ACM510X1

ACM510X1

HPF

In dB

0
-6   +12

Thr
0
+10   -20

Atk
ms
0.1   10

Rel
s
0.1   1

GR
20

0

Ratio
1:1   10:1

Out dB
0
-6   +20

In

500   Ø

Contents

<u>Appendices</u>

Section 1 - Introduction

1.1 - What is the ACM510X1

The ACM510X1 plug-in for Windows or Linux PCs and compatible audio workstation applications comprises a versatile dynamic range compressor with a valve overdrive characteristic at high output levels, similar to analogue 'tape saturation'. It is intended to be used with the ACM500X1 Channel EQ to form a complete channel strip dynamics and EQ processing solution for Digital Audio Workstations.

1.2 - Main Features

- VST, VST3 and CLAP plug-in for 64Bit Windows or Linux PCs running a compatible host application.

- Soft Knee compression characteristic, ensures a gentle transition from 1:1 ratio below the threshold to the selected ratio above it.

- Vintage overdrive stage adds extra 'tape saturation' or tube overdrive 'warmth' to the sound when driven at high levels.

- 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 ACM510X1 compressor. 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

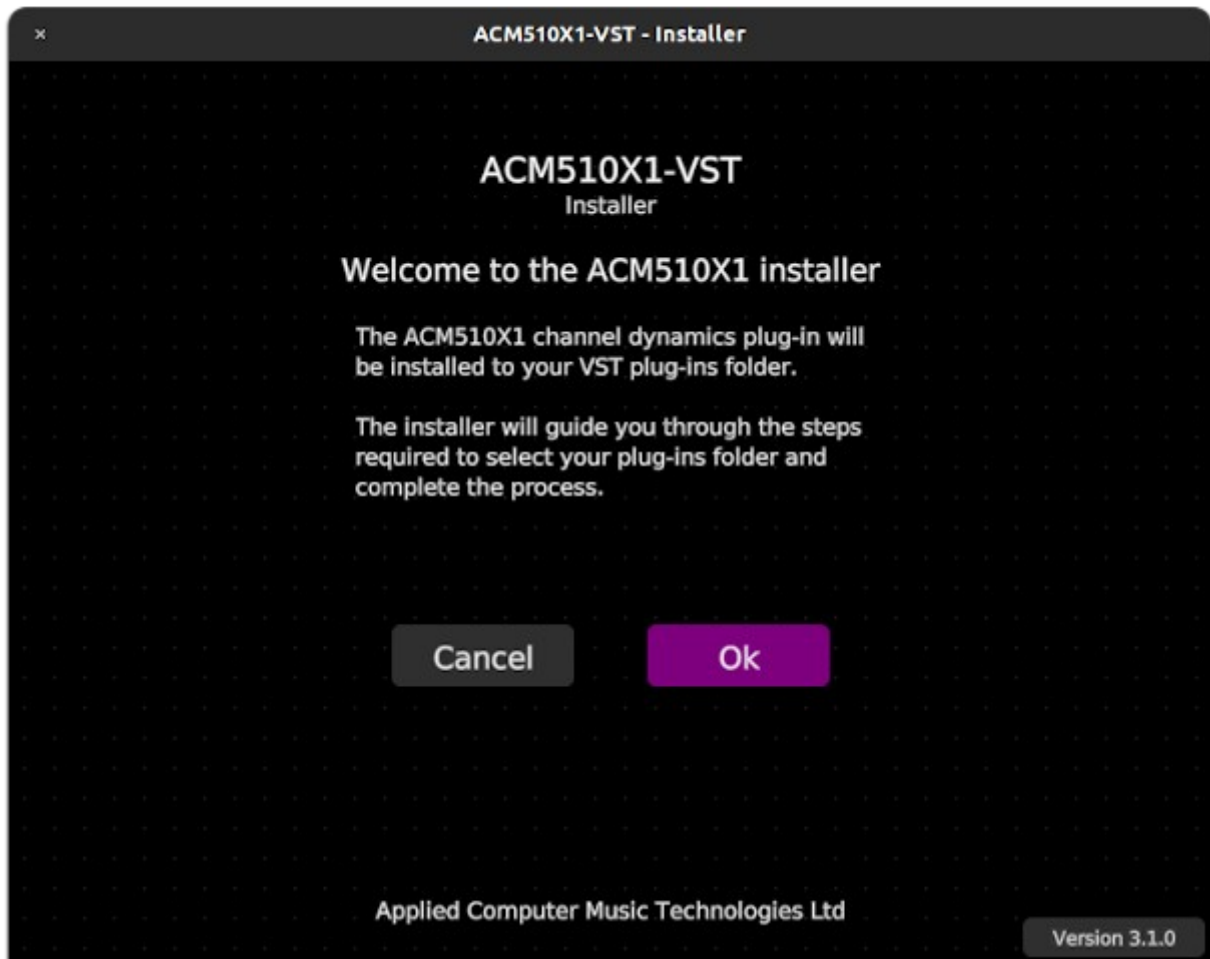**Control Panel -> Add or Remove Programs**

and select **Remove** for the ACM510X1.

<u>2.2b Installing the Plug-In for Linux</u>

Installing the Plug-In for Linux:

Within the Linux folder, you will find the x86-64 folder containing the installer executable.
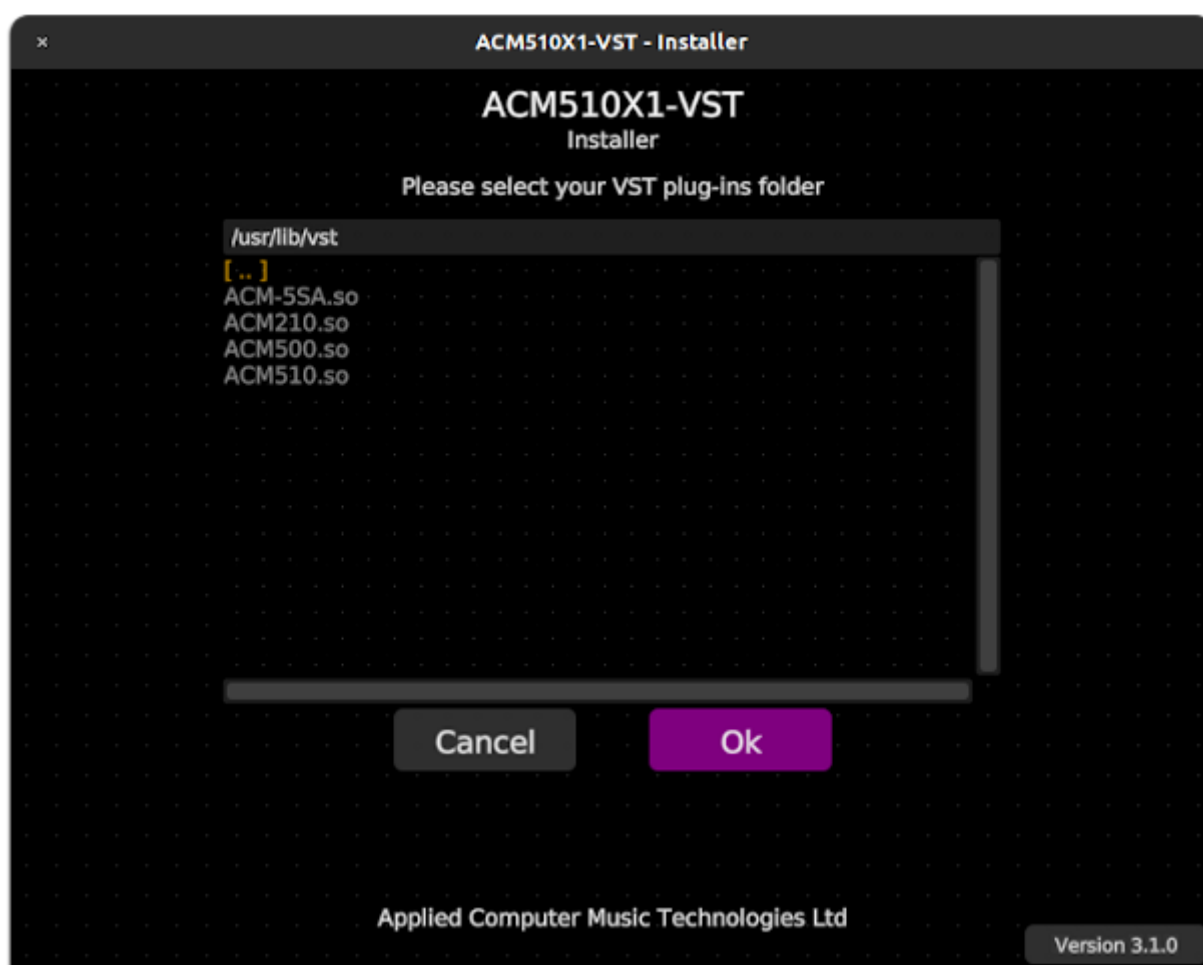
Run the installer executable by (double) clicking it in a file browser, or launching it from the command line. The installer will guide you through the installation process.

Applied Computer Music Technologies Ltd

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-ins 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 installers as 'executable' in order for them 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 installers, 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 formats.

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-ins, or encounter problems during the installation, please contact:

support@acmt.co.uk

Section 3 - Operation

3.1 - The Graphical User Interface

This is the ACM510X1 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.

Applied Computer Music Technologies Ltd

3.4 - The Controls

The front panel controls allow you to adjust the compressor effect:

1. Input Gain

The input gain control selects the amount of gain applied to the signal before it enters the compressor. It has a detent at 0dB. It will require a bit more mouse effort to turn the control around the detent, a bit like a 'click stop' on a conventional analogue control. This is to help you quickly find the 0dB point again if you need to.

2. High-Pass Filter

The HPF switch places a 75Hz high-pass filter into the side-chain. This helps to stop low frequency content from causing the compressor to pump or over-compress.

3. Threshold

The Threshold control sets the point at which the compressor begins to act. For example, if the threshold is set to -20dB, signals quieter than -20dBu will pass through the compressor without being affected. If a signal larger than the threshold enters the compressor, it will be progressively attenuated depending on the setting of the ratio control.

4. Attack (ms)

The attack control sets the speed with which the compressor reacts to signals which are louder than the threshold. The shorter the time, the quicker the compressor will respond to changes in input level and reduce loud signals. Set the attack to be fast (anticlockwise) if you want to aggressively control loud signals and don't want any of the initial 'transient' to get through.

5. Gain Reduction Meter

The gain reduction meter shows the amount of gain reduction (attenuation) being applied to the signal as it passes through the compressor. The amount of attenuation is dependent on the threshold and ratio settings, Increasing amounts of gain reduction mean the compressor is having to act more strongly to control the level of the signal.

Side-Chain Time Constants and Meter Ballistics

The speed with which the meter responds to a change in the gain is determined by the Attack and Release settings. This is because the meter is showing the attenuation calculated by the level detector in the side-chain. The attack and release *envelope* has a non-linear slope, similar to the charge/ discharge curve of a capacitor in analogue circuitry. As such the attack time is calculated as the time taken for the side-chain level to reach approx 2/3 of its maximum. The release time is calculated as the time taken for the side-chain level to decay to approx 1/3 of its initial value. Therefore it is possible that the meter will appear to take longer than the release settings would seem to indicate for it to decay to zero.

6.Release [s]

The release control sets the speed with which the compressor recovers after reducing a loud signal. If you set this to a short time (anticlockwise) the compressor will recover quickly, but this can lead to an audible 'pumping' of the signal at high compression settings - this is normal for a signal processor of this type, and in some cases is perceived as a desirable effect. It depends upon the effect you are trying to achieve.

Note: With very short attack and release settings, the compressor may introduce some distortion as the side chain response time becomes close to the period of low frequencies present in the audio signal. In some cases this is a desirable effect (for 'dirtying' the sound a bit), once again, it depends upon the effect you are trying to achieve. All compressors have their own *sound* this is due to a combination of factors including the side-chain response. This particular one is modelled on some of the older valve units.

7. Ratio

The ratio control sets the amount of compression applied to audio which is louder than the threshold. In simple terms, the ratio is the ratio of the change in input level to the change in output level, so for example, if the compression ratio is set to 10:1, a change of 10dB in the input signal (assuming it is already above the threshold) will only result in a 1dB change in the output level. A ratio of 1:1 is equivalent to having no compressing action, in this case a change in input of 10dB results in a change in output of 10dB.

This compressor has a *soft knee* compression characteristic, that is, the change from no compression when the signal is below the threshold to compression determined by the ratio control when the signal is above the threshold is not an abrupt one. There is a gradual increase in compressing action up to a maximum set by the ratio control as the signal becomes greater than the threshold. This is similar to older analogue designs and is generally thought to give a more pleasing sound.

If you were to plot a graph of input level vs output level, the *knee* would be the change in gradient that occurs around the threshold point.

8. Output Level

The output gain control, sometimes referred to as *Make-up Gain*, allows you to add gain after the compressor, in order to *Make up* for attenuation by the compressor. This may seem like a strange thing to do since you want the compressor to tame loud signals, but consider, if you set the threshold to -20dB, and the ratio to a high value, you will get aggressive compression, which gives good control of the signal but it will struggle to get much louder than -20dB so will be subjectively quieter. By adding some *Make-up Gain* you can bring the signal back to the level it was before – only this time the louder peaks will have been well and truly squashed. Switch the compressor in and out of circuit while adjusting this control until you get the effect you require.

9. Effect In/Out

This is the bypass switch which switches the compressor and its gain controls in or out of the signal path. With the switch off (not illuminated), the signal passes through unaffected by the compressor. With the switch on (illuminated) the compressor will begin affecting the signal.

3.5 - Saturation

This is the last stage in the process through the compressor. There will always be a point at which the signal passing through the compressor cannot be turned down enough to stop it overloading or *clipping* – this is just as true of digital equipment as of analogue, at some point there will be a signal that is too large to represent either as an analogue voltage or a number in your sound-card. If this were just allowed to 'hard clip' to the maximum value allowed, the result would be a sudden harsh distortion of the signal, sometimes described as a 'splattering' sound, and not very pleasant.
One of the more pleasing aspects of old analogue equipment is the ability to overload gradually, softening the transition from clean to distorted sound before finally clipping to a limit. That characteristic is simulated here, if you turn up the gain through the compressor it will eventually distort, but with a more gradual onset similar to old valve based electronics or analogue *tape saturation*. In some cases you can get as much as an extra 3dB or so through the compressor even when it is clipping before you are aware of it – the sound just gets a little dirtier.

If you just want to use the overdrive sound without any compression, set the threshold control to 0dB and the ratio to 1:1 Then adjust the In and Out dB controls until you get the desired amount of overdrive. You may also consider placing the effect *pre* or *post* fader in order that you can control the level of the sound in the mix with or without affecting the amount of overdrive.

3.6 - Mono and Stereo Operation

The ACM510X1 plug-in is a stereo compressor. Most host applications will permit the use of a stereo plug-in in a mono channel. In stereo operation, the left and right side-chains are linked, in a 'loudest wins' configuration, ensuring both channels are subjected to the same gain reduction, determined by the strongest input signal. In a mono channel, the compressor should function normally, either with only one side active, or with both sides being fed identical signals (this will depend upon the configuration adopted by the host application).

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.
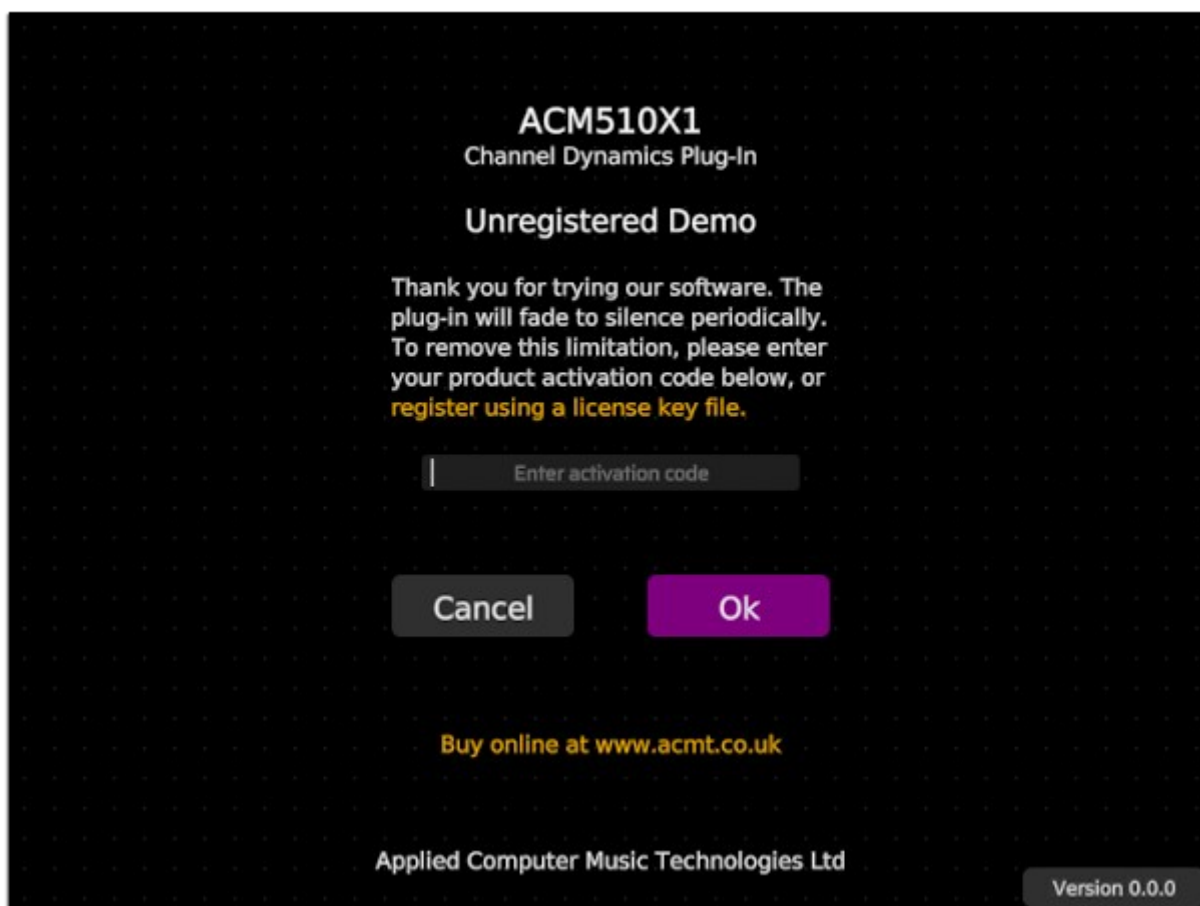
Section 5 - Presets

5.1 - Factory Presets

The ACM510X1 has five factory presets designed to provide a guide to some of the more common combinations of control settings.

Factory Preset 1 - Light Vocal Compression	Gentle 2:1 compression for vocal or acoustic instruments.
Factory Preset 2 - Heavy Vocal Compression	Heavier 10:1 compression for vocal.
Factory Preset 3 - Snare Hit Long	Heavy compression with short release time and extra make-up gain, extends 'tail' on snare hits etc.
Factory Preset 4 - Snare Hit Short	Heavy compression with long release time and extra make-up gain, controls the initial transient with less extension of the 'tail'.
Factory Preset 5 - Light Acoustic Compression	Low compression ratio for acoustic instruments.

Applied Computer Music Technologies Ltd

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.
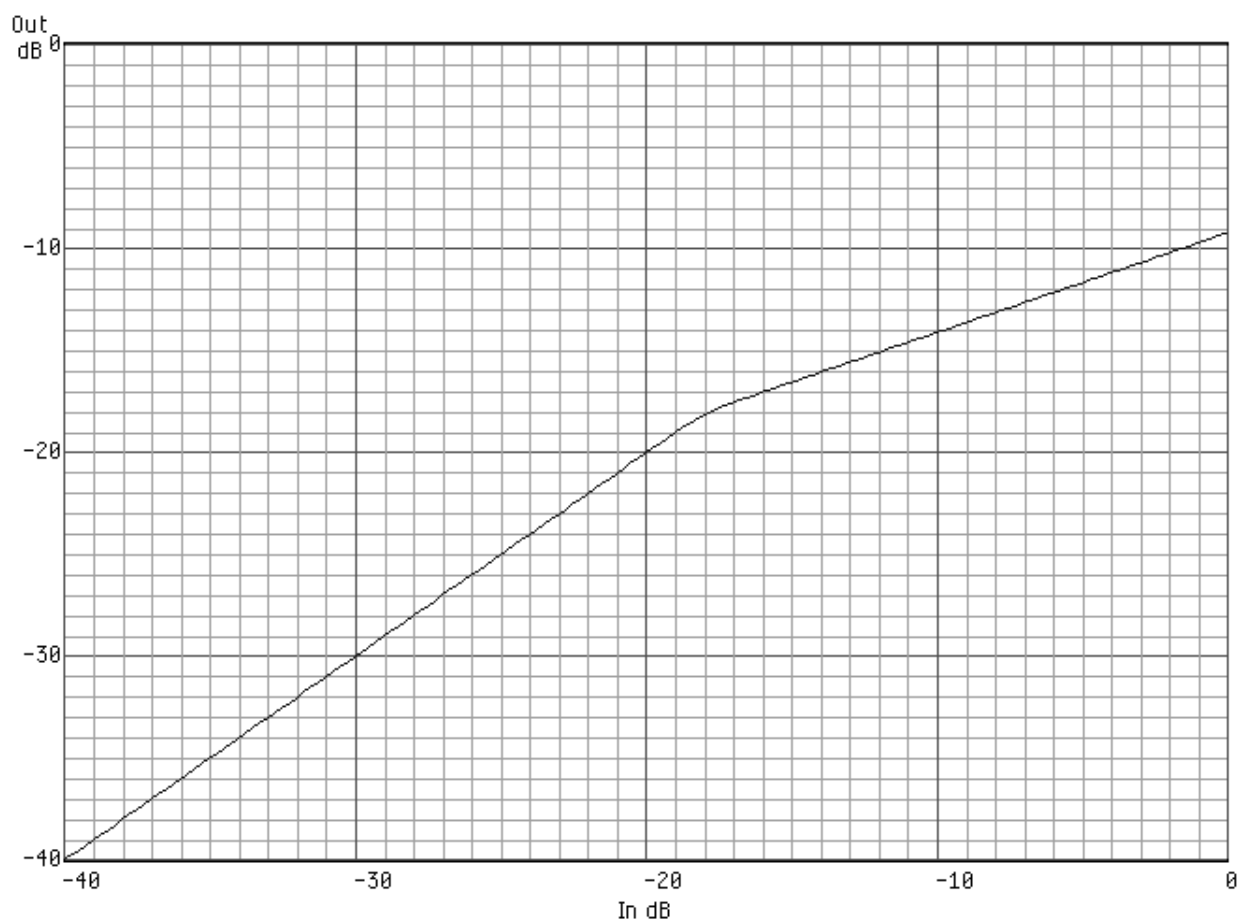
This Page Intentionally Left Blank

Appendix

Appendix A - Technical Data

<u>1 Technical Specifications</u>

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 by internal processing resolution (32bit floating point) and progressive limiting after 10dBu (-8dBFS).
Input Gain:	-6dB to +12dB.
Compressor Threshold	+10dBu to -20dBu.
Attack Time:	0.1ms to 10ms.
Release Time:	100ms to 1 second.
Compression Ratio:	1:1 to 10:1.
Make-Up Gain:	-6dB to +20dB.

Appendix B - Measured Performance

1 - Compression Ratio 2 : 1

Graph showing measured response to -40 - 0 dBFS level sweep at 1kHz.

Test Signal:

Input Signal	-40 - 0dBFS level swept sine at 1kHz
Sample Rate	48kHz

Control Settings

Threshold	0 dBu
Ratio	2 : 1

Applied Computer Music Technologies Ltd

Appendix C - Spare Parts and Service

With regular care and maintenance your new ACM510X1 compressor 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

<u>Disclaimer</u>

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.

Applied Computer Music Technologies Ltd

This Page Intentionally Left Blank