

## RECENT DEVELOPMENTS IN ALTERNATIVE TO CAMAC FOR DATA ACQUISITION AT DIII-D\*

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For over twenty years, data acquisition hardware at DIII-D has been based on the CAMAC platform. These rugged and reliable systems, however, are gradually becoming obsolete due to end-of-life issues, ever-decreasing industry support of older hardware, and the availability of modern alternative hardware with superior performance. Efforts are underway at DIII-D to adopt new data acquisition solutions which exploit modern technologies and surpass the limitations of the CAMAC standard. These efforts have involved the procurement and development of data acquisition systems based on the PCI and Compact-PCI platform standards. These systems are comprised of rack-mount computers containing data acquisition boards (“digitizers”), Ethernet connectivity, and the drivers and software necessary for control. Each digitizer contains analog-to-digital converters, control circuitry, firmware and memory to collect, store, and transfer waveform data acquired using internal or external triggers and clocks. Software has been developed which allows the DIII-D data acquisition computers to program the operational parameters of the digitizers, as well as to upload acquired data into the DIII-D acquisition database. All communication between host computers and the new acquisition systems occurs via standard Ethernet connections, a vast improvement over the slower, serial loop highways used for control and data transfer with CAMAC systems. In addition, the capabilities available in modern integrated and printed circuit manufacture result in digitizers with high channel count and memory density. Cost savings are also realized by utilizing a platform based on standards of the personal computer industry. Details of the new systems at DIII-D are presented, along with initial experience with their use, and plans for future expansion and improvement.

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