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PCI Expansion Chassis
User's Guide



13 Slot PCI Expansion

Model: P13R
Model: P13RR

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Preface

What's in this Guide

This PCI Expansion Chassis User Guide is designed to accompany a Magma Host Card Installation Guide. This guide provides easy instructions to install your expansion system, verify the installation was completed correctly, and troubleshoot the installation, if necessary. The corresponding Host Card Installation Guide provides similar information for your Magma host card.

This manual is divided into the following parts:

Chapter 1: Provides General Specifications and Parts List.

Chapter 2: Briefly explains Expansion Chassis installation.

Chapter 3: Explains how to verify a successful installation.

Chapter 4: Provides information on installing 3rd Party PCI cards.

Chapter 5: Provides general maintenance information.

Chapter 6: Provides troubleshooting assistance.

Chapter 7: Explains where to get technical support.

Appendix A: Explains Bus Hierarchy.

Appendix B: How to connect multiple Magma systems to one PC.

Appendix C: .Provides information about Compliance.

Advisories

Five types of advisories are used throughout this manual to provide helpful information, or to alert you to the potential for hardware damage or personal injury. They are **Note**, **Important**, **Caution**, **Warning**, and **Danger**. The following is an example of each type of advisory.



NOTE

Used to amplify or explain a comment related to procedural steps or text.



IMPORTANT

Used to indicate an important piece of information or special “tip” to help you



CAUTION

Used to indicate and prevent the following procedure or step from causing damage to the equipment.



WARNING

Used to indicate and prevent the following step from causing injury.



DANGER or STOP

Used to indicate and prevent the following step from causing serious injury or significant data loss.

Disclaimer: We have attempted to identify most situations that may pose a danger, warning, or caution condition in this manual. However, Magma does not claim to have covered all situations that might require the use of a Caution, Warning, or Danger indicator.

Safety Instructions

Always use caution when servicing any electrical component. Before handling the Magma PCI Expansion chassis, read the following instructions and safety guidelines to prevent damage to the product and to ensure your own personal safety. Refer to the “Advisories” section for advisory conventions used in this manual, including the distinction between Dangers, Warnings, Cautions, and Notes.

- Always use caution when handling/operating the computer. Only qualified, experienced, authorized electronics personnel should access the interior of the computer. The power supplies produce high voltages and energy hazards, which can cause bodily harm.

- Use extreme caution when installing or removing components. Refer to the installation instructions in this manual for precautions and procedures. If you have any questions, please contact Magma Technical Support.



WARNING

High voltages are present inside the expansion chassis when the unit's power cord is plugged into an electrical outlet. Disconnect the power cord from its source before removing the system cover.

Never modify or remove the radio frequency interference shielding from your workstation or expansion unit. To do so may cause your installation to produce emissions that could interfere with other electronic equipment in the area of your system.

When Working Inside a Computer

Before taking covers off a computer, perform the following steps:

1. Turn off the computer and any peripherals

2. Disconnect the computer and peripherals from their power sources to prevent electric shock or system board damage.

3. Disconnect any telephone or telecommunications lines from the computer.

In addition, take note of these safety guidelines when appropriate:

- To help avoid possible damage to systems boards, wait five seconds after turning off the computer before removing a component, removing a system board, or disconnecting a peripheral device from the computer.

- When you disconnect a cable, pull on its connector or on its strain-relief loop, not on the cable itself. Some cables have a connector with locking tabs. If you are disconnecting this type of cable, press in on the locking tabs before disconnecting the cable. As you pull connectors apart, keep them evenly aligned

to avoid bending any connector pins. Also, before connecting a cable, make sure both connectors are correctly oriented and aligned.



CAUTION

Do not attempt to service the system yourself except as explained in this manual. Follow installation instructions closely.

Protecting Against Electrostatic Discharge

Electrostatic Discharge (ESD) Warning



Electrostatic Discharge (ESD) is the enemy of semiconductor devices. You should always take precautions to eliminate any electrostatic charge from your body and clothing before touching any semiconductor device or card by using an electrostatic wrist strap and/or rubber mat.

Static electricity can harm system boards. Perform service at an ESD workstation and follow proper ESD procedure to reduce the risk of damage to components. Magma strongly encourages you to follow proper ESD procedure, which can include wrist straps and smocks, when servicing equipment.

You can also take the following steps to prevent damage from electrostatic discharge (ESD):

- When unpacking a static-sensitive component from its shipping carton, do not remove the component's anti-static packaging material until you are ready to install the component in a computer. Just before unwrapping the anti-static packaging, be sure you are at an ESD workstation or grounded.
- When transporting a sensitive component, first place it in an anti-static container or packaging.
- Handle all sensitive components at an ESD workstation. If possible, use anti-static floor pads and workbench pads.
- Handle components and boards with care. Don't touch the components or contacts on a board. Hold a board by its edges or by its metal mounting bracket.

Chapter 1 Introduction

General Specifications

Magma's 13 Slot PCI Expansion System is a general-purpose bus expansion system for the Peripheral Component Interconnect (PCI) local bus. The expansion bus is fully compliant with the PCI Local Bus Specification. The PCI expansion system consists of an expansion bus cable (a shielded, high-speed cable), an expansion interface card, an expansion motherboard and a rack-mount enclosure with a power supply.

Item	Description
Backplane:	13 PCI Slots (supports full or short-length PCI cards)
Enclosure:	19" Rack-mount Standard
Dimensions:	(4U) 19" W x 7" H x 17.7" D
Weight:	24 lb or 11.804 kg
Construction:	All Steel Chassis
Cooling:	Two 70-105 CFM fans
Power Supply:	400W or 400W redundant
Standard Cable:	1-meter
MTBF:	37,000 hours
PCI Bus:	32 bits/33 MHz
PCI Local Bus Specification:	Revision 2.2
PCI Bridge Architecture Spec:	Revision 1.2
Interconnect Bandwidth:	132 MB/sec (Theoretical Max. of PCI 33/32)
Operating Environment:	0° to 50° C Operating Temperature -20° to 60° C Storage Temperature 5% to 85% Relative Humidity, Non-condensing
Operating Systems:	Windows Vista/XP/2000/Server 2003 Mac OS X Version 10.4.x + Linux Kernel 2.6.x +
Warranty:	1 Year Return to Factory
Available Options:	1.5-meter cable (PN: SUBCBL1.5HF) Disk Drive Cage for up to four 3.5” internal disk drives (PN: RDRIVECAGE) PCI card hold down kit (PN: RCHD7) Rack-mount slide kit (PN: RSLIDES-*XX*)

Pre-Installation Information

Before using the Magma expansion chassis you should perform the following steps:

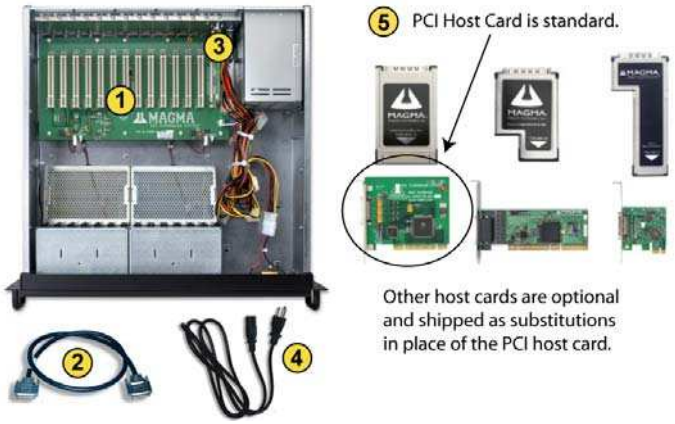
- Inventory the shipping carton contents for all of the required parts
- Gather all of the necessary tools required for installation
- Read this manual

Parts List

The following parts are provided:

	Qty	Item
①	1	Rack-mount enclosure containing a 13 slot PCI expansion motherboard and auto-switching power supply (400W)
②	1	PCI expansion cable (1-meter or 1.5-meter)[1]
③	1	PCI expansion interface card
④	1 or 2	Power supply cord
⑤	1	Host Card (PCI is standard)
	1	User's Manual

[1]The Magma PCI expansion cable uses a 68-pin connector; however, it is NOT an "off-the-shelf" SCSI cable. The Magma PCI expansion cable is a custom cable designed specifically for PCI Expansion.



Tools Required for Installation

In order to complete the installation of the Magma expansion system you will need a Phillips-head screwdriver.



Chapter 2 Hardware Installation

The following steps will guide you in completing the hardware installation of your Magma PCI Expansion System.

Electrostatic Discharge (ESD) Warning



All PCI cards are susceptible to electrostatic discharge. When moving PCI cards, it is best to carry the cards in anti-static packaging. If you need to set a PCI card down, be sure to place it inside or on top of an anti-static surface. For more information, see "Protecting Against Electrostatic Discharge" in the Preface.

WARNING



High voltages are present inside the expansion chassis when the unit's power cord is plugged into an electrical outlet. Disconnect the power cord from its source before removing the enclosure cover. Turning the system power off at the power on/off switch does not remove power to components. High voltage is still present.

CAUTION



Before touching anything inside the enclosure, move to an ESD station and follow proper ESD procedure. Failure to do so may result in electrostatic discharge damaging the computer or its components. For more information, see "Protecting Against Electrostatic Discharge" in the Preface.

STOP



If your Magma expansion chassis was not purchased directly from Magma, you must check to ensure that it doesn't contain any pre-installed PCI cards.

Check the rear side of the chassis to see if any PCI cards are visible in the slots. If you see a PCI card, you should continue installation using instructions provided by your dealer. If no separate instructions are available, remove the cover by using instructions in Step 1. Then remove the card as normal. If no PCI card is visible, then continue with the cable installation.

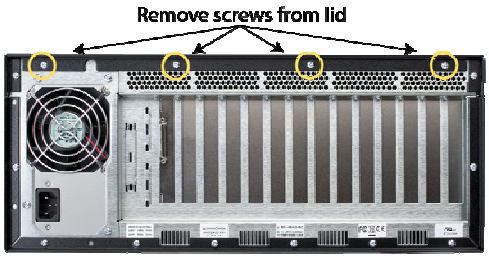
Before you Begin

The power supply is auto-switching. This means that it will automatically switch to match whatever source power you are using. Since all products ship with a US Standard 115V power cord, you will need to use a power cord adapter for non-US Standard 115V power sources.

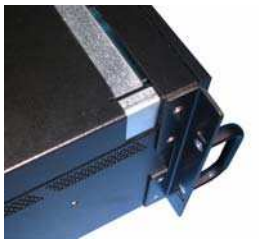
1 Install Expansion Interface Card

The first step is to install the PCI Expansion Interface Card.

Four (4) screws retain the cover on the expansion chassis. Remove them to open the enclosure.



All models



Next, slide the enclosure cover backwards, disengaging it from the guides at the front of the enclosure, by firmly grasping the rear cover lip over the card I/O area and pulling the cover backward about ½" and then lifting the cover off.

Finally, install the PCI Expansion Interface Card into the PCI Slot marked Expansion Interface (Slot J15) and secure it to the chassis using the mounting screw preinstalled above the slot.



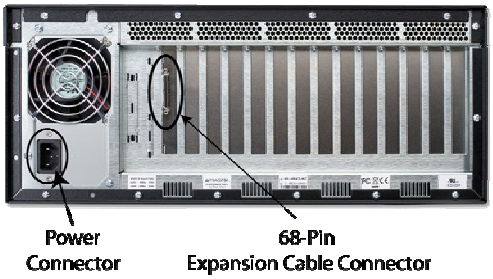
2 Attach PCI Expansion and Power Cable

Carefully position the Magma expansion chassis so that the supplied PCI expansion cable will conveniently reach from the connector of the Host Card to the connector on the back of the chassis.



Attach one end of the PCI expansion cable to the Host Card and secure it using the captive thumbscrews on the cable. *See the Host Card Installation Guide for more information on connecting the cable to the card.*

Carefully route the cable to the rear side of the expansion chassis and attach it to the 68-pin connector, as shown below:



Secure the cable with the captive thumbscrews. It is important that the cable be attached securely to the connectors at both ends.



Before connecting the power cord(s), check that the expansion chassis On/Off switch is set to the OFF position. This switch is located on the left side of the front of the chassis.



NOTE

If at all possible, plug all power cords from the Magma expansion chassis and your host computer into a shared power strip, preferably one that has surge and noise suppression circuitry built into it.

3 Recheck the Installation

Check your installation before powering up the Magma expansion chassis for the first time. Although the power supply has an over voltage protection device built into it, it may not "trip" in time to fully protect a device that has been improperly connected, or whose power cable has been damaged.

4 Applying Power Correctly

Starting Up:

You must apply power to the Magma expansion chassis BEFORE you power up your computer. This will allow the higher numbered PCI buses in the PCI bus hierarchy to be at a stable state when the host system issues its master power-on bus reset. In systems that perform automatic PCI bus configuration, this will allow the configuration code to recognize the PCI bus hierarchy and any attached devices.

There is an On/Off switch on the front panel, as well as an LED indicator to indicate power status. Verify that the green power indicator is ON.



STOP

DO NOT TURN ON THE MAGMA EXPANSION CHASSIS UNTIL YOU HAVE SHUT DOWN YOUR LAPTOP COMPLETELY! It can cause a system lockup and loss of any unsaved data.

Shutting Down:

When shutting your system down, it is recommended that you first shut down the computer correctly, and then power down the Magma expansion chassis to avoid 'computer lock-up' and potential data loss.



STOP

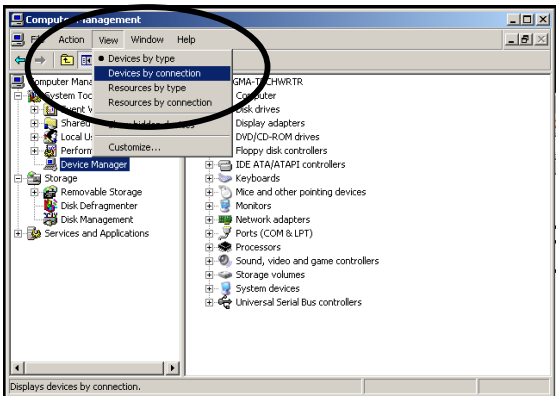
DO NOT TURN OFF THE MAGMA EXPANSION CHASSIS UNTIL YOU HAVE SHUT DOWN YOUR LAPTOP COMPLETELY! It can cause a system lockup and loss of any unsaved data.

CHAPTER 3 Verify Installation

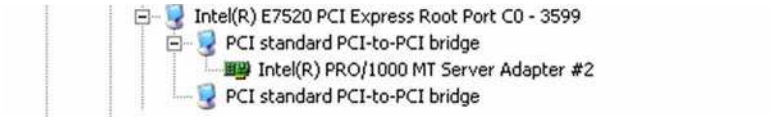
The Magma Host Card is not visible to the Windows' Device Manager or the Apple System Profiler *until the Expansion System has been successfully connected and properly powered on*. Therefore, you will need to connect your Expansion System to the host computer and turn them both on before you can verify the Magma Expansion Chassis installation. See your Host Card Installation Guide for information on how to connect your Host Card. Always power-up your Expansion System by turning on the power to the Expansion Chassis first, followed by your host computer.

Windows

To verify a successful installation on Windows, find the '**My Computer**' icon and "right-click" on it. Then select '*Manage*' from the pop-up menu. Next, click on '*Device Manager*' in the leftmost Computer Management window. Finally, click on the *View Menu* and select *View Devices by Connection.*



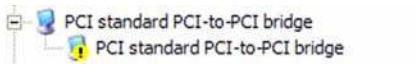
Open ACPI (BIOS) □ Open PCI Bus□ Click the '+' sign several times until your reach a PCI or PCI Express Root Port with a PCI Standard PCI-to-PCI Bridge beneath it.



When installed correctly, you will see three “PCI to PCI Bridges” below your system’s PCIe Controller. Any 3rd Party PCI cards installed in the chassis will appear below one of the PCI-to-PCI bridges.

If everything is OK, then the Magma Expansion System installation is complete. You can now proceed to Chapter 4 for help with the installation of 3rd Party PCI Cards.

If, however, the installation was unsuccessful, you may not see the PCI to PCI Bridge, or it will have a small yellow in front of it.

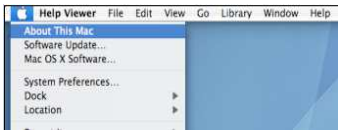


If any of these devices are not displayed as shown above, you should shut down your system (host computer first, then the expansion chassis) and reconnect the cables and reseat the PCI Host Card to ensure that you have a solid connection. Then restart the Magma expansion chassis, followed by the host computer. Next, try to verify the installation again, as shown above. If you are still having problems, review *Chapter 5, Troubleshooting* before contacting Magma Technical Support at (858) 530-2511. Additional troubleshooting help is available in your Host Card Installation Guide and on the web at www.Magma.com.

Mac OS X

When using Mac OS X no additional software or drivers are needed. As long as you are using Mac OS X Version 10.2.2 or newer, the operating system should automatically recognize the Magma expansion chassis.

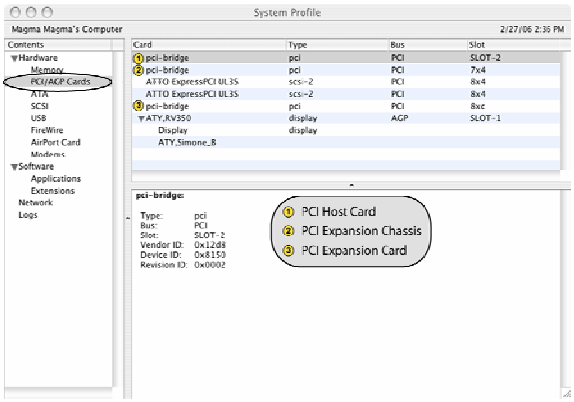
Select "**About This Mac**" under the Apple Icon



Then click the "**More Info**" button.

MAC OS 10.3.x & 10.4.x

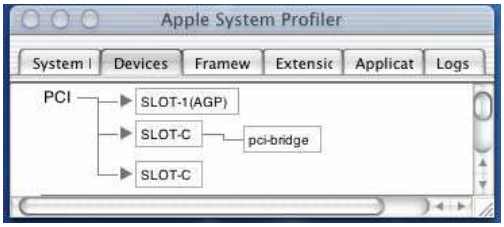
Next, click on the **PCI Card** item. You should see a **pci-bridge** device listed under PCI as shown below:



Any PCI Cards you install in the expansion chassis will appear behind the **pci-bridge** device.

MAC OS 10.2.x

Next, click on the **Devices** tab. You should see a **pci-bridge** device listed under PCI as shown below:



Any PCI Cards you install in the expansion chassis will appear behind the **pci-bridge** device.

If any of these devices are not displayed as shown above, you should shut down your system (computer first, then the expansion chassis) and reconnect the cables and the PCI expansion host card to ensure that you have a solid connection. Then restart the Magma expansion chassis followed by the computer. Next, try to verify the installation again, as shown above. If you are still having problems, contact Magma Technical Support at (858) 530-2511.

Chapter 4 Install 3rd Party PCI Cards

This chapter provides information on how to install 3rd Party PCI cards into your Magma expansion chassis. More details on the installation of individual cards are provided by the card's manufacturer. This chapter is provided as a simple guide to help you install your PCI cards in the chassis.

For the purpose of installation, the Magma expansion chassis functions exactly as a standard desktop computer chassis. Always follow the manufacturer's instructions for installing their card on a desktop computer.



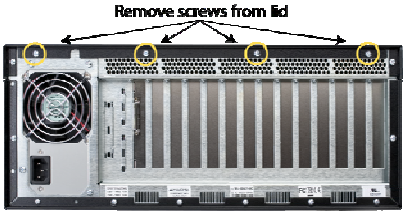
IMPORTANT

We will provide reasonable technical support with 3rd Party PCI cards. However, if you have verified a successful installation of the Magma expansion system (as defined in *Chapter 3*), but experience difficulty installing your 3rd Party PCI cards, the PCI card manufacturer should be able to provide the best support.



Remove PCI Expansion Chassis Cover

Four (4) screws retain the cover on the expansion chassis. Remove them to open the enclosure.



All models

Next, slide the enclosure cover backwards, disengaging it from the guides at the front of the enclosure, by firmly grasping the rear cover lip over the card I/O area and pulling the cover backward about ½" and then lifting the cover off.



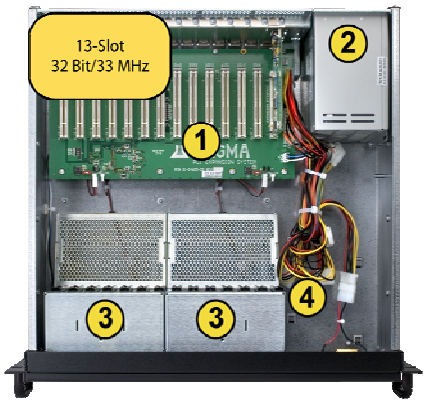
CAUTION

When replacing the enclosure cover, be sure that the front edge guides on the cover engage the inner lip of the enclosure.

2 Install PCI Cards in PCI Expansion Chassis

CAUTION

When installing PCI cards or hard drives, please ensure that the input current rating specified on the AC input label is not exceeded.



1. PCI slots
2. Power Supply
3. Fan assembly with slot holders for full-length cards
4. Drive bay – used to mount up to eight (8) 3.5" internal hard drives using 1 or 2 optional Disk Drive Cages (PN: RDRIVECAGE)
5. 5V load resistor – to be removed if optional hard drives are installed



Generally, when installing 3rd Party PCI cards in your Magma expansion chassis, it should make no difference which PCI slot you place your cards in, unless specified by the card manufacturer. If you have PCI cards that need priority assignments, slot ordering in your PCI Expansion chassis begins with **Slot 4**.

Install PCI cards following PCI card manufacturer's recommendations. Some PCI card manufacturers recommend that you install their software driver(s) prior to installing the hardware. If this is the case, you should install their driver before you connect and power up the expansion chassis.

Make sure that all PCI cards are fully seated in their connectors. When correctly seated in its connector, you will notice a firm resistance when you pull up gently on the card. To keep the cards in place, secure them in the enclosure with their retaining screws (supplied with the Magma expansion chassis).

IMPORTANT



The sheer number of PCI cards and device drivers available makes it impossible for Magma to fully test and certify all available PCI cards for use in the Magma expansion chassis. Our best advice to you in this regard is to insist on full PCI Specification compliance from your card and system vendors. Cards and systems should be at least PCI Specification Revision 2.0 compliant or better. Compliance in your system motherboard, PCI cards, and console firmware (or BIOS) is your best assurance that everything will install and operate smoothly.

Not all PCI cards are as "well-behaved" as they should be. Sometimes simply moving a PCI card that is having a problem to a different slot, or reordering your cards in their slots, will alleviate "behavior" problems.

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