Insight 2 Help

Introduction

New in Insight 2.1

Updated Loudness Metering Options

1. **Updated Loudness Gating Options:** Monitor the **dialogue-gated** loudness of your mix to ensure it meets streaming platform recommendations with the new **dialogue-gated** option in the **Loudness** meter panel.
2. **New LRA Target Range Control:** Set custom LRA target range values in the **Loudness** meter panel.

New in Insight 2.0

Ensure Intelligibility Across Different Listener Environments

1. **Intelligibility Meter**:
    1. Brand new to Insight 2!
    2. Send Dialogue busses to Insight 2 with **Relay** to ensure your dialogue mix holds up in different listener environments.

Updated Loudness Standard Compliance

1. **Loudness Meter**:
    1. Monitor the loudness of your surround sound mixes with support for Dolby Atmos 7.1.2 track configurations.
    2. BS.1770-4 compliant Loudness Metering
    3. Quickly check compliance against a number of different loudness standards with new built in loudness target presets.

Monitor Surround Levels With Support For Dolby Atmos 7.1.2 Tracks

1. **Levels**:
    1. Monitor the levels of your surround mixes with expanded support for surround sound channel configurations.
    2. Insert Insight 2 on surround tracks or busses (with support for up to 10 channels of audio; Dolby Atmos 7.1.2)

Dig Into Your Mix Mith Relay

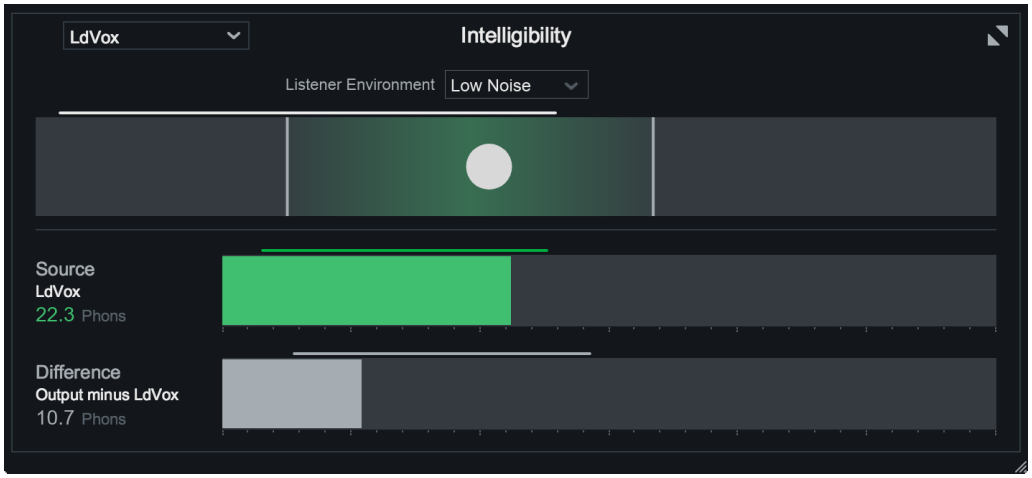
1. **Relay**:
    1. Send audio data to Insight 2 with the all new Relay plug-in.
    2. Select Relay instances in the Intelligibility meter.
    3. Select up to 8 instances of Relay at a time in the Spectrogram meter.

Refreshed User Interface

Intelligibility

Overview

The Intelligibility meter uses inter plug-in communication to receive audio data from **Relay** plug-in instances to allow for the monitoring of dialogue intelligibility in the context of different listener environments.



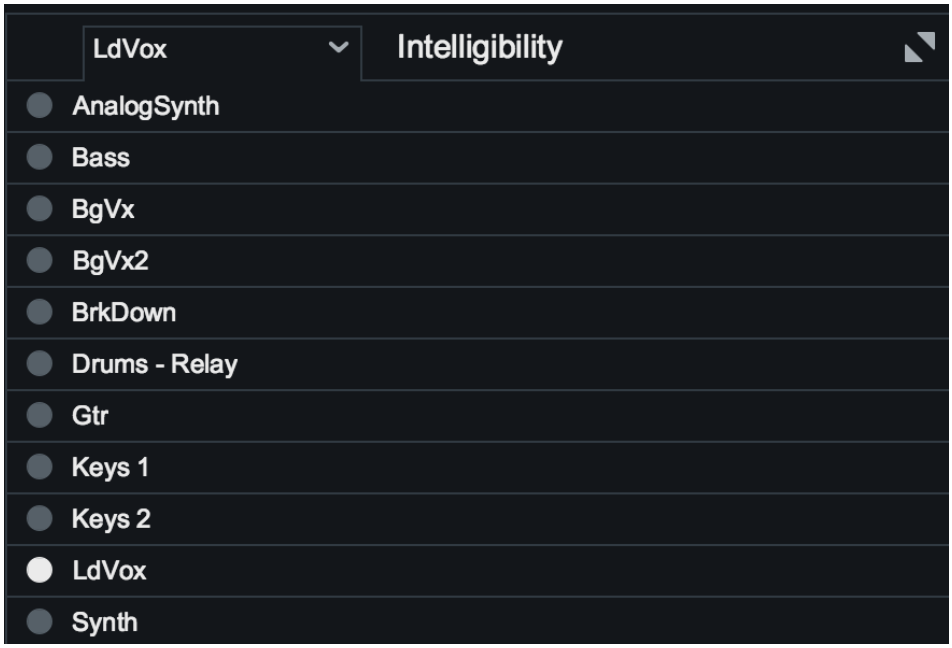
Configuration

The following steps outline the setup and recommended configuration for the Intelligibility meter:

1. Insert Insight 2 on the master bus.
2. Insert Relay on a dialogue bus or track.

    1. Relay should be inserted on the bus or track that is feeding into the master bus. e.g. if multiple tracks are being sent to a dialogue submix which is then routed to the master bus, insert Relay on the dialogue submix rather than the individual dialogue track.
    2. If other plug-ins are inserted on the dialogue bus, add Relay to the *last* available insert slot.
    3. For the best results, ensure that Insight 2 and Relay are inserted on tracks the use the same channel configuration. e.g. Insight 2 is inserted on a 5.1 master bus, Relay is inserted on a 5.1 submix bus.

3. In the Intelligibility meter panel, select the Relay instance on the dialogue bus in the source list. Click “Ok” to dismiss the source list view.



Meters and Controls

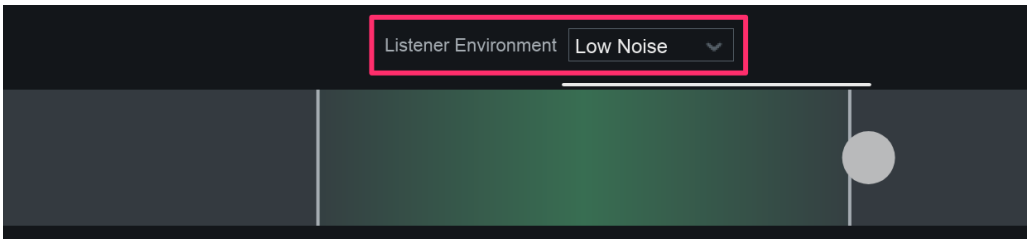
The following meters and controls are available in the Intelligibility meter panel.

Intelligibility Meter

The top meter bar is the Intelligibility meter. This meter displays estimated intelligibility (dot meter) of the selected source, the recommended range of intelligibility for the selected Listener Environment, and a history meter that displays the range of the estimated intelligibility values over the course of 10 seconds.

Listener Environment

The menu above the intelligibility meter selects between different noise levels in a listener's environment and recommends an intelligibility range for the source instance.

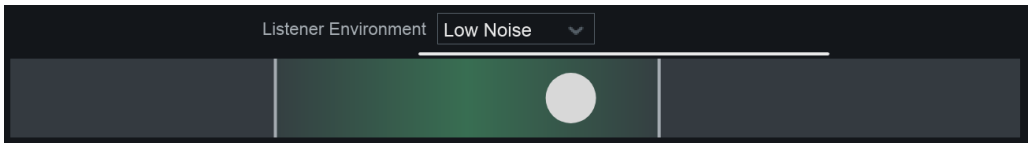


Choices include: Low Noise, Medium Noise, High Noise.

Recommended Range

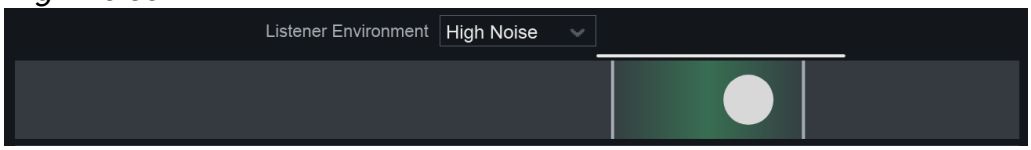
The green range display in the intelligibility meter updates to reflect the suggested range of dialogue intelligibility when listening to the full mix in low, medium, or high noise environments.

Low Noise:



Medium Noise:

High Noise:



Estimated Intelligibility

The dot meter represents the estimated intelligibility of the selected source instance.

Source Meter

The source meter displays the perceived loudness (phons) level of the selected source plug-in. The thin meter above the main meter bar is a history meter that displays the range of the source meter values over the course of 10 seconds.

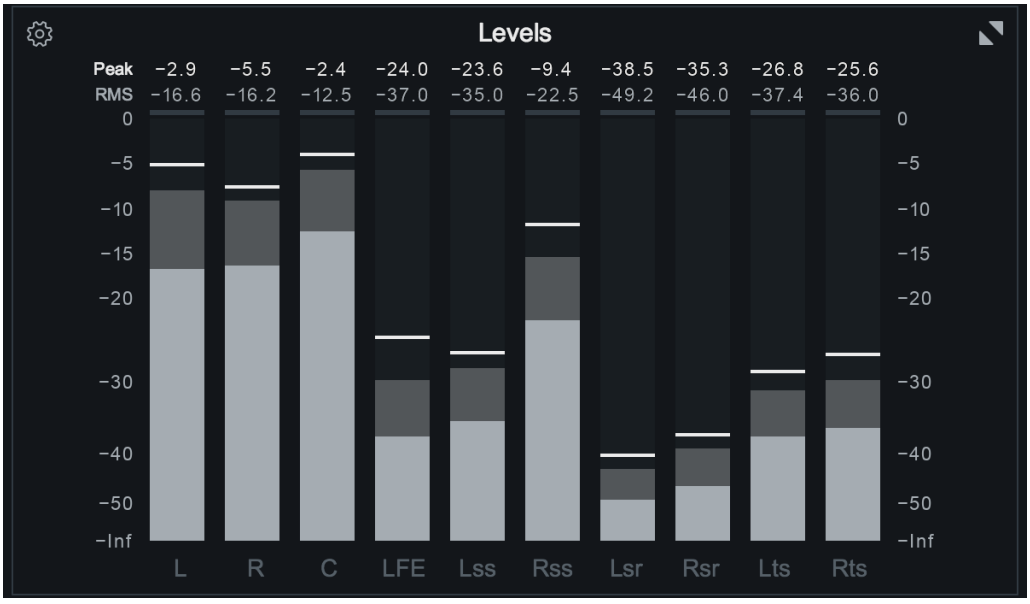
Difference Meter

The difference meter displays the estimated difference between the perceived loudness levels of the output (Insight 2) and the selected source instance. The thin meter above the main meter bar is a history meter that displays the range of difference meter values over the course of 10 seconds.

Levels

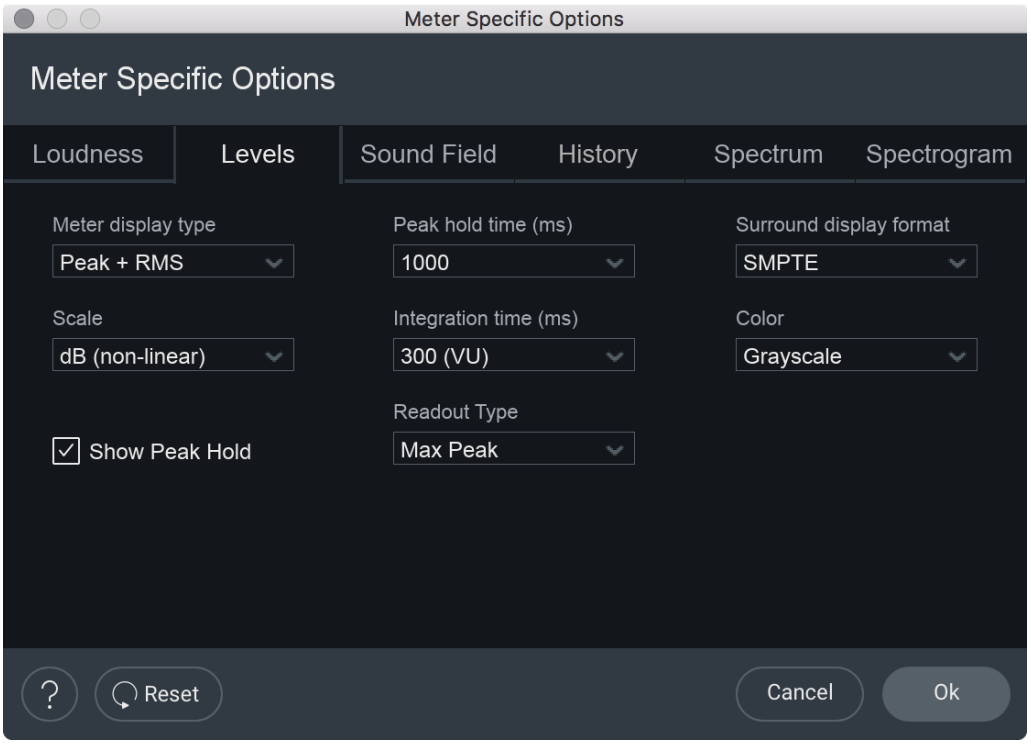
Overview

The Level meter panel displays both instantaneous (true-peak) and averaged (RMS) levels for each channel of input audio. Insight 2 expands on the surround support of Insight 1, adding for support for monitoring levels of tracks with up to 10 channels, including support for up to Dolby Atmos 7.1.2 channel configurations.



Options

The following options are available for the Levels meter panel:



Meter Display Type

Sets the type of metering used for by the True Peak meters. Available options include Peak + RMS and K-System.

Scale

For Peak + RMS, selects between dB (linear) and dB (non-linear). For K-System metering, selects between K-12, K-14, and K-20.

Show Peak Hold

Determines if the peak hold display will be shown in the level meters.

Peak Hold Time

Cycles through different peak hold times. The choices include: 5ms, 250ms, 500ms, 1000ms, 5000ms, and infinite. If set to infinite, the peak value will be held until you double click on the meter.

Integration Time

Only applies if the level meter displays RMS. It lets you specify the integration time for the RMS calculation. In most RMS meters, the integration time is set to around 300ms.

Readout Type

Determines the type of text readout displayed above the peak indicators.

Surround Display Format

Determines the display order of surround level meters. Choices include: SMPTE and Film.

Color

Selects the color preset for the level meter displays.

Loudness

Overview

The Loudness panel includes measurements used to ensure loudness compliance when delivering media for broadcast TV or streaming services. Loudness measurements are based on the ITU-R BS.1770 recommendation [1], which defines audio measurement algorithms for determining true peak signal level and subjective loudness over the course of a program.

The Loudness meter panel features dynamic **view configurations** based on the height of the meter, **loudness measurements**, common **loudness**

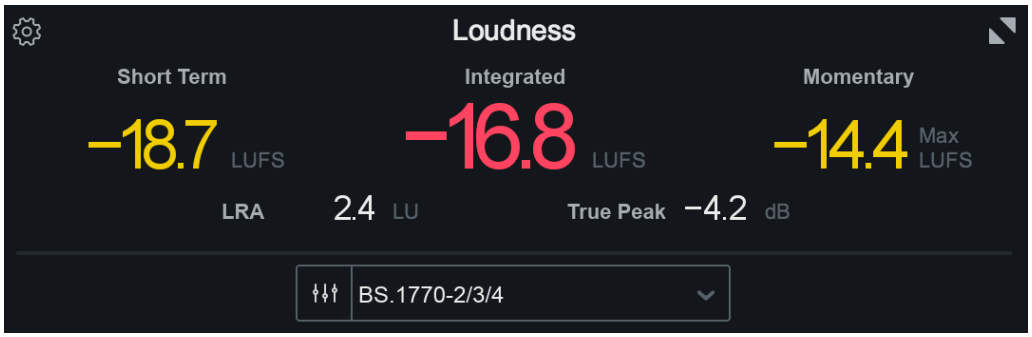
standard target presets, and a **Targets control panel** for customizing meter targets and the loudness measurement **Gate** mode.

Views

There are two possible views available in the Loudness meter panel: **minimized** and **maximized**. These views are shown dynamically based on the *height* of the Loudness meter panel.

Minimized view

The minimized view configuration is dynamically loaded when the *height* of the Loudness meter panel is *less than 270 pixels*. The meter bars are hidden in minimized view to provide a compact overview of loudness statistics.

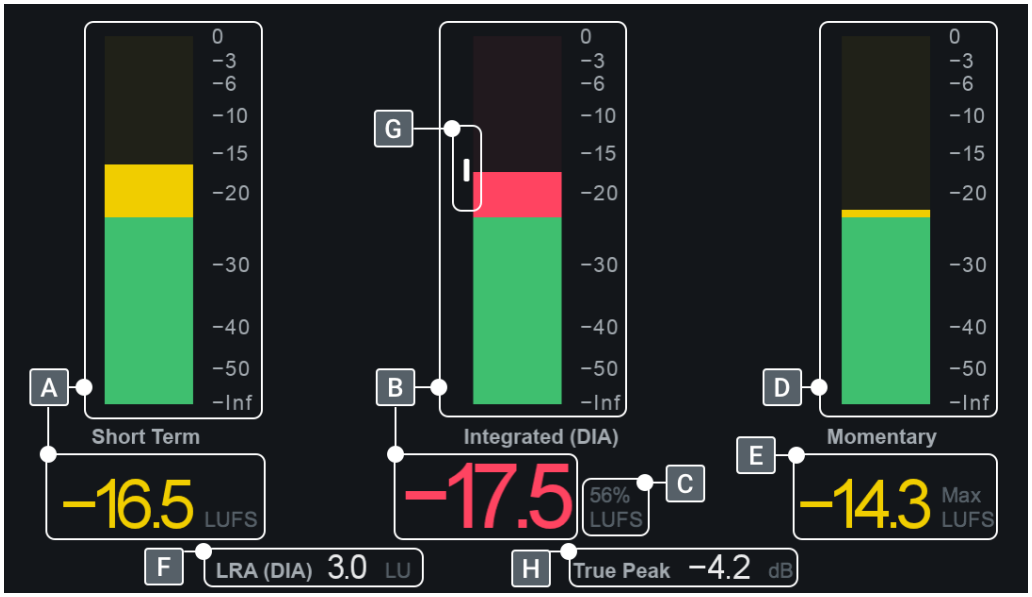


Maximized view

The maximized view configuration is dynamically loaded when the *height* of the Loudness meter panel is *equal to or greater than 270 pixels*. The meter bars are displayed alongside the text readouts in maximized view configuration to provide a full overview of loudness statistics.

Measurements

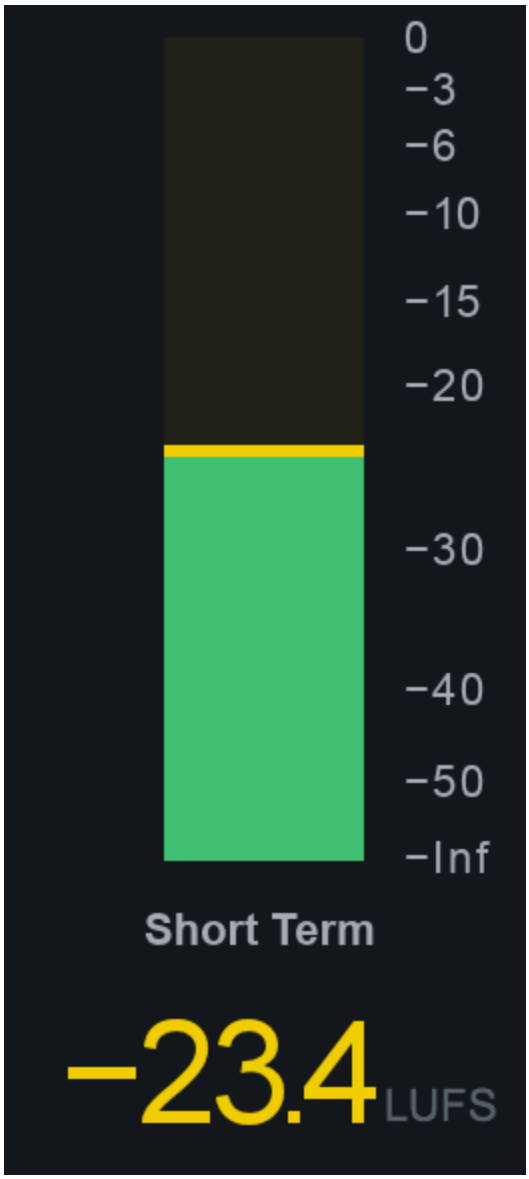
The following image outlines the measurements available in the Loudness meter panel:



1. **A**: **Short-term loudness** (LUFS/LKFS)
2. **B**: **Integrated loudness** (LUFS/LKFS)
3. **C**: **Dialogue Content Percentage** (%)
4. **D**: **Momentary loudness** (LUFS/LKFS)
5. **E**: **Momentary Maximum loudness** (LUFS/LKFS)
6. **F**: **Loudness Range (LRA)** (LU)
7. **G**: **Loudness Range (LRA) meter bar** (LU)
8. **H**: **True Peak Maximum** (dBTP)

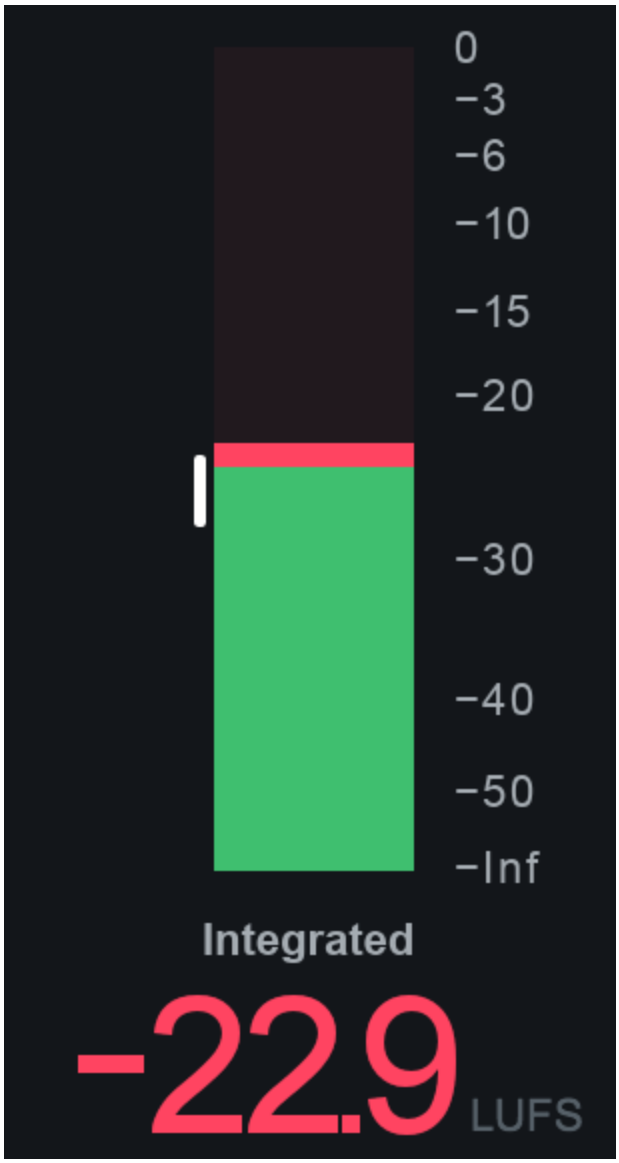
Short-term

Measures loudness over the course of 3 seconds. Short-term measurements are useful for monitoring immediate trends in loudness. Short-term loudness measurements are never gated, regardless of the currently selected **Gate** option in the **Targets control panel**.



Integrated

Measures loudness over an indefinite period of time, including any selected **Gate** threshold. Integrated loudness is an infinite average that generates a single value for the entire duration of the calculation. When the **Dialogue Gate** is selected, a "**(DIA)**" label will be displayed next to the **Integrated** label to indicate that it is a dialogue-gated measurement.



⚑ LOUDNESS TARGET CONTROL

The **Loudness target** can be **customized** in the **Targets control panel**. Selecting a **Loudness Standard Target Preset** will set the **Loudness target** to the value associated with the selected loudness standard.

DIALOGUE-GATED INTEGRATED MEASUREMENTS

The **Integrated** measurement displays will be delayed in updating for the **first two seconds** of the **Dialogue-gated** loudness measurement, even if there is dialogue present in the source material. After the initial two second delay, the **Dialogue-gated** Integrated measurement will only begin to update if/once dialogue content has been detected in the source material.

Dialogue Content Percentage

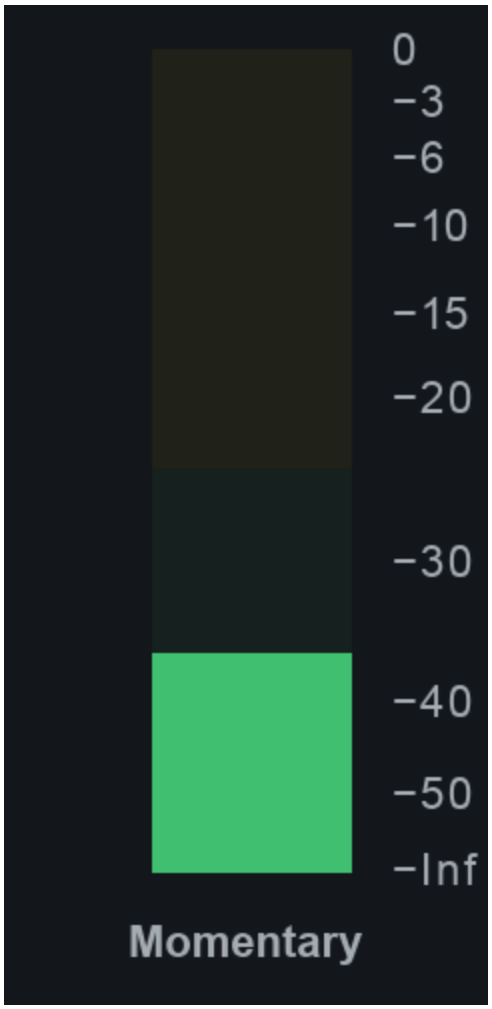
Displays the percentage of dialogue detected in the source material over the entire duration of a **Dialogue-gated** loudness calculation. This measurement represents the ratio of detected dialogue content to the total content in the source material. The presence of dialogue is determined in slices of 500 milliseconds and the percentage is updated throughout the entire duration of the calculation.

DIALOGUE CONTENT PERCENTAGE AVAILABILITY

The Dialogue Content Percentage measurement is only visible when the **Dialogue Gate** option is selected in the **Targets control panel**.

Momentary

Measures loudness over the course of 400 milliseconds. Momentary loudness measurements are **never gated**, regardless of the currently selected **Gate** option in the **Targets control panel**.



⚑ MOMENTARY MEASUREMENT IN MINIMIZED VIEW

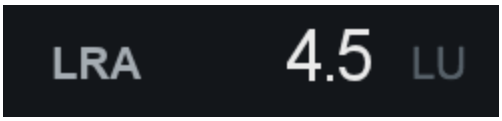
When the **minimized view** configuration is active, all loudness meter bars are hidden from view. Increase the height of the Loudness meter panel to access **maximized view** or utilize the Momentary loudness trace in the **History** meter panel to monitor Momentary loudness activity.

Momentary Maximum

Displays the **maximum Momentary** loudness value measured over the duration of the loudness calculation. Momentary loudness measurements are never gated, regardless of the currently selected **Gate** option in the **Targets control panel**.

Loudness Range (LRA)

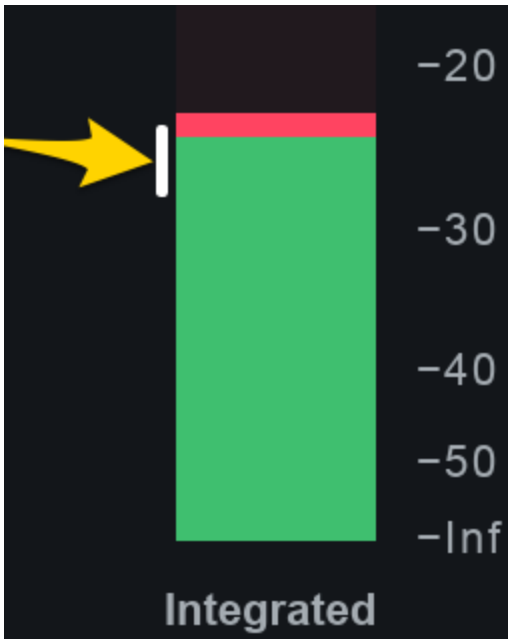
Measures the loudness range of the source material over the course of the entire loudness calculation. Loudness Range is measured in LU (Loudness Units), where 1 LU is equal to 1 dB. When the **Dialogue Gate** option is selected in the **Targets control panel**, a "**(DIA)**" label will be displayed next to the LRA measurement label.



> ⚑ **LRA TARGET RANGE**
>
> **LRA Target Range** values can be **customized** in the **Targets control panel**. Selecting a **Loudness Standard Target Preset** will set the LRA target range to the values associated with the selected loudness standard.

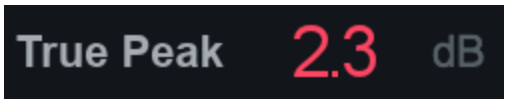
Loudness Range (LRA) Meter Bar

Displays the loudness range of the source material as a white vertical bar along the left edge of the **Integrated** meter bar.



True Peak Maximum

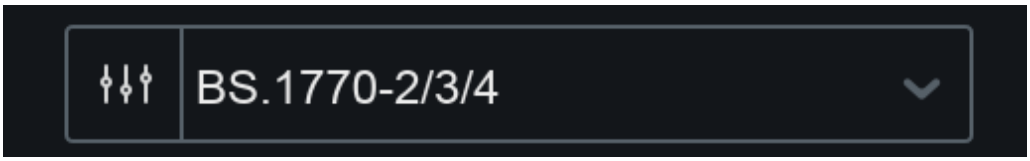
Displays the maximum true peak level measured across all channels for the duration of the loudness calculation.



> **PEAK TARGET CONTROL**
>
> The **Peak target** value can be **customized** in the **Targets control panel**. Selecting a **Loudness Standard Target Preset** will set the **Peak target** to the value associated with the selected loudness standard.

Loudness Standards and Targets

The bottom of the Loudness meter panel includes a list of **Loudness Standard Target Presets** and a **Targets control panel** with options for customizing meter target values and loudness gating options.



TARGET SAVING BEHAVIOR

Any customized or preset loudness target configurations:

1. Will not save with **Layout** presets.
2. Will not be affected when the **Layout** preset selection changes.
3. Will save with sessions.

Loudness Standard Target Presets

This dropdown menu includes a number of common loudness standard target presets (detailed in the **table below**).

The following meter targets and controls are affected when a loudness target preset is loaded: **Loudness target**, **Peak target**, **LRA target range**, and **Gate**.

Insight Loudness Standard Target Presets

Preset Name	Integrated	Tolerance	Gate	True Peak	Notes
AES AGOTTVS TD1006.1.17-10 [2]	-16 LUFS	± 2.0 LU	On (**Program**)	-1 dBTP	
AGCOM 219/09/CSP	-24 LUFS	± 0.5 LU	On (**Program**)	-2 dBTP	Italy
ARIB TR-B32 A/85	-24 LKFS	± 2.0 LU	On (**Program**)	-1 dBTP	Japan
ATSC A/85	-24 LKFS	± 2.0 LU	On (**Program**)	-2 dBTP	USA, Canada, Puerto Rico
BS.1770-1 [1]	-24 LKFS	± 2.0 LU	**Off**	-2 dBTP	International
BS.1770-2/3/4 [3]	-24 LKFS	± 2.0 LU	On (**Program**)	-2 dBTP	International
EBU R128 [4]	-23 LUFS	± 0.5 LU	On (**Program**)	-1 dBTP	Europe
EBU R128 DPP	-23 LUFS	± 0.5 LU	On (**Program**)	-3 dBTP	Europe
EBU R128 (South Africa)	-23 LUFS	±1.0 LU	On (**Program**)	-2 dBTP	South Africa
OP-59	-24 LKFS	±1.0 LU	On (**Program**)	-2 dBTP	Australia/New Zealand
Portaria 354	-23 LUFS	± 0.5 LU	On (**Program**)	-2 dBTP	Brazil
Netflix [5]	-27 LKFS	± 0.5 LU	On (**Dialogue**)	-2 dBTP	Dialogue Target LRA of 7 LU or less. Based on v1.0 of Netflix Audio Mix Specifications

Preset Name	Integrated	Tolerance	Gate	True Peak	Notes
					and Best Practices [5]

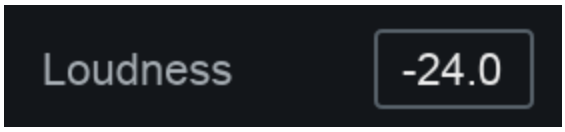
Targets Control Panel

The Targets control panel allows for the customization of meter target values and the type of **Gate** used when measuring integrated loudness. Adjusting the meter targets will determine when the associated meter will change color to indicate that it has exceeded the target value.

The Targets control panel can be accessed by clicking on the button to the left of the loudness standard target preset dropdown menu. The panel will be pinned open and can be dismissed by clicking on the button again.

> ⚑ **CUSTOM TARGETS**
>
> When any parameter in the **Targets control panel** is modified, the target preset name will be updated to **"Custom"** to indicate that the values have been modified.

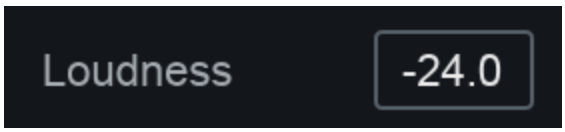
The following image outlines the parameters available in the Targets control panel:



> ⚑ **TIP: ADJUSTING LOUDNESS AND PEAK TARGET VALUES**
>
> The following methods can be used to modify the **Peak** and **Loudness** target values in the **Targets control panel**:
>
> 1. **Click and drag** the mouse up or down to modify the target value.
> 2. **Enter target values manually:** Double-click on the desired target value readout, Type the new value into the text edit field, Press the return key or click anywhere in the interface to dismiss the edit field.

Loudness Target

Sets the **loudness target** value for the **Integrated**, **Short-term**, and **Momentary** loudness meters.



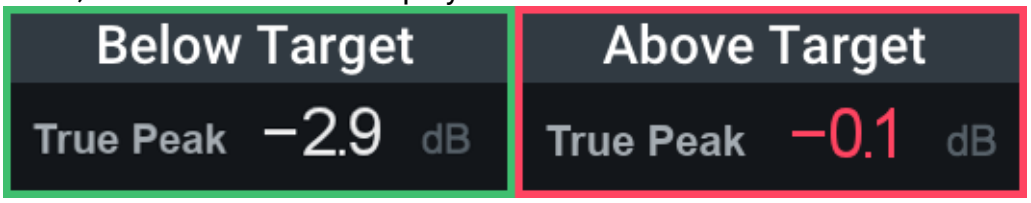
When the **Integrated** measurement has **exceeded** the loudness target, **Integrated** measurements will be displayed in **red**. When the **Momentary**, **Momentary maximum** or **Short-term** measurements have **exceeded** the loudness target, the associated meters and readouts will be displayed in **yellow**.

> **HISTORY METER: LOUDNESS TARGET**
>
> When the **loudness target** is adjusted, the red dotted line in the **History** meter will update to reflect the new loudness target value.

Peak Target

Sets the true peak target value in the **Loudness** and **Levels** meter panels.

When the maximum True Peak level (across all channels) is **below** the **Peak target** value, the readout will be displayed in **white** text. When the maximum True Peak level (across all channels) **exceeds** the **Peak target** value, the readout will be displayed in **red** text.



> **PEAK TARGET IN LEVELS METER PANEL**
>
> When the **peak target** is adjusted to a negative value, a red dotted line will be drawn in the **Peak+RMS** meter bar displays in the **Levels** meter panel to indicate the adjusted **peak target** value.

LRA Targets

Sets the upper and lower target values for the **Loudness Range (LRA)** text readout. LRA targets can be set to values within a range of 0 LU and 30 LU.

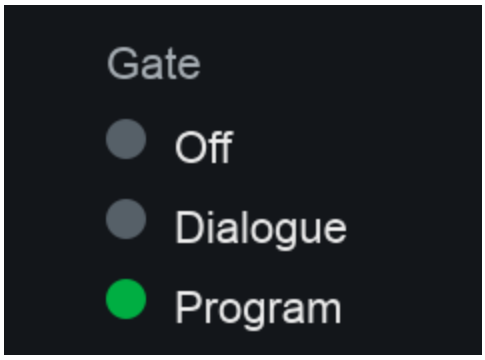
Any LRA measurement that falls **between the two target values** will be considered as **in range** and the readout will be displayed in **white** text. Any LRA value that falls **outside of the LRA target range** will be displayed in **red** text.

TIP: ADJUSTING LRA TARGETS

1. **Click and drag** the slider handles left or right.
2. **Arrow Key Adjustments:**
    1. **Left Arrow Key:** Shifts the target range down by reducing both of the target values by 1 LU per key press.
    2. **Right Arrow Key:** Shifts the target range up by increasing both of the target values by 1 LU per key press.
    3. **Up Arrow Key:** Increases the LRA target range by subtracting 1 LU from the minimum value and adding 1 LU to the maximum value with each key press.
    4. **Down Arrow Key:** Decreases the LRA target range by adding 1 LU to the minimum value and subtracting 1 LU from the maximum value with each key press.

Gate

There are three different gating options for loudness calculations in the Loudness meter panel: **Off**, **Dialogue**, and **Program**. Gating is employed in loudness measurements in order to exclude quieter sections of a program from lowering the overall loudness measurement (**Program-gated**) or to measure the loudness of a program using dialogue as an anchor element (focal point) for the loudness calculation (**Dialogue-gated**).



Off

When **Off** is selected, no gating method is enabled when calculating loudness. When selected, the loudness measurements are based on the BS.1770-1 [1] recommendation, which did not employ the -10 LU relative **program** gate.

Dialogue

Enables a loudness gating method that detects if dialogue is present in the source material. Only segments of the program where dialogue is detected will contribute to the **Integrated** loudness measurement. When selected, the loudness measurement is based on the ITU-R BS.1770-1 revision [1]. The -10 LU relative **program** gate threshold is **not** when the dialogue gate is enabled.

DIALOGUE-GATED LOUDNESS: INITIAL DRAWING DELAY

1. The algorithm used to calculate dialogue-gated loudness requires at least two seconds of incoming audio in order to begin detecting dialogue content in the input signal.
2. This two second delay can be observed in the initial drawing of the following measurements:
    1. Dialogue-gated **Integrated** measurements in the Loudness meter panel.
    2. The Short-term, Momentary, and Integrated loudness traces in the **History** meter panel.
3. *This delay does not affect the accuracy of the loudness measurements.*

Program

Enables a -10 LU relative gating threshold when calculating loudness in order to exclude lower level noise from decreasing the overall loudness measurement of a program. The BS.1770-2/3/4 revisions of the ITU-R BS.1770 recommendation [3] requires that a -10 LU relative program gate threshold is applied when calculating integrated loudness.

Calculation Settings

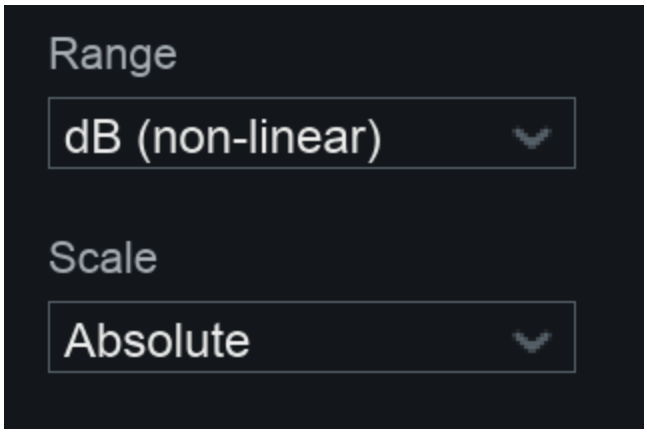
Controls for resetting, pausing or holding loudness meter calculations are located in the header of the Insight plug-in window.

	Name	Description
	Reset	Manually **resets** all loudness calculations in the **Loudness** and **History** meters.
	Pause	Freezes all meters in the **Loudness**, **History**, and **Spectrogram** meter panels. All values in applicable meters (**Loudness**, **History**, and **Spectrogram**) are retained when Pause is enabled, regardless of the transport state of the DAW/NLE.
	Hold	**When enabled**, the current loudness values will be retained when the transport is stopped. The calculation will continue from the last known value when the transport is started again. **When disabled**, the Loudness meter calculations will reset each time the transport state changes.

Options

To access **Loudness meter options**, click on the **gear** button in the upper left-hand corner of the **Loudness meter panel** to open the **Meter Specific Options** window.

The **Loudness tab** of the **Meter Specific Options** window includes options for modifying the **scale** and **range** of measurements displayed in the **Loudness meter panel**.



METER SPECIFIC OPTIONS SAVING BEHAVIOR

1. Meter Specific Options **are saved with Layout** presets.
2. Meter Specific Options **are saved with sessions**.

Range

Determines the minimum/maximum loudness values displayed in the **Loudness meter scales**. Available Range options include: **dB (linear)**, **dB (non-linear)**, **BS1771**, **EBU +9**, and **EBU +18**.

dB (linear)

Full scale (dBFS) range for measuring loudness. The scale values are evenly spaced in this mode, **ranging from -inf dBFS to 0 dBFS**.

dB (non-linear)

Full scale (dBFS) range for measuring loudness. The scale values are logarithmically spaced in this mode, **ranging from -inf dBFS to 0 dBFS**.

BS1771

Loudness meter scale range recommended by the ITU [6]. The scale mark values displayed differ depending on the **Scale** type selection (e.g. **Absolute** or **Relative**):

1. **Absolute** range: **-45 LUFS** to **-14 LUFS**
2. **Relative** range: **-21 LU** to **+9 LU**

EBU +9

Loudness meter scale range recommended by the EBU as a default setting. The scale mark values will differ depending on the **Scale** type selection (e.g. **Absolute** or **Relative** scale).

1. **Absolute** range: **-41 LUFS to -14 LUFS**
2. **Relative** range: **-18 LU to +9 LU**

EBU +18

Loudness meter scale range recommended by the EBU for material with a wide loudness range. The scale mark values will differ depending on the **Scale** type selection (e.g. **Absolute** or **Relative** scale).

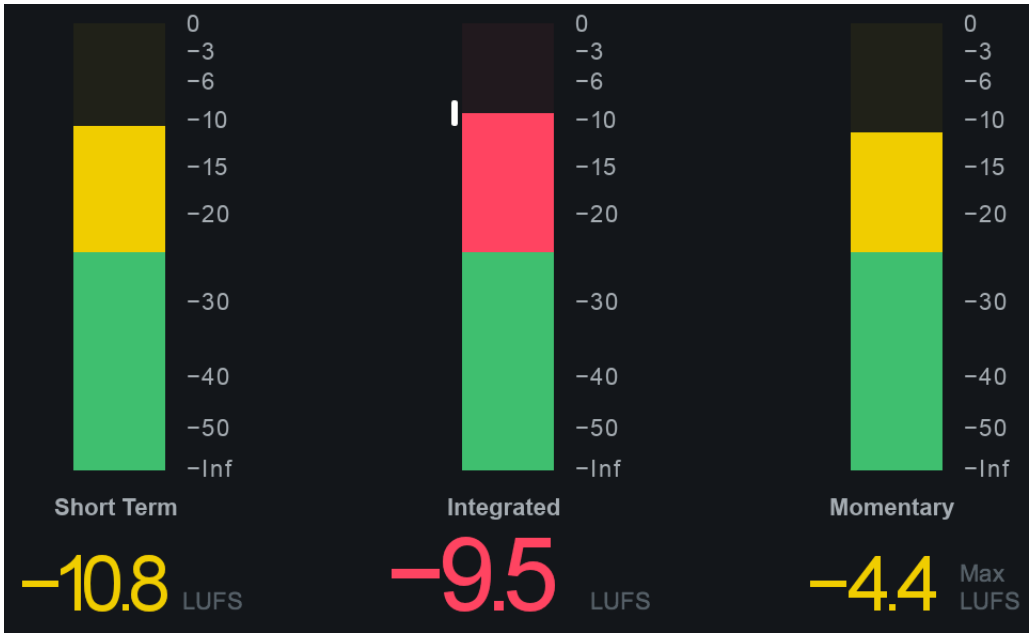
1. **Absolute** Scale Range: **-59 LUFS to -5 LUFS**
2. **Relative** Scale Range: **-36 LU to +18 LU**

Scale

Determines the scale and units used in the loudness meter bar displays. Available scale options include: **Absolute** or **Relative**.

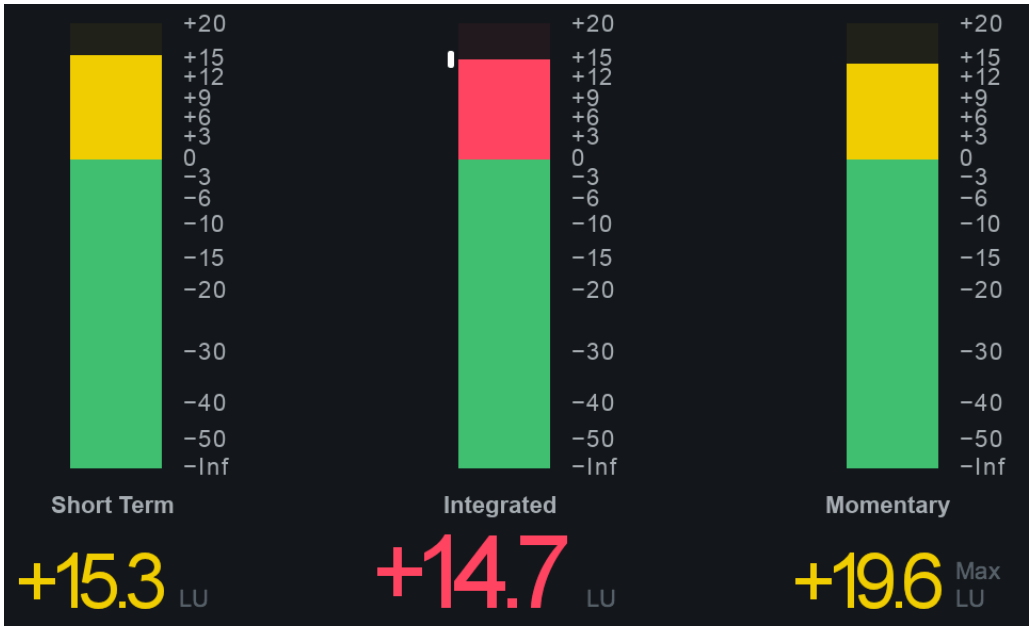
Absolute

Displays loudness values in LUFS (Loudness Units, relative to Full Scale).



Relative

Displays loudness values in LU (Loudness Units) that are relative to the current **Loudness Target** value.



> ⚑ **RELATIVE SCALE EXAMPLE**
>
> If the **loudness target** value is set to -23, a value of 0 LU in **Relative scale** mode is equivalent to -23 LUFS in **Absolute scale** mode.

Related Meters

1. **History meter panel**: Monitor loudness values over time with the History meter.
2. **Levels meter panel**: View Peak+RMS or K-System metering information for each channel.

---

1. **Rec. ITU-R BS.1770-1 (09/2007)** ↩
2. **Technical Document - AESTD1006.1.17-10: Loudness Guidelines for OTT and OVD Content - October 2017** ↩
3. **Rec. ITU-R BS.1770-4 (10/2015)** ↩
4. **EBU Recommendation: R 128 Loudness normalisation and permitted maximum level of audio signals** ↩
5. **Netflix Audio Mix Specifications and Best Practices (v1.0)** ↩
6. **Rec. ITU-R BS.1771-1 (12/2012): Requirements for loudness and true-peak indicating meters** ↩

History

Overview

The History meter panel draws traces over time for the following loudness measurements: **Integrated**, **Short-term**, and **Momentary**. To learn more about the different loudness measurements, see the **Loudness** chapter.

Resizing

The History meter can be resized using the following methods:

1. Clicking and dragging the bottom right corner of the main Insight plug-in window up or down.
2. Clicking and dragging the dividers between meter panels.
3. Clicking the maximize/minimize toggle button in the upper right hand corner of the History meter panel.

Displays and Rulers

Cursor Position Readout

When hovering the cursor over the history graph, a text readout will appear with information about the measurements at that point in time. Current time; M = Momentary; S = Short-term; I = Integrated.

Integrated Loudness Target Line

The **Integrated** loudness target set in the **Loudness** meter panel is indicated by the horizontal dotted red line displayed in the loudness

history graph.

When the Integrated loudness trace has exceeded the **Integrated** target, the trace will be drawn in red.

> ⚑ **INTEGRATED LOUDNESS TRACE & GATE**
>
> The **Gate** selection in the **Loudness** meter panel influences the values used to draw the Integrated loudness trace.
> See the **Loudness chapter** for more information about the Gate options.

DIALOGUE-GATED LOUDNESS: INITIAL DRAWING DELAY

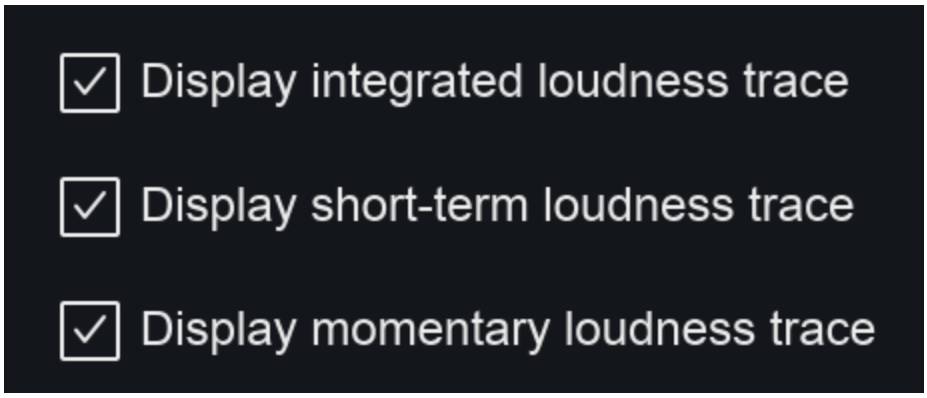
1. **The algorithm used to calculate dialogue-gated loudness requires at least two seconds of incoming audio in order to begin detecting dialogue content in the input signal.**
2. **This two second delay can be observed in the initial drawing of the following measurements**:
    1. **Dialogue-gated Integrated** measurements in the **Loudness** meter panel.
    2. The **Short-term**, **Momentary**, and **Integrated** loudness **traces** in the **History** meter panel.
3. **This delay does not affect the accuracy of the loudness measurements.**
4. For more information about dialogue-gated loudness measurements, see the **Loudness** meter chapter.

Zooming

1. Zoom on the time scale or loudness scale by hovering the cursor over the axis and using the mousewheel or trackpad to zoom in or out.
2. Click and drag on the time or loudness scales when zoomed in to modify the view range.
3. Double-click on the time or loudness scales to reset the zoom level to default.

Options

The History meter options menu can be accessed by clicking the gear button in the upper left-hand corner of the History meter panel. The History options tab allows for individual loudness trace visibility to be toggled on or off.



Enable or disable the history trace displays using the following options:

1. **Display integrated loudness trace**: Shows/hides the integrated loudness history trace.
2. **Display short-term loudness trace**: Shows/hides the short-term loudness history trace.
3. **Display momentary loudness trace**: Shows/hides the momentary loudness history trace.

> ⚑ **GLOBAL OPTIONS: LOUDNESS HISTORY CSV EXPORT**
>
> 1. The **Global Options** window includes an option to export a .csv file of loudness history values.
> 2. To access the **Global Options** window, click on the **gear** button in the upper right-hand corner of the **Insight 2 plug-in window**.
> 3. Learn more about the **Loudness options** in the **Global Options** chapter.

Related Meters

Loudness: Monitor program loudness and adjust loudness target values to ensure loudness compliance.

Spectrogram

Overview

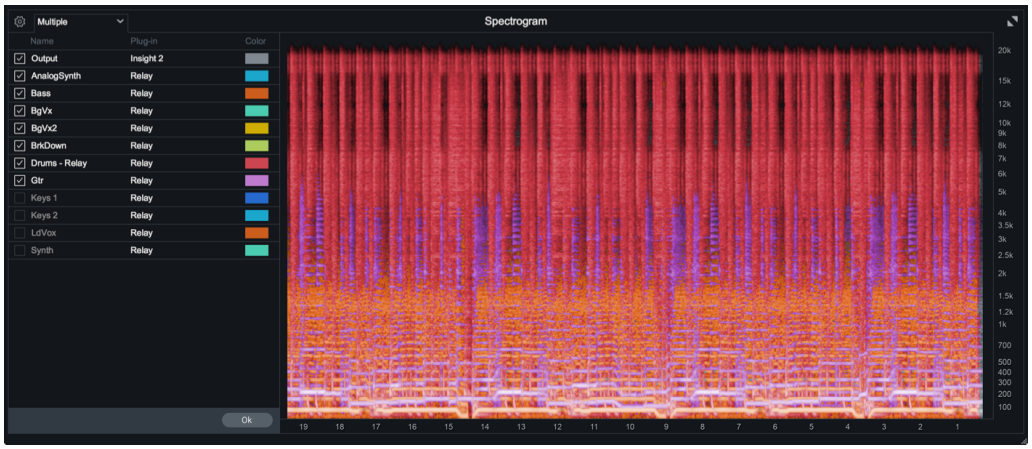
The Spectrogram provides an intuitive way to pinpoint individual elements within a mix. The Spectrogram can display data for up to 8 sources simultaneously for analysis by selecting **Relay** instances in the source selection menu.

> **WHAT IS A SPECTROGRAM?**
>
> A Spectrogram is a spectral representation of audio varying over time. The vertical axis represents frequency while the horizontal axis represents time. Amplitude is displayed as color intensity in the 2D Spectrogram and as height in the 3D Spectrogram.

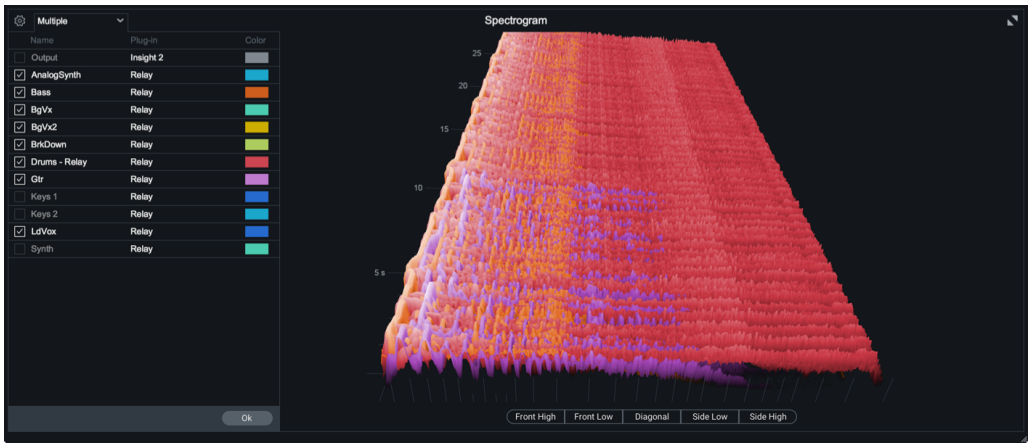
Views

The spectrogram offers two view modes: 2D and 3D.

2D Mode



3D Mode



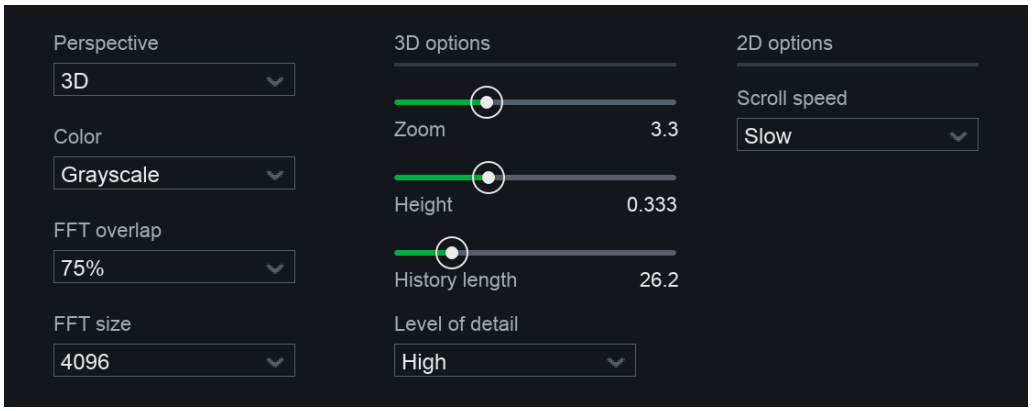
Preset 3D Camera Views

The buttons along the bottom of the spectrogram meter panel (when 3D mode is selected) allow for quick adjustment of 3D spectrogram camera angles.

> ★ **TIP**
>
> Single- or double-clicking and dragging on the spectrogram display will rotate the view angles.

Options

Spectrogram specific options can be accessed by clicking the gear button in the upper left hand corner of the spectrogram panel.



The following options are available for the Spectrogram meter: **General**, **3D Options**, and **2D Options**.

General

1. **Perspective**: Selects 2D or 3D spectrogram view.
2. **Color**: Selects the color scheme for the spectrogram.
3. **FFT Overlap**: Adjusts how often the spectrum is computed. Higher

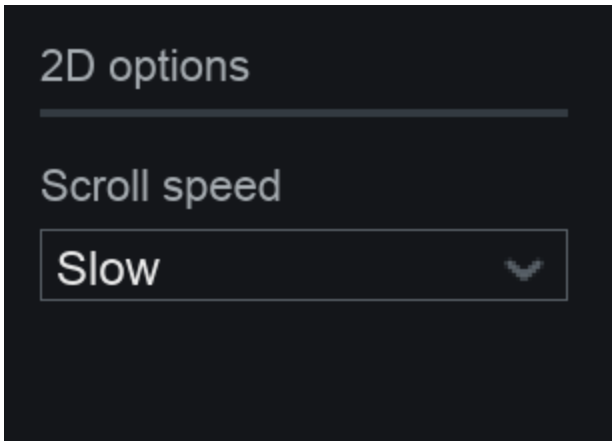
values compute the spectrum more often.
4. **FFT Size**: Adjusts the frequency and time resolution used to draw the spectrogram.

3D Options

The following options apply to the 3D spectrogram only:

1. **Zoom**: Zooms in and out on the center of the 3D spectrogram.
2. **Height**: Scales the amplitude (z-axis) of the 3D spectrogram.
3. **History Length**: Scales the time (y-axis) of the 3D spectrogram.
4. **Level Of Detail**: Adjusts the level of detail used when drawing the 3D spectrogram. Low detail may improve performance.

2D Options



The following option applies to the 2D spectrogram only:

Scroll Speed: Adjusts the time scale length of the 2D spectrogram.

Inter Plug-in Communication

Up to 8 sources can be displayed at a time in the Spectrogram. To access the source selection display, click the dropdown menu to the right of the gear button in the meter panel.

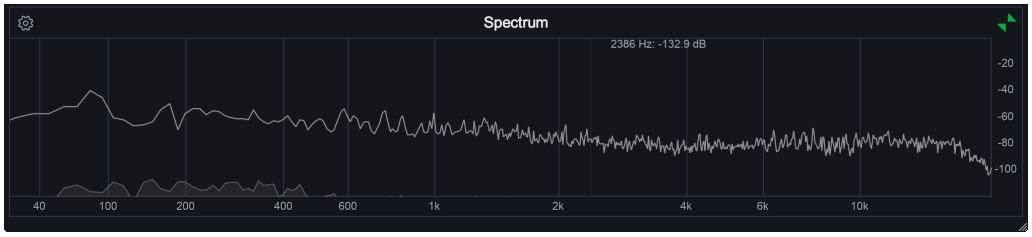
The source panel lists all available **Relay** plug-in instances in the session. To display an instance in the spectrogram, check the box to the left of the instance name.

To change the color of a specific instance, click on the color box on the right side of the list. Select the desired color in the color selection window and click Ok to save changes.

Spectrum

Overview

A Spectrum Analyzer is a meter that measures amplitude across the frequencies which encompass the spectrum of human hearing. The vertical axis represents amplitude while the horizontal axis represents frequency.



Cursor Position Readout

Hovering your cursor anywhere in the spectrum analyzer will display a readout of the frequency and amplitude at that location.

Zooming and Scrolling

Both the frequency and decibel scales are freely zoomable and draggable. To zoom in on a given scale simply hover over the scale and use your mouse wheel to zoom in or out. To drag a given scale simply click anywhere on the scale and drag it in the desired direction. Double-click on either scale to return to the default view.

Options

The Spectrum Analyzer includes the following options:

1. **Spectrum Type:** Selects between 4 different types of spectrums.
    1. **Linear:** a continuous line connecting the calculated points of the spectrum.
    2. **1/3 Octave:** Splits the spectrum into bars with a width of 1/3 of an octave. Although the spectrum is split into discrete bands, this option can provide excellent resolution at lower frequencies.
    3. **Full Octave:** Splits the spectrum into bars with a width of one full octave.
    4. **Critical Bands:** Splits the spectrum into bands that correspond to how we hear, or more specifically how we differentiate between sounds of different frequencies. Each band represents sounds that are considered “similar” in frequency.

2. **Average Time:** Spectrum is averaged according to this setting. Higher average times can be useful for viewing the overall tonal balance of a mix, while shorter average times provide a more “real time” display.
3. **Peak Hold Time:** Selects between specific hold times in milliseconds, or Infinite, where the peak is held indefinitely.
4. **Window Size:** Controls the trade off between frequency and time resolution in the spectrum. Higher values will let you see smaller peaks in the spectrum, but the spectrum will update more slowly.
5. **Window:** Selects a window type for the spectrum. In most cases the default window type will work well, but you can choose from a

variety of window types. Each window type has different amplitude and frequency resolution characteristics.
6. **Overlap:** Controls how often the spectrum updates. More overlap will cause the spectrum to update more frequently, at the expense of increased CPU usage.
7. **Show Peak Hold:** Turns the peak hold display on/off.

Sound Field

Overview

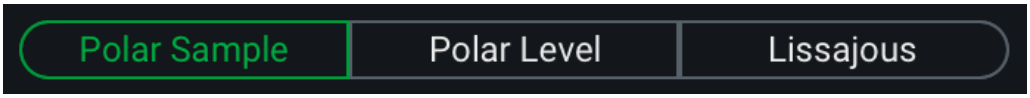
The Sound Field meter panel features a stereo vectorscope and a surround scope meter.

Vectorscope

A Vectorscope is a meter that juxtaposes the two channels of a stereo signal on an x-y axis in order to display the similarity or difference between the two channels. A mono signal will produce a straight vertical line while signals with a wider stereo image will produce more horizontal shapes. A Vectorscope can be used to monitor the stereo width of a signal while mixing or mastering. It can also help to highlight potential issues with phase cancellation.

The following view modes are available in the stereo vectorscope:

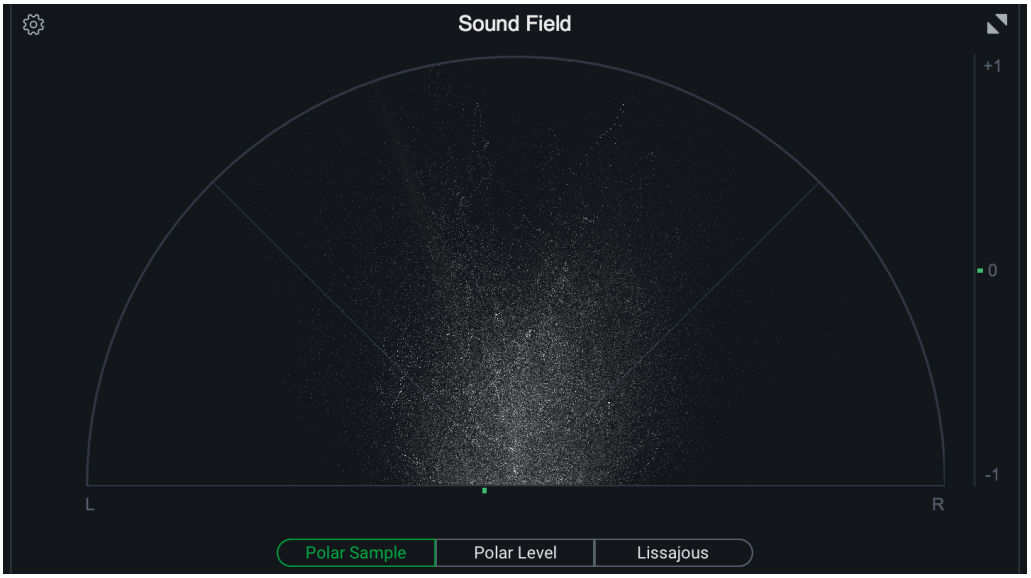
1. Polar Sample
2. Polar Level
3. Lissajous



Polar Sample

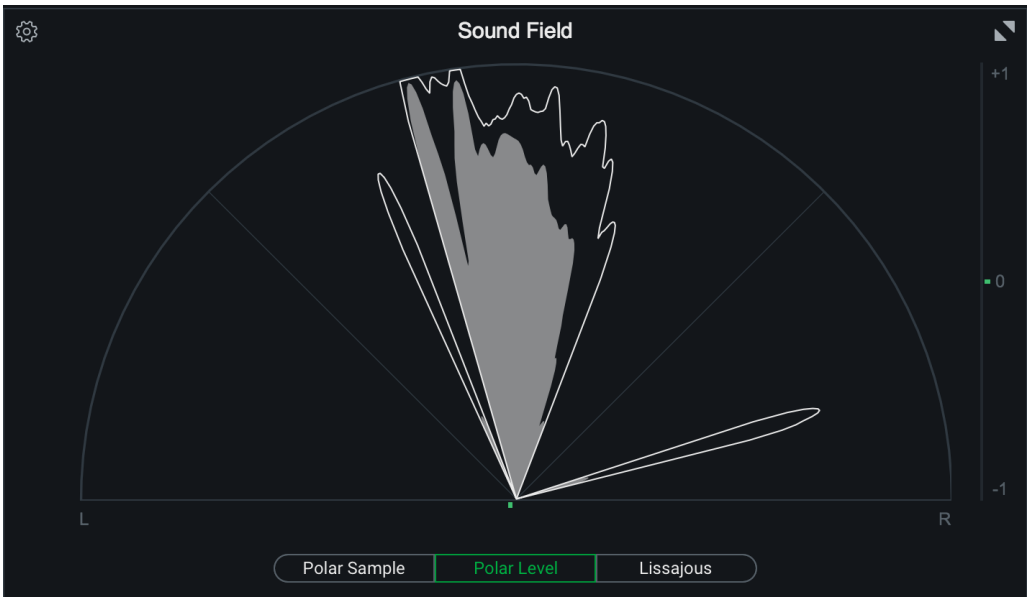
The Polar Sample Vectorscope plots dots per sample, but uses a polar coordinate display that is more useful in highlighting the stereo image of the incoming signal. Patterns that appear within the 45-degree safe lines represent in phase signals while patterns outside these lines

represent out of phase audio. The history of the Polar Sample Vectorscope also fades out slowly. The infinite history is shown as the faintest shade of grey while the last few seconds are displayed as slowly fading data points. You can reset the display by clicking on the meter.



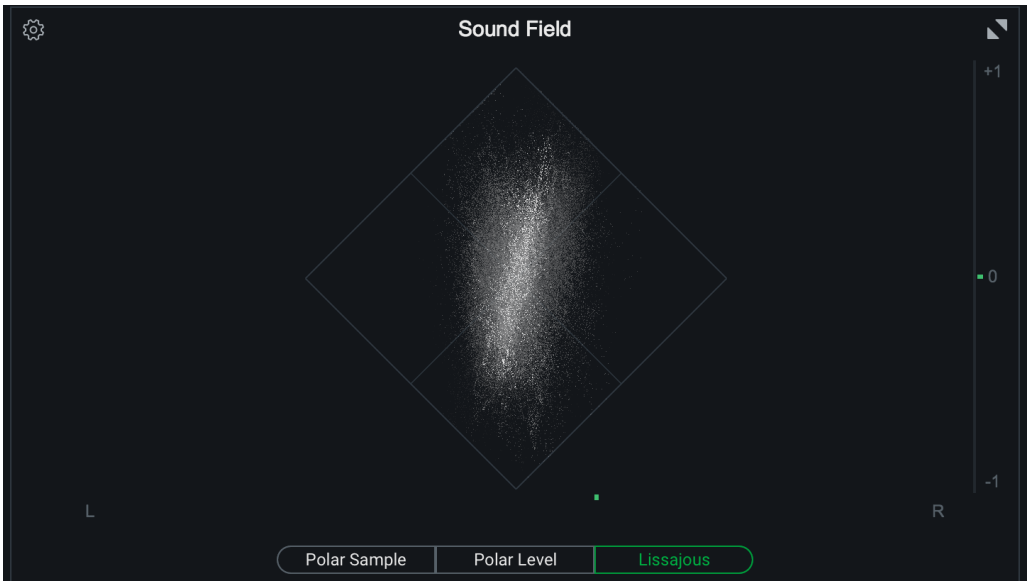
Polar Level

The stereo energy of a recording is clearly represented by the Polar Level Vectorscope which plots rays on a polar coordinate display that represent sample averages. The length of the rays represents amplitude while the angle of the rays represents their position in the stereo image. Rays within the 45-degree safe lines represent in phase audio while anything beyond these lines represents audio that is out of phase. History is represented on the Polar Level Vectorscope with the shrinking of the plotted rays slowly over time. The rays shrink towards the center of the vectorscope leaving the outer portion of the display for real-time analysis.



Lissajous

Like the Polar Sample vectorscope, the Lissajous Vectorscope plots per sample dots on a traditional oscilloscope display. Typically, stereo recordings produce a random pattern on a Lissajous Vectorscope that is taller than it is wide. Vertical patterns mean left and right channels are similar (approaching mono, which is a vertical line). Horizontal patterns mean the two channels are very different, which could result in mono compatibility problems.



The history of the Lissajous Vectorscope fades out slowly. The history is shown as the faintest shade of grey while the last few seconds are displayed as slowly fading data points. You can reset the display by clicking on the meter.

Clipping

The Vectorscope will draw any clipped samples in red.

Balance Meter

The horizontal bar meter below the stereo vectorscope display indicates the averaged stereo location of the input signal.

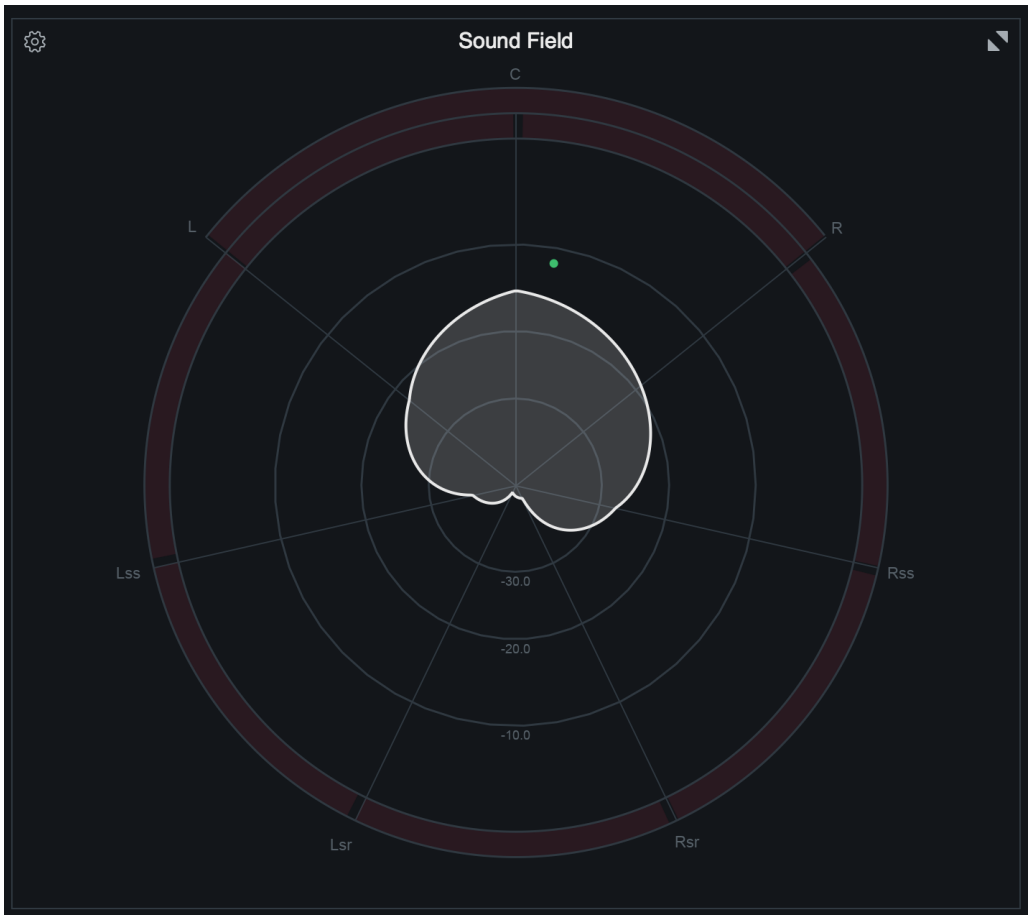
Correlation Meter

The vertical bar meter to the right of the stereo vectorscope display indicates the amount similarity (or correlation) between the left and right channels. When two signals are exactly the same (in phase) a reading of +1 would register on the correlation meter. When two signals are perfectly out of phase and thus completely different a reading of -1 would register on the correlation meter.

A Correlation Meter is used in stereo to ensure that the left and right signals will sum to mono without any cancellation of frequencies. If two signals are perfectly out of phase, then summing them would result in no audible audio. Typically, mixed audio will have values between 0 and +1 depending on the width of the stereo signal. Values that dip briefly below zero do not necessarily represent serious problems with your audio, but prolonged negative readings indicate issues with mono compatibility.

Surround Scope

The Surround Scope is a stylized display of the amplitude of surround channels. This display stresses the spatial relationship of the channels while still illustrating the level of each channel. The Surround Scope monitors the phase relationship between neighboring audio channels and displays an alert when there is a negative correlation or phase cancellation taking place.



Surround Amplitude

The Surround Amplitude Meter plots rays within a 360 degree readout with markers designating the various surround channels.

Surround Balance Indicators

The Surround Balance Indicator displays a tracking dot in different locations on the 360 degree readout. The location of the dot represents the summed surround location of all channels.

Surround Correlation Alerts

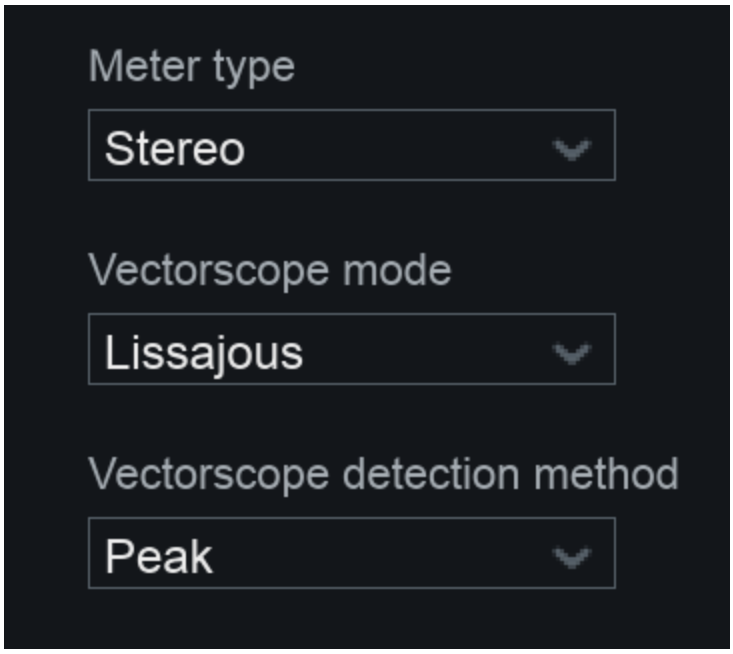
Correlation Alerts which bring your attention to any potential issues of phase between neighboring channels. The cells bordering the 360 degree plot of the Surround Scope each represent a given channel relationship. Only prominent signals that are significantly out of phase will trigger the alerts.

Surround Meter Scale

The rings within the meter represent precise RMS signal levels of each of your channels. Signals below -60dB RMS will not register as vectors on the Surround Meter.

Options

To access the meter specific options, click the gear button in the upper left hand corner of the Sound Field meter panel.



The Sound Field options tab offers the following options:

Meter Type

Selects between stereo or surround meter modes.

Vectorscope Mode

Selects the stereo vectorscope meter type. This can also be set by clicking the corresponding buttons in the Sound Field meter panel when Stereo Vectorscope is selected.

Vectorscope Detection Method

When in Polar Level mode, this determines how the sample averages are detected. Selects between Peak, RMS, and Envelope. Envelope mode can be most useful when analyzing amplitude as it detects even levels across all frequencies.

Layouts

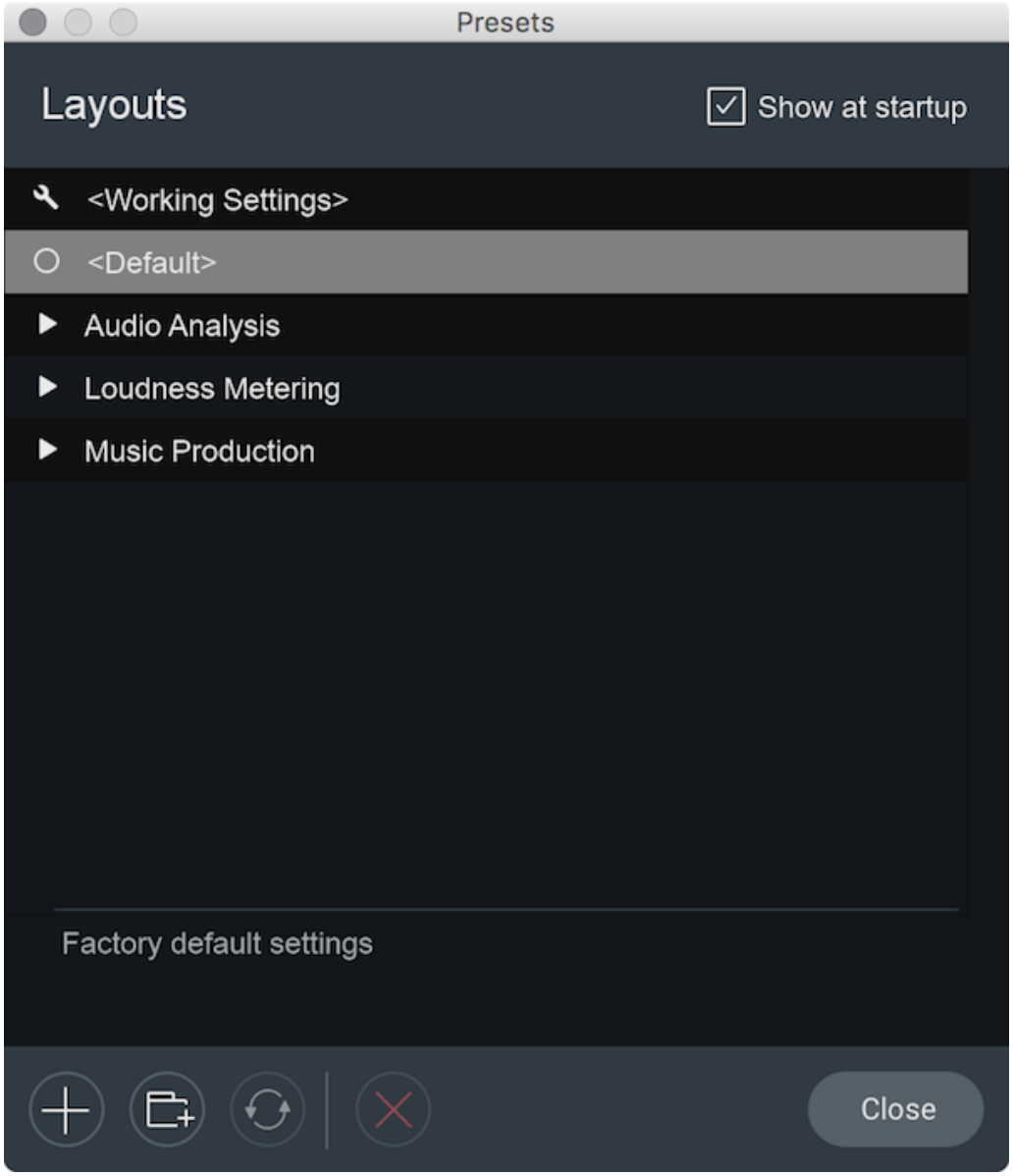
Overview

The Layouts window offers the ability to save the current meter panel layout and the associated meter specific option states to a preset file. The Layouts preset manager can be opened by clicking on the Layout preset name display bar in the header of the Insight 2 plug-in window.

The previous and next buttons to the right of the main layout name display bar can be used to quickly cycle through the layout preset list without opening the Layout preset manager window.

Layout Preset Manager

The following controls and functions are available in the Layout preset manager window:

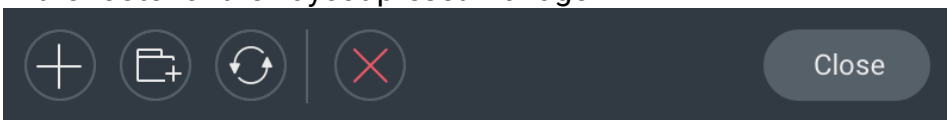


1. **Show At Startup:** When checked, the Layout preset manager window will automatically open every time Insight 2 is launched.
2. **Layout Preset Selector List:** Displays a list of available layout presets and layout preset folders.

    1. **Default Settings:** Returns the meter panel layout configuration and meter specific options to their factory default values.
    2. **Working Settings:** Returns the meter panel layout configuration and meter specific options to their last

modified values. This is useful for returning to an unsaved layout state after selecting a layout preset from the list.
3. **Layout Preset Folders:** Layout preset folders are displayed as they appear in the Presets directory on disk. Double-click on a folder name to rename it.
4. **Layout Presets:** Layout presets are displayed in the main list area of the layout preset manager. Single-click on a layout preset to load it. Double-click on a layout preset name to rename it.

3. **Layout Preset Comments:** The area below the main layout preset selector list displays comment text associated with the currently selected layout preset. To edit the comment text, single-click on the comment text to open an inline edit box. Modify the text and use the return/enter key to save the changes and exit the inline edit box.
4. **Layout Preset Footer Controls** The following controls are available in the footer of the Layout preset manager:

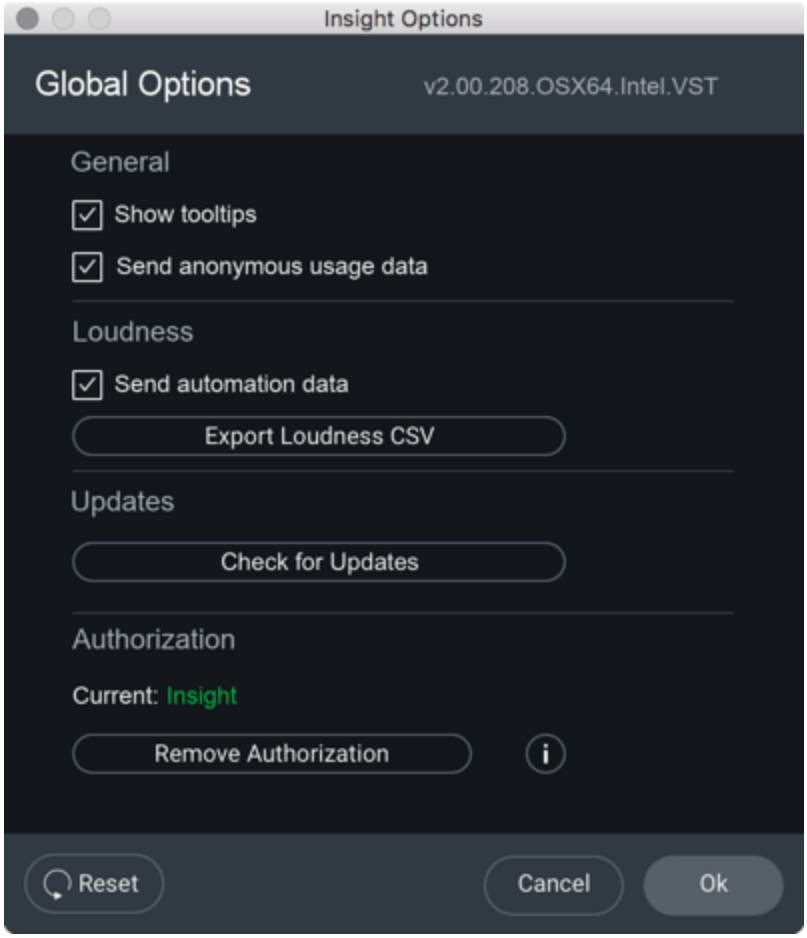


1. **Add Preset:** Creates a new layout preset from the current configuration.
2. **Add Folder:** Creates a new layout preset folder.
3. **Update Preset:** Saves changes made to currently selected layout preset. Only available when selected preset has unsaved changes.
4. **Close:** Closes the Layout preset manager window.

Global Options

Overview

The global options window includes the following sections: General, Loudness, Updates, and Authorization. These options save to a configuration file, which means that modifications to the factory default values will persist in new instantiations of Insight 2.



The buttons along the bottom of the Global Options window include:

1. **Reset:** Resets all options to their factory default settings.
2. **Cancel:** Discards changes made since last opening the global options window and closes the window.
3. **Ok:** Saves changes and closes the global options window.

General

1. **Show tooltips:** Enables/disables the display of tooltip text.
2. **Send anonymous usage data:** Enables sending of anonymous usage data to iZotope to help improve Insight 2.

Loudness

1. **Enable automation data:** When checked, Insight 2 will broadcast loudness overflow and integrated loudness automation data to the DAW/NLE. Enable track automation in the DAW/NLE to write the loudness data to two automation envelopes.

    1. **Loudness overflow:** When the integrated loudness target has been exceeded, this will broadcast a value of “True”, or “1”. When the integrated loudness level is below the target, this will broadcast a value of “False” or “0”.
    2. **Integrated loudness:** Broadcasts the Integrated loudness measurement value. When this value has exceeded the loudness target, the automation events will be broadcast and written more often. When integrated loudness falls below the loudness target value, the automation events will be broadcast and written less often.

2. **Export Loudness CSV:** Saves a .csv file with loudness history values captured over the course of the current calculation. The .csv file includes four main pieces of information: **Timestamp:** h:m:s.ms, **Integrated Loudness**, **Short-term Loudness**, **Momentary Loudness**. The loudness measurements written to the .csv file are only written as absolute loudness values, even if Relative scale is selected in the Loudness meter options. The Integrated loudness trace will not reflect dialogue-gated measurements, even if **dialogue gate** is selected in the **targets control panel** in the **Loudness meter**.

    EXAMPLE OF LOUDNESS HISTORY CSV EXPORT

    h:m:s.ms, Integrated [LKFS], Short-term [LKFS], Momentary [LKFS],
    00:00:0.5, -16.3116, -33.7392, -13.5834,
    00:00:1.0, -15.0203, -22.6982, -12.3178,

LEARN MORE ABOUT LOUDNESS METERING

1. Learn more about the Loudness History meter in the **History** chapter.
2. Learn more about the Loudness meter in the **Loudness** chapter.

Updates

1. **Download Product Portal:** To stay up to date with new versions of Insight 2, download the iZotope Product Portal application.
2. **Check for Updates:** Manually check for available updates. Clicking this button will open the Product Portal application to check for updates.
3. **Download Update:** If an update is available, a small green dot will appear. Clicking the Download Update button in the Insight options window will open the Product Portal application and display the Updates page.

Authorization

This section displays information about the current authorization state of the Insight 2 plug-in.

1. **Current Authorization Status Text:** Displays the current Insight 2 authorization state.
2. **Authorize:** Opens the iZotope Authorization wizard.
3. **Remove Authorization:** Removes the current authorization.

ADDITIONAL HELP WITH LICENSING AND INSTALLATION

Visit the iZotope Support website for additional information about licensing, authorization and installation.
support.izotope.com/hc/en-us/sections/360004410134

Relay

Overview

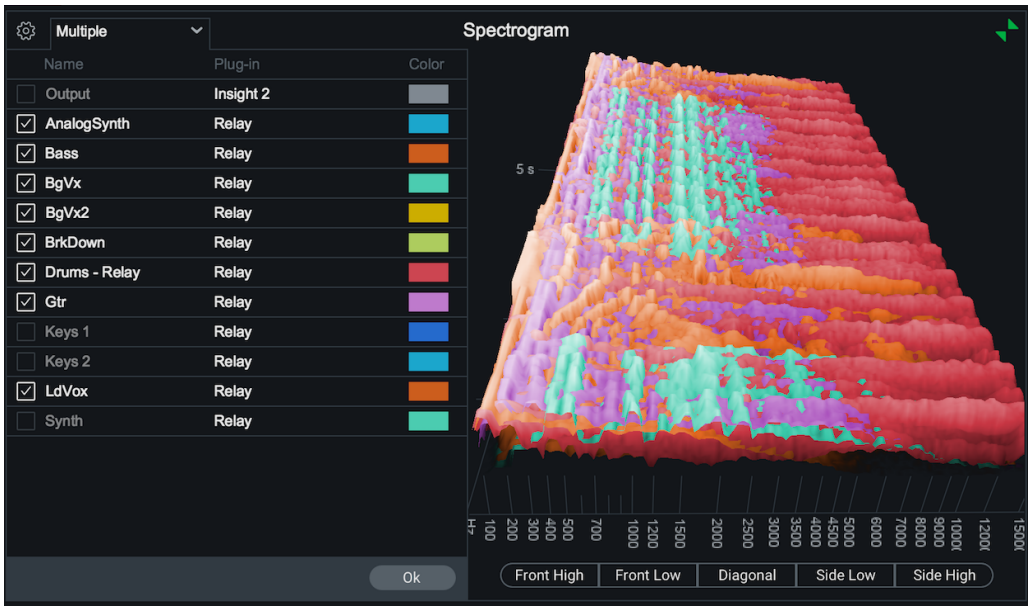
Relay can send metering data to, or receive information from, select Inter Plug-in Communication (“IPC”) compatible iZotope plug-ins.

Relay and Insight

Relay can send metering data to the Spectrogram and Intelligibility meters in Insight.

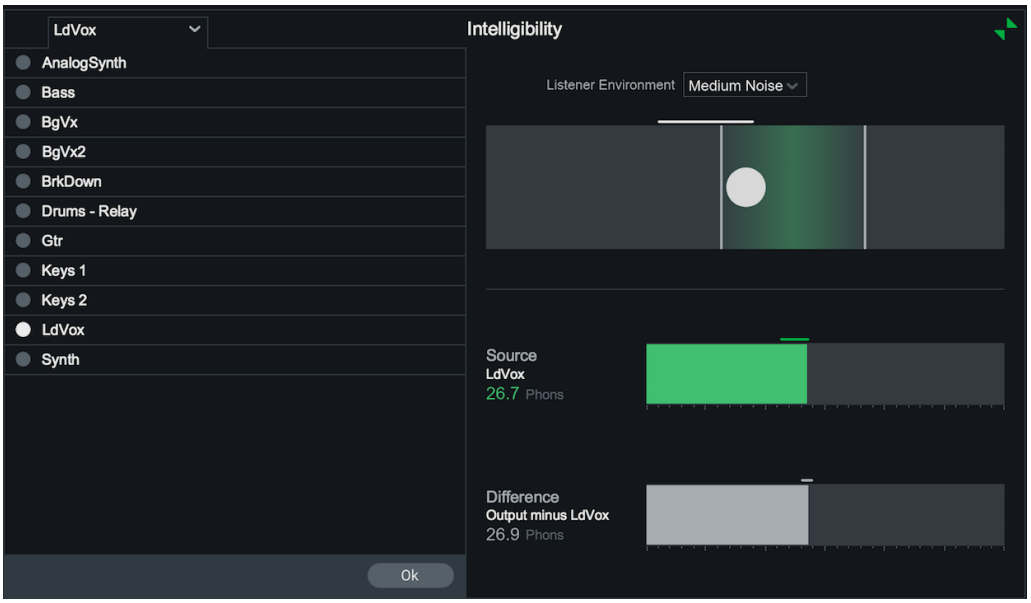
Relay in the Spectrogram

Up to eight Relay instances can be displayed at once in the Spectrogram meter panel in Insight.



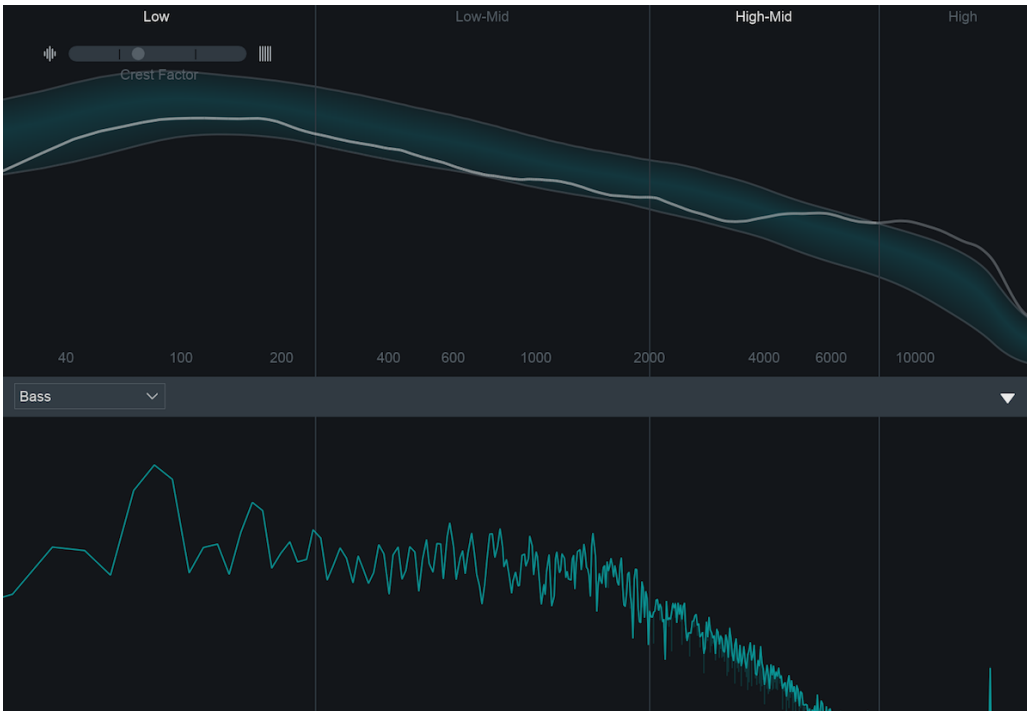
Relay in the Intelligibility Meter

Relay instances can be selected as a Source in the Intelligibility meter panel in Insight.



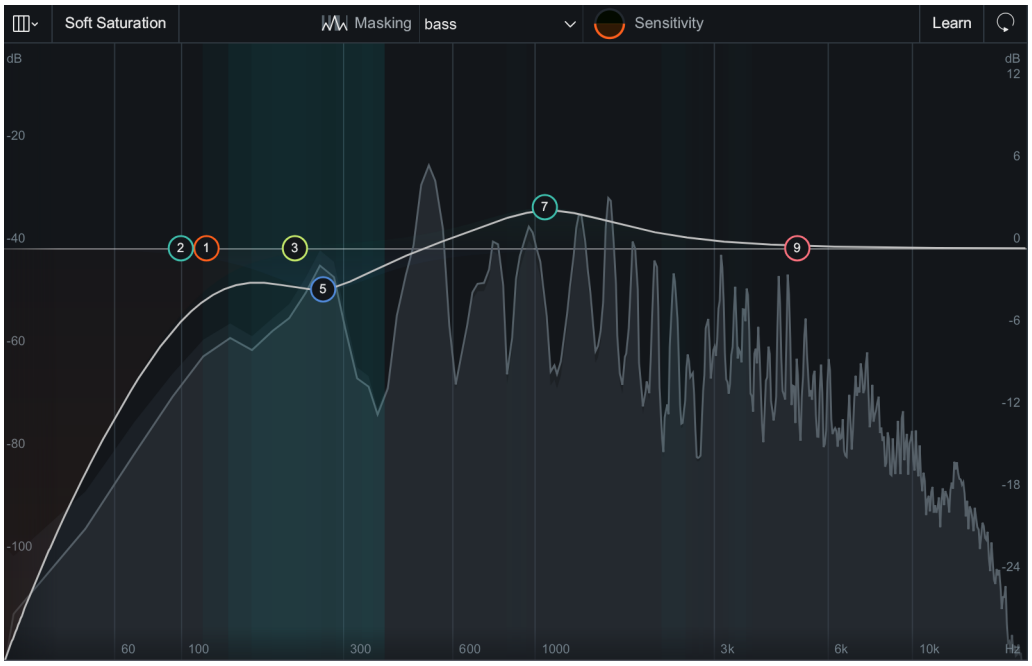
Relay and Tonal Balance Control

Relay can be selected as a source in the Tonal Balance Control plug-in.



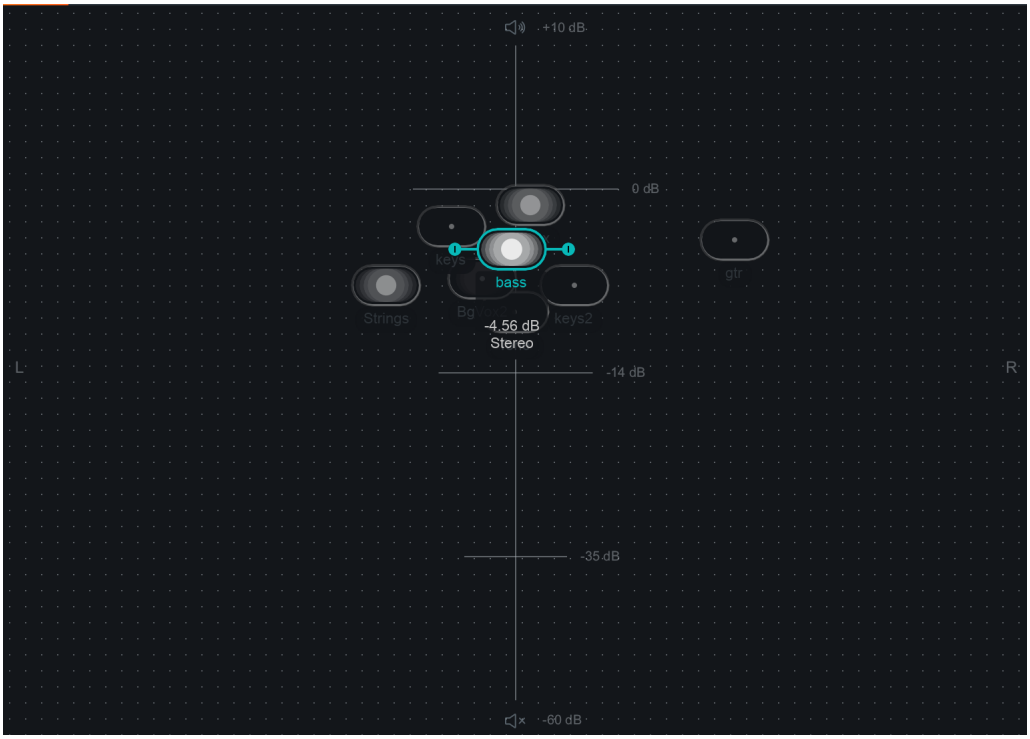
Relay and the Neutron Masking Meter

Relay can be selected as a source in the Masking Meter feature included in the following plug-ins: Neutron EQ module and Neutron EQ component plug-in.



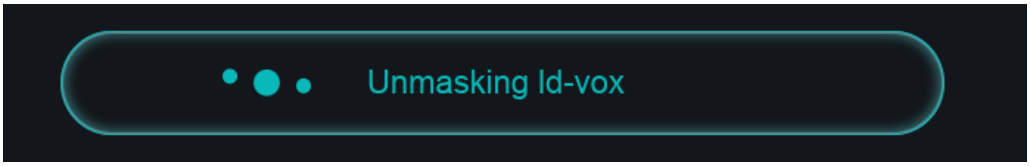
Relay and Neutron Visual Mixer

Relay controls can be remotely modified in the Neutron Visual Mixer plug-in. Moving a Relay node up or down in the Visual Mixer will adjust the gain slider in the remote instance. Moving a Relay node left or right in the Visual Mixer will adjust the pan control in the remote instance (stereo Relay instances only). Dragging Relay node handles in the Visual mixer will adjust the width parameter in the remote instance (stereo Relay instances only).



Relay and Nectar

Relay can be used as an Unmask source in Nectar's Vocal Assistant. When masking is detected between the Nectar instance and the Relay instance, an EQ curve will be applied to the Relay instance in order to reduce masking of the vocal track. When the EQ curve is active, Relay will display the track name it is unmasking. The EQ curve can be disabled by clicking on the "Unmasking" status button in the Relay interface.



Authorization

Overview

The iZotope Authorization window will appear the first time you open Insight 2 in your DAW or NLE.

The Authorization window allows you to:

1. **TRIAL:** Start or continue a 10 day Trial period prior to purchasing.
2. **DEMO:** Evaluate the product with Demo limitations.
3. **AUTHORIZE:** Authorize the product with a serial number.

Trial & Demo Modes

A 10 day trial period will start the first time Insight 2 is opened in your DAW or NLE. When the 10 day trial period has expired, Insight 2 will operate in demo mode until authorized with a valid serial number.

Trial Mode

Upon opening Insight 2 in your DAW or NLE, the authorization wizard window will appear and display the number of days remaining in your trial period.

Clicking “Continue” will dismiss the Authorization window and allow you to continue evaluating Insight 2 in trial mode with full functionality.

Demo Mode

When the 10 day Trial period has expired, enter a valid serial number to authorize the product or use Insight 2 in Demo mode. All meters are disabled when Insight 2 is run in Demo mode.

Authorizing Insight

We offer three methods for authorizing Insight 2:

1. **Online Authorization:** Use this method to authorize Insight 2 on a machine that is connected to the internet.
2. **Offline Authorization:** Use this method to authorize Insight 2 on a machine that is not connected to the internet.
3. **iLok Authorization:** Use this method to authorize Insight 2 using an iLok.

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>
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1. **How long does iZotope provide customer support for purchased products?**

    1. You can email us with any question for 12 months after you buy any iZotope product. Past 12 months, we'll still help you with your account and authorization but will not provide technical support for in-depth product questions. If you need

more detailed help on how to use the product, please check out our FAQs and Tutorials.

2. **How long does iZotope support its products?**

    1. Although we can't guarantee it, we do our best to keep our products up to date with the operating systems and plug-in hosts that we support. Sometimes, other companies make changes that we're not able to support, but we actively work with other companies to avoid these sorts of compatibility problems. We also do our best to address bug fixes within the product itself to ensure our products operate in accordance with our specifications.

We will provide software updates for 12 months from product release. After 12 months, no software updates will be provided.

For details on what operating systems and plug-in host software are officially supported for a product, please check that product's Specs page.

Contacting iZotope Customer Care

For additional help with Insight 2:

1. Check out the Customer Care pages on our web site at **support.izotope.com**
2. Contact our Customer Care department at **support@izotope.com**

iZotope's highly trained Customer Care team is committed to responding to all requests within one (1) business day and frequently respond faster. Please try to explain your problem with as much detail and clarity as possible. This will ensure our ability to solve your problem accurately, the first time around. Please include all system specs and the build/version of Insight 2 that you are using.

Once your Customer Care request is submitted, you will receive a confirmation email from iZotope Customer Care. If you do not receive this email within a few minutes, please check your spam folder and make sure our responses are not getting blocked. To prevent this from happening please add **support@izotope.com** to your list of allowed email addresses.

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Thanks for using Insight 2!

1. The iZotope Team

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1.4.0

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Anti-Grain Geometry

Version 2.4

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Better Enums

Version 0.11.1

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C++ Rest SDK

Version 2.10.15

Main Library:

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Bundled Libraries:

****** Base 64 Library (base64/base64.hpp) ******
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base64.cpp and base64.h

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René Nyffenegger **rene.nyffenegger@adp-gmbh.ch**

****** SHA1 Library (sha1/sha1.hpp) ******

sha1.hpp is a repackaging of the sha1.cpp and sha1.h files from the shallsha1 library (**http://code.google.com/p/smallsha1/**) into a single header suitable for use as a header only library. This conversion was done by Peter Thorson (**webmaster@zaphoyd.com**) in 2013. All modifications to the code are redistributed under the same license as the original, which is listed below.

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****** MD5 Library (common/md5.hpp) ******
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L. Peter Deutsch
ghost@aladdin.com

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Eigen

Version 3.4.99

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fmt

Version 4.0.0

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gsl

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JsonCpp

Version 1.2.1

LAME

libmp3lame

Version 3.99.5

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LibXML2

Version 2.7.8

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nanomsg

Version 0.5-beta

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readerwriterqueue

Roboto font family

Skia

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Yoga

Version 1.9.0

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