



NI mioDAQ

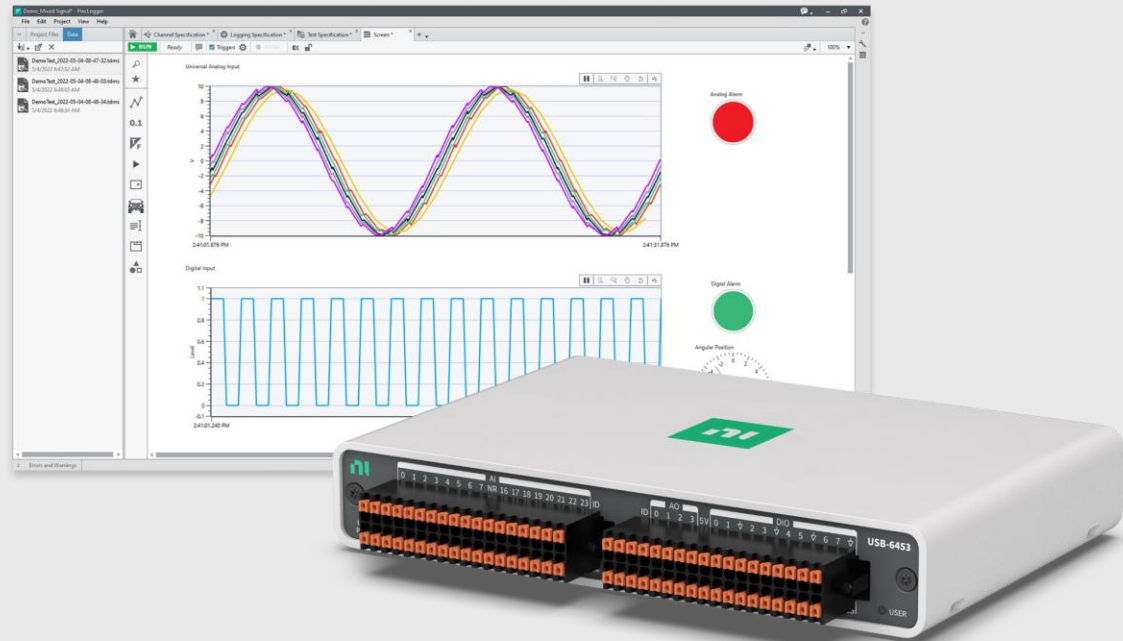
Better Measurements

Better Setup Experience

Better Software Options

NI mioDAQ

NI's latest USB DAQ Hardware



- **Better Measurements**

- Up to 20-bit, ± 10 V inputs @ 1 MS/s/ch sample rate
- Four ± 10 V outputs @ 250 ks/s/ch update rate
- 16 digital lines and four counter/timers

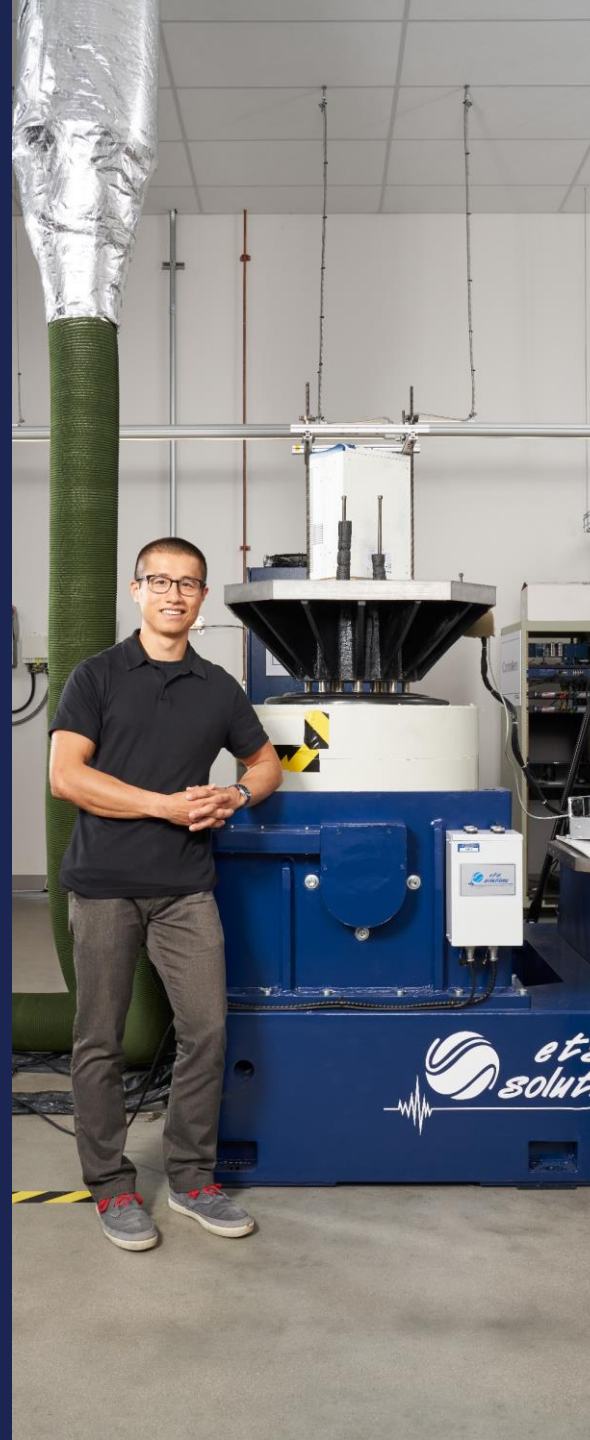
- **Better Setup Experience**

- Bus-powered USB Type-C connection
- QR-code guided setup
- Connection accessories included
- Multiple mounting accessories

- **Better Software Options**

- Free DAQ software with FlexLogger Lite
- Industry-best LabVIEW integration
- Support for Python, C/C++, C# and more

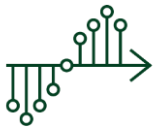
mioDAQ benefits for the engineer



Test, measurement, and research
that helps you succeed.

- Better data with more confidence
- Less stress and frustration from setup
- Software that scales

Measurement Quality Features



20-bit resolution @ 1 MS/s/ch

Get better measurements, especially for low voltage signals on sensor and control boards



Independent timing engines

Clock AI, AO, DIO at different rates, or synchronize based on your test system needs.



Flexible DIO Lines

Set DIO lines for static or clocked input/output, clock, trigger, or route to a counter. Set thresholds to 5 V, 3.3 V, or 2.5 V.



Self-Calibration

miODAQ's precision circuitry adjusts for differences in temperature and manufacturing components.



100 MHz Timebase

Quality time resolution for measurements, faster response for triggers and digital latching.



Guaranteed Specifications

Two- and ten-year external calibration intervals.

User Experience Features



QR-Code setup

Find drivers, software, and user manuals without a massive search effort.



Zip Tie Mounting

Less stress when you setup an ad hoc test. Just zip it.



Accessories included

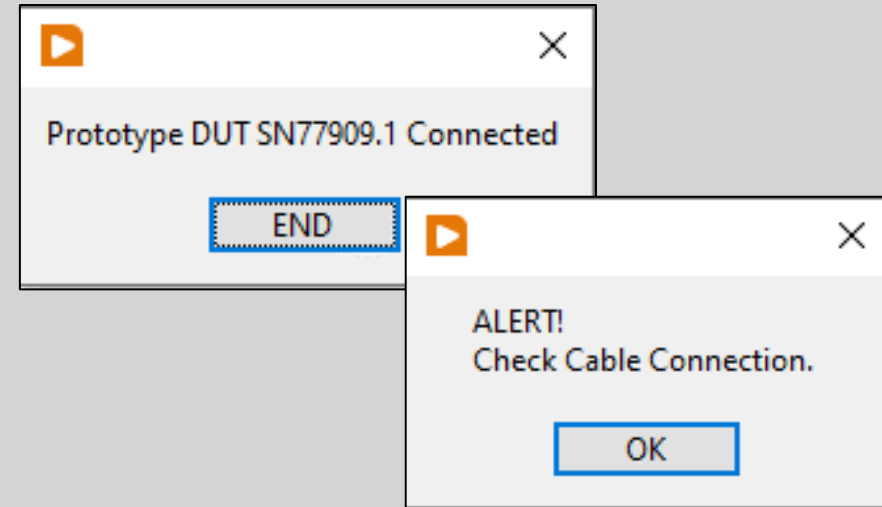
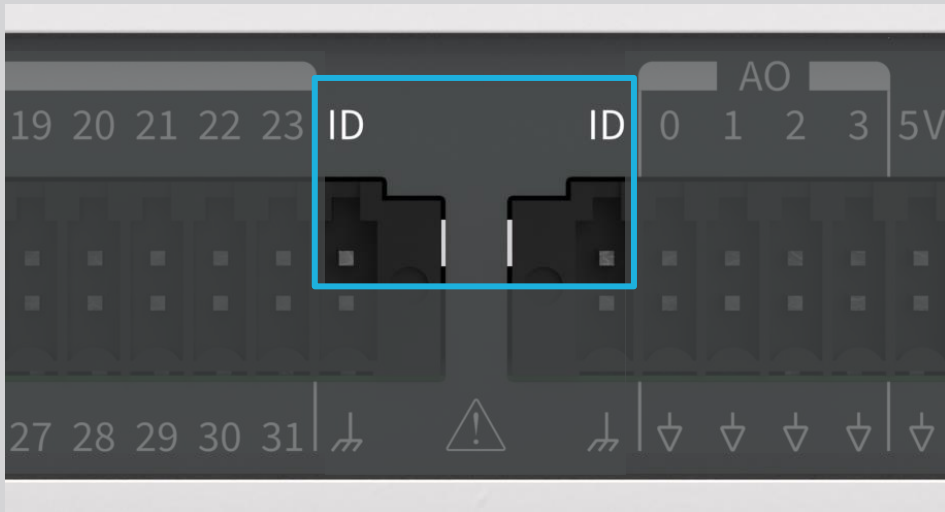
Everything you need is in the box. Just add your sensor/signal wires.



Bus-powered USB Type-C

Your computer powers mioDAQ over the USB cable.

Smart ID Pin



What is the Smart ID Pin?

- Read/Write 1-wire EEPROM using API
 - *API Support ships with Q4 2024 driver*
- Install EEPROM in test PCB/fixture, or connect to spring terminal

What can you automate with the Smart ID Pin?

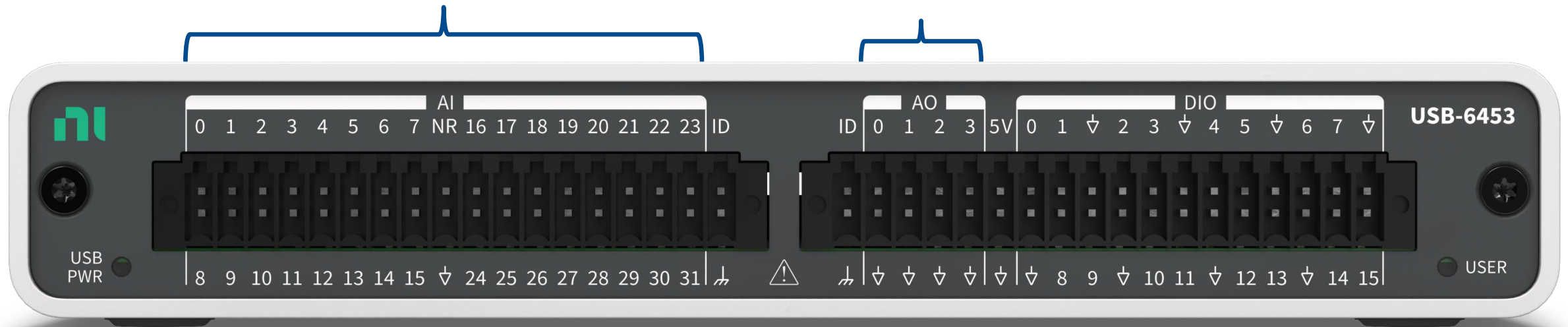
- Load channel maps and calibration constants
- Validate proper cable connections
- Log prototype information as test metadata (SN, firmware rev., etc.)

Up to 20-bit, 1MS/s/ch ± 10 V Inputs

- Multiplexed and simultaneous options
- Multiple gain settings (± 0.2 V, ± 1 V, ± 5 V, ± 10 V)

± 10 Volt Outputs

200 kS/s/ch update rate



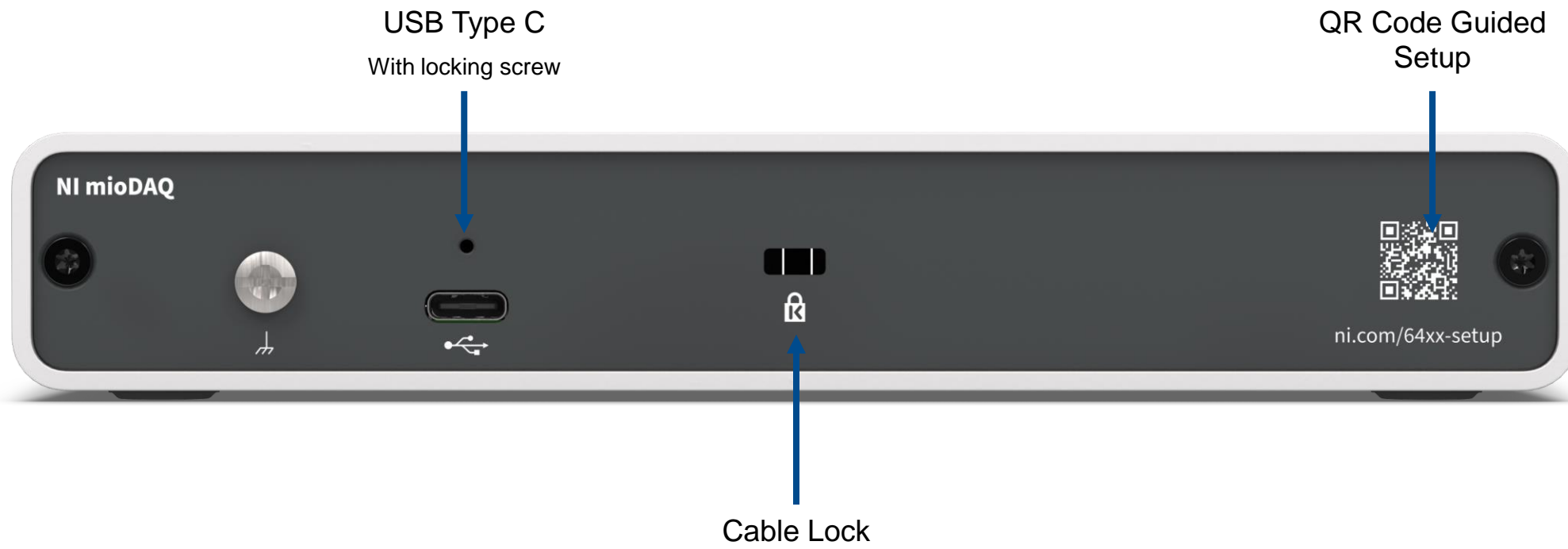
CJC for Thermocouple Measurements

Smart ID Pins

+5 V pin

Flexible Digital Lines

User LED



mioDAQ Mounting Bracket Accessory

For vertical panel mount and vertical DIN rail mount installation.



Rack Mounting Accessory for mioDAQ





Use Cases

- Quick debug at your desk
- High-performance, portable measurements
- Instrumentation that fits in your backpack
- Simple scope measurements and waveform generation
- DAQ for automated test benches

Applications

- Automated power performance validation of battery-powered electronic designs
- Automated firmware validation test of control boards
- Stimulus-response test
- Electro-mechanical system and component test benches
 - HVAC/appliance components, smart/IoT sensors, automotive/aerospace vehicle component test
- And many more...

What can you measure with mioDAQ?

Measure

±10 volt signals at 16- and 20-bit resolution

Sensors that output ±10 volts

High-speed voltage signals up to 1,000,000 samples/second/channel.

Thermocouples

Voltage drops across a shunt resistor for current measurement

Battery cell voltages (±10 volt peak cell measurement)

Power rails on USB/battery-powered electronic boards (PCBs)

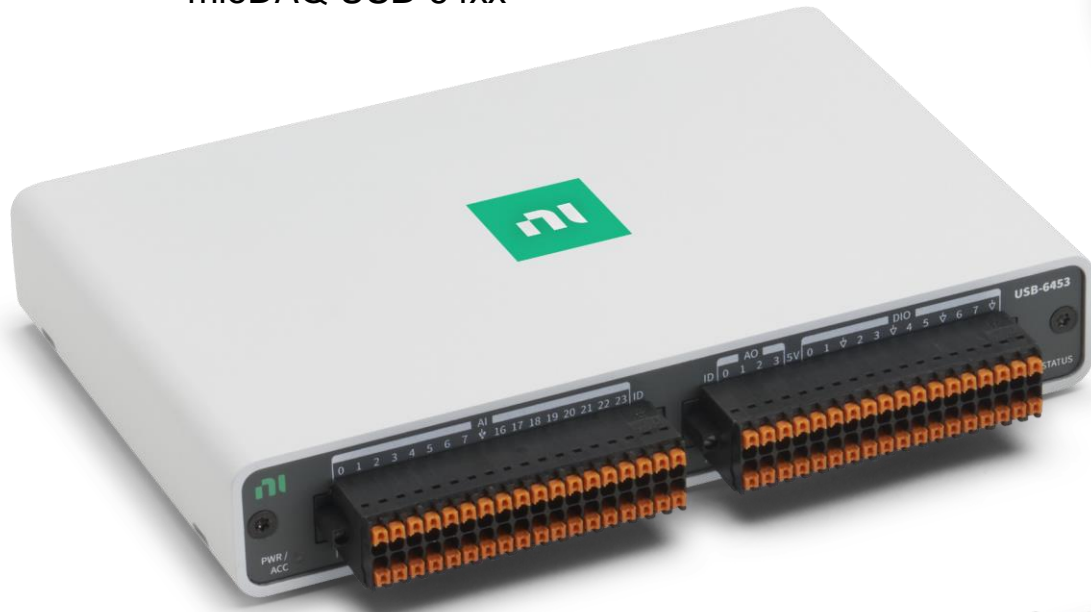
- Pulse and event counting
- Digital (2.5 V, 3.3 V, and 5 V thresholds)
- Quadrature encoder
- Resolvers
- String pots, line pots
- Low voltage current sensors
- Low voltage potential transformers
- And many more...

Generate and Control

- Voltage output (±10 V)
- Digital output (TTL)
- Relay module (250 V_{RMS} @ 2 A, 60 VDC @ 1A)
- External relay (control with digital lines)
- Generate pulse-width modulated signals
- Simulate sensors/signals
- Connect to LEDs

What's in the Box?

mioDAQ USB-64xx



2m USB type-C cable
Locking jackscrew on mioDAQ side.



Back shells and zip ties
For strain relief



Classic NI Screwdriver

Select Your mioDAQ Hardware

	Lowest Cost	More Channels	Better Speed/Resolution	Highest Performance
mioDAQ model	USB-6421	USB-6423	USB-6451	USB-6453
Part Number	789887-01	789882-01	789888-01	789884-01
Analog Input Channels (Single-ended/Differential)	16/8	32/16	16/8	32/16
Max Sampling Rate*	250 kS/s (1 channel)	250 kS/s (1 channel)	1 MS/s/ch (8 channels)	1 MS/s/ch (16 channels)
Number of ADCs	1	1	8	16
Simultaneous	No	No	Yes	Yes
Resolution	16-bit	16-bit	20-bit	20-bit
Analog Output Channels	2	4	2	4
Digital I/O Channels	16	16	16	16
Counters	4	4	4	4

*USB-6451/53 have a multiplexed mode to achieve higher channel counts. Max sample rate is per channel over # of ADCs. See manual for details.

Options beyond mioDAQ

Install inside a computer



PCIe DAQ Devices

Select over USB mioDAQ for:

- Faster control loop rates over PCIe bus
- Higher-channel count systems

Modular System Connected to a Computer



NI CompactDAQ

Select over mioDAQ for:

- Modularity
- More Measurement Options
- Rugged Operating Specs
- Ethernet expansion with synchronization

PXI (*Computer for Test engineers*)



PXI Chassis

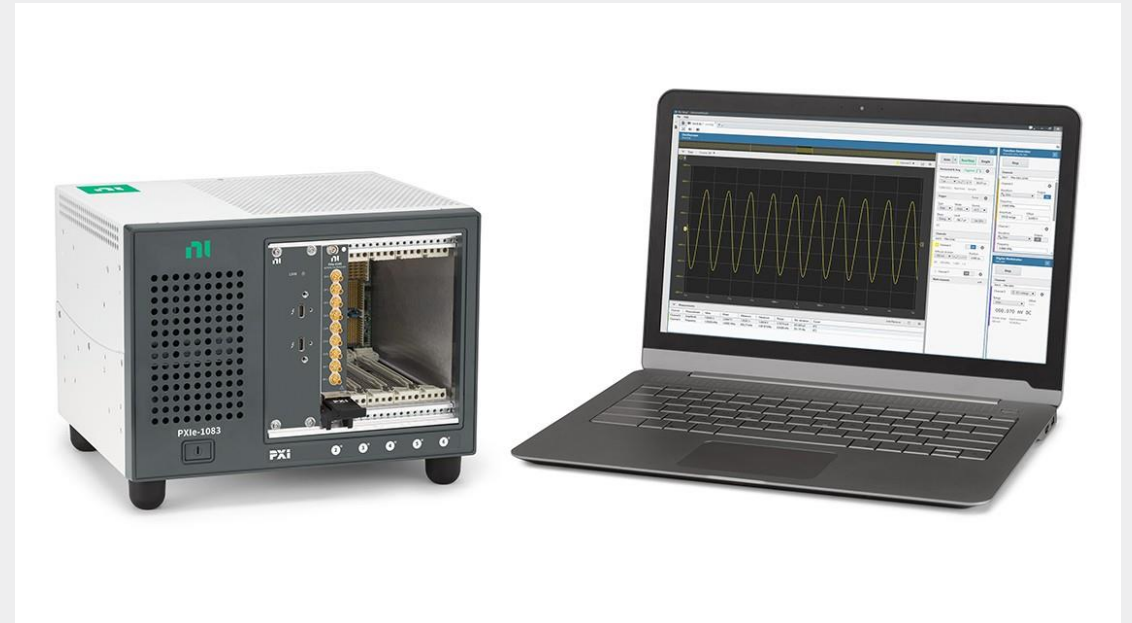
Select over mioDAQ for:

- Highest measurement performance
- Combining DAQ with DMMs, scopes and other instruments
- Manufacturing test systems

Data Acquisition for PXI

Upgrade to PXI DAQ for use cases that include:

- High-bandwidth applications like record/playback
- Manufacturing test systems
- Electronic validation test systems that combine data acquisition with instruments (DMM, Scope, ARB, etc.)
- Measurement accuracy and quality is paramount for voltage, sound, vibration, bridge/strain measurements, etc.



Select from portable, desktop PXI chassis that connect to a laptop (as seen in image above), or rack-mounted 18-slot chassis with the computer built in.

NI's Industry-leading DAQ Software



For Everyone (free)

NI DAQmx Driver

FlexLogger Lite Data Logging Software

- Configure your DAQ device
- Drag-and-drop graphs for a display
- Log to Excel or .TDMS files

API for Python, C, .NET

- Documented programming interface for DAQ hardware
- Example programs
- Support while on hardware service program (1st year included)

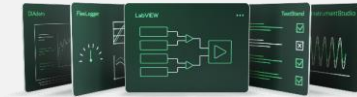


For the Engineer

LabVIEW

LabVIEW

- Control valves, motors, relays, chambers, and other equipment for cyclical tests
- Automate instruments like power supplies and SMUs
- Create professional user interfaces
- Program like you think with graphical data flow
- Use your Python, C, and MATLAB code



For the Test Professional

LabVIEW+ Suite

The LabVIEW+ Suite

- Reduce development and maintenance time with software designed for engineers
- Improve data analysis and utilization with automated report generation and interactive analysis
- Future proof your system with open software compatible with non-NI instruments and code from Python, C, or MATLAB.



A graphical programming environment engineers use to develop automated research, validation, and production test systems.



Create Professional User Interfaces

View data and control your test system via an interactive UI built from drag-and-drop UI elements



Integrate All Your Instruments

Acquire data from and control any instrument with 1000s of device drivers and industry-standard protocols



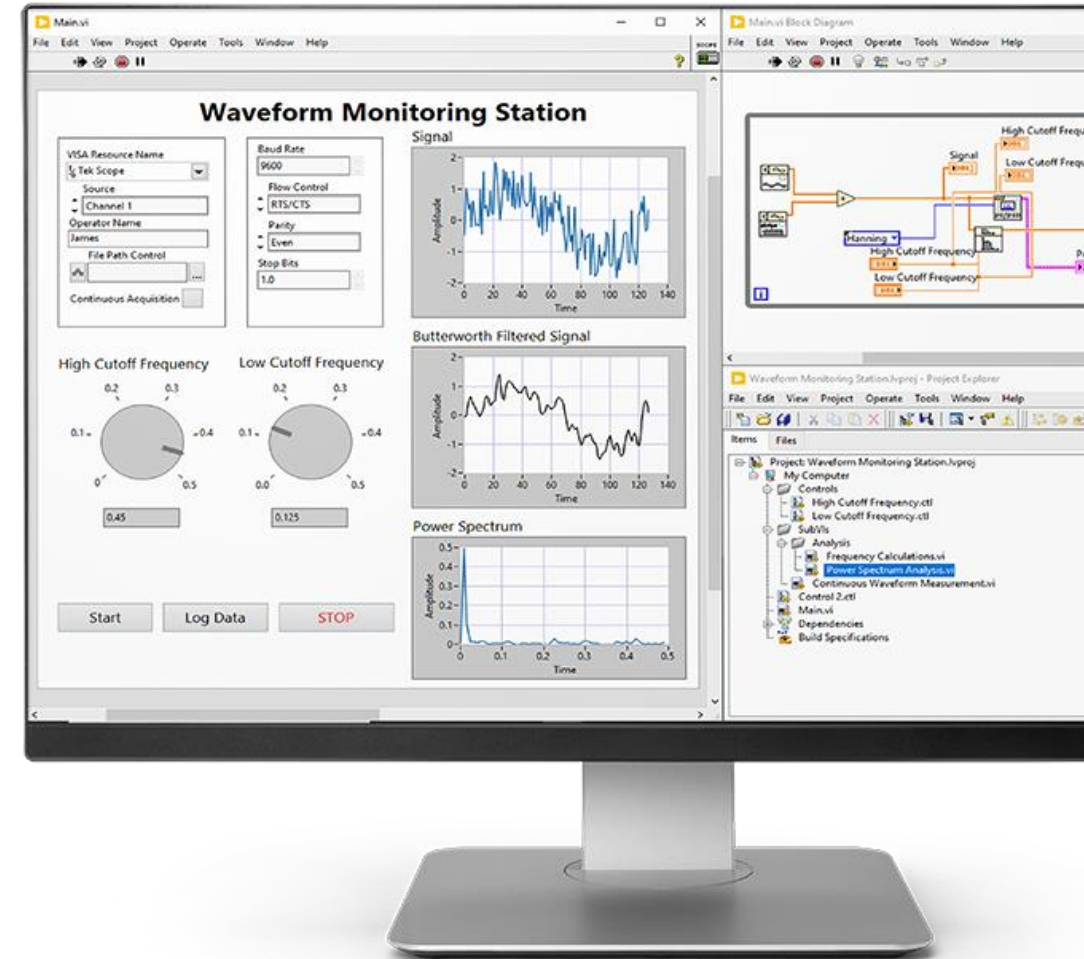
Program Like You Think

Save development time by creating and visualizing applications using data flow programming.



Use Other Code

Leverage other and existing code written in Python, C/C++, MATLAB®, and .NET





FlexLogger

A no-code data acquisition software engineers use to build validation and verification test applications.



Configure Measurements

Set up your system in minutes by interactively selecting devices and measurement channels



Create Dashboards

Monitor and control test with drag-and-drop visualization and interactive elements



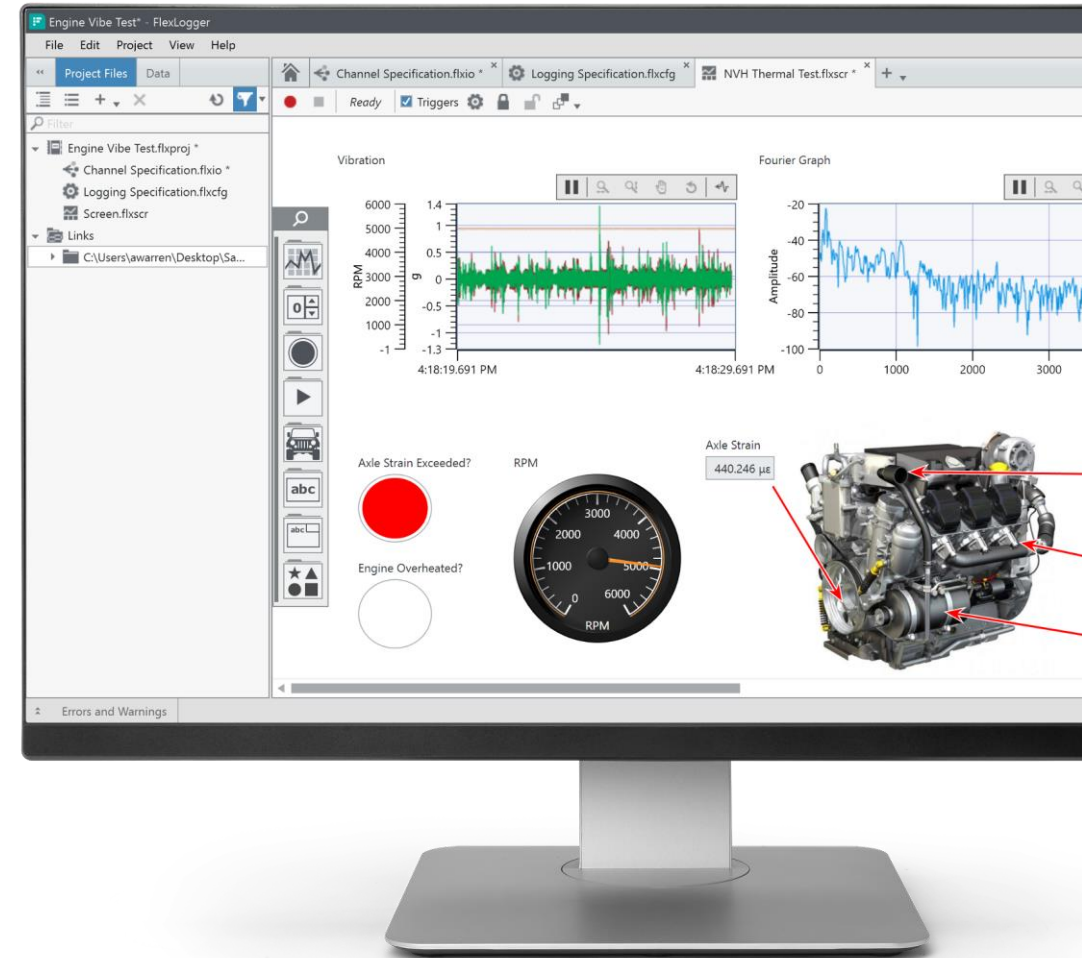
Store Results

Configure data storage preferences to automatically partition files and store to multiple locations




Analyze Data

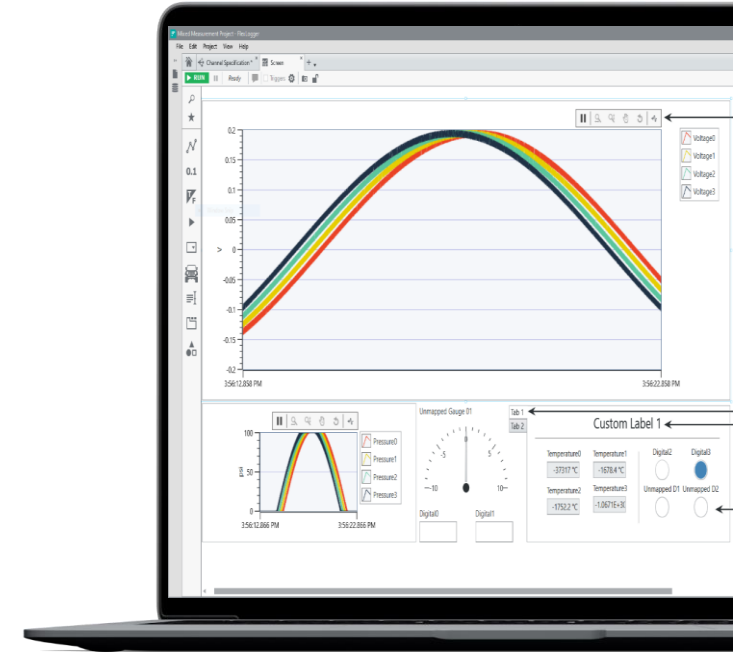
Use native functionality for simple math, filtering, Boolean logic, and more to do inline calculations





FlexLogger Edition Comparison

	FlexLogger Lite (Free Companion)	FlexLogger (Paid – Enhanced) 
Configure and validate DAQ measurements	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Manually log to standard data formats	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Monitor tests with customizable dashboards	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Visually inspect data using TDMS Viewer	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
XNET and TEDs support		<input checked="" type="checkbox"/>
Python integration		<input checked="" type="checkbox"/>
Configure events, alarms, and triggers		<input checked="" type="checkbox"/>
Connect data to SystemLink		<input checked="" type="checkbox"/>
Create plug-ins to extend capabilities (3 rd party hw, custom)		<input checked="" type="checkbox"/>
Scale with multi-chassis synchronization		<input checked="" type="checkbox"/>
Preview		<input checked="" type="checkbox"/>
Operator mode		<input checked="" type="checkbox"/>





Programming Language Support

Develop your own software for data acquisition and test using your preferred language.



Python

- nidaqmx package available on GitHub
- Support for Cpython 3.8+ and PyPy3
- Example programs included

C/C++, VB 6.0, VB.NET and C#



- API installs with the NI-DAQmx driver
- Libraries of functions for all data acquisition operations
- Example programs included

