Pixie Link

Instruments That Advance The Art

Pixie Link

Multi-Channel Desktop Digital Pulse Processor

FEATURES

- Compact standalone detector readout electronics
- POSIX SMP real-time OS
- On-board MCA spectra
- Waveform capture and Pulse Shape Analysis
- Web interface
- 10 Gbps Ethernet output for list-mode data
- Sub-nanosecond time resolution
- C/C++ SDK for custom apps

OVERVIEW

The Pixie Link is a multi-channel digital pulse processor designed for high-precision experiments using HPGe, scintillator, or silicon detectors. Besides nuclear spectroscopy, the Pixie-Net XL can be used for neutron/gamma discrimination, time-of-flight measurements, and coincidence/anti-coincidence measurements.

Built on XIA's proven digital pulse processing, the Pixie Link combines an embedded POSIX SMB real-time OS with a high-speed FPGA. This combination provides you not only with energy and time, but also with digitized waveforms, CFD, and pulse-shape analysis. These data make the system capable of instrumenting nearly any experiment that requires robust data acquisition.

The Pixie Link delivers a complete, network-integrated solution for demanding applications. It works with commercial off-the-shelf networking gear making integrating with existing networks much easier. The desktop form-factor makes the system easy to install near the detectors. Co-location shortens your cable lengths and can reduce your overall experimental costs.

APPLICATIONS

- Scintillator, HPGe, Si detectors
- Real-time Pulse-Shape Discrimination
- Clover detectors
- Distributed Data Acquisition
- Homeland Security
- OEM systems
- Remote monitoring

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ARCHITECTURE

Two Signal Processing Units with

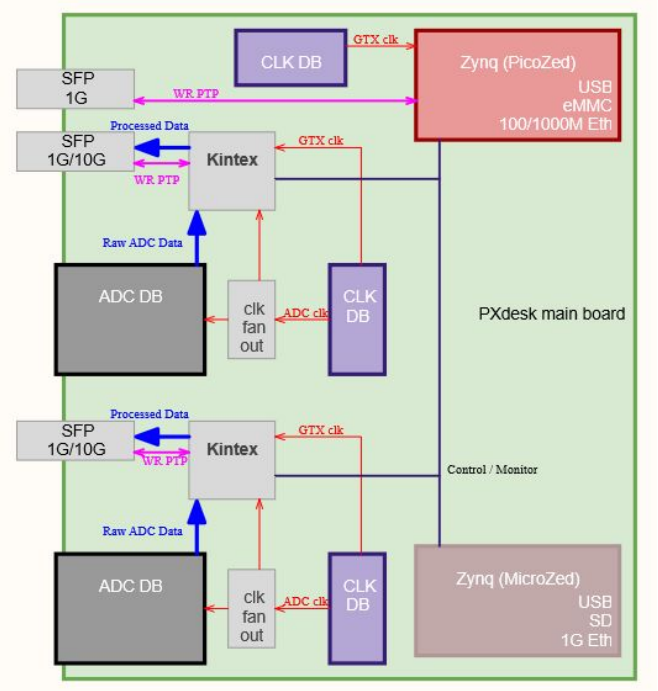
- 8 channels, 14bit, 250 MHz, variable offset, fixed gain, 0.1" header input connectors
- Total power consumption ~40 W

Two Pulse Processing FPGAs With

- High speed LVDS I/O to daughtercard
- Dedicated SFP cage for 1 or 10 Gbps Ethernet (copper or optical)
- 4 Gbit DDR3 SDRAM
- List mode data output rates up to 500,000 events/s, 70 MB/s (1G) or 350 MB/s (10G)

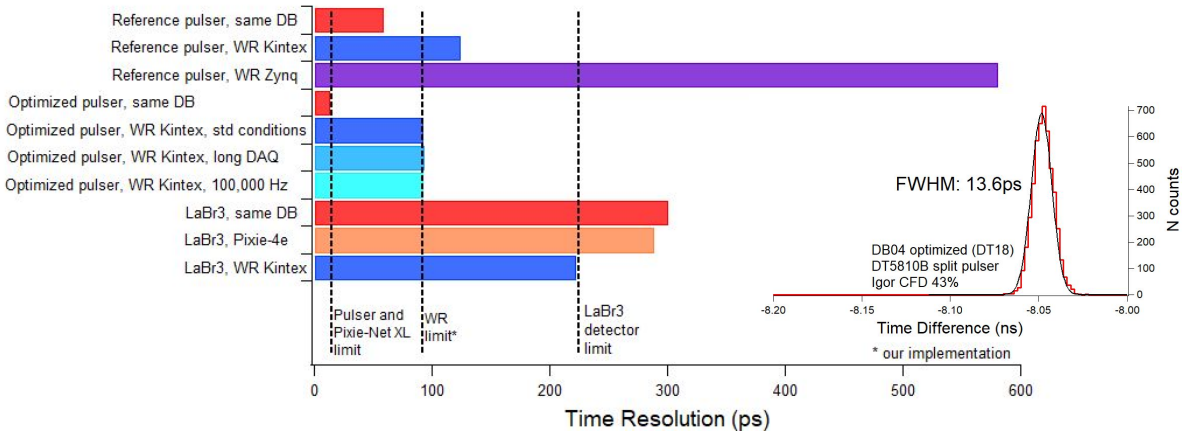
Embedded operating system

- RTEMS
- Embedded web page for monitoring and configuration
- Gigabit Ethernet control network
- 10 G SFP+ for list-mode data network



High Speed Data Flow: ADC ► FPGA ► SFP

Timing Performance



Summary of time resolution for split pulser and scintillator pair, same daughtercard or White Rabbit synchronization

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