PandA Motion Project - A Collaboration Between SOLEIL and Diamond to Upgrade Their 'Position and Acquisition' Processing Platform

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Collaboration

PandA will provide a common synchronous triggering and data capture platform for simultaneous and multi-technique scanning applications with support of multiple encoder standards.

- Both institutes want to standardize hardware, in order to reduce number of systems which need to be developed and maintained by the support staff.
- Develop a ready to use and complete solution, in order to install quickly and easily all the hardware and software components.

It will provide a flexible and open solution to interface different third party hardware (detectors and motion Controllers).

Hardware Architecture

- Supports multi-channel TTL and LVDS I/O.
- Wide range of encoder standards (Incremental, SSI, EnDat and BisSS) via RS485.
- A fully compliant Low-Pin Count FMC slot.
- 3-Channels of SFP Gigabit Transceiver interface.
- Gigabit ethernet connectivity.

Firmware Design

- Multiple instances of Function Generator, SR Gate, Pulse Generator, Divider, Sequencer and Clock Generator blocks.
- Multiple instances of Encoder Input and Output, Quadrature Input and Output, Counter/Timer and Analog I/O (via FMC) blocks.
- Multiple Position Compare and Capture blocks.

Mechanics

PandA will consists of a 1U metal box, with BNC and LEMO connectors for single ended, differential signals and Gigabit Ethernet on the front panel. 15-way D-type connectors for RS485 encoder signals and power on the back panel.

Software Architecture

The Zynq-Arm will run linux and use a dedicated linux device to tightly integrate with the FPGA logic.

Common Layers:
- Kernel driver.
- TCP Server for data and control.

PandA will be integrated either with an EPICS IOC, a webserver interface, or with a separate TANGO server.