User Manual

ALP280e & ALP280e-MIC

Professional multi-channel sound cards

February 2025

Author	Date	Status
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1 INTRODUCTION

This document describes the installation and use of the following Digigram multichannel PCI Express cards under Windows: ALP280e, and ALP280e-MIC.

These cards are part of the ALP-X professional sound cards range.

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Digigram and the Digigram logo, ALP280e and ALP280e-MIC are trademarks or brand names of Digigram Digital. All other marks are owned by their respective companies.

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:

- The ALP280e or ALP280e-MIC sound card equipped with a low-profile bracket (79.2 mm),
- a standard height bracket (full height: 120 mm) that can be fitted instead of the low profile one.

The two breakout cables that bear the XLR and BNC connectors are available as an option. One cable supports the analog I/Os, the other one supports the GPIOs and external clocks.

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

4 GENERAL CHARACTERISTICS

ALP280e and ALP280e-MIC are PCI EXPRESS™ x1 sound cards. They can be inserted into and therefore operate in PCIe® x1, x4, x8 or x16 slots.

4.1 Main hardware characteristics

- 8 balanced analog inputs with:
  - software-adjustable analog gain and a maximum input line level of +24 dBu, and a maximum input mic level of +10 dBu (ALP280e-MIC)
  - switchable 48V phantom power on each input (ALP280e-MIC)

  These inputs can be used in unbalanced mode ("-" signal to be connected to the ground).
- 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 word clock input/output (up to 192 kHz)
- 1 AES11 sync input (up to 192 kHz)
- 8 GPI dry contacts and 8 GPO relays
- Inter-card synchronisation

4.2 Main software characteristics

- Low latency multi-card drivers
  - Wasapi/DirectSound and ASIO application programming interfaces under Windows
- 8 playback channels / 8 recording channels
- 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 (internal, wordclock, AES11)
  - frequency of the fallback internal clock
  - input and output gains and VU-meters

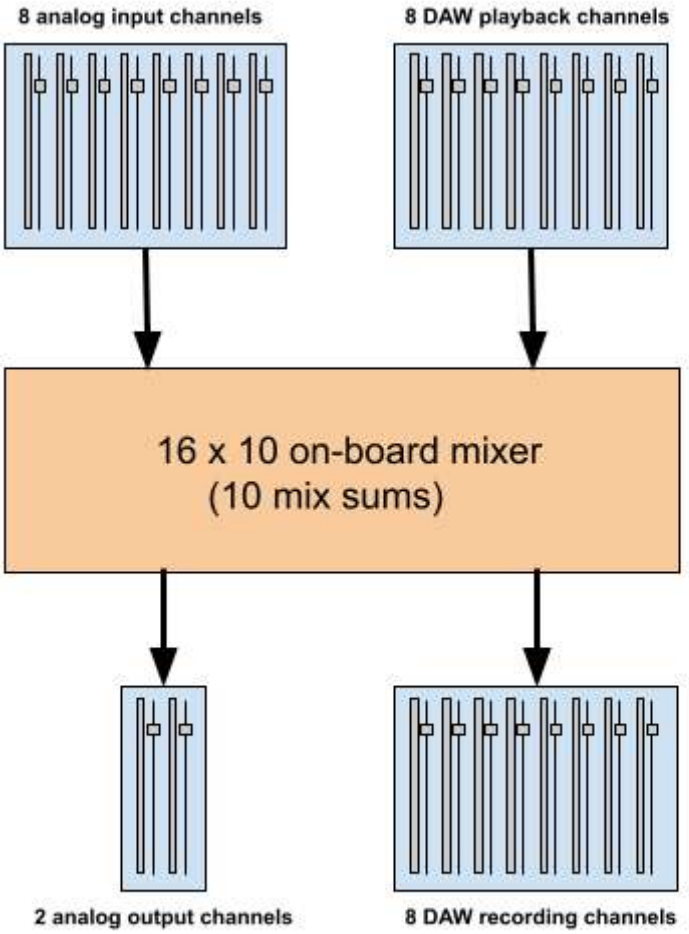
- 48V phantom power switches (for -MIC cards)
- routing of inputs to outputs
- GPIOs

- API for implementing the management of the card settings in a software application.

4.3 Routing audio streams in the card

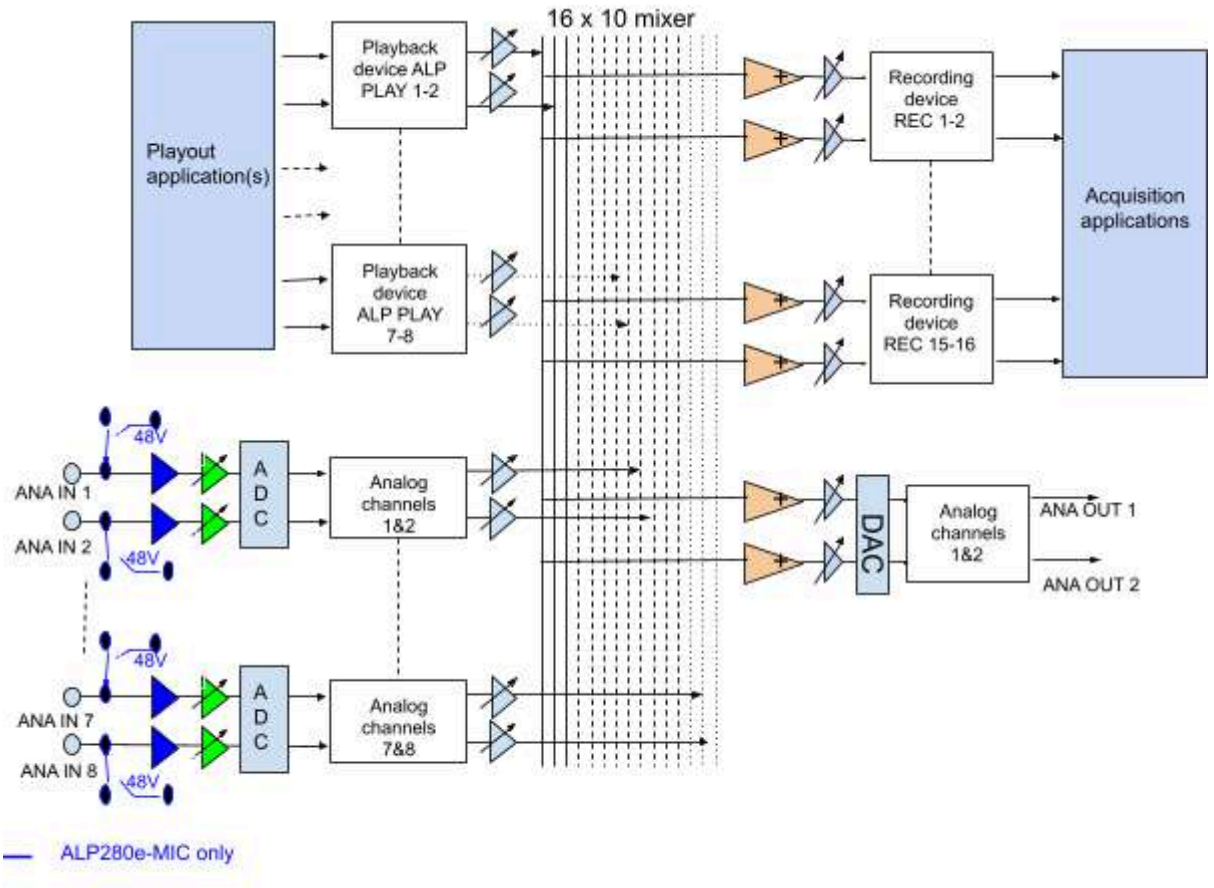
The ALP cards incorporate an on-board mixer in an FPGA component.

On ALP280e and ALP280e-MIC, this is a mixer with 16 mono inputs and 10 mono outputs. The mixer captures the 8 analog input channels of the card and the 8 channels from the software playback devices.
The mixer restores 10 audio channels, respectively to the 2 physical analog outputs of the card and the 8 software recording device channels.
The mixer can therefore be configured to perform the mixing and the routing of the 16 input channels to the 10 output channels (10 mix sums).



ALP280e & ALP280e-MIC

The following diagrams show a more detailed view of the workflows in the card, with the input and output gains.



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, 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.

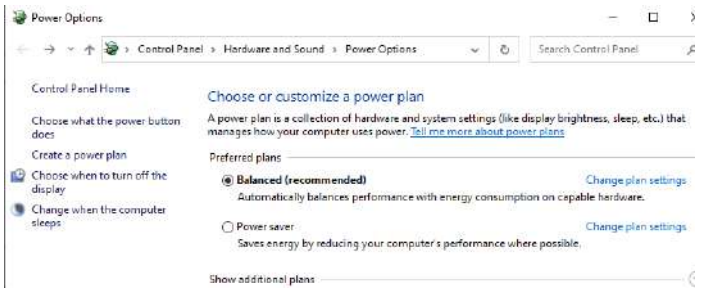
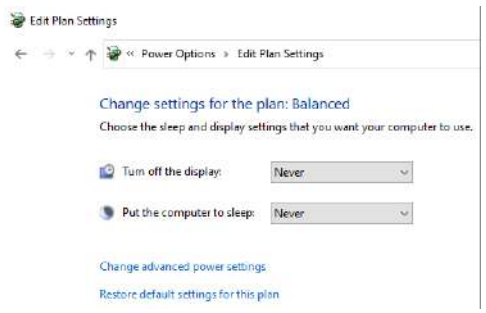
In case the PC goes to sleep mode under Windows, please proceed as follows to disable the sleep mode.

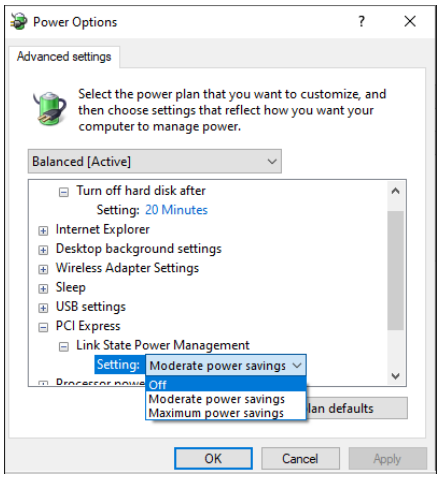
The windows sleep mode for the PCIe bus must be disabled.

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”.

	Click on “Change plan settings” in front of “Balanced (recommended)”
	Select “Change advanced power settings”.



Select “PCI Express”, “Link State Power Management”, and select “Off” for the setting.

Click on Ok to validate

5.2 Necessary software configuration under Windows

ALP cards operate under Windows from 64-bit versions of Windows 10 (from version 20H2), and under Windows Server from version 2019.

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 support page of any ALP card (the same diver supports all the ALP cards).

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 (32 bits and 64 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***”

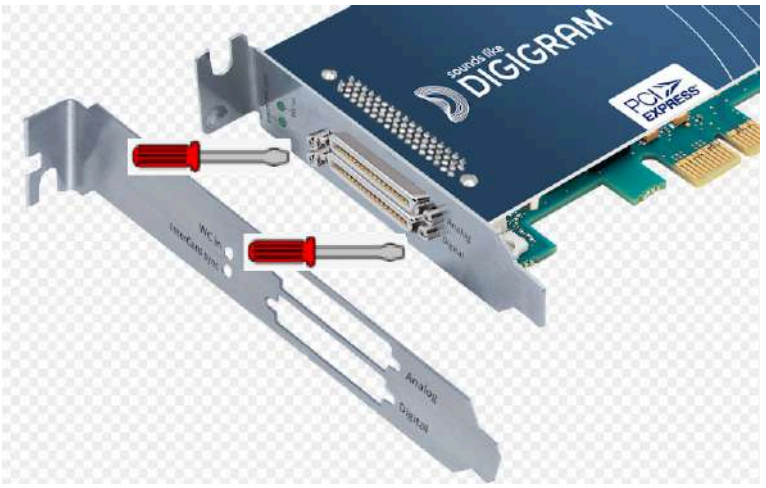
6 HARDWARE INSTALLATION

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 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.

6.3 State of internal LED

The ALP card has two internal LEDs on the edge of its mother board, as shown below. The state of these LEDs can be seen when the PC cover is open.

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.

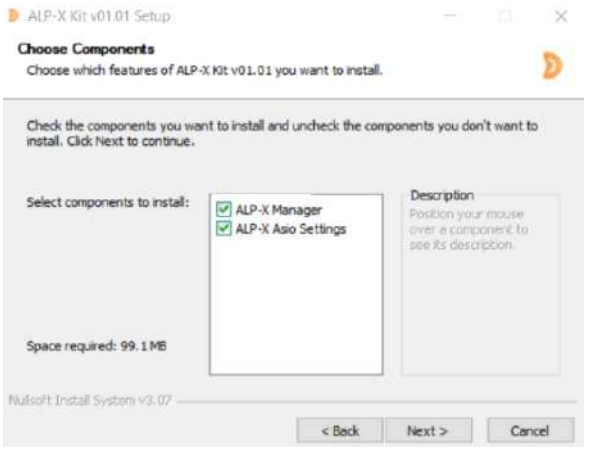
Please visit the Digigram website at www.digigram.com to obtain the most recent driver.

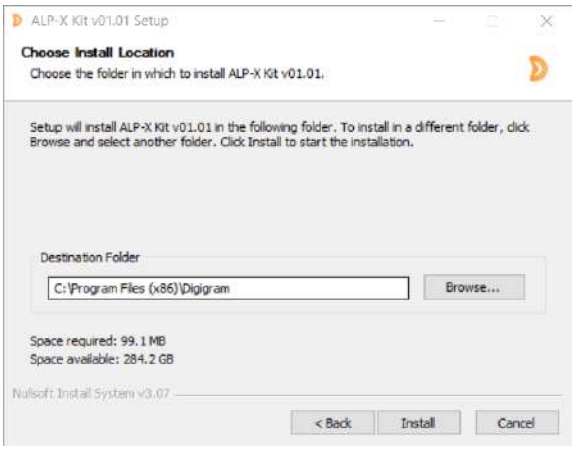
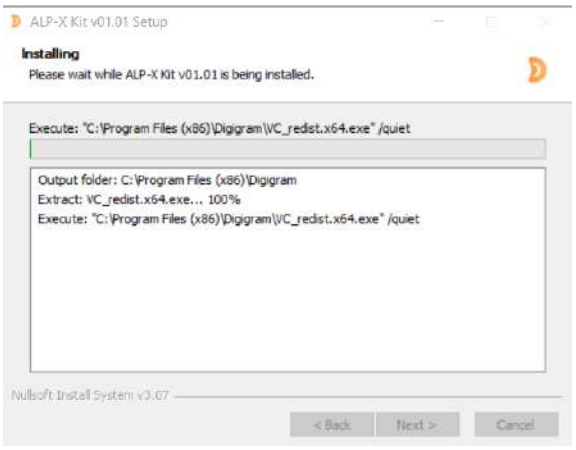
Should you use a specific application developed or installed by a Digigram partner, this may mean using a specific driver version. In this case, confirm with your application supplier which driver version to use.

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 an available PCIe slot.
- 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"

	Click on Next to continue with the installation.
	Click on "I agree" to continue with the installation.
	In this window, select the components to be installed in addition to the card driver. • 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. • 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.

	The driver is installed by default in the folder "C:\Program Files (x86)\Digigram\ALP-X". To change this folder, click on Browse and select a new destination. Click on Install to continue with the installation.
	The driver and selected components are being installed.

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).

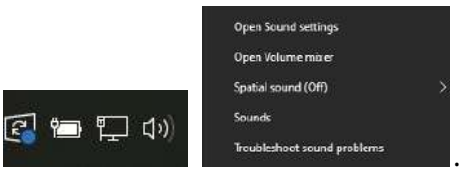
-

7.4 Verifying the card installation

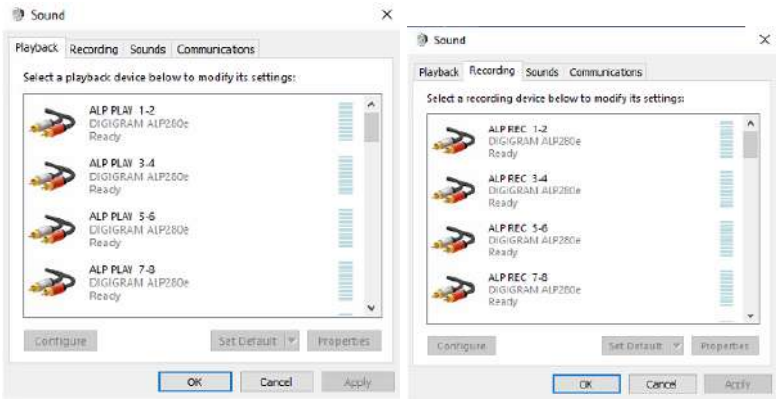
Once the driver and card have been installed as per the process described hereinabove, you can verify that the card is installed correctly and working properly.

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 card 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.

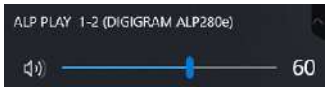
Playback to a device can be tested by right clicking on it and selecting "Test". The VU-meter must then show modulation and the sound must be heard on the card output(s) according to the routing and levels configured in the ALP-X Manager application.

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 ALP280e, the second card is an ALP442e, and the third card is an ALP882e.

First card: ALP280e	Second card: ALP442e	Third card: ALP882e
ALP PLAY 1-2 *Digigram ALP280e* ***ALP PLAY 3-4*** *Digigram ALP280e* ... ***ALP PLAY 7-8*** *Digigram ALP280e*	***ALP PLAY 1-2*** *Digigram ALP442e* ***ALP PLAY 3-4*** *Digigram ALP442e* ... ***ALP PLAY 7-8*** *Digigram ALP442e*	***ALP PLAY 1-2*** *2-Digigram ALP882e* ***ALP PLAY 3-4*** *2-Digigram ALP882e* ... ***ALP PLAY 15-16*** *2-DigigramALP882e*

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.

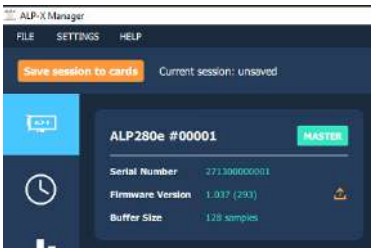


Note that after the first installation of the card, the default gain settings are as follows:

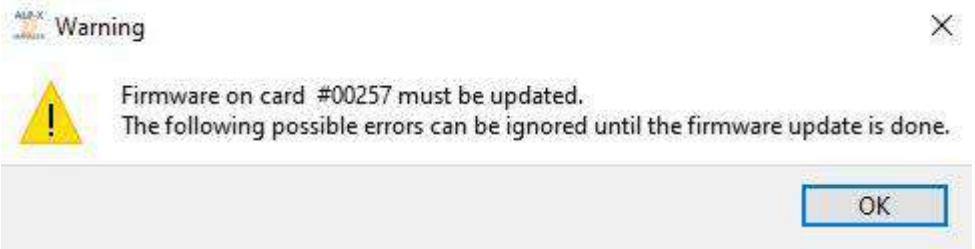
- Input analog gains are set to -24 dB (+24 dU -> 0 dBfs).
- Digital input and output gains are set to 0 dB

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

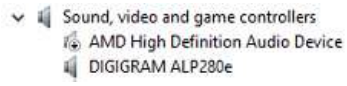
If the ASIO driver for the card has been installed (option to be selected during the installation procedure), then the card must be detected and displayed in the ASIO control panel.
This control panel can be started from the ASIO application to select the appropriate audio devices.
All cards present must be listed in the "ACTIVE CARDS GROUP" selection list.

7.5 Adjusting the internal latency of the card

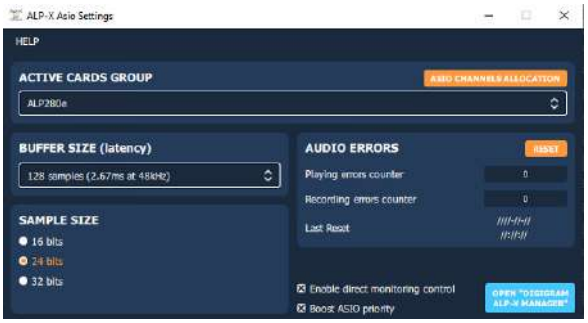
The following describes advanced settings that may impact the proper functioning of data exchanges between the card and the PC. It is recommended that you do not change these settings.

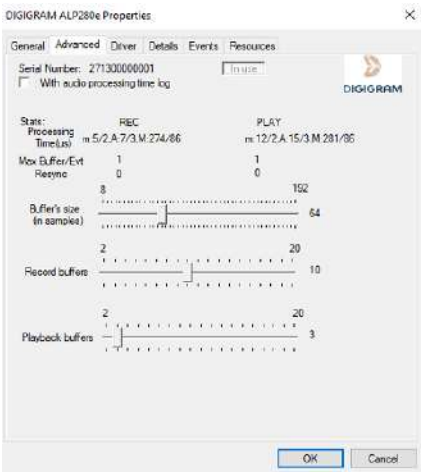
The internal latency of the card is determined by the duration of sample buffers the card exchanges with the PC for playback and recording audio streams. By default, this duration is 512 sampling clock periods (10.7ms at 48 kHz).
The lower the internal latency, the lower the global latency of the card. 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 the card can be changed by electing 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:





With audio processing timelog:
This option is to be used only for debugging purposes (debugview). Do not activate it unless requested by Digigram technical support.

Stats: These displayed values are only for technical investigation purposes.

Buffer size: size of the buffers exchanged between the card and the driver. The size is expressed in samples (ex: at 48 kHz, a value of 48 corresponds to 1ms buffer).
Values are from 8 samples to 192 samples.
It impacts the driver latency.

Record buffers: Number of internal buffers used for recording (from 2 to 20 buffers).

Playbackbuffers: Number of internal buffers used for playback (from 2 to 20 buffers).

Note: in case breaks in the audio flow are experienced, it is necessary to test other parameter values (number of buffers, size of buffers).

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

The PC must be restarted.

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 one slot to another, it is strongly recommended to proceed as follows:

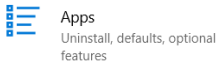
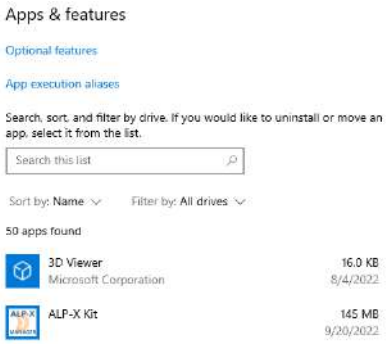
- Turn off the PC.
- Remove the cards to be moved.
- Restart the PC.

- 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.

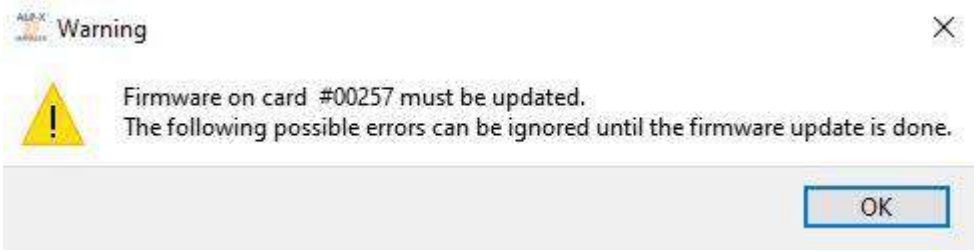
Please note that uninstalling a version must be done prior to the installation of another version.

	From Windows Start menu, open the ”Settings” panel
	Click on the “Apps” icon.
	From the list of installed Apps & features, select ALP-X Kit.
	Click on Uninstall. This will remove all the ALP-X … components

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.

Please refer to the firmware update procedure.

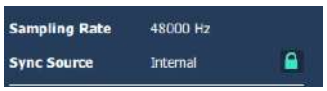
If another view is displayed, click on the card icon  to display the list of ALP cards present and detected.

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.

	The ALP card can be configured as an internal clock or external clock (AES11 Sync, Word Clock). To select the clock source, click on the "Prioritized source" selection list and select the desired source. 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. In addition, the detected sample rate of an external clock is displayed in the clock list.
	If the internal clock is selected (“Internal”), select the sampling Rate value from the “Internal Sampling Rate” selection list. 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. Selecting “Application” means that the sampling frequency is set by the application. 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.
	If an external clock is selected, the card is synchronised to it as long as it is present. 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.
	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.

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 -24 dB (+24 dU -> 0 dBfs).
- Digital input and output gains are set to 0 dB
- The routing matrix is configured this way:

Play 1-2 routed to analog outputs 1-2 Play 3-4 routed to analog outputs 1-2 Play 5-6 routed to analog outputs 1-2 Play 7-8 routed to analog outputs 1-2	Analog Inputs 1-2 routed to Rec channels 1-2 Analog Inputs 3-4 routed to Rec channels 3-4 Analog Inputs 5-6 routed to Rec channels 5-6 Analog Inputs 7-8 routed to Rec channels 7-8

The other routing points of the matrix are muted (no mix).

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

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

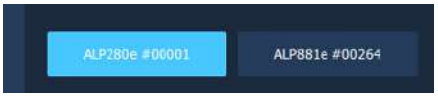
- Software playback inputs. They correspond to the playback devices exposed by the driver to the applications.
- Physical inputs (analog)
- Physical outputs (analog)
- Software recording outputs. They correspond to the recording devices exposed by the driver and captured by the applications

The table below gives the correspondence between the sound devices exposed in the operating system and the Play inputs and Rec outputs of the matrix.

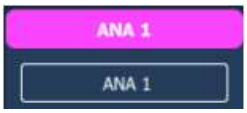
Software audio device	Windows Audio Devices	ASIO devices		Software audio device	Windows Audio Devices	ASIO devices
Playback devices = Mixer inputs				**Recording devices = Mixer output**		
PLAY 1-2 (stereo) PLAY 1 & PLAY 2 (mono)	ALP PLAY 1-2	ALP-1 / ALP-2		REC 1-2 (stereo) REC 1 & REC 2 (mono)	ALP REC 1-2	ALP-1 / ALP-2
PLAY 3-4 (stereo) PLAY 3 & PLAY 4 (mono)	ALP PLAY 3-4	ALP-3 / ALP-4		REC 3-4 (stereo) REC 3 & REC 4 (mono)	ALP REC 3-4	ALP-3 / ALP-4
PLAY 5-6 (stereo) PLAY 5 & PLAY 6 (mono)	ALP PLAY 5-6	ALP-5 / ALP-6		PLAY 5-6 (stereo) REC 5 & REC 6 (mono)	ALP REC 5-6	ALP-5 / ALP-6
PLAY 7-8 (stereo) PLAY 7 & PLAY 8 (mono)	ALP PLAY 7-8	ALP-7 / ALP-8		REC 7-8 (stereo) REC 7 & REC 8 (mono)	ALP REC 7-8	ALP-7 / ALP-8

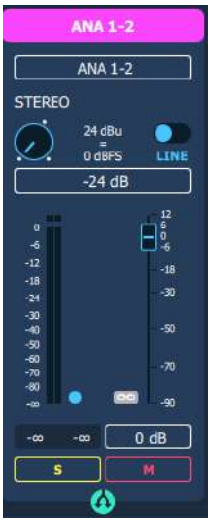
The physical inputs are displayed in the mixer GUI when the "INPUTS" vertical button is activated.
The software playback inputs are displayed when the "PLAYBACK" vertical button is activated.
The physical outputs are displayed when the "OUTPUTS" vertical button is activated.
The software recording inputs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

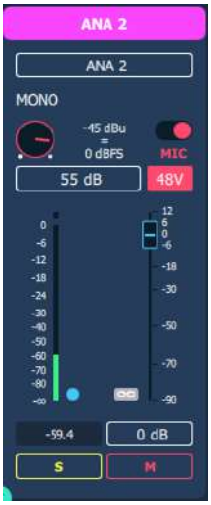
From the bottom bar of the I/O Monitor view, select the ALP card to display its Monitor page.



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

	Click on this icon to display the concerned pair of channels as two mono channel strips.
	Click on this icon to display the concerned pair of channels as one stereo channel strip. On a stereo channel strip, the controls (volumes, solo, mute) are applied to the left and right channels.
	**Channel strip name** Click on the channel strip name  and enter a new name. 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. As a consequence, it is recommended to keep the display mode used (mono or stereo) when the channel strip names have been changed.





Analog input gain settings

The first screen capture on the left relates to the ALP280e. The screen capture below relates to the ALP280e-MIC, where a Line/Mic level selection is available.

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.

There are three ways of adjusting the input gain.

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.
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.
3) Click on the gain value displayed below the potentiometer, write and enter the new value.

Double click on the potentiometer to reset the analog gain to 0 dB.

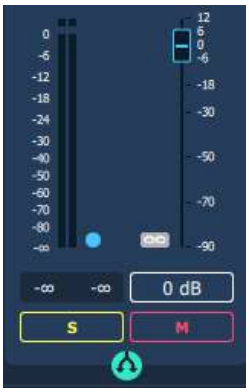
For ALP280e and ALP280e-MIC in LINE input mode, analog input gain values range from -24 dB to +16 dB, in steps of 0.5 dB.

Selecting the Mic mode from the Line/Mic selector sets the input to the Mic mode. This changes the gain range and gives access to the 48V phantom power switch.

For ALP280e-MIC in Mic input mode, analog input gain values range from 0 dB to +56 dB, in steps of 0.5 dB.

Here are a few examples of input level alignment:

ALP280e and ALP280e-MIC in LINE input mode	ALP280e-MIC in Mic input mode
Gain=+16dB: -16 dBu->0 dBfs. *Gain=+ 10 dB: -10 dBu->0 dBfs* *Gain=+ 0 dB: 0 dBu->0 dBfs* *Gain=-10 dB: +10 dBu->0 dBfs* *Gain=-24 dB: +24 dBu->-0 dBfs*	*Gain= 56 dB: -56 dBu->0 dBfs* *Gain= 46 dB: -46 dBu-> 0dBfs* *Gain= 30 dB: -30 dBu-> 0dBfs* *Gain= 10 dB: -10 dBu->0 dBfs* *Gain= 0 dB: 0 dBu->0 dBfs* *Gapain= -10 dB: +10 dBu->0 dBfs*



Digital gain settings

Digital gains are available for all the input and output audio streams, and can be adjusted via the faders.

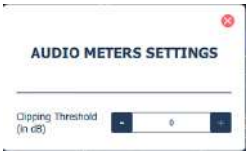
There are three ways of adjusting the digital gain.

1) Click and hold the fader button down and move the mouse vertically to increase/decrease the gain in 0.1 dB steps.
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.
3) Click on the gain value displayed below the fader, write and enter the new value.

Double click on the fader to reset the digital gain to 0 dB.
Digital gain values range from -90.1 dB to +12 dB, in steps of 0.1 dB.

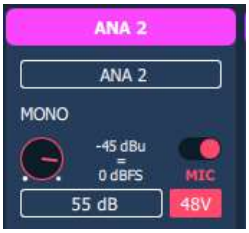
Each Vu-meter displays the input signal level in dBfs, before or after the digital gain is applied..
Double click on the blue radio button on the bottom left of the vu-meter to display the Pre/Post digital gain selection. The radio button appearance depends on the selected mode

 : Pre-fader  : Post-fader



The Vu-meters display the levels in peak-meter.

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.



48V phantom power

Setting the phantom power on an analog input is possible when this input is set to Mic level mode.

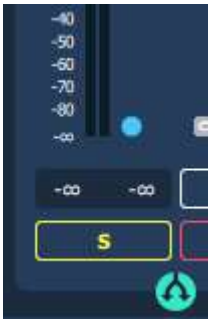
Solo
The solo button has an effect on the two channels of a stereo pair.

A click on this button sets the two channels in solo mode, and it turns yellow.

Mute

The mute button has an effect on the two channels of a stereo pair.

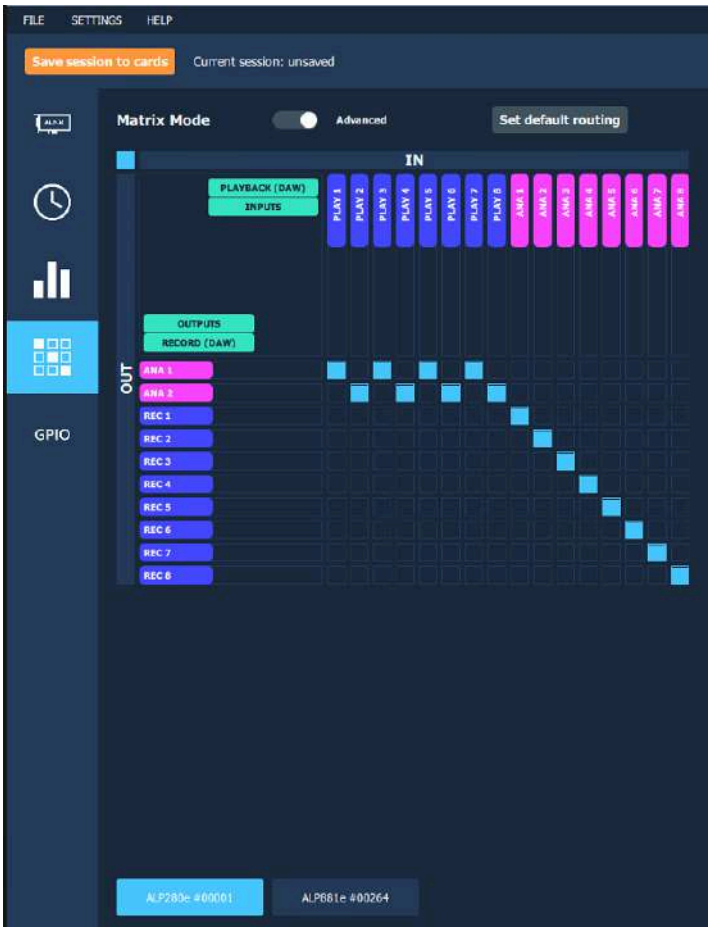
A click on this button sets the two channels in mute mode, and it turns red.

	**Pairing channel strips** 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.
	**Pre or post fader Vu-meters** The blue LED button allows selecting if the Vu-meter displays the signal level before or after the digital gain set via the fader. 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.

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 (screen capture here-above). 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 (screen capture here-below). This view is displayed when the "MATRIX MODE" selector is positioned on "REDUCED" (below).
  It allows to route left input channels of the matrix to its left output channels, and the right input channels to its right output channels

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

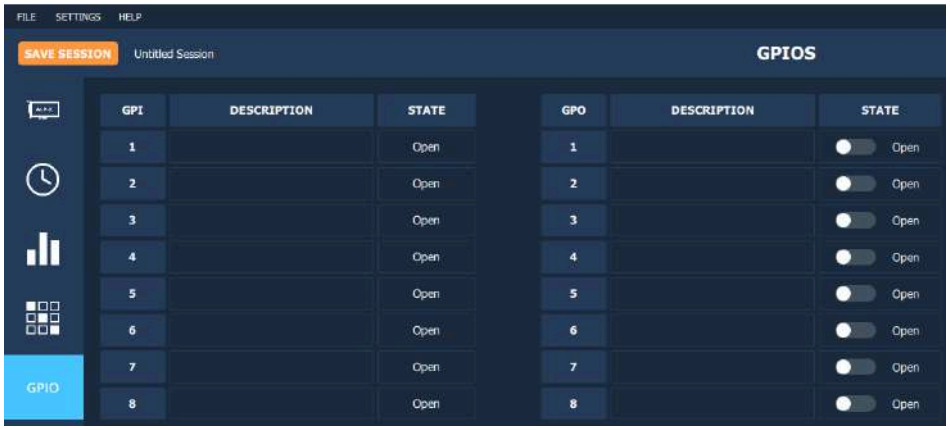
The digital gain applied to the channel can be adjusted for each mixing point. To do this, press the Ctrl key, place the mouse cursor over the mixing point without clicking and use the mouse wheel to increase or decrease the digital gain value; the gain value applied is then displayed during the adjustment.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

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 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 settings 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.

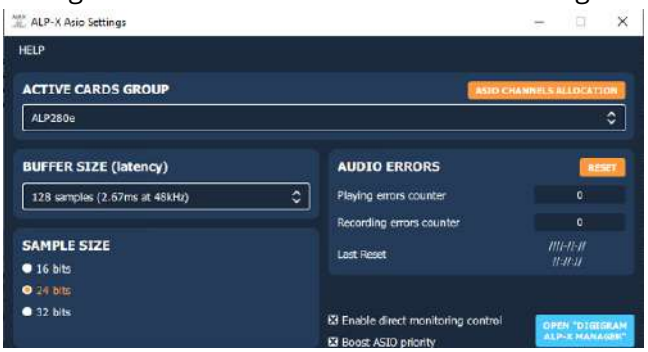
	The ALP card is selected from the list of cards detected. Click on the "Browse" button and select the file matching the new firmware to be applied (file with extension “.bin”).
	Click on the "Update" button to launch the update.
	The firmware upload is in progress
	Once the upload is completed, it is 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.
	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.

9.7 Keyboard shortcuts

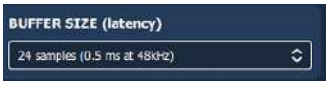
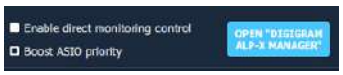
Keyboard shortcut	Action
Session	
Ctrl + S	Save
Ctrl + Alt + S	Save As
Ctrl + N	New
Ctrl + O	Open
Potentiometer/Fader	
Ctrl + Wheel	1 dB increments on the potentiometer/fader
Ctrl + Shift + Wheel	0.1 dB increments on the fader 0.5 dB increments on the potentiometer
Double click	Reset the fader/potentiometer 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 and the ASIO configuration.



Active cards group	 This section allows selecting one ALP card to be used under ASIO, or all the ALP cards (multi-card ASIO feature). In case the option “All ALP boards” is selected, all the ALP cards must be interconnected via the Wordclock. From the ALP-X Manager application, the first card clock can be internal or external, and its wordclock output must be connected to the wordclock input of the second board. The clock source of the 2nd board must be set to Wordclock, and its wordclock output must be connected to the wordclock input of the 3rd board, and so on until the last ALP card. The 1st card can be any of the installed cards.
Asio channels allocation	This section is used to select the input 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 the card or the Group of cards selected from the “ACTIVE CARDS GROUP” list, click on the "ASIO CHANNELS ALLOCATION" button and select the channels to be used under ASIO.  In case only some channels have to be used, uncheck “All channels”, and select the required channels. Click on  to save the settings. 

	A card that is not used under ASIO can be used from a WASAPI or DirectSound application.
	**Buffer size (latency)** This section is used to select the size of 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. The buffer size is from 24 samples to 8192 samples. However it must be at least equal to the number of internal playback buffers minus one, multiplied by the internal buffer size (internal buffer size and number of playback buffer size being set from the Windows device manager, card properties tab). Example:  ● Internal buffer size = 64 ● Number of playback buffers=3 **=>** Minimum size of ASIO buffers: (3-1)*64=128 samples. A small ASIO buffer size can lead to breaks in audio throughput on a low-powered machine or on a machine with a high processor load.
	**Sample size** This setting defines the format of samples exchanged between the application and the card driver.
	**Enable Direct Monitoring Control** 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.
	Boost ASIO priority 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.
	**Audio errors** 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. Sync status errors reflect clock synchro errors (AES11 external clock, WordClock or inter-card synchro). Error counters can be reset to zero by clicking on the RESET button. Lastly, a time counter displays the time elapsed since the last counter reset.

11 LOADING THE ASIO DRIVER FROM A SERVICE

When the ALP-X ASIO driver is loaded by a service owned by the SYSTEM user, the ALP-X Asio Settings software must be started externally from an administrator-level command.

- First run the service and initialize the ASIO driver, in order to generate the registry key.
- Using regedit, find the generated key in HKEY_LOCAL_MACHINE\SOFTWARE\ASIO\ASIO ALP-X\[application MD5 key]
  There may be several MD5 keys under the "ASIO ALP-X" level. In this case just check the "ApplicationName" value under each key.
- If the service is a 32-bit application, the registry path does not use a MD5 hash, and contains the "WOW6432Node" level :
  HKEY_LOCAL_MACHINE\SOFTWARE\WOW6432Node\ASIO\ASIO ALP-X\[application path]
- Then run AsioSettings.exe from an administrator console :
  > cd "\Program Files\Digigram\ALP-X\ALP-X ASIO Settings"
  If the service is a 32 bits application :
  >AsioSettings.exe --asioRegPath "HKEY_LOCAL_MACHINE\SOFTWARE\WOW6432Node\ASIO\ASIO ALP-X\[application path]"
  If the service is a 64 bits application :
  > AsioSettings.exe --asioRegPath "HKEY_LOCAL_MACHINE\SOFTWARE\ASIO\ASIO ALP-X\[application MD5 key] "

15 SPECIFICATIONS

15.1 Configuration

Bus/Format	PCI EXPRESS™ x1 / Low profile (compatible 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%

15.2 Inputs

	ALP280e	**ALP280e-Mic**
Analog inputs	8 balanced line	8 balanced Mic/line
Maximum input level / impedance	+24 dBu / >10 kΩ	Line: +24 dBu / >10 kΩ Mic : +10 dBu /> 10 kΩ
Line input gains	-24 dB to +16 dB, in 0.5 dB steps Max. sensitivity: 0 dBfs for -16 dBu	
Mic input gains	-	0 dB to +56 dB, in 0.5 dB steps Max. sensitivity: 0 dBfs for -56 dBu
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	
GPIs	8 dry contacts	

15.3 Outputs

	ALP280e & ALP280e-Mic
Line level analog outputs	2 electronically balanced (can be used asymmetrically without loss of level)
Maximum output level / impedance	+24 dBu / <100 kΩ
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
Contacts	8 relay contacts, 0.5 A, 48 VDC

15.4 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

15.5 Analog performances

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

Frequency response	@48 kHz, 20 Hz - 20 kHz - Inputs: +/- 0.83 dB Outputs: +/- 0.57 dB @48 kHz, 10 Hz - 20 kHz - Inputs: +/- 2.72 dB Outputs: +/- 0.57 dB
Phase shift between tracks	@10 Hz: Inputs: < 0.81° / Outputs: < -0.24° @1 kHz: Inputs: < 0.01° / Outputs: < -0.02° @20 kHz: Inputs: < 0.14° / Outputs: < -0.13°
Signal to Noise Ratio	Inputs: >115 dBA (>112 dB unweighted) Outputs: >109 dBA (>106 dB unweighted)
THD + Noise	@1 kHz +24 dBu : Inputs: <-95dB / Outputs: <-94 dB +22 dBu : Inputs: <-98dB / Outputs: <-96 dB
Crosstalk	Inputs: -128 dB @1 kHz / -107 dB @15 kHz / -105 dB @20 kHz Outputs: -127 dB @1 kHz / -112 dB @15 kHz / -108.5 dB @20 kHz
Equivalent Input Noise (E.I.N) (ALP882e-MIC)	-124 dB (A/D-D/A, G=+56 dB)

15.7 Connectors

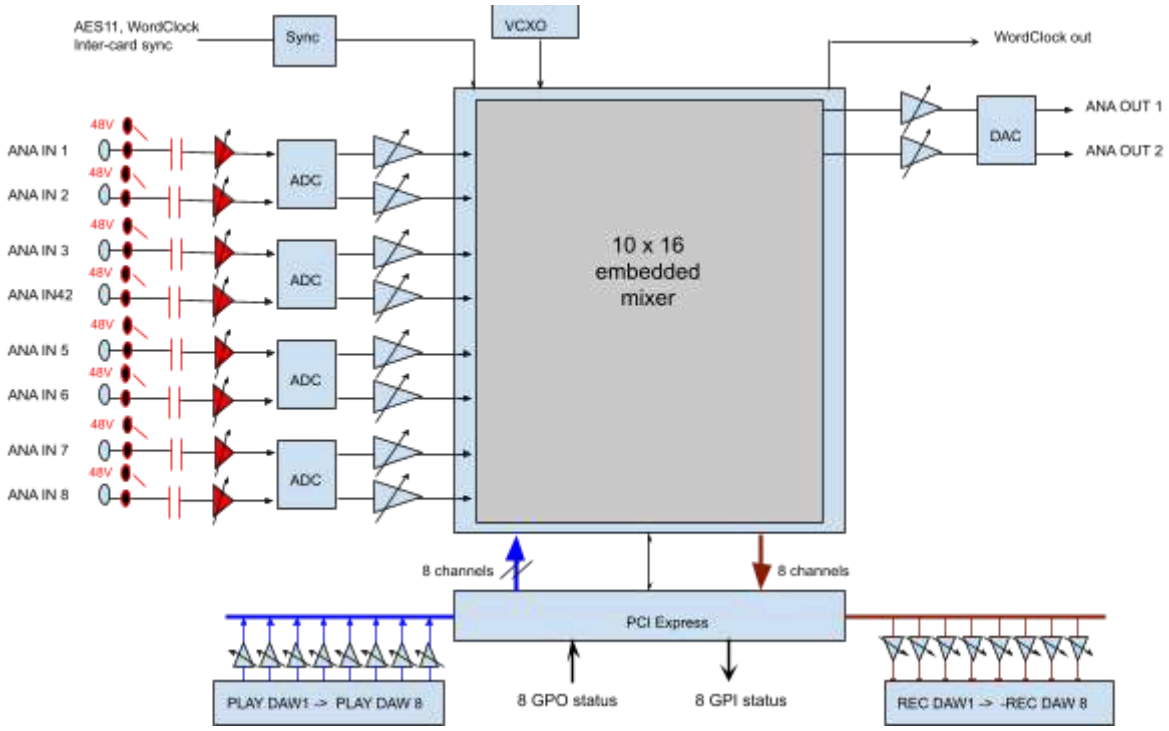
Internal connectors	Inter-card synchronisation
External connectors	2 x 68-pin VHDCI connectors One for analog I/Os One for Digital I/Os (Clocks + GPIOs)

15.8 Development environment

Drivers	DirectSound/WASAPI, ASIO
Operating systems supported	Windows 10 from version 20H2, Enterprise version LTSC 1607
Main characteristics of on-board processing	PCM playback and acquisition, Float IEEE754, direct monitoring, real time mixing, levels adjustment, panning management

16 APPENDICES

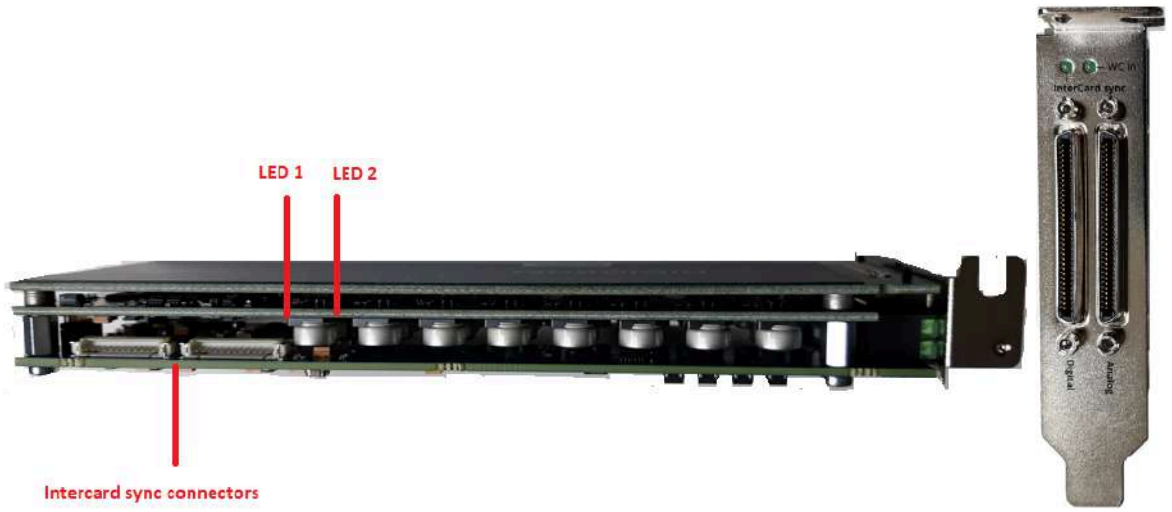
16.2 ALP280e & ALP280e-MIC functional diagram



Note: 48V phantom power only for ALP280e-MIC

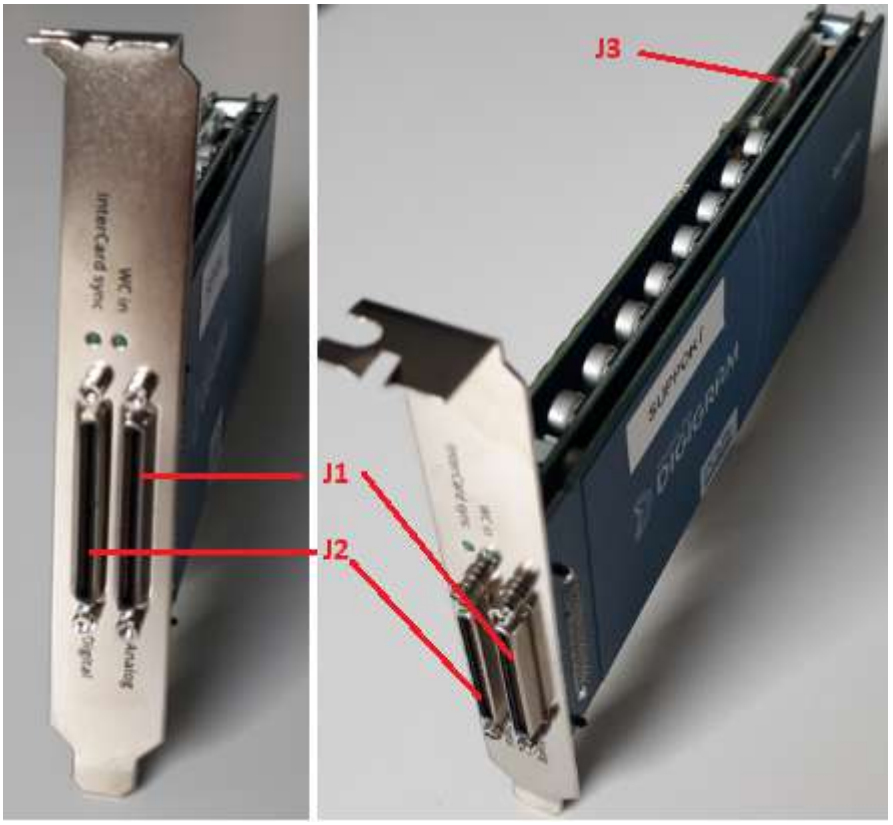
16.3 LED

The ALP card has four green LEDs: 2 LEDs on the PCB (only visible when the PC is open) and two LEDs 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.	• Flashes every 2 seconds: The card runs the last uploaded firmware version (normal behaviour). • 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.
WC In	Wordclock	• Off when no Wordclock signal is detected. • Flashes when a Wordclock signal is detected but the card is not synchronised on it • Lit when the card is synchronised to the Wordclock input
InterCard sync	Intercard synchro / card locator	• Off when the card is not synchronised to another one via the inter card ribbon cable • Lit when the card is slaved to another one via the intercard synchro ribbon. • Flashes when the button “card locator” is pressed from the ALP-X Manager application.

16.4 Connectors and switches



J1: Connector for analog I/Os
VHDCI 68 pins, female

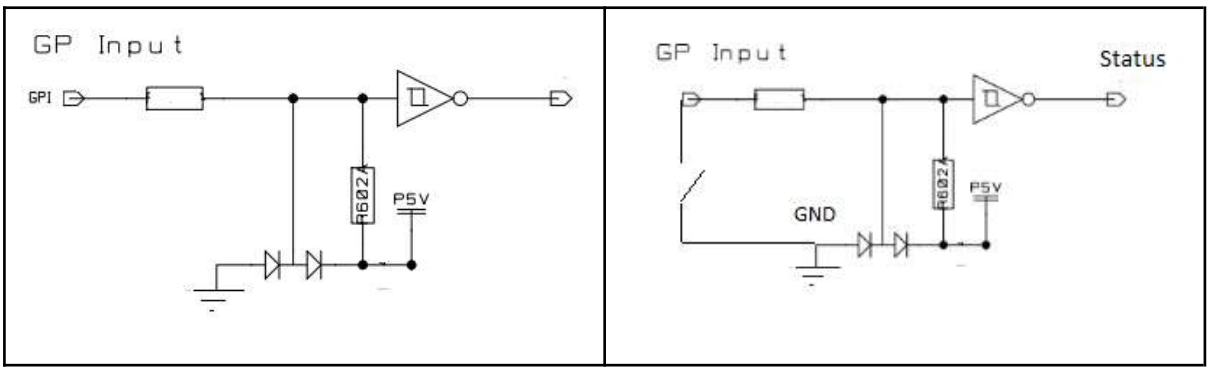
J2: Connector for digital I/Os
VHDCI 68 pins, female.

J3: Connector for inter-card synchronisation

16.5 How to use the GPIOs

16.5.1 GPIs

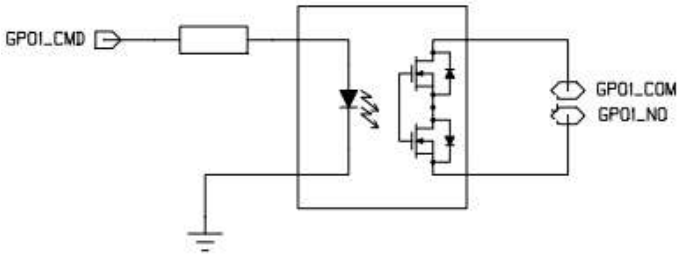
The eight GPIs are dry contacts, as shown on the diagram below. It is not necessary to connect a voltage to the GPIs.



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

16.5.2 GPOs

The eight GPOs are opti-relays, as shown on the diagram below.

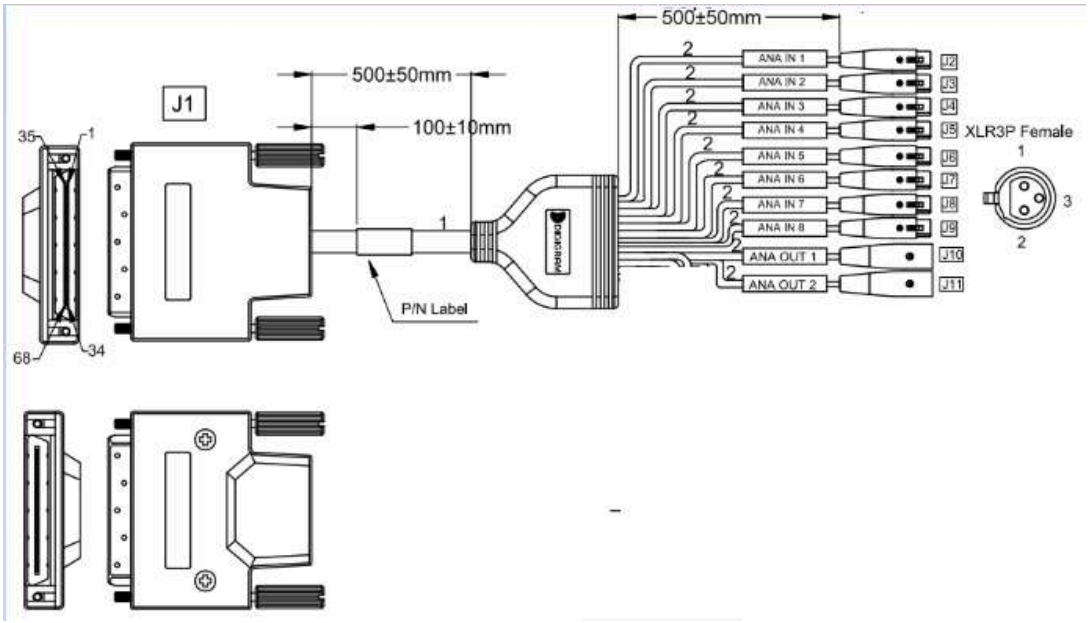


The contact between GPO_COM and GPO-NO is made when the CLOSED command is sent.
GPOs support a maximal voltage of 48VDC and a maximum current of 500 mA.

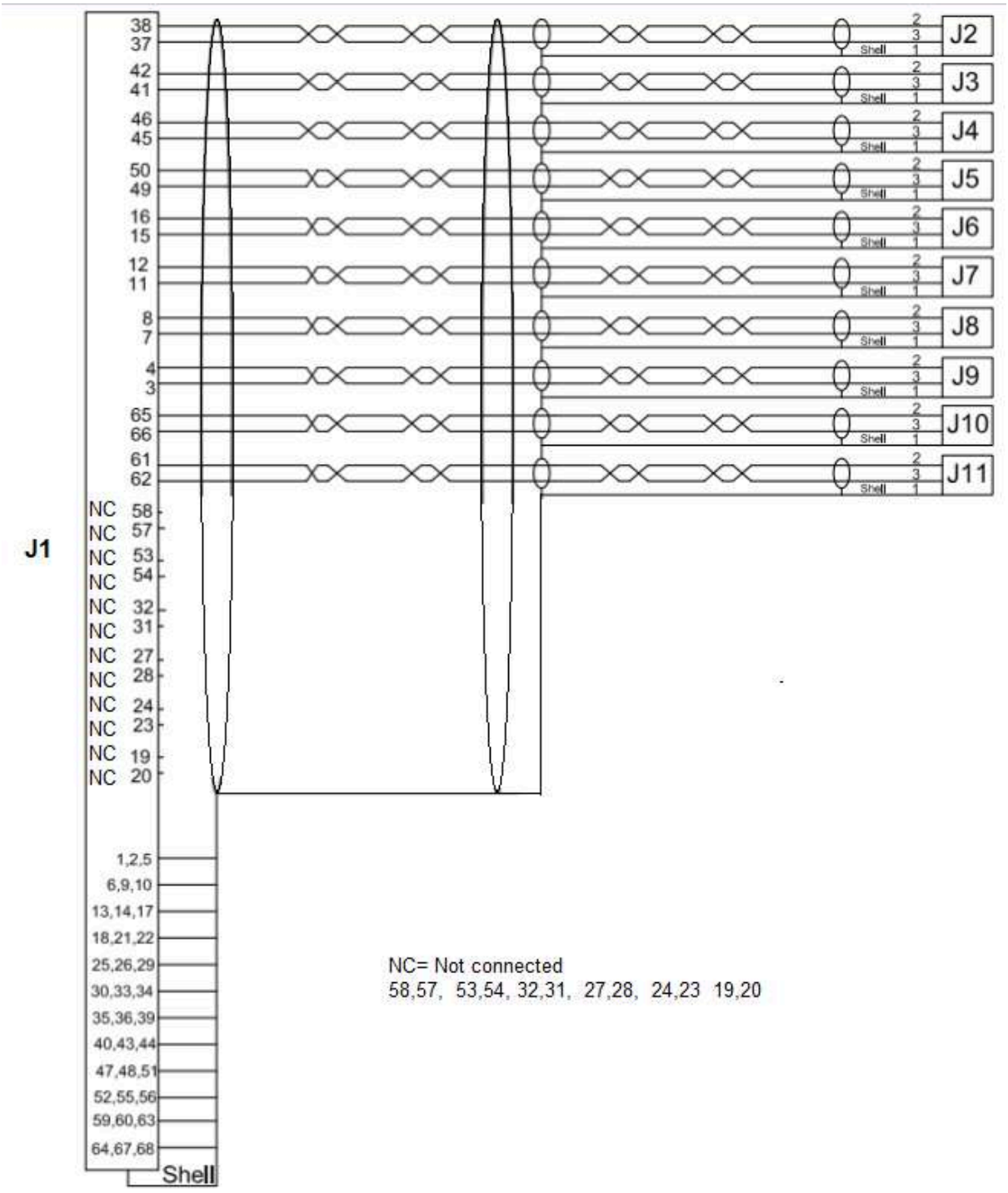
16.7 Breakout cables

16.7.1 Cable for analog I/Os

16.7.1.1 Diagram



16.7.1.2 Pinout



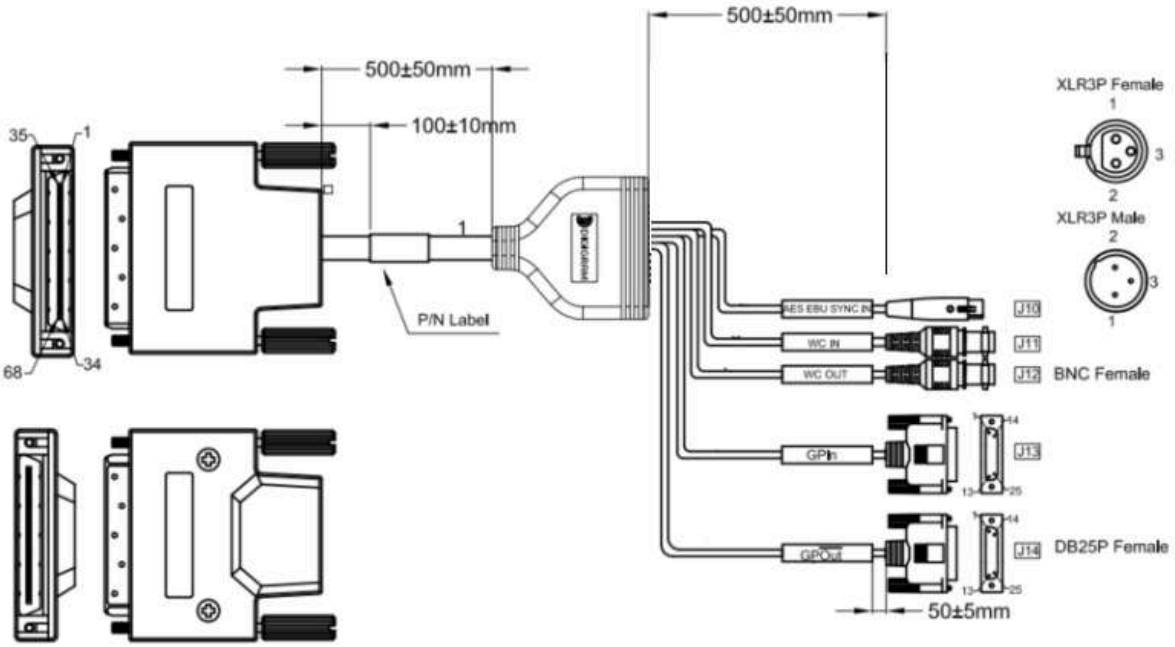
J1	Upper VHDCI 68 pins male
J2 , J3	Female XLR: analog inputs
J10 to J17	Male XLR: analog outputs

Pinout of connector J1 (VHDCI male)

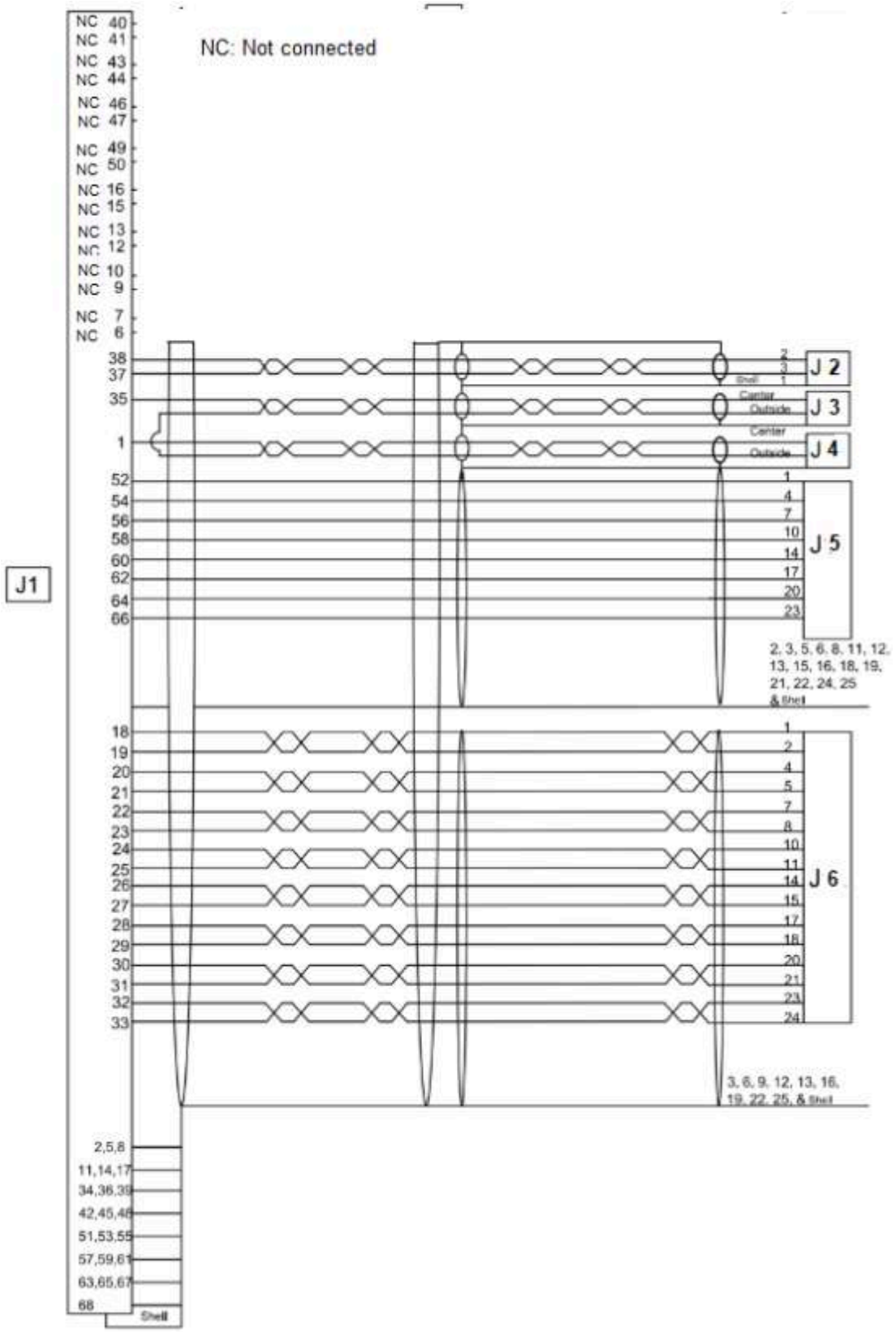
Pin#	Signal	Pin #	Signal	Pin #	Signal
1	GND	24	-	47	GND
2	GND	25	GND	48	GND
3	ANA IN8 -	26	GND	49	ANA IN4 -
4	ANA IN8 +	27	-	50	ANA IN4 +
5	GND	28	-	51	GND
6	GND	29	GND	52	GND
7	ANA IN7 -	30	GND	53	-
8	ANA IN7 +	31	-	54	-
9	GND	32	-	55	GND
10	GND	33	GND	56	GND
11	ANA IN6 -	34	GND	57	-
12	ANA IN6 +	35	GND	58	-
13	GND	36	GND	59	GND
14	GND	37	ANA IN1 -	60	GND
15	ANA IN5 -	38	ANA IN1 +	61	ANA OUT2 +
16	ANA IN5 +	39	GND	62	ANA OUT2 -
17	GND	40	GND	63	GND
18	GND	41	ANA IN2 -	64	GND
19	-	42	ANA IN2 +	65	ANA OUT1 +
20	-	43	GND	66	ANA OUT1 -
21	GND	44	GND	67	GND
22	GND	45	ANA IN3 -	68	GND
23	ANA OUT7 -	46	ANA IN3 +	-	-

16.7.2 Cable for digital I/Os

16.7.2.1 Diagram



16.7.2.2 Pinout



J1 connector (lower VHDCI male)							
Pin#	**Signal**	**Pin #**	**Signal**	**Pin #**	**Signal**	**Pin #**	**Signal**
1	WLCK OUT	**18**	GPO1-COM	**35**	WLCK IN	**52**	GPI 1
2	GND	**19**	GPO1-NO	**36**	GND	**53**	GND
3	GND	**20**	GPO2-COM	**37**	AES11-SYNC IN-	**54**	GPI 2
4	-	**21**	GPO2-NO	**38**	AES11-SYNC IN+	**55**	GND
5	-	**22**	GPO3-COM	**39**	GND	**56**	GPI 3
6	-	**23**	GPO3-NO	**40**	-	**57**	GND
7	-	**24**	GPO4-COM	**41**	-	**58**	GPI 4
8	GND	**25**	GPO4-NO	**42**	GND	**59**	GND
9	-	**26**	GPO5-COM	**43**	-	**60**	GPI 5
10	-	**27**	GPO5-NO	**44**	-	**61**	GND
11	GND	**28**	GPO6-COM	**45**	GND	**62**	GPI 6
12	-	**29**	GPO6-NO	**46**	-	**63**	GND
13	-	**30**	GPO7-COM	**47**	-	**64**	GPI 7
14	GND	**31**	GPO7-NO	**48**	GND	**65**	GND
15	-	**32**	GPO8-COM	**49**	-	**66**	GPI 8
16	-	**33**	GPO8-NO	**50**	-	**67**	GND
17	GND	**34**	GND	**51**	GND	**68**	GND

J13 (Sub-DB25 female) - GPIs			
Pin#	**Signal**	**Pin#**	**Signal**
1	GPI 1	**14**	GPI5
2	GND	**15**	GND
3	GND	**17**	GPI6
4	GPI 2	**18**	GND
5	GND	**20**	GPI7
6	GND	**21**	GND
7	GPI3	**23**	GPI8
8	GND	**24**	GND
10	GPI4	**25**	GND

J14 (Sub-DB25 female) - GPOs			
Pin#	**Signal**	**Pin#**	**Signal**
1	GPO1 COM	**14**	GPO5 COM
2	GPO1 NO	**15**	GPO5 NO
4	GPO2 COM	**17**	GPO6 COM
5	GPO2 NO	**18**	GPO6 NO
7	GPO3 COM	**20**	GPO7 COM
8	GPO3 NO	**21**	GPO7 NO
7	GND	**23**	GPO8 COM
10	GPO4 COM	**24**	GPO8 NO
11	GPO4 NO	**25**	GND

Please contact your distributor for all technical support issues

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