**HV subsystem**

**Functionality:** Power distribution for 40 detector modules

**Modules:**
- 2 x 20 channels
  - CAEN SY527/A1732
- 12 channels modules
  - loc: S2B03 or S2B04 in the counting room
  - 2 x 20 HV switches
  - loc: HV patch panels

**Controls:**
- individual V set (V tables load)
- individual/global V on/off
- individual/global occupancy limit set
- individual I limit set (I tables load)
- trip/alarm handling

**Monitors:**
- V/I monitor
- trip counter (time)
- crate T (cooling)

**Interlock/alarm data:**
- trip

**Interlock:**
- gas composition
- gas leak
- gas flow
- trip counter
- LV on/off
- cooling water leak/overpressure
- beam
- B field

**Logs:**
- V/I, crate T

**Feedback loop:**
- environment monitor V/I

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**Gas subsystem**

**Functionality:** Gas distribution for 40 detector modules

**Modules:**
- 1 Mixer Unit
- 2 Distribution Modules
  - 10 (+10 return) x 2 lines

**Controls:**
- Gas composition
- Gas flow

**Monitors:**
- gas composition
- gas flow
- gas pressure
- water/oxygen content

**Interlock/alarm data:**
- composition for HV flow for HV
- gas leak (oxygen) for HV
- overpressure

**Interlock:**
- overpressure

**Logs:**
- composition, flow, pressure, water and oxygen content

**Feedback data:** for HV system

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**Environment monitors**

**Functionality:** Monitor of ambient T, P, R and level of radiation

**Modules:**
- T monitor
- P monitor
- R humidity monitor
- Radiation monitor

**Controls:**
- on/off

**Monitors:**
- LV for monitors
  - T, P, R

**Logs:**
- T, P, R, radiation

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**Electronics Cooling**

**Functionality:** Power distribution for FE

**Modules:**
- 4x 2.5V 10A
- 4x2 2.5V 10A
- 4x1 2.5V 5A
- WIENER
- 12 channels modules
- loc: racks close to detectors

**Controls:**
- on/off
- V, I

**Monitors:**
- on/off
- V, I

**crates T (cooling)

**Interlock/alarm data:**
- on/off for HV system

**Interlock:**
- electronics T for LV system
- water T
- water flow
- water leak
- water overpressure

**Logs:**
- V, I

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**LV subsystem**

**Functionality:**
- water flow on/off
- water flow pressure
- water temperature

**Modules:**
- water in/out T, P, flow electronics T

**Interlock/alarm data:**
- electronics T for LV system
- water flow for LV system
- leak (flow) for LV&HV systems
- water overpressure for LV&HV systems

**Interlock:**
- leak
- overpressure

**Logs:**
- water flow, T, P electronics T

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**Electronics Data & Trigger**

**Functionality:**
- data & trigger delivery: calibration, threshold, delays settings, chips & channels suppression, gain (HV), gas composition loops

**Modules:**
- FE

**Controls:**
- Programmable chip parameters

**Monitors:**
- Chips, channels status

**Logs:**
- Chips & channels status parameters

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**Gas distribution for 40 detector modules**

**Functionality:** Power distribution for 40 detector modules

**Modules:**
- 1 Mixer Unit
- 2 Distribution Modules
  - 10 (+10 return) x 2 lines

**Controls:**
- Gas composition
- Gas flow

**Monitors:**
- gas composition
- gas flow
- gas pressure
- water/oxygen content

**Interlock/alarm data:**
- composition for HV
- flow for HV
- gas leak (oxygen) for HV
- overpressure

**Interlock:**
- overpressure

**Logs:**
- composition, flow, pressure, water and oxygen content

**Feedback data:** for HV system

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**Data & Trigger**

**Functionality:**
- data & trigger delivery: calibration, threshold, delays settings, chips & channels suppression, gain (HV), gas composition loops

**Modules:**
- FE

**Controls:**
- Programmable chip parameters

**Monitors:**
- Chips, channels status

**Logs:**
- Chips & channels status parameters

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**Functionality:**
- power distribution for FE

**Modules:**
- 4x 2.5V 10A
- 4x2 2.5V 10A
- 4x1 2.5V 5A
- WIENER
- 12 channels modules
- loc: racks close to detectors

**Controls:**
- on/off
- V, I

**Monitors:**
- on/off
- V, I

**crates T (cooling)

**Interlock/alarm data:**
- on/off for HV system

**Interlock:**
- electronics T for LV system
- water T
- water flow
- water leak
- water overpressure

**Logs:**
- V, I

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**Functionality:**
- water cooling for the FE

**Modules:**
- Water pressure
- Water flow
- Water T monitor
- T sensors on electronics cards (40 channels)

**Controls:**
- water flow on/off
- water flow pressure
- water temperature

**Monitors:**
- water in/out T, P, flow electronics T

**Interlock/alarm data:**
- electronics T for LV system
- water flow for LV system
- leak (flow) for LV&HV systems
- water overpressure for LV&HV systems

**Interlock:**
- leak
- overpressure

**Logs:**
- water flow, T, P electronics T