PropDAQ

USB Data Acquisition Module

Description

The PropDAQ is a module that allows interfacing electrical instruments or devices with a computer. It can take up to 4 analog electrical signals (from 0V to 5V) and up to 4 digital electrical signals (0V or 5V), converts them into digital data, and sends that data to a computer. It can also receive commands from a computer to generate up to 2 analog electrical signals (from 0V to 4V) and up to 4 digital electrical signals (0V or 5V).

The PropDAQ module incorporates a programmable controller (Propeller from Parallax) along with a dedicated circuitry to process the different electrical signals and communicate with a computer via a USB link. The module is pre-programmed with a standard firmware and a standard set of instructions, but can also be custom-programmed to perform specific functions or respond to specific commands. The module also comes with a simple data acquisition software that can run on almost any personal computer. This software is written in Python and is offered as Open Source.

Preliminary hardware specs

All I/O updated at 200 Hz / 200 updates/sec MAX.

- 4 Analog inputs single-ended
  - 0V to 5.00V
  - 12 bit precision
  - 200 Samples /sec (Single Channel) [50 Samples / sec 4 Channels)
- 2 Analog outputs
  - 0V to 4.0V (10mV to 4.08V)
  - 1/1000 precision
  - 20 Hz Modulation MAX (~ 6.8V/msec)
- 4 Digital Input
  - 0V / 5V (Protected up to 100V)
  - 200 update / sec
  - 10 kOhm impedance
- 4 Digital Output
  - 0V / 5V
  - 200 update / sec
  - 20mA / channel, 200mA total
  - Unprotected
- No additional power supply needed (powered from USB)
- Works with Windows 98, XP, vista, 7 & 8, Mac OS, Linux
- Includes drivers and OpenSource SimplePyDAQ (python)
- Includes cables and screwdriver

Preliminary PC software specs

Compatible with Windows, MacOS, Linux (written in Python).
Basic software is planned to be released as Open Source.
Saves data in csv (comma separated values) file format.
Main control panel window with all channels.
Data acquisition with timing, sampling rate, averaging, trigger.
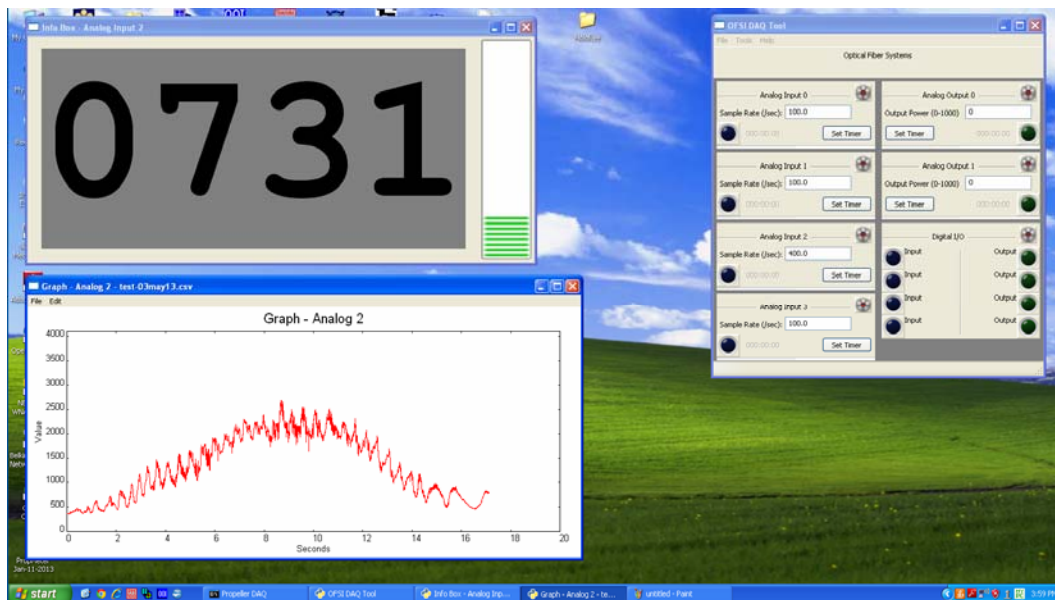
Simple display tools:
    Large billboard display (numeric value and bar graph)
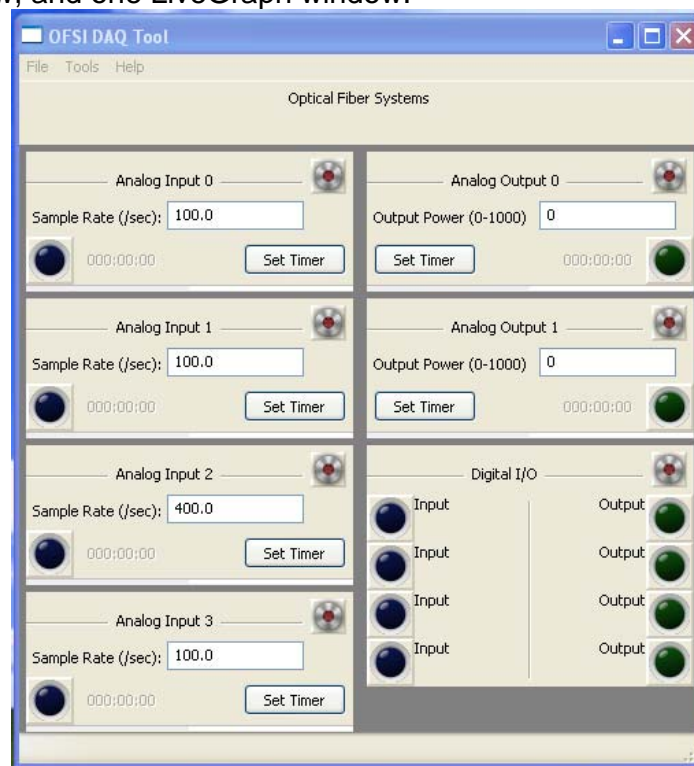   Simple time graph
    Data scan (single point acquisition from push-button or trigger)
    Basic function generator (pulse, square wave, saw-tooth, sine wave)
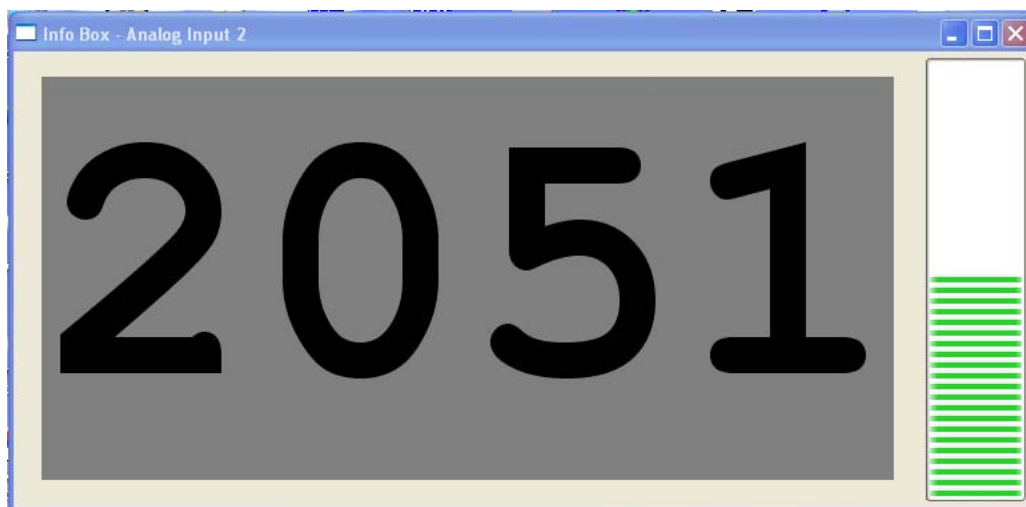
Easily expandable: add your own tools or functions.

Typical screen shot running PropMeter, with the MainControlPanel Window, one Billboard window, and one LiveGraph window.
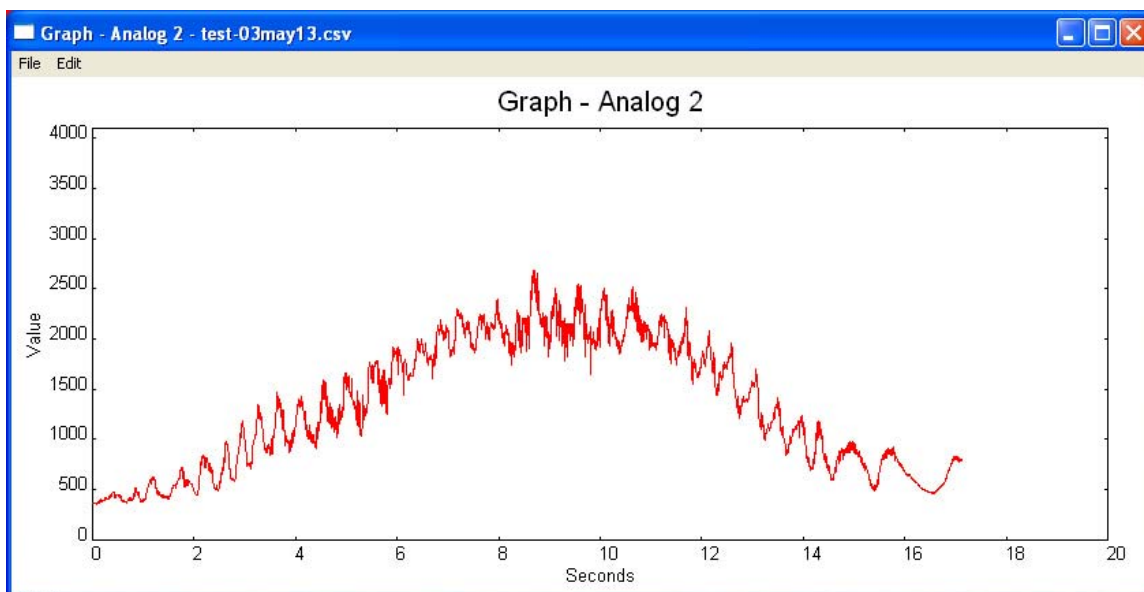

Main control panel window. This lets you access all the functions, including start/stop acquisition, file saving, channel selection, graph display, etc…

Large "billboard" display of selected input channel. Display includes numeric value (0 to 4096) and bar graph on the side.
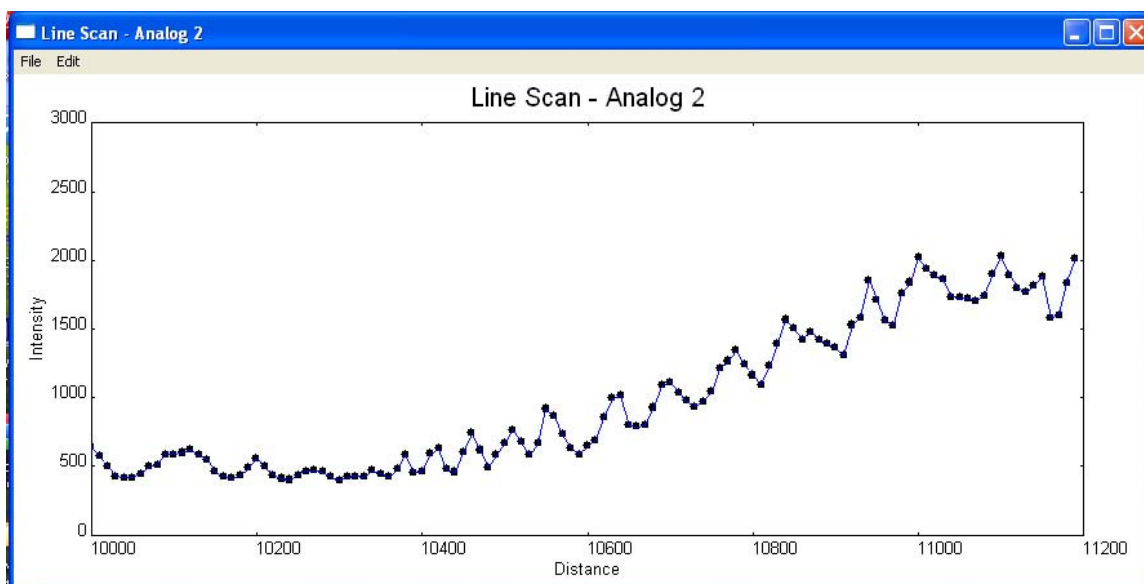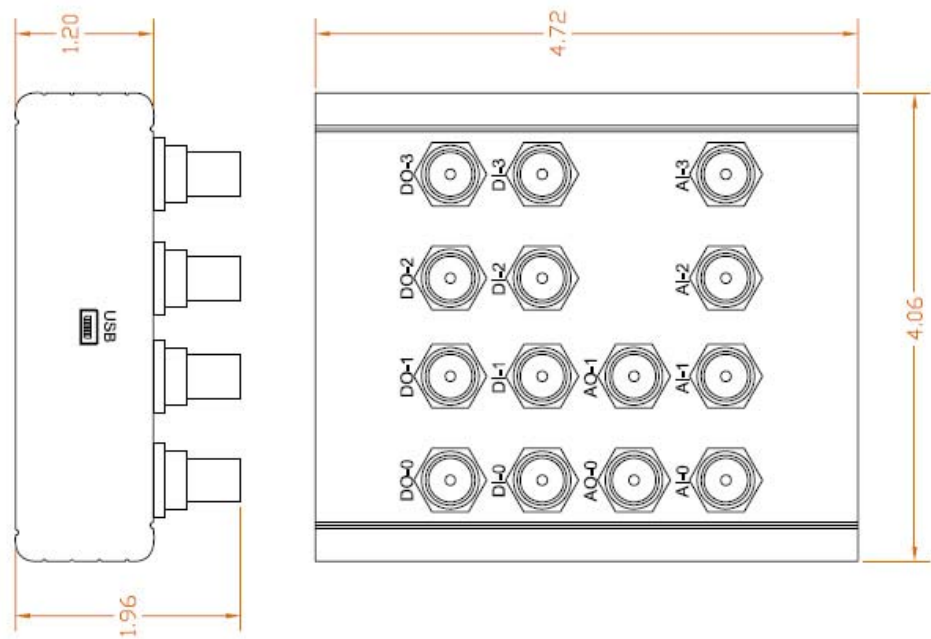

Graph display of a LineScan. Each data point is acquired when a selected trigger event happens.

Basic graph window. Displays live data being acquired. Both axis can be re-scaled or auto-scaled. Maximum of 4000 points displayed (earlier points are dropped off the graph but are kept in memory).

Mechanical Outline

Option A – BNC Connectors

Option B – Terminal Block