MAGMA
MISSION TECHNOLOGY GROUP, INC.

PCI Expansion System
Users Manual

13 Slot PCI to PCI Expansion
With Redundant Power and Remote Monitoring

Model: P13RR-RAS

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Preface

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.

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.

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

The MAGMA P13RR-RAS is a rugged COTS (Commercial-Off-The-Shelf) 13 Slot PCI to PCI Expansion System designed specifically for industrial telephony and military-grade configurations requiring remote monitoring capability. In addition, this expansion system was designed to meet the MIL-STD 461E standard. The expansion chassis is fully compliant with the PCI Local Bus Specification. This MAGMA expansion system consists of a PCI Host Interface Card, a PCI expansion cable (a shielded, high-speed cable), a 16 gauge steel expansion chassis containing a 13 slot PCI backplane, the SNMP remote monitoring system and status panel, a locator LED, a redundant power supply, and high volume cooling fans.

Item	Description
▪ Backplane:	13 standard PCI slots 32-bit / 33MHz
▪ Enclosure:	Black, 4U Rack-Mount
▪ Dimensions:	19"W x 7"H x 18"D
▪ Weight:	28.8lbs or 13.00 kg
▪ Standard Cable Length:	1 meter
▪ PCI Local Bus Specification:	Revision 2.2
▪ PCI Bridge Architecture Spec:	Revision 1.1
▪ Interconnect Bandwidth:	132 MB/sec (Theoretical Max. of PCI 33/32)
▪ Cooling:	Four 77 CFM fans (2) fans (10.9 CFM) in each power supply module
▪ Power Supply:	550W, 100-240VAC, 47-63HZ, 1+1 redundant, hot swappable power supply
▪ MTBF:	100,000 hours
▪ Monitoring:	SNMP via Ethernet Audible Alarm Status panel
▪ Operating Environment:	Recommended operating temperature up to 50º C -55º to 125º C Storage Temperature 0% to 90% Relative Humidity, Non-condensing
▪ Operating Systems:	Windows 7/Vista/XP/Server 2003 Mac OS X version 10.4.x + Linux Kernel 2.6x+ Solaris
▪ Warranty:	1 Year Return to Factory
▪ Available Options:	▪ 1.5-meter cable (PN: SUBCBL1.5HF) ▪ CardBus Card: required to use the expansion chassis with a laptop computer (PN: SUBCBHIF) ▪ Rack mount slide kit (PN: RSLIDES-XX) ▪ PCI Express Host interface card (PN:SUBPEHIFX1)

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	13 Slot PCI to PCI Expansion Chassis
②	1	PCI Expansion Cable (1-meter or 1.5-meter)[1]
③	1	PCI Host Interface Card
④	13	Long card retainers
	13	Short card retainers
⑤	2	U.S. Standard 115V power cord
	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 P13RR-RAS.

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.

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.

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.

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 *Chapter 4 Install 3rd Party PCI Cards*. Then remove the card as normal. If no PCI card is visible, then continue with the cable installation.

Before you Begin

The 550W redundant power supply is auto-switching. These 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 PCI Host Interface Card

Begin the installation of your PCI expansion host card by first powering down the host computer. Use the procedures for shutting down your operating system and shutting off power to your system provided in your owner's manual or system documentation.

The PCI Host Interface Card includes a voltage switch in the top right corner of the board that may need to be adjusted for proper installation. It is an easy process to determine if the voltage switch needs to be adjusted for your configuration.

1. Insert the PCI Host Interface Card into a vacant PCI slot by gently pushing the card until it is firmly seated.
2. Secure the card in the PCI slot opening with a mounting screw.
3. Turn on power to the host computer.
4. If both LEDs shown below are lit, **DO NOT** adjust the dip switch, simply power down and continue to step two.
5. If only the +5V LED is lit, shut down your computer, then flip the switch to the ON position before continuing to the next step. When you power up the computer again, both LEDs should now be lit.
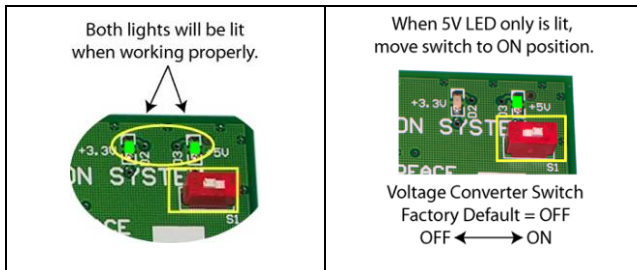
Installing a PCI Express Host Interface Card (Optional)

The optional PCI Express (PCIe) host interface card allows you to connect the P13RR-RAS expansion chassis to a PCI Express host computer. The host system requires at least a x1 PCIe connector to facilitate this host card. Once connected you will have expanded one PCIe slot into 13 PCI slots.

To install the card follow the same procedure listed in step 1 above.

YOU MUST ONLY INSTALL THE PCIe HOST CARD INTO A **PCI EXPRESS SLOT**.

**Only use cards WITH brackets.** This will ensure that your PCIe host card could only be inserted into a PCIe slot. Although PCI Express cards without brackets may fit into conventional PCI slots, you run the risk of damaging the PCI Express host card if you insert it into a PCI slot. Please ensure that your host computer has PCI Express slots and install the host card **only** into a PCI Express 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 PCI host card to the connector on the back of the PCI expansion. The standard size cable that ships with the P13RR-RAS is 1 meter long. An optional 1.5 meter cable is available from Magma in case you didn't order it with your system during your initial purchase.

Attach one end of the PCI expansion cable to the PCI expansion host card and secure it using the captive thumbscrews on the cable.

Carefully route the cable to the rear side of the expansion chassis and attach it to the 68-pin connector, as shown below:
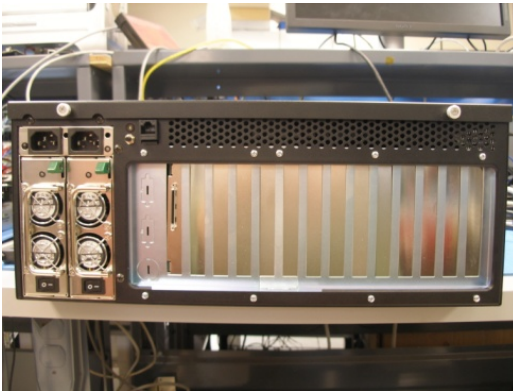
Secure the cable with the captive thumb-screws. It is important that the cable be attached securely to the connectors at both ends.

Before connecting the power cords, check that the expansion chassis On/Off switch is set to the OFF position. This switch is located on the right side of the monitor control on 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 LED indicators to indicate power status. Verify that the green power indicators are ON.
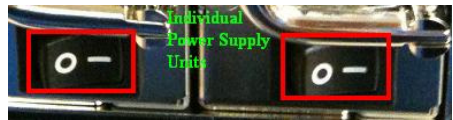
After first turning on each of the individual power switches in the back of the chassis, the entire system can then be turned on using the master power switch in the front.

IMPORTANT

- Unless both redundant power supplies are turned on first, an alarm will sound once the master switch is activated (the system considering one of them as having failed).

- These 1+1 redundant power supplies are hot swappable, which means that the system can fully operate on one power supply while the other is removed for repair/replacement.

- A power supply unit (PSU) should be switched off before removal and upon insertion of its replacement.

- After replacing a PSU, be sure to secure the new one in place with its snap-in mechanism for better grounding and noise immunity.

Windows XP and Windows 2000 Start Up

As your Windows XP/2000 computer starts up, you will see a small message box pop-up in the lower-right corner of the screen to alert you that Windows has found new hardware.
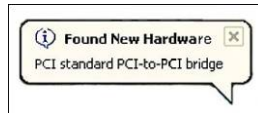
You are now ready to go. No drivers are needed. Now go to *Chapter 3 Verify Installation.*

MAC Start Up

MAC computers will boot up without any visible indicators that the Expansion System is connected. Go to *Chapter 3* Verify Installation.

Shutting Down:

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

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.

CHAPTER 3   Verify Installation

Windows 2000 and XP

To verify a successful installation on Windows XP or 2000, find the 'My Computer' icon → Right-click and select 'Manage' → Highlight 'Device Manager' → Click on the View Menu and select View Devices by Connection
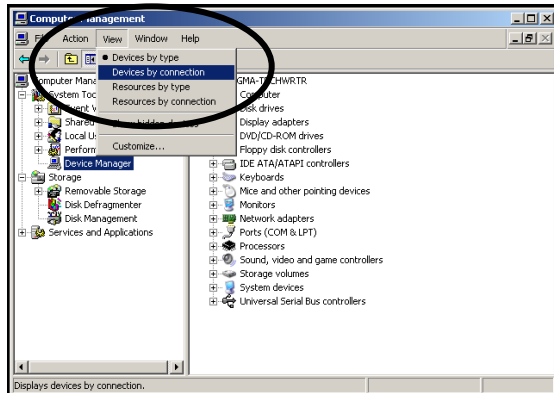
Open ACPI (BIOS) → Open PCI Bus→ Click the '+' sign several times until your reach the PCI Standard PCI to PCI Bridge.

When installed correctly, you will see three "PCI to PCI Bridges" below your system's PCI Controller.
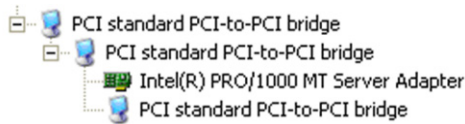
If everything is OK, then the MAGMA PCI expansion host card installation is complete. You can now proceed to *Chapter 4 Install 3rd Party PCI Cards.*

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.
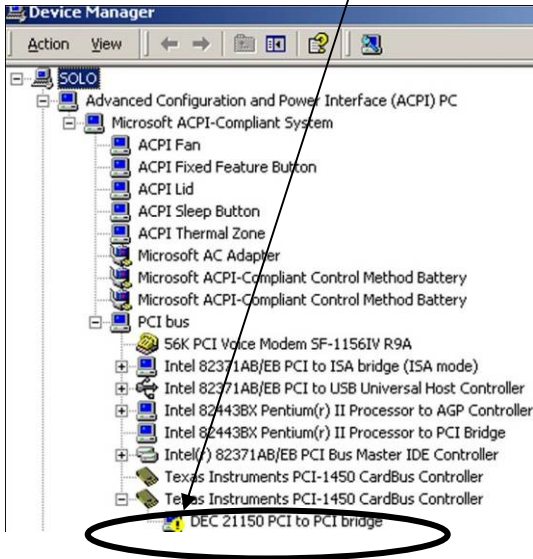
Proceed to *Chapter 7 Troubleshooting* for help with Windows installation problems.

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
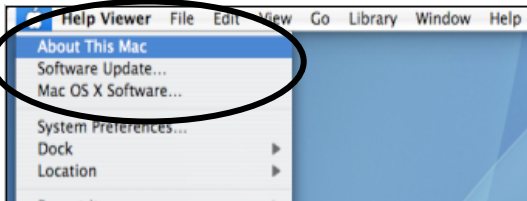
Then click the "More Info" button → click on the Devices tab→ you should see a **pci-bridge** device listed under PCI as shown below:

Any PCI Cards you install in the expansion chassis will appear behind the **pci-bridge** device.
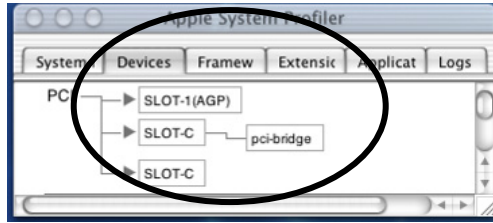
Mac OS 10.2.x

Card	Type	Bus	Slot
pci–bridge	pci	PCI	SLOT–2
pci–bridge	pci	PCI	7x4
ATTO ExpressPCI UL3S	scsi–2	PCI	8x4
ATTO ExpressPCI UL3S	scsi–2	PCI	8x4
pci–bridge	pci	PCI	8xc

Mac OS 10.3.x & 10.4.x

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.

> 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.
>
> **Important**

1 Remove PCI Expansion Chassis Cover

Two captive thumb screws retain the cover on the expansion chassis. Loosen them to release the cover.

Slide the enclosure cover backwards, disengaging it from the guides at the front of the enclosure, by firmly grasping the cover lip and pulling the cover backward about a quarter of an inch 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 PCI Expansion Interface Card

Next, check the PCI Expansion Interface Card. This card is factory installed in the 1st PCI slot next to the power supply connections on the backplane. It is required to allow your host computer to communicate with the PCI cards in the expansion chassis.

PCI Expansion Interface Card

Ensure that the card is installed in the slot labeled "Expansion Interface" and that it is fully inserted into the slot and fastened to the chassis.

Also note the card hold-down assembly, whose purpose is to hold the 13 PCI cards securely to the backplane.
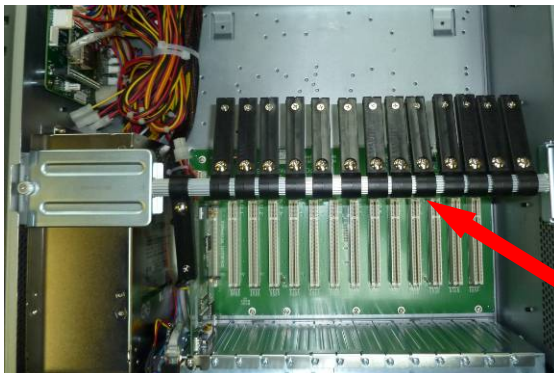
Card hold-down assembly

③ 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.

In order to access the add-in PCIe cards, you will need to remove the card hold-down assembly as follows:

1. Rotate the plastic pieces until their grooves are aligned with the cards.

2. Unscrew the captive screw, lift up and remove the bar:
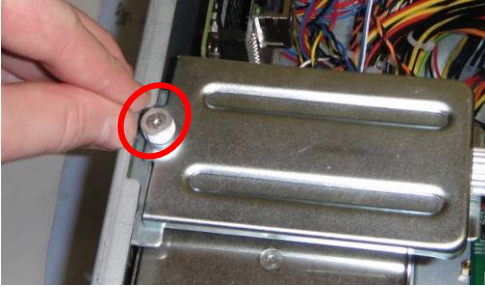
3. Tighten the screw in the black plastic piece to lock it into place and prepare it to lock the PCIe add-in card that will be installed.

4. Reinsert the bar into the chassis and tighten the captive screw.

Slot ordering in the 13 Slot PCI to PCI Expansion chassis should begin with Slot 4 – previously identified as the slot next the slot identified as the "Expansion Interface" slot.

Generally, when installing 3rd Party PCI cards in the MAGMA expansion chassis, it should make no difference which PCI slot you place your cards in, *unless specified by the card manufacturer*.

Install each PCI card following the 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.

> **Note**
>
> To reduce potential problems with the installation of 3rd Party PCI cards, it is recommended that the cards and their drivers, if any, are installed and tested individually. This practice will reduce troubleshooting tasks in the event of a problem.

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.
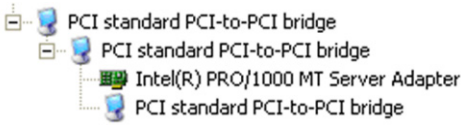
4 System Should Be Up and Running

Apply power to the MAGMA expansion chassis first, then power up the computer.

M A G M A

Use the procedures detailed in *Chapter 3* to confirm the card installation(s) in the Windows Device Manager or Apple System Profiler.

```
├─ 🖳 PCI standard PCI-to-PCI bridge
│   └─ 🖳 PCI standard PCI-to-PCI bridge
│       ├─ 🖳 Intel(R) PRO/1000 MT Server Adapter
│       └─ 🖳 PCI standard PCI-to-PCI bridge
```

Windows Device Manager

Card	Type	Bus	Slot
pci–bridge	pci	PCI	SLOT–2
pci–bridge	pci	PCI	7x4
ATTO ExpressPCI UL3S	scsi–2	PCI	8x4
ATTO ExpressPCI UL3S	scsi–2	PCI	8x4
pci–bridge	pci	PCI	8xc

MAC Apple System Profiler

5 Install Chassis in Rack

Locate a vacant 4U slot in your rack that is within the reach of the one-meter cable that came with your P13RR-RAS Expansion System. Install the rails in the rack as shown below:

Measure the rack from front to back so you can confirm how long the rail must be to fit properly.
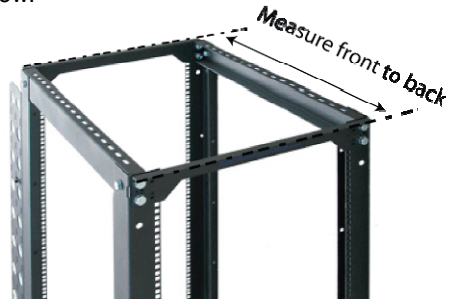
Next, assemble the Slide piece with the end bracket as shown and secure with 2 Panhead screws. Ensure the Phillips screw head is located on the "open" side of the Slide pieces as shown.

Tighten finger tight only to allow for minor adjustment during assembly.

Attach Rail to Chassis

Use at least three screws per side of the unit for mounting of the slides. Be sure you have measured accurately to ensure that everything fits in the rack correctly.

Attach Slide Rail to Rack

Attach to inside of rack with "fingers" pointing "out" and the end bracket   to the rear. Secure each Slide Mount with 4 screws.

If your rack has holes too large for the screws, you can use the Bar Nut to secure your mounting by inserting the Panhead screw through the rack hole and screwing it into the Bar Nut on the reverse side of the rack post, as shown.

Note	**NOTE** Notice that the holes on the Bar Nut are spaced unevenly to accommodate different racks.

Secure the slide rail to the rack with 2 screws to both front and rear posts. After you have secured the slide rail fingers to the rack posts, tighten the 2 screws used to attach the slide rail to the end bracket.

Combine Chassis and Slide Rail

The chassis mounts into the rack from the front. Insert the chassis into the rack slide and press it forward until the chassis stops. When the chassis is completely inserted into the rack, secure all the mounting screws on each side.

Chapter 5　　Remote Monitoring

SNMP Features

Magma's P13RR-RAS chassis supports the Simple Network Management Protocol for remote monitoring and administration by offering the following features:

- Internal Temperature monitoring
- Clear Alarm button monitoring
- Swappable fan status (for fans 1,2,3 and 4 in the front)
- Power supply 1 status
- Power supply 2 status
- 10 Traps are defined to alert the SNMP server in case of overheat or failure in any of the subsystems mentioned above

SNMP Configuration

To ensure that you can successfully monitor your new system, you will need to connect it to a local or private hub using a standard RJ-45 Ethernet Cable. Connect one end of the cable to the RJ-45 port, located to the right of the power supply modules, and the other end to your local area network connector. In case you connect the chassis to a local computer/laptop be sure to use a Hub with a regular network cable or a crossover cable without a Hub.

The SNMP module in the P13RR-RAS system is configured for DHCP access (though this setting can be changed as described in the next section). Once the chassis is turned on it will be assigned an IP address by your network's DHCP server.

If you have access to your network's DHCP server make sure to look up and write down that IP address. In any other case you will need to use the **IPsetup.exe** utility to discover the IP address that was assigned to the chassis. It can be downloaded in the SNMP section of the Magma driver downloads at: http://www.magma.com/drivers.asp

Double click on the utility icon after your chassis has been connected to the network and powered on. It will then identify your chassis based on its MAC address and display the following information:
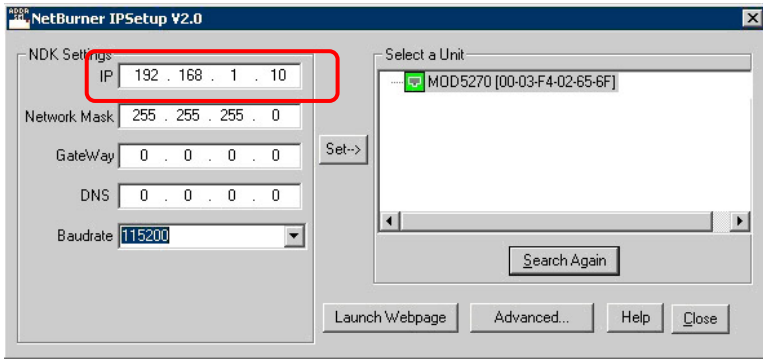
In this case the IPsetup utility has found the P13RR-RAS chassis at IP address 192.168.1.10.

CAUTION

Caution

Aside from reading an IP address, the IPsetup.exe utility can be used to set an IP address other than the one assigned initially by the DHCP server—using the Set button. It is recommended, however, not to use the utility for this purpose since we will loose connectivity with the chassis until the machine running IPsetup.exe obtains an IP address in the same IP subnet. The next section will show a preferred way of accomplishing this via the browser interface. In case you need to back-trace any of these steps, you can always reset the chassis back to its factory settings.

Configure Network Settings

Open your browser and enter the discovered IP address in the URL bar and press **Enter**. The following authentication window will open up:

The factory settings will define the *User name* to be "**default**" and the *password* to be "**magma**". Enter these values in the appropriate field and select OK.

If the username and password have not been changed from the factory settings, the Generic Info page will appear, showing the current IP address, the Trap destination address and current system status concerning the fans and the redundant power supplies.

If the following page does not appear, double check the network connectivity to the chassis via the RJ-45 cable or see your network administrator for the correct user name and password.
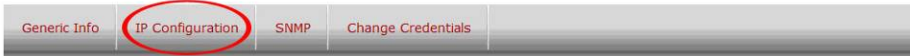

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| Generic Info | IP Configuration | SNMP | Change Credentials | |

Generic Information

Chassis Status	On
Device IP Address	192.168.1.100
Trap Destination IP Address	192.168.1.2
Power Supply One Status	Good
Power Supply Two Status	Good
Fan One Status	Good
Fan Two Status	Good
Fan Three Status	Good
Fan Four Status	Good

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To change the IP address, click on the IP Configuration link on the top bar and the following should appear:

Enter the new static IP address in the IP Address field. Enter the new subnet mask in the Network Mask field. Enter the IP addresses for the Gateway and the DNS Server in the appropriate fields. Finally, enter the network name for the P13RR-RAS in the Device Name field for use when accessing the chassis when DHCP is enabled. By default the device name is Magma EB4-90A7.

If you wish to use **DHCP**, enter 0.0.0.0 in the IP Address field.

When you have finished configuring the network settings, you can either configure the SNMP settings as will be described in the next section, change the default user name and password, or save the current changes by clicking on the **Save Network configuration** button at the bottom of the screen.

Now you can connect your chassis to the network. To find the IP address assigned by your DHCP server, look in the DHCP server's list of attached devices for the name you assigned to your P13RR-RAS chassis.

Configure SNMP Settings

If you are adding your P13RR-RAS chassis to an existing SNMP
network, or if you are planning to trap SNMP errors, you will need to
configure the SNMP settings for use with your SNMP agent.

The default values for the SNMP settings are shown below:

To configure these values for your SNMP network, simply change the
default values to match your requirements.

Change the **Read Community Name** and **Write Community Name**
fields to match those required by your SNMP network. The default value
is *public*.

Change the **Trap Destination IP Address** to the IP address of the
computer getting the SNMP data. The default **Trap Destination IP
address** in the above example was: *192.168.1.2*

Finally, save the newly entered settings:

Change Credentials

This section allows you to change the default **user name** (*default*) and **password** (*magma*).

To change the **user name**, simply enter your new user name in the **user name** field. To change your password, enter your new password in the **password** field. Enter it again in the **password(again)** field. The password in both fields must match before they can be accepted.

IMPORTANT

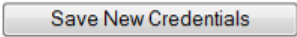The **user name** and **password** fields are case-sensitive.

When you have finished changing the default user name and password save the current changes by clicking on the **Save New Credentials** button at the bottom of the screen:

Reset to Default Values

In order to restore the P13RR-RAS chassis to its factory default values you must first turn off the chassis. However, keep the power cords plugged in and the power supplies in the ON position. Then press and hold the Alarm Reset Button for 10 seconds during which the Power LED will blink. When all values have been restored, the LED will stop blinking and turn off.

Configure your SNMP Agent

If you use an SNMP agent to help you monitor your network, you will find all necessary monitoring information in the MIB file.

Retrieving the MIB File

The MIB file is available for download at: http://www.magma.com/drivers.asp in the SNMP section of that page.

After you click on the MIB file link, save the file as type "All Files" to your preferred location. You may then open the file (using Notepad, or equivalent text editor) and all the information needed to configure your SNMP agent will be displayed on the screen:
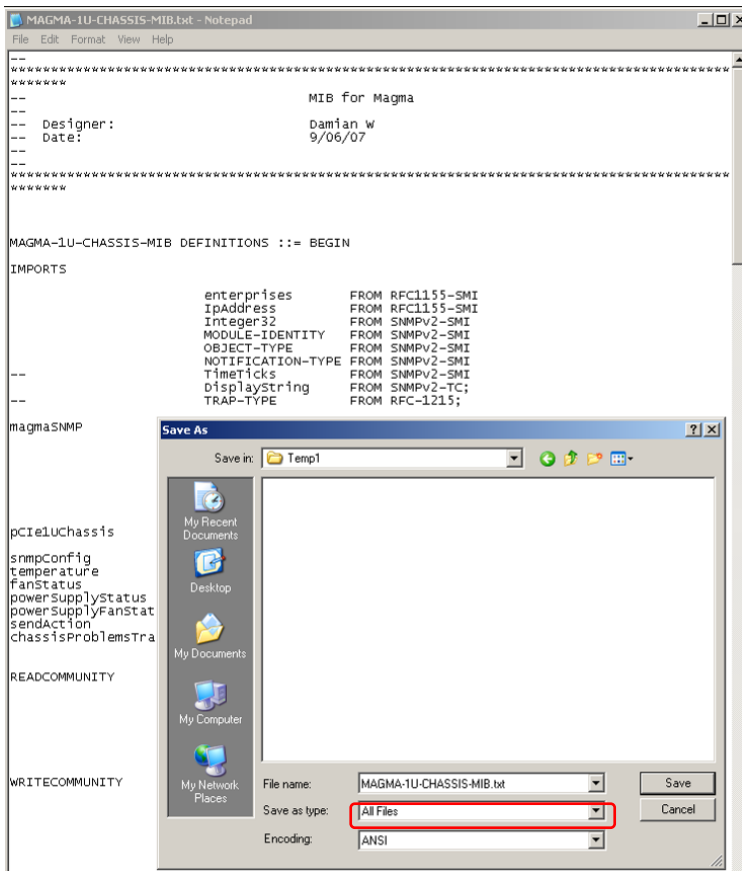

Once the MIB file is saved it can now be copied and loaded locally or to a remote server.

Accessing the various SNMP functions

Once the MIB file has been loaded to an SNMP server (via a front-end software typically called a MIB Browser) we can read in status information and set up specific functions otherwise not available via the Web interface.

The MIB Browser (or equivalent front-end SNMP software) will display the Magma chassis MIB contents in an explorer-like, Tree interface. A snapshot form the MIB Browser by iReasoning is shown below:
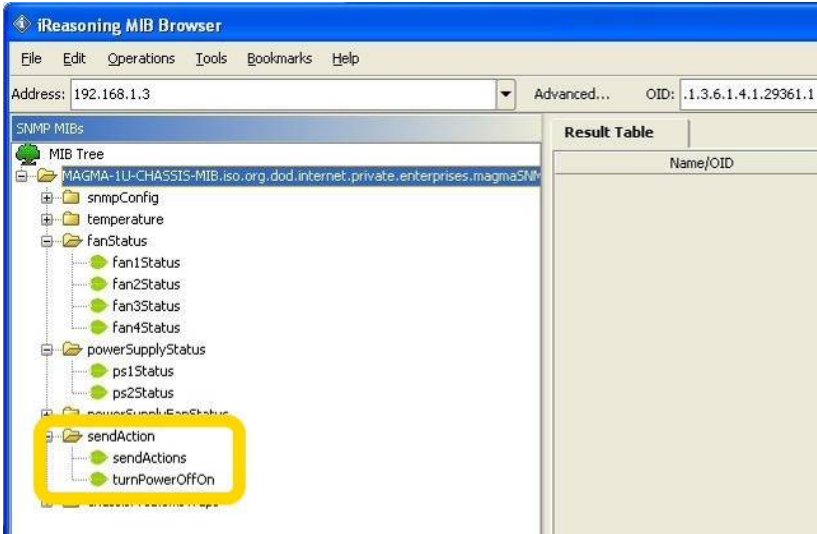
Under the MIB Tree, the Magma Chassis will have status information that can be read by expanding the respective folders. This information is also available in the Web interface mentioned previously. In addition, if we expand the *sendAction* folder (as shown above) we gain access to "writable" functions that essentially allow us to remote-control the chassis.

Enabling/disabling the chassis' Audible Alarm:

In the above screen locate the Alarm entry in the *sendAction* folder where you can set its status as follows:

- Set *sendAction* to 8 will enable the audible alarm.

- Set *sendAction* to 4 will disable the audible alarm.

Chapter 6   Chassis Maintenance

Like all computer systems, you will need to perform some routine maintenance tasks. Some of these include making sure that the air vents in the chassis are clear of obstructions and that the cooling air from the fans flows freely. You will also need to check the foam filter behind the front panel to ensure it is clean, thus allowing for unrestricted air flow to the fans. You should always keep an eye on all cables to make sure they are not damaged and are securely connected. Occasionally, you should remove the chassis cover and check for loose cards, and remove any dust build-up.

> Always remember to power down your computer and the expansion system BEFORE you attempt to perform any maintenance tasks.

General Chassis Cleaning

The environment where your Magma chassis is operating should be the determining factor as to how often you should perform a general cleanup of the chassis. To perform a routine general cleaning of your chassis, you will need the following:

1. Can of compressed air (proper distance, 6 inches)
2. Cotton Swabs
3. Isopropyl (alcohol)
4. Anti static wipes
5. Warm water (for filter)
6. Dish soap (for filter)

> Do not use a vacuum because vacuums create ESD.

First, remove the four cover screws and the top chassis cover:

Next, use a can of compressed air from your local computer store to blow out any dust that may have accumulated in the chassis fans.

Two of these components are field-replaceable: the cooling fans and the hot-swappable redundant power supply modules.

Fan replacement

The P13RR-RAS chassis was designed to allow "hot-swappable" fan replacement while the chassis is powered on for maximal uptime.

First you will need to remove the chassis' lid as shown in the beginning of Chapter 4. Then locate the fan that has failed, unlock its thumbscrew, lift up its metal tab and pull it out.

Insert the new fan in and secure it in place. Verify the new fan is spinning and restore the chassis lid.


NOTE

The Magma part number for a replacement fan is: 26-00031-00

"Hot-Swappable" Power Supply

In spite of regular performance of routine maintenance tasks, some computer systems can experience hardware failures. Fortunately, your investment in a Magma Expansion system with a redundant power supply provides you with the ability to easily replace a power module in the event of a failure.
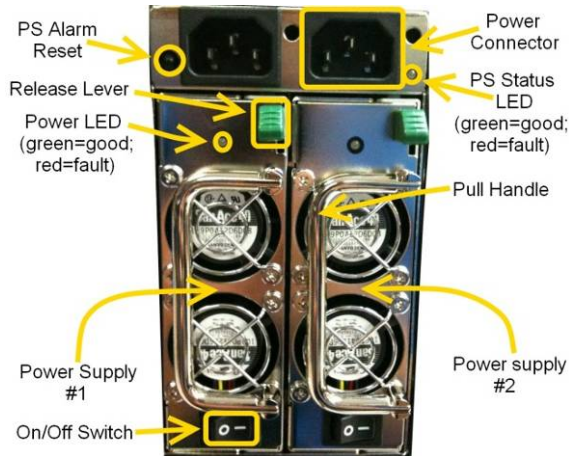
The redundant power supply includes two hot-swappable modules that share the power load requirements during normal operations. Should one module fail for any reason, the power load will be shifted to the other module and sound an audible alarm.

If a power supply fails, an alarm will sound to alert you of the problem. There are two types of audible alerts:

- Two short beeps – Occurs when one of the power supply modules has failed.

- A continuous beep – Occurs in the event of multiple, successive power surges during a short interval.

Press the black button on the status panel in the front of the chassis in order to turn off the audible alert.

To replace a failed power supply, simply grab the handle, press down on the green release lever at the top of the module, and pull. Replace the failed module with a new one and turn on the power to the module using the power switch at the bottom of the module. The power load will again be shared between these two modules.

> In order to ensure the safety and efficiency of your expansion system, it is recommended that you keep a spare power supply module on hand – just in case. Protect yourself, keep a spare. Order your spare power supply module from Magma – PN 40-00030-01.

**Important**

Cleaning the Air Filter

The chassis is equipped with an air filter that is easy to remove and clean. To keep your chassis running at its coolest, you should clean this filter regularly. How often the filter requires cleaning depends on environmental conditions where your Magma Expansion chassis is located. To clean this filter, follow these simple steps.
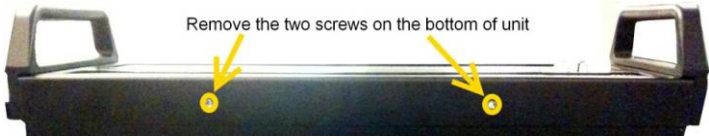
First, power down the chassis and then remove the screws on the side of the front panel with a Phillips screwdriver.
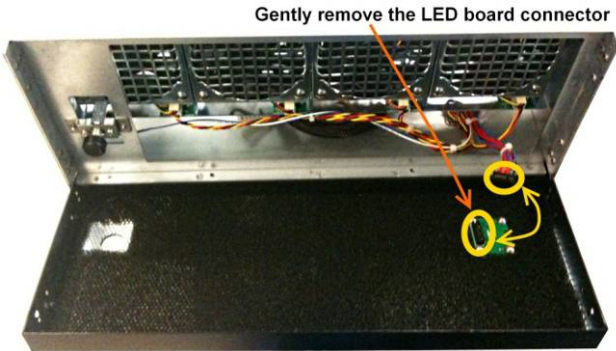
Note

NOTE

Note the different types of screws and where they go as you take them out.

Remove all screws

Remove the two screws on the bottom of unit
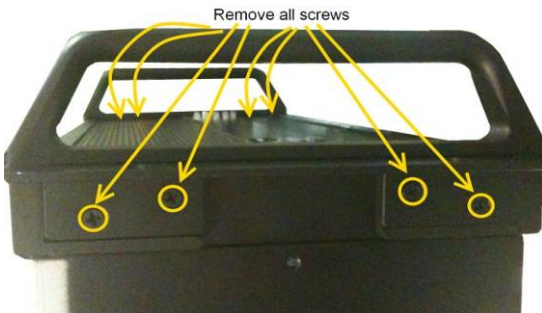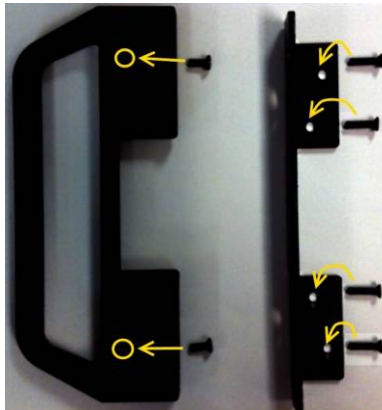
Next, open the faceplate slowly and disconnect the wire marked bellow:

Gently remove the LED board connector

Then remove the foam filter, located behind the faceplate, and clean it with a solution of warm water and mild dish soap.

Finally, replace the filter, reconnect the LED panel. Secure faceplate with Phillips screws. Tighten screws until snug and turn on power to the chassis.

Important	In order to ensure the safety and efficiency of your expansion system, it is recommended that you keep a spare power supply module on hand – just in case. Protect yourself, keep a spare. Order your spare power supply module from Magma.

|	
Important	If your chassis is extremely dirty and you would like professional help with getting it clean, you can contact Magma Support for instructions and costs on shipping the chassis back for cleaning.

Chapter 7   Troubleshooting

Before discussing a troubleshooting methodology for locating the problem we will first introduce several indicators and configuration switches that provide general and specific information for this process.

Status Indicators and configuration switches

Under normal operating conditions the status indicators are for internal Magma troubleshooting while the configuration switches/jumpers should remain in their default state preset by Magma for best compatibility. However, should a problem occur with the chassis (or a special mode of operation be solicited by the client) we included below explanations as to what all these items are and how they should be treated:

Status Panel indicators:
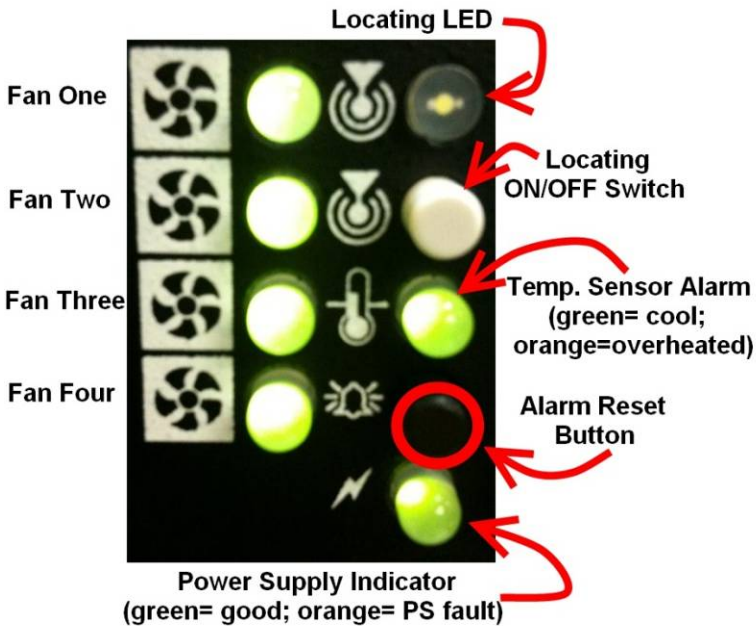
All LED's should be green at all times. An orange LED means a fault of the corresponding item listed in the picture above.

Locate the Problem

If you are having trouble with the MAGMA expansion system, verify that all cards are seated properly and all cables are connected properly. Be sure you followed the instructions in earlier sections of this User Guide. Always remember to power **On** and **Off** correctly when rechecking and testing your installation. If you are still having problems, try these simple troubleshooting steps.

- My Computer Can't Find the PCI Expansion System
- When Nothing Works
- My PCI Card Doesn't Work

The PCI to PCI Expansion System is correctly displayed as a **"PCI standard PCI-to-PCI bridge"** (Windows Device Manager) and as a **"pci-bridge"** (MAC Apple System Profiler). When connected and functioning correctly, this Expansion System will be displayed as follows:
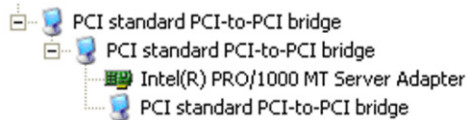
Windows

MAC

If this is not what you see when you verify your installation, the following troubleshooting steps may help you to locate and resolve your installation issues, without having to call Technical Support.

My Computer Can't Find the PCI Expansion System

If the expansion system is not visible in your Windows Device Manager or your Apple System Profiler at all, you will need to turn off your computer (first) and then the MAGMA expansion chassis (second) and test all cords and cables to ensure you have everything connected correctly. If everything seems to be connected correctly, and you are sure you have applied power correctly (power up expansion chassis first and then the computer), then try these additional troubleshooting steps:
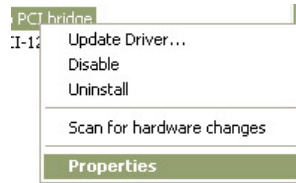
- Double-check the PCI host card to ensure it is inserted correctly in a PCI slot.

- Try moving the PCI host card to a different PCI slot.

- Check for a bad cable or connection. Try another expansion cable, if you have one.

- If the expansion system is still not visible after trying all of the above steps, go to *Chapter 8* to see about getting additional help.

Windows

If the PCI to PCI Bridge is now visible, but contains a 🔸 in front of it, it has a problem that must be fixed.

To identify this problem, right-click on the line with the 🔸 and select "Properties" from the pop-up menu.

Resolve the identified problem or go to *Chapter 8* to see about getting additional help.

PCI bridge
:I-12   Update Driver…
        Disable
        Uninstall

        Scan for hardware changes

        Properties

MAC

Go to *Chapter 8* to see about getting additional help.

When Nothing Works

The following troubleshooting steps will help you when the computer or chassis won't turn on or "nothing seems to work" correctly:
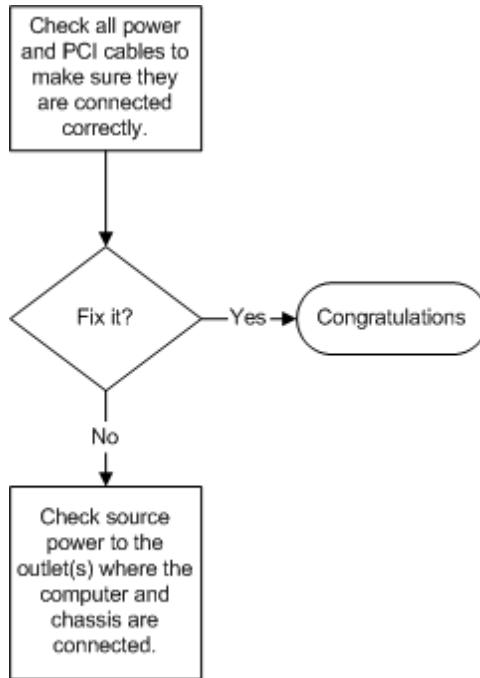
Note	Review Chapters *3 (Verify Installation)* and *4 (Install 3rd Party PCI Cards)* as necessary to verify that you have a valid installation of the MAGMA expansion system and that you have correctly installed your 3rd Party PCI card(s) and their associated drivers (as required).

If it powers up OK, but nothing works, check the computer's Device Manager or System Profiler to see if the expansion system has been found. If not found, try the troubleshooting steps for *My Computer Can't Find the PCI Expansion System*. If the expansion system is visible, but has a problem, try to resolve the problem (See Note above). If that fails, go to *Chapter 8* to see about getting additional help.

My Computer Hangs During Power Up

If your computer "hangs" while being turned on and you can't even start, follow these simple steps to try to fix this problem:

1. Shut off the computer (first) and then the MAGMA expansion system and verify that all cards and cables are installed correctly. Reapply power first to the expansion system and then to the computer.

2. If it still hangs, remove all 3rd Party PCI cards and try booting up without any cards installed.

    a. If it still hangs, remove the MAGMA PCI expansion host card from the computer and try booting up without the MAGMA expansion system attached.

        i.   If it boots up OK without the MAGMA expansion system attached, call Magma Technical Support.

        ii. If it still hangs, the problem is in the computer and not with the MAGMA expansion system or the 3rd Party PCI cards.

    b. If it boots up OK without any 3rd Party PCI cards installed, try adding only one card and see if it boots up.

        i.   If it boots up OK with one card in it, shut it down (in the proper order, of course) and swap cards. Repeat this until all cards have been tested. If they all test OK, then add them back one at a time until you find the combination that doesn't work, or you are running fine. If you find a bad card, call Technical Support. If you don't – congratulations, you fixed it!

        ii. If it still hangs up, try a different card – this one is probably bad (or has driver problems). If the second cards works, troubleshoot the first card. If the second card also fails, call Technical Support.

My PCI Card Doesn't Work

Follow these simple troubleshooting steps to resolve typical 3rd Party PCI card problems:
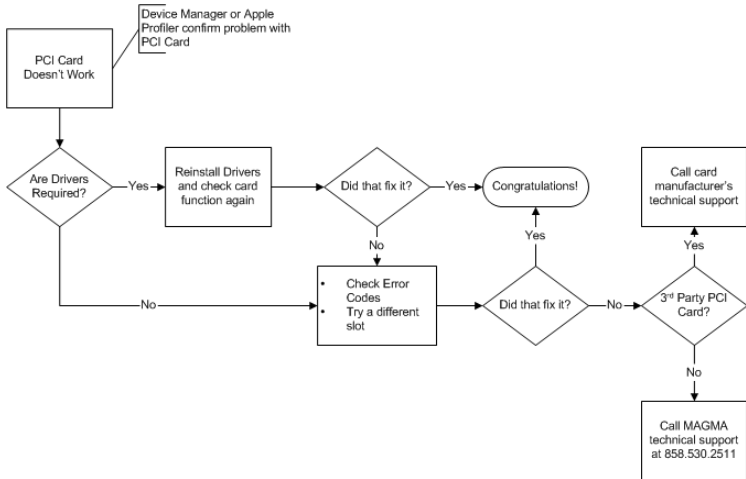
The following additional steps might also help when the above troubleshooting steps for fail to resolve your problem:

1. Shut down the computer followed by the MAGMA expansion chassis

2. Remove the PCI card displaying a problem

3. Replace the "problem card" with a *simple* PCI card, such as an Ethernet card that has drivers built into the operating system. *(Using this "type of card" will avoid any future questions about drivers possibly being installed incorrectly.)*

4. Turn on the MAGMA expansion chassis, and then turn on the computer.

Windows

5. Next, open the Device Manager (View by Connection selection).

    If the ⚠ is gone, the problem is with the 3rd Party PCI card or the card drivers. You should go to the *Windows Error Codes* section of this chapter to learn how to troubleshoot using error codes.

    If the ⚠ is still visible, the problem may be with the MAGMA expansion system. Please contact Magma Technical Support for further guidance and/or a replacement product.

    If an error shows on any of the PCIe to PCI Bridge Connections, call Magma Technical Support immediately.

MAC

5. Next, open the Apple System Profiler and if the PCIe to PCI Bridge Connections and the 3rd Party PCI card(s) are now correctly visible.

Support for 3rd Party PCI Cards

Magma will provide reasonable technical support to with 3rd Party PCI cards. However, if you have verified a successful installation of the MAGMA PCI Expansion System (as defined in *Chapter 4*), but experience difficulty installing your 3rd Party PCI cards, the PCI card manufacturer may be able to provide the best support.

The MAGMA PCI Expansion System is designed to function exactly like your desktop computer. This means that you should follow the PCI card maker's instructions for installation on a Windows or Mac computer as if the expansion chassis WAS the desktop computer. When correctly installed, there is no difference to the operating system, removable cards, or most software.

Windows Error Codes

If you are having a problem with one of your devices, and the Device status box shows a Windows Error Code, refer to the following list of error codes for guidance:
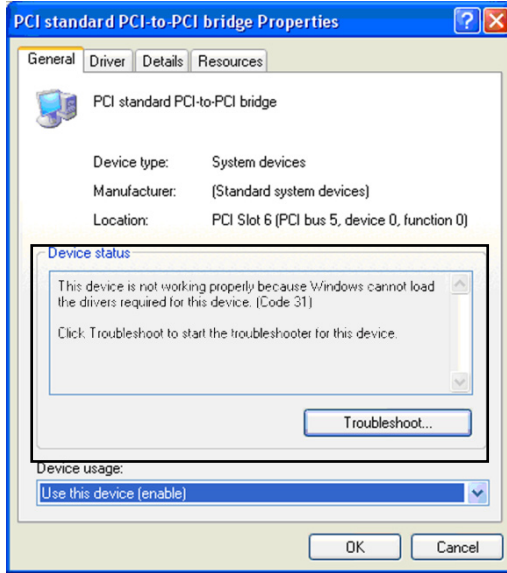
Error Code	Description/Action
10	**This code indicates that there is a problem with the 3rd Party PCI Card driver.** If necessary, contact the PCI Card's manufacturer for updated PNP compatible drivers. If all else fails, contact Magma Technical Support for further assistance.
12	**On the Bridge:** If you receive error code 12 on the first PCI to PCI Bridge, call Magma Technical Support. **On the PCI Card**: This usually means the memory, I/O, or prefetch is more than has been allocated. Call Magma Technical Support.

Error Code	Description/Action
28 (PCI Card)	The driver for the PCI Card is not installed on your system. Reinstall the PCI Card driver following the manufacturer's instructions. If that fails to fix the problem, call the card manufacturer for new drivers.
1	The PCI host card or expansion chassis are not working correctly. Reinstall the PCI host card into the computer's PCI slot and recheck all cable connections. If the error code remains, try another PCI slot. If you still have the error, call Magma Technical Support.
Other Codes	For all other error codes, call: **On the PCI to PCI Bridge:** Magma Technical Support **On the PCI Card:** Card Manufacturer's Technical Support, after first verifying that the MAGMA expansion system is installed properly.

If you are still having problems, contact Magma Technical Support for more help.

Chapter 8   How to Get More Help

Frequently Asked Questions (FAQ)

You can visit the MAGMA Technical Support FAQ pages on the Internet at:

www.magma.com/support/

Contacting Technical Support

Our support department can be reached by fax at (858) 530-2733 or by phone at (858) 530-2511. Support is available Monday through Friday, 8:00 AM to 5:00 PM PT. When contacting MAGMA Technical Support, please be sure to include the following information:

1) Name	7) Serial Number
2) Company Name	8) Computer Make
3) Phone Number	9) Computer Model
4) Fax Number	10) Operating System and Version
5) Email Address	11) Make/Model of PCI cards in expansion chassis
6) Model Number	12) Detailed description of the problem

You can also visit our web site at:

www.magma.com/support/

For a quick response, use the Technical Support and RMA Request Form available in the Support Section of the website. Simply complete the form with all required information. Please make sure that your problem description is sufficiently detailed to help us understand your problem.

> *For example: Don't say "Won't boot up." Do say "Tried all the steps in the Troubleshooting Section and it still won't boot up."*

For faster diagnosis of your problem, please run the two utility programs described in the following sections and include the diagnostic files they generate with your email.

MAGMA Debug Utility

Occasionally, Magma Technical Support may request Windows users to produce and email a MAGMA debug log file to help them resolve your problem. This file should be emailed to support@magma.com. This file should have a ".log" file extension. To create the *.log file, follow these instructions:

1. Locate a file called **dbgview.exe** on the MAGMA CDROM.
2. Double-click on the file **dbgview.exe**
3. While the **dbgview** screen is open, locate and double-click on a file called **dump.exe** on the MAGMA CDROM.
4. Switch back to the **dbgview** screen, which is now filled with data.
5. Save this file and email to support@magma.com upon request.
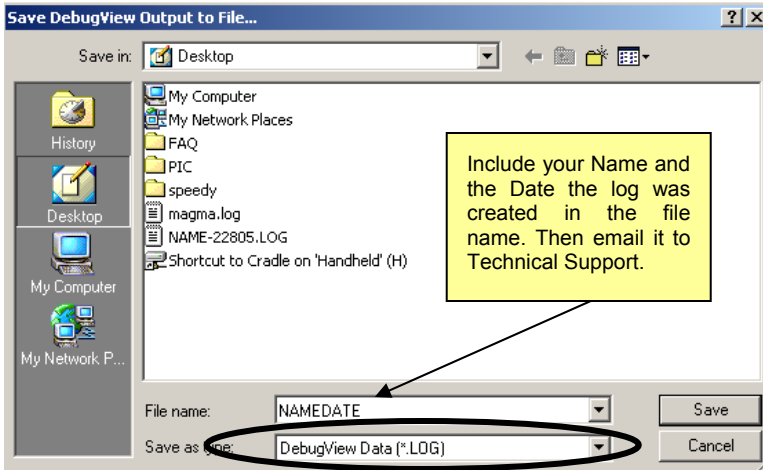
Use the "Save as type" drop-down arrow to select a file type of (*.LOG).

PCIScope Software Utility

PCIScope is a powerful tool for Windows users. It was designed by a Germany company called APSoft. This software utility is a valuable resource to explore, examine and debug the PCI subsystem of your computer. It was made to fit the requirements of the most demanding users, especially engineers, programmers, and system administrators, and to integrate all advanced functions and tools into one product. Please visit www.tssc.de for more information about the capabilities of **PCIScope** and other utilities offered by APSoft.

An evaluation version of **PCIScope** is available for download at www.tssc.de. (You can purchase an inexpensive license from APSoft for use beyond the evaluation period.)

PCIScope has proven to be extremely useful when verifying and debugging configurations involving the MAGMA PCI Expansion Systems under any Windows platform.

PCIScope can provide information to you and our Technical Support Group such as PCI Bus Numbering, Resource Allocation, and other information that may prove useful when debugging expansion chassis or PCI card problems.

If you are experiencing problems setting up your system, you should run **PCIScope** before contacting the Magma Technical Support Group.

With the MAGMA expansion chassis powered up and connected to your computer, load and launch the **PCIScope** application. The **PCIScope** Program will be installed on your computer and a window similar to the one shown below will appear. (The example was taken from a Compaq Armada 7400)

You should save this data as a file on your computer. Please include your name and date as part of the file name with an extension of ".bpd." Then email this file to support@magma.com if you are experiencing configuration problems.

Returning Merchandise to MAGMA

If factory service is required, a Service Representative will give you a Return Merchandise Authorization (RMA) number. Put this number and your return address on the shipping label when you return the item(s) for service. **MAGMA will return any product that is not accompanied by an RMA number**. Please note that MAGMA WILL NOT accept COD packages, so be sure to return the product freight and duties-paid.

Ship the well-packaged product to the address below:

> MAGMA RETURNS DEPT.
> RMA # _____
> 9918 Via Pasar
> San Diego, CA 92126
> USA

It is not required, though highly recommended, that you keep the packaging from the original shipment of your MAGMA product. However, if you return a product to MAGMA for warranty repair/ replacement or take advantage of the 30-day money back guarantee, you will need to package the product in a manner similar to the manner in which it was received from our plant. MAGMA cannot be responsible for any physical damage to the product or component pieces of the product (such as the host or expansion interfaces for PCI expansion chassis) that are damaged due to inadequate packing.   Physical damage sustained in such a situation will be repaired at the owner's expense in accordance with Out of Warranty Procedures.   Please, protect your investment, a bit more padding in a good box will go a long way to insuring the device is returned to use in the same condition you shipped it in. Please call for an RMA number first.

Appendix A   Bus Hierarchy

Bus Hierarchy

The following figure is representative of the PCI Bus hierarchies for the 13 Slot PCI to PCI Expansion System. This figure pictorially conveys the overall PCI bus topology of the system.

13 Slot Topology
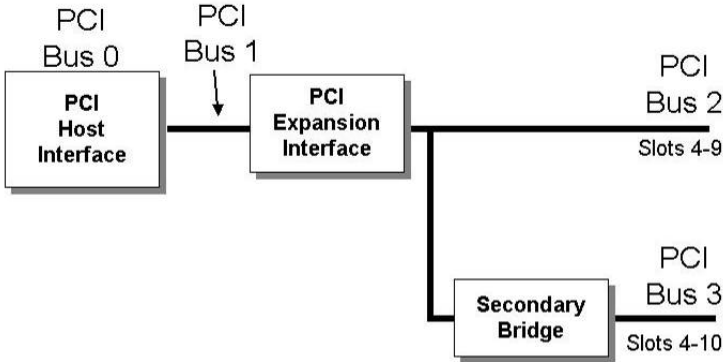
In general, we do not know what the actual Bus numbers are. We only know how they increment starting from the PCI expansion host card.

The key point in the figure of the 13 Slot Topology is that the connecting cable between the PCI expansion host card and the 13 Slot backplane is actually a PCI bus itself. This is represented in the Windows Device Manager as shown below:
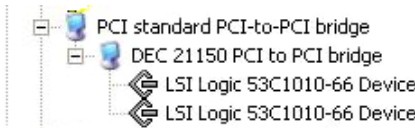
Note	All PCI cards installed in the PCI Expansion chassis will appear on the Third PCI Bus behind the PCI Bus that the PCI host card is installed on. *If you need to know the actual Bus number, right-click on the Bus and select Properties*.

Appendix B   Need More Slots?

Multiple PCI Expansion System Configurations

The PCI Local Bus Specification defines the PCI bus as a *hierarchical bus*, where PCI to PCI Bridges (PPBs) may be used to add "levels" to the PCI bus hierarchy. Because hierarchies are *organized systems arranged into different levels*, you can take advantage of this automatic organizing and layering to expand the number of available PCI slots beyond the number available in your computer's motherboard.

You can easily add two or more Magma expansion systems to your current system in either a "fan-out" or "daisy-chain" configuration. Each of these configurations has advantages and uses. To determine which type of configuration you wish to use, you should first understand a few basic facts:

1. In a desktop computer, the bios enumerates automatically behind PCI bridges. In the Magma configuration, the bios finds the Magma host card in a PCI slot. The bios configures it, and then looks beyond it to find any PCI cards installed in the expansion chassis. The bios then configures the cards and allocates resources. Empty PCI slots are ignored during configuration.

In theory, your computer "should" be able to travel across up to 255 PCI buses to identify and configure all installed PCI cards. Unfortunately, not all computers are created equal. The 255 PCI bus limit is actually a theoretical maximum. The practical limit is somewhat lower, but should still be a fairly large number.

In a desktop computer the bus numbers tend to be lower (0, 1, 2, etc.). Once the bios is finished configuring everything and assigning resources, the Operating System starts loading and activates the PCI cards found.

When adding more Expansion Systems to an existing system, be sure to connect and test them "one-at-a-time." This will allow you to quickly resolve any connectivity, or other, issues right at the start. *DO NOT INSTALL any 3rd Party PCI cards into any system until ALL attached systems are working correctly.*

---

2. The 4 and 7 Slot Magma Expansion Systems each add two (2) PCI to PCI Bridges to the PCI Local Bus. The 13 Slot adds three (3) PCI to PCI Bridges to the PCI Local Bus. The 6 Slot adds one (1) bridge. These bridges are the communication paths between the PCI cards and the computer resources. Most computers allow multiple bridges (and thus PCI buses) to be correctly configured. Some computers, unfortunately, place an arbitrary limit on the number of bridge levels that can be traveled during power-on configuration. Your computer "power-on-software" should be PCI Specification 2.1 compliant in order to effectively use a MAGMA PCI Expansion System. For "fan-out" and "daisy chained" system configurations, where more than one PCI expansion system is being used, you should count all of the bridge levels to your most deeply nested PCI bus to determine the maximum number of bridge levels that must be traveled.

3. For easier understanding, the PCI Local Bus should be viewed as a "Resource Toll road" that runs from the computer CPU (resource home), through the "Toll Booths" (the PCI bridges), to the "Resource Users" (PCI Cards). As in the case of a real Toll Road, the more Toll Booths you have to slow down a "nanosecond" for, the longer it will take you (your data) to get from the PCI Card to the CPU and back again. Under most circumstances the effect cannot even be detected. However, under other conditions, it can be important to know about.

Fan-Out

For reasons described in bullet #3 above, we recommend using a fan-out configuration when you need to add successive PCI expansion systems to the host computer. This addition to the PCI bus hierarchy is at the "peer" level of other existing expansion buses, thus adding "breadth" to the PCI bus hierarchy, since these buses will be at the same hierarchical level within the system configuration.

| Note	You may use either PCIe or PCI host cards in your host computer, depending on available slots and your performance requirements. You must ensure that you have the corresponding PCIe to PCI Expansion System, or PCI Expansion System, chassis to connect with your host card and support your desired configuration.
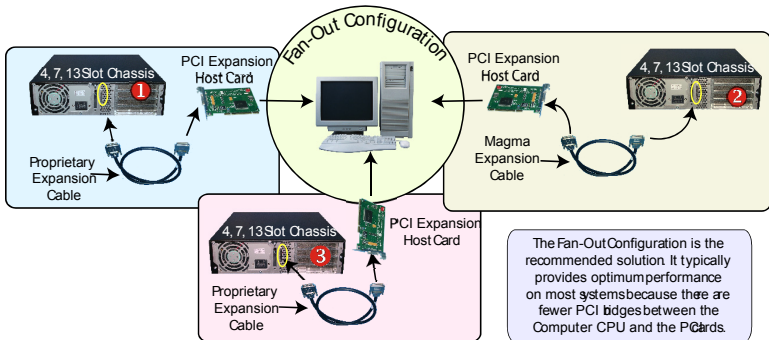
In this configuration, you have fewer "Toll Booths" (PCI Bridges) to pass through; therefore there are fewer opportunities for concern.

Important	For clarification, it is necessary to understand that the amount of latency caused by any PCI Bridge (even those built into a 3rd Party PCI card or the computer motherboard itself) is negligible ("nanoseconds") and will not produce any visible effect on most systems. It is only mentioned here because on a few rare configurations which use some unique PCI cards with special software drivers, the total number of PCI buses that the data must pass through COULD make a difference. See Chapter 5 Troubleshooting for more information if you suspect this could be an issue with one of your specialty PCI cards.

Verify your configuration

Before you start installing your PCI cards *(refer to Chapter 4 Install Cards and Drives for more information)*, you should confirm that everything is in proper working order. Refer to Chapter 3 Verify Installation for guidance in verifying the proper installation of your Expansion System. The following image shows the Windows Device Manager display when a Windows PC has 2 Expansion Systems connected in a "Fan-Out" configuration.
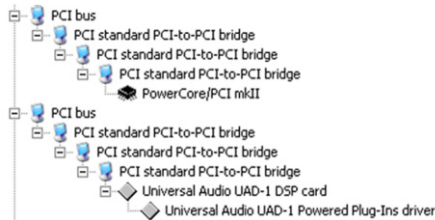
Windows Device Manager with 2 PCI to PCI Expansion Systems Installed in a "Fan-Out Configuration.

The following image shows the Apple Profiler display when a MAC has 2 Expansion Systems connected in a "Fan-Out" configuration

| Card	Type	Bus	Slot
pci-bridge	pci	PCI	bxc
pci-bridge	pci	PCI	7x4
pci-bridge	pci	PCI	ax4
pci-bridge	pci	PCI	SLOT-2
pci-bridge	pci	PCI	8xc
pci-bridge	pci	PCI	SLOT-3
pci110b,4	Other Multimedia	PCI	bx4
pci1057,6		PCI	8x4

MAC System Profiler with 2 PCI to PCI Expansion Systems Installed in a "Fan-Out Configuration.

Daisy-Chaining

Recognizing the typical insignificance of the performance variance between the "Fan-Out" and "Daisy-Chaining" configurations, the primary reason for using this one would be limitations on physical space. This could be the number of available slots on the computer motherboard, or a lack of desk or rack space.

Daisy-Chaining Expansion Systems
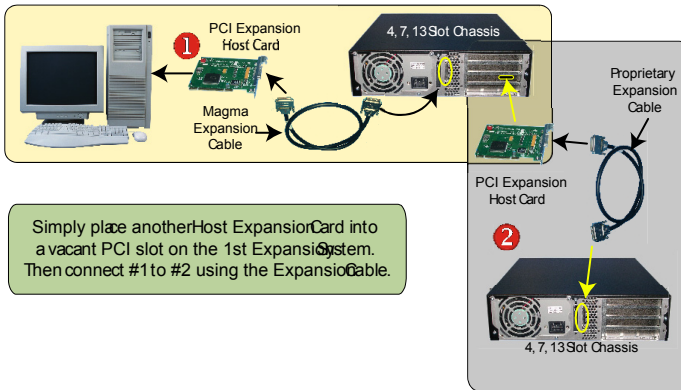
In the daisy-chain configuration, successive PCI expansion systems are added to the "end" of the PCI bus hierarchy, which adds "depth" to the PCI Local Bus by increasing the number of PCI Local Bus levels active in the system configuration.

Verify your configuration

Before you start installing your PCI cards *(refer to Chapter 4 Install Cards and Drives for more information)*, you should confirm that everything is in proper working order. Refer to Chapter 3 Verify Installation for guidance in verifying the proper installation of your Expansion System.

| Note	Notice that each Daisy-Chained unit appears in the Device Manager in the reverse order of its place in the configuration.

Combination Configurations

Depending on your business requirements, and your physical space limitations, you can add additional Expansion System in multiple configurations, such as these. These combinations are only limited by the available slots and/or slot types: PCIe or PCI.

Fan-Out Daisy-Chain Combination Configuration

Workstation
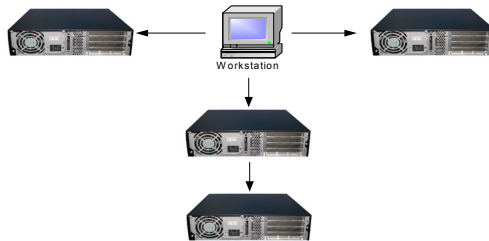
Daisy-Chain Fan-Out Combination Configuration

Workstation
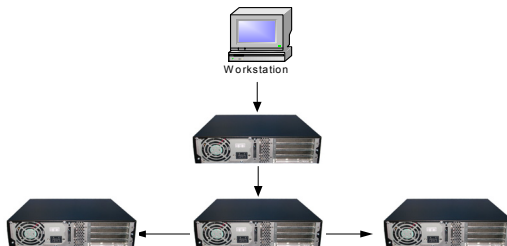
Obviously, you will need to keep an eye on your system performance and make any adjustments that may be required, either to PCI card

location or to Expansion System configuration, to obtain maximum performance.

PCI Card Conflicts

If you determine that one PCI card is interfering with the operation of another card, first try reorganizing the cards on the motherboard. Moving the cards around can change the order in which the cards are configured by the system during power-on. This will go a long way toward resolving module conflicts.

Power-On Sequence for Advanced Configurations

As previously stated in Chapter 2 Hardware Installation, it remains necessary to power up ALL Expansions Systems BEFORE you turn on the computer. This will ensure that your power-on software can read all available PCI buses and properly configure all installed PCI cards.

Obviously, the reverse also remains true for shutting your system down. The computer must be shut off BEFORE you attempt to turn off your Expansion System(s).

Troubleshooting Advanced Configurations

When trying to troubleshoot problems with PCI cards in a multiple expansion system configuration, it is vital to correctly determine the nature of the problem. Therefore, the first task is to identify the card or chassis having a problem by using the Windows Device Manager, or Apple System Profiler. Refer to the first part of this Appendix for more information on identifying hierarchical levels in multiple expansion system configurations.

Remember, Fan-Out configurations can consist of both PCIe to PCI Expansion Systems and PCI to PCI Expansion Systems. Whereas, Daisy-Chain configurations will consist only of a PCI to PCI Expansion System, or a PCIe to PCI Expansion System, followed by one or more PCI to PCI Expansion Systems. Only after you have all expansion systems working without any 3rd Party PCI cards should you attempt to install any 3rd Party PCI cards.
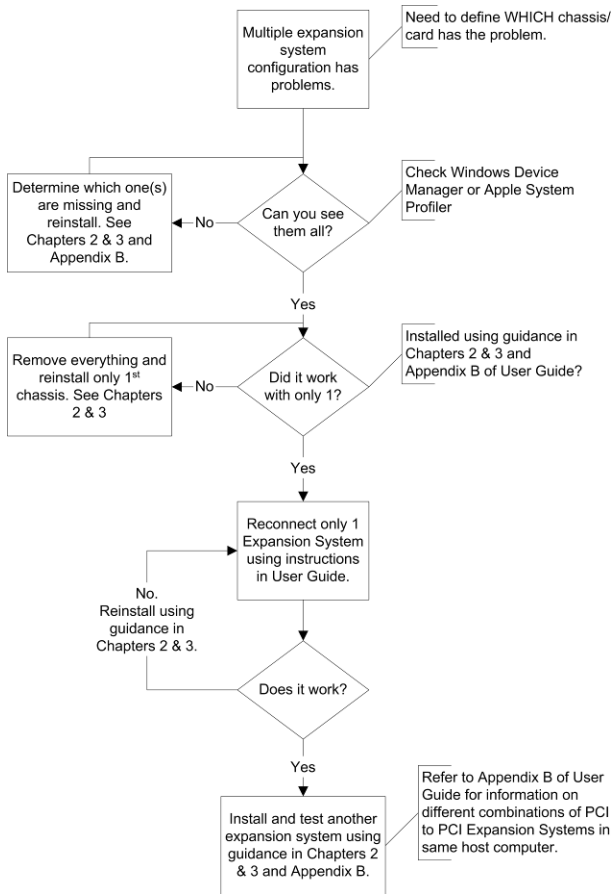
Problems with 3rd Party cards might only be traceable once you have identified the expansion system containing the problem card. Remember, it may be necessary to identify the PCI Slot that the Host Interface Card is in before you can properly identify the correct expansion chassis and ultimately the card. Obviously, this is only an issue if you have multiples of the same type of card installed.

Finding the Problem Card

Windows

If you need help to determine which PCI card, or which expansion chassis, has the problem, you can "right-click" on the card with the and check the information contained in the "Location:" field.
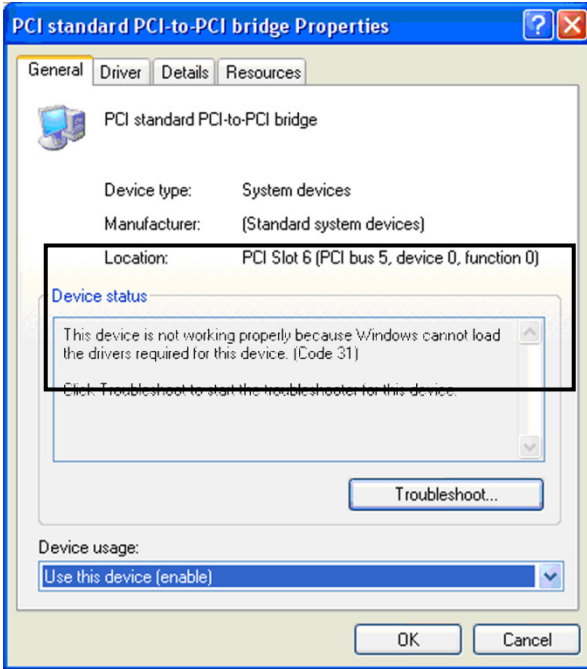
Look for the "Error Code" in the box in the center of the Properties Window and then go to the *Windows Error Code* section for information on how to resolve this issue.

MAC

If you have already reinstalled and reseated everything according to instructions in *Chapter 2*, and the PCI to PCI Bridge is still not visible in the Apple System Profiler, call Magma Technical Support.

APPENDIX C   Compliance

FCC

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This device complies with Part 15 of the 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.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note	The assembler of a personal computer system may be required to test the system and/or make necessary modifications if a system is found to cause harmful interferences or to be noncompliant with the appropriate standards for its intended use.

Industry Canada

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numériqué de la classe A est conformé à la norme NMB-003 du Canada

CE

The product(s) described in this manual complies with all applicable European Union (CE) directives. Magma will not retest or recertify systems or components that have been reconfigured by customers

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