Appendix B : ECAL DCS – Humidity monitoring.

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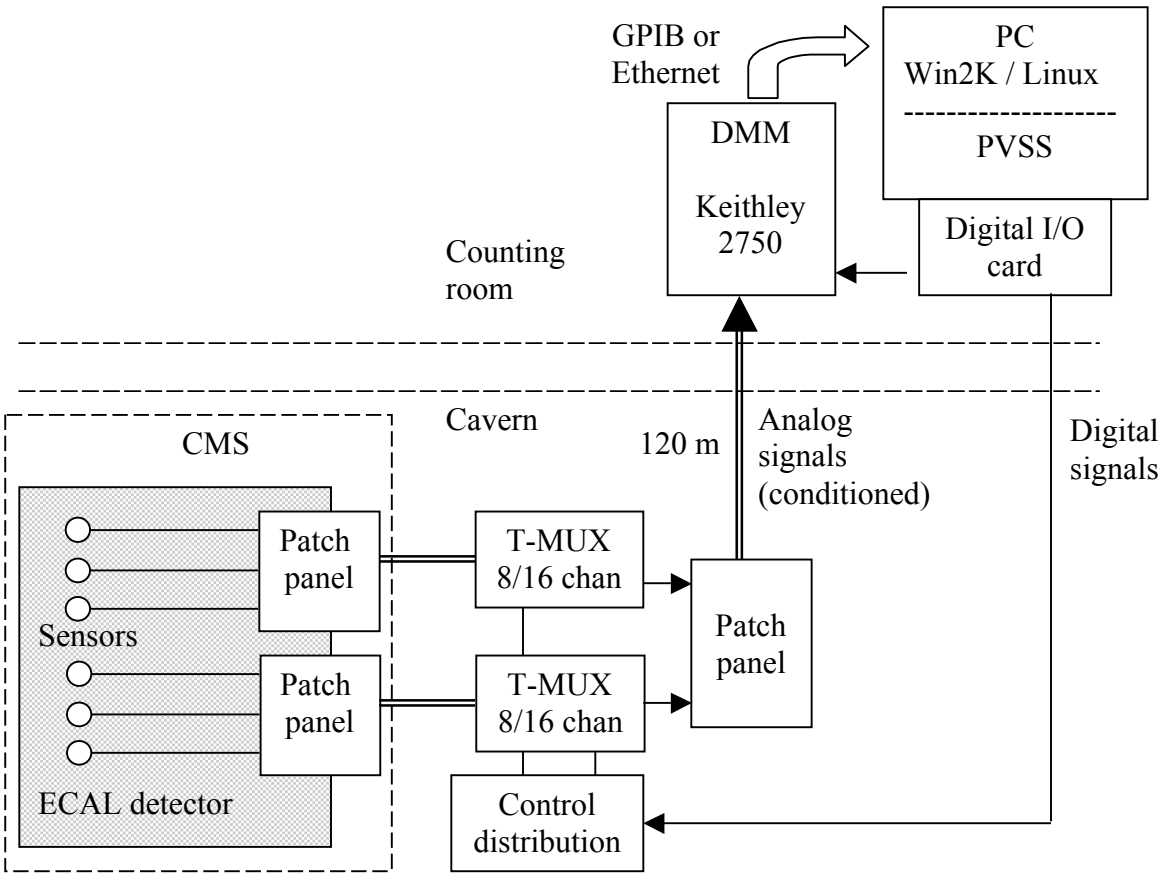
Task: constant monitoring of humidity (RH / Dew point) inside each module
Operation: continuous (non-stop) 24h/day, 365d/y.
Precision: 5-10 %.
No. sensors: approx. 200 (EB / EE).

Sensor location:
Sensors are distributed as:
1 sensor module => 4 per SM (EB)
4 sensors per quadrant (EE)

General layout:
In general it is envisaged to set up a system which resembles as closely as possible the precision temperature monitoring system.
Sensor signals are conditioned with local multiplexing transducers (T-MUXs, located in the cavern, close to CMS) and then transmitted to the counting room – there, signals are digitized with a multichannel multimeter (Keithley 2750) and the data are sent to a PC, which runs PVSS SCADA software. The PVSS humidity monitoring application provides regular data acquisition, data visualization and archiving. Also, it provides alarm and warning messages if the humidity goes out of the predefined limits.



Sensors: Final specifications are still to be defined. This work is going on in collaboration with the Tracker DCS group.

Sensor probes and signal cables:
Sensors are to be mounted in rigid probes. Probes also provide the connection of sensor leads to an individual signal cable (2-3 m), which runs to a patch panel (see the figure above). From the patch panel, a multi-conductor (STP) cable runs to a T-MUX.

Front-end electronics:
A multiplexing transducer module (T-MUX), as designed for the precision temperature system, provides sensor excitation and raw signal conditioning for 8/16 sensors.

Data acquisition electronics:
Analog signals from T-MUX modules are digitized with a high precision (22 bit) multichannel DMM (digital multimeter), Keithley 2750.

It is assumed that the same K-2750 will be used for temperature and humidity measurements. More details on the K-2750 are found in the "temperature monitoring" section.

PVSS application:
Same comments as for temperature monitoring.