



SOFTWARE INSTALLATION AND OPERATION PROCEDURE

Part No.: LSC-APS

Description: **Loudspeaker Controller Audio Programming Software**
 Document No.: **LSC-APS README** Rev.: **1.00**

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2. Requirements

2.1 Equipment

Model No.	Manufacturer	Description
7,8,10 - LSC-APS**	- - AEM	Windows 64bit PC Computer USB A male to 3.5mm male Cable* V1.00 or other compatible Programming Software

*- an approved equivalent may be substituted.

** - other compatible versions or an approved equivalent may be substituted.

3. Software Installation

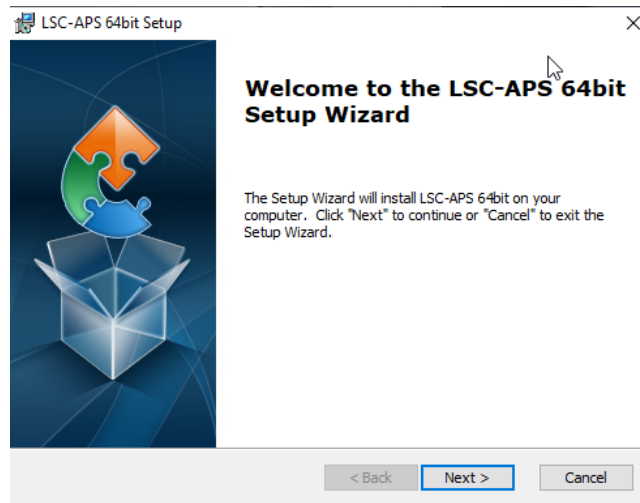
To determine the current software version, open the previously installed LSC-APS program and locate the version number.

3.1 LSC-APS Installation

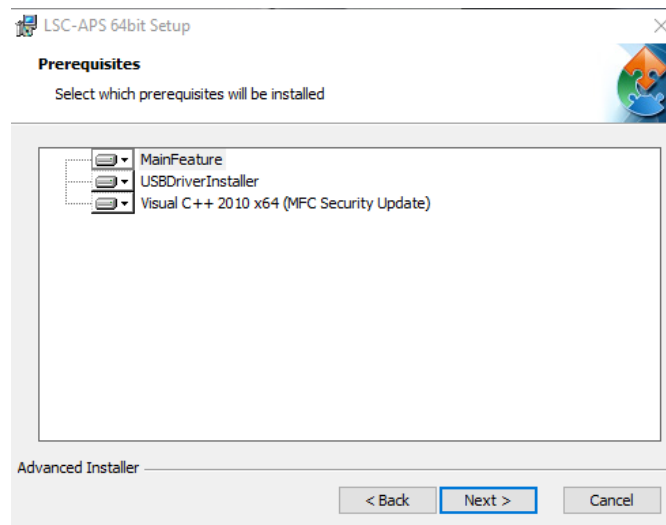
3.1.1 Uninstall any previous version of the LSC-APS software.

3.1.2 Navigate to the appropriate directory, copy the latest version of the LSC-APS.exe to your local machine and double click the LSC-APS.exe (Administrator Privileges will be required. It may be necessary to contact your network administrator)

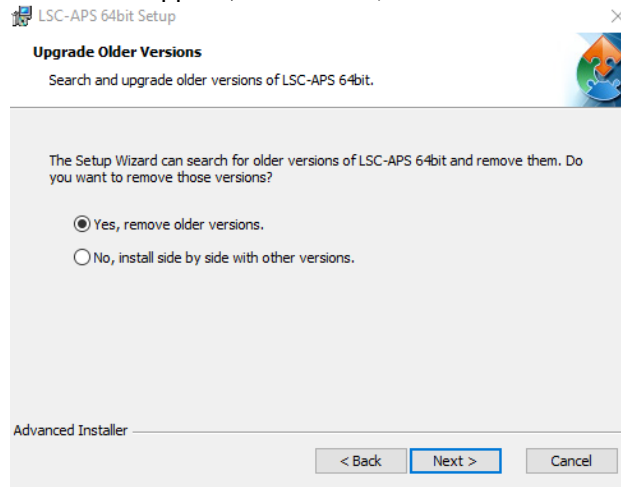
3.1.3 The following window will appear. The version number and document names listed in the application windows below are for reference only. Click Next.



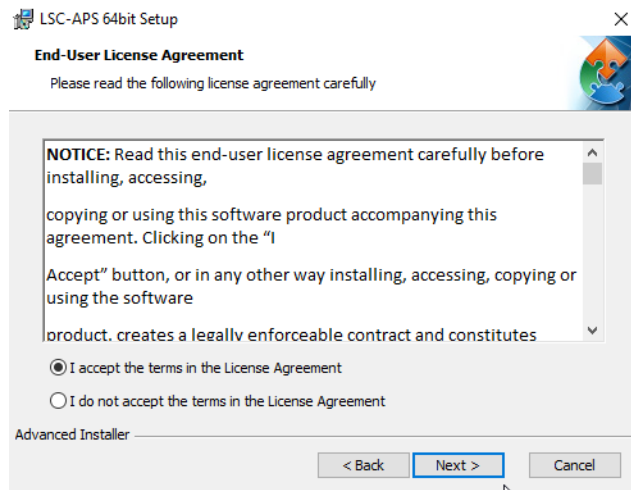
3.1.4 The following window will appear, click "Next".



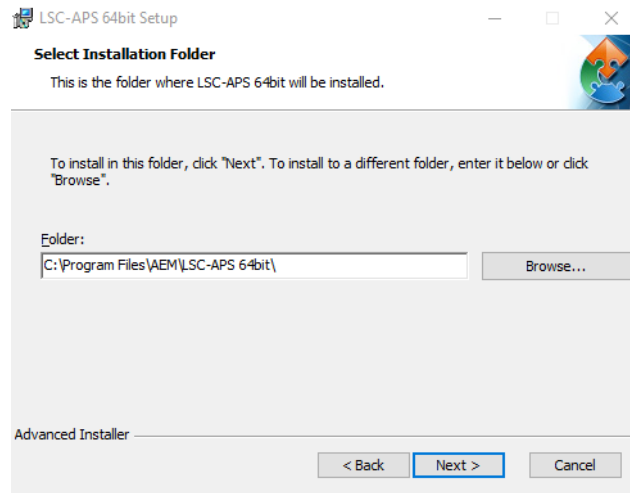
3.1.5 The following window will appear, select “Yes, remove older versions.” and click “Next”.



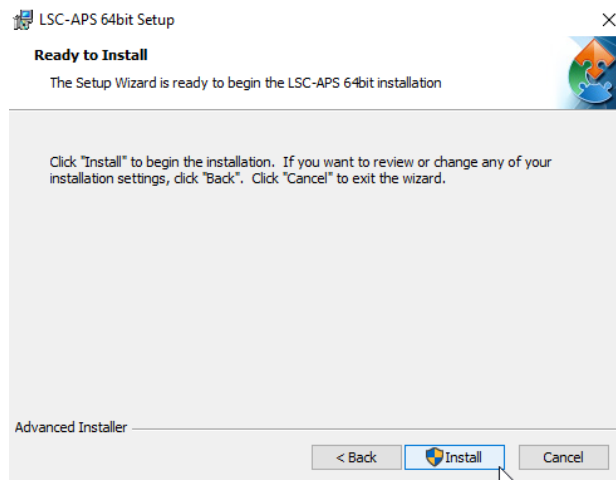
3.1.6 The following window will appear, Read the user agreement. Select and appropriate answer and click “Next”.



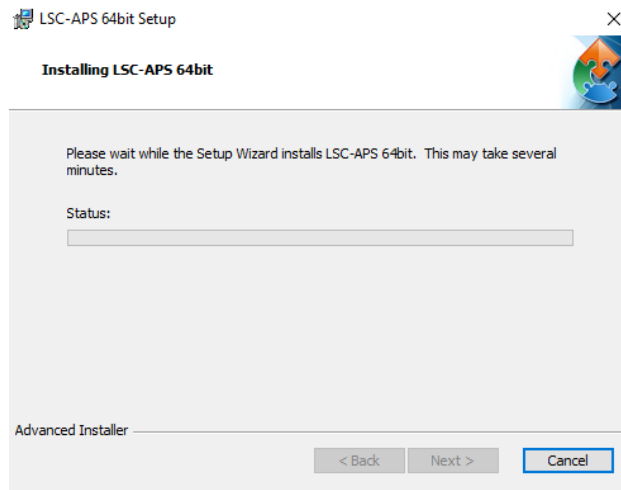
3.1.7 The following window will appear, click “Next”.



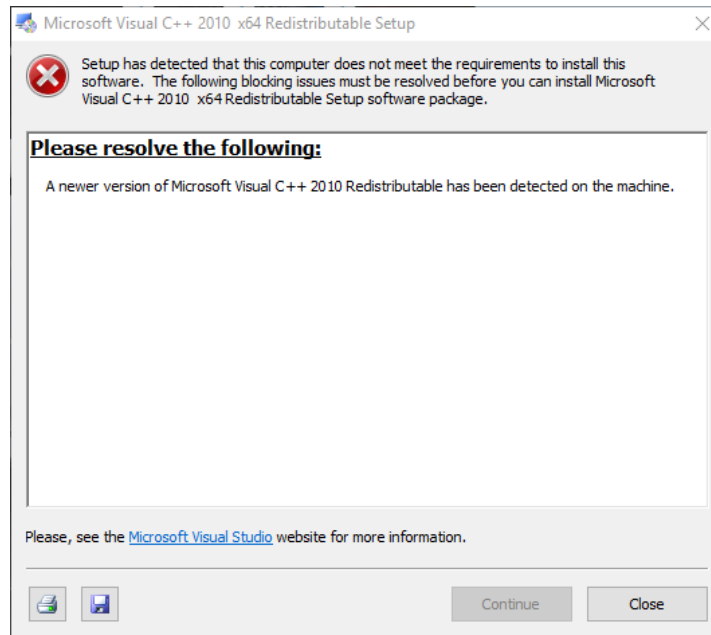
3.1.8 The following window will appear, click “Install”.



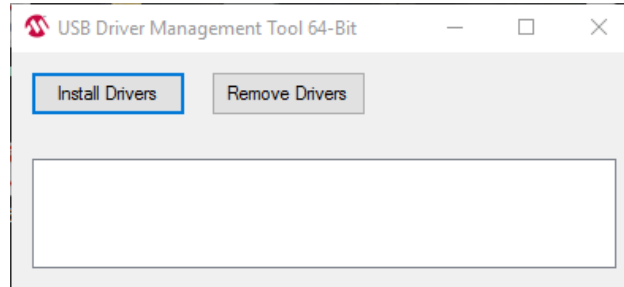
- 3.1.9 A progress bar will appear to outline the installation progress. Wait for the installation to complete.



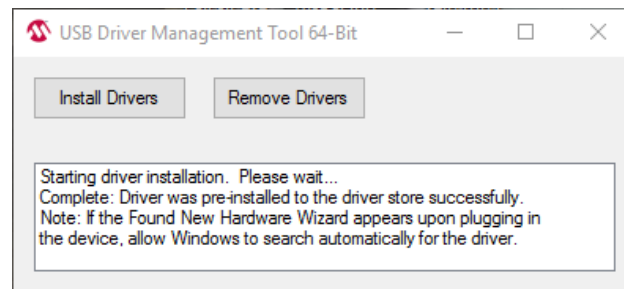
- 3.1.10 Once file extraction has completed the window below may appear. If the PC does **not** have a version of Visual studio C++ 2010 click "Continue". If a newer version of Visual studio is already installed, the "Continue" button will not be clickable. Click "Close" to continue software installation.



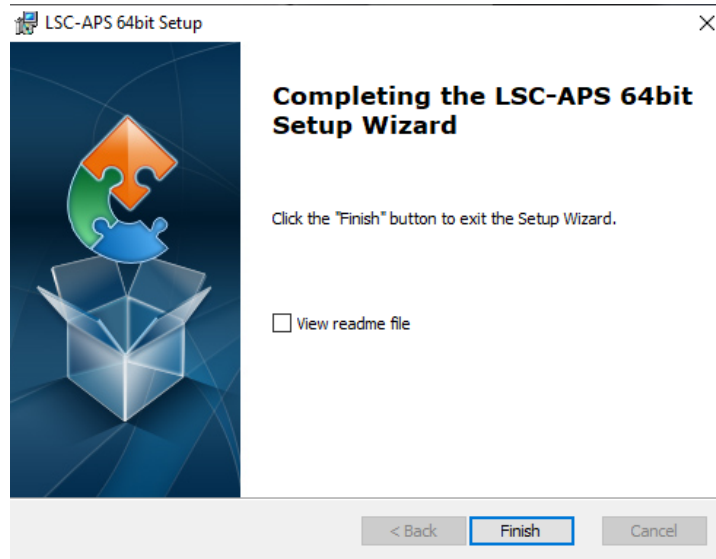
- 3.1.11 If the PC does not have the drivers installed. Click “Install Drivers”. This may take a few minutes to complete.



- 3.1.12 If the driver was previously installed the following message will be displayed. Click the “X” in the top right-hand corner of the window to close the program.



- 3.1.13 A progress bar should now illustrate program installation. Once complete, the following window will appear. Click “Finish”



- 3.1.14 Installation of the LSC-APS program is now complete.

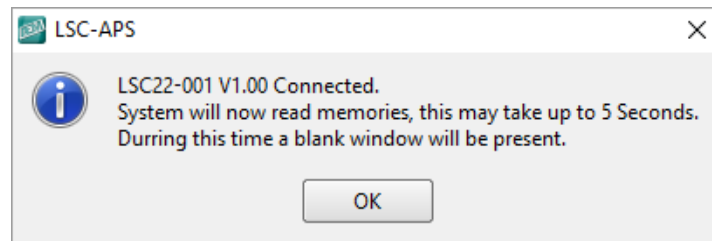
4. LSC-APS

4.1 LSC-APS Operation

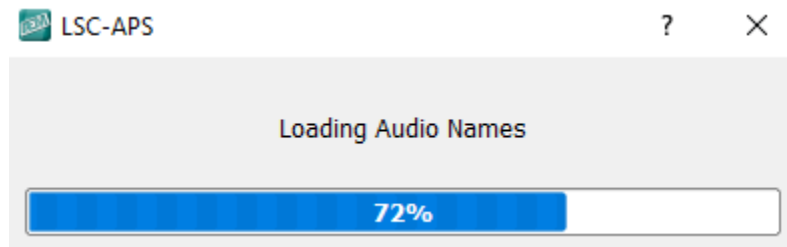
- 4.1.1 Ensure LSC22 is powered OFF. Connect the USB to 3.5mm jack to the front of the LSC22-001. Connect the USB plug to a USB port on a PC with LSC-APS installed. Reference section 2 above, if the Personal Computer (PC) does not have the LSC-APS application installed.

Note: Allow drivers to install on USB connection before starting LSC-APS application.

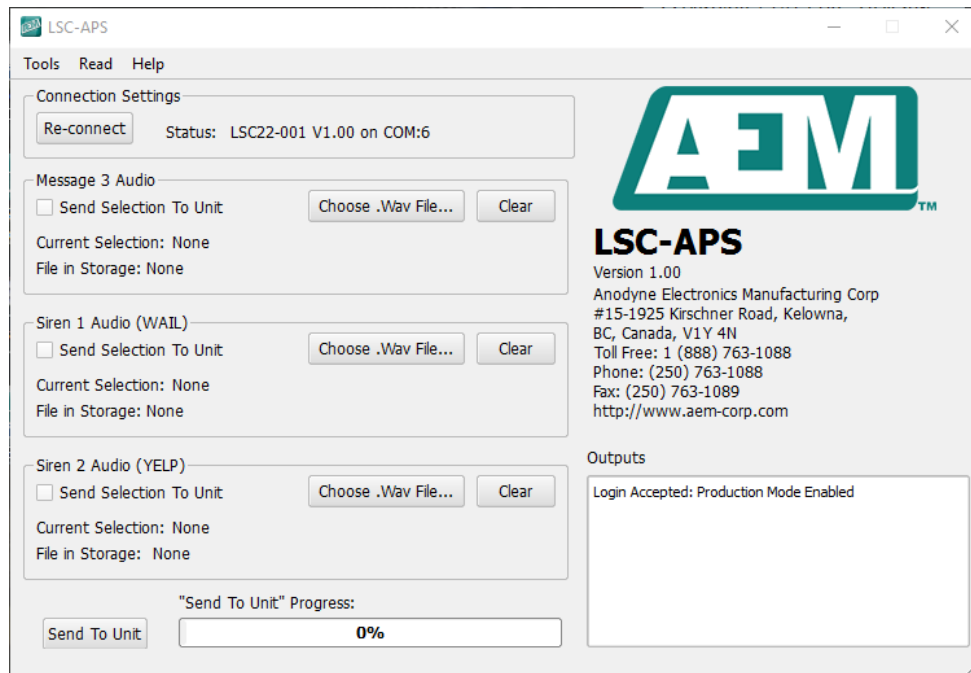
- 4.1.2 Double click the desktop icon for the LSC-APS program or navigate to the appropriate directory and double click the LSC-APS executable. Product names and Version numbers illustrated in the program windows are for reference only.
- 4.1.3 The following window will display the product name and internal bootloader version upon a successful connection during LSC-APS start-up. Click "OK".



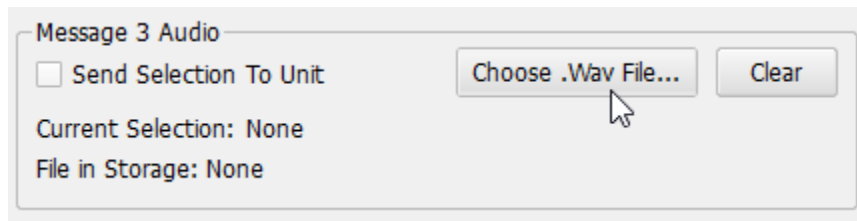
- 4.1.4 A loading bar will appear.



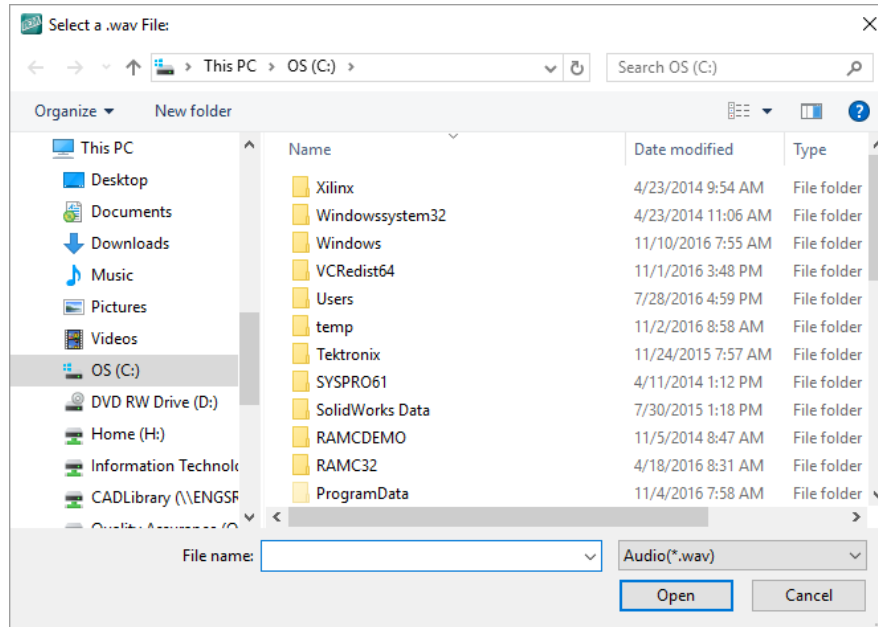
- 4.1.5 The name of the product, version number and connected COM (Communication Port) should be displayed beside the “Re-connect” button.



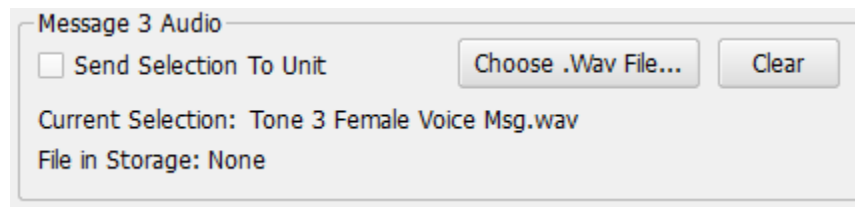
- 4.1.6 Select “Choose. Wav File...” within the Message 3 Audio Group box to select a new file to upload to the connected LSC22 .



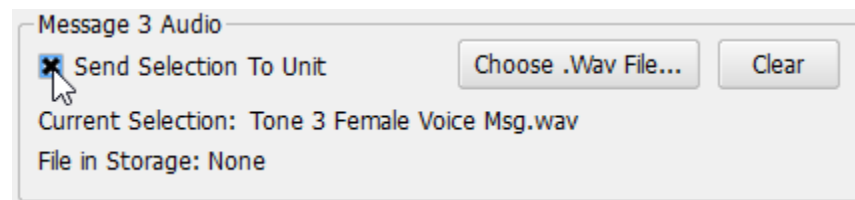
- 4.1.7 Navigate to the appropriate directory and select the file listed on the appropriate **Product Build Standard**. Click “Open”.



- 4.1.8 The file name of the selected file will be displayed beside “Current Selection:”

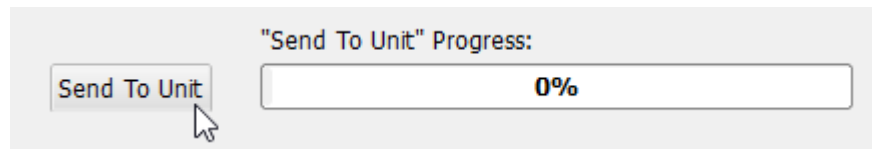


- 4.1.9 Click the “Send Selection To Unit” Checkbox. If this is the only .wav file to be loaded, proceed to step 4.1.11.

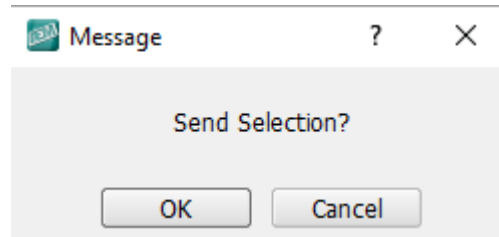


- 4.1.10 Repeat steps 4.1.6 to 4.1.9 for the Siren 1 Audio (Wail) and Siren 2 Audio (Yelp) group boxes.

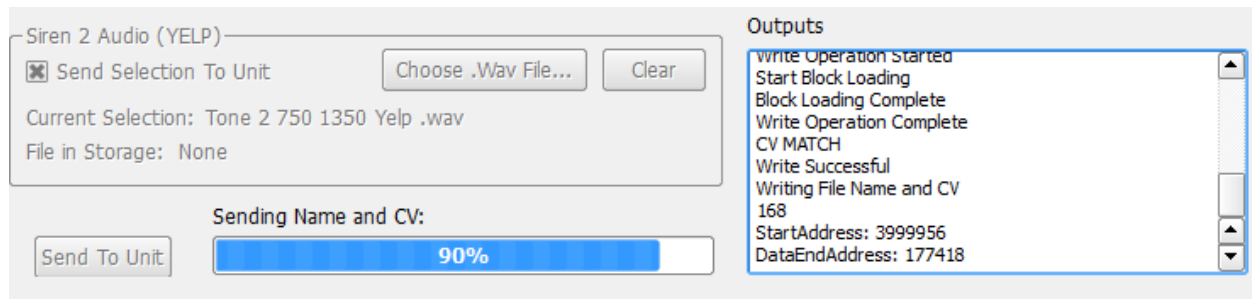
- 4.1.11 Click “Send To Unit”.
Note: Clicking “Send To Unit”, will send all the chosen selected .wav files, if the corresponding group boxes are also checked.



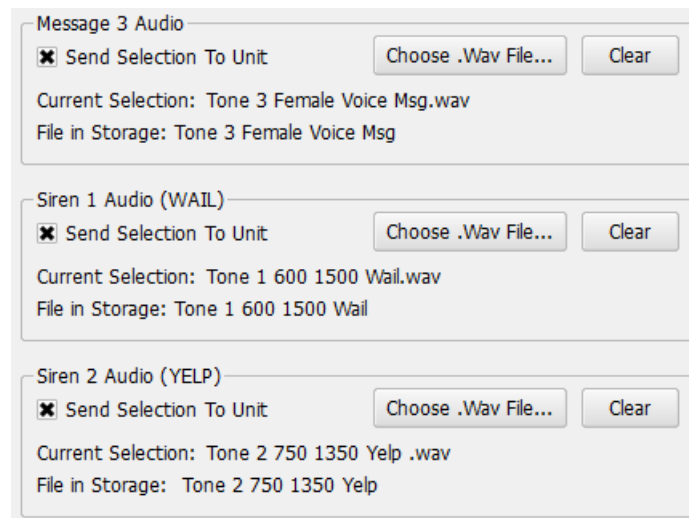
- 4.1.12 The following window will appear. Click “OK”.



- 4.1.13 The progress bar will display the file loading processes and the Output window displays status information.



- 4.1.14 The names of the written .wav files should now be displayed in each box beside “File in Storage:”.



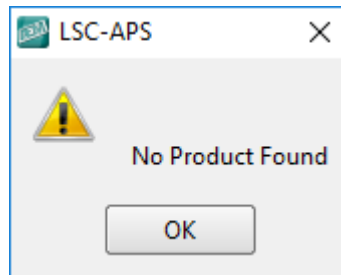


4.1.15 Close the program.

5. LSC-APS Troubleshooting

5.1 No Product Found

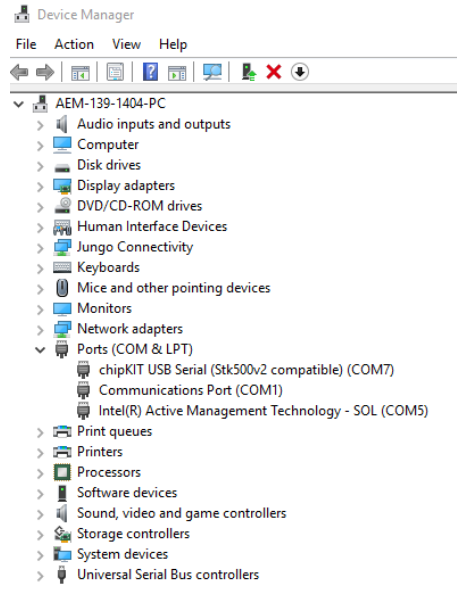
The “No Product Found” Pop up message may display during initial LSC-APS start-up or during operation on the LSC-APS program if a product is not connected to the software. Click “OK”.



5.1.1 Make sure a LSC22 is connected to the PC computer and ensure the cables connectors are fully connected.

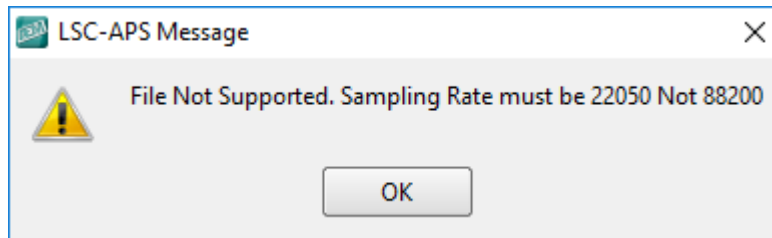
5.1.2 If a LSC22 is connected but the “No Product Found” message occurs. Close the LSC-APS program, unplug the USB connection, wait 5 seconds and re-connect the USB cable and wait 5 seconds before starting the LSC-APS program or before clicking re-connect while the LSC-APS program is open.

- 5.1.3 Make sure the LSC22 driver is installed correctly by navigating to “Device Manager” in windows. The LSC22 will show up as “chipKIT USB Serial (stk500v2 compatible)”



5.2 **File Not Supported**

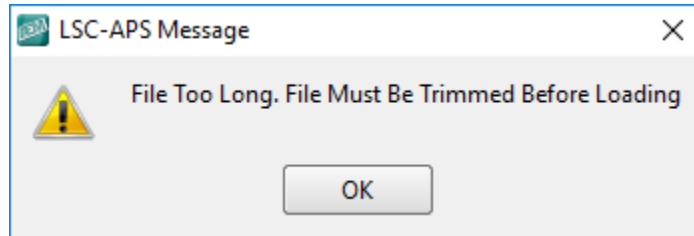
The File Not supported Message may display if the user has selected a .wav file that is not compatible with the connected LSC22. The file must be formatted as described in section 6.0 for best performance.



- 5.2.1 The message above informs the user that the file must be sampled at 22050 samples per second, not 88200 samples per second.

5.3 **File Too Long**

The File Too Long Message will display if the select file exceed the maximum file length for the LSC22. It is recommended to follow section 6.0 and edit the file to the appropriate length.



6. **Audio File Requirements (.Wav)**

Note: Basic audio editing knowledge or experimentation will be required to edit audio correctly. The original Audio should be recorded in a noise free environment with consistent audio volume applied to the recording microphone for bet results.

6.1 **Free Audio Editing Software Examples**

6.1.1 Audacity

6.1.2 Goldwave (Free edition)

6.1.3 Acoustica Basic Edition

6.2 **File Format**

6.2.1 The audio format for the LSC22 is the following:

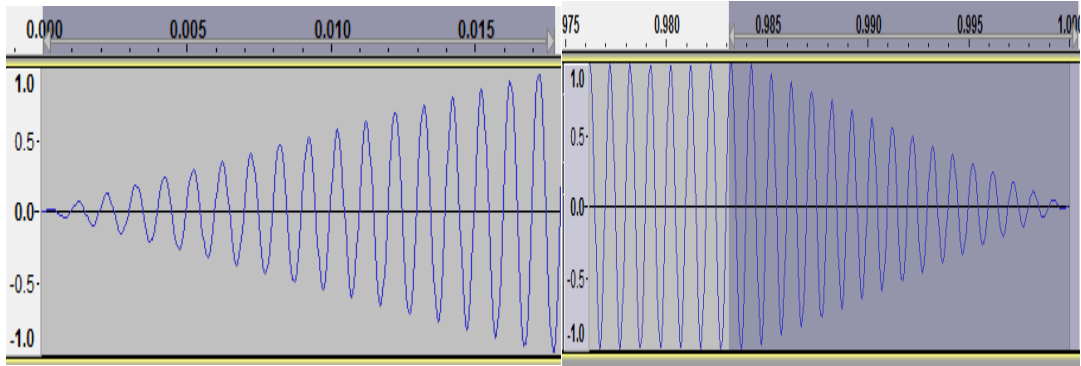
File Type: .wav
Sampling rate: 22050
Channels: Mono (1)
Bits: 16bit
Message length: 2.0 Minutes (Max)

6.3 **File Data Requirements**

Note: The examples displayed below were computed using audacity.

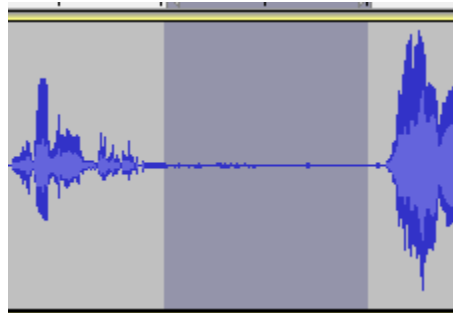
6.3.1 The audio data should be modified using an audio editing program.

6.3.2 The start of the data should fade-in and the end of the audio data should fade-out. The fade rate is dependent on file data. Fade is defined as a gradual rise or gradual reduction of signal amplitude. Fade is particularly important on custom siren audio to reduce pops and clicks during repetition. Longer file lengths before repetition also reduces the presence of any pops or clicks.



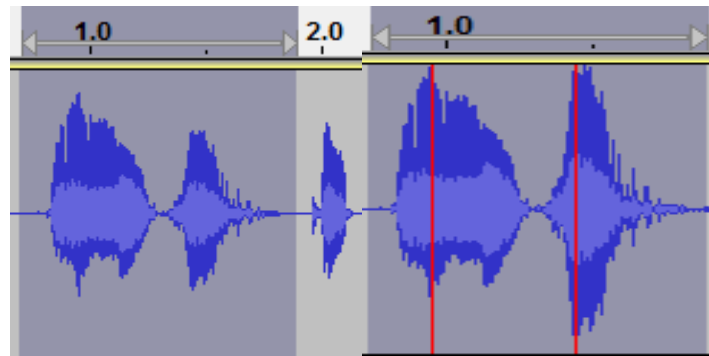
Fade in (left) Fade out (right) example

- 6.3.3 Pauses or delays in audio should be minimized to achieve the highest possible audio output. The highlighted region below illustrates a long pause.



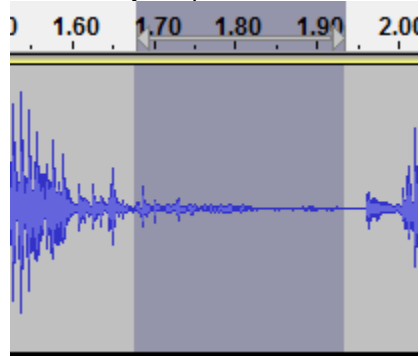
Pause example

- 6.3.4 Amplitude of the audio data should be normalized and the gain maximized. This process will increase the volume of the audio file and make the volume more consistent throughout playback.



Unedited (left), Normalized (right)

6.3.5 Filter background noise and/or any frequencies above 14kHz.



Noise in the selected region

End of Installation Procedure