ACM500XB

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Manual

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Section 1 - Introduction

1.1 - What is the ACM500XB

The ACM500XB plug-in for Windows or Linux PCs and compatible audio workstation applications comprises a four band equalizer inspired by channel EQ processing from legendary analogue recording consoles. The plug-in models equivalent analogue filter behaviour without requiring CPU intensive processing. The EQ features adjustable low and high frequency shelves and an adjustable high-mid and low-mid parametric.

1.2 - Main Features

- VST, VST3 and CLAP plug-in for 64Bit Windows or Linux PCs and compatible host applications.
- Adjustable high and low frequency shelves, high-mid and low-mid parametric.
- Switchable high and low frequency bell curve
- Analogue filter modelling - replicates the natural sound of analogue EQs without requiring high sample rates or CPU intensive techniques.
- Physical control weighting replicates the feel of high quality rotary controls, also improving accuracy for small control changes.

1.3 System Requirements

Windows:
A PC running 64Bit Windows 7 or newer and a VST, VST3 or CLAP compatible host application.

Linux:
An X11 compatible Linux distribution and a Linux VST, VST3 or CLAP compatible host application.

1.4 - About the Manual

This manual covers the installation and use of the ACM500X1 equalizer. Features and operation may vary depending upon your operating system configuration and host application. Where appropriate, examples are also illustrated with screenshots of the features being discussed.

1.5 - Conventions Used

Access to menu items are shown as follows:

`Menu -> Item -> Item`

A `Mono-spaced font` Is used to illustrate commands as they are typed on the command line.

Section 2 - Installation

2.1 Download Contents

Within the folder that contained this manual you will find Windows and Linux folders containing the plug-in built for **64Bit Windows or Linux systems**. Please refer to section 1.3 for system requirements.

2.2a Installing the Plug-In for Windows

Installing the Plug-In for Windows:

Within the Windows folder you will find installers for the VST, VST3 and CLAP plug-ins. The installers will guide you through the steps required to install the plug-ins.

> *NOTE: VST3 and CLAP define specific locations for compatible plug-ins. For Windows this is normally:*
>
> **`Program Files\Common Files\VST3\[CompanyName]`**
>
> *and*
>
> **`Program Files\Common Files\CLAP\[CompanyName]`**
>
> *The installer will permit other locations however you should use only the installer recommended location for the VST3 or CLAP plug-ins. unless you are confident of a specific reason for selecting an alternative.*

The installer will only install the files necessary for the plug-in to function. It will not install anything else on your computer.

Uninstalling the plug-in:

To uninstall the plug-in It is recommended to use

`Control Panel -> Add or Remove Programs`

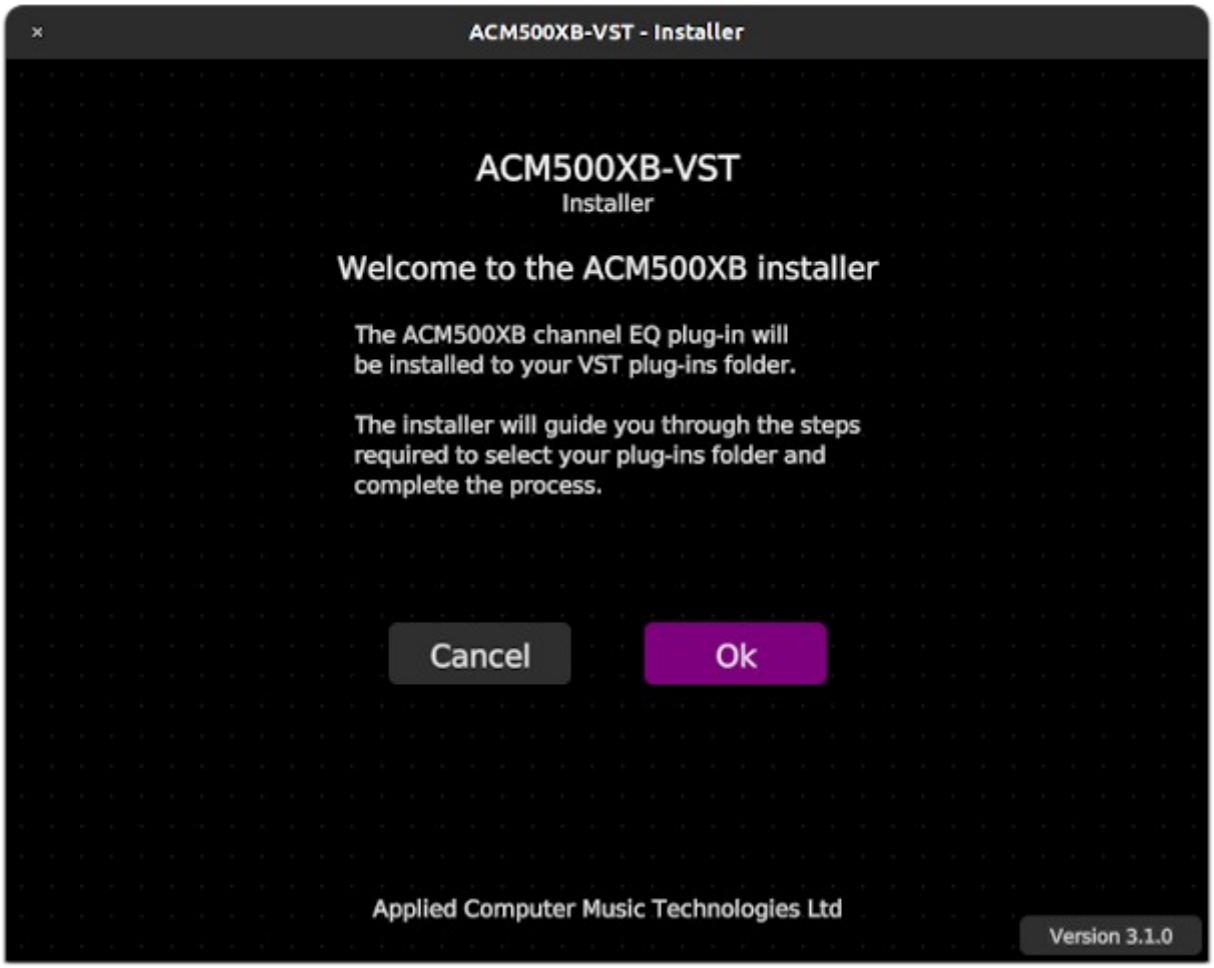
and select **Remove** for the ACM500X1.

2.2b Installing the Plug-In for Linux

Installing the Plug-In for Linux:

Within the Linux folder, you will find the x86-64 folder containing the installer executable.

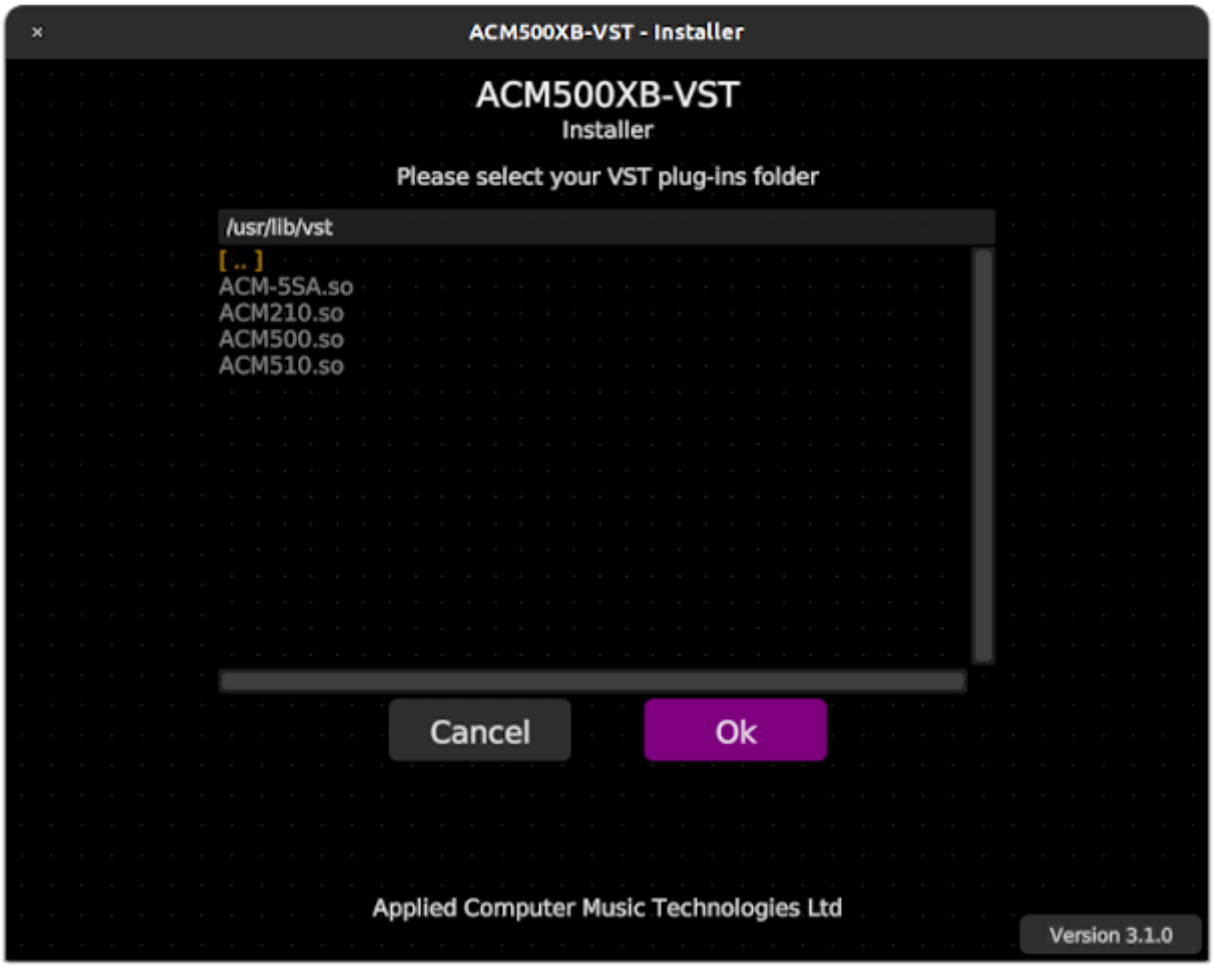
Run the installer executable by (double) clicking it in a file browser, or launching it from the command line. The installer will guide you through the installation process.



Selecting the Install Location

The installer will prompt for your plug-ins folder location. Normally this will be `/home/your-user-name/.vst` or `.vst3` It is recommended to have a single VST or VST3 plug-ins folder, but you can install the plug-ins to as many different locations as you require (just run the installer again and select a new location).

Depending upon system configuration, you may also be prompted for your user or root password if you attempt to install to a system folder, or one to which you do not have write permissions. The installer uses a standard system authentication process `(pkexec)` and does not directly gain elevated permissions.



Troubleshooting

The installer is designed to be self-contained and compatible with most Linux distributions, if you need to backup the installer, the single executable file should be all you need. However, due to the varied and customizable nature of Linux distributions, it is possible that the installer may not be compatible with your system configuration. If this happens, follow these steps to isolate the problem or install the plug-in manually.

1. Do not try to run the installer as the root / admin user. If you do, there will be a warning message on the console and the installer will exit. The installer is designed to be run as a normal user and will prompt for a password if required.

2. The installer uses the `pkexec` authentication method if attempting to install to a system folder, or one to which the current user does not have write access. (the installer itself never gains root or elevated permissions on your system). If this is not a standard component of your Linux distribution, you will need to correctly install and configure it for your system, or select a different install location with appropriate user access permissions.

3. In some circumstances you may need to mark the installer as 'executable' in order for it to be launched. You can normally do this by right-clicking the installer and selecting:

   `Properties -> Permissions -> Allow executing file as program`

Manually Installing the Plug-In

If your system configuration is not compatible with the installer, you can install the plug-in manually by copying the required files onto your system. You will need to be familiar with command line operations in order to do this.

The plug-in binary files are contained in the `plug-in-binaries.tar.gz` file within the x86 or x86-64 folders. Extract the archive, and you will find it contains VST and VST3 folders.

The VST and VST3 folders contain the plug-in in Linux VST and VST3 format.

There is also a README file which details how to copy the required files onto your system.

2.3 Product Support

If you are unsure how to install the plug-in, or encounter problems during the installation, please contact:

support@acmt.co.uk

Section 3 - Operation

3.1 - The Graphical User Interface

This is the ACM500XB front panel. You can control it by clicking and dragging on the rotary controls or buttons. Some controls may have detents – these manifest themselves as areas in the control rotation where the reluctance to move is increased such that you have to drag a bit 'harder'. They are intended to behave like real controls which may have a 'click stop' at OdB for example.
You can also adjust the controls by placing the mouse pointer over them and using the scroll wheel. In this case the centre indent has no effect. The way in which the rotary controls respond to mouse movement may also be affected by host application configuration, as described in the next section.

3.2 Control Modes

The control mode determines the way in which the rotary controls respond to mouse movement. This can normally be configured via the host application preferences. Please refer to your host application documentation for details.

1. Circular

This is the default mode unless changed by host application settings. Clicking on a control will move it immediately to the mouse pointer's angular position. To adjust the control, drag the mouse pointer in a circle or arc.

2. Relative Circular (Default)

Similar to circular mode, however moving the mouse will adjust the control relative to its current setting.

3. Linear

The control responds to vertical movement. Drag up to increase the value, turning the control clockwise, or down to decrease the value, turning the control anticlockwise.

In all modes, double clicking in the centre of a control will return it to its default position.

3.3 - Physically Weighted Controls

To improve the feel of the controls, and make them behave more as hardware equivalents do, the rotary controls have been given a small amount of physical 'inertia'. This weighting does not affect the 'law' of the control, only the way it responds to mouse movement. When you begin to drag on a control, or change direction, its 'gearing' will be at a higher resolution (which also helps to locate more precise settings). As you continue to drag the control, it will become more closely geared to the mouse movement, meaning that you can still make significant control changes without large and awkward movements of the mouse.

As the controls are operated their value will be displayed in the status display in the front panel. If at any time you need to know a control's setting, just click on its centre and the value will appear in the status display.

3.4 – Control Functions

The front panel controls allow you to adjust the equalizer settings:

1. HF Bell

With the HF 'Bell' switch deselected, the HF section operates as a shelving filter, in which all frequencies above a point determined by the HF kHz control are affected according to the HF gain setting.

With the HF 'Bell' switch selected, the HF section operates more as a fixed bandwidth peak or 'bell' filter affecting a range of frequencies centred at a point determined by the HF kHz setting.

2. HF dB

The HF dB control sets the amount of boost or cut applied at frequencies above the corner frequency (shelf mode) or at the centre frequency ('bell' mode) determined by the HF kHz setting. The control range is nominally +/- 15dB Turning the control clockwise or anticlockwise, by dragging up or down, increases or decreases the gain.

3. HF kHz

The HF kHz control sets the corner frequency above which the high frequency boost or cut occurs (shelf mode) or the centre (peak) frequency ('bell' mode). Turning the control clockwise or anticlockwise, by dragging up or down, increases or decreases the frequency. The HF filter is adjustable from 1.5kHz to 16kHz.

4. HMF dB:

The HMF dB or high-mid gain control sets the amount of boost or cut applied at a centre frequency determined by the HMF kHz setting. Turning the control clockwise or anticlockwise by dragging up or down increases or decreases the gain. The control covers a range of +/- 15dB, rising to +/- 18dB depending upon the Q control setting.

5. HMF kHz:

The HMF kHz control sets the centre (peak) frequency at which the high-mid boost or cut occurs. Turning the control clockwise or anticlockwise by dragging up or down increases or decreases the frequency. The HMF filter is adjustable from 0.6kHz (600Hz) to 7kHz.

6. HMF Q:

The HMF Q control affects the high-mid filter bandwidth. Turning the control anticlockwise by dragging down increases the Q, providing a sharper and more selective filter, while turning the control clockwise by dragging up provides a broader setting, allowing the filter to affect a wider range of frequencies.
The HMF Q control also influences the available HMF gain, as shown in the measured response in appendix B6.

7. EQ In/Out:

The Bypass switch places the equalizer in or out of the audio path. With the switch on, the equalizer is in circuit and will begin affecting the signal when the controls are turned from their flat or 0dB positions.

With the switch off, the equalizer is not in circuit, and will not affect the signal.

8. LMF dB:

As with the high-mid or HMF dB control, the LMF dB or low-mid gain selects the amount of boost or cut, this time applied to the low-mid range, at a centre frequency selected by the LMF kHz setting. Turning the control clockwise or anticlockwise by dragging up or down increases or decreases the gain. The control covers a range of +/- 15dB, rising to +/- 18dB depending upon the Q control setting.

9. LMF kHz:

The LMF kHz control sets the centre (peak) frequency at which the low-mid boost or cut occurs. Turning the control clockwise or anticlockwise by dragging up or down increases or decreases the frequency. The LMF filter is adjustable from 0.2kHz (200Hz) to 2.5kHz.

10. LMF Q:

As with the high-mid or HMF Q control, the LMF Q affects the filter bandwidth. Turning the control anticlockwise, by dragging down, increases the Q, providing a sharper and more selective filter while turning the control clockwise by dragging up provides a broader setting, allowing the filter to affect a wider range of frequencies.
As with the HMF filter, the LMF Q control also influences the available LMF gain, as shown in the measured response in appendix B5.

11. LF Hz:

The LF Hz control sets the corner frequency below which the low frequency boost or cut occurs (shelf mode) or the centre peak frequency ('Bell' mode). Turning the control clockwise or anticlockwise, by dragging up or down, increases or decreases the frequency. The control covers a range from 30Hz to 450Hz.

12. LF dB:

The LF dB control sets the amount of boost or cut applied at frequencies below the corner frequency (shelf mode) or at the centre frequency ('Bell' mode) selected by the LF Hz setting. The control range is nominally +/- 15dB however this will vary slightly depending upon control settings. Turning the control clockwise or anticlockwise, by dragging up or down, increases or decreases the gain.

13. LF Bell Switch:

As with the HF filter, with the LF 'Bell' switch deselected, the LF section operates as a shelving filter, in which all frequencies below a point set by the LF Hz control are affected according to the LF gain setting.

With the LF 'Bell' switch selected, the LF section operates as a fixed bandwidth peak or 'bell' filter affecting a range of frequencies centred at a point determined by the LF Hz setting.

The EQ accurately models equivalent analogue filter behaviour, using analogue filter modelling algorithms to provide a natural sounding EQ character without requiring CPU intensive upsampling.

NOTE: When applying large amounts of boost to the signal, be careful not to damage amplifiers, speakers (or ears) this is not a 'fault' with the equalizer, it is just something you can do if you turn things up too loud. Any equalizer – digital or analogue - has the potential to cause low or high frequency transients that are far in excess of the nominal average level of the signal. As with all signal processors, its best to start with small amounts of boost or cut and add more gradually.

Section 4 – System Toolbars

4.1 - Preset Selectors

In addition to the preset selector options provided by the host application, the plug-in has a pair of preset selector buttons to the right of the status display. Pressing the right or left arrows will step up or down through the factory presets and the four user preset memories.

4.2 - Info Button

Clicking on the Info button will open a pop-up showing the current version, together with a product ID code if the plug-in has been activated with a valid key.

4.3 – Demo Indicator

The red lock icon indicates the plug-in has not been activated with a valid key. To unlock the plug-in and remove the demo limitations, click the button to open the demo / activation key pop-up and enter your key (see section 4.2). Once the key is accepted, the lock will change to an open symbol. **You will need to restart the host application to complete the activation process.**

4.4 – Phase / Polarity

The phase / polarity switch causes the signal at the output to be inverted. When switching between inverted and normal settings, or when bypassing the plug-in with the phase invert enabled, there may be a slight interruption to the audio.

4.5 – Output Trim

The level trim adjusts the output by up to +/- 6dB. Click on the control and drag upwards to increase the level or down to decrease. The mouse scroll-wheel can also be used to adjust the level in +/- 3dB steps. Double clicking on the control will return it to its default 0.0dB setting.

Section 5 - Presets

5.1 - Factory Presets

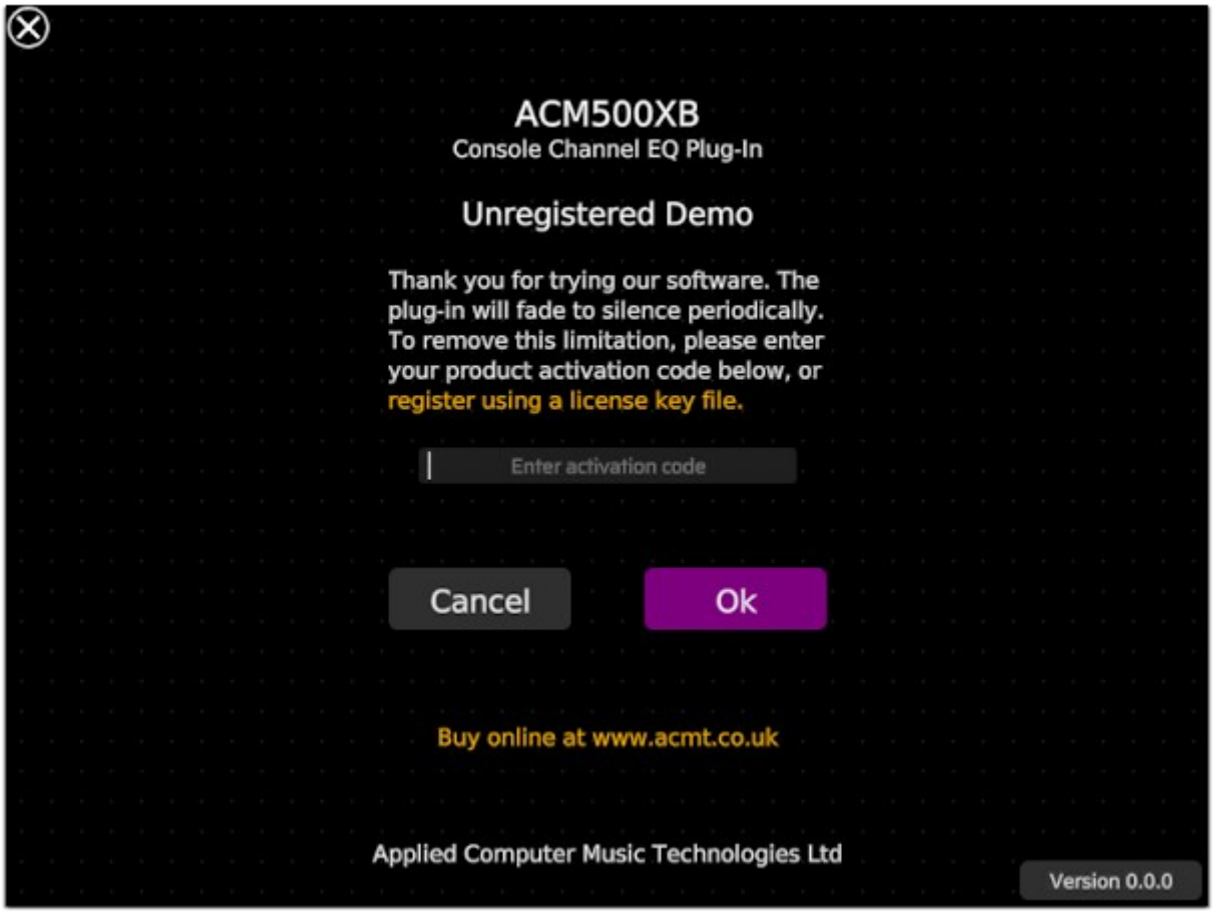
The ACM500XB has six factory presets, designed to provide a guide to some of the more common combinations of control settings.

Factory Preset 1 - Acoustic	Preset for guitar and other acoustic instruments.
Factory Preset 2 - Vox	Preset for presence and 'Air' on lead vocals.
Factory Preset 3 - Kick (01)	Preset for kick drum.
Factory Preset 4 - Kick (02)	Preset for kick drum.
Factory Preset 5 - Snare (01)	Preset for snare drum.
Factory Preset 6 - Snare (02)	Preset for snare drum.

Section 6 – Demo Limitations

6.1 - Demo Screen

When the plug-in is first added to a channel / buss, the following screen will appear if it has not been activated by a valid key. This indicates the plug-in is in demo mode and will run with some limitations. To remove these limitations you will need to obtain a valid activation key from the Applied Computer Music Technologies website at: https://www.acmt.co.uk



To activate the plug-in, enter your activation code into the text box (you can also paste it from the clipboard by right-clicking and selecting the 'Paste' context pop-up). You will need to restart your host application to complete the process. If you do not have a valid key, you can cancel the pop-up and activate it at another time by clicking the lock button in the plug-in's graphical user-interface.

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Appendix

Appendix A - Technical Data

1. Technical Specifications

Frequency Response:	0Hz to Fs/2 (bypassed) - where Fs is the sample rate.
Internal Processing:	32bit floating point.
Reference Level:	0dBu = -18dBFS.
Dynamic range:	Limited only by internal processing resolution (32bit floating point).

HF Gain (HF Bell On):	+/- 18dB
HF Freq:	1.5kHz - 16kHz.
HF Q (HF Bell On):	0.6

HMF Gain:	+/- 18dB.
HMF Freq:	600Hz - 7kHz.
HMF Q:	Variable 0.5 - 2.5

LMF Gain:	+/- 18dB.
LMF Freq:	200Hz - 2.5kHz.
LMF Q:	Variable 0.5 - 2.5

LF Gain (LF Bell On):	+/- 18dB.
LF Freq:	30Hz - 450Hz.
LF Q (LF Bell On):	0.6

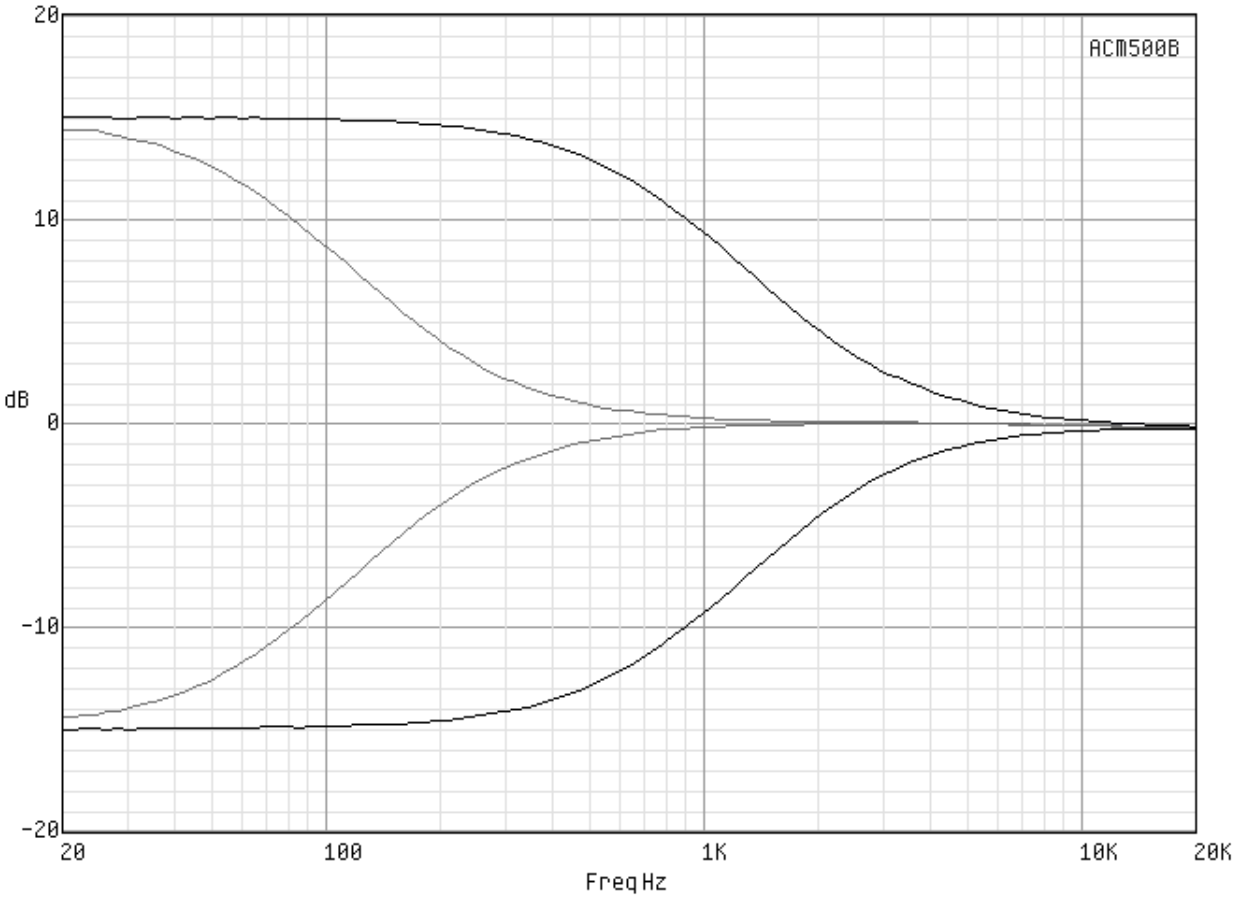
Maximum available gain may be affected by control interaction.

NOTE: VST is a trademark of Steinberg Media Technologies GmbH

Appendix B - Measured Performance

1 – LF Shelf

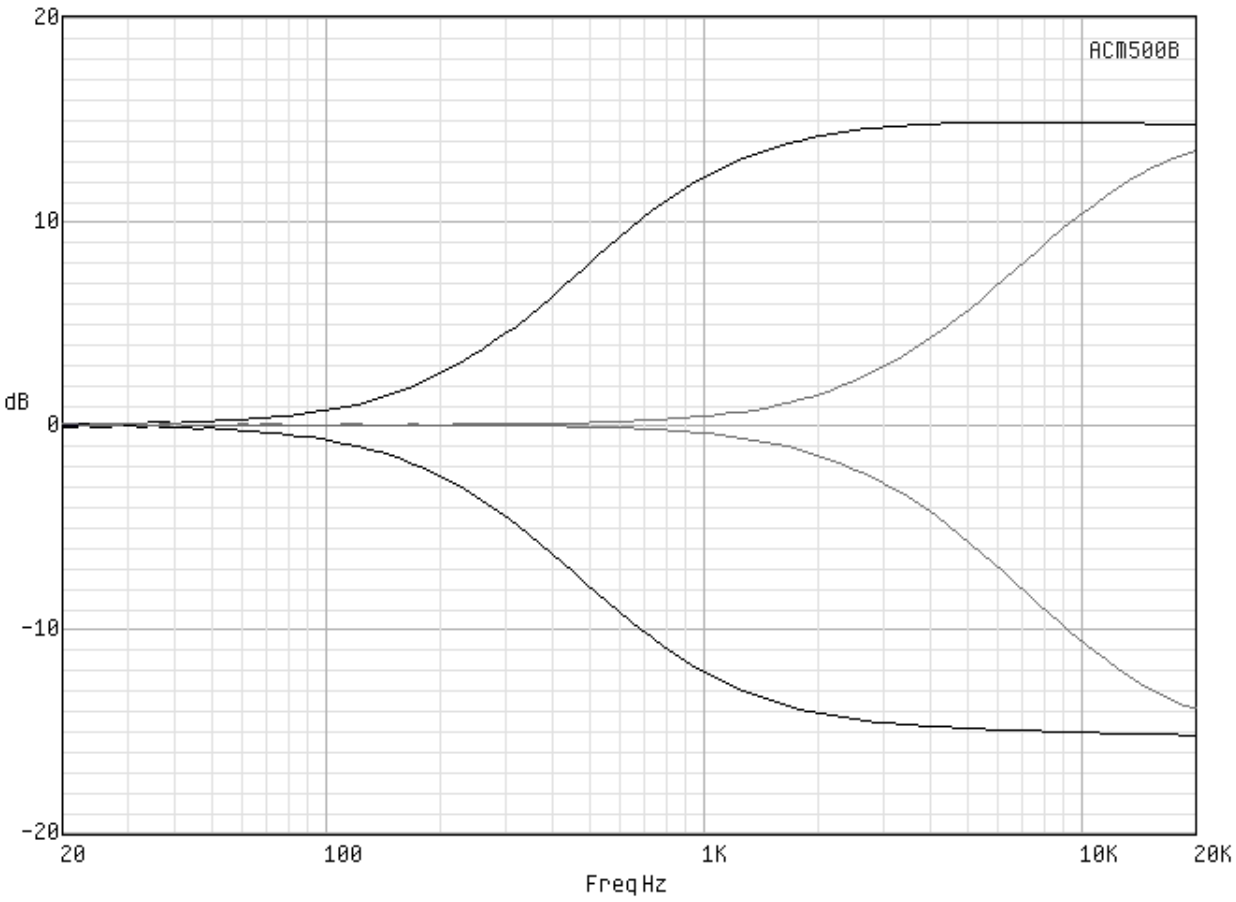
Composite graph showing the measured response to a 20Hz - 20kHz swept sine.



Test Signal	
Input Signal	20Hz - 20kHz swept sine at 0dBFS
Sample Rate	48kHz
Control Settings	
LF Boost	+/- 15dB
LF Bell	Off
LF Freq	30Hz - 450Hz

2 – HF Shelf

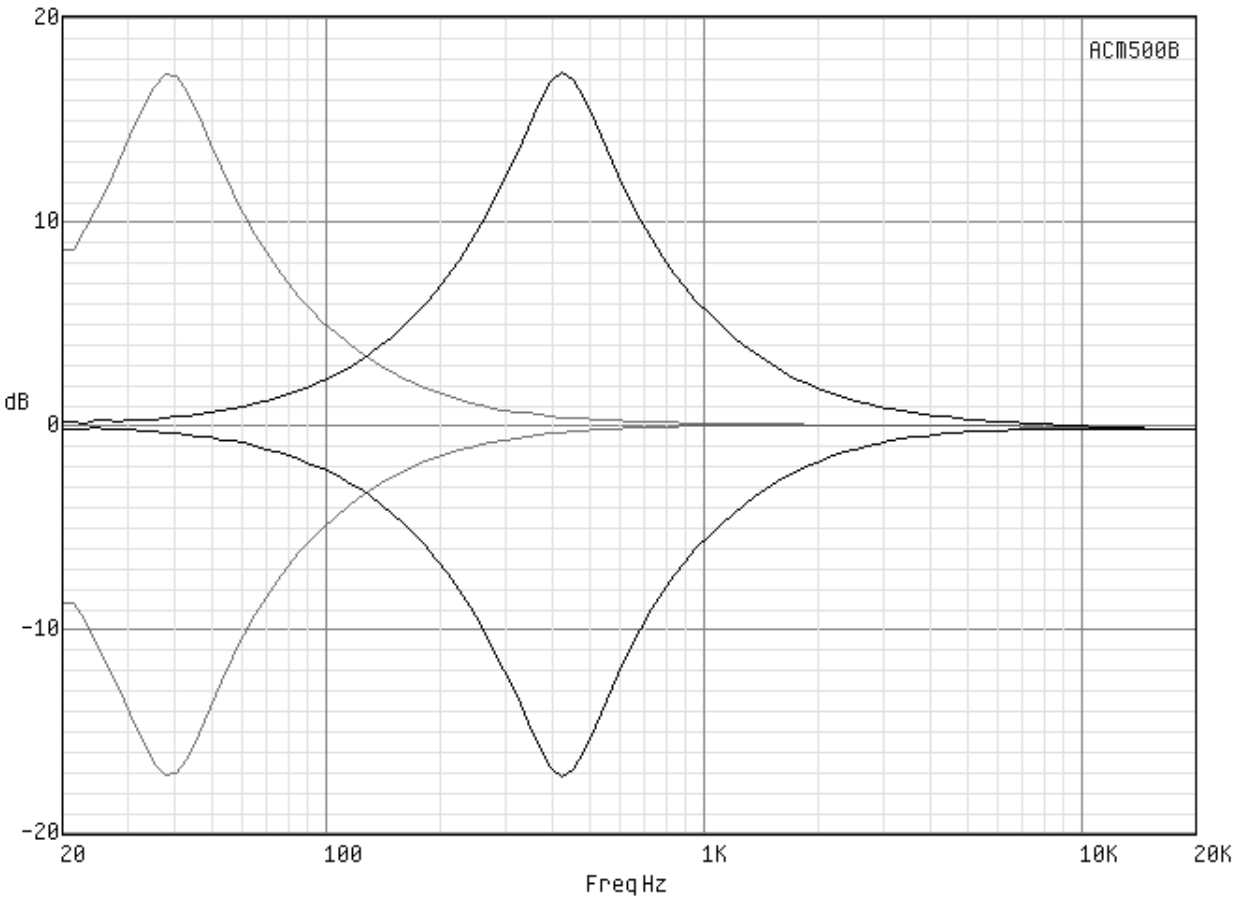
Composite graph showing the measured response to a 20Hz - 20kHz swept sine.



Test Signal	
Input Signal	20Hz - 20kHz swept sine at 0dBFS
Sample Rate	48kHz
Control Settings	
HF Boost	+/- 15dB
HF Bell	Off
HF Freq	1.5kHz - 16kHz

3 – LF Bell

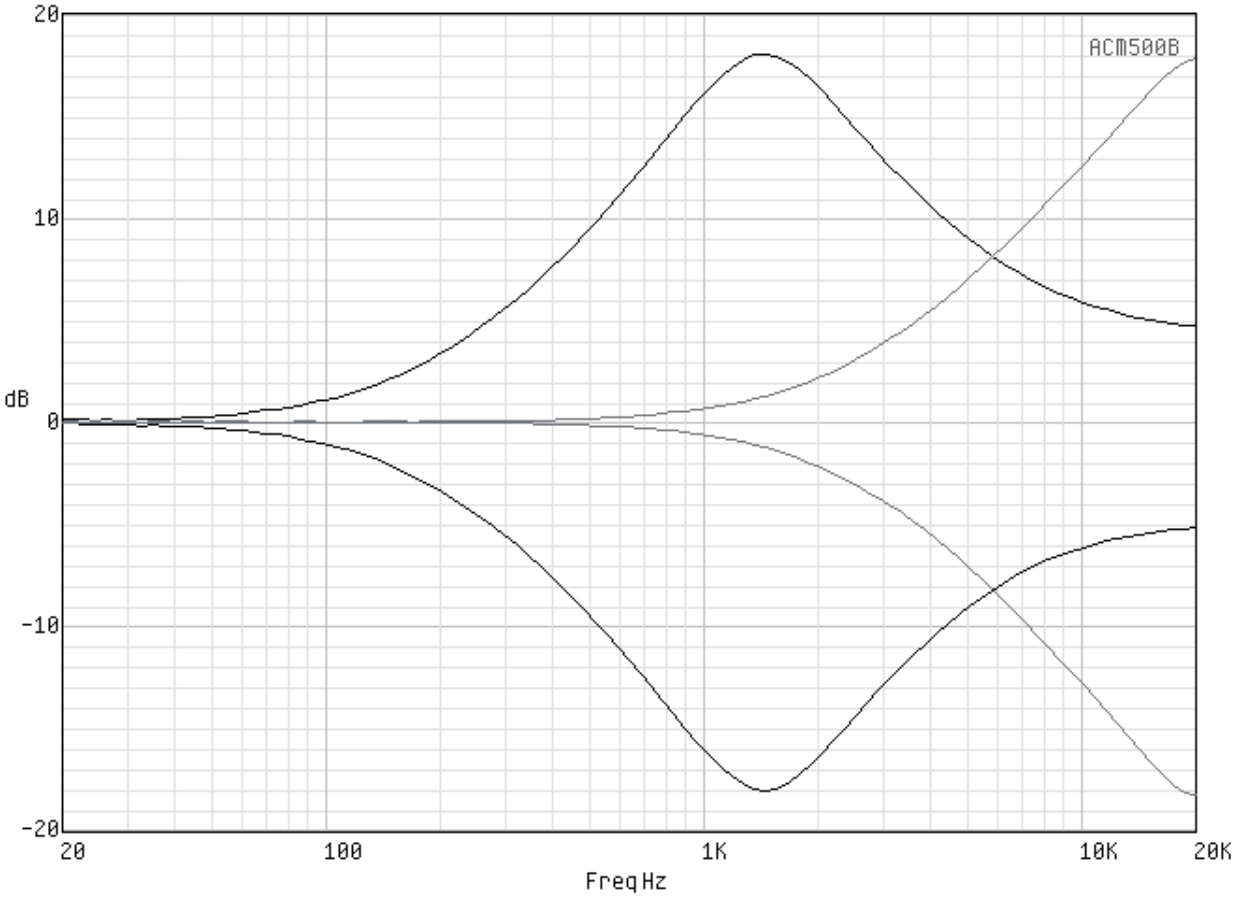
Composite graph showing the measured response to a 20Hz - 20kHz swept sine.



Test Signal	
Input Signal	20Hz - 20kHz swept sine at 0dBFS
Sample Rate	48kHz
Control Settings	
LF Boost	+/- 15dB
LF Bell	On
LF Freq	30Hz - 450Hz

4 – HF Bell

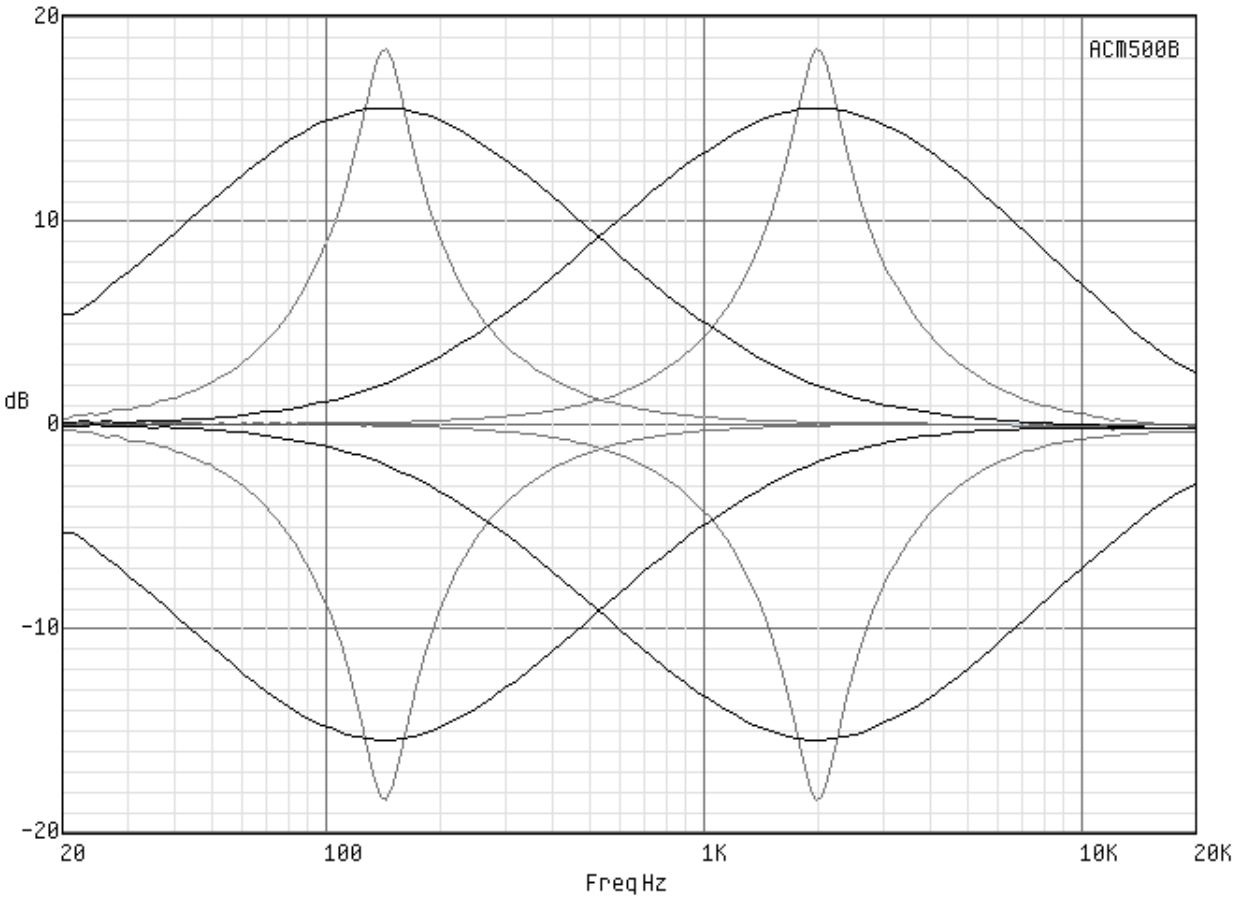
Composite graph showing the measured response to a 20Hz - 20kHz swept sine.



Test Signal	
Input Signal	20Hz - 20kHz swept sine at 0dBFS
Sample Rate	48kHz
Control Settings	
HF Boost	+/- 15dB
HF Bell	On
HF Freq	1.5kHz - 16kHz

5 – LMF Bell

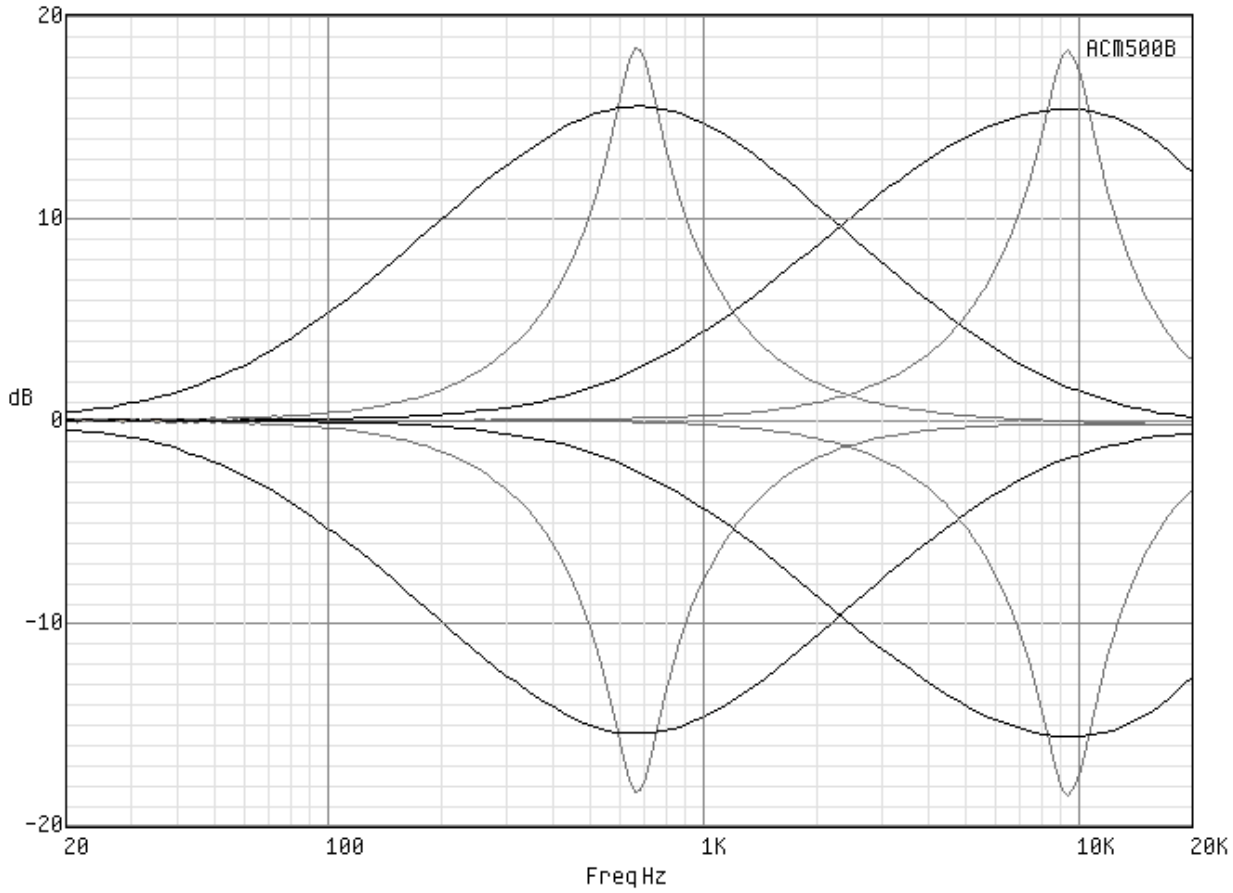
Composite graph showing the measured response to a 20Hz - 20kHz swept sine.



Test Signal	
Input Signal	20Hz - 20kHz swept sine at 0dBFS
Sample Rate	48kHz
Control Settings	
LMF Boost	+/- 15dB
LMF Q	Min - Max
LMF Freq	200Hz – 2.5kHz

6 – HMF Bell

Composite graph showing the measured response to a 20Hz - 20kHz swept sine.



Test Signal	
Input Signal	20Hz - 20kHz swept sine at 0dBFS
Sample Rate	48kHz
Control Settings	
HMF Boost	+/- 15dB
HMF Q	Min - Max
HMF Freq	600Hz - 7kHz

Appendix C - Spare Parts and Service

With regular care and maintenance your new ACM500XB equalizer plug-in is designed to give long and reliable service. Spare parts and service updates can be downloaded from:

`https://www.acmt.co.uk`

Always ensure it has adequate ventilation and is kept free from dust. **Always use genuine replacement parts.** For service and support information contact:

`support@acmt.co.uk`

Appendix D – Disclaimer

Disclaimer

All trademarks are the property of their respective owners and are used for information purposes only. References to other companies or their products or representation of those products does not imply any official endorsement of the software by those companies or any affiliation to those companies unless expressly stated otherwise.

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