



- Data acquisition and graphics system for the vision sciences
- DVI input from laptop or PC
- Dual synchronized VGA outputs with 16-bit video DACs
- Fast 16-bit data ADCs/DACs
- Stereo audio input/outputs
- 24 TTL trigger input/outputs
- All analog and digital inputs/outputs feature microsecond synchronization to video refresh



Now for Mac OS X and Windows!

## DATAPiXX Features

### Multi-Function Integration and Synchronization

VPiXX Technologies introduces DATAPiXX, a multi-function data and video processing USB peripheral for vision research. This highly integrated device incorporates subsystems for video I/O, analog data I/O, audio data I/O, and digital data I/O. Integrating these functions within a single device enables all of the subsystems to be synchronized to the video refresh with microsecond precision.

### Video Processing

The DATAPiXX video subsystem converts a dual-link DVI digital video input from the host computer (or laptop), into VGA analog video outputs. The VGA outputs feature full 16-bit video DACs for ultimate precision in very low contrast stimuli. A second VGA output head can show the tester a mirror of the primary stimulus display; or alternatively, the left/right halves of a wide DVI input image can be split onto the two VGA displays, ensuring perfect frame synchronization between the left/right displays. To further support stereo applications, the DATAPiXX also includes a standard VESA mini-DIN-3 connector for interfacing with stereo goggles.

### Analog Inputs

The DATAPiXX analog subsystem includes 16 ADC (Analog-to-Digital Converter) channels, with 16-bit precision and  $\pm 10V$  input range. The maximum sampling rate is 200 kSPS, and all 16 channels are simultaneously sampled for evoked potential and other applications sensitive to sampling phase. ADC sample rate can be specified in samples per second, samples per video frame, or nanoseconds per sample, and sampling can be synchronized to video refresh with microsecond precision.

### Analog Outputs

The DATAPiXX analog subsystem contains 4 DAC (Digital-to-Analog Converter) channels, with 16-bit precision and up to  $\pm 10V$  output swing. The maximum update rate is 1 MSPS, and all 4 channels update simultaneously. DAC update rate can be specified in samples per second, samples per video frame, or nanoseconds per sample, and waveform onset can be synchronized to video refresh with microsecond precision.

### Audio I/O

The DATAPiXX contains a stereo audio CODEC which can bias and convert a stereo microphone input. The CODEC can also

drive a 96 kSPS audio stimulus directly into headphones or  $8-\Omega$  speakers. Stimulus phase between audio-left, audio-right, and video refresh, can be controlled with microsecond precision for cross-modal research.

### Digital I/O

The DATAPiXX contains 24 TTL inputs, and 24 TTL outputs. Inputs are pulled up, so simple response boxes can be read with no additional hardware. TTL input transitions are timetagged enabling response-time calculation with microsecond precision. Similarly TTL outputs can be scheduled to transition at a specified point within a video frame, enabling simple triggering of external testing hardware.

### USB

A USB 2.0 interface is used for communicating between host software and DATAPiXX on-board registers and buffer memory.

### Software

The DATAPiXX is delivered with a low-level "C" API, and MATLAB/Octave libraries for Mac OS X and Windows XP. In addition, the DATAPiXX is directly supported by the VPiXX high-level OS X testing application.



## DATAPixx Specifications

### Video Processing

- DVI input: Dual link on DVI-I connector
- DVI input frequency: 25 MHz to 330 MHz
- VGA output channels: 2 ch on db-15 connectors
- VGA video DAC resolution: 16 bits per RGB gun
- VGA maximum dot rate: 200 MHz (per VGA channel)
- Maximum vertical refresh rate: 200 Hz

### • Analog to Digital Converters

- Number of channels: 16 (or 8 differential), on db-25
- Converter resolution: 16 bits
- Maximum sampling rate: 200 kSPS per channel
- Frequency programming modes:
  - samples per second, or per video frame
  - nanoseconds per sample
- Simultaneous sampling across all channels
- Input range: +-10V
- Input impedance:  $1.6 \times 10^8 \Omega // 3 \text{ pF}$
- Absolute maximum input tolerance: +-12V

### Digital to Analog Converters

- Number of channels: 4 on db-25 connector
- Converter resolution: 16 bits
- Maximum sampling rate: 1 MSPS per channel
- Frequency programming modes:
  - samples per second, or per video frame
  - nanoseconds per sample
- Simultaneous output updates
- Output ranges: +-10V on 2 ch, +-5V on 2 ch
- Drive capability: +-25 mA

### Audio CODEC

- Audio line in, microphone in, speaker out, on 3.5 mm jacks
- Stereo microphone input amplifier resistance: 20 k $\Omega$
- Microphone sampling rate: 96 kHz
- Programmable microphone bias voltage range: 2.0 V to 3.1 V
- Stereo DAC sampling rate: 96 kHz
- Maximum output power into 8  $\Omega$  load: 500 mW

### Digital I/O

- Number of digital inputs: 24 on db-25 connector
- Input termination: >20 k $\Omega$  pullup to 3.3V
- Input tolerance: 5V
- Number of digital outputs: 24 on db-25 connector
- Output drive stage: 5V through 25  $\Omega$  series resistor
- Maximum output current:
  - source: 15 mA
  - sink: 12 mA

### General

- USB 2.0 with 480 Mbit/s theoretical maximum bandwidth
- On-board memory: 128 MBytes for buffering I/O data.
- Operating temperature: 0°C to 70°C
- Enclosure: steel, with 19" rack-mount hardware available
- Dimensions:
  - 11.70"Wx5.58"Dx2.10"H
  - 29.72Wx14.17Dx5.33H cm.
- Power requirements: 5 VDC @ 4 A, 20 W max. (international AC adaptor included)

## Ordering Information

**Description: DATAPixx**

**Ordering Number: VPX-DPX-1001C**