

## The Challenge

A first tier aerospace manufacturer requested a data acquisition and logging system to monitor the internal and external environmental conditions of a multi-day product transport. The DAQ system would record physical forces imposed on the shipping container and product to ensure the product experienced no damage during transport.



## The Solution

PVI Systems developed a rackmount NI PXI hardware system and incorporated PVI's **Chameleon** Software. The multi-chassis redundant data acquisition system included GPS timing and synchronization, custom sensor filtering, signal conditions, and excitation. Sensors sampled air temperature, ambient and differential pressure, humidity, shock, and acceleration.



The **Chameleon** software runs on the PXI hardware and is responsible for acquiring and storing the sensor data. A Monitor application runs on a laptop and remotely monitors the sensor data for real-time monitoring and data management.

Based upon their mission requirements, the client needed additional features for the **Chameleon** software. **Chameleon**, having been developed in NI LabVIEW, was easily modified to meet these additional requirements. The new features included improved warning and alarm capabilities as well as a centralized software to monitor the redundant data acquisition systems.

## Additional System Features:

- PXI based data acquisition and control
- Mixed signal input
- Custom signal conditioning and filtering
- Configuration-based software to allow for changes in test requirements
- MilSpec Flight Shock and Vibration certified
- Centralized monitoring and alarms
- Custom post processing of transport events



*Rack-mounted monitor server with RAID & NI PXI chassis.*

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## The Chameleon System –

- 8 Strain Channels
- 96 Voltage Channels for a variety of custom sensors
- 64 Analog Output channels for sensor excitation
- GPS/IRIG B Timing and synchronization
- PXIe-1085 18-slot chassis for future expansion
- PXI-MXI interface to rack mount server with SSD RAID capability
- Precision Filters cDAQ based low pass filtering modules



The flexibility of the NI PXI-based data acquisition and control hardware combined with PVI Systems' Chameleon Data Acquisition software has equipped the client with a robust system that provides for both current and future application capabilities.

*Custom Strain Gauge Assembly - Front*



*Custom Strain Gauge Assembly - Back*



*Inside strain gauge assembly with Precision Filter low-pass filtering module.*



### Benefits of Using Chameleon

- Flexible, Scalable, Turnkey
- Time and Frequency Acquisition
- Live Signal Monitoring
- Data Display and Processing
- Data Export to .mat or CSV
- Easily Re-Configured
- Multiple Repeated Acquisitions
- Pre-Triggered Acquisition
- Rugged and Reliable

[www.ChameleonDAQ.com](http://www.ChameleonDAQ.com)



Since 1999, PVI Systems has been designing and building Test and Measurement systems to provide clients with solutions that significantly improve their product development, manufacturing, or testing processes.

We work with leading companies from a diverse array of industries including Defense, Aerospace, Manufacturing, Life Sciences, Pharmaceutical, Energy, Academia, and more.

*Contact us for more information about the Chameleon System or custom-engineered Data Acquisition, Automated Test & Measurement, Machine Vision, and Process & Motion Control systems.*



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