License and Installation Notes

(updated 09/2014)

PPMulator+

Metering software plugin

PPMulatorXL

Metering software plugin + loudness

VST Audio Units RTAS Microsoft Windows Mac OS X Suitable for Vegetarians

zplane | zplane.development audio technology

June 2015

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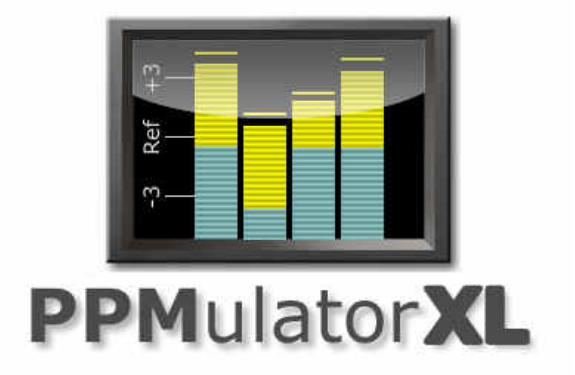
II. Introduction

PPMulator+ is a plugin for audio editing software which emulates 'Peak Programme Meters'. Unlike most other types of digital meters, Peak Programme Meters - or 'PPMs' - are designed to a very strict set of standards which are universally-accepted in broadcast and audio post-production.

By installing and using PPMulator+, you can be sure that your audio is at the perfect level for film, radio or TV - something which is virtually impossible to achieve using the meters found in most audio editing systems.

III. New in Version 3

PPMulator v3 comes in two versions: PPMulator+ (PPM+) and PPMulatorXL (PPMXL). As a convention throughout this manual we will talk of 'PPMulator' if the info is related to both versions. Otherwise the explicit names are used.
PPMulatorXL has all features of PPMulator+ as well as both loudness metering and the possibility to meter audio files way faster than real-time. This is the icon logo for PPMulatorXL:



Please find below an overview of new main features:

- **EBU R128 compliant loudness metering**
- **ATSC A/85 compliant loudness metering**
- **True-peak metering (ITU-R BS.1770 compliant)**
- **Batch-mode offline metering in multiple real-time**
- **Three-stage over indication**

To make the controls more intuitive and user-friendly some tabs were revised and/or expanded. Therefore it is recommended to read through this manual thoroughly.

General info about loudness metering and the loudness specification can be found here:

- http://tech.ebu.ch/loudness
- http://tech.ebu.ch/docs/tech/tech3341.pdf
- http://tech.ebu.ch/docs/r/r128.pdf

IV. Installation

PPMulator is supplied for Windows XP/Vista/7 and Mac OS X as a standalone program and also as a VST, AU (Audio Unit) and RTAS plugin for compatible host programs, such as Tracktion, Nuendo, Pro Tools, Logic, Cubase, SONAR etc.

If you have a demo version of PPMulator installed, please remove/uninstall it before you install the full version.

Download the PPMulator install program (PPMulatorInstaller.exe) onto your system's hard drive and run it by double-clicking it.
Once you have read and accepted the licence agreement, the installer will automatically copy versions of PPMulator into the appropriate folders on your hard drive. For most users, the default folder settings will be appropriate, though you may specify alternative folders in which to install the various plugins if you wish. It is usually better to install PPMulator plugins whilst your host program is not running. The PPMulator installer will install a standalone executable version (PPMulator3.exe), and optionally a VST plugin (PPMulator3.dll) and an RTAS plugin (PPMulator3.dpm) for use with Digidesign Pro Tools.

Download the PPMulator install programm (PPMulatorInstaller.mpkg) onto your system's hard drive and run it by double-clicking it. The package contains inside four files: these are PPMulator3.app (the standalone version), PPMulator3.vst (the VST plugin), PPMulator3s.component (the AU plugin) and PPMulator3.dpm (the RTAS plugin).
The standalone version can be copied anywhere you want the program to reside on your system (normally in the 'Applications' folder) whilst there are dedicated folders for plugins: for VSTs, these are home/Library/Audio/Plug-Ins/VST (which is user-specific) or Library/Audio/Plug-Ins/VST (which is global to all users on the machine) and for AU (Audio Unit) plugins the folders are home/Library/Audio/Plug-Ins/Components or Library/Audio/Plug-Ins/Components. For Pro Tools, the RTAS plugin should be placed in the folder /Library/Application Support/Digidesign/Plugins.
Please consult the documentation for your host program for further details on installing and configuring plugins.

V. Registration and Unlocking

The unregistered PPMulator software will behave like the publicly available demo software: it will cease to work after several minutes of use. Then, a restart of the software is necessary.

After you bought and installed the software, please register your copy of PPMulator by clicking the small plus icon on the meters to display the settings page, and then selecting the 'Unlock' tab and following the on-screen instructions.

To unlock your copy you need the serial number, which you received after buying the software, and an unlock key. To receive the unlock key, you need to register as a user at https://www.zplane.de/products/index.php.
This site should look similar to the image below. In the top right corner you find the place for creating an account (or the login to an existing account). After setting up your account and filling in the serial number you will receive the unlock key by email. Furthermore, your user account allows you to look up your serial number and unlock key anytime and to download the newest full version of your software.

If you have any problems with registration, you can contact us at the following email address: support@zplane.de

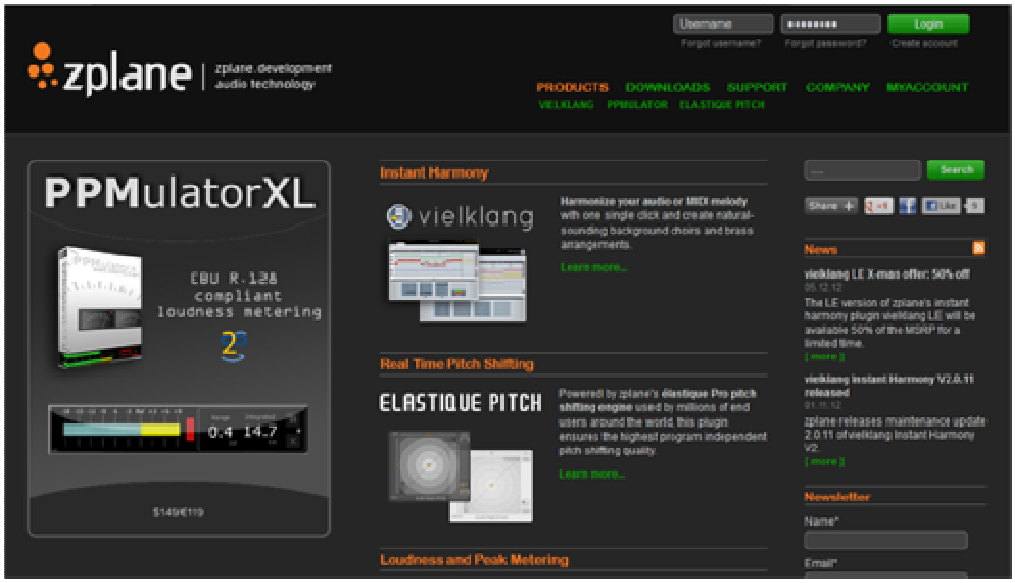


Figure 1: Website login page

VI. Upgrade from PPMulator+ to PPMulatorXL

PPMulatorXL offers a set of powerful new features that are not supported by PPMulator+.

These include loudness metering and blazingly fast batch metering of multiple files.
If you would like to upgrade to PPMulatorXL, you have to install the new version 3 of PPMulator+ first. PPMulator 3 now detects which version is already installed and gives you the opportunity to upgrade to the full featured and enhanced version of PPMulatorXL.

VII. PPMulator V3 demo version

The PPMulator version has the option to switch between PPMulator+ and PPMulatorXL to see what you gain if you use the 'big brother' of PPMulator+.
Beside the limitation in time there are some more in PPMulatorXL demo mode: Batch processing is limited to one file only.

Note: The demo version of PPMulator cannot be altered to the full version! You need to remove the demo first and install then the full version that comes with a different installer. You´ll find the full installer in your MyAccount section at the product page:
https://www.zplane.de/products/index.php

VIII. Using PPMulator

PPMulator can be run in one of two ways - either as a standalone program, or as a VST/AU/RTAS plugin:

- **Standalone**

The standalone version of PPMulator simply looks at the signal coming into your soundcard and shows it on the meters. This can be useful for setting the levels of audio being recorded to a known value. To set up PPMulator
, double-click the program icon and then press the small icon on the pop-up meters to access the settings panel (you can also right mouseclick to access this feature). On this settings panel, locate the 'Audio' tab (indicated by a loudspeaker icon) and set which audio inputs you wish PPMulator to monitor.
To quit the program, either select the 'Quit the application' option on the first tab of the settings panel, or right mouse-click the meters themselves and select 'Quit' from the pop-up menu.

- **Plugin**

PPMulator+ is best-suited to being run as a VST/AU/RTAS plugin under a compatible host application. Check your host program's own documentation for how to add a plugin to your audio, but generally, PPMulator+ is most useful when placed across the main master outputs of your mix bus - note that some host programs allow both pre-fade and post-fade inserts, which will make a difference if the master output fader is not at unity (zero). It is generally better to place PPMulator+ pre-fade on the master output, as changes to the master level will then not affect the metering.
If, however, you are using a fully-calibrated soundcard and you wish to accurately monitor the actual output of your host program, then PPMulator+ can be placed post-master fader and will reflect changes to the master output level. Alternatively, the PPMulator+ plugin can be placed across any individual tracks, groups or even on the input channels.
When placed pre-master fader (or with the master output at unity) it is possible to use PPMulator+ to work in a calibrated environment, such that you adjust all your individual clip and channel levels to give a good peak reading on the meter, then when that project is exported as either OMF or AAF to another system, you can be confident that the overall project levels will be correct on the destination system.

- **Peak Logging**

When run as a VST/AU/RTAS plugin, PPMulator+ has a unique 'Peak Logging' feature which allows the user to accurately view (and correct) all instances of peaks within the program material. For more details on this feature, see the 'Peak Logging' page later in this guide.

Note: the standalone version of PPMulator+ does not contain this feature as there will be no time code to log the peaks against! PPMulator+ has to be run as a plugin within a compatible host application for this feature to be of use.

Note: The standalone of PPMulatorXL also has a peak logging page where you can check any audio file (supported formats: wav/aiff) faster than real-time!

IX. The Settings Panel

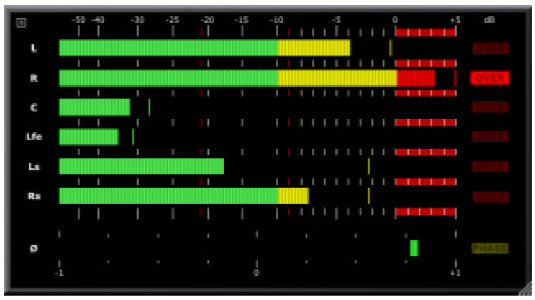
PPMulator can be configured in a number of different ways, to accurately model the ballistics, responses and graphics of a wide range of standard peak programme meters. These meters currently include the following:

- **Meter Types**:
  IEC 268-10 Type I (Nordic N9 meter)
  IEC 268-10 Type IIa (BBC PPM meter)
  IEC268-10 Type IIb (EBU PPM meter)
  DIN 45406
  ITU-1770 True-Peak meter
  EBU R128: Loudness metering (PPMXL only!)
  ATSC A/85:2009-loudness (PPMXL only!)
  ATSC A/85:2013-loudness (PPMXL only!)

- **Display types**:
  Mono needle meter
  Stereo needle meter
  Mid-Side needle meter
  Stereo + M-S needle meter
  Multi-channel/surround needle meters
  Optional phase meter

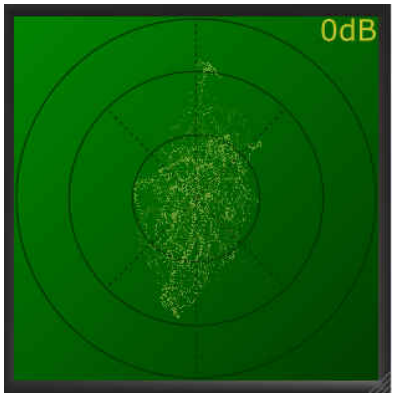
Twin needle BBC-style PPM meters

  Mono bargraph meter
  Stereo bargraph meter
  Mid-Side bargraph meter
  Stereo + M-S bargraph meter
  Multi-channel/surround bargraph meters
  Optional phase meter



5.1/surround DIN 45406 PPM bargraphs, with optional phase meter

- Goniometer/Jellyfish



- **Resizing**:

Both horizontal and vertical bargraph options are available, and all PPMulator meter types can be resized by clicking-and-dragging the bottom right-hand corner. Bear in mind that depending on your graphics card, using extremely large instances of PPMulator may have a slight effect on your computer's performance!

To access the settings panel, simply click the icon displayed in the corner of any of the PPMulator meter types (or you can right mouse-click on the meters and choose "Show Settings Panel" from the pop-up menu). Across the top of the settings panel are seven icons - one for each area of PPMulator's functionality. The following pages outline each panel's functions in detail.

X. Type (Display Parameters)

The Type panel allows PPMulator's standard, scale and ballistics settings to be adjusted:

• meter ballistics:
A list of the types of Peak Programme Meters which are emulated.

• over level:
The point at which the meter's over leds illuminate. You can either slide the slider to adjust this point, or type a value directly into the box.

• integration time:
This is a carefully-defined part of a PPM meter's standard and is defined as the amount of time taken for the meter to reach a particular dB value in a particular time. This can be thought of as a form of 'attack time'. Unlike true digital peak-reading meters, PPMs are designed to 'miss' short transients in the signal - consequently, material mixed using PPM meters tends to be several dB louder than when using meters with a faster response.

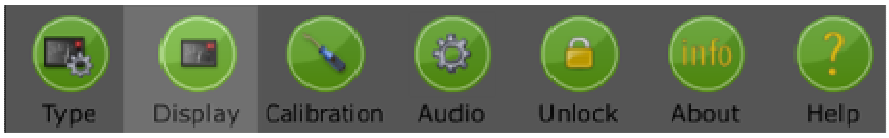
PPMulator adheres to the PPM standard closely and uses the correct integration time for each PPM meter type. You can adjust this time to give the meter a faster response time (such as zero, where it will show all digital peaks) but this will, of course, make it a nonstandard PPM meter and will therefore give erroneous readings when used.

• fallback time:
Like integration time above, the fallback time - the time taken for the needle/bargraph to drop after reaching a particular value - is a carefully-defined part of the PPM specification. Changing this will make a faster or slower-reacting meter, but it will no longer react like a true PPM meter. With the BBC-style meters, there is an additional option to mimic the slower fallback between PPM1 and zero sometimes found on older models of PPM meters.

• peak hold:
By setting the peak hold time you can configure how long the peak bar stays at its peak location. When setting it to infinite it will always stay at it maximum position and will never return to zero. You can reset the peak hold by clicking on the over sign or click the second mouse button when your are over the PPMulator display. In the popup menu that will open then you can select 'reset peaks and overloads' to reset the current peak hold.

• over hold:
Same as with peak hold. By setting the over to infinite you can make sure that overs are displayed and you cannot miss one.

• restore defaults:
Restores any changes to the currently-selected meter type back to the default settings.



XI. Display

The Display panel allows PPMulator+'s graphical display settings to be adjusted:

• display type:
A list of the types of Peak Programme Meters which are emulated. Allows a choice of 'analogue-style' needle meter (Type IIa and IIb only), horizontal or vertical bargraph meters. In PPMulator+, there is now the choice of multi-channel/surround meters, for use in 5.1 and surround projects.

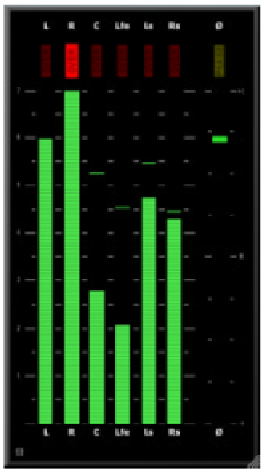
Below are some example scale and display types:

5.1/surround BBC PPM needle meters, with optional phase meter

Twin BBC PPM needle meters

Stereo Nordic N9 PPM bargraph

EBU scale needle PPM meter, showing Mid & Side (M/S)


5.1/surround BBC PPM bargraph, with optional phase meter

• show peak needles:
When the display type is set to a 'needle meter', this option displays an additional thin red needle which temporarily shows the peak before being reset (similar to the 'peak hold' function on a regular bargraph meter).

• channels (multi-channel/surround meters only):
If a multi-channel/surround meter type is chosen above, you have the option to enable/disable up to 6 channels for metering, with a choice of which audio channel is assigned to which meter channel. Click each of the six grey squares to display a drop-down list of possible audio channels to meter.

Note: Some hosts will only allow a stereo plugin across a stereo track or bus, and a multichannel plugin across a multi-channel bus. If PPMulator+ does not appear to be functioning correctly, check that you've selected an appropriate metering mode - stereo or multichannel - for the type of insert.

Also, although most hosts will map the correct channels to PPMulator+ in the correct order (i.e. L, R, C, Lfe, Ls and Rs, respectively "Left", "Right", "Centre", "Low Frequency Effects", "Left Surround" and

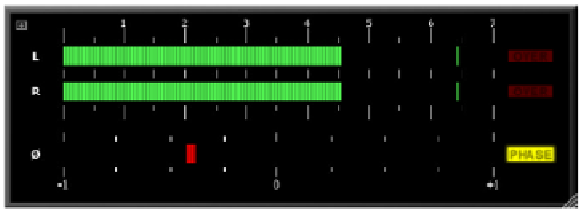
"Right Surround"), it may be necessary to change the order of these channels using this option so that the appropriate channels are metered.

• needle/bargraph colour (multi-channel/surround meters only):
If a multi-channel/surround meter type is chosen above, these buttons select the colour of each meter's needle or bargraph, for easier recognition when working in 5.1. If the meter type is set to IEC 268-10 Type IIa or b (BBC or EBU meters) then each channel's bargraph is composed of a single colour. If the meter type is set to IEC 268-10 Type I (Nordic N9 or DIN) then you have additional "mid" and "peak" colours for each bargraph.

• label (multi-channel/surround meters only):
This allows you to give each meter channel a short on-screen label which will identify the channel being metered. The defaults are L, R, C, Lfe, Ls and Rs (respectively "Left", "Right", "Centre", "Low Frequency Effects", "Left Surround" and "Right Surround") though these can be changed by simply typing in a new label.

• phase meter (multi-channel/surround meters only):
This enables or disables a phase meter, which shows phase-correlation (and therefore mono compatibility) between any pair of channels. Use the drop-down list to select which two audio channels you wish to measure phase-correlation between.

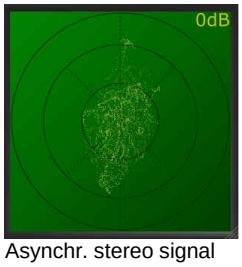
Example of box-and-needle and bargraph PPMs, with optional phase-correlation meters, both indicating negative phase warnings



A reading of +1 indicates that the two channels are in phase (i.e. mono), whilst a reading of -1 means that the two channels being metered are 180° out of phase (i.e. will result in silence in mono). This is also indicated by a yellow warning led and, with bargraphs, the meter turns red. Any phase-correlation of less than zero will result in some cancellation in mono, so this should be carefully checked for maximum mono broadcast compatibility.

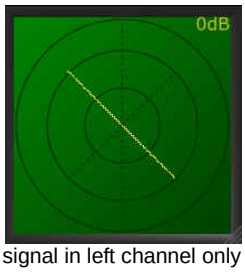
Note: If you select a stereo PPM meter, there is no phase meter option available. However, if you wish to have a phase meter alongside a stereo PPM meter, simply select the multichannel/surround meter option and disable all channels other than "L" and "R".

• goniometer/jellyfish
This is another option to get a quick glance of phase-correlation in stereo signals. You can decide where it should be located, to the right or below the main metering display. You have two parameters: delay (which regulates the fadeout) and brightness (which regulates the maximum contrast). If the signal level is low you have the option to amplify it for the display. Simply click on the 0dB label and it will cycle through gains of +3dB ⇒ +6dB ⇒ 0dB.

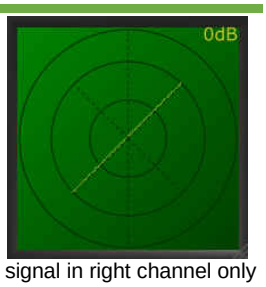


Asynchr. stereo signal

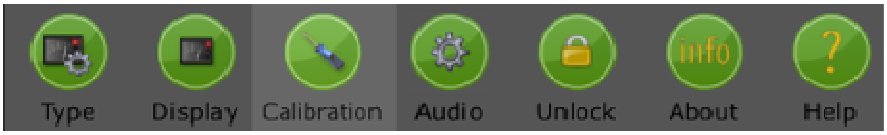
mono signal



signal in left channel only



signal in right channel only



XII. Calibration

The Calibration panel allows PPMulator+ to be set up with a particular reference level:

• mono trim setting:
PPMulator+ has several types of mono PPM meter options, all of which display the sum of the left and right stereo channels. Generally, most PPM meters use a gain trim to deduct either 6 or 3dB from this sum to give a more accurate indication of the mono level. These gain trims are known as M6 or M3 mode.

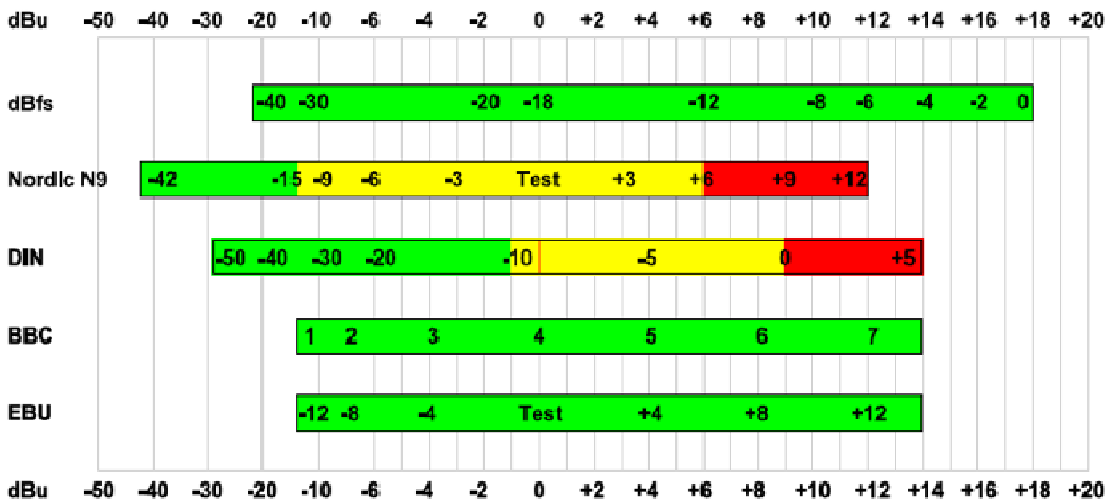
PPMulator+ allows you to select either -6dB of mono trim (the widely-used amount), -3dB (less usual, although still a standard within certain obscure parts of the BBC) or no mono trim (where mono = left + right).

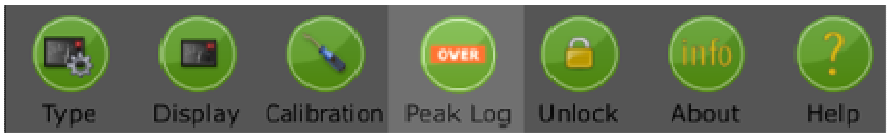
• reference level:
This slider is used to calibrate PPMulator+ to your system's reference level. Generally, most TV audio post-production studios work at a reference level of -18dBFS and film studios tend to work at -20dBFS.

You can either slide this slider to change the reference level, or type a value directly into the dBFS box (hint: press and hold the [Ctrl] key whilst sliding the slider for more accurate control over values when sliding).

• generate reference tone files:
This option allows you to create stereo sine wave files at a known level, to reimport back into your host program to calibrate PPMulator+ and the rest of your system. Clicking this button will pop up a menu allowing you to select the level of the sine wave (in dBFS), the frequency (a choice of A=440Hz, the standard 1kHz (or 997 Hz) line-up tone, or a 5kHz tone), the sample rate (44.1, 48 or 96kHz) and the bit-depth (16 or 24-bit).

Comparitive Meterchart





XIII. Peak Logging

The Peak Logging page can be used to log all instances of peak overloads in PPMulator+ against the timecode where they occurred for unattended mixes, playouts or laybacks. At the end of the logging session, any "overs" can be sorted in order of time, or by peak (in dB) so that the mix can simply be reduced by the amount of the highest peak and run again for 100% confidence:

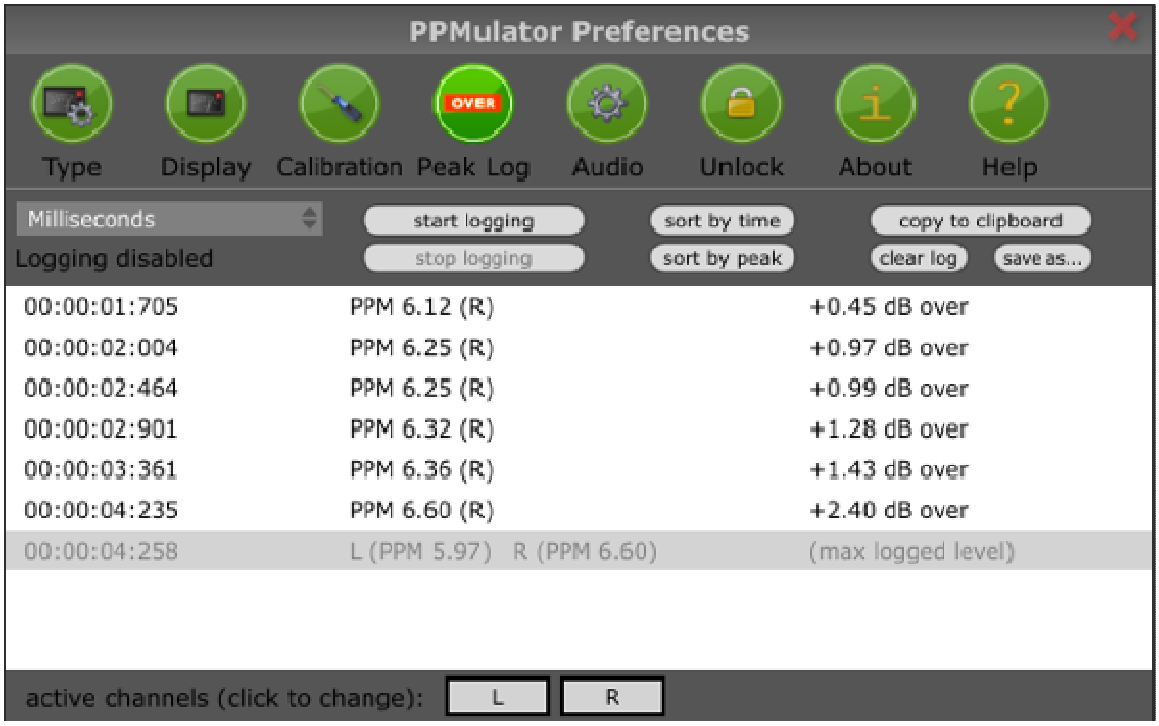
• start logging / stop logging:
These buttons can be used to start/stop logging of peaks. Note that pressing "start" will not reset this page and clear any previously-recorded peaks. This start/stop arrangement can be used to 'pause' a logging session whilst you adjust levels, and then continue.

Note: whenever "start logging" is pressed, PPMulator+ will automatically show the maximum level shown on the meters until the first peak is logged. This can be useful in the case of logging a session which contains no peak overloads - at the end of the logged session, it is possible to see what the maximum level during the session was, and if it was too low, the mix can be increased by an appropriate level and simply run again.

• sort by time:
This will sort the list in ascending order of time.

• sort by peak:
This will sort the list in descending order of peak overload, starting with the largest.

• active channels:
This allows certain channels to be shown or hidden on the logging panel. Note that overloads on All channels (including phase errors) are always logged at all times - toggling these grey buttons simply hides/shows those channels' values from the list.



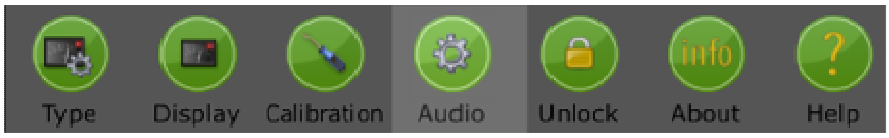
• frame rate selector:
This drop-down list allows the user to select a timecode standard for the logging session. Normally, this standard is passed to PPMulator+ by the host program, but alternative timecode formats for the peak log list can be selected using this option.

• clear log:
This button clears the current logging session.

• copy to clipboard:
This copies the current logging list to the clipboard, for printing or pasting into a document.

• save as:
This allows the current logging list to be saved as a standard tab-delimited text file.

Note: if PPMulator+ registers several peak overloads in succession for more than 5 seconds, rather than list all these dozens of overlapping peaks individually, a more general error message is displayed that it's all gone horribly-wrong at that point...



XIV. Audio (standalone version only)

The Audio page allows the standalone version of PPMulator+ to be configured to monitor one of several audio devices present on the computer:

• audio device:
This is a drop-down list of all audio devices present on the system. Select which ones you wish PPMulator+ to meter. Note that PPMulator+ will only monitor input audio streams (such as your soundcard's inputs) rather than the output.

• sample rate:
This can be used to set PPMulator+ to your soundcard's native sample rate.

• audio buffer size:
This setting tells PPMulator+ how large (or small) an audio buffer to use. Generally, it's better to have as small a buffer size as possible - since the meter will react faster and update more smoothly - but if this size is set too low, then glitches in audio recording and playback may result.

• input channels:
This is used to map input channels on your selected audio device to PPMulator+ audio channels for metering.

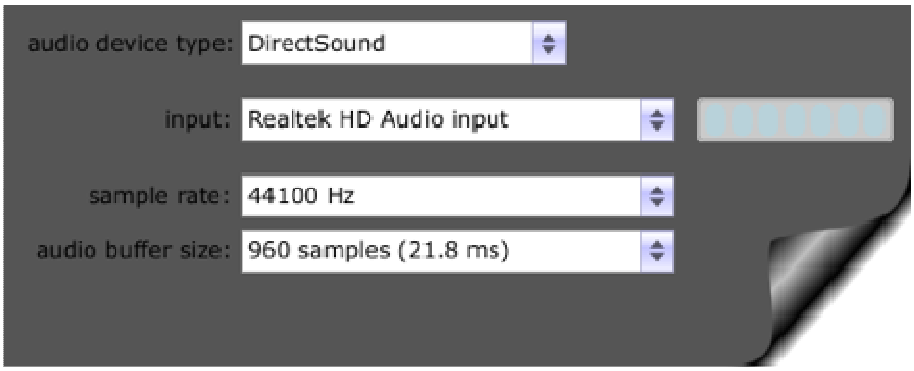


Figure: possible audio settings

XV. Contact

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