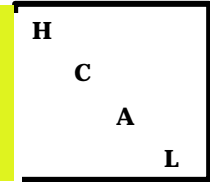




# RBX Monitoring



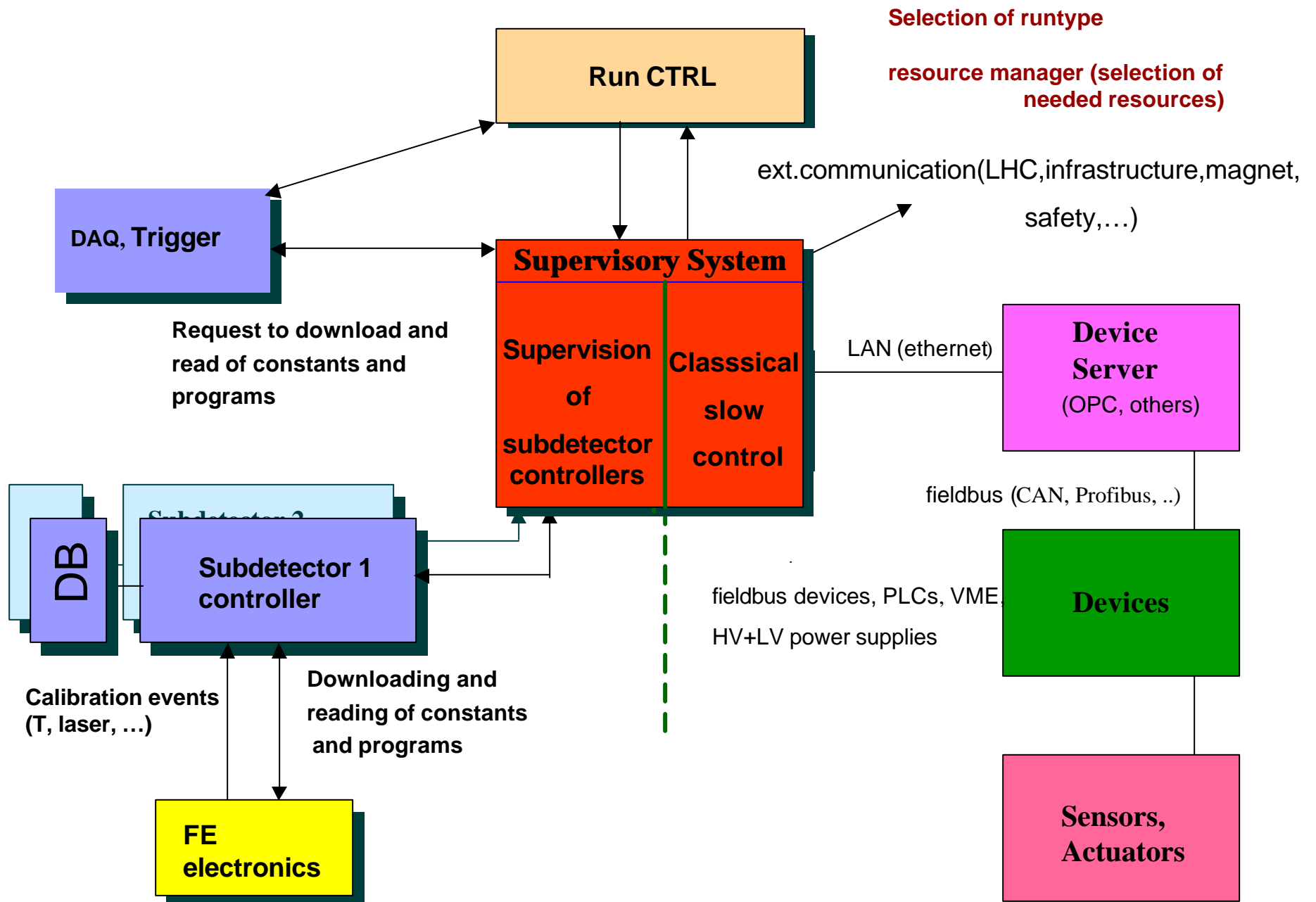
## RBX Production Readiness Review

### Monitoring, Fieldbus and DCS

John E. Elias

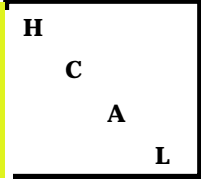
HCAL Electronics Coordinator

# Architecture of the CMS control system (functional block diagram):





# Clock and Control Module



## One clock and control module per RBX

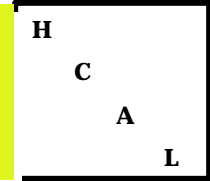
- Star configuration, not daisy chained

## Control functions

- Download the Channel Control ASICs
- Readback (verify) the Channel Control ASICs
- Configure the TTC Rx
- Readback the electronics temperatures
- Readback the low voltage supply values
- Execute master reset on command
- Translate between fieldbus and RBX serial bus



# Design Basis



## Proven CAN bus technology

- ATLAS Tile Calorimeter
- ATLAS DCS

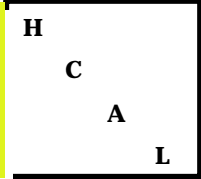
## Radiation tolerance

- <http://atlas.web.cern.ch/Atlas/GROUPS/FRONTEND/radhard.htm#Content>
- <http://radhome.gsfc.nasa.gov/top.htm>
- <http://www.national.com/appinfo/milaero/>
- <http://www.xilinx.com/partinfo/military.pdf>

## Part availability



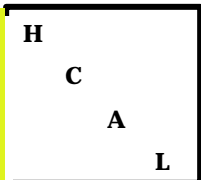
# Candidate Parts



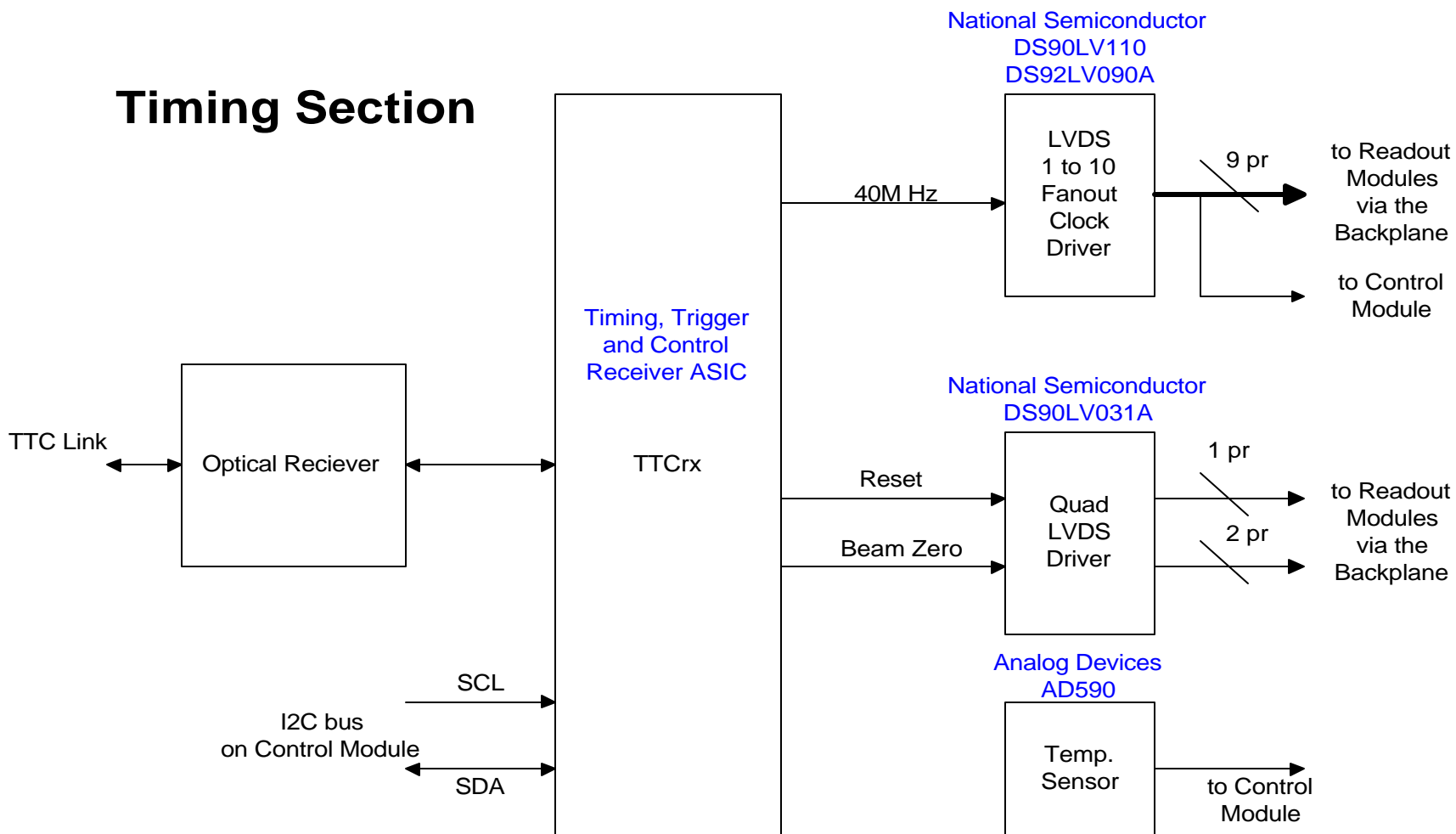
Part Number	Availability	Radiation Tolerance
Philips PCA82C250N	Checking	ATLAS Tile Calorimeter & ATLAS DCS
Hewlett Packard HCPL-0601/0731	Stock	ATLAS Tile Calorimeter & ATLAS DCS
Analog Devices ADG706BRU	Checking	Fermi Lab will test.
Siemens/Infineom SABC505CA4EMTR	Checking	ATLAS Tile Calorimeter used a C501
Philips P87C591VFAA	18 wk – Lead time	Checking if fab process is similar - PCA82C250N
AMD AM29F010	Stock	ATLAS Tile Calorimeter
Texas Instruments 74HC05	Stock	Fermi Lab will test.
National Semiconductor DS90LV110	Preliminary Part	Checking with National in regards to possible testing.
National Semiconductor DS92LV090A	Production/Samples	Checking with National in regards to possible testing.
National Semiconductor DS90LV031A	Stock	National Semiconductor Enhanced Solutions Radiation Assured Product
Analog Devices AD590KH	Stock	Fermi Lab will test.
XILINX Virtex FPGA	Stock	<a href="http://www.xilinx.com/appnotes/VtxTest.pdf">http://www.xilinx.com/appnotes/VtxTest.pdf</a>



# Clock Distribution

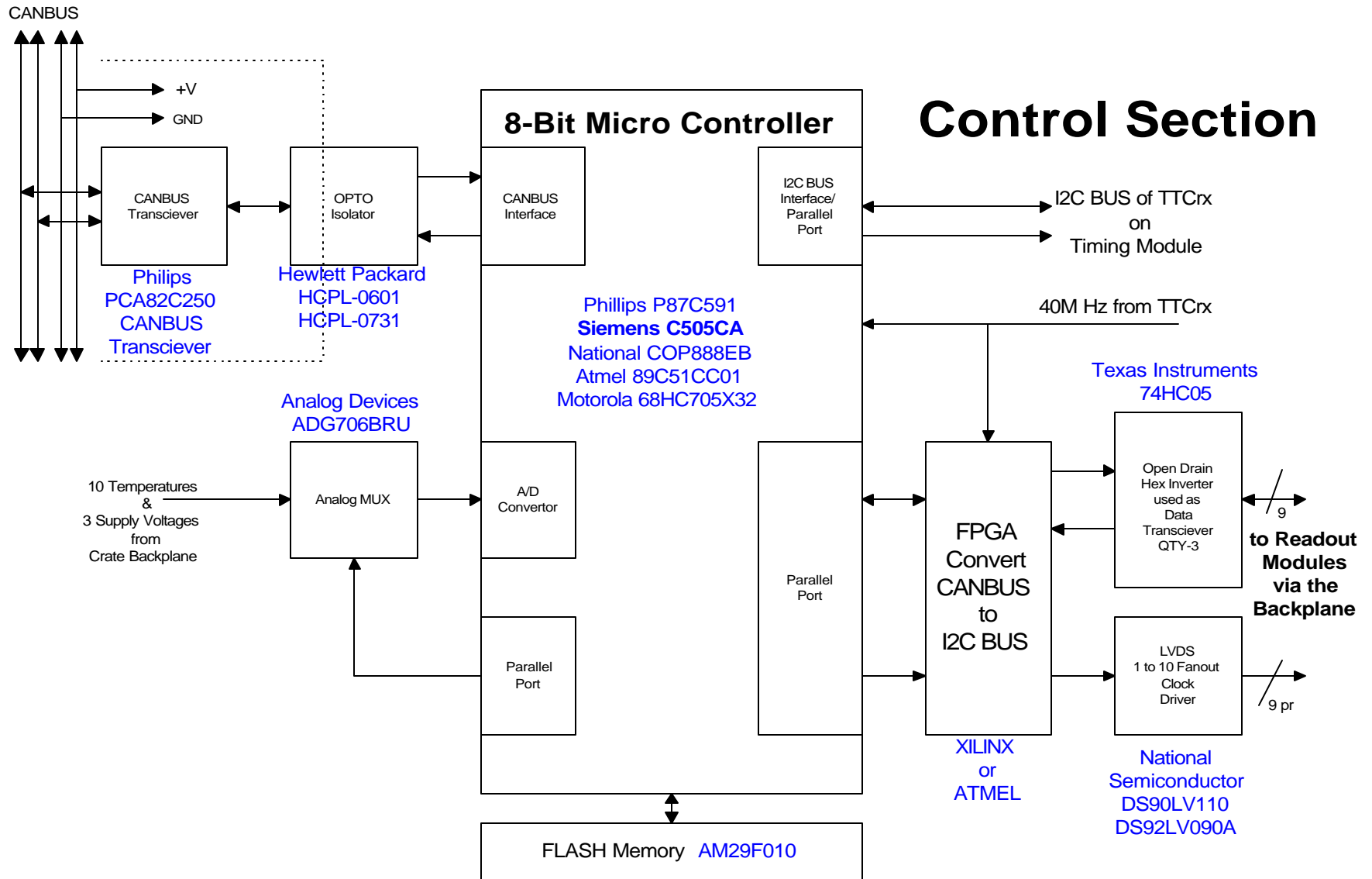
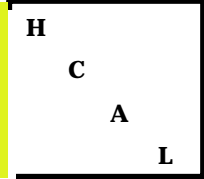


## Timing Section



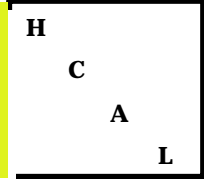


# Control Block Diagram





# Summary



## Monitor and control integrated with DCS

- Joint Controls Project team at CERN provides hardware and software support for CAN bus
- Client/server interface to the official SCADA, PVSS II, to be done by DUBNA collaborators

## Engineering

- Development platform for CAN is LabView
- Principal challenge is implementing the functional block diagram using radiation tolerant COTS – the design may not be as simple and elegant as it could be otherwise
- Prototype milestone is July 2001