User Manual

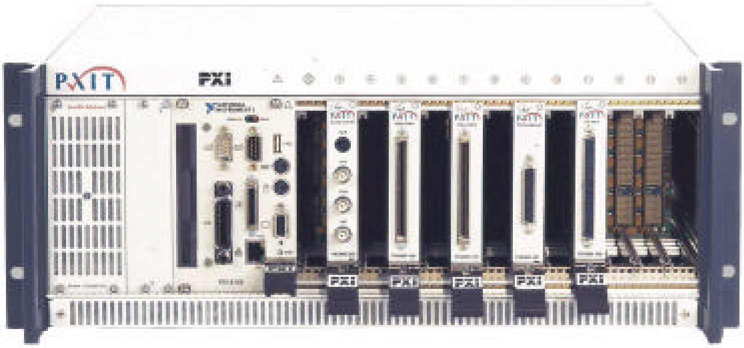
PX2000-514
PXI Fourteen Slot Test Platform

User Manual

Part Number: 603007

PX Instrument Technology

Sensible Solutions



PX Instrument Technology Ltd.,
Unit 32 Beechwood Close,
Boghall Road, Bray, Co Wicklow.

Tel 353-1-2864221   Fax 353-1-2864223
Email : info@pxit.com
Web : http://www.pxit.com

PX2000-514 User Manual

Document Number: *603007*

Description: *PX2000-514 PXI 14 Slot Chassis User Manual*

Revision History

Rev	Date	Description	Written by:	Checked by:
1.0	21 Jun 2000	Initial Release	PD	LD
2.0	03 Dec 2001	Added 514B/X Point	L Delany	P Dalton

PX Instrument Technology reserves the right to change specifications and contents of this document without prior notice.

Warranty.

The PX2000-514 is warranted against hardware defects in materials and workmanship for a period of one year from the date of delivery as noted on the delivery and/or shipping documentation. PX Instrument Technology is not responsible for any damage caused to its product, or any other equipment caused by misuse of PXIT product or damage caused to PXIT product by the failure to follow the instructions of PX Instrument Technology, or problems caused by other third party equipment, supplies, services, modification to supplied equipment, etc…. PX Instrument Technology will repair/replace at their option any equipment which proves to be defective during the warranty period. This warranty applies to parts and labour. PX Instrument Technology cannot be held responsible for any consequential loss due to defects in supplied product.

Year 2000

Each of the products supplied by PX instrument Technology Ltd., are designed using Y2K Compliant tools and PX Instrument Technology endeavours to ensure that all products are compliant as per "**DISC PD2000-1 *A Definition of Year 2000 Conformity Requirements***" as defined by the British Standards Institution.

PX Instrument Technology is not responsible for any damage or loss caused to its product, or any other equipment caused by the use of PXIT product with any other product or equipment which is not certified as Year 2000 compliant.

Warning

⚠

Products designed by PX Instrument Technology Limited are not tested for use in medical or clinical applications.

⚡

The PX2000-514 series of PXI chassis is designed for use, only under the power supply conditions as defined in section 1.2 of this manual and the operating environment as defined in section 1.4 of this manual.

Table of Contents

1. Introduction

1.1 Company description.

PX Instrument Technology Ltd. (PXIT) is an Irish Company situated in a modern manufacturing facility in Bray, Co Wicklow.

PX Instrument Technology designs and manufactures PXI modules and systems. PXIT also produces GPIB optical and electrical switching systems.

1.2 Product description.

PX Instrument Technology's PX2000-514 is a 14 slot, 19 inch rack-mountable chassis, which fully complies with the PXI and Compact PCI standards. All slots have full PXI functionality. Separate forced-air cooling is provided for the power supply and PXI slots. Fan noise is minimised by varying fan speed according to system temperature. The PX2000-514A model includes features such as temperature and PSU monitoring.

Optional features which are supplied with the PX2000-514B model include an 8 bit isolated I/O port, 4 voltage sources, integrated user power supplies and 8 user relays.

The expanded slot capability of the unit provides system integrators with a single-box solution, thus avoiding synchronisation, integration and cost issues associated with multi-platform solutions. With its compact case size of 4U / 19 inch, the PX2000-514 provides the small footprint required for today's ATE and Data Acquisition applications. All of the additional features supplied with the 'B' option chassis are accessible from the back of the unit in order to reduce front harnessing and maximise PXI card access.

- Accommodates PXI controller and up to 13 PXI Cards.
- Integral PCI/PXI Bridge Cross (X) Point Bridge.
- Full PXI functionality on all slots.
- 19 Inch Rack mount case (4U).
- Separate forced air cooling for PSU and PXI slots.
- Variable Speed Fans (PXI slots) minimise noise.
- Temperature / PSU Monitoring.
- Optional auxiliary I/O and user power supplies.
- 8 bit isolated digital I/O port ('B' option Chassis).
- +/-12 Volt DC and +5 Volt DC integrated user power supplies ('B'
- option Chassis).
- Quad 12 bit programmable voltage source.
- 8 User Relays – Form C ('B' option Chassis).
- 4 user and 4 dedicated Analogue inputs ('B' option Chassis).

Specifications

Backplane Configuration 1 Embedded Controller (16HP) or MXI-3 Slot.
1 PXI / CompactPCI or Star Trigger Controller slot.
12 PXI / CompactPCI peripheral slots.

Bridge X-Point Palatte Bridge.
(Bridges primary and secondary Trigger Bus signals via a matrix. Capable of routing signals back onto different triggers on the source side of the backplane).
Trigger bus matrix propagation delay: Approx 25nS

System Power
Type: 350 W auto sensing supply
Input: 120-240 V~, 50-440 Hz

Outputs: 5V DC @ 35A, 3.3V DC @ 35A
+12V DC @ 10A, - 12V Dc @ 4A

User PS: +12V DC @ 1A, -12V DC @ 1A, +5V DC @ 2A

Fuse: 5 Amp, Bussmann Anti-Surge S505 (T), 5*20 mm.
T5AH/250~

Available Slot Current
(As per PXI Spec 2.0)

Controller Slot:- 5V @ 6A
3.3V @ 6A
+12V @ 0.5A
-12V @ 0.1A

Each Peripheral Slot:- 5V @ 2A
3.3V @ 0A
+12V @ 0.5A
-12V @ 0.1A

Cooling PXI Slots 2 thermistor controlled variable speed fans @ 100 CFM (max) each
PSU Bay : Single 25 CFM in line fan

Voltage Monitor 3.3V DC, 5V DC, 12V DC, -12V DC.

Temperature Monitor Over PXI slot 5, PXI slot 10, Controller Slot and in PSU bay.

Dimensions H x W x D : 4U (7”) **x** 19” **x** 16.54”
177.8 mm **x** 482.6 mm **x** 420 mm

Standards IEC 61326, IEC 1010, IEC1010-1: 1990 and amendments 1&2, EN50082-1, EN55011, EN61010 PXI Spec Rev 2.0, UL3111-1: 1994, CAN/CSA22.2No. 1010-1

1.3 Models and Options Available

PX2000-514A – PXI 14 Slot PXI Chassis.

Accommodates PXI controller and up to 13 PXI Cards.
Integral PCI/PXI Bridge, Full PXI functionality on all slots
19" Rack mount case, Separate forced air cooling for PSU and PXI slots
Temperature Controlled Variable Speed Fans (PXI slots) minimise noise
System Temperature and Power Supply Monitoring.
Trigger Bus cross segment X-Point connecitivity (Rev 2 Bridge Cards – 200049)

PX2000-514B – PXI 14 Slot PXI Chassis (Includes PX2000-514A specification)

Integral auxiliary I/O module (25 pin D-Type rear panel connectors) :
Isolated User Power Supply (with isolating relays) +5V @2A and +/- 12V @1A each.
Quad 12-Bit analog O/P's (0-10V Isolated), 8 Auxiliary I/O lines
8 Relays, Form C contacts, 300V, 5A.
4 User and 4 dedicated Analogue inputs.
Power interlock connector (isolates all relays)

Software provided includes application software drivers - VISA®, LabView® and LabWindows®

Additional support is provided for Visual Basic, C and C++ through DLL's and example programs and Borland C++

1.4 Detailed Specification of 514B Option Components.

1.4.1 4-channel programmable voltage source.

Isolation:	300Vrms.
Output voltage:	0 to 10V or 0-5V Factory setting.
Resolution:	12 Bit.
Output current:	10mA Max
Reference:	Channel 1 and 2 share the same ground, which is isolated from chassis ground. Channel 3 and 4 share the same ground, which is isolated from chassis ground and from channel 1 and 2 ground.
Connectivity:	Connector type: D-Type 25Way Plug (male pins) Connector name: PPSU
Application:	These outputs are primary design to command an external programmable power supply. They can also be used as individual voltage source within the above specifications. PXIT recommend the following external power supply: Lambda Omega series with DP programmable modules. Supplied by ***Coutant Lambda*** http://www.lambda-gb.com

1.4.2 8 Bit I/O Port.

The port is made of 8 isolated input, and 8 isolated output. Both inputs and outputs are isolated from the chassis and from each other. The isolation level is 300V.

Input:	8 Input channels
Isolation:	1000 Volts RMS

	MIN	TYP	MAX	Unit	condition
Input current (If)	5	15*	35	mA	
Reverse Break Down Voltage			6	V	
Forward Voltage(Vf)		1.2	1.65	V	If = 35mA

*Recommended input current

A series resistor is required for different input voltages:

For 12V input, add a 620Ω resistor in series with input pin.
For 5V input, add a 150Ω resistor in series with input pin.
For 3V3 input, no resistor in required.

Output:	8 Output channels
Output Isolation:	300 Volts RMS

	MIN	TYP	MAX	Unit	condition
Output load current (Ic)		1*	35	mA	
VCE Break Down Voltage			50	V	
VEC Break Down Voltage			6	V	
Coupling frequency			100	kHz	If = 15mA Ic = 35mA
Saturation Voltage			0.4	V	Ic= 1mA

*Recommended output current

A series resistor is required for different output pull-up voltage. The resistor value is selected to keep Ic at the recommended current:

For 12V output, add a 10KΩ resistor in series with output pin.
For 5V output, add a 4.3kΩ resistor in series with output pin.
For 3V3 output, add a 2.7kΩ resistor in series with output pin.

Connectivity:	Connector type:	D-Type 25Way Plug (male pins)
	Connector name:	DIGITAL

1.4.3 Analogue inputs.

Inputs:	4 fully isolated User Inputs 4 fully isolated Current and Voltage sensing Inputs (2 each)
Voltage range:	0 to 100V
Resolution:	10Bit
Scale:	2 Reading scale available: 0 to 100V and 0 to 5V. Scales. They can be auto-selected or forced in either mode by software.
Input impedance:	0-100V range: 1MΩ; 0-5V range: 1MΩ
Sampling time:	Fixed scale: less than 100ms Auto-scale: less than 300ms
Connectivity:	Connector type: D-Type 25Way Plug (male pins) Connector name: ANALOGUE

1.4.4 User power supply.

The 3 output voltages use the same common and fully isolated from the chassis ground.

Output:	+12V @ 1A; -12V @ 1A; +5 @ 2A. (Common Ground)
Protection:	Overload protection on all output.
Output Control:	Software controlled out0put enable/disable. Hardware controlled output disable (Emergencies disconnect)
Connectivity:	Connector type: D-Type 25Way Plug (male pins) Connector name: PPSU

1.4.5 User Relays.

8 User relays for general application use.

Contact type:	SPCO (single pole change over)
Switching current:	5A
Switching voltage:	300V AC/DC
Mechanical life:	3 x 10^7 ops
Contact material:	Ag SnO
Relay Control:	All relays are individually software controlled.
Connectivity:	Connector type: D-Type 25Way Plug (male pins) Connector name: RELAYS

1.5 Regulatory Notices

1.5.1 FCC Notice (U.S. Only)

All models of the PX Instrument Technology PX2000-514 series PXI Chassis are classified by the FCC as Class A digital devices and as such the following FCC notices apply:

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

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 manufacturer's 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.

Shielded cables must be used with this unit to ensure compliance with the Class A FCC limits.

1.5.2 IC Notice (Canada Only)

All models of the PX Instrument Technology PX2000-514 series PXI Chassis are classified by Industry Canada (IC) ICES-003, Issue 2 as Class A digital devices. Devices that are tested and comply with Class A FCC Specifications also comply with the Canadian Specification following the harmonisation of Canadian Regulation with existing FCC regulations effective January 31, 1989. As such the following notices apply:

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le present appareil numerique n'emet pas de bruits radioelectriques depassant les limites applicables aux appareils numeriques de la class A prescrites dans le Reglement sur le brouillage radioelectrique edicte par le ministere Des Communications du Canada.
CE Notice

Marking by the **CE** symbol indicates compliance of all models of the PX Instrument Technology PX2000-514 series PXI Chassis to the EMC directive of the European Community. Such marking means that these PX2000-514 chassis meet technical standard EN55022 - Limits and Methods of Measurements of Radio Interference Characteristics of Information Technology Equipment (ITE) as a Class A device. As such the following notices apply:

WARNING: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

1.5.3 VCCI Notice (Japan Only)

All models the PX Instrument Technology PX2000-514 series PXI Chassis are classified by the Voluntary Control Council for Interference (VCCI) as Class 1 information technology equipment (ITE) and as such the following VCCI notices apply:

Class 1 Notice

This equipment complies with the limits for a Class 1 digital device (devices used in commercial and/or industrial environments) and conforms to the standards for information technology equipment (ITE) that are set by the Voluntary Control Council for Interference for preventing radio frequency interference in commercial and/or industrial areas.

Consequently, when used in a residential area or in an area adjacent to a residential area, this equipment may cause radio interference with radio and television receivers or other communications equipment.

To ensure that such radio interference does not occur, it is important to install and use this equipment in accordance with the manufacturer's instruction manual

1.6 Safety Notices

This equipment is designed to be safe at least under the following conditions:
Indoor use, altitude up to 2000m, temperature 5 Degrees Centigrade to 40 Degrees Centigrade, maximum relative humidity 80% for temperatures up to 31 Degrees Centigrade decreasing linearly to 50% relative humidity at 40 Degrees Centigrade, mains supply fluctuations not to exceed +/- 10% of the nominal voltage, transient overvoltages according to Installation Category II and Pollution degree 2 in accordance with IEC 664

1.7 Mains Cord

Only use mains cords which are approved for use in electrical equipment and are appropriate for the country of use.

1.8 Other PXIT Products

1.8.1 PX2000-100 Series.

The PX2000-100 series of modules consists of a range of electrical switching matrix, multiplexer, actuator and driver modules which are used for general purpose and high density switching ATE applications. It also includes a breadboard development module.

1.8.2 PX2000-200 Series

The PX2000-200 series of modules consists of a range of RF and Optical switching modules for general and specialised applications. 50Ω and 75Ω RF multiplexer modules and Dual optical switches are available.

1.8.3 PX2000-300 Series

The PX2000-300 Series of modules is a range of instrument and photonics modules for data/signal generation and analysis.

1.8.4 PX2000-500 Series

The PX2000-500 product series is a range of 3U PXI chassis suitable for general purpose and specialised applications.

1.8.5 PX2000-600 Series

The PX2000-600 Series of products are a range of 6U format PXI switching and Instrument Modules for use in a 6U PXI Chassis

1.8.6 Broad Band Switching (GPIB)

A large range of 6U Electrical, RF and Optical switching modules are available. They are used with a PXIT SW6U chassis (up to 12 I/O modules) or SW3U chassis (up to 3 I/O modules).

For more information, visit our web page at **http://www.pxit.com**.

2 Resources required

2.1 Hardware.

The PX2000-514 range of PXI Chassis can be used with any 3U PXI cards and CompactPCI cards which comply with the PXI Revision 1.0 specification (or greater) announced by National Instruments in August 1997 and with the CompactPCI specification of the PCI Industrial Computer Group (PICMG).

It is recommended that Windows 98 or Windows NT 4.0 or Windows2000 or greater operating systems be used with this chassis. The minimum recommended memory requirement for a Windows 98 operating system is 32 Mbytes of RAM and for a Windows NT/2000 operating system is 64 Mbytes of RAM.

Note: Windows 95 or lower will not support multiple bridging so can not be used in with the PX2000-514 series chassis.

2.2 Software.

The PX2000-514 option modules use NI VISA drivers. Before these drivers are installed, a current version of National Instrument VISA (NI-VISA Version 2.01 or greater) must be installed. If this has not already been installed on your system you can install it from the CD supplied with your chassis, or the latest version can be down loaded directly from the National Instruments web site at www.ni.com.

The CD supplied with the PX2000-514 chassis contains software drivers, sample programs and control panels which allow the user/integrator to avail of the extra functionality supplied with the various different options of the chassis such as System Monitoring and Auxiliary I/O.

3 Hardware Set-up

3.1 Checklist

⚠

Before powering up the PX2000-514 Chassis,

- Check to ensure that there has been no damage caused by the shipping the unit.
- Check that no screws or panels have come loose.
- Ensure that you connect the unit to a voltage and frequency range within those listed in the system power input specifications in section 1.2 of this manual.
- Ensure that the chassis is correctly grounded at all times when installed or/and set-up for use, even when switched off.

3.2 Power switch and indications.

There are two switches on the PX2000-514 Chassis. One is on the rear of the chassis and the other is on the front of the chassis.

The switch on the rear of the chassis is a Mains voltage switch and is used to connect mains voltage to the chassis power supply. When switched on, the AC OK LED on the front of the chassis will be on and the power supply fan will be running.

The switch on the front of the chassis is a low voltage DC switch connected to the power supply module control circuit and controls the power supply DC modules. When switched off, there is NO DC voltage applied to the PXI Backplane. When switched on, DC voltages of +5V, +3.3V, +12V and –12V will be applied to the backplane, the rear panel cooling fans will run and the **DC OK** LED will be on.

The appliance coupler or the mains cord must be accessible for disconnect in the case of emergency.

3.3 Mounting

Ensure that the unit is disconnected from any mains supply.

As shipped, the unit is equipped with four feet for bench top use. If it is required that the chassis needs to be rack mounted, the feet need to be removed. To remove the feet, unclip the feet covers. Remove the screws one at a time by removing the mounting screw using a **T15** Torx driver. Replace the mounting screw.

⚠

WARNING: When mounting in a 19-inch rack, ensure that the chassis rear is supported. The front mounting flanges MUST NOT be used for sole support. Mounting rails suitable for this purpose are supplied by most of the major enclosure manufacturers.

3.4 Replacing A Fuse

To replace the fuse on a PX2000-514 chassis first isolate the chassis from all mains power sources. With a flat headed screwdriver ease out the fuse holder located below the ON/OFF switch on the rear panel of the chassis.

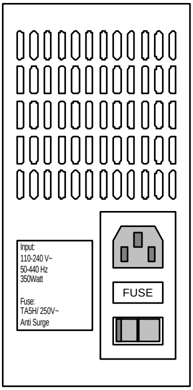


Figure 3.1 - Front Panel

Replace the blown fuse with a 5 Amp, Bussmann Anti-Surge S505 (T) fuse, dimensions 5 mm x 20 mm. Ease the fuse holder back into the switch. Unit can now be reconnected and powered up.

3.5 Cleaning Filters

There are two filters on a PX2000-514, both of which are located at the front of the unit to allow for easy access. To get access to the filter on the Power supply unit remove the four corner flat head shoulder screws from the front panel. Care should be taken not to damage the LED's or DC switch mounted on the PSU panel. To extract the filter remove the screw in the centre of the plate.

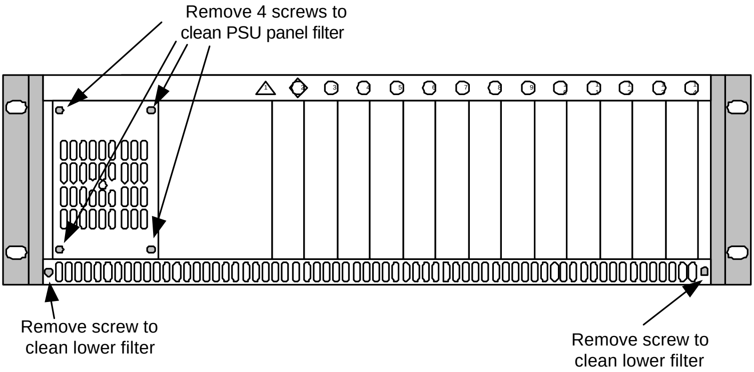


Figure 3.2 – Chassis Front View.

To extract the filter in the bottom panel of the unit, remove the two cross head screws at each end.

Filters may be cleaned using warm soapy water or replaced with a filter replacement kit.

3.6 Air flow

The PX2000-514 Chassis card frame is cooled with two 50-100 CFM vario fans. The air is brought in through the grille in the front of the chassis, sucked up through the card frame and exhausted through the rear.

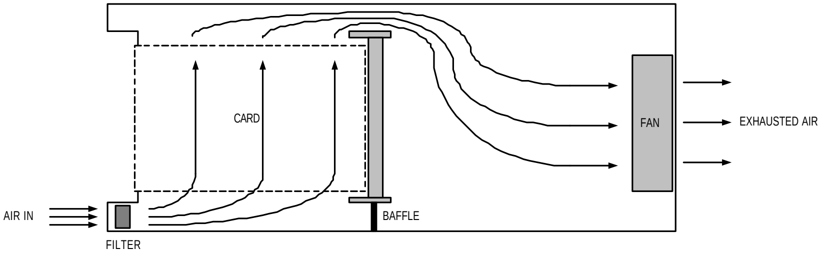


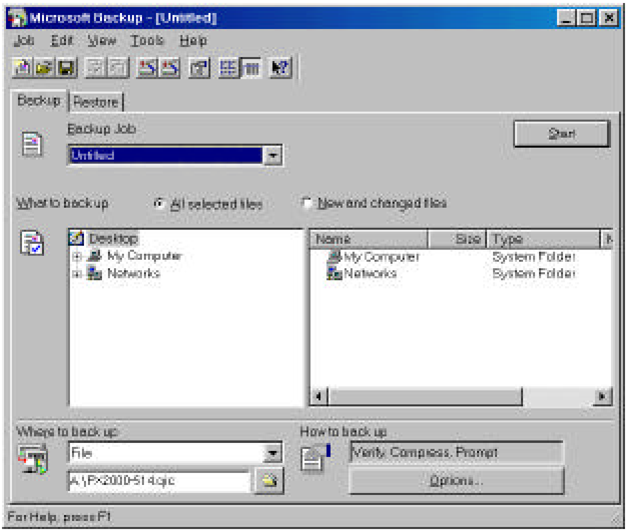
Figure 3.3 - Air Flow Model.

To ensure that maximum airflow is directed through the card frame area, blanking panels MUST be used to cover slots where there are no cards installed.

4 Software Installation

4.1 Bridge Driver Installation

Insert the CD supplied with the unit into a CD drive which is accessible by the PXI Controller which is used with the chassis. USB Port or Parallel Port CD drives are suitable for this. If these are not available, it is possible to span the required files across a number of floppy disks using a utility such as Microsoft Backup.



Backup Job: Untitled

What to back up: ● All selected files ○ New and changed files

Name	Size	Type
My Computer		System Folder
Networks		System Folder

Where to back up: File
A:\PX2000-514.qic

How to back up: Verify, Compress, Prompt

Figure 4.1 - Microsoft Backup

Locate the directory on the CD, which refers to PX2000-514 / Bridge Driver and run the SETUP.EXE program. This file is normally located in the **CD:\PX Products\Bridge Install** directory on the CD. Select the sub-directory relevant to your operating system (Win98, WinNT or Win2000). This will begin the installation of the software that locates and registers the bridge within the system Registry. Follow the instructions on the screen to complete installation. If no CD drive is present on the system, copy the relevant files from the CD onto a floppy disk.

4.2 Option Driver Installation

Insert the CD supplied with the unit into a CD drive which is accessible by the PXI Controller which is used with the chassis. Locate the directory on the CD, which refers to PX2000-514 / Option Software and run the SETUP.EXE program. This software is normally located in the **CD:\PX Products\PX2000-514x** directory. This will begin the installation of the software applications and drivers which are used to allow access to the system monitoring and optional I/O drivers. Follow the instructions on the screen to complete installation.

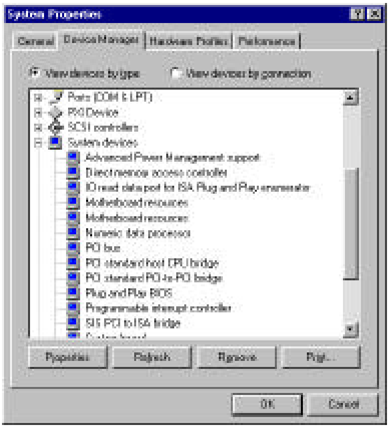
Note: If no CD drive is present on the system, copy the relevant folder onto a floppy disk and run as explained above.

4.3 Installing other PXI/CompactPCI modules

Installation of additional PXI/CompactPCI modules should be carried out as per the individual instructions for each PXI/CompactPCI module.

4.4 Verifying Installations

4.4.1 Bridge Card



● View devices by type ○ View devices by connection

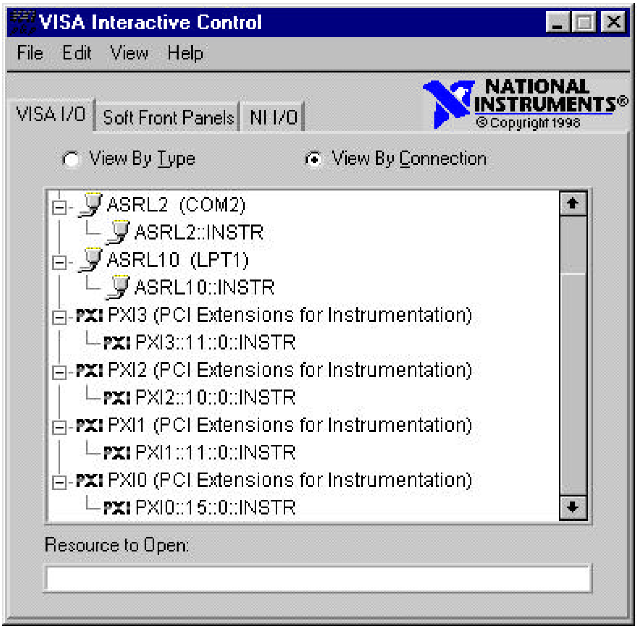
- Ports (COM & LPT)
- PXI Device
- SCSI controllers
- System devices
  - Advanced Power Management support
  - Direct memory access controller
  - IO read data port for ISA Plug and Play enumerator
  - Motherboard resources
  - Motherboard resources
  - Numeric data processor
  - PCI bus
  - PCI standard host CPU bridge
  - PCI standard PCI-to-PCI bridge
  - Plug and Play BIOS
  - Programmable interrupt controller
  - SIS PCI to ISA bridge
  - System board

Figure 4.2 - Registered Devices.

To verify that the bridge card is operating correctly with the Operating System, open the control panel window, select system and then click on the Device manager tab. You should see the PCI to PCI Bridge listed as shown in figure 4.2 above. (You may have to expand the Systems Devices tree.) In some systems this will also be identified with the reference 21150.

4.4.2 Other PXI Modules

Some PXI Modules will be supplied with their own test/verification program. However, the National Instruments software application, VISA Interactive Control can also be used to verify PXI module installation. This is a program, which identifies installed VISA resources including PXI resources as shown in figure 4.3 below.



○ View By Type ● View By Connection

```
⊟- ASRL2  (COM2)
│  └ ASRL2::INSTR
⊟- ASRL10  (LPT1)
│  └ ASRL10::INSTR
⊟- PXI PXI3 (PCI Extensions for Instrumentation)
│  └ PXI PXI3::11::0::INSTR
⊟- PXI PXI2 (PCI Extensions for Instrumentation)
│  └ PXI PXI2::10::0::INSTR
⊟- PXI PXI1 (PCI Extensions for Instrumentation)
│  └ PXI PXI1::11::0::INSTR
⊟- PXI PXI0 (PCI Extensions for Instrumentation)
   └ PXI PXI0::15::0::INSTR
```

Figure 4.3 - VISA Resources.

In this example, there are three different PXI modules installed. These identification numbers identify which slot the module is installed in. Slot 1 is always the controller slot. Slot 2 is either the star trigger slot or a general peripheral slot. Module slots 3 to 14 are all general peripheral slots. Each module slot has a unique identifier. These identifiers are shown in table 4.1 below.

Instrument identifiers which begin with 'PXI0' are normally contained within the first bus segment. Instrument identifiers which begin with 'PXI1' are normally contained within the second bus segment. If additional chassises are linked with a 'Standard' PCI to CompactPCI/PXI bridge, each bus segment should be numbered sequentially (e.g. PXI2, PXI3, etc…).

VISA Instrument Description	Slot Number
PXI0::20::0::INSTR[Note 1]	Slot 2
PXI0::19::0::INSTR	Slot 3
PXI0::18::0::INSTR	Slot 4
PXI0::16::0::INSTR	Slot 5
PXI0::15::0::INSTR	Slot 6
PXI0::14::0::INSTR	Slot 7
PXI1::15::0::INSTR	Slot 8
PXI1::14::0::INSTR	Slot 9
PXI1::13::0::INSTR	Slot 10
PXI1::12::0::INSTR	Slot 11
PXI1::11::0::INSTR	Slot 12
PXI1::10::0::INSTR	Slot 13
PXI1::09::0::INSTR	Slot 14

Table 4.1

Note1: For VISA Interactive Control Version 2.5 or greater, the VISA description has slightly changed. e.g. ***PXI0::20::INSTR***.

Although bus-mastering is supported on the primary segment of the backplane and on the secondary segment of the backplane, inter-segment bus-mastering is not supported when issue A or lower, bridge cards, part number 200015 are used on the PX2000-514 series of chassis. However, the newer bridge, part number 200049 does support bus-mastering between the primary and secondary bus. Rev 2 versions of the 200049 bridge (200049-1) also support Trigger Bus X-Point connection.

5 Operation and Connectivity

5.1 PX2000-514A

5.1.1 Chassis topology

The PX2000-514A PXI chassis is the standard model of chassis. It allows the insertion and use of one controller and up to thirteen CompactPCI/PXI cards. However, the chassis can be used in a number of other configurations.

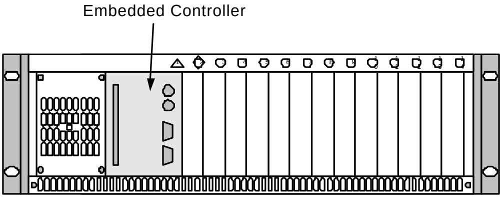


Figure 5.1 - Single Chassis with embedded Controller.

Figure 5.1 shows the chassis when used as a stand alone unit with an embedded PXI controller in the controller slot. This configuration will

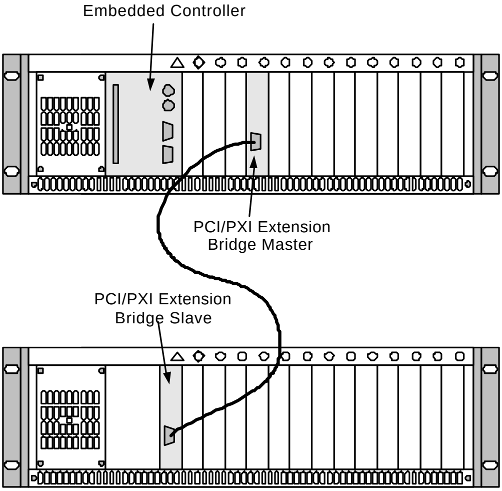


Figure 5.2 - Master and slave configuration.

take up to 13 peripheral cards. The primary bus will normally be designated as PXI0 and the secondary bus will be designated as PXI1. Figure 5.2 shows a Master/Slave configuration, where the second chassis is connected to the Primary chassis via a CompactPCI/PXI to CompactPCI/PXI extension bridge. In this instance, the primary bus of the master chassis will normally be designated as PXI0 and the secondary bus of the master chassis designated as PX1. The primary bus of the slave chassis will be designated as PXI2 and the secondary bus of the slave chassis will be designated as PXI3. The configuration as shown in Figure 5.2 gives the user the option to have up to 25 CompactPCI/PXI peripheral cards in one system. It is possible to use this type of Bridge technology to add additional chassises to a single system.

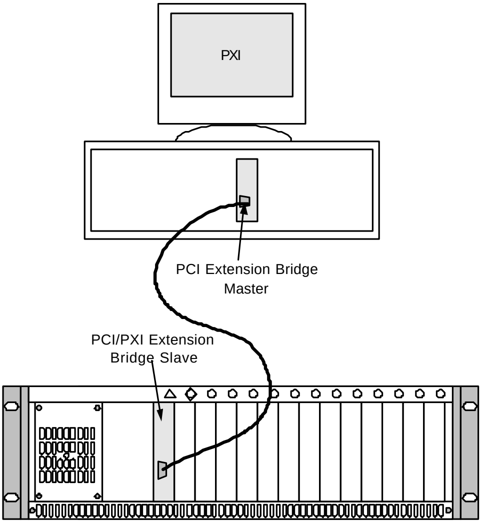


Figure 5.3 - Desktop PC (PCI expansion Bridge) to PXI Chassis.

The example in figure 5.3 shows how a standard Desktop PC can be used to control a PXI chassis by using a PCI to CompactPCI/PXI extension bridge. In some instances, depending on the hardware configuration of the PC and the configuration of its BIOS, the primary bus in the PXI chassis could be identified as PXI1 while the secondary bus would be identified as PXI2.

5.1.2 Peripheral slot identification

Each PX2000-514 chassis has 14 PCI slot locations. These are identified by numbers on the top section of the chassis. The first location is reserved for the controller. This can be either an embedded controller or a bridge expansion controller card. In a PXI chassis, this slot is always located in the left most slot of the PCI bus. It is always identified with the triangle glyph as shown in figure 5.4. and numbered '1'.

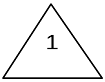


Figure 5.4 - Controller slot glyph.

The second slot position is the star trigger/peripheral card position. This can be used with any standard CompactPCI/PXI card or a special star trigger card. This slot is identified with a circle inside a diamond as shown in figure 5.5. It is numbered '2'.

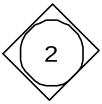


Figure 5.5 - Star trigger/general peripheral slot glyph.

Slots three to fourteen are all general peripheral slots. These slots are identified by the numbers '3' to '14' inclusive inside a circle.

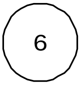
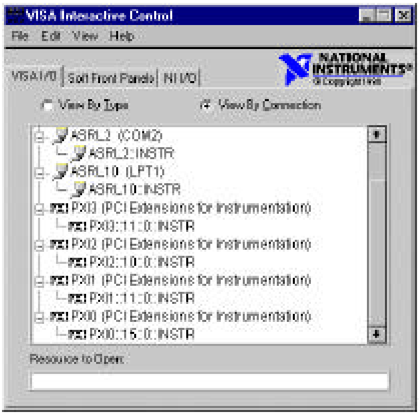


Figure 5.6 - General peripheral slot glyph.

The fourteen slot positions are achieved by bridging one primary 8 slot PXI bus to a secondary 8 slot PXI bus. The bridge card occupies one slot position on each bus. The boundary between primary and secondary bus on the chassis is identified by the boundary glyph as shown in figure 5.7 below.

Figure 5.7 - Bus boundary glyph.

Each peripheral slot is identified in software with a unique number. When using the National Instruments software application, VISA Interactive Control, the slot identification of all PXI resources can be displayed as shown in figure 5.8 below.



○ View By Type ● View By Connection

```
ASRL2 (COM2)
  ASRL2::INSTR
ASRL10 (LPT1)
  ASRL10::INSTR
PXI3 (PCI Extensions for Instrumentation)
  PXI3::11::0::INSTR
PXI2 (PCI Extensions for Instrumentation)
  PXI2::10::0::INSTR
PXI1 (PCI Extensions for Instrumentation)
  PXI1::11::0::INSTR
PXI0 (PCI Extensions for Instrumentation)
  PXI0::15::0::INSTR
```

Resource to Open:

Figure 5.8 - PXI Resources.

Each PCI bus segment has a unique identifier per system. When using the PX2000-514 series of PXI chassis, the slots are identified as shown in table 5.1.The character ‘a’ represents the number which identifies the primary bus and the character ‘b’ represents the number which identifies the secondary bus.

VISA Instrument Description	Slot Number
PXIa::20::INSTR	Slot 2
PXIa::19::INSTR	Slot 3
PXIa::18::INSTR	Slot 4
17 Reserved for Bridge	N/A
PXIa::16::INSTR	Slot 5
PXIa::15::INSTR	Slot 6
PXIa::14::INSTR	Slot 7
PXIb::15::INSTR	Slot 8
PXIb::14::INSTR	Slot 9
PXIb::13::INSTR	Slot 10
PXIb::12::INSTR	Slot 11
PXIb::11::INSTR	Slot 12
PXIb::10::INSTR	Slot 13
PXIb::09::INSTR	Slot 14

Table 5.1

5.1.3 Star trigger

The PXI star trigger bus originates in the slot 2 position and is used to provide synchronization features to users of PXI systems. The star trigger bus provides a dedicated trigger line between slot 2 and each of the other 12 peripheral slots.

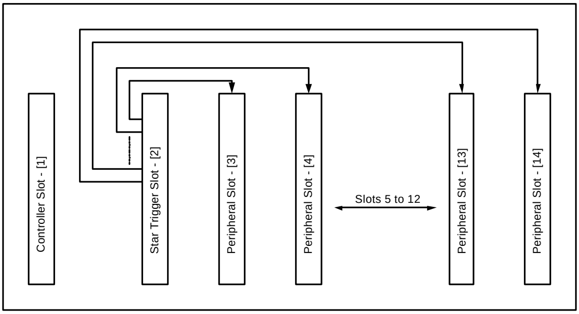


Figure 5.9 - Star Trigger Routing.

This can provide very precise trigger signals to other peripheral modules. Each star trigger line is designed to provide an equal propagation delay and low skew from slot 2 to each of the other peripheral slots.

PXI Star Trigger slot Signal Name	Peripheral Slot Destination
PXI_STAR0	SLOT 3
PXI_STAR1	SLOT 4
PXI_STAR2	SLOT 5
PXI_STAR3	SLOT 6
PXI_STAR4	SLOT 7
PXI_STAR5	SLOT 8
PXI_STAR6	SLOT 9
PXI_STAR7	SLOT 10
PXI_STAR8	SLOT 11
PXI_STAR9	SLOT 12
PXI_STAR10	SLOT 13
PXI_STAR11	SLOT 14

Figure 5.10 - Star trigger routing from slot 2.

Star trigger signals are identified as PXI_STAR0 to PXI_STAR11. See appendix for slot pin details.

5.1.4 Local Bus

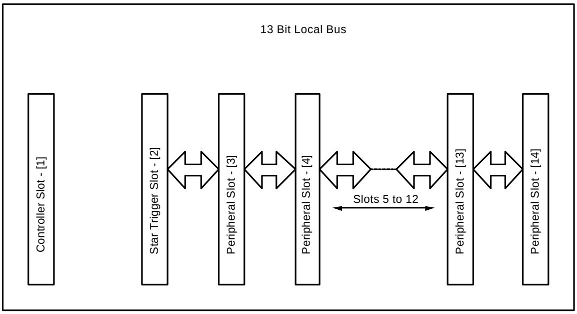


Figure 5.11 - Local Bus.

A 13 bit local bus is provided between each peripheral card position on the PXI backplane. This bus can be used to provide a data path between any peripheral card and the peripheral card immediately adjacent to it without affecting the bandwidth of the PCI Bus. The local bus to the left of a card is called the Local Bus Left (LBL) and the local bus to the right of a card is called the Local Bus Right (LBR). There is no local bus to the left of the star trigger slot (slot 2). The local bus can be used for signals with a level of up to 42 Volts. Local bus signals are identified as PXI_LBL0 to PXI_LBL12 and PXI_LBR0 to PXI_LBR12.

5.1.5 PXI Trigger Bus

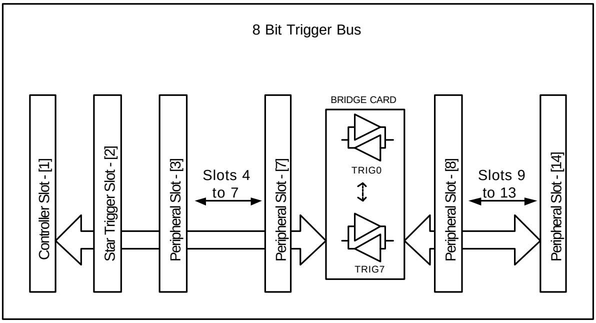


Figure 5.12 - 8 bit trigger bus.

The PXI trigger bus provides an 8-bit bus, which can be used for inter-module triggering, synchronisation, data communication or clock transmission. The trigger bus bits are identified as PXI_TRIG0 to PXI_TRIG7.

On the PX2000-514 chassis, there are two PXI trigger busses implemented. One is on the primary side of the PCI bus and incorporates slots 1 (controller slot) to 7. The other is on the secondary PCI bus side and incorporates slots 8 to 14. Between the two PXI trigger busses is a matrix connected to bi-directional buffers and inverters. These buffers and inverters route the trigger bus signals from one side of the bus and can route it to any of the 8 trigger bus signals on the other side. It can also route the signal to another trigger bus signal on the same segment. Each signal can also be inverted.

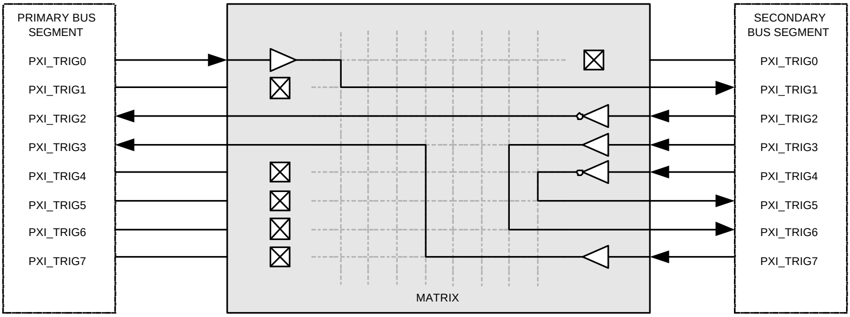


Figure 5.13 - Example of Bridge matrix routing.

5.1.6 10MHz system clock

The PXI system has a 10MHz system clock which is used to control inter-module timing This clock has low skew properties and is ideal as a reference for synchronisation between PXI modules. This clock is distributed to each peripheral slot and is called PXI_CLK10.

In the slot 2 (Star trigger/peripheral) position, there is a system clock input pin called PXI_CLK10_IN. On the PX2000-514 chassis, users can supply their own clock reference to this pin. A clock input on this pin will switch off the system 10MHz clock signal and replaces it.

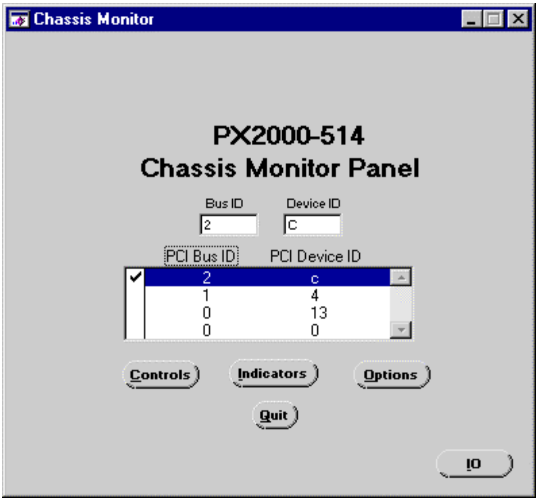
5.1.7 PX2000-514 Panel

The base model of the PX2000-514 chassis has voltage and temperature monitoring circuitry and PXI trigger bus buffer control. The users have available to them, software calls which give them access to these functions.

Supplied with the PX2000-514 is a software program which opens a sample control panel. This panel program allows the user to look at the voltage and temperature monitoring system and operate the PXI trigger buffers.

From the START menu, PROGRAMS, locate the PX2000-514 executable program and run it. This will display a panel as shown in figure 5.14 below. This panel allows the user to select between controls and indicators.

It also allows the user to select which bridge they want to talk to if more than one bridge is used in a system with multiple chassis. This is done by entering or selecting from the list box the correct Bus ID and Bridge ID relevant to the system. Selecting the <controls> button will display a trigger buffer control panel as shown in figure 5.15. The user can select each individual buffer and decide which direction the data should pass



PX2000-514
Chassis Monitor Panel

Bus ID: 2
Device ID: C

PCI Bus ID	PCI Device ID
2	c
1	4
0	13
0	0

Figure 5.14 – PX2000-514 Chassis Monitor Panel.

and how to route the trigger bus signal. If a trigger bus signal is routed back onto itself, it will provide a logic ‘1’ or a logic ‘0’ depending on whether a buffer or inverter is selected. If the trigger bus lines are ‘not connected’ the buffer/inverters are held in tri-state mode and no data can pass between either bus segment of the chassis on the tri-stated lines.

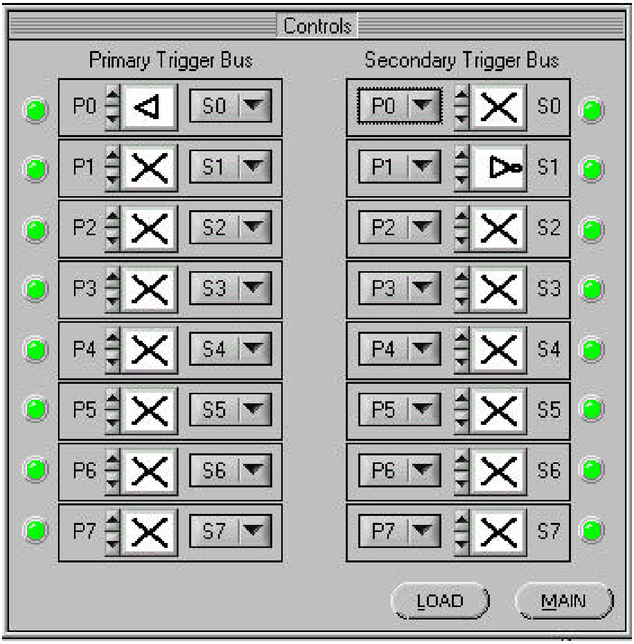


Figure 5.15 - Trigger Bus control panel.

Figure 5.15 shows an example of PXI_TRIG0 being routed from the secondary side of the bus to the primary side of the bus and PXI_TRIG1 being routed from the primary side of the trigger bus and being inverted onto the secondary trigger bus. After making changes, select the <LOAD> button to commit the changes.

The second panel available is the indicators panel as shown in figure 5.16 below. This panel is used to monitor the four main power supplies of the PX2000-514 chassis. These are the +5 Volts DC, the +3.3 Volts DC, the +12 Volts DC and the –12 Volts DC. The panel also displays indicators which monitor the chassis internal temperature.

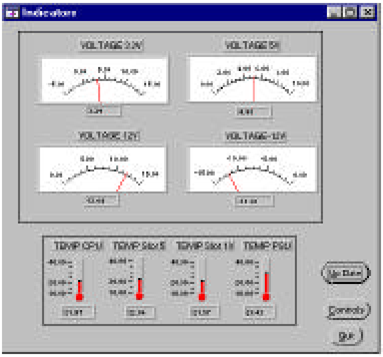


Figure 5.16 - Indicators Panel

There are sensors mounted over the CPU slot, Slot 5, Slot10 and one in the PSU compartment. The panel requires manual update by clicking on the ***<UpDate>*** button. The ***<Quit>*** will exit the Program.

There are two other temperature sensors in the chassis which control the speed of the fans. As the internal temperature of the chassis increases, the fan speed increases. These additional sensors are not monitored.

5.2 PX2000-514B

The PX2000-514B chassis includes all of the functionality of the PX2000-514A chassis with additional options. These include:-

[a] 4 channel programmable voltage source.

[b] 8 Bit isolated I/O Port.

[c] 4 user and 4 dedicated analog inputs.

[d] User Power Supply.

[e] 8 Form C relay outputs.

Connectivity to the extra functionality is via four 25 male pin D Connectors mounted on the rear panel of the chassis.

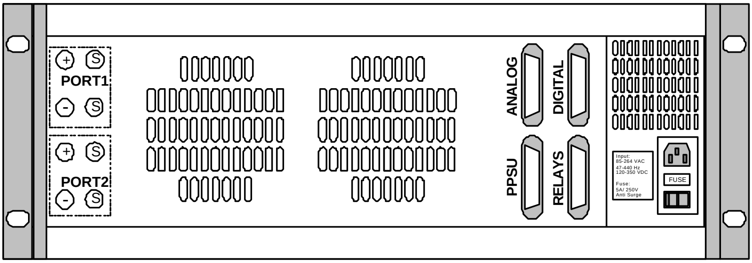


Figure 5.2.1 – Chassis viewed from Rear

5.2.1 4-channel programmable voltage source.

A four channel isolated programmable voltage source is provided. The outputs of this voltage source are designed primarily to command an external programmable power supply. The resolution is 12 bit with an output voltage range is 0V to 10V at 10mA maximum output current.

PXIT recommend the following external power supply:

Lambda Omega series with DP programmable modules.
Supplied by ***Coutant Lambda*** http://www.lambda-gb.com

Channel 1 and 2 share the same ground, which is isolated from chassis ground. Channel 3 and 4 share the same ground, which is isolated from chassis ground and from channel 1 and 2 ground.

Connector type: D-Type 25Way Plug (male pins)
Connector name: PPSU

PPSU Connector Pin-out for voltage source	**Ch 1**	**Ch 2**	**Ch 3**	**Ch 4**
Hi	1	2	4	5
Lo	3	3	6	6

5.2.2 8 Bit I/O Port.

The 8 Bit I/O port consists of 8 isolated digital input circuits and 8 isolated digital output circuits. Inputs and outputs are isolated from the chassis and from each other.

Typical Applications:-

The port can be use as communication medium in applications where data needs to pass thought an electrical safety gap. For example: collecting or sending data to mains related system (e.g. mains monitoring system in switch-mode power supply).

It can also be used to protect the chassis from electronic noise emitting system (e.g. Communication with motor driver).

Other applications using this port could sense or command units under test (e.g. sensing position of product on test bench while testing or controlling carrier belt systems for fast mass testing).

The isolation level is 300V peak. The input circuit is shown in figure 5.2.2.1 below.

For input voltage flexibility the input stage has direct access to the opto-coupler as shown below:

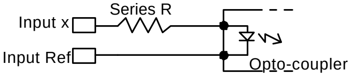


Figure 5.2.2.1 – Input circuit.

Input Specification	MIN	TYP	MAX	Unit	condition
Input current (If)	5	15*	35	mA	
Reverse Break Down Voltage			6	V	
Forward Voltage(Vf)		1.2	1.65	V	If = 35mA

*Recommended input current

As the input circuit is low current, a resistor is required in series with each input pin:-

Input Voltage	Resistor Value
12 Volts	620Ù
5 Volts	150Ù
3.3 Volts	Not required

The output circuit is designed to provide a single or multi-bit control to optically isolated digital interface circuitry.

For output voltage flexibility the output stage has direct access to the opto-coupler as shown below:

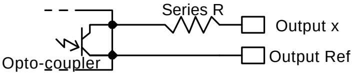


Figure 5.2.2.2 – Output circuit.

Output Specification	MIN	TYP	MAX	Unit	condition
Output load current (Ic)		1*	35	mA	
VCE Break Down Voltage			50	V	
VEC Break Down Voltage			6	V	
Coupling frequency			100	kHz	If = 15mA Ic = 35mA
Saturation Voltage			0.4	V	Ic= 1mA

*Recommended output current

Depending on the output pull-up voltage used, different series resistors will be required to ensure that the recommended load current is maintained:-

Input Voltage	Resistor Value
12 Volts	10kÙ
5 Volts	4.3kÙ
3.3 Volts	2.7kÙ

Connection: Connector type: D-Type 25 Way Plug (male pin)
Connector name: DIGITAL

DIGITAL Connector Pin-out	Bit 0	Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6	Bit 7	Ref.
INPUT	1	14	2	15	3	16	4	17	5
OUTPUT	13	25	12	24	11	23	10	22	9

5.2.3 4 user and 4 dedicated analogue input.

Eight fully isolated analogue inputs are provided on the chassis. 4 of these can be used by the user and the other four are dedicated for use in conjunction with the **PVS** or the **PPSU** options. Two voltage range are available. These can be set to either mode by the software, or be auto-selectable. User inputs can be use for any type of measurement in accordance with the specification below. While the digital port is more appropriate to position sensor, analogue inputs are suitable to monitor environmental test condition. (E.g. monitoring continuous analogue sensor outputs).

Voltage range:	0 to 100 Volts 0 to 5 Volts
Accuracy:	10Bit resolution on both ranges
Input impedance:	0-100V range: 1MΩ; 0-5V range: 100KΩ
Sampling time:	Fixed scale: less than 100ms Auto-scale: less than 300ms
Allocation:	Channel 1 to 4: User Channel 5: Current sensing output 1 for 24V PVS or 30V PPSU Option Channel 6: Current sensing output 2 for 24V PVS or 30V PPSU Option Channel 7: Voltage sensing output 1 for 30PPSU Option Channel 8: Voltage sensing output 2 for 30PPSU Option
Connection:	Connector type: D-Type 25 Way Plug (male pin)
Connector name:	ANALOGUE

Analogue Connector Pin-out	**Input* 1**	**Input 2**	**Input 3**	**Input 4**
Hi	1	3	5	7
Lo	2	4	6	8

*Input 5 to 8 are connected internally.

5.2.4 User power supply.

The PX2000-514B chassis has an extra power module mounted in its system power supply unit. This module provides 3 additional output voltages which are totally independent of and isolated from the system supplies. These 3 additional outputs share the same common which is fully isolated from the chassis ground. An emergency disconnect link is provided on the ANALOGUE connector which will disconnect the three user outputs. To enable the outputs, the two pins on the connector should be linked.

PSU Specification: +12V DC @ 1A
-12V DC @ 1A
+5V DC @ 2A

Overload protection on all output.
Emergency stop (disconnect) - normally close link.

Internal disconnection software controlled on +/-12V and 5V output.

Connector type: D-Type 25 Way Plug (male pin)
Connector name: PPSU

PPSU Connector Pin-out				
Vout	**+12V**	**-12V**	**+5V**	**GND**
PIN	10,11,12*	7,8,9*	14,15,16,17,18*	19,20,21,22,23,24,25,*
ANALOGUE Connector Pin-out for Emergency Disconnect				
PIN	10**	11**		

* All pins for each signal must be used, regardless of the current being used.
** Pins must be linked to enable power supply outputs

5.2.5 8 user relays.

Eight Form C user relays are available for switching up to 300V AC/DC with a maximum switching and carry current of up to 5A. All of these relays are individually controlled via software calls.

Connector type: D-Type 25 Way Plug (male pin)
Connector name: RELAYS

RELAYS Connector Pin-out	RL1	RL2	RL3	RL4	RL5	RL6	RL7	RL8
N/C	1	15	4	18	7	21	10	24
COM	14	3	17	6	20	9	23	12
N/O	2	16	5	19	8	22	11	25

5.3 PX2000-514B-PPSU30

The PX2000-514B-PPSU30 PXI Chassis includes the 514B chassis specification with the addition of a dual 30V programmable power supply installed internally in the chassis.

Internal Programmable Power Supply (PPSU)

PPSU Specifications : Dual 30V / 2A Supplies w / external sense
Voltage / Current programming & measure
Programmable Isolating Relays w/ safety interlock

5.4 PX2000-514B-PVS24

The PX2000-514B-PVS24 PXI Chassis includes the 514B chassis specification with the addition of a two 24V Voltage sources mounted internally in the chassis.

Internal Programmable Voltage Source (PVS)

PVS Specifications : Two 24V / 2A Supplies w / external sense
Voltage / Current programming & measure
Programmable Isolating Relays w/ safety interlock

6 Appendices

Appendix A – PXITBridge.DLL Calls

PXITBridgeReadPCICount

Description

This function interrogates the PXIT module and identifies the module type.

C Prototype

```
ViInt16_VI_FUNC PXITBridgeReadPCICount();
```

Parameters

Input	Description	Data Type
Void	No value	Void

Return Values

Output	Description	Data Type
ViSuccess	Success.	ViInt16
-1	No bridge card info available, unable to use pxitcard.ini.	ViInt16
-2	Not a PXIT card type	ViInt16
-3	Relay parameters incorrect or not a valid relay card	ViInt16
-4	IO error	ViInt16

PXITBridgeReturn

Description

This function is a dummy call that returns the value that is passed to it.

C Prototype

```
ViInt16 _VI_FUNC PXITBridgeReturn(ViInt16 value);
```

Parameters

Input	Description	Data Type
Value	Any 16bit value.	ViInt16

Return Values

Output	Description	Data Type
Value	Should be the same as value passes	ViInt16
-1	Error	ViInt16

PXITBridgeInfo

Description

This function returns a point to the Bridge map structure that is set up at the start of the initialisation stage. It contains all the information of any PXIT bridge in the system. Structure can be seen in the PXITBridge.h file.

C Prototype

```
Bridge_Map* _VI_FUNC PXITBridgeInfo(ViInt16 BusID, ViInt16 DevID);
```

Parameters

Input	Description	Data Type
BusID	PCI Bus segment number in Hex.	ViInt16
DevID	PCI Device number in Hex.	ViInt16

Return Values

Output	Description	Data Type
Value	Pointer to bridge structure	BridgeMap* (ViInt16)
-1	Error	BridgeMap* (ViInt16)

PXITBridgeDisablePort

Description

This closes down communication to an individual bridge.

C Prototype

```
ViInt16 _VI_FUNC PXITBridgeDisablePort(ViInt16 BusID, ViInt16
DevID);
```

Parameters

Input	Description	Data Type
BusID	PCI Bus segment number in Hex.	ViInt16
DevID	PCI Device number in Hex.	ViInt16

Return Values

Output	Description	Data Type
Value	PCI Device number.	ViInt16
-1	Error.	ViInt16

PXITBridgeEnablePort

Description

This function set up communication to the PXIT Bridge that you would like to commutate with.

C Prototype

```
ViInt16 _VI_FUNC PXITBridgeEnablePort(ViInt16 BusID, ViInt16
DevID);
```

Parameters

Input	Description	Data Type
BusID	PCI Bus segment number in Hex.	ViInt16
DevID	PCI Device number in Hex.	ViInt16

Return Values

Output	Description	Data Type
ViSuccess	Port to bridge open success	ViInt16
-1	Error. No known bridge device in system	ViInt16

PXITVerfiyBridge

Description

This function looks in the bridge structure to check that there is a PXIT bridge in the system and that communication can take place with this device.

C Prototype

```
ViInt16 _VI_FUNC PXITBridgeVerfiyBridge(ViInt16 BusID, ViInt16
DevID);
```

Parameters

Input	Description	Data Type
BusID	PCI Bus segment number in Hex.	ViInt16
DevID	PCI Device number in Hex.	ViInt16

Return Values

Output	Description	Data Type
ViSuccess	PXIT type bridge exists.	ViInt16
-1	Error	ViInt16

PXITBridgeReadVersion

Description

This function reads the firmware version of the embedded PIC code on the PXIT Bridge that you are communication with.

C Prototype

```
ViReal64 _VI_FUNC PXITBridgeReadVersion(ViInt16 BusID, ViInt16
DevID);
```

Parameters

Input	Description	Data Type
BusID	PCI Bus segment number in Hex.	ViInt16
DevID	PCI Device number in Hex.	ViInt16

Return Values

Output	Description	Data Type
Value	PCI Device number	ViReal64
-1	Error	ViReal64 (ViInt16)

PXITBridgeWriteBuffer

Description

This function writes out an 8-bit word to one of two registers (0 and1). This registers control the bi-directional buffers that pass the PXI Triggering across the bridge.
Note! NOT used for X-Point Bridges

C Prototype

```
ViInt16 _VI_FUNC PXITBridgeWriteBuffer(ViInt16 regnumber, ViInt16
value, ViInt16 BusID, ViInt16 DevID);
```

Parameters

Input	Description	Data Type
Regnumber	Register address to write to.	ViInt16
Value	8bit Value to be writhen to a register.	ViInt16
BusID	PCI Bus segment number in Hex.	ViInt16
DevID	PCI Device number in Hex.	ViInt16

Return Values

Output	Description	Data Type
ViSuccess	The current PXIT card version	ViInt16
-1	Error	ViInt16

PXITBridgeReadVoltage

Description

This function reads that voltage channels (0-3) in Volts. Channel 0= +12 volts, channel 1 = +5 volts, channel 2 = 3.3 volts, channel 3 = -12volts.

C Prototype

```
ViReal64 _VI_FUNC PXITBridgeReadVoltage(ViInt16 channel, ViInt16
BusID, ViInt16 DevID);
```

Parameters

Input	Description	Data Type
Channel	Voltage channel to read value	ViInt16
BusID	PCI Bus segment number in Hex.	ViInt16
DevID	PCI Device number in Hex.	ViInt16

Return Values

Output	Description	Data Type
Value	Voltage read correctly in Volts.	ViReal64
-1	Facility not enabled	ViReal64 (ViInt16)

PXITBridgeReadTemperature

Description

This function reads temperature sensors (0-3) in degrees. Sensor 0- controller slot, sensor 1 = slot 5, sensor 2 = slot 10, sensor 3 = power supply bay.

C Prototype

```
ViReal64 _VI_FUNC PXITBridgeReadTemperature(ViInt16 sensor,
ViInt16 BusID, ViInt16 DevID);
```

Parameters

Input	Description	Data Type
Sensor	Temperature sensor to read value	ViInt16
BusID	PCI Bus segment number in Hex.	ViInt16
DevID	PCI Device number in Hex.	ViInt16

Return Values

Output	Description	Data Type
Value	Temperature read correctly in degrees Celsius	ViReal64
-1	Facility not enables	ViReal64 (ViInt16)
-3	Error opening device	ViReal64 (ViInt16)

PXITBridgeWriteReg

Description

This function writes a value to one of the 64 registers on the bridge card.

C Prototype

```
ViInt16 _VI_FUNC PXITBridgeWriteReg(ViInt16 regnumber, ViInt16
value, ViInt16 BusID, ViInt16 DevID);
```

Parameters

Input	Description	Data Type
Regnumber	Register address to write to.	ViInt16
Value	8bit Value to be writhen to the register.	ViInt16
BusID	PCI Bus segment number in Hex.	ViInt16
DevID	PCI Device number in Hex.	ViInt16

Return Values

Output	Description	Data Type
ViSuccess	Voltage read correctly	ViInt16
-1	Error	ViInt16

PXITBridgeReadReg

Description

This function reads a value from one of the 64 registers on the bridge card.

C Prototype

ViInt16 _VI_FUNC PXITBridgeReadReg(ViInt16 regnumber, ViInt16 BusID, ViInt16 DevID);

Parameters

Input	Description	Data Type
Regnumber	Register address to write to.	ViInt16
Value	8bit Value to writhen to the register.	ViInt16
BusID	PCI Bus segment number in Hex.	ViInt16
DevID	PCI Device number in Hex.	ViInt16

Return Values

Output	Description	Data Type
Value	Returned value read from resister.	ViInt16 (ViUInt8)
-1	Error	ViInt16

PXITBridgeReadAuxADC

Description

This function reads a value for the user analogy to digital converter on the bridge card.

C Prototype

ViRead64 _VI_FUNC PXITBridgeReadAuxADC(ViInt16 BusID, ViInt16 DevID);

Parameters

Input	Description	Data Type
BusID	PCI Bus segment number in Hex.	ViInt16
DevID	PCI Device number in Hex.	ViInt16

Return Values

Output	Description	Data Type
Value	Return value read (0-5) volts.	ViReal64
-1	Error	ViReal64(ViInt16)

PXITBridgeWriteEEReg

Description

This function writes a value to the on board EEDATA.

C Prototype

```
ViInt16 _VI_FUNC PXITBridgeWriteEEReg(ViInt16 regnumber, ViInt16
value, ViInt16 BusID, ViInt16 DevID);
```

Parameters

Input	Description	Data Type
RegNumber	Register address to write to.	ViInt16
Value	8bit Value to be writhen to the register.	ViInt16
BusID	PCI Bus segment number in Hex.	ViInt16
DevID	PCI Device number in Hex.	ViInt16

Return Values

Output	Description	Data Type
ViSuccess	Voltage read correctly	ViInt16
-1	Error	ViInt16

PXITBridgeReadEEReg

Description

This function reads a value from the on board EEDATA.

C Prototype

```
ViInt16 _VI_FUNC PXITBridgeReadEEReg(ViInt16 regnumber, ViInt16
BusID, ViInt16 DevID);
```

Parameters

Input	Description	Data Type
ReNumber	Register address to write to.	ViInt16
BusID	PCI Bus segment number in Hex.	ViInt16
DevID	PCI Device number in Hex.	ViInt16

Return Values

Output	Description	Data Type
Value	Data read from EEData	ViInt16
-1	Error	ViInt16

PXITWrite_To_Internal_DAC_Dual

Description

This function writes out the scaling values to the 2 Internal PSU's.
Note! Rev B Model

C Prototype

```
ViInt16 _VI_FUNC PXITWrite_To_Internal_DAC_Dual(ViInt16 BusID,
ViInt16 DevID, float Source1_scale, float Sourse2_scale);
```

Parameters

Input	Description	Data Type
BusID	PCI Bus segment number in Hex.	ViInt16
DevID	PCI Device number in Hex.	ViInt16
Source1_scale	Scaling value for the first power supply	Float
Source2_scale	Scaling value for the second power supply	Float

Return Values

Output	Description	Data Type
Value	PCI Device number	ViInt16
-1	Error	ViInt16

PXITWrite_To_Internal_DAC_Quad

Description

This function writes out the scaling values to the 4 Internal PSU's.
Note! Rev B Model

C Prototype

```
ViInt16 _VI_FUNC PXITWrite_To_Internal_DAC_Quad(ViInt16 BusID,
ViInt16 DevID, float Source1_scale, float Sourse2_scale,float
Source3_scale, float Sourse4_scale);
```

Parameters

Input	Description	Data Type
BusID	PCI Bus segment number in Hex.	ViInt16
DevID	PCI Device number in Hex.	ViInt16
Source1_scale	Scaling value for the first power supply	Float
Source2_scale	Scaling value for the second power supply	Float
Source3_scale	Scaling value for the third power supply	Float
Source4_scale	Scaling value for the forth power supply	Float

Return Values

Output	Description	Data Type
Value	PCI Device number	ViInt16
-1	Error	ViInt16

PXITWrite_To_External_DAC_Quad

Description

This function writes out the scaling values to the 4 External PSU's.
Note! Rev B Model

C Prototype

```
ViInt16 _VI_FUNC PXITWrite_To_External_DAC_Quad(ViInt16 BusID,
ViInt16 DevID, float Source1_scale, float Sourse2_scale,  float
Source3_scale, float Sourse4_scale);
```

Parameters

Input	Description	Data Type
BusID	PCI Bus segment number in Hex.	ViInt16
DevID	PCI Device number in Hex.	ViInt16
Source1_scale	Scaling value for the first power supply	Float
Source2_scale	Scaling value for the second power supply	Float

Return Values

Output	Description	Data Type
Value	PCI Device number	ViInt16
-1	Error	ViInt16

PXITReadOpto_IO_Port

Description

This function reads in data from the optically isolated port on the B- option chassis.
Note! Rev B Model

C Prototype

```
ViInt16 _VI_FUNC PXITReadOpto_IO_Port(ViInt16 BusID, ViInt16
DevID);
```

Parameters

Input	Description	Data Type
BusID	PCI Bus segment number in Hex.	ViInt16
DevID	PCI Device number in Hex.	ViInt16

Return Values

Output	Description	Data Type
Value	Value from IO Port	ViInt16

PXITWriteOpto_IO_Port

Description

This function writes out date to the optically isolated port on the B- option chassis.

C Prototype

```
ViInt16 _VI_FUNC PXITWriteOpto_IO_Port(ViInt16 BusID, ViInt16
DevID, ViInt16 Data);
```

Parameters

Input	Description	Data Type
BusID	PCI Bus segment number in Hex.	ViInt16
DevID	PCI Device number in Hex.	ViInt16
Data	Data to be writhen to the Opto IO Port.	ViInt16

Return Values

Output	Description	Data Type
Value	PCI Device number	ViInt16
-1	Error	ViInt16

PXITCalculate_Scale_Values

Description

This function calculates the scaling values needed to control the PSU.
Note! Rev B Model

C Prototype

```
ViInt16 _VI_FUNC PXITCalculate_Scale_Values(float MaxLim, float
MinLim, float source);
```

Parameters

Input	Description	Data Type
MaxLim	Maximum limit for voltage sources	Float
MinLim	Minimum limit of voltage scourse	Float
Source	Voltage source to be controled	Float

Return Values

Output	Description	Data Type
Value	PCI Device number	ViInt16
-1	Error	ViInt16

PXITBridgeRouteTriggerBusChannel

Description

This function provides simple routing from A to B with inversion capability if required. For example, to connect TRIG3 (channel 3) on the primary side of the bus to TRIG1 on the secondary side of the bus (channel 9), TRIG1 on the secondary side being the driver, PXITBridgeRouteTriggerBusChannel(3,9,0,bus,dev) would be used.

		Channel Number:
Primary Bus	PXI_TRIG0	0
	PXI_TRIG1	1
	PXI_TRIG2	2
	PXI_TRIG3	3
	PXI_TRIG4	4
	PXI_TRIG5	5
	PXI_TRIG6	6
	PXI_TRIG7	7
Secondary Bus	PXI_TRIG0	8
	PXI_TRIG1	9
	PXI_TRIG2	10
	PXI_TRIG3	11
	PXI_TRIG4	12
	PXI_TRIG5	13
	PXI_TRIG6	14
	PXI_TRIG7	15

Multiple channels can be connected to a single source if required. A further option is to connect a channel to itself, which results in the channel driving either a 1 or 0 depending on the invert option.

Note! X-Point Bridge Only

C Prototype

```
ViInt16_VI_FUNC PXITBridgeRouteTriggerBusChannel(ViInt16
destinationchannel, ViInt16 sourcechannel, ViInt16 invert, ViInt16
BusID, ViInt16 DevID);Parameters
```

Input	Description	Data Type
`Destination channel`	The output channel to be used	`ViInt16`
`Source channel`	The input channel to be used	`ViInt16`

`Invert`	Invert the output if 1	`ViInt16`
`Bus ID`	The Bridge PCI Bus Number	`ViInt16`
`Dev ID`	The Bridge PCI device ID	`ViInt16`

Return Values

Output	Description	Data Type
ViSuccess	Success.	ViInt16
-1	No known bridge device, comms error	ViInt16
-2	Channel out of range	ViInt16

PXITBridgeDisableTriggerBusChannel

Description

This function disable a specific channel from being driven by another channel effectively turning the output off. The channel can of course still drive other channels.

Note! X-Point Bridge Only

C Prototype

```
ViInt16_VI_FUNC PXITBridgeDisableTriggerBusChannel(ViInt16
channel, ViInt16 BusID, ViInt16 DevID);
```

Parameters

Input	Description	Data Type
`channel`	The channel number	`ViInt16`
`Bus ID`	The Bridge PCI Bus Number	`ViInt16`
`Dev ID`	The Bridge PCI device ID	`ViInt16`

Return Values

Output	Description	Data Type
ViSuccess	Success.	ViInt16
-1	No known bridge device, comms error	ViInt16
-2	Channel out of range	ViInt16

PXITBridgeDriveTriggerBusChannel

Description

This function sets a specific channel to either drive high or a low. It is similiar to the use of using PXITBridgeRouteTriggerBusChannel(), except with identical source and destinations.
Note! X-Point Bridge Only

C Prototype

```
ViInt16_VI_FUNC PXITBridgeDriveTriggerBusChannel(ViInt16 channel,
ViInt16 invert, ViInt16 enable, ViInt16 BusID, ViInt16 DevID);
```

Parameters

Input	Description	Data Type
`channel`	The output channel to be used	`ViInt16`
`Enable`	Enable or disable the output	`ViInt16`
`Invert`	Invert the output if 1	`ViInt16`
`Bus ID`	The Bridge PCI Bus Number	`ViInt16`
`Dev ID`	The Bridge PCI device ID	`ViInt16`

Return Values

Output	Description	Data Type
ViSuccess	Success.	ViInt16
-1	No known bridge device, comms error	ViInt16
-2	Channel out of range	ViInt16

PXITBridgeReadBridgeIDs

Description
This function returns a list of PCI Bus and PCI Device numbers of all known PCI-PCI bridges

C Prototype

```
ViInt16_VI_FUNC PXITBridgeReadBridgeIDs(ViInt16 *BusID, ViInt16
*DevID, ViUInt8*count);
```

Parameters

Input	Description	Data Type
`count`	On entry, A count describing how many array locations are available, and on exit how many bridges were returned	`ViUInt8`
`Bus ID`	An array of Bridge PCI Bus Numbers	`ViInt16*`
`Dev ID`	An array of Bridge PCI device IDs	`ViInt16*`

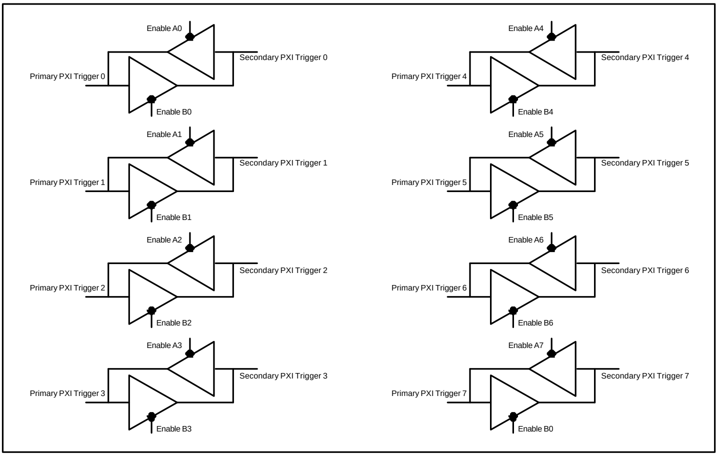
Note! count needs to be initialised to Array size.

Return Values

Output	Description	Data Type
ViSuccess	Success.	ViInt16
-1	Insufficient array size	ViInt16

Appendix B - PXI Trigger Buffer

Notes: This applies to NON X-Point Bridges.



To configure the PXI Trigger buffers from primary (controller side) to secondary bus segments. The user can configure the buffers directly from their own source code or with the user front panel supplied with the PX2000-514.

To configure using our direct .DLL call:

ViInt16 VI_FUNC PXIWriteBuffer(ViInt16 regnumber, ViInt16 value);

Return Values:

-1	Error
ViSuccess	Success

Description: This writes out an 8-bit word to one of two registers (0 and 1). The registers control the bi-directional buffers that relay the PXI Triggering across the bridge.

Register 0 controls Buffer 0, 1, 2 and 3.
Register 1 controls Buffer 4, 5, 6 and 7.

The format of bits

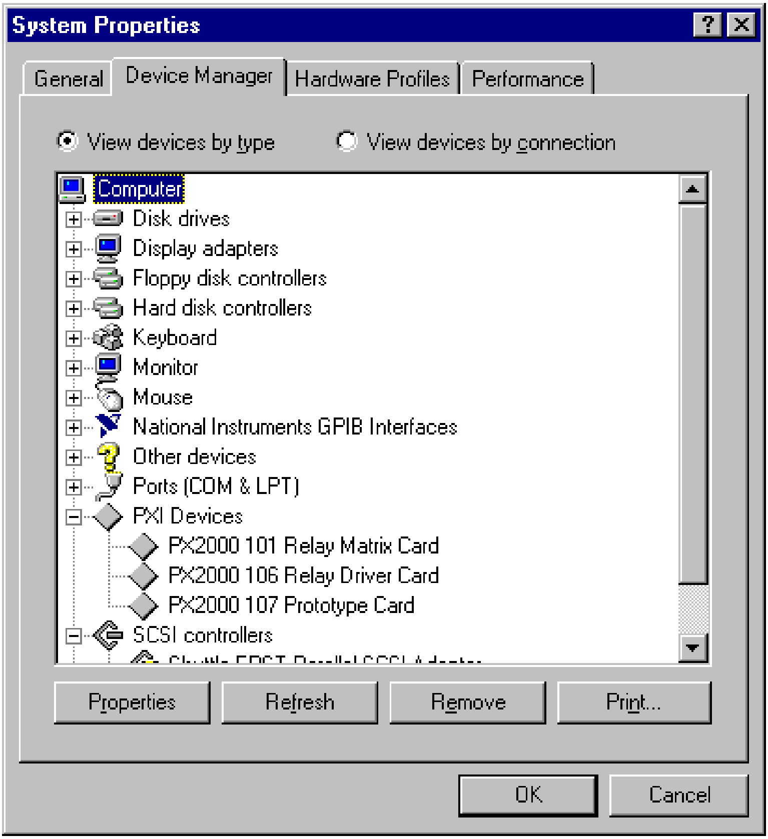
REGISTER 0								
	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Buffer 0								
None							X	0
Pri – Sec							1	1
Sec – Pri							0	1
Buffer 1								
None					X	0		
Pri – Sec					1	1		
Sec – Pri					0	1		
Buffer 2								
None			X	0				
Pri – Sec			1	1				
Sec – Pri			0	1				
Buffer 3								
None	X	0						
Pri – Sec	1	1						
Sec – Pri	0	1						

REGISTOR 1								
	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Buffer 4								
None							X	0
Pri – Sec							1	1
Sec – Pri							0	1
Buffer 5								
None					X	0		
Pri – Sec					1	1		
Sec – Pri					0	1		
Buffer 6								
None			X	0				
Pri – Sec			1	1				
Sec – Pri			0	1				
Buffer 7								
None	X	0						
Pri – Sec	1	1						
Sec – Pri	0	1						

6.3 Appendix C - Problem Solving.

If VISA does not see the installed module, the module must not be registering with the operating system.

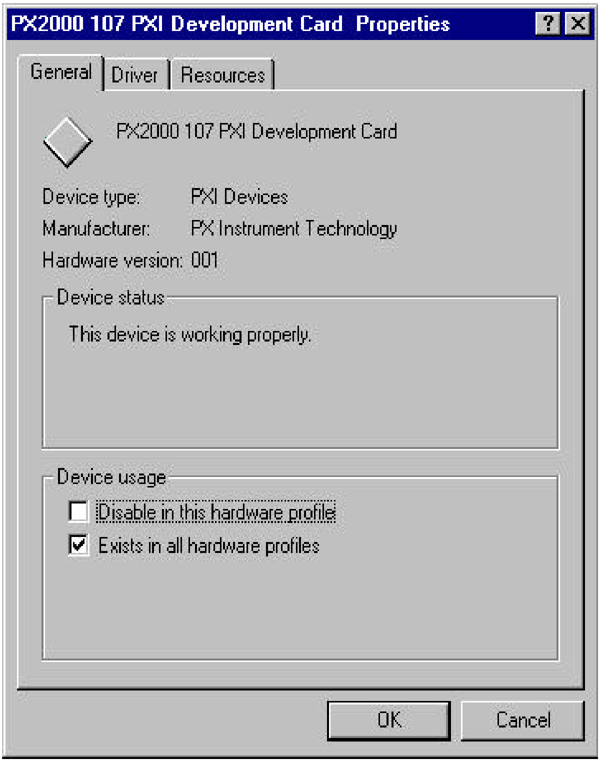
On Windows 98/2000 check the Control Panel/System/Devices from the Start Menu window to verify that the modules are present as shown in figure 6.1.1 and 6.1.2 below.



● View devices by type ○ View devices by connection

- Computer
  - Disk drives
  - Display adapters
  - Floppy disk controllers
  - Hard disk controllers
  - Keyboard
  - Monitor
  - Mouse
  - National Instruments GPIB Interfaces
  - Other devices
  - Ports (COM & LPT)
  - PXI Devices
    - PX2000 101 Relay Matrix Card
    - PX2000 106 Relay Driver Card
    - PX2000 107 Prototype Card
  - SCSI controllers
    - Shuttle EPST Parallel SCSI Adapter

Figure 6.1.1 - Registered Devices



PX2000 107 PXI Development Card Properties

PX2000 107 PXI Development Card

Device type: PXI Devices

Manufacturer: PX Instrument Technology

Hardware version: 001

Device status

This device is working properly.

Device usage

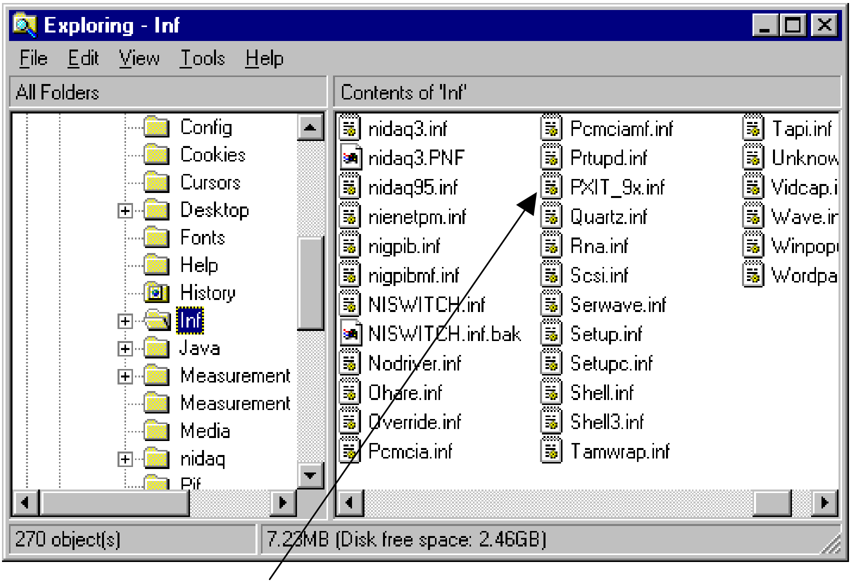
□ Disable in this hardware profile

☑ Exists in all hardware profiles

Figure 6.1.2 - Correctly configured device.

Check to see if an up to date version of NI_VISA is installed (must be 2.01 or greater).

Check that the relevant **.INF** file is in the Windows\INF directory as shown in Figure 6.1.3 below. (Win 98/2000, Win NT).



Config
Cookies
Cursors
Desktop
Fonts
Help
History
Inf
Java
Measurement
Measurement
Media
nidaq
Pif

nidaq3.inf
nidaq3.PNF
nidaq95.inf
nienetpm.inf
nigpib.inf
nigpibmf.inf
NISWITCH.inf
NISWITCH.inf.bak
Nodriver.inf
Ohare.inf
Override.inf
Pcmcia.inf
Pcmciamf.inf
Prtupd.inf
PXIT_9x.inf
Quartz.inf
Rna.inf
Scsi.inf
Serwave.inf
Setup.inf
Setupc.inf
Shell.inf
Shell3.inf
Tamwrap.inf
Tapi.inf
Unknow
Vidcap.i
Wave.ir
Winpopi
Wordpa

270 object(s)
7.23MB (Disk free space: 2.46GB)

The PXIT_9x.inf file.

Figure 6.1.3 - INF Directory (Note: Example shows Windows

6.4 Appendix D - Example Program.

```
void main(void)
{
    /**Enable bridge to process commands**/
    if (PXIBridgeEnable() == 0)
    {
        printf("pci to pci bridge found\n");
        getchar();

        /**Read Chassis Voltage levels**/
        /**Print Values to screen*******/
        printf("+12V :%f\n",PXIBridgeReadVoltage(0));
        printf("+5V :%f\n",PXIBridgeReadVoltage(1));
        printf("+3.3V :%f\n",PXIBridgeReadVoltage(2));
        printf("-12V :%f\n",PXIBridgeReadVoltage(3));
        getchar();

        /**Read Chassis Temperatures**/
        /**Print Values to screen*****/
        printf("sensor #0 CPU :%f\n",PXIBridgeReadTemperature(0));
        printf("sensor #1 Slot 5 :%f\n",PXIBridgeReadTemperature(1));
        printf("sensor #2 Slot 10 :%f\n",PXIBridgeReadTemperature(2));
        printf("sensor #3 PSU :%f\n",PXIBridgeReadTemperature(3));
        getchar();

        /**Writes out a value to the registers**/
        /**Reads register value back************/
        PXIBridgeWriteReg(0, 0xff);
        printf("0 0xff? %x\n",PXIBridgeReadReg(0));
        PXIBridgeWriteReg(0, 0x55);
        printf("0 0x55? %x\n",PXIBridgeReadReg(0));
        PXIBridgeWriteReg(1, 0xff);
        printf("1 0xff? %x\n",PXIBridgeReadReg(1));
        PXIBridgeWriteReg(1, 0x55);
        printf("1 0x55? %x\n",PXIBridgeReadReg(1));
        PXIBridgeWriteReg(2, 0xff);
        printf("2 0xff? %x\n",PXIBridgeReadReg(2));
        PXIBridgeWriteReg(2, 0x55);
        printf("2 0x55? %x\n",PXIBridgeReadReg(2));
        getchar();
    }

    /**Bridge failed to enable**/
    else
    {   printf("failed to start Bridge\n");
    }
    if (PXIBridgeEnable() == 0)
    {
        PXIBridgeDisable();
    }
    else
    {
        printf("failed to start Bridge\n");
    }

          /**End of program disable bridge**/
          PXIBridgeDisable();
```

6.5 Appendix E – Slot Pinout Table

Generic Peripheral Slot Pinout

22	GND	**GA4**	**GA3**	**GA2**	**GA1**	**GA0**	GND	
21	GND	**PXI_LBR0**	GND	**PXI_LBR1**	**PXI_LBR2**	**PXI_LBR3**	GND	
20	GND	**PXI_LBR4**	**PXI_LBR5**	**PXI_LBL0**	GND	**PXI_LBL1**	GND	
19	GND	**PXI_LBL2**	GND	**PXI_LBL3**	**PXI_LBL4**	**PXI_LBL5**	GND	
18	GND	**PXI_TRIG3**	**PXI_TRIG4**	**PXI_TRIG5**	GND	**PXI_TRIG6**	GND	P2
17	GND	**PXI_TRIG2**	GND	RSV	**PXI_STAR**	**PXI_CLK10**	GND	/
16	GND	**PXI_TRIG1**	**PXI_TRIG0**	RSV	GND	**PXI_TRIG7**	GND	J2
15	GND	**PXI_BRSVA15**	GND	RSV	**PXI_LBL6**	**PXI_LBR6**	GND	
14	GND	AD[35]	AD[34]	AD[33]	GND	AD[32]	GND	
13	GND	AD[38]	GND	V(I/O)	AD[37]	AD[36]	GND	C
12	GND	AD[42]	AD[41]	AD[40]	GND	AD[39]	GND	O
11	GND	AD[45]	GND	V(I/O)	AD[44]	AD[43]	GND	N
10	GND	AD[49]	AD[48]	AD[47]	GND	AD[46]	GND	N
9	GND	AD[52]	GND	V(I/O)	AD[51]	AD[50]	GND	E
8	GND	AD[56]	AD[55]	AD[54]	GND	AD[53]	GND	C
7	GND	AD[59]	GND	V(I/O)	AD[58]	AD[57]	GND	T
6	GND	AD[63]	AD[62]	AD[61]	GND	AD[60]	GND	O
5	GND	C/BE[5]#	GND	V(I/O)	C/BE[4]#	PAR64	GND	R
4	GND	V(I/O)	**PXI_BRSVB4**	C/BE[7]#	GND	C/BE[6]#	GND	
3	GND	**PXI_LBR7**	GND	**PXI_LBR8**	**PXI_LBR9**	**PXI_LBR10**	GND	
2	GND	**PXI_LBR11**	**PXI_LBR12**	UNC	**PXI_LBL7**	**PXI_LBL8**	GND	
1	GND	**PXI_LBL9**	GND	**PXI_LBL10**	**PXI_LBL11**	**PXI_LBL12**	GND	
25	GND	5V	REQ64#	ENUM#	3.3V	5V	GND	
24	GND	AD[1]	5V	V(I/O)	AD[0]	ACK64#	GND	
23	GND	3.3V	AD[4]	AD[3]	5V	AD[2]	GND	
22	GND	AD[7]	GND	3.3V	AD[6]	AD[5]	GND	
21	GND	3.3V	AD[9]	AD[8]	M66EN	C/BE[0]#	GND	
20	GND	AD[12]	GND	V(I/O)	AD[11]	AD[10]	GND	
19	GND	3.3V	AD[15]	AD[14]	GND	AD[13]	GND	P1
18	GND	SERR#	GND	3.3V	PAR	C/BE[1]#	GND	/
17	GND	3.3V	IPMB_SCL	IPMB_SDA	GND	PERR#	GND	J1
16	GND	DEVSEL#	GND	V(I/O)	STOP#	LOCK#	GND	
15	GND	3.3V	FRAME#	IRDY#	BD_SEL#	TRDY#	GND	
12–14	Key Area							C
11	GND	AD[18]	AD[17]	AD[16]	GND	C/BE[2]#	GND	O
10	GND	AD[21]	GND	3.3V	AD[20]	AD[19]	GND	N
9	GND	C/BE[3]#	IDSEL	AD[23]	GND	AD[22]	GND	N
8	GND	AD[26]	GND	V(I/O)	AD[25]	AD[24]	GND	E
7	GND	AD[30]	AD[29]	AD[28]	GND	AD[27]	GND	C
6	GND	REQ#	GND	3.3V	CLK	AD[31]	GND	T
5	GND	BRSVP1A5	BRSVP1B5	RST#	GND	GNT#	GND	O
4	GND	IPMB_PWR	GND	V(I/O)	INTP	INTS	GND	R
3	GND	INTA#	INTB#	INTC#	5V	INTD#	GND	
2	GND	TCK	5V	TMS	TDO	TDI	GND	
1	GND	5V	-12V	TRST#	+12V	5V	GND	
Pin	**Z**	**A**	**B**	**C**	**D**	**E**	**F**	

System Slot Pinout

22	GND	**GA4**	**GA3**	**GA2**	**GA1**	**GA0**	GND	
21	GND	CLK6	GND	RSV	RSV	RSV	GND	
20	GND	CLK5	GND	RSV	GND	RSV	GND	
19	GND	GND	GND	RSV	RSV	RSV	GND	
18	GND	**PXI_TRIG3**	**PXI_TRIG4**	**PXI_TRIG5**	GND	**PXI_TRIG6**	GND	P2
17	GND	**PXI_TRIG2**	GND	PRST#	REQ6#	GNT6#	GND	/
16	GND	**PXI_TRIG1**	**PXI_TRIG0**	DEG#	GND	**PXI_TRIG7**	GND	J2
15	GND	**PXI_BRSVA15**	GND	FAL#	REQ5#	GNT5#	GND	
14	GND	AD[35]	AD[34]	AD[33]	GND	AD[32]	GND	
13	GND	AD[38]	GND	V(I/O)	AD[37]	AD[36]	GND	C
12	GND	AD[42]	AD[41]	AD[40]	GND	AD[39]	GND	O
11	GND	AD[45]	GND	V(I/O)	AD[44]	AD[43]	GND	N
10	GND	AD[49]	AD[48]	AD[47]	GND	AD[46]	GND	N
9	GND	AD[52]	GND	V(I/O)	AD[51]	AD[50]	GND	E
8	GND	AD[56]	AD[55]	AD[54]	GND	AD[53]	GND	C
7	GND	AD[59]	GND	V(I/O)	AD[58]	AD[57]	GND	T
6	GND	AD[63]	AD[62]	AD[61]	GND	AD[60]	GND	O
5	GND	C/BE[5]#	GND	V(I/O)	C/BE[4]#	PAR64	GND	R
4	GND	V(I/O)	**PXI_BRSVB4**	C/BE[7]#	GND	C/BE[6]#	GND	
3	GND	CLK4	GND	GNT3#	REQ4#	GNT4#	GND	
2	GND	CLK2	CLK3	SYSEN#	GNT2#	REQ3#	GND	
1	GND	CLK1	GND	REQ1#	GNT1#	REQ2#	GND	
25	GND	5V	REQ64#	ENUM#	3.3V	5V	GND	
24	GND	AD[1]	5V	V(I/O)	AD[0]	ACK64#	GND	
23	GND	3.3V	AD[4]	AD[3]	5V	AD[2]	GND	
22	GND	AD[7]	GND	3.3V	AD[6]	AD[5]	GND	
21	GND	3.3V	AD[9]	AD[8]	M66EN	C/BE[0]#	GND	
20	GND	AD[12]	GND	V(I/O)	AD[11]	AD[10]	GND	
19	GND	3.3V	AD[15]	AD[14]	GND	AD[13]	GND	P1
18	GND	SERR#	GND	3.3V	PAR	C/BE[1]#	GND	/
17	GND	3.3V	IPMB_SCL	IPMB_SDA	GND	PERR#	GND	J1
16	GND	DEVSEL#	GND	V(I/O)	STOP#	LOCK#	GND	
15	GND	3.3V	FRAME#	IRDY#	GND	TRDY#	GND	
12–14	Key Area							C
11	GND	AD[18]	AD[17]	AD[16]	GND	C/BE[2]#	GND	O
10	GND	AD[21]	GND	3.3V	AD[20]	AD[19]	GND	N
9	GND	C/BE[3]#	IDSEL	AD[23]	GND	AD[22]	GND	N
8	GND	AD[26]	GND	V(I/O)	AD[25]	AD[24]	GND	E
7	GND	AD[30]	AD[29]	AD[28]	GND	AD[27]	GND	C
6	GND	REQ#	GND	3.3V	CLK	AD[31]	GND	T
5	GND	BRSVP1A5	BRSVP1B5	RST#	GND	GNT#	GND	O
4	GND	IPMB_PWR	GND	V(I/O)	INTP	INTS	GND	R
3	GND	INTA#	INTB#	INTC#	5V	INTD#	GND	
2	GND	TCK	5V	TMS	TDO	TDI	GND	
1	GND	5V	-12V	TRST#	+12V	5V	GND	
Pin	**Z**	**A**	**B**	**C**	**D**	**E**	**F**	

Star Trigger Slot Pinout

Pin	Z	A	B	C	D	E	F	
22	GND	**GA4**	**GA3**	**GA2**	**GA1**	**GA0**	GND	P2 / J2 CONNECTOR
21	GND	**PXI_LBR0**	GND	**PXI_LBR1**	**PXI_LBR2**	**PXI_LBR3**	GND	
20	GND	**PXI_LBR4**	**PXI_LBR5**	**PXI_STAR0**	GND	**PXI_STAR1**	GND	
19	GND	**PXI_STAR2**	GND	**PXI_STAR3**	**PXI_STAR4**	**PXI_STAR5**	GND	
18	GND	**PXI_TRIG3**	**PXI_TRIG4**	**PXI_TRIG5**	GND	**PXI_TRIG6**	GND	
17	GND	**PXI_TRIG2**	GND	RSV	**PXI_CLK10_IN**	**PXI_CLK10**	GND	
16	GND	**PXI_TRIG1**	**PXI_TRIG0**	RSV	GND	**PXI_TRIG7**	GND	
15	GND	**PXI_BRSVA15**	GND	RSV	**PXI_STAR6**	**PXI_LBR6**	GND	
14	GND	AD[35]	AD[34]	AD[33]	GND	AD[32]	GND	
13	GND	AD[38]	GND	V(I/O)	AD[37]	AD[36]	GND	
12	GND	AD[42]	AD[41]	AD[40]	GND	AD[39]	GND	
11	GND	AD[45]	GND	V(I/O)	AD[44]	AD[43]	GND	
10	GND	AD[49]	AD[48]	AD[47]	GND	AD[46]	GND	
9	GND	AD[52]	GND	V(I/O)	AD[51]	AD[50]	GND	
8	GND	AD[56]	AD[55]	AD[54]	GND	AD[53]	GND	
7	GND	AD[59]	GND	V(I/O)	AD[58]	AD[57]	GND	
6	GND	AD[63]	AD[62]	AD[61]	GND	AD[60]	GND	
5	GND	C/BE[5]#	GND	V(I/O)	C/BE[4]#	PAR64	GND	
4	GND	V(I/O)	**PXI_BRSVB4**	C/BE[7]#	GND	C/BE[6]#	GND	
3	GND	**PXI_LBR7**	GND	**PXI_LBR8**	**PXI_LBR9**	**PXI_LBR10**	GND	
2	GND	**PXI_LBR11**	**PXI_LBR12**	UNC	**PXI_STAR7**	**PXI_STAR8**	GND	
1	GND	**PXI_STAR9**	GND	**PXI_STAR10**	**PXI_STAR11**	**PXI_STAR12**	GND	
25	GND	5V	REQ64#	ENUM#	3.3V	5V	GND	P1 / J1 CONNECTOR
24	GND	AD[1]	5V	V(I/O)	AD[0]	ACK64#	GND	
23	GND	3.3V	AD[4]	AD[3]	5V	AD[2]	GND	
22	GND	AD[7]	GND	3.3V	AD[6]	AD[5]	GND	
21	GND	3.3V	AD[9]	AD[8]	M66EN	C/BE[0]#	GND	
20	GND	AD[12]	GND	V(I/O)	AD[11]	AD[10]	GND	
19	GND	3.3V	AD[15]	AD[14]	GND	AD[13]	GND	
18	GND	SERR#	GND	3.3V	PAR	C/BE[1]#	GND	
17	GND	3.3V	IPMB_SCL	IPMB_SDA	GND	PERR#	GND	
16	GND	DEVSEL#	GND	V(I/O)	STOP#	LOCK#	GND	
15	GND	3.3V	FRAME#	IRDY#	BD_SEL#	TRDY#	GND	
12–14	Key Area							
11	GND	AD[18]	AD[17]	AD[16]	GND	C/BE[2]#	GND	
10	GND	AD[21]	GND	3.3V	AD[20]	AD[19]	GND	
9	GND	C/BE[3]#	IDSEL	AD[23]	GND	AD[22]	GND	
8	GND	AD[26]	GND	V(I/O)	AD[25]	AD[24]	GND	
7	GND	AD[30]	AD[29]	AD[28]	GND	AD[27]	GND	
6	GND	REQ#	GND	3.3V	CLK	AD[31]	GND	
5	GND	BRSVP1A5	BRSVP1B5	RST#	GND	GNT#	GND	
4	GND	IPMB_PWR	GND	V(I/O)	INTP	INTS	GND	
3	GND	INTA#	INTB#	INTC#	5V	INTD#	GND	
2	GND	TCK	5V	TMS	TDO	TDI	GND	
1	GND	5V	-12V	TRST#	+12V	5V	GND	

7 Notes