Introduction

This document provides some basic information about what the PXI standard is, and what is required to get started.

Contents

1 What is PXI

PXI is an abbreviation for **PCI eXtensions for Instrumentation**.

PXI is based on the PCI architecture, which is a commonly-used standard in personal computers, and uses the industrial CompactPCI (cPCI) connector. A second connector adds instrumentation-specific signals to the backplane, like clock and trigger signals.

A PXI instrument inserted in the system appears to the operating system as a device, just like a PCI card in a personal computer.

Figure 1 An example of a PXI instrument

2 What do I need to get started?

The things you need to get started with a PXI instrument are described below.

2.1 A PXI chassis

The PXI chassis holds a power supply and a PXI backplane. The backplane accepts one controller (see chapter 2.2) and a number of PXI instruments (ranging from ca. 3 to 18 slots).

2.2 A PXI controller

The controller gives access to the PXI bus, where the PXI instruments are on. There are basically two types of controllers: remote controllers and embedded controllers. Both types are described below.

2.2.1 Remote controllers

A remote controller is a bridge card to connect the PXI bus in the PXI chassis to a standard PC. A remote controller set typically consists of an interface card for in the PC (PCI or PCIe), an interface card for in the PXI system, and a cable to link these two interfaces.
When using a remote controller, the PXI instruments appear to the host PC as if it were a local PCI card.

2.2.2 Embedded controllers

Embedded controllers allow you to run your software directly on the controller. Most types run MS Windows, and have keyboard/mouse/monitor/USB/Ethernet connections etc. In this case you don't need an external PC for your measurements.

Figure 2 A 4-slot PXI chassis with embedded controller and three instruments installed.

2.3 Measurement software

Since PXI instruments can be used in so many different applications, a PXI instrument typically does not come with a complete software application. The manufacturer provides a driver plus documentation, and often an example application, so that the user can build its own application.

Applicos PXI instruments come with at least a VXI*plug&play* compliant VISA driver and a LabVIEW driver.

With the VISA driver you can write your own applications in any programming language that can use standard Windows DLLs.

LabVIEW is a programming language that is often used to setup a measurement application. It is a graphical programming language, which makes it very easy for the inexperienced user to modify existing application examples, or create your own from scratch. Build the graphical user interface in the "Soft Front Panel", and build the code execution in the underlying block diagram.

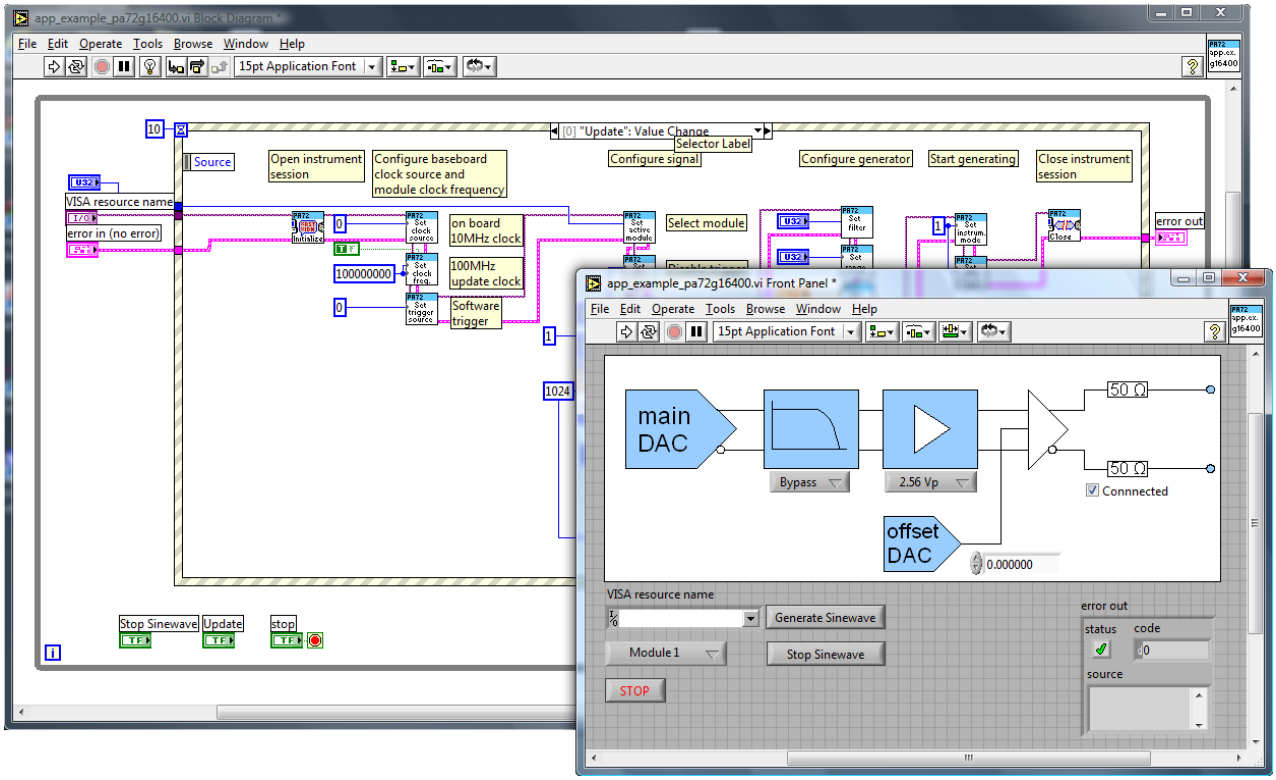

Figure 3 LabVIEW soft front panel and underlying block diagram

3 PXI Express: PXI's evolution

PXI Express, abbreviated PXIe, is the PXI counterpart for PCI Express (PCIe). It uses the PCI Express electrical standard to communicate between the instrument and the controller. PXI Express uses the same connector for the instrumentation extension, but it does not use the CompactPCI connector that is used for PXI, making the two standards incompatible. There are, however, PXI chassis that have a backplanes with both PXI slots and PXI Express slots. Also Hybrid-backplane chassis are available, accepting both standards on the same position.

4 Applicos PXI instruments

Applicos is in the PXI market since 2004. At the time of writing this document, there are PXI instruments in five categories:

- Arbitrary Waveform Generators
- Digitizers
- Multifunctional programmable Digital I/O cards
- Filter modules
- Programmable Power Supply.

Please check http://www.applicos.com/products/pxi-instruments for an overview of the Applicos PXI instruments.