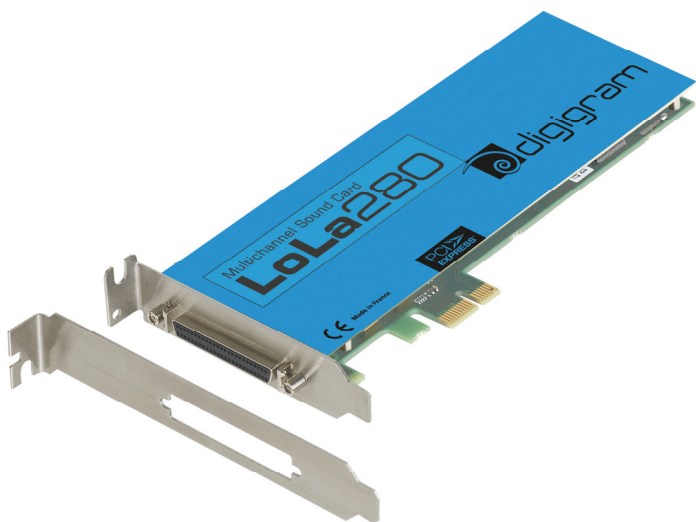


LoLa280

*Professional
multichannel sound card*



User manual

**For technical support,
please contact your supplier**



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INFORMATION FOR THE USER

This device complies with part 15 of FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a CLASS B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions contained in this data sheet, may cause harmful interference to radio and television communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- * reorient or relocate the receiving antenna
- * increase the separation between the equipment and the receiver
- * connect the equipment into an outlet on a circuit different from that of the receiver
- * consult the dealer or an experienced audio television technician.

Note: *Connecting this device to peripheral devices that do not comply with CLASS B requirements or using an unshielded peripheral data cable could also result in harmful interference to radio or television reception. The user is cautioned that any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. To ensure that the use of this product does not contribute to interference, it is necessary to use shielded I/O cables.*

Warning:

Electrostatic discharge (ESD) can damage several components on the board. To avoid such damage in handling the board, take the following precautions:

Bring the device and everything that contacts it to ground potential by providing a conductive surface and discharge paths. As a minimum, observe these precautions:

- Disconnect all power and signal sources.
- Place the device on a grounded conductive work surface.
- Ground yourself via a grounding wrist strap or by holding a grounded object.
- Ground any tool that will contact the device.



IMPORTANT NOTICE

This card has been tested and found to comply with the following standards:

- International: CISPR22 (2005) Class B.
- Europe: EMC 2004/108/CE specifications.
- United States: FCC Rules-Part 15-Class B (digital device).

In order to guarantee compliance with the above standards in an installation, the following must be done:

- the provided cable must not be modified.
- additional cables used must have their respective shield connected to each extremity.

Due to the reduced length of the PCI EXPRESS™ bus connector and the resulting lack of mechanical stability, we strongly advise against transporting the card(s) installed in a computer, unless its chassis or case provides a dedicated support to keep the card securely in place in order to avoid physical damage.

CONTENTS OF THIS PACKAGE

Thank you for purchasing a Digigram LoLa280 PCIe® sound card.

The package consists of the following components:

- the LoLa280 sound card,
- A 'low profile' bracket

The end user version additionally includes:

- a cable
- a CD-Rom with drivers, installation notices, FAQs, etc...
- a registration form

For the OEM version, the cables are available optionally.

Also available (optional):

External 1U/19" microphone preamplifier

FEATURES

LoLa280 is an audio card for PCI EXPRESS™ (PCIe®) bus. It comes in PCI EXPRESS™ x1 format and can thus be plugged into any PCIe® slot (x1, x2, x4, x8, x16, x32). Thanks to the second bracket provided (cf Annexes “Replacing the bracket”), the card can easily be installed in compact desktop machines, servers, or computers equipped with ‘low profile’ slots.

Main hardware features

- 8 balanced analog mono line inputs, with software adjustable gain and a maximum input level of +24 dBu
- 2 balanced* analog mono line outputs, with software adjustable gain and a maximum output level of +24 dBu
- 1 standard Word Clock input (up to 192 kHz)
- 1 standard Word Clock output (up to 192 kHz)
- 1 mini jack stereo headphones output.

Main software features

- Real-time, simultaneous record and playback in PCM (16, 24 and 32 bits)
- adaptable AGC (**A**utomatic **G**ain **C**ontrol) on each of the eight inputs
- Integrated mixer allowing routing and mixing eight physical inputs and eight application level audio stream inputs towards two physical outputs and eight recording outputs, with management of the analog and digital gains and of the AGC on the inputs.
- Digigram LoLa Manager application allowing to easily control the integrated mixer.
- Low latency DirectSound and ASIO drivers

MINIMUM REQUIREMENTS

Hardware requirements

PC with one free PCI EXPRESS™ (PCIe®) slot (x1, x2, x4, x8, x16 or x32), either standard or ‘low profile’ format.

The power of the processor and the memory depend on application and operating system used on the PC.

* the use in unbalanced mode is not recommended; in addition to the level loss of 6 dB it causes, it entails overconsumption and heating of the card

Software requirements

The LoLa280 requires installation of the drivers included in the LoLa Kit version 1.03 or higher.

The LoLa Kit includes:

- a WDM *DirectSound* driver
- an ASIO driver
- The Digigram LoLa Manager application allowing to control the integrated mixer

OS supported

The LoLa280 runs under Windows XP, Windows Server 2003, Windows Server 2008, and Windows Vista, and Windows 7.

HARDWARE INSTALLATION

Due to the reduced length of the PCI EXPRESS™ bus connector and the resulting lack of mechanical stability, we strongly advise against transporting the card(s) installed in a computer, unless its chassis or case provides a dedicated support to keep the card securely in place in order to avoid physical damage.

The card has to be installed in the computer prior to installing its driver.

Installing the card

Gently plug the card in a free PCIe® slot and press it down to position it firmly. Tighten the fastening screw of the bracket, or lock the card by means of the mechanism provided for this purpose on your computer.

Interrupt and memory address

Hardware interrupt and addresses are automatically set up at start-up by the PCI PnP BIOS.

SOFTWARE INSTALLATION

Note: *the installation of the software requires administrator rights on your computer*

Please visit the Digigram web site at www.digigram.com for the most recent driver.

In case you run a specific application developed or installed by a Digigram partner, it might require the use of a specific driver version. In this case, make sure that the updated driver has been approved by your supplier.

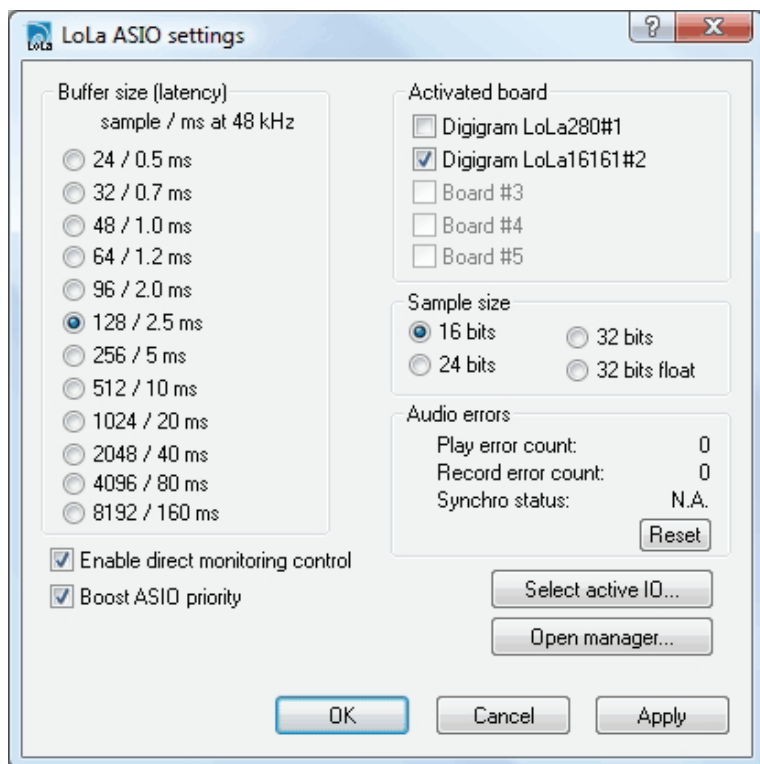
Installation under Windows XP, Windows Server 2003, Windows Server 2008, Windows Vista, and Windows 7

If the driver has been downloaded from our web site, it has to be expanded prior to the driver's installation as follows: double-click on the downloaded file (self-expanding). You can use the default destination location (Windows temporary folder) or select another directory.

- Shut down your computer and insert the LoLa280 card.
- Restart your computer.
- Click on **Cancel** if the “**Found New Hardware**” wizard appears.
- Double-click onto the *Digigram LoLa Kit vxx.msi* to launch the driver installation.
- A welcome message is displayed, click **Next** to continue.
- The “**License Agreement**” window appears: read it, and click on “**I accept the terms in the license agreement**” to approve it. Do the same in the next window for Virtual PCX and PC Codec Legal Notice.
- The WDM DirectSound and ASIO drivers are now installed.
Next.
- In the “**Ready to Install the Program Window**”, click on **Install** to start copying the files.
 - **Note:** In case you use an unsigned driver version, the “Digital Signature Not Found” message may appear because a non-Microsoft software is about to be installed.
Click **Continue** in the “**Hardware installation**” window (Windows XP, Server 2003).
- **Under Windows Vista, Server 2008, and Windows 7:**
Click **Allow** in the “**User Account Control**” window.
Click **Install** in the “**Windows Security**” window.
- Click **Continue** in the “**Hardware installation**” window.
- Click the **Finish** button to complete the driver installation.

The ASIO control panel

To launch this interface, go to <Start>, <Programs>, <LoLa>, <LoLa ASIO Settings>. For help on how to use this control panel, please refer to its on-line help (“? Help” button).



The 'Digigram LoLa Manager' control panel

This graphical interface allows you to make the most of the embedded routing and mixing functionalities of the LoLa sound card in the most simple and intuitive way. It gives access to a matrix providing the features described underneath. To launch this interface, go to **<Start>**, **<Programs>**, **<LoLa>**, **<LoLa Manager>**.

Inputs:

- 8 analog inputs of the LoLa with the following features on each input:
 - analog input gain with input peak meter, solo and mute, and AGC (**A**utomatic **G**ain **C**ontrol)
 - routing of the input signal after gain, solo, mute, and AGC towards one or both output channels for monitoring
 - routing of the input signal after application of gain, solo, mute, and AGC towards one or several recording channels
 - 8 audio input streams coming from applications, with the following features:
 - digital gain with peak meter, solo, and mute
 - routing of the audio stream after application of gain, solo, and mute towards the two output channels for monitoring
- All input signals assigned to the same output (monitoring, recording) are mixed. The result of this mix is sent to the output.

Outputs:

- 2 analog outputs of the Lola280 (monitoring), each providing the following features:
 - Digital gain, peak meter, analog gain
- 8 recording channels featuring:
 - digital gain applied to the signal to be recorded, peak meter

For help on how to use this control panel, please refer to its on-line help.

Removing the driver under Windows XP and Windows Server 2003

- Open the Windows Control Panel and double-click on the **Add/Remove Software** icon.
- Select “**Digigram np Runtime...**”, and **Change/Remove**.
- Select **Remove** in the “**LoLa Kit**” window.
- Follow the instructions to finish the driver removal.

Removing the driver under Windows Vista, Windows Server 2008, and Windows 7

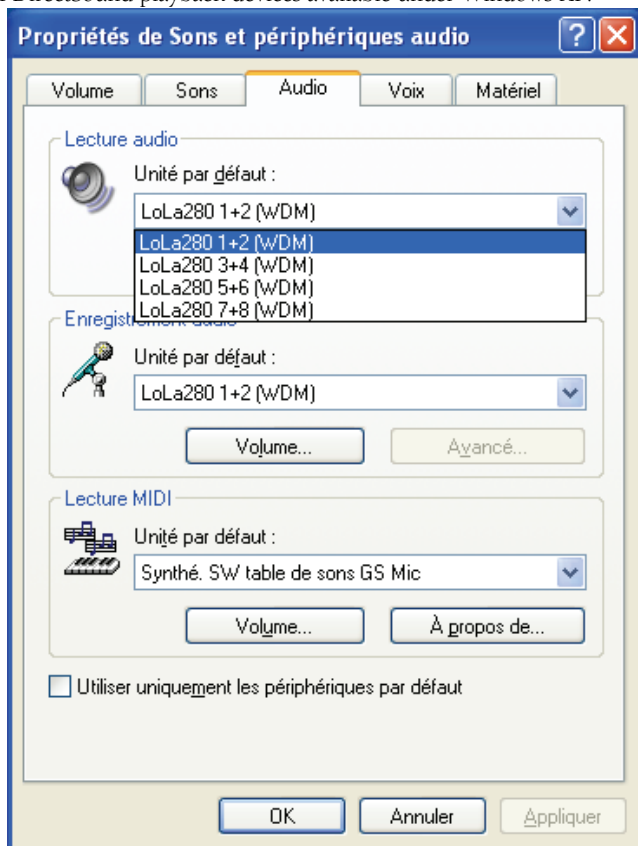
- Open the **Windows Control Panel** and double-click on the **Programs and Features** icon.
- Select **Digigram LoLa Kit vxx.msi** and **Remove**.
- Follow the instructions to finish the driver removal.

How to check the installation

Once the driver and the cards are installed according to the procedure described in this manual, you can verify that the card is properly installed and works fine as follows:

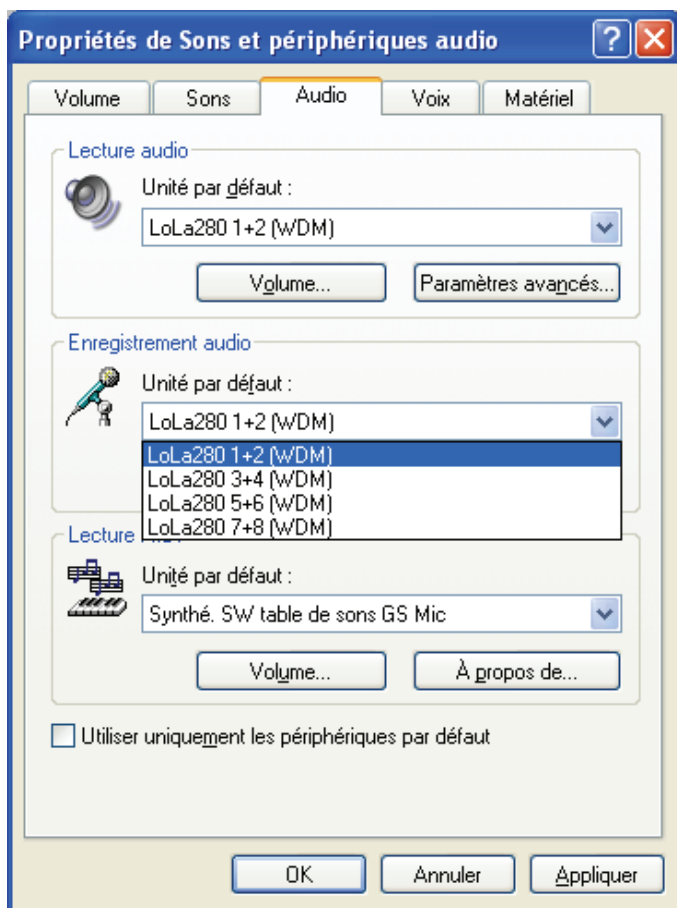
- Menu **<Start> <Settings> <Control panel>, <Sound and Multimedia>**, tab **“Audio”**, **Default device** (Playback device, Recording device). The card’s channels can be selected.

WDM DirectSound playback devices available under Windows XP:



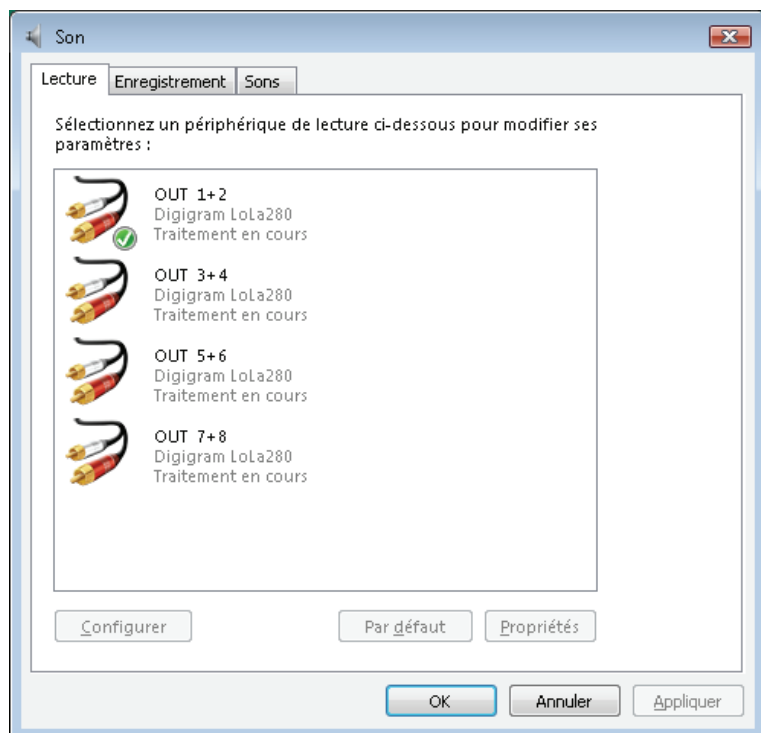
The DirectSound devices in playback mode correspond to the **“Playback”** inputs of the mixer. The manager allows mixing the corresponding streams on the two analog outputs.

WDM DirectSound recording devices available under Windows XP:



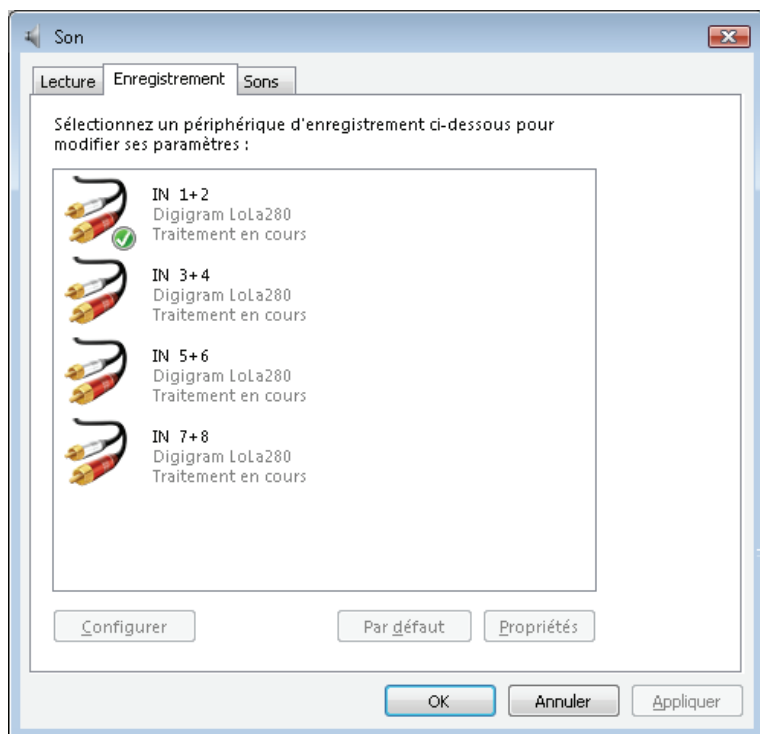
The DirectSound devices in recording mode correspond to the “**Record**” outputs of the mixer. The manager allows to send any combination of the eight analog input signals onto each one of these devices.

WDM DirectSound playback devices available under Windows Vista and Windows 7:



The DirectSound devices in playback mode correspond to the “**Playback**” inputs of the mixer. The manager allows mixing the corresponding streams on the two analog outputs.

WDM DirectSound recording devices available under Windows Vista and Windows 7:



The DirectSound devices in recording mode correspond to the “**Record**” outputs of the mixer. The manager allows to send any combination of the eight analog input signals onto each one of these devices.

- the card can be used with any DirectSound application.
- Launch the LoLa Manager from <Start> <Programs> <LoLa> <LoLa Manager> to see the cards in the “Board:” combo-box and select them there.
- The card is visible from any ASIO application.

SPECIFICATIONS

Configuration

	LoLa280
Bus/Format	PCI EXPRESS™ (PCIe®) x1 (compatible x2, x4, x8, x16, x32)
Size	168 mm × 69 mm x 20 mm
Power requirements (+3.3 V / +12 V)	1,2 A / 0,22 A
Operating: temp / humidity (non-condensing)	0°C / +50°C • 5% / 90%
Storage: temp / humidity (non-condensing)	-5°C / +70°C • 0% / 95%

Inputs

	LoLa280
Analog line inputs (mono)	8 balanced
Maximum input level/impedance	+24 dBu / < 10 kΩ
Adjustable input gain (manager)	analog: from -90 dB to +18 dB [⊗] digital: from +18 dB to +36 dB
Other inputs	1 standard Word Clock input (up to 192 kHz)

[⊗] maximum sensitivity: 0 dBFs for +6 dBu input

Outputs

	LoLa280
Analog line outputs (mono)	2 balanced*
Maximum output level / impedance	+24 dBu / > 100 Ω
Adjustable output gain (manager)	analog: from -48 dB to 0 dB digital: from -110 dB to +12 dB
Other outputs	• 1 standard Word Clock output (up to 192 kHz) • Stereo headphones (20 mW in 600 Ω) on mini jack (female TRS 3,5 mm)

Connectors

	LoLa280
External connector	50 pin SCSI

Audio specifications

	LoLa280
Sampling frequencies available	Programmable from 22,05 to 192 kHz
A/D and D/A converter resolution	24 bits
Supported audio formats	PCM (16, 24, 32 bits, and 32 bits Float)

* the use in unbalanced mode is not recommended; in addition to the level loss of 6 dB it causes, it entails overconsumption and heating of the card

Analog audio performance

Measurements done at $F_s=48$ kHz unless stated otherwise, with filter on the 22 Hz- 22 kHz range

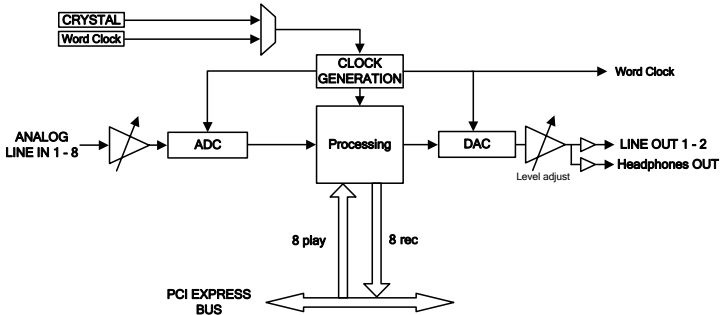
	LoLa280
Frequency response (record + play)	at 48 kHz: 20 Hz -20 kHz: +0.1 /-0,3 dB at 96 kHz: 20 Hz -40 kHz: +0.1 /-0,6 dB at 192 kHz: 20 Hz -80 kHz: +0.1 /-5 dB
Channel phase difference: 20/20kHz	$<0.2^\circ/2^\circ$
Dynamic range (A-weighted)	Analog In: >100 dB Analog Out: > 97 dB
THD + noise 1 kHz at -2 dBfs	Analog In: <-97 dB Analog Out: <-87 dB
Crosstalk (Analog in or out)	1 kHz at 24 dBu: <-94 dB 15 kHz at 24 dBu: <-70 dB

Development environments

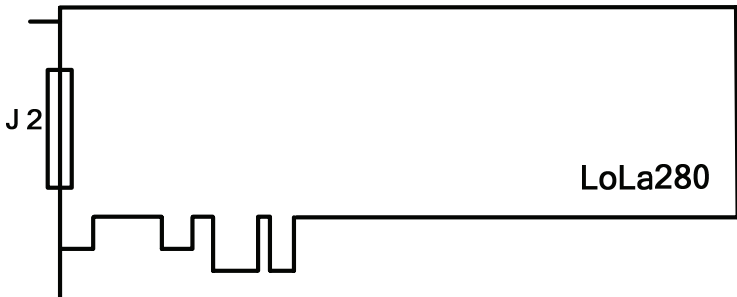
	LoLa280
Management	DirectSound, ASIO
OS supported	Windows XP, Windows Server 2003, Windows Server 2008, Windows Vista, and Windows 7
Main on-board processing features	PCM record & play, direct monitoring, realtime mixing and routing, level adjustment, AGC on all inputs

Appendix A: Schematic diagram

LoLa280 Schematic Diagram



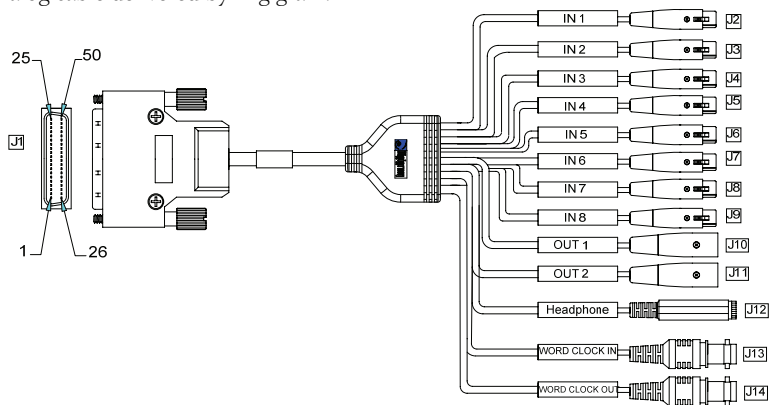
Layout



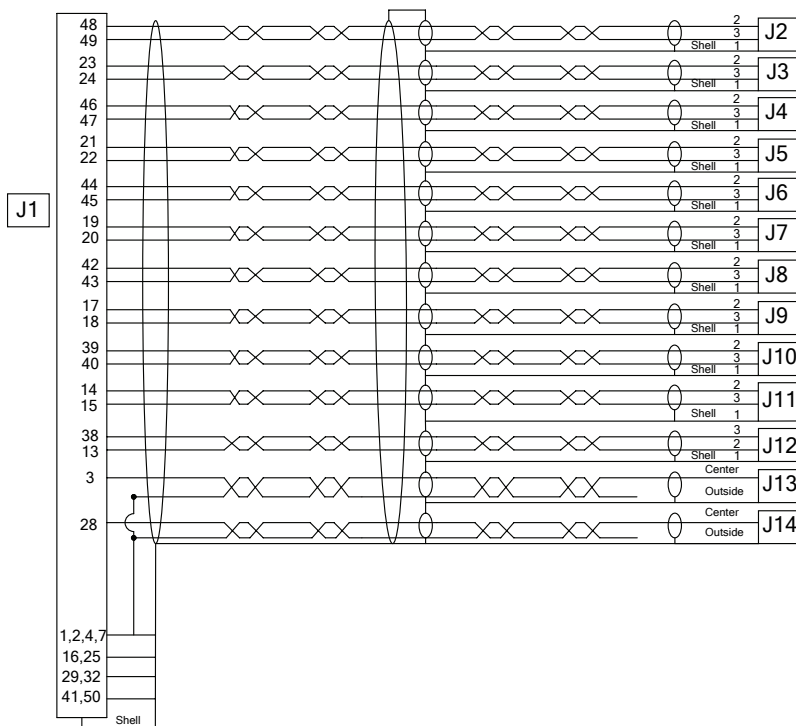
APPENDIX B: CÂBLES

LoLa280 analog I/O cable

Analog cable delivered by Digigram:



Wiring Diagram – analog cable LoLa280

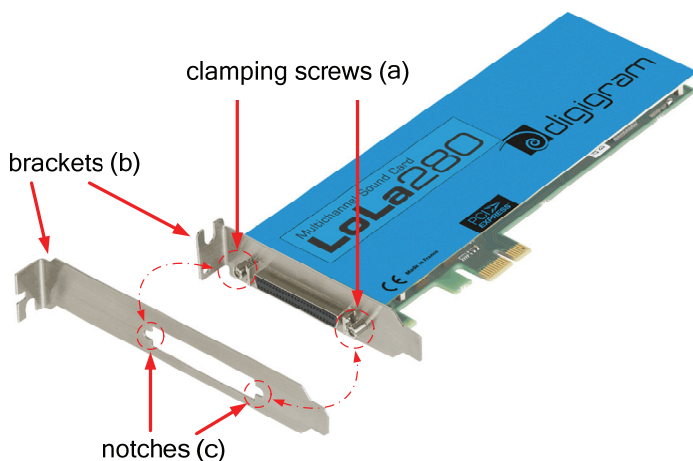


LoLa280 cable pinout

Pin	Signal	Pin	Signal
1	GND	26	Reserved
2	GND	27	Reserved
3	Word Clock IN	28	Word Clock OUT
4	GND	29	GND
5	Reserved	30	Reserved
6	Reserved	31	Reserved
7	GND	32	GND
8	NC	33	NC
9	NC	34	NC
10	NC	35	NC
11	NC	36	NC
12	NC	37	NC
13	Headphones right	38	Headphones left
14	OUT 2 +	39	OUT 1 +
15	OUT 2 -	40	OUT 1 -
16	GND	41	GND
17	IN 8 +	42	IN 7 +
18	IN 8 -	43	IN 7 -
19	IN 6 +	44	IN 5 +
20	IN 6 -	45	IN 5 -
21	IN 4 +	46	IN 3 +
22	IN 4 -	47	IN 3 -
23	IN 2 +	48	IN 1 +
24	IN 2 -	49	IN 1 -
25	GND	50	GND

APPENDIX C: BRACKET

Replacing the bracket



Unscrew the clamping screws (a), then remove the bracket (b) from the card and replace it by the one to be used, positioning it in the same sense on the card. Re-fasten the clamping screws using the notches (c) in the brackets.