



Audio Loudness Meter User's Guide

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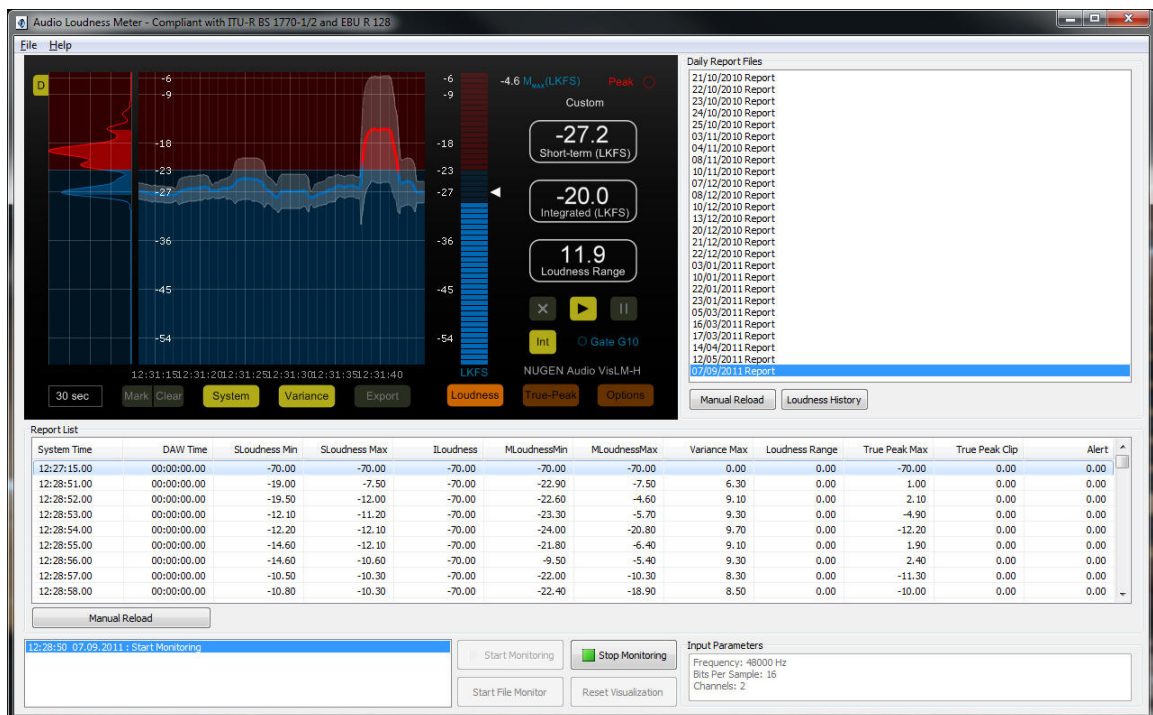
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1. Overview

Audio Loudness Meter is a powerful solution for on-air audio loudness metering and assessment. The product provides 24/7 loudness measurement compliant to ITU-R BS.1770-1, ITU-R BS.1770-2 and EBU R 128 recommendations. In intuitive interface, the solution provides the user with the ability to observe and measure the true peak level and to log the measured audio levels information.



1.1 General Features

- Graphical display of the current measurement – 0 - 24 h
- Graphical display of the saved/logged measurements
- 1, 2, 4 and 6 mono PCM audio input channels
- 16 and 24 bit audio
- From 6 KHz to 96 kHz input audio

- Live audio measurement
- File audio measurement
- Digital and Analog live audio input
- 24/7 measurement logging
- CSV log output
- Log history graphical display
- Audio loudness alarm

1.2 Measurement Features

- Momentary Loudness Meter
- Momentary Loudness Meter Max Value
- Short-term Loudness
- Integrated Loudness
- Loudness range descriptor
- Integrated loudness measurement functionality
- EBU mode indicator
- True-Peak overload indicator

2. Installation

2.1 Installing Audio Loudness Meter

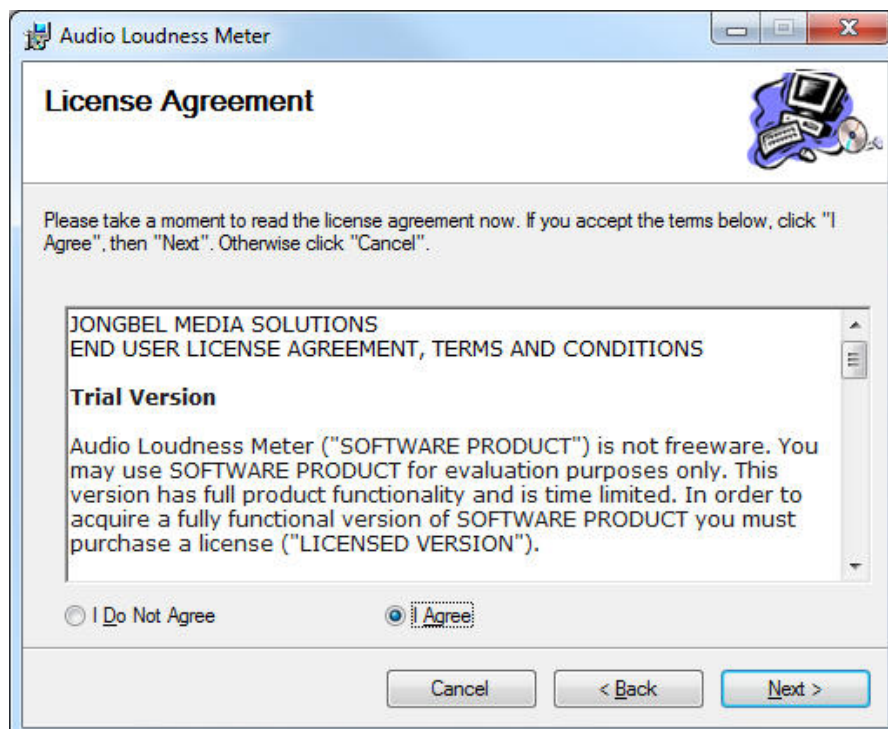
Before installing the **Audio Loudness Meter** solution, make sure that any previous version of the product has been uninstalled refer 2.2.

The installation package of **Audio Loudness Meter** is distributed in msi file. After downloading the file from the official Jongbel Media Solutions web site – www.jongbel.com, execute the installation by starting the msi file.

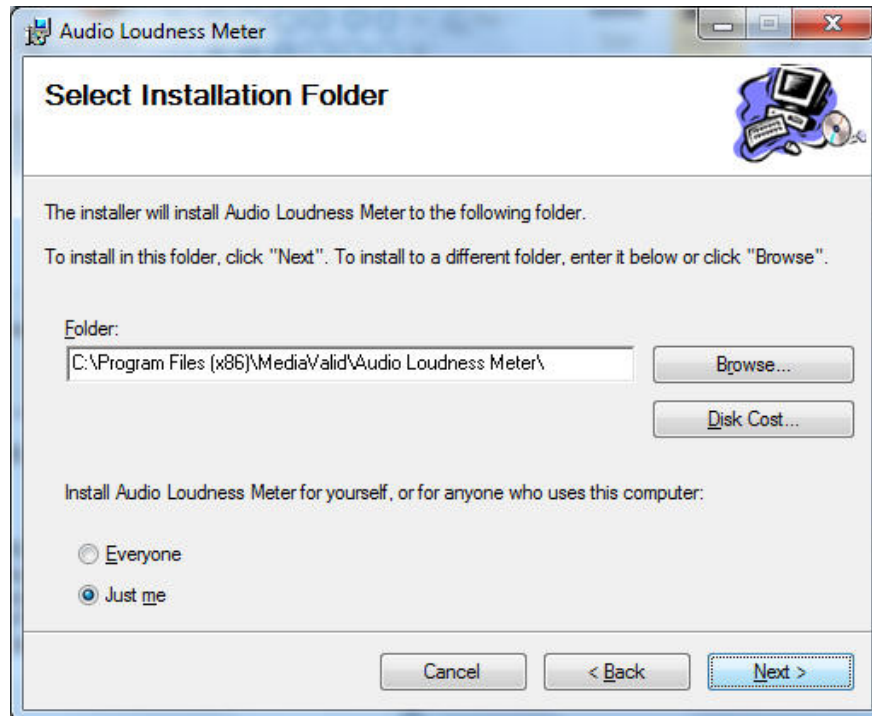
First a Welcome dialog pops up. Click "Next" in order to proceed.



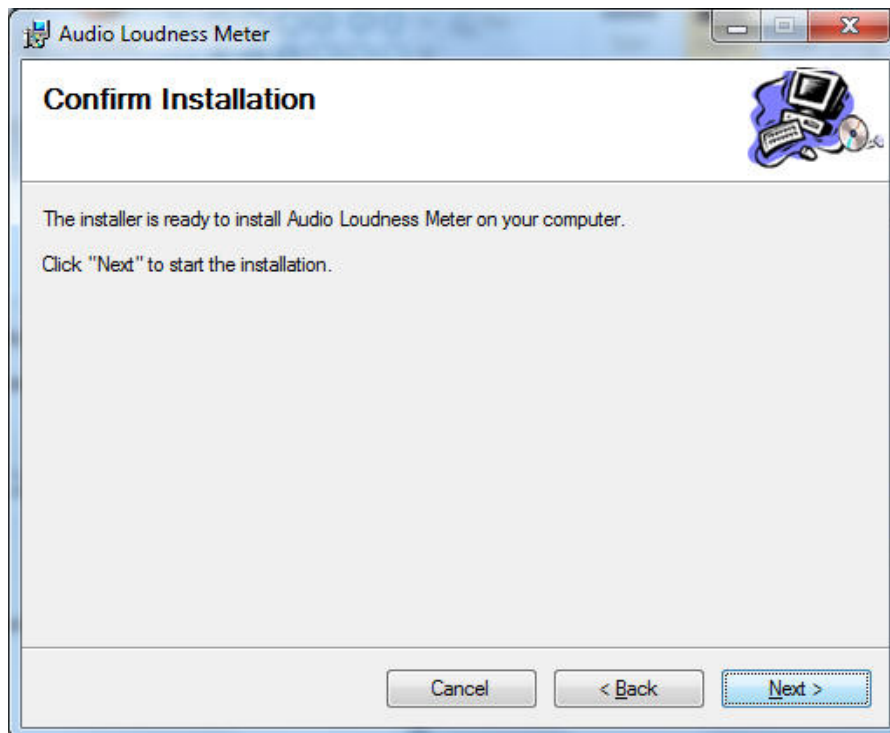
After this a License Agreement dialog pops up. Read the agreement carefully, select "I Agree" if you agree all the terms and click "Next" to proceed.



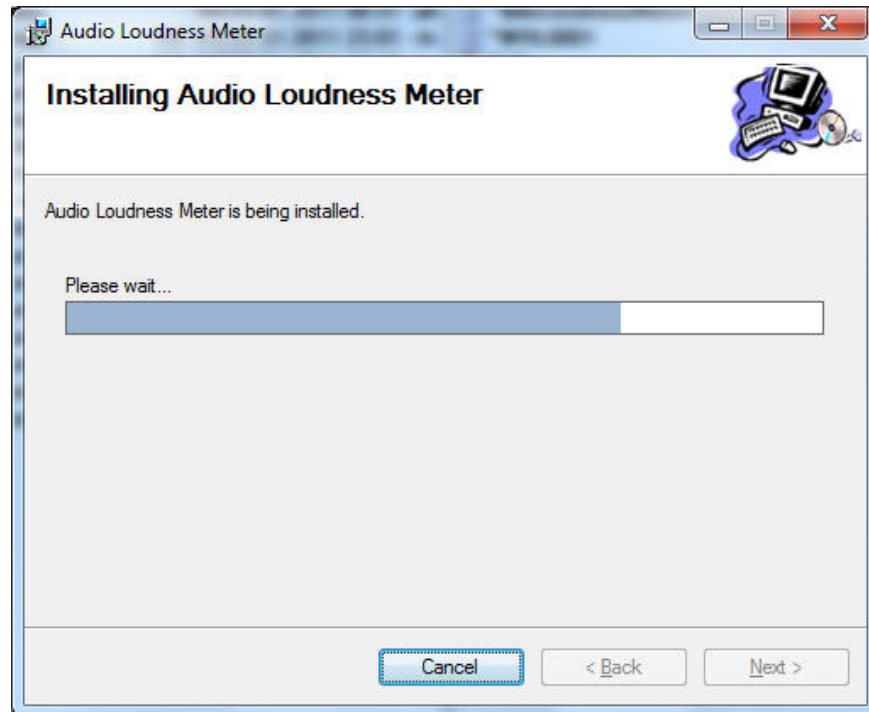
The next window shown specifies the installation product location and user access to the product. Change the destination product folder and user access if needed and click “Next” to proceed.



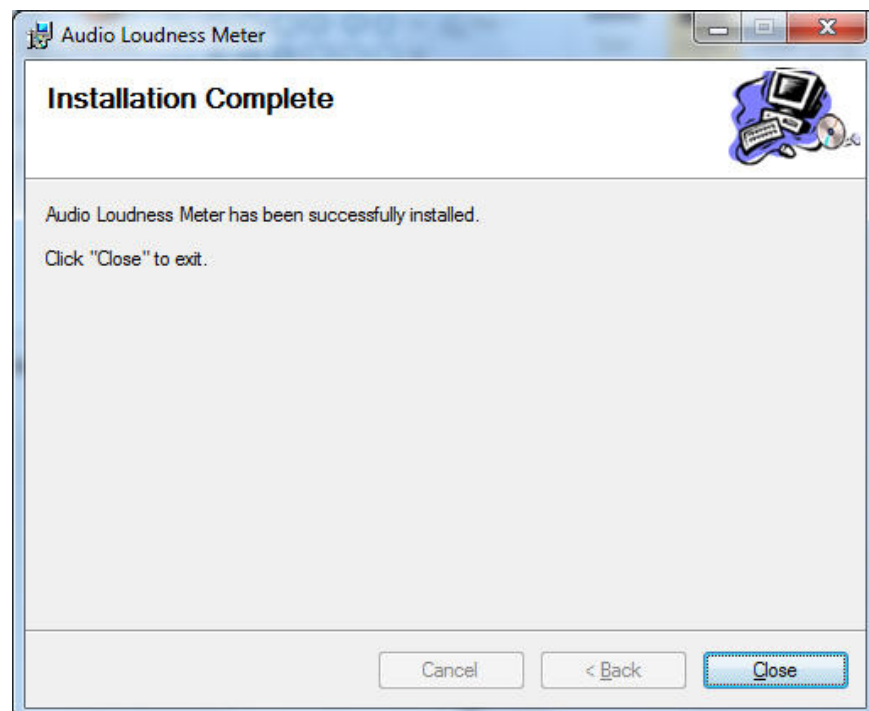
The next dialog is a confirmation dialog. Confirm by clicking “Next” in order to start the installation procedure.



While the product is being installed an “Installing” window shows the installation progress. Wait until the product is being installed.



At the end an “Installation Complete” dialog pops up, which denotes the successful Audio Loudness Meter installation. Click “Close” to finalize the process.



2.2 Uninstalling Audio Loudness Meter

The application can be removed opening the Control Panel – Programs and Features. Select the **Audio Loudness Meter** application and click Uninstall.

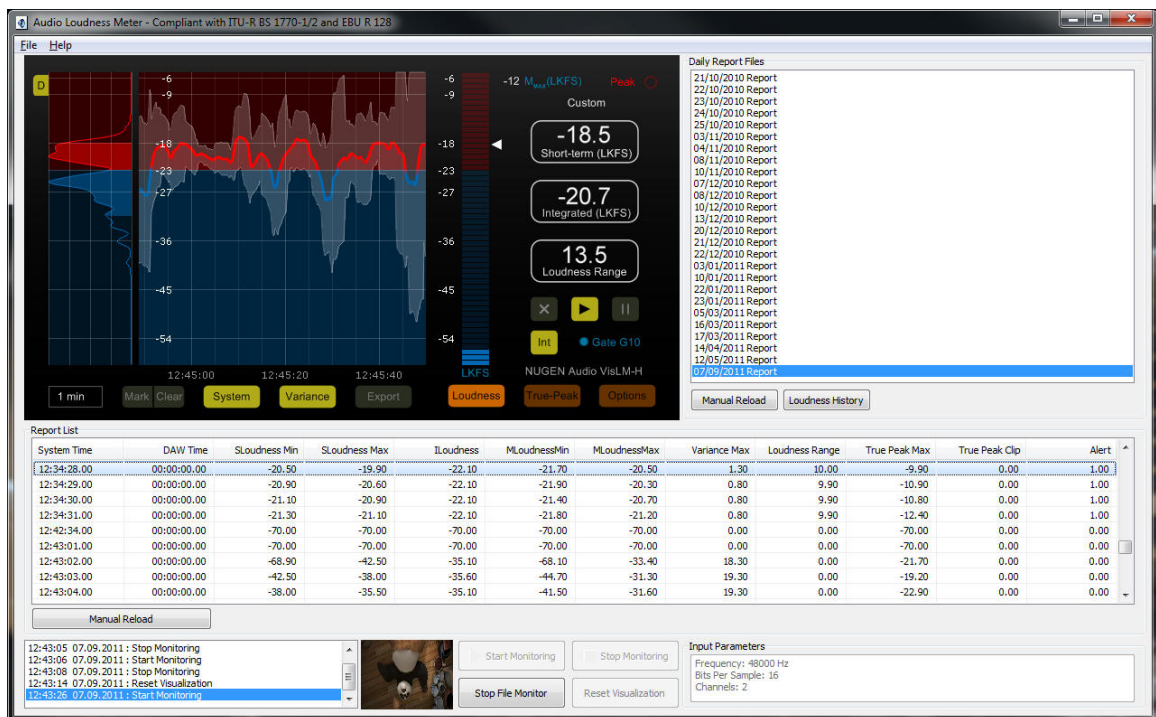
3. Quick Startup

Start **Audio Loudness Meter** application. Make sure that you have selected input audio device and its input parameters from the Configuration dialog. Once the input and its audio parameters are selected, the on-air measurement process can be started by clicking **Start Monitoring** button at the main form. The graphical representation of instant measurements appears at the top-left NUGEN panel. The top-right list represents the daily logs. The table in the middle of the application form represents the tabular representation of the loudness measurements. The application action event log is represented in the lower-left list. The control buttons can be found at the bottom of the form, along with the selected on-air input audio parameters.

System Time	DAW Time	Sloudness Min	Sloudness Max	Iloudness	MLoudnessMin	MLoudnessMax	Variance Max	Loudness Range	True Peak Max	True Peak Clip	Alert
12:27:15.00	00:00:00.00	-70.00	-70.00	-70.00	-70.00	-70.00	0.00	0.00	-70.00	0.00	0.00
12:28:51.00	00:00:00.00	-19.00	-7.50	-70.00	-22.90	-7.50	6.30	0.00	1.00	0.00	0.00
12:28:52.00	00:00:00.00	-19.50	-12.00	-70.00	-22.60	-4.60	9.10	0.00	2.10	0.00	0.00
12:28:53.00	00:00:00.00	-12.10	-11.20	-70.00	-23.30	-5.70	9.30	0.00	-4.90	0.00	0.00
12:28:54.00	00:00:00.00	-12.20	-12.10	-70.00	-24.00	-20.80	9.70	0.00	-12.20	0.00	0.00
12:28:55.00	00:00:00.00	-14.60	-12.10	-70.00	-21.80	-6.40	9.10	0.00	1.90	0.00	0.00
12:28:56.00	00:00:00.00	-14.60	-10.60	-70.00	-9.50	-5.40	9.30	0.00	2.40	0.00	0.00
12:28:57.00	00:00:00.00	-10.50	-10.30	-70.00	-22.00	-10.30	8.30	0.00	-11.30	0.00	0.00
12:28:58.00	00:00:00.00	-10.80	-10.30	-70.00	-22.40	-18.90	8.50	0.00	-10.00	0.00	0.00

Stop the monitoring process by clicking **Stop Monitoring**.

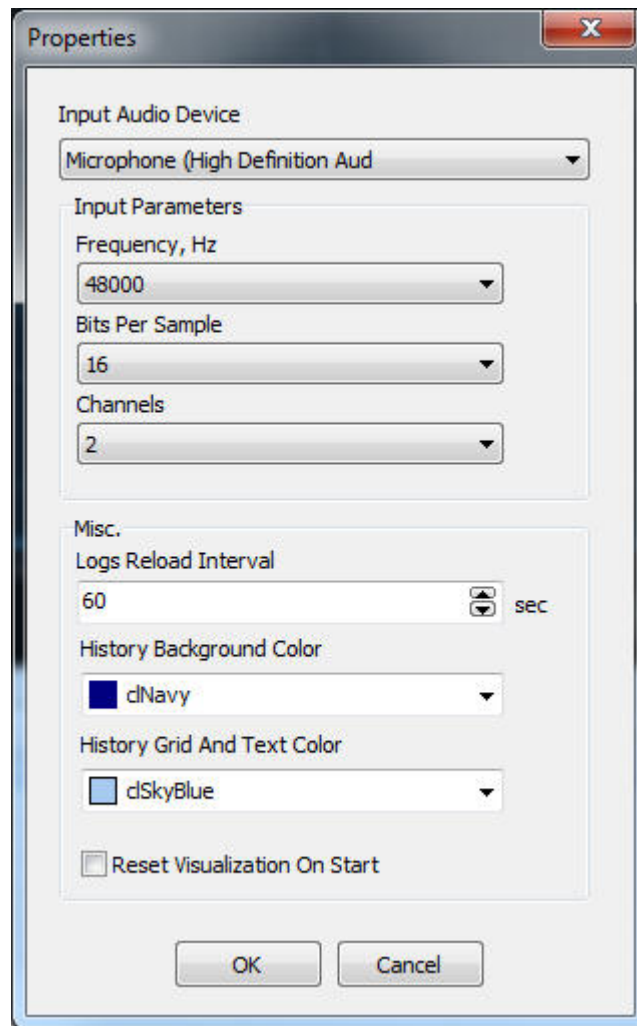
Start File Monitoring starts audio loudness metering of a media file. In order to perform the measurement of a certain media file, all the proper DirectShow Filters, have to be installed before the file processing. If the file has a video stream, a video preview window is opened at the bottom of the application form. The measurements are again displayed in the NUGEN module and saved in the daily logs.



Stop File Monitoring stops the audio loudness metering process.

4. Setting Up

From the **File** menu open **Properties** to set the product configuration settings.



For on-air audio loudness metering, an **Input Audio Device** must be selected. All installed on the system devices, which support the Microsoft DirectShow architecture are listed and available for selection. After the **Input Audio Device** selection, the input parameters group of parameters is updated with the available for the device parameters.

Frequency list shows the supported by the selected device input frequencies in Hz. The selected frequency will be used for the on-air measurements.

Bits Per Sample list shows the supported by the selected device input bits per sample. The selected bits per sample value will be used for the on-air measurements.

Channels list shows the supported by the selected device input mono PCM audio channels. The selected number of audio channels will be used for the on-air measurements.

Logs Reload Interval denotes the interval in seconds for logging information reloading and update in the log table. This option doesn't affect the measurements frequency, only the update/display interval of the measurements.

History Background Color specifies the background color in the Loudness History dialog.

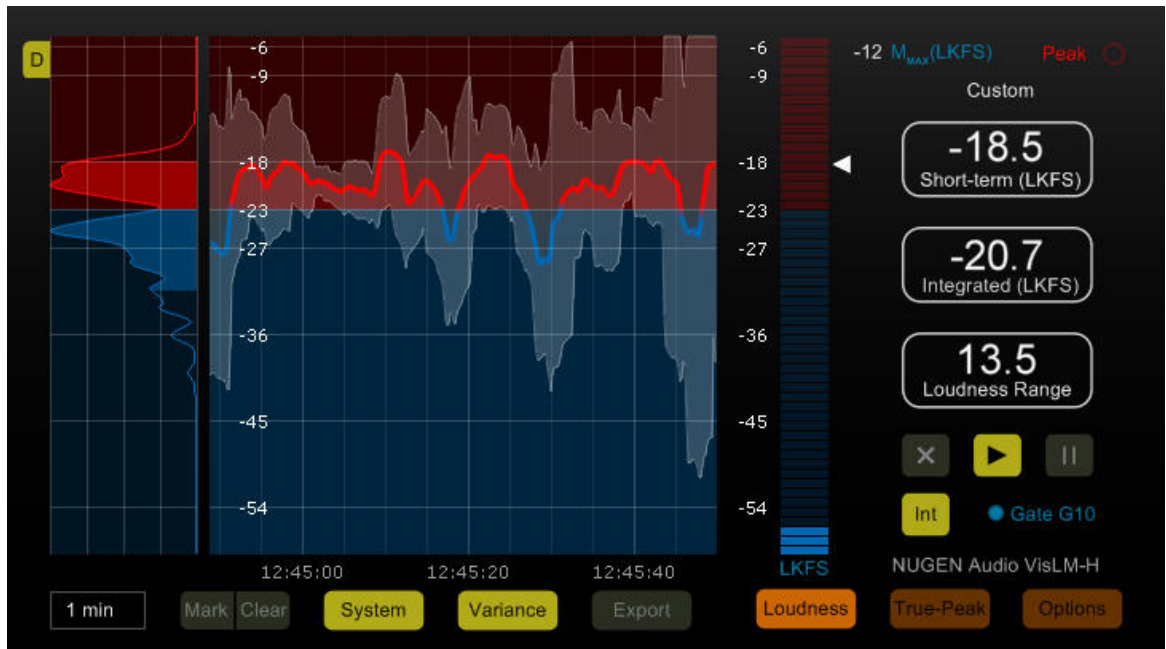
History Grid And Text Color specifies the grid and text color in the Loudness History dialog.

Reset Visualization On Start enables/disables NUGEN module reset on before every on-air or file measurement start.

5. NUGEN module

The NUGEN module performs the main processing of the input PCM streams and graphical representation and logging of the processed audio loudness measurements.

The NUGEN Audio VisLM is a loudness metering system fully compliant with the ITU-R BS.1770/1771 metering standard, and with the forthcoming EBU R128 recommendation as a work in progress. NUGEN Audio is a member of the P/LOUD discussion group involved in defining EBU R128 and will implement the agreed recommendations as soon as practical.



5.1. Controls

The controls are grouped into several distinct zones, to aid intuitive operation

Main display. The main display area shows the information relevant to the current view setting; the Loudness Meter, True-Peak meter or Options page.

Main display control. These controls determine what is shown in the main display.

- i) Loudness – Loudness Meter
- ii) True-Peak – True-Peak Meter
- iii) Options – Options panel

Loudness History. Only available in the VisLM-H version. The history view presents the historical short-term loudness over time.

5.2. Loudness Meter

This section displays the primary Loudness Meter values and controls. The performance and values given in this section of the meter in accordance with and as defined by ITU-R BS.1770-1/2 and/or EBU R128.

Loudness Meter select. This control switches the main display to show the Loudness Meter and is mutually exclusive to the True-Peak and Options select controls.

Momentary Loudness (M) Meter. Shows the level of the current audio input in Loudness Units (LU/LUFS) as defined by EBU R128 for momentary loudness. Various colour splits can be established using the parameters available in the Loudness Meter options panel.

Momentary Loudness (M) Meter Max Value. This value shows Maximum value of the momentary loudness meter. Click to reset. This value is also reset when the integrated loudness measurement is reset.

Short-term (S) Loudness. Displays the short-term loudness value as defined by EBU R128.

Integrated Loudness (I). This value displays integrated loudness using gating as described in ITU-R-BS.1770 and EBU R128 and is activated and controlled using the Integrated loudness functions.

Loudness range descriptor (LRA). This value quantifies the variation in a time-varying loudness measurement and is supplementary to the measure of overall loudness, that is, 'integrated loudness'.

Integrated Loudness functions. This group of controls provides access to the Integrated Loudness section of the meter.

Int. Select to activate/de-activate Integrated Loudness functionality.

Play control. Start/continue the measurement of integrated loudness and LRA simultaneously.

Pause control. Pause/continue the measurement of integrated loudness and LRA simultaneously.

X control. Reset the measurement of integrated loudness and LRA simultaneously. May be operated whether the meter is running or paused.

Gate. The integrated loudness measurement utilises a complex gating function. This indicator lights to give an indication that the gate is potentially active. As the gate may act retrospectively, this is not an exact indicator, but rather gives an indication that gating is likely.

EBU mode indicator. This indicator lights when the meter is operating in 'EBU mode'. It is possible, to set VisLM to work specifically to ITU-R-BS.1770 and it may also be useful to define 'transitional' settings moving toward EBU R128. In these situations, where the full definition of EBU R128 is not adhered to, the EBU mode indicator will not light.

True-Peak overload indicator. This indicator will activate if the true-peak level reaches the level set on the options page, and hold momentarily after the signal has fallen below this threshold so as to be clearly visible when activated.

5.3. Loudness History

The loudness history section displays the historical data of the short-term loudness reading (compensated for screen resolution where required). This view is active at all times, irrespective of the main display control settings.

Loudness History View. This area displays the short-term loudness history compensated for screen resolution where required. The data scrolls to the left, away from the momentary meter, building up the view over time.

Loudness History zoom. Determines the zoom level of the history view, from 30 secs to 24 hours. All data is available until the plug-in is re-set, so it is possible to choose different zoom levels at differing times without losing data from the view.

System time. Chose this option to toggle between absolute time and system clock (HH:MM:SS). When system time is selected, the time scale will scroll along with the history view to allow events to correlated with the system clock.

Variance. This control toggles on/off an envelope of 'variance'. The variance measure is a sub-value of the loudness range descriptor, and shows the measure of variation in the level over time.

5.4. True Peak Meter

The true-peak meter displays true-peak values as defined in ITU-R BS.1770. VisLM is available in stereo and 5.1 formats, with the 5.1 format being able to handle input from mono through to 5.1 surround automatically where the plug-in host facilitates this. The loudness history section displays the historical data of the short-term

True-Peak meter select. This control activates opens the true-peak meter in the main display, and is mutually exclusive with the Loudness Meter control (Loudness). To return to using the Loudness Meter in the main display, use the Loudness control.

True-peak level meter. Shows true-peak audio levels on available input channels from single (mono) input, through to 5.1 surround. A permanent peak hold bar marks the highest level achieved. Click the meter to reset.

True-Peak overload indicator. This indicator will activate if the true-peak level reaches the level set on the options page, and hold momentarily after the signal has fallen below this threshold so as to be clearly visible when activated.

Momentary Loudness (M) Meter Max Value. This value shows Maximum value of the momentary loudness meter. Click to reset. This value is the same value as shown on the Loudness Meter main display.

5.5. Loudness Meter Options

The options window allows for in-depth configuration of the various meter parameters. It is possible to configure the meter in a number of different ways to suit the intended application. The true-peak meter displays true-peak values as defined in ITU-R BS.1770.

Options select. This control activates opens the Options window in the main display, and is mutually exclusive with the Loudness Meter control (Loudness) and True-Peak meter control (True-Peak). To return to using the meters in the main display, select the appropriate control.

EBU mode indicator. This indicator lights when the meter is operating in 'EBU mode'. It is possible, to set VisLM to work specifically to ITU-R-BS.1770 and it may also be useful to define 'transitional' settings moving toward EBU R128. In these situations, where the full definition of EBU R128 is not adhered to, the EBU mode indicator will not light.

Splits. This section allows the meter (and meter history – VisLM-H only) to be split into colour banding to facilitate the rapid assessment of whether loudness readings are falling within specification. The split points (1 and 2) determine the position of the colour boundaries. To change the colours of the sections, click the swatch to open up the colour picker window.

Alerts settings. Alerts can be set to give a warning if the short-term value fall outside defined levels for a set period of time. Toggle the alerts function on and off using the 'alerts' button. Use the alert (max) value to set the upper limit and the alert (min) the lower. The Period (max) and Period (min) values determine the time the level must exceed or fall below the appropriate alert level before the alert indicator is activated. The value

given by the short-term loudness output on the loudness meter will change colour to indicate an alert has been triggered. Click the short-term loudness value to reset the alerts.]

Scale. Choose from defined scales EBU +9, EBU +18 and ITU-R BS.1170

Segments. Determines the number of loudness units represented by each segment on the momentary loudness meter.

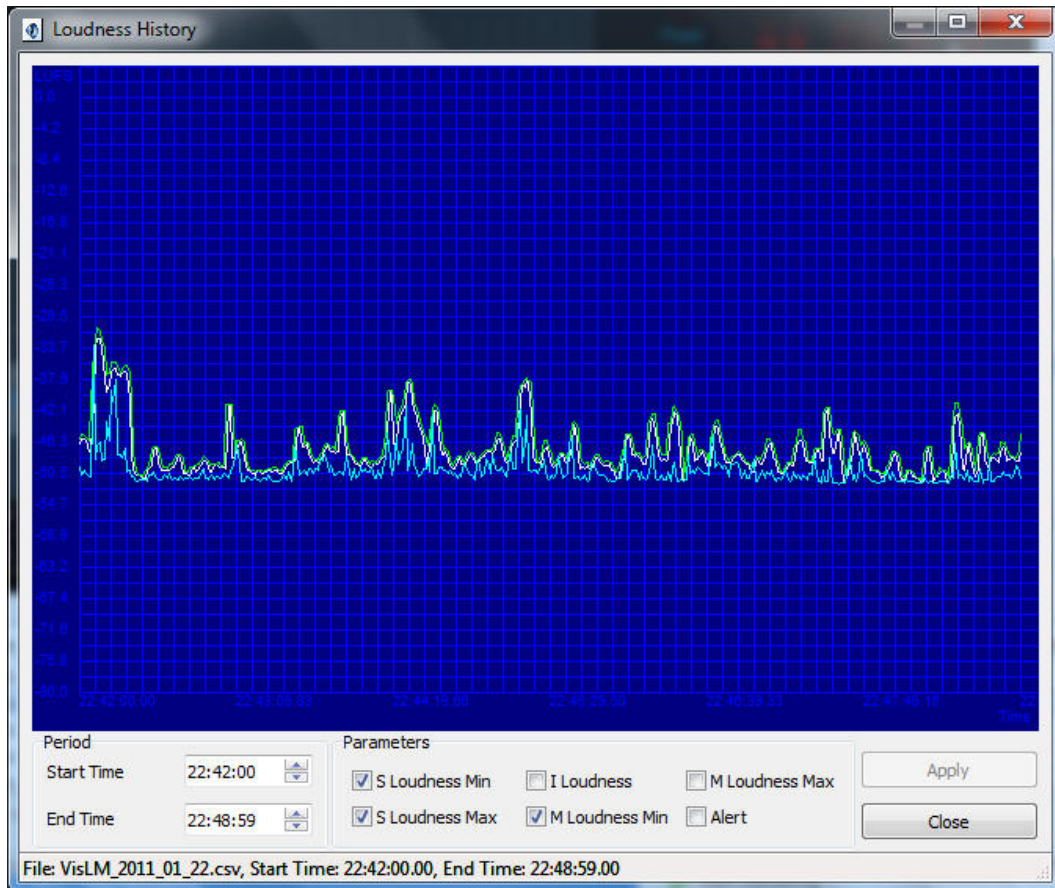
Ballistics. Sets meter ballistics to recognised standards. The update rate and time window is as defined in EBU R128, this parameter determines the decay time only.

TP Clip. Sets the value at which the true-peak overload indicator lights.

Relative Scale. Allows for absolute scale mapping (LUFS) or mapping of the zero point to some other value, such as target loudness (as in BS. 1771). The EBU target loudness is defined as $-23 \text{ LUFS} = 0 \text{ LU}$, although other values can be defined.

6. Loudness History

The loudness measurements are logged on a daily basis. The logs on each day can be reviewed by selecting the log with the needed date from the **Daily Report Files** list. This selection automatically updated the **Report List** table with the measurements from the selected log. Graphical representation of the selected log can be displayed by clicking the **Loudness History** button.



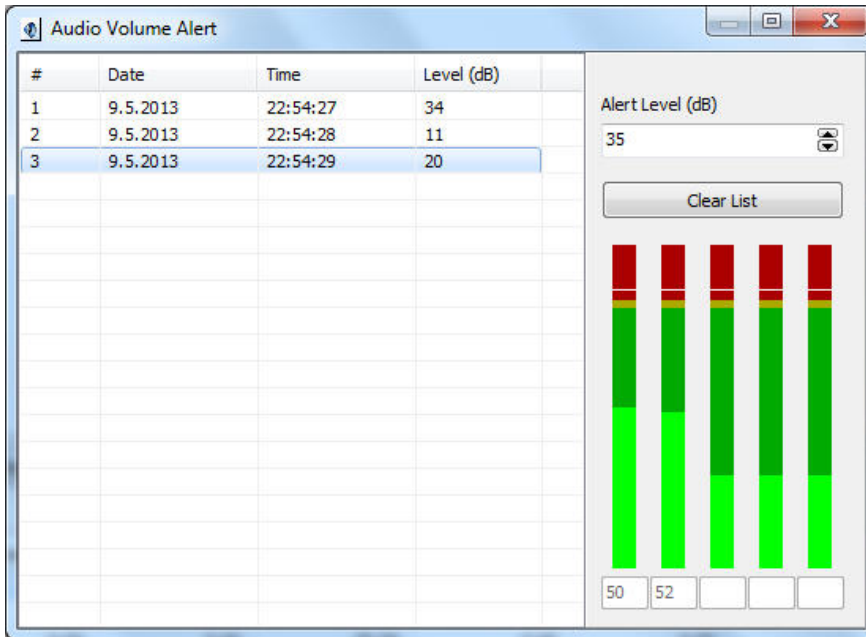
The **Period** group of settings contains the **Start Time** and the **End Time** of the reviewed measurement period, which is displayed.

The **Parameters** group of settings contains the measurement parameters, which will be displayed in the graphical window – **S Loudness Min**, **S Loudness Max**, **I Loudness**, **M Loudness Min**, **M Loudness Max** and **Alert**.

After altering the time period and the included parameters, click **Apply** to update the graphic.

7. Audio Loudness Alert

Audio Loudness Meter product provides an alarming functionality. The alarm is triggered on reaching previously specified loudness volume level in dB.



The Audio Volume Alert dialog has a list view table with all the alerts and a control-preview panel. Each alert log has an alert log number, alert log date, alert log time and alert volume in dB. In the control-preview panel the Alert Level (dB) edit specifies the maximum audio volume level threshold which would trigger the alert. The button “Clear List” clears the list view log. Below, in the preview panel are placed the audio volume meters and volume edit boxes denoting the current volume level of each channel in dB. The list view is updated to the latest position, unless the user selects a previous log position.