



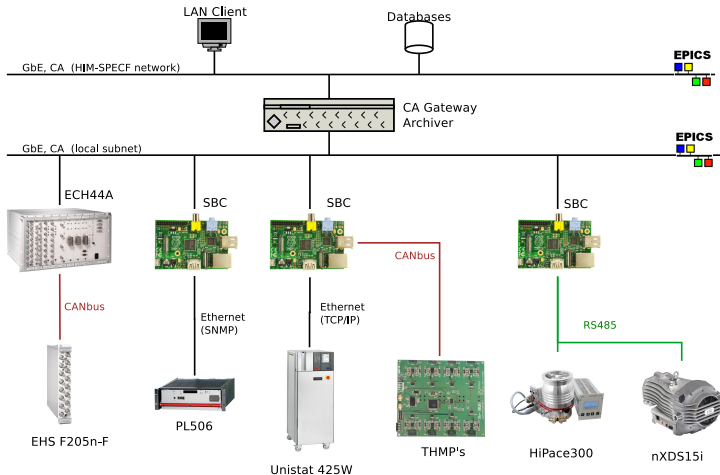
Status of the Detector Control Systems for the Luminosity Detector

PANDA Collaboration Meeting 18/3

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Current Setup in our Lab



- IOCs running on Single Board Computer (SBC)
- Structure in our lab similar to final PANDA scheme

High Voltage Power Supply

HV-MAPS need “high voltage”
power supply (~ 60 V)

Using ISEG EHS F4 05n-F:

- Controlled via CAN bus
- -500 V; 10 mA per channel
- 16 channels (single channel floating GND)
- Current resolution: 50 pA
- Ripple 5 mV_{P-P}
- Supplying five sensors with one HV channel

*Using same EPICS IOC and OPIs
as EMC group*



Low Voltage Power Supply

We need:

- 1.8 V for HV-MAPS
- 3.3 V for electronics (LVDS repeater, Multiplexers)

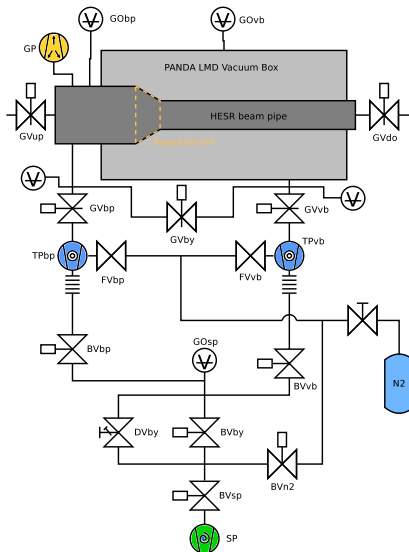
Using Wiener PL506 with MEH-02/07 modules

- 6 channels, 0 – 7 V, 115 A/550 W
- Remote control via Ethernet (SNMP)
- Channels can be grouped to increase current output

Using same EPICS IOC and OPIs as EMC group

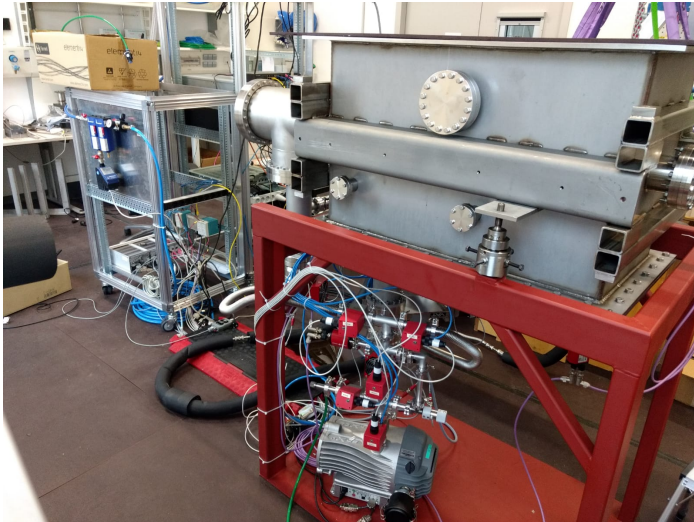
Vacuum System

- Thin transition foil
- ⇒ Vacuum in Box required
- Differential pumping to avoid large pressure differences
- Equipment
 - ▶ Edwards nXDS15i
 - ▶ Pfeiffer HiPace300 with TCP350 controller
 - ▶ Pfeiffer MPT200, PPT200
 - ▶ Valves from Pfeiffer and VAT
- Requirements
 - ▶ Beam pipe: $1 \cdot 10^{-9}$ mbar
 - ▶ Vacuum box: $1 \cdot 10^{-6}$ mbar



Vacuum System

Vacuum system attached to prototype



Current status

- Pumps and Gauges read out via RS485 bus
EPICS device support: *asyn* and *stream*^a
- Electro-pneumatic valves controlled via GPIOs from SBC
EPICS device support: *devgpio*^b

^a<https://github.com/epics-modules>

^b<https://github.com/ffeldbauer/epics-devgpio>

But: Controlling valves/pumps via multi-purpose OS is dangerous

- Software might fail
- Processor might be blocked by other processes
- Valves might be opened/closed by other processes

Control of Vacuum System

Control vacuum system via “Equipment Protection System” (EPS)
⇒ Siemens SIMATIC ET200SP PLC



Connection to EPICS via PROFINET (WIP)¹

¹Maybe <http://epics.web.psi.ch/software/s7plc/>



Hubert Unistate 425W

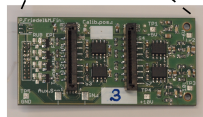
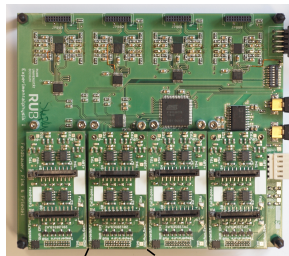
- Cooling power @ $-20\text{ }^{\circ}\text{C}$: 1.9 W
- Max pumping speed: 105 l min^{-1}
- Max pumping pressure: 2.5 bar (custom version)
- Remote control via telnet-like TCP/IP and RS-232
- EPICS Device Support *asyn* and *stream*

Temperature regulated on internal bath temperature ($-25\text{ }^{\circ}\text{C}$)

Temperature Monitoring

Temperature monitoring via THMP

- Modular readout system (s. talk by Tobias, “EMC DCS Status”)
 - Using PT100 on holding structures
 - HV-MAPS have build-in NTC thermistors
- ⇒ Modification of temperature piggyback board necessary
- *Using same EPICS IOC and OPIs as EMC group*



What is ready:

- Power Supplies: HV, LV
- Vacuum System: Pumps, Gauges, Valves
- Cooling: Chiller, Temperature Sensors (THMP, PT100)

What is missing:

- PLC for vacuum system (programming)
- Linear Shift Mechanism: (Motor control, distance sensors)
- Modification of THMP Temp-PBB for NTC thermistor read-out
- MuPix configuration