COMPASS DCS

Technical Board, June 2018
DCS main PC → exchanged
- Same name → pccompass07 → no changes for users
- 4 GB of RAM from Old pccompass07 moved to pccompass04
- Old PC → spare PC

HDD for manual backups moved to pccompass04
Overview

Proton Radius Measurement

2021+

Polarized Drell Yan

Proton Radius Measurement setup

C. Pires - COMPASS DCS
Technical Board, June 2018

Overview

Proton Radius Measurement

2021+

Polarized Drell Yan
CEDARs

Integration ongoing:
- High voltage
- VME crate
- DIP monitoring restarted and working
Overview

Polarized Drell Yan

Proton Radius Measurement

2021+

Polarized Target

Monitoring improved
- Temperature
- Cold box
- He4 pump system
- Trim coils current

Alarms and notifications
Radiation levels

Environmental monitoring:
- Integrated dose
Network switches – remote control

No remote control for the switch in the gallery

Power switch

Overview  Polarized Drell Yan  Proton Radius Measurement  2021+
Others

Tool to:
• Count spills
• Integrate T6, ion chamber 2
• Calculate mean values
  • Dead times
  • T6
  • Ion chamber 2
### Proton Radius Measurement

<table>
<thead>
<tr>
<th>Proton Radius</th>
<th>TPC</th>
<th>Silicon HV</th>
<th>Silicon LV</th>
<th>Silicon PS</th>
<th>Silicon Temp.</th>
<th>Trigger</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HV</td>
<td>Pulsed</td>
<td>Station 1</td>
<td>Station 2</td>
<td>Station 3</td>
<td>Station 4</td>
</tr>
<tr>
<td></td>
<td>T &amp; P</td>
<td>HV System</td>
<td>Station 3</td>
<td>Station 4</td>
<td>Temperatures</td>
<td>BT HV</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Scales</td>
</tr>
</tbody>
</table>

![Diagram of Proton Radius Measurement System](image)

- **Overview**
- **Polarized Drell Yan**
- **Proton Radius Measurement**

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**C. Pires - COMPASS DCS**

**Technical Board, June 2018**
WinCC OA Roadmap

- **2017**: Run II
- **2018**: LS2
- **2021**: Run III
- **2024**: LS3

Proposed WinCC OA roadmap

- **WinCC OA 3.15**
  - Current production version
  - Maintained until end of LS2

- **WinCC OA 3.16**
  - "Pilot" use starting now (ie. ALICE, protoDUNE)
  - Official support starting in Autumn 2018

- **Beginning of Run III?**
  - The decision depends on the content/compatibility/timing of WinCC OA 3.17 and LS3 schedule
  - Upgrade to 3.17 during LS2 may be on very tight schedule
  (injectors startup in Q2 2020, commissioning of PS8 in April)

JCOP FWWG 29 May 2018
OPC Evolution

- OPC-DA is being phased out → Need to move to OPC Unified Architecture
- Decision to develop the OPC servers at CERN
  - Within CERN
    - EN-ICE and ATLAS collaborate to develop QUASAR, a framework which provides consistent implementations of OPC-UA servers
  - Outside CERN
    - Planned collaborations with CAEN, Wiener and ISEG
    - CERN to implement ~80% of device logic, expert knowledge required from commercial partners for 20% optimisation.
    - Per-vendor collaboration agreements to be negotiated to agree on goals and responsibilities of collaborations.
    - KIT involved to assist with open sourcing QUASAR
  - LGPLv3 licensed.

Implementation Progress

The 3 servers are based on the quasar framework, with the HAL layer being provided by each vendor. Goal: Production ready by start of LS2.

<table>
<thead>
<tr>
<th>Server Implementations: Status</th>
<th>Company</th>
<th>CAEN</th>
<th>Wiener</th>
</tr>
</thead>
<tbody>
<tr>
<td>HAL status</td>
<td>Linux: OK. win64: work needed.</td>
<td>Linux: OK.</td>
<td>Linux: work needed. win64: work needed. (NB: work has started)</td>
</tr>
<tr>
<td>Server status</td>
<td>Linux: available. in end-user testing (ATLAS, ALICE) Win64: HAL required.</td>
<td>Linux: available. in end-user testing (ATLAS) Win64: &quot;just&quot; cross-compilation required.</td>
<td>Linux: HAL required.</td>
</tr>
<tr>
<td>Overall status</td>
<td>On track.</td>
<td>On track.</td>
<td>Effort required.</td>
</tr>
</tbody>
</table>

OPC-DA → OPC-UA migration

CAEN, Iseg, Wiener, Schneider, Siemens, CANOpen

IV JCOP Workshop 2015

JCOP FWWG 6 February 2018
OPC-DA → OPC-UA migration

COMPASS non-compatible hardware

CAEN
- SY127
- SY403
- SY527

Iseg
- EHQ20025p204
- EHQ8006p605F

Wiener
- VME 50XX
Can

Can Evolution

Today’s Status

- Various CAN interfaces
  - ISEG: PEAK (PCI & USB) and SYSTEC(USB), Wiener: KVASER(PCI), SYSTEC(USB) ELMB: KVASER(PCI), SYSTEC(USB)
  - Different ways to interface these gateways to the OPC Servers
  - Newly supported and recommended Ethernet-CAN interface: ANAGATE based on Linux running on ARM CPUs

Plans

- Ongoing and LS2 plans (with OPC DA being phased out)
  - Homogenize the CAN hardware and software across CERN to facilitate installation, maintenance and support
  - Drop of the support of the Wrappers (after OPC DA decommissioning)
  - ANAGATE: recommended solution for upgrade and new developments
    - SYSTEC will continue to be supported beyond LS2
  - LS3 and beyond
    - Recommendations to JCOP to evaluate alternatives to CANbus for future detector electronics

Currently using:
- PEAK PCI
- KVASER PCI

PCI cards to be phased out!
Embedded Local Monitor Board (ELMB)

ELMB:
- General purpose plug-on I/O module
- CANbus industry standard
- CANOpen as high-level communication protocol
- Used to read analog inputs and for digital input and output
- Old and not produced anymore

Nowadays, other boards exist on the market
- Raspberry Pi, Beaglebone, etc

Might be an option for low radiation areas, ex: barracks

CERN ELMB++/ELMB2:
ELMB successor requirements
Status and Plans for the Replacement of the ELMB
ELMB++ monthly meeting
Discussion on MDT RO in Phase II

Radiation hard option
SLiC

SLiC:

- Used to monitor and control old CAEN equipment:
  - SY127, SY403 and SY527

- SLC5 / i386, custom kernel build options
  - SLC5 / i386 - End of General User Support: 31st March 2017
    (Dedicated experiment support is maintained)
  - Dedicated support for experiments and accelerator controls will be
    maintained for four months after LHC Long Shutdown 2 start: until
    31st of March 2019.

- CAEN A1303 PCI CAENET controllers, driver v 1.7

- COMPASS is the only known user at CERN

- Not supported since many years
Plan

- Upgrade WinCC OA to recommended/supported version
- Upgrade DCS hardware *
- Migrate from OPC-DA to OPC-UA *
- Update DCS project **

* When not possible: freeze the components and maintain on a best effort basis

** Might be an opportunity to create a new project and include features not available at the time the current project was created, ex: JCOP FSM.
Thank you!