

§29. LHD Monitoring System for Control Data and Plasma Experiment

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The data monitoring system is completed for the LHD. The contents and performance of the system are as follows^{1, 2, 4},

A) Real time monitoring has been carried out as a slow sampling process. Sampling time is 1 s or longer.

B) Fast sampling (= batch system) are also carried out in same ADC, and the sampling time is 1 ms or longer. External trigger and CPU trigger are available.

C) Quench monitoring system is included, and this system is kicked off by the external trigger when the quench detector works.

D) Relation Data Base (RDB) is used to manage the data and set-up of this system. The data of the LHD operational set-up is also included.

E) WWW technology is the basis for the user. Web browser (Netscape Communicator4.01) is

used to obtain the data, to write the comments, to set the trigger and the data acquisition condition. The data is saved as a Netscape file and it can be read from spread-sheet software (Excel, Lotus etc.).

Figure 1 shows the system set up in the present time. Total 512 CH monitor channels are prepared and about 300 CH are used for the plant monitor (vacuum vessel temperatures, low temperature strain gauges, temperatures of helium and magnets, pressures of helium, flow rates of helium, electric currents of magnets, voltage of magnets and etc), and others are used for the plasma monitoring such as spectroscopy, divertor plate temperatures, diamagnetic loop and etc). Present users are about 10, and PC is the usual computer for user, and its environments and as follows, Netscape communicator 4.0+ JDK1.1 on the Windows NT 4.0 + service pack 3. 64 MB memory is required at least. Since the system is set inside the fire wall, users can not access the system out side of the network in the present time. However, this system is planned to use as an usual data acquisition system for the plasma diagnostics, same of this system will be set outside of the fire wall.

The system is in operation from Feb. 20, 1998, and the total memory of the experiments are about 10 GB in the present time (the end of May), where the sampling time of the slow sampling process is about 2 s, and the fast data is about 1000 shots for 1 s discharge. In order to reduce the memory cost, the compression technique is tested and developed³. The compression ratio is about 3 to 5 and this technique will be used in the next version of the system.

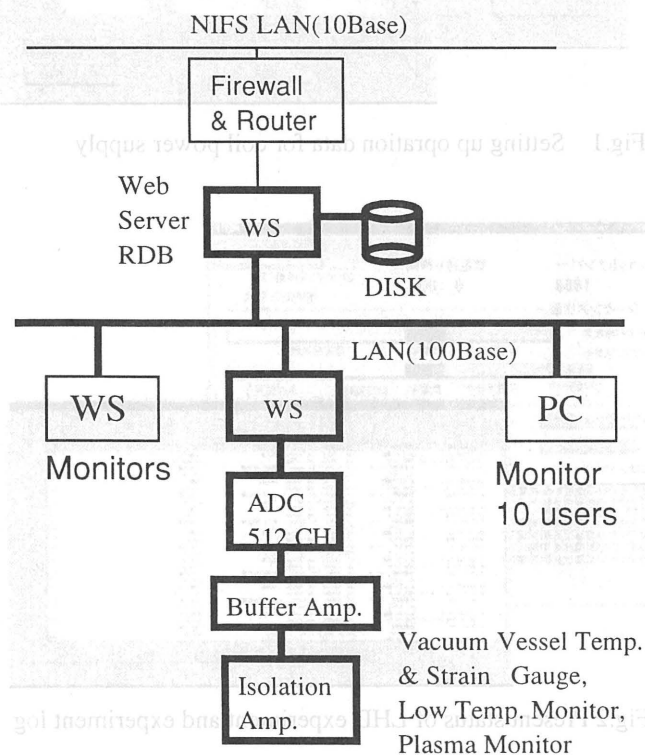


Fig. 1 System set up

Reference

- [1] J. Kariya et al, Proc. 16th Int. Conf. Cryo. Eng./Int. Cryo. Mat. Conf., p. 673, 1997.
- [2] S. Yamaguchi et al, J. Plasma Physic and Nucl. Fusion Japan, vol. 73, p. 335, 1997.
- [3] H. Okumura, J. Plasma Physic and Nucl. Fusion Japan, vol. 73, p. 1135, 1997.
- [4] J. Kariya et al, J. Plasma Physic and Nucl. Fusion Japan, vol. 74, p. 67, 1998.