

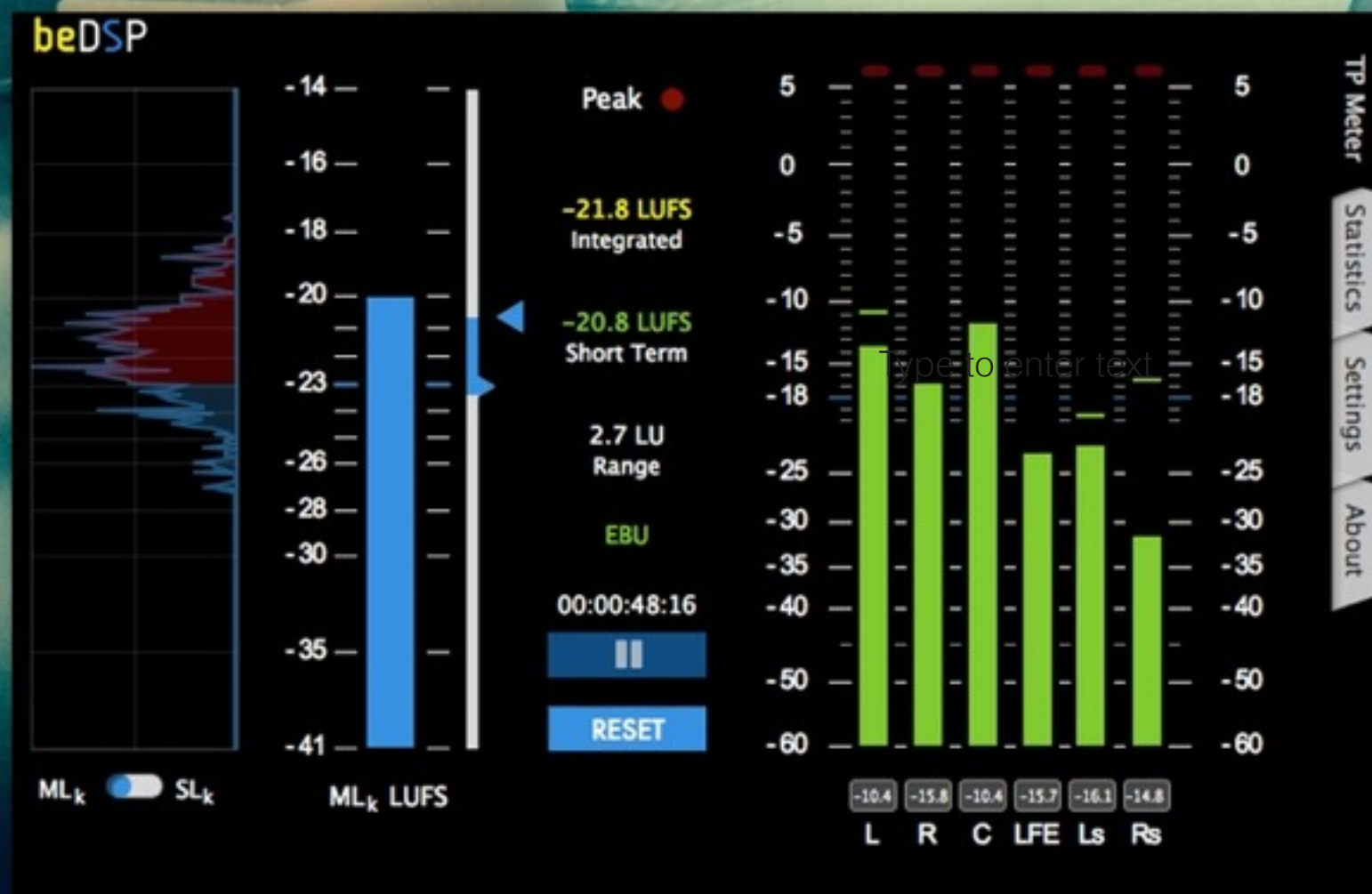
# beDSP

## User Manual

# ALM 5.1

Loudness and True Peak metering at your hand

Audio Loudness and True Peak Metering VST, AU and AAX plugin based on BS1770 (rev.3), EBU R128, ATSC A/85 and ARIB TR-B32 . Now, you have a panoramic view of the main loudness descriptors anytime you need.





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Loudness and True Peak metering at your hand

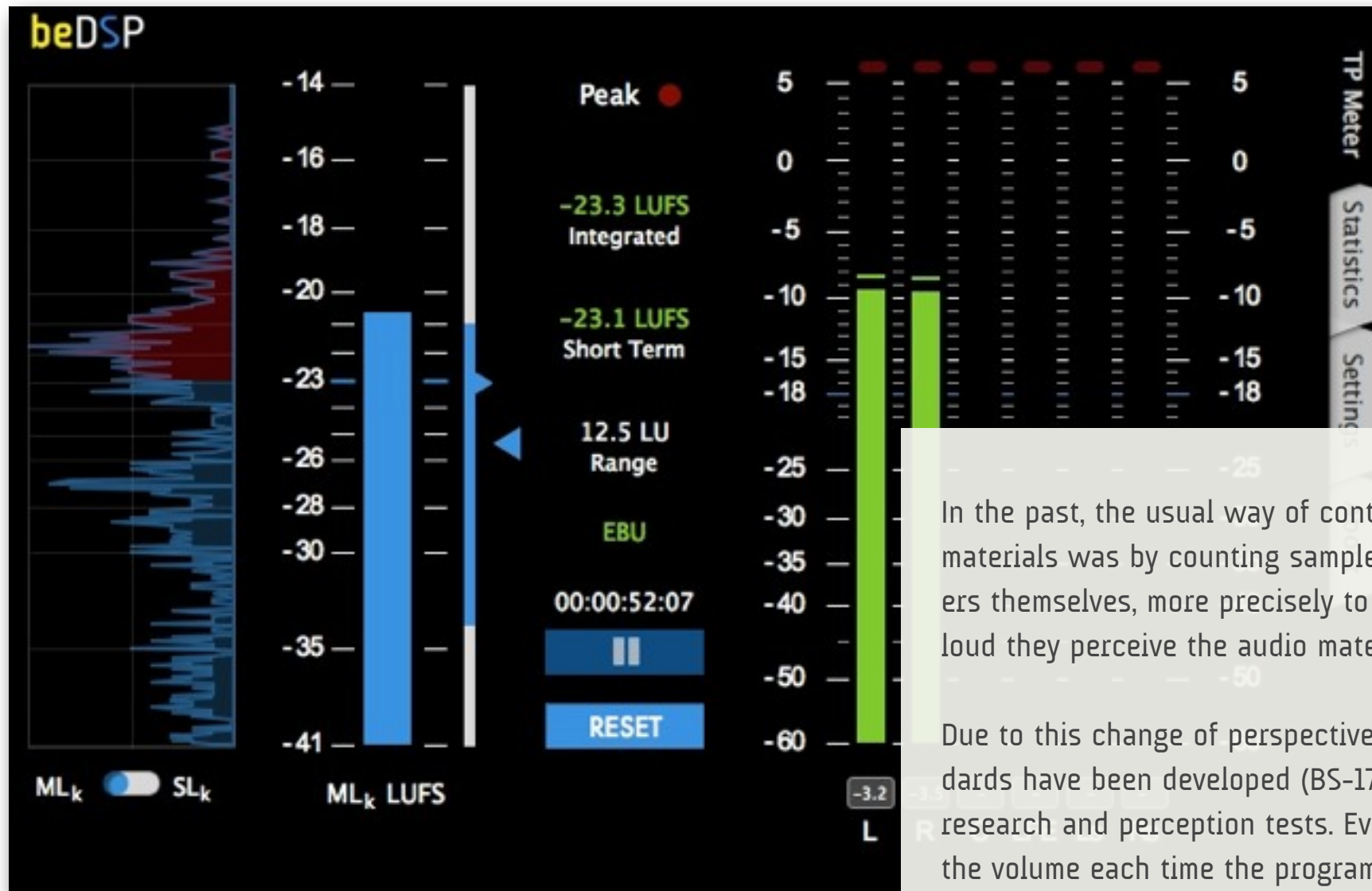
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# 1. ALM 5.1 – Loudness and True Peak Meter

Loudness and True Peak metering at your hand



In the past, the usual way of controlling the level of the broadcasted audio materials was by counting samples. Today, the focus switches to the listeners themselves, more precisely to the listener's audio perception and how loud they perceive the audio material.

Due to this change of perspective, a number of international broadcast standards have been developed (BS-1770, EBU R128, ATSC A/85, ARIB) based on research and perception tests. Everybody knows how annoying is to adjust the volume each time the program is changed or during commercial breaks. Now, we have a specific set of tools that helps us solve the loudness problem.

ALM 5.1 is a key component in your mixing workflow. Based on the ITU, EBU, ATSC and ARIB loudness standards, the software offers you full Loudness and True Peak Metering for Mono, Stereo and 5.1 channel formats featuring measurements for Momentary, Short Term and Integrated Loudness, with Loudness Range and Max True Peak Level. The software provides channel order configuration for ITU, C|24 and DTS.

ALM 5.1 is all you need to control the loudness of your audio material, whether your target is -23 LUFS (according to EBU specifications), -24 LUFS (according to ATSC/ARIB specifications) or you want to use the relative gate of -10 LU. Both LU and LUFS scales are available, you can set the start and the stop of your measurements or you can let the plugin do it by following the host transport.

For a higher resolution in the target zone you can use the +9 LU scale. For a higher dynamic range use the + 18 LU scale. Both a value and a bar indicator are available for Loudness Range, so you can decide if your audio needs more dynamic compression.

In both cases you don't have to worry about peaks because the ALM 5.1 features peak holders and led indicators to let you know anytime a overload occurs. Two scales with different reference levels (-18 dBTP and -20 dBTP) are available for the True Peak Meter. ALM 5.1 takes into account all the inter-samples that can be missed in quantization. The plug-in features a timecode counter of the measurements and you can reset the measurements anytime you want.

A new feature of ALM 5.1 is the statistics view . You can view the values for the Program Loudness, Loudness Range, Maximum Short Term, Momentary and True Peak Loudness, all which can be saved in a report for your convenience. For the maximum values, their positions are also made visible.

If you want to see the loudness distribution, you can use the histogram, a new addition to ALM 5.1. You can switch between Short Term Loudness or Momentary Loudness, thresholds for loudness values are also available. The information is also saved in the report.

## Features

- Audio Loudness and True Peak Metering VST, AU and AAX plugins;
- Channel Formats: mono, stereo and 5.1;
- Full compliance with loudness standards : BS-1770 (rev.3), EBU R128, ATSC A/85 and ARIB TR-B32; presets and color coding are also available;
- ITU, Avid C|24 and DTS 5.1 channel configuration;
- Full loudness measurements using universal descriptors: Integrated Loudness/Program Loudness, Momentary Loudness, Short Time Loudness and Loudness Range;
- Correct measurements for all the usual sample rates: 44.1 kHz, 48 kHz and multiples;
- Real-time metering for Momentary Loudness, Short Term Loudness and Loudness Range;
- Histogram for Momentary Loudness and Short Term Loudness;
- Custom thresholds for Momentary Loudness and Short Term Loudness;
- Real time visual representation of Momentary and Short Term Loudness through host automation lane.
- True Peak Level Metering with peak hold;
- Max True Peak Level (calculated using inter-sample peaks that can be missed in quantization);
- Full statistics for Program Loudness, LRA, Max SL, Max ML, Max True Peak with timecode position for maximum values;
- Overload counter for Momentary Loudness and Short Term Loudness;
- Save loudness report option;
- Low CPU usage due to the software optimization.

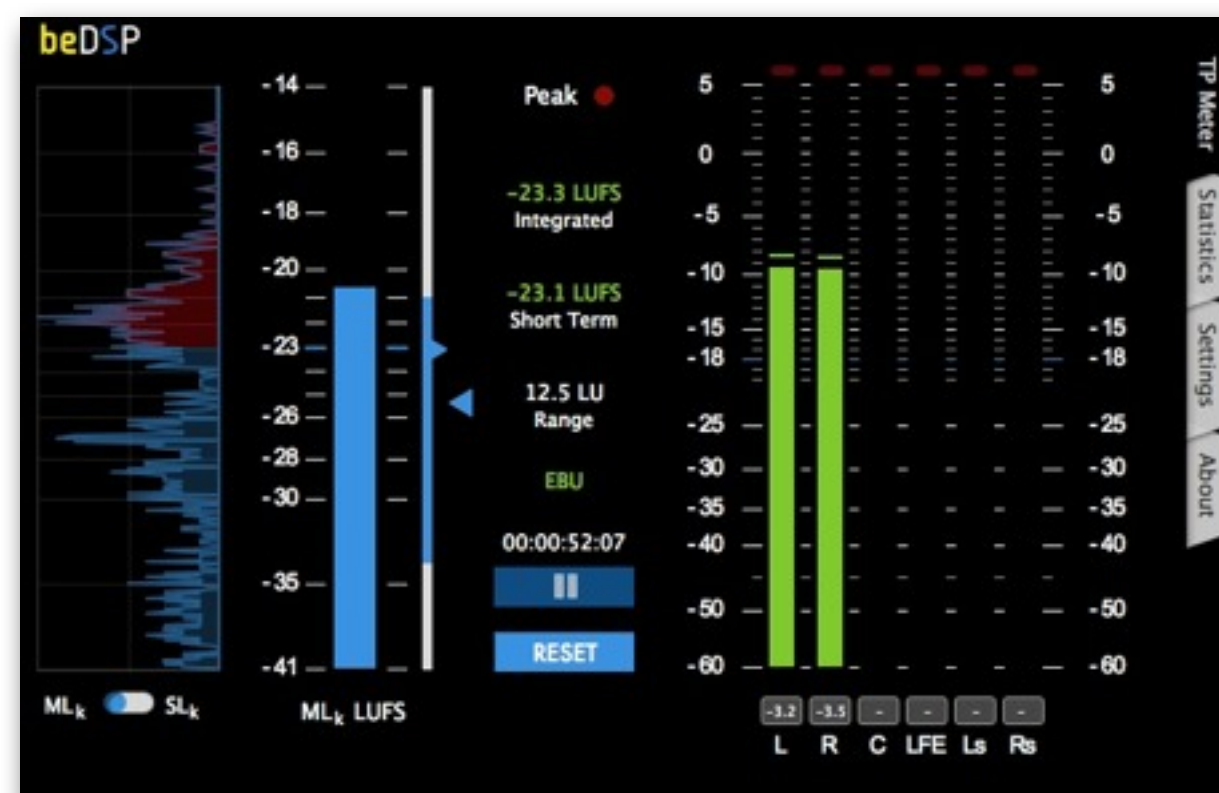


Figure 1: ALM5.1 Interface

## Loudness Descriptors

- **Integrated Loudness or Program Loudness** (in LUFS<sup>1</sup>, LU<sup>2</sup> or LKFS<sup>3</sup>) - describes the long-term integrated loudness of an audio material from 'start' to 'stop'. This is measured using the specifications of international standards: for Europe - ITU-R BS.1770 (with no gate) or ITU-R BS.1770-3 (with gate at -10 LU), for America - ATSC A/85 and for Japan - ARIB TR - B32. The gate is used to exclude blocks of audio signal 10 LU below the absolute-gated loudness level (for Settings see page 25). This ensures that an audio material with long periods of silence will not be too loud after a possible loudness normalization.
- **Momentary Loudness** - ML (in LUFS, LU or LKFS) - calculated with a time window of 400 ms;
- **Short Term Loudness** - SL (in LUFS, LU or LKFS) - calculated with a time window of 3 s;
- **Loudness Range** - LRA (in LU) - loudness dynamic range from 'start' to 'stop' that helps you decide if dynamic compression is necessary;
- **True Peak Max Level** - (in dBTP<sup>4</sup>) - indicates the maximum value of the signal waveform in the continuous time domain (this value is calculated using inter-sample peaks that can be missed in quantization).

1. LUFS - Loudness, K-Weighting, referenced to digital Full Scale

2. LU - Loudness Units: 1 LU = 1 dB

3. LKFS - Loudness Level, K- weighted

4. dBTP - deciBel referenced to digital Full Scale measured with a True Peak meter



## 2. Installation and Authentication

beDSP

Loudness and True Peak metering at your hand

### Minimum System Requirements

#### MAC:

Dual Core CPU (Intel or AMD) with SSE2 support  
2GB RAM  
OSX 10.6

#### PC:

Dual Core CPU(Intel or AMD) with SSE2 support  
2GB RAM  
Windows 7

### Available Formats

#### MAC:

VST 2.4 universal binary  
AU universal binary  
AAX (64bits)  
Standalone

#### PC:

VST 2.4 universal binary  
AAX (64bits)  
Standalone

Thank you for choosing ALM 5.1!

Once you have downloaded the package **ALM51\_Bundle** and you own a serial number, please follow the next steps for installation (for OSX or Windows) and authentication of your product.

## OSX Installation

1. Double click on ALM51\_Bundle.mpkg and an installation window will appear (see Figure 2). Press the **Continue** button to **start** the installation;

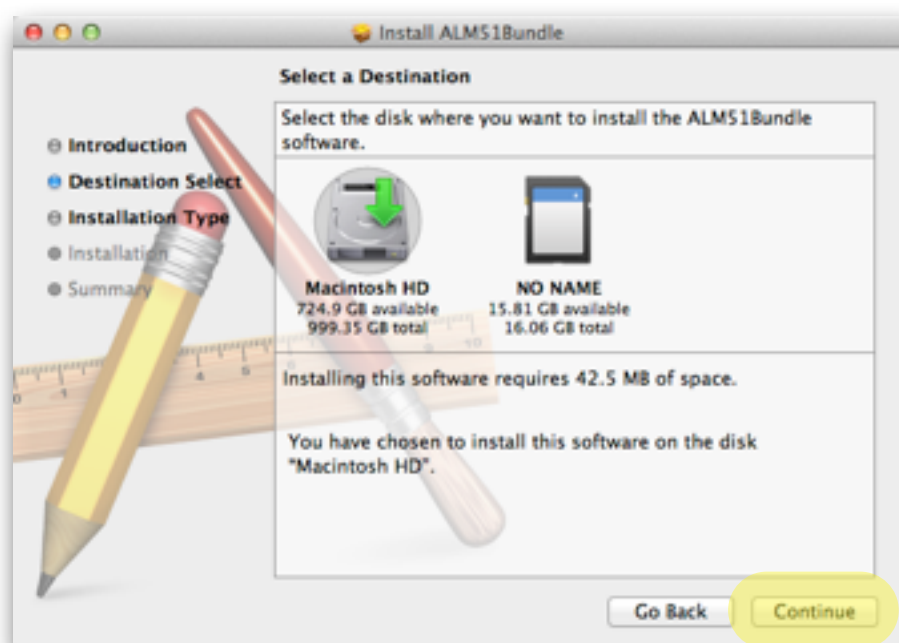


Figure 2: Destination of the installation

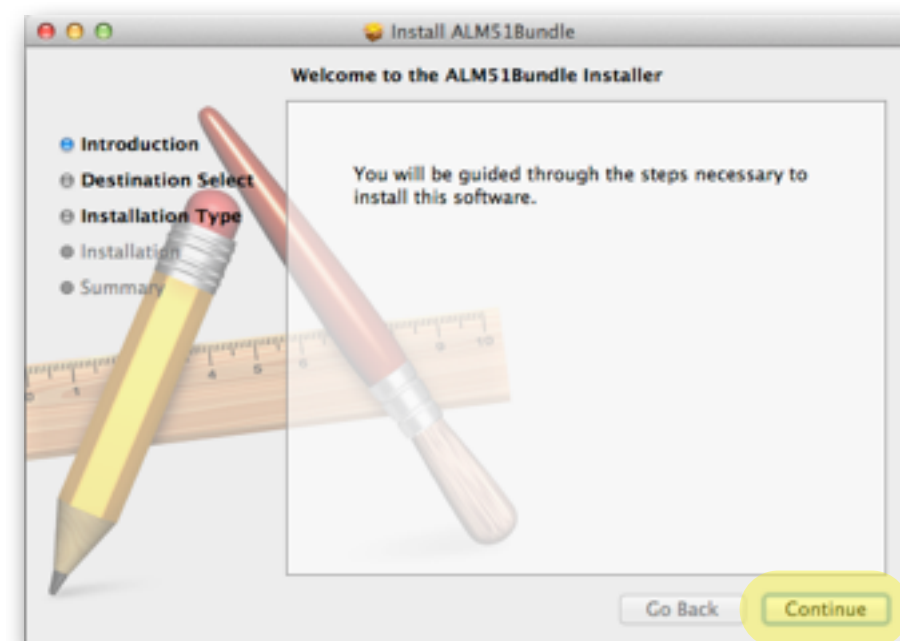


Figure 3: Installation window

2. **Select a Destination** for the installation (see Figure 3) and then press the **Continue** button;



3. Select the **Installation type** you want and then press the **Continue** button (see Figure 4);

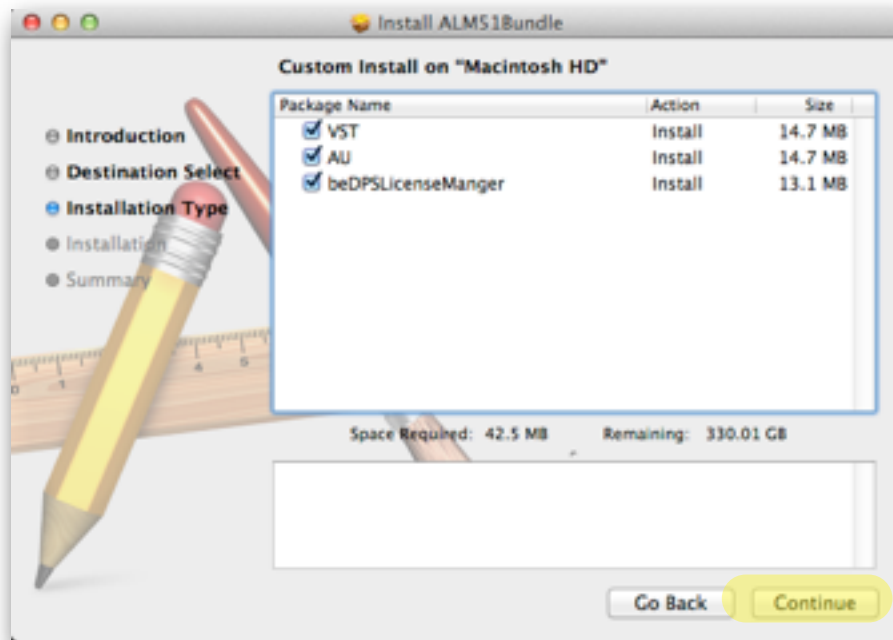


Figure 4: Installation Type

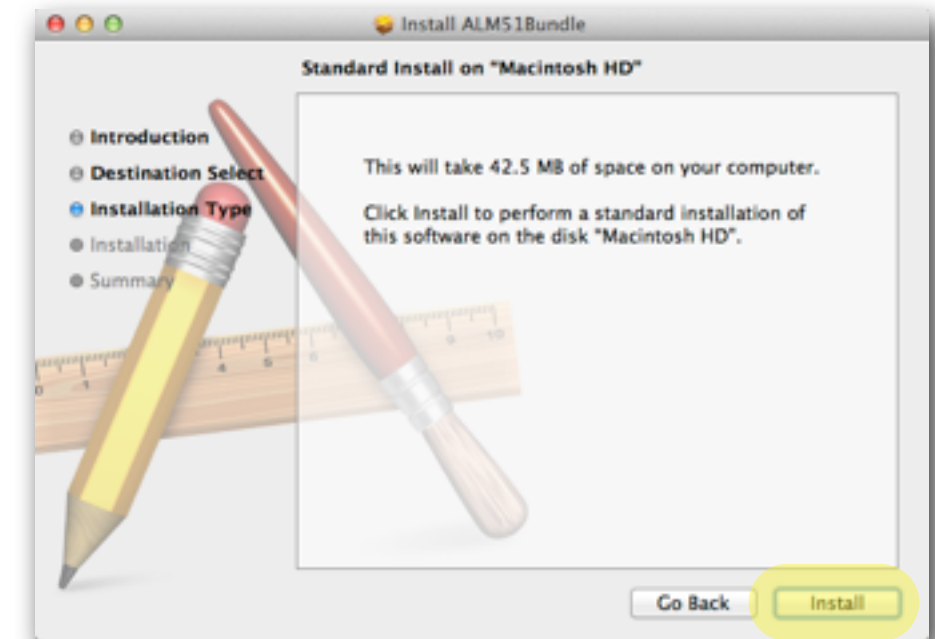


Figure 5: Free space necessary for the installation

4. An information message will appear. Press the **Install** button if you have the necessary free **space** for a proper installation (see Figure 5);
5. Wait until the installation is completed and a confirmation window appears (see Figure 6). Press the **Close** button and pass to the **Authentication** part.

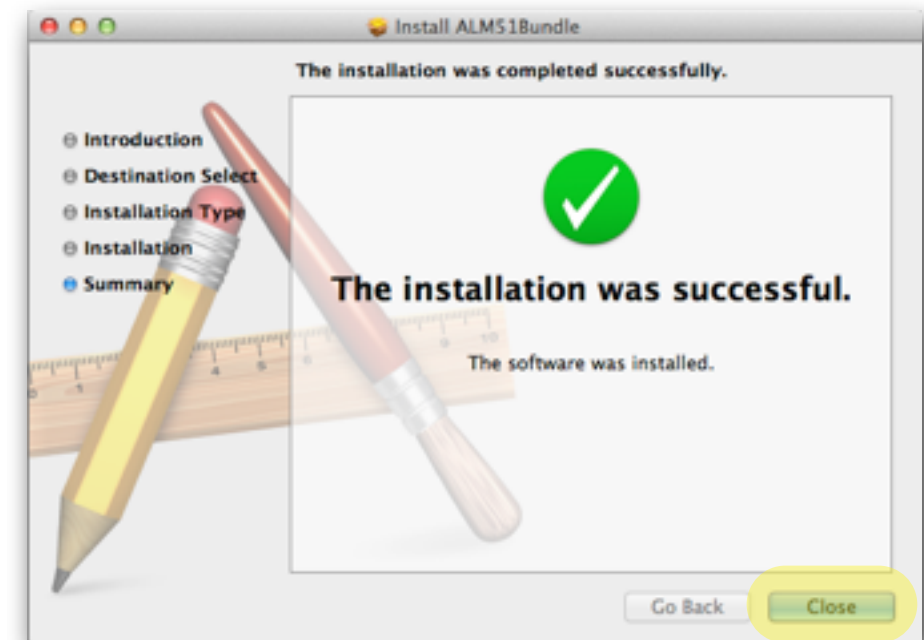


Figure 6: Installation completed

## Windows Installation



Figure 7: Setup window


1. Double click on the icon  **ALM51Bundle** and a setup window will appear (see Figure 7). Press the **Next** button to continue the setup;
2. When the setup is ready to begin installing ALM5.1 on your computer (see Figure 8), press the **Install** button.
3. Press the **Finish** button to exit the Setup. You have the possibility to automatically launch the ALM 5.1 application (see Figure 9).



Figure 8: Installation start

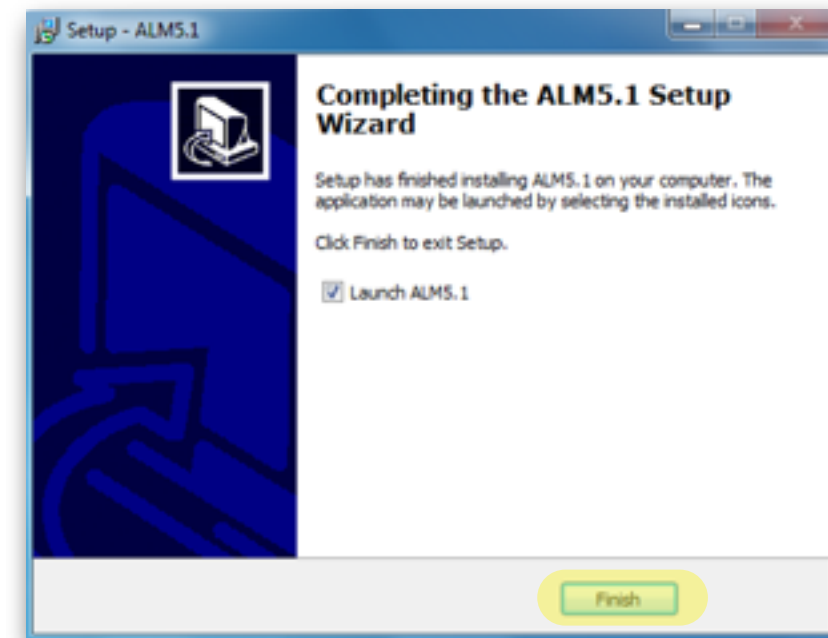


Figure 9: Installation start



## Authentication

Go to the **Applications/ProgramFiles** where you will find the **beDSP** folder.

Double click on the **beDSPLicenseManager** icon and the main menu window will appear (see Figure 10) with three available options:

**Online Activation**, **Offline Activation** and **Trial Request**. For any type of activation you must have a beDSP account.

If you don't have one, go to [www.bedsp.net/sign-up](http://www.bedsp.net/sign-up) and create your account. The username will be the same as the e-mail you used for registration.

## Online Activation

1. If you have an internet connection, select **Online Activation**, otherwise you will have to select **Offline Activation** (see Figure 10).
2. If you want to activate the application on your computer, select **For this computer** (see Figure 11).

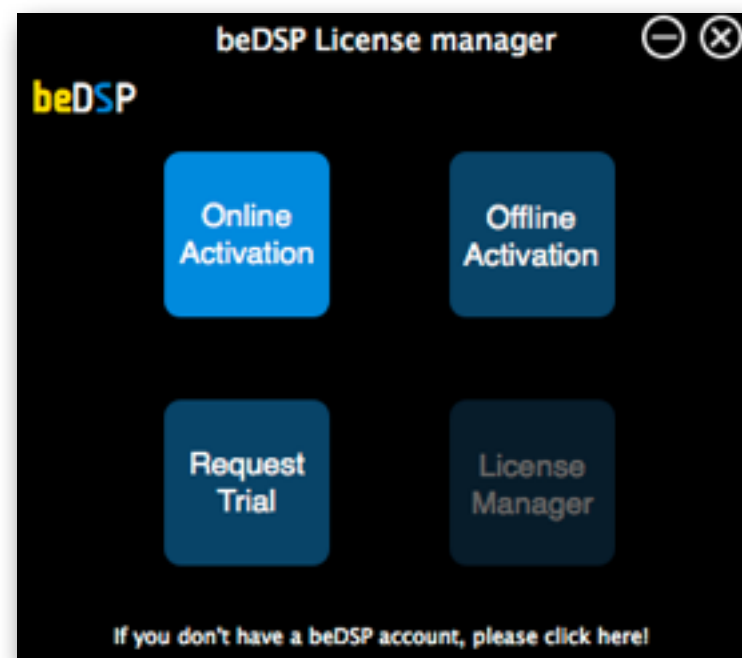


Figure 10: Main menu



Figure 11: Online Activation options

3. An authentication window will appear (see Figure 12) .  
Insert your beDSP username (same as your e-mail), password and serial number.

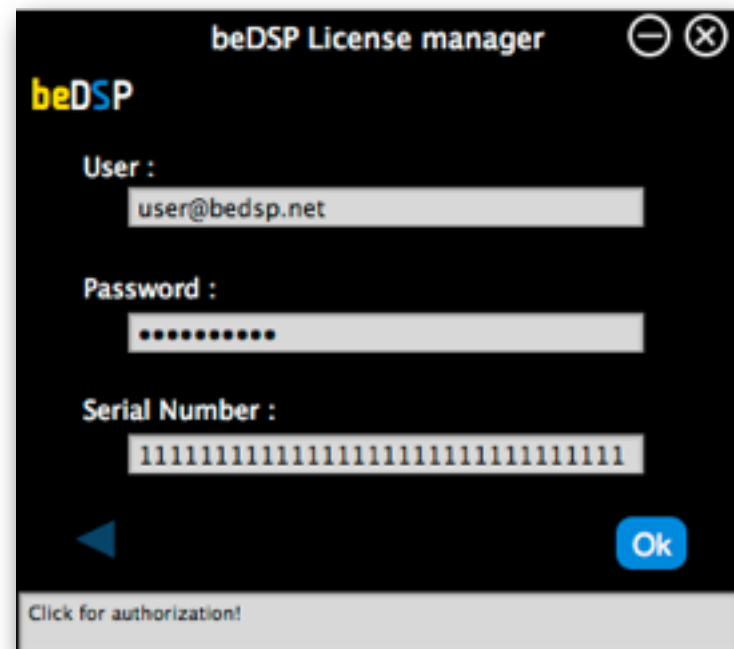


Figure 12: Authentication window

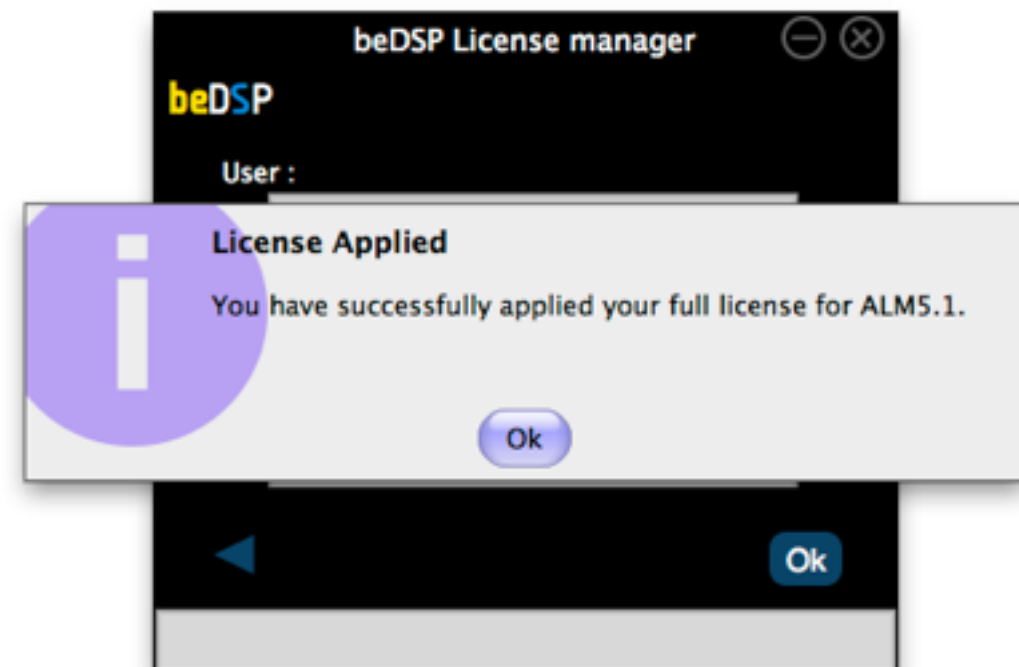


Figure 13: Confirmation window

4. A confirmation window will appear, that specifies the name of the product you have just activated and the type of license (see Figure 13).  
Press **OK** and enjoy your product!

## Offline Activation

If you don't have an internet connection, select **Offline Activation** from the main menu (see Figure 10), then **Generate Request** (see Figure 14).

1. Insert your serial number and select the folder where you want to save your license request (see Figure 15).
2. After clicking ok, your license request will be saved. A window containing the license request will be revealed.
3. Copy your license request on a flash drive or any data storage device and move it on the online computer (this second computer must have the beDSP license manager installed and an internet connection so you can continue your activation).

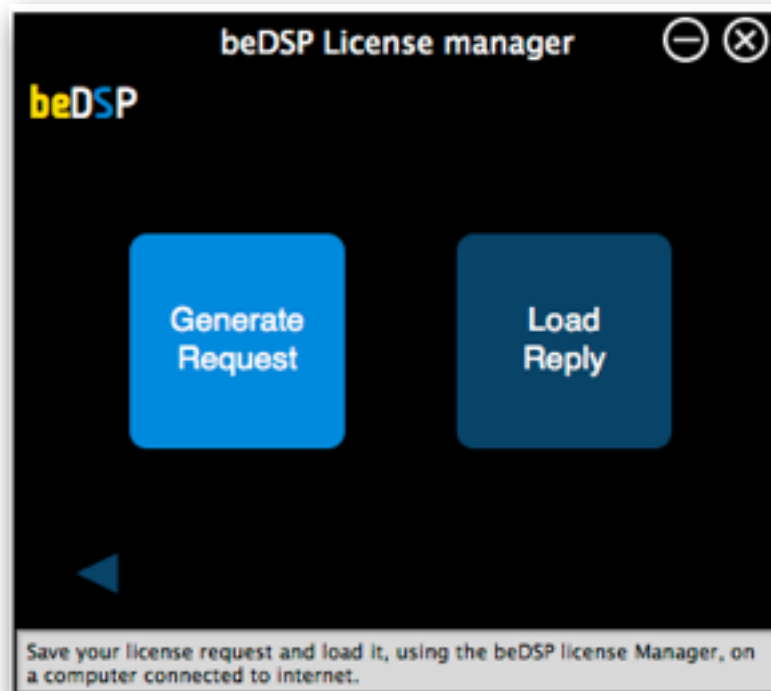


Figure 14: Offline Activation options

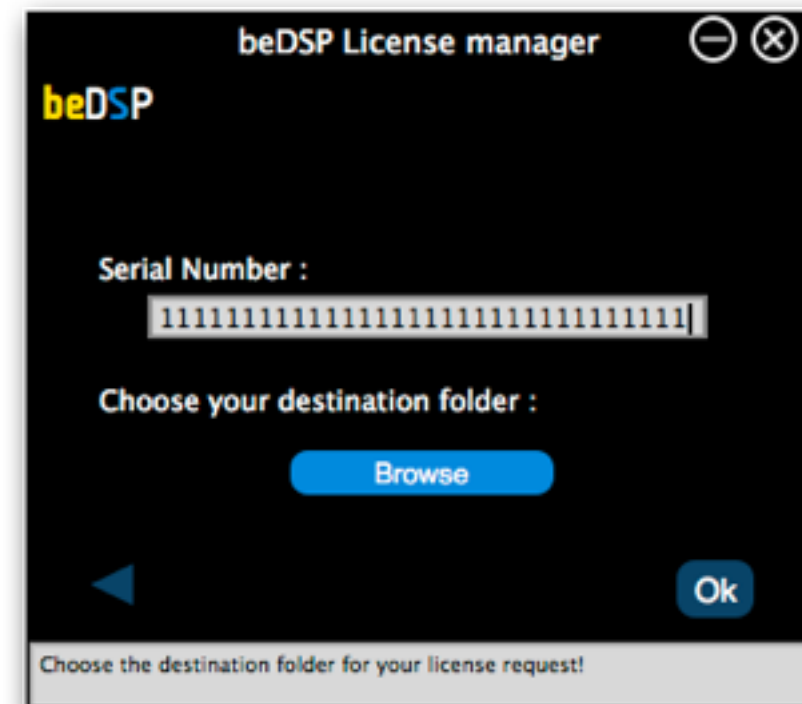


Figure 15: Generating the license request

4. From the **Online Activation** menu, pick **For Another Computer** (see Figure 11).
5. In the authentication window (see Figure 16), insert your beDSP username (same as your e-mail), password and load your license request. Click ok for authorization.
6. A folder with the license reply will be revealed, named “LicensesToMove”. This folder is saved in the same place you’ve copied your license request. Move your license reply on the computer you wish to authorize.

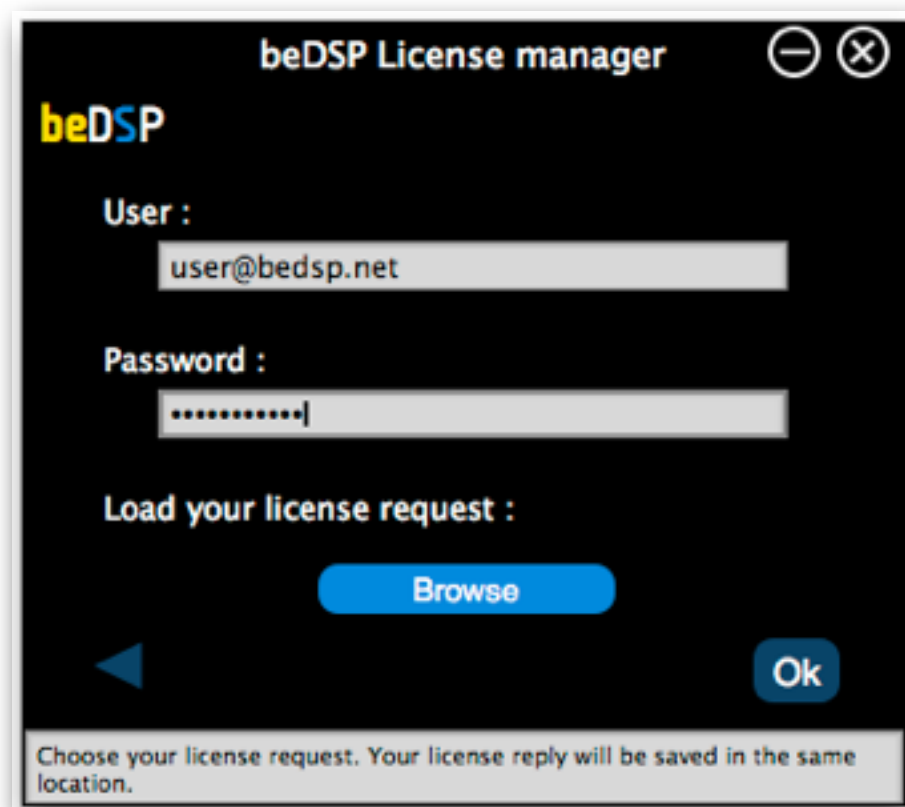


Figure 16: Authorizing your license request

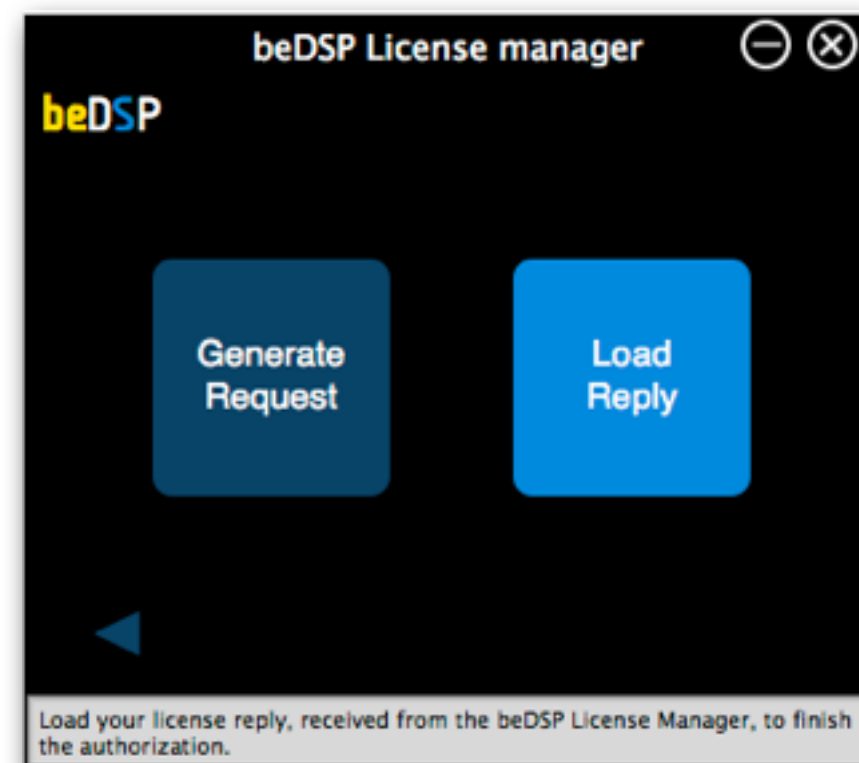


Figure 17: Loading your reply

7. Back on your computer, from the main menu (see Figure 10), pick **Offline Activation**, then choose **Load Reply** (see Figure 17). A browser window will open and you have to select your reply.
8. After loading your reply, a confirmation window will appear, like the one from Figure 13. Press **Ok** and enjoy your product!

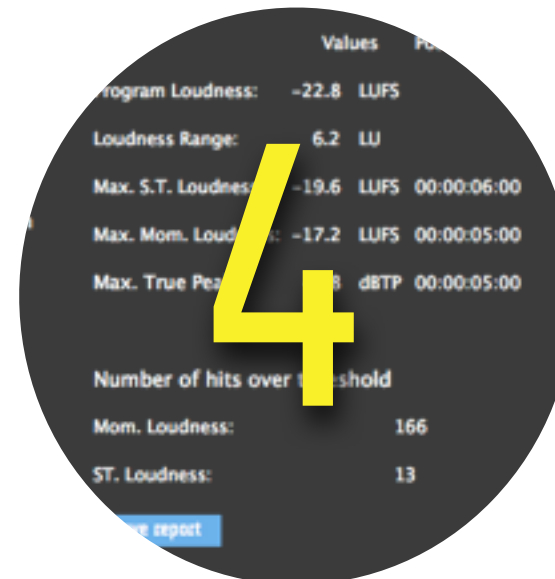
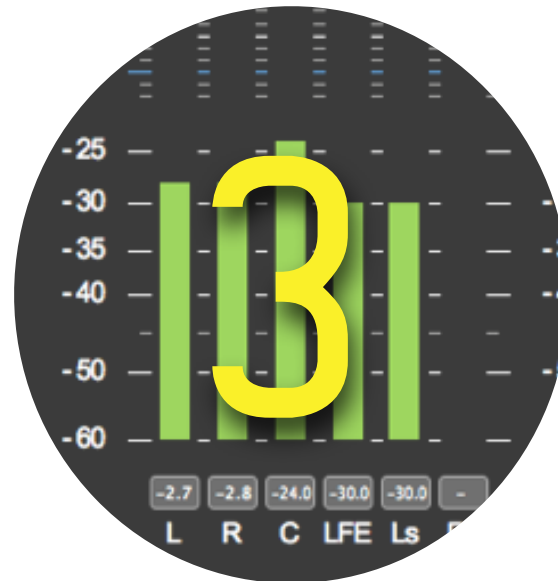
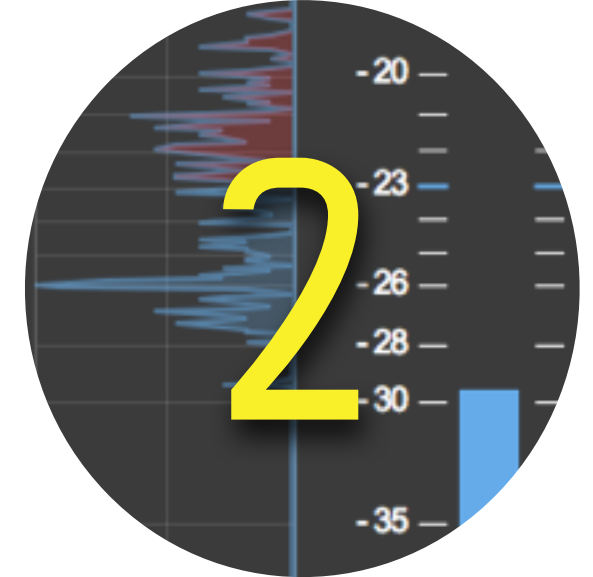
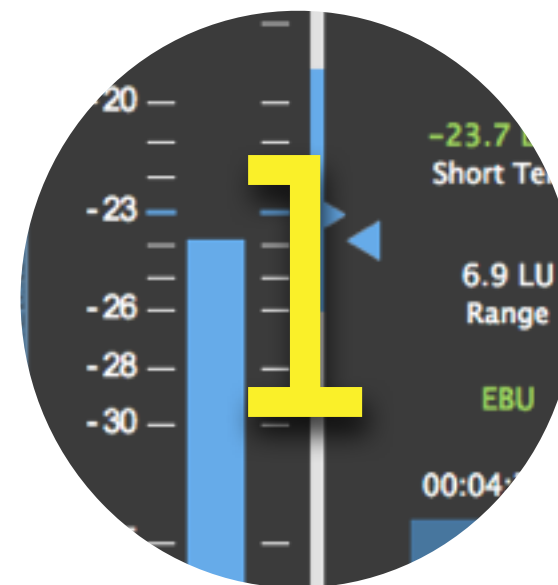
### 3. How it works?

#### Loudness and True Peak metering at your hand

The first step for a proper mix is to calibrate the monitors and set a preliminary level for each track. Next, you have to make sure that the Integrated Loudness Level is in accordance with the target level, by constantly monitoring the Momentary or Short Time Loudness level. Also, if the Maximum True Peak level is -1 dBTP, the phenomenon of 'hitting the wall' is less likely to occur.

ALM 5.1 has a simple structure, so it's easy to focus on the mixing process. There are five important parts:

- Loudness metering (1 - see Page 19);
- Momentary and Short Term Loudness histogram (2 - see Page 22 );
- True Peak metering (3 - see Page 23 );
- Statistics (4 - see Page 24 );
- Settings (5 - see Page 25).



## Interface

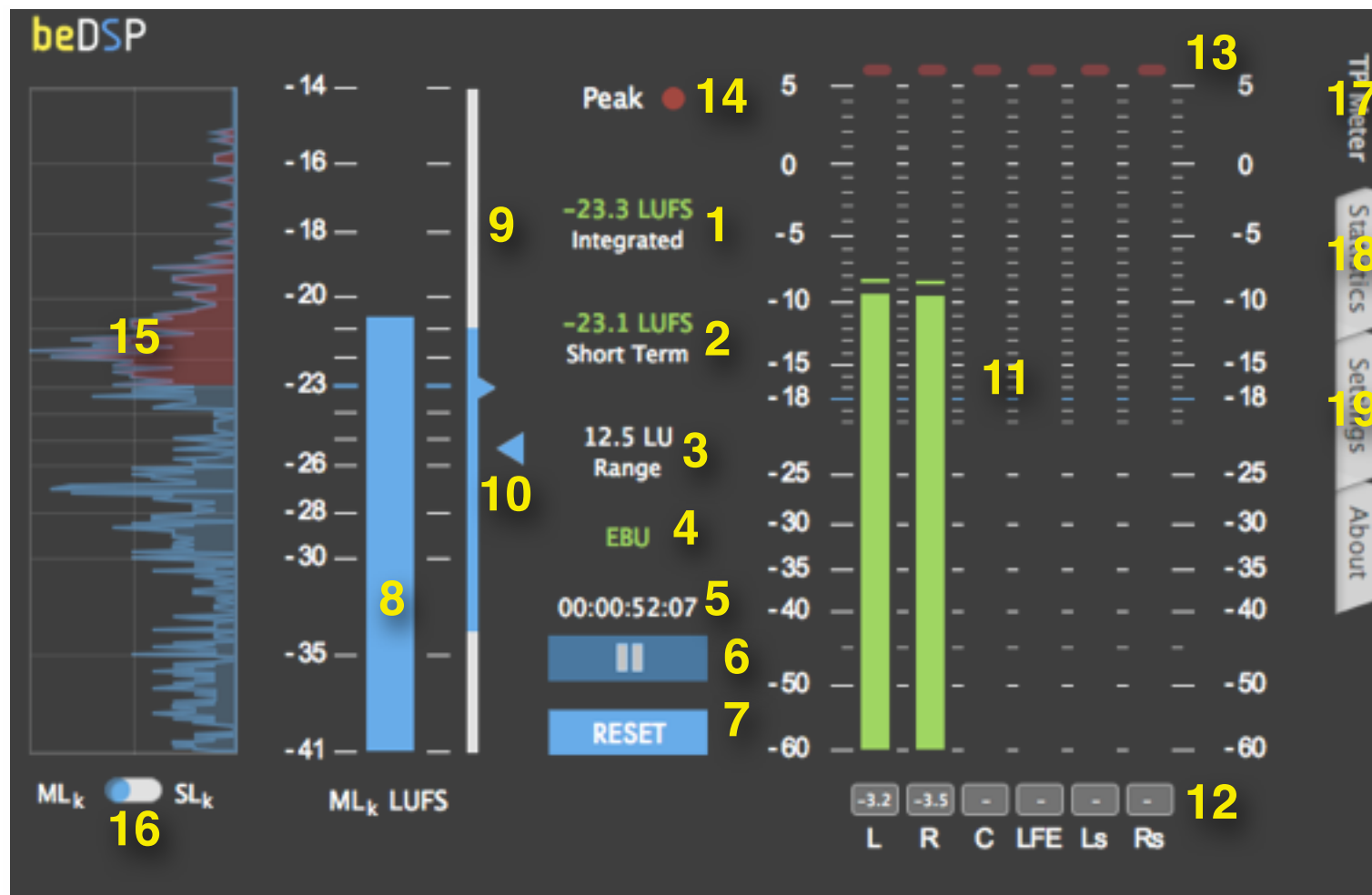


Figure 18: ALM5.1 - Interface

1. Integrated Loudness or Program Loudness (in LUFS/LU);
2. Short Term Loudness (in LUFS/LU);
3. Loudness Range (in LU);
4. Measurements can be done according with EBU, ATSC or ARIB specifications;
5. Time counter for the duration of Integrated Loudness measurement;
6. Play/Stop the measurements for Integrated Loudness and Loudness Range (which is active only when the setting "Follow Transport" is not active);
7. RESET for all the measurements;
8. Real time **Momentary Loudness Meter**;
9. Loudness Range bar Indicator;
10. Short Term Loudness indicator;
11. Real time **True Peak Meter**;
12. **Max True Peak Level** (in dBTP);
13. Peak Led indicators;
14. Peak Led indicator;
15. Momentary or Short Term Loudness histogram;
16. Momentary or Short Term Loudness switch;
17. Meter Window;
18. Statistics Window;
19. Settings Window.



Figure 19: ALM5.1 - EBU, ATSC and ARIB scales for +9LU

Figure 20: ALM5.1 - EBU, ATSC and ARIB scales for +18LU

## Loudness Metering

ALM 5.1 calculates the values for the most important descriptors specified by the standards (Integrated Loudness - Program Loudness, Momentary Loudness, Short Time Loudness, Loudness Range) and provides real time metering for Momentary Loudness. You can also **choose the scale** for Momentary Loudness according to your needs. There are two options that can be accessed in the Settings window (see Page 24):

- The **standard**: EBU with reference level at -23 LUFS, ATSC and ARIB with reference level at -24 LUFS (see Figure 19 and Figure 20).
- The **scale**: +9 LU for a good resolution in the reference level zone (see Figure 19) and +18 LU for a bigger dynamic range (see Figure 20).
- Real time visual representation of Momentary and Short Term Loudness through host automation lane (see an example from Pro Tools in Figure ).

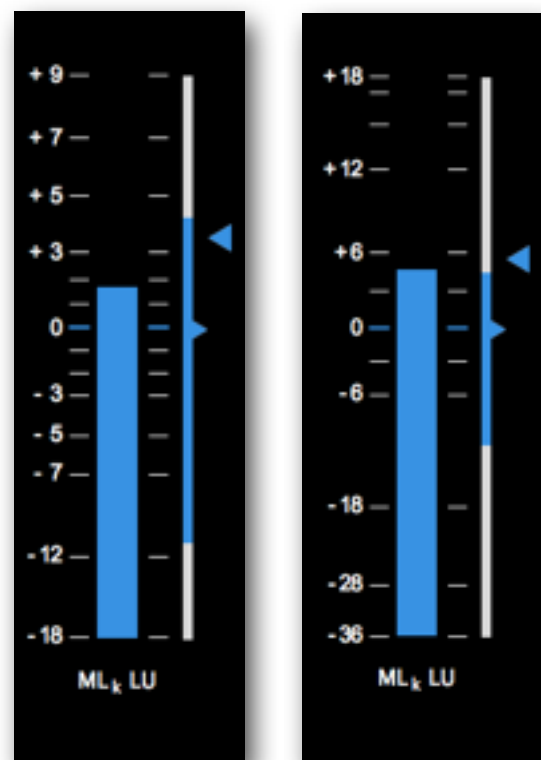


Figure 21: ALM 5.1 - Relative scales for +9 LU (left) and +18 LU (right)

You can also use **relative scales**, with the reference level of 0 LU (see Figure 21). In this case the scale is the same for all the standards.

First of all, the measurements for Integrated Loudness and Loudness Range are done considering the gate at 10 LU below the absolute-gated loudness level. In this case, the name of the standard is green. If you chose **no gate**, the name of the standard will be red (see Figure 22).



Figure 22: ALM 5.1 - No gate - the standard's name is red

## Color Code

For a better monitoring of the **Integrated Loudness**, ALM 5.1 uses a color code. This way, you will know how your program loudness fares compared to the accepted tolerance of each standard (see Figure 23 and Figure 24).

The accepted tolerance zone is the range of loudness that is comfortable to the listener. Note that the Integrated Loudness may not be constant through the program. It can vary within a specific zone according to the content requirements.

The color of Integrated Loudness parameter is:

- green, if the Integrated Loudness matches the standard's specifications;
- yellow, if it's around the standard's specification, but you still have to turn the volume up/down;
- red, if the material is annoyingly loud/soft.



## For EBU specifications:

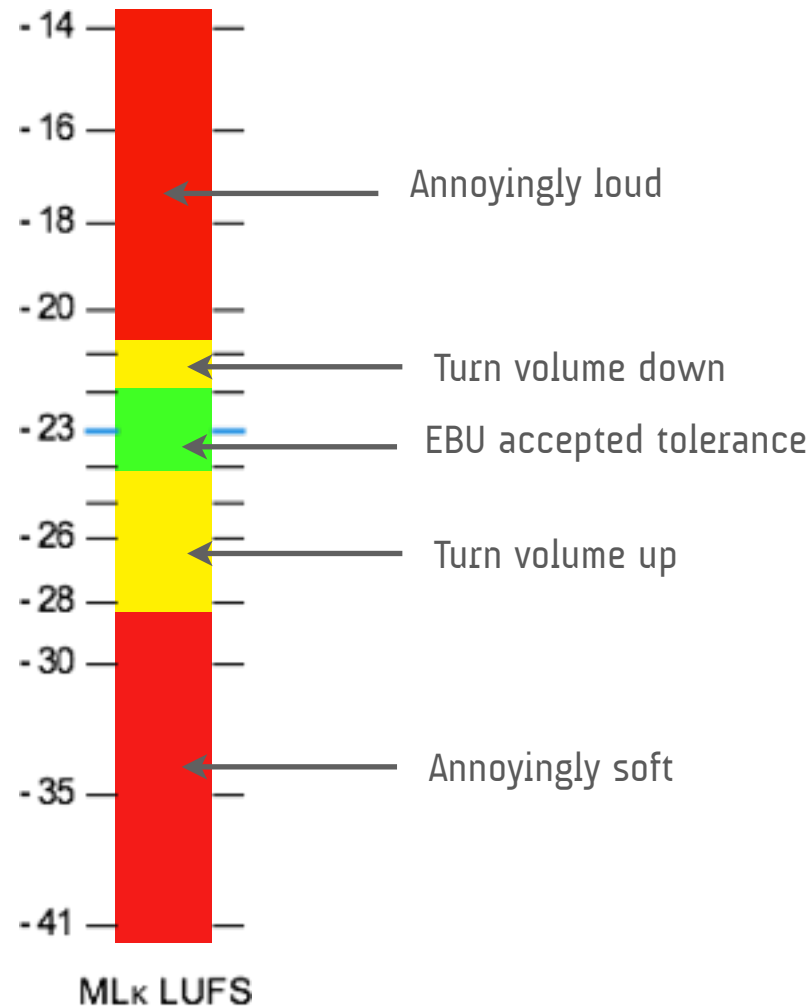


Figure 23: ALM5.1 - The color code according to EBU specifications

## For ATSC and ARIB specifications:

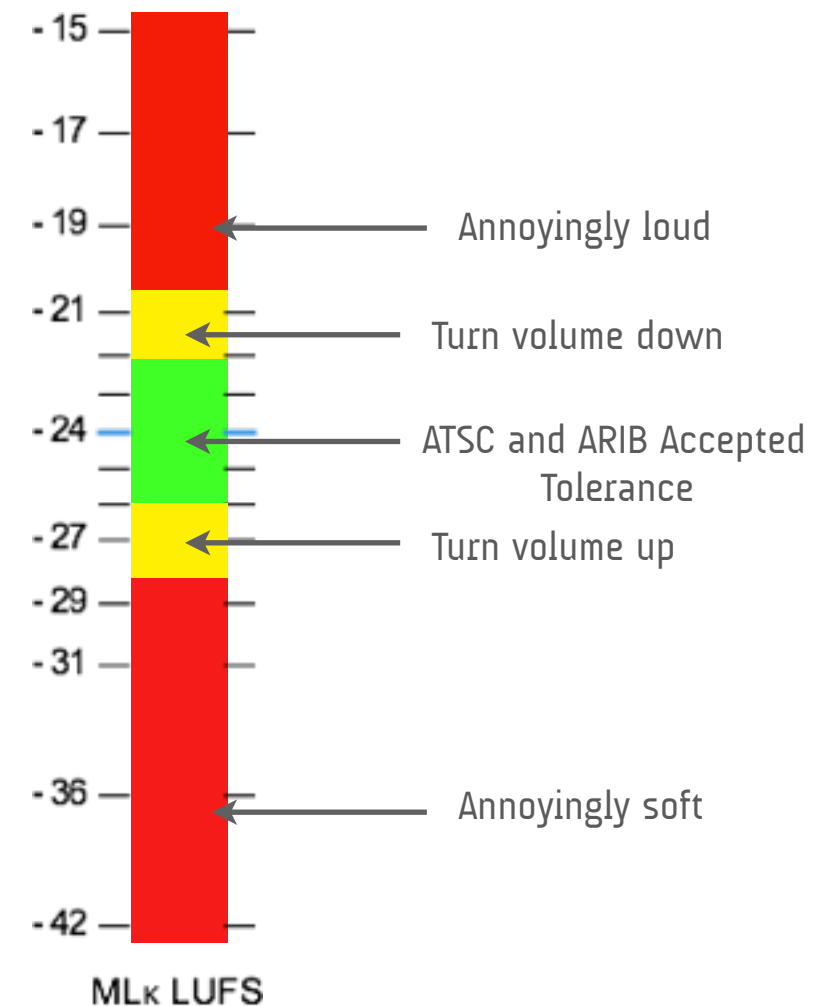


Figure 24 ALM5.1 - The color code according to ATSC and ARIB specifications

If you choose to use the presets, the default threshold for the **Short Term Loudness** will be the one specified by each standard. You can select another value according to your own needs.

The color of **Short Term Loudness** descriptor is in accordance with the threshold from the Settings window(see Figure 25 and Page 25).

If the measured value is above the threshold, the SL is green and if it is beyond the threshold, the SL is red.

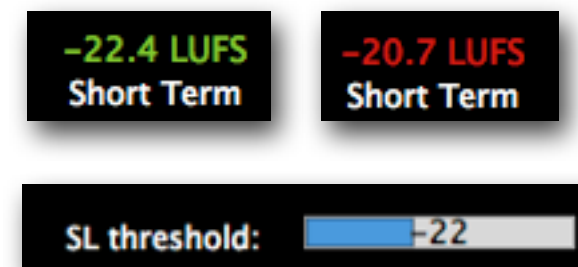


Figure 25: ALM5.1 - Shot Term Loudness color code

## Histogram

ALM 5.1 offers you a histogram with two possible views: one for the distribution of Momentary Loudness values and another one for the distribution of Short Term Loudness values. You can switch between them using the toggle button below the graph. Also you have a color representation according with the chosen threshold values (from the Settings tab). The values above the threshold will be colored red and the ones below will be blue.



Figure 26: ALM5.1 - M.L. and S.T. Loudness threshold

## S.T. Loudness and Mom. Loudness visual representation

Using the real time visual representation of Momentary and Short Term Loudness through host automation lane and the number of hits over threshold from the statistics page, you can easily detect and correct the points with loudness problems (see Figure 28).

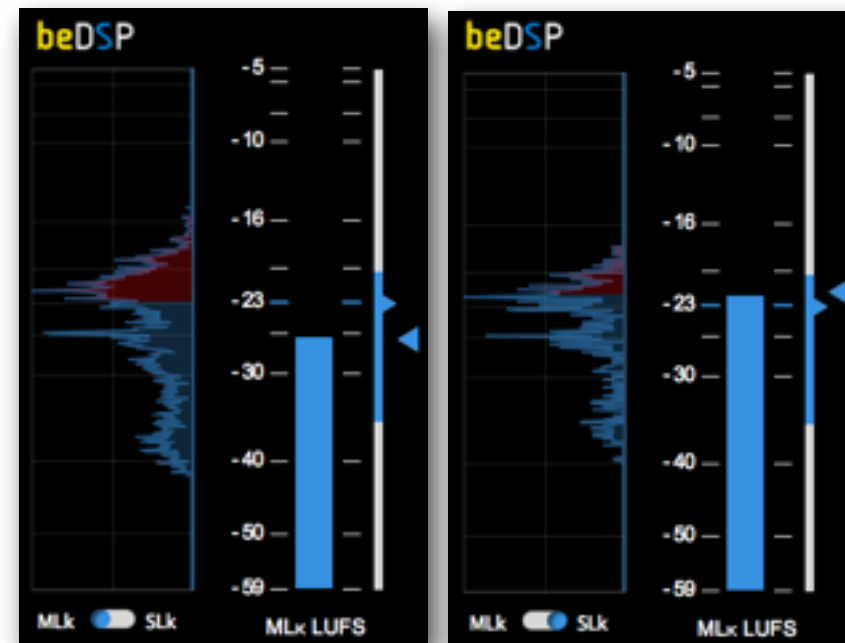


Figure 27: ALM5.1 - Histogram- Momentary Loudness (left), Short Term Loudness (right)

Number of hits over threshold	
Mom. Loudness:	479
S.T. Loudness:	76

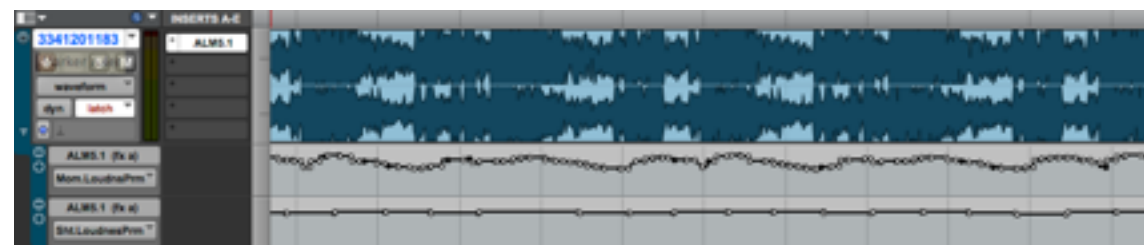


Figure 28: ALM5.1 - Visual representation of Momentary and Short Term Loudness through host automation

## True Peak Metering

ALM 5.1 offers you real time True Peak Metering with peak hold for mono, stereo and 5.1 channels. Beside this, the plugin gives you the possibility to configure your measurements by accessing the Settings window (see Page 26).

You can choose:

- the **Channel order** you are using: ITU - L,R,C,LFE,Ls,Rs  
C|24 - L,C,R,Ls,Rs,LFE  
DTS - L,R,Ls,Rs,C,LFE
- the **True Peak** reference level -18 dBTP or -20 dBTP (see Figure 27)
- the **Peak Holding Time**
- the **Overload Hold**

Note that ALM 5.1 uses always the ITU configuration for the True Peak Metering representation: L,R,C,LFE,Ls,Rs. If you have a different channel order, you can choose the one you want to use.

Even if the True Peak Meter isn't visible, you can still see the peaks indicated by the Peak led. Also, the alarms are turned on until you reset the measurements or press on them.



Figure 29: ALM5.1 - True Peak Metering

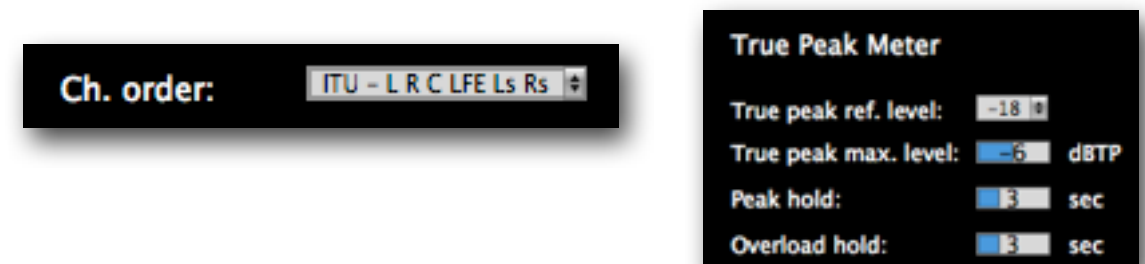


Figure 30: ALM5.1 - Channel order and-True Peak Meter Settings

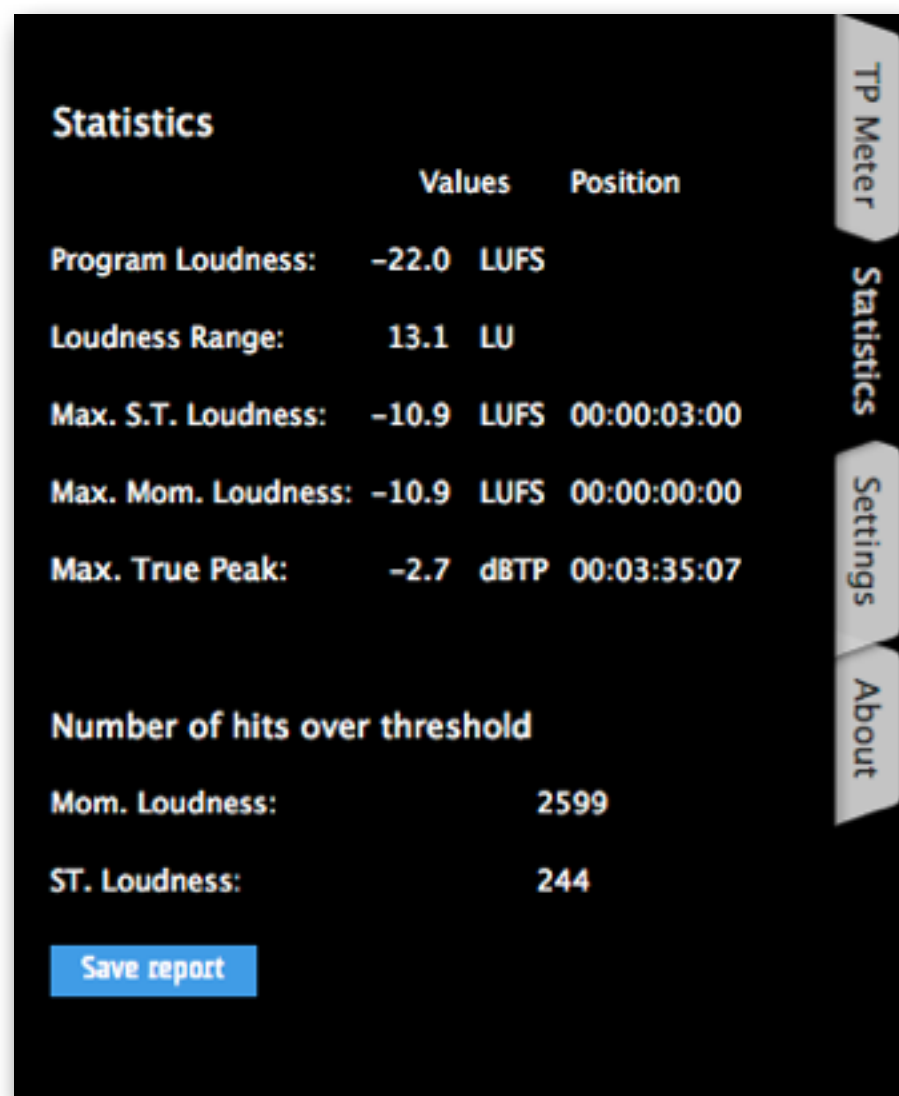


Figure 31: ALM5.1 - Statistics Window

## Statistics

ALM 5.1 offers full statistics and real time values for all the main loudness descriptors of your program:

- Program Loudness
- Loudness Range
- Max. Short Term Loudness with TC position for the maximum value
- Max. Momentary Loudness with TC position for the maximum value
- Max. True Peak with TC position for the maximum value

Also, you have the number of hits over the threshold for ML and SL.

You can save all these parameters in a .txt file, using the **Save Report** button.

In the Figure 32 you can see the structure of a report file.

These values can also be reseted.

```
Program Loudness: -22.0 LUFS
Loudness Range: 13.1 LU
Max. S.T. Loudness: -10.9 LUFS at 00:00:03:00
Max. Mom. Loudness: -10.9 LUFS at 00:00:00:00
Max. True Peak: -2.7 dBTP at 00:03:35:07
Mom. Loudness threshold: -23
Mom. Loudness hits over threshold: 2599
S.T. Loudness threshold: -21
S.T. Loudness hits over threshold: 124
```

Figure 32: ALM5.1 - Report

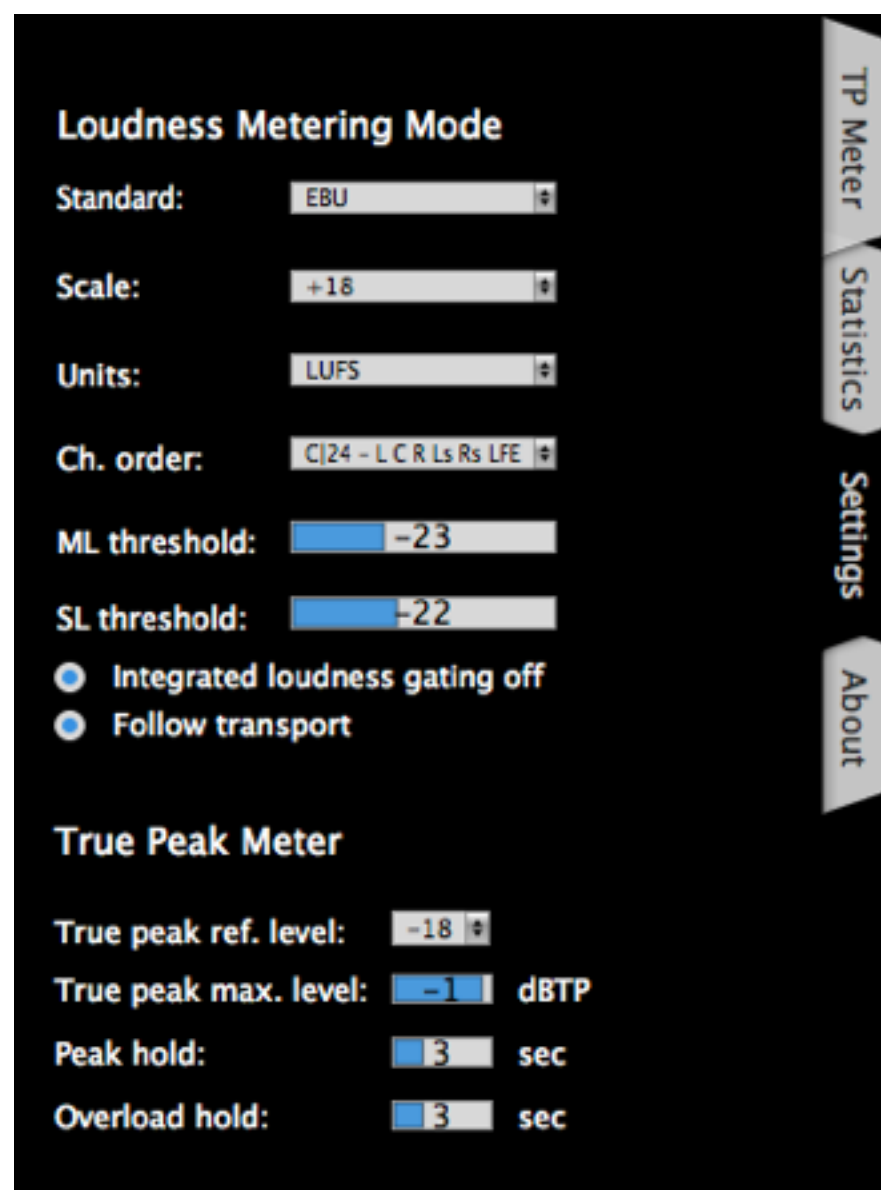


Figure 33: ALM5.1 - Settings - plugin version

## Settings - plugin version

- **Metering Standards:** EBU, ATSC and ARIB specifications ;
- **Loudness Scales :** +9 LU and +18 LU;
- **Loudness Units :** LUFS and LU;
- **The Channel order** you are using: ITU - L,R,C,LFE,Ls,Rs  
C|24 - L,C,R,Ls,Rs,LFE  
DTS - L,R,Ls,Rs,C,LFE
- **Integrated Loudness gating off :** the gate (set at 10 LU below the absolute-gated loudness level) will not be used. The Integrated Loudness and Loudness Range values are calculated for the entire audio material;
- **Follow transport :** the measurements are done only if the audio material is in 'play' mode;
- **True Peak ref. level :** -18 dBTP and -20 dBTP;
- **True Peak max. level :** from -5 dBTP to -1 dBTP. Sets the maximum value of the signal waveform calculated using inter-sample peaks that can be missed in quantization. Above that value the peak led indicators are red (the level is the same for all the channels);
- **Peak hold :** from 0 s to 10 s. Represents the period of time the Peak holders are on;
- **Overload hold :** from 0 s to 10 s. Represents the period of time the Peak Led indicators are on.

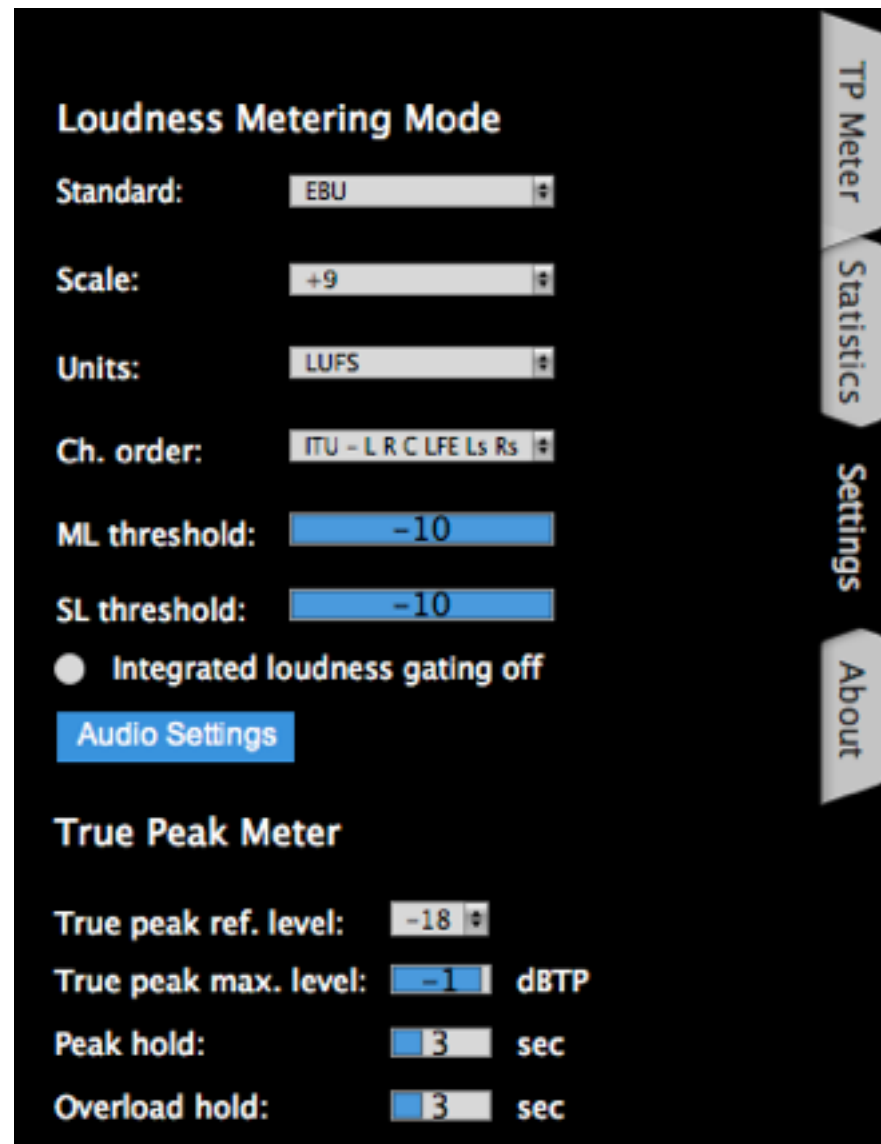


Figure 34: ALM5.1 - Settings - standalone version

## Settings - standalone version

- **Metering Standards:** EBU, ATSC and ARIB specifications ;
- **Loudness Scales :** +9 LU and +18 LU;
- **Loudness Units :** LUFS and LU;
- **The Channel order** you are using: ITU - L,R,C,LFE,Ls,Rs  
C|24 - L,C,R,Ls,Rs,LFE  
DTS - L,R,Ls,Rs,C,LFE
- **Integrated loudness gating off :** the gate (set at 10 LU below the absolute-gated loudness level) will not be used. The Integrated Loudness and Loudness Range values are calculated for the entire audio material;
- **True Peak ref. level :** -18 dBTP and -20 dBTP;
- **True Peak max. level :** from -5 dBTP to -1 dBTP. Sets the maximum value of the signal waveform calculated using inter-sample peaks that can be missed in quantization. Above that value Peak Led indicators are red (the level is the same for all the channels);
- **Peak hold :** from 0 s to 10 s. Represents the period of time the Peak holders are on;
- **Overload hold :** from 0 s to 10 s. Represents the period of time the Peak Led indicators are on.

## Audio Settings - standalone version

The ALM 5.1 standalone version offers complex I/O Audio Settings and routing capabilities. This way you can take advantage of the same features even if your system doesn't support VST, AU or AAX plugins. You can choose:

- Input and output audio interface
- Sample Rate
- Audio buffer size
- The inputs and the outputs for L, R, C, LFE, LS, RS

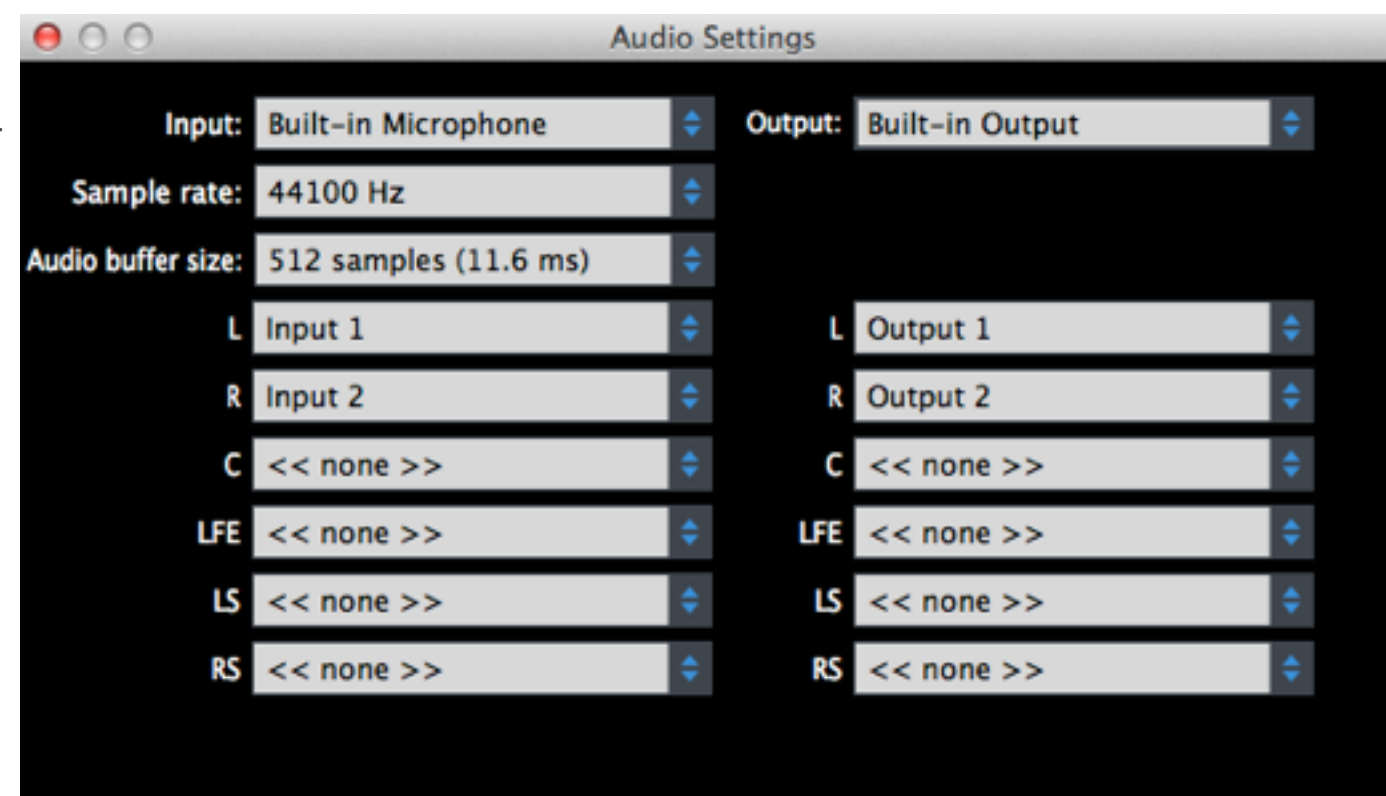


Figure 35: ALM5.1 - Audio Settings - standalone

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## ALM 5.1

Loudness and True Peak Meter

VST, AU and AAX plugin based on BS1770 (rev.3) and  
EBU R128

## Contact

web: [www.bedsp.net](http://www.bedsp.net)

e-mail: [contact@bedsp.net](mailto:contact@bedsp.net)