



ENGINEER
NEXT
NIDays

The logo features the words "ENGINEER" and "NEXT" in a large, white, sans-serif font, stacked vertically. A yellow graphic element, resembling a stylized 'N' or a series of parallel lines, is positioned between the two words. Below this, the word "NIDays" is written in a smaller, white, sans-serif font, enclosed within a white rectangular border. The entire logo is set against a background of diagonal stripes in various shades of blue, green, and orange.



Live Demo: Programming a Distributed DAQ Application



Session Agenda

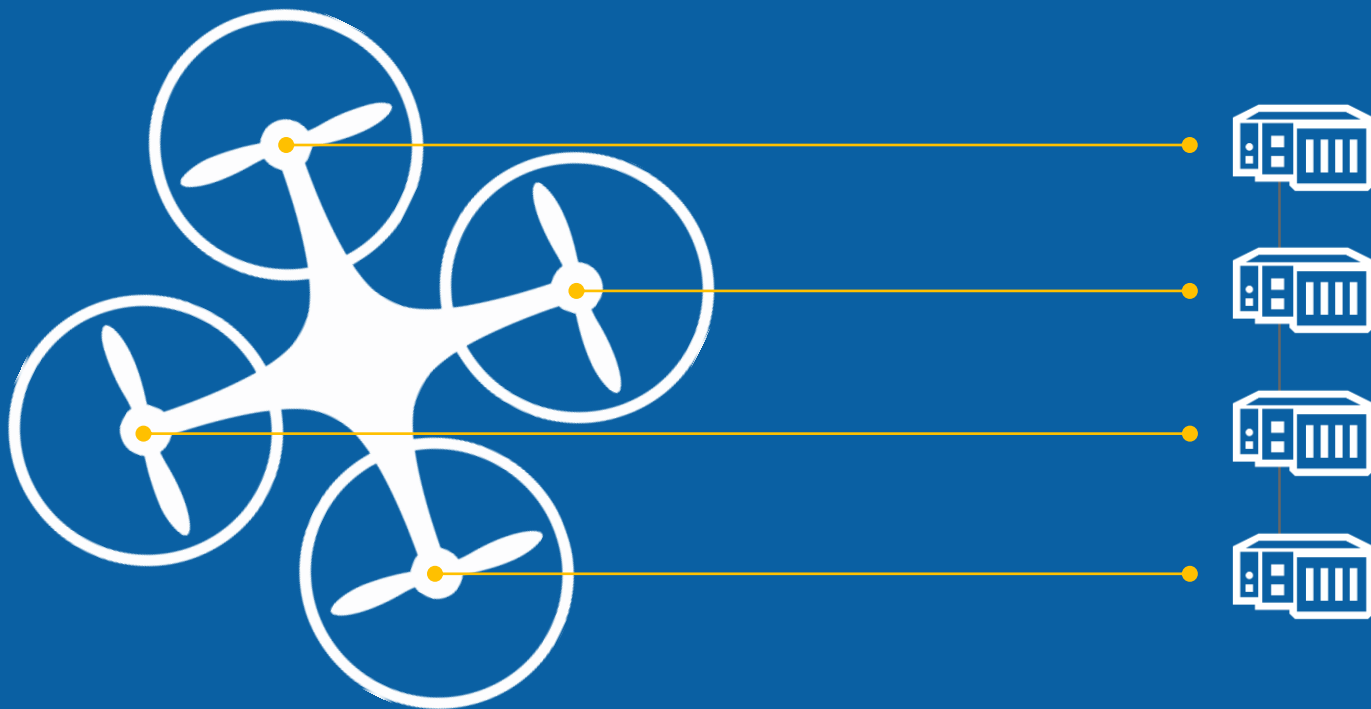
Goal

- Build a distributed, synchronized, mixed-signal DAQ application

Key Takeaways

- New capabilities in LabVIEW NXG
- Quick configuration and setup
- NI-DAQmx task best practices
- Well-documented data files
- Reliable operation

Test System Overview



Demo Procedure

Getting Started

- Check hardware accuracy
- Identify metadata in advance
- Confirm proper sensor operation

Application Development

- Synchronize temperature and vibration
- Save metadata and log to disk
- Synchronize multiple chassis

Integrating Reliability

- Implement watchdog timer
- Configure email alerts

Is the Accuracy Sufficient?

Test Requirements

Expected Physical Measurement	5 mV/g
Accelerometer Output	50 g
Tolerance	$\pm 10\% = 5 \text{ g}$



NI 9234 Sound and Vibration Module

Accuracy = Reading*Gain Error + Range*Offset Error + Noise Uncertainty

$$= ((50 \text{ g} * 5 \times 10^{-3} \text{ V}) * 0.05\%) + 10 \text{ V} * 0.006\% + 50 \times 10^{-6} \text{ V RMS} * \left(\frac{3}{\sqrt{51,200}} \right)$$

$$= \sim 0.186 \text{ mV} = < 1 \text{ g}$$

What Metadata Should I Include?

File

- Name
- Author
- Test Description
- Date and Time
- Test Location
- Test Operator

Group

- Test Fixture
- Test Procedure
- UUT Name
- UUT Serial Number
- Test Status

Channel

- Name
- Measurement Type
- Units
- Minimum
- Maximum
- Limits
- Sensor Properties
- Waveform Timing