



The logo for NIDays Engineer Next is centered on a blue background with diagonal stripes. It features the text "NIDays" in white inside a white rectangular box, followed by "ENGINEER" in white capital letters, and "NEXT" in large white capital letters. A yellow stylized graphic, resembling a folded ribbon or a stylized 'N', is positioned between "ENGINEER" and "NEXT".

NIDays ENGINEER  
NEXT

# Live Demo: Programming a Distributed DAQ Application

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# Session Agenda

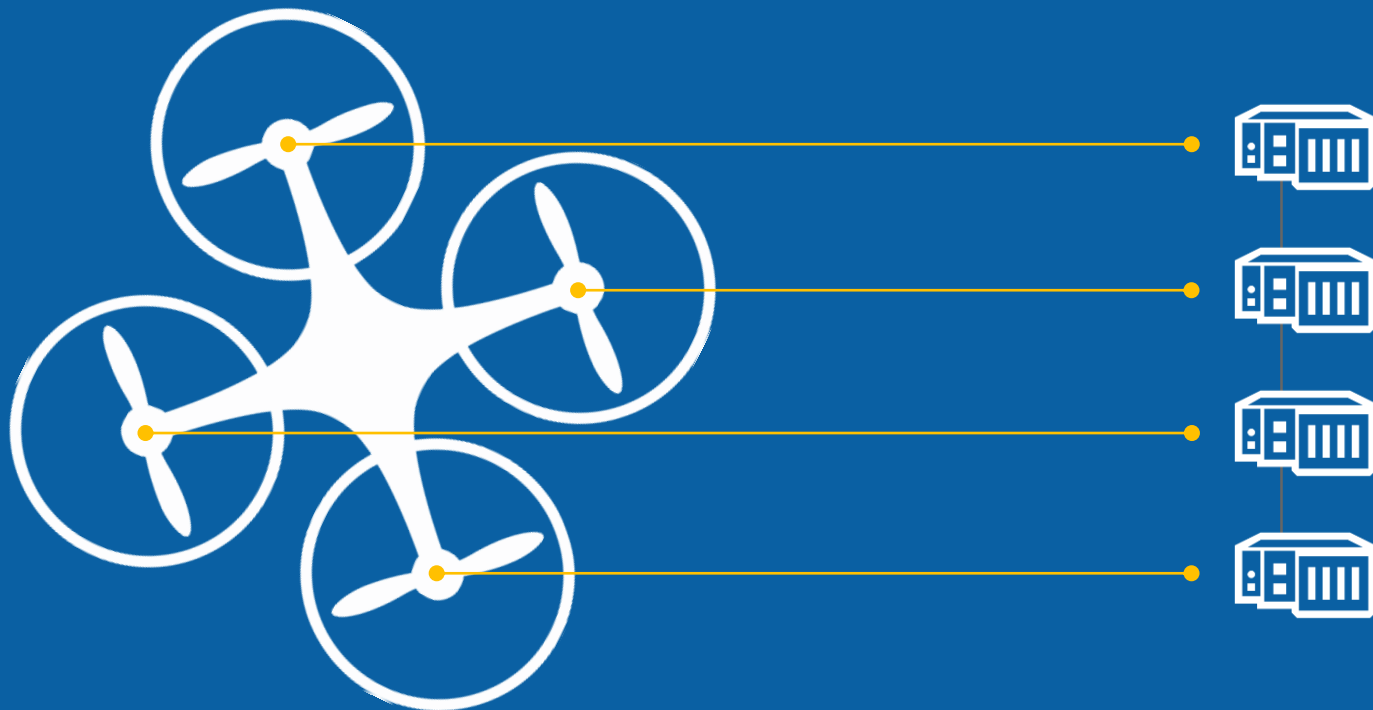
## Goal

- 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

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