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# Design and development of embedded EPICS system for beam measurement electronics

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The embedded EPICS control system for beam measurement is implemented based on the Zynq 7z020 SoC, which enables efficient and reliable real-time data acquisition, transmission, processing, and PV publishing of embedded IOCs. The data acquisition module uses a 24-bit ADC with a sampling frequency of 10Msps, which enables continuous sampling and data processing of detector signals, and interlocking signals can be output within 10μs. Data transmission and communication from the PL to the PS is achieved through the AXI bus, and the real-time data of different BRAMs and registers is accessed by manipulating memory base addresses and offsets. The ADC raw data with a continuous data rate of 200K/s can be stored without losing points. Through long-term online testing, the beam measurement electronics system can accurately monitor beam signals, output interlocking signals in a timely manner, and the software and hardware systems work stably and reliably for a long time. It can be widely used for signal measurement of beam loss, CT, Faraday cup, integral coil, power ripple, ionization chamber, wire scanner, etc.

## Footnotes

## Funding Agency

## I have read and accept the Privacy Policy Statement

Yes

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