

A Real-Time Control System for a Photon Source Using COTS (Commercial Off The Shelf) DSP Products

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Abstract

This paper outlines the technical issues involved in configuring an electron beam correction feedback system for the Elettra Synchrotron in Trieste, Italy. The system objective was to produce a photon source at energy levels of several tens of KeV by deflecting an electron beam of up to 2.4 GeV.

By measuring the electron beam with fast A/D converters and then analyzing the error in beam position using multiple digital signal processors, a corrective magnetic field is applied to the beam to steer the beam back into optimum alignment. Commercial data acquisition and DSP products were successfully deployed to achieve real-time operation.