

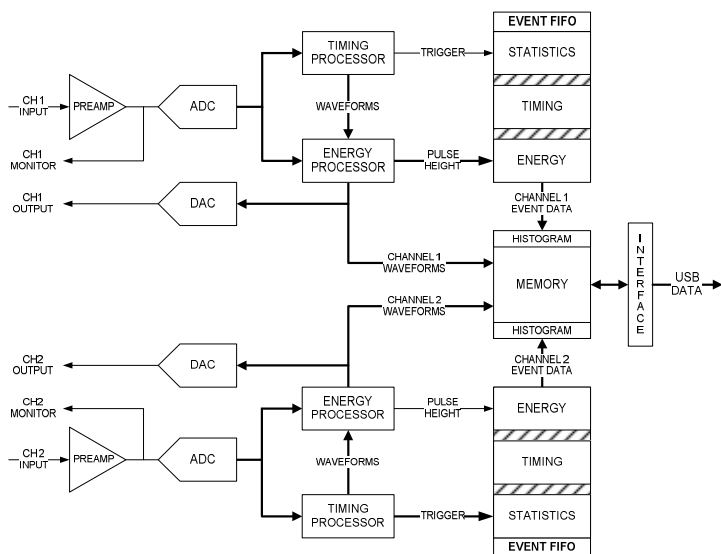
## Description

- Two Channel Pulse Analyzer
- Pulse Height / Pulse Timing
- General Purpose Lab Instrument
- USB Interface to Computer
- GUI Configurable
- Real-Time Display and Logging
- Log File Playback



## Applications

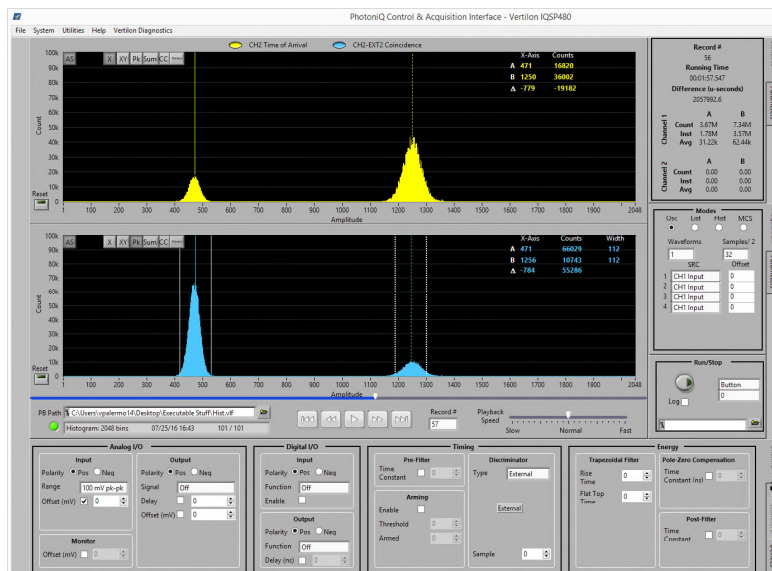
- Waveform Digitizer
- Multichannel Analyzer (MCA)
- Pulse Height Analyzer (PHA)
- Time-to-Digital Converter (TDC)
- Coincidence / Anti-Coincidence Detector
- Programmable Discriminator
- Charge to Digital Converter (QDC)
- Single Channel Analyzer (SCA)
- Time of Flight
- Gated Integration
- Particle Counter
- Signal Delay
- Multichannel Scaler (MCS)
- Pulse Shape Analyzer



SIMPLIFIED BLOCK DIAGRAM

## Key Features

- Two Independent Processing Channels
- 500 MHz Waveform Sampling
- Two Programmable Analog Outputs
- Easily Configured Using Full Function GUI
- Programmable Time and Energy Filters
- Selectable Discriminators
- Up to 16K MCA Bins
- Time to Digital Conversion
- Front Panel Counting Statistics



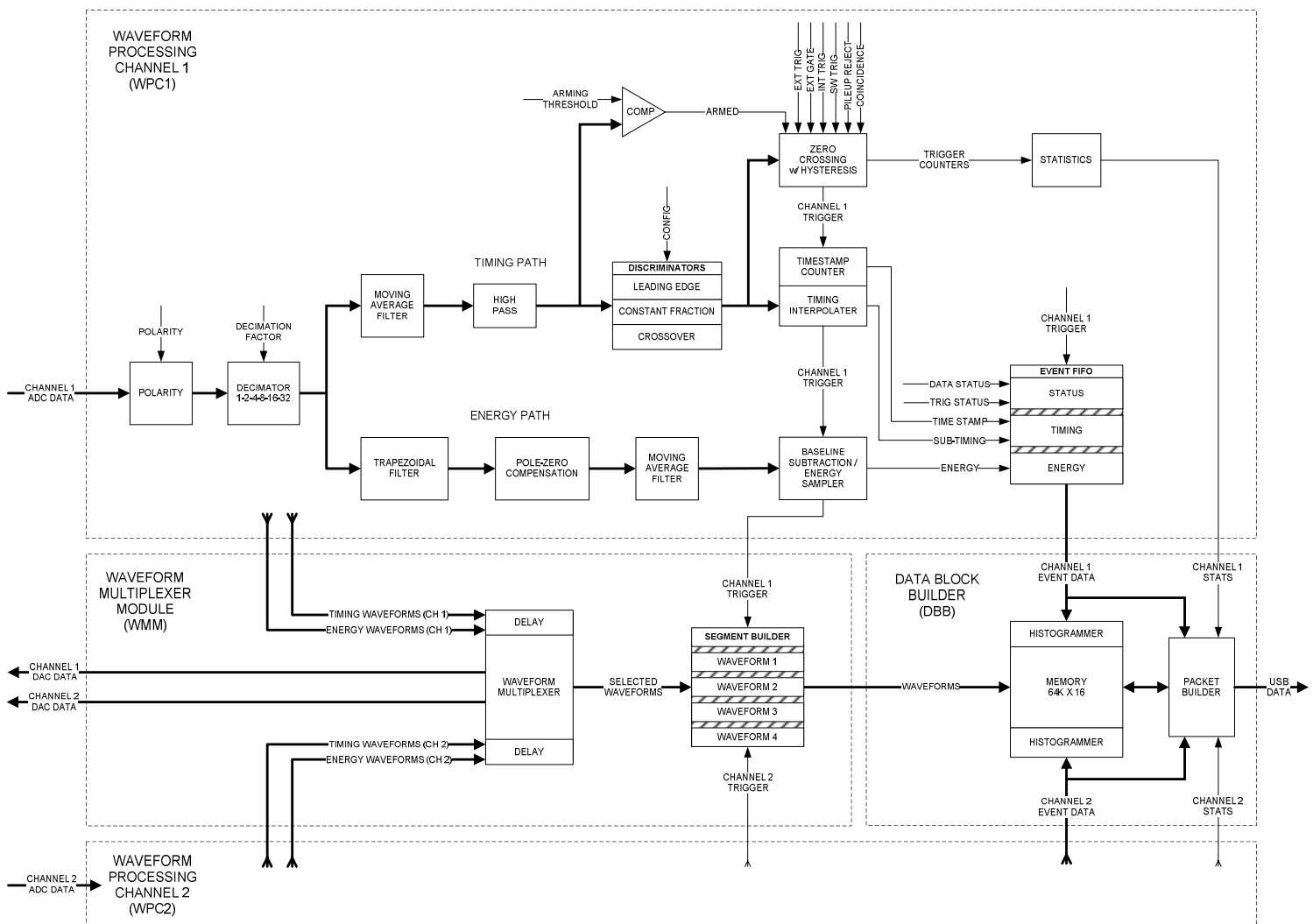
# DPA201 Two Channel Pulse Analyzer

## Description

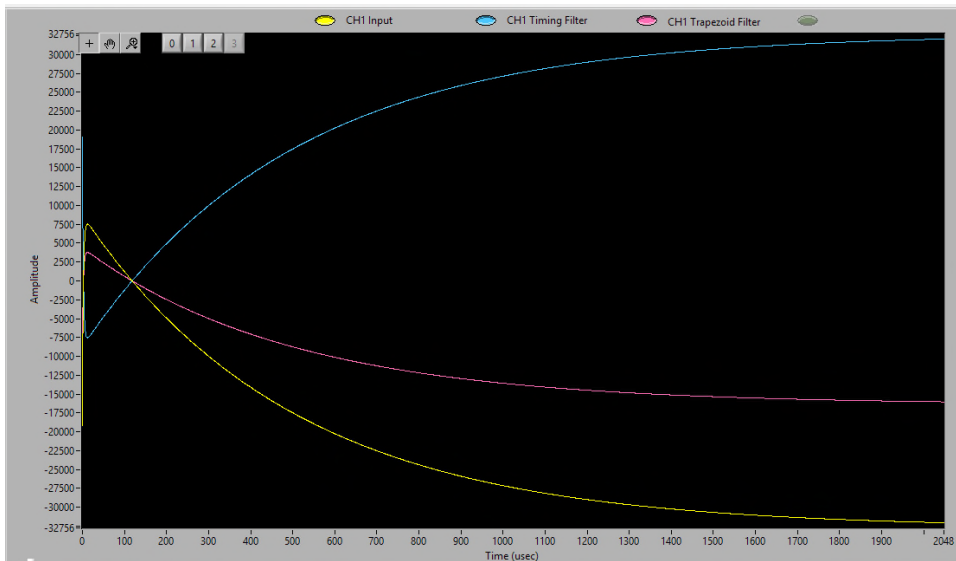
The Vertilon Model DPA201 is a two channel general purpose pulse height / pulse timing analyzer. It is implemented as a stand-alone programmable laboratory instrument with a PC interface that is ideal for use as a pulse height analyzer (MCA), time-to-digital converter (TDC), waveform digitizer, coincidence / anti-coincidence detector, discriminator, particle counter, multichannel scaler (MCS), charge-to-digital converter (QDC), or pulse shape analyzer.

The DPA201 has the capability to operate in four acquisition modes — oscillogram, list mode, histogram, and multichannel scaler (MCS). The standard software package for the DPA201 supports oscillogram mode where the unit operates as a two channel pulse digitizer configurable through the included graphical user interface. This mode is used to capture and stream pulse waveform segments to the GUI for real-time display and logging to the computer. It is extremely useful for setup, diagnostics, and implementing user-defined off-line waveform processing functions. Each input channel consists of a fully programmable timing signal path comprised of noise reduction filters, an arming circuit, and three types of user-selectable discriminators. The timing path generates high resolution timestamps and trigger signals that are used by the energy path in the other acquisition modes. List mode, histogram (MCA) and multichannel scaler (MCS) functionality are available separately through optional software upgrades. In list mode, pulse height signals are processed in the energy path by a moving average noise filter, a trapezoidal shaping filter, a pole-zero compensator, and baseline subtractor. The resulting energy and timestamp data are displayed in the GUI and logged to disk. The system's playback mode allows log files to be retrieved from disk and played back in the GUI display. Energy and time data can be further processed with the optional histogram and MCS software.

## Digital Processing Unit

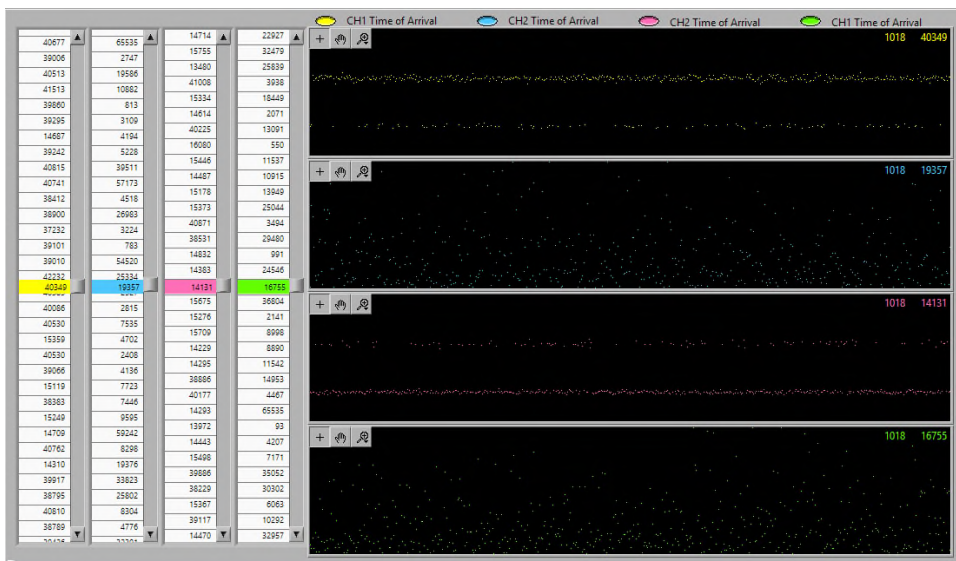


## Acquisition Modes



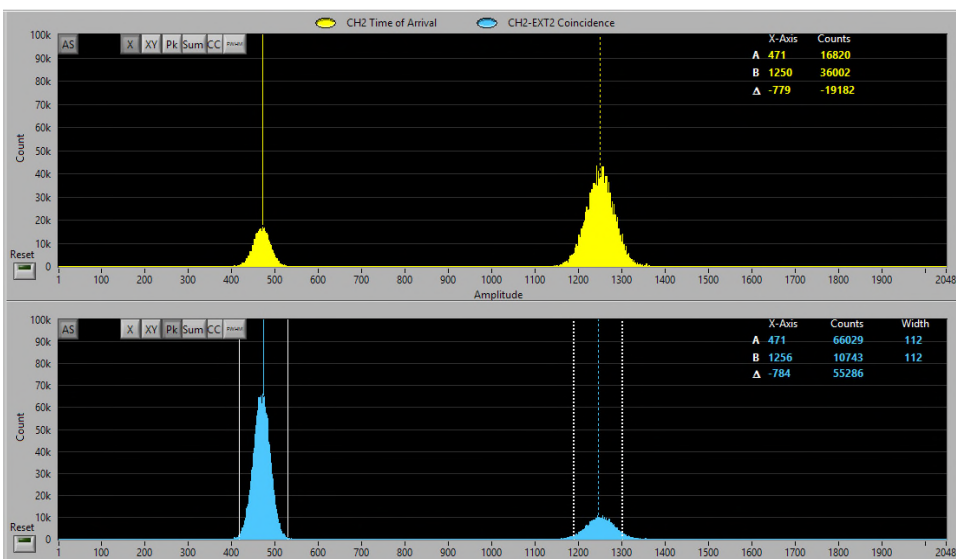
### Oscilloscope

- Real-Time Waveform Display
- Up to Four Waveforms
- Selectable Timing / Energy Signals
- Variable # of Samples per Waveform
- Dual Cursor Set
- High Speed Waveform Logging
- Playback of Logged Files on Display



### List Mode

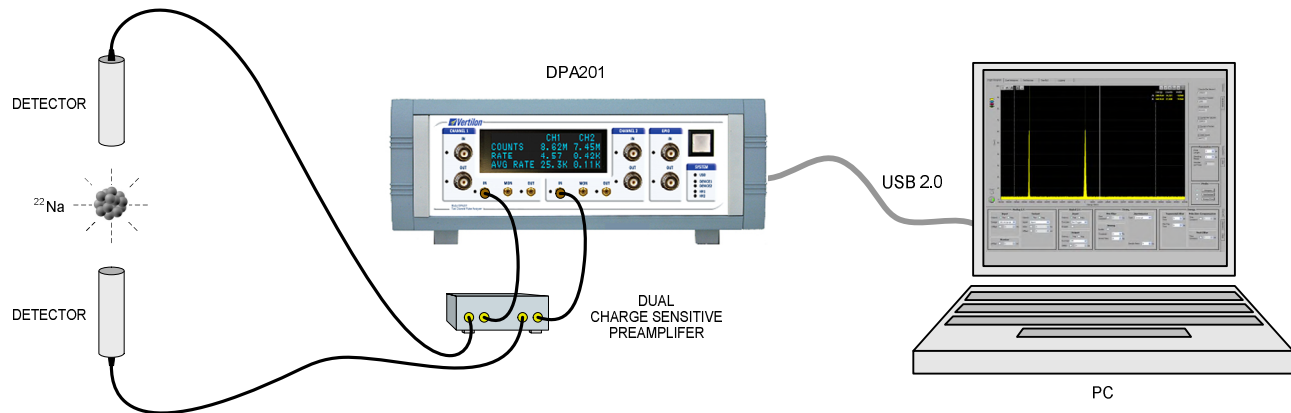
- Up to Four Lists of Data
- Height, Time of Arrival, Delta Time
- Real-Time Display of Lists
- Programmable Timing Parameters
- Programmable Energy Parameters
- High Speed List Data Logging
- Playback of List Files on Display



### Histogram

- Single/Dual Histogram Display
- Energy/Time Data Plots
- Live Histogram Display
- Region of Interest Cursors
- Programmable Number of Bins
- Histogram Logging
- Histogram Playback

## Typical Time of Flight Application



## Specifications

### I/O

**Analog:** Two input, two output, and two monitor channels

**Digital:** Two trigger / gate inputs, two timing / sync outputs, one general purpose input, one general purpose output

### Performance

**Analog Front End:** Bipolar 3.2 V pk-pk input range, six factor of 2 gain settings, +/- 5V offset control, 50 ohm input

**ADC:** 500 MHz sampling, 12 bit resolution

**Decimation Factor:** 1-2-4-8-16-32

**Analog Output:** +/- 1V into 50 ohms,

**DAC:** 500 MHz update rate, 14 bit resolution

### Count Statistics

**Log File Size:**  $4.3 \times 10^9$  events maximum

**Continuous Running Time:** 1,193 hours

**Event Counters:**  $2.8 \times 10^{14}$  counts maximum

### Timing

**Discriminators:** Leading edge, crossover, constant fraction

**Trigger Qualifiers:** Internal, external, external gate, software, pile-up reject, coincidence, anti-coincidence, energy level

**Moving Average Filter:** Up to 1 usec differencing time

**Crossover Discriminator:** Double differencer, 1 usec delay max

**CF Discriminator:** 0.1 to 0.5 fraction, 1 usec delay max

### Energy

**Trapezoidal Filter:** Up to 2 usec rise / fall time, 32 usec flat top

**Pole-Zero Compensation:** Up to 128 usec

**Post Moving Average Filter:** Up to 500 nsec

**Amplitude Dynamic Range:** 20 bits

**Amplitude Data Width:** 16 bits

**Processing:** Pile-up rejection, baseline subtractor

### System

**Acquisition Modes:** Oscilloscope, list mode, energy histogram, timing histogram, data logging, playback of logged files

**Oscilloscope Mode:** Up to 4096 samples

**Histogram Mode:** Up to 16K bins

**Front Panel Display:** 20 character x 4 line OLED

**Front Panel Indicators:** Data active, input overload

**Graphical User Interface:** PC-based, LabView DLL

**Operating System:** Windows XP or higher

**Interface:** USB 2.0 to PC

**Power:** +5V wall transformer included

**Dimensions:** 250mm x 85mm x 260mm (W x H x D)

## Ordering Information

Model		Description
DPA201		Two channel pulse analyzer with oscilloscope, timestamps, and count statistic software
SFM01	<b>L</b>	List mode software includes energy data, time of arrival and time difference
SFM02	<b>H</b>	Histogram software includes energy histogram, time of arrival histogram, and multichannel analyzer capability
SFM03	<b>M</b>	Multichannel scaler software
SFM04	<b>T</b>	Tool kit software includes coincidence / anti-coincidence detector, programmable analog outputs, and charge-to-digital converter (QDC)



Vertilon Corporation has made every attempt to ensure that the information in this document is accurate and complete. Vertilon assumes no liability for errors or for any incidental, consequential, indirect, or special damages including, without limitation, loss of use, loss or alteration of data, delays, lost profits or savings, arising from the use of this document or the product which it accompanies. Vertilon reserves the right to change this product without prior notice. No responsibility is assumed by Vertilon for any infringements of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under the patent and proprietary information rights of Vertilon Corporation.