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## A scalable gigabit data acquisition system for calorimeters for linear collider

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This article presents the scalable Data Acquisition (DAQ) system that has been designed for prototypes of ultra-granular calorimeters for the International Linear Collider (ILC). Our design is generic enough to cope with other applications with some minor adaptations. The DAQ is made up of four different modules, including an optional one. One Detector InterFace (DIF) is placed at each end of the detector elements (SLAB) to communicate with up to 160 ASICs. A single HDMI cable is used to transmit both slow-control and readout data over a serial 8b/10b encoded characters at 50 Mb/s to the Gigabit Concentrator Card (GDCC). The GDCC controls up to 7 DIFs, it is distributing the system clock and ASICs configuration, and collecting data from them. Each DIFs data packet is encapsulated in Ethernet format and sent out via an optical or copper link. The Data Concentrator Card (DCC) is a multiplexer (1 to 8) that can be optionally inserted between the GDCC and the DIFs, increasing the number of managed ASICs by the GDCC. Using a single GDCC and 7 DCCs would allow a single PC to control and readout up to 8960 ASICs (~ 500000 channels). The fourth card is the Clock and Control Card (CCC) that provides a clock and control fanout to up to 8 GDCCs and therefore to the entire system. A software suite (named Calicoes) written in C and Python manages the overall system. This system have been used for several tests on the SiW-ECAL prototype detector (1800 channels). The full design and test results will here detailed.

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