



Contribution ID: 645 Contribution code: THPA023

Type: **Poster Presentation**

## **Data acquisition and supervision systems for the HL-LHC quench protection system - part I the hardware**

*Thursday, 11 May 2023 16:30 (2 hours)*

Protection of the superconducting circuits of the High Luminosity Upgrade of the LHC project (HL-LHC) will be ensured by a new generation of quench detection systems and various quench protection systems for the superconducting circuits and magnets.

The HL-LHC quench detection systems serve as well as high-performance data acquisition systems, that also provide essential input for the automatic analysis of events such as a superconducting magnet quench.

The supervision of the quench protection systems required the development of data acquisition and monitoring systems adapted to the specific characteristics of this equipment. Of particular importance are the protection device supervision units (PDSU), which are monitoring and interlocking the quench heater circuits and the Coupling Loss Induced Quench (CLIQ) systems.

All data acquisition and monitoring systems use Ethernet-based communication with precise timing instead of a classic serial fieldbus solution. This approach ensures the required data transfer rates and time synchronisation.

The contribution will discuss the specific functional requirements, the status of development and the results of extensive system validation testing. It will also report on the system integration and the preparation for the first deployment in the upcoming IT-String project.

### **Funding Agency**

Research supported by the HL-LHC project

### **Footnotes**

### **I have read and accept the Privacy Policy Statement**

Yes

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**Session Classification:** Thursday Poster Session

**Track Classification:** MC6: Beam Instrumentation, Controls, Feedback and Operational Aspects:  
MC6.T04: Accelerator/Storage Ring Control Systems