DUENDE

User Guide

Version 2.0 Rev. A   Mac & PC

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1. 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.
- Clean only with dry cloth.
- 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-adjustable, or user-servicable items, inside this apparatus. Do not remove the covers of this apparatus; doing so will invalidate your warranty.
- Refer all servicing to qualified personnel. Servicing is required when the power supply has been damaged in any way, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally or has been dropped.
- Adjustments or alterations to this apparatus may affect the performance such that safety and/or international compliance standards may no longer be met.

Power Safety
This apparatus is supplied with a universal power supply, approved and certified for operation with this apparatus – adaptors are supplied to enable use world-wide, as required. There are no user-replaceable fuses.
- Where the universal power supply is required, use only the Solid State Logic-provided power supply. Use of any other power supply is not covered by your warranty and may cause fire or explosion.
- Any external power supply may become hot during normal operation of the unit. Use care when handling the power supply.
- Do not attempt to modify the power supply unit in any way – other than to fit the appropriate power adaptor, as required (see overleaf).
- If an extension power cable or adaptor is used, ensure that the total power rating of the power cable and/or adaptor is not exceeded.
- The power socket used for this apparatus should be located nearby and be easily accessible.
- Unplug this apparatus during an electrical storm or when unused for long periods of time.

Installation Notes
- When installing this apparatus, place the apparatus on a secure level surface.
- Ensure that no strain is placed on the cables connecting to this apparatus.
- Ensure also that such cables are not placed where they can be stepped on, pulled or tripped over.
- Do not operate this apparatus whilst it is covered or boxed in any way.

A high quality IEEE1394/Firewire 400 cable is supplied. Use of alternative, inferior cables may result in reduced performance, including increased susceptibility to external interference.
Although IEEE1394/Firewire permits 'hot-plugging' there are persistent reports of permanent damage caused to either host or peripheral equipment by this practice. Therefore, Solid State Logic strongly recommends that IEEE1394/Firewire connections are made only when both the host and Duende units are unpowered.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/ TV technician for help.

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Instructions for Disposal of WEEE by Users in the European Union

The symbol shown here is on the product or on its packaging, which indicates that this product must not be disposed of with other waste. Instead, it is the user's responsibility to dispose of their waste equipment by handing it over to a designated collection point for recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or where you purchased the product.

Standards Conformance

For CE conformance, this apparatus conforms to the following standards:

- EN 60950 Safety for information technology equipment, including electrical business (IEC 60950) equipment
- EN 55022 Limits and methods of measurement of radio disturbance characteristics (CISPR 22) of information technology equipment
- EN 55024 Information technology equipment – immunity characteristics – (CISPR 24) limits and methods of measurement

With reference to regulations in the following directives: 73/23/EEC, 89/336/EEC

2. Product Specifications & System Requirements

System Requirements for Apple Macintosh:

- Mac PowerPC G4/G5 or Intel 1 Ghz or higher
- 512Mb RAM (1Gb recommended)
- Mac OS X (Version 10.4.8 or higher)
- 1 spare IEEE1394/Firewire 400 port
- 60Mb Hard Disk space
- Audio Units, VST or RTAS* compatible host application
- One available Firewire port (1394A / 400 Mbit)
- 17' or larger colour monitor with screen resolution of 1024 x 768 or higher recommended
- Internet Connection (for product registration and to download software updates)
- Approved Audio Interface

NOTE: RTAS is supported through the integrated FXPansion VST-RTAS wrapper, a product developed by FXPansion Audio UK Ltd. For more info visit www.fxpansion.com An up-to-date list of tested configurations can be found at http://solid-state-logic-en.custhelp.com

Physical
Depth 165mm / 6.5 inches *casing only*
235mm / 9.25 inches *inc' connectors*
Height 44.5mm / 1.75 inches (1 RU)
Width 438mm / 17.25 inches *casing only*
482mm / 19 inches *inc' rack ears*
Weight 1.8kg / 4 pounds
Power < 6 Watts
Boxed size 320mm x 550mm x 80mm
12.75" x 21.75" x 3.25"
Boxed weight 2.6kg / 6 pounds
All values are approximate

Environmental
Temperature Operating: +5 to 30 Deg. C
Non-operating: –20 to 50 Deg. C
Max. gradient: 15 Deg. C/Hour
Relative Operating: 20 to 80 %
Humidity Non-operating: 5 to 90 %
Max. wet bulb: 29 Deg. C
(non-condensing)
Vibration Operating: < 0.2 G (3 - 100Hz)
Non-operating,
power off: < 0.4 G (3 - 100Hz)
Shock Operating: < 2 G (10mSec. Max.)
Non-operating: < 10 G (10mSec. Max.)
Altitude Operating: 0 to 3000m
(above sea level) Non-operating: 0 to 12000m

Performance
CPU 32bit ARM7 RISC Processor
DSP 4 x 333MHz SHARC® DSP
40bit Floating Point
Connection IEEE1394/Firewire 400
(1 x in/out, 1 x loop-through)

System Requirements for Windows/PC:

- Minimum of Intel Pentium IV 1.0GHz or equivalent
- 512 MB RAM (1Gb recommended)
- Windows XP Service Pack 1 or higher
- 80Mb of free Hard Disk space
- Approved VST or RTAS* compatible host application
- One available Firewire port (1394A / 400Mbit)
- 17' or larger color monitor with screen resolution of 1024 x 768 or higher recommended
- Internet Connection (for product registration and to download software updates)
- Approved Audio Interface

3. Introduction

Hi – and thank you for purchasing Duende – the SSL processing solution for your audio workstation. As you're sat here reading this, the chances are that you have a pretty good understanding of who we are and our outstanding reputation in audio recording technology. How did we get here? Well, there were no great plans to make SSL into a major manufacturer of mixing consoles when it all started back in the seventies - the company began with nothing more than an enthusiasm for music and the concept of recording. Along the way that spirit, coupled with a passion for excellence in music recording tools, helped build a multi-million dollar international business. The SSL HQ may be a little bigger now than it was in the seventies, but passion and innovation still lies at its heart.

In 2005, we decided to embark on a technology project to figure out how we could take the processing power of a console and squeeze it into a 1U rack, so we could serve up the SSL sound to home and project studio owners who don't have the budget (or the floor space!) required to install a large-format console.

Drawing on our unique understanding of audio processing and years of DSP know-how, our team of engineers set about creating the SSL processing solution for your DAW environment. We knew we needed serious DSP horsepower to accommodate our powerful algorithms, and we knew it had to come in a package that could integrate seamlessly with the most popular workstations … and so Duende was born.

Based on the digital technology behind SSL's C-Series consoles, Duende delivers the complete SSL mix experience – powerful channel and dynamics processing and the legendary Bus Compressor.

Duende offers complete integration into the most popular workstation environments with one simple FireWire cable connection. The different processing blocks appear as VST/AU/RTAS plug-ins – and include an authentic SSL channel strip with filters, E and G series EQ and dynamics processing, as well as the legendary SSL Bus Compressor.

Oh, you're probably wondering about the name, right? It was a hot day, someone in the team had bought in a CD of flamenco guitar music and one of the tunes, 'Duende', just kind of hung in the air. Something inspired us to discover that in flamenco culture, Duende is a word for spirit, soul, it's the force that inspires the music. That just seemed to sit well as a description for the 1U silver box before us. We hope you will enjoy mixing your music with Duende.

For product news and software updates please register at www.solid-state-logic.com/duende

And don't forget to join the www.mixbuss.com community, the on-line resource for sharing knowledge on better music production.
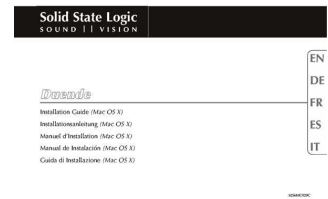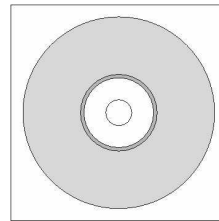
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4. Installation

Unpack

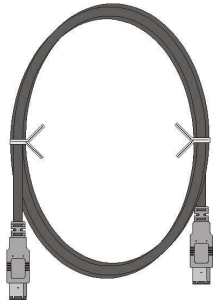Your Duende Box should contain the following:

Universal Power Supply + World-Wide AC socket adapters
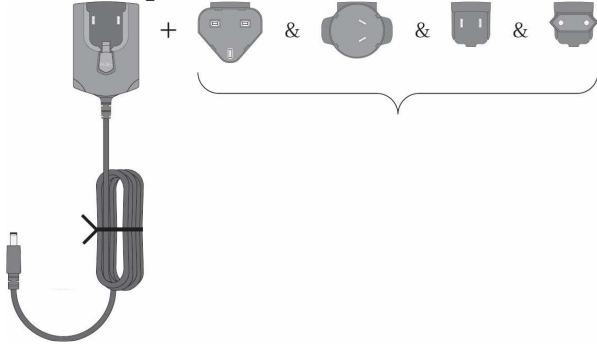
CD and Installation Guide

2m 6-Pin Firewire Cable

The Duende Unit

Configure the Power Supply (If required)

Configure the Duende power supply to suit your local mains connection:
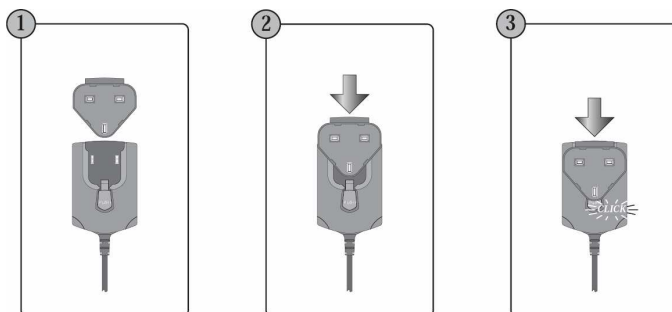
* Illustration shows UK mains adaptor – AU, Euro and US adaptors are also supplied (see opposite).
Refer also to the 'Safety and Installation Considerations' section at the beginning of this manual. The power supply supplied may differ from the one illustrated here.

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Software & Hardware Installation (PC)

1) Insert the Duende installation CD in your CD drive
2) Navigate to your CD drive
3) Launch the Duende installer by double clicking the Duende installer icon
4) Follow the installation instructions on the screen
5) Connect IEEE 1394 Firewire Cable
6) Connect Power
7) Switch Duende On

After the Duende installer has installed all of the required software on your computer, click 'Finish' to quit the installer.

Software & Hardware Installation (Mac)

Connect Duende

1) Ensure that both Duende and your computer are powered down
2) Connect IEEE1394/Firewire
3) Connect Power
4) Switch Computer On
5) Switch Duende On
6) Insert the Duende installation CD in your CD drive
7) Click the Duende icon to view the CD content
8) Launch the Duende installer by double clicking the Duende Installer icon

9) Follow the installation instructions on screen

After the Duende installer has installed all of the required software on your computer, click 'Finish Up' to quit the installer.

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5. Operational Overview

Once your Duende hardware and software has been properly installed, Duende plug-ins are accessed and used just like any host-based plug-in. You can run Duende plug-ins simultaneously with your other host based plug-ins in any combination.

All Duende plug-ins support up to 40bit 96kHz operation. Please note that Duende plug-ins use twice as much DSP resources at 96kHz.

Duende parameters are changed by dragging, rotating or clicking knobs and buttons, whose behavior varies slightly depending on which software is being used to host the plug-ins. Generally the further away the mouse pointer is from the knob, the more resolution is available for parameter adjustment.

When the mouse cursor is hovered over a knob it's value is displayed in the appropriate units. At any point you can see exactly what value a knob has without touching it. If you have a mouse with scroll wheel, it can be used to change the knob position.

OS X:
To reset a knob to its default value hold 'COMMAND' whilst clicking on that knob.

For very fine adjustment, hold 'SHIFT' whilst dragging.

Windows XP:
To reset a knob to its default value hold 'CTRL' whilst clicking on that knob.

Every Duende plug-in parameter can be automated so long as parameter automation is supported by the host application. The method for recording and editing automation varies from host to host. For specific instructions on using automation with the host consult the host application documentation.

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5.1 Duende Preferences/Control Panel
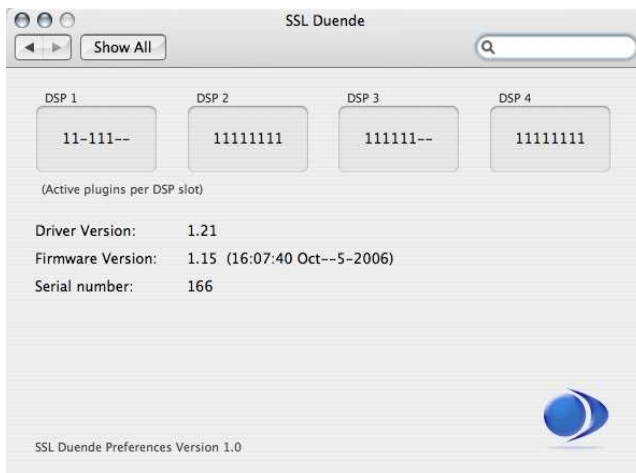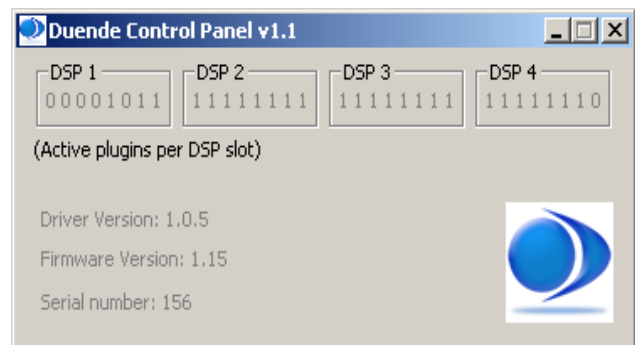
| OS X | Windows XP |

The Duende Preferences/Control Panel shows information about your Duende such as serial no (Authentication ID), firmware version and driver version. It also displays DSP resource information and allows you to easily see how much DSP you have available at any time.

OS X:
The panel can be found by navigating to 'Apple Menu>System Preferences>SSL Duende'.

Windows XP:
The panel can be found in 'Start Menu>Progams>Solid State Logic>Duende' or in the Windows control panel.

Each mono plug-in loaded into Duende will take up one slot, a '1' representing a used slot and a '- ' representing an unused slot. At 44.1 and 48kHz there are 32 slots available and at 88.2 and 96kHz there are 16 slots available. A stereo version of a plug in will take up 2 slots.

5.2 Launching a Duende plug-in

Each host application has its own particular methods for instantiating (launching) a plug-in. Consult the host application documentation for specific instructions on loading and using plug-ins within the application.

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Launching a Duende channel strip in Logic 7:

Launching a Duende channel strip in Cubase SX:

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5.3 DSP Resource Management

Due to the nature of Duende having 4 DSP chips, a minimal amount of resource management should be done when running Duende at high load.

If there are, for example 2 slots free and you wish to load a stereo plug-in, Duende will under certain conditions notify you that you are out of DSP resources. This will only happen if the two slots are on different DSP chips as Duende is not able to load a stereo plug-in across 2 chips. This may well occur because you have filled up all the resources and subsequently unloaded 2 mono plug-ins. This situation can be seen in the diagram below:

As you can see above, the two remaining slots reside on different DSP chips and in this case when you attempt to load a stereo plug-in you will encounter the afore mentioned situation.

The way to handle this is as follows:

1. Save your project/song
2. Close your project/song
3. Re-open project/song

When this has been done Duende will be forced to reload all the plug-ins but will do so in the most economical way possible. The 2 free slots will now reside on the same DSP chip allowing the loading of a stereo plug-in.

5.4 General guidelines for plug-in Delay Compensation

When Duende plug-ins are used, the audio data to be processed by Duende is sent to the Duende DSP engine by the host application. The audio is then processed by the DSPs and sent back to the host application.

This transfer of audio data produces latency (delay) in the audio signal being processed. Latency time is dependant on the sample rate, type of plug-in(s) loaded and the audio interface buffer setting.

If this latency is not compensated, the processed audio will arrive late in relation to the unprocessed audio. The more processing that takes place on a particular signal, the later it will arrive back in the host.

Most host applications automatically compensate for this latency by simply turning on the Plug-in Delay Compensation (PDC) or similar, usually found in the applications preferences. Some hosts even provide full plug-in delay compensation throughout the entire signal path, including sends, groups, and buses.

The location of the settings for the PDC option within some common host applications is as follows:

Cubase SX + Nuendo 2/3:
Always on unless the 'Constrain Delay Compensation' feature is used to disable delay compensation on individual plug-ins: 'Devices Menu>Plug-in Information>Use Delay Compensation'

Logic Pro:
'Preferences>Audio>General'

Digital Performer 4/5:
'Setup menu>Configure Audio System>Configure Studio Settings...'

Ableton Live:
'Options>Delay Compensation'

Important: Delay compensation is fully automatic and requires no user intervention when Duende plug-ins are used in hosts that support full Plug-in Delay Compensation.

PDC	No PDC
Steinberg Cubase 4	Final Cut Pro
Steinberg Cubase SX 2 & 3	Soundtracks Pro
Steinberg Nuendo 2 & 3	Garageband
Logic Pro 7.1 or higher	Pro Tools LE and M-Powered
Digital Performer 4.5 & higher	
Pro Tools HD 7 or higher	
Ableton Live 5	
Cakewalk Sonar 5 & 6	

Depending on the host application implementation, the delay compensation feature may not provide automatic compensation when Duende plug-ins are inserted on sends, groups, or buses. In this situation, the solution is to manually compensate for the plug-ins.

These explanations of delay compensation apply primarily to playback only.

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Compensating for latency in Pro Tools LE and M-Powered

Because Pro Tools LE and M-Powered do not feature PDC it must be done manually when Duende plug-ins are used. Due to the use of firewire and the nature of how signals are sent to and from Duende, a latency is introduced which will delay any audio track, aux input, master fader or instrument track by a specified amount.
Tracks that use no Duende plug-ins or less than the track with the most Duende plug-ins will need to be delayed so they are all in time. Because this latency is reported by Pro Tools it is easily compensated for.

Here's how:

The track with the most Duende plug-ins will introduce the most latency, those with 1 or 2 plug-ins will introduce less and those with no Duende plug-ins will introduce no latency (providing other plug-ins that introduce latency are not used).

To find out the latency introduced on a particular track by Duende plug-ins, go to the channel in the mixer and 'COMMAND/CTRL+CLICK' twice in the green text below the fader (normally showing vol). The value shown (dly) is the latency introduced on that track in samples.

Now load the 'Digidesign Time Adjuster Long' plug-in on, for example, a track with no Duende plug-ins. Double click on the delay box and type in the latency value of the track that has the most Duende plug-ins. The track with the most Duende plug-ins and the track with none will now be perfectly in sync on playback.

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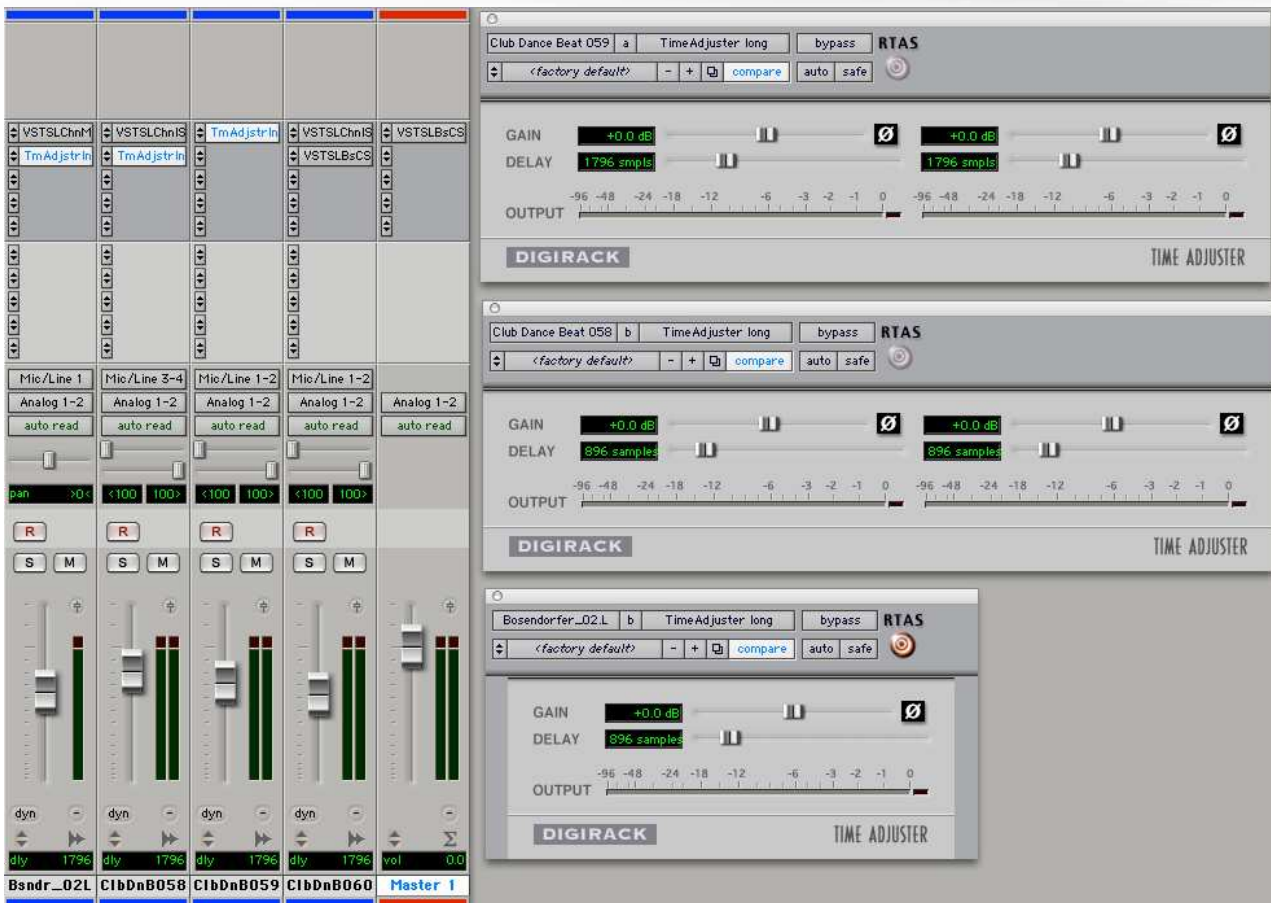
Any tracks that have a smaller latency than the maximum must also be delayed but by a smaller amount (i.e. tracks with 1 Duende plug-in where the maximum has 3). The delay value for these will be maximum latency minus the latency reported by that track.

Using Automatic Delay Compensation in Pro Tools HD

Pro Tools HD users have the luxury of being able to use Automatic Delay Compensation, as opposed to the manual method required in Pro Tools LE and M-Powered. However, there are still some considerations to be taken into account to make sure all Duende plug-ins are compensated for and everything stays perfectly in sync.

To turn on ADC in PTHD go to 'Setup>Playback Engine' whilst Pro Tools is stopped and you will see a box labeled 'Delay Compensation Engine'. Change the setting here to 'Long (4095 Samples per channel)'.
Pro Tools will then tell you that it will close and re-open your session after clicking the OK button in the dialogue box; therefore make sure you have saved your session prior to doing this. Also put the CPU usage limit to 85%.
Pro Tools will now automatically compensate for any introduced latency of 4095 samples or less.
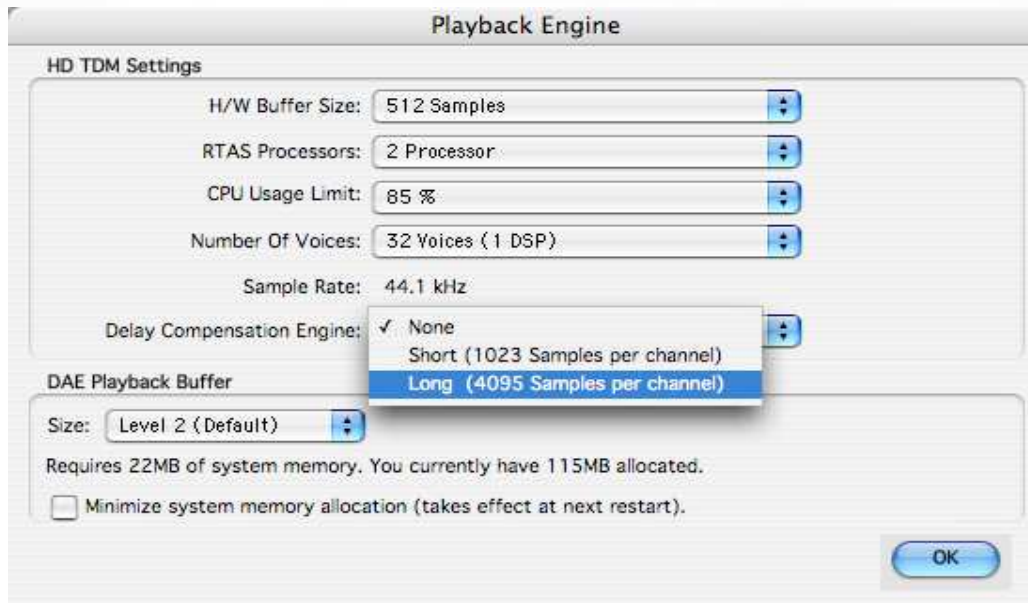
This means that you can generally use up to 2 Duende plug-ins per channel without considering latency issues, but this will depend on the buffer size set in Pro Tools, the sample rate and which Duende plug-ins are loaded.

Note that if an audio track with 1 Duende plug-in is routed to an aux channel with 2 Duende plug-ins the total latency for that audio getting to the mix bus will equal 3 plug-ins; this will however be clearly shown by Pro Tools.

To view the latency introduced by plug-ins go to the bottom left hand corner of the Mix view, click on the small black/grey box and select 'Delay Compensation'.

Here you will find 2 values; 'dly' is the amount of latency introduced by the plug-ins on that channel and 'cmp' is the number of samples Pro Tools is delaying the other channels by. If the 'dly' value is less than the 4095 set in the Delay Compensation box then you don't need to worry and everything will be compensated for.

As you can see in the picture above the 'kc merged' channel has 1 Duende channel strip loaded onto it, therefore Pro Tools is automatically delaying the other channels by that amount (1028 samples) to ensure all audio is kept in sync.

If the total latency on a channel exceeds this maximum value the text will be red indicating that Pro Tools cannot compensate for this much latency. In this scenario the additional latency which Pro Tools cannot compensate for will have to be dealt with manually.

The value of this will be the maximum latency minus maximum latency Pro Tools can compensate for, ie 4095 samples. In this case it is:

4108 (shown in red) – 4095 (Pro Tools maximum) = 13 samples
Please refer to the 'Compensating for latency in Pro Tools LE and M-Powered' found in this manual for information on how to do this manually.

6. Duende EQ and Dynamics Channel Strip

6.1 Introduction

The Duende EQ and Dynamics Channel Strip plug-in is based on the EQ and compressor sections of the XL 9000 K Series console. SSL were the first manufacturer to feature dynamics and EQ on every channel on an in-line console with the SL 4000 B Series in 1977. The plug-in includes separate high and low pass filters, a four band parametric equalizer, an independent compressor/limiter and gate/expander as well as input and output gain adjustment knobs and a phase invert button. Let's have a closer look at each section in detail.

6.2 Input Section

Input Gain: Controls the level of the incoming audio signal

Phase Reverse: Reverses the phase of the incoming input signal

6.3 Filter Section

The Filter Section of the EQ and Dynamics Channel Strip plug-in includes a 12dB/Octave low pass filter and an 18dB/Octave high pass filter. The low pass filter operates from 3kHz to 22 kHz and the high pass filter operates from 20Hz to 500Hz. In addition, each filter has an OUT position which bypasses the filter.

There are three positions where the Filter Section can be placed: after the equalizer, before the equalizer or in the sidechain of the dynamics section.

When no buttons in the Filter section are pressed, the filters come after the Equalizer section
With the INPUT button pressed, the filters come before the Equalizer section
When the DYN SC button is pressed, the filters are switched into the sidechain of the Dynamics section. The term 'sidechain' and the process of sidechaining will be discussed in greater detail in the overview of the Dynamics section.

Using Filters

DYN SC: The Filters are switched into the sidechain of the Dynamics section. The Equaliser can be switched into the sidechain independently. Note that DYN SC overrides the INPUT function (see below).

INPUT: Moves the Filters to put them in circuit immediately after the Channel Input section. This allows the Filters to be used to clean up signals before compressing them. Selecting Dynamics 'PRE EQ' will allow the compressed signal to be EQ'd.
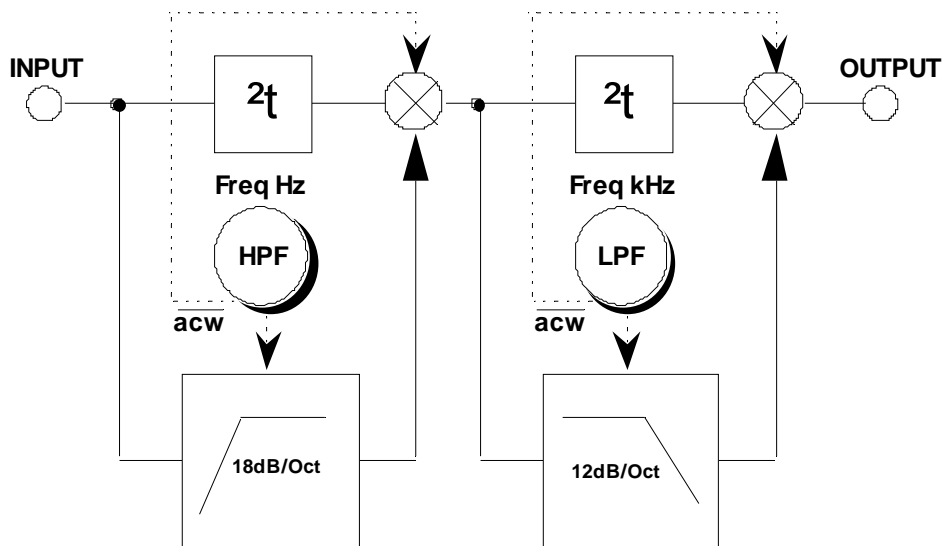
6.4 Equaliser Section
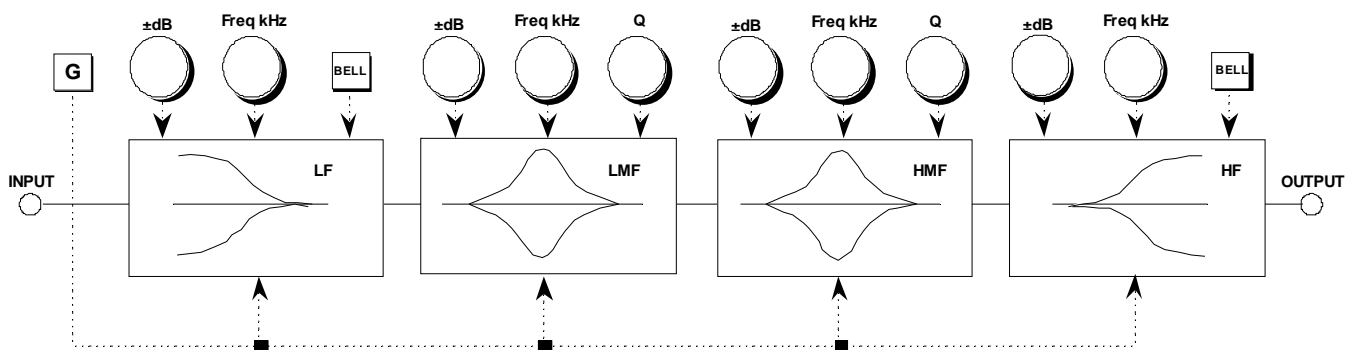
Operation

The equaliser included with the Duende EQ and Dynamics Channel Strip plug-in is a four band parametric EQ. Based on the XL 9000 K Series EQ circuit, this plug-in includes two distinct EQ curves, one based on the SSL G Series EQ and another based on the latest version of SSL's classic E Series EQ.

The plug-in includes high and low frequency shelving equalizers (which can be switched to peaking curves via the BELL button) and two overlapping equalizers with adjustable Q.

The LF section operates over a frequency range of 40Hz - 600Hz and is capable of up to 16.5dB of cut or boost. The HF section operates over a frequency range of 1.5kHz - 22kHz and is capable of up to 20dB of cut or boost.

Normally these shelving curves have a degree of overshoot/undershoot (depending on whether you are boosting or cutting) below the selected HF frequency or above the selected LF frequency. De-selecting the G button removes the overshoot/undershoot effect and provides a slightly gentler slope. Selecting BELL in either mode switches the equaliser to a peaking curve.

The LMF section operates over a frequency range of 200Hz - 2 kHz and is capable of ±20dB of gain with a continuously variable Q from 0.5 to 2.5.

The HMF section operates over a frequency range of 600Hz - 7kHz and is capable of ±20dB of gain with a continuously variable Q from 0.5 to 2.5.

Normally, at any Q setting, the bandwidth of the HMF and LMF sections varies with gain, whereby an increase in boost or cut increases the selectivity of the EQ. This type of EQ can sound effective when used at moderate settings; the gentle Q curve lends itself to the application of overall EQ on combined sources and subtle corrective adjustments to instruments and vocals.

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When the EQ is switched to 'E' operation, the bandwidth of the HMF and LMF sections remains constant at all gains, so at lower gains the EQ curves are comparatively narrower for a given Q setting. This is particularly useful for drums, since relatively high Q is available at low gain settings. However, it is not so suitable for overall EQ or subtle corrections, as you need to adjust the Q to maintain the same effect when the gain is changed.

- Normal (G type) curves with the 'E' switch OUT, have a modified slope with a degree of overshoot/undershoot for increased selectivity
- 'E type' curves with the 'E' switch IN follow conventional cut or boost characteristics

The two parametric bands have selectable characteristics which affect the relationship between frequency bandwidth and gain:

With the 'E' switch OUT, the frequency bandwidth reduces with increased gain, thereby increasing the selectivity of the EQ as the gain is increased.
With the 'E' switch IN, the frequency bandwidth is constant at all gains.
At full boost or cut both are identical.

There are three buttons associated with this section of the plug-in.
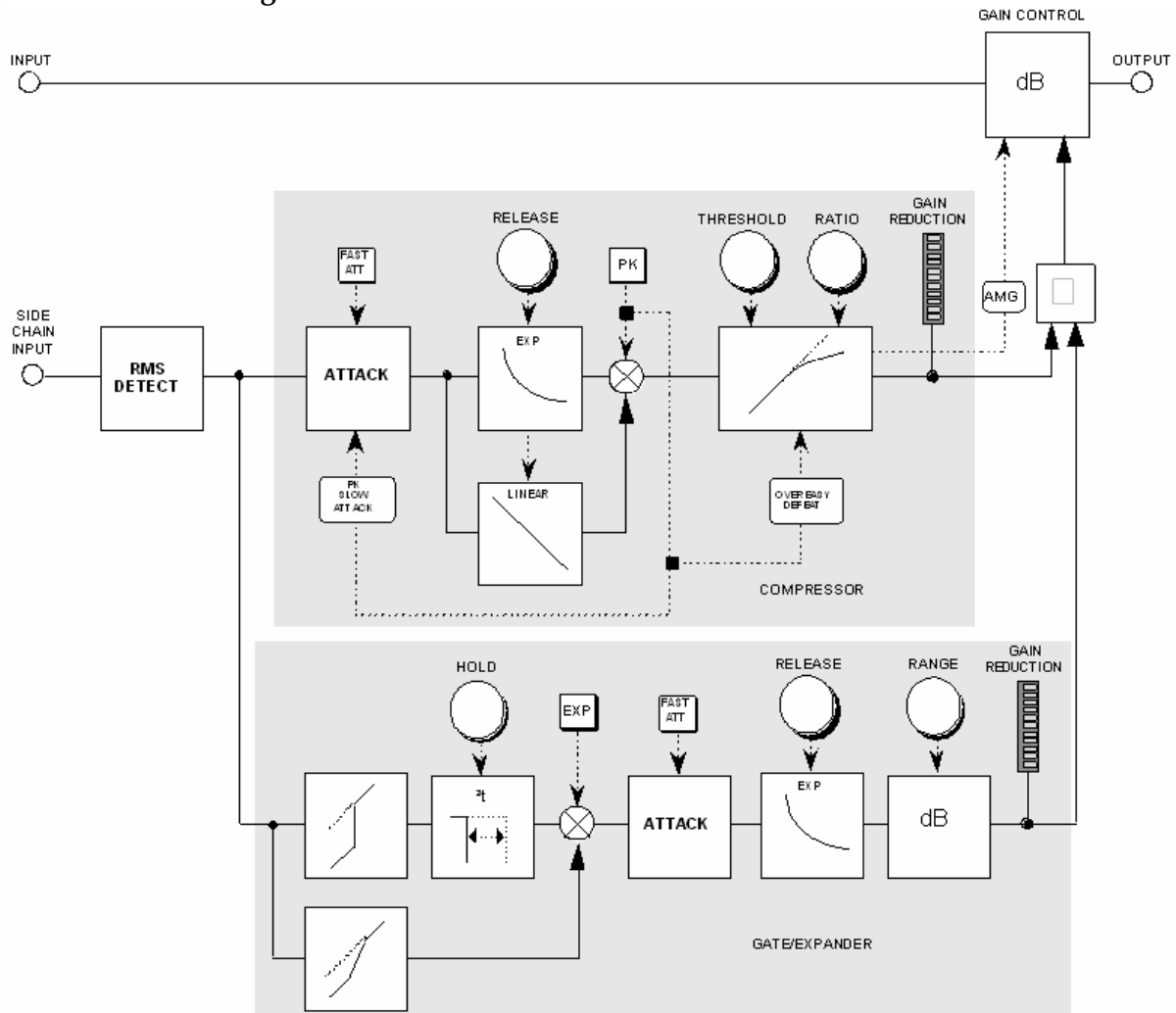
EQ IN : Switches the EQ section into circuit.

E : Switches the EQ from 'G' operation to 'E' operation - see below.

DYN SC : Switches the EQ section into the sidechain of the Dynamics section. The Filter Section can be switched independently of the EQ section. If both Filter and EQ sections are assigned to the dynamic sidechain the EQ section precedes the Filter.

6.5 Dynamics Section

The Dynamics Section comprises a compressor/limiter and an expander/gate. Both sections work independently, but can be operational at the same time, providing sophisticated control of signal levels. The Filter and/or the equaliser section can be assigned to the dynamics sidechain allowing for advanced processes like de-essing etc.

Dynamics Section Diagram

The Dynamics Section has a few routing buttons associated with it.

DYN IN : Switches the Dynamics section into the signal path, post EQ.

PRE EQ : Switches the Dynamics section pre the EQ section (but post the Filter section if the Filter INPUT switch is pressed).

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Compressor/Limiter

Introduction

The Channel Compressor/Limiter Section has a number of key features including a variable compression ratio from 1:1 to Infinity:1, a variable threshold from -20dB to +10dB, auto sensing attack time (or selectable 1ms attack time), and a variable release from 0.1 to 4 seconds.

The Compressor/Limiter has two modes of signal detection, Peak and RMS. As their names suggest these modes of detection either act on peaks of the incoming signals or on their RMS or average levels. This gives two very different modes of compression and limiting with Peak Mode giving far more dramatic compression characteristics.

Detailed Parameter Description

RATIO: When turned to 1:1, the Compressor/Limiter section is inactive. Turning the control clockwise increases the compression ratio to give a true limiter at the fully clockwise position.
The compressor normally has an 'over-easy' characteristic. Selecting 'PK' changes this to peak sensing, and replaces the 'over–easy' characteristic with a hard knee, providing an alternative for some instruments.

THRESHOLD: Whenever a signal exceeds the level set by this control, the compressor will start to act at the ratio set by the RATIO control. This control also provides automatic make-up gain, so as you lower the threshold and introduce more compression, the output level is increased, maintaining a steady output level regardless of the amount of compression.

RELEASE: Sets the time constant (speed) with which the compressor returns to normal gain settings once the signal has passed its maximum.

FAST ATT: Provides a fast attack time (3mS for 20dB gain reduction). When off the attack time is program dependent (3mS – 30mS).

The yellow and red LEDs, on the bottom of the LED display area, indicate the amount of gain reduction (compression).

Expander/Gate

Introduction

The gate/expander section contains a number of useful features including a variable range from 0 to 40dB, a variable threshold from -30dB to +10dB, a fixed attack time (switchable to Fast Attack of

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100 µs), a variable hold time from 0 to four seconds and a variable release time from 0.1 to 4 seconds.

The sidechain signal is sourced from the signal feeding the dynamics section and the filters and/or equaliser can be inserted in this sidechain. The green LEDs indicate the amount of gain reduction on the expander/gate.

By default, the Gate/Expander section functions as an Infinity:1 gate. When the EXP button is pressed, the section becomes a 2:1 expander.

Detailed Parameter Description

RANGE: Determines the depth of gating or expansion. When turned fully anticlockwise (Range = 0), this section is inactive. When turned fully clockwise, a range of 40dB can be obtained.

THRESHOLD: A Variable hysteresis is incorporated in the threshold circuitry. For any given 'open' setting, the Expander/Gate will have a lower 'close' threshold. The hysteresis value is increased as the threshold is lowered. This is very useful in music recording as it allows instruments to decay below the open threshold before gating or expansion takes place.

RELEASE: This determines the time constant (speed), variable from 0.1- 4 seconds, at which the Gate/Expander reduces the signal level once it has passed below the threshold. Note that this control interacts with the Range control.

FAST ATT: Provides a fast attack time (100µs per 40db). When off, a controlled linear attack time of 1.5ms per 40dB is selected. The attack time is the time taken for the Expander/Gate to 'recover' once the signal level is above the threshold. When gating signals with a steep rising edge, such as drums, a slow attack may effectively mask the initial 'Thwack', so you should be aware of this when selecting the appropriate attack time.

HOLD: Determines the time after the signal has decayed below the threshold before the gate closes.

Variable from 0 to 4 seconds.

Note that when the Dynamics Section is not in circuit, its sidechain input is also bypassed.

Output Section

The Output Section consists of a ±20dB output gain control, and a 6-segment LED meter.

S/C LISTEN: Pressing the SC LISTEN switch routes the sidechain directly to the output, so you can monitor the sidechain signal

BYPASS ALL: Engaging this button will bypass all channel processing whilst still routing the signal through Duende. This avoids the time shift which occurs when a 'hard' bypass is done using the default DAW control, allowing for easier A/B comparison between processed and unprocessed signals.

6.6 Advanced Signal Routing Options

Channel Processing Order

There are two switches that control the order of the signal processing elements. These are the 'Filters to INPUT' switch in the Filter Section and the 'Dynamics PRE EQ' in the Dynamics Section.

The table below shows the effect of these:

Switch 1	Switch 2	Processing Order		
		Equaliser	Filters	Dynamics
Filters to INPUT		Filters	Equaliser	Dynamics
Dynamics PRE EQ		Dynamics	Equaliser	Filters
Filters to INPUT	Dynamics PRE EQ	Filters	Dynamics	Equaliser

Side Chain Processing Order

The EQ and filter sections can be assigned to the Dynamics sidechain using the DYN S/CH switches in the respective sections. The table below shows the sidechain source and processing for the various combinations of these:

Switch 1	Switch 2	SC Source	Sidechain Processing order	
		Dynamics Input		
EQ to Dyn S/C		Dynamics Input	Equaliser	
Filters to DYN S/C		Dynamics Input	Filters	
EQ to Dyn S/C	Filters to Dyn S/C	Dynamics Input	Equaliser	Filters

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7. Duende Stereo Bus Compressor

Introduction

The Stereo Bus Compressor plug-in is a stereo version of the legendary bus compressor found on the XL 9000 K Series console. It provides high quality stereo compression, giving you critical control over the dynamic range of audio signals.

Uses may include inserting the bus compressor over a stereo mix which has the effect of 'gluing' the mix together whilst still maintaining a big sound. The dynamics of drum overheads or whole drum kits can be controlled very effectively with the bus compressor . As it is available as either a stereo or mono plug-in the bus compressor can be used for practically any application that requires superior compression.

Detailed Parameter Description

Compression Meter: Shows Gain Reduction

Threshold: Continuously variable -20dB to +20dB

Attack: Six switchable ranges 0.1, 0.3, 1, 3 , 10 and 30mSec.

Release: Five switchable ranges 0.1, 0.3, 0.6, 1.2sec and 'Auto' (release time dependant upon the duration of the signal peak).

Make-Up: Level compensation to compensate for compressor action, continuously variable from -5dB to +15dB
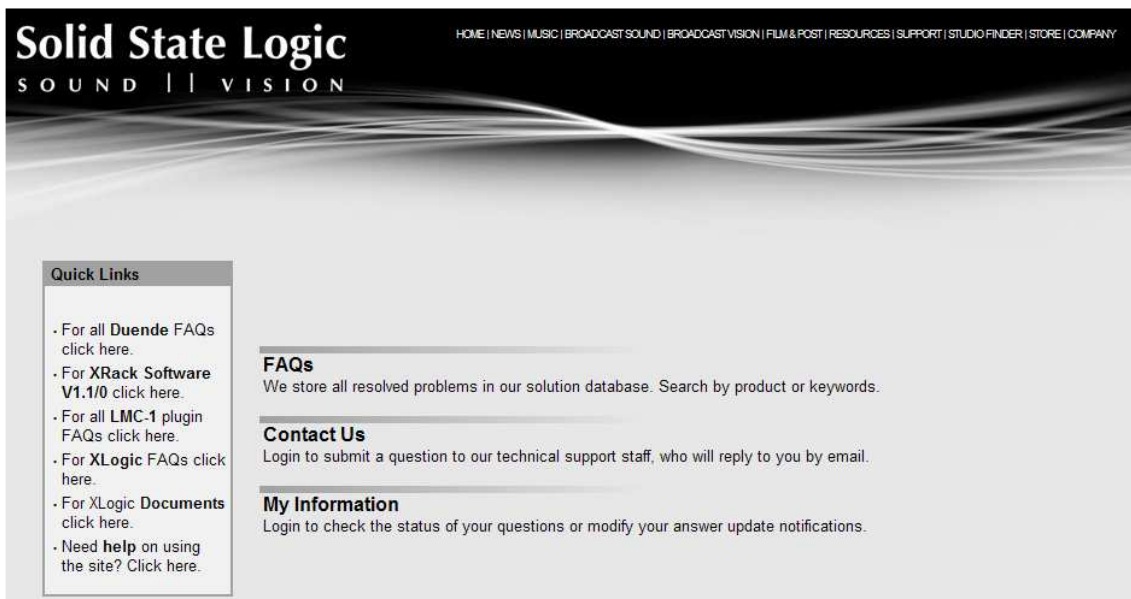
Compressor IN: Switches the compressor IN/OUT of the signal path.

8. Duende Support

Support FAQs

To access the latest support information on Duende, 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.

URL: http://solid-state-logic-en.custhelp.com

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

www.solid-state-logic.com

9. Warranty

Warranty Period

The warranty period for this unit is 12 months from date of purchase.

In Warranty Repairs

In the event of a fault during the warranty period the unit must be returned to your local dealer or distributor who will arrange for it to be shipped to Solid State Logic for repair. All units should be shipped to Solid State Logic in their original packaging. Solid State Logic can not be held responsible for any damage caused by shipping units in other packaging. In such cases Solid State Logic will return the unit in a suitable box, which you will be charged for. Please do not send manuals, power leads or any other cables - Solid State Logic can not guarantee to return them to you. Please also note that warranty returns will only be accepted as such if accompanied by a copy of the receipt or other proof of purchase.

Out of Warranty Repairs

In the event of a fault after the warranty period has expired, return the unit in its original packaging to your local distributor for shipment to Solid State Logic. You will be charged for the time spent on the repair (at Solid State Logic's current repair rate) plus the cost of parts and shipping.

Visit SSL at URL: http://www.solid-state-logic.com

Part Number: 82S6MC040D

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