PXI and PCI
Getting Started

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Contact

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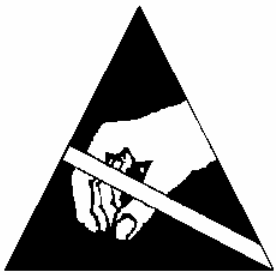

Handling Precautions for Electronic Devices Subject to Damage by Static Electricity

PXI and PCI modules are susceptible to Electronic Static Discharge (ESD) damage. When transporting, place the module in conductive (anti-static) envelopes or carriers. Open only at an ESD-approved work surface. An ESD safe work surface is defined as follows:

- The work surface must be conductive and reliably connected to an earth ground with a safety resistance of approximately 250 kilohms.

- The surface must NOT be metal. A resistance of 30–300 kilohms per square inch is suggested.

Ground the frame of any line-powered equipment, chassis, test instruments, lamps, soldering irons, etc., directly to the earth ground. To avoid shorting out the safety resistance, ensure that the grounded equipment has rubber feet or other means of insulation from the work surface.

Avoid placing tools or electrical parts on insulators. Do NOT use any hand tool that can generate a static charge, such as a non-conductive plunger-type solder sucker. Use a conductive strap or cable with a wrist cuff to reliably ground to the work surface. The cuff must make electrical contact directly with the skin; do NOT wear it over clothing.

Note: Resistance between the skin and the work surface is typically 250 kilohms to 1 megohm using a commercially-available personnel grounding device.

Avoid circumstances that are likely to produce static charges, such as wearing clothes of synthetic material, sitting on a plastic-covered stool (especially when wearing woolen material), combing the hair, or making extensive pencil erasures. These circumstances are most significant when the air is dry.

When testing static sensitive devices, ensure DC power is ON before, during, and after application of test signals. Ensure all pertinent voltages are switched OFF while circuit boards or components are removed or inserted.

Revision History

Rev	Date	Section	Description
1	06-14-04	All	Initial Release
2	02-15-05	All	New release updating all sections and information
3	02-10-05	All	New release updating all sections and adding content

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Introduction

The PXI/PCI Getting Started Manual pertains to the following instruments:

- ZT450PXI/PCI
- ZT431PXI/PCI
- ZT410PXI/PCI
- ZT530PXI/PCI
- ZT002PXI
- ZT1000 PXI

This manual is intended for customers using Microsoft Windows version 2000 and XP. For customers using other operating systems, please review this document and then contact ZTEC Instruments for additional assistance if needed. In this manual, the instructions are interchangeable with PXI and PCI instruments with the exception of hardware installation. You can get answers to your questions, browse the knowledge base, download drivers and documentation, and open technical support tickets all from our website: www.ztecinstruments.com

Requirements

The following are the minimum and recommended computer systems to use with your PXI or PCI module:

System Minimum

Processor: Pentium 200 MHz or equivalent
RAM: 64 MB
Microsoft Internet Explorer 5.5 or later
Screen resolution of 640 × 480 with 256 colors
Windows 2000 or XP

System Recommended

Processor: Pentium III/Celeron 600 MHz or equivalent
RAM: 256 MB
Microsoft Internet Explorer 5.5 or later
Screen resolution of 640 × 480 with 256 colors—required for Scope SFP
Windows XP Professional

Other Required Items

In addition to the ZTEC PXI or PCI module and a computer, the following are needed:

1/8 in. flat-head screwdriver
Grounding Strap

For PXI Devices:

A PXI chassis, a PXI/SCXI combination chassis, or a PXI/CompactPCI chassis—with a controller and the chassis documentation

For PCI Devices:

A desktop computer and its documentation

Instrument Installation for Windows

You must install the Windows Device Driver before you install the instrument into the chassis or computer!

Windows Device Driver Installation:

1. **Install Virtual Instrumentation Software Architecture (VISA) on your computer.**

   Note: *You must have VISA installed on your system. VISA can be obtained from National Instruments or Agilent.*

   For customers using a National Instruments program development environment, such as LabWindows or LabVIEW, NI-VISA will most likely be already installed on your system. To check for an NI-VISA installation, open the National Instruments Measurement and Automation Explorer (NI-MAX) and check for an NI-VISA entry in the "Software" directory.

2. **Copy the contents of the Product CD or download the latest drivers and documentation to your computer (We recommend going to www.ztec-inc.com/support to get the latest drivers and documentation for your instrument):**

   - If using the product CD:

     [product cd]:/zt…
     [local drive]:/ztec/

   - If downloading the drivers and documentation, the files will be compressed (.zip) files. Unzip them to the following recommended folders:

     [local drive]:/ztec/zt…/Drivers (for the drivers)
     [local drive]:/ztec/zt…/Manuals (for the documentation)
     [local drive]:/ztec/zt…/Applications (for the soft front panel)

3. **Open the following directory:**

   [local drive]:/ztec/zt…/Drivers/Device

4. Install the ZTEC Instruments PXI device driver: This device driver will allow your operating system to recognize the ZTEC PXI or PCI hardware.

- Windows 2000, XP — ZTEC_NT5.inf
- LabVIEW Real Time — ZTEC_RT.inf (Contact ZTEC if using LabVIEW RT)
- Windows 95, 98 — ZTEC_9x.inf (Hardware only support)
- Windows NT — ZTEC_NT4.inf (Hardware only support)

a) Right click on the appropriate file and select “Install” from the pop-up menu. For example, if you are using Windows XP, right click on the “ZTEC_NT5.inf” file and select “Install” as shown:

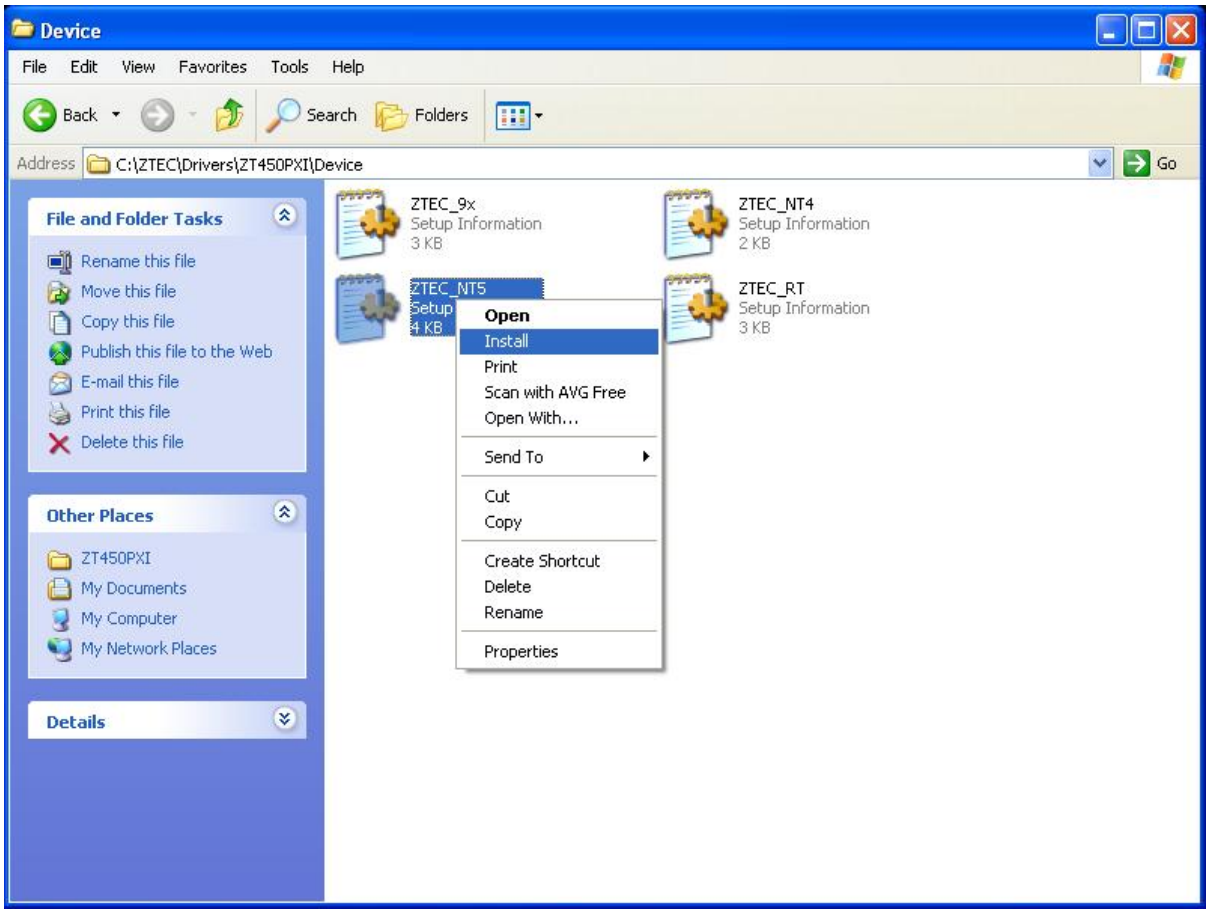

Figure 1: Installing the Device Driver

You may see the following message pop up:

Figure 2: Possible Error Popup

If so, click on Open to continue. You will **not** get any confirmation that the driver has been installed until the hardware has been installed. Shut down the computer or chassis and go on to the next step: Installing the hardware.

5) Install your hardware. Depending on the instrument you are installing, please go to the appropriate section "PXI Hardware Installation" or "PCI Hardware Installation."

a. PXI Hardware Installation:

1. Power off the cPCI/PXI chassis.
2. With a grounding strap properly connected, slide the ZTEC PXI module into an available slot on the chassis until the front panel handle contacts the chassis.
3. Complete unit installation by pressing upward on the front panel handle until the handle lock engages.
4. Once the module is seated, tighten the captive screw at the top and bottom into the mainframe.

b. PCI Hardware Installation for single module:

1. Power down the PC before opening and accessing the PCI slots.

2. Unscrew and remove the dedicated blind-bracket that is mounted to cover the unused PCI slots of the PC. Keep the screw within reach to secure the PCI board in the PCI slot afterwards.

CAUTION

- While inserting the PCI module, take care not to tilt the retainer in the track. Failure to do so may cause damage to the module.
- Be very careful when inserting the board in the PCI slot, as most of the main boards are mounted with spacers and therefore might be damaged if they are exposed to high pressure.

3. With a grounding strap properly connected, insert the PCI module slowly into the PC. This is done best with one hand each at both ends of the board.

4. After inserting the PCI module, fasten the screw of the bracket carefully and without over-tightening.

c. PCI Hardware Installation for multiple modules:

1. Power down the PC before opening and accessing the PCI slots.

2. Unscrew and remove the dedicated blind-brackets that are mounted to cover unused slots of the PC. Please keep the screws in reach to secure the boards afterwards.

CAUTION

- Determine if there is enough space in the computer case (e.g., a big tower case) in order to mount all of the required boards before inserting and connecting any boards.
- While inserting the PCI boards, take care not to tilt the retainers in the tracks. Failure to do so may cause damage to the boards.
- Be very careful when inserting any board in the PCI slot, as most of the main boards are mounted with spacers and therefore might be damaged if they are exposed to high pressure.

3. With a grounding strap properly connected, insert the ZTEC PCI module and other required boards slowly into the computer. This is done best with one hand at each end of the board.

4. After inserting the boards, fasten the screw of the bracket carefully and without over-tightening.

5. Connect the boards in daisy-chain using the appropriate ribbon cable (FFSD-10-D-6.00-01-N-D4) to the mating connectors (See Figure 3) on the top of the boards. The ribbon cable is matched to the same length to achieve a zero clock delay between the boards. Table 1 shows the pin out for the mating connectors.

Note: *When using this configuration, one board acts as a timing and arm source; all of the other boards are receivers.*

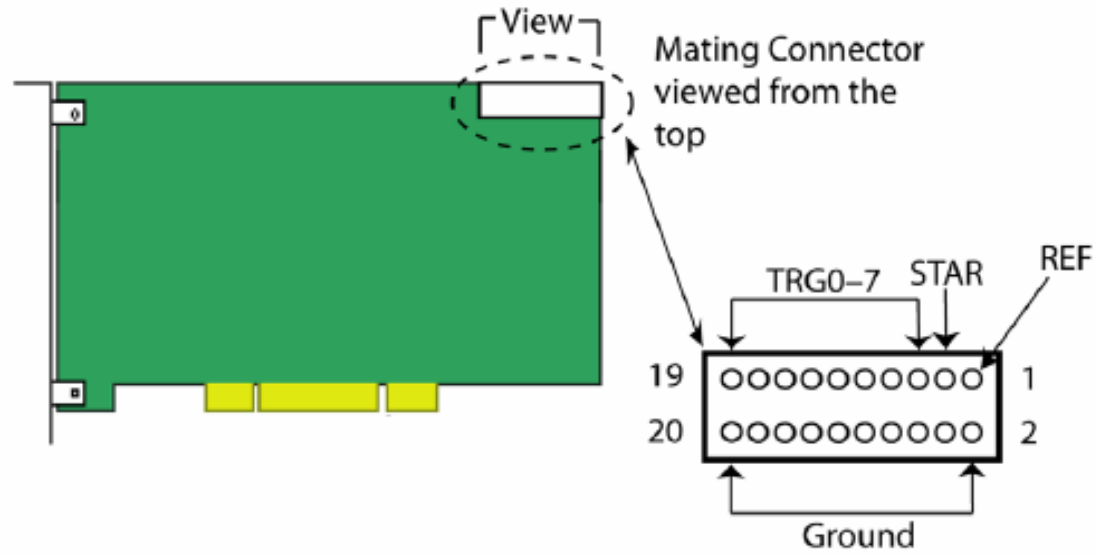

Figure 3: Mating Connector

Pin	Function	Pin	Function
1	REF	**2**	GND
3	STAR	**4**	GND
5	TRG7	**6**	GND
7	TRG6	**8**	GND
9	TRG5	**10**	GND
11	TRG4	**12**	GND
13	TRG3	**14**	GND
15	TRG2	**16**	GND
17	TRG1	**18**	GND
19	TRG0	**20**	GND

Table 1: ZTEC PCI Module Mating Connector Pin Out

6) Confirm the Installation.

a. After you have shut down the computer and installed the hardware, restart the computer or chassis. When Windows boots up, the instrument should be found and you should see the "Found New Hardware Wizard" popup as shown:

Figure 4: Found New Hardware Popup

Select "No, not this time" and click "Next >" to continue. You should see the following window:

Figure 5: Hardware Install Window

Make sure that “Install the software automatically (Recommended)” is selected and click “Next >” to continue. Windows will automatically install the driver. When it is finished, you should see the following window:

Figure 6: Hardware Installation Complete

Click on “Finish”. The instrument driver has been successfully installed. Now, to confirm that the instrument has been recognized and is in the system, go on to the next step.

b. In Windows, click on “Start>>Control Panel”. Then find the “System” icon and double click on it. Under the “Hardware” tab, find the device manager button and click on it to open the device manager. You should see something like this:

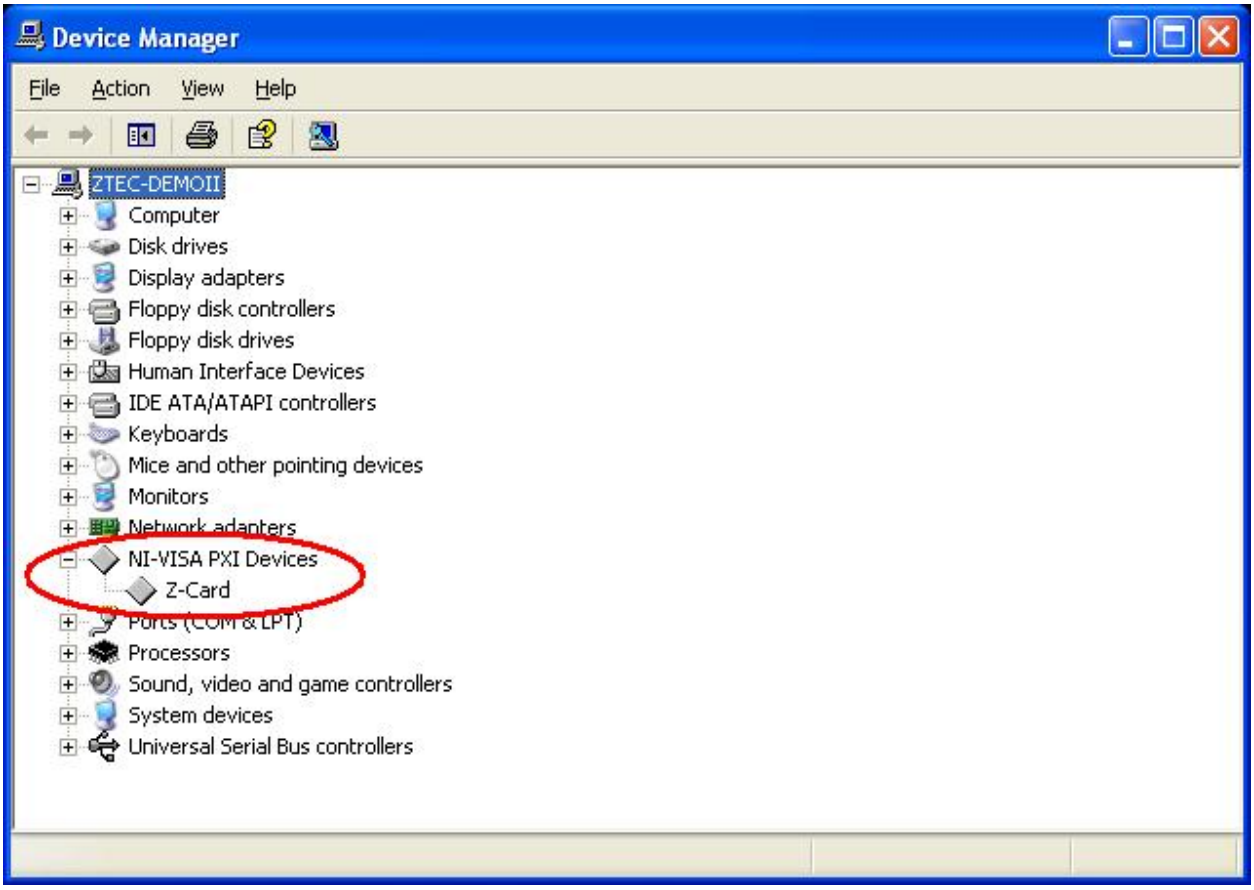

Figure 7: Device Manager View

Notice that there is now an entry called “NI-VISA PXI Devices”. By clicking on the plus sign next to it, you will see that there is a “Z-Card” installed. Any PCI instruments will show up as “NI-VISA PXI Devices” as well. If you do not see this entry or if you get an error, go to the “Troubleshooting” section of this manual.

c. If using NI-VISA, you can confirm the installation using NI-MAX. To do so, open NI-MAX and locate the new PXI or PCI instrument under the “Devices and Interfaces” folder. The PXI or PCI instrument should have NI-VISA resource identifier, such as “PXI2::13::INSTR” for example. As shown in Figure 8, the ZTEC instrument will have a 4172 Manufacturer ID.

Note: *If using PCI, NI-MAX will show the PCI card as PXI.*

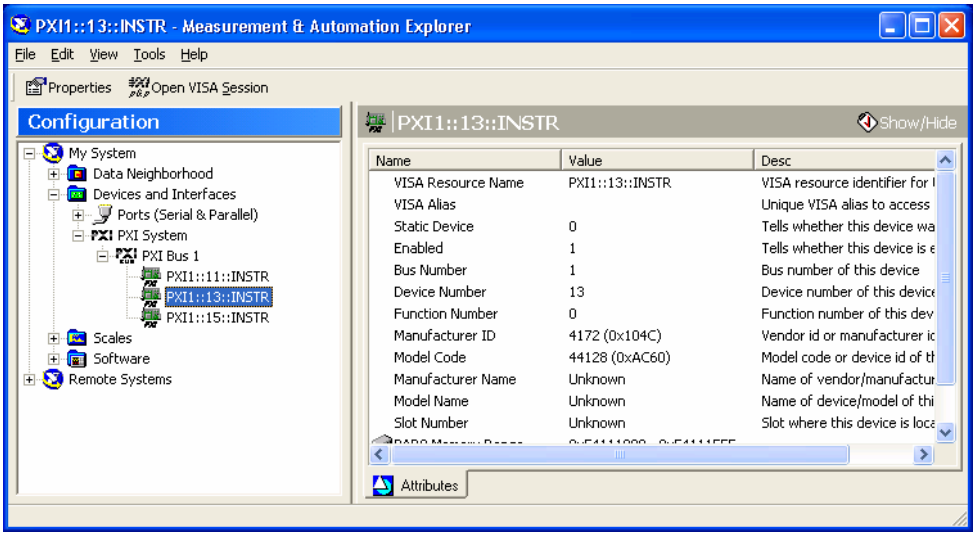

Figure 8: Measurement and Automation Explorer Verification

If you do not see any instruments listed, go to the "Troubleshooting" section of this manual.

7) Using the Soft Front Panel to verify communication with the instrument:

a. Install the soft front panel (SFP). Soft front panels are available for these instruments:

- ZT431PXI/PCI
- ZT450PXI/PCI
- ZT410PXI/PCI
- ZT530PXI/PCI

There is no soft front panel available for either the ZT002PXI or the ZT1000PXI.

This installation example is for the ZT450PXI/PCI. Other SFP installations will be similar but not exactly the same. Contact ZTEC Technical Support if you need assistance.

The Soft Front Panel installation file is located in the following directory:

[local drive]:/ztec/zt…/Applications

To install the soft front panel, simply locate and double click on the "Setup.exe" file. For this example, we will use the ZScope soft front panel. The following window should pop up:

Figure 9: ZScope Installation Window

Click on "Next >" and enter the folder in which to install the program (the default location should work). The following window should open when installation completes:

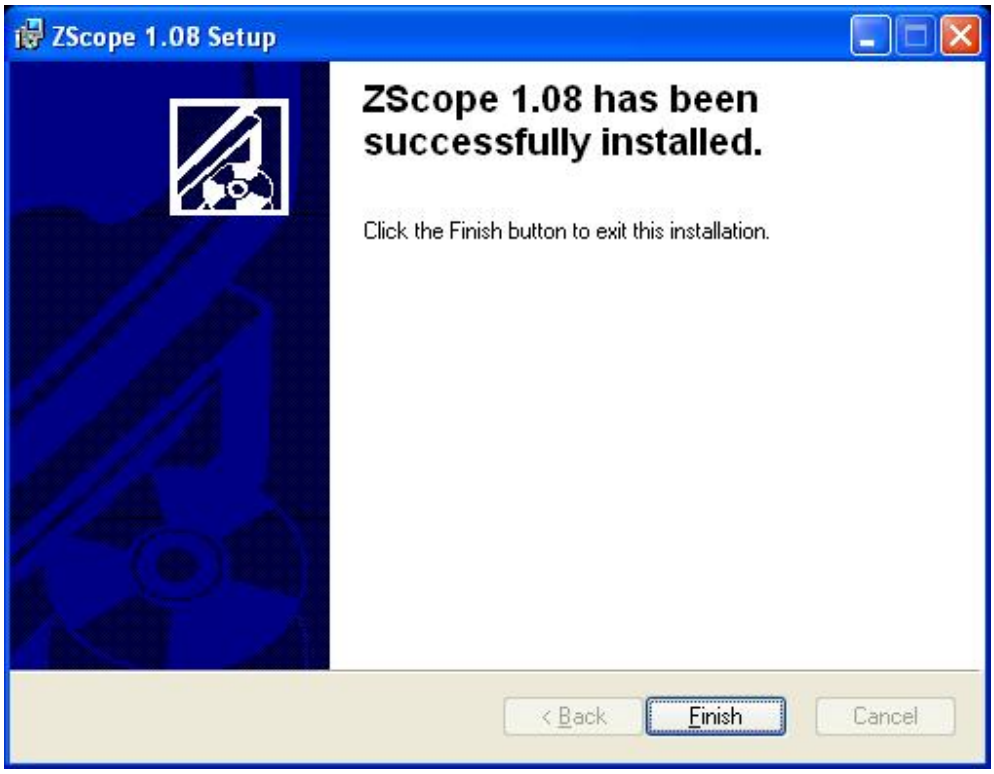

Figure 10: ZScope Installation Complete

b. The installation should have placed a shortcut on the desktop. Locate it and start the program by double clicking on it. If you don't have the instrument installed or there is a problem communicating with the instrument, you may see this pop up:

Figure 11: ZScope Error

If you see this error, it means that the panel could not communicate with the instrument. If all the above steps are completed, this should never appear. The Soft front panel loads in "Simulation" mode when this happens.

If you did not see the above error, you should see the following window:

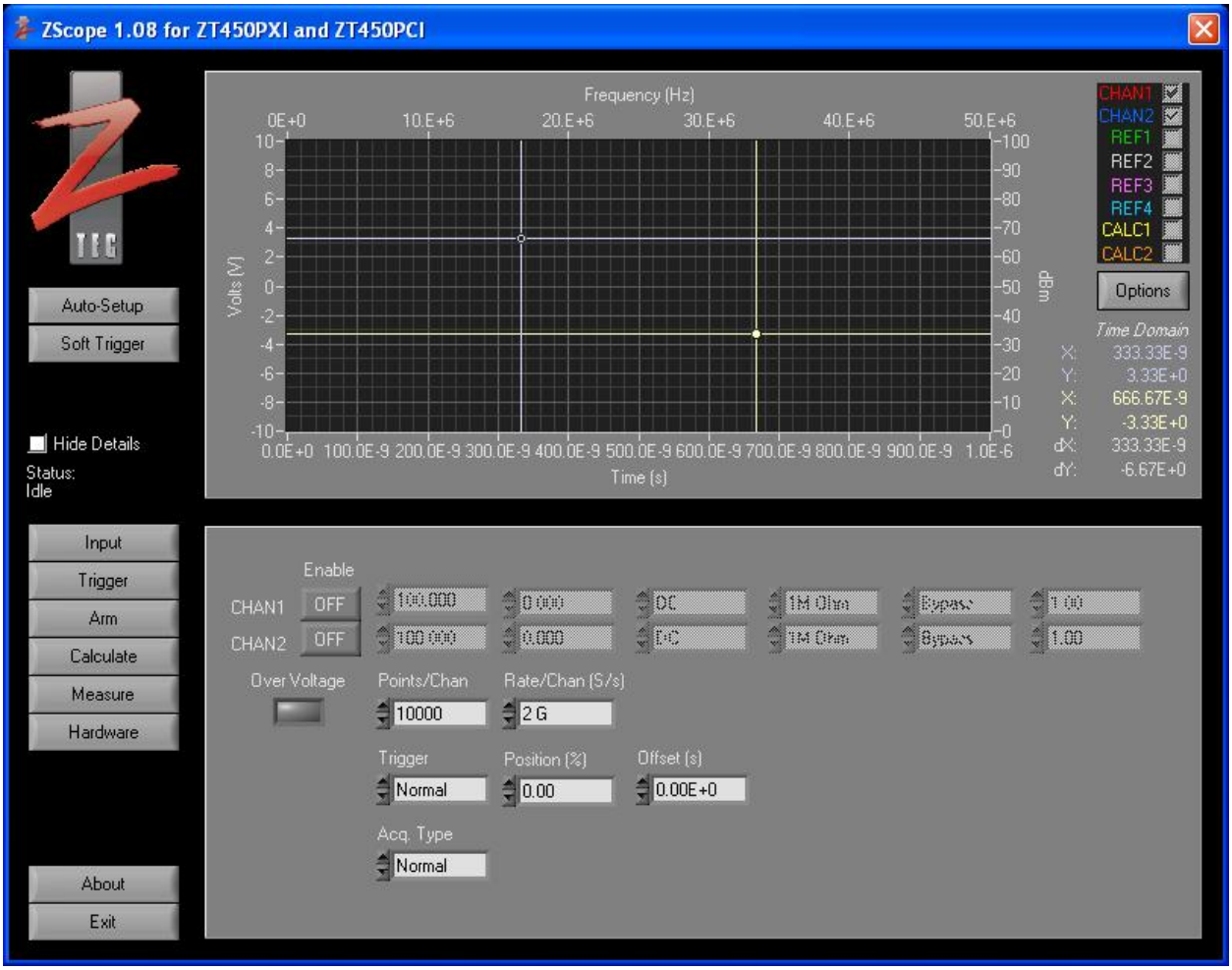

Figure 12: ZScope Soft Front Panel

You can click on “Hardware” to verify the instrument you are using is selected. This soft front panel will allow you to get started using your instrument right away.

Importing CVI Drivers into LabVIEW

Note: *If you are using LabVIEW 8.0 or later, please contact ZTEC for assistance importing the drivers.*

Using the included CVI Instrument Driver (LabVIEW 7.1 and below)

1. Before running LabVIEW:

- Find the appropriate driver on your product CD or in the .zip file downloaded from our website at www.ztec-inc.com/support
- Create a new folder for your driver under C:\ZTEC\Drivers\<*driver name*>. "C:\ZTEC\Drivers\ZT450PXI" for example.
- On the CD or in the .zip file, find the folder labeled "CVI". Copy and paste it into the new driver folder you just created.

2. Run LabVIEW:

- Create a new Blank VI
- In the Block Diagram, on the menu bar, go to Tools>>Instrumentation>>Import CVI Instrument Driver… as shown:

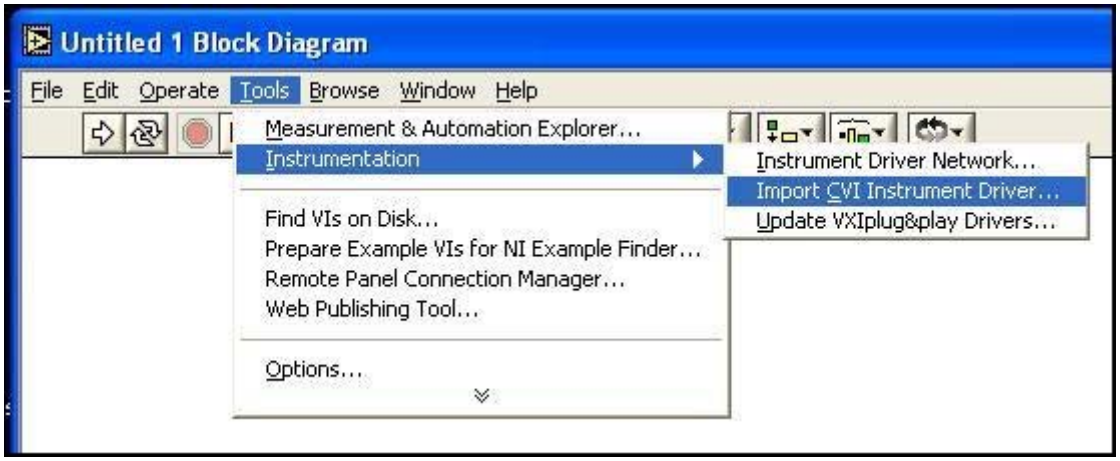

Figure 13: Importing CVI Instrument Driver

- From the dialog window, select the .fp file for the CVI driver to be imported. This file will be named similar to the instrument with which it is associated (ex. zt450pxi.fp). See Figure 14 below:

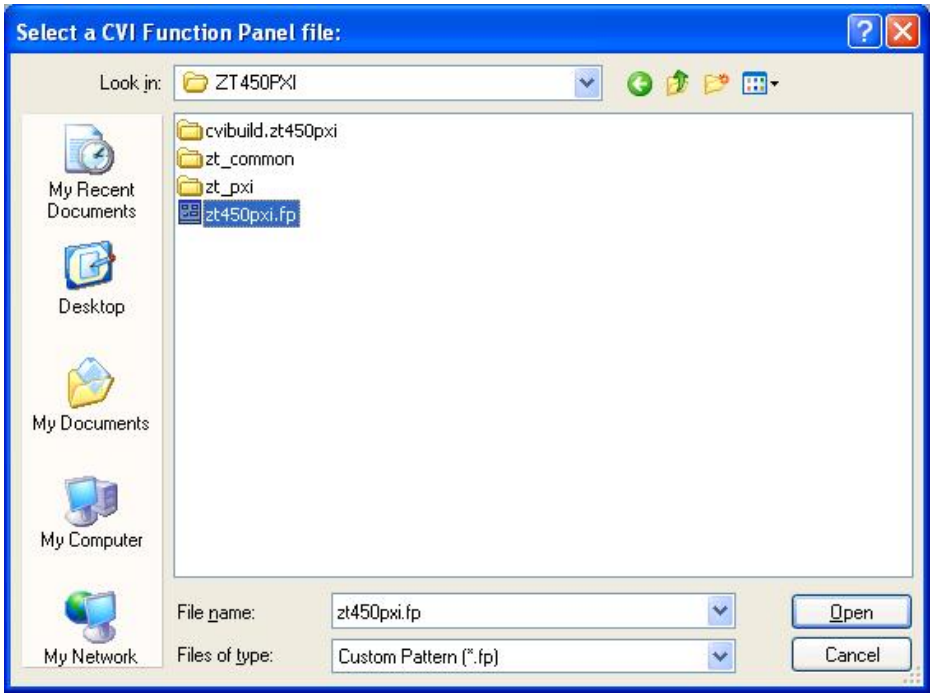

Figure 14: Selecting the Function Panel file

- After clicking OK, the following window will appear:

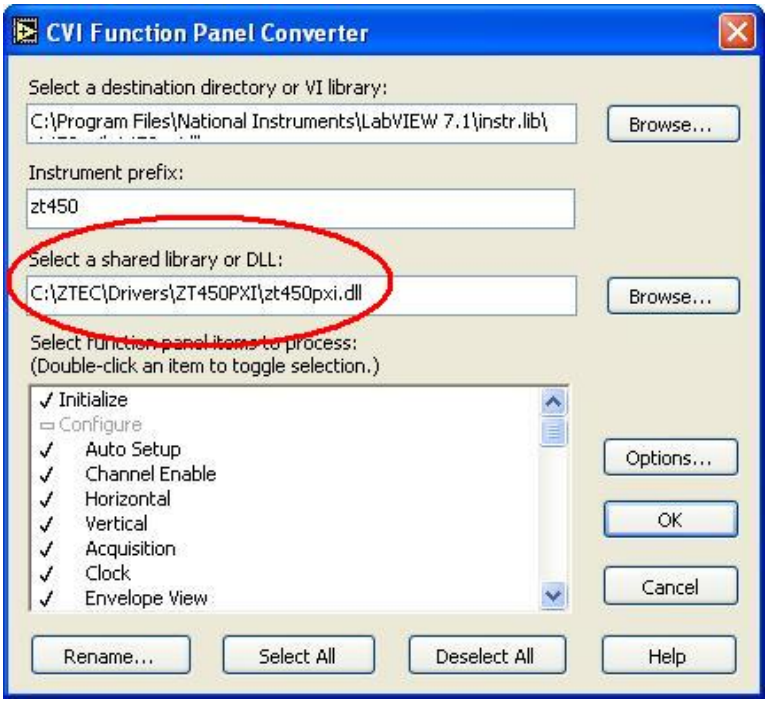

Figure 15: Function Panel Converter Window

- Under “Select a Shared Library or DLL:” click “Browse…” (the portion circled in red) and select the .dll file for the CVI driver located in the driver folder. **The default filename is incorrect.**

- Click “Options…” and set the options as shown in Figure 16:

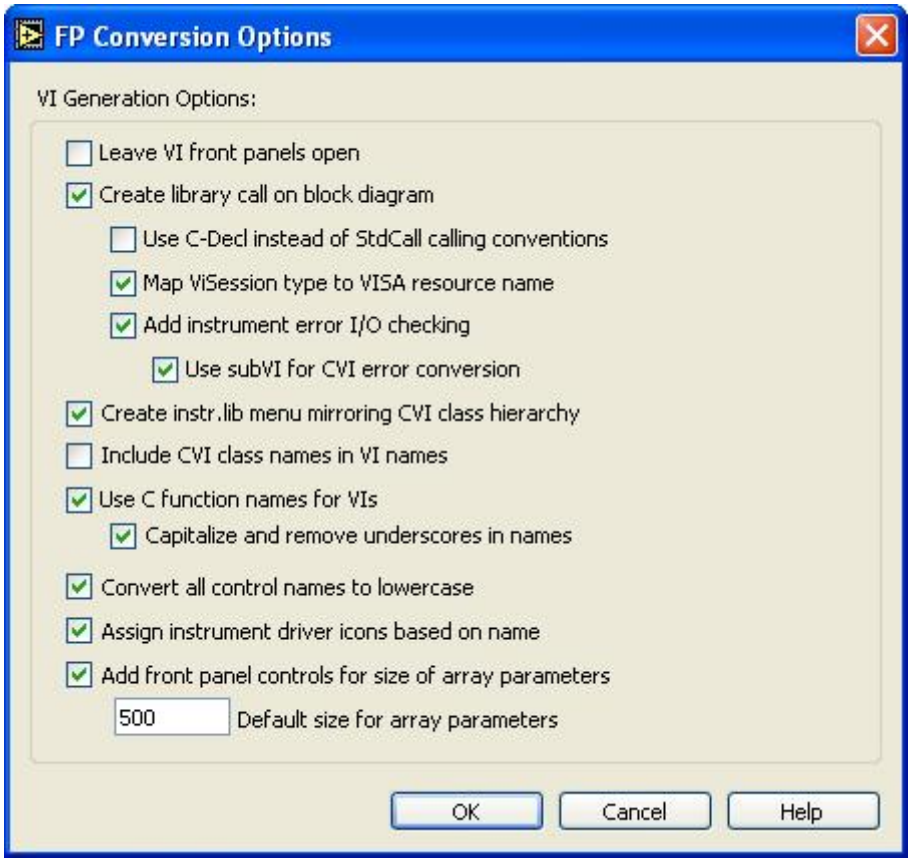

Figure 16: Converter Options Window

- Click “OK” on the options panel.
- Click “OK” on the converter panel.
- You should now be able to access the CVI driver functions from the diagram, under LabVIEW. The functions will be found, on your Functions Palette, under Instrument I/O>>Instrument Drivers then the name of the driver. All the functions will be represented here.

Application Development Environments

The following application development environments are compatible with ZTEC PXI and PCI modules:

Fully Supported:

LabVIEW 6.0 or later
LabWindows™/CVI™ 6.0 or later

Contact ZTEC for assistance with these development environments:

LabVIEW Real-Time Module 6.0 or later
Measurement Studio 6.0 or later
Microsoft Visual C++ (MSVC) 6.0 or later
Microsoft Visual Basic 6.0

Troubleshooting Installation

If you cannot find your instrument in the Windows Device Manager and you cannot see the instrument listed in NI-MAX, follow these steps to fix the problem:

1. Go to the Windows Device Manager by clicking on Start>>Control Panel>>System and then click on the "Hardware" tab where you should find the button for the Windows Device Manager.

2. Look for any "Unknown" devices or devices with big yellow question marks by them. If you find any, delete them by highlighting them and hitting "delete" on your keyboard. If it asks you if you are sure, click yes.

3. Shutdown the computer. Remove your instrument from the computer (PCI), or chassis if it is already installed.

4. Restart the computer, go to the Windows Device Manager again, and check again for any "Unknown" devices. Again, if there are some there, delete them.

5. Find the device driver for your instrument (ie. ZTEC_NT5.inf if you are using Windows XP, etc...). Right click on the .inf file and select "Install".

6. Reboot the computer (without re-inserting the ZTEC card) to be sure everything has finished installing and loading.

7. Shut down the computer and re-install the instrument.

8. Reboot the computer again. If you get a message that new hardware has been found, go ahead and tell it to install the driver automatically, and point it to the correct file.

9. Your instrument should be installed and viewable in the Device manager as well as NI-MAX. (Note: You may have to reboot one final time)

10. If the instrument is still not showing up, try re-installing the latest version of NI-VISA and reboot the machine again.

11. Contact Technical Support if none of the above steps solve the problem.

Contacting Technical Support

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www.ztec-inc.com/support

Website

Technical Support, Knowledge Base, and Release Notes	**www.ztec-inc.com/support**
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