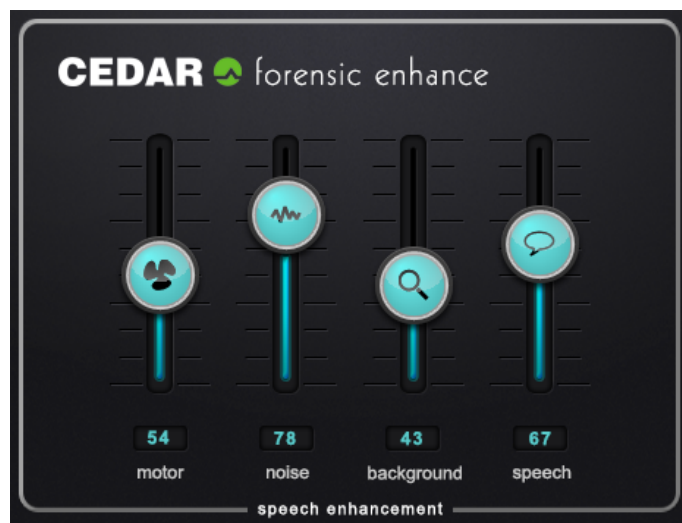


# Forensic Enhance

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CEDAR Audio Limited

[www.cedaraudio.com](http://www.cedaraudio.com)

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## Getting Started

The Forensic Enhance speech enhancement filter bank was originally developed as part of the CEDAR Trinity audio surveillance system, but it's now available as a module for CEDAR Cambridge as well as the Forensic Enhance VST/AU/AAX plug-in to run on hosts such as Pro Tools®, Adobe Audition® and Adobe Premiere®.

Designed specifically for audio forensic use, it provides four related tools that allow you to suppress background noise and increase the intelligibility of speech. It also allows you to enhance the background if that contains wanted detail. Its user interface has been designed to operate with the minimum of parameters so that users can obtain first-class results in the quickest possible time.

Forensic Enhance conforms to the 64-bit AAX Native, 64-bit VST 2.4 and VST 3, and AU plug-in formats. It is not compatible with 32-bit operating systems or hosts.

### Unpacking

Forensic Enhance is supplied for hosts using an iLok dongle or iLok Cloud, so no physical objects are necessary or supplied.

### Assumed Knowledge

This manual assumes that you are fully conversant with your Mac or PC system(s), and that you know how to operate the host software onto which you're loading Forensic Enhance. It will refer to operations that are common to these products, but will not attempt to explain them.

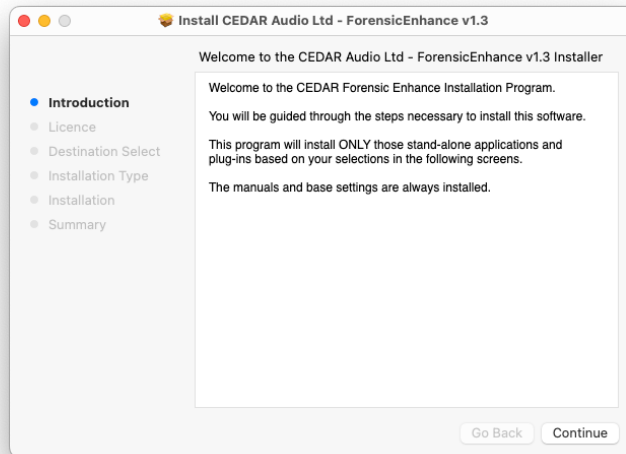
### Troubleshooting Non-CEDAR Components

If you encounter problems with your Macintosh®, macOS®, Mac OS X®, your PC, Microsoft Windows® or any 3<sup>rd</sup> party host system, please refer to their support materials or contact the dealer that supplied these to you. Unless appointed independently as authorised dealers for the following products, CEDAR Audio's dealers will not attempt to provide technical support for:

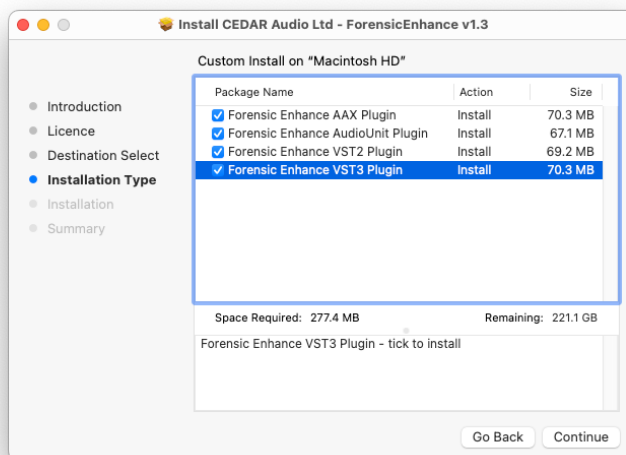
- Macintosh computers
- macOS and Mac OS X
- PCs of any description
- Microsoft Windows
- 3<sup>rd</sup> party host hardware
- 3<sup>rd</sup> party host software

## Installing Forensic Enhance – Mac

- Before proceeding, ensure that any older versions of the plug-in (if any) are archived and removed from the plug-in folder.
- Double-click on the installer package:  
**CEDARAudioLtd-ForensicEnhance1.3.pkg**
- Follow the instructions offered by the installer.



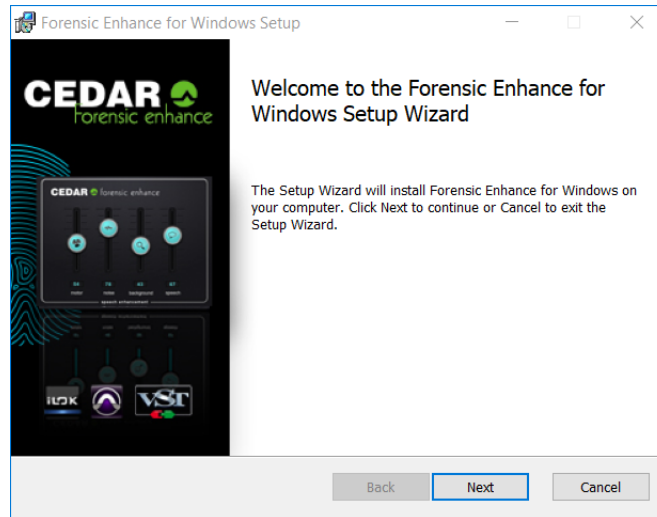
- Ensure that you have sufficient space on your drive and then press Install to install the complete package or press the Customise button to select which format and/or selection of modules are loaded.



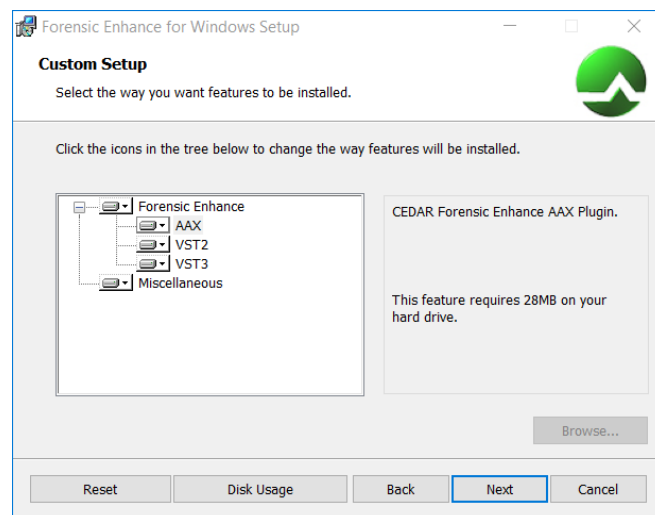
- A message will appear to tell you that installation was completed successfully.
- Licensing of Forensic Enhance is achieved using the iLok licence manager. Please refer to your iLok documentation.

## Installing Forensic Enhance – PC

- If necessary, uninstall any previous version of Forensic Enhance.
- Double-click on the installer package: **ForensicEnhance\_Full\_Setup.exe**



- Follow the instructions offered by the installer.
- Ensure that you have sufficient space on your drive and then select the processes you wish to install in the required plug-in format(s).



- A message will appear to tell you that installation was completed successfully. Click on OK and Finish.
- Licensing of Forensic Enhance is achieved using the iLok licence manager. Please refer to your iLok documentation.

## Operation



There are four processes, each with a single control. The controls have scales from zero to 100. There are no units for these numbers.

### Motor

The motor algorithm recognises repetitive patterns in noise and adapts continuously to combat them. It is good at dealing with motor noises in vehicles, air conditioning noise in office environments, and other constant low-frequency noises. It is also good at reducing reverberation and echoes, wind noise, hums and some repetitive electrical noises. When applicable, increase the amount of processing until a satisfactory amount of noise suppression is achieved without making the wanted speech sound too thin.

### Noise

High levels of broadband noise can cause listener fatigue. The broadband noise removal algorithm is therefore useful for removing all kinds of background noise as well as low frequency road noise and background speech in café type situations. It will also counteract any hiss introduced by the motor process. Use it in conjunction with the motor control on noisy vehicle recordings and also café type recordings, especially if there is an electrical noise source (such as a refrigerator) or interfering background speech. To do so, increase the amount of noise removal up to (but not beyond) the point that speech begins to sound less intelligible and, if necessary, reduce the amount of processing during difficult periods of audio.

### Background

The background process makes background sounds appear louder relative to the foreground. This is useful if someone who is near the microphone is talking to someone who is further away. It also works well on emergency calls where an operator is talking to a caller but there is something of interest happening in the background. It should nearly always be used in conjunction with the motor and noise controls because it's important to reduce any noise in the signal before bringing up the background level. Note that increasing the background value will increase the overall level of the audio, so you should adjust the final output level downward if necessary. This will be particularly important if you are monitoring using headphones.



## Speech

The speech control enhances important frequencies in the speech band, often making the wanted speech sound brighter, more listenable and more intelligible. It should be adjusted after finding suitable settings for the other three controls. When applicable, increase the amount of speech enhancement to help reveal the voices. If the sound starts to become harsh, loud or boxy, reduce the value a little.

## Tutorial:

Always start each enhancement session by making sure that the sliders are at the bottom of their ranges. You can achieve this by moving the slider itself or by typing the desired value (in this case, zero) into the value window underneath each.

Now listen to the noisy audio. If there is a pronounced continuous component to the noise, raise the **motor** slider to a moderate setting – say, in the range 5 to 10 – and listen carefully to the processed signal. If appropriate raise it further until continuous noise is suppressed to the desired degree or even eliminated. If the voice becomes too thin, reduce the value of this parameter a little.

If there is broadband noise or hiss still present, raise the **noise** slider to a similar initial setting and then adjust this so that this type of noise is suppressed to the desired degree or eliminated.

- Work on reducing any noise using the **motor** and **noise** controls before raising the background and speech controls above zero.
- If the noise contained in the recording isn't appropriate for using the **motor** control, return this to zero. Using **motor** when it's unnecessary can damage the wanted signal.

Having found suitable settings for the **motor** and **noise** controls, decide whether you wish to enhance the background, which may contain quiet speech of interest. Raise the **background** slider to increase the loudness of low-level signals.

If the speech is still unclear, you can further enhance it by raising the **speech** slider by an appropriate amount.

In most cases, you should attempt to find the minimum value of each parameter that achieves optimum intelligibility. Raising the values of the controls too much can (and usually will) make the processed signal sound unpleasant and less intelligible. This is especially true for the **noise** and **speech** controls. Experiment to find the optimum combination of parameter values.

Use the **bypass** control in the host system to switch the processing off and on regularly to check that what you're doing is appropriate, and to make sure that the processed signal is an improvement upon the original.

*Note:*

- It is almost always better to retain some noise in the signal rather than to try to remove all of it. An over-processing signal will sound unnatural, be less pleasant, and will often be less intelligible.

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## Contact Information and Support

### Headquarters

Address:	CEDAR Audio Ltd, 20 Home End, Fulbourn, Cambridge, CB21 5BS, UK
Telephone and Fax:	T: +44 1223 881771 F: +44 1223 881778
Email:	support@cedaraudio.com

### USA Office

Address:	CEDAR Audio USA, 82 Gilman Street, Portland, ME 04102, USA
Telephone and Fax:	T: +1 207 828 0024 F: +1 207 773 2422
Email:	cedarusa@cedaraudio.com

### German Office

Address:	CEDAR Deutschland, Görlitzer Str 3, D-49525 Lengerich, Deutschland
Telephone and Fax:	T: +49 5481 945087 F: +49 5481 945088
Email:	info@cedaraudio.de

### Web

English language:	www.cedaraudio.com
German language:	www.cedaraudio.de

### Worldwide Dealer List

For an up-to-date dealer list, please visit [www.cedaraudio.com](http://www.cedaraudio.com).

### Technical Support

Should you experience difficulties with Forensic Enhance, please contact your local dealer or CEDAR office. Alternatively, you may send an email to **support@cedaraudio.com**. In either case, please provide the following details:

- Your iLok account name and your software version number.
- Details of the host system and version numbers.
- A precise description of the problem.

## Licence and Limited Warranty

### 1. DEFINITIONS

In this Licence and Limited Warranty the following words and phrases shall bear the following meanings:

'the Company' is CEDAR Audio Limited of 20 Home End, Fulbourn, Cambridge, CB21 5BS, UK;

'the System' means any instance of CEDAR Forensic Enhance;

'this Document' means this Licence and Limited Warranty.

### 2. ISSUE AND USE OF THE SYSTEM

2.1 The terms and conditions of this Document are implicitly accepted by any person or body corporate who shall at any time use or have access to the System, and are effective from the date of supply of the System by CEDAR Audio Limited to its immediate customer.

2.2 The Company hereby grants to the Licensee and the Licensee agrees to accept a non-exclusive right to use the System.

### 3. PROPERTY AND CONFIDENTIALITY

3.1 The System contains confidential information of the Company and all copyright, trademarks, trade names, styles and logos and other intellectual property rights in the System including all documentation and manuals relating thereto are the exclusive property of the Company. The Licensee acknowledges that all such rights are the property of the Company and shall not question or dispute the ownership of any such rights nor use or adopt any trading name or style similar to that of the Company.

3.2 The Licensee shall not attempt to reverse engineer, modify, copy, merge or transcribe the whole or any part of the System or any information or documentation relating thereto.

3.3 The Licensee shall take all reasonable steps to protect the confidential information and intellectual property rights of the Company.

### 4. LIMITED WARRANTY AND POST-WARRANTY OBLIGATIONS

4.1 The Company warrants that the System will perform substantially in accordance with the appropriate section of its accompanying product manual for a period of one year from the date of supply to the Company's immediate customers.

4.2 The Company will make good at its own expenses by repair or replacement any defect or failure that develops in the System within one year of supply to the Company's immediate customer.

4.3 The Company shall have no liability to remedy any defect, failure, error or malfunction that arises as a result of any improper use, operation or neglect of the System, or any attempt to repair or modify the System by any person other than the Company or a person appointed with the Company's prior written consent.

4.4 In the case of any defect or failure in the System occurring more than twelve months after its supply to the Company's immediate customer the Company will at its option and for a reasonable fee make good such defect or failure by repair or replacement (at the option of the Company) subject to the faulty equipment having first been returned to the Company. The Company will use reasonable efforts to return repaired or replacement items promptly, all shipping, handling and insurance costs being for the account of the Licensee.

4.5 The above undertakings 4.1 to 4.4 are accepted by the Licensee in lieu of any other legal remedy in respect of any defect or failure occurring during the said period and of any other obligations or warranties expressed or implied including but not limited to the implied warranties of saleability and fitness for a specific purpose.

4.6 The Licensee hereby acknowledges and accepts that nothing in this Document shall impose upon the Company any obligation to repair or replace any item after a time when it is no longer produced or offered for supply by the Company or which the Company certifies has been superseded by a later version or has become obsolete.

### 5. FORCE MAJEURE

The Company shall not be liable for any breach of its obligations hereunder resulting from causes beyond its reasonable control including, but not limited to, fires, strikes (of its own or other employees), insurrection or riots, embargoes, container shortages, wrecks or delays in transportation, inability to obtain supplies and raw materials, or requirements or regulations of any civil or military authority.

## 6. WAIVER

The waiver by either party of a breach of the provisions hereof by the other shall not be construed as a waiver of any succeeding breach of the same or other provisions, nor shall any delay or omission on the part of either party to exercise any right that it may have under this Licence operate as a waiver of any breach or default by the other party.

## 7. NOTICES

Any notices or instruction to be given hereunder shall be delivered or sent by first-class post or telecopier to the other party, and shall be deemed to have been served (if delivered) at the time of delivery or (if sent by post) upon the expiration of seven days after posting or (if sent by telecopier) upon the expiration of twelve hours after transmission.

## 8. ASSIGNMENT AND SUB-LICENSING

The Licensee may at his discretion assign the System and in doing so shall assign this Licence its rights and obligations to the purchaser who shall without reservation agree to be bound by this Licence. The original Licensee and any subsequent Licensees shall be bound by the obligations of this Licence in perpetuity.

## 9. LIMITATION OF LIABILITY

The Company's maximum liability under any claim including any claim in respect of infringement of the intellectual property rights of any third party shall be, at the option of the Company either:

(a) return of a sum calculated as the price received for the System by the Company from its immediate customer depreciated on a straight line basis over a one year write-off period; or

(b) repair or replacement of those components of the System that do not meet the warranties contained within this Document.

The foregoing states the entire liability of the Company to the Licensee.

## 10. CONSEQUENTIAL LOSS

Even if the Company has been advised of the possibility of such damages, and notwithstanding anything else contained herein the Company shall under no event be liable to the Licensee or to any other persons for loss of profits or contracts or damage (whether direct or consequential) arising in connection with the System or any modification, variation or enhancement thereof and including any documentation or data provided by the Company or for any other indirect or consequential loss.

## 11. ENTIRE AGREEMENT

The Company shall not be liable to the Licensee for any loss arising in connection with any representations, agreements, statements or undertakings made prior to the date of supply of the System to the Licensee.

## 12. TERMINATION

This Licence may be terminated forthwith by the Company if the Licensee commits any material breach of any terms of this Licence. Forthwith upon such termination the Company shall have immediate right of access to the System for the purpose of removing it.

## 13. SEVERABILITY

Notwithstanding that the whole or any part of any provision of this Document may prove to be illegal or unenforceable the other provisions of this Document and the remainder of the provision in question shall remain in full force and effect.

## 14. HEADINGS

The headings to the Clauses are for ease of reference only and shall not affect the interpretation or construction of this Document.

## 15. LAW

This Document shall be governed by and construed in accordance with English law and all disputes between the parties shall be determined in England in accordance with the Arbitration Act 1950 and 1979.

# Forensic Enhance

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w: [www.cedaraudio.com](http://www.cedaraudio.com)

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