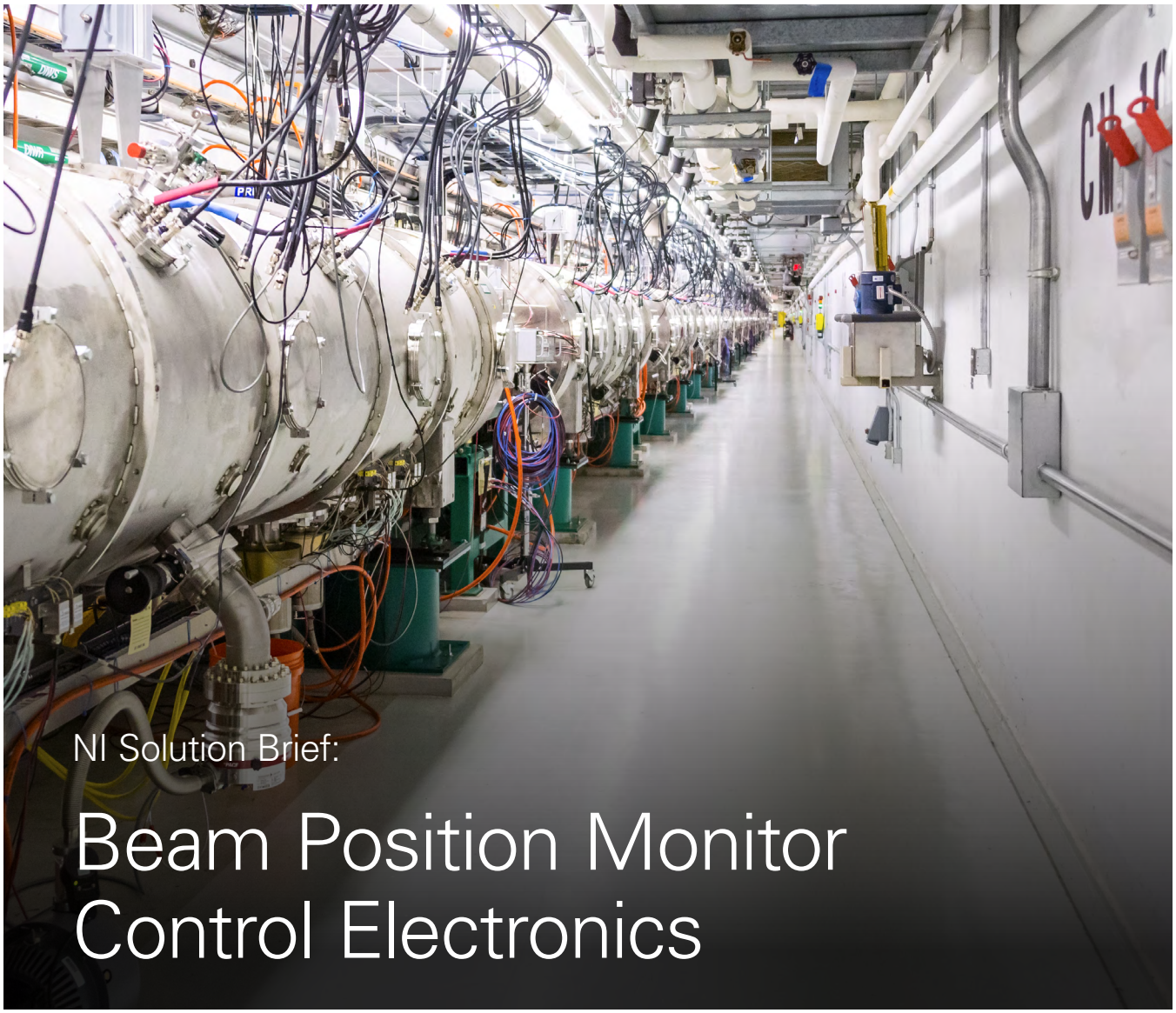


NI Solution Brief:

Beam Position Monitor Control Electronics

Spallation Neutron Source, Oak Ridge National Laboratory

Modern particle accelerators must operate with highly demanding beam stability requirements. To deliver such stability, beam control electronics need to meet stringent precision, accuracy, and dynamic range requirements. In addition, electronics must be reliable and flexible, and speed up the development process.

NATIONAL INSTRUMENTS

Beam Position Monitor Control Electronics

With NI's beam position monitor (BPM) control electronics solution, you can measure critical beam parameters to enable beam tune-up, trajectory correction, and beam centering on the target and dumps. You also can reduce instrument development time and resources while improving reliability and availability. Decrease tuning time by using accurate measurements in the beam dynamics simulation model as part of this commercial off-the-shelf (COTS) solution.

Application Requirements

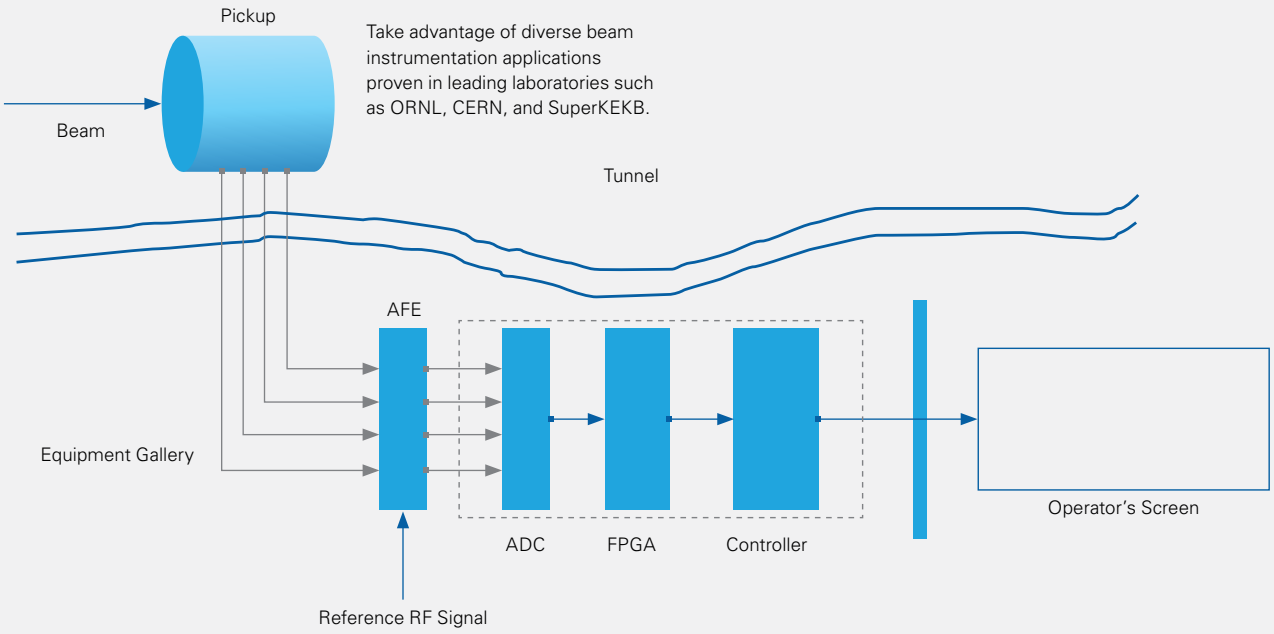
- Take measurements from many channels and perform high-speed signal processing for closed-loop control.
- Achieve Linux OS support and connectivity to industry-standard tools such as EPICS and Tango
- Meet demanding schedule, cost, and RASM targets while ensuring long life-cycle management.

The NI Solution

Measurement Devices
Take advantage of industry-leading, high-performance, and comprehensive measurement devices with real-time signal processing.

Signal Processing
Achieve the I/O flexibility and scalability you need and utilze FPGA programmability FPGAs for signal processing using FlexRIO.

Desktop and Real-Time Configurations
Receive support for Red Hat, CentOS, and other Linux kernels for EPICS IOC operation in desktop and real-time configurations.

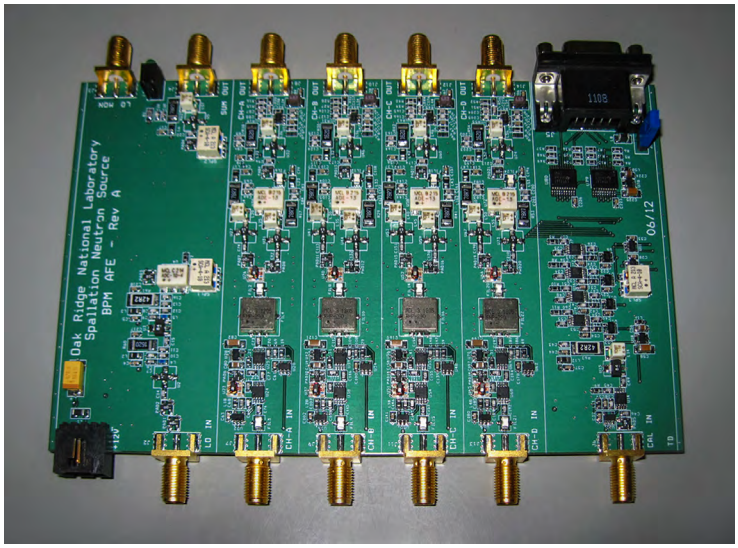


The NI Advantage

Take advantage of diverse beam instrumentation applications proven in leading laboratories such as ORNL, CERN, and SuperKEKB.

Use a single platform that scales from the high speed and high resolution needed for BPM instrumentation to the motion control required for beam collimation applications.

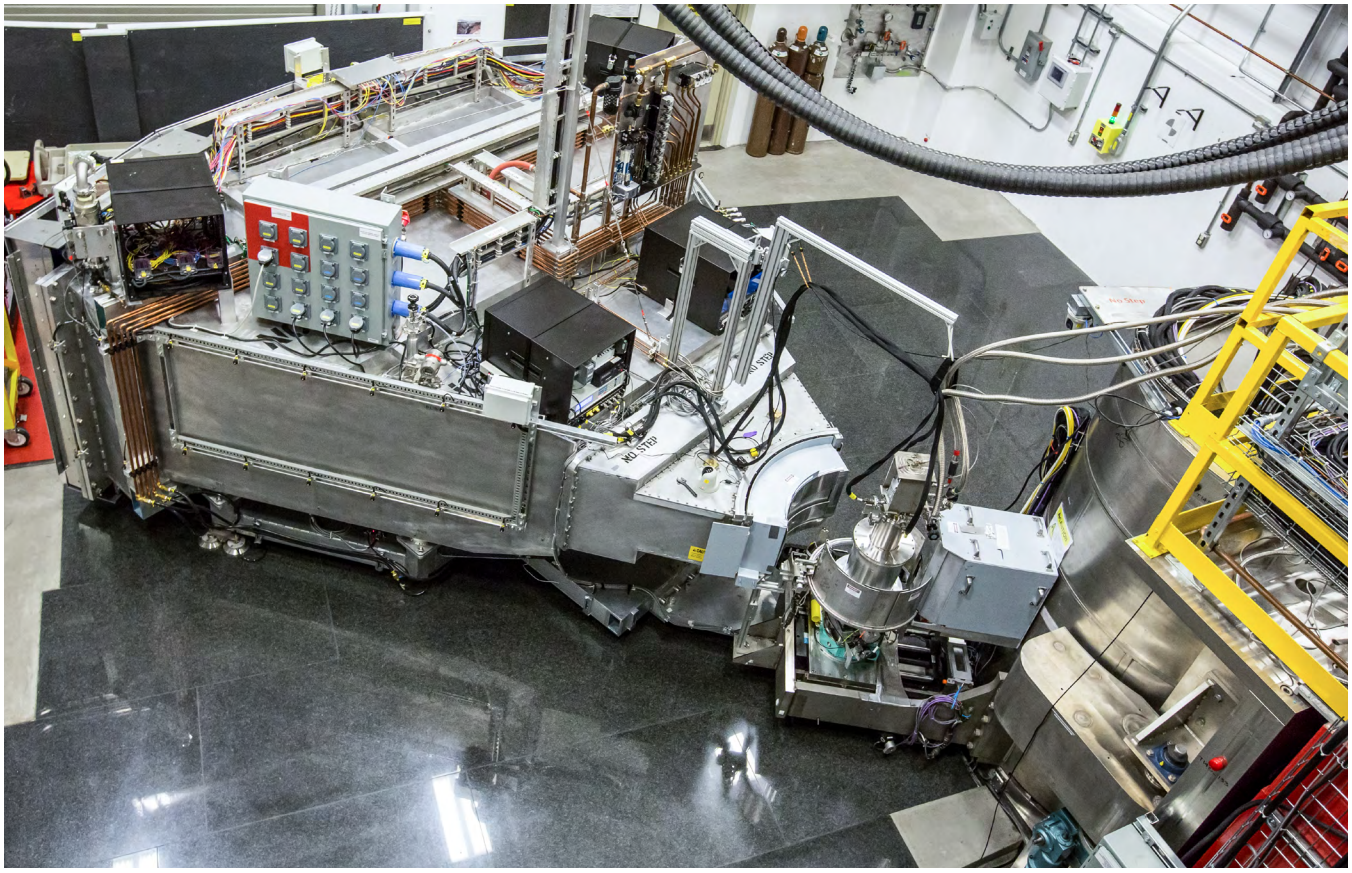
Take advantage of diverse beam instrumentation applications proven in leading laboratories such as ORNL, CERN, and SuperKEKB.



Key Specifications (FlexRIO)	
Maximum Sample Rate	6.4 GS/s
Analog Input Resolution	Up to 16 bits
FPGA	Kintex UltraScale, Kintex-7 (Xilinx)
Data Streaming	Up to 7 GB/s
Form Factors	PXI, PCIe, Stand-Alone

"The wide range of off-the-shelf ADCs and complementary modules available from NI combined with the flexibility of FlexRIO allowed us to develop a modern, large-scale accelerator BPM system with significantly fewer resources than any custom solution would require."

Alexander (Sasha) Aleksandrov, Spallation Neutron Source, Oak Ridge National Laboratory



HYSPEC Beamline, Spallation Neutron Source

System Integration on Your Terms

NI offers a variety of solution integration options customized to your application-specific requirements. You can use your own internal integration teams for full system control or leverage the expertise of our worldwide network of Alliance Partners to obtain a turnkey system.

Discover how NI can help you increase product quality and accelerate test timelines by contacting your account manager, calling **(888) 280-7645** or emailing info@ni.com.

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