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KEK electron/positron injector LINAC control system

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Since May 2019, the KEK electron/positron injector LINAC has successfully conducted simultaneous top-up injections into four independent storage rings and a positron damping ring. To ensure long-term stable beam operation under such a complex operational scheme, maintaining high availability of the entire control system is essential.

The original LINAC control system, developed in the 1990s, was based on a proprietary in-house software framework utilizing Unix servers, VME bus systems, and PLCs. Its operator interface was implemented using the Tcl/Tk scripting language and supported approximately 3,500 control points.

To improve development efficiency and enhance compatibility with other accelerator control systems, the LINAC control system has been progressively migrated from this legacy platform to an EPICS-based architecture. As a result, the system now supports approximately 200,000 control points. In addition, Linux-based hyper-converged servers, a PXI bus-based system, and in-house embedded frontends have also been implemented.

In this paper, we provide a detailed overview of the current status of the KEK injector LINAC control system, along with prospects for its future development.

Footnotes

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