Audessence PodBlaster

Installation & Operation Manual
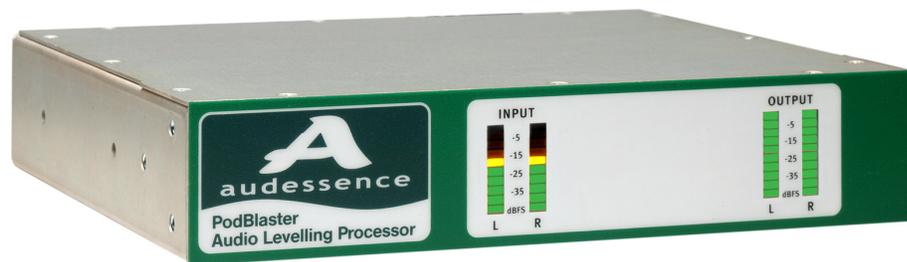
PodBlaster Manual   Ver 4.00   2012-11-21

Contents

Safety Information

Warning Symbols

⚡	This symbol is intended to alert the user to the presence of dangerous voltages inside the equipment's enclosure. Voltages may be sufficient to constitute risk of electric shock.

PodBlaster is normally supplied with an external, double-insulated power supply unit (often known as 'desk-top power supply'). THE USER SHOULD **NEVER** ATTEMPT TO OPEN THE AC POWER SUPPLY!

The PodBlaster unit itself is powered from 5VDC. 5V DC does not present a safety hazard, but please see **important** note on grounding below.

⚠	This symbol alerts the user to important operating and maintenance instructions in literature that may accompany the product. Please read, understand, and observe all information provided.

Other Safety Instructions

⚠

Grounding: Even if external power supplies are considered intrinsically safe, employ suitable grounding of all metal cases to protect installers and users against possible failures, voltages carried in on external cabling, static discharges, earth leakage potentials caused by power supply RFI measures, etc. If in doubt seek expert advice. A dedicated M4 size captive ground point with suitable fastener is provided on all Audessence equipment. This must be used for a permanent ground connection.

Servicing: Refer all servicing to qualified personnel only.

Safety Information: Retain all safety information for future use, including by others who may become responsible for the equipment in the future.

Warnings: Take note of all warnings and adhere to them.

Water and moisture: This equipment does not have any large openings in its enclosure, but neither is it sealed against moisture. Do not use in the immediate vicinity of water on in an excessively humid environment. Take care that unit is not exposed to dripping or splashing.

Ventilation: There is no specific requirement for air movement since the unit does not employ a cooling fan.

Heat: The ambient temperature where the unit is installed should not exceed 40 degrees Celsius.

Power Source: Use the equipment only with the type of power source described in the specifications and / or as marked on the equipment.

Conformity

CE

This device complies with the requirements of the EEC council directives: 93/68/EEC (CE marking); 73/23/EEC (Safety – low voltage directive; 89/336/EEC (electromagnetic compatibility). Conformity is declared to the following standards as applicable: EN55022, EN55103-1, EN55103-2, EN61000-4-3, EN61000-4-4, EN60950-1.

USA Warning – This equipment generates, uses and can radiate radio frequency energy. If not installed and used in accordance with the instructions in this manual it may cause interference to radio communications. It has been tested and found to comply within the limits for a Class-A computing device (pursuant to Part 15, Subpart J), which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area could cause interference, in which case the user will be required to take whatever measures may be required to correct the interference at their own expense.

Canada Warning – This digital apparatus does not exceed the Class A limits for radio noise emissions set out in the Radio Interference Regulations of the Canadian Department of Communications . Le present appareil numerique n'emet pas de bruits radioelectriques depassant les limits applicables aux brouillage radioelectrique edicte par le ministere des Communications du Canada.

Use of Shielded cables: In order to meet EMC specifications as above, digital ports must be connected with the correct type of cable. This means foil- or double-screened 110-Ohm digital cable (e.g. Canford DFT or Belden 1696A) for XLR (AES-3) ports and RG58 or similar coaxial cable for phono/RCA (S/PDIF) ports. Use of cheap lapped-screen cables may cause radiated emissions to increase and / or reduce immunity. Special cables are not required for analogue or power ports.

Quick Start Guide

1./   Setup & Control: PodBlaster can only be set up via computer control. Graphical User Interface (GUI) software, supplied on CD with every unit, gives full control of all parameters and the PC can be remote from the PodBlaster hardware box.

System requirements for GUI software: Windows PC running Windows 2000 with SP4, any version of XP, Vista, or Windows 7. USB port required.

2./   Software Installation. Load software directly from the CD <u>**before**</u> connecting the PodBlaster unit to the PC. Once the software is all installed, then connect PodBlaster to the USB port <u>**afterwards**</u>. Installer programme should auto-run from CD, or if necessary run 'setup.exe' manually. Installer shell checks for required framework (Microsoft .NET ver 2) and USB drivers, and installs them from the CD if not already present.

Default connection at PC end is COM-1. You need to go to 'Connections' menu in the GUI to re-scan for available ports and select USB (USB runs as virtual COM port and will often be the highest COM port number in the list).

3./   Login and Security: When using the GUI, after pressing 'Connect', note that although you will be able to see menus and controls without logging-in, it will not be possible to change anything until logged in. Login is found in Menus under \Security\Login. (NB: the right-hand of the two big buttons at the top toggles the main screen between Menus and Presets).

Default pasword for log-in is AAAA. **N.B: Sessions TIME-OUT after about 10 minutes of inactivity!** If controls aren't working, try logging in again.

4./   Input – Analogue or Digital? Decide whether you are going to be using Analogue inputs or S-PDIF (digital) input. Navigate to 'Input' menu and select the input you wish to use. In the GUI this is found in 'Setup\Input' menu.

If you select AES (Digital) input then **N.B:** *sample rate selection* is much more important than with other processors. When selecting digital (AES) input, at the same time you **must** select whether the Base Rate is 96kHz (supports professional rates of 32, 48, 96kHz ONLY at the input) or 88.2kHz (supports consumer rates of 44.1 and 88.2 kHz ONLY at the input). If base rate is not selected properly, digital audio inputs *will* be corrupted!

5./   Levels setup: You have gain trims on the inputs and Cieling (=maximum allowed level) controls for the Outputs.

PodBlaster's **analogue input** expects to receive a signal *peaking* at +4dBu to +8dBu. If the input is going to be significantly above or below this level, you can adjust the Analogue Input Gain trim to compensate.

PodBlaster's **S-PDIF/ digital input** expects to receive a signal *peaking* at –20 to –16dBFS. If the input is going to be significantly above or below this level, you can adjust the Digital Input Gain trim to compensate.

PodBlaster's **analogue output** will normally send out a signal peaking at up to +8dBu but never above this 'ceiling' value. If you require a higher or lower level, you can adjust the Analogue Output ceiling directly to whatever *maximum* output level in dBu you require.

PodBlaster's **digital output** will normally send out a signal peaking at up to 0dBFS but never above this 'ceiling' value. If you require a lower level, you can adjust the Digital Output ceiling to whatever *maximum* output level in dBFS you require.

On the S-PDIF digital output you can also select Double Rate (96/88.2kHz) or Half Rate (48 / 44.1kHz).

If in doubt leave all Output settings at their default values (+8dBu analogue level, 0dBFS digital level and 96kHz sample rate) and come back later - armed with the full manual!

6./   Saving Changes: Any changes made via the GUI are NOT permanent until stored to non-volatile memory.

Changes are only saved to non-volatile memory when you press 'Save' button (it is in the 'Save' menu), or when you exit the GUI programme. *ALWAYS press the 'Disconnect' button before shutting down the GUI, disconnecting the PodBlaster unit, or turning off power; then your settings will be saved safely.*

7./   Getting Started: For the vast majority of applications, just plug in and go - and you will find your levels are much better controlled than before! The next step, still easy, is to select a Factory Preset from one of the nine factory presets stored in the PodBlaster unit. See manual page 13.

8./   Grounding.   Always ground the equipment using a permanent cable connected to the M4 ground point provided on the rear panel of PodBlaster.

9./   Problem? Email tech@audessence.com for fast tech support.

Installing the Audessence Controller Software

> See the separate manual "Audessence Controller Software Installation &
> Operation Manual" for further information regarding installation and use
> of the Audessence Controller software.

Software Modes

The Audessence Controller (GUI) software can be operated in either of two modes,
Expert Mode or Easy Mode. The preferred mode is set up via a wizard when the
software is first run for the first time. It is also possible to swap modes during
operation, although settings can't always be carried across modes.

'Expert Mode' assumes expert knowledge of audio and audio-processing terminology
and practice. In this mode, every parameter is available for adjustment over a wide
range, and no attempt is made to restrict control ranges to 'safe' values. Use this
mode if you are very familiar with audio processors.

'Easy Mode' uses only four controls for the audio processing instead of around forty,
and is designed for the non-expert to be able to use quickly and with a minimum of
fuss to get the desired results. Each control has detailed 'help text' in a nearby
window, which gives guidance on what each control does and how it should be set.

The mode of the software also affects the preset list available. Easy mode presets are
more generic, since if 'more' or 'less' processing is required, it is a very simple matter
to go into the Controls and tweak the preset. Expert Mode presets cover fewer tasks,
but with a greater spread of options for the most common leveling tasks – e.g. for
studio based levelling, there are three Expert Mode presets, compared to the single
Easy Mode preset for 'Analogue Levelling'.

Connections

All signal connections to the PodBlaster are conventional and standards-based:

Analogue Audio Input and Output: Electronically balanced, RFI-suppressed on ¼" (A-gauge) T-R-S (tip-ring-sleeve) jack sockets. 10k (bridging) input, 50R (Low-Z) output.

Digital Audio Input and Output: S-PDIF on RFI-suppressed Phono (RCA) connectors.

Control: USB on 'B' type female USB connector [Rear panel]. For use with Audessence Controller GUI programme for Windows PC.

Power: Cliff DC10A power socket. Pin diameter 2.1mm, accepts 5.5mm outer diameter plug. Accepts 5VDC only. Polarity: Centre pin is positive.

Earth / Ground: A M4x10mm bolt is supplied with one spring washer and two M4 plain washers to mate with M4 female captive 'PEM' fastener on right-hand side of rear panel. Unscrew the M4 bolt to allow connection of fixed earth lead / ground cable.

N.B: Careful consideration of grounding is particularly important for the PodBlaster, which of course does not have an integral mains cable to provide any grounding / earthing by default.

This equipment should always be earthed / grounded via a permanent cable.

Input / Output Setup

Both analogue and digital Input level settings have been pre-set to optimised default values for typical programme material, as you would find it at the output of a mixing desk. In the analogue domain this means peaking up to PPM6 / +8dBu maximum, but with music generally peaking *up to* PPM5 / +4dBu, with higher levels reserved for the loudest passages only. In the digital domain this means the input peaking at around -16dBFS normally, (...and *occasional* true peaks can be up to about 6dB louder still).

Particularly with digital input, there is a chance of some programme segments (for example direct dubs from commercially mastered CDs) having a much higher peak level all the way up to 0dBFS. If required, PodBlaster will cope with these extra-loud inputs remarkably well.

[Technical note #1]: The additional headroom available on the analogue input for peaks caused by operator error is another 14dB; so the clip (= distortion) point of the input is at +22dBu].

[Older ALPS and PodBlaster units with serial numbers starting 07– and 08– have 13dB of extra headroom and clip at +21dBu].

[Technical Note #2]: – because the AGC is r.m.s. responding, the procedure to calibrate the input gain of the unit with sine–waves does not correspond to older processors that respond to the peak value of the input signal. Line–up with tone requires that the level be 14dB lower than you might expect, because tone is that much 'denser' than typical programme material].

[Technical Note #3]: – because the Input and Output meters are true–peak responding, a **PPM meter** connected to the same signal will read the same value on tones but a small amount, (around 2dB) *less* on programme material. This is because a PPM meter *integrates* peaks over 5 or 10 milliseconds.

Input Levels

Lineup with tones: A value of–30dBFS digital is required at the input to bring the AGC indication to 0dB with **sine-wave (NOT programme)** drive. This is normally equivalent to –10dBu analogue input (again, remember this is only with sine-waves). The calibration of input gain will change if the setting of the 'Input gain trim' control is changed.

Lineup with programme: The important thing to remember is that, with AGC engaged of course, the AGC meter should sit at 0dB (plus or minus 4dB or so) when the incoming programme is peaking 'normally' i.e. up to around PPM 5 / +4dBu in the analogue domain, or alternatively, peaking at around -16dBFS indicated in the digital domain.

Input Metering: The Left and Right 'Input' meters provided are calibrated in –dBFS, and are true-peak responding. If analogue input is in use, 'top of scale' or 0dBFS is equivalent to +20dBu. Normal programme peaks should register around -20 to -15dBFS on the PodBlaster's input meters (the first two yellow segments of the front-panel meters), regardless of whether digital or analogue input is being used.

Input Gain Trim: There should normally be no need to adjust the input gain. However, in recognition of the wide range of differing operational practices around the globe, 'Input Gain Trim' controls have been provided.

N.B. analogue and digital inputs have individual gain trims.

The procedure to adjust Analogue input gain follows: First login as per the procedure in Audessence Controller manual. Navigate to the **'Setup\Input'** Menu, and use the slider marked **'Analogue Input Gain Trim'**. The Input Gain Trim for analogue sources has a range of -8 to +14dB, with 0dB default.

The procedure if Digital input is in use is identical, except use the **'Digital Input Gain Trim'** control, and note that the available gain trim range for digital signals is -20dB to +6dB. **N.B**: **Positive settings of the Digital Input control are for use in exceptional circumstances only!**

Output Levels

The separate Analogue and Digital Output level ceilings of PodBlaster have been pre-set to default values that should be fine for 'normal' operation in a professional or semi-professional environment. The Analogue outputs peak at up to PPM6 (+8dBu) with no possibility of any overshoot. The digital output peaks at up to 0dBFS, again with no possibility of overshoot at the selected sample rate.

If necessary the Output level ceilings can be adjusted. Login and navigate to **'Setup\Output'** menu. N.B. **'Digital Output Ceiling'** and **'Analogue Output Ceiling'** have separate independent values, since you can use both outputs simultaneously.

'Analogue Output Ceiling' range is -6dBu to +18dBu peak (*). It is calibrated directly as the maximum peak signal that the unit can produce. The +8dBu 'Nominal' setting of the control corresponds to +8dBu true-peak ceiling.
(*) [previously to +14dBu, on older units with serial numbers starting 07- and 08-]

It is OK for the output level from your Audessence processor to be set louder than its 'normal' input, because after processing the peak level that the signal can reach has been accurately defined; in this way any distortion caused by excessive level can be completely eliminated…

Be aware if this is what you are doing, and also please be aware that it does not have to be this way, only if you want it so! PodBlaster's r.m.s. responding AGC can also keep the output at a consistent level *without* making everything loud! See later manual section on setting audio processing parameters [Wideband Limiter Drive] for further information. For now, set the output ceiling control to give the greatest peak level the processor could ever output (normally, this would occur when the input suddenly surges from very quiet to very loud, say from less than -8dBu to +8dBu or more).

Digital Output: range is -20dBFS to +6dBFS. Default is 0dBFS.

N.B: Positive gains should <u>never</u> be required in normal operation, and **PLEASE NOTE**, *selecting a positive value for digital Output is risky!* as it is very likely to introduce distortion! For most applications the default of 0dBFS will be fine. ***ONLY select >0dBFS Digital Output ceiling with great caution, and if you are a real expert in digital audio!***

The 'Output Level' controls are applied after all other audio processing stages. They are just gain / attenuation, right at each output. So do not fear that adjusting the output level will disturb the density of the audio you have selected or the amount of peak limiting applied, it will not.

*Just one more reminder, **please** DON'T set positive Digital Output gain unless you know what you are doing!*

Presets

Getting started with presets

The best way to get started with setting the PodBlaster to produce the exact levelling action you require is simply to load one of the nine built-in factory presets.

If you are in 'Menu' mode, press the 'Preset' button in the Controller (it's just to the right of the 'disconnect' button – *and N.B: this button toggles between 'Menu' mode and 'Preset' mode*). This will bring up a list of available presets for the unit. Even if you have never worked on Presets before and thus have no User Preset Files on your PC, you will see the nine Factory Presets that are loaded into each PodBlaster unit during manufacture:
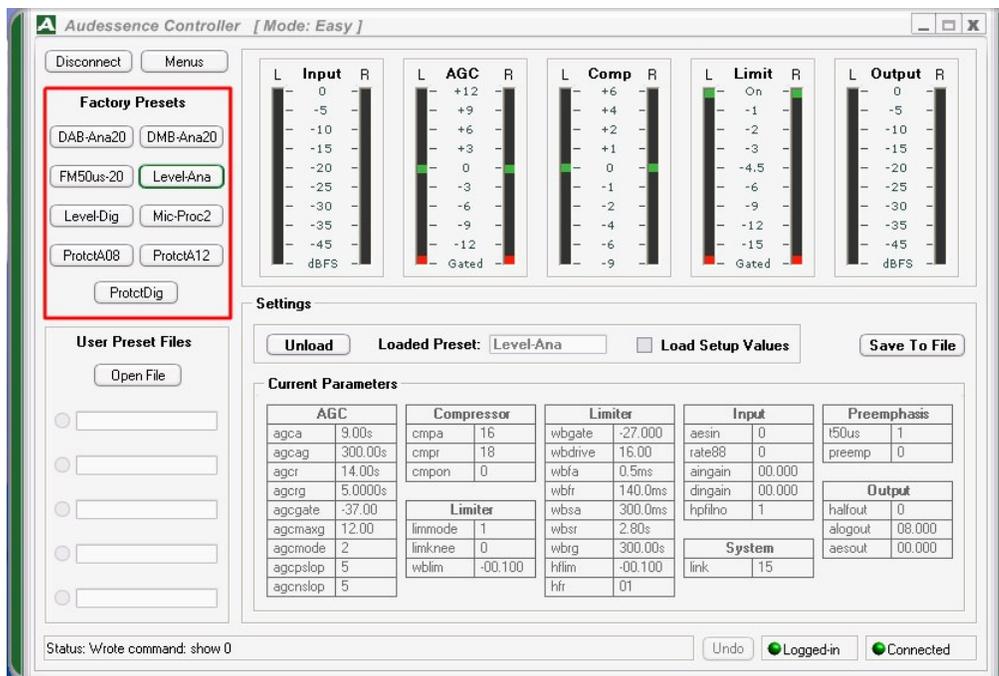
These can be loaded for immediate use, just by pressing the relevant button. A description of the purpose and action of each factory preset is presented further on in the manual.

- **Note on Impermanence**

  When you press the button for a factory preset, the preset is loaded into volatile memory only.

  - If you make a mistake and overwrite a previous setup that turned out to be preferable to a factory preset you just loaded, don't despair! To get back to the values that were in use immediately prior to entering the Presets mode, just click the button marked **'Unload'.   'Unload' takes you back to a snapshot of all settings, taken when you entered the 'Presets' window.**

  - **Any changes you make are automatically saved to non-volatile memory when the GUI programme is disconnected or shut down.**

  - **Alternatively, you can go back to the Menus screen and save manually via the 'Save' button at any time. This is found in the 'Save' menu.**

- **Note on Setup Parameters and Presets**

  Please note that Presets normally include only the parameters that affect the audio processing directly…

There are some additional 'Setup' parameters in the I/O, System, and Pre-emphasis menus that are saved in the PodBlaster hardware unit but are not normally loaded from a preset, because they are likely to be specific to the individual unit rather than to a preset.

The engineering - related parameters include:

- Input Source

- Input Gain Trims

- Output Ceilings

- Digital rate selections

- Emphasis time-constant selection and de-emphasis selection

These values do *not* form part of the '**factory** presets' stored in the PodBlaster unit.

These values **are** saved to the PodBlaster unit when exiting the GUI or pressing 'Save'.

These values *are* saved when a setup is **'Saved As' a file** on the PC.

When Uploading a **file from PC back to the PodBlaster**, there is a checkbox to select whether or not to load Setup Parameters into the PodBlaster.

Description of Easy Mode Factory Presets

Select the most suitable preset from the list below. (e.g. for most levelling duties, use Level-Ana or Level-Dig as appropriate to which input - analogue or digital - you wish to use).

Later, if necessary, swap to 'Menus' mode and use the highly simplified controls to tweak the processing to give exactly the results you require.

- **DAB-Ana:** This preset is ideal for Digital Audio Broadcasting including Eureka-147 DAB, HD Radio in the USA, web streaming and so on. It keeps the level within a comfortable 4dB 'window', but without resorting to constant dynamic squashing of the audio. Works especially well with low-bit-rate codecs at 128kbps and below, maintaining great audio quality.

- **DMB-Ana:** This has been developed specifically for broadcasting to tiny handheld devices like mobile phones. Bass is rolled off to make the most of the very small speakers, other parameters are similar to the DAB preset, avoiding too much fast limiting.

- **FM50us:** A preset specifically for FM broadcasting. This can also be used for 'de-essing' in studio environments.

- **Level-Ana:** The starting point for all studio-based levelling applications where the analogue input will be used. This is very similar to Agc-Wide in the Expert mode presets. It is a wide-ranging levelling preset that will reduce a 30dB range at the input to less than 4dB at the output. If this gives too much levelling for your specific application, go into the Easy-Mode controls and reduce 'Capture Range' (mainly affects very low levels) or 'Amount of Control' (affects all levels) until the processing is exactly as you require.

- **Level-Dig:** Exactly as above but for applications where the Digital input will be used.

- **Mic-Proc:** Specifically for microphone processing. Uses analogue input, ideal for where a PodBlaster or ALPS is connected to the insert point of an analogue mixing desk, to tame the level of Main and / or Guest mics.

- **ProtectA08:** Gives brick-wall protection limiting only (no AGC) for analogue signals at +8dBu (PPM6).

- **Protect A12*:** Gives brick-wall protection limiting only (no AGC) for analogue signals at +12dBu (PPM7).

- **ProtctDig:**   Brick-wall protection limiting for digital signals. The output is configured to stop digital signals from ever exceeding –8dBFS.

* NB: You have to check the box marked 'Load Setup Values' to change the actual limit point for the **ProtectA12** preset. This changes the Input Gain Trim and Output Ceiling controls for you. If you later need to return to a standard preset for +8dBu ceiling, return the Input Gain Trim and Output Ceiling controls to their default values of 0dB and +8dBu manually.

Description of Expert Mode Factory Presets

Note (1): the final two characters of every preset name are
numerical and indicate the version number of that preset.
Obviously, these numbers are subject to change as the Factory
presets are improved following further work at Audessence, and
user feedback.

- **Preset 1: Protect****

  This preset has no AGC (it will not bring up quiet passages). It is designed
  specifically to do as little as possible to programme audio of normal level. It stops
  'over-loud' passages that would cause distortion in link equipment from peaking
  above its pre-set threshold of +8dBu.

  Protect** is mainly used for protecting links with analogue inputs such as digital
  codecs and all kinds of studio-to-transmitter-links (STLs) that can distort if over-
  driven.

  It is a look-ahead hard-knee limiter, which will do nothing to signals peaking up to
  +8dBu (PPM 6). Above this level the limiter has hit its output ceiling of +8dBu and
  due to its look-ahead it can never exceed this output level, even on transients. Its
  input will handle peaks of up to +21dBu without any audible distortion at all
  (better than -78dBr THD&N at +20dBu input). Limiter release is complex and
  reasonably fast, so that limiting action is not objectionably audible.

  Advanced setup tip for 'protection' apps: In the analogue domain, Input Gain
  trim can be used in conjunction with Output Ceiling to tailor the setup of the unit
  for particular protection tasks, for instance:

  As shipped, the 'Protect' preset guarantees that even the briefest programme
  peaks are limited to +8dBu (PPM6).

  However, this is often overly cautious. In many circumstances there may be no
  need to limit at +8dBu, if the codec or other equipment being protected can take a
  higher level.

  For example, the Input Gain Trim could be reduced by 4dB to -4dB, and the Output
  Ceiling could be increased by 4dB to +12dBu. For normal programme levels in the
  PPM1 to PPM6 range, this will have zero net effect. The PodBlaster will now
  guarantee that programme peaks can't exceed +12dBu, (PPM7) instead of +8dBu
  (PPM6) as in the stock preset.

  Tailoring the protection capabilities of your Audessence PodBlaster processor can
  maximise the programme dynamic range and 'presenter satisfaction', whilst
  providing totally reliable, tweak-proof protection against overload to all
  downstream equipment.

- **Preset 2: AgcLite****

  This preset was designed specifically for gentle, artistically sensitive processing of classical music and other musical genres that rely on dynamics for the musical effect. A dynamic range of somewhat more than 24dB at the input (PPM 1 to PPM 7+) is gently, and relatively sedately, processed to a controlled dynamic range of less than 12dB at the output (PPM 3 to PPM 6). Some musical dynamics are thus retained, but with maximum and minimum suitable for live broadcast. Peak limiting is included, and its time-constants have been optimised to give the illusion of greater loudness if occasional surges on the input cause AGC output to exceed the +8dBu peak-limiting threshold.   AGC uses gentle slopes, while soft-knee look-ahead limiter gives brick-wall peak control with minimum artefacts.

- **Preset 3: AgcNorm****

  Normal AGC action, this would be our choice for the majority of broadcast applications where a studio or other source's output has to be normalised but without destroying dynamics. A dynamic range of greater than 24dB at the input is processed to around 8dB measured range at the output - yet hide your PPM, and this preset still sounds remarkably good! We used a whole arsenal of tricks to minimise ducking, hole-punching and other unpleasant artefacts of AGC, so that peak limiting could be restricted to dealing with unusual transients that the AGC can't track, bass peaks, or when the input has a remarkably high 'crest factor'. Most material is controlled intelligently by the AGC and passes through 'un-squashed' by the limiters.

- **Preset 4: AgcWide****

  This preset is the power-on default for all new ALPS and PodBlasters 'fresh out of the box'.   Similar to the above, but with a super-wide 'capture range' for dealing with very unpredictable levels or super-sloppy desk jockeys. Suitable for general pop and rock music. A massive 30dB peak range at the input is processed to less than 4dB measured range at the output, with a moderate overall response time in the region of three to five seconds.

- **Preset 5: AgcFast****

  Similar to AgcWide, but with much faster action. This is mainly intended for all-speech applications and could accurately be described as an aggressive quality AGC. This will maximise intelligibility under the most difficult of conditions. Good for sports and other live OBs (outside broadcasts) ('remotes' for stateside users) where the levels really are wild.

- **Preset 6: AgcLoud****

  AGC properties are similar to AGCnorm, but this one cranks the drive into the wideband dynamic limiter for significantly boosted perceived loudness. A surprising amount of punch is also retained due to intelligent coding. This one *is* for those who want to make everything LOUD! However, it does not do anything that would introduce chronic and fatiguing distortion, or annoying pumping.

- **Preset 7: CommCon****

  This preset is specifically for controlling the loudness of commercials in television broadcasting. It is designed for use where the commercials can be separately processed.

- **Preset 8: FM-norm****

  AGC action is based on AGC-Norm for the optimum balance between effective control and maintaining some programme dynamics. Somewhat greater drive to peak limiter gives decent audibility in bands crowded with loud commercial stations. HF limiter still sounds sweet and open.

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Note (2):  The FM preset takes account of pre-emphasis, by using
an HF limiter in addition to the wideband limiter used in the AGC
presets.  By default the output is also de-emphasised with the
same time-constant so it is 'flat' (but this can be changed).

Note (3):  FM presets can be used to 'de-Ess' speech material as
well as for their originally intended purpose of feeding FM
broadcast transmitters.  The De-essing action is audibly
relatively gentle, yet very effective at reducing sibilance
nonetheless.  Peak amplitude is additionally constrained by
around 15dB at 15kHz (50us setting) or 19dB at 15kHz (75us
setting).
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- **Preset 9: DigiRad****

  Optimised for bit-rate reduced digital radio systems. This gives very consistent levels, boosting clarity but without exacerbating the problems of digital perceptual coding systems. This is also louder than all of the AGC presets except for AGC-Loud.

  This preset is suitable for all forms of digitally-delivered radio and audio such as webstreaming, Podcasting, DAB, and HD Radio.

  ❑ If you can't find an Expert Mode preset that gives the desired result, try *'Easy Mode'* or contact Audessence by email - in the first instance to:

    tech@audessence.com.

Easy Mode Audio Processing Controls

'**Easy-Mode**' will allow you to easily create a customised setting, but without having to go into all the technicalities of audio processing.

All '***Easy-Mode***' controls display help text when you hover the cursor over them. Thus Easy-Mode is easy to learn just by hovering the cursor over all areas of each screen and reading the associated help texts (help text appears in the right-hand pane of each window).

Please note that Easy Mode settings can be carried into Expert mode but Expert Mode settings do not transfer into Easy Mode. If you are not sure which mode to use, it may be best to start in Easy Mode. If you later want to change to Expert Mode, save your results to File on the PC before changing mode.

'Volume Correction'

These controls concern how the perceived volume of the programme audio is controlled or 'normalised' towards a medium, comfortable level.

Note that this is *not* the same as the 'normalise' function found in workstations and software programmes, which most often merely try to make the peak level taken over an entire segment some set value, often 0dBFS. PodBlaster allows control of the perceived volume, which is only related very loosely to the peak level, as well as controlling the ***perceived volume*** in ***real-time*** fashion, smoothing out extremes as they come along.

In Expert Mode these functions are referred to under the AGC ('Automatic Gain Control') headings.

- **Capture Range**

This affects how very quiet sounds are processed by the AGC stage. There is always a level below which the processor will assume that the programme has paused. In this case it will not try to boost the volume any further, as this would lead to unwanted exaggeration of background noises and breathing between sentences, or strange-sounding effects in very quiet passages of music, etc.

With the Capture Range control set to zero, sounds that are quieter than normal will not be boosted at all. The AGC will only pull back the level of sounds that are louder than normal.

As the Capture Range control is advanced, progressively quieter and quieter sounds will fall within the range that can be processed.

- **Amount of Correction**

This slider affects how much volume correction is applied by the AGC stage.

With the slider at 'Zero', perceived volume correction (sometimes rather loosely referred to as 'compression' or 'normalisation') is completely disabled.

N.B even with this control at zero, very high levels that would otherwise cause the pre-set 'Output Ceiling'* of the processor to be exceeded (with possible consequent distortion) will still be reduced by a separate stage in the processor (the 'peak limiter'), which is only concerned with controlling the maximum peak output level.

As this control is advanced towards the right, the perceived volume is more and more corrected to a comfortable, medium level.

* For notes on the 'Output Ceiling', see the Output Setup menu, and hover the cursor over the 'Output Level' controls.

- **Speed of Correction:**

This slider controls how rapidly the 'volume correction' applied by the AGC stage is able to change.

Settings towards the left will cause the AGC to respond slowly, which in most cases will mean the effect of the AGC is less noticeable. As the slider is advanced towards the right, the AGC response to changes in the programme level will get faster and faster, meaning that the perceived volume will be controlled more rigidly.

The best results are often obtained with a compromise, mid-range setting.

'Audio Loudness'

This simply makes the audio louder, within the confines of the maximum peak level ('Ceiling') set in the Output menu.

- **Loudness:**

This slider controls how loud your audio will sound.

The higher you set this control, the nearer you get to the Output Level Ceiling set in the Output menu.

Settings from 'Quiet' to one or two clicks above 'Quiet' can be considered safe, in that the peak limiter is unlikely to have to have so much work to do that its action will be noticeable. These lower settings are useful when you want to *maintain the original quality* of the source programme *closely*.

The 'Normal' setting should be just right for everyday broadcasting applications.

Depending on the type of programme material, (speech or type of music etc), settings up to one or two clicks above 'Normal' are often fine.

See the 'Limit' bar-graph meter above to check how hard the limiter is working. Up to 6dB /maximum/ indication on this meter is OK for most applications; although this should occur only occasionally, not regularly. Most of the time, expect to see between 0 and 3dB on this meter.

Be very careful with high settings for 'Loudness' towards the 'Loud' end of the scale. ***Generating increased loudness always incurs a cost in terms of reduced audio quality***. Although this may not seem important compared to the immediate gratification of a louder sound, it is! All those experienced in audio work agree: 'a little goes a long way'. For further discussion, see: http://www.turnmeup.org/

Expert Mode Audio Processing Controls

The Audio Processing Controls found in Menu (Expert) Mode are designed for the use of audio processing experts. If you are not experienced in adjusting audio processors, start by using factory presets.

Filters

PodBlaster includes low-pass and high-pass filters immediately before the active audio processing stages.

The low-pass filter is a fixed linear-phase filter, which is less than -0.2dB at 20kHz.

The High-pass ('rumble') filter can be adjusted for a -3dB frequency of 3Hz, 25Hz, 40Hz, 70Hz or 110Hz, with a default value of 25Hz in the Levelling presets and 3Hz in the 'protection' presets. The control for the high-pass filter is found in the 'System' menu.

AGC

[AGC Basic]

- **Attack**
  Controls how fast the AGC responds when the input is getting louder.

- **Release**
  Controls how fast the AGC responds when the input is getting quieter.

- **Gtd (Gated) Attack and Gtd Release**

  These controls are all about what happens during pauses in the programme. N.B., you can use the **AGC GATE** control, found in **AGC Advanced** menu, to set the level below which a pause is identified.

  If the programme before the pause was loud, then the AGC will be in negative gain immediately prior to the pause. In this case, during the pause the AGC gain will head up towards 0dB at a rate determined by **'AGC Gated Release'**. A moderate AGC Gated release (maybe 15 seconds) is good, because if the AGC was stuck in negative gain it would be dangerous to have it recover too slowly in case the next passage starts quietly. Using a moderate AGC Gated release time gets you smoothly back to 0dB ready for whatever may happen next after a pause in the programme.

  If the programme before the pause was quiet, then the AGC will be in positive gain immediately prior to the pause. In this case, during the pause the AGC will head back towards 0dB at a rate determined by **'AGC Gated Attack'**. A very slow AGC Gated Attack (maybe 300 seconds) is good, because if the programme was very quiet as it went under the gate, it is quite likely to be quiet as it comes out of the gate again. In these circumstances, you want the Gain Reduction to effectively freeze during the pause, this way very quiet song intros or a very week speech segment do not go dipping and surging as they vary around the gate threshold, they just stay boosted, which is better. The maximum AGC boost in these circumstances will be constrained by AGC Max Gain (see later).

  If programme does get very loud with positive AGC after a pause then the various attack times deal with that situation very well, the peak limiter keeping things under control while the AGC reacts. If Advanced AGC is selected, even huge surges of 30dB are coped with very adequately.

[AGC Advanced]

- **Mode [Off / Normal / Adv (Advanced) Low / Adv Medium / Adv High]**

    Off means no AGC action at all. The AGC gain will be permanently frozen at 0dB.

    Normal means the AGC response will use fixed time-constants ('AGC Attack' and 'AGC Release') only.

    Adv-Low means the AGC response will speed up if its target gain is outside a total range of 14dB around the current gain, and is above the AGC gate threshold.

    Adv-Med means the AGC response will speed up if its target gain is outside a total range of 11dB around the current gain, and is above the AGC gate threshold.

    Adv-High means the AGC response will speed up if its target gain is outside a total range of 8dB around the current gain, and is above the AGC gate threshold.

- **Gate**

    The AGC gate determines the level of incoming programme below which 'Gated' behaviour (- a return of the AGC gain to its 0dB 'resting' position), occurs.

- **Max Gain**

    This control limits the maximum amount of boost the AGC can apply to quiet sounds that are nevertheless above the AGC gate threshold. Essential when Advanced AGC is engaged, to prevent unnatural boost profile of sounds that are trailing away towards silence.

- **Pos Slope:**

    This controls how much correction is applied to inputs that are too quiet (i.e. that will result in positive AGC gain). Expressed as a ratio, or slope. Max setting of 'Inf' (infinity) applies total correction – e.g. a signal that is 10dB too low will be boosted eventually by 10dB (eventually because of the effects of time constants). A setting of 2:1 applies 50% correction, i.e. 5dB correction for a 10dB gain error).

- **Neg Slope**

    This controls how much correction is applied to inputs that are too loud (i.e. that will result in negative AGC gain). Expressed as a ratio, or slope. Max setting of 'Inf' (infinity) applies total correction – e.g. a signal that is 10dB too loud will be cut by 10dB.   2:1 setting applies 50% correction (5dB correction for 10dB error).

- **ITU-1770**

    Off is a compatibility mode, which will give the exact same AGC action as earlier versions of Audessence levellers.

    On makes AGC response fully compliant with ITU-R BS 1770 (the *LeqRLB* curve). This means it will respond to *perceived loudness as agreed by the ITU standard*, and it will also control *'strident'* material more accurately.

Compressor

The compressor is designed to boost very low-level signals moderately, and to ameliorate very high levels. It can be used to deliberately compress the sound, adding 'density' and audibly processing the dynamics of speech and music.

The compressor also includes a 1.33:1 expander function below -31dBrNOL [reference: normal operating level] so that for very low levels below -43dBrNOL the compressor has unity gain even when engaged.

The compressor has a fixed maximum boost of just 4dB between -31dBrNOL and -22dBrNOL. It has a slope of 1.5:1 above threshold so that at -10dBrNOL it has unity gain and at +20dBrNOL it has -10dB gain.

On/Off: A detailed description of the full extent of the functionality of this control is beyond the scope of this manual.

Attack and Release: Compressor uses a simple single time-constant scheme. Time-constants are specified by preset numbers. Smaller numbers mean shorter times, on a logarithmic scale.

#4 = 0.33 milliseconds	#13 = 170 milliseconds
#5 = 0.65 milliseconds	#14 = 340milliseconds
#6 = 1.3 milliseconds	#15 = 680milliseconds
#7 = 2.7 milliseconds	#16 = 1.4secs
#8 = 5.3 milliseconds	#17 = 2.8 secs
#9 = 11 milliseconds	#18 = 5.6 secs
#10 = 21 milliseconds	#19 = 11 secs
#11 = 43 milliseconds	#20 = 22 secs
#12 = 85 milliseconds	#21 = 44 secs

Limiter

[Limiter Basic]

- **Mode (Off / Wideband / Wideband + HF)**

  The limiter is normally set to Wideband.

  If the limiter is switched 'off' then there is nothing that will absolutely guarantee the maximum peak output level or ensure that the output signal cannot clip. N.B: under these circumstances there is no boost (wideband drive) applied to the signal either. In this mode, if the AGC is engaged then the output level will typically peak around -16dBFS digital (and -8dBu analogue) during periods when the input is of normal, stable medium-term peak level.

  The wideband limiter is used for most studio-based applications in conjunction with the AGC. Using the wideband limiter guarantees that the output of PodBlaster won't clip. It can also be used to drive the signal in order to make it sound louder whilst remaining at the same peak level.

  The HF limiter applies additional limiting to HF components of the audio and should only be engaged for applications where the processor feeds an FM transmitter, or where there is a need to reduce sibilance ('de-ess').

- **WB (Wideband) Drive**

  This is a very important control and is quite easy to grasp. Increasing the drive from 0dB makes the output sound louder, but without the peak output of the processor exceeding the Output Ceiling set in the Analogue I/O menu. If you want the target output level of the processor to be louder or quieter, it can be achieved in most cases by setting this control. Higher numbers (more drive) will make the sound louder.

  In technical terms, the wideband drive is a fixed gain after the AGC stage and before the wideband limiter stage. Drive can only be set if the wideband limiter is engaged, or in other words if the wideband limiter is off, then the wideband drive defaults to 0dB.

- **WB (Wideband) Threshold**

  This is an advanced feature. Don't adjust this control unless you are working in the digital domain and are an expert. If it is set wrong it can easily lead to great confusion over levels! If you want a different digital output level, it would normally be better to navigate to the Output menu and set the output level there (Digital Output control).

  N.B: Don't ever try to exceed 0dBFS digital level in an attempt to make the sound louder. This will lead to many technical problems!

- **WB (Wideband) Gate**

  This is an advanced feature that slows down the release of the wideband limiter during pauses in the signal. It is especially useful for reducing pumping and over-processing of voice signals.

  Normal setting -22 to -27dB.

- **Knee**

From Issue 2.0.0.0 onwards, the Wideband Limiter knee can be selected as 'Hard' or 'Soft' (previously it was always in 'soft' mode, apart from a few specials we produced to customer request).

Soft-knee gives a gradual transition from zero limiter action to full limiter action (the limiter has zero slope, or infinite ratio, once it is doing more than 3dB of gain reduction even in soft mode). Generally soft-knee sounds much better for all types of general levelling duties.

Hard-Knee has been included for those protection-limiting functions that require to do *NOTHING* to the audio below the limiter threshold, and to provide perfect limiting above the threshold.

Note that PodBlaster series processors *can never* clip the signal in their limiting stage!

[Limiter Advanced 1 and Limiter Advanced 2]

These are advanced time-constant settings that take great experience to set correctly. We strongly recommend **NOT** to adjust these settings!

In particular, it is recommended never to adjust 'fast attack'. This should generally always be set to 0.5 milliseconds. If it is set to a higher value, the wideband limiter can overshoot and this could introduce clipping distortion if the output exceeds 0dBFS.

HF (Pre-emphasis) Limiter / and 'De-Essing'

- **HF Release Slow – Medium - Fast**

   This setting affects a trade-off between brightness and distortion in the HF limiter. It **only** makes any difference if the HF limiter is on (i.e. Limiter Mode set to **'Wideband & HF'**). Medium will be right for most applications. Slow will make the sound less bright but possibly cleaner as well. Fast will make the sound brighter but possibly dirtier - which effect is more noticeable will depend mostly on the type of programme material.

- **HF Threshold**

   This is an advanced feature. Don't adjust this control unless you are working in the digital domain and are an expert. If it is set wrong it can easily lead to great confusion over levels!

Miscellaneous Controls

[Digital I/O]

- **Input Source**
   Selects Digital or Analogue input source.

- **Digital Rate – *IMPORTANT!***
   Selects 96 / 48 kHz, or 88.2 / 44.1 kHz baserate. If set to 96 / 48, the input will also lock to 32kHz with no problems. *N.B: **For input to lock to 44.1 or 88.2, this must be set! Otherwise, input will lock to 'pro' rates (32,48,or 96) ONLY!***

- **Digital Output Rate**
   Selects double rate (96 or 88.2kHz) or normal rate (48 or 44.1kHz) for interfacing to any digital system. PodBlaster does not support 32kHz or lower *output* rates.

[Pre-Emphasis]

- **De-emphasis on-off**
   If Limiter Mode is set to 'Wideband & HF' (only!), this selects whether the output is actually pre-emphasised or whether it takes account of pre-emphasis but has a flat characteristic.

- **Time Constant**
      Selects 75us for North America & Canada or 50us for rest of world.   Again this **only** makes any difference if the Limiter is set to @wideband & HF'.

[System Menu]

- **Link**
  Normally a stereo unit, the PodBlaster Left and Right channels are normally linked so that the louder of the two controls both. PodBlaster can also be set to dual-mono mode, so that two completely independent mono programmes could be processed by a single PodBlaster unit. The processing parameters and level trims used will be the same for each of the two channels.

DSP Software Update

Your PodBlaster has a DSP software update capability. Whenever a new GUI (Windows PC 'Controller' programme) version is released, you will be able to download it from the Audessence website, install the new GUI on your PC and then, if you wish, upload the latest DSP software from the new GUI into your PodBlaster. All updates are provided at no additional cost.

Your current DSP software version and GUI version can be determined by running the GUI, connecting to your PodBlaster unit and then going to the 'About' menu.

If you require advice on whether to update or not, please just email the serial number of your unit to us along with your current GUI and DSP software versions, to: tech@audessence.com and we will be able to inform you of all issues to consider.

Having downloaded the latest version of the GUI from the Audessence website, the first action you will need to perform is to unzip the bundle. It is probably best to save the unzipped version on your hard drive (although this is not essential, it may be useful if you ever need to re-install or install to a new PC).

When you have an unzipped copy of the new version, install it onto your PC by running 'Setup.exe'. There is absolutely no need to uninstall any earlier version. The new installation is fully automatic and a wizard will guide you through the process. At this time you will be presented with some dialog windows and it is possible to choose whether or not to install a desktop shortcut for launching the GUI.

PodBlasters connect via USB only. See the Quick Start section of this manual for information on Virtual Com Port selection.

The update takes a few minutes to complete, and it is important that it is not interrupted while loading. There is a final verification routine that should avoid loading an incomplete or corrupted update to the EEPROMs, if something unexpected should occur. Before starting the update from the GUI, take reasonable precautions to ensure that there won't be any problems - close down any other software that might be running on the PC, and ensure that power and data connections to both PC and PodBlaster unit are both secure.

To perform the update, run the GUI and Connect. Log in (the Login menu is near the top, under the 'Security' heading). Then simply go to the 'Config' menu and press the 'Update DSP' button. Follow the instructions onscreen. All you have to do is OK firmware versions and OK the update to start, it is then automatic until completed, at which time it is necessary to reboot the PodBlaster unit.

If in doubt as to the basic procedure for installing and using the GUI, see the 'Quickstart Guide' section starting on page 7 of this manual.

In case of any difficulty, please refer to Audessence for more information. Simply email: tech@audessence.com for fast tech support.

Contact Us

Please contact Steve Webster if you have any questions, comments or suggestions regarding the Audessence Controller PC programme. Email: steve@audessence.com

Please contact Martin Spencer if you have any questions, comments or suggestions regarding audio processing, setup of Audessence audio processors and operational considerations. Email: martin@audessence.com

Please contact Graham Sloggett if you have any questions, comments or suggestions for the Sales department. Email: sales@audessence.com

[ends]./