

A COMBINED PLC AND CPU APPROACH TO A MULTIPROCESSOR CONTROL*

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A sophisticated multiprocessor control system has been developed for use in the E-Power Supply System Integrated Control (EPSSIC) on the DIII-D tokamak. EPSSIC provides control and interlocks for the ohmic heating coil power supply and its associated systems. Of particular interest is the architecture of this system: both a Programmable Logic Controller (PLC) and Central Processor Unit (CPU) have been combined on a standard VME bus. The PLC and CPU input and output signals are first routed through signal conditioning modules, which provide the necessary voltage and ground isolation. Additionally these modules adapt the signal levels to that of the VME I/O boards. One set of I/O signals is shared between the two processors. The resulting multiprocessor system provides a number of advantages: redundant operation for mission critical situations, flexible communications using conventional TCP/IP protocols, the simplicity of ladder logic programming for the majority of control code, and an easily maintained and expandable non proprietary system.

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