

Contents

Section 1	Introduction	Page 4
1.1	What is the ACM500X1	
1.2	Main Features	
1.3	System Requirements	
1.4	About the Manual	
1.5	Conventions Used in the Manual	
Section 2	Installation	Page 5
2.1	Download Contents	
2.2	Installing the Plug-In	
2.3	Product Support	
Section 3	Operation	Page 9
3.1	The Graphical User Interface	
3.2	Control Modes	
3.3	Physically Weighted Controls	
3.4	Control Functions	
Section 4	System Toolbars	Page 13
4.1	Preset Selectors	
4.2	Info Button	
4.3	Demo Indicator	
4.4	Phase / Polarity	
4.5	Output Trim	
Section 5	Presets	
5.1	Factory Presets	Page 14
Section 6	Demo Limitations	Page 15
6.1	Demo Screen	

Appendices

Appendix A	Technical Data	Page 17
Appendix B	Measured Performance	Page 18
Appendix C	Spare Parts and Service	Page 24
Appendix D	Disclaimer	Page 25

Section 1 - Introduction

1.1 - What is the ACM500X1

The ACM500X1 plug-in for Windows or Linux PCs and compatible audio workstation applications comprises a three band equalizer which models equivalent analogue circuit behaviour without requiring CPU intensive processing. The EQ features adjustable low and high frequency shelves and an adjustable mid frequency 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 and mid-range parametric.
- 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

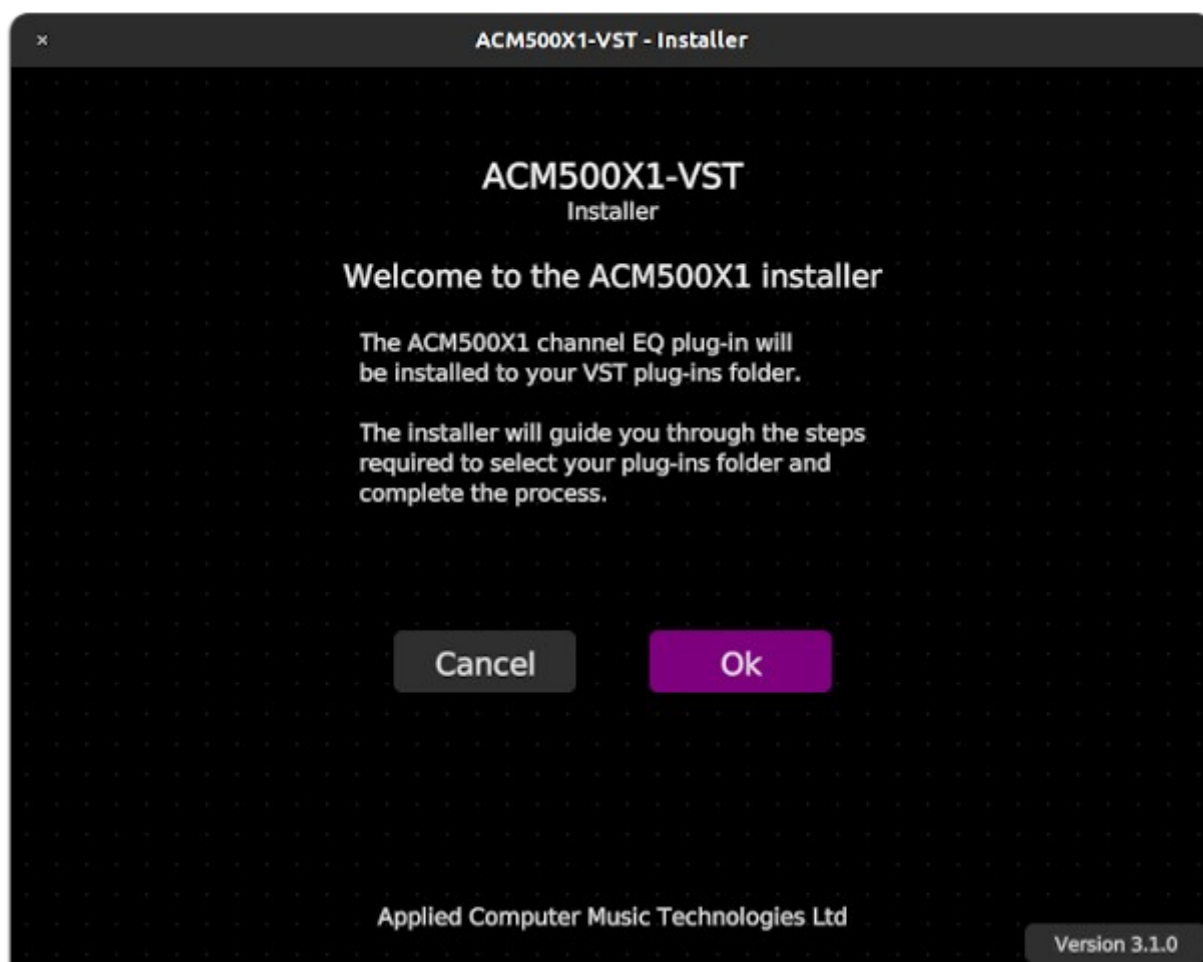
and select **Remove** for the ACM500X1.

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.

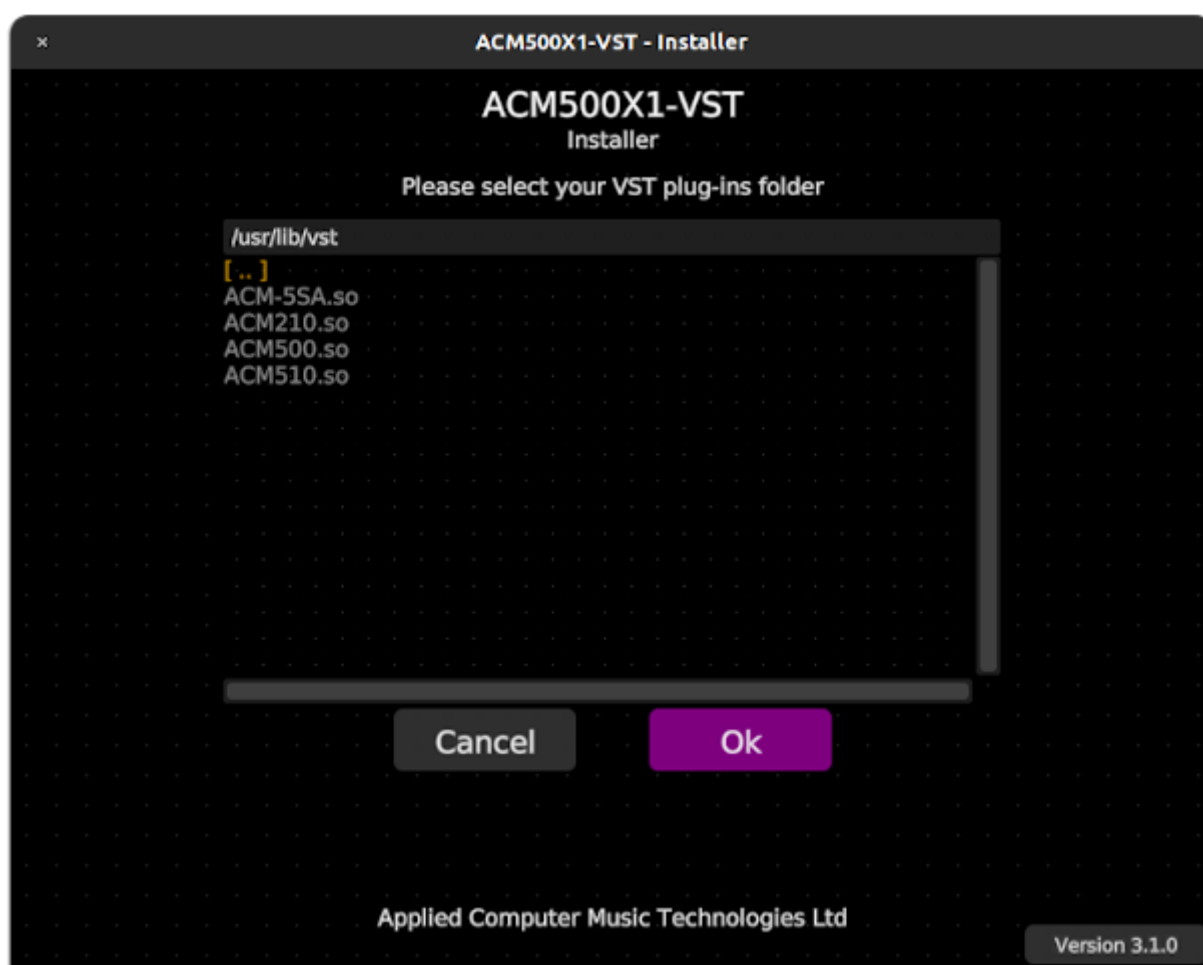
Run the installer executable by (double) clicking it in a file browser, or launching it from the command line. The installer will guide you through the installation process.



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 ACM500X1 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 0dB 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.

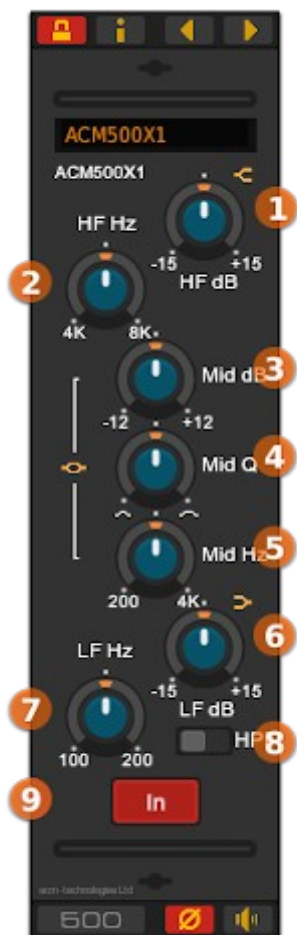
3.3 - Physically Weighted Controls

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 - The Controls

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



1. High Frequency Boost / Cut - HF dB

The HF dB control sets the amount of boost or cut applied to the high frequencies. The HF dB control boosts or cuts all frequencies above the point in the frequency spectrum set by the **HF Hz** control. You can boost or cut by as much as 15dB.

2. High Cut Off Frequency - HF Hz

This control – located to the left of the **HF dB** control – sets the roll-over frequency for the high frequency shelving filter, determining the point above which the boosting or cutting action takes place. Turning it clockwise increases the frequency, turning it anticlockwise decreases the frequency. You can vary the frequency between 4kHz and 8kHz.

3. Mid Parametric Boost / Cut - Mid dB

The Mid dB control sets the amount of boost or cut applied at the centre frequency selected by the **Mid Hz** control. You can boost or cut by as much as 12dB.

4. Mid Parametric Q

The Mid Q control, located between **Mid Hz** and **Mid dB**, controls the spread of frequencies affected by the mid parametric boost or cut. At the fully anticlockwise position, the peak is narrow, at the fully clockwise position, the peak is broad.

5. Mid Parametric Frequency - Mid Hz

The Mid Hz control selects the centre frequency of the parametric section. The parametric is essentially a peak / notch filter, which will boost or cut a range of frequencies centred about the Mid Hz setting. You can vary the frequency between 200Hz and 4KHz.

6. Low Frequency Boost / Cut - LF dB

The LF dB control sets the amount of boost or cut applied to the low frequencies. The low frequency filter is a 'shelving' type, similar to the 'bass' in a 'bass' and 'treble' tone control circuit. The low frequency gain control boosts or cuts all frequencies below the point in the frequency spectrum selected by the **LF Hz control**. You can boost or cut by as much as 15dB.

7. Low Cut Off Frequency - LF Hz:

The LF Hz control, to the left of the **LF dB** allows you to set the roll-over frequency of the low frequency shelving filter. If you turn it anticlockwise, the frequency gets lower, whereas turning it clockwise moves the frequency higher. You can vary the frequency between 100 and 200Hz.

8. High-Pass Filter - HPF

The HPF switch places a 75Hz high-pass filter into the signal chain. This can be used to help tame subsonic frequencies, low frequency rumble or mechanical noise, especially when also applying low frequency boost.

9. 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 neither its gain controls or its frequency boost/cut controls will affect the audio.

The EQ accurately models equivalent analogue circuit 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

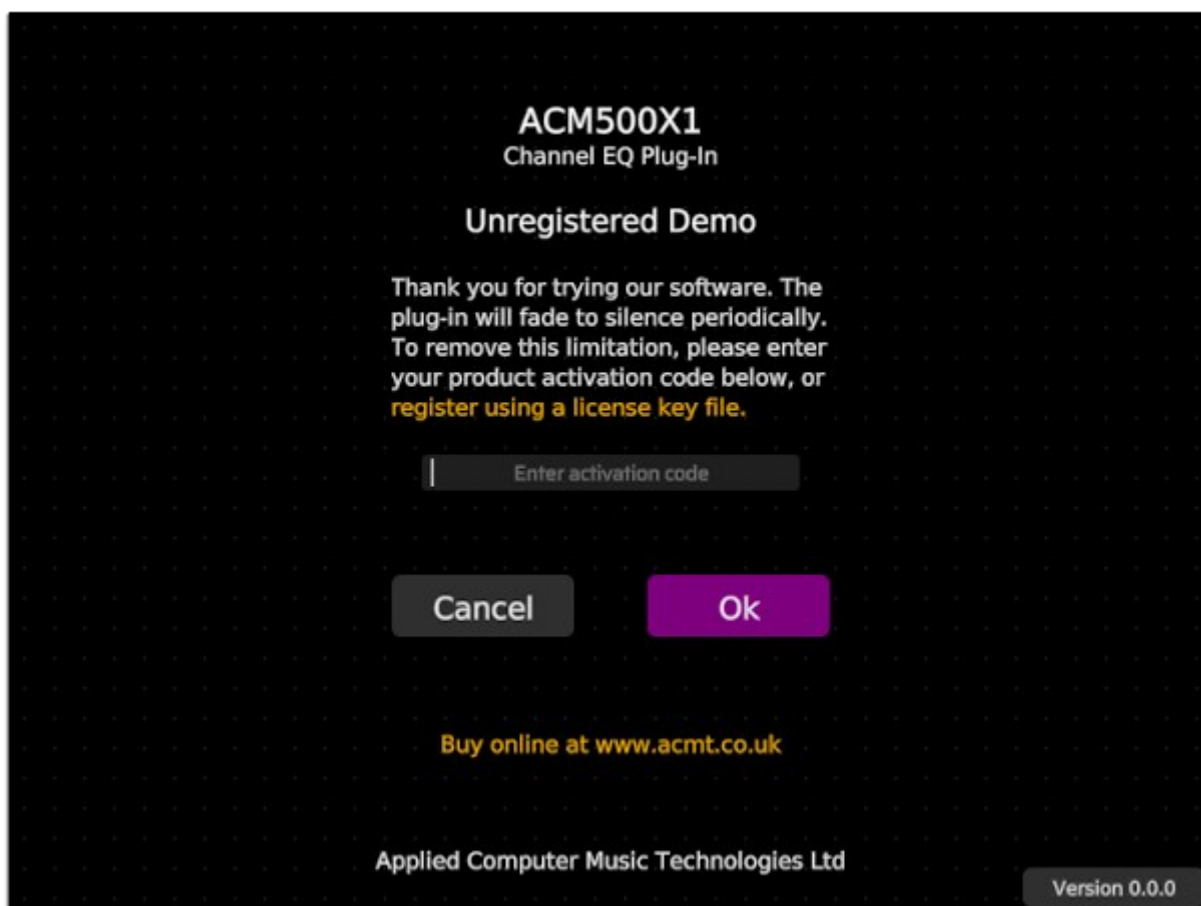
The ACM500X1 has five factory presets, designed to provide a guide to some of the more common combinations of control settings.

Factory Preset 1 - Low End Boost	Using the LF Boost combined with a mid / low frequency 'dip' similar to the Pultec 'low-end trick'.
Factory Preset 2 - Presence	Small amounts of Low and Mid boost provide extra presence.
Factory Preset 3 - Vocal 'Air'	Top boost provides extra 'Air' for vocals without becoming harsh.
Factory Preset 4 - Loudness	HF and LF boost - the classic 'loudness' compensation curve.
Factory Preset 5 - Hollow Mid	'Scooped' mid range combined with some LF boost.

Section 6 – Demo Limitations

6.1 - Demo Screen

When the plug-in is first added to a channel / bus, 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

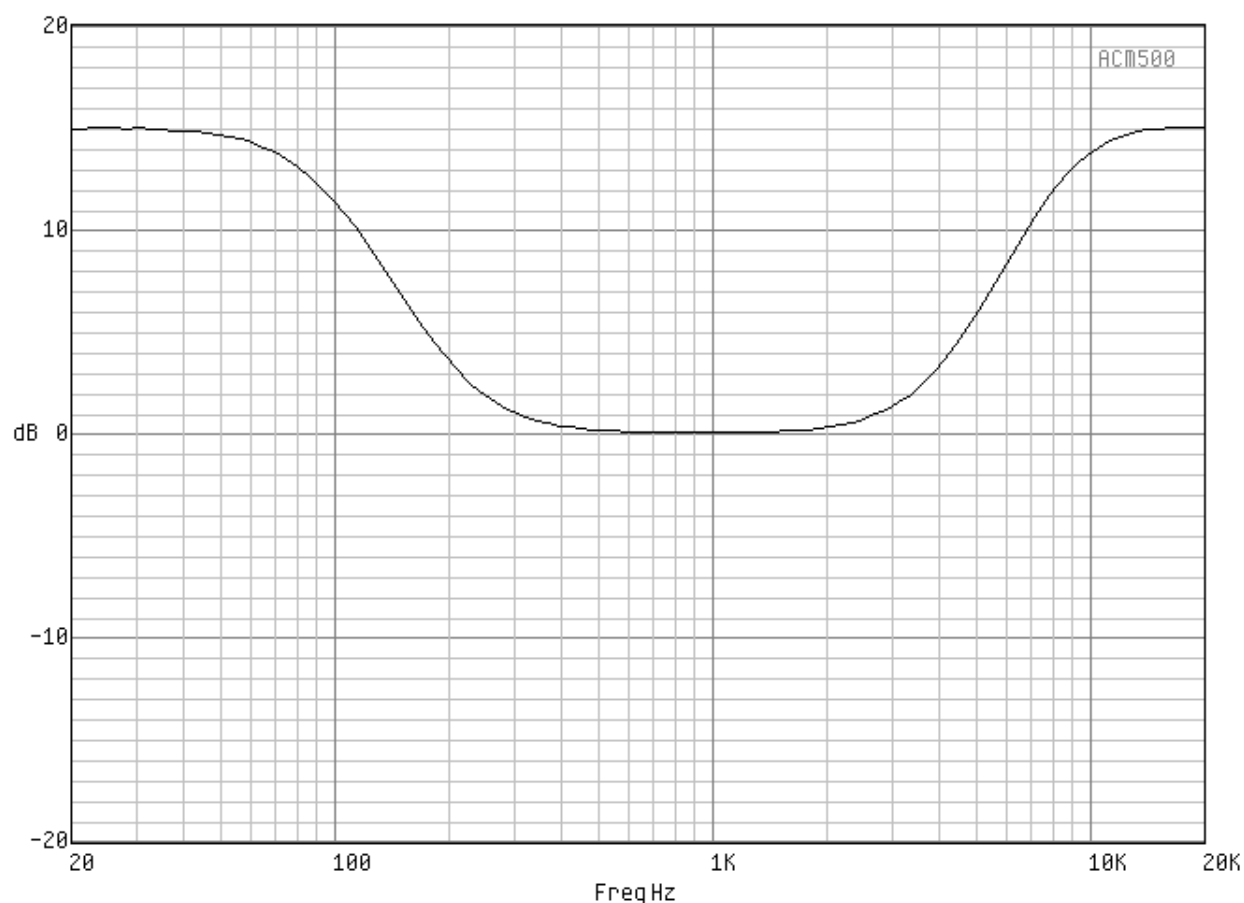
1. Technical Specifications

Frequency Response:	0Hz to $F_s/2$ (bypassed) - where F_s is the sample rate.	
Internal Processing:	32bit floating point.	
Reference Level:	0dBu = -18dBFS.	
Dynamic Range:	Limited only by internal processing resolution (32bit floating point)	
Maximum Boost:	Low or high frequency shelf:	15dB.
	Mid peak:	12dB.
Maximum Cut:	Low or high frequency shelf:	15dB.
	Mid peak:	12dB.
Low Shelf Frequency:	Adjustable from 100Hz to 200Hz.	
High Shelf Frequency:	Adjustable from 4kHz to 8kHz.	
Mid Frequency:	Adjustable from 200Hz to 4kHz.	
Mid Q:	0.5 – 3.5	

NOTE: VST is a trademark of Steinberg Media Technologies GmbH

Appendix B - Measured Performance**1 - Full High and Low Frequency Boost.**

Graph showing measured response to 20Hz - 20kHz swept sine.

**Test Signal**

Input Signal 20Hz - 20kHz swept sine at 0dBFS
Sample Rate 48kHz

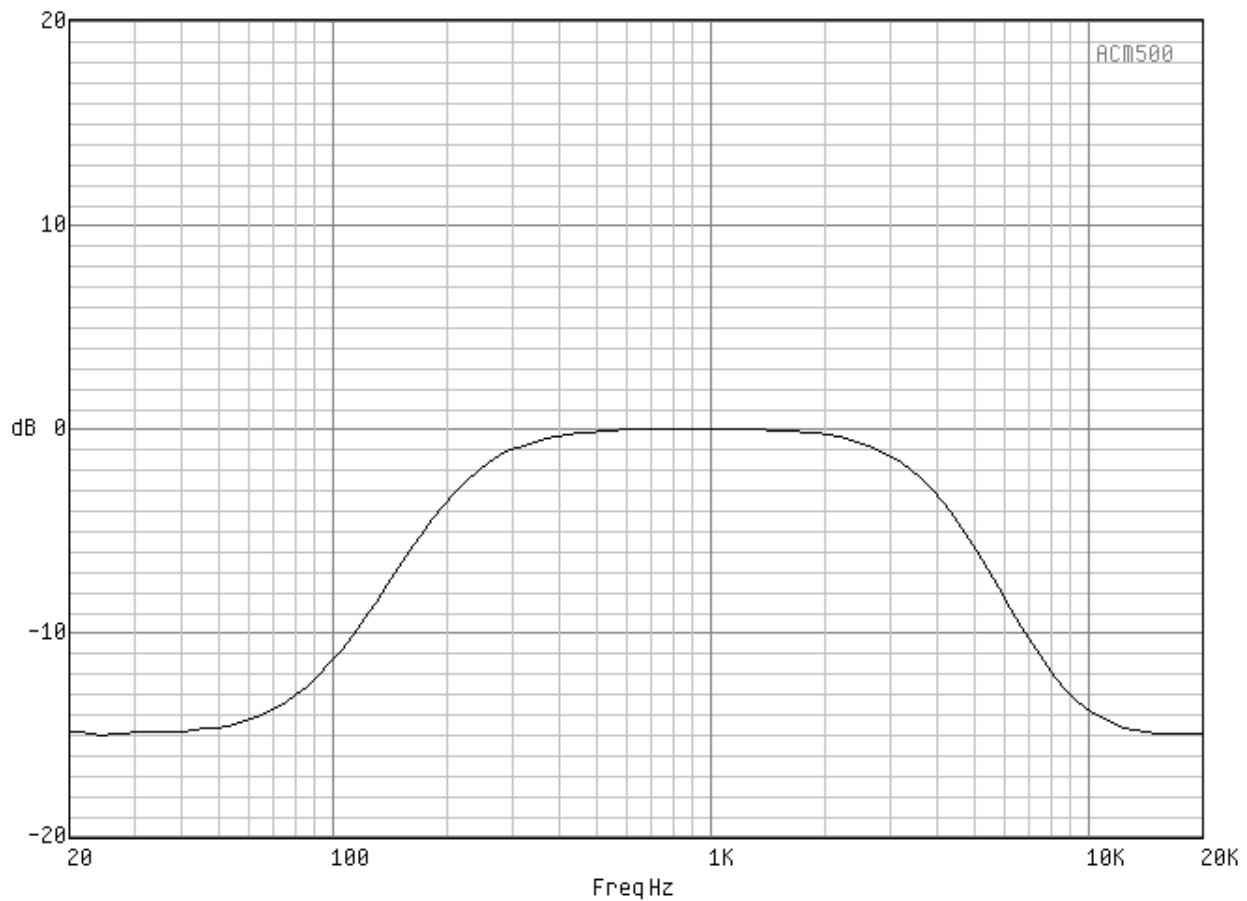
Control Settings

HF Boost 15dB
LF Boost 15dB
Mid Boost 0dB

ACM500X1 Channel EQ Plug-In

2 - Full High and Low Frequency Cut.

Graph showing measured response to 20Hz - 20kHz swept sine.



Test Signal

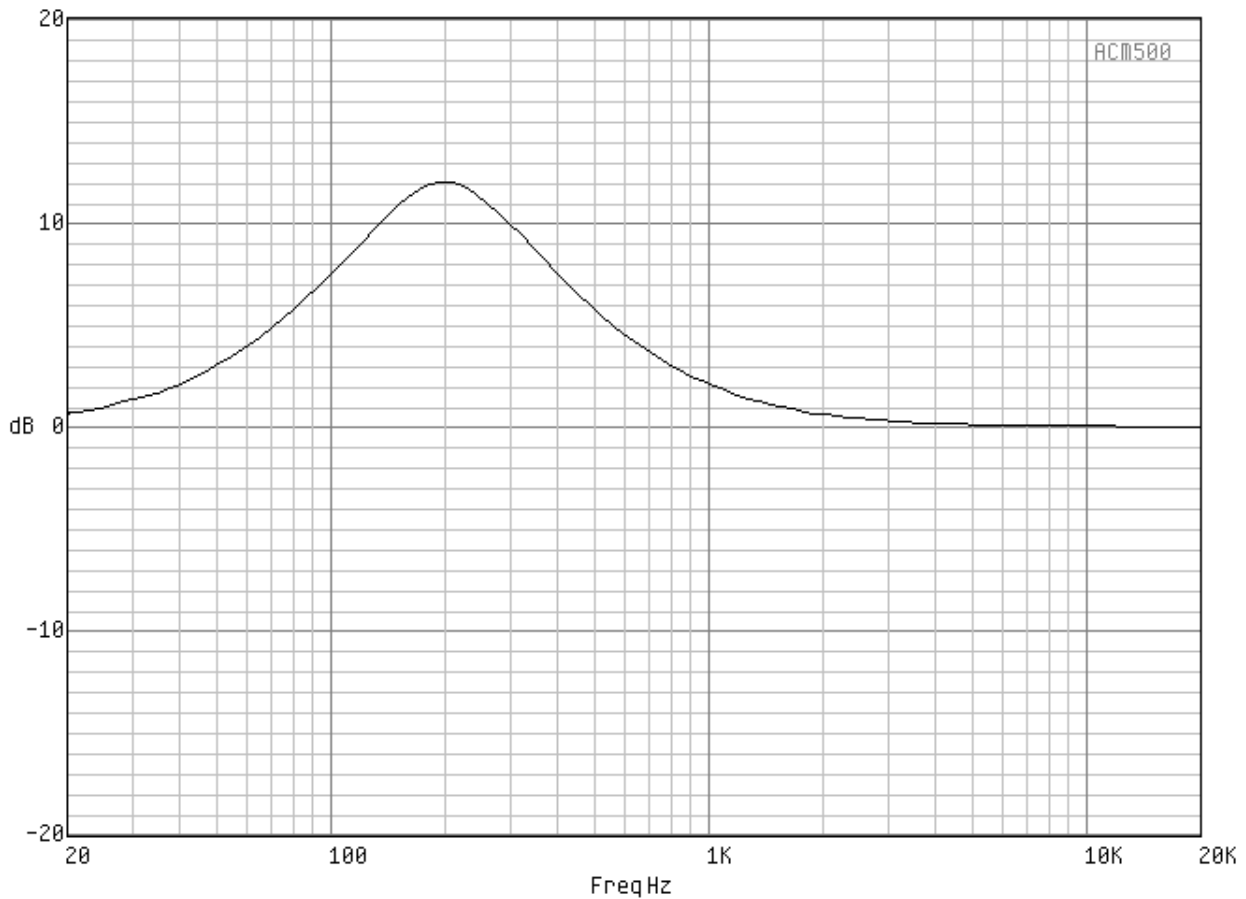
Input Signal 20Hz - 20kHz swept sine at 0dBFS
Sample Rate 48kHz

Control Settings

HF Boost - 15dB
LF Boost - 15dB
Mid Boost 0dB

3 - Full Mid Boost at 200Hz

Graph showing measured response to 20Hz - 20kHz swept sine.



Test Signal

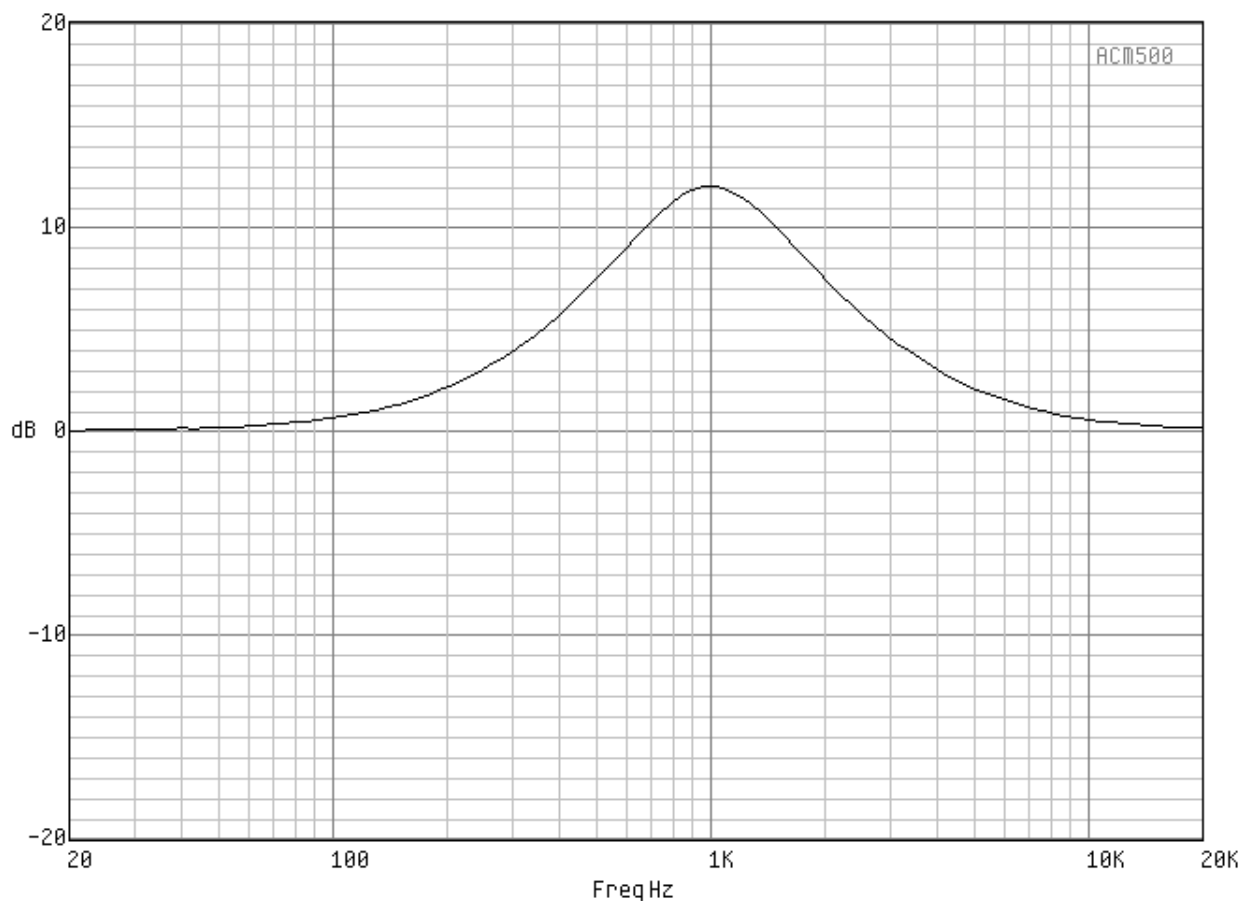
Input Signal 20Hz - 20kHz swept sine at 0dBFS
Sample Rate 48kHz

Control Settings

HF Boost 0dB
LF Boost 0dB
Mid Boost 12dB
Mid Freq 200Hz
Mid Q 0.5

4 - Full Mid Boost at 1kHz

Graph showing measured response to 20Hz - 20kHz swept sine.



Test Signal

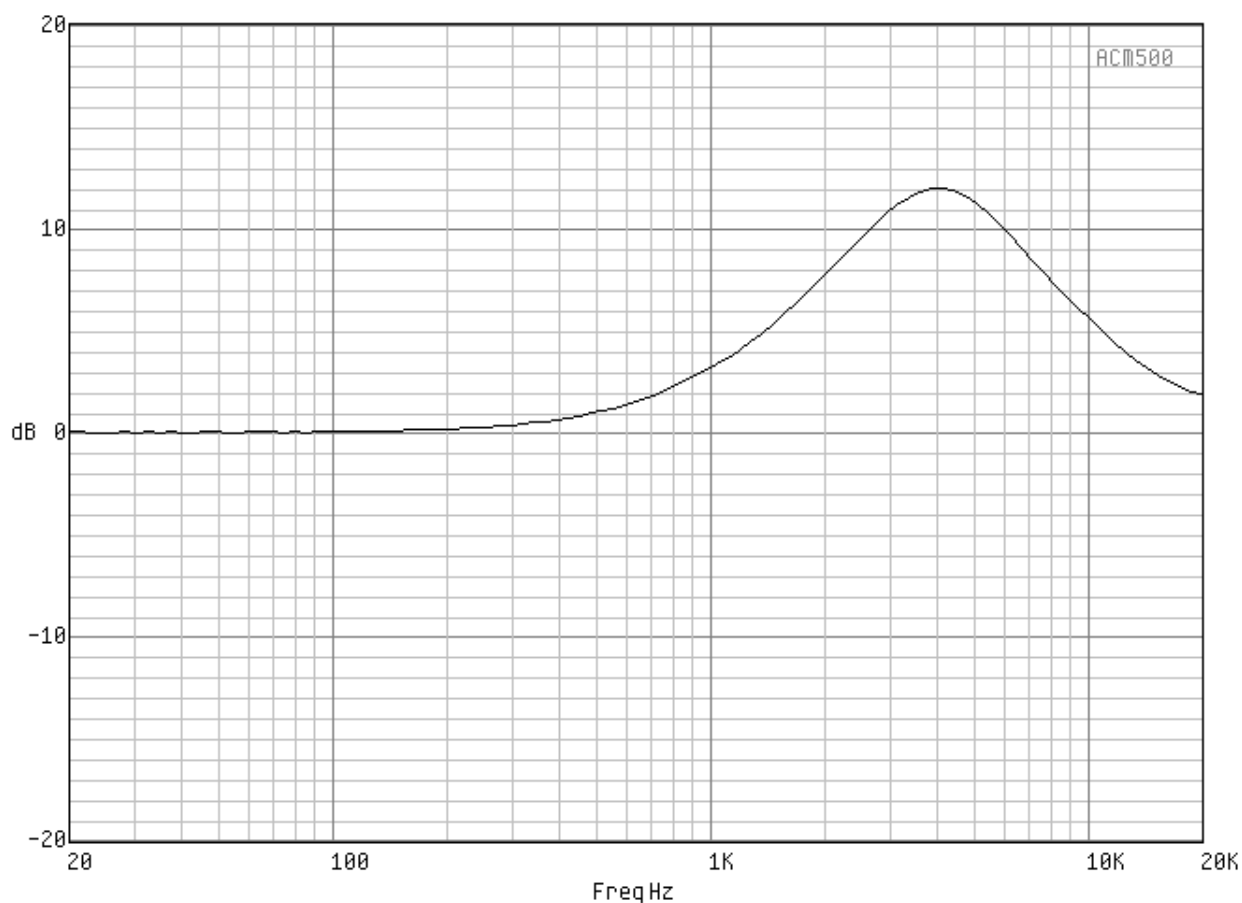
Input Signal 20Hz - 20kHz swept sine at 0dBFS
Sample Rate 48kHz

Control Settings

HF Boost 0dB
LF Boost 0dB
Mid Boost 12dB
Mid Freq 1kHz
Mid Q 0.5

5 - Full Mid Boost at 4kHz

Graph showing measured response to 20Hz - 20kHz swept sine.



Test Signal

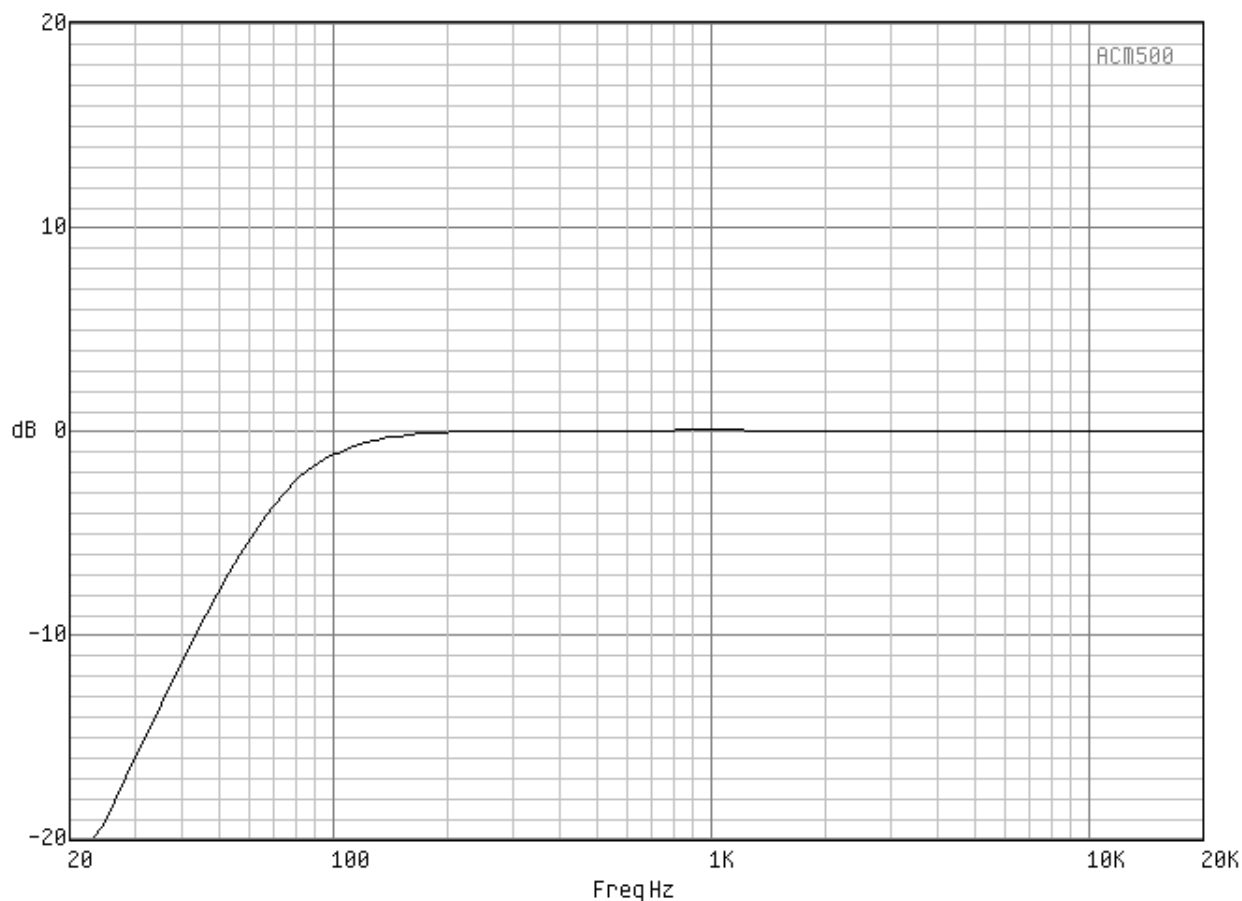
Input Signal 20Hz - 20kHz swept sine at 0dBFS
Sample Rate 48kHz

Control Settings

HF Boost 0dB
LF Boost 0dB
Mid Boost 12dB
Mid Freq 4kHz
Mid Q 0.5

6 – High-Pass Filter

Graph showing measured response to 20Hz - 20kHz swept sine.



Test Signal

Input Signal 20Hz - 20kHz swept sine at 0dBFS
Sample Rate 48kHz

Control Settings

HF Boost 0dB
LF Boost 0dB
Mid Boost 0dB
HPF Enabled

Appendix C - Spare Parts and Service

With regular care and maintenance your new ACM500X1 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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