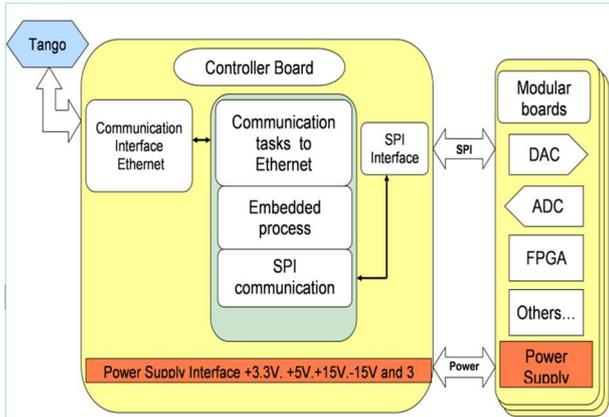


Principle of SPI BOARD PACKAGE

✓ It's a set of electronic boards developed by ECA group. These boards can be connected together in daisy chain and communicate to the embedded controller by SPI Bus.

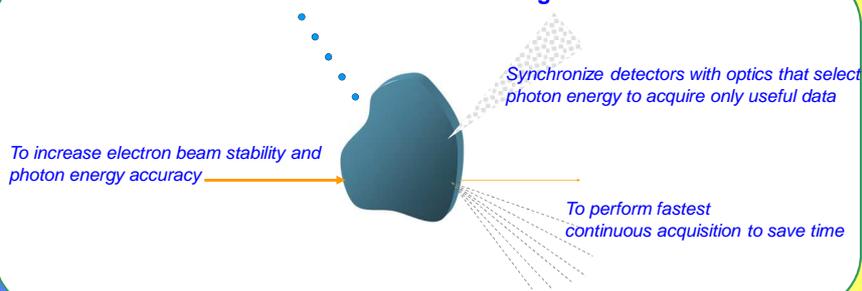
Architecture



Objectives

- Development of a new platform with up to date components that allows:
- Build solution for application requiring synchronization
 - Modulare systems with board communicating in SPI
 - Easy to connect to a control system via Ethernet.
 - Development with simple and reliable tools.
 - Embedded low level Code

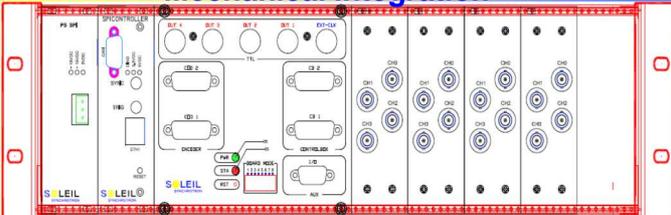
What's are our current challenges ?



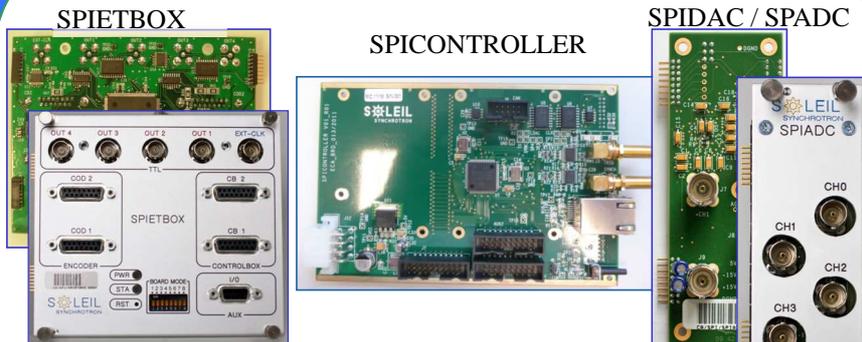
Technical choices

- Microcontroller ARM cortex M3
 - Microcontroller multipurpose used in industry and medical applications
 - Integrated Ethernet controller
 - ✓ Ethernet 10/100 MAC&PHY
 - On chip Memory
 - ✓ 256KB Flash
 - ✓ 96KB SRAM
 - Cortex Processor Core 80MHz .
 - 2 SPI interfaces
- Tools Keil with RTX operating system and TCPnet TCP/IP stack

Mechanical Integration

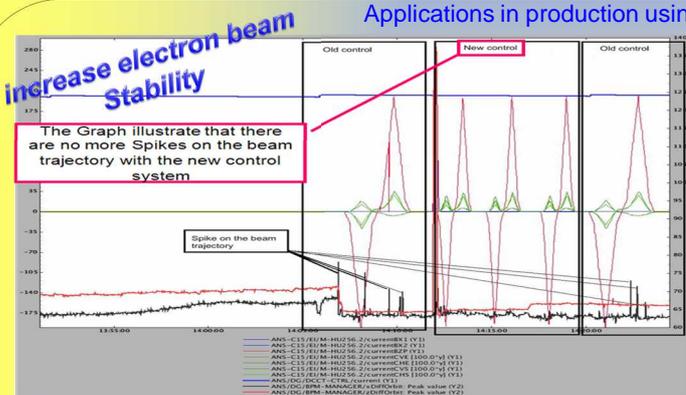


The existing Boards



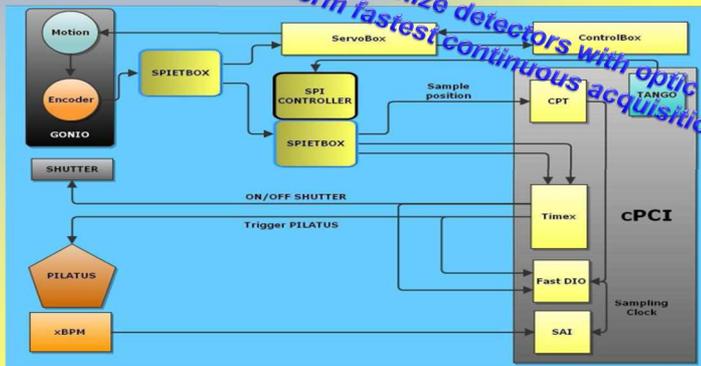
- SPICONTROLLER : Controller board based on ARM Cortex M3
- SPIDAC: DAC 4 channels board, 16 bits, 10V
- SPIADC: ADC 4 channels board, 16 bits, 10V
- SPIETBOX: Processing encoder signal board based on Xilinx FPGA SPARTAN III, 4 Encoder inputs/outputs, 4 TTL Outputs, 1SPI interface (Works in standalone or connected to SPICONTROLLER)

Applications in production using SPI Board Package



Acquisition showing the difference between old control system of HU256 undulators and the analog control made with the SPI Package. In this application we use SPICONTROLLER and SPIDAC and the process to control the undulator is embeded in SPICONTROLLER

*Synchronize detectors with optic
Perform fastest continuous acquisition*



architecture implemented with SPICONTROLLER and SPIETBOX to make continous scan using Pilatus detector. It allows to:

- Synchronize goniometer position, Shutter aperture and Pilatus acquisition
- Check that acquisition is well done during scan