

Rocket Engine Test Systems

Modern technologies to meet rocket test challenges

High-Quality Measurements

PXI
C-Series DAQ

Bring laboratory-grade measurement systems to your rocket test stands to ensure accurate, traceable, and repeatable test results

Ruggedized Platforms

CompactRIO
CompactDAQ

Deploy your control and measurement systems close to your devices to reduce cable costs and improve noise immunity

Reliable Processing

NI Linux Real-Time
on PXI or cRIO

Run processing and control algorithms at the edge with NI Linux Real-Time, designed with LabVIEW or text-based tools.

Powerful Software

LabVIEW or
JKI STAR-GOAT

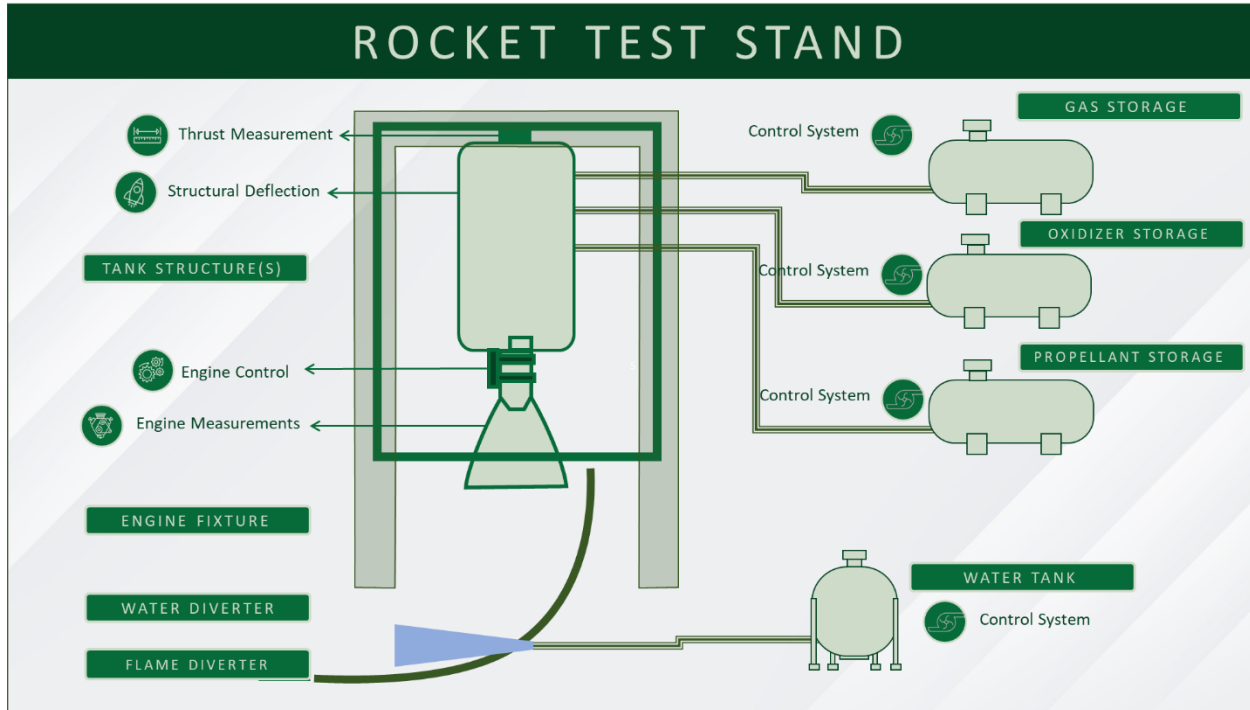
Leverage LabVIEW's rapid development environment or use ready-to-run solutions from NI's space partners.

Using NI platforms, new space and traditional space companies reduce program risk using proven measurement technologies. NI is a proven global leader in data acquisition systems, providing solutions in every industry. NI engineers bring the benefits of technology advances made with feedback from thousands of customers to the space industry to accelerate rocket propulsion testing.

With proven productivity tools like LabVIEW, PXI, and C-Series devices, space engineers accelerate time to market by supporting the test design and deployment process. These tools enable space teams to keep up with fast-changing design requirements as new rocket features are introduced.

NI's partners provide out-of-the-box solutions designed specifically to meet the challenging requirements of space applications. JKI's STAR-GOAT application provides all the controls and measurements for demanding rocket test applications, while providing the flexibility and reliability that the space industry demands.

NI Products in Rocket Test



Engineers use CompactRIO as **control systems for cryogenic fluids** – providing local, rugged control systems. NI's redundant architectures provide assurance in these demanding applications. Low-level access to the real-time processor and on-board FPGA means engineers can design a distributed control system they can count on.

Engineers also use CompactRIO to **control rocket stand equipment**. Whether controlling a water spray system, engine mount actuator, or safety lockout system, CompactRIO provides reliability even in demanding environmental conditions.

CompactRIO is also used for **rocket engine control** during the tests. Real-Time control, with FPGA timing, and a large variety of signal support, make CompactRIO the ideal flexible control platform to adjust engine parameters between tests.

For **recording engine test measurement data**, engineers turn to PXI or CompactDAQ to bring laboratory-grade instrumentation to the rugged environment of a rocket test stand. These systems are mounted in junction boxes mounted around the test facility, or routed to a central data center.

PXI



NI PXI combines an embedded Windows or Linux controller with high-grade measurement devices. Engineers use PXI to build high-performance mixed-measurement systems, a perfect match for the signals in a typical rocket propulsion test. PXI systems are ideally suited for test systems where you can run signals to a test facility providing environmental protection.

More information at ni.com/pxi

CompactRIO



NI CompactRIO provides a platform for high-performance, distributed control and processing. Program the on-board Real-Time processor or the user-programmable FPGA with NI LabVIEW or standard text-based tools. C-Series modules provide a variety of sensor inputs while preserving the rugged environmental specifications of cRIO to get as close as possible to the rocket during a test.

More information at ni.com/compactrio

PXI Modules



With more than 600 input and output modules, PXI supports signal needs from DC to mmWave. Select from a variety of instruments to support sensors including vibration sensors, load cells, voltage, current, and anything your rocket tests demand.

More information at ni.com/pxi

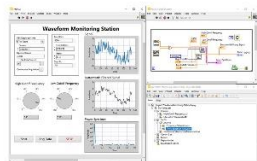
CompactDAQ



Using the same C-Series modules as cRIO, cDAQ provides a distributed measurement-only platform to bring signals back to a central processing computer over ethernet, EtherCAT, or USB. cDAQ supports TSN and 1588 for distributed timing signals.

More information at ni.com/compactdaq

LabVIEW



LabVIEW is graphical systems engineering software for applications that require test, measurement, and control with rapid access to hardware and data insights. Accelerate updates to your data system with this tool designed specifically for the needs of test engineering teams.

More information at ni.com/labview

C-Series Modules



C-Series Modules are compatible with both cRIO and cDAQ platforms, providing support for a wide range of sensors including vibration, strain, load, temperature, current, and voltage. C-Series modules preserve the ruggedness of these platforms to fit measurement needs on the rocket test stand itself.

More information at ni.com/cseries

Partner Solution Highlight: JKI STAR-GOAT

The development of a secure, reliable rocket test control and measurement solution requires experience, planning, and careful development to meet your test needs while following regulatory guidelines. You can't approach rocket test the same way you approach other industries – there are fundamental challenges that make rocket science unique.

One of NI's leading partners across multiple industries is JKI. JKI has applied their experience from the space industry to create a ready-to-run solution with the flexibility to meet the needs of a rocket control and measurement application. Originally designed for an application with NASA, JKI's STAR-GOAT is a powerful application directed at testing launch vehicle propulsion systems. For more information, visit jki.net/star-goat.

The image displays three overlapping screenshots of the STAR-GOAT software interface. The top-left screenshot shows a 'Sequence' configuration window with a table of test steps. The top-right screenshot shows a 'Propulsion Test Cell A' diagram with various sensors and actuators, and a 'NO CODE VIS' window. The bottom screenshot shows an Excel spreadsheet with columns for 'Sequence Name', 'Step Name', 'Task Time (s)', 'End Time (s)', 'Channel', 'Min Bound', 'Max Bound', 'Pass/Fail', and 'Action'.

Drag and drop IO config to configure any channel in seconds.

Create custom user interfaces with no code required

Generate sequences with Excel-based scripting



Sequential Tester for Aerospace Research – Ground & Operation Acceptance Testing