

THE CONTROL SYSTEM OF POLOIDAL FIELD POWER SUPPLY FOR EAST SUPERCONDUCTING TOKAMAK

P.Fu, P.J.Qin, S.Y.He, F.Y.Chen, M.Chen, L.S.Wang

Institute of Plasma Physics, Chinese Academy of Science

Box. 1126, Hefei 230031, China. Email: fupeng@ipp.ac.cn

The EAST superconducting tokamak is an advanced steady state experimental device being built at ASIPP in China from 1998 to around 2005. Its poloidal field (PF) power supply system, which consists of 12 set independent electrical circuits, energizes the 14 superconducting coils. It realizes plasma current drive, and plasma control for current, shape and position.

The local control system of the PF power supplies provides the routine control, the real-time control, the communication of control data, a timing system for precise control of event initiation, and the data acquisition. The PF power supply system has more than 200 analog signals and 1800 digital signals. A Distributed Control System (DCS) consisting of Industrial Personal Computers (IPC) has been used. All computers are connected as a real time Ethernet network by the QNX real time operation system. A field-bus network is also used as an interface between the computers and the actuators or components.

The distance between the power supply building and its control room is 40m. To decrease the transmitting cable and disturbance, A network consisted of fieldbus has been built. Many modules work at the location of the power supply. All supervised signals, a majority of control and protection signals, and a majority of analog signals are transmitted by fieldbuse net. Other critical signals required for high real time performance are transmitted directly by wires.

All logical signals and A/D conversion of analog signals measured by the IPC and Fieldbus modules is transmitted to a database computer.