![NUGEN Audio logo]

DialogCheck

Dialog clarity meter

Contents

Introduction

NUGEN Audio DialogCheck is a mono, stereo and multichannel dialog clarity (intelligibility) metering plug-in. It is suitable for use in Film, Television, Radio, Podcasting and Game Audio production and post-production environments.

DialogCheck is used to provide an objective measure of how intelligible speech audio is (dialog clarity).

By using the real-time bar meter and the history graph, the user can easily compare the audio they are playing to the dialog clarity readings given by DialogCheck to identify sections of speech which may have poor clarity, and may be hard for a fresh listener to understand.

By using the distribution view and the numerical statistical values given for an entire clip, the user can quickly get an overview of how intelligible the speech in an entire program is.

Quick Start Guide

While Mixing

To get a constant, objective, real-time measure of the dialog clarity in the audio you are working on, insert DialogCheck on your Master Fader and place the plug-in window somewhere you can see it.
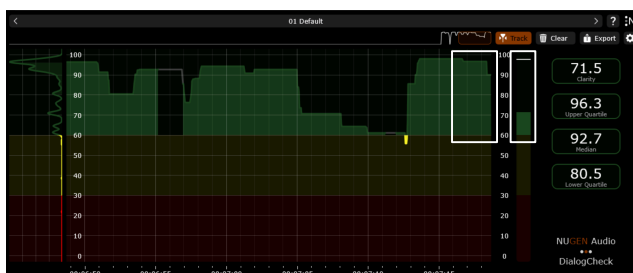
Readings in the green indicate speech that is probably clear - the more green the clearer.

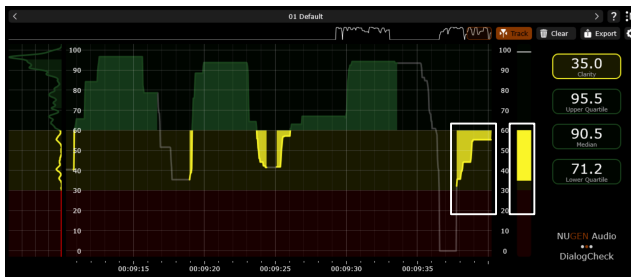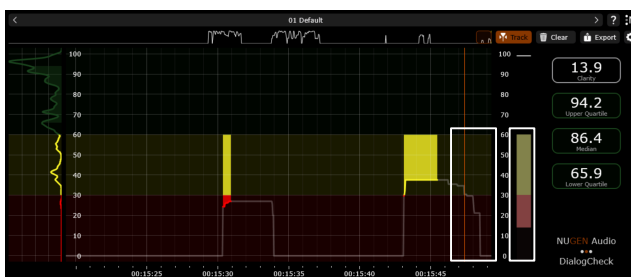Readings in the yellow indicate speech that is probably not clear - the more yellow (or even red) the less clear the speech is.

Depending on the creative intention here you may wish to increase the clarity (the method used will depend on the source of the lack of clarity).

When the history trace and level meter are greyed out, this indicates that DialogCheck doesn't think speech is present in that portion of audio (ie- it is non-dialog). This could be silence, sound effects, music, or, in some cases, speech which is so unclear that DialogCheck doesn't even recognise it as dialog at all.

Assessing a Completed Mix
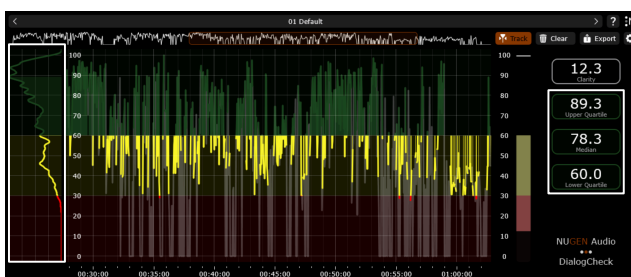
To quickly assess the dialog clarity in a completed mix, run the entire program through DialogCheck (this can be done faster-than-real-time using an offline render or AudioSuite in ProTools).

The Distribution View (far left) gives a graphical representation of how clear most of the dialog is.. The more green there is, the more clear dialog there is - depending on the creative intention, different profiles here may be considered desirable or acceptable.

The Statistical Readouts on the right-hand side of the interface ("Upper Quartile", "Median" and "Lower Quartile") give numerical measures describing the distribution of the clarity of the dialog in the program. Higher numbers indicate that more of the dialog in the program is probably clear. Lower numbers (eg- lower than 60) probably indicate that a significant amount of the dialog is not clear - this might suggest that the mix could benefit from the clarity being increased in places.
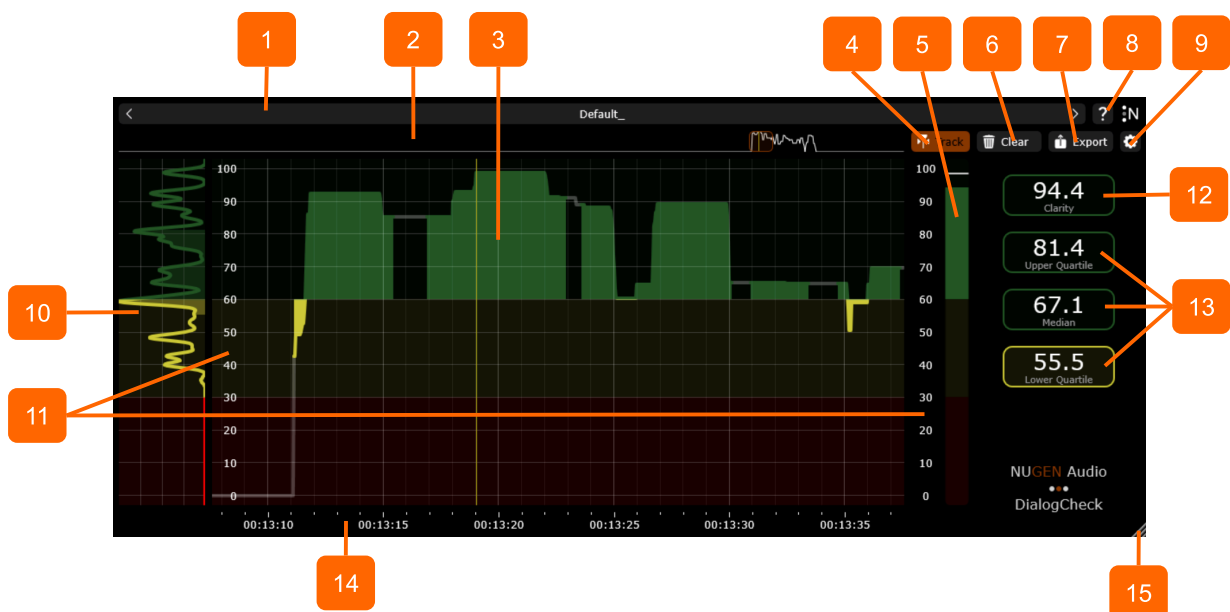
Informally you could think of the statistical readings having the following meanings:

- Median reading = "the average clarity of your dialog"

- Lower quartile = "how clear your worse dialog is"

- Upper quartile = "how clear your better dialog is"

Interface

Main Interface

Below is the main graphical user interface for DialogCheck.

1   **Preset Bar.** Use the arrow buttons to step sequentially through the presets forwards or backwards. Click the preset bar to open the preset browser.

2   **Macro View.** This view shows a thumbnail view of the overall history of dialog clarity readings stored by the plug-in. This view can be used to rapidly locate areas of specific interest in the main dialog clarity history view. The highlighted section of the Macro View shows the portion of the history which is currently visible in the History View.

3   **History View.** This view presents a graph of the dialog clarity readings measured by the plug-in over time (the history of the readings). If the Track function is active, as the transport in the DAW is played, and audio is played through the plug-in, the history view will scroll to the left.

The user can click their left mouse button and drag left and right in the History View to scroll the view accordingly. The user can also drag the highlighted section of the Macro View left and right to scroll the History View left and right to allow closer inspection of specific portions of the dialog clarity history.

The color banding of the history view, into horizontal stripes, reflects the color banding of the Realtime Meter, and is controlled in the Settings Panel.

When the plugin is receiving audio at a transport position that is already present in the history (ie- the user is playing some audio back through the plug-in for a second time), the current transport position (the play indicator) is shown as a vertical line on the History View.

4   **Track Button.** Toggles the Track function on and off. When Track is active, the History View and Macro View will follow the transport position of the audio being played through the plug-in. Dragging the history view or the selected region in the macro view automatically disables tracking.

5   **Realtime Meter.** Displays the current dialog clarity reading. The color banding is controlled in the Settings Panel. The purpose of the color banding is as a usability feature, to allow for easy visual identification of areas of good, medium and poor dialog clarity. Depending on the type of material being measured, the intended audience and the "station sound" or customer's preference / guidelines, the user may choose to set these color bars at different levels, and may also change the colors displayed.

6   **Clear Button.** This clears the history stored in the plug-in.

7   **Export Button.** This exports a text file which contains some overall information about the current history stored in the plug-in and also a table of readings in comma separated values (csv) format.

8   **Manual Button**. Opens this manual.

9   **Settings Panel Button.** Toggles the Settings Panel on and off.

10   **Distribution View.** Displays the statistical distribution of the readings throughout the history stored in the plug-in, with color banding to match the History View. The levels at which the Distribution View goes from being shaded to unshaded, show the upper quartile and lower quartile levels of the distribution (or the selected upper percentile and lower percentile levels if the user has changed those levels in the settings).

The Distribution View can be used to get a quick visual overview of the distribution of dialog clarity over the entirety of a program.

11   **Dialog Clarity Scale.** This shows the scale that the readings are over. This corresponds to 0 - 100, where 0 is very unclear dialog, and 100 is very clear dialog.

12   **Realtime Readout.** Displays a numerical readout of the current dialog clarity level.

13   **Statistical Readouts.** Displays statistical information for the entire history currently stored in the plug-in. The percentile levels for these readouts can be adjusted in the settings.

14   **Timeline Bar.** Displays the transport positions for the corresponding parts of the History View. The user can left-drag the bar up and down to zoom the horizontal scale of the History View in or out.

15   **Plug-in Resize Handle.** Left-drag this handle to resize the plug-in interface.

Preset Browser

Below is the Preset Browser user interface for DialogCheck.

The settings used by the plug-in can be saved or loaded as a group, known as a "preset". When the plug-in is first installed or is updated, some Factory presets will be installed along with it - these are read-only and cannot be changed by the user.

The user can create their own presets, by adjusting the various settings as they require and then saving those settings as a new preset. This new preset will be a User preset and can be edited, renamed or deleted.
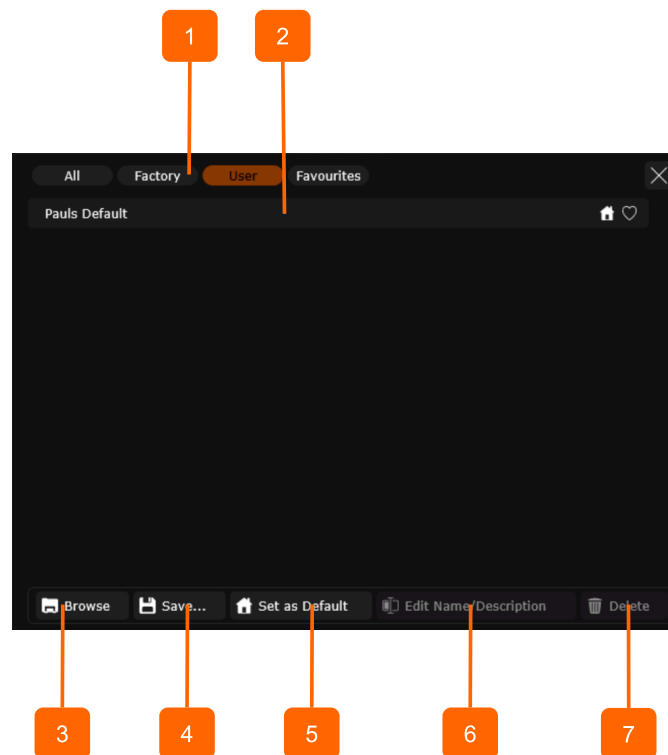
1   **Preset Types Selector**. These buttons filter the types of presets that are shown in the Preset List below. Factory presets are installed with the plug-in and are read-only. User presets are created by the user and can be edited or deleted. Any presets can be selected as a Favourite preset by clicking the heart icon in the Preset List.

2   **Preset List**. The list of all presets on the type selected by the Preset Types Selector buttons. The currently selected preset is highlighted in orange. Presets can be set as Favourite by clicking the heart icon next to them. The preset with a home icon next to it is the currently set default preset. When a new instance of the plug-in is opened in the DAW, it will default to this preset (this may depend on some specific DAW functionality).

3   **Browse Button**. This opens the machine's operating system file browser window at the location where User presets are stored. User presets are stored as .nap text files (in an XML format) and are transportable. This allows for easy

sharing and distributing of presets. For example, this could be useful to propagate a company wide preset to all users.

4   **Save Button**. This saves the current settings as a preset. This can be used to update the currently selected preset, or create a new User preset.

5   **Set as Default Button**. This sets the currently selected preset as the default preset. Note - this does not set the current settings as the default settings. To set the current settings as the default settings, the user must first use the Save Button to save the current settings as a preset, and then set that preset as the default preset.

6   **Edit Name / Description Button**. When a User preset is selected in the Preset List above, this allows for renaming the current preset.

7   **Delete Button**. When a User preset is selected in the Preset List above, this allows for deleting the current preset.

Settings Panel - Interface Tab

The plugin has a Settings Panel which has multiple tabs that the user can switch between.

Below is the Settings Panel showing the Interface tab.

1   **Interface Tab**. The tab buttons at the top of the Settings Panel control which group of settings are displayed.

2   **Interface Color**. Controls the main color of the plug-in interface.

3   **Play Indicator Color**. Controls the color of the vertical line play indicator on the History View, which shows the current transport position.

4   **Line Thickness**. Controls the thickness of the line used to display the history.

5   **Fill Alpha**. Controls the amount of transparency of the fill in the history graph.

6   **Color Splits**. These controls can be used to control the color of the Realtime

Meter, and also the History View and the Distribution View. The Level controls

can be used to adjust at what reading levels the colors boundaries are.

7   **Fill mode**. Used to determine which areas of the history graph are filled.

8   **Colorize Readings**. Switches off or on coloring of the readout numbers and

out-line lozenges on the main interface.

9   **Colorize Reading Background**. Switches off or on coloring of the readout

lozenges fill areas on the main interface.

10   **Zero Non-Dialog**. Controls what level the history graph should display when

dialog is not detected.

Settings Panel - General Tab

Below is the Settings Panel showing the General tab.

1   **General Tab**. The tab buttons at the top of the Settings Panel control which group of settings are displayed.

2   **Decimal Places**. This controls the number of decimal places output into the csv file when the Export function is used

3   **Percentiles**. These can be used to set the percentiles displayed on the readouts of the main interface and the shaded area of the Distribution View.

Settings Panel - Algorithm Tab

Below is the Settings Panel showing the Algorithm tab.

It is likely that most users will not need to adjust many of the settings on this tab. Changing these settings should be done with caution.
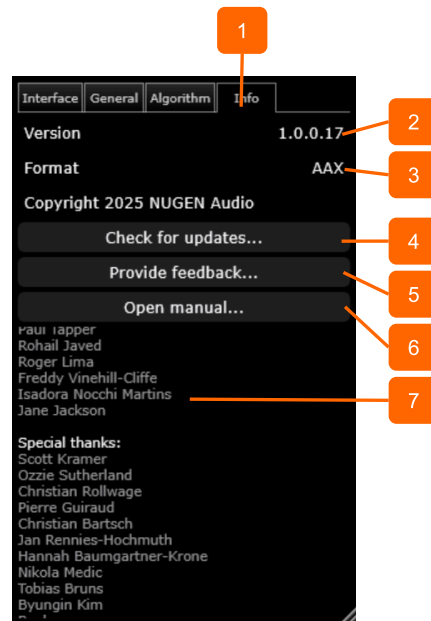

1   **Algorithm Tab**. The tab buttons at the top of the Settings Panel control which group of settings are displayed.

2   **Ignore Dialog Length**. This can be used to cause the algorithm to ignore detected dialog shorter than the given length of time, to help avoid false positives.

3   **Ignore Non-Dialog Length**. This can be used to cause the algorithm to ignore detected non-dialog shorter than the given length of time, to help avoid false negatives.

4   **Non-Dialog Threshold**. Set a minimum level of dialog clarity, below which the audio will be automatically considered non-dialog.

5   **Smoothing Window Duration**. To help with readability, the raw readings from the underlying algorithm are smoothed. This control can be used to set the length of the smoothing window.

6   **Smoothing Power**. This can be used to set what exponent of readings is used for the smoothing (for example a value of 2 would be used to achieve root-mean-squared smoothing [rms]). A value of 0 represents the maximum value over the smoothing window (modified by the window function).

7   **Window Function**. This is used to set what windowing function is to be used for readings over the smoothing window. Selecting Rectangular is equivalent to not using a window function.

8   **Function Power**. For some window functions this controls the proportion of the window that is the "taper" part. The value ranges from 0 to 0.5. A value of 0 results in no taper (a rectangular window), and value of 0.5 results in all taper.

9   **Half-Window**. When switched on, the smoothing windowing will only use half of the windowing function - starting at the peak value, and tapering towards the end. The purpose of this is to aid with readability and to enable the user to more easily see when more clear or less clear dialog starts.

Settings Panel - Info Tab

Below is the Settings Panel showing the Info tab.

1   **Info Tab**. The tab buttons at the top of the Settings Panel control which group of settings are displayed.

2   **Version**. Displays the version number of the plug-in that is currently running.

3   **Format**. Displays the audio plug-in format of the plug-in that is currently running.

4   **Check for Updates**. This opens an online connection to the NUGEN Audio website to check whether there is an updated version of this plug-in available for download.

5   **Provide Feedback**. This opens a page on the NUGEN Audio website which allows the user to provide feedback to the NUGEN Audio support and development teams.

6   **Open Manual**. This button opens a copy of this manual.

7   **Credits.**

Applications

Audio Post-Production

The primary intended use for DialogCheck is during audio post-production for content intended for television, film, video streaming services, radio, game audio and podcasting. Any audio which includes speech (dialog) content could benefit from the use of DialogCheck.

It is important to note that DialogCheck is a metering tool. It does not apply any signal processing itself, but, instead, provides the objective measurement of the audio needed by an engineer to help achieve speech content which is clear and easy to understand.

During post-production, an audio engineer can play their full mix through DialogCheck to get an objective measure of how clear the dialog is in the mix. This may guide them to make changes in the mix to make the dialog clearer and then re-test with DialogCheck.

What is Dialog Clarity?

Throughout this manual, we are using the terms "speech" and "dialog" interchangeably. Strictly speaking, dialog means speech between two or more people, but "dialog" is commonly used to refer to any speech content in an audio mix.

We are using the term "Dialog Clarity" informally, to mean "how easy it is for a listener to understand a specific piece of dialog / speech". This is often referred to as Dialog Intelligibility.

Dialog clarity is very important - poor intelligibility is commonly cited as a major source of audience complaints in TV (eg- see [EBU Tech Review: Speech Intelligibility in TV, June 2022](#)).

How easy it is for a listener to understand a piece of dialog is affected by a huge number of factors, including:

- Speech in a language the listener recognises

- Speech in a dialect that the listener is familiar with

- Listener hearing disability

- Loudness of speech

- Loudness of other non-speech audio mixed in with the speech (background noise, music, etc)

- How clearly the speaker enunciated their words and any speech impediments

- Quality of audio signal (eg- audio signal compression, loss of frequency ranges, clipping, etc)

- Reverb and other audio effects

- Number and placement of loud-speakers ([the cocktail effect](#) can help to distinguish dialog from background noise)

- Familiarity with the speech (has the listener heard it before? Do they have the script?), or the topic of the speech, or the vocabulary in use

- Visuals (eg- seeing the speaker's lips helps the listener to understand what's being said, even if they are not fully lip-reading)

- Audio distortions (eg- excessive breathe noise or pops and clicks)

- Level of attention that the listener is giving to the program

- Listening environment

Clearly, several of these potential issues cannot be addressed by an audio post-production engineer (eg- the post engineer cannot ensure that the listener speaks the correct language well!), but, many of the issues listed above could potentially be addressed by a post engineer. This could include actions such as:

- Adjusting the level of the dialog, sound effects and music in the mix, relative to each other

- Adjusting the processing in use

- Applying audio-correction / cleaning / de-reverb / noise-reduction techniques to the source dialog audio

- Correcting audio pipeline problems which may have resulted in poor quality audio (eg- getting the original uncompressed audio for a clip instead of a heavily compressed version)

- Use of ADR (Automatic Dialog Replacement)

Without a way of getting an objective measure of the dialog clarity, such as DialogCheck, it can be hard for the engineer to judge whether they need to make further changes to improve the clarity. The engineer is likely to be listening in a much better audio environment than the final mix will be played out in, and paying much closer attention to it than some of the final audience will be. Also, the very act of working on the speech audio will mean that the engineer has heard it several times

and will likely find it easier to understand than if they had never heard it before. The engineer may well have the script / subtitles for the speech.

Audio Pre-Production

The closer production audio is to the final desired result (and so the less processing that needs to happen during post-production), the better the final result is likely to be. DialogCheck could be used during pre / early production to assess different mic-ing configurations, performance styles, room set-ups, etc, to ensure that raw production audio already has near to the desirable level of dialog clarity.

Algorithm

The plugin DialogCheck is implemented using the 'Listening Effort Meter' developed by Fraunhofer IDMT allows sound engineers to visualize listening effort during mixing and conduct post-mixing checks to optimize audio quality.

The Listening Effort Meter (LE-Meter) is a software tool designed to objectively assess the listening effort of dialog in broadcast material, utilizing automatic speech recognition and psychoacoustic modeling. The LE-Meter provides metrics for evaluating the intelligibility of dialog.

The LE-Meter has been validated through systematic listening tests. The metrics of the LE-Meter show a high correlation with subjective assessments of listening effort, making it a practical tool for enhancing the clarity of film and television audio.

Reporting a Problem

If you encounter a problem with any of NUGEN Audio's products, please let us know, to help us improve them.

You can email the NUGEN Audio support team at support@nugenaudio.com.

To make it easier for us to resolve the issue you are seeing:

- Please give a clear explanation of the problem, including any steps required to reproduce it if appropriate.

- Please state how frequently you've experienced the problem.

- Please supply details of the system you are using, in particular:

  - The operating system (Windows/Mac OS) and version.

  - Host application and version.

- CPU speed and RAM available.

Please be patient with any problems you may experience, particularly with products at a beta stage of release. At NUGEN Audio we take problems with our software seriously, and will endeavor to correct them as quickly as possible.

Plug-in Version History

1.0.0   Initial release