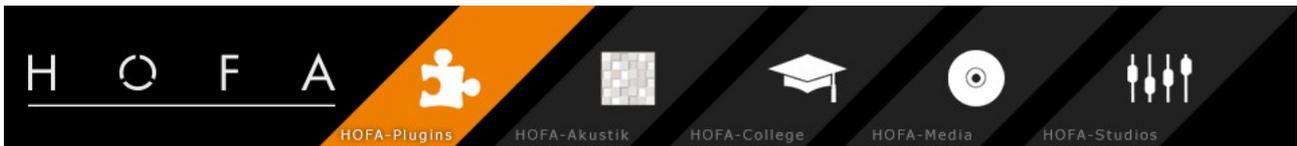


HOFA 4U Meter, Fader & MS-Pan



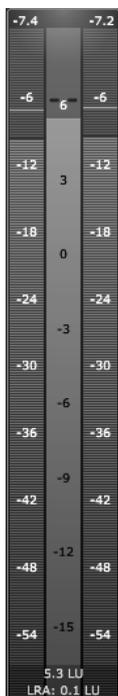
Manual
HOFA
V2.0 / M1



Features

The HOFA 4U Meter, Fader & MS-Pan consist of the peak/EBU-meter which is also part of the IQ-Analyser, a volume fader and a dual panner which also allows panning into the side signal.

Meter



The meter has an intersample peak-meter (left & right) and a EBU loudness meter (in between). Besides the EBU R128 loudness, the loudness range is also shown using square brackets.

For a detailed description of intersample peaks and EBU loudness see the [Intersample Peaks](#) and [EBU R 128](#) sections.

Fader



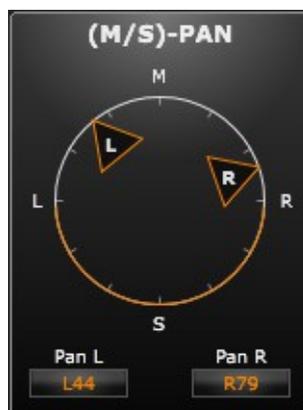
The fader adjusts – as might be expected – the volume. To allow a large fader range as well as the ability for fine adjustment the range about 0 dB has a wider scale than very high or low gains.

Gain



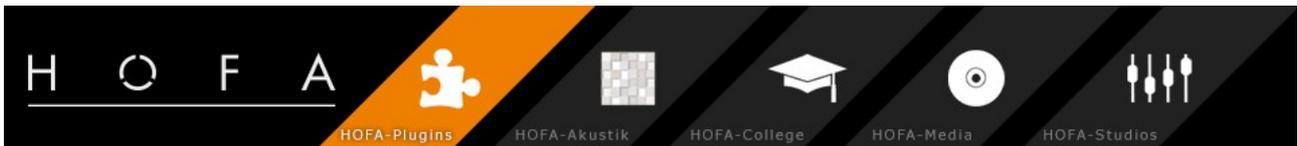
Input-gain control. When using the plugin in M/S mode they control mid/side instead of left/right.

MS-Pan



The MS-Pan is mainly a dual panner. Furthermore it is possible to route the input channels into the output's side signal. For example, this allows a wide stereo image or spatial effects. In this case the mono compatibility may be affected, so it is advised to check the compatibility by a goniometer (e.g. by the HOFA 4 U Goniometer & Korrelator or the HOFA IQ Analyser).

The Trim controls provide adjustments for the left and right input channel.



Controls

Meter

The meter's settings can be set via a menu that appears after right-clicking the plug-in. The meter's peak-hold can also be reset by clicking onto the display above the meter.



Close menu



Switch between EBU modes. Momentary is the quickest response, Integral sums over time allowing loudness comparison.



Switch between scales



If checked, EBU Integral and Loudness Range will be updated



Reset EBU Integral and Loudness Range



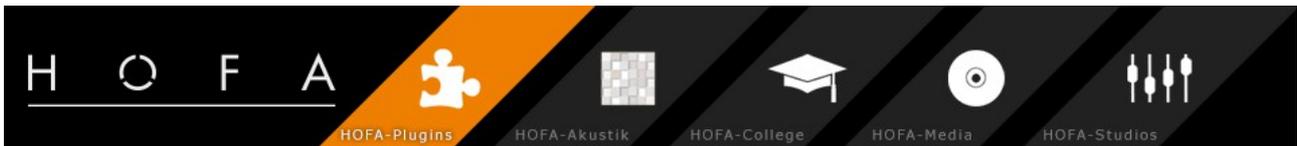
Show intersample peaks.



Enable mouse-over tool-tips

Fader

The fader can be set by mouse-drag, mouse wheel and via input in the decimal display below.



Gain

The trimmers range from $-\infty$ to +24 dB. In M/S mode the input gain is applied to the mid and side signal. Gain is processed before the MS-Pan module.

MS-Pan

All displays can be dragged with the mouse. By clicking, values can be put in directly. In the pan displays "l"/"L"/ "-" can be used for the left and "r"/"R"/"+" for the right side.

Panning is possible from L200 to R200 with values above 100 representing a panning into the side signal.

The panners can also be adjusted by mouse or mouse wheel. To reach values above 100 the "alt" key has to be pressed. "Shift" enables panning width only, "ctrl" mid only.

Buttons



Decode MS; if enabled the left input is routed as mid, the right input as side signal. The Trim controls can be used to adjust mid/side gain.



Invert phase for left/right. Shift-click toggles both sides at once.



Show meter. If disabled, the EBU and peak levels won't be processed.



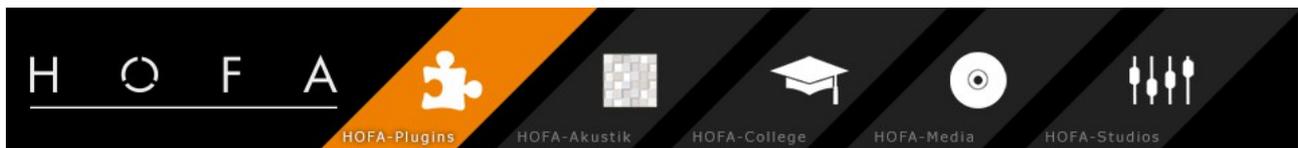
Switch output to mono. This is done behind the panning so the pan setting effects the output volume.



Meter shows signal on input (pre) or output (post)



Mute output



Offline Analysis

To get a quick overview an audio file can be dropped onto the plugin. The plugin will then analyse the EBU- (Integral Loudness & Loudness Range) and peak-levels (sample peak & intersamplepeak/true peak) and show them in a popup box.

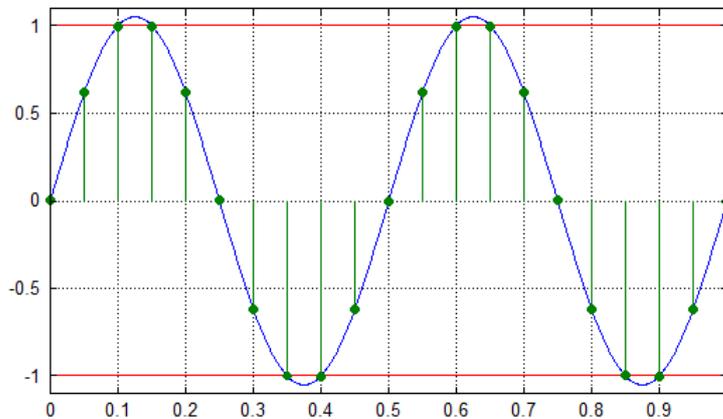
When working with Steinberg Cubase / Nuendo or Presonus Studio One 3, you can also drop parts directly. If several parts are selected and dragged onto the plugin, they will be interpreted as one audio file without pauses between the parts.

In Logic, audio files can also be dragged onto the plugin from the project audio window.

Interesting facts

Intersample Peaks

In the digital domain, signals are represented by samples taken at discrete time intervals. This can lead to a signal that exceeds the digitally available magnitude range when converted to an analog signal while the digital signal still lies inside the range. The following figure demonstrates this:



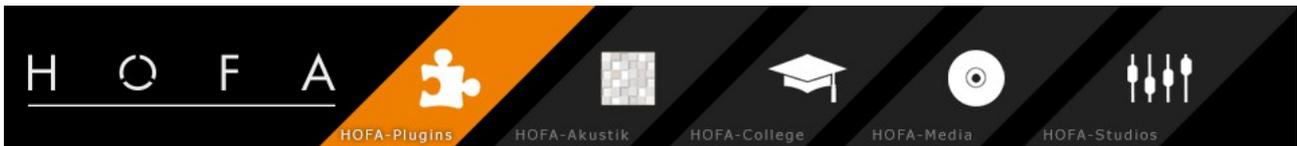
While the (green) digital signal lies in between ± 1 , the (blue) analog signal exceeds this range. This wouldn't be a problem if the analog signal had enough headroom. Unfortunately, most DA converters run on low supply voltages and therefore lack the needed headroom. Therefore a signal might clip even if a sample peak meter doesn't show this.

Intersample peak meters also measure between samples and thus show clippings that only might occur in the analog domain.

EBU R 128

EBU R 128 is an EBU (European Broadcasting Union) standard defining guide values for loudness in broadcasting. The origin of this standard lies in the increasing loudness in broadcasting and the dynamic variations resulting from that (e.g. ads are often louder than regular program). To counteract this, loudness normalization was introduced, aside with a referenced target level.

With EBU R 128 an open standard for loudness measurement was created. Also new



units LU and LUFS (Loudness Unit / Full Scale) were introduced. One LU is basically the same as one dB but describes a loudness measured according to EBU R 128. While LU is a relative level, LUFS is an absolute level, the relationship being $0 \text{ LU} = -23 \text{ LUFS}$.

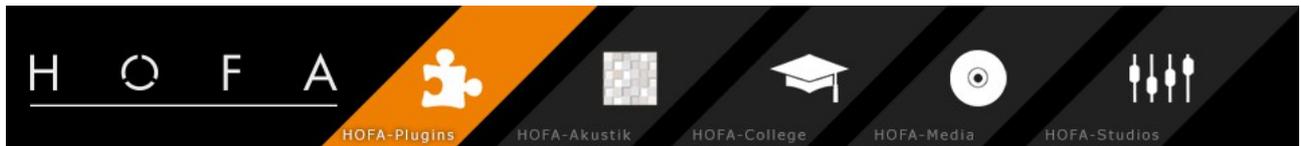
To evaluate a loudness, three different ballistics are introduced. These are the momentary loudness, the short-term loudness and the integral loudness. The first and second ballistic show the actual loudness with the second reacting slower. The last one measures the loudness over a longer time period, resulting in a loudness for that whole time. This measurement is gated, so silent parts don't influence the measurement. Also this loudness is used for a loudness normalization according to EBU R 128.

To judge the program dynamic, EBU R 128 defines the loudness range (LRA). The loudness range quantifies the variations of loudness in time, e.g. the proportion between louder parts and quieter parts.

EBU R 128 claims a program loudness of -23 LUFS ($= 0 \text{ LU}$). On the other hand the loudness of most music is about -10 LUFS , ranging up to -5 LUFS . So one might ask why an EBU meter should be used for music.

The answer is simple: While a loudness reference of -23 LUFS isn't very suitable for music, having a standardized tool for loudness measurement certainly is. Due to the open standard, loudness is comparable between different measurement tools.

The loudness range can help judging the loudness across several music titles (premastering) or on long tracks. Especially on premastered music the value might not be very meaningful.



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