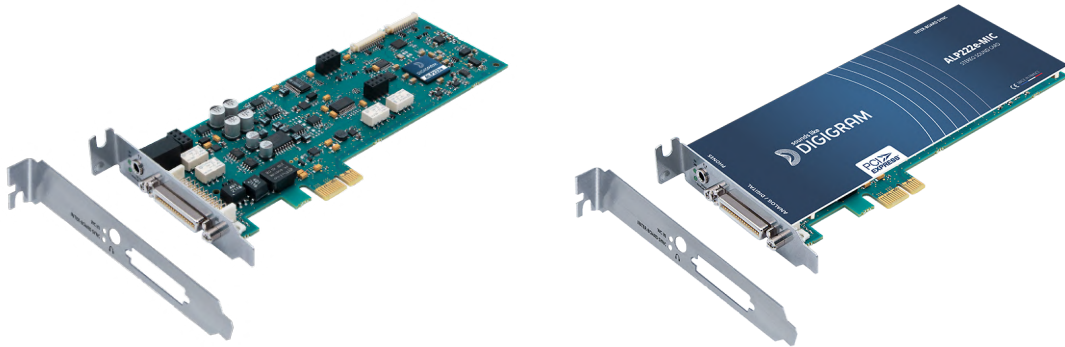


# User Manual

# ALP222e &

# ALP222e-Mic

*Professional stereo sound cards*



May 2023

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# 1 INTRODUCTION

This document describes the installation and use of the PCI Express DIGIGRAM ALP222e & ALP222e-Mic sound cards under Windows and Linux.

These two stereo cards are part of the ALP-X professional sound cards range, which also includes multi-channel cards (4, 8 channels).

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## 2 IMPORTANT NOTICE

### Certifications

*The product is currently being certified.*

This product has been designed in accordance with the following standards:

- EMC Directive 2014/30/EU.
- FCC Rules Part 15, Subpart B.

To ensure compliance with the standards listed above, the following rules must be followed:

- The cable supplied must not be modified.
- The additional cables used must have their respective shielding connected at each end.

### Caution



An electrostatic discharge (ESD) can damage the card components. Take the following precautions to avoid such damage when handling the card:



Connect the card and everything entering into contact with it to the earth potential by providing a conductive surface and discharge paths. Take these precautions as a minimum:

- Unplug all power and signal sources.
- Place the card on an earthed conductive work surface.
- Connect to the earth potential using an anti-static strap or by holding an earthed object.
- Earth all the tools entering into contact with the card.

**Given the shortened length of the PCI EXPRESS™ connector and the resulting lack of mechanical stability, we strongly advise against transporting the cards installed in a computer, unless its chassis or case has a device for holding the card firmly in place to avoid material damage.**

## 3 BOX CONTENTS

Thank you for purchasing a DIGIGRAM sound card in the ALP-X range.

The box contains:

- an ALP222e or ALP222e-Mic sound card equipped with a standard height bracket (full height: 120 mm),
- a low-profile bracket (79.2 mm) that can be fitted instead of the full-height bracket,

The breakout cable that bears the XLR and BNC connectors is available as an option.

Please contact your card supplier to acquire the Digigram-certified cable.



To download the most recent card driver, please visit the digigram website at: [www.digigram.com/support/drivers-firmware-downloads/](http://www.digigram.com/support/drivers-firmware-downloads/)

## 4 GENERAL CHARACTERISTICS

ALP222e and ALP222e-Mic are PCI EXPRESS™ x1 sound cards. They can be inserted into and therefore operate in PCIe® x1, x2, x4, x8 or x16 slots.

### 4.1 Main hardware characteristics

- 2 balanced analog inputs (can be used unbalanced) with software-adjustable analog gain and a maximum input level of +24 dBu.  
Mic/Line level selection and switchable 48V phantom power on ALP222e-Mic.
- 2 electronically balanced analog outputs, with a maximum output level of +24 dBu. (Electronically balanced outputs can process either balanced or unbalanced lines without loss of level).
- 1 stereo AES3 digital input, 32 kHz to 192 kHz, with high quality hardware sample rate converter (SRC).
- 1 AES11 synchronisation input (up to 192 kHz)
- 1 AES3 digital stereo output (up to 192 kHz)
- 1 mini jack stereo headphone output, which replicates the analog outputs.
- 1 word clock input/output (up to 192 kHz)
- 2 GPI dry contacts and 2 GPO relays
- Inter-card synchronisation

### 4.2 Main software characteristics

- Low latency multi-card drivers
- Wasapi/DirectSound and ASIO application programming interfaces under Windows, and Alsa and libgpi for Linux
- Simultaneous acquisition and playback in PCM (8, 16 and 24 bit)
- On-board mixing of physical audio inputs and software "playback" devices to physical audio outputs and software recording devices.
- "ALP-X Manager" application installed with the driver, to control the card settings:
  - clock source
  - frequency of the fallback internal clock
  - input and output gains, phantom power (ALP222e-Mic), RMS VU-meters with peak-meters
  - routing of inputs to outputs
- API for implementing the management of the card settings in a software application.

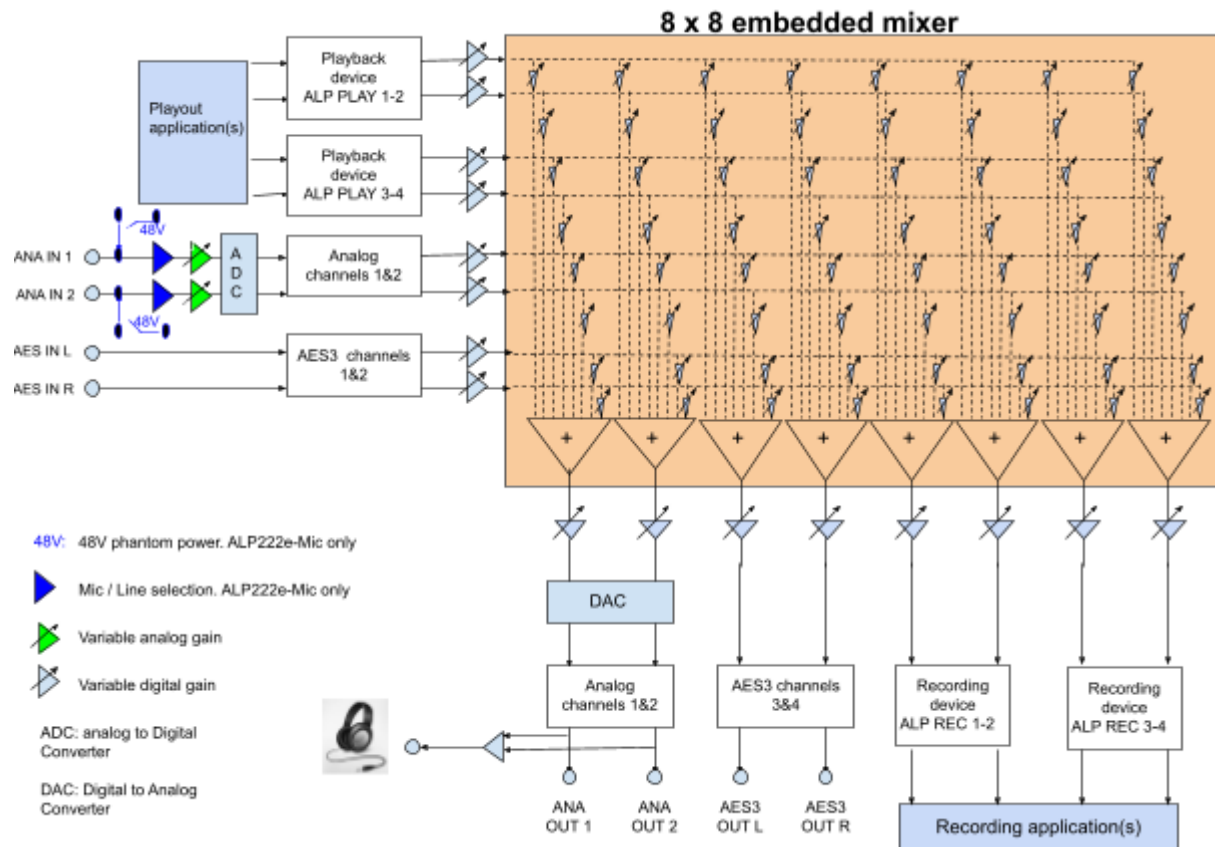
### 4.3 Routing audio streams in the card

The ALP card incorporates an on-board mixer in an FPGA component. This is a mixer with 8 mono inputs (4 stereo) and 8 mono outputs (4 stereo).

The mixer captures the 4 physical input channels of the card (2 analog channels and 2 AES3 channels) and the 4 channels of the playback devices.

The mixer restores 8 audio channels, respectively to the 4 physical outputs of the card (2 analog channels and 2 AES3 channels) and the 4 recording device channels.

The mixer can therefore be configured to perform the mixing and the routing of the 8 input channels to the 8 output channels (8 mix sums).



**Principle of the ALP222e on-board mixer**

**Note:** the stereo headphone output replicates the analog outputs.



# 5 REQUIRED CONFIGURATION

## 5.1 Required hardware configuration

There are no particular hardware restrictions in terms of PC on using the ALP card and its driver. The PC can have standard height or low profile PCIe card slots. The ALP card can in particular be used in 2U racks or reduced size PCs, by using the smaller bracket instead of the standard height bracket that is fitted by default.

A PCI EXPRESS™ (PCIe®) x1, x2, x4, x8 or x16 slot must be available to plug in the card.

The processor power and memory required depend mainly on the operating system and the applications used on the PC.

**Note:** The driver of the card reports to the OS that it does not manage the Sleep mode. As a consequence, the PC should not go to sleep mode.

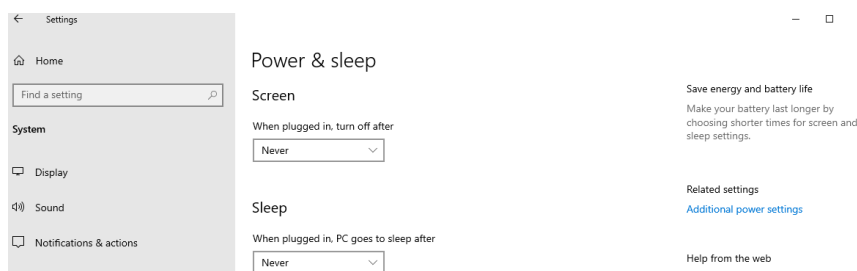
In case the PC goes to sleep mode under Windows, please proceed as follows to disable the sleep mode.



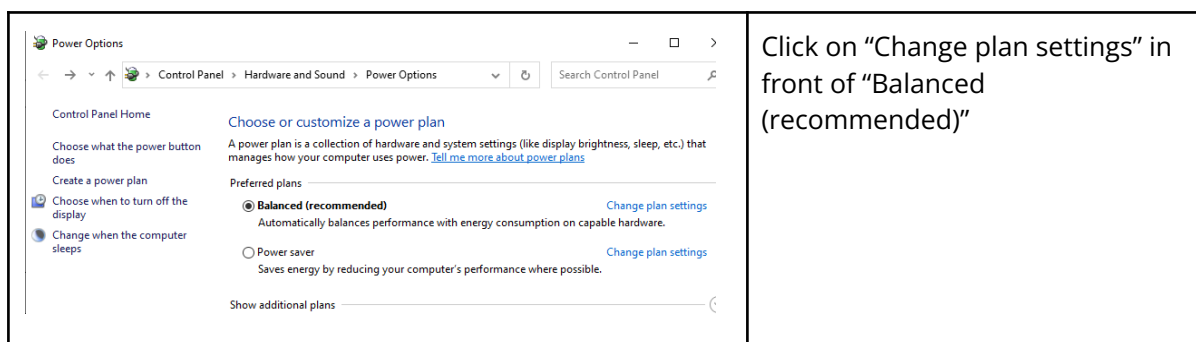
**The sleep mode for the PCIe bus must be disabled.**

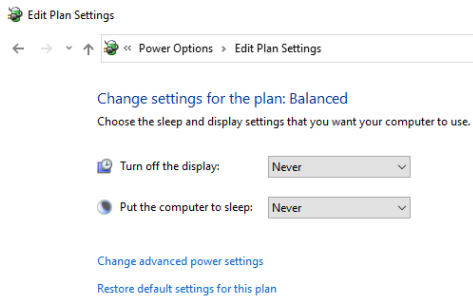
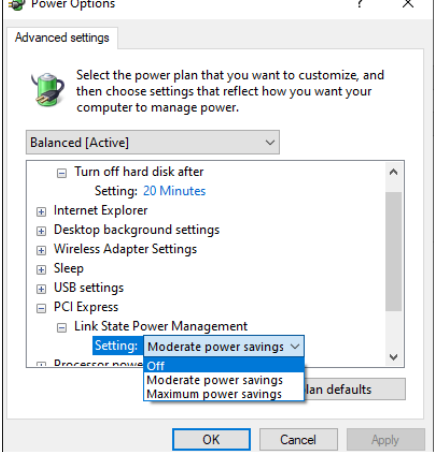
Go to Windows Settings, System, and select “Power & sleep”.

Select “Never” for the option “Put the computer to sleep”.



On the same window, click on “Additional power settings”.



	<p>Select "Change advanced power settings".</p>
	<p>Select "PCI Express", "Link State Power Management", and select "Off" for the setting. Click on Ok to validate</p>

## 5.2 Necessary software configuration under Windows

ALP222e and ALP222e-Mic operate under Windows from 64-bit versions of Windows 10 (from version 20H2).

To use your ALP-X card, you must install the driver included in the installation kit "ALP-X Kit". Download the latest version from the digigram website from the [ALP222e card support page](#) or from the [ALP222e-Mic support page](#) (these two pages point to the same driver kit).

The "ALP-X Kit" installer is used to install the following components:

- a 64-bit WDM driver offering the WASAPI and DirectSound application interfaces,
- an ASIO driver (64 bits and 32 bits), with its "ALP-X ASIO Settings" configuration interface. Installing this component is optional,
- the "ALP-X Manager" application, which serves to adjust the ALP-X card settings and display the vu-meters. Installing this component is optional.

### Note for Windows Server operating systems

Under Windows server, it is necessary to allow the applications to access the input audio devices of the sound cards.

Please proceed as follows:

- Go to the Windows Settings, and select **Privacy**.
- Select "**Microphone**"
- Activate the option "**Allow apps to access your microphone**"

## 5.3 Necessary software configuration under Linux

ALP222e and ALP222e-Mic operate under Linux from the 64-bit Kernel 4.1x onwards.

The Alsa driver for Linux is available for downloading. It is supplied as a DKMS package, which can therefore be used to compile the driver for the target Linux distribution used.

## 6 HARDWARE INSTALLATION

Given the shortened length of the PCI EXPRESS™ connector and the resulting lack of mechanical stability, we strongly advise against transporting the cards installed in a computer, unless it has a device for holding the card firmly in place to avoid material damage.

The card(s) must be inserted in the computer before installing its driver.

### 6.1 Preparing the card

Before fixing the card in the computer, make sure you install on the card the bracket matching the PCIe slot into which it is going to be inserted.

To install the card in a standard height PCIe slot, remove the low profile bracket by loosening the two screws on the sides of the cable connector, position the standard height bracket and retighten the two screws.

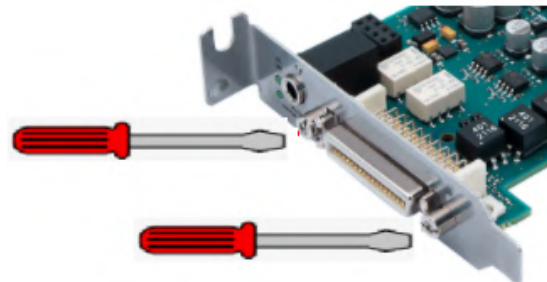
### 6.2 Installing the card

Insert the card in the available PCIe slot and press to position it firmly.

Tighten the screw fixing the bracket to the chassis or lock the card using the device provided for this purpose on your computer.

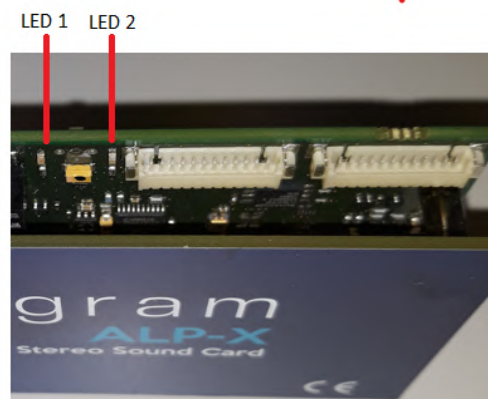
Several ALP cards can be installed in a computer.

### 6.3 State of internal LED



The ALP card has two internal LEDs on the top channel strip. The state of these LEDs can be seen when the PC cover is open.

internal LEDs on the top channel



If the card and its on-board firmware are initialised correctly, LED 1 must be lit solid green, and LED 2 must flash every second (1 Hz).

If LED 2 flashes faster (twice per second - 2 Hz), this means that the firmware version that has been uploaded to the card is corrupted, and the card is running the backup factory firmware version. It is then necessary to re-install the appropriate firmware version.

# 7 SOFTWARE INSTALLATION UNDER WINDOWS

## **IMPORTANT**

To install the software, you must have administrator rights on the computer.

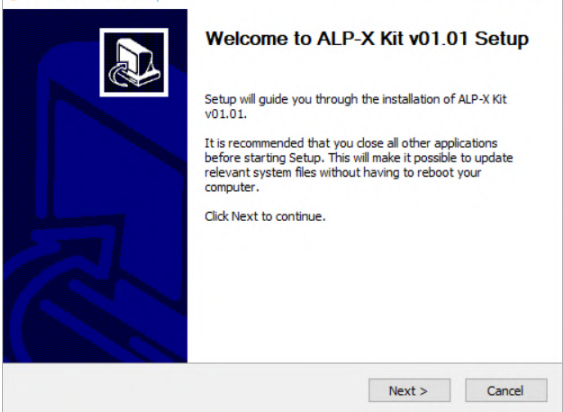
Please visit the Digigram website at [www.digigram.com](http://www.digigram.com) to obtain the most recent driver.

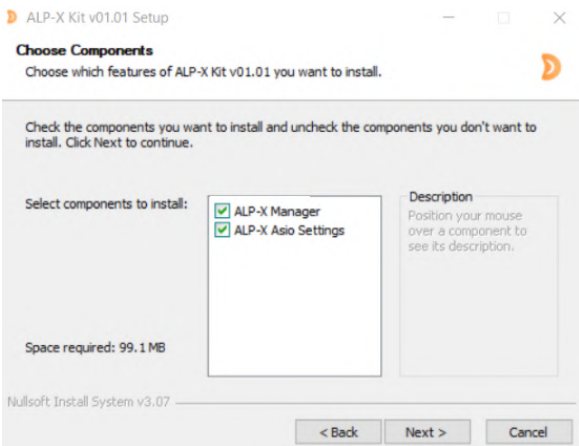
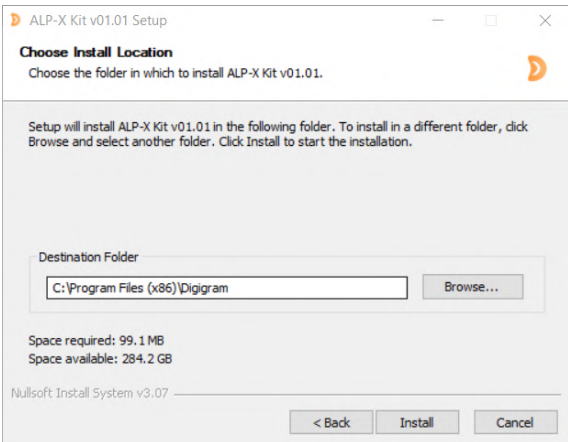
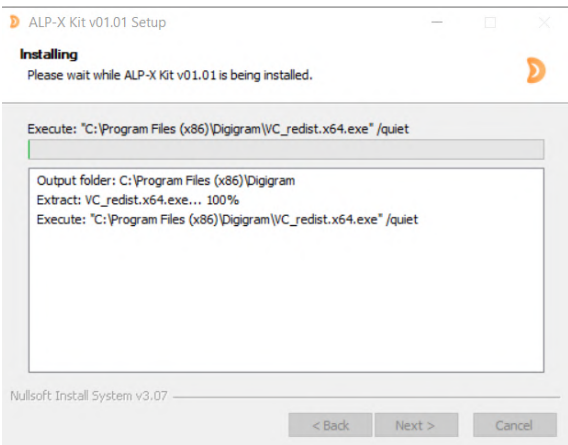
Should you use a specific application developed or installed by a Digigram partner, this may mean using a specific driver version. In this case, confirm with your application supplier which driver version to use.

Any driver downloaded from our website has to be unpacked before installing it. Double click on the downloaded file to start the auto-extraction utility. You can choose the default destination (temporary Windows folder) or select another one.

## 7.1 Very first installation

- Switch off the computer and insert the ALP card(s) in the available PCIe slot(s).
- Restart the computer.
- Click on Cancel if the "New device detected" wizard appears.
- Double click on the ALP driver installation file "ALP-X Kit vxx.exe"

	<p>Click on Next to continue with the installation.</p>
	<p>Click on "I agree" to continue with the installation.</p>

	<p>In this window, select the components to be installed in addition to the card driver.</p> <ul style="list-style-type: none"> <li>• ALP-X Manager: application used to configure the settings of the ALP card(s) installed. Some software programs may have been designed with the ALP card settings controls built in. In this case, it may be recommended not to install the ALP-X Manager application.</li> <li>• ALP-X ASIO Settings: this application is used to configure the ASIO driver settings. There is no need to install it if no application reliant on the ASIO interface is used.</li> </ul>
	<p>The driver is installed by default in the folder "C:\Program Files (x86)\Digigram\ALP-X".</p> <p>To change this folder, click on Browse and select a new destination.</p> <p>Click on Install to continue with the installation.</p>
	<p>The driver and selected components are being installed.</p>

## 7.2 Updating the driver version

If a driver version for the ALP card has already been installed, and you want to install another version, first uninstall the current driver version (see chapter [“Uninstalling the driver under Windows”](#)), and then install the new version by double clicking on the driver installation file "ALP-X Kit vxx.exe" (see the detailed procedure in the hereinabove chapter [“Very first installation”](#)).

## 7.3 Updating the firmware

The ALP card on-board firmware may have to be upgraded, and updates can be supplied by Digigram and prove necessary.

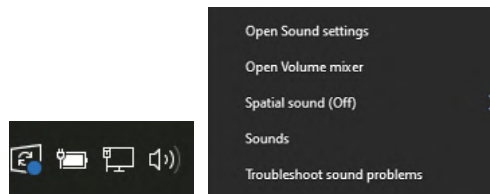
Updating the firmware can be done from the ALP-X Manager GUI (see chapter [“Firmware update procedure”](#)).

## 7.4 Verifying the card installation

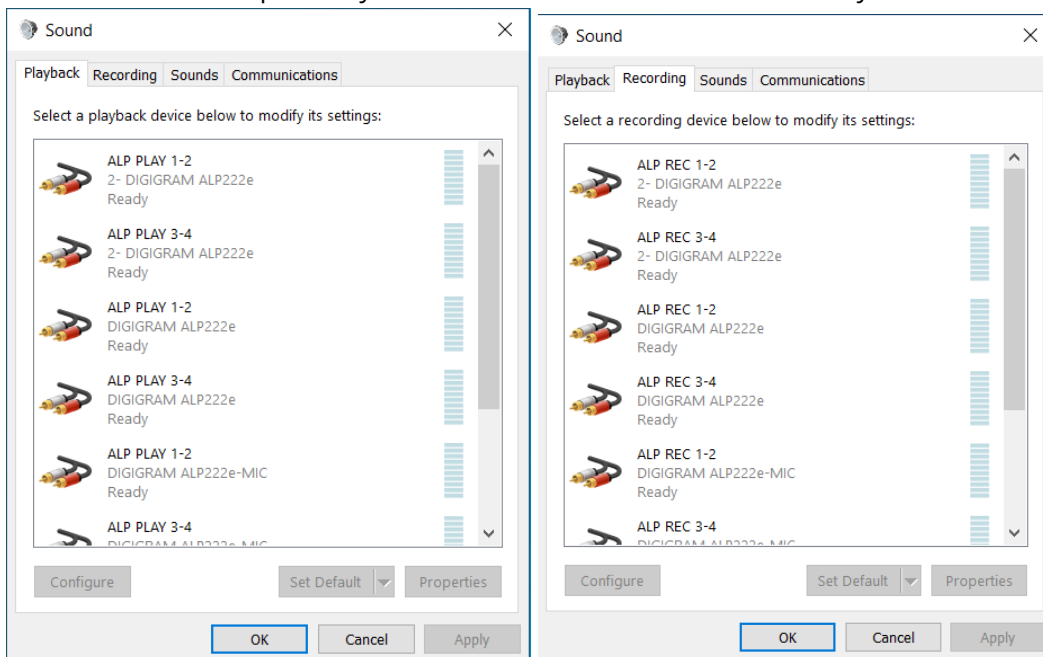
Once the driver and card have been installed as per the process described hereinabove, you can verify that the card is installed correctly and working properly.

### 7.4.1 Presence of playback and recording devices

The audio devices exposed by the card driver are visible on the Windows Sound panel. To open it, right click on the loudspeaker icon in the Windows taskbar and select "Sounds":



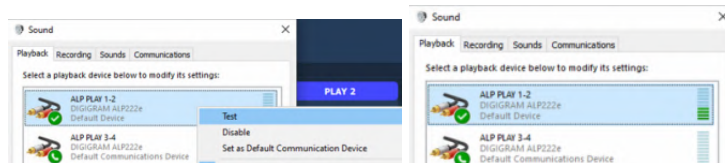
The audio devices exposed by the ALP driver are visible from the "Play" and "Record" tabs.



If the card devices are not listed in the Windows Sound control panel:

- Make sure that the card is inserted correctly in the PCI slot and screwed to the computer chassis.
- Try to uninstall the **ALP-X Kit** (from the Windows control panel, Applications) and re-install it.

Playback to a device can be tested by right clicking on it and selecting "Test". The VU-meter must then show modulation and the sound must be heard on the card output(s) according to the routing and levels configured in the ALP-X Manager application.

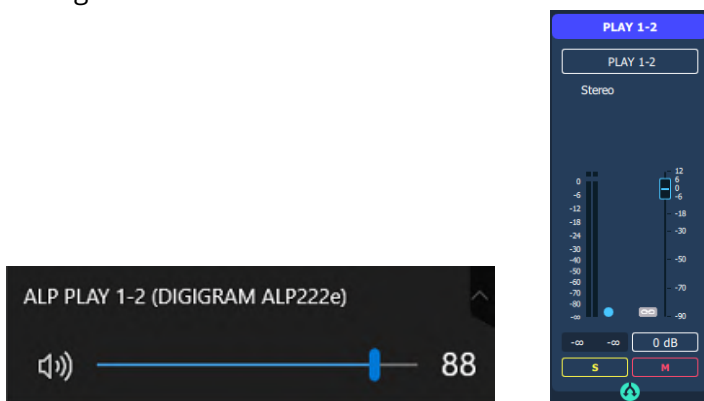


If several cards of the same model are installed, their devices have the same name (ALP PLAY and ALP REC), but the name of the card associated to each device differs from an index (no index for the first card, and index starting from 2 for the following cards of the same model). In the example below, the first card in the PCIe slot enumeration order is an ALP222e, the second card is an ALP222e-Mic, and the third card is an ALP222e.

First card: ALP222e	Second card: ALP222e-MIC	Third card: ALP222e
<p><b>ALP PLAY 1-2</b> Digigram ALP222e</p> <p><b>ALP PLAY 3-4</b> Digigram ALP222e</p>	<p><b>ALP PLAY 1-2</b> Digigram ALP222e-MIC</p> <p><b>ALP PLAY 3-4</b> Digigram ALP222e-MIC</p>	<p><b>ALP PLAY 1-2</b> 2-Digigram ALP222e</p> <p><b>ALP PLAY 3-4</b> 2-Digigram ALP222e</p>

**Note**

The output WDM device level setting, accessible from the Windows Sound control panel, is coupled to the corresponding input level setting of the card's onboard mixer, and impacts left and right channels.



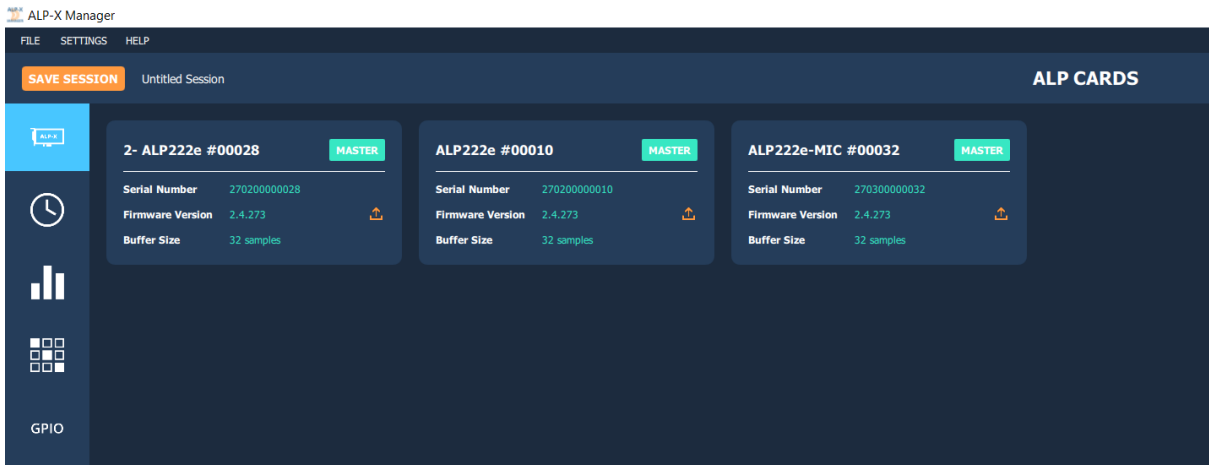
Note that after the first installation of the card, the default gain settings are as follows:



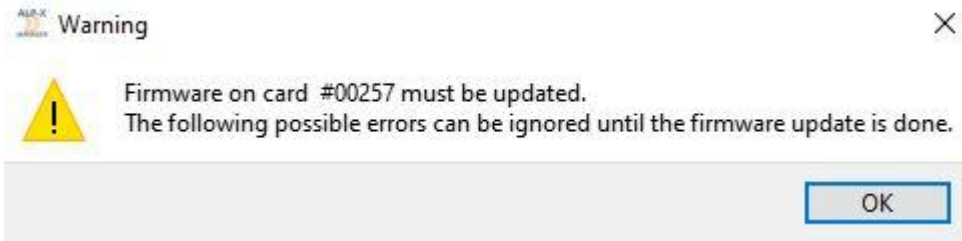
- Input analog gains are set to 0 dB (+24 dBu-> 0 dBfs).
- Digital input and output gains are set to 0 dB

## 7.4.2 Card detected by the Digigram ALP-X Manager application

The ALP-X Manager application, installed with the driver, is used to control the ALP card settings via a graphic interface. This application can be launched from the shortcut created on the desktop or from the start menu, Digigram group. The card must appear as below if it and its driver are installed correctly. Note that a maximum of eight ALP cards can be displayed and handled in ALP-X Manager.



Note: When the ALP Manager application is started, if the driver detects that the firmware version on the ALP Card is too old, a message like the following one is displayed.



If several ALP cards are running in the PC with a too old firmware version, one message per card is displayed.

From the list of ALP cards displayed in the ALP Manager, a firmware to be updated is displayed in red colour as shown below.

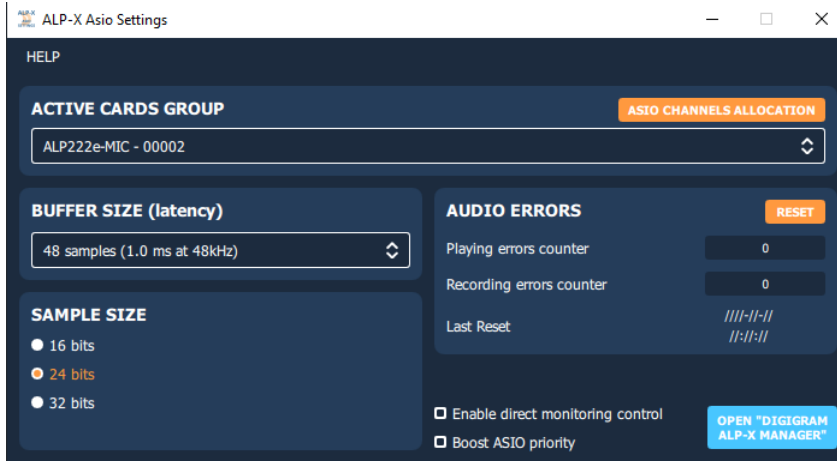


Please refer to the [firmware update procedure](#).

### 7.4.3 Card availability under ASIO

If the ASIO driver for the card has been installed (option to be selected during the installation procedure), then the card must be detected and displayed in the ASIO control panel. This control panel can be started from the ASIO application to select the appropriate audio devices.

All cards present must be listed in the "ACTIVE CARDS GROUP" selection list.



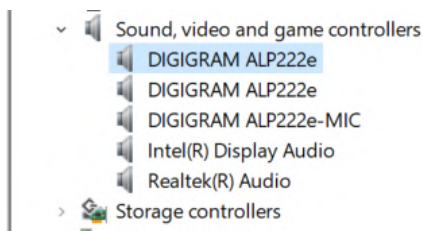
### 7.5 Adjusting the internal latency of the card

The following describes advanced settings that may impact the proper functioning of data exchanges between the card and the PC. It is recommended that you do not change these settings.

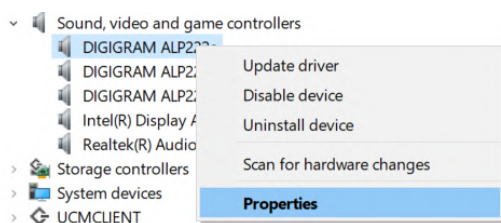
The internal latency of the card is determined by the duration of sample buffers the card exchanges with the PC for playback and recording audio streams. By default, this duration is 32 sampling clock periods (0.67ms at 48 kHz).

The lower the internal latency, the lower the global latency of the card. However, a very low latency may lead to "choppy" audio on slow PCs. In this case it is necessary to increase the internal latency.

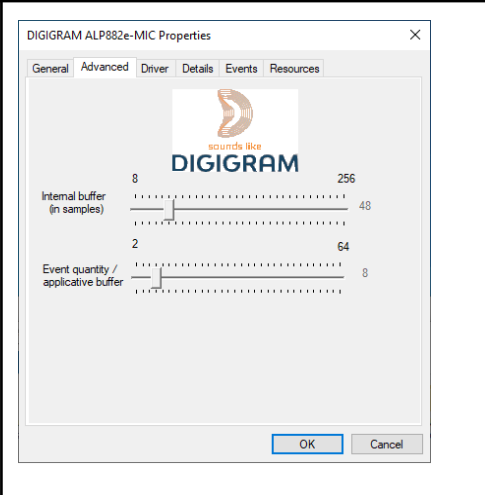
The internal latency of each ALP card can be changed by selecting the properties of the card, from the Windows Device Manager:



Right click on the ALP card, and select Properties, Advanced.



The following window is displayed:

	<p><b>Internal buffer:</b> number of sampling clock periods of the buffers exchanged between the card and the driver.</p> <p><b>Event quantity:</b> This parameter should not be modified without having technical advice from Digigram.</p>
---	--

Select the new latency value, and click on “Ok”.

This operation has to be done for each installed ALP card whose internal latency has to be changed (ALP cards in the same PC may have different latencies, depending on the application needs).

The PC must be restarted to take the changes into account.

## 7.6 Replacing a card

If an ALP card has to be replaced by another one, it is strongly recommended to proceed as follows:

- Turn off the PC.
- Remove the card to be replaced.
- Restart the PC.
- Go to the Windows Device Manager, and select “Sound, video and game controllers”. From the “View” menu, select “Show Hidden devices”. Select the ALP card that was hidden and select “Uninstall”.
- Turn off the PC.
- Insert the new card.
- Restart the PC.

## 7.7 Changing the order of installed cards









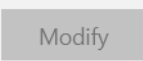
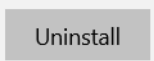
If several ALP cards are installed, and you want to move cards from a slot to another, it is strongly recommended to proceed as follows:

- Turn off the PC.
- Remove the cards to be moved.
- Restart the PC.
- Go to the Windows Device Manager, and select “Sound, video and game controllers”. From the “View” menu, select “Show Hidden devices”. Select the ALP cards that were hidden and select “Uninstall”.
- Turn off the PC.
- Insert the cards in the appropriate slots.
- Restart the PC.

## 8 UNINSTALLING THE DRIVER UNDER WINDOWS

Proceed as follows to uninstall an ALP driver version.

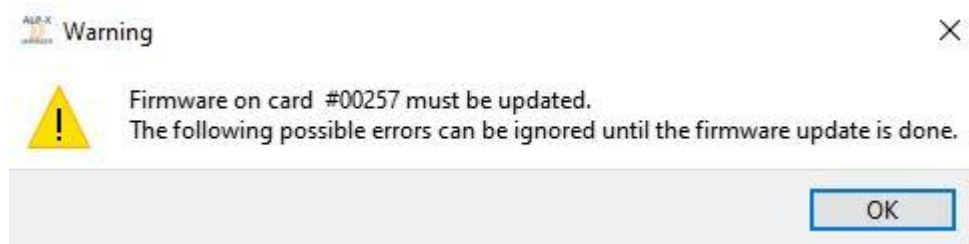
Please note that uninstalling a version must be done prior to the installation of another version.

	<p>From Windows Start menu, open the "Settings" panel</p>						
 <p>Apps Uninstall, defaults, optional features</p>	<p>Click on the "Apps" icon.</p>						
<p>Apps &amp; features</p> <p>Optional features</p> <p>App execution aliases</p> <p>Search, sort, and filter by drive. If you would like to uninstall or move an app, select it from the list.</p> <input type="text" value="Search this list"/> <p>Sort by: Name Filter by: All drives</p> <p>50 apps found</p> <table border="0"> <tr> <td></td> <td>3D Viewer Microsoft Corporation</td> <td>16.0 KB 8/4/2022</td> </tr> <tr> <td></td> <td>ALP-X Kit</td> <td>145 MB 9/20/2022</td> </tr> </table>		3D Viewer Microsoft Corporation	16.0 KB 8/4/2022		ALP-X Kit	145 MB 9/20/2022	<p>From the list of installed Apps &amp; features, select ALP-X Kit.</p>
	3D Viewer Microsoft Corporation	16.0 KB 8/4/2022					
	ALP-X Kit	145 MB 9/20/2022					
 	<p>Click on Uninstall. This will remove all the ALP-X ... components</p>						

## 9 CONFIGURING THE CARD UNDER WINDOWS VIA THE ALP-X MANAGER APPLICATION

This application can be launched from the shortcut created on the desktop or from the start menu, Digigram group.

When the ALP Manager application is started, if the driver detects that the firmware version on the ALP Card is too old, a message like the following one is displayed.




If several ALP cards are running in the PC with a too old firmware version, one message per card is displayed.

From the list of ALP cards displayed in the ALP Manager, a firmware to be updated is displayed in red colour as shown below.

2- ALP222e #00964	ALP442e-MIC #00257	ALP222e-MIC #20003
Serial Number 270200000964	Serial Number 270500000257	Serial Number 270300020003
Firmware Version 2.2.262	Firmware Version 1.8.240	Firmware Version 2.4.273
Buffer Size 48 samples	Buffer Size 48 samples	Buffer Size 48 samples

Please refer to the [firmware update procedure](#).

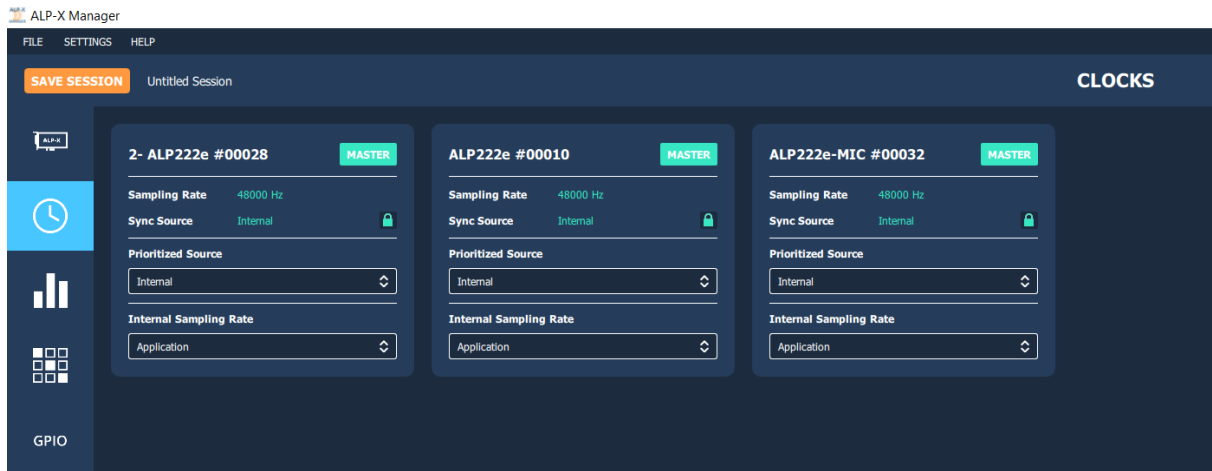
If another view is displayed, click on the  icon to display the list of ALP cards present and detected.

The following settings are displayed for each ALP card detected:

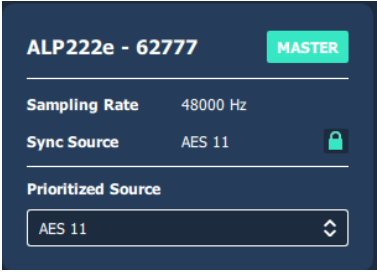
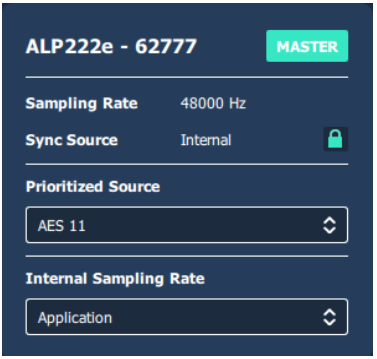

- its serial number,
- the on-board firmware version,
- the size of buffers exchanged between the driver and the card (see [Adjusting the internal latency of the card](#)).

## 9.1 Sampling clock management

Click on the clock icon to display the clock selection settings of each present ALP card.




	<p>The ALP card can be configured with an internal clock or an external clock (AES11, AES3 input, Word Clock). To select the clock source, click on the "Prioritized source" selection list, and select the desired source.</p> <p>A red padlock icon on the right of the clock name means the clock signal is absent. A green padlock icon on the right of the clock name means the clock signal is present.</p> <p>In addition, the detected sample rate of an external clock is displayed in the clock list.</p>
	<p><b>If the internal clock is selected ("Internal"),</b> select the sampling Rate value from the "Internal Sampling Rate" selection list.</p> <p>Possible values are: (in kHz) 11.025, 16, 22.05, 24, 32, 44.1, 48, 64, 88.2, 96, 128, 176.4, 192, and Application.</p> <p>Selecting "Application" means that the sampling frequency is set by the application.</p> <p>Setting the card to one of the frequency values means that a software application that uses the card must be configured at the same frequency value.</p>

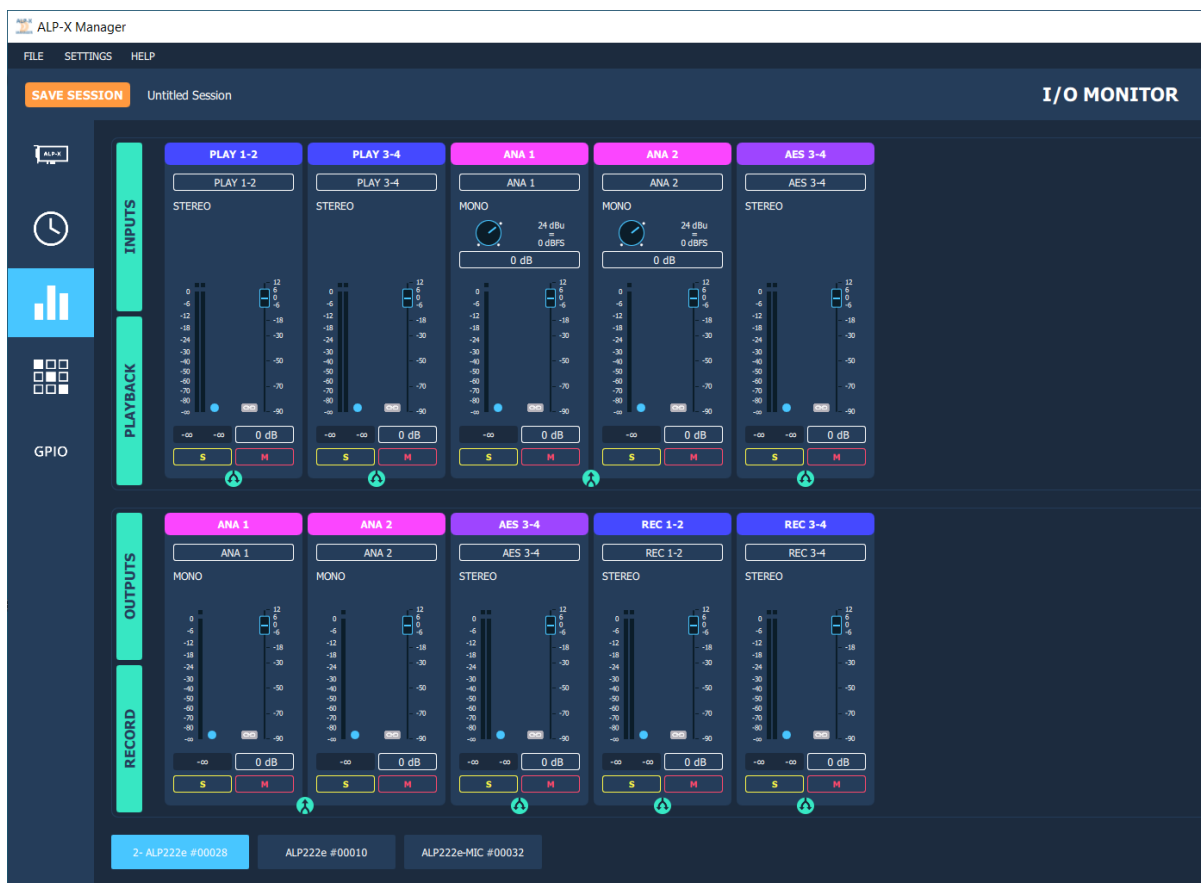
	<p><b>If an external clock is selected,</b> the card is synchronised to it as long as it is present.</p> <p>If the external clock signal is lost, the ALP card falls back to its internal clock, which is automatically set at the same frequency as the external clock.</p>
	
	<p>The clock source used at a given moment is displayed in the "Sync Source" field, and its frequency value is given by the "Sampling Rate" field.</p>

## 9.2 Managing input and output levels

At the first installation of the card, the default gain settings are as follows:

- Input analog gains are set to 0 dB (+24 dBu-> 0 dBfs).
- Digital input and output gains are set to 0 dB
- The 8x8 routing matrix is configured this way:
  - Play 1-2 routed to outputs 1-2
  - Play 3-4 routed to outputs 3-4
  - Inputs 1-2 (analog) routed to Rec 1-2
  - Inputs 3-4 (AES2) routed to Rec 3-4
 The other routing points of the matrix are muted.

Click on the  icon to access the "I/O Monitor" view which is used to adjust the ALP cards audio levels.



The onboard mixer features two categories of audio inputs and audio outputs

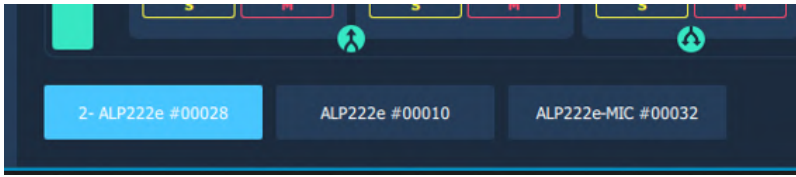
- Physical inputs (analog and AES3)
- Software playback inputs. They correspond to the playback devices exposed by the driver to the applications.
- Physical outputs (analog and AES3)
- Software recording outputs. They correspond to the recording devices exposed by the driver and captured by the applications

Mixer inputs or outputs	Windows Audio Devices	ASIO devices
PLAY 1-2 (stereo view) PLAY 1 and PLAY 2 (mono view)	ALP PLAY 1-2	ALP-1 / ALP-2
PLAY 3-4 (stereo view) PLAY 3 and PLAY 4 (mono view)	ALP PLAY 3-4	ALP-3 / ALP-4
REC 1-2 (stereo view) REC 1 and REC 2 (mono view)	ALP REC 1-2	ALP-1 / ALP-2
REC 3-4 (stereo view) REC 3 and REC 4 (mono view)	ALP REC 3-4	ALP-3 / ALP-4



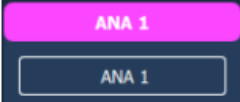

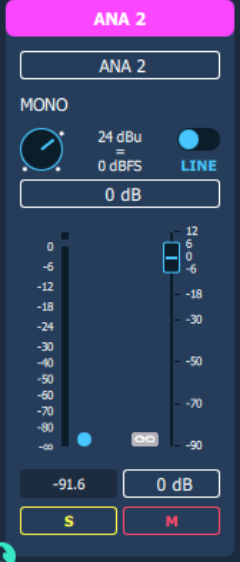
The physical inputs are displayed in the mixer GUI when the "INPUTS" button is activated. The software playback inputs are displayed when the "PLAYBACK" button is activated. The physical outputs are displayed when the "OUTPUTS" button is activated. The software recording inputs are displayed when the "RECORD" button is activated.

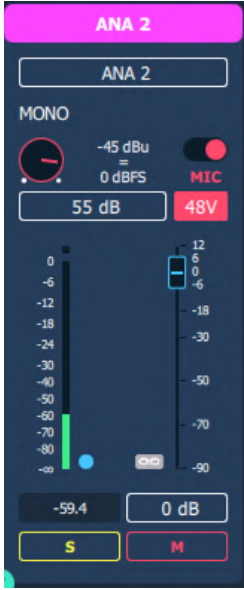
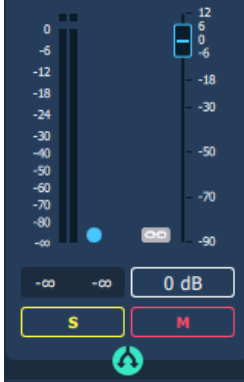



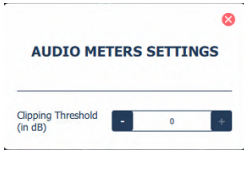




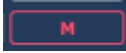

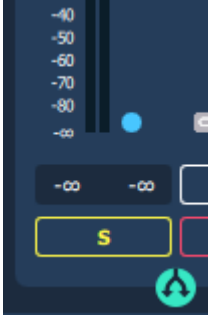
From the bottom bar of the I/O Monitor view, select the ALP card to display its Monitor page.




The following table lists the various possible settings from the mixer view.

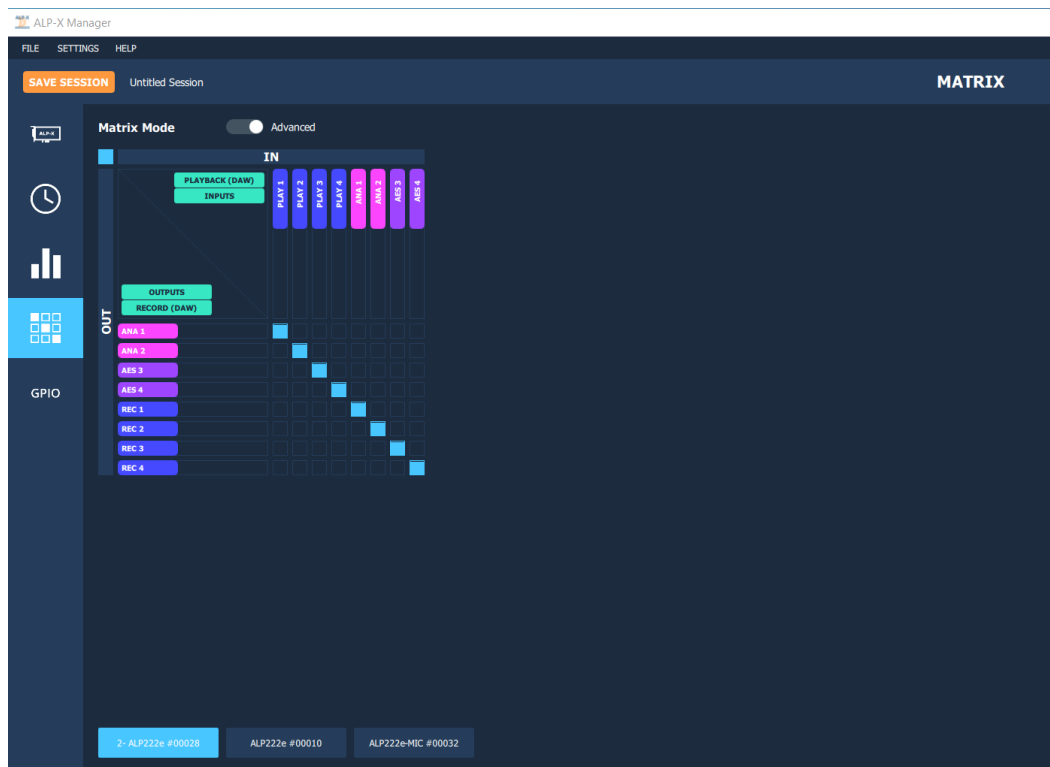
	<p>Click on this icon to display the concerned pair of channels as two mono channel strips.</p>
	<p>Click on this icon to display the concerned pair of channels as one stereo channel strip.</p> <p>On a stereo channel strip, the controls (volumes, solo, mute) are applied to the left and right channels.</p>
	<p><b>Channel strip name</b></p> <p>Click on the channel strip name  and enter a new name.</p> <p>Note: when a channel strip display is changed from mono to stereo, or stereo to mono, the channel stream name goes back to the default name.</p> <p>As a consequence, it is recommended to keep the display mode used (mono or stereo) when the channel strip names have been changed.</p>
	<p><b>Analog input gain settings</b></p> <p>The first screen capture on the left relates to the ALP222e, and the second one just below relates to the ALP222e-Mic which features a Line/Mic level selector.</p> <p>The analog input gain can be adjusted thanks to the potentiometer at the top of the analog input channel strip. Note that if the inputs are displayed as a stereo input, the gain adjustment applies to the left and right channels.</p> <p>There are three ways of adjusting the input gain.</p> <ol style="list-style-type: none"> <li>1) Click on the round potentiometer without releasing and move the mouse left or right to decrease and increase the gain respectively, in steps of 0.5 dB.</li> <li>2) Press the Ctrl key without releasing and then click on the potentiometer with the mouse. The gain can be adjusted in steps of 1 dB with the mouse wheel as long as the Ctrl key remains pressed.</li> <li>3) Click on the gain value displayed below the potentiometer, write and enter the new value.</li> </ol> <p>Double click on the potentiometer to reset the analog gain to 0 dB.</p> <p>For ALP222e and ALP222e-Mic in LINE input mode, analog input gain</p>

	<p>values range from -87 dB to +40 dB, in steps of 0.5 dB.</p> <p>For ALP222e-Mic in Mic input mode, analog input gain values range from 0 dB to +65 dB, in steps of 0.5 dB.</p> <p>Here are a few examples of input level alignment:</p> <table border="1" data-bbox="464 360 1378 638"> <thead> <tr> <th>ALP222e / ALP222e-Mic in LINE input mode</th> <th>ALP222e-Mic in Mic input mode</th> </tr> </thead> <tbody> <tr> <td>Gain=0 dB: +24 dBu-&gt;0 dBfs.</td> <td>Gain=+ 65 dB: -55 dBu-&gt;0 dBfs.</td> </tr> <tr> <td>Gain=+ 10 dB: +14 dBu-&gt;0 dBfs</td> <td>Gain=+ 30 dB: -20 dBu-&gt;0dBfs</td> </tr> <tr> <td>Gain=+ 39 dB: -15 dBu-&gt;0 dBfs</td> <td>Gain=+ 10 dB: 0 dBu-&gt;0 dBfs</td> </tr> <tr> <td>Gain=-10 dB: +24 dBu-&gt;-10 dBfs</td> <td>Gain=+ 0 dB: +10 dBu-&gt;0 dBfs</td> </tr> </tbody> </table>	ALP222e / ALP222e-Mic in LINE input mode	ALP222e-Mic in Mic input mode	Gain=0 dB: +24 dBu->0 dBfs.	Gain=+ 65 dB: -55 dBu->0 dBfs.	Gain=+ 10 dB: +14 dBu->0 dBfs	Gain=+ 30 dB: -20 dBu->0dBfs	Gain=+ 39 dB: -15 dBu->0 dBfs	Gain=+ 10 dB: 0 dBu->0 dBfs	Gain=-10 dB: +24 dBu->-10 dBfs	Gain=+ 0 dB: +10 dBu->0 dBfs
ALP222e / ALP222e-Mic in LINE input mode	ALP222e-Mic in Mic input mode										
Gain=0 dB: +24 dBu->0 dBfs.	Gain=+ 65 dB: -55 dBu->0 dBfs.										
Gain=+ 10 dB: +14 dBu->0 dBfs	Gain=+ 30 dB: -20 dBu->0dBfs										
Gain=+ 39 dB: -15 dBu->0 dBfs	Gain=+ 10 dB: 0 dBu->0 dBfs										
Gain=-10 dB: +24 dBu->-10 dBfs	Gain=+ 0 dB: +10 dBu->0 dBfs										
 	<p><b>Vu-meters</b></p> <p>Each Vu-meter displays the input signal level in dBfs, before or after the digital gain is applied..</p> <p>Double click on the blue radio button on the bottom left of the vu-meter to display the Pre/Post digital gain selection. The radio button appearance depends on the selected mode</p> <p> : Pre-fader       : Post-fader</p> <p><b>Digital gain settings</b></p> <p>Digital gains are available for all the input and output audio streams, and can be adjusted via the faders.</p> <p>There are three ways of adjusting the digital gain.</p> <ol style="list-style-type: none"> <li>1) Click and hold the fader button down and move the mouse vertically to increase/decrease the gain in 0.1 dB steps.</li> <li>2) Press the Ctrl key without releasing and then click on the fader button. The gain can be adjusted with the mouse wheel in 1 dB steps as long as the Ctrl key remains pressed.</li> <li>3) Click on the gain value displayed below the fader, write and enter the new value.</li> </ol> <p>Double click on the fader to reset the digital gain to 0 dB.</p> <p>Digital gain values range from -90 dB to +12 dB, in steps of 0.1 dB.</p>										
	<p>The Vu-meters display the levels in peak-meter.</p> <p>The clipping threshold of the vu-meters can be adjusted from the global menu "Settings/Audio meters" . When the signal level exceeds this threshold, the red LED above the Vu-meter lights up.</p>										

	<p><b>48V phantom power (ALP222e-Mic)</b></p> <p>Setting the phantom power on each analog input of the ALP222e-Mic is possible when the input is set to Mic level mode.</p>
	<p><b>Solo</b></p> <p>The solo button has an effect on the two channels of a stereo pair. A click on this button sets the two channels in solo mode, and it turns yellow.</p>
	<p><b>Mute</b></p> <p>The mute button has an effect on the two channels of a stereo pair. A click on this button sets the two channels in mute mode, and it turns red.</p>
	<p><b>Pairing channel strips</b></p> <p>To set a common level for several input channel strips, validate the button on each channel strip. The gain setting on one channel strip is then applied to all the paired channel strips.</p>
	<p><b>Pre or post fader Vu-meters</b></p> <p>The blue LED button allows selecting if the Vu-meter displays the signal level before or after the digital gain set via the fader.</p> <p>To select pre or post fader Vu-meter, click on the blue LED button on the right of the Vu-meter bar(s), and select the mode.</p>

## 9.3 Managing the routing and mixing of input signals

Click on the  icon to access the "Matrix" view which is used to mix/route input signals towards the outputs.



From the bottom bar of the MATRIX view, select the ALP card to display its matrix.

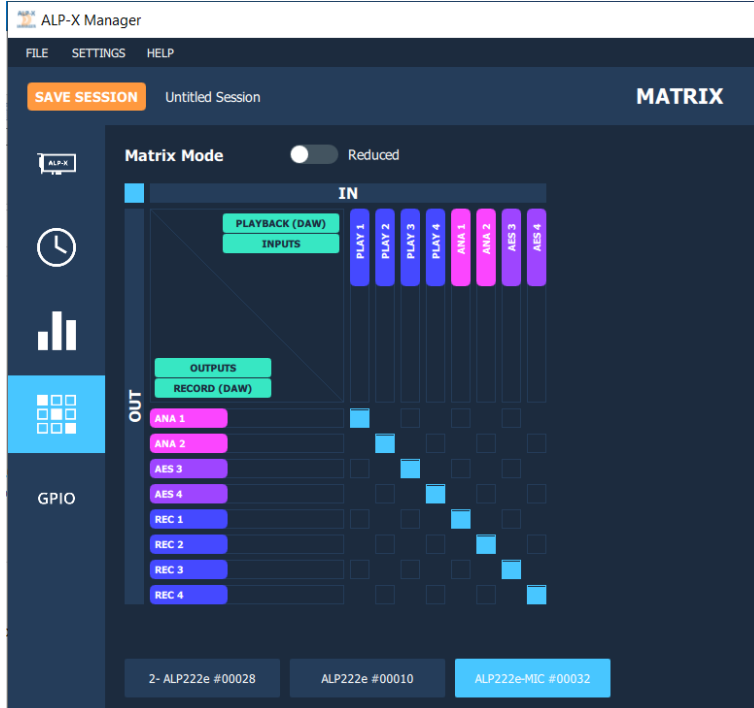
For each ALP card, the internal mixer can mix all or some of the input signals towards each output. Each output can therefore receive its own mix of inputs.

As in the "I/O Monitor" view, it is possible to select the inputs displayed in this matrix (physical inputs-INPUTS and/or software play inputs-PLAYBACK) and the outputs displayed (physical outputs-OUTPUTS and/or outputs-RECORD).

There are two possible matrix views:

- A complete view that shows all the mixing points. This view is displayed when the "MATRIX MODE" selector is positioned on "ADVANCED" (view displayed above).

- A reduced view which displays a sub-assembly of mixing points. This view is displayed when the "MATRIX MODE" selector is positioned on "REDUCED" (below).



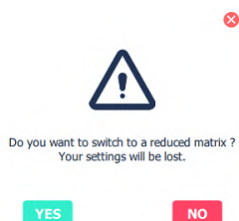
Each mixing point can be activated or deactivated by clicking on it (Mute / Unmute). All the hidden boxes are deactivated mixing points.

The digital gain applied to the channel can be adjusted for each mixing point. To do this, press the Ctrl key, place the mouse cursor over the mixing point without clicking and use the mouse wheel to increase or decrease the digital gain value; the gain value applied is then displayed during the adjustment.

To directly set the gain to 0dB, press the Ctrl key and double click on the mixing point.

Visually, a mixing point is a solid blue if the gain is at its maximum (+12 dB). It is circled in blue and empty if the gain is at its minimum value (-90 dB).

**Caution:**



Moving from "ADVANCED" view to "REDUCED" view deactivates certain mixing points. If gain settings have been configured on these points in the "ADVANCED" view, these settings are lost when moving to "REDUCED" mode. The message opposite warns the user. Select Yes to confirm the move to REDUCED mode.

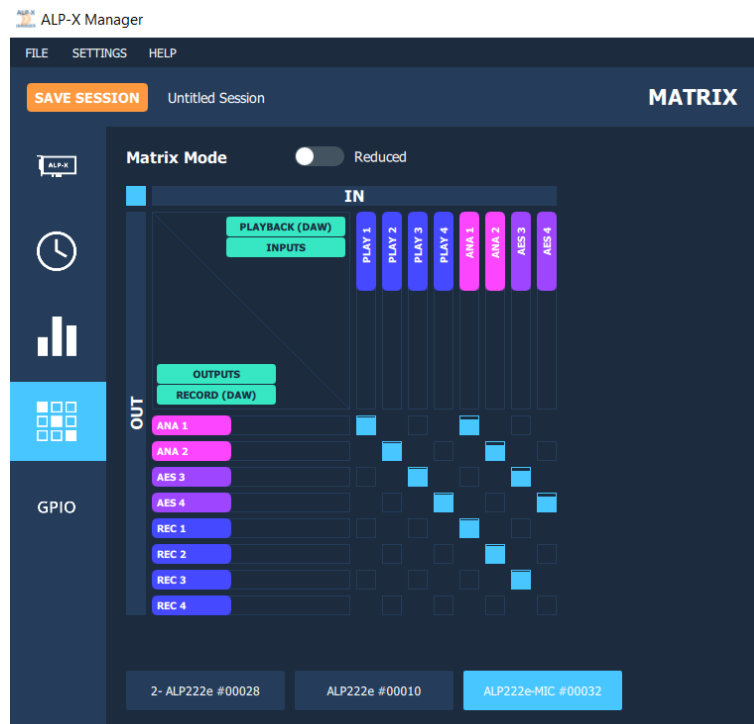
As an example, the matrix below allows the following:

- Routing the audio stream played by an application: playback channels 1&2 routed towards analog outputs 1&2, and playback channels 3&4 routed towards the AES3 output.
- Routing the physical input signals towards the corresponding outputs (ana IN 1 towards ana OUT1, ana IN 2 towards ana OUT2, AES 3 IN towards AES3 OUT).

As a result, playback signals and input signals are mixed to the outputs.

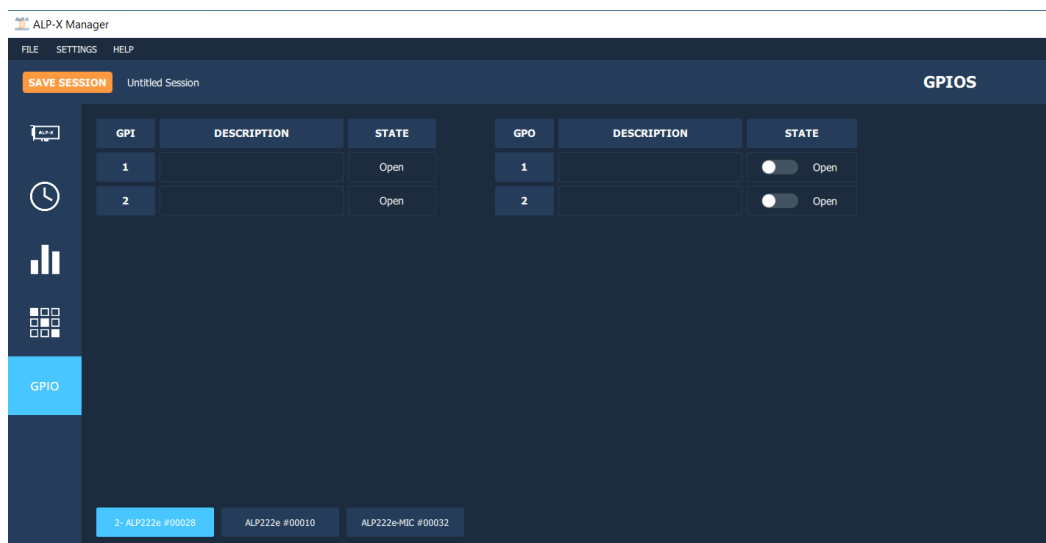
Note that a gain is applied to each input signal towards the output.

- Routing the content of physical inputs towards the associated recording outputs, so that an application can capture the input signals.



## 9.4 Display of GPIOs and control of GPOs

Click on the **GPIO** icon to access the view that displays the state of the card's GPIO, from which the GPO can be activated/deactivated.



From the bottom bar of the GPIOs view, select the ALP card to display the status of its GPIOs.

The status of the GPIs is displayed on the left, and the state of the GPO is displayed on the right.

To position the state of a GPO manually, click on the "STATE" switch matching this GPO to move it to the desired position: Open or Close.

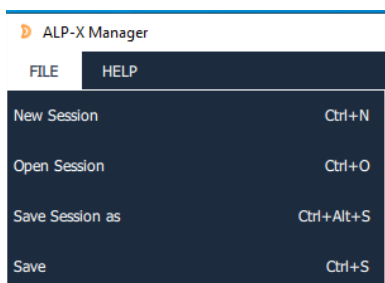
## 9.5 Creating, saving and loading setting sessions

The current configuration of all settings defined in ALP-X Manager can be saved. Go to the File menu and select "Save session as".

To load a configuration, go to the File menu and select "Open session".


To create a new configuration from blank settings, go to the File menu and select "New session".

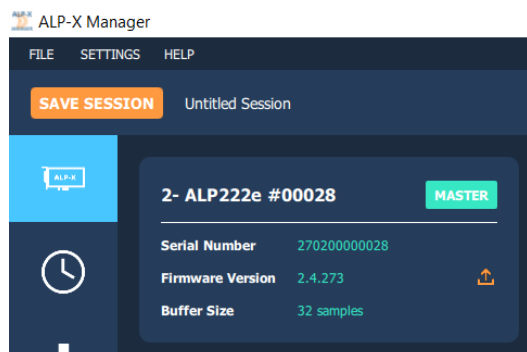
To save the settings during an existing session, go to the File menu and select "Save".

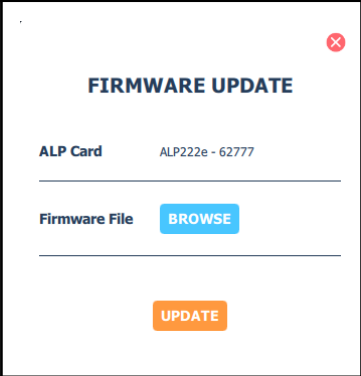
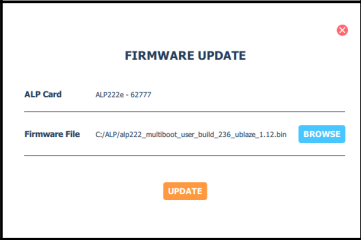
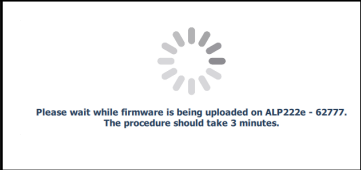
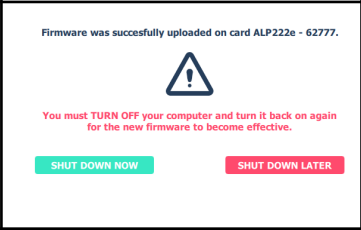
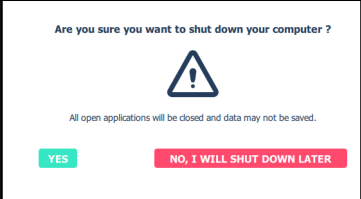


## 9.6 Firmware update procedure

The ALP card on-board firmware may have to be upgraded, and updates can be supplied by Digigram and prove necessary.

To perform an update, click on the button  on the right of the "Firmware version" field, as shown on the screen capture below.



	<p>The ALP card is selected from the list of cards detected.</p> <p>Click on the "Browse" button and select the file matching the new firmware to be applied (file with extension ".bin").</p>
	<p>Click on the "Update" button to launch the update.</p>
	<p>The firmware upload is in progress</p>
	<p>Once the upload is completed, it is necessary to shut down the computer. Select "Shut down now" for an immediate automatic shutdown, or "Shut down later" if you want to shut down the computer later. In this latter case, don't forget to shut down and restart the computer before using the card.</p>
	<p>Select "Yes" to confirm the shut down, or "No, I will shut down later". In this latter case, don't forget to shut down and restart the computer before using the card.</p>

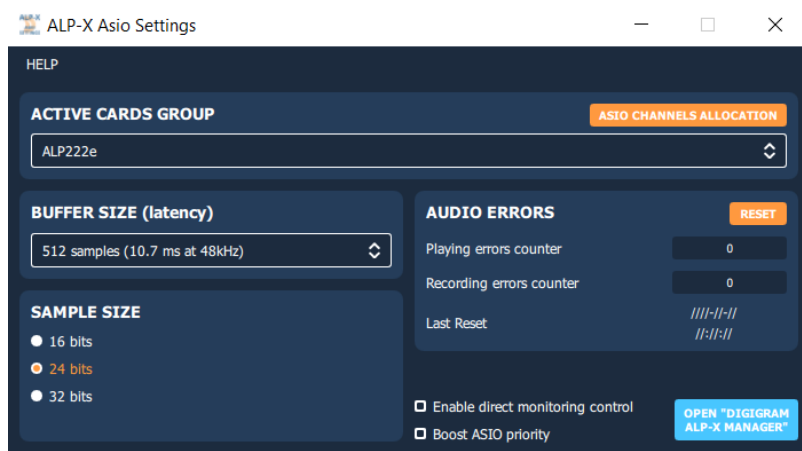


## 9.7 Keyboard shortcuts

Keyboard shortcut	Action
Session	
Ctrl + S	Save
Ctrl + Alt + S	Save As
Ctrl + N	New
Ctrl + O	Open
Potentiometer/Fader	
Ctrl + Wheel	1 dB increments on the potentiometer/fader
Ctrl + Shift + Wheel	0.1 dB increments on the fader 0.5 dB increments on the potentiometer
Double click	Reset the fader/potentiometer value to 0
Matrix	
Ctrl + Wheel	1 dB increments on the mixing point
Ctrl + Shift + Wheel	0.1 dB increments on the mixing point

# 10 ASIO CONTROL PANEL for Windows

The ASIO control panel can be started from the Asio application, from the menu allowing for the settings of the audio device(s) and the ASIO configuration.



Active cards group/Asio channels allocation

This section is used to select the input channels and output channels that are managed by the ASIO driver and which can therefore be used by any application based on the ASIO interface.

For every card selected from the "ACTIVE CARDS GROUP" list, click on the "ASIO CHANNELS ALLOCATION" button and select the channels to be used under ASIO.



**IMPORTANT:** The current driver version does allow for the selection of multiple cards to be used from the same application.

A card that is not used under ASIO can be used from a WASAPI or DirectSound application.

**BUFFER SIZE (latency)**

24 samples (0.5 ms at 48kHz)

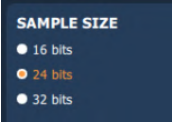
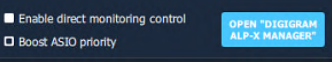

## Buffer size (latency)

This section is used to select the size of the audio buffers used by the ASIO driver. This size is given as a number of samples and a cross-reference in duration is indicated for a sampling frequency of 48 kHz. The higher the buffer size, the higher the latency.

A small buffer size can lead to breaks in audio throughput on a low-powered machine or on a machine with a high processor load.

The latency value to select **must be** at least 5ms (which is 256 samples at 48 kHz).

The default value is set to 512 samples (10,7ms).

	<p><b>Sample size</b></p> <p>This setting defines the format of samples exchanged between the application and the card driver.</p>
	<p><b>Enable Direct Monitoring Control</b></p> <p>Tick this setting to authorise an ASIO application to drive the zero latency hardware monitoring of inputs towards outputs. If an application monitors software, this causes latency between the input signal and the output signal, linked to the ASIO buffer sizes.</p>
	<p><b>Boost ASIO priority</b></p> <p>This option allows the system to run the ASIO process with high priority, thereby increasing the reliability of this process. Caution, however, this can make other processes unstable.</p>
	<p><b>Audio errors</b></p> <p>This section is used to visualise current errors for playback and recording via the ASIO driver. Errors frequently reflect too small an ASIO buffer size for the system's possibilities. Should they occur, then the buffer size needs to be increased until there are no more errors.</p> <p>Error counters can be reset to zero by clicking on the RESET button.</p> <p>Lastly, a time counter displays the time elapsed since the last counter reset.</p>

# 11 SOFTWARE INSTALLATION UNDER LINUX

## 11.1 Automatic installation

This method works on most major distributions, by using the DKMS system. After the initial installation, nothing more is needed to be done as DKMS will take care of re-building the driver every time the kernel is updated, or a new kernel is installed.

Requirements:

A package manager which supports DKMS. Most major distributions support this, please check your distribution's documentation if you are not sure.

DKMS

The kernel headers for the kernel version(s) you need

Git, if you don't use a Debian-based or RPM-based distribution

1. Download and install the driver
2. Install the dependencies
3. Download the driver package (Choose the latest .deb or .rpm package)
4. Install the driver package

## 11.2 Building and installing the driver manually

This method works for any Linux system, but it is necessary to apply it every time the kernel is updated, as it doesn't use any package manager to automatically rebuild the driver.

Requirements:

The kernel headers for the kernel version(s) you need

Git

Make and a C compiler such as gcc

Please refer to your distribution's documentation to install these requirements.

1. Get the source code
2. Compile the driver: Go into the src/ directory, and compile the driver by simply running make to create the file: snd-alpx.ko and snd-pcm-dmaengine.ko depending on your current kernel's configuration
3. Install and load the driver: The compilation has generated a kernel module: snd-alpx.ko.
4. Copy this/these module(s) to the kernel's module directory:
5. Run "sudo depmod -a"
6. Run sudo modprobe snd-alpx
7. Then run lsmod | grep snd to check installation of the driver
8. Run aplay -l or L to list the devices
9. Launch alsamixer

# 12 CONFIGURING UNDER LINUX VIA AMIXER

## 12.1 Diagram of the inputs towards outputs chain

The mixer inputs and outputs are numbered 0 to 7.

The DAW0, DAW1, DAW2 and DAW3 inputs are the four audio channels from the host machine (played by software on the host machine).

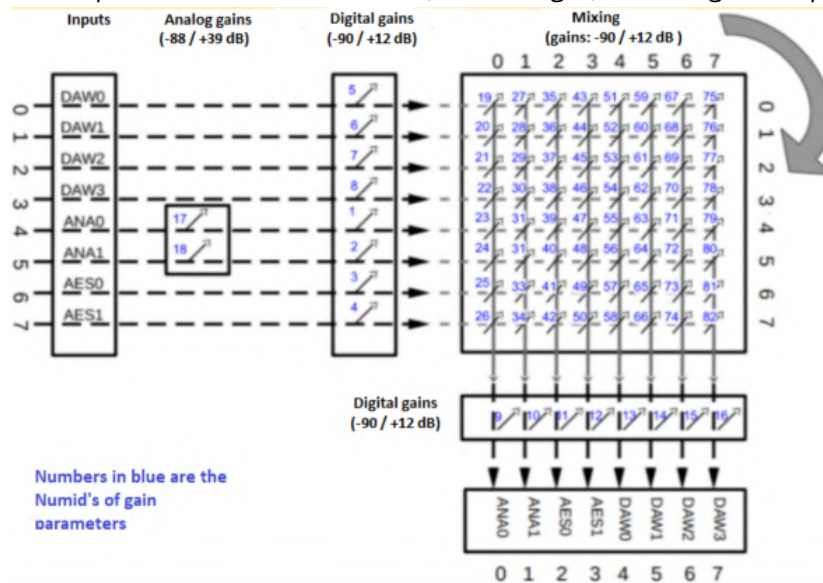
The ANA0 and ANA1 inputs are the two analog input channels (IN1 and IN2)

The AES0 and AES1 inputs are the two channels (left and right) of the digital input AES/EBU IN

The DAW0, DAW1, DAW2 and DAW3 outputs are the four audio channels destined for the host machine (captured by software on the host machine).

The ANA0 and ANA1 outputs are the two analog output channels (OUT1 and OUT2)

The AES0 and AES1 outputs are the two channels (left and right) of the digital output AES/EBU OUT



Each output channel receives a mix of eight input channels. A digital gain can be applied to each input component of each mix

By default, the matrix gains are positioned so as to have:

DAW0 PLAY -> ANA0 (OUT1)	ANA0 (IN1) -> DAW0 Record
DAW1 PLAY -> ANA1 (OUT2)	ANA1 (IN2) -> DAW1 Record
DAW2 PLAY -> AES0 (AES3 OUT Left)	AES0 (AES/EBU IN Left) -> DAW2 Record
DAW3 PLAY -> AES1 (AES3 OUT Right)	AES1 (AES/EBU IN right) -> DAW3 Record

## 12.2 Description of controls

### 12.2.1 Managing the clock source and SRCs

Description	Alsa mixer control	Read / Write	Index	NumId	Values	Detail
Card clock source	Clk Src	R	0	83	0 1 2 3	Word Clk = Wordclock input AES Syn = AES11 Sync input Aud = AES3 audio input Internal = Internal clock
Clock value	Clk base	R	0	84	8, 11.025, 16, 22.05, 32, 44.1, 48	Effective clock value in kHz is: "Clk base" x "Clk Coef".
	Clk Coef	R	0	85	1, 2, or 4	
Enable / disable the SRC on the AES3 input	AES SRC	W		86	0 1	Disabled Enabled
Authorisation to switch to a source with lower priority	CkSc Up	W	0	87	0 1	No switching Switching authorised
Authorisation to switch to a source with higher priority	CkSc Down	W	0	88		
Clock priority 0 (highest priority)	Clk P0	W	0	89	0 1 2 3	Word Clk = Wordclock input AES Syn = AES11 Sync AES input Aud = AES3 audio input Internal = Internal clock
Clock priority 1	Clk P1	W	0	90		
Clock priority 2	Clk P2	W	0	91		
Clock priority 3 (lowest priority)	Clk P3	W	0	92		

## 12.2.2 Mic / Line mode of analog inputs

Description of control	Alsa mixer control	Read / Write	Index	NumId	Values	Gain in dB
48V phantom power switch for the left analog input (ALP222e-Mic only)	McPhL	R / W	0	95	1 0	48V ON 48V OFF
48V phantom power switch for the right analog input (ALP222e-Mic only)	McPhR	R / W	0	96		
Mic / Line level selection for the left analog input (ALP222e-Mic only)	McEnL	R / W	0	97	1 0	Mic Level Line level
Mic / Line level selection for the right analog input (ALP222e-Mic only)	McEnR	R / W	0	98		

## 12.2.3 Gains on the physical inputs

Description of control	Alsa mixer control	Read / Write	Index	NumId	Values	Gain in dB
Analog gain on left analog Line input (for ALP222e, and ALP222e-Mic in Line input mode)	Codec Analog Capture Volume	R / W	0	17	0 1 176	Mute -88 dB 0 dB
Analog gain on right analog Line input (for ALP222e, and ALP222e-Mic in Line input mode)	Codec Analog Capture Volume	R / W	1	18	255	+39 dB (0.5 dB steps)
Analog gain on left analog Mic input (only for ALP222e-Mic in Mic input mode)	Codec Analog Capture Volume	R / W	0	93	10 to 65	+10 dB to +65 dB (1 dB steps)
Analog gain on right analog Mic input (only for ALP222e-Mic in Mic input mode)	Codec Analog Capture Volume	R / W	1	94		
Digital gain on left analog input	Ana Capture Volume	R / W	0	1	0 1 901 1021	Mute -90 dB 0 dB +12 dB (0.1 dB steps)
Digital gain on right analog input	Ana Capture Volume	R / W	1	2		
Digital gain on left AES3 input	AES Capture Volume	R / W	0	3		
Digital gain on right AES3 input	AES Capture Volume	R / W	1	4		

## 12.2.4 Gains on the application DAW inputs (play from software applications)

Description	Alsa mixer control	Read / Write	Index	NumId	Values	Gain in dB
Digital gain on Play DAW0 input	DAW Playback Volume	R / W	0	5	0 1 901 1021	Mute -90 dB 0 dB +12 dB (0.1 dB steps)
Digital gain on Play DAW1 input	DAW Playback Volume	R / W	1	6		
Digital gain on Play DAW2 input	DAW Playback Volume	R / W	2	7		
Digital gain on Play DAW4 input	DAW Playback Volume	R / W	3	8		

## 12.2.5 Gains on the physical outputs

Description	Alsa mixer control	Read / Write	Index	NumId	Values	Gain in dB
Digital gain on left analog output	Ana Playback Volume	R / W	0	9	0 1 901 1021	Mute -90 dB 0 dB +12 dB (0.1 dB steps)
Digital gain on right analog output	Ana Playback Volume	R / W	1	10		
Digital gain on left AES3 output	AES Playback Volume	R / W	0	11		
Digital gain on right AES3 output	AES Playback Volume	R / W	1	12		

## 12.2.6 Gains on the DAW outputs (recording from software applications)

Description	Alsa mixer control	Read / Write	Index	NumId	Values	Gain in dB
Digital gain on DAW0 output	DAW Capture Volume	R / W	0	13	0 1 901 1021	Mute -90 dB 0 dB +12 dB (0.1 dB steps)
Digital gain on DAW1 output	DAW Capture Volume	R / W	1	14		
Digital gain on DAW2 output	DAW Capture Volume	R / W	2	15		
Digital gain on DAW4 output	DAW Capture Volume	R / W	3	16		

## 12.2.7 Gains in the matrix applied to the Play DAW0 input

Description	Alsa mixer control	Read / Write	Index	NumId	Values	Gain in dB
Play DAW0 gain towards left analog output	Mxr 0/0	R / W	0	19	0 1	Mute -90 dB
Play DAW0 gain towards right analog output	Mxr 0/1	R / W	0	27		
Play DAW0 gain towards left AES3 output	Mxr 0/2	R / W	0	35		
Play DAW0 gain towards right AES3 output	Mxr 0/3	R / W	0	43		



Play DAW0 gain towards record DAW0 output	Mxr 0/4	R / W	0	51	901	0 dB
Play DAW0 gain towards record DAW1 output	Mxr 0/5	R / W	0	59	1021	+12 dB (0.1 dB steps)
Play DAW0 gain towards record DAW2 output	Mxr 0/6	R / W	0	67		
Play DAW0 gain towards record DAW3 output	Mxr 0/7	R / W	0	75		

## 12.2.8 Gains in the matrix applied to the Play DAW1 input

Description	Alsa mixer control	Index	NumId	Values	Gain in dB
Play DAW1 gain towards left analog output	Mxr 1/0	0	20	0 1 901 1021	Mute -90 dB 0 dB +12 dB (0.1 dB steps)
Play DAW1 gain towards right analog output	Mxr 1/1	0	28		
Play DAW1 gain towards left AES3 output	Mxr 1/2	0	36		
Play DAW1 gain towards right AES3 output	Mxr 1/3	0	44		
Play DAW1 gain towards record DAW0 output	Mxr 1/4	0	52		
Play DAW1 gain towards record DAW1 output	Mxr 1/5	0	60		
Play DAW1 gain towards record DAW2 output	Mxr 1/6	0	68		
Play DAW1 gain towards record DAW3 output	Mxr 1/7	0	76		

## 12.2.9 Gains in the matrix applied to the Play DAW2 input

Description	Alsa mixer control	Index	NumId	Values	Gain in dB
Play DAW2 gain towards left analog output	Mxr 2/0	0	21	0 1 901 1021	Mute -90 dB 0 dB +12 dB (0.1 dB steps)
Play DAW2 gain towards right analog output	Mxr 2/1	0	29		
Play DAW2 gain towards left AES3 output	Mxr 2/2	0	37		
Play DAW2 gain towards right AES3 output	Mxr 2/3	0	45		
Play DAW2 gain towards record DAW0 output	Mxr 2/4	0	53		
Play DAW2 gain towards record DAW1 output	Mxr 2/5	0	61		
Play DAW2 gain towards record DAW2 output	Mxr 2/6	0	69		
Play DAW2 gain towards record DAW3 output	Mxr 2/7	0	77		

## 12.2.10 Gains in the matrix applied to the Play DAW3 input

Description	Alsa mixer control	Index	NumId	Values	Gain in dB
Play DAW3 gain towards left analog output	Mxr 3/0	0	22	0 1 901 1021	Mute -90 dB 0 dB +12 dB (0.1 dB steps)
Play DAW3 gain towards right analog output	Mxr 3/1	0	30		
Play DAW3 gain towards left AES3 output	Mxr 3/2	0	38		
Play DAW3 gain towards right AES3 output	Mxr 3/3	0	46		
Play DAW3 gain towards record DAW0 output	Mxr 3/4	0	54		
Play DAW3 gain towards record DAW1 output	Mxr 3/5	0	62		
Play DAW3 gain towards record DAW2 output	Mxr 3/6	0	70		
Play DAW3 gain towards record DAW3 output	Mxr 3/7	0	78		

## 12.2.11 Gains in the matrix applied to the signal from the left analog input

Description	Alsa mixer control	Index	NumId	Values	Gain in dB
Gain on left analog input towards left analog output	Mxr 4/0	0	23	0 1 901 1021	Mute -90 dB 0 dB +12 dB (0.1 dB steps)
Gain on left analog input towards right analog output	Mxr 4/1	0	31		
Gain on left analog input towards left AES3 output	Mxr4/2	0	39		
Gain on left analog input towards right AES3 output	Mxr 4/3	0	47		
Play gain on left analog input towards record DAW0 output	Mxr4/4	0	55		
Gain on left analog input towards record DAW1 output	Mxr 4/5	0	63		
Gain on left analog input towards record DAW2 output	Mxr 4/6	0	71		
Gain on left analog input towards record DAW3 output	Mxr4/7	0	79		

## 12.2.12 Gains in the matrix applied to the signal from the right analog input

Description	Alsa mixer control	Index	NumId	Values	Gain in dB
Gain on right analog input towards left analog output	Mxr 5/0	0	24	0 1 901 1021	Mute -90 dB 0 dB +12 dB (0.1 dB steps)
Gain on right analog input towards right analog output	Mxr 5/1	0	32		
Gain on right analog input towards left AES3 output	Mxr 5/2	0	40		
Gain on right analog input towards right AES3 output	Mxr 5/3	0	48		
Play gain on right analog input towards record DAW0 output	Mxr 5/4	0	56		
Gain on right analog input towards record DAW1 output	Mxr 5/5	0	64		
Gain on right analog input towards record DAW2 output	Mxr 5/6	0	72		
Gain on right analog input towards record DAW3 output	Mxr 5/7	0	80		

## 12.2.13 Gains in the matrix applied to the signal from the left channel digital input

Description	Alsa mixer control	Index	NumId	Values	Gain in dB
Gain on left digital input towards left analog output	Mxr 6/0	0	25	0	Mute
Gain on left digital input towards right analog output	Mxr 6/1	0	33		
Gain on left digital input towards left AES3 output	Mxr 6/2	0	41		

Gain on left digital input towards right AES3 output	Mxr 6/3	0	49	1	-90 dB
Play gain on left right digital towards record DAW0 output	Mxr 6/4	0	57	901	0 dB
Gain on left digital input towards record DAW1 output	Mxr 6/5	0	65	1021	+12 dB (0.1 dB steps)
Gain on left digital input towards record DAW2 output	Mxr 6/6	0	73		
Gain on left digital input towards record DAW3 output	Mxr 6/7	0	81		

## 12.2.14 Gains in the matrix applied to the signal from the right channel digital input

Description	Alsa mixer control	Index	NumId	Values	Gain in dB
Gain on right digital input towards left analog output	Mxr 7/0	0	26	0 1 901 1021	Mute -90 dB 0 dB +12 dB (0.1 dB steps)
Gain on right digital input towards right analog output	Mxr 7/1	0	34		
Gain on right digital input towards left AES3 output	Mxr 7/2	0	42		
Gain on right digital input towards right AES3 output	Mxr 7/3	0	50		
Play gain on right digital towards record DAW0 output	Mxr 7/4	0	58		
Gain on right digital input towards record DAW1 output	Mxr 7/5	0	66		
Gain on right digital input towards record DAW2 output	Mxr 7/6	0	74		
Gain on right digital input towards record DAW3 output	Mxr 7/7	0	82		

## 12.3 Setting the parameters from a mixer

### 12.3.1 Analog gains on the analog inputs

#### **Analog gain on left track input IN1**

Simple mixer control 'Codec Analog Capture',0

Capabilities: cvolume cvolume-joined

Capture channels: Mono

Limits: Capture 0 - 255

Mono: Capture 193 [76%] [0.50 dB]

#### **Analog gain on right track input IN2**

Simple mixer control 'Codec Analog Capture',1

Capabilities: cvolume cvolume-joined

Capture channels: Mono

Limits: Capture 0 - 255  
Mono: Capture 192 [75%] [0.00 dB]

## 12.3.2 Digital gains on the signals of analog inputs/outputs

These gains are applied after the analog/digital conversion from IN1 and IN2, and before the digital/analog conversion towards OUT1 and OUT2)

### **Digital gain on left analog input/output (IN1/OUT1)**

Simple mixer control 'Ana',0

Capabilities: pvolume pvolume-joined cvolume cvolume-joined

Playback channels: Mono

Capture channels: Mono

Limits: Playback 0 - 1021 Capture 0 - 1021

Mono: Playback 966 [95%] [6.50 dB] Capture 899 [88%] [-0.20 dB]

### **Digital gain on right analog input/output (IN2/OUT2)**

Simple mixer control 'Ana',1

Capabilities: pvolume pvolume-joined cvolume cvolume-joined

Playback channels: Mono

Capture channels: Mono

Limits: Playback 0 - 1021 Capture 0 - 1021

Mono: Playback 966 [95%] [6.50 dB] Capture 899 [88%] [-0.20 dB]

## 12.3.3 Digital gains on AES3 digital input/output (AES/EBU IN/OUT)

### Digital gain on AES3 digital input/output, left channel

Simple mixer control 'AES',0

Capabilities: pvolume pvolume-joined cvolume cvolume-joined

Playback channels: Mono

Capture channels: Mono

Limits: Playback 0 - 1021 Capture 0 - 1021

Mono: Playback 969 [95%] [6.80 dB] Capture 899 [88%] [-0.20 dB]

### Digital gain on AES3 digital input/output, right channel

Simple mixer control 'AES',1

Capabilities: pvolume pvolume-joined cvolume cvolume-joined

Playback channels: Mono

Capture channels: Mono

Limits: Playback 0 - 1021 Capture 0 - 1021

Mono: Playback 969 [95%] [6.80 dB] Capture 899 [88%] [-0.20 dB]

## 12.3.4 Card clock

### Clock source selection

numid=83,iface=MIXER,name='Clk Src'

numid=87,iface=MIXER,name='CkSc Up'

numid=88,iface=MIXER,name='CkSc Down'

numid=89,iface=MIXER,name='Clk P0'

numid=90,iface=MIXER,name='Clk P1'

numid=91,iface=MIXER,name='Clk P2'

numid=92,iface=MIXER,name='Clk P3'

Simple mixer control 'Clk Src',0

Capabilities: enum

Items: 'Word Clk' 'AES Syn' 'AES Aud' 'Internal'

Item0: 'AES Aud'

### Hardware SRC activation

numid=86,iface=MIXER,name='AES SRC'

## 12.3.5 Digital gains on the DAW PLAY inputs

### Digital gain on DAW0 input channel

Simple mixer control 'DAW',0

Capabilities: pvolume pvolume-joined cvolume cvolume-joined

Playback channels: Mono

Capture channels: Mono

Limits: Playback 0 - 1021 Capture 0 - 1021

Mono: Playback 963 [94%] [6.20 dB] Capture 901 [88%] [0.00 dB]

### **Digital gain on DAW1 input channel**

Simple mixer control 'DAW',1

Capabilities: pvolume pvolume-joined cvolume cvolume-joined

Playback channels: Mono

Capture channels: Mono

Limits: Playback 0 - 1021 Capture 0 - 1021

Mono: Playback 963 [94%] [6.20 dB] Capture 901 [88%] [0.00 dB]

### **Digital gain on DAW2 input channel**

Simple mixer control 'DAW',2

Capabilities: pvolume pvolume-joined cvolume cvolume-joined

Playback channels: Mono

Capture channels: Mono

Limits: Playback 0 - 1021 Capture 0 - 1021

Mono: Playback 963 [94%] [6.20 dB] Capture 901 [88%] [0.00 dB]

### **Digital gain on DAW3 input channel**

Simple mixer control 'DAW',3

Capabilities: pvolume pvolume-joined cvolume cvolume-joined

Playback channels: Mono

Capture channels: Mono

Limits: Playback 0 - 1021 Capture 0 - 1021

Mono: Playback 963 [94%] [6.20 dB] Capture 901 [88%] [0.00 dB]

## **12.3.6 Digital gains in the matrix**

### **Digital gain on DAW0 input channel towards mixing bus for analog output 1 (OUT1)**

Simple mixer control 'Mxr 0/0',0

Capabilities: pvolume pvolume-joined

Playback channels: Mono

Limits: Playback 0 - 1021

Mono: Playback 901 [88%] [0.00 dB]

### **Digital gain on DAW0 input channel towards mixing bus for analog output 2 (OUT2)**

Simple mixer control 'Mxr 0/1',0

Capabilities: pvolume pvolume-joined

Playback channels: Mono

Limits: Playback 0 - 1021

Mono: Playback 0 [0%] [-99999.99 dB]

**Digital gain on DAW0 input channel towards mixing bus for left AES3 output)**

Simple mixer control 'Mxr 0/2',0

Capabilities: pvolume pvolume-joined

Playback channels: Mono

Limits: Playback 0 - 1021

Mono: Playback 0 [0%] [-99999.99 dB]

**Digital gain on DAW0 input channel towards mixing bus for right AES3 output)**

Simple mixer control 'Mxr 0/3',0

Capabilities: pvolume pvolume-joined

Playback channels: Mono

Limits: Playback 0 - 1021

Mono: Playback 0 [0%] [-99999.99 dB]

**Digital gain on DAW0 input channel towards mixing bus for record DAW0 output)**

Simple mixer control 'Mxr 0/4',0

Capabilities: pvolume pvolume-joined

Playback channels: Mono

Limits: Playback 0 - 1021

Mono: Playback 0 [0%] [-99999.99 dB]

**Digital gain on DAW0 input channel towards mixing bus for record DAW1 output)**

Simple mixer control 'Mxr 0/5',0

Capabilities: pvolume pvolume-joined

Playback channels: Mono

Limits: Playback 0 - 1021

Mono: Playback 0 [0%] [-99999.99 dB]

**Digital gain on DAW0 input channel towards mixing bus for record DAW2 output)**

Simple mixer control 'Mxr 0/6',0

Capabilities: pvolume pvolume-joined

Playback channels: Mono

Limits: Playback 0 - 1021

Mono: Playback 0 [0%] [-99999.99 dB]

**Digital gain on DAW0 input channel towards mixing bus for record DAW3 output)**

Simple mixer control 'Mxr 0/7',0

Capabilities: pvolume pvolume-joined

Playback channels: Mono

Limits: Playback 0 - 1021

Mono: Playback 0 [0%] [-99999.99 dB]

**Digital gain on DAW1 input channel towards mixing bus for analog output 1 (OUT1)**



Simple mixer control 'Mxr 1/0',0  
Capabilities: pvolume pvolume-joined  
Playback channels: Mono  
Limits: Playback 0 - 1021  
Mono: Playback 0 [0%] [-99999.99 dB]

**Digital gain on DAW1 input channel towards mixing bus for analog output 2 (OUT2)**

Simple mixer control 'Mxr 1/1',0  
Capabilities: pvolume pvolume-joined  
Playback channels: Mono  
Limits: Playback 0 - 1021  
Mono: Playback 901 [88%] [0.00 dB]

**Digital gain on DAW1 input channel towards mixing bus for left AES3 output)**

Simple mixer control 'Mxr 1/2',0  
Capabilities: pvolume pvolume-joined  
Playback channels: Mono  
Limits: Playback 0 - 1021  
Mono: Playback 0 [0%] [-99999.99 dB]

**Digital gain on DAW1 input channel towards mixing bus for right AES3 output)**

Simple mixer control 'Mxr 1/3',0  
Capabilities: pvolume pvolume-joined  
Playback channels: Mono  
Limits: Playback 0 - 1021  
Mono: Playback 0 [0%] [-99999.99 dB]

**Digital gain on DAW1 input channel towards mixing bus for record DAW0 output)**

Simple mixer control 'Mxr 1/4',0  
Capabilities: pvolume pvolume-joined  
Playback channels: Mono  
Limits: Playback 0 - 1021  
Mono: Playback 0 [0%] [-99999.99 dB]

**Digital gain on DAW1 input channel towards mixing bus for record DAW1 output)**

Simple mixer control 'Mxr 1/5',0  
Capabilities: pvolume pvolume-joined  
Playback channels: Mono  
Limits: Playback 0 - 1021  
Mono: Playback 0 [0%] [-99999.99 dB]

**Digital gain on DAW1 input channel towards mixing bus for record DAW2 output)**

Simple mixer control 'Mxr 1/6',0  
Capabilities: pvolume pvolume-joined  
Playback channels: Mono

Limits: Playback 0 - 1021

Mono: Playback 0 [0%] [-99999.99 dB]

**Digital gain on DAW1 input channel towards mixing bus for record DAW3 output)**

Simple mixer control 'Mxr 1/7',0

Capabilities: pvolume pvolume-joined

Playback channels: Mono

Limits: Playback 0 - 1021

Mono: Playback 0 [0%] [-99999.99 dB]

**Digital gain on DAW2 input channel towards mixing bus for analog output 1 (OUT1)**

Simple mixer control 'Mxr 2/0',0

Capabilities: pvolume pvolume-joined

Playback channels: Mono

Limits: Playback 0 - 1021

Mono: Playback 0 [0%] [-99999.99 dB]

**Digital gain on DAW2 input channel towards mixing bus for analog output 2 (OUT2)**

Simple mixer control 'Mxr 2/1',0

Capabilities: pvolume pvolume-joined

Playback channels: Mono

Limits: Playback 0 - 1021

Mono: Playback 0 [0%] [-99999.99dB]

**Digital gain on DAW2 input channel towards mixing bus for right AES3 output**

Simple mixer control 'Mxr 2/2',

Capabilities: pvolume pvolume-joined

Playback channels: Mono

Limits: Playback 0 - 1021

Mono: Playback 901 [88%] [0.00dB]

**Digital gain on DAW2 input channel towards mixing bus for right AES3 output)**

Simple mixer control 'Mxr 2/3',0

Capabilities: pvolume pvolume-joined

Playback channels: Mono

Limits: Playback 0 - 1021

Mono: Playback 0 [0%] [-99999.99dB]

**Digital gain on DAW2 input channel towards mixing bus for record DAW0 output)**

Simple mixer control 'Mxr 2/4',0

Capabilities: pvolume pvolume-joined

Playback channels: Mono

Limits: Playback 0 - 1021

Mono: Playback 0 [0%] [-99999.99 dB]

**Digital gain on DAW2 input channel towards mixing bus for record DAW1 output)**

Simple mixer control 'Mxr 2/5',0  
Capabilities: pvolume pvolume-joined  
Playback channels: Mono  
Limits: Playback 0 - 1021  
Mono: Playback 0 [0%] [-99999.99 dB]

**Digital gain on DAW2 input channel towards mixing bus for record DAW2 output)**

Simple mixer control 'Mxr 2/6',0  
Capabilities: pvolume pvolume-joined  
Playback channels: Mono  
Limits: Playback 0 - 1021  
Mono: Playback 0 [0%] [-99999.99 dB]

**Digital gain on DAW2 input channel towards mixing bus for record DAW3 output)**

Simple mixer control 'Mxr 2/7',0  
Capabilities: pvolume pvolume-joined  
Playback channels: Mono  
Limits: Playback 0 - 1021  
Mono: Playback 0 [0%] [-99999.99 dB]

**Digital gain on DAW3 input channel towards mixing bus for analog output 1 (OUT1)**

Simple mixer control 'Mxr 3/0',0  
Capabilities: pvolume pvolume-joined  
Playback channels: Mono  
Limits: Playback 0 - 1021  
Mono: Playback 0 [0%] [-99999.99 dB]

**Digital gain on DAW3 input channel towards mixing bus for analog output 2 (OUT2)**

Simple mixer control 'Mxr 3/1',0  
Capabilities: pvolume pvolume-joined  
Playback channels: Mono  
Limits: Playback 0 - 1021  
Mono: Playback 0 [0%] [-99999.99 dB]

**Digital gain on DAW3 input channel towards mixing bus for left AES3 output)**

Simple mixer control 'Mxr 3/2',0  
Capabilities: pvolume pvolume-joined  
Playback channels: Mono  
Limits: Playback 0 - 1021  
Mono: Playback 0 [0%] [-99999.99 dB]

**Digital gain on DAW3 input channel towards mixing bus for right AES3 output)**

Simple mixer control 'Mxr 3/3',0  
Capabilities: pvolume pvolume-joined  
Playback channels: Mono

Limits: Playback 0 - 1021

Mono: Playback 901 [88%] [0.00 dB]

**Digital gain on DAW3 input channel towards mixing bus for record DAW0 output)**

Simple mixer control 'Mxr 3/4',0

Capabilities: pvolume pvolume-joined

Playback channels: Mono

Limits: Playback 0 - 1021

Mono: Playback 0 [0%] [-99999.99 dB]

**Digital gain on DAW3 input channel towards mixing bus for record DAW1 output)**

Simple mixer control 'Mxr 3/5',0

Capabilities: pvolume pvolume-joined

Playback channels: Mono

Limits: Playback 0 - 1021

Mono: Playback 0 [0%] [-99999.99 dB]

**Digital gain on DAW3 input channel towards mixing bus for record DAW2 output)**

Simple mixer control 'Mxr 3/6',0

Capabilities: pvolume pvolume-joined

Playback channels: Mono

Limits: Playback 0 - 1021

Mono: Playback 0 [0%] [-99999.99 dB]

**Digital gain on DAW3 input channel towards mixing bus for record DAW3 output)**

Simple mixer control 'Mxr 3/7',0

Capabilities: pvolume pvolume-joined

Playback channels: Mono

Limits: Playback 0 - 1021

Mono: Playback 0 [0%] [-99999.99 dB]

**Digital gain on ANA0 (IN1) input channel towards mixing bus for analog output 1 (OUT1)**

Simple mixer control 'Mxr 4/0',0

Capabilities: pvolume pvolume-joined

Playback channels: Mono

Limits: Playback 0 - 1021

Mono: Playback 0 [0%] [-99999.99 dB]

**Digital gain on ANA0 (IN1) input channel towards mixing bus for analog output 2 (OUT2)**

Simple mixer control 'Mxr 4/1',0

Capabilities: pvolume pvolume-joined

Playback channels: Mono

Limits: Playback 0 - 1021

Mono: Playback 0 [0%] [-99999.99dB]

**Digital gain on ANA0 (IN1) input channel towards mixing bus for left AES3 output)**

Simple mixer control 'Mxr 4/2',0  
Capabilities: pvolume pvolume-joined  
Playback channels: Mono  
Limits: Playback 0 - 1021  
Mono: Playback 0 [0%] [-99999.99dB]

**Digital gain on ANA0 (IN1) input channel towards mixing bus for right AES3 output)**

Simple mixer control 'Mxr 4/3',0  
Capabilities: pvolume pvolume-joined  
Playback channels: Mono  
Limits: Playback 0 - 1021  
Mono: Playback 0 [0%] [-99999.99dB]

**Digital gain on ANA0 (IN1) input channel towards mixing bus for record DAW0 output)**

Simple mixer control 'Mxr 4/4',0  
Capabilities: pvolume pvolume-joined  
Playback channels: Mono  
Limits: Playback 0 - 1021  
Mono: Playback 901 [88%] [0.00dB]

**Digital gain on ANA0 (IN1) input channel towards mixing bus for record DAW1 output)**

Simple mixer control 'Mxr 4/5',0  
Capabilities: pvolume pvolume-joined  
Playback channels: Mono  
Limits: Playback 0 - 1021  
Mono: Playback 0 [0%] [-99999.99dB]

**Digital gain on ANA0 (IN1) input channel towards mixing bus for record DAW2 output)**

Simple mixer control 'Mxr 4/6',0  
Capabilities: pvolume pvolume-joined  
Playback channels: Mono  
Limits: Playback 0 - 1021  
Mono: Playback 0 [0%] [-99999.99dB]

**Digital gain on ANA0 (IN1) input channel towards mixing bus for record DAW3 output)**

Simple mixer control 'Mxr 4/7',0  
Capabilities: pvolume pvolume-joined  
Playback channels: Mono  
Limits: Playback 0 - 1021  
Mono: Playback 0 [0%] [-99999.99dB]

**Digital gain on ANA1 (IN2) input channel towards mixing bus for analog output 1 (OUT1)**

Simple mixer control 'Mxr 5/0',0  
Capabilities: pvolume pvolume-joined  
Playback channels: Mono

Limits: Playback 0 - 1021

Mono: Playback 0 [0%] [-99999.99dB]

### **Digital gain on ANA1 (IN2) input channel towards mixing bus for analog output 2 (OUT2)**

Simple mixer control 'Mxr 5/1',0

Capabilities: pvolume pvolume-joined

Playback channels: Mono

Limits: Playback 0 - 1021

Mono: Playback 0 [0%] [-99999.99dB]

### **Digital gain on ANA1 (IN2) input channel towards mixing bus for left AES3 output)**

Simple mixer control 'Mxr 5/2',0

Capabilities: pvolume pvolume-joined

Playback channels: Mono

Limits: Playback 0 - 1021

Mono: Playback 0 [0%] [-99999.99dB]

### **Digital gain on ANA1 (IN2) input channel towards mixing bus for right AES3 output)**

Simple mixer control 'Mxr 5/3',0

Capabilities: pvolume pvolume-joined

Playback channels: Mono

Limits: Playback 0 - 1021

Mono: Playback 0 [0%] [-99999.99 dB]

### **Digital gain on ANA1 (IN2) input channel towards mixing bus for record DAW0 output)**

Simple mixer control 'Mxr 5/4',0

Capabilities: pvolume pvolume-joined

Playback channels: Mono

Limits: Playback 0 - 1021

Mono: Playback 0 [0%] [-99999.99dB]

### **Digital gain on ANA1 (IN2) input channel towards mixing bus for record DAW1 output)**

Simple mixer control 'Mxr 5/5',0

Capabilities: pvolume pvolume-joined

Playback channels: Mono

Limits: Playback 0 - 1021

Mono: Playback 901 [88%] [0.00dB]

### **Digital gain on ANA1 (IN2) input channel towards mixing bus for record DAW2 output)**

Simple mixer control 'Mxr 5/6',0

Capabilities: pvolume pvolume-joined

Playback channels: Mono

Limits: Playback 0 - 1021

Mono: Playback 0 [0%] [-99999.99dB]

**Digital gain on ANA1 (IN2) input channel towards mixing bus for record DAW3 output)**

Simple mixer control 'Mxr 5/7',0  
Capabilities: pvolume pvolume-joined  
Playback channels: Mono  
Limits: Playback 0 - 1021  
Mono: Playback 0 [0%] [-99999.99dB]

**Digital gain on AES3 input left channel towards mixing bus for analog output 1 (OUT1)**

Simple mixer control 'Mxr 6/0',0  
Capabilities: pvolume pvolume-joined  
Playback channels: Mono  
Limits: Playback 0 - 1021  
Mono: Playback 0 [0%] [-99999.99dB]

**Digital gain on AES3 input left channel towards mixing bus for analog output 2 (OUT2)**

Simple mixer control 'Mxr 6/1',0  
Capabilities: pvolume pvolume-joined  
Playback channels: Mono  
Limits: Playback 0 - 1021  
Mono: Playback 0 [0%] [-99999.99dB]

**Digital gain on AES3 input left channel towards mixing bus for left AES3 output)**

Simple mixer control 'Mxr 6/2',0  
Capabilities: pvolume pvolume-joined  
Playback channels: Mono  
Limits: Playback 0 - 1021  
Mono: Playback 0 [0%] [-99999.99dB]

**Digital gain on AES3 input left channel towards mixing bus for right AES3 output)**

Simple mixer control 'Mxr 6/3',0  
Capabilities: pvolume pvolume-joined  
Playback channels: Mono  
Limits: Playback 0 - 1021  
Mono: Playback 0 [0%] [-99999.99dB]

**Digital gain on AES3 input left channel towards mixing bus for record DAW0 output)**

Simple mixer control 'Mxr 6/4',0  
Capabilities: pvolume pvolume-joined  
Playback channels: Mono  
Limits: Playback 0 - 1021  
Mono: Playback 0 [0%] [-99999.99dB]

**Digital gain on AES3 input left channel towards mixing bus for record DAW1 output)**

Simple mixer control 'Mxr 6/5',0  
Capabilities: pvolume pvolume-joined  
Playback channels: Mono

Limits: Playback 0 - 1021

Mono: Playback 0 [0%] [-99999.99dB]

**Digital gain on AES3 input left channel towards mixing bus for record DAW2 output)**

Simple mixer control 'Mxr 6/6',0

Capabilities: pvolume pvolume-joined

Playback channels: Mono

Limits: Playback 0 - 1021

Mono: Playback 901 [88%] [0.00dB]

**Digital gain on AES3 input left channel towards mixing bus for record DAW3 output)**

Simple mixer control 'Mxr 6/7',0

Capabilities: pvolume pvolume-joined

Playback channels: Mono

Limits: Playback 0 - 1021

Mono: Playback 0 [0%] [-99999.99dB]

**Digital gain AES3 input right channel towards mixing bus for analog output 1 (OUT1)**

Simple mixer control 'Mxr 7/0',0

Capabilities: pvolume pvolume-joined

Playback channels: Mono

Limits: Playback 0 - 1021

Mono: Playback 0 [0%] [-99999.99dB]

**Digital gain AES3 input right channel towards mixing bus for analog output 2 (OUT2)**

Simple mixer control 'Mxr 7/1',0

Capabilities: pvolume pvolume-joined

Playback channels: Mono

Limits: Playback 0 - 1021

Mono: Playback 0 [0%] [-99999.99dB]

**Digital gain on AES3 input right channel towards mixing bus for left AES3 output**

Simple mixer control 'Mxr 7/2',0

Capabilities: pvolume pvolume-joined

Playback channels: Mono

Limits: Playback 0 - 1021

Mono: Playback 0 [0%] [-99999.99dB]

**Digital gain AES3 input right channel towards mixing bus for right AES3**

Simple mixer control 'Mxr 7/3',0

Capabilities: pvolume pvolume-joined

Playback channels: Mono

Limits: Playback 0 - 1021

Mono: Playback 0 [0%] [-99999.99dB]

**Digital gain AES3 input right channel towards mixing bus for record DAW0 output**



Simple mixer control 'Mxr 7/4',0  
Capabilities: pvolume pvolume-joined  
Playback channels: Mono  
Limits: Playback 0 - 1021  
Mono: Playback 0 [0%] [-99999.99dB]

**Digital gain AES3 input right channel towards mixing bus for record DAW1 output**

Simple mixer control 'Mxr 7/5',0  
Capabilities: pvolume pvolume-joined  
Playback channels: Mono  
Limits: Playback 0 - 1021  
Mono: Playback 0 [0%] [-99999.99dB]

**Digital gain AES3 input right channel towards mixing bus for record DAW2 output**

Simple mixer control 'Mxr 7/6',0  
Capabilities: pvolume pvolume-joined  
Playback channels: Mono  
Limits: Playback 0 - 1021  
Mono: Playback 0 [0%] [-99999.99dB]

**Digital gain AES3 input right channel towards mixing bus for record DAW3 output**

Simple mixer control 'Mxr 7/7',0  
Capabilities: pvolume pvolume-joined  
Playback channels: Mono  
Limits: Playback 0 - 1021  
Mono: Playback 901 [88%] [0.00dB]

## 13 SPECIFICATIONS

### 13.1 Configuration

Bus/Format	PCI EXPRESS™ (PCIe®) x1/Low profile (compatible x2, x4, x8, x16)
Dimensions	168 mm × 69 mm x 20 mm
Consumption (+3.3 V/+12 V)	1 A/0.35 A
In operation: temperature/humidity (without condensation)	0°C/+50°C • 5%/90%
Storage: temperature/humidity (without condensation)	-5°C/+70°C • 0%/95%

## 13.2 Inputs

Line analog inputs	2 mono symmetrical (can be used asymmetrically)
Maximum input level/impedance	Line: +24 dBu/>10 kΩ Mic (ALP222e-Mic only): +10 dBu/>10 kΩ
Digital input (stereo)	1 AES3 stereo, 110 Ohms, with hardware sample rate converter (SRC)
Programmable analog input gains	Line: -87 dB to +40 dB, 0.5 dB increments Max. sensitivity: 0 dBfs for -40 dBu Mic (ALP222e-Mic only): 0 dB to +65 dB, 0.5 dB increments Max. sensitivity: 0 dBfs for -55 dBu
Programmable digital input gains	-90 dB to +12 dB, 0.1 dB increments
Synchronisation inputs	1 AES11, 32 kHz to 192 KHz 1 Word Clock, (75 Ohms), 32 kHz to 192 KHz
On/Off contacts	2 dry contacts

## 13.3 Outputs

Line analog outputs	2 electronically balanced mono (can be used asymmetrically without loss of level)
Maximum output level/impedance	+24 dBu/<100 k $\Omega$
Digital output	1 AES3 stereo, up to 192 kHz
Programmable digital output gain	-90 dB to +12 dB, 0.1 dB increments
Clock output	1 Word Clock, (75 Ohms), 32 kHz to 192 KHz
Headphone output	1 stereo headphone output 20 mW/600 $\Omega$
Contacts	2 relay contacts, 0.5 A, 48 VDC

## 13.4 Audio characteristics

Sampling frequency	Programmable from 8 to 192 kHz
CAN/CNA resolutions	24 bits/192 kHz
Audio formats supported	PCM: 16, 24, 32 bits, Float IEEE754

## 13.5 Analog performances

Measurements taken at  $F_s=48$  kHz, with filter on band 22 Hz-22 kHz.

Frequency response	@48 kHz, 20 Hz - 20 kHz Inputs: +/- 0.5 dB Outputs: +/- 0.08 dB
Phase shift between tracks	Inputs: < 0.01° (@1 kHz) Outputs: < -7.5° (@1 kHz)
Signal to Noise Ratio	Inputs: >110 dBA (>108 dB unweighted) Outputs: >115 dBA (>112 dB unweighted)
THD + Noise	Inputs: <-96 dB @18 dBu (1 kHz) Outputs: <-101 dB @18 dBu (1 kHz)
Crosstalk	Inputs: -111 dB @1 kHz/-110 dB @15 kHz Outputs: -130 dB @1 kHz/-111 dB @15 kHz
Equivalent Input Noise (EIN) (ALP222e-Mic, Mic input level)	-124 dB (A/D-D/A at 48kHz, G=65 dB)

## 13.6 Sample rate converter performance (SRC)

Maximum frequency	192 kHz
Frequency ratio	1:8 to 7.5:1
THD + noise 1 kHz to -2 dBfs	<-130 dB

## 13.7 Connectors

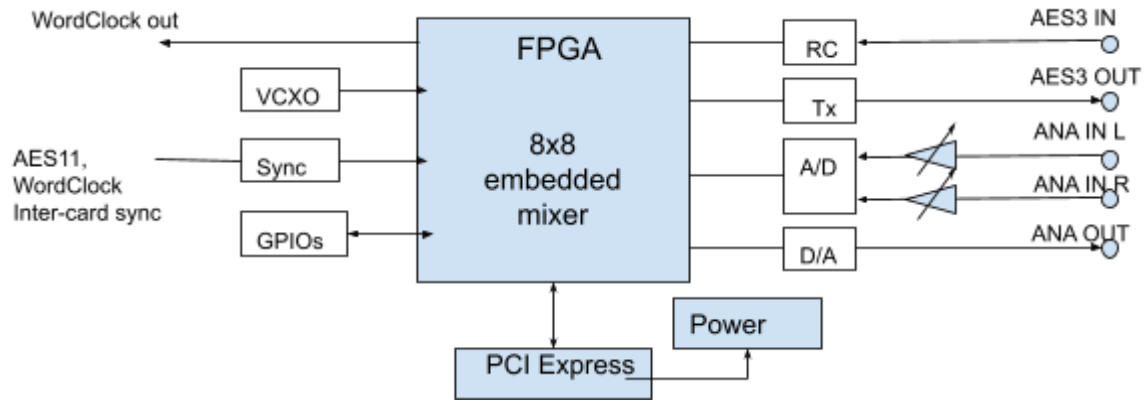
Internal connectors	Inter-card synchronisation
External connectors	D-Sub Micro-D 36 points for the audio and clock I/O Mini jack (female TRS 3.5 mm) for the stereo headphones output

## 13.8 Development environment

Drivers	DirectSound/WASAPI, ASIO, Alsa, Libgpi
Operating systems supported	Windows 10 from version 20H2 Linux (from Linux Kernel 4.9)
Main characteristics of on-board processing	PCM playback and acquisition, Float IEEE754, <i>direct monitoring</i> , real time mixing, levels adjustment, panning

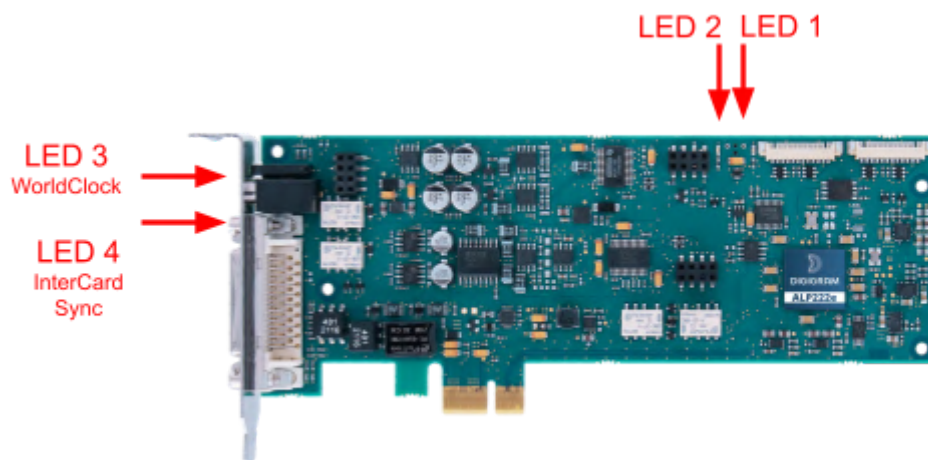
# 14 APPENDICES

## 14.1 ALP222e functional diagram



## 14.2 LED

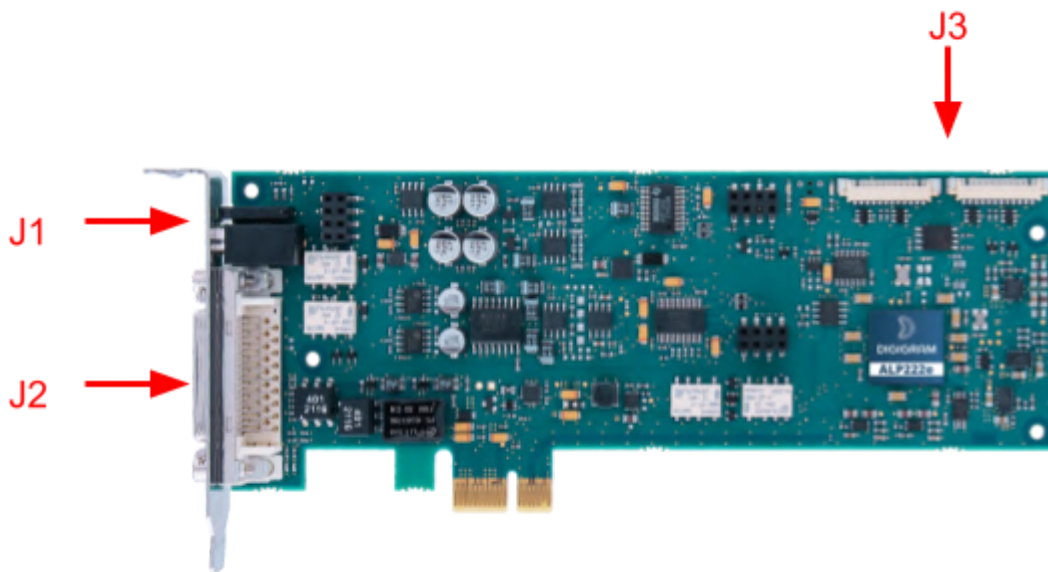
The ALP card has four green LED: 2 LED on the PCB (only visible when the PC is open) and two LED on the bracket as illustrated in the diagram below.



LED	Description	Behaviour
LED 1	Signals when the card is initialised correctly	Constantly lit
LED 2	Signals if the card is running the last updated firmware or the backup factory firmware version.	<ul style="list-style-type: none"> <li>Flashes every 2 seconds: The card runs the last uploaded firmware version (normal behaviour).</li> <li>Flashes every second: The card runs the backup factory firmware instead of the last uploaded version This last firmware is corrupted in memory and has to be applied again.</li> </ul>
LED 3	Wordclock	<ul style="list-style-type: none"> <li>Off when no Wordclock signal is detected.</li> <li>Flashes when a Wordclock signal is detected but the card is not synchronised on it</li> <li>Lit when the card is synchronised to the Wordclock input</li> </ul>
LED 4	Intre card synchro / card locator	<ul style="list-style-type: none"> <li>Off when the card is not synchronised to another one via the inter card ribbon cable</li> <li>Lit when the card is slaved to another one via the intercard synchro ribbon.</li> <li>Flashes when the button "card locator" is pressed from the ALP-X Manager application.</li> </ul>



## 14.3 Connectors and switches



**J1: Headphones socket**

*Female 3.5 mm TRS (mini-jack)*

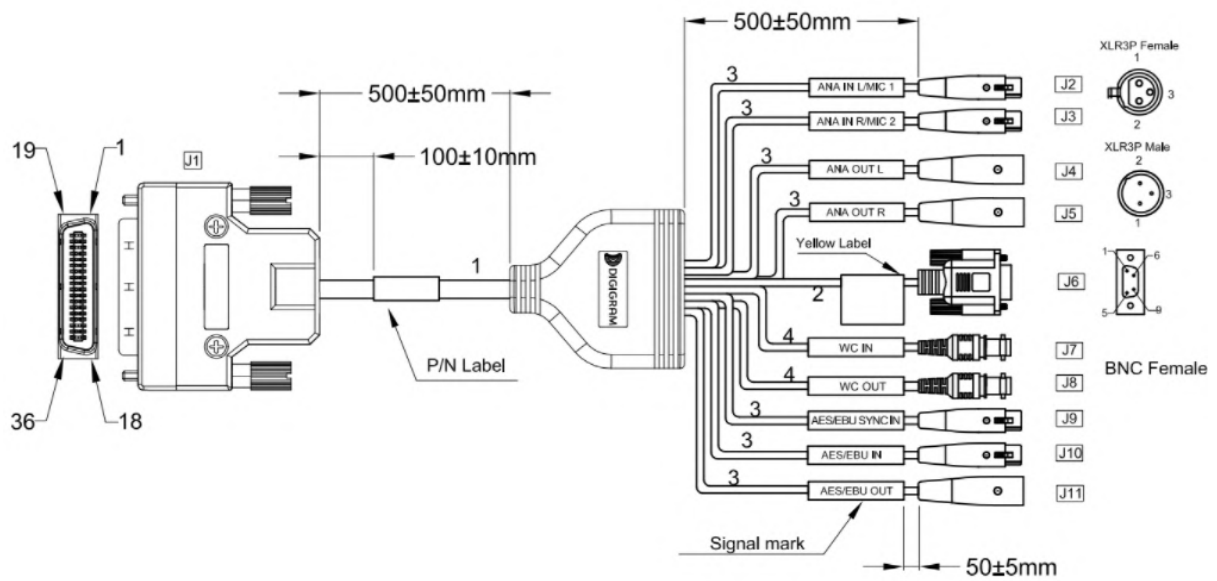
**J2: Connector for the breakout cable**

*Female D-Sub Micro-D 36P.*

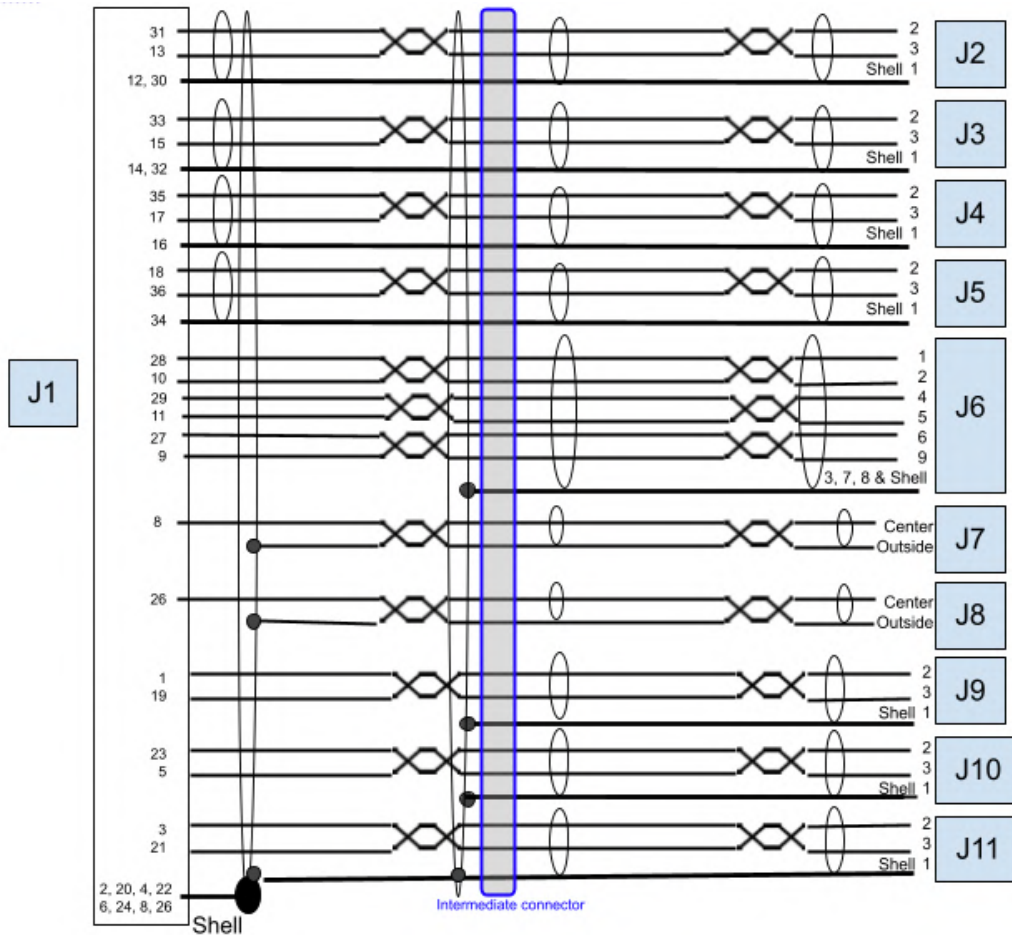
**J3: Connector for inter-card synchronisation**

## 14.4 Breakout cable diagram

Diagram of the breakout cable provided by Digigram (optional).



## 14.5 Pinout of the breakout cable connector



<b>J1</b>	Male D-Sub Micro-D 36P	<b>J6</b>	GPIO (male D-Sub 9P)
<b>J2</b>	Female XLR: Left analog input	<b>J7</b>	BNC: Word Clock input
<b>J3</b>	Female XLR: Right analog input	<b>J8</b>	BNC: Word Clock input
<b>J4</b>	Male XLR: Left analog output	<b>J9</b>	Female XLR: AES/EBU SYNC IN
<b>J5</b>	Male XLR: Right analog output	<b>J10</b>	Female XLR: AES EBU IN
		<b>J11</b>	Male XLR:AES/EBU OUT

**Pinout of connector J1 (Male D-Sub Micro-D 36 pins)**

Row 1		Row 2	
Pin#		Pin #	
1	AES/EBU SYNC IN +	19	AES/EBU SYNC IN -
2	GND	20	GND
3	AES/EBU OUT +	21	AES/EBU OUT -
4	GND	22	GND
5	AES/EBU IN -	23	AES/EBU IN +
6	GND	24	GND
7	WC/IN	25	WC/OUT
8	GND	26	GND
9	GPI 2	27	GPI 1
10	GPO 1B	28	GPO 1A
11	GPO 2B	29	GPO 2A
12	GND	30	GND
13	ANA/IN L -	31	ANA/IN L +
14	GND	32	GND
15	ANA/IN R -	33	ANA/IN R +
16	GND	34	GND
17	ANA/OUT L -	35	ANA/OUT L +
18	ANA/OUT R +	36	ANA/OUT R -

**Pinout of connector J6 f GPIO's (Male D-Sub 9 pins)**

1	GPO 1A	6	GPI 1
2	GPO 1B	7	GND
3	GND	8	GND
4	GPO 1B	9	GPI 2
5	GPO 2B		

## 14.6 How to use GPI's and GPO's

The two GPI's are dry contacts.

When the GPI X pin is not connected, the GPI status is OPEN.

When the GPI X pin is connected to the ground, the GPI status is CLOSED.

The two GPO's are relays, which means the contact between GPO xA and GPO xB is made when the CLOSED command is sent. GPO's support a maximal voltage of 48VDC and a maximum current of 0.5 amps.

**Please contact your distributor for all technical support issues**



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