

Modification in LHCD DAC System to Incorporate Measurement of RF Power

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The Lower Hybrid Current Drive (LHCD) system has four klystrons, each rated for 0.5 MW, CW power at 3.7 GHz, which are employed to launch the lower hybrid waves into plasma [1]. VME and PXI based Data Acquisition and Control (DAC) system has already been implemented for the operation of LHCD System. VME based DAC system has been modified to incorporate measurement of RF Power signals.

The existing VME based DAC system has various instrumentation like DIO, AO, AI and timer cards integrated with VME RTOS program. The VGD4 acquisition card was integrated for the measurement of power from 96 signals of LHCD system. However because of random data acquisition problem, this card is replaced by IP330 analog input cards. IP330 analog cards have been included and integrated with existing system to measure 128 power measurement signals requirement with the subsystem. Carrier boards have been replaced with new version of device driver to integrate IP modules of AI, AO and timer card. Existing device driver program have been modified to add additional functionality for data acquisition and time synchronization. Adapter classes have been developed to integrate with RTOS application environment for low context switching and higher performance. NTFS has been used to handle long chunk of data during experimental shots. User interface is modified on Linux host machine to monitor and acquire for additional signals. The system has been validated during the SST-1 campaigns. Developed DAC software is modular, hierarchical and scalable in nature. To achieve the data storage with calibration and plotting, MDSPlus has been integrated for data visualization and management of after shot analysis. In this paper, the design, implementation and results obtained with IP330 cards are reported and discussed.

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