

# LX1616ES

# LX6464ES

*EtherSound PCI Sound Cards*



*User manual*

**For technical support,  
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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

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

- International: CISPR22 Class B.
- Europe: EMC 89/336/CEE (1992) specifications.
- United States: FCC Rules-Part 15-Class B (digital device).

## CONTENTS OF THIS PACKAGE

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Thank you for purchasing a Digigram LX EtherSound PCI sound card.

The package consists of the following components:

- an LX1616ES or LX6464ES sound card,
- a CD-Rom

*\* not delivered with the OEM version.*

*On the LX1616ES, EtherSound I/Os can be added by up to three bundles of 16/16 channels through a software key. For this option, please contact your system supplier.*

## FEATURES

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LX1616ES and LX6464ES are audio cards for PCI bus. They are Universal PCI 2.2 (32-bit/66 MHz), which means they can be plugged in 32-bit/33 MHz 5 V keyed PCI slots as well as in 64-bit/66 MHz 3.3 V keyed PCI slots. The cards are also compatible with PCI-X interfaces.

### LX1616ES main hardware features

- 16 EtherSound ES-100 mono inputs at 44.1 kHz or 48 kHz
- 16 EtherSound ES-100 mono outputs at 44.1 kHz or 48 kHz
- 1 standard Word Clock input

### LX6464ES main hardware features

- 64 EtherSound ES-100 mono inputs at 44.1 kHz or 48 kHz
- 64 EtherSound ES-100 mono outputs at 44.1 kHz or 48 kHz
- 1 standard Word Clock input

### Main software features

- Real-time, simultaneous record and playback in PCM (16 and 24 bits)
- Low latency DirectSound and ASIO drivers

### EtherSound features

- EtherSound ES-100 compatible
- The card can generate the network audio clock, or it can synchronize on the network audio clock
- Network clock frequencies supported:  
48 kHz if the card itself generates the audio clock source for the network  
44.1 kHz or 48 kHz if the card synchronizes on the EtherSound network or on an external Word Clock
- Audio sampling frequencies supported:  
48 kHz, 96 kHz, 192 kHz *at a network clock frequency of 48 kHz\**  
44.1 kHz, 88.2 kHz, 176.4 kHz *at a network clock frequency of 44.1 kHz\**

**Note:** *the audio sampling frequency defines the number of available inputs/outputs:*

*at 88.2 kHz or 96 kHz: 32 inputs and 32 outputs*  
*at 176.4 kHz or 192 kHz: 16 inputs and 16 outputs*

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\* For the management of these modes, please refer to the corresponding question on our web site in the FAQ section

## HARDWARE REQUIREMENTS

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### Minimum requirements

PC with one free PCI or PCI-X slot (5 V or 3.3 V)

CPU power and memory required depend on the operating system and on the audio application used.

### Software requirements

LX1616ES and LX6464ES require installation of the drivers included in the LX6464ES Kit version 1.10 or higher. This kit includes:

- a WDM DirectSound driver
- an ASIO driver

### Supported operating systems

LX1616ES and LX6464ES cards run under Windows Server 2003\*, Windows XP\*, Windows Vista\*, and Windows 7\*.

## HARDWARE INSTALLATION

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

### Installing the card

Gently plug the card in a free PCI slot and press it down to position it firmly. Tighten the screw.

### Interrupt and memory address

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

## SOFTWARE INSTALLATION

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

Please visit the Digigram web site at [www.digigram.com](http://www.digigram.com) for the most recent driver.

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

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\*32-bit version

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

- Shut down your computer and insert your card.
- Restart your computer.
- Click on Cancel if the “Found New Hardware” Wizard appears.
- Double-click on the **LX6464 Kit vxx.msi/ Digigram LX6464ES Kit for Vista** icon 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.
- In the “Custom Setup” window, the “Drivers for the LX6464ES board” are displayed; by default, both WDM DirectSound and ASIO LX are 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 on **Continue** in the “Hardware installation” window.
- Under Windows Vista:  
Click **Allow** in the “User Account Control” window.  
Click **Install** in the “Windows Security” window.
- Click on **Continue** in the “Hardware installation” window.
- *Once the files have been copied to your disk and the driver has been started, the firmware version of your card will be checked against the version included in the driver package.*

**WARNING:** if the firmware of your card requires an update, it will start automatically at this stage. The update is recommended, it ensures optimal performances and robustness of the system. The update **MUST IN NO CASE BE INTERRUPTED.** If you do so, the card will have to be returned to our After Sales Service.

- The “DirectSound Device Builder application” will prompt you to define your DirectSound devices (For details, please refer to the application’s online help).
- To use the card via the DirectSound interface, you’ll have to configure the devices you intend to use in the “DirectSound Device Builder” application, which is launched automatically. One DirectSound stereo device is declared (channels 1 and 2). You can declare additional devices by using the “+” button, then enter the first channel used by this device, the number of channels, and – under Windows Server 2003 and XP - the name of the



device; under Windows Vista, please use the Vista Control Panel ‘Sound’ to name your devices. A DirectSound device can be multichannel (the application must be able to manage this type of device). For more details, please refer to the online help of this application.

**Note:** The “DirectSound Device Builder” application can be launched at any time once the driver of the LX6464ES installed (<Start>, <Programs>, <Digigram>, <Digigram Control Center>). It is necessary to reboot the computer to apply the changes.

- In the “Digigram drivers” window, select the granularity\* of the audio data. A granularity of 128 samples is the default value (recommended). Under DirectSound, selecting a lower value (64, 32) will decrease the latency, but limits the number of devices that can be used simultaneously without venturing possible dropouts. . Under ASIO, granularity may be set to 32 samples, as the ASIO driver uses one single 64-channel device .  
For more details, please see the Control Panel’s online help or the “Performance” section of the DirectSound Device Builder’s or the ASIO control panel’s online help.  
Click on **Ok**.
- Click on the **Finish** button to complete the driver installation.

### 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 LX6464ES Kit ...”, and **Change/Remove**.
- Select **Remove**.
- Follow the instructions to finish the driver removal.

### Removing the driver under Windows Vista and Windows 7

- Open the Windows Control Panel and double-click on the **Programs and Features** icon.
- Select “Digigram LX6464ES Kit ...”, and **Change/Remove**.
- Select **Uninstall**.
- Follow the instructions to finish removing the driver.

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\* The granularity corresponds to the computing unit of the card. It is expressed in samples.

## HOW TO CHECK THE INSTALLATION

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Once driver and card installed according to the procedure described in this manual, you can verify that the card works correctly as follows:

- **Windows XP and Server 2003:**  
Menu <Start>, <Settings>, <Control panel>, <Sound and Multimedia>, tab “Audio”, <Default device> (Playback device, Recording device). Pull-down menus allow for the card’s DirectSound devices as declared during installation (e.g. “LX6464ES -01 (WDM)” by default for the card’s first stereo channel). The card can be used with any application based on *DirectSound* or *DirectKS* (see pages hereafter).  
**Windows Vista:**  
<Control Panel>, <Hardware and Sound>, <Sound> (Tab Playback, Recording): the declared devices are displayed. Check ‘Properties’ and click “Test” button.
- If the ASIO option has been selected during installation, the card is visible through any ASIO compliant application.

### *If the card is not displayed:*

- Make sure that the box “Drivers for the LX6464ES board” is checked in the “Select components” window.
- Make sure that the card is correctly inserted in the PCI slot, and screwed on the PC chassis.
- If necessary, uninstall the driver as described in this manual, and re-install it.

## **DIRECTSOUND CONTROL PANEL**

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The card does not dispose of digital gain. Under the Windows 'Volume' control panel only a 'Mute' is available.

## **ASIO CONTROL PANEL**

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With the *ASIO* driver installed, the card's settings can be adjusted through the *ASIO* control panel. To launch this interface, go to <Start>, <Programs>, <Digigram>, <ASIO HR Settings>.

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

## **CLOCK AND ROUTING**

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The clock management as well as the assignment of devices to EtherSound channels ("I/O mapping") are done through Digigram's EScontrol application, or a specific application conceived by one of our development partners.

## SPECIFICATIONS

### Configuration

	LX1616ES	LX6464ES
Bus/Format	Universal PCI (32-bit/66 MHz), PCI-X compatible, master mode	
Size	175 mm x 99 mm x 20 mm	
Power requirements (+3.3 V / +5 V / +12 V / -12 V)	1 A / 0.2 A / 0 A / 0 A	
Operating: temp / humidity (non-condensing)	0°C / +50°C • 5% / 90%	
Storage: temp / humidity (non-condensing)	-5°C / +70°C • 0% / 95%	

### Inputs/Outputs

	LX1616ES	LX6464ES
Inputs	- 16 EtherSound channels at 44.1 or 48 kHz - 8 EtherSound channels at 88.2 kHz or 96 kHz - 4 EtherSound channels à 176.4 kHz or 192 kHz	- 64 EtherSound channels at 44.1 or 48 kHz - 32 EtherSound channels at 88.2 kHz or 96 kHz - 16 EtherSound channels à 176.4 kHz or 192 kHz
Outputs	- 16 EtherSound channels at 44.1 or 48 kHz - 8 EtherSound channels at 88.2 kHz or 96 kHz - 4 EtherSound channels à 176.4 kHz or 192 kHz	- 64 EtherSound channels at 44.1 or 48 kHz - 32 EtherSound channels at 88.2 kHz or 96 kHz - 16 EtherSound channels à 176.4 kHz or 192 kHz
Other inputs	Word clock, 44.1 or 48 kHz <i>(can be used if card is the audio clock for the EtherSound network)</i>	

### Connectors

	LX1616ES	LX6464ES
EtherSound IN	RJ45 female	
EtherSound OUT	RJ45 female	
Word Clock IN	BNC female	

# LX6464ES

## User manual

### EtherSound

	LX1616ES	LX6464ES
Technology	ES-100	
Functions	Compatible with Ring Redundancy mode Can generate the audio network clock in all modes	
Network clock frequencies supported	Can generate a 48 KHz audio clock for the EtherSound network Can synchronize on an EtherSound network at either 44.1 or 48 kHz	
Other inputs	Word clock, the card can generate a 44.1 or 48 kHz audio clock synchronized on the Word Clock In	
EtherSound virtual control port	Virtual Ethernet interface (software) enabling an application such as EScontrol, installed on the same PC, to directly access an EtherSound network with no need of an additional network connection	

### Audio specifications

	LX1616ES	LX6464ES
Audio sampling frequencies supported	192 kHz, 96 kHz, 48 kHz* (at 48 kHz network clock frequency) 176.4 kHz, 88.2 kHz, 44.1 kHz* (at 44.1 kHz network clock frequency)	
Supported audio formats	PCM 16, 24, 24 bits "packed" (packets of 32 bits)	

### Development environments

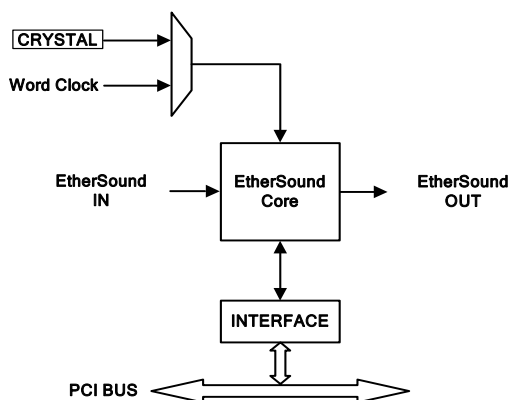
	LX1616ES	LX6464ES
Management	WDM DirectSound, ASIO	
Supported operating systems	Windows XP*, 2003 Server*, Windows Vista*, and Windows 7*	

\* For the management of these modes, please refer to the corresponding question on our web site in the FAQ section

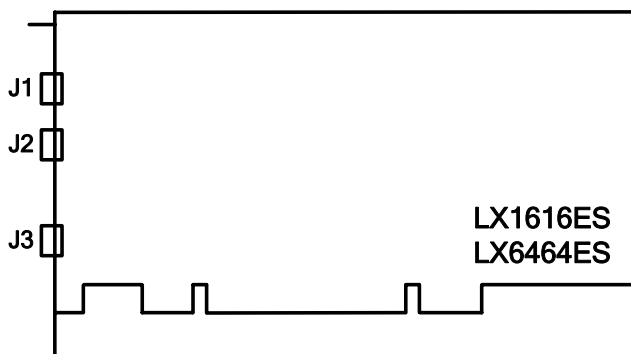
\* 32-bit version

## APPENDICES

### LX1616ES/LX6464ES schematic diagram



### Connectors



- J1 : EtherSound IN
- J2 : EtherSound OUT
- J3 : Word Clock IN