engine	6
2.2 SSL X-Verb Overview	7
a) Key Features	7
b) X-Verb Graphical User Interface	7
c) User Interface Elements	8
3. Installation and Authorisation	9
3.1 Compatible Computers	9
3.2 Compatible DUENDE Units	9
DUENDE Classic, DUENDE Mini	9
DUENDE PCIe	9
3.3 Compatible OS Versions and Plug-In Formats	9
3.4 Installation	10
3.5 Authorisation	10
4. X-Verb Reference Guide	11
4.1 Input and Output Sections	12
4.2 Quick Controls	13
4.3 Mix and Image Section	16
4.4 Reverb Control Section	17
a) Section and sub page/sub menu Navigator	17
b) Graphs	17
c) Sub page and sub menu Parameter Display	19
4.5 Preset Handling	26
4.6 Morph Section	26
4.7 Kill Tail Button	27
5. Using X-Verb	28
5.1 Factory Presets	28
5.2 Tips on Quick Controls and Morphing	28
5.3 DUENDE V3 Hybrid Core Processing (HCP) Slots	29
6. Support	30
7. Legal Disclaimer	31

1. About this manual

Congratulations on your purchase of the X-Verb Plug-In.

The SSL X-Verb is designed to provide you with many years of superb audio quality that you expect from any SSL product.

Should you ever need assistance in setting up or using your DUENDE Unit, Solid State Logic's worldwide customer support team is easy to contact via the Support section of the SSL website and is always happy to help.

Please register your SSL DUENDE on our website. This will ensure that you receive notifications of future software upgrades and other important information, and that your guarantee is registered. Registration will also make you eligible for technical support. The Solid State Logic home page is at: www.solid-state-logic.com

Solid State Logic is committed to the development and marketing of professional solutions for native PC and Mac based digital audio recording systems.

1.1 How to use this manual

The SSL product range has been designed from the ground up to be easy to use.

If you are familiar with the MAC OS or Windows environment, installing PCIe or Firewire units and the basics of recording and playing back digital audio, you could probably just set the system up and feel comfortable running a session within an hour.

However, the SSL X-Verb offers a wealth of powerful and helpful features that you will only discover quickly by reading this manual. It is therefore advisable, at some point, to read it from cover to cover.

Please make sure you understand the concept of Plug-Ins and how to use them in your choice of DAW software.

It is also a good idea to have the system switched on while you read the manual, so that you can experiment with the features as you read about them.

We trust that you will soon feel confident creating and using your own Reverb Sounds.

However, even when it has become second nature, the comprehensive Table of Contents (located at the beginning) and the search function in your PDF reader software will provide convenient ways to check specific information whenever you need it.

If possible: Please do not print this manual.



NOTE: This Manual does not contain an **Index**. Please use your **PDF Reader's build in search function** to find the sections containing specific words and topics.

1.2 Reading conventions

Designation of supported hardware and software

The SSL X-Verb Plug-In software only runs on SSL DUENDE Units that have been upgraded to the DUENDE V3 Firmware/Drivers. The functionality of the different DUENDE Models is largely similar although their detailed specifications may vary, especially the optional V3 Slot Extensions which allow a different number of X-Verb instances to be used at the same time.

The information in this manual relates to all Slot and Multi DUENDE configurations. Differences are pointed out where necessary.

Key commands and key combinations

Some functions of the SSL X-Verb may be accessed through the use of computer keyboard keys or key combinations, as well as by using a mouse or other input device. In this manual computer keys will be shown between square brackets. For example, the key for the letter "E" will be written: [E]. Key combinations will be written using "+" signs. For example, pressing the "D" key while holding the "Control" key will be written as [Ctrl]+[D].

Menus

Where appropriate, to indicate a "path" under one of the main software menus, the following format will be used:

menu: **Header|Submenu 1|Submenu 2|Submenu 3|Item.**

Screen shots

The appearance of the SSL X-Verb on your computer screen may be different from the screen shots in this manual. This could be because your SSL hardware configuration is different, because you are using a different version of the Operating System, because you are using different OS display settings, or because the look of the SSL X-Verb might have slightly changed.

1.3 Safety and Installation Considerations

This section contains definitions, warnings, and practical information to ensure a safe working environment. Please take time to read this section before installing or using this unit. Please do not dispose of these instructions.

General Safety

- Read these instructions.
- Keep these instructions.
- Heed all warnings.
- Follow all instructions.
- Do not use this apparatus near water.
- Do not expose this apparatus to rain or moisture.
- Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- Do not install near any heat sources such as radiators, heat registers, stoves or other apparatus (including amplifiers) that produce heat.
- There are no user-adjustments, or user-serviceable items, on this apparatus.
- Adjustments or alterations to this apparatus may affect the performance such that safety and/or international compliance standards may no longer be met.

Caution

- To reduce the risk of electric shock, do not perform any servicing other than that contained in these Installation Instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

Installation Notes

- When installing this apparatus, place the host system into which it is to be installed on a secure level surface.
- To prevent damage from static electricity when installing this apparatus, either to the host system or to this apparatus, always take proper anti-static precautions. Always use an anti-static wristband. If in doubt, please refer to qualified service personnel.
- Take care of rough or sharp edges when accessing the inside of the host system.
- Never install or remove this apparatus whilst the host system is powered. Always remove the power cord from the host system prior to accessing this apparatus.
- If in doubt about installing this apparatus, please refer to qualified service personnel.

1.4 Disclaimer

This manual has been written with great care and attention to detail, and we have attempted to cover every operational aspect of the SSL X-Verb running on DUENDE V3. However, it is not a contractual document. Solid State Logic and/or the writer(s) of this manual cannot be held responsible for any loss or damage arising directly or indirectly from any error or omission in this manual.

1.5 Trademarks

All trademarks are the property of their respective owners and are hereby acknowledged.

1.6 Website

The URL for the Solid State Logic website is:

<http://www.solid-state-logic.com>

The SSL Support Website is:

<http://solidstatelogic.com/support>

The screenshot shows the Solid State Logic website's support page. At the top is a navigation menu with links: HOME, NEWS, PRODUCTS, SUPPORT, GALLERY, STORE, LOCATOR, ABOUT, and LOGIN-REGISTER. Below the menu is a header banner with the Solid State Logic logo (SOUND || VISION) and the word "Support" in large white text. The main content area is titled "FAQs, documentation and other useful utilities" and includes a paragraph of introductory text. Below this are five vertical columns, each representing a product category with an image and a list of products:

- Console Resources:** Duality, AWS 900+, C100 HD, C200 HD, C300 HD, XL 9000 K.
- Duende:** Duende Classic, Duende Mini, Duende PCIe, Plug-ins.
- Audio I/O:** Alpha-Link Range, Delta-Link, MADI-HD, MadiXtreme, MADI Opti-Coax.
- Workstation Products:** Pro-Convert, Mixpander, X-ISM Plug-in, LMC-1 Plug-in, Soundscape.
- Analogue Outboard:** X-Rack, G Series Bus Comp, E-Signature Channel, SuperAnalogue Ch, Multichannel Comp, Alpha Channel.

At the bottom right of the page is the Solid State Logic logo (SOUND || VISION). At the bottom left, there is a small copyright notice: © 2009 Solid State Logic. | Terms & Conditions.

2. Introduction

2.1 The X-Verb Story

Digital Studio Reverb

At some point in the 1970's digital Reverb Units started to conquer Studios around the world. It is quite difficult to find any Album produced in the last 30 years, that does not use a high-end Reverb Processor.

The flexibility of room emulation, possibility to recall presets quickly and the guaranteed realtime processing still make 19" Reverb Hardware the Engineers 2nd best friend (well, remember, we are a Console Company :-).

Although the production process uses more and more Computer based processing, the significant challenges of professional sounding reverb mean that experienced engineers still value hardware digital reverb units for their unique sounds and algorithms.

Studio Reverbs and Convolution Reverb Plug-Ins

While Computers are powerful enough to do plenty of simultaneous convolution Reverbs today and there is enough choice of very well produced Impulse Response libraries to "clone" the sound of real Spaces and Reverb Hardware originals, professional users often dislike Convolution Reverbs as they don't offer the same amount of realtime control, sound quality and processing speed they got used to with their Studio Reverb Hardware.

Quite unbelievable, but apparently no real Reverb Plug-In for any DAW or DAW Hardware seems to have fully caught up with Hardware being older than a decade or two. There was something we had to do about it...

SSL X-Verb HiD Engine

SSL's signal processing has defined the sound of decades of successful productions. Our expertise in producing the highest quality signal processing in both analogue and digital domains is well proven. SSL analogue and digital consoles are the No.1 choice for many of the world's finest audio engineers and producers.

When SSL developed Duende, our aim was to bring our signal processing expertise to the world of digital audio workstations (DAWs). One area of signal processing that was missing from our processing arsenal was reverb. For SSL to release a reverb processing plug-in, it needed to be something special.

In discussion with our customers, we realised that many engineers still appreciate the unique character and complex processing algorithms that classic hardware based reverb units provide. These 19" engines full of dedicated processing create rich, realistic sounding spaces from hugely complex combinations of time, frequency and filter modulation that many modern plug-in and convolution based reverbs fail to reproduce. We made creating these rich environments our primary goals for X-verb.

From this initial vision, we wanted to create a reverb plug-in that not only sounded 'like' these legendary hardware reverbs, but create something new and more creative. A reverb that sounds even better and offers a completely new workflow by adopting "DAW features" such as automation, graphical parameter animation, morphing and processing multiple instances in one project. This demands the powerful processing that Duende V3's new Hybrid Core Processing (HCP) technology and modern multi-core processors provide.

We had all the ingredients, we needed a recipe! To help us put this together we worked closely with the very talented team at Relab Development ApS. Several thousands of hours of development and testing later, it was done.

We truly believe that X-Verb is the most exciting and revolutionary reverb plug-in released for DAW's in some time. We're excited to hear what happens when our science meets your creativity... read the manual, realise the possibilities, get creative!

X-Verb was developed by **Solid State Logic** in collaboration with **Relab Development ApS**.



RELAB DEVELOPMENT
DSP Audio Technology

2.2 SSL X-Verb Overview

X-Verb is a versatile and comprehensive studio grade reverberation plug-in, built from the ground up for Duende V3. X-Verb by SSL delivers the density, warmth, depth and stunning detail usually only associated with high class hardware reverb units. The use of innovative Diffusion Engines and innovative processing design provides superior performance that surpasses other Reverb Plug-Ins in both artistic freedom, depth and sonic quality. This plug-in may well provide all the different Reverb options you will ever need.

The power behind the true professional quality of X-Verb is simple; it is not a Convolution Reverb based on impulse responses, it is a true Reverberation Generator based on unique SSL HiD algorithms. The algorithm based approach generates stunning sonic results with lowest possible latencies and allows dynamic access to all of the fine detail parameters of the Early Reflection and Reverb structure. The sheer sonic might of X-Verb is wrapped in a stunning GUI that provides comprehensive editability. The new 'Morph' feature allows externally controllable and automatable crossfading between 2 presets.

a) Key Features

- Unique and modular SSL HiD Reverb Algorithm Engine
- 4 Core Algorithms create a complete collection of processors
- extendible with free and/or payable Reverb Algorithms
- Quick Controls panel to easily alter the superb Presets
- Stunning Graphical User Interface to access detailed parameter set
- Unique automatable Morphing feature to dynamically morph from one preset to another
- Uses 4 Duende slots per stereo instance

Liberated from any legacy hardware style, the X-Verb graphical user interface will especially appeal to people who like to see what they are hearing. The fully interactive display shows the exact reverb shapes and resulting filter curves. Extensive control options include drag able Reverb and ER nodes, traditional gain mouse parameter control and exact numerical entry.

b) X-Verb Graphical User Interface

- 1 Input Gain Slider
- 2 Stereo Input Peakmeter + L/R RMS Meter
- 3 Preset Load/Save, Previous/Next Preset Buttons
- 4 A/B Memory Button
- 5 A<->B Morph Section, Morph Slider + A/B Relation Displ.
- 6 Kill Tail Button resets the Reverberation Engine
- 7 Output Gain Section
- 8 Process IN/OUT Button
- 9 Quick Controls linked to various Parameters
- 10 Reverb Algorithm selector
- 11 ER/REV and Dry/Wet Mixing section
- 12 Mix Relation Preset Selector
- 13 Stereo Image Output Control Section
- 14 Stereo Image Preset Selector
- 15 Reverb Control Section
- 16 Rev Control sub page Selector
- 17 Graph Zoom / Scrollbar
- 18 Graph Area
- 19 Sub page and sub menu Parameter Area



c) User Interface Elements

The chances are high that you have used Plug-Ins on Computers before, so you might immediately understand how to work with the several X-Verb GUI elements;-)

Gain Faders and Gain Meters

- The Input/Output Sections have a transparent Gain Slider on Top of the Peakmeters
- The Input and Output Gain can be adjusted between 0dB and -30dB
- Input Peak/RMS Meters are Pre In Fader, Output Peak/RMS Meters are Post Out Fader



Knobs

- Click and Drag Up/Down to change Value
- with SHIFT pressed on the Keyboard Click/Drag goes into fine-tune mode with higher Knob Resolution
- Double click on Knob (or value Display) to enter a value with the keyboard followed by enter
- to cancel typing press ESC or click anywhere outside the selected/active value text
- the knobs are colour coded, every parameter has a specific colour for the value ring.



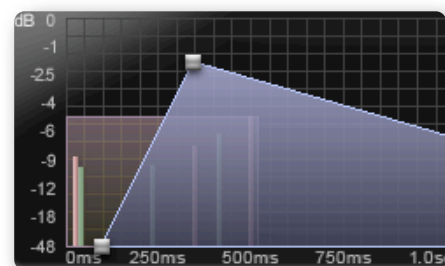
Buttons

- Pressed (active) state looks pressed in, the outside of the button is illuminated
- Toggle switch (A/B) shows active memory illuminated
- Some buttons (Load/Save, Next/Previous, Kill Tail) are temporary In buttons, that are only active while they are clicked
- Non pressed state (not active) appears flat without outside illumination
- Colour and appearance of outside illumination may vary in the Reverb Control Section



Graph Section

- The Reverb Control Graph is interactive, the silver handles change parameters
- Graphs belonging to the current Reverb Control sub page in focus are in the foreground and have silver handles
- Graphs belonging to other sections / sub pages are darker and in the background
- clicking on a Background Graphs will bring its section / sub page into focus
- Graph enables fast editing, fine tuning may be more accurate with the individual parameter knobs



Drop Down Menus

3 Drop Down Menus provide direct access to:

- Reverb Algorithm selection
- Mix Presets
- Stereo Image Presets



Section, sub page / sub menu Navigation

- 2 Main Sections, ER and REV
- both sections are divided into several sub pages which are divided into sub menus, reachable from the Top Navigation bar
- sub pages and sub menus can also be changed in the Parameter section (sub page/menu names are buttons)



3. Installation and Authorisation

3.1 Compatible Computers

Apple Macintosh

- SSL Duende running V3.0 software and firmware (or higher)
- Intel MAC 1.6GHz or higher
- 512Mb RAM (1Gb recommended)
- Mac OS X (Version 10.5.3 or higher)
- 15Mb of free hard disk space
- Audio Units, VST or RTAS* compatible host application
- 17" or larger colour monitor with a min. screen resolution of 1024 x 768
- Internet Connection (for product registration and software updates)

Windows PC

- SSL Duende running V3.0 software and firmware (or higher)
- Intel Pentium Core 2 1.6GHz or higher (or equiv. AMD CPU)
- 512Mb RAM (1Gb recommended)
- Win XP SP2 or higher, Vista 32 SP1 or higher
- 15Mb of free hard disk space
- approved Audio Units, VST or RTAS* compatible host application
- 17" or larger colour monitor with a min. screen resolution of 1024 x 768
- Internet Connection (for product registration and software updates)

3.2 Compatible DUENDE Units

DUENDE Classic, DUENDE Mini

DUNEDE Classic and DUENDE Mini are both Firewire 400 Units. If the Units run V3 Firmware they are enabled to process 32 Hybrid Core Processing Slots as standard. This can be upgraded to 64 HCP Slots or even 128 HCP Slots per Unit.

DUENDE V3 also adds the ability to run 4 DUENDE Units (mixture of Classic, Mini and PCIe) on one Computer for up to 512 HCP Slots. However this needs a very powerful Computer.

DUENDE PCIe

DUNEDE PCIe is a Card which plugs into any available PCIe Slot on your Computer. The PCIe Interface provides an extremely fast communication with the main CPU Infrastructure and is therefore the most efficient way to incorporate additional hardware.

If the Units run V3 Firmware they are enabled to process 32 Hybrid Core Processing Slots as standard. This can be upgraded to 64 HCP Slots or even 128 HCP Slots per Unit.

DUENDE V3 also adds the ability to run 4 DUENDE Units (mixture of Classic, Mini and PCIe) on one Computer for up to 512 HCP Slots. This however needs a very powerful Computer.

3.3 Compatible OS Versions and Plug-In Formats

DUENDE and associated software/drivers/Plug-Ins are compatible with the following operating systems and Plug-In Formats:

Platform	Operating System	Plug-In Format
PC	Windows XP SP2 or later (32-bit only)	VST 2.4, RTAS*
	Windows Vista SP1 or later (32-bit only)	

Platform	Operating System	Driver Protocols
MAC	MAC OS X 10.5 or higher	AU, VST 2.4, RTAS*

The **DUENDE V3 Plug-In Interface** allows very low latencies for all supported Plug-In Formats and also has a faster than realtime bouncing engine (for supported Hosts). However, dynamic automation of any DUENDE Plug-In will NOT work faster than realtime. Please use a realtime bounce in this case.

VST and RTAS versions are provided for use under Windows on the PC platform. VST, AU and RTAS* formats are provided for Intel based Macs. X-Verb will take four of the available DUENDE V3 'slots' in stereo. Please see the Duende manual for more information on DSP resource management.* RTAS support is provided by the included FXpansion VST-RTAS wrapper: www.fxpansion.com*

3.4 Installation

A usage limited trial version of X-Verb will be installed during the Duende V3.x software update. This allows X-Verb to be run in evaluation mode, which means the plug-in can be used with full functionality until a certain number of Plug-In starts have been processed.

Please be aware that loading a project containing one instance of X-Verb (also restarting your DAW application and automatically loading the last used Project) will be counted as 1 Plug-In start. Also removing X-Verb from a channelstrip and inserting X-Verb on a different one will cause the Plug-In start counter to decrease by one. Using multiple Instances of X-Verb will be counted as multiple Plug-In starts, so make sure you are not using up the precious evaluation time erroneously.

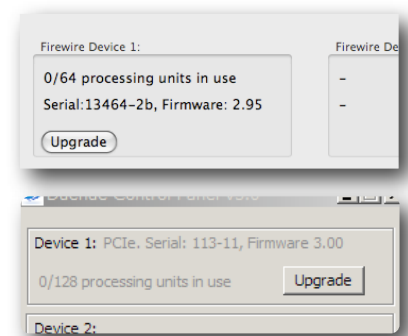
Once the counter has reached 3 Software starts left it will turn red. Once the timer reaches zero starts left the plug-in will cease to process audio.

3.5 Authorisation

If you wish to continue using X-Verb after this period, you can purchase the full version from www.solidstatellogic.com. Once the authorisation procedure has been completed, you will have an unrestricted version of X-Verb.

Purchasing X-Verb

- Please proceed to the SSL webshop : <http://solid-state-logic.com/store/index.asp>.
- Add X-Verb to your cart and confirm your identity in the next step.
- In step 3 you will be asked to enter your DUENDE Serial. This is found in the DUENDE Preferences/Control Panel.
- If your Duende hardware is not already registered you will be asked to register it here.
- Enter your payment details and your order will be completed.
- you will be provided with the Unlock Code for your DUENDE unit.

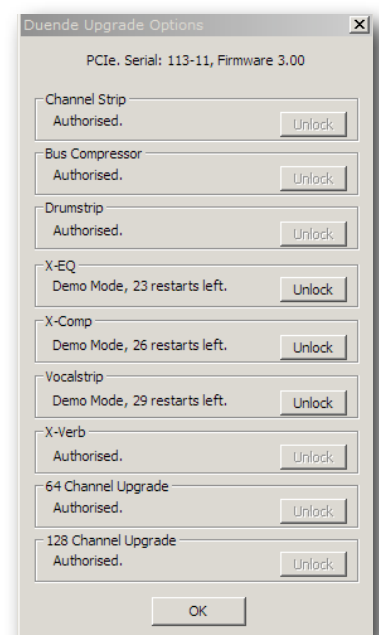
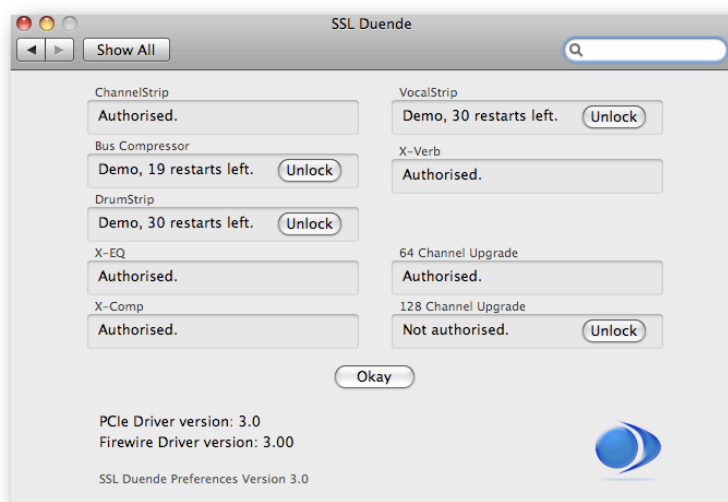


Upgrading (Activating) the DUENDE Unit with the X-Verb Unlock Key

Upgrade options are accessed from the Preferences/Control Panel by pressing the 'Upgrade' button.

Here you will see a list of plug-in and channel count options, each displaying their status. To unlock X-Verb press the 'Unlock' button in the X-Verb field, enter the unlock code you purchased online and press OK.

The option will then be permanently enabled in the Duende hardware so it will work on any computer system on which the software is installed.



Please note that the X-Verb Unlock Code will only activate X-Verb on the particular Duende hardware for which it is created for.

4. X-Verb Reference Guide

This chapter is divided into 7 main sections that match X-Verb's main User Interface Sections:

- 1 **Input and Output Sections** with In/Out Button, Gain Sliders and Stereo Peak/RMS Meters
- 2 **Quick Control Section** with 7 macro quick controls and reverb algorithm selector
- 3 **Mix and Image Section** with ER/REV + Dry/Wet Balance and enhanced Stereo Image Control
- 4 **Reverb Control Section** containing all Parameter Pages for ER (Early Reflections) and REV (Tail)
 - a) Section, sub page and sub menu navigator
 - b) Graph Area
 - c) sub page/menu Parameter Area
- 5 **Preset Handling** with Load/Save and Previous/Next Preset Buttons
- 6 **Morph Section** containing A/B Memory and Morph Buttons and Morph Slider
- 7 **Kill Tail Button** stopping the Reverb tail immediately



Parameter Matrix

1	In/Out Button								
	Input	Input Gain							
	Output	Output Gain							
2	Quick Controls	PreDelay	Size	REV Time	ER Time	Density	Colour	Distance	Algorithm ▾
3	Mix	ER/REV Mix	Dry/Wet Mix	MixPreset ▾					
	Image	Image	Imag Preset ▾						
4	ER	Master Delay	Master Level	Master Time					
		L1,2,3 R1,2,3	Main	Delay	Level	Phase	Pan		
			Modulate	Chorus Rate	Chorus Depth				
			Filters	Rebound	LP Cutoff				
	REV	Reverb	PreDelay	RevLevel	RevTime				
			Body	Size	Density	Definition	Crossfeed		
			Envelope	Shape	Attack	ReverbMode			
			Modulate	Chorus Rate	Chorus Depth	Lifeliness	Floatation		
		Freq/Time	Low Time	Low Crossover	Mid Time	Hi Time	Hi Crossover		
		Filters	Low Freq	LoShelve Gain	LS On/Off	Hi Freq	HiShelve Gain	HS On/Off	
5	Preset	Load Button	Save Button	Prev Preset	Next Preset				
6	Morph	A/B Toggle	Morph On/Off	Morph Balance					
7	Kill Tail Button								

4.1 Input and Output Sections

The Input/Output Section provides an accurate Metering of Input/Output Levels as Stereo Peak and L/R RMS (average Levels). Also belonging to this section is the IN/OUT button on the top left hand side, that toggles between processing active (pressed state) and processing bypassed (non-pressed state).

The IN/OUT Button has the same function as the Bypass or ON/OFF switch in your Host Software.

IN/OUT Switch

The IN/OUT can bypass the Reverb Section completely. Depending on the host software switching the Button to OUT (not pressed) can also free up CPU resources.

In general this switch provides a quick comparison between original and processed sound.



Input Section

The Input Section Metering System shows the Levels on the Plug-Ins Input (Pre-Fader).

The Stereo Peakmeter shows an accurate Readout of the Left and Right Channel Input Gain.

The RMS Meter on the right shows an average of L/R levels, the higher RMS level from Left and Right channel "wins".

Above all 3 Meters a Clip LED will illuminate when the Audio entering the Plug-In is overloaded (more than 1 consecutive Sample at 0 dBFS).

The Gain Fader can decrease the Input level continuously between 0dB and -30dB, before the Audio enters the Reverb Module of the Plug-In.

In certain cases, it may be necessary to lower the Input level at this stage to prevent the Reverberation producing overloaded signals.

This is especially the case for very long Reverb Tails, High ER Rebound settings and dramatic REV Freq/Time Settings.



Output Section

The Output Section Metering System shows the Levels on the Plug-Ins Output (Post Mix, Image and Output Gain Faders).

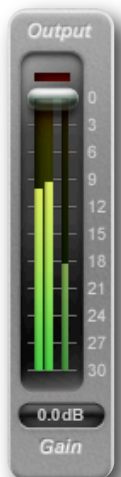
The Stereo Peakmeter shows an accurate Readout of the Left and Right Channel Output Gain.

The RMS Meter on the right shows an average of L/R levels, the higher RMS level from Left and Right channel "wins".

Above all 3 Meters a Clip LED will illuminate when the Audio leaving the Plug-In is overloaded (more than 1 consecutive Sample at 0 dBFS).

The Gain Fader can decrease the Output level continuously between 0dB and -30dB.

The Output Gain should be used to compensate for loudness differences to the original signal, since a Reverb can significantly add density and therefore create a higher RMS level.



4.2 Quick Controls

The 7 Quick Controls are parameter macros which allow you to quickly fine tune a preset without having to dive deep into X-Verbs parameter structure, which offers almost 100 single parameters.



The most significant aspect to control the sound of a reverb are covered with individual macros:

PreDelay, Size, REV Time, ER Time, Density, Colour and Distance.

Each Quick Control remote controls several linked (and related) individual parameters. As you alter any of the Quick Controls, you will see one, two, or more parameters in the X-Verb interface update.

The Quick Control Knobs are either centred, inside a negative (left) or positive (right) range. Therefore they more or less look and behave like "Pan" Controls.

Since Quick Controls are altering the linked parameters relatively, the impact of each quick control adjustment is completely dependent on the individual parameter values of the current setting. If for example a linked parameter is already at maximum, turning the linked Quick Controls into positive range can not change this parameter any further.

Quick Control Parameter Linking

Quick Control Name	Left Range	Right Range	Quick Control <->Parameter relation
PreDelay	Short	Long	Controlling the ER Master Delay and the REV PreDel parameters. It therefore globally extends the pre delay for the Early Reflection and the Reverberation engine.
Size	Tiny	Huge	Linked to Size, ER MasterTime and ER Tap Rebound . Moving the Knob towards „Tiny“, the Reverb Size is getting smaller, the ER Taps are moved closer together and the ER Taps are less reflected. Moving the knob towards „Huge“ does the opposite.
REV Time	Short	Long	Controls RevTime, Shape and PreDel . Reducing REV Time creates a shorter reverb tail, the tail builds up quicker and the Predelay gets smaller. In the positive range, the Reverb Time gets longer, the tail envelope gets flatter and the Predelay gets longer.
ER Time	Short	Long	Changes ER Master Time and Master Delay . Towards „Short“ ER Taps are coming earlier and are moved together, towards „Long“ they are becoming less dense and Early Reflections are coming later.
Density	Thin	Dense	Linked to Density, Definition and Attack . With less Density the Diffusion Engine produces less „glue“ between the different reverb tap lines and the Refraction Engine creates more focussed and defined delays. With more Density the tail becomes smoother and more dense and the Re-fractions start to „melt“ inside the tail.
Colour	Dark	Bright	Controls 9 linked Parameters, including the ER Tap Filters , the Rev Low and High Shelf Filters and the Hi and Lo Freq Time . It's a very useful Quick Control to alter the harmonic colour in a natural way.
Distance	Close	Far	Is linked to 10 parameters: ER Master Time, Master Delay, Master Level, REV PreDel, Master Level, Definition, Density, Shape, Attack and Rev Mode . This Quick Control let's you quickly create the impression to move closer to the Audio source or further away.

Using Quick Controls

Since Quick Controls are remote controlling several parameters that are also accessible separately on the GUI and that are also exposed to the Hosts automation and Hardware Controllers, there is a potential "parameter fight" when using the Quick Controls and the individual parameters simultaneously.

Let's say you have written automation for the individual Parameter Reverb Time to ramp up from 2.5 sec to 10 sec.

While this automation is running you start to change the Quick Control REV Time, that is also linked to Reverb Time, which "has to" follow automation, no matter what you are doing to the quick control.

The result of this "fight" are parameter jumps, that are unpredictable.

Therefore it is necessary to understand that quick controls should not be used when automation for individual parameters is already in place.

Quick Controls linked to X-Verb Parameters that fundamentally change the time constants of the Early Reflections, the Refraction and Diffusion Engine and the Shape of the Reverb Tail, can more or less introduce audible artefacts, while the parameter is changed.

Some Quick Controls change a couple of time critical parameters simultaneously and artefacts could add up.

Algorithm Selection

At the right Top of the Quick Control section you will find the X-Verb Algorithm drop down box. When you change the X-Verb Algorithm, the parameters of the current setting are not changed (i.e. to a default value), so it's easy to compare similar settings with different Algorithms. However some parameters may change their behaviour or range depending on the selected algorithm (i.e. Definition, Lifeliness and Floatation).

Please bare in mind, that changing the Algorithm stops and restarts the Reverb Engine with completely different DSP code, which may lead to short audio interrupts or artefacts.



X-Verb features a unique modular Reverb-Algorithm Infrastructure. In the future it is possible to add completely different SSL HiD Core Algorithms to X-Verb. Those may include optional Algorithms as well as an extension of the "factory" algorithms.

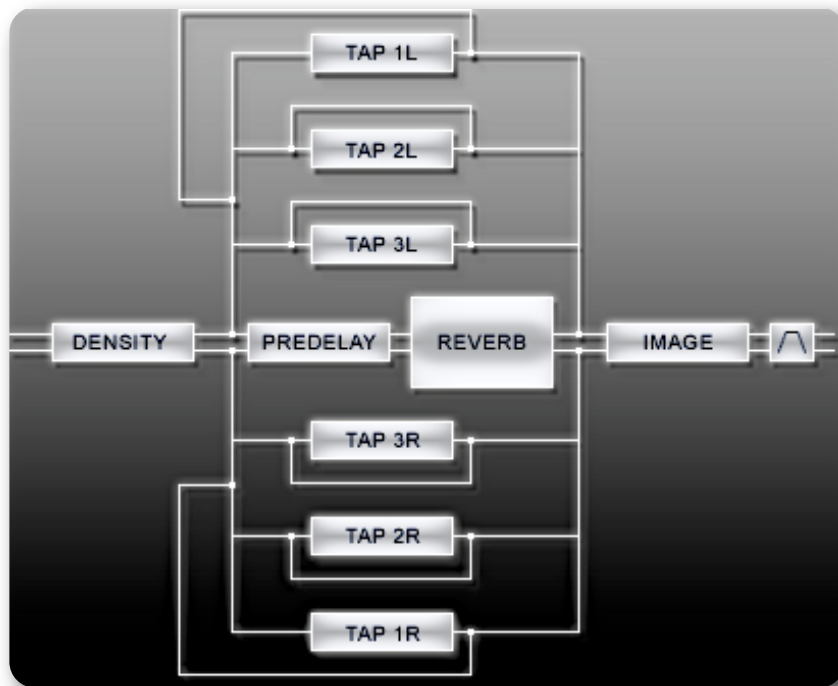
All SSL HiD Reverb Algorithms have been created with a huge amount of attention to detail and they represent the absolute state of the art for Reverb processing on any Pro-Audio DAW platform.

The following SSL High End Reverb Algorithms are included in X-Verb V1.0:

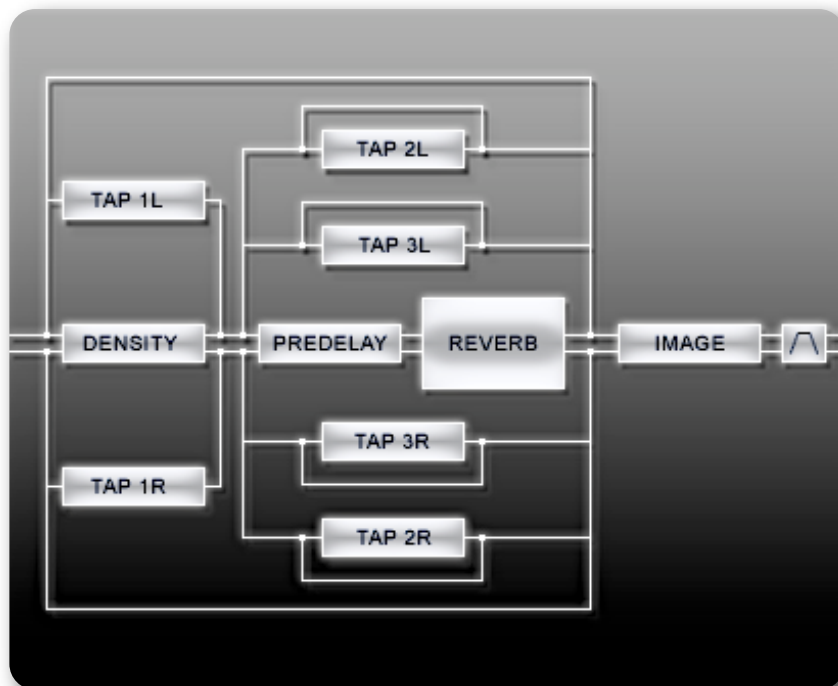
Algorithm	best used for	Description
Super Natural	Small, medium and large Rooms, Huge Halls	It's in the name. Super Natural produces real sounding Rooms and Halls, with a rich Diffusion and natural sounding Reverb Envelope. The Density of Super Natural mimics very expensive Hardware Reverbs and sounds very natural for small, mid sized and huge Rooms or Halls. Super Natural adds a dynamic amount of non-linear and random influences into the Refraction and Diffusion engine, which produces the richness and reality that sounds like Rooms and real Spaces.
Super Natural HiD	Small, medium and large Rooms, Huge Halls	Super Natural HiD goes a bit further than the Standard Super Natural Algorithm. With a higher density and a more pleasing Diffusion and Refraction Engine, this algorithm produces even more natural and smooth sounding Spaces. Super Natural HiD takes natural sounding reverberation into the 21st century.
Ultra Plate	Plates, medium and large Rooms + Reverbs	Ultra Plate is an extremely rich, silky and warm Reverb algorithm. It has a more traditional reverberation engine, with mainly static and predictable Refraction and Diffusions. It creates rather „Reverbs“ than real spaces, but it's great for Instruments and Vocals to stand out in a Mix. Also it's a great tool for Sound Designers and Film composers, that need huge Reverbs.
Ultra Plate HiD	Plates, medium and large Rooms + Reverbs	The Ultra Plate HiD adds more density, shine and depth. It almost sounds like real spaces, but with a very different character to the Super Natural Algorithm. The results are silky, complex and somewhere between digital reverberation and a real room.

Algorithm Signal Flow Diagram

Super Natural / Super Natural HiD



Ultra Plate / Ultra Plate HiD



4.3 Mix and Image Section

Mix Section

With the **ER/Rev** Knob you can control the balance between Early Reflections (ER) and Reverb Tail (REV). This control is independent of the ER Master Level and the REV Master Level .

At 50:50% (centred) both ER and REV Levels are at full level.

At 0:100% (REV only) the Early Reflection engine is switched off to use less CPU resources.



The **Dry/Wet** Knob controls the balance between the Audio at the Input Stage (Dry) and the processed sound from the X-Verb Plug-in (wet).

At 50:50% (centred) both Dry and Wet Levels are equal and at their own full levels.

Mix Presets

The Mix Section preset drop down allows a quick setup of both knobs to match default mixing situations.

Preset	Settings	Used for
Bus ER	ER/REV=75:25% Dry/Wet= 0:100%	This setting is ideal, if X-Verb is inserted into a BUS or AUX Channelstrip and you want to hear more ER's than Reverb.
Bus ER/REV	ER/REV=50:50% Dry/Wet= 0:100%	X-Verb is inserted into a BUS or AUX Channelstrip and you want to hear an equal amount of ER's and Reverb.
Bus REV	ER/REV=25:75% Dry/Wet= 0:100%	X-Verb is inserted into a BUS or AUX Channelstrip and you want to hear more of the Reverb and less ER's.
CH ER	ER/REV=75:25% Dry/Wet= 50:50%	This setting is ideal, if X-Verb is directly inserted into the Instrument or group Channelstrip and you want to hear more ER's than Reverb.
CH ER/REV	ER/REV=50:50% Dry/Wet= 50:50%	X-Verb is directly inserted into the Instrument or group Channelstrip and you want to hear an equal amount of ER's and Reverb.
CH REV	ER/REV=25:75% Dry/Wet= 50:50%	X-Verb is directly inserted into the Instrument or group Channelstrip and you want to hear more of the Reverb and less ER's.

Image Control Section

X-Verb comes with an innovative Stereo Image Control. The Image Control Section not only controls the Stereo Base width, but also is able to perform Phase Inversions, Left/Right Inversions (Channel swapping) and Surround Processor Compatible L-R, R-L Operations.



The Image Control Knob performs two complete cycles of 360° each, the Range goes from -360° to 0° and from 0° to +360°.

This means you can rotate the processed sound in a complete circle of 360°, no matter at which position you start.

In order to understand the Image Control and the little Status "LED's" on it, take a look at the following table of Knob Positions.

Position	Preset	Phase	Stereo Image	Stereo Width	Surround
0°	Mono	Normal	L+R Normal	Mono	-
45°	L/R	Normal	L/R Normal	Stereo	-
90°	L-R / R-L	Normal	L - R, R - L	-	Normal
135°	R/L Inv	Inverted	R/L Swapped	Stereo	-
180°	Mono Inv	Inverted	R+L Swapped	Mono	-
225°	L/R Inv	Inverted	L/R Normal	Stereo	-
270°	R-L / L-R	Normal	R/L Swapped	-	Inverted
315°	R/L	Normal	R/L Swapped	Stereo	-

4.4 Reverb Control Section

a) Section and sub page/sub menu Navigator

X-Verb provides 2 main sections, ER (Early Reflections) and REV (Reverb Tail).

These sections are divided into several sub pages and sub pages can be divided into sub menus.



The Top of the Reverb Control Graph Area provides a Navigator to quickly navigate to a certain sub page and sub menu.



The Navigator is context sensitive, meaning that the content of the sub page and sub menu areas change depending on the selected section and sub page.



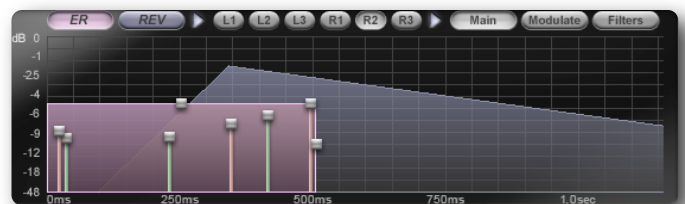
b) Graphs

The interactive graph area provides a graphical display of parameters and a visual way of altering them by clicking and dragging the silver handles.

ER Section

If the ER section is active, the ER block is displayed inside the graph. Each ER Tap (L1,2,3 and R1,2,3) has a handle, that can be clicked/dragged horizontally to adjust the Delay Time and vertically to adjust the Taps Level.

The handle on the Top Mid of the ER Block adjusts the Master Level (increasing/decreasing the individual taps levels relatively), the handle on the Mid Right adjusts the Master Time (increasing/decreasing the individual taps delays relatively).



While the ER graph is displayed, the REV triangle is always visible in the background. Clicking on the REV Triangle will always switch the section to REV and the sub page to Reverb and puts the REV triangle in focus. Clicking on the ER block switches the focus back to the ER Section. This behaviour allows an intuitive iterative adjustment of ER and REV.

REV Section

Reverb sub page

If the REV section is active and the Reverb sub page is selected, the REV Tail Triangle is displayed inside the graph. The left handle on the bottom adjusts the reverb tails pre-delay (horizontal), the handle on the Top adjusts the reverb level (vertical) and the right bottom handle changes the reverb time.

As mentioned above, the ER block is visible in the background and by clicking on it, the ER sub page can be brought into focus.

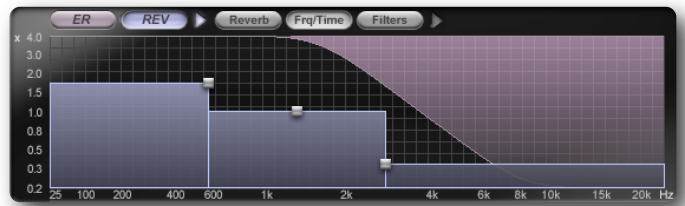


Frq/Time and Filters sub pages

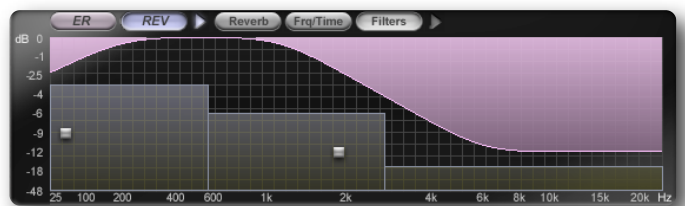
If either of these sub pages are active, the Graph changes to display the Frequency/Time blocks and High/Low Shelf filter curves. Both graphs are overlaid with the active graph being in focus (on top).

Unlike the afore mentioned ER/REV overlay the focus cannot be switched between these 2 sub pages by clicking on the background graph.

Inside the **Frq/Time** graph the left handle allows to alter the low reverb time factor (vertical) and low crossover frequency (horizontal). The mid handle adjusts the mid frequency time factor (vertical) and the right handle changes the high reverb time factor (vertical) and high crossover frequency (horizontal).



In the **Filters** sub page a Graph is only displayed if either or both filters are switches In (pressed). Each filter has a handle to adjust the frequency (horizontal) and cut gain (vertical).



Graph Zoom and Scrollbar

X-Verb can simulate everything from tiny spaces with a reverb time of a few hundred milliseconds to huge rooms, halls and plate emulations with a reverb time of up to 100 seconds. The Graph display therefore provides a zoom able X-Axis when time is displayed and a way to scroll horizontally.



Zoom Handles:

The Zoom and Scrollbar provides Handles on the left and the right side.

Clicking and dragging the right handle to the left zooms in the X-Axis, keeping the left time position fixed (start in time).



Clicking and dragging the left handle to the right zooms in the X-Axis, keeping the right time position fixed (end in time).



Clicking and dragging the middle between the handles scrolls the graph to the left and/or right.

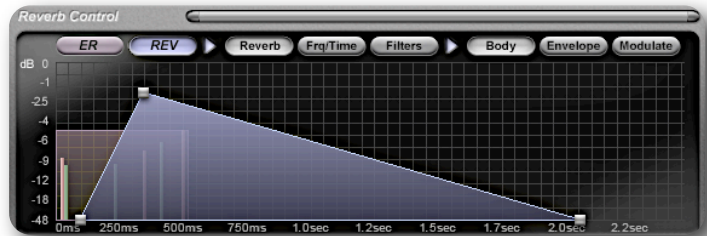


REV Auto-zoom

While altering the Reverb Time (or Size and Shape) X-Verb will always automatically zoom the time axis.

If the zoom and scrollbar is filled to its limits, auto-zoom will always fit the reverb triangle into the graph display.

When the bar is used to zoom and scroll (bar is smaller than the scroll area), auto-zoom will maintain the current graph position and apply a zoom factor that will fit the Rev Triangle into the Graph when the bar is stretched back to its limits.



c) Sub page and sub menu Parameter Display

This context sensitive area shows all available parameters of the currently selected sub page or sub menu.



For better visibility the currently active Section and sub page are displayed on the left side of this area.

In some sub pages and sub menus the centre of the parameter display also contains an interactive sub page/sub menu display & switcher, that allows you to quickly jump to another sub page/sub menu without having to leave the parameter display area.



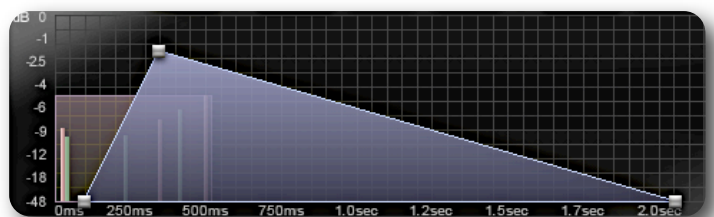
Reverb Control Parameters

ER and REV

While the ER's are essential for human "decoding" of certain room specifics, the Reverb Tail (or REV) contains more overlaying delays and reflections than human brains (and ears) can "process" to extract defined spatial information.

However the relationship in time between ER's and REV building up and fading out tells us, how big the room is, where the audio source is located, and how far we are away from source and reflecting walls.

Also the level relationship between ER's and REV is essential, such that the closer we are to the sound source and reflecting walls the louder the ERs will be, where as if we are further away from the source we will mainly hear the REV tail.



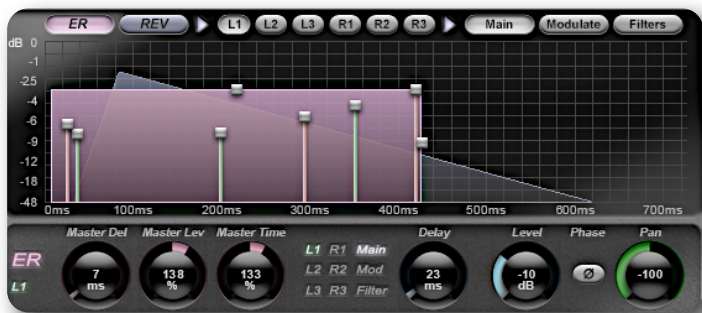
To reflect this extremely important relationship between ER and REV, the Reverb Control section by default shows an overlaying Graph of the ER block and the REV tail triangle.

ER - Early Reflections

Switching the Reverb Control Section to the ER Display

Clicking on the ER Button in the Graphs Sub-page selector presents the ER Main Page. Alternatively you can also click on the Pink "ER-Block" inside the Graph.

Early Reflections (or ER's) define the actual impression of a room. Human ears are very sensitive to the tiny delays in the stereo field that immediately reflect from walls, objects and "absorbing" surfaces.



X-Verb offers a complete ER design toolbox, modelling real room impressions or covering artificial slap-backs, larger than life spatially spread acoustics or just interesting tweaks to existing rooms.

X-Verb Contains "6 ER Taps" (or 6 different Delay lines) to create stunning Reflection Patterns from scratch.

The Taps L1, L2 and L3 derive their Input signal from the left Input, the Taps R1, R2, R3 from the right Input.

The first order sub page selector shows the active Tap, the 2nd order sub menu selector the different parameter pages for this Tap.

To quickly navigate between the different Taps you can click it's graph handle, the sub-page selector or the little jump display inside the parameter Section.

ER Section global Parameters

No matter which Tap or sub menu is selected, the following Parameters are always visible in the ER Parameter Section on the bottom left.

Parameter	Range	Description
Master Delay	(0 - 1500 ms)	Adds a Pre-Delay to the whole "ER Block", so all individual Taps move to the right.
Master Level	(0%-100 ; 100%-400%)	Adjusts the level of all Taps, counter-clockwise to decrease, clockwise to increase all tap levels.
Master Time	(0%-100 ; 100%-400%)	Adjusts the delay of all Taps, counter-clockwise to decrease, clockwise to increase all delay times.

Master Time and Master Level can also be changed with the little Node Handle on the Top and Right side of the ER Block.

The figure shows the ER control interface with the Master Delay, Master Level, and Master Time knobs highlighted. The Master Delay knob is set to 7 ms, Master Level to 138 %, and Master Time to 133 %. There is also a small graph handle on the right side of the ER block.

Sub pages for Tap L1-R3 | sub menu Main

Parameter	Range	Description
Delay	(0 - 2500 ms)	Defines the Delay of the Tap.
Level	(-Inf - 0dB)	Adjusts the Level of the Tap.
Phase	(On/Off)	Inverts the Phase (in pressed state) of the Tap.
Pan	(-100 to + 100)	Places the Tap in the stereo field, -100 = Left only, +100 = Right Only.

The figure shows the ER control interface with the Delay, Level, Phase, and Pan knobs highlighted for Tap L1. The Delay knob is set to 23 ms, Level to -10 dB, Phase to 0, and Pan to -100. There are also sub-page selectors 'L1 R1 Main', 'L2 R2 Mod', and 'L3 R3 Filter'.

Sub pages for Tap L1-R3 | sub menu Modulate

Cho Rate	(0.0-4.0 Hz)	Adds a Chorus to the Tap to thicken and blur the reflection. At 0.00Hz the Chorus is off.
Cho Depth	(0-100%)	Adjusts the modulation depth of the Chorus. At 0% the Chorus is switched off.

Sub pages for Tap L1-R3 | sub menu Filters

ER Rebound	(0-100%)	Adds a modulated Feedback Loop to the delay line of a Tap to create complexity inside the Reflection.
Cutoff Freq	(25 Hz - 24000 Hz)	Adjusts the Cut off Frequency of a smooth Low Pass Filter to dampen the reflection and the rebounds.

REV | Reverb

Switching the Reverb Control Section to the REV Display

Clicking on the REV Button in the Graphs Navigator presents the REV Main Page. Alternatively you can also click on the blue Tail Triangle in the Graph.



REV | Sub page Reverb

Reverb global Parameters

No matter which Reverb Sub page (Body/Envelope/Modulate) is selected, the following Parameters are always visible in the REV->Reverb Parameter Section on the left bottom.

ER REV Reverb Frq/Time Filters Body Envelope Modulate		
PreDelay	(0 - 1500 ms)	Adds a Pre-Delay to the Reverb Tail, so the whole Triangle moves to the right
RevLevel	(-Inf - 0dB)	Adjusts the level of the reverb tail
RevTime	(range varies, in ms/s)	Determines the RT 60 time of the Reverb Tail, which is the time until the Reverb tails level has fallen below -60dB. This time is dependant on the Parameters Size, Shape, Attack and the Algorithm that is used. Altering any of these parameters can change the resulting RT60 time and the potential parameter range.

PreDelay, RevLevel and RevTime can also be changed with the little Node Handles at the corners of the REV Triangle.

Sub page Reverb | sub menu Body

ER REV Reverb Frq/Time Filters Body Envelope Modulate		
Size	(0-60m)	Adjusts the size of the Room by altering the Reverb delay structure, the diffusion engine and the complexity approximation. IMPORTANT: The Size Parameter changes quite a lot of fundamental aspects of the X-Verb Algorithms. It is therefore impossible to change Size without audible artefacts.
Density	(0-100%)	Adjusts the amount of density created in the diffusion and refraction engine and complexity approximation. Higher values smoothen the Reverb Tail and individual "refractions" or ringing echoes disappear.
Definition	(0-100%)	Adds defined and randomly modulated reflections to the beginning of the Reverb tail. Definition can add some clarity but may take away density in the diffusion engine. For Ultra Plate Definition also modulates the Density in relation to the Input Level to create a more natural decay.
Crossfeed	(0-100%)	X-Verb is a true Stereo Reverb with separate diffusion engines for the left and right Channel. Crossfeed allows to feed the left input to the right and the right input to the Left Diffusion Engine. Higher values therefore undermine the true stereo nature of X-Verb but might add the impression of distance.

The screenshot shows the REV control interface with the Body sub-menu selected. The parameters shown are: PreDelay (32 ms), Rev Level (-1.9 dB), Rev Time (585 ms), Body (51 m), Density (100%), Definition (24%), and Crossfeed (15%).

Sub page Reverb | sub menu Envelope

ER REV ▶ Reverb Frq/Time Filters ▶ Body Envelope Modulate		
Shape	(0-255)	Alters the Shape of the Reverb Triangle. At higher values the Reverb Build Up Phase (Attack) becomes longer, while the tails fade out phase becomes shorter.
Attack	(0-255)	Expands the time of the Attack Phase when Shape is not 0. At higher values the Reverb build up time can take up to 700 ms (depending on Shape, Size and RevTime). IMPORTANT: When Shape is set to 0 (no Build Up Time) Attack does not alter the Envelope.
Rev Mode	(-9-0; 0-+9)	Negative values "unlink" the relationship between Size and Attack, which can lead to interesting rather than natural sounding reverb tails. At 0 the reverb tails attack and decay sounds very natural. Positive values "compress" the reverb tails shape. Both negative and positive values may lead to artefacts (especially with signals containing a lot of energy in low frequencies) like distortion, clicking and compression. Lowering the Input level or setting RevMode to 0 eliminates these artefacts.

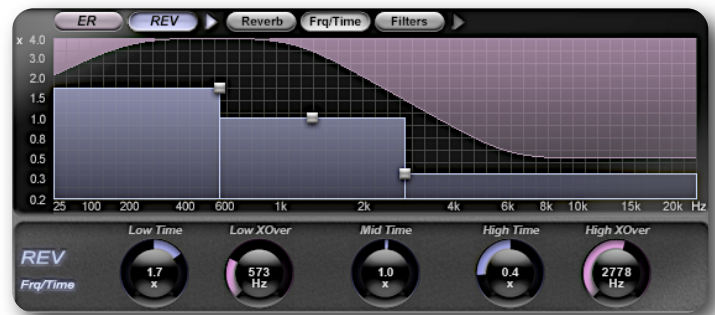
Sub page Reverb | sub menu Modulate

ER REV ▶ Reverb Frq/Time Filters ▶ Body Envelope Modulate		
Cho Rate	(0.0-4.0Hz)	Adds a Chorus to the Tail to thicken and smoothen the Reverb. At 0.00Hz the Chorus is off.
Cho Depth	(0-100%)	Adjusts the modulation depth of the Chorus. At 0% the Chorus is switched off.
Lifelyness	(0-48)	Adds a natural sounding random time modulation to the refractions entering the Diffusion engine. For Ultra Plate Lifelyness adds random modulation to the Chorus.
Floation	(0 - 22 ms)	Determines the maximum range of random time fluctuation for the Lifelyness parameter. This Parameter is not available in the Ultra Plate Algorithms.

REV | Frq/Time

In the Frequency/Time sub page the Frequency Range is divided into 3 Bands with individual RevTime multipliers. This makes it possible to boost or cut different frequency ranges over time inside the Reverb tail.

In a natural Room the behaviour of Freq/Time is mainly determined by the geometry of the room, the positions of Source and Listener and by the materials of the Reflection surfaces (Walls, Floor, Ceiling, Objects inside the Room), that reflect or absorb certain frequencies. All times are changed in factors in regard to the overall RevTime.



All Parameters can also be changed in the Frq/Time Graph with the Handles. The Low and High Band Handles can be moved in X and Y direction to adjust time and crossovers simultaneously.

The Graph for the Frq/Time overlays the Filters Graph (next Section), to keep all Frequency related Information about the Reverb Tail visible, however it is not possible to switch to the Filters page by clicking on the Filter Graphs.

IMPORTANT: Changing the Time Multipliers does NOT change the displayed RevTime in the Reverb sub page.

REV | Sub page Frq/Time

REV Sub page Frq/Time		
Low Time	(0.1-1.0 ; 1.0-4.0x)	Factor for the RevTime multiplier of the Low Band. Counter clockwise to shorten, clockwise to lengthen the RevTime of the Low Band.
Low XOver	(25-24000 Hz)	Adjusts the crossover frequency between Low and Mid Band.
Mid Time	(0.1-1.0 ; 1.0-4.0x)	Factor for the RevTime multiplier of the Mid Band. Counter clockwise to shorten, clockwise to lengthen the RevTime of the Mid Band.
High Time	(0.1-1.0 ; 1.0-4.0x)	Factor for the RevTime multiplier of the High Band. Counter clockwise to shorten, clockwise to lengthen the RevTime of the High Band. Since High Frequencies have the least energy, the default factor is 0.2. Settings above 1.0 are unlikely to happen in the real world, but might be nice as effects.
High XOver	(25-24000 Hz)	Adjusts the crossover frequency between Mid and High Band.

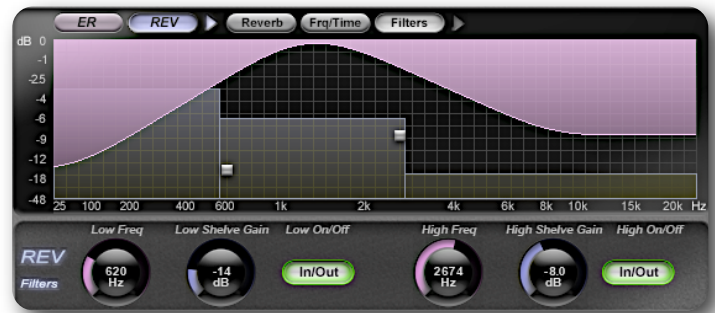
REV | Filters

The Filter sub page gives access to Low and a High Shelving Filter. The Shelving filters are cut only (no boost) with a range down to -Inf, so they can also act as very smooth and natural sounding Low Cut and High Cut Filters.

IMPORTANT: The Filters are placed before the Output Section and also process the Early Reflections.

All Parameters can also be changed in the Filters Graph with the Handles.

The Low and High Shelf Handles can be moved in the X and Y direction to adjust Frequency and Cut Level simultaneously. The Graph for the Filters overlays the **Frq/Time Graph** (previous Section), to keep all Frequency related Information about the Reverb Tail visible. However it is not possible to switch to the Frq/Time sub page by clicking on the Frq/Time Graph.



REV | Sub page Filters

Parameter	Range	Description
Low Freq	(25-24000 Hz)	Sets the filter frequency of the Low Shelf.
Low Shelf Gain	(-Inf -odB)	Sets the Gain (Cut-Level) of the Low Shelf Filter.
Low On/Off	(In/Out)	Switches the Low Shelf filter In (pressed) or Out of the processing Chain.
High Freq	(25-24000 Hz)	Sets the filter frequency of the High Shelf.
High Shelf Gain	(-Inf -odB)	Sets the Gain (Cut-Level) of the High Shelf Filter.
High On/Off	(In/Out)	Switches the High Shelf filter In (pressed) or Out of the processing Chain.

4.5 Preset Handling

X-Verb has a built-in preset mechanism to load and save reverb settings as presets.

This facility allows you to use presets between different host applications and operating systems or even different plug-in formats (VST/AU/RTAS).

The DUENDE Installer creates a standard folder with the X-Verb factory presets. Clicking on the Load and Save Button will open a standard OS File Browser Dialogue that defaults to this location. It might therefore be a good idea to create your own User Presets inside the **09 USER** sub folder.

The location on Windows is: C:/Program Files/ Solid State Logic/Duende/Presets/X-Verb
and on MAC: Macintosh HD/Applications/Solid State Logic/Presets/X-Verb

Next to Load and Save are the Load PREVIOUS Preset and Load NEXT Preset Buttons.

Once you have loaded a preset from a certain sub folder the NEXT Button will alphabetically run through the folder until it has loaded the last available entry, the PREVIOUS button...well it's in the name.

In order to "zap" through another preset folder, you can simply LOAD the first preset from from another sub folder.

IMPORTANT: PREVIOUS and NEXT do not jump to another sub folder.



4.6 Morph Section

A/B memories

X-Verb offers two temporary memories, that allow easy A/B comparison between 2 reverb settings. By default the A memory is active and altered, while changing parameters or loading a preset.



Clicking on the B memory allows you to create another reverb setting or load a 2nd preset. By switching between A and B the two settings can now be quickly compared.

IMPORTANT: Using SAVE will always save the currently active temporary memory. It is therefore possible to save both, A and B memory, as individual presets.

Morph

Activating the MORPH Button engages the Morph Slider. With the slider it is now possible to GRADUALLY morph between the A and B Memory.



Doesn't A/B comparison always end with the desire to get "something in between"???



Which parameters can be morphed?

Every parameter except the active X-Verb **Algorithm** and the active **Size**.

Algorithm and Size settings are always used from **the active A or B memory**.

While Morph is active, the active A or B memory can be changed to use the Algorithm and Size parameters from the other preset.



Artefacts when changing the Morph Slider...

Every X-Verb Parameter that fundamentally changes the time constants of the Early Reflections, the Refraction and Diffusion Engine and the Shape of the Reverb Tail can more or less introduce audible artefacts, while the parameter is changed.

When using Morph various parameters may be changed simultaneously and artefacts could add up.

If you want to use Morphing to dynamically automate i.e.. Reverb Time and Filters on a Drum Loop, this is perfectly possible without artefacts.

The Morph Button pops out!

As soon as any parameter or quick control on the GUI is touched or X-Verb receives parameter changes from the automation or a hardware controller, the Morph function is immediately deactivated.

The Morph slider can be automated; however this will only work, when no other parameter or quick control is changed manually or by automation, otherwise the slider moves but Morph is not active.

4.7 Kill Tail Button

The Kill Tail button functions as an instant "relief" for long reverb tails.

Clicking KILL TAIL immediately resets all delay lines and refraction loops to stop the reverb tail.



However, if there is still an Input signal present, a huge space will quickly build up again.

5. Using X-Verb

X-Verb's high quality Reverberation uses significant resources from the Duende Unit and the Computers CPU/Memory. It is therefore probably a very good idea to use a couple of X-Verb instances in AUX Busses rather than inserting X-Verb on every individual channel.

However, don't forget that you can upgrade your DUENDE V3 Unit to process 128 Slots, which allows you to use 32 Stereo X-Verbs per DUENDE Unit, host CPU power permitting.

5.1 Factory Presets

X-Verb's comes with a broad selection of high quality Reverb Factory Presets.

The presets were created with great care to offer useful starting points for your own explorations. They emulate the most "famous" Studio Reverb sounds which you might already be quite familiar with.

Just browse through the 5 preset sub folders and use the PREVIOUS/NEXT buttons to quickly find THE reverb sound you are after.

Why not use the Quick Controls to tweak a preset until it's exactly what you want...?

5.2 Tips on Quick Controls and Morphing

Quick Controls

When talking to producers about how they use Hardware Reverbs in daily productions, it became pretty clear that direct control is only required for a rather limited amount of reverb parameters. However these parameters should not be buried in sub pages and have a hardware knob on the front panel (or a little controller unit on the Console;-).

Apparently in day to day production where speed and efficiency are king, most people rely on their own ready made presets (or those that came with the box) and only do some quick fine tuning to match the sound with the task.

On the other hand producers also insist on being still able to dive deep into the algorithm and do the subtle or massive changes to create the reverb sound that converts a simple song into a hit.

The Quick Controls section offers direct access to the essential aspects of a Reverb or Room Sound, given that you start with a sound that is already somewhat close to what you want.

Since each Quick Control is linked to several parameters, it avoids the need to tweak several controls simultaneously, something that cannot be done easily with a mouse.

Because the range (-64 to +63) of the Quick Controls is quite big, average adjustments might only sound good in the range between -30 to +30.

In order to make yourself really familiar and comfortable with the vast potential of X-Verb, we would like to suggest that it's a great idea to start experimenting with the Reverb Control Section as soon as you can. Yes you will find many parameters, some with funny names, but once you know them all you will be rewarded with a great deal of understanding about how to create the best sounding rooms and reverbs...don't be shy, it won't bite.

Morphing

We couldn't stop with just implementing a simple A/B comparison method. We wanted to reveal all the interesting sounds, that are actually somewhere between two presets, hence we added Morphing control.

Morphing can however do a lot more for you in a production.

Let's say you have found the right room for your lead vocal and saved it as preset A. It is a pleasant sounding mid size room, not too bright or flashy. In the chorus however, it is a bit too dull and small, the chorus needs more "air".

Adjust until it sounds great for the chorus and save as preset B. Now load preset A and B to the A/B memories respectively, activate Morph and dynamically automate the Morph Slider to get a smooth transition between verse and chorus and back to verse.

Or Morph to the brighter version for a single word in the chorus only, or give the snare in a drum loop a slightly different room...you will soon find out that Morph is an extremely useful addition to X-Verb.

5.3 DUENDE V3 Hybrid Core Processing (HCP) Slots

X-Verb's quality heavily relies on the new Duende V3 HCP architecture, which utilises the Duende Hardware as well as your computers CPU and Memory.

X-Verb uses 2 Slots per channel, meaning that one X-Verb Instance (Stereo) needs 4 Slots on DUENDE.

All Duende Units can be expanded to 128 Slots per device, a maximum of 4 Duende Units (2x PCIe+2x Firewire) can be connected to one computer.

This means you can build a Duende System with up to 512 Processing Slots or the equivalent of 128 Stereo X-Verbs.

Since X-Verb will use a significant amount of Computer Memory per instance and needs very fast CPU/Memory transfers it is however very unlikely, if not impossible, to get a computer that is able to do his part of the work and run 128 Instances of X-Verb.

Since we didn't want to create any logical resource sharing limitation for X-Verb and also find it quite unlikely that anybody will ever need or even try 128 Reverbs in one project, you can theoretically run up to 128 Instances with 4 Duende Units.

Most current host computers are unlikely to be powerful enough to support these processing extremes.

On the most recent high end 8 Core computers you might be able to squeeze 80-100 Stereo Instances of X-Verb at 44.1/48 kHz out of the silicon, however this Machine is unlikely to be able to do anything else.

As a ballpark figure, one Instance of X-Verb needs approx. the following resources from your Computer at 44.1/48 kHz (Mac or PC): up to 20MB of directly accessible memory (wired), up to 50MB of virtual active Memory, between 5-10% of a Single Core Intel CPU running at 1.8GHz.

A Computer that is easily capable of running 32 Instances of X-Verb at 44.1/48 kHz (i.e. with one DUENDE Unit expanded to 128 Slots) alongside with other tasks (like recording/editing audio, virtual instruments etc.) needs to meet the following minimum specs: Quad Core with 2.8GHz, 3 GB of Memory, Intel Core2Duo/i7 or equivalent AMD System.

Even today this is quite a powerful computer, however please bare in mind that this Duende/Computer combo offers the equivalent of 32 Reverb Boxes with a cost similar to a luxury sports car, small house or a typical modern professional studio environment.

88.2/96 kHz Operation

Please note, that X-Verb uses significantly more resources at higher sample rates. The memory requirements double, and CPU requirements may even triple, depending on the settings for ER's, Size and RevTime.

Duende V3 is capable of supporting up to 128 slots at 88.2/96kHz (e.g. 32 X-Verbs in stereo), however, it is likely that the host computer will run out of processing capacity before these limits are reached.

6. Support

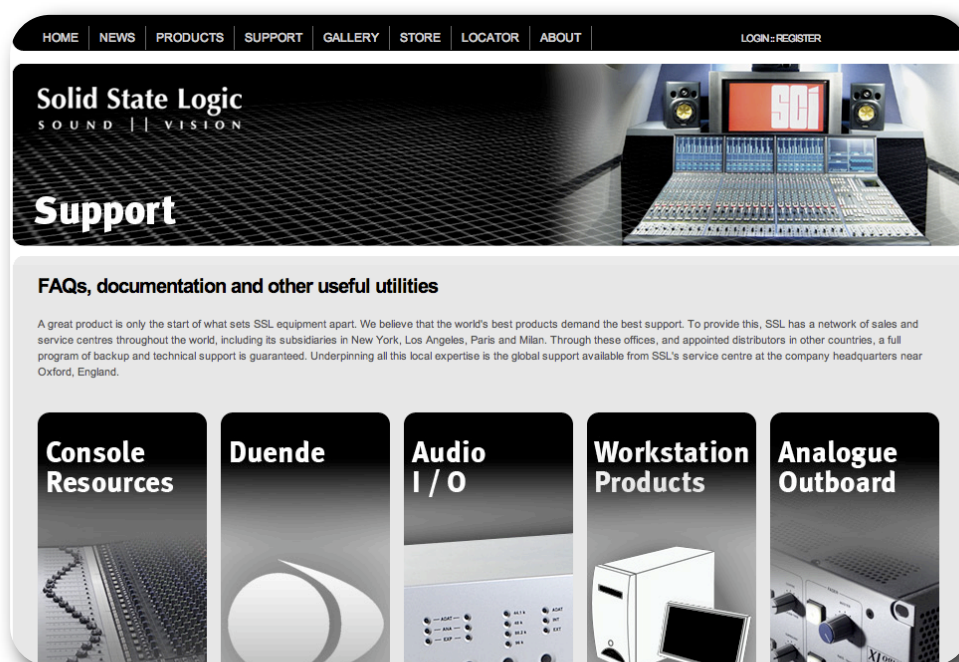
Support, FAQs and Online Help Centre

To access the latest support information on DUENDE and X-Verb, please visit our online support site.

The information there is kept up to date by our support staff to make sure all information is accurate. All information is available to you 24/7/365.

If you can't find your answer or a solution to your issue, you can submit a question via the site to our support staff for resolution.

URL: <http://www.solidstatellogic.com/support>



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