



PRODUCT FLYER

# CompactDAQ Chassis

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# CompactDAQ Chassis

cDAQ-9171, cDAQ-9174, cDAQ-9178, cDAQ-9179, cDAQ-9181, cDAQ-9185, cDAQ-9189, cDAQ-9191



- Customize your acquisition, analysis, visualization, and reporting with LabVIEW
- Choose from USB, Ethernet, or wireless bus options
- 60+ I/O modules to support a variety of input and output types
- Easy timing customization with up to seven hardware-timed clocks per chassis
- Time Sensitive Networking enabled Ethernet chassis for distributed measurements
- Rugged form factors withstand -40 °C to 70 °C, 50g shock, 5g vibration

## Built for Accurate, Conditioned Measurements

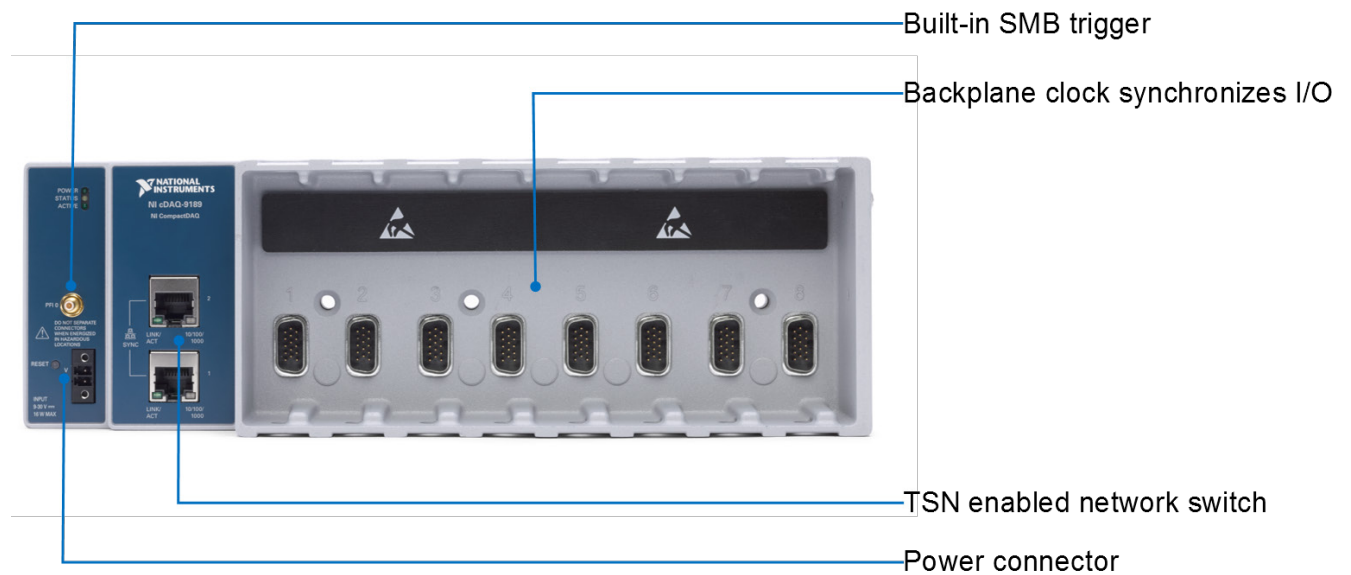
From appliance validation test to benchtop research, you most likely need multiple types of sensors. Many devices can individually measure temperature, voltage, or vibration, but CompactDAQ can acquire and synchronize all of these measurements in one system. CompactDAQ chassis feature USB, Ethernet, or WiFi connectivity and come in multiple slot counts to provide the right amount of I/O for various applications. You use these models with a combination of C Series I/O modules to create a mix of analog I/O, digital I/O, and counter/timer measurements.

You can use CompactDAQ with LabVIEW software to customize how you acquire, analyze, present, and manage your measurement data. CompactDAQ makes programming easier because the same NI-DAQmx driver is used for all measurements. All modules are automatically detected and synchronized by the hardware clock in the backplane of the chassis. If there are problems with any of the measurements or equipment, award-winning local NI support is the only contact for all your instrumentation needs.

Table 1. NI offers chassis with a breadth of bus, size, and rugged options to meet different application requirements.

Models	Bus Connectivity	Slot Count	TSN Synchronization Enabled	Built-In Trigger	Operating Temperature Range
cDAQ-9171	USB 2.0	1			-20 °C to 55 °C
cDAQ-9174	USB 2.0	4		•	-20 °C to 55 °C
cDAQ-9178	USB 2.0	8		•	-20 °C to 55 °C
cDAQ-9179	USB 3.0	14		•	-20 °C to 55 °C
cDAQ-9181	Ethernet	1			0 °C to 55 °C
cDAQ-9185	Ethernet	4	•	•	-40 °C to 70 °C
cDAQ-9189	Ethernet	8	•	•	-40 °C to 70 °C
cDAQ-9191	Wi-Fi	1			0 °C to 55 °C

## Detailed View of cDAQ-9189



# Key Features

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## Mixed Measurement Systems

CompactDAQ chassis control the timing, synchronization, and data transfer between C Series modules and an external host. Each C Series module contains measurement-specific signal conditioning to connect directly to an array of sensors and signals, bank and channel-to-channel isolation options, and support for wide temperature ranges to meet a variety of application and environmental needs. Choose from more than 60 C Series I/O modules for different measurements including thermocouple, voltage, resistance temperature detector, current, resistance, strain, digital (TTL and other), accelerometer, and microphone. Channel counts on the individual modules range from one to 32 channels to accommodate a wide range of system requirements.



Figure 1. Connect to any sensor on any bus with C Series I/O modules.

## Precise Timing and Synchronization

Because CompactDAQ is a modular system, you can add more measurement types and channels to the system by simply plugging in additional modules. All modules are automatically detected and synchronized to the clock in the backplane of the chassis. CompactDAQ has multiple timing engines, which allow you to run multiple hardware-timed operations simultaneously with independent rates for analog input. Ideal for highly distributed systems, TSN enabled chassis synchronize measurements using network-based time, which allows for accurate synchronization over long distances and eliminates the need for lengthy, physical timing cables.



Figure 2. Easily expand your system with an integrated network switch for simple daisy-chaining.

## Rugged Design

With the rugged features of CompactDAQ, you can reconfigure and move a single test system from the lab to field without having to purchase different equipment. CompactDAQ and all C Series I/O modules are constructed from A380 cast aluminum to withstand operating temperatures from -20 °C to 55 °C and up to 30 g of shock. Minimize cabling costs and distribute measurements closer to your sensor or signal using rugged form factors with an extended operating temperature range as wide as -40 °C to 70 °C (-40 °F to 158 °F), 50 g shock, and 5 g vibration ratings. CompactDAQ chassis also meet a variety of international safety, Hazloc, and environmental certifications and ratings for operation in harsh industrial environments.

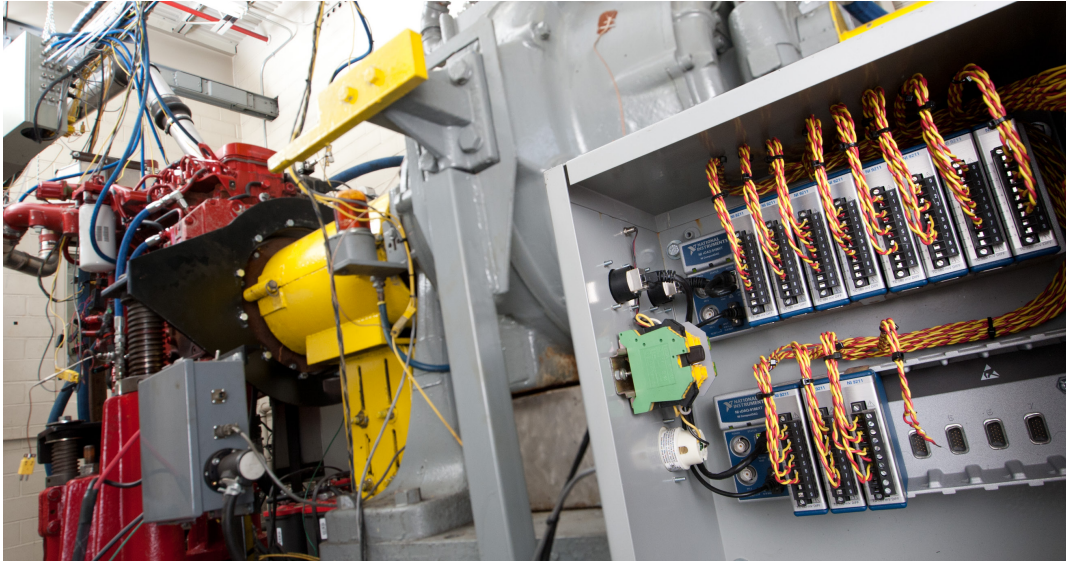
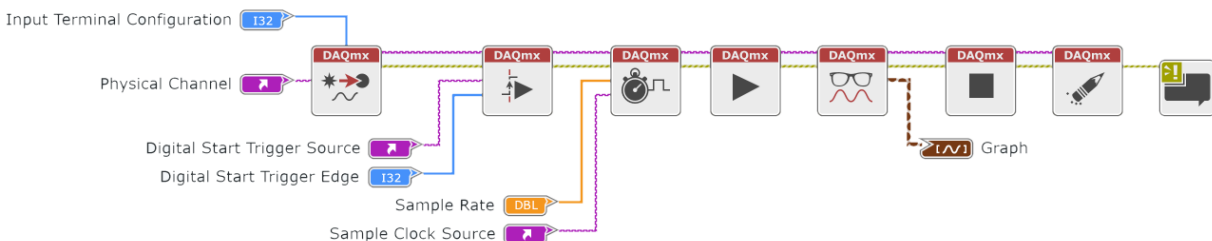


Figure 3. Spend less time preparing instrumentation for the rigors of field testing with an extended temperature range and high shock and vibration resistance.

## NI-DAQmx Application Programming Interface (API)

The [NI-DAQmx driver](#) includes a best-in-class API that works directly with a variety of development options including LabVIEW, DAQExpress, C, C#, Python, and others. The native integration provides exceptional performance and a seamless experience without the need for manual wrapping of functions. To ensure long-term interoperability of DAQ devices, the NI-DAQmx driver API is the same API used for all National Instruments DAQ products – meaning re-development efforts can be minimized regardless of hardware changes or upgrades. Additionally, the driver provides access to help files, documentation, and dozens of ready-to-run shipping examples you can use as a starting point for your application.



# Platform-Based Approach to Conditioned Measurements

## What Is CompactDAQ?

CompactDAQ is a portable, rugged data acquisition platform. CompactDAQ combines signal connectors, integrated signal conditioning, and converters in a single package to deliver higher accuracy measurements by eliminating error-prone cabling and connectors and reducing the number of components in a measurement system. With over 60 available C Series I/O modules supporting nearly any sensor type, you can quickly design a custom hardware setup optimized for size, cost, and performance. The breadth of bus, chassis, and I/O conditioning options, combined with the truly customizable nature of LabVIEW, provides the best solution to meet your medium-channel-count application needs.

### Any Bus, Any Form Factor

Choose from USB, Ethernet, and wireless bus options or stand-alone controllers to meet your application needs in either the lab or the field.

### Accurate Conditioned Measurements

Take advantage of over 60 sensor-specific modules to directly connect to your sensor or signal.

### Precise Timing and Synchronization

Easy timing customization for each sensor or signal with up to seven hardware-timed clocks per chassis.



### Truly Customizable Software

Tailor the automation of your data acquisition, analysis, visualization, and reporting to meet specific application needs with LabVIEW software.

### Measurements Closer to the Sensor

Distribute measurements closer to the sensor or signal using rugged form factors with -40 °C to 70 °C temperature ranges and fanless operation.

### Increased Streaming

Increase data streaming over the same bus with NI Signal Streaming and the TDMS binary file format.

## Flexible to Meet Changing Requirements

Whether adding new sensors or deploying from the lab to the field, CompactDAQ is a modular platform that can meet the demands of future applications. By simply changing to a different chassis or controller, you add new functionality, like an integrated processor or extended operating temperature range. With four-, eight-, and 14-slot chassis options, you can scale systems to higher channel counts by moving to a larger chassis or synchronizing multiple chassis. Additionally, TSN enabled chassis simplify building distributed systems with time synchronization over Ethernet and simple daisy-chaining. Because the same hardware driver, NI-DAQmx, is used to program all CompactDAQ hardware and C series I/O modules, you can modify existing test systems without any significant software changes.

# Hardware Services

All NI hardware includes a one-year warranty for basic repair coverage, and calibration in adherence to NI specifications prior to shipment. CompactDAQ systems also include basic assembly and a functional test. NI offers additional entitlements to improve uptime and lower maintenance costs with service programs for hardware.

	Standard	Premium	Description
Program Duration	3 or 5 years	3 or 5 years	Length of service program
Extended Repair Coverage	•	•	NI restores your device's functionality and includes firmware updates and factory calibration.
System Configuration, Assembly, and Test <sup>1</sup>	•	•	NI technicians assemble, install software in, and test your system per your custom configuration prior to shipment.
Advanced Replacement <sup>2</sup>		•	NI stocks replacement hardware that can be shipped immediately if a repair is needed.
System Return Material Authorization (RMA) <sup>1</sup>		•	NI accepts the delivery of fully assembled systems when performing repair services.
Calibration Plan (Optional)	Standard	Expedited <sup>3</sup>	NI performs the requested level of calibration at the specified calibration interval for the duration of the service program.

<sup>1</sup>This option is only available for PXI, CompactRIO, and CompactDAQ systems.

<sup>2</sup>This option is not available for all products in all countries. Contact your local NI sales engineer to confirm availability.

<sup>3</sup>Expedited calibration only includes traceable levels.

## PremiumPlus Service Program

NI can customize the offerings listed above, or offer additional entitlements such as on-site calibration, custom sparring, and life-cycle services through a PremiumPlus Service Program. Contact your NI sales representative to learn more.

## Technical Support

Every NI system includes a 30-day trial for phone and e-mail support from NI engineers, which can be extended through a [Software Service Program \(SSP\)](#) membership. NI has more than 400 support engineers available around the globe to provide local support in more than 30 languages. Additionally, take advantage of NI's award winning [online resources](#) and [communities](#).