



# **Lawo Plug-in Collection**

## **Operator's Manual**

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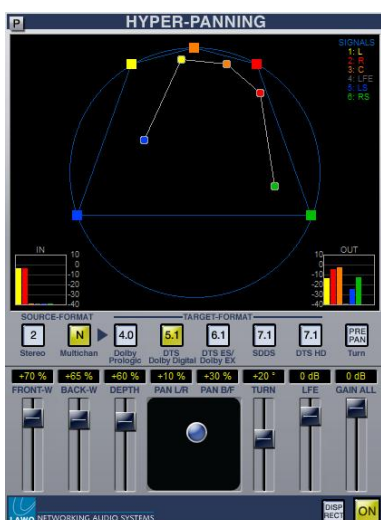
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## Chapter 1: Overview

### Welcome

Welcome to Lawo's plug-in collection, a unique series of high end signal processing plug-ins designed to run on any VST compatible workstation.

Each plug-in reproduces signal processing found on Lawo's **mc<sup>2</sup>** series of mixing consoles, with a few tweaks and additions to provide some great processing tools including:



- **AGC (Automatic Gain Control)** – ideal for ‘levelling’ signals with a wide dynamic range. This plug-in combines an expander and compressor with maximum and minimum gain controls and sidechain filter section.
- **Compressor** – Lawo’s mc<sup>2</sup> Compressor section: a great sounding compressor featuring hard or soft behaviour.
- **CompressorSCF** – as above but with two bands of parametric EQ available in the compressor sidechain.
- **Limiter** – Lawo’s mc<sup>2</sup> Limiter section: an excellent peak limiter with ‘look ahead delay’.
- **Expander** – Lawo’s mc<sup>2</sup> Expander section: faithfully reproduced from the mc<sup>2</sup> series.
- **Gate** – Lawo’s mc<sup>2</sup> Gate section: a noise gate featuring hysteresis control.
- **GateSCF** – as above but with two bands of parametric EQ available in the expander sidechain.
- **Parametric-Equaliser** - Lawo’s mc<sup>2</sup> EQ section: a 4-band parametric equaliser featuring bell, constant Q, notch, shelf and pass band filter types.
- **Graphic-Equaliser** – a fully adjustable 31-band graphic equaliser with additional filters for high-pass, low-pass and notch filter operation.
- **Delay** – up to 1.8 seconds of delay with dry/wet and feedback controls. Delay time can be entered in ms, samples, meters, bpm or frames; a TAP button exists for easy tempo entry.
- **Image-Control X** - Lawo’s mc<sup>2</sup> Image section: a great tool for controlling stereo width and image. Also includes phase reverse, MS encoding/decoding and mono compatibility functions to deal with problem stereo sources.
- **Hyper-Surround Panning** – a unique tool for controlling source positioning within a surround field. Hyper-Panning can take any mono, stereo or surround input, and control its position within the surround field.

## Chapter 2: Installation

### Plug-in Components

In order to run the Lawo plug-in collection, you will need to install the Lawo plug-ins onto your host workstation and connect an **iLok** dongle containing the Lawo plug-ins user license.

**iLok** is a USB hardware “dongle” manufactured by PACE Anti-Piracy. It can hold multiple cross-platform licenses and enables users of licensed software to use that software on different machines without having to “register” each one.

Note that an **iLok** dongle is NOT included with the Lawo bundle.

Delivered with the Lawo bundle are two components:

- **Lawo plug-in Installer Disc** – installs the complete Lawo plug-in collection onto your host workstation.
- **Lawo plug-in User License Code** – this may be included with the bundle or emailed to you after purchase. You will need to transfer the user license onto your iLok dongle via the iLok website at: [www.ilok.com](http://www.ilok.com).



Note

### System Requirements

The Lawo plug-in collection can be installed and operated from any host workstation meeting the following requirements:

#### Macintosh

- OSX 10.4.x
- Intel® Core™ 1.66 GHz, 1 GB RAM
- Audio Unit or VST-2.4 Host

#### PC

- Windows 2000 / XP (32Bit) / Vista (32/64Bit)
- Processor: Pentium 3 or higher (not Itanium)
- VST-2.4 Host

The Lawo plug-in bundle contains VST PC, VST Mac, Audio Unit and MAC-RTAS plug-in formats.

Note that Lawo plug-ins support up to 64-bit, 192kHz operation; resolution is limited only by the resolution of the host application.



Note

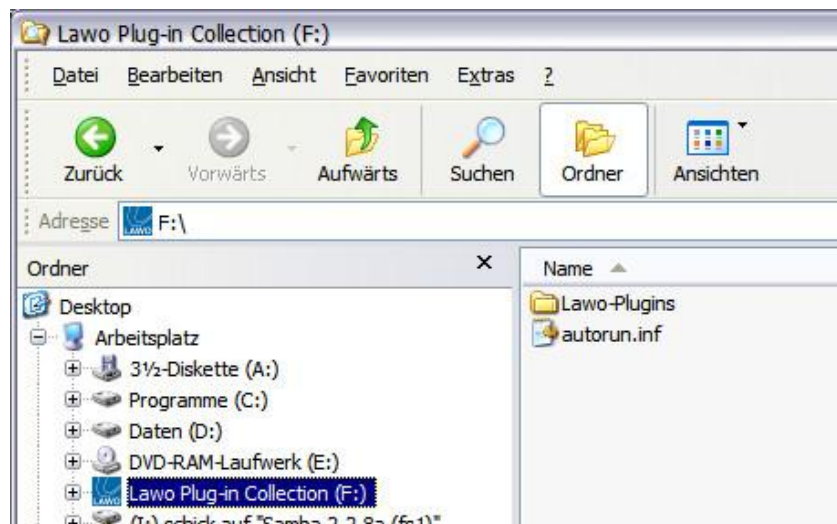
## Software Installation

The installer programme installs the complete Lawo plug-in collection onto your host workstation. You may install the collection onto multiple machines; you do not need the iLok dongle to complete the installation process.

1. Insert the “Lawo Plug-in Collection” disk to the host computer.

*If Autoplay is activate then the installer programme will start.*

If the installer programme does not start, select the “\*.exe” file contained on the disk:



2. Follow the on-screen instructions to install the plug-in collection.

The plug-in files are copied to the following locations on the hard drive during installation:

### VST Windows

C:\Program Files\Steinberg\VstPlugins\Lawo\

### Macintosh

- **AU:** Startup Disk/Library/Audio/Plug-Ins/Components
- **VST:** Startup Disk /Library/Audio/Plug-Ins/VST
- **RTAS:** Startup Disk /Library/Application Support/Digidesign/Plug-Ins

## User License

To operate the plug-ins you will need an **iLok** dongle (not provided) holding a valid Lawo plug-in user license connected to the USB port of the host workstation.

The **iLok** user license code will either be supplied with the plug-in bundle or emailed to you after purchase. To transfer the user license onto your iLok dongle please visit the iLok website at: [www.ilok.com](http://www.ilok.com).

You can find instructions on how to install **iLok** drivers onto your workstation and transfer a user license to the **iLok** dongle in the following documents which accompany this manual:

- **iLok Driver Installation.pdf**
- **Lawo Plug-in Collection License Redemption.pdf**

Once you have installed the plug-in collection and connected your **iLok** dongle, you will be able to assign Lawo plug-ins from your host application.

Each host DAW application has its own method for assigning plug-ins and opening their Editor window. Therefore, please consult your DAW documentation for details.

## Chapter 3: Operating Principles

### Introduction

This chapter deals with the general operating principles common to all plug-ins within the Lawo collection.



Note that throughout this manual you should assume that to click means a left-click operation unless otherwise stated. Keyboard functions are described in [ ] brackets – for example, press and hold [SHIFT] means that you should press and hold the **SHIFT** button on your keyboard.

### The Plug-in Edit Window

The plug-in Editor allows you to adjust and view parameters. Below is the Edit window for the **mc<sup>2</sup> Compressor**:



## Adjusting Switched Parameters

To adjust switched parameters such as compressor **ON**, **SOFT KNEE** or mono/stereo:

1. Click on the button:
  - **Yellow** buttons are enabled (**on**).
  - **White** buttons are disabled (**off**).



## Adjusting Rotary Controls

To adjust rotary controls such as Compressor Make-up **GAIN**, either:

1. Click on the rotary control and drag left/down to reduce or right/up to increase the value.

Or:

2. On some host applications, you may press and hold **[ALT]** and then drag on the control in a circular motion, just like you would operate a physical control on a mixing desk.



Or:

3. Click on the parameter value (e.g. **+10.0dB**) and type in a new value from the keyboard:
  - On the first click, the whole value is selected (as shown opposite) and will be overwritten when you type.
  - Click again to position your cursor within the field to modify the current value.
  - You can type **k**, **m** or **u** after the value to enter kilo, milli or micro – for example, type **10k** to enter a frequency of 10000Hz.
  - You can right-click (PC Users) to **Cut**, **Copy**, **Paste**, **Delete** or **Select All** of the text field.



Each rotary control also has its own dedicated display:

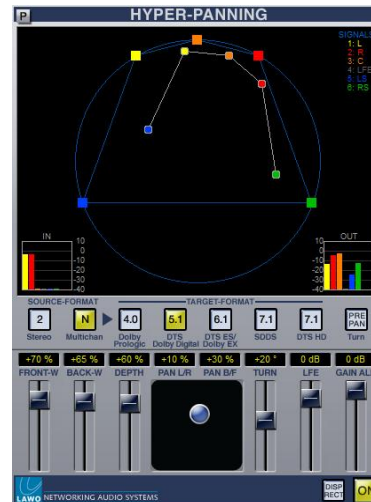


The display shows the parameter value (e.g. **+10.0 dB**), and the current position of the control is indicated within the horizontal bar.

Note that for parameters such as level, this bar indicates how far away the control is from zero.

## Adjusting Sliders

Some plug-ins use sliders (faders) to adjust parameter values – for example, on the **Graphic-Equaliser** or **Hyper-Panning**:



To adjust sliders:

1. Click on the slider and drag to adjust the parameter value.

You can press and hold **[SHIFT]** and then drag the slider for fine adjustment.

Or:



2. Click on the parameter value (e.g. **+5%**) and type in a new value from the keyboard:

- On the first click, the whole value is selected (as shown opposite) and will be overwritten when you type.
- Click again to position your cursor within the field to modify the current value.
- You can right-click (PC Users) to **Cut**, **Copy**, **Paste**, **Delete** or **Select All** of the text field.

## Resetting Parameters

To reset a rotary control or slider to its default value:

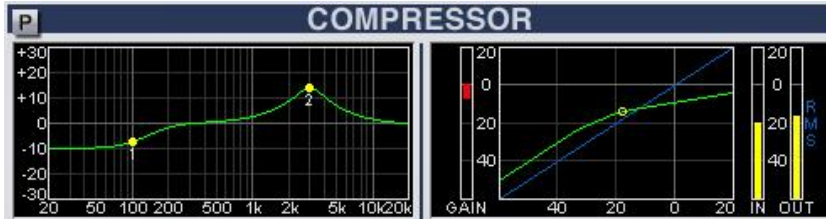
1. Press and hold **[CTRL]** and then click on the rotary control or slider.

Or:

2. Right-click on the rotary control or slider (PC Users).

## Graphical Overview

All plug-ins feature a graphical overview of their settings – for example, on the **Compressor SCF** plug-in you can view the sidechain EQ on the left and compressor action on the right:



Note that with the exception of the **Graphic-Equaliser** plug-in, these areas are for display purposes only; you cannot draw on the graphs to alter parametric EQ or compressor settings.

## Mono, Stereo or Multi-channel Operation

All Lawo plug-ins can be assigned to mono or stereo channels. In addition, the Hyper-Panning plug-in may be used on surround channels (up to 7.1).

On dynamics plug-ins such as the **Compressor** shown opposite, click on the mono/stereo button to enable or disable stereo operation. In our example, the compressor is set for stereo.

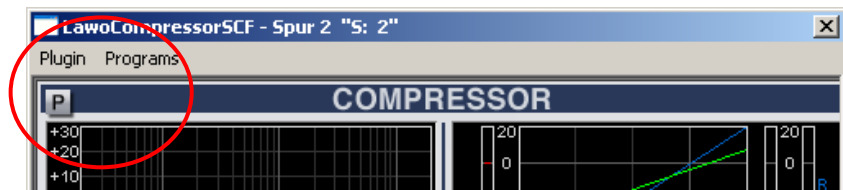
Note that if a dynamics plug-in is assigned to a stereo channel and switched to mono mode, the left and right channels are both controlled by the left input signal.

For details on the configuration of the **Hyper-Panning** plug-in, please see Page 45.



## Presets/Programs

Depending on your host DAW application, you may see some additional menus and options at the top of each plug-in window. The example below shows a plug-in Editor launched within the Sequoia DAW:



The **Plugin** menu option, in our example, provides access to functions such as Bypass, Program or Bank save/load, etc.

The **Programs** or **P** button accesses additional operations such as “restore current preset” or “switch to another preset without loading it”.

Each host DAW application has its own method for accessing these functions, so please consult your DAW documentation for details.

## Automation

Each Lawo plug-in parameter may be automated if automation is supported by your host DAW.

## External MIDI control

In addition, Lawo plug-in parameters may be controlled by an external MIDI controller if this feature is supported by your host DAW.

Please consult your DAW documentation for details.

## Chapter 4: The Plug-in Collection

### Introduction

This chapter describes the specific parameters and applications for each Lawo plug-in. Plug-ins are described in the following order:

#### Dynamics:

- **Compressor** – Page 14.
- **CompressorSCF** – Page 16.
- **Limiter** – Page 19.
- **Expander** – Page 21.
- **Gate** – Page 23.
- **GateSCF** – Page 25.
- **AGC (Automatic Gain Control)** – Page 27.

#### EQ:

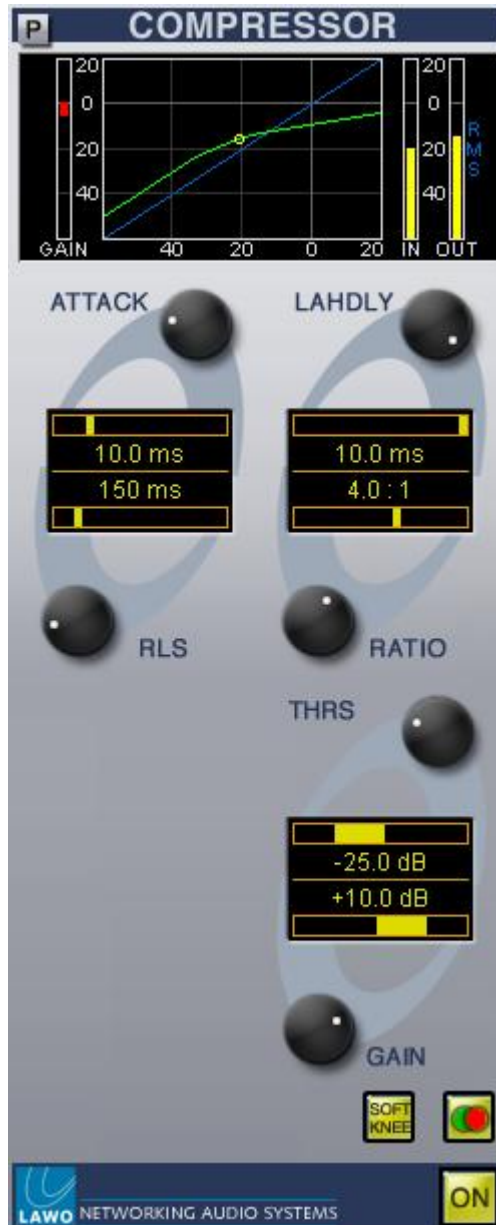
- **Parametric-Equaliser** – Page 30.
- **Graphic-Equaliser** – Page 33.

#### Other Processing:


- **Delay** – Page 39.
- **Image-Control X** – Page 41.
- **Hyper-Surround Panning** – Page 45.

## Compressor

This plug-in faithfully reproduces the signal processing of Lawo's mc<sup>2</sup> Compressor section: a great sounding compressor featuring hard or soft knee behaviour.

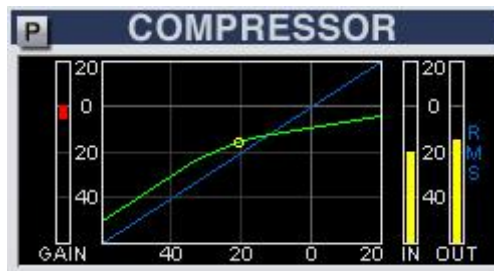


## Parameters

<b>ATTACK</b>	Attack time from 100µs to 250ms.
<b>RLS</b>	Release time from 1ms to 10s.
<b>LAHDLY</b>	Look Ahead Delay from 0 to 10ms.
<b>RATIO</b>	Ratio from 1:1 to 10:1.
<b>THRS</b>	Threshold from -70dB to +20dB.
<b>GAIN</b>	Make-up gain from -20dB to +20dB
<b>SOFT KNEE</b>	Hard or soft knee operation.
	Mono or stereo operation.
<b>ON</b>	Switches the plug-in on or off.

## Operation

The action of the compressor is best described by looking at the top of the plug-in window:



This area shows:

- **GAIN** - the amount of GAIN reduction applied by the compressor.
- Graph – a graphical overview of the compressor settings.
- **IN** and **OUT** – the input and output signal levels to and from the compressor plug-in (the power-sum of left and right channels).

As you adjust your settings, the yellow bouncing ball on the graph shows momentary input level versus gain.

Use the Look Ahead Delay (**LAHDLY**) to delay the main signal path relative to the sidechain. This will result in pleasant dynamics processing even for widely varying dynamic signals.

Note that the GAIN reduction metering follows the attack and release settings. So, if you have a very fast attack, the metering will reflect this.



Tip

## Compressor SCF (Sidechain Filter)


This plug-in is identical to the **Compressor** but adds two bands of parametric EQ enabling you to equalize or filter the compressor sidechain.



## Parameters

Parameters on the right of the Edit window are identical to the **Compressor** plug-in, see Page 14.

The sidechain EQ parameters are adjusted as follows. For each band of EQ:

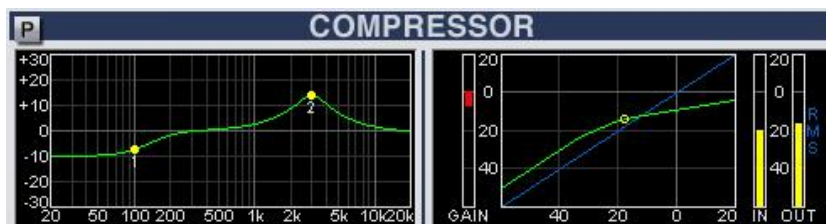
<b>Q / ORD</b>	Quality from 0.1 to 80 (parametric EQ) Or, when operating as a shelving or high/low pass filter, this control sets the order: <ul style="list-style-type: none"> <li>• <b>Order 1</b> – 6dB per octave.</li> <li>• <b>Order 2</b> – 12dB per octave</li> <li>• <b>Order 3</b> – 18dB per octave</li> </ul>
<b>FREQ</b>	Frequency from 20Hz to 20kHz.
<b>GAIN</b>	Gain from -24dB to +24dB
<b>EQ Type</b> 	These buttons select the EQ type: <ul style="list-style-type: none"> <li>• Parametric EQ</li> <li>• Shelving EQ</li> <li>• High or Low pass Filter</li> </ul>
<b>OFF</b>	Switches the band of EQ on or off. Use this button to switch an individual band out of circuit.

For the complete EQ section:

<b>SCF ON</b>	Switches the sidechain equalisation (both EQ bands) on or off.
<b>SCF LSN</b>	Click this button to listen to the sidechain.

## Operation

You will see an overview of the sidechain EQ at the top left of the plug-in window:



To equalize the compressor sidechain:

1. Set up your compressor as described on Page 14.
2. Select the **SCF ON** button (yellow) so that the sidechain EQ is in circuit.

The sidechain EQ graph turns green as shown above. If the **SCF ON** button is off, then the graph is coloured yellow.

3. Make sure that the **OFF** buttons are deselected so that each band of EQ is in operation.
4. Select the EQ type for each of the two bands.
5. Adjust your **GAIN**, **FREQ** and **Q** or **ORDER** parameters.

You are now listening to the results of the compressor with an equalized sidechain.

6. Deselect the **SCF ON** button to listen to the compressor without sidechain EQ.

Or:

7. Select **SCF LSN** to audition the sidechain.

You are now listening to the compressor sidechain. Use this mode to adjust your EQ settings accordingly.

8. Deselect **SCF LSN** to return to the output of the compressor.

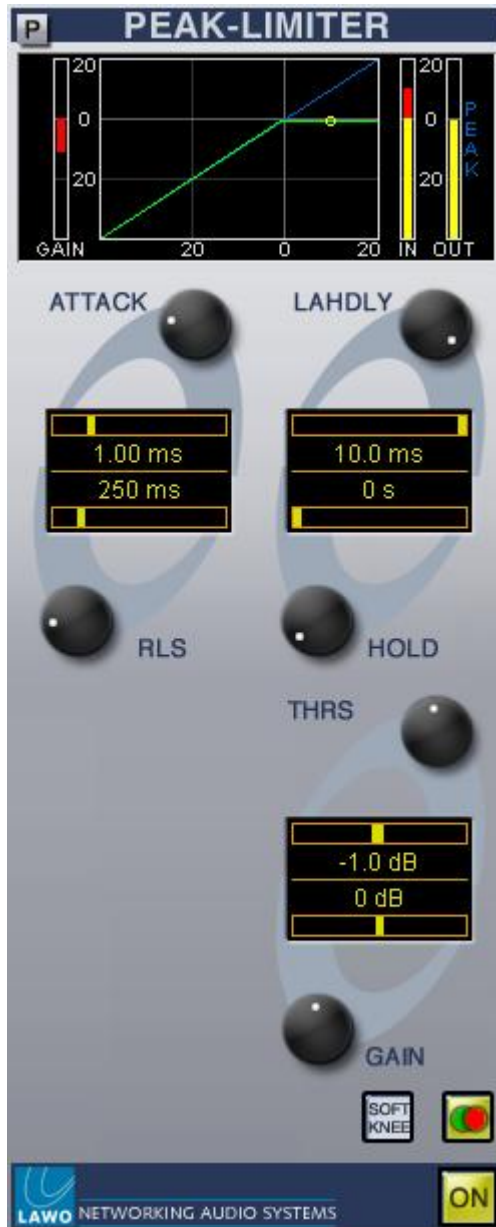


Tip


For a smoother compressor, set -10dB gain for an Order 1 low shelving filter at around 125Hz to prevent unwanted pumping caused by low frequencies.

## Limiter

This plug-in reproduces the signal processing of Lawo's mc<sup>2</sup> Limiter section: an excellent peak limiter with look ahead delay.



## Parameters

<b>ATTACK</b>	Attack time from 100µs to 20ms.
<b>RLS</b>	Release time from 10ms to 10s.
<b>LAHDLY</b>	Look Ahead Delay from 0 to 10ms.
<b>HOLD</b>	Hold time from 0 to 500ms.
<b>THRS</b>	Threshold from -20dB to +20dB.
<b>GAIN</b>	Make-up gain from -20dB to +20dB
<b>SOFT KNEE</b>	Hard or soft knee operation.
	Mono or stereo operation.
<b>ON</b>	Switches the plug-in on or off.

## Operation

The action of the limiter is best described by looking at the top of the plug-in window:



This area shows:

- **GAIN** - the amount of GAIN reduction applied by the limiter.
- Graph – a graphical overview of the limiter settings.
- **IN** and **OUT** – the input and output signal levels to and from the limiter plug-in (the maximum peak level of left or right channels).

As you adjust your settings, the yellow bouncing ball on the graph shows momentary input level versus gain.



For best results you should give the limiter the chance to 'see' signal peaks in advance by setting a look ahead delay (LAHD) of around 5ms.


Note that the GAIN reduction metering follows the attack and release settings. So, if you have a very fast attack, the metering will reflect this.

## Expander

This plug-in reproduces the signal processing of Lawo's mc<sup>2</sup> Expander section.

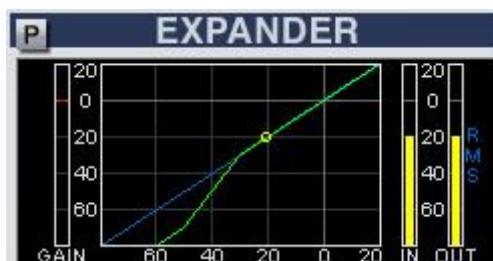


## Parameters

<b>ATTACK</b>	Attack time from 100µs to 250ms.
<b>RLS</b>	Release time from 1ms to 10s.
<b>LAHDLY</b>	Look Ahead Delay from 0 to 10ms.
<b>RATIO</b>	Ratio from 0.10:1 to 1:1.
<b>THRS</b>	Threshold from -80dB to 0dB.
<b>FLOOR</b>	Floor level from -40dB to 0dB
	Mono or stereo operation.
<b>ON</b>	Switches the plug-in on or off.

## Operation

The action of the expander is best described by looking at the top of the plug-in window:



This area shows:

- **GAIN** - the amount of GAIN applied by the expander.
- Graph – a graphical overview of the expander settings.
- **IN** and **OUT** – the input and output signal levels to and from the expander plug-in (the power-sum of left and right channels).

As you adjust your settings, the yellow bouncing ball on the graph shows momentary input level versus gain.


Note that the GAIN metering follows the attack and release settings. So, if you have a very fast attack, the metering will reflect this.

## Gate

This plug-in reproduces the signal processing of Lawo's mc<sup>2</sup> Gate section: a noise gate featuring hysteresis control.

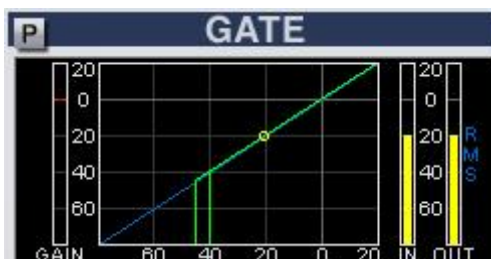


## Parameters

<b>ATTACK</b>	Attack time from 100µs to 250ms.
<b>RLS</b>	Release time from 1ms to 10s.
<b>LAHDLY</b>	Look Ahead Delay from 0 to 10ms.
<b>HOLD</b>	Hold time from 0 to 500ms.
<b>THRS</b>	Threshold from -70dB to 0dB.
<b>HYST</b>	Hysteresis from -10dB to 0dB.
<b>FLOOR</b>	Floor level from off to 0dB
	Mono or stereo operation.
<b>ON</b>	Switches the plug-in on or off.

## Operation

The action of the gate is best described by looking at the top of the plug-in window:



This area shows:

- **GAIN** - the amount of GAIN reduction; when the gate is active, the meter turns red.
- Graph – a graphical overview of the gate settings.
- **IN** and **OUT** – the input and output signal levels to and from the gate plug-in (the power-sum of left and right channels).

As you adjust your settings, the yellow bouncing ball on the graph shows momentary input level versus gain. You can also see any hysteresis applied (the second vertical green line).

Note that the GAIN metering follows the attack and release settings. So, if you have a very fast attack, the metering will reflect this.

## Gate SCF (Sidechain Filter)

This plug-in is identical to the **Gate** but adds two bands of parametric EQ enabling you to equalize or filter the sidechain of the noise gate.



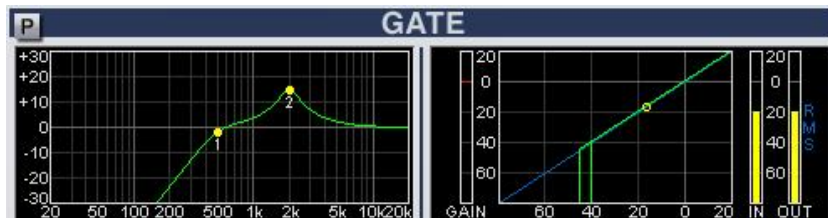
## Parameters

Parameters on the right of the Edit window are identical to the **Gate** plug-in, see Page 23.

Parameters on the right of the Edit window are identical to the sidechain EQ of the **Compressor SCF** plug-in, see Page 16.

## Operation

You will see an overview of the sidechain EQ at the top left of the plug-in window:



To equalize the gate sidechain:

1. Set up your gate as described on Page 23.
2. Select the **SCF ON** button (yellow) so that the sidechain EQ is in circuit.

The sidechain EQ graph turns green as shown above. If the **SCF ON** button is off, then the graph is coloured yellow.

3. Make sure that the **OFF** buttons are deselected so that each band of EQ is in operation.
4. Select the EQ type for each of the two bands.
5. Adjust your **GAIN**, **FREQ** and **Q** or **ORDER** parameters.

You are now listening to the results of the gate with an equalized sidechain.

6. Deselect the **SCF ON** button to listen to the gate without sidechain EQ.

Or:

7. Select **SCF LSN** to audition the sidechain.

You are now listening to the gate sidechain. Use this mode to adjust your EQ settings accordingly.

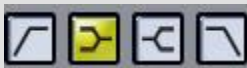

8. Deselect **SCF LSN** to return to the output of the gate.

## Automatic Gain Control (AGC)

This plug-in combines an expander and compressor with maximum and minimum gain controls and sidechain filter section. It is ideal for 'leveling' signals with a wide dynamic range.

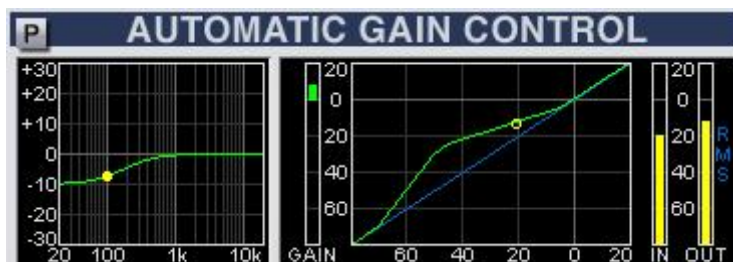


## Parameters

<b>ATTACK</b>	Attack time from 100µs to 250ms.
<b>RLS</b>	Release time from 1ms to 60s.
<b>LAHDLY</b>	Look Ahead Delay from 0 to 10ms.
<b>MAX-GAIN</b>	Maximum gain from 0dB to +30dB.
<b>MIN-GAIN</b>	Minimum gain from -30dB to 0dB.
<b>SCF-FREQ</b>	Sidechain Filter frequency from 20Hz to 20kHz.
<b>SCF-GAIN</b>	Sidechain Filter gain from -24dB to +24dB
<b>SCF-Type</b> 	These buttons select the sidechain type: <ul style="list-style-type: none"> <li>• High Pass Filter</li> <li>• High Shelving Filter</li> <li>• Low Shelving Filter</li> <li>• Low Pass Filter</li> </ul>
<b>SCF ON</b>	Switches the sidechain EQ on or off.
<b>SCF LSN</b>	Click this button to listen to the sidechain.
<b>E-RATIO</b>	Expander ratio from 0.10:1 to 1:1.
<b>E-THRS</b>	Expander threshold from -70dB to 0dB.
<b>C-RATIO</b>	Compressor ratio from 1:1 to 10:1.
<b>C-ROT.P</b>	Compressor rotation point from -20dB to +20dB.
	Mono or stereo operation.
<b>ON</b>	Switches the plug-in on or off.

## Operation

This plug-in combines several processes in order to achieve automatic gain control of an incoming signal. You will see an overview of the processing of the top of the plug-in window:



- **Sidechain EQ** – an overview of any sidechain filtering.
- **GAIN** - the amount of GAIN reduction applied.
- **Graph** – a graphical overview of the expander, compressor and maximum/minimum gain settings.
- **IN** and **OUT** – the input and output signal levels to and from the AGC plug-in (the power-sum of left and right channels).

As you adjust your settings, the yellow bouncing ball on the graph shows input level versus gain.

To use this plug-in to 'level' a signal with a wide dynamic range:

1. Select the **ON** button (yellow) so that the AGC is on.
2. Set the Compressor Rotation point (**C-ROT.P**) and the Compressor Ratio (**C-RATIO**) – the default settings of -5dB and 2:1 are a good starting point for most signals.
3. Now adjust the Maximum Gain and Minimum Gain:

Note that the Compressor Rotation point defines where the Maximum and Minimum Gain will be applied:

- Maximum Gain – is applied to signal levels below the Compressor Rotation point.
- Minimum Gain – is applied to signal levels above the Compressor Rotation point.

So to squash your signal harder, apply lots of Maximum Gain (e.g. +30dB) and reduce the Minimum Gain (e.g. -30dB).

4. Now set an Expander so that low signal levels (e.g. noise) will not be increased by the compressor:
  - Levels below the Expander Threshold (**E-THRES**) remain at 1:1.
  - Adjust the slope using the **E-RATIO** control.

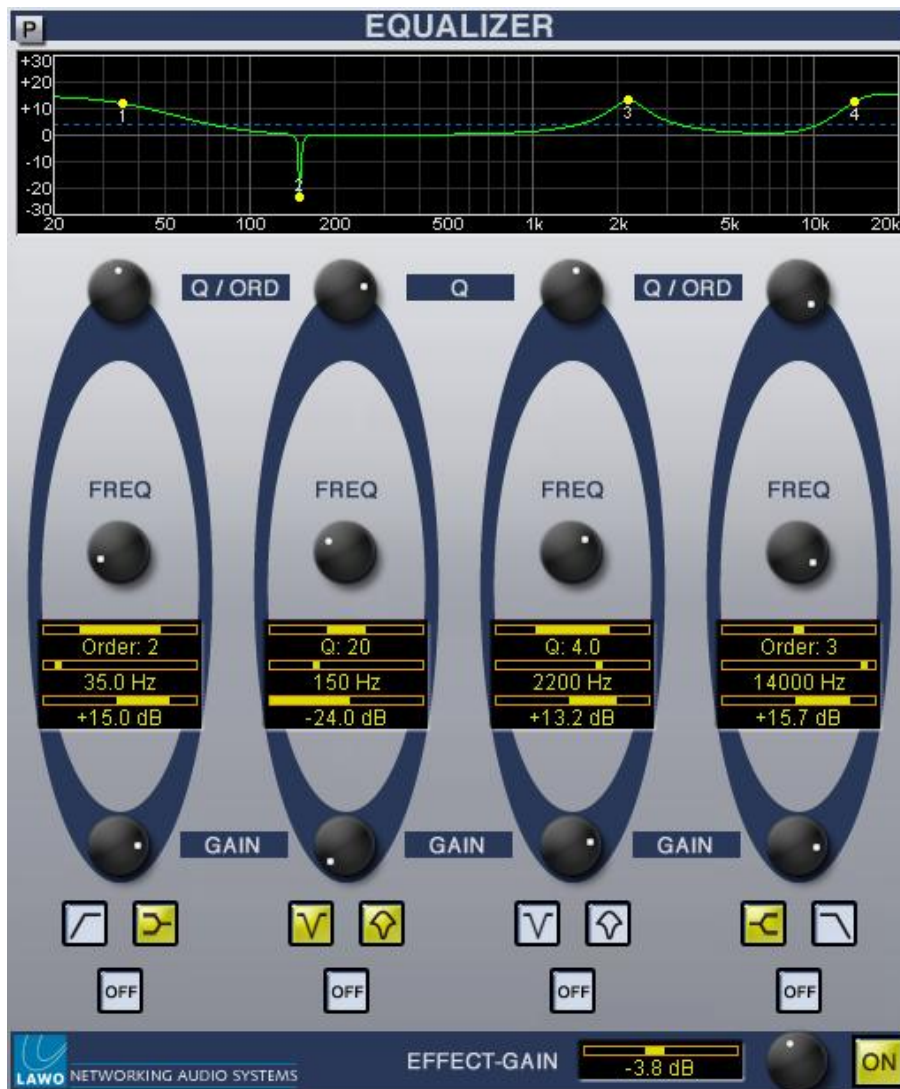
As with the other dynamics processing plug-ins, you can use the Look Ahead Delay (**LAHD**) and Sidechain Filter to optimise the signal processing. See Page 16 for details.



Note

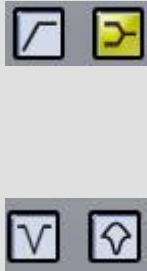
## Parametric-Equaliser

This plug-in faithfully reproduces the signal processing of Lawo's mc<sup>2</sup> EQ section: a 4-band parametric equaliser featuring bell, constant Q, notch, shelving and pass band filter types.



## Parameters

For each band of EQ:

<b>Q / ORD</b>	<p>Quality from 0.1 to 80 (parametric EQ) Or, when operating as a shelving or high/low pass filter, this control sets the order:</p> <ul style="list-style-type: none"> <li>• <b>Order 1</b> – 6dB per octave.</li> <li>• <b>Order 2</b> – 12dB per octave</li> <li>• <b>Order 3</b> – 18dB per octave</li> </ul>
<b>FREQ</b>	Frequency from 20Hz to 20kHz.
<b>GAIN</b>	Gain from -24dB to +24dB
<b>EQ Type</b>  	<p>The two outer bands may operate as:</p> <ul style="list-style-type: none"> <li>• Constant Q (all buttons off)</li> <li>• Shelving EQ (shown opposite)</li> <li>• High or Low pass Filter</li> </ul> <p>The two inner bands may operate as:</p> <ul style="list-style-type: none"> <li>• Constant Q (shown opposite)</li> <li>• Notch</li> <li>• Bell</li> </ul>
<b>OFF</b>	Switches the band of EQ on or off. Use this button to switch an individual band out of circuit.

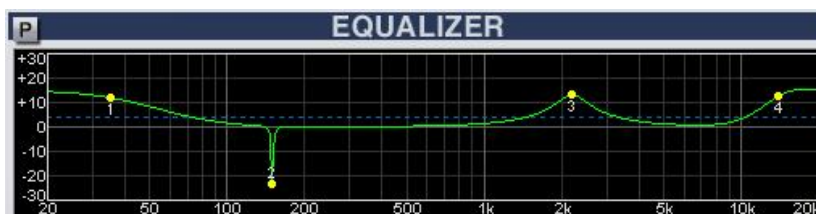
For the complete EQ section:

<b>EFFECT-GAIN</b>	Gain (boosts the output gain of the EQ section) from -24dB to +24dB.
<b>ON</b>	Switches the plug-in on or off.

## Operation

All 4-bands of EQ operate across the full frequency range (20Hz to 20kHz), and offer a variety of different EQ types.

The centre, or corner, frequencies for each band (1 to 4) are displayed within the EQ graph at the top of the plug-in window:



To apply EQ to a signal:

1. Select the **ON** button (yellow) so that the EQ section is in circuit.
2. Make sure that the **OFF** buttons are deselected so that each band of EQ is in operation.
3. Select the EQ type for each band.
4. Adjust your **GAIN**, **FREQ** and **Q** or **ORDER** parameters.



Note

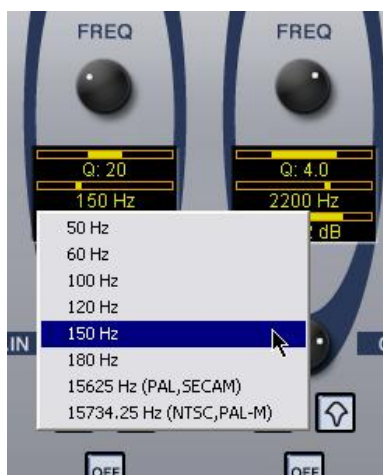
Note that the **ORDER** control offers three positions:

- **Order 1** – 6dB per octave.
- **Order 2** – 12dB per octave
- **Order 3** – 18dB per octave



Tip

Right-click on a frequency value (e.g. **150Hz**) to select from the drop-down menu – this is great for selecting specific frequencies for a notch filter:



5. Use the **OFF** buttons to switch an individual band on/off.
6. Press and hold **[CTRL]** and then click on a rotary control to reset an individual parameter.
7. Use the **EFFECT-GAIN** control to adjust the output level from the EQ plug-in.

## Graphic-Equaliser

This plug-in is a fully adjustable 31-band graphic equaliser ideal for controlling feedback or room tones. It includes additional filters for high-pass, low-pass and double notch filter operation.



## Operation

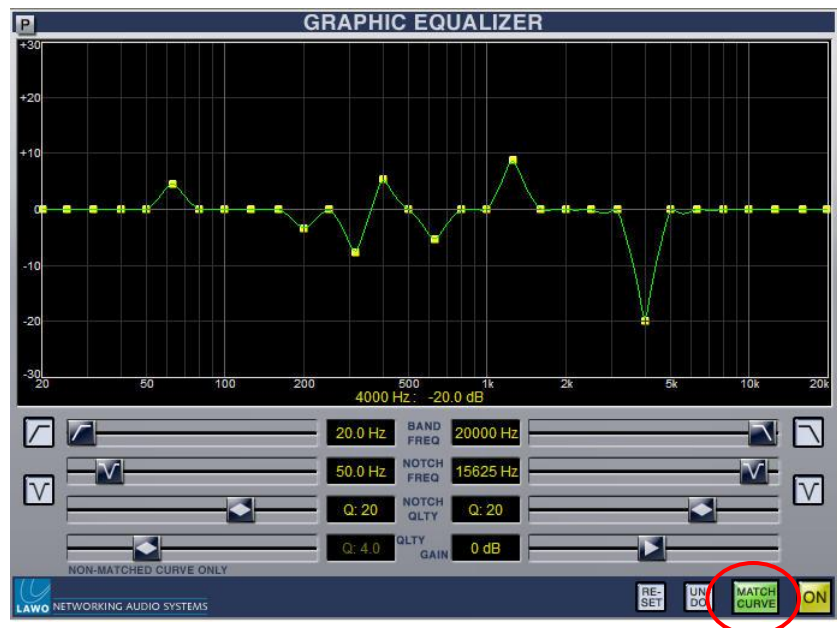
This plug-in provides 31 fixed frequency bands spaced one third of an octave apart from 20Hz to 20kHz. You may adjust the gain of each band individually, and/or use the quick-buttons to action an additional filter function – high pass, low pass and two notch filter bands.

### Operating the Graphic EQ

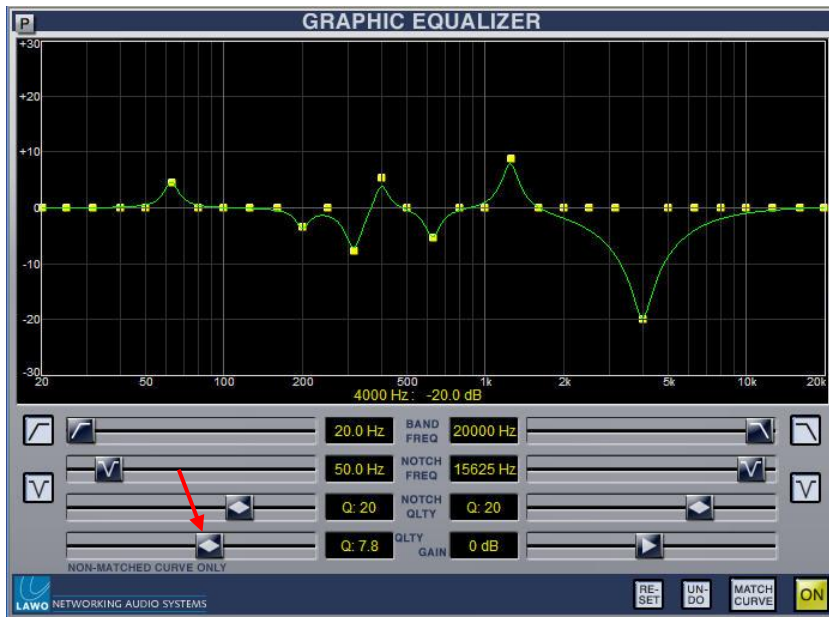
1. Select the **ON** button (yellow) so that the EQ is in circuit.
2. Click and drag on the yellow frequency nodes within the graph area to adjust the gain at a specific frequency.

*Gain may be adjusted from -20dB to +20dB for each band.*

3. If you want the curve to follow your frequency nodes precisely, then select the **MATCH CURVE** button (green):



4. Alternatively, you can create a smoother curve by turning **MATCH CURVE** off and adjusting the **QLTY** slider to adjust the quality (Q) of all frequency bands:



5. You can reset an individual frequency band to 0dB by pressing and holding **[CTRL]** and clicking on the yellow node.



Tip



### Using the Additional Filters

To achieve a high-pass, low-pass or notch filter quickly, there are a number of quick buttons in the lower part of the plug-in window:

1. To add a high-pass filter, select the appropriate quick button and adjust the **BAND FREQ** slider to set the roll-off frequency:



Note

Note that your filter settings are superimposed over the existing 31-band graphic EQ curve; you can still adjust individual frequency bands by clicking and dragging on the yellow nodes.

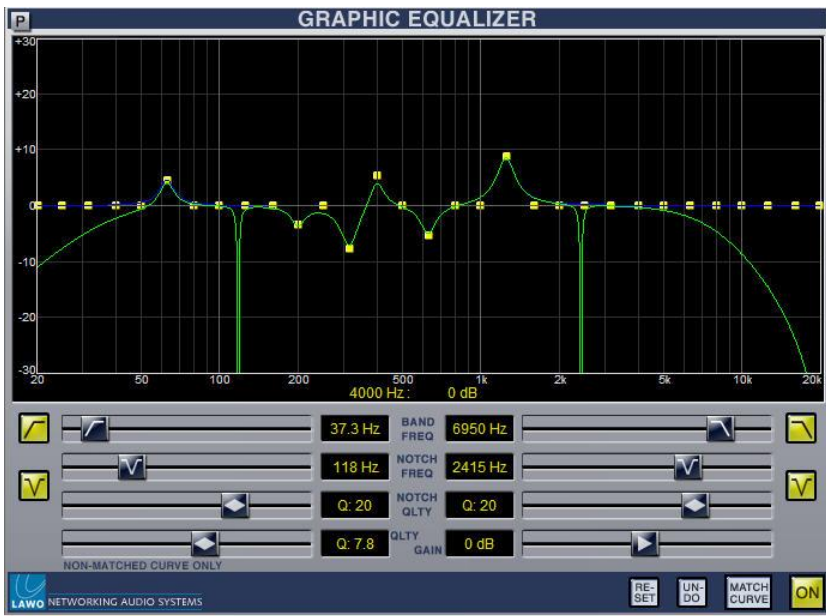
The 31-band Graphic EQ settings are indicated by the blue line; the combined EQ curve is the green line:



2. To add a high-pass filter, select the High Pass quick-button and adjust its **BAND FREQ** slider:



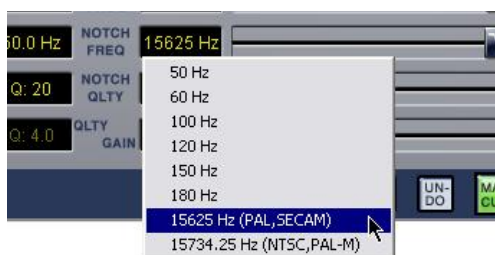
3. You can also add up to two notch filters and adjust the **NOTCH FREQ** and **NOTCH QLTY** for each:



You can right-click on the **NOTCH FREQ** value (e.g. 15625Hz) to select a specific frequency from the drop-down menu:



Tip



## Other Controls

1. Use the **GAIN** slider to boost or cut the output level from the Graphic EQ plug-in.

*If the GAIN is adjusted (not 0dB), then this is represented by a dotted blue line:*



2. Select the **RE-SET** button to reset all frequency bands to 0dB.

Note that this button only resets the frequency bands, and does not deselect any high-pass, low-pass or notch filter quick-buttons.

3. If you select **RE-SET** by accident, select **UN-DO** to undo the reset!

## Delay

This plug-in provides up to 1.8 seconds of delay and may be used as an effect, or to delay a signal by a specific value.



## Parameters

<b>FEEDBK</b>	The amount of feedback applied to the delayed signal from 0% (no feedback) to 99%.
<b>MIX</b>	The mix of dry to wet (delayed) signal. This control can be set from 0% to 100% where: <ul style="list-style-type: none"> <li>• 0% = dry signal only (no delay).</li> <li>• 50% = equal levels of dry to wet.</li> <li>• 100% = wet (delayed signal only).</li> </ul>
<b>DELAY</b>	Delay time which can be set in: <ul style="list-style-type: none"> <li>• ms – up to 1800 milliseconds (1.8 sec)</li> <li>• Spls – up to 79380 samples</li> <li>• Meters – up to 612 meters</li> <li>• BPM – up to 33.3 beats per minute</li> <li>• FR – frames: <ul style="list-style-type: none"> <li>○ up to 43.16 frames (23.98 fps)</li> <li>○ up to 43.30 frames (24 fps)</li> <li>○ up to 45.00 frames (25 fps)</li> <li>○ up to 53.95 frames (29.97 fps)</li> <li>○ up to 54.00 frames (30 fps)</li> </ul> </li> </ul>
<b>MOD</b>	Steps through the delay time modes above.

<b>TAP</b>	Click this button repeatedly to enter the delay time automatically.
<b>ON</b>	Switches the plug-in on or off.

## Operation

To delay a signal by a specific value (for example, to delay an audio signal to match picture delayed by 12 frames):



1. Select the **ON** button (yellow) so that the Delay section is in circuit.
2. Set the **MIX** control to **100%** so that only delayed signal is output from the plug-in.
3. Make sure that the **FEEDBK** control is set to **0%** so that there are no feedback loops.
4. Now enter the delay time using the **DELAY** control.

You can change the entry mode to frames by clicking on the **MOD** button to cycle through to the desired frame option:

- FR23.98 = 23.98 frames per second
- FR24 = 24 frames per second (film)
- FR25 = 25 frames per second (PAL or SECAM TV)
- FR29.97 = 29.97 frames per second (drop frame NTSC)
- FR 30 = 30 frames per second (non-drop frame)

You can also access these options by right-clicking on the delay time.

To use the delay as an effect (for example, to add delay to a vocal channel):



1. Select the **ON** button (yellow) so that the Delay section is in circuit.
2. Set the **MIX** control to **25%** so that you have a mix of dry and wet signal.
3. Enter the delay time using the **DELAY** control.

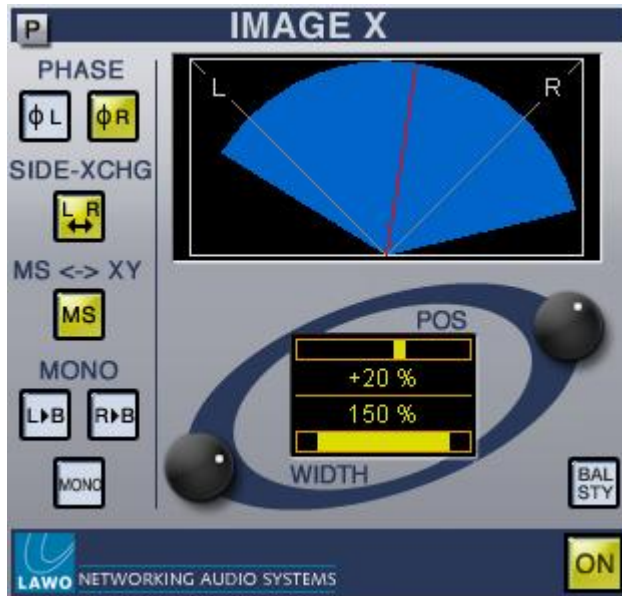
For our example, it might be nice to tap in the tempo, so click on the **TAP** button repeatedly in time to the music. The delay time is automatically calculated.

You can see the tempo entered in beats per minute by pressing the **MOD** button until you reach the BPM option shown opposite.


## Image-Control X

This plug-in is based on a combination of Lawo's mc<sup>2</sup> Image and Input Mixer sections, and is specifically designed for stereo signals.

The Image controls on the right are a great tool for controlling stereo width and image. The Input mixer buttons on the left provide phase reverse, left/right reverse, MS encoding/decoding and mono compatibility functions.



### Parameters: Input Mixer

Ø L	Reverses the phase of the left input.
Ø R	Reverses the phase of the right input.
	Reverses the left and right inputs.
MS	Encodes/decodes sources using sum and difference coding.
L>B	Left to Both. Routes the left input to both sides of the plug-in channel.
R>B	Right to Both. Routes the right input to both sides of the plug-in channel.
MONO	Monos the signal - sums the Left and Right inputs.

## Operation: Input Mixer


The Input mixer controls on the left of the plug-in window can be used as follows:

Remember to select the **ON** button (yellow) so that the plug-in is active.

### » Phase Reverse

Select the **Ø L** or **Ø R** buttons to reverse the phase of either the left or right channel.

### » Left/Right Reverse

Select the  button to reverse the left and right inputs of the stereo channel.

### » MS Encoding/Decoding

Select **MS** to encode or decode sources using sum and difference coding (Sum to Left, Difference to Right).

### » Mono Compatibility

Use the MONO buttons to deal with problem stereo sources which are not stereo:

1. Select either **L>B** or **R>B** to route either the left or right source to both sides of the plug-in channel.

You can use the buttons to deal with situations where either the left or right source signal has disappeared.

2. Select the **MONO** button to sum the Left and Right inputs.

## Parameters: Image Control

<b>POS</b>	Positions the stereo image.
<b>WIDTH</b>	Use this control to adjust the stereo width.
<b>BAL STY</b>	When selected, the <b>POS</b> control also affects stereo width. When not selected, stereo width is retained while the image is positioned.

## Operation: Image Control

The Image controls adjust the position and width of the stereo channel. They may be used in one of two styles:

- **BAL STY** off – the width of the stereo image is retained while the **POS** control offsets the position within the stereo field.
- **BAL STY** on – the **POS** control collapses the width of the stereo image towards the left or right.

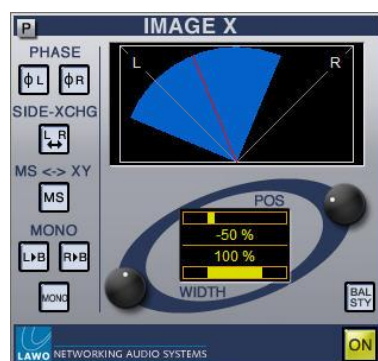
To adjust the stereo width and positioning:

1. Select the **ON** button (yellow) so that the plug-in is active.
2. Make sure **BAL STY** off.
3. Use the **WIDTH** control to widen or narrow the stereo image.

*The graph updates to show your changes by narrowing or widening the blue image area.*

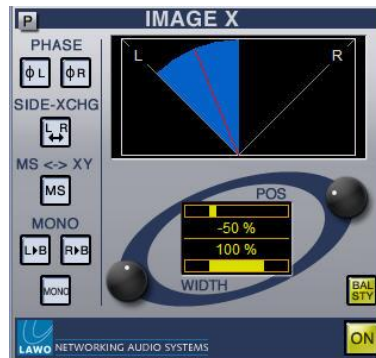
4. Now adjust the **POS** control to move the narrowed or widened image within the stereo field.

*Note how the image width is retained, and the red line on the Image graph moves as you adjust this control to represent the direction of the image control:*



5. Now turn on the **BAL STY** button and adjust the **POS** control.

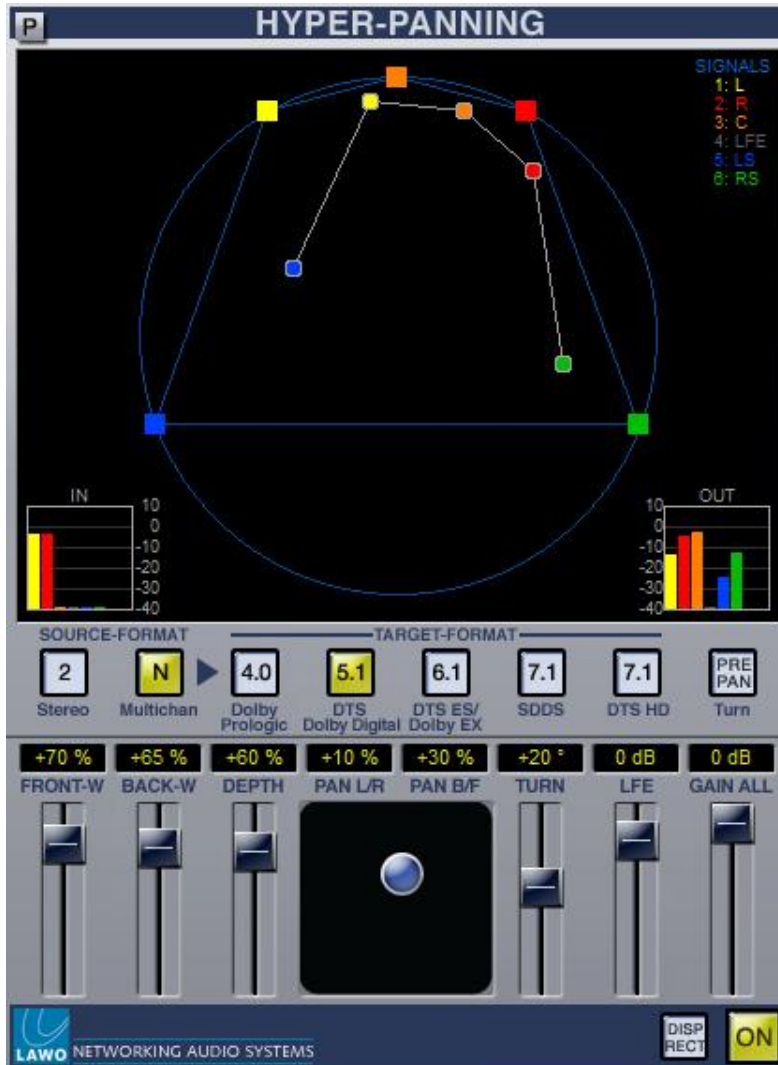
*This time the stereo width collapses as indicated by the narrowing blue area on the graph:*



## Hyper-Surround-Panning

This plug-in faithfully reproduces the Hyper Pan controls found on Lawo's mc<sup>2</sup> mixing consoles, and is a unique tool for controlling source positioning within a surround field.

The tool has many applications, for example, you may have to deal with a surround microphone where the left and right inputs are out of phase, or maybe you wish to rotate the surround source around the sweet spot axis.



## Operational Overview

### Sources and Targets

Hyper Pan can take any mono, stereo or surround input, and control its pan position to a surround output. The choice of input and output formats is made using the SOURCE-FORMAT and TARGET-FORMAT buttons. You may select:

- SOURCE-FORMAT – stereo (2) or multichannel (N).
- TARGET-FORMAT – any one of:
  - 4.0 Dolby ProLogic
  - 5.1 Dolby Digital and DTS
  - 6.1 Dolby EX and DTS ES
  - 7.1 SDDS
  - 7.1 DTS HD



Note

Note that this plug-in utilises 8 inputs and 8 outputs. Therefore, after selecting your SOURCE and TARGET formats, make sure that the inputs and outputs to the plug-in are assigned correctly within your host DAW application. Please consult your host application documentation for details.

In our example, we are operating with a 5.1 TARGET format and therefore should assign output 1 to Left, output 2 to Right, output 3 to Centre, and so on. The correct assignments for your chosen TARGET format are always displayed under the **SIGNALS** list at the top right of the plug-in window:



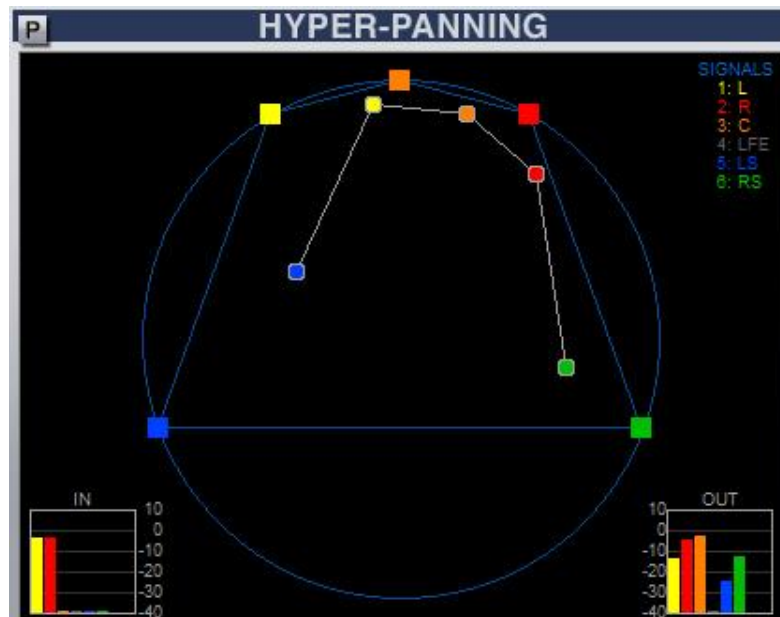
This list also acts as a key to the colour coded nodes within the surround field – in our example, Left is yellow, Right is red, Centre is orange and so on.

## Hyper Pan Parameters

Having selected a source and target format, you can then use the sliders and on-screen joystick to adjust the following parameters:

<b>FRONT-W</b>	Front Width from +100% to -100%
<b>BACK-W</b>	Back Width from +100% to -100%
<b>DEPTH</b>	Depth from +100% to -100%
<b>PAN L/R</b>	Left to Right pan position (X).
<b>PAN B/F</b>	Front to Back pan position (Y).
<b>TURN</b>	Use this parameter to turn the source from +180° to -180°.
<b>LFE</b>	Low Frequency Effect (Subwoofer) Level from off to +15dB.
<b>GAIN ALL</b>	Reduces the gain of all output channels from 0dB to -20dB.
<b>PRE PAN</b>	When selected, <b>TURN</b> operates pre pan (i.e. relative to the sweet spot and not the current X/Y pan position).
<b>DISP RECT</b>	Changes the graphical view of the surround field from a circle to a rectangle.
<b>ON</b>	Switches the plug-in on or off.

The action of Hyper Pan is best described by looking at the top of the plug-in window:



This area shows:

- **IN** and **OUT** – the input and output signal levels to and from the plug-in (up to 8 inputs and 8 outputs).
- **SIGNALS** – shows the input and output order as selected by your TARGET-FORMAT. In our example, we have selected **5.1**.
- Surround field – shows the position of each input (L, C, R, etc.) in relation to the output format. Each node is colour coded. In our example, the colours are:
  - Yellow = Front Left
  - Orange = Front Centre
  - Red = Front Right
  - Blue = Surround Left
  - Green = Surround Right

## Operational Examples

To fully explain each Hyper Pan parameter, it is best to use some examples.

### Using Hyper Pan on a Surround Source

Let's look at how to use Hyper Pan to control the positioning of a 5.1 source to a 5.1 output.

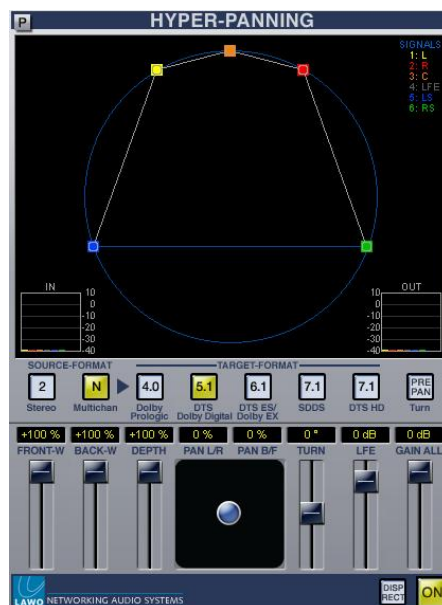
1. Make sure the **ON** button is selected (yellow) so that the plug-in is active.
2. Select **N** as the SOURCE-FORMAT and check the assignment of your 6 input channels (Left, Right, Centre, etc.) to the Hyper Pan plug-in.
3. Select **5.1** as the TARGET-FORMAT and check the output assignments from the plug-in.

Each host DAW application has its own method for assigning inputs and outputs to plug-ins. Therefore, please consult your DAW documentation for details.

We will assume that you are starting from the default settings.

4. To reset the parameters, press and hold **[CTRL]** and then click on a slider or on the joystick control to reset each individual parameter.

Your Hyper Pan window should look as follows:



Note that Hyper Pan is affected by the current joystick (X/Y) pan position. The default starting point is the sweet spot ( $X = 0$  and  $Y = 0$ ).

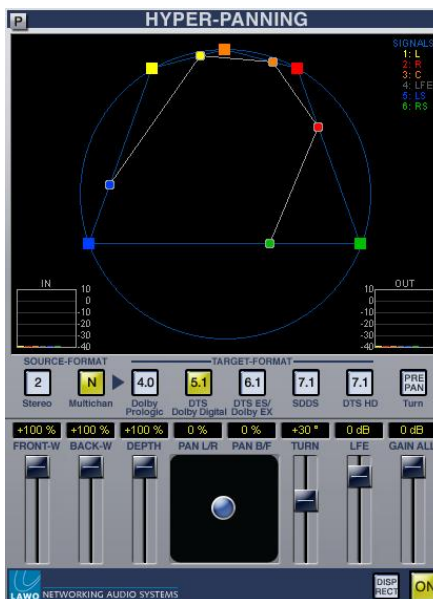


Note

Now let's look at each of the Hyper Pan controls in turn. Note that in each case we will reset each control before adjusting the next to show the affect of each parameter:

### » TURN

This parameter can be used to rotate the surround source within the surround field. It can be adjusted from  $+180^\circ$  to  $-180^\circ$  - our example shows a turn of  $+30^\circ$ :

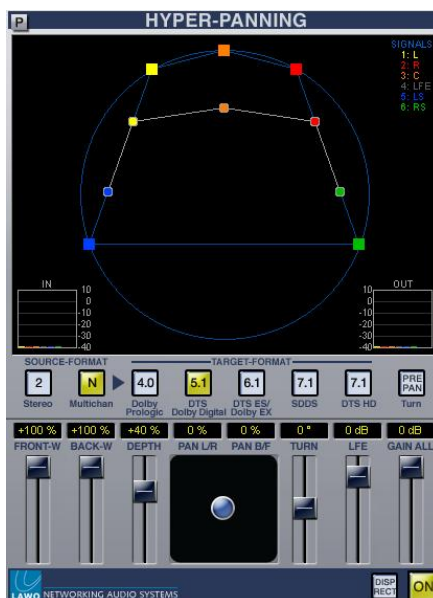


Note

Note that if you have altered the X/Y pan position away from the central sweet spot, then the result of the **TURN** is dependent on the **PRE PAN** button.

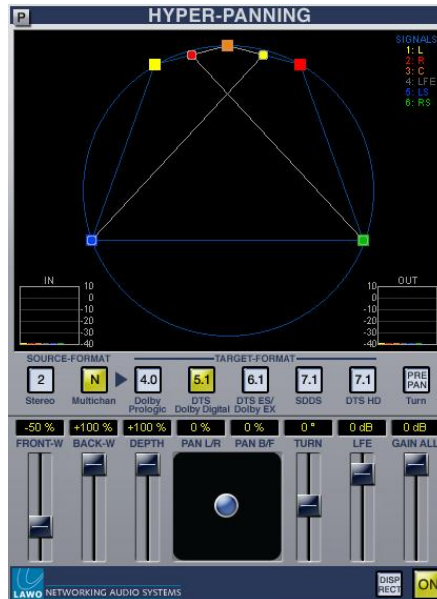
### » DEPTH

This parameter reduces the depth of the surround source with respect to the sweet spot. It can be adjusted from  $+100\%$  through  $0\%$  (all nodes are aligned at the sweet spot) to  $-100\%$  (front and rear nodes are reversed) - our example shows a depth of  $+40\%$ :



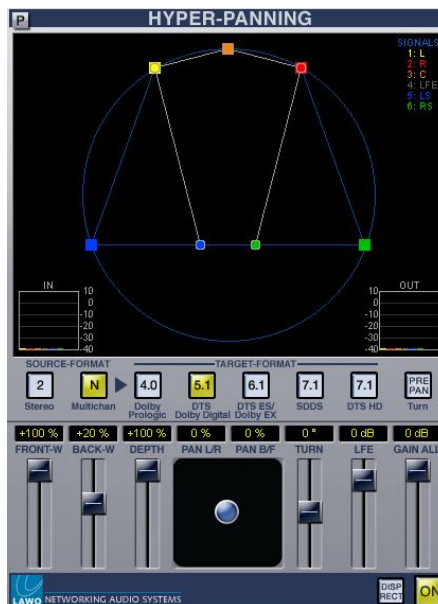
### ► FRONT-W (Front Width)

This parameter adjusts the width of the front channels. It can be adjusted from +100% (full width) through 0% (all channels centered) to -100% (left and right channels are reversed) - our example shows a Front Width of -50%:



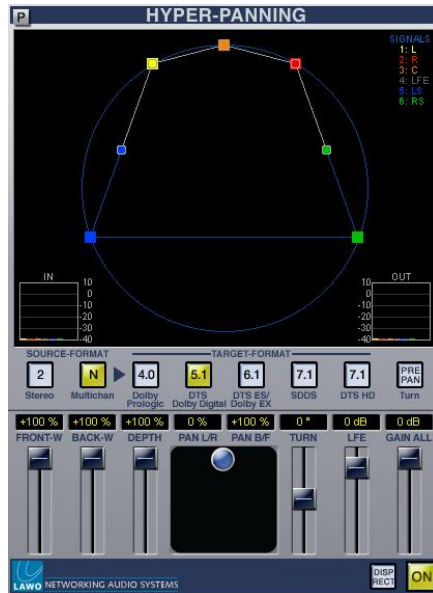
### ► BACK-W (Back Width)

This parameter adjusts the width of the rear channels. It can be adjusted from +100% (full width) through 0% (all channels centered) to -100% (left and right channels are reversed) - our example shows Back Width of +20%:



### » Combining Parameters and Using the Joystick

You can combine any of the above parameters. And you can use the joystick to reposition the sweet spot – the example below shows all parameters set to their defaults, but with the joystick position set forward, effectively bringing the surround channels closer to the front field:

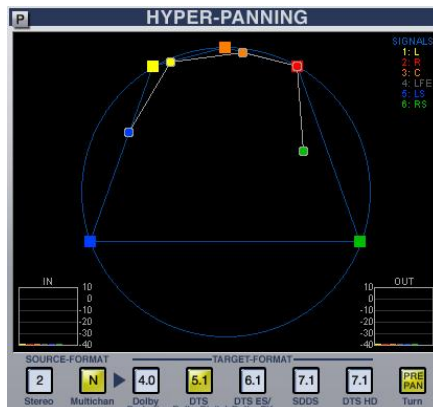


If you now adjust the **TURN** slider, you will find that the surround source rotates around front centre (the current joystick position).



Note that when the X/Y pan position moves away from the central sweet spot, then **TURN** is dependent on the **PRE PAN** button:

- **PRE PAN** off – the surround source rotates around front centre (the current joystick position) as above.
- **PRE PAN** on – allows you to turn to surround source relative to the central sweet spot, and then position the rotated source:



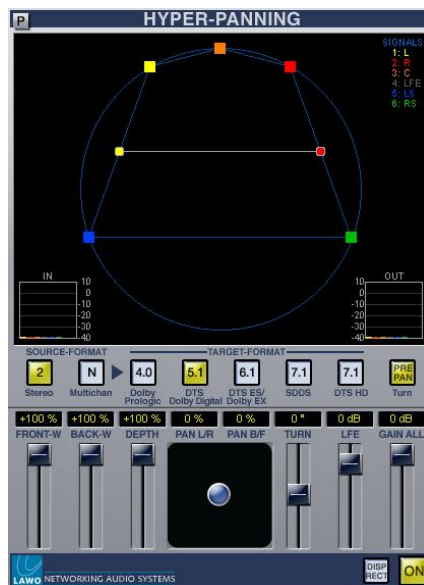
## Using Hyper Pan on Mono Channels

You can also use Hyper Pan to control the positioning of an individual channel within the surround field. Select N as your SOURCE-FORMAT but assign your mono source to the Centre input (in our example, input 3).

The position of the Centre channel now reflects the position of your mono source within the surround field.

## Using Hyper Pan on Stereo Channels

To use Hyper Pan on stereo channels, select the **2** (stereo) SOURCE-TARGET button. The example below shows the starting position of a stereo source with all parameters reset:



Use the **TURN** control to rotate the stereo source around the joystick position, and **FRONT-W** to adjust the stereo width:

