CONTROL SYSTEM OF BEAM LINE MAGNETS IN KEK

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Abstract

A computer control and monitor system was constructed to handle power supplies of the beam line magnets. The system consists of 10 CAMAC crates and a CAMAC serial highway.

1. Introduction

The motivations of constructing a fully computer-controlled system are:
1)   The number of magnets is too much to be managed by a single person in charge or even a well trained operator.
2)   Because the secondary beam lines may be operated in an open-shop system, a complete protection for the mis-handling is needed and at the same time the operation method must be easily learned.
3)   The real-time centralized monitoring will attain a high availability because of lessening a MTTR of the system.
4)   The expansion of the system can be performed in the same principle by a well evaluated method.

The premature system, which supported beam line magnets in K2 and K3 beam lines only, was completed in Oct. 1978 and was safely drived for a year. The overview of this system is described elsewhere [1]. The characteristic feature of the. system is that the system is constructed under the serial CAMAC standard [2] to interface destination devices to the computer. In 1979, the system was graded up to control all the beam line magnets in the extracted beam channels.

2. Control System

The principal function of the system are;
1)   to control power supplies according to the user's command from a CRT terminal key board in a remote station,
2)   to monitor magnet/ power supply status and output current/voltage,
3)   and to display magnet/ power supply conditions on a TV screen or on a CRT display.

In fig. 1, the geometrical overview of the serial highway is shown. The serial driver (SD) is installed in a CAMAC crate controlled by a HIDIC-80 computer via a dedicated crate controller (DCCA). Besides this crate, there are 9 crates under control of the serial highway system. The crate #1 has video-RAM modules and a communication interface (CM/IF). The crate #2, #3, #4 and #5 have PS interface modules (PS/IF). The crate #7, #8 and #9 have a communication interface only. The configuration of the crates is illustrated in fig. 2.   The monitor informations are gathered by a one board 8080A computer system which has a CAMAC auxiliary crate controller functions [3].

References

[1]   S. Kurokawa et al., IEEE trans. NS-26 (1979) 3325-3327
[2]   The specification is shown in IEEE Std.595-1976.
[3]   The multiple controllers in a CAMAC crate are specified
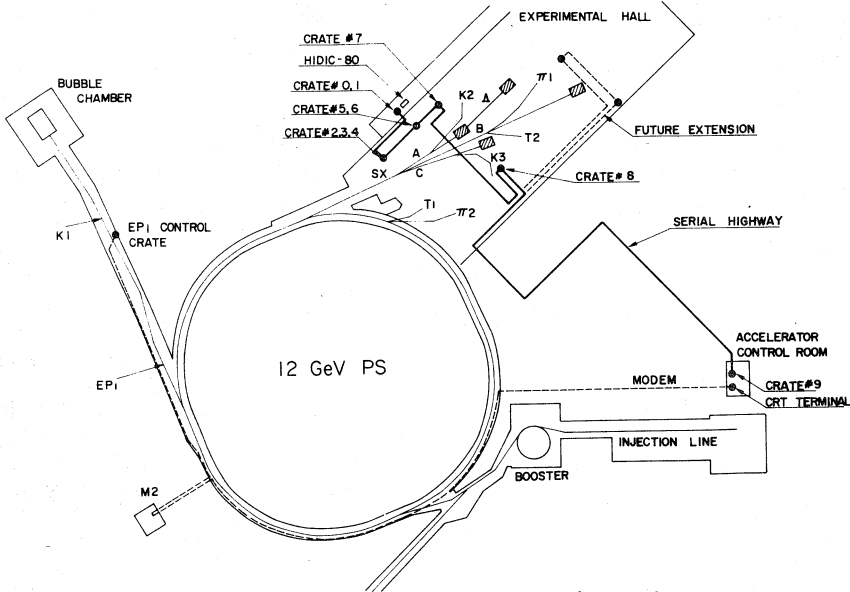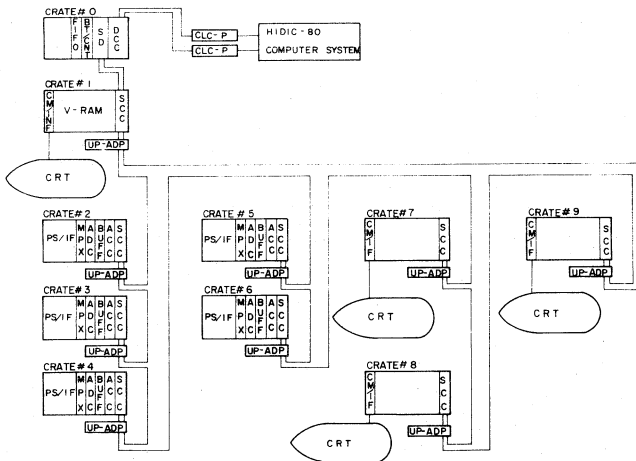   in EUR6500e.

Fig. 1 Serial Highway with 12 GeV PS

Fig. 2 Serial CAMAC System