Technical Sales

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Requirements and Compatibility | Detailed Specifications
For user manuals and dimensional drawings, visit the product page resources tab on ni.com.

Last Revised: 2014-11-06 07:13:59.0

Ethernet GPIB Controllers

NI GPIB-ENET/100

- Controls IEEE 488 instruments anywhere on an Ethernet-based TCP/IP network
- Up to 14 GPIB devices can be interfaced per controller
- Shares GPIB equipment from several network hosts
- Compatible with Gigabit, 100BASE-TX, and 10BASE-T
- DHCP or manual IP address assignment
- Maximum GPIB transfer rates: Up to 1.45 MB/s (IEEE 488.1) and up to 5.6 MB/s (HS488)
- External DC power supply
- Optional rack-mount and DIN rail/wall-mount hardware

Overview

Ethernet ports are a standard feature of today's computers. Most of these computers have OSs with built-in TCP/IP network software capability. NI Ethernet-to-GPIB controllers and NI-488.2 take advantage of this network connectivity in instrument control applications. Using the NI GPIB-ENET/1000 or NI GPIB-ENET/100, networked computers can communicate with and control IEEE 488 devices from anywhere on an Ethernet-based TCP/IP network. You can use these controllers to share a single GPIB system among many networked users or to control several test systems from a single networked host computer. The GPIB-ENET/1000 performs up to 4X faster on large data transfers and up to 3X faster on small byte transfers than its predecessor, the NI GPIB-ENET/100. You can control up to 100 GPIB-ENET/1000 interfaces via a single computer. By purchasing the NI GPIB-ENET/1000, you acquire a multiple access license to use the NI-488.2 software in accordance with the applicable NI Software License Agreement.

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Requirements and Compatibility

OS Information

- Windows 7
- Windows Server 2003
- Windows Server 2008 R2 64-bit
- Windows Vista
- Windows XP

Driver Information

- NI-488.2
- NI-VISA

Software Compatibility

- ANSI C/C++
- C#,Visual Basic,.NET
- LabVIEW
- LabWindows/CVI
- Measurement Studio

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Application and Technology

IEEE 488 and Network Interface Details

NI Ethernet-to-GPIB controllers use TCP/IP protocols to convert a computer with an Ethernet port into a GPIB talker, listener, and controller. The GPIB-ENET/1000/100 controllers implement the full range of GPIB controller functions.

Network Details

The Internet Protocol (IP) uses the Internet to route information among network nodes. The Transmission Control Protocol (TCP), used on top of the IP, guarantees correct, in-sequence data between network hosts and devices.

Although you commonly use TCP/IP protocols on the Internet, most TCP/IP users are not connected to the actual Internet. Individual institutions and corporations have created their own internal intranets to connect their computers, other network hosts, and devices that use TCP/IP. The regional application depicted in Figure 1 shows an example of both Internet and intranet applications. The Internet application example shows how a user on a workstation in a corporate facility can access a GPIB-ENET/1000 installed in a facility at another location. Within the corporate facility, an intranet configuration connects workstations with other GPIB devices, such as printers and plotters. You can share GPIB systems throughout a building, a complex, a country, or around the world.

The GPIB-ENET/1000 works with Gigabit, 100BASE-TX (100 Mbit/s), and 10BASE-T (10 Mbit/s) networks. It automatically detects the type of network available and communicates at the highest speed possible.

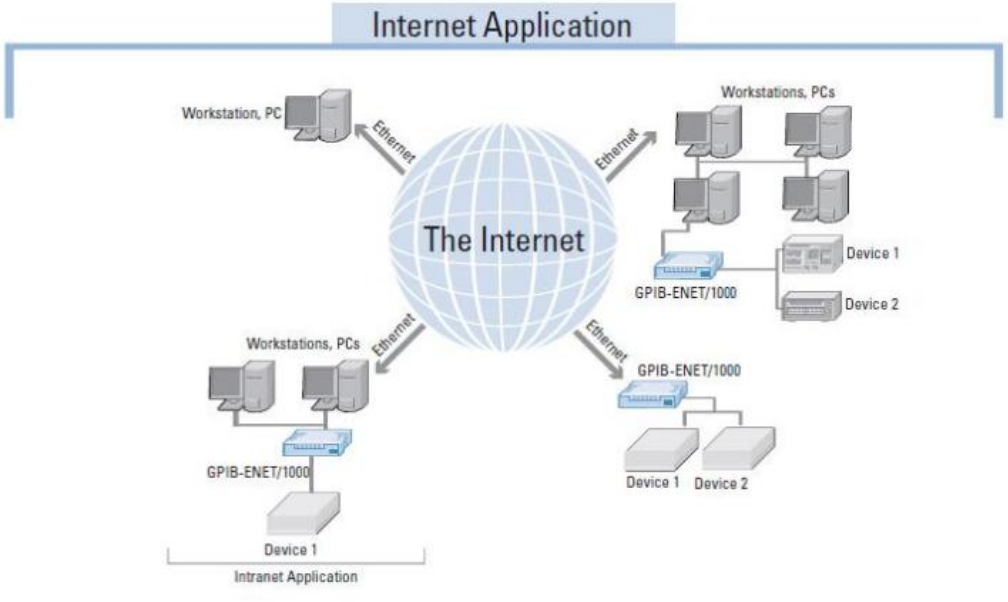


Figure 1. Regional Application Configuration

Performance

The NI GPIB-ENET/1000 is a GPIB controller that delivers high performance by combining the following:

- A high-performance 32-bit CPU
- A fast Ethernet controller
- A TNT family GPIB interface ASIC
- Substantial onboard buffer RAM
- Efficient firmware design

Typical sustained data throughput is more than 1450 kB/s. This performance is comparable to that of GPIB plug-in boards. Data transfer rates can vary substantially with the NI GPIB-ENET/1000 because of the variable network traffic and the unique operating characteristics each subnet displays.

Cabling

You can connect the GPIB-ENET/1000 directly to Gigabit, 100BASE-TX, or 10BASE-T networks using CAT 5 twisted pair Ethernet cables (see figures 2a and 2b). If you need to connect the GPIB-ENET/1000 to a different type of network, such as a coax network (10base2), you can add a converter to your setup. For example, you can place a coax-to-twisted pair converter between the GPIB-ENET/1000 and the coax Ethernet tap. You can also connect a GPIB-ENET/1000 controller directly to a computer Ethernet port, without an Ethernet hub, using an Ethernet crossover cable (see Figure 2c).

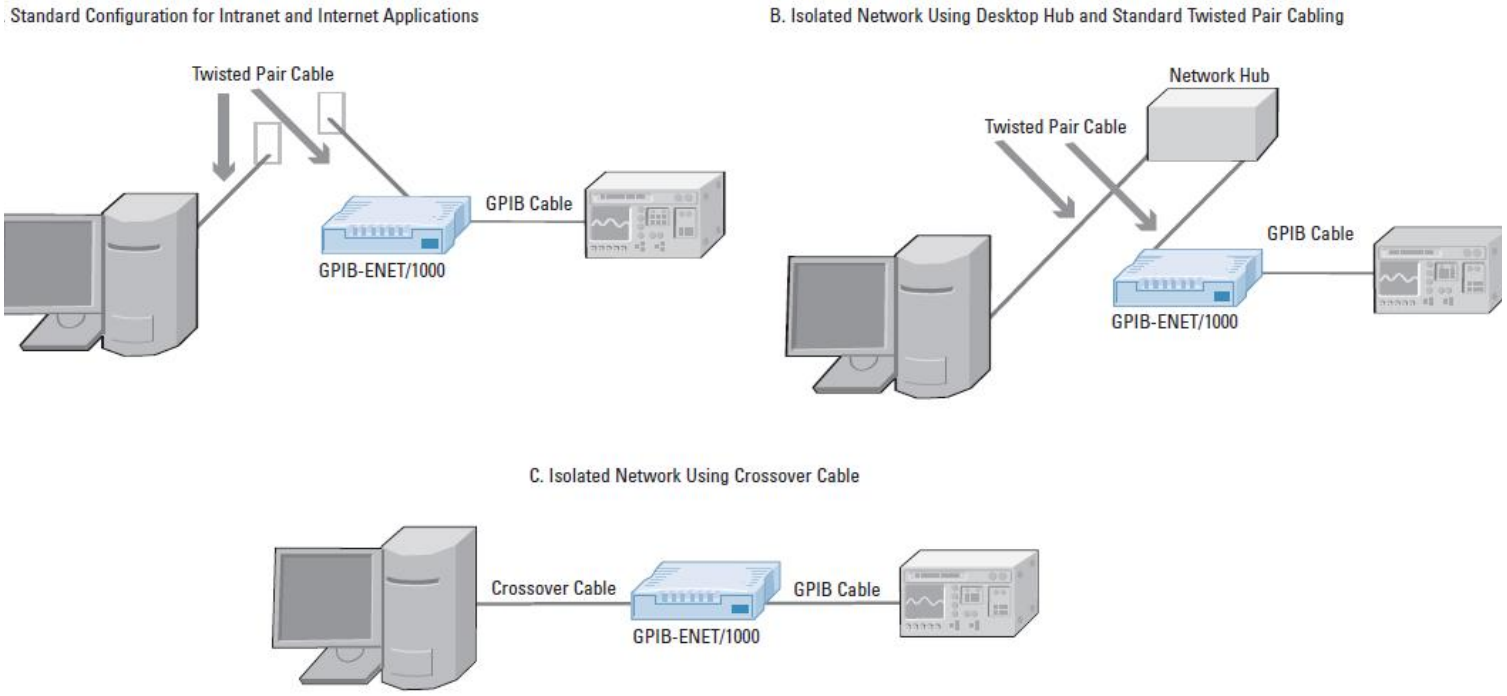


Figure 2. Network Cabling Configurations

Network Addressing

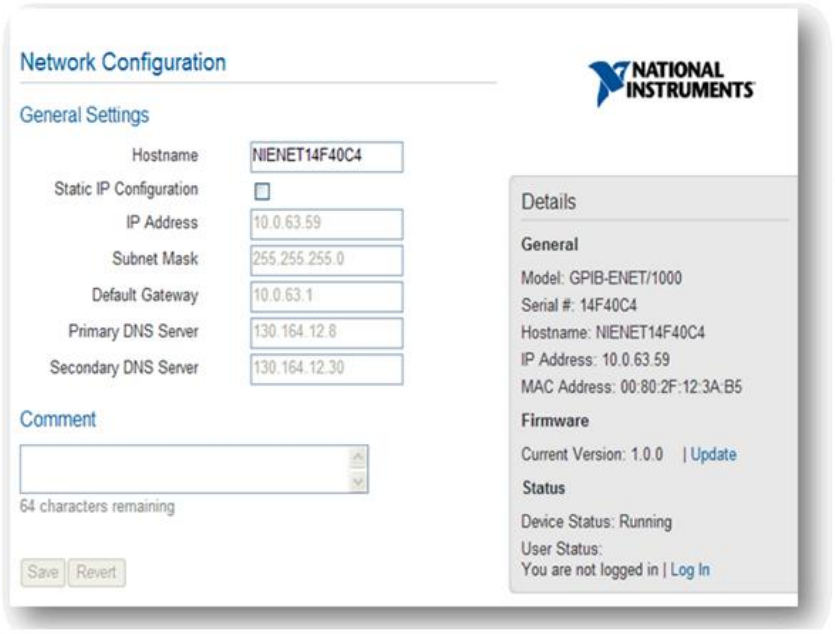
Each GPIB-ENET/1000 receives a unique Ethernet hardware address at the factory. This address is a 48-bit value used to specify the source and destination of Ethernet packets. The TCP/IP protocols also require an Internet address. The Internet address is a 32-bit value used to locate a device on the network; the Internet address has no relationship to the Ethernet address.

You can assign the Internet address to the GPIB-ENET/1000 automatically or manually. If the network uses the DHCP protocol, the GPIB-ENET/1000 automatically configures its Internet address. If DHCP is not available, you can use the GPIB-ENET/1000 web interface to assign the Internet address manually (see Figure 3a). Network parameters not assigned by DHCP are stored in nonvolatile memory. After the Internet address has been assigned, you can associate the address to a GPIB interface using NI Measurement & Automation Explorer (MAX) configuration software, as shown in Figure 3b, and use the same programs previously written for other NI GPIB interfaces.

Firmware

The necessary command interpretation, IEEE 488.2 and TCP/IP protocol management, and system upkeep of the GPIB-ENET/1000 are stored in Flash EPROM as an onboard firmware OS. Although code is installed at the factory, you can easily upgrade the firmware by downloading new code to the GPIB-ENET/1000 memory. You can download the firmware at your site with a special utility provided with NI-488.2. Firmware upgrades are instantaneous; you do not need to replace the physical EEPROM inside the GPIB-ENET/1000.

A. Detect NI Ethernet-based controllers and assign their IP addresses or host names



B. Associate the IP address or host name of the GPIB-ENET/1000 to a GPIB interface in Measurement & Automation Explorer

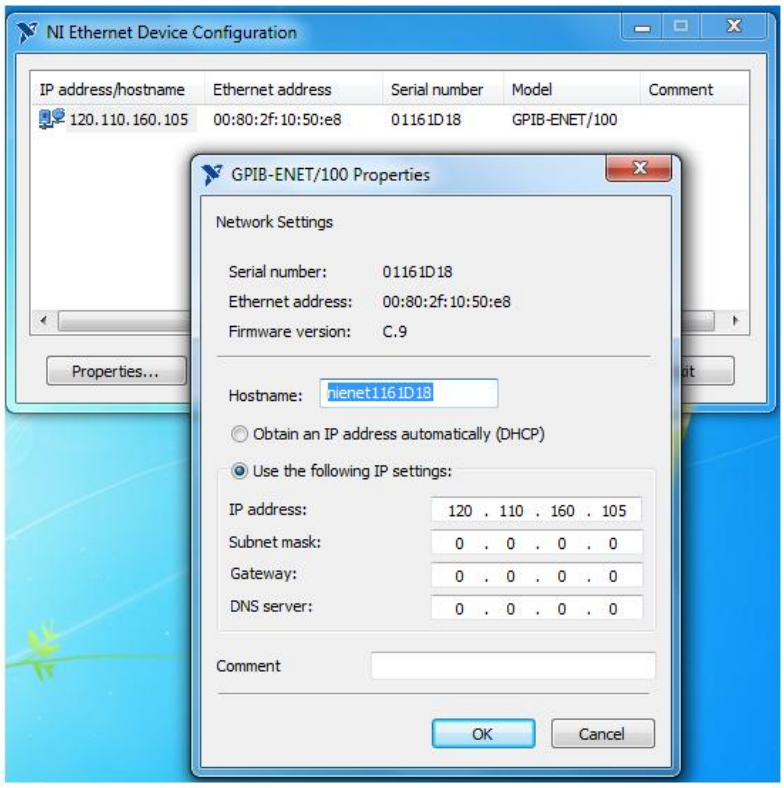


Figure 3. Easy Steps to Configure Your GPIB-ENET/1000

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Software Recommendations

- Real-time advanced 2D graphs and charts

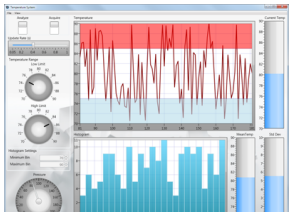
NI LabVIEW Full Development System for Windows

- Fully integrated graphical system design software
- Support for a wide range of measurement hardware, I/O, and buses
- Custom, event-driven user interfaces for measurement and control
- Extensive signal processing, analysis, and math functionality
- Advanced compiler to ensure high-performance execution and code optimization
- Includes SSP for professional technical support, online training, and software upgrades

NI LabWindows™/CVI for Windows

- Complete hardware compatibility with IVI, VISA, DAQ, GPIB, and serial
- Analysis tools for array manipulation, signal processing statistics, and curve fitting
- Simplified cross-platform communication with network variables
- Measurement Studio .NET tools (included in LabWindows/CVI Full only)
- The mark LabWindows is used under a license from Microsoft Corporation.

NI Measurement Studio Professional Edition



- Customizable graphs and charts for WPF, Windows Forms, and ASP.NET Web Forms UI design
- Analysis libraries for array operations, signal generation, windowing, filters, signal processing
- Hardware integration support with native .NET data acquisition and instrument control libraries
- Automatic code generation for all NI-DAQmx data acquisition hardware
- Intelligent and efficient data-logging libraries for streaming measurement data to disk
- Support for Microsoft Visual Studio .NET 2012/2010/2008

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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.

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.

- **Classroom training in cities worldwide** - the most comprehensive hands-on training taught by engineers.
- **On-site training at your facility** - an excellent option to train multiple employees at the same time.
- **Online instructor-led training** - lower-cost, remote training if classroom or on-site courses are not possible.
- **Course kits** - lowest-cost, self-paced training that you can use as reference guides.
- **Training memberships** and training credits - to buy now and schedule training later.

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.

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Detailed Specifications

Environment	
Operating ambient temperature	0 to 65 °C
Operating relative humidity	10 to 90%, noncondensing
Storage ambient temperature	–40 to 100 °C
Storage relative humidity	5 to 95%, noncondensing (Tested in accordance with IEC-60068-2-1, IEC-60068-2-2, and IEC-60068-2-56.)
Power requirements	External source 9 to 30 VDC, +15 VDC @ 250 mA typical, 425 mA max
Altitude	2,000 m (at 25 °C ambient temperature)
Pollution Degree	2
Indoor use only.	

Performance	
GPIB	
3-wire	Up to 1000 Kbytes/s

Safety

This product is designed to meet the requirements of the following standards of safety for information technology equipment:

- IEC 60950-1, EN 60950-1
- UL 60950-1, CSA 60950-1

Caution Overloading the circuits may damage supply wiring. Do not exceed the ratings on the equipment nameplate when connecting equipment to the supply circuit.

Note For UL and other safety certifications, refer to the product label or the *Online Product Certification* section.

Electromagnetic Compatibility

This product meets the requirements of the following EMC standards for electrical equipment for measurement, control, and laboratory use:

- EN 61326 (IEC 61326): Class A emissions; Basic immunity
- EN 55011 (CISPR 11): Group 1, Class A emissions
- AS/NZS CISPR 11: Group 1, Class A emissions
- FCC 47 CFR Part 15B: Class A emissions
- ICES-001: Class A emissions

Note For EMC declarations and certifications, refer to the *Online Product Certification* section.

Note When operating this product, use shielded cables and accessories.

CE Compliance CE

This product meets the essential requirements of applicable European Directives, as amended for CE marking, as follows:

- 2006/95/EC; Low-Voltage Directive (safety)
- 2004/108/EC; Electromagnetic Compatibility Directive (EMC)

Online Product Certification

To obtain product certifications and the DoC for this product, visit ni.com/certification, search by model number or product line, and click the appropriate link in the Certification column.

Environmental Management

NI is committed to designing and manufacturing products in an environmentally responsible manner. NI recognizes that eliminating certain hazardous substances from our products is beneficial not only to the environment but also to NI customers.

For additional environmental information, refer to the *NI and the Environment* Web page at ni.com/environment. This page contains the environmental regulations and directives with which NI complies, as well as other environmental information not included in this document.

Waste Electrical and Electronic Equipment (WEEE)

EU Customers At the end of the product life cycle, all products *must* be sent to a WEEE recycling center. For more information about WEEE recycling centers, National Instruments WEEE initiatives, and compliance with WEEE Directive 2002/96/EC on Waste Electrical and Electronic Equipment, visit ni.com/environment/weee.htm.

电子信息产品污染控制管理办法 （中国 RoHS）

中国客户 National Instruments 符合中国电子信息产品中限制使用某些有害物质指令 (RoHS)。
关于 National Instruments 中国 RoHS 合规性信息，请登录 ni.com/environment/rohs_china。
(For information about China RoHS compliance, go to ni.com/environment/rohs_china.)

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