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Find the *National Instruments cDAQ-9189* at our website: *Click HERE*

Technical Sales

(866) 531-6285
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Ordering Information

For user manuals and dimensional drawings, visit the product page resources tab on ni.com.

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NI cDAQ-9184

4-Slot Ethernet NI CompactDAQ Chassis



- Measure up to 128 channels of sensor, analog I/O, and digital I/O signals
- Choose from more than 50 hot-swappable I/O modules with integrated signal conditioning
- Run up to seven hardware-timed measurement I/O tasks simultaneously
- Stream continuous waveform I/O with patented NI Signal Streaming technology
- Standard IEEE 802.3ab Gigabit Ethernet communication interface
- Access four 32-bit advanced general-purpose counters built into the chassis
- Simplify setup with zero configuration networking and web-based configuration
- Pair with the Moxa AWK-3121 wireless access point for high-speed wireless streaming applications

Overview

Simple, Complete Ethernet Data Acquisition

The NI cDAQ-9184 is a 4-slot NI CompactDAQ Gigabit Ethernet chassis designed for remote or distributed sensor and electrical measurements. A single NI CompactDAQ chassis can measure up to 256 channels of sensor signals, analog I/O, digital I/O, and counter/timers with an Ethernet interface back to a host PC or laptop. By combining more than 50 sensor-specific NI C Series I/O modules with patented NI Signal Streaming technology, the NI CompactDAQ platform delivers high-speed data and ease of use in a flexible, mixed-measurement system. Modules are available for a variety of sensor measurements including thermocouples, resistance temperature detectors (RTDs), strain gages, load and pressure transducers, torque cells, accelerometers, flow meters, and microphones. In addition, with NI-DAQmx driver software, you can log data for simple experiments on the benchtop or deploy a distributed test system across the factory floor using NI LabVIEW, ANSI C/C++, Visual Basic .NET, and other programming environments.

Back to Top

Application and Technology

Mix Analog, Digital, and Sensor Measurements in the Same System

Many devices can measure temperature, voltage, or bridge-based sensors, but NI CompactDAQ can integrate all of these measurements and more into a single device that outputs all of the data via the same bus interface. With an NI CompactDAQ system, you can mix multiplexed voltage input signals, simultaneously sampled accelerometers, low-speed thermocouples, and TTL digital I/O all in the same chassis using the same driver, NI-DAQmx. NI CompactDAQ makes programming easier because you use the same driver for all measurements. This solution saves space and simplifies service and support.



Figure 1. The NI cDAQ-9184 Ethernet chassis can hold up to four analog I/O, digital I/O, or sensor measurement modules.

More Than 50 C Series Modules

You can choose from more than 50 NI C Series modules for different measurements including thermocouple, voltage, RTD, current, resistance, strain, digital (TTL and other), accelerometers, and microphones. Each C Series module combines sensor connectivity, signal conditioning, and A/D converters into a small 2.8 by 3.5 in. package. Channel counts on the individual modules range from three to 32 channels to accommodate a wide variety of system requirements. With eight slots to fill per chassis, you can tailor each NI CompactDAQ system to your unique application needs.



Figure 2. You can choose from more than 50 NI C Series measurement modules.

Long-Distance Ethernet Data Acquisition

The convenience and reliability of Ethernet technology are as familiar to most as those of USB. For data acquisition, however, Ethernet offers two advantages when compared to other common PC peripheral buses: long cabling lengths and distributed infrastructure. Ethernet is ideal for taking measurements at distances beyond the 5 m limit of a USB cable. A single CAT 5E cable can reach 100 m before needing a switch or router to carry the signal farther. Furthermore, many IT departments have standardized on Gigabit Ethernet (IEEE 802.3ab) as the backbone for their corporate networks. With NI CompactDAQ, you can take advantage of that existing infrastructure and additional network bandwidth for your remote or distributed measurement applications. One host computer can manage multiple test stations within the same facility or across multiple sites.



Figure 3. NI CompactDAQ Ethernet chassis use standard 10/100 Ethernet or Gigabit Ethernet connections to communicate with a host PC or laptop.

Rugged Design

NI CompactDAQ and all C Series modules are constructed from A380 cast aluminum for a rugged system that can withstand operating temperatures from -20 to 55 °C and up to 30 g of shock. NI CompactDAQ was built to be used in the lab but not to necessarily stay there. With this rugged, flexible system, you can reconfigure and move a single test system from place to place without having to purchase different equipment for every lab or test stand. C Series modules are equally rugged and designed with spring-loaded latches to lock into place when installed in the chassis. The shock and vibration specifications are all tested on an NI CompactDAQ system with modules installed, so modules do not fall out or come undocked under the specified conditions. The rugged features of NI CompactDAQ help you quickly begin testing because less time is needed to prepare the instrumentation for the rigors of field testing.

Four 32-Bit General-Purpose Counters

The cDAQ-9184 chassis has four 32-bit counters built in. These counters are accessed through an installed hardware-timed digital I/O module (sold separately) such as the NI 9401 or NI 9402. Once you have installed the digital module, you can create a counter task in software for operations such as quadrature encoder, period and frequency measurement, or finite pulse train and PWM generation.

Multiple Timing Engines to Acquire From Different Modules at Different Rates

With the cDAQ-9184 chassis, you can install a thermocouple module next to an accelerometer measurement module and acquire from both simultaneously at different rates. The cDAQ-9184 chassis has multiple analog input timing engines, which means you can group all of your analog input modules in up to three sets of modules. These sets, known as tasks, can all run at different rates because each one has its own timing engine in the chassis backplane. This alleviates the need to decimate or parse lower-speed data from the higher-speed data, which you must do for devices with only one timing engine or ADC.

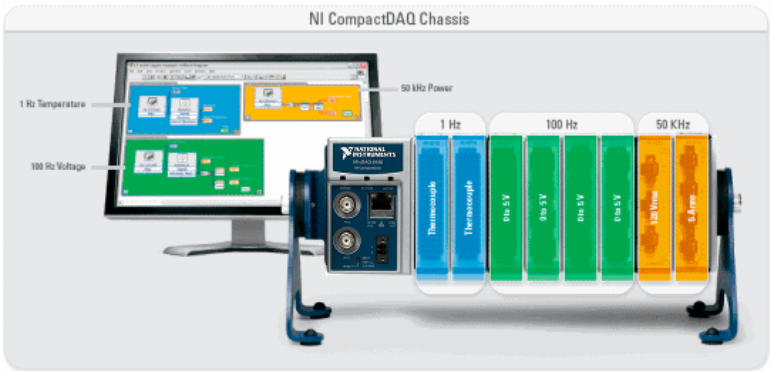


Figure 4. Run multiple tasks at different sampling rates in independent parallel loops.

NI Signal Streaming Technology

To take advantage of the 1,000 Mbit/s of bandwidth on a Gigabit Ethernet network, NI CompactDAQ chassis implement a TCP/IP version of the same patented NI Signal Streaming technology on high-performance NI USB data acquisition (DAQ) products. With this technology, high-speed C Series modules, such as the NI 9223, can continuously acquire up to 1 MS/s of simultaneous 16-bit data on each of four channels. Furthermore, multiple NI CompactDAQ chassis can share the same Gigabit Ethernet network for distributed, high-channel-count systems. Using a sophisticated software architecture, NI-DAQmx driver software maintains a double-buffered transfer mechanism between the chassis and host computer capable of sustaining several bidirectional continuous waveforms. At the same time, the driver monitors the state of the network to adjust for unexpected delays or temporary interruptions. All of this is abstracted from the user, so you can focus on the measurement application and not the network.

Zero Configuration Networking

To make networking technology more accessible to the non-IT professional, NI CompactDAQ uses the Zero Configuration Networking (Zeroconf) collection of standards. With Zeroconf technology, you can plug an NI CompactDAQ system directly into your computer or local subnet, and it appears automatically in NI Measurement & Automation Explorer (MAX) without any network setup or configuration. In addition, you can use a new web configuration interface built into the cDAQ-9184 to manage your system through a web browser without installing any software on your host machine.

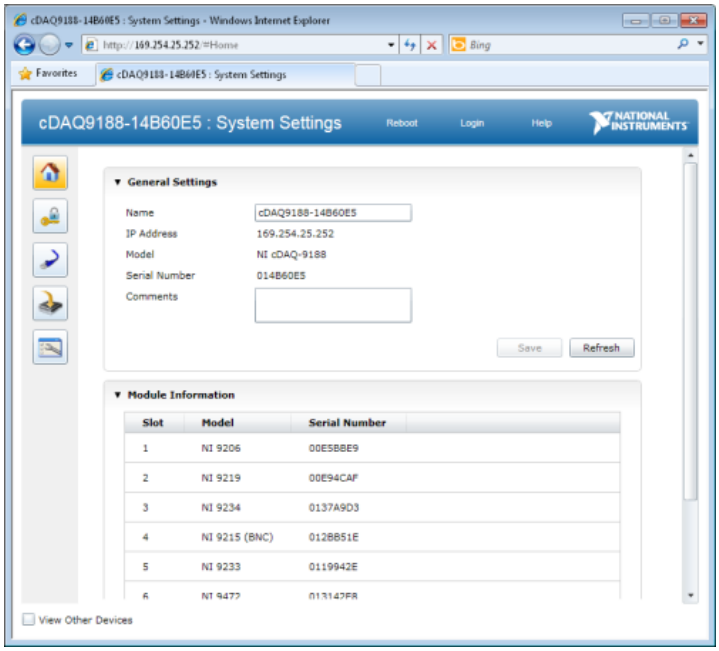


Figure 5. With the embedded web server on any Ethernet NI CompactDAQ chassis, you can remotely configure your NI CompactDAQ system from a web browser.

NI-DAQmx Software Flexibility

Recognizing the diversity of measurement applications, NI approaches programmatic data acquisition independently of specific PC bus technologies. You can use the same NI-DAQmx driver software to communicate with NI data acquisition hardware across PCI, PCI Express, PXI, PXI Express, USB, Ethernet, and Wi-Fi. You can use an application developed for an NI CompactDAQ USB system with an NI CompactDAQ Ethernet system without making any changes to your software. Furthermore, the NI-DAQmx API is consistent across multiple programming platforms, so you can develop an application for NI CompactDAQ in NI LabVIEW, ANSI C/C++, C#, or Microsoft Visual Basic .NET.



Figure 6. NI-DAQmx driver software abstracts data acquisition bus technology and provides a consistent API across multiple programming languages.

National Instruments recommends using the latest version of NI-DAQmx driver software for application development in NI LabVIEW, LabVIEW SignalExpress, LabWindows™/CVI, and Measurement Studio software. To obtain the latest version of NI-DAQmx, visit ni.com/support/daq/versions. NI measurement services software speeds up your development with features including the following:

- A configuration-based interface to create fast and accurate measurements with no programming using the DAQ Assistant
- Automatic code generation to create your application in LabVIEW; LabWindows/CVI; LabVIEW SignalExpress; and C#, Visual Studio .NET, ANSI C/C++, or Visual Basic using Measurement Studio
- Multithreaded streaming technology for 1,000X performance improvements
- More than 3,000 free software downloads at ni.com/zone to jump-start your project
- A single programming interface for hundreds of PCI, PXI, USB, Ethernet, and Wi-Fi data acquisition hardware devices

NI CompactDAQ Ethernet chassis are compatible with the following versions (or later) of NI application software: LabVIEW 8.6, LabWindows/CVI 8.x, and Measurement Studio 8.x. They are also compatible with ANSI C/C++, C#, and Visual Basic .NET.

Shipping Kit Contents

Every cDAQ-9184 shipping kit includes the following:

- cDAQ-9184 four-slot NI CompactDAQ Gigabit Ethernet chassis
- 12 VDC power supply (**region-specific power cord not included**)
- NI-DAQmx 9.6 (or later) software DVD for Windows 7/Vista/XP
- LabVIEW SignalExpress LE data-logging software
- cDAQ-9184 Quick Start flyer
- NI screwdriver (flat and Phillips head)

Accessories



Desktop Mounting Kit (779473-01)



DIN Rail Mounting Kit (779018-01)



Panel Mounting Kit (779558-01)



Rugged Carrying Case (780315-01)



Industrial Wireless Client/Access Point/Bridge (782436-01, 782436-02, 782436-03)



Industrial Power Supplies (781093-01, 781094-01, 781095-01)

Back to Top

Ordering Information

For a complete list of accessories, visit the product page on ni.com.

Products	Part Number	Recommended Accessories	Part Number
NI CompactDAQ Ethernet Chassis			
NI cDAQ-9184 4-Slot Ethernet NI CompactDAQ Chassis	782069-01	No accessories required.	
Accessories			
Panel Mounting Kit	779097-01	No accessories required.	
Rugged Carrying Case	780315-01	No accessories required.	
Filler Module for Empty Slots	196917-01	No accessories required.	
Replacement/Spare Power Supply	780703-01	No accessories required.	
Desktop Mounting Kit	779473-01	No accessories required.	
DIN-Rail Mounting Kit	779019-01	No accessories required.	
Industrial Wireless Client/Access Point/Bridge			
MOXA AWK-3121 802.11g (North America)	782436-01	No accessories required.	
MOXA AWK-3121 802.11g (International)	782436-02	No accessories required.	
MOXA AWK-3121 802.11g (Japan)	782436-03	No accessories required.	
Power Cords (Not Included in Shipping Kit)			
U.S., 120 VAC	763000-01	No accessories required.	
Japan, 100 VAC	763634-01	No accessories required.	
Switzerland, 220 VAC	763065-01	No accessories required.	
Europe, 240 VAC	763067-01	No accessories required.	
Australia, 240 VAC	763066-01	No accessories required.	

UK, 240 VAC	763064-01	No accessories required.
North America, 240 VAC	763068-01	No accessories required.

Back to Top

Support and Services

System Assurance Programs

NI system assurance programs are designed to make it even easier for you to own an NI system. These programs include configuration and deployment services for your NI PXI, CompactRIO, or Compact FieldPoint system. The NI Basic System Assurance Program provides a simple integration test and ensures that your system is delivered completely assembled in one box. When you configure your system with the NI Standard System Assurance Program, you can select from available NI system driver sets and application development environments to create customized, reorderable software configurations. Your system arrives fully assembled and tested in one box with your software preinstalled. When you order your system with the standard program, you also receive system-specific documentation including a bill of materials, an integration test report, a recommended maintenance plan, and frequently asked question documents. Finally, the standard program reduces the total cost of owning an NI system by providing three years of warranty coverage and calibration service. Use the online product advisors at ni.com/advisor to find a system assurance program to meet your needs.

Calibration

NI measurement hardware is calibrated to ensure measurement accuracy and verify that the device meets its published specifications. To ensure the ongoing accuracy of your measurement hardware, NI offers basic or detailed recalibration service that provides ongoing ISO 9001 audit compliance and confidence in your measurements. To learn more about NI calibration services or to locate a qualified service center near you, contact your local sales office or visit ni.com/calibration.

Technical Support

Get answers to your technical questions using the following National Instruments resources.

- **Support** - Visit ni.com/support to access the NI KnowledgeBase, example programs, and tutorials or to contact our applications engineers who are located in NI sales offices around the world and speak the local language.
- **Discussion Forums** - Visit forums.ni.com for a diverse set of discussion boards on topics you care about.
- **Online Community** - Visit community.ni.com to find, contribute, or collaborate on customer-contributed technical content with users like you.

Repair

While you may never need your hardware repaired, NI understands that unexpected events may lead to necessary repairs. NI offers repair services performed by highly trained technicians who quickly return your device with the guarantee that it will perform to factory specifications. For more information, visit ni.com/repair.

Training and Certifications

The NI training and certification program delivers the fastest, most certain route to increased proficiency and productivity using NI software and hardware. Training builds the skills to more efficiently develop robust, maintainable applications, while certification validates your knowledge and ability.

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Visit ni.com/training for more information.

Extended Warranty

NI offers options for extending the standard product warranty to meet the life-cycle requirements of your project. In addition, because NI understands that your requirements may change, the extended warranty is flexible in length and easily renewed. For more information, visit ni.com/warranty.

OEM

NI offers design-in consulting and product integration assistance if you need NI products for OEM applications. For information about special pricing and services for OEM customers, visit ni.com/oem.

Alliance

Our Professional Services Team is comprised of NI applications engineers, NI Consulting Services, and a worldwide National Instruments Alliance Partner program of more than 700 independent consultants and integrators. Services range from start-up assistance to turnkey system integration. Visit ni.com/alliance.

Back to Top

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