Applications

Aircraft Structural Test
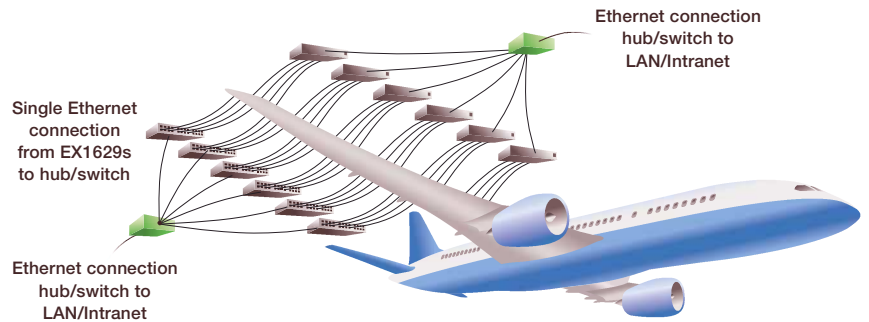
The Challenge

Accurately measure and synchronize over 3,000 channels of strain gauge inputs distributed across a commercial airframe.

The Solution

The EX1629 high-performance strain gauge instrument delivered exceptional measurement accuracy in a distributed topology that simplified setup and configuration.

Key application features include:

- Independent 24-bit A/D per channel
- Complete end-to-end self-calibration
- Integrated TEDS support
- Precision onboard excitation
- LXI-based Ethernet connectivity
- Trigger bus device synchronization

Single Ethernet connection from EX1629s to hub/switch

Ethernet connection hub/switch to LAN/Intranet

Ethernet connection hub/switch to LAN/Intranet

Multiple EX1629 instruments strategically located around the aircraft are wired to individual strain gauge devices

Small Turbofan Testing

The Challenge

Accurately measure and synchronize high-level voltages with a single platform.

The Solution

The EX1000A and EX1048A High-Performance Voltage and Temperature instruments provided the flexibility of measuring low-level as well as high-level voltages levels in a distributed topology, along with simplified setup and configuration.

Key application features include:

- Quick and reliable connectorization
- Adjacent channel noise immunity
- Multiple gain range capability
- Complete end-to-end self-calibration
- LXI-based Ethernet connectivity
- IEEE 1588 bus device synchronization

Solid Rocket Motor Reliability Testing
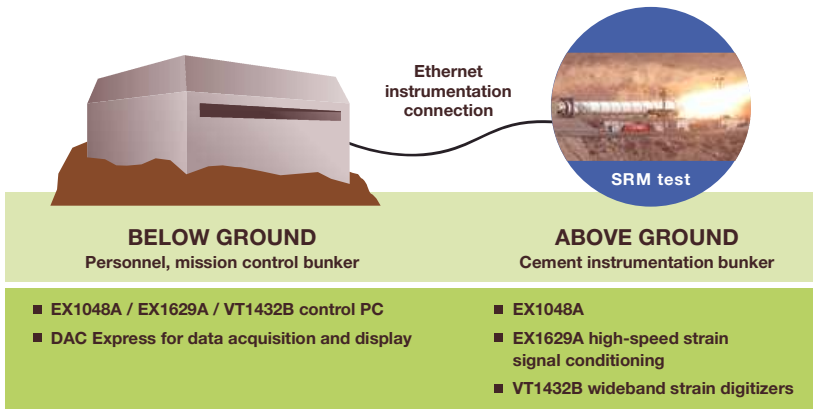
The Challenge

Maintain measurement stability and accuracy in a hostile environment located 1500 meters from the safety of the bunker.

The Solution

Thermocouple, strain gauge and high-speed signals were acquired using the EX1048A, EX1629 and VT1432B/EX2500, respectively. The instrumentation design permitted operation under these harsh conditions without sacrificing accuracy or reliability.

Key application features include:

- End-to-end self-calibration
- Open-thermocouple detection
- RJ-45 connectivity
- Independent filtering per channel
- Scalability
- DAC Express intuitive software

Ethernet instrumentation connection

SRM test

BELOW GROUND
Personnel, mission control bunker

ABOVE GROUND
Cement instrumentation bunker

- EX1048A / EX1629A / VT1432B control PC
- DAC Express for data acquisition and display

- EX1048A
- EX1629A high-speed strain signal conditioning
- VT1432B wideband strain digitizers

Rail Car Load Testing

The Challenge

Place measurement instrumentation at specific locations within a moving rail car and gather data from load sensors.

The Solution

The EX1000A and EX10SC provided the right combination of voltage and bridge measurement capability. Individual channel definition simplified transducer placement and field connectivity.

Key application features include:

- Individual channel configurability
- Simple field terminations
- Independent filtering per channel
- Scalability
- DAC Express intuitive software

Roller Coaster Performance Testing

The Challenge

Measure key performance characteristics to confirm operational integrity of the roller coaster cars.

The Solution

The EX1629 provides accurate transducer excitation and measurement in a single, high-performance package. During coaster test runs, accelerometers are strapped into the car and data is gathered to identify out-of-tolerance points on the rail system.

Key application features include:

- High-speed inputs
- Integrated bridge excitation
- Easy-to-use RJ-45 strain input connectors
- Software-selectable shunt calibration
- Simplified start-up using standard API
- Ability to operate under challenging environmental conditions

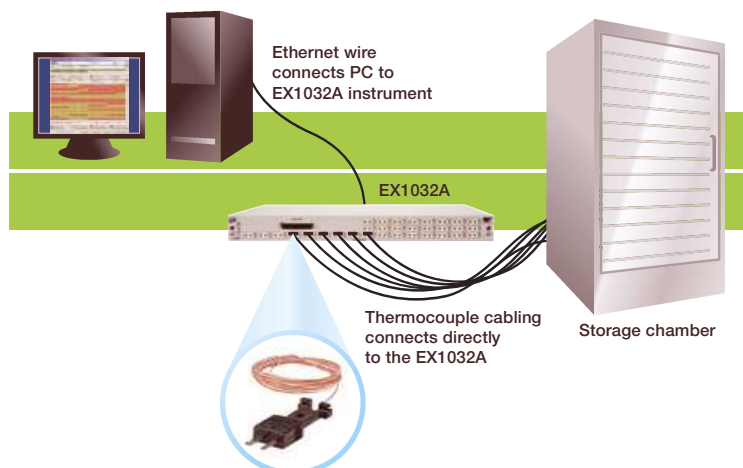## Critical Temperature Monitoring

The Challenge

Measure and control temperatures in coolers and freezers used for the storage of blood products. The critical nature of this application requires extremely accurate and stable temperature measurements.

The Solution

The EX1048A Precision Thermocouple instrument provides exceptional measurement accuracy and stability. LXI Class A capabilities include simplified measurement distribution and data synchronization.

Key application features include:

- 1,000 Sa/s
- Independent filtering per channel
- Visual open-thermocouple detection
- Stable cold junction compensation (CJC)
- LXI Class A certification

Ethernet wire connects PC to EX1032A instrument

EX1032A

Thermocouple cabling connects directly to the EX1032A

Storage chamber

Large-Scale Stress Screening
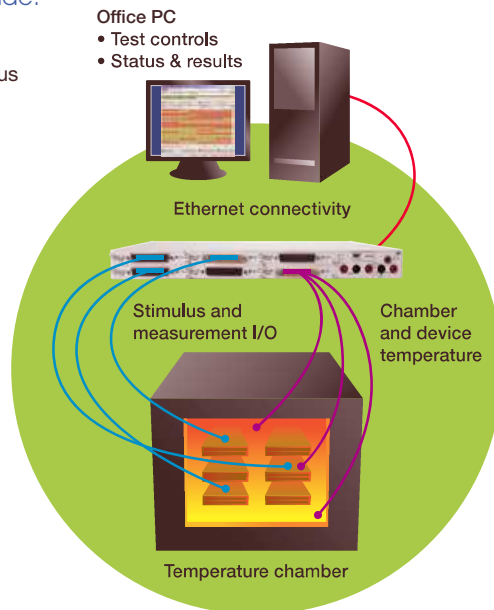
The Challenge

Generate stimulus signals while accurately measuring chamber temperatures and monitoring device response.

The Solution

The EX1266 provides the ability to generate a variety of outputs to the devices under test. The responses are then measured along with chamber and device temperatures.

Key application features include:

- Flexible signal routing and stimulus
- Embedded scan list test sequencing
- Wide variety of signal routing alternatives
- Compatible digital I/O and analog output modules
- LXI-based web access and control capabilities

Office PC
- Test controls
- Status & results

Ethernet connectivity

Stimulus and measurement I/O

Chamber and device temperature

Temperature chamber

Wind Turbine Health Monitoring

The Challenge

Measure run-time electrical and mechanical characteristics of wind turbines in remote locations.

The Solution

The EX1016A paired with the EX10SC provides the ability to measure numerous transducer inputs on a single platform. Temperature, pressure, RPM and current were acquired with the necessary isolation. The EX1629 allows the user to measure strain gauges which are then seamlessly integrated into the data stream.

Key application features include:

- Flexible per-channel input configuration
- Remote software-controlled bridge shunt calibration
- Remote instrument self-calibration
- Synchronization of different signal types
- Ethernet-based LXI data transmission from remote locations

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