PI-4005 Data Acquisition System

Features:

- Gain and Offset Correction
- 16 Megabytes of RAM
- Area of Interest
- Low Noise
- VME Backplane

The Pulse Instruments PI-4005 Data Acquisition System is designed specifically for the low noise acquisition of data from imaging devices like CMOS Imagers, CCDs, and IR Focal Plane Arrays.

The system consists of a set of low noise mainframes, the host computer, and software to setup and control acquisition of data from the device under test (DUT).

Preamplifier modules are available for applications that require close proximity of a preamplifier to the device under test.

A host of programmable features make the system ideal for Research and Development, Characterization and Product Test.

The system is designed to operate as part of an integrated Test System, or to function as a stand alone data acquisition system.

Taking advantage of the VME bus, the PI-4005 Acquisition System can acquire analog data at rates up to 40 MHz with 10 bit resolution or with up to 16 bit resolution at 2 MHz. Digital acquisition cards are also available.

The system is designed to control and synchronize multiple acquisition cards. A single mainframe can house up to eight acquisition cards and multiple mainframe configurations are available.

Separate power supplies and Separate ground systems are used for the Analog and Digital circuitry, with only the required ground connection underneath the A/D converter as the common point. This common point on the digital side of the card is supported by a separate 5V power supply. This is part of the PI-4008 analog power mainframe, and separates the A/D converter from the power supplies that are on the bus.

Each Data Acquisition Card is complete with two stages of Amplification, Filtering, Correlated Double Sampling, A/D Converter, and 16 Megabytes of RAM per channel.

An Area of Interest (AOI) feature is included for sub-image acquisition. This feature allows processing and display of a window of the focal plane of any size up to 2048 x 2048 pixels. Area of Interest acquisition provides efficient use of memory. Operations can be computed on selected pixel areas without having to acquire the entire image to save on board memory.

PI-4005 Features

Card Features

- **Analog input voltage range on the Data Acquisition PC Card is ± 10 volts (± 5V offset adjustable and ± 5V signal).**
- **A buffered analog output is available at a BNC connector for viewing the analog signal with an oscilloscope prior to A/D conversion.**
- **Correlated Double Sampling is programmable to allow selectable sampling points to within 1% accuracy of the period.**
- **Output of the A/D Converter is stored in 32 bit structure for increased system speed.**
- **There is a D/A Converter with buffered BNC output for viewing the output data from the A/D Converter.**
- **Data Acquisition Card inputs include Frame Sync, Line Sync, and Pixel Clock Input. The system allows the Frame Sync, Line Sync, and Pixel Clock Input to be used on each Data Acquisition Card independently, or to be routed through the VME backplane via the Clock Fanout Card.**

Data Acquisition Cards

- #**400550** - 2 MHz 16 Bit
- #**400540** - 8 MHz 14 Bit
- #**400530** - 10 MHz 12 Bit
- **#400510D** - Digital Acquisition Card/16 bit serial or parallel - Digital Acquisition Card/16 bit serial or parallel
- #**400520** - 40 MHz 10 Bit

PI-4005 Ordering Information

PI-4005 - Acquisition Mainframe	**Consists of the mainframe. Internal DC power supplies for the digital electronics on the output side of the opto isolators and a High Speed VME Backplane. The mainframe contains 12 VME slots, allowing installation of up to eight Data Acquisition Cards. Rackmount is standard. For benchtop systems, specify at time of order.**
PI-4008 - Analog Power Mainframe	**Supplies the DC power for the analog and "clean digital" sections of the Acquisition mainframe and PI-4007 Preamplifier Module to limit system noise.**
PI-4007 - Preamplifier Module	**Four channel programmable preamplifier designed to be placed near the dewar or device under test for signal conditioning. The Preamplifier can be used as four separate input channels, or can be mux'ed to allow the four channels to share one Data Acquisition PC Card. Requires one 40511 Preamplifier Controller PC Card per two PI-4007 Preamplifier Modules. Also requires one 40096 cable.**
40511 - Preamplifier Controller Card	**One PC Card will support two PI-4007 Preamplifier Modules (eight channels) used in the system. This card controls all of the programmable functions of the PI-4007 Preamplifier Module and is located in the PI-4005 Acquisition Mainframe.**
40502 - PCI Bus to PC to VME Adapter Card	**Adapts the VME backplane directly to the PC; includes two cards; one for the VME backplane in the PI-4005 Acquisition mainframe, and one that is installed in the PC. Requires one 40097 cable.**
40097 - Cable, VME to PCI	**Shielded, 25 ft. in length**
40096 - Cable, Preamplifier to controller	**Controlling cable from PI-4007 Preamplifier Module to 40511 Preamplifier Controller. One cable required for each preamplifier module.**

System Configuration

**Here is the configuration for a minimum system with four channels
of preamplifier mux'ed to one data acquisition channel.**

- **(1) PI-4005 Acquisition Mainframe**
- **(1) PI-4008 Analog Power Mainframe**
- **(1) Data Acquisition PC Card (any of 400520 through 400550)**
- **(1) PI-4007 Preamplifier Module**
- **(1) 40511 Preamplifier Controller**
- **(1) 40502 PC to VME Adapter PC Card**
- **(1) 40097 Cable, VME to PCI**
- **(1) 40096 Cable, Preamplifier to Controller**
- **(1) Computer Controller**