



# Waves SSL EV2

## User Guide



# Introduction

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We suggest that you become familiar with the Waves Support pages: [www.waves.com/support](http://www.waves.com/support). There you will find technical articles about installation, troubleshooting, specifications, and more. Plus, you'll find company contact information and Waves Support news.

## SSL EV2 CHANNEL

If any piece of hardware has earned the title “Classic,” it’s the Solid State Logic 4000 Series analog mixing console. A generation of engineers created iconic mixes for music, television, and films, seated at these desks. The SSL 4000 E, introduced in 1979, was the first mixing desk to incorporate dynamics processing on every channel, along with a master bus compressor in the center section. The ability to patch into the master bus compressor, and to control its sidechain from an internal sub-mix, provided a versatile workspace that opened up many creative possibilities. The 4000 E has a unique personality: it can be present and aggressive, which, along with the characteristic punchiness of the dynamics section, makes for a distinctive sound.

The original 4000 E channel strip includes a mic/line input section that introduces a certain amount of harmonic distortion, a filter section with sweepable HP and LP controls, a four-band EQ, and a dynamics section with a compressor and gate/expander. Filter and EQ can be part of the audio chain or used in the sidechain of the dynamics section. As EQ capabilities evolved, new EQ modules were introduced. Models differed by the slope of filters and EQ behavior. They were identified by the color of their filter knobs [Black Knob (242), Brown Knob (02), Orange Knob (232), and Pink Knob (292)].



## Brown Knob vs. Black Knob

The **Brown Knob** EQ was the original SSL 4000 E channel strip EQ/filter. This established the “SSL Sound” for rock and pop music and was soon heard on the radio everywhere. Because of its wide EQ, the Brown sound can be pronounced, even gritty, yet it is very musical; and it excels on drums and bass. The **Black Knob** EQ was introduced in the mid-1980s. It is cleaner and a tad more open than the Brown Knob and is well suited for vocals and acoustic instruments.

Brown is a wider EQ and is considered better suited for reshaping. Black is narrower, which is usually what you want for scooping. Each has a distinct sound.

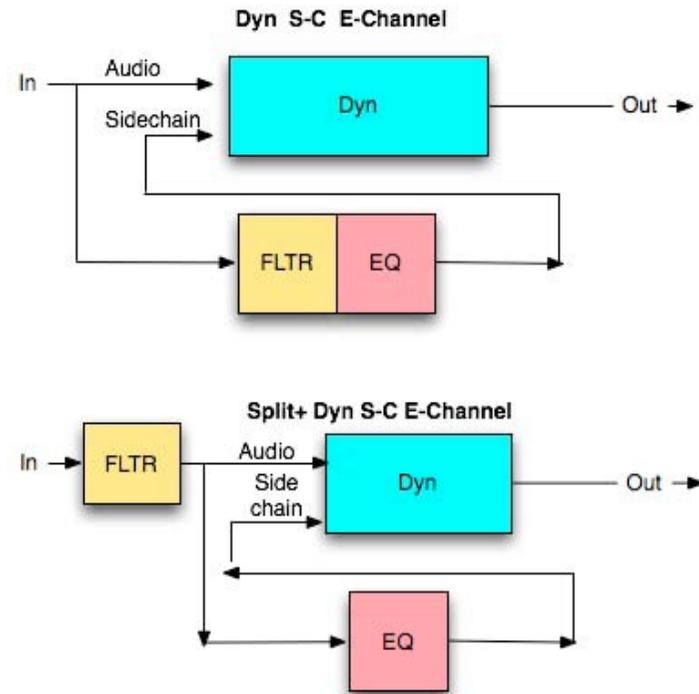
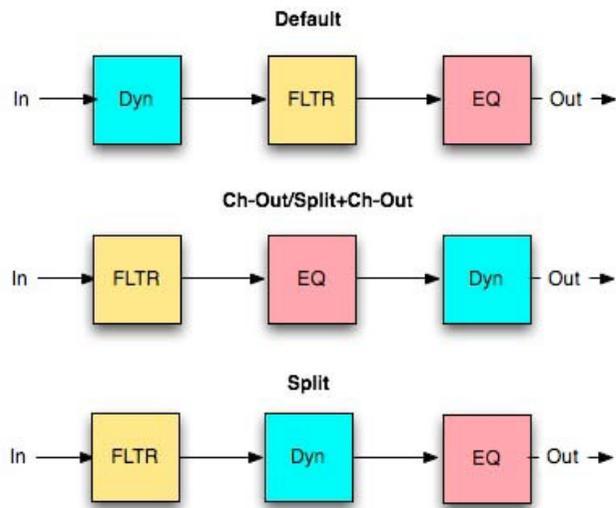
## WAVES SSL EV2 PLUGIN

The original Waves SSL 4000 Collection was released in 2006, in partnership with SSL. It was a groundbreaker in analog device modeling. Every aspect of the SSL hardware was measured, analyzed, and duplicated as a plugin. Every routing option was faithfully recreated. It proved to be a very successful tool, and it remains one of the most frequently used plugins in the business. The Waves SSL EV2 Channel plugin is a new modeling of the SSL 4000 E. It delivers the same functionality as the classic Waves SSL Channel plugin, with a few new features and a slightly rearranged interface. Most notably, you can now switch between the Brown Knob and Black Knob EQs, within the plugin, so you get the best of both worlds. It also provides switchable input analogue harmonic noise distortion and an output imager to control the width of the stereo field.

Waves has been developing modeled devices for a long time. SSL EV2 Channel is an offspring of this work and experience. It reflects the latest advances in hardware modeling, so its sound and behavior are closer to that of the SSL 4000 E channel hardware than was possible when the SSL 4000 Collection was created. If, however, you’re using the original Waves SSL 4000 plugin, you probably like its particular sound and know how to work with it. Each modeling—the old and the new—has its own personality and color, so insert them both in your session and find out which works best for you at that moment.



# SSL 4000E Channel Routing Diagram



## Waves SSL EV2 Controls

The plugin is made up of four sections, and, by default, this is the signal flow: input, dynamics, EQ, and master. The dynamics section and EQ section offer alternative routing.

### Input Section



- **Line** controls the input level to the plugin. As gain increases, so will harmonic distortion.  
Range: -20 dB to +20 dB
- **Mic** can add as much as 50 dB of input gain, which can result in internal distortion. Such high input gains will increase THD but will probably not cause output distortion.  
Range: 0 dB to +50 dB
- **Analog** adds harmonic distortion, which is a key element in recreating the sound of an analog mixing console. If Analog control is off, the line and mic controls will act as pure gain: no THD will be added. If you prefer a cleaner, more modern sound, turn Analog processing off.  
Range: on or off
- **20 dB Pad** reduces the input level by 20 dB.
- **Phase Reverse (Ø)** reverses the phase of the input signal.

! THD is added in the input stage, as well as the output stage; the same behavior as in the SSL 4000 analog mixing desk. Turning Analog off removes all THD from both input and output. It also removes these from the CPU for better performance and greater track count.



## Dynamics Section Controls



The dynamics section consists of a soft-knee compressor/limiter and an expander/gate. Dynamics can be switched to pre-equalizer (default) or post-equalizer (CH OUT).

Although the same gain change circuitry is used for both the compressor/limiter and the expander/gate, two dedicated gain reduction LEDs display activity for each device. Automatic gain makeup, calculated from the Ratio and Threshold settings of the compressor, is applied by the compressor to maintain a steady output level. The default compressor attack time is program-sensitive, responding to the audio material's wavefront.

The dynamics section's threshold circuitry uses variable hysteresis, which allows the signal to decay below its opening level. (Hysteresis is the lag between making a change in input, such as increasing or decreasing power, and the response or effect of that change.) This enables program-dependent dynamic processing.

### Compressor (white knobs)

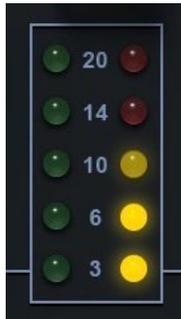
- The compressor's **Ratio/Slope** can be set from 1 to infinity (limiter).
- The **Threshold** is variably adjustable from +10 dB to -20 dB.
- When the **Attack** time switch is set to Slow (F.ATK off), attack time is auto-sensing and program dependent. Fast setting (F.ATK) attack time is 1 ms.
- **Release** time is adjustable from 0.1 second to 4 seconds.



## Expander/Gate (green knobs)

- The expander's **Threshold** is variable from -30 dB to +10 dB.
- **Range** is variable from 0 dB to 40 dB.
- When the **Attack Time** switch is set to Slow (F.ATK off) attack time is auto-sensing and program-dependent; Fast setting (F.ATK) attack time is 1 ms.
- **Release Time** is adjustable from 0.1 second to 4 seconds.
- The **Gate** switch toggles the section from an expander (default mode) to a gate.

## Gain Reduction Meters



There are two LED meters in the dynamics section:

- Green: gate gain reduction
- Yellow: compressor gain reduction

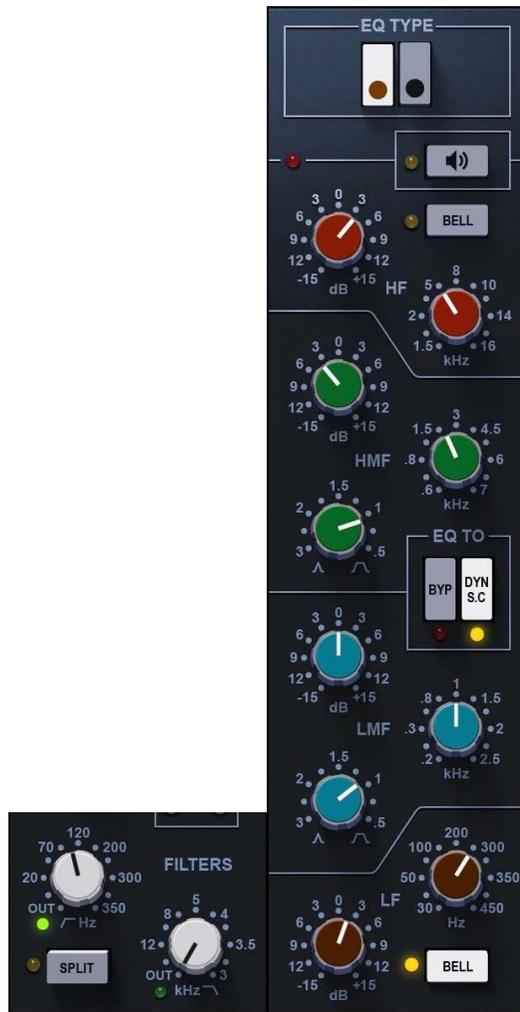
## Dyn To



- **Bypass** bypasses the entire dynamics section. Bypass removes the dynamics from the CPU for better performance and track count.
- **Ch Out** moves the dynamics to the output of the E-Channel, making it post-EQ.



## E-Channel EQ Section Controls



The equalizer is a four-band device that can be routed to the processor's output or to the sidechain of the dynamics section. **Q** can be adjusted in the **LMF** and **HMF** ranges. The Black knob has a **High Pass** filter (18 dB/octave) filter and a **Low Pass** filter (12 dB/octave). The Brown Knob has a **High Pass** filter (12 dB/octave) filter and a **Low Pass** filter (12 dB/octave) filter.

Normally, low pass and high pass filters follow the same path as the entire EQ section. However, when **Split** is selected, the low pass and high pass filters are placed *before* the dynamics processors in the chain. The equalizer can be switched into the dynamics sidechain to afford simple de-essing and other frequency- controlled dynamics processing by selecting **Dyn S-C** at the foot of the section.

LF and HF shelves can be reshaped to bell curves by pressing **Bell**.

### EQ Type



Use the buttons at the top of the EQ panel to select between the SSL EQ types: Black knob (default) or Brown knob. Each EQ type has its distinct sound and behavior. On the original SSL 4000 E channel strip, the color of the LF knobs indicates the EQ type, so we followed that tradition.



Selecting between Black knob and Brown knob EQ types changes the behavior of the entire EQ section, not just the LF controls.



### Low and High Pass Filters (Brown Knob)

- **Low Pass:** 12 dB/octave, 3 kHz to 22 kHz (-3 dB point)
- **High Pass:** 12 dB/octave, 16 Hz to 350 Hz (-3 dB point)
- Turning the knob completely to the left bypasses the filter.
- When **Split** is selected, the low pass and high pass filters are placed before the dynamics processors in the chain.

### Low and High Pass Filters (Black Knob)

- **Low Pass:** 12 dB/octave, 3 kHz to 22 kHz (-3 dB point)
- **High Pass:** 18 dB/octave, 16 Hz to 350 Hz (-3 dB point)
- **Q:** approx. 1.7
- Turning the knob completely to the left bypasses the filter.
- When **Split** is selected, the low pass and high pass filters are placed before the dynamics processors in the chain.

### High Frequency EQ Section

- **Frequency** range: 1.5 kHz to 16 kHz.
- **Gain** range (Brown Knob, bell): -15 dB to +15 dB ( $\pm 1$ db)  
(Brown Knob, shelf): -15 dB to +15 dB ( $\pm 1$ db)
- **Gain** range (Black Knob, bell): -18 dB to +18 dB ( $\pm 1$ db)  
(Black Knob, shelf): -15 dB to +15 dB ( $\pm 1$ db)
- Selecting **Bell** changes the LF and HF EQ from shelf to bell shape.
- Q (bell): 1.7 ( $\pm 10\%$ ), varies with the cut/boost

### High Medium Frequency EQ Section

- **Frequency** range: 600 Hz to 7 kHz
- **Q:** continuously adjustable from 0.1 to 3.5
- **Gain** range (Brown Knob): varies from  $\pm 15$  dB when Q is set at 3.5, less when Q is set tot 0.1
- **Gain** range (Black Knob): varies from  $\pm 18$  dB when Q is set at 3.5, less when Q is set to 0.1



## Low Medium Frequency EQ Section

- **Frequency** range: 200 Hz to 2.5 kHz
- **Q**: continuously adjustable from 0.1 to 3.5
- **Gain** range (Brown Knob): varies from  $\pm 15$  dB when Q is set at 3.5, Q is set at 3.5, less when Q is set to 0.1.
- **Gain** range (Black Knob): varies from  $\pm 18$  dB when Q is set at 3.5, Q is set at 3.5, less when Q is set to 0.1.

## Low Frequency EQ Section (Black Knob)

- **Frequency range**: 30 Hz to 450 Hz
- **Gain** range: (Brown Knob, bell) -15 dB to +15 dB ( $\pm 1$ db)  
(Brown Knob, shelf) -15 dB to +15 dB ( $\pm 1$ db)
- **Gain** range: (Black Knob, bell) -18 dB to +18 dB ( $\pm 1$ db)  
(Black Knob, shelf) -15 dB to +15 dB ( $\pm 1$ db)
- Selecting **Bell** changes the LF and HF EQ from shelf to bell shape. The slope of the bells varies with the cut/boost.
- Q (bell): 1.0 ( $\pm 10\%$ ), varies with the cut/boost

## EQ To



**Bypass** bypasses the EQ section. Bypass removes the EQ from the CPU for better performance and track count.  
**Dyn SC** switches the filters and EQ into the dynamics sidechain.

## Setting Up an External Sidechain



Assign a buss in your DAW to a sidechain. Click the SC button on the WaveSystem Toolbar to enable the external sidechain.



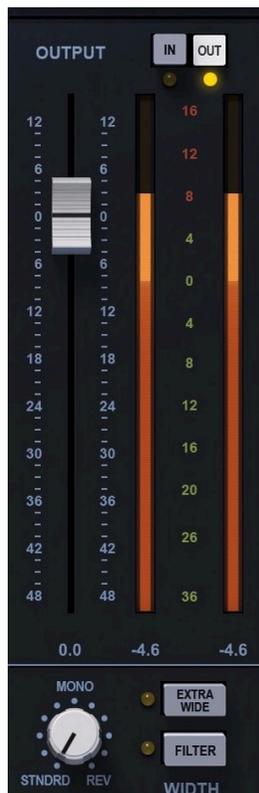
## EQ Solo



The EQ Solo button isolates the EQ band that you are currently adjusting, which helps you to accurately adjust Q and frequency of that band. Touch an EQ frequency or Q control and you will hear only that band.

The red light to the left of the Solo button is an EQ headroom indicator. It is triggered when the output of the EQ section reaches -3 dBFS.

## Master Section



- **In and Out** switch the meter between input and output.
- **Level Indicator** displays levels in VU, where -18 dBFS = 0VU. A red LED indicates clipping. Click on the meter to remove the clip warning.
- **Output Fader** controls the output level of the processor.
- **Width** shapes the signal's stereo image from normal full stereo (Standard) to mono (center position) to reversed full stereo (Rev).
- **Extra Wide** is the width enhancer that lets you spread the sound image wider than the loudspeakers. It's an aggressive effect that alters the signal's phase structure and reduces mid-signal content, so it's important to use it carefully. The amount of the Extra Wide effect is influenced by the Mono control.
- **Filter** is a low-frequency shelf at approximately 200 Hz (before width adjustment) that helps to maintain the integrity of the center during extreme width processing.



## M/S and DUO Processing with StudioRack

SSL EV2 uses the free StudioRack plugin for M/S and DUO processing. StudioRack is a plugin chainer that, among other things, enables parallel processing for discrete channel control. When you install SSL EV2 from [Waves Central](#), the necessary StudioRack presets will be installed. Similarly, when you install StudioRack, the presets that are needed by SSL EV2 are installed.

Using SSL EV2 with StudioRack provides two specific types of processing:

- M/S** (mid/sides) The signal is divided into mid and side components, which can be processed separately. This lets you change the processing and panning between the foreground and background and adjust focus.
- DUO** (separate channels) One StudioRack Parallel Rack is assigned to the left channel and another to the right channel. This lets you adjust the processing of each channel separately, which can change the internal balance.

To set up M/S and DUO processing, first open an instance of StudioRack in your DAW.



- 1 In the main StudioRack, insert a Parallel Split. Open the StudioRack presets menu and select “Plugins Setup/SSL EV2 Channel/MS.” This will take care of the entire StudioRack M/S setup.
- 2 If you prefer to do this manually, use the drop-down menu at the top of each Parallel rack to select a rack input source:  
For M/S processing, Ch1=Mid; Ch2=Sides  
For DUO processing, Ch1=Left; Ch2=Right
- 3 Assign an instance of SSL EV2 to both racks.

Once the StudioRack parallel racks have been processed separately, they are returned to L/R stereo at the output of the StudioRack plugin. Visit the [StudioRack product page](#) to learn more.

