

# Ethernet Digital I/O Devices

## NI ENET-9421, NI ENET-9472, NI ENET-9481 **NEW!**

- 10/100BASE-T/X Ethernet port
- Up to 100 m cabling distance per segment
- C Series signal conditioning for 6 to 30 VDC digital I/O and 60 VDC/250 V<sub>rms</sub> relay output
- Two digital PFI lines for triggering import/export
- Channel-to-channel or channel-to-earth isolation for protection from high-voltage transients and ground loops
- 0 to 55 °C temperature range
- 9 to 30 VDC power supply
- Panel and DIN-rail mounting kits available

### Operating Systems

- Windows Vista/XP/2000

### Software Support

- LabVIEW
- LabWindows™/CVI
- Measurement Studio
- ANSI C/C++
- C# and Visual Basic .NET
- Visual Basic 6.0

### Measurement Services Software (included)

- NI-DAQmx driver software
- Measurement & Automation Explorer configuration utility
- LabVIEW SignalExpress LE data-logging software



Model	Logic Level	Input Lines	Output Lines	Sink/Source	Signal Levels	Output Drive	Connectivity
ENET-9421	24 V	8	–	Sink	11 to 30 V	–	Screw term, D-Sub
ENET-9472	High voltage	–	8	Source	6 to 30 V	750 mA	Screw term, D-Sub
ENET-9481	Relay	–	4	Sink/source	60 VDC, 250 V <sub>rms</sub>	2 A	Screw term

Table 1. NI Ethernet Digital I/O Devices

## Ethernet Data Acquisition Overview

Ethernet data acquisition is an extension of PC-based data acquisition to measurement and automation applications distributed over a large area or network. NI Ethernet digital I/O devices combine industry-standard Ethernet communication, direct sensor connectivity, and the flexibility of NI LabVIEW software for remote monitoring and control of pumps, valves, relays, and more. With the flexibility of LabVIEW graphical programming and the ubiquity of the Ethernet networking infrastructure, NI Wi-Fi data acquisition (DAQ) makes it easy to incorporate wireless connectivity into new or existing PC-based measurement or control systems.

## NI ENET-9163 and C Series Hardware

Each NI Ethernet DAQ device is a combination of an NI ENET-9163 wireless carrier and an NI C Series signal conditioning module (Figure 1). The ENET-9163 provides IEEE 802.3 Ethernet connectivity back to a host PC. You can synchronize an ENET-9163 with other devices by using two onboard individually programmable digital trigger lines to export or import sample clocks, start triggers, pause triggers, and reference triggers (Figure 2).

C Series modules offer direct sensor connections and built-in signal conditioning for a variety of measurements, including temperature,

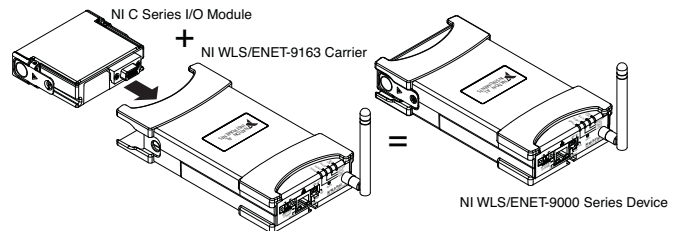
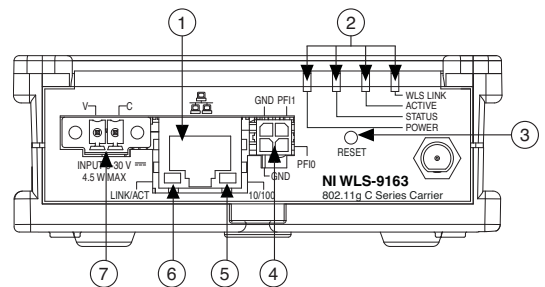


Figure 1. NI WLS/ENET-9163 Carrier Forming the NI WLS/ENET-9xxx Series Device



- |  |                     |
|--|---------------------|
| 1 RJ45 Ethernet Port                         | 4 Trigger Connector |
| 2 LEDs: WLS LINK*, ACTIVE, STATUS, and POWER | 5 10/100 LED        |
| 3 Reset Button                               | 6 LINK/ACT LED      |
|  | 7 Power Connector   |

\* NI WLS-9163 Carrier Only

Figure 2. NI WLS/ENET-9163 Carrier Interface

## Ethernet Digital I/O Devices

high-voltage digital I/O, strain, acceleration, current, and voltage. In addition to the ENET-9163, you can use them for measurement and control applications with different chassis, including NI CompactDAQ, NI CompactRIO, and the NI USB-9162 carrier. The NI WLS-9163 carrier provides the same features as the ENET-9163 plus an integrated IEEE 802.11b/g radio for wireless communication.

You may purchase ENET-9163 carriers and select C Series modules separately or together in a kit as ENET-9xxx devices. Visit [ni.com/crio/cseries](http://ni.com/crio/cseries) for a list of compatible devices.

### Recommended Software

NI Ethernet DAQ devices use the same NI-DAQmx API as hundreds of other NI PCI, PXI, and USB DAQ devices, so incorporating an NI Ethernet DAQ device into a new or existing measurement system is easy. National Instruments measurement services software, built around NI-DAQmx driver software, includes intuitive application programming interfaces, configuration tools, I/O assistants, and other tools designed to reduce system setup, configuration, and development time.

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](http://ni.com/support/daq/versions).

NI Ethernet DAQ devices are compatible with the following versions (or later) of NI application software: LabVIEW 7.1<sup>1</sup>, LabWindows/CVI 7.x, and Measurement Studio 7.x. They are also compatible with ANSI C/C++, C#, Visual Basic .NET, and Visual Basic 6.0.

<sup>1</sup> NI Ethernet DAQ devices are not compatible with NI LabVIEW 8.0.

### Shipping Kit Contents

Every shipping kit for ENET-9xxx wireless DAQ devices includes the following:

- ENET-9163 Ethernet C Series carrier
- 12 VDC power supply (region-specific power cord not included)
- Micro-fit plug and terminal kit (NI 9942)
- Rubber nonslip adhesive feet
- NI-DAQmx 8.9 (or later) software CDs for Windows Vista/XP/2000 (includes NI LabVIEW SignalExpress LE)
- *NI-DAQmx for the NI WLS/ENET-9163 Getting Started Guide*

### Additional Specifications

Find additional technical specifications for the ENET-9163 carrier in the *NI WLS/ENET-9163 User Guide and Specifications* document on [ni.com/manuals](http://ni.com/manuals). For additional technical specifications on supported C Series modules, visit [ni.com/crio/cseries](http://ni.com/crio/cseries).

### Ordering Information

NI ENET-9163 carrier only ..... 780501-01

#### Combined NI WLS-9163 and C Series Module Kits

NI ENET-9421 ..... 780943-01  
NI ENET-9421 D-Sub ..... 780944-01  
NI ENET-9472 ..... 780945-01  
NI ENET-9472 D-Sub ..... 780946-01  
NI ENET-9481 ..... 780947-01

#### Power Cord (Required)

U.S., 120 VAC ..... 763000-01  
North America, 240 VAC ..... 763068-01  
UK, 240 VAC ..... 763064-01  
Australia, 240 VAC ..... 763066-01  
Europe, 240 VAC ..... 763067-01  
Switzerland, 220 VAC ..... 763065-01  
Japan, 100 VAC ..... 763634-01

#### Industrial IEEE 802.11 Access Points (Optional)

NI UES-3880, unmanaged ..... 780038-01  
NI UES-3980, managed ..... 780039-01

### BUY NOW!

For complete product specifications, pricing, and accessory information, call 800 813 3693 (U.S.) or go to [ni.com/wifi](http://ni.com/wifi).

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range from start-up assistance to turnkey system integration. Visit [ni.com/alliance](http://ni.com/alliance).

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## Hardware 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](http://ni.com/advisor) to find a system assurance program to meet your needs.

### Calibration Services

NI recognizes the need to maintain properly calibrated devices for high-accuracy measurements. We provide manual calibration procedures, services to recalibrate your products, and automated calibration software specifically designed for use by metrology laboratories. Visit [ni.com/calibration](http://ni.com/calibration).

### Repair and Extended Warranty

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