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Agilent E5810A

LAN/GPIB Gateway for Windows®

User's Guide



Agilent Technologies

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Front Matter

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Declaration of Conformity

See the next page for the Declaration of Conformity for the E5810A LAN/GPIB Gateway for Windows.

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Agilent Technologies	**DECLARATION OF CONFORMITY** According to ISO/IEC Guide 22 and CEN/CENELEC EN 45014	CE

Manufacturer's Name: Agilent Technologies, Incorporated
Manufacturer's Address: 815 – 14th St. SW
Loveland, CO 80537
USA

Declares under sole responsibility that the product as originally delivered

Product Name: LAN/GPIB Gateway for Windows
Model Number: E5810A
Product Options: This declaration covers all options of the above product(s)

complies with the essential requirements of the following applicable European Directives, and carries the CE marking accordingly:

EMC Directive (89/336/EEC, amended by 93/68/EEC)
Low Voltage Directive (73/23/EEC, amended by 93/68/EEC)

and conforms with the following product standards:

EMC	**Standard**	**Limit**
	IEC 61326-1:1997+A1:1998 / EN 61326-1:1997+A1:1998	
	CISPR 11:1990 / EN 55011:1991	Group 1 Class A
	IEC 61000-4-2:1995+A1:1998 / EN 61000-4-2:1995	4 kV CD, 8 kV AD
	IEC 61000-4-3:1995 / EN 61000-4-3:1995	3 V/m, 80-1000 MHz
	IEC 61000-4-4:1995 / EN 61000-4-4:1995	0.5 kV signal lines, 1 kV power lines
	IEC 61000-4-5:1995 / EN 61000-4-5:1995	0.5 kV line-line, 1 kV line-ground
	IEC 61000-4-6:1996 / EN 61000-4-6:1996	3 V, 0.15-80 MHz 1 cycle, 100%
	IEC 61000-4-11:1994 / EN 61000-4-11:1994	Dips: 30% 10 ms; 60% 100 ms Interrupt: > 95%@5000 ms
	Canada: ICES-001:1998	
	Australia/New Zealand: AS/NZS 2064.1	
	The product was tested in a typical configuration with Agilent Technologies test systems.	
Safety	IEC 61010-1:2001 / EN 61010-1:2001 Canada: CSA C22.2 No. 1010.1:1992 UL 61010B-1: 2003	

Supplementary Information:

This DoC applies to above-listed products placed on the EU market after:

20 April 2004
Date

Ray Corson
Product Regulations Program Manager

For further information, please contact your local Agilent Technologies sales office, agent or distributor,
or Agilent Technologies Deutschland GmbH, Herrenberger Straße 130, D 71034 Böblingen, Germany.

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ICES Statement

This ISM device complies with Canadian ICES-001.
Cet appareil ISM est conforme à la norme NMB-001 du Canada.

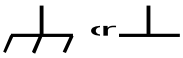
Safety Symbols



Instruction manual symbol affixed to product. Indicates that the user must refer to the manual for specific WARNING or CAUTION information to avoid personal injury or damage to the product.



Indicates the field wiring terminal that must be connected to earth ground before operating the equipment — protects against electrical shock in case of fault.



Frame or chassis ground terminal—typically connects to the equipment's metal frame



Alternating current (AC).



Direct current (DC).



Warning. Risk of electrical shock.

WARNING Calls attention to a procedure, practice, or condition that could cause bodily injury or death.

CAUTION Calls attention to a procedure, practice, or condition that could possibly cause damage to equipment or permanent loss of data.

WARNINGS

The following general safety precautions must be observed during all phases of operation, service, and repair of this product. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the product. Agilent Technologies assumes no liability for the customer's failure to comply with these requirements.

Ground the equipment: For Safety Class 1 equipment (equipment having a protective earth terminal), an uninterruptible safety earth ground must be provided from the mains power source to the product input wiring terminals or supplied power cable.

DO NOT operate the product in an explosive atmosphere or in the presence of flammable gases or fumes.

For continued protection against fire, replace the line fuse(s) only with fuse(s) of the same voltage and current rating and type. DO NOT use repaired fuses or short-circuited fuse holders.

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Keep away from live circuits: Operating personnel must not remove equipment covers or shields. Procedures involving the removal of covers or shields are for use by service-trained personnel only. Under certain conditions, dangerous voltages may exist even with the equipment switched off. To avoid dangerous electrical shock, DO NOT perform procedures involving cover or shield removal unless you are qualified to do so.

DO NOT operate damaged equipment: Whenever it is possible that the safety protection features built into this product have been impaired, either through physical damage, excessive moisture, or any other reason, REMOVE POWER and do not use the product until safe operation can be verified by service-trained personnel. If necessary, return the product to Agilent for service and repair to ensure that safety features are maintained.

DO NOT service or adjust alone: Do not attempt internal service or adjustment unless another person, capable of rendering first aid and resuscitation, is present.

DO NOT substitute parts or modify equipment: Because of the danger of introducing additional hazards, do not install substitute parts or perform any unauthorized modification to the product. Return the product to Agilent for service and repair to ensure that safety features are maintained.

Documentation History

All Editions and Updates of this manual and their creation date are listed below. The first Edition of the manual is Edition 1. The Edition number increments by 1 whenever the manual is revised. Updates, which are issued between Editions, contain replacement pages to correct or add additional information to the current Edition of the manual. Whenever a new Edition is created, it will contain all of the Update information for the previous Edition. Each new Edition or Update also includes a revised copy of this documentation history page.

Edition 1 . . . . . May 2002
Edition 2 . . . . . December 2003
Edition 3 . . . . . May 2004
Edition 4 . . . . . January 2005
Edition 5 . . . . . September 2007

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Support Information

Support information for the E5810A LAN/GPIB Gateway for Windows follows. When calling Agilent with support questions, please have the following information available so we can provide you with a quicker solution to the problem.

- E5810A Serial Number (printed on bottom of the unit and displayed on the **Welcome** page of the E5810A Web access)
- Description of the Problem
- Corrective actions already tried (see *Chapter 4 - Troubleshooting Information* for suggested troubleshooting tips)

Contacting Agilent

- You can reach Agilent Technologies at this telephone number in the Americas:

  Americas Call Center: 1-800-452-4444

- For other countries, contact your country's Agilent support organization. A list of contact information for other countries is available on the Agilent Internet site:
  `www.agilent.com/find/assist.`
  A list of other Agilent Web sites follows.

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URL	Description
www.agilent.com/find/assist	Agilent Technologies “Contact Us” page
www.agilent.com/find/e5810a	The latest E5810A product information with links to key Web sites such as FAQs, Data Sheets, etc.
www.agilent.com/find/iolib	Update the Agilent IO Libraries Suite software
www.agilent.com/find/techsupport	The latest customer support information
www.agilent.com/find/ADN	Connectivity resources all in one place
www.agilent.com/find/manuals	Technical support information, including manuals, application notes, FAQs, and software and firmware downloads
www.agilent.com/find/connectivity	For connection, communication and control of test instruments from your computer, you can find out the latest in the world of connectivity.

User’s Guide Information

This *Agilent E5810A LAN/GPIB Gateway for Windows User’s Guide* describes installation, configuration, and use of an E5810A LAN/GPIB Gateway for Windows that is connected to an Enterprise (corporate) network, to a Local Network, or directly to a PC.

NOTE

All Agilent IO Libraries information in this guide refers to Agilent IO Libraries Suite version 15.0. For specific information on other versions of the Agilent IO Libraries or Agilent IO Libraries Suite, see the documentation for that version. You can download both updates and older versions (for backward compatibility) of the IO Libraries software at `http://www.agilent.com/find/iolib`.

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What's in This Guide?

A listing of the guide contents follows.

NOTE

This guide is NOT a tutorial on Local Area Networks (LANs) or specific LAN operation. Consult your Information Technology (IT) department for LAN specifics for your application.

Chapter	Description
Chapter 1 - E5810 Description	Describes the E5810, including hardware description and network operation.
Chapter 2 - Installing the E5810	Shows how to install the E5810 and the Agilent IO Libraries Suite.
Chapter 3 - Using E5810 Web Access	Shows how to use the E5810 Web access to interface with the E5810 from your PC.
Chapter 4 - Troubleshooting Information	Shows some ways to troubleshoot the E5810, including front panel, network, PC client, and instrument checks.
Appendix A - E5810 Specifications	Provides specifications for the E5810.
Appendix B - Using the Telnet Utility	Provides a summary of using the Telnet utility.
Glossary	Defines some of the technical terms used in this guide.

Accessing an Electronic Copy of This Guide

There are three ways you can access an electronic (.pdf) version of this guide, as follows. You will need Adobe Acrobat Reader Version 3.0 or later to view the electronic version.

- **Access From the E5810 Web Access.** After the E5810 is installed, you can access an electronic version of the manual by going to the **Welcome** page and clicking User's Guide (under the **E5810 Documentation** heading).

- **Access from the IO Control.** If the Agilent IO Libraries Suite is installed, a blue circled IO icon appears on the right hand side of the Windows toolbar. To access an electronic version of this guide, click the IO icon, then click **Documentation** and then click **E5810 LAN/GPIB Users Guide**.

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- **Access from the Web.** On your Web browser address line, type: **`www.agilent.com/find/manuals`** and navigate to the E5810 manual.

E5810 Related Documentation

Suggested documentation you can use for E5810 LAN/GPIB Gateway for Windows operation with the listed I/O application software products follow. After the Agilent IO Libraries Suite has been installed on your PC, .pdf files of the Agilent IO Libraries Suite documentation including VISA and SICL User's Guides are available. Click the blue IO icon on the Windows taskbar and then click **Documentation**.

Product	Related Documentation
Agilent IO Libraries Suite	The *Agilent IO Libraries Suite Getting Started Guide* and the *IO Libraries Suite Online Help* describe the use of the IO Libraries Suite.
VISA	To use the E5810 with VISA, you must configure a remote interface (also known as VISA LAN Client operation). To develop and use VISA applications for the E5810, see the *Agilent VISA User's Guide*.
SICL	To develop and use SICL I/O applications for the E5810 in Windows, see the *Agilent SICL User's Guide for Windows*.
T&M Toolkit	To develop programs in Visual Studio .NET, see the *Agilent T&M Toolkit* product. Information is available at **`www.agilent.com/find/toolkit`**.

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1

E5810 Description

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E5810 Description

This chapter gives guidelines to install, configure, and troubleshoot the E5810 LAN/GPIB Gateway for Windows (E5810) for use with supported, network-equipped computer systems, including:

- E5810 Hardware Description
- E5810 Software/Firmware

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E5810 Hardware Description

The E5810 LAN/GPIB Gateway for Windows provides a gateway between network-equipped computer systems and GPIB and/or RS-232 based instruments. This section provides an overview of E5810 hardware, including:

- Typical Network Connections
- Front Panel Features
- Rear Panel Features
- Power-On and Default Settings
- Rack Mount Kit (Optional)

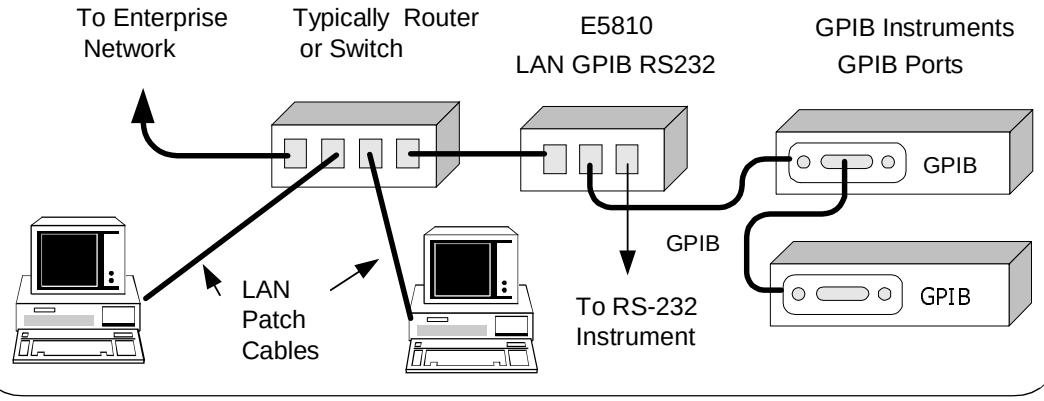
Typical Network Connections

The E5810 can be connected to an Enterprise (corporate) network, to a Local network (isolated LAN), or directly to a PC and can be connected to as many as 14 GPIB instruments and/or to one RS-232 instrument. The E5810 allows I/O applications to obtain measurement data either locally or remotely from GPIB and/or RS-232 instrumentation. The following figures show typical network and direct PC connections to an E5810.

Enterprise Network Connections

In a typical Enterprise (corporate) network, the E5810 is connected to the network by a router or switch. For this configuration, the E5810 is visible to the Enterprise network.

Enterprise Network Connections

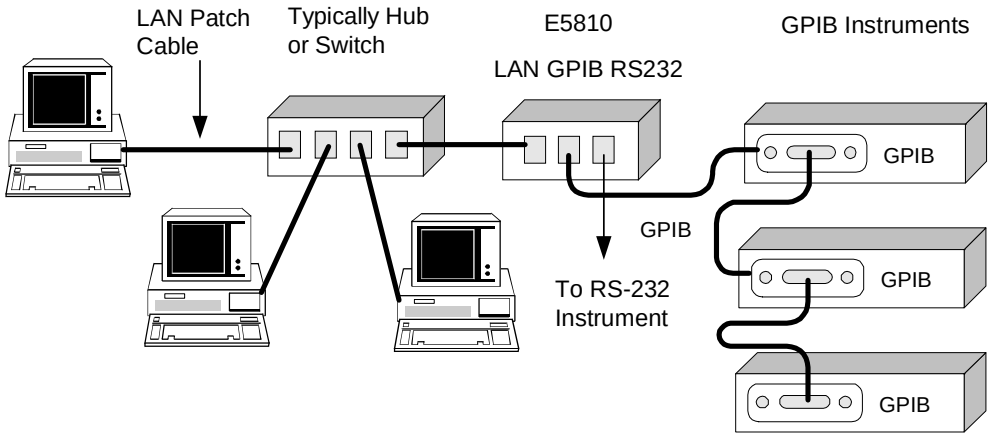


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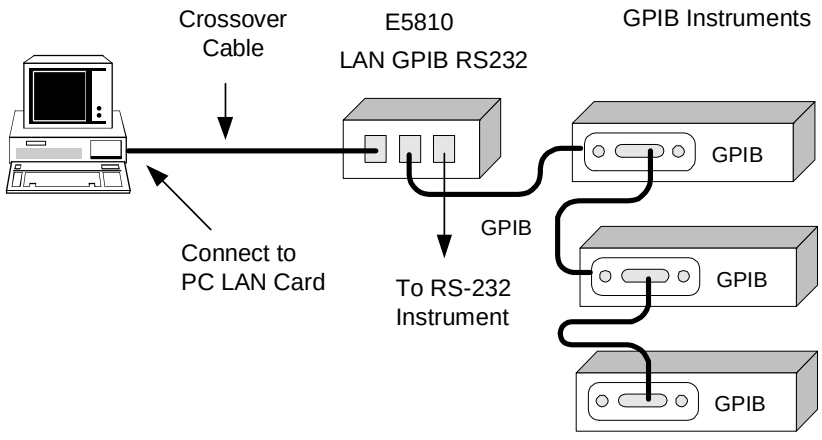
Local Network Connections

Typically, a hub or switch is used for local network configuration. A cable/DSL router may be used to provide a DHCP Server. For typical direct connections from a PC to the E5810, a **crossover cable** is connected from the E5810 LAN port to a LAN card on the PC. For Local Network or direct PC connections, the E5810 is not visible on the Enterprise network.

Local Network Connections (Multiple PCs can Communicate with the E5810)



Direct PC Connection (Only One PC can Communicate with the E5810)



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Front Panel Features

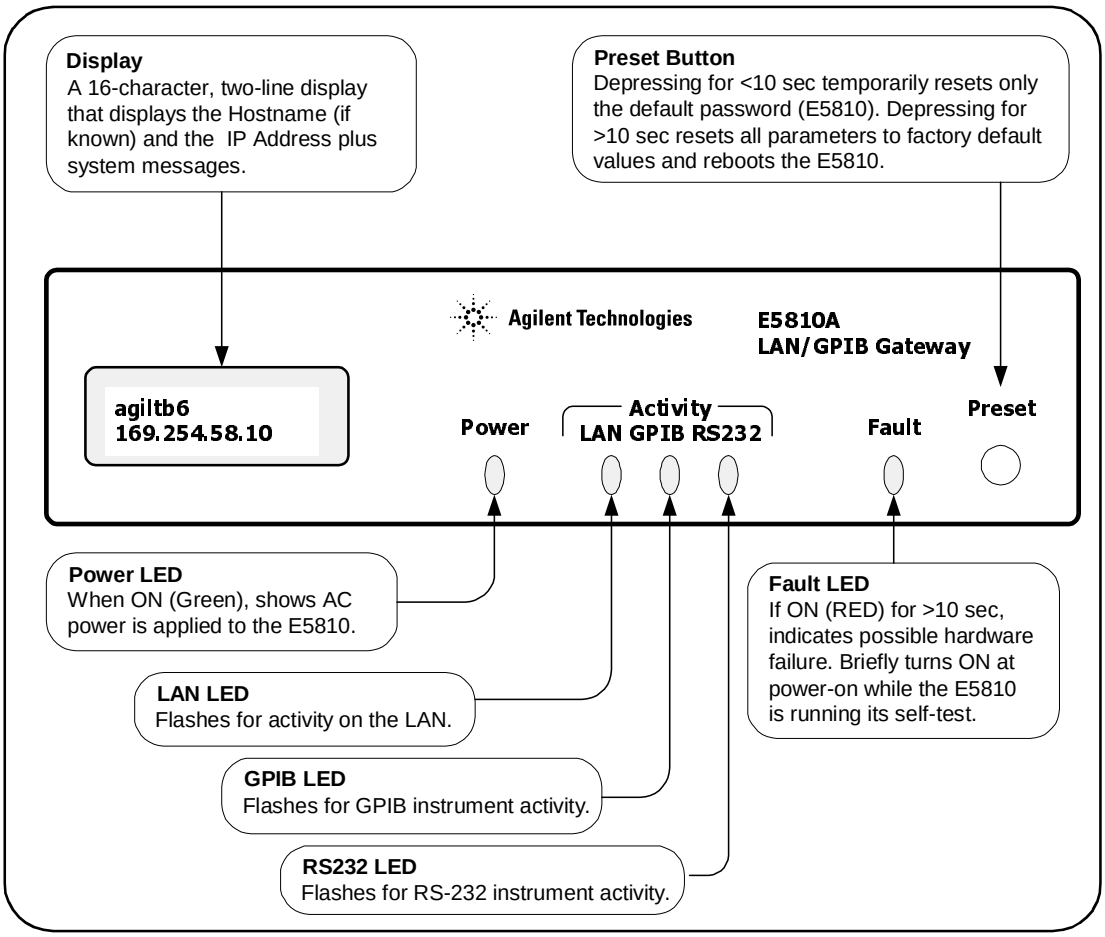
This section describes the E5810 front panel features,

NOTE

The Hostname, if detected, is displayed on the first line of the E5810 front panel display. The IP Address of the E5810 is displayed on the second line of the E5810 front panel display.

Front Panel Display/LEDs

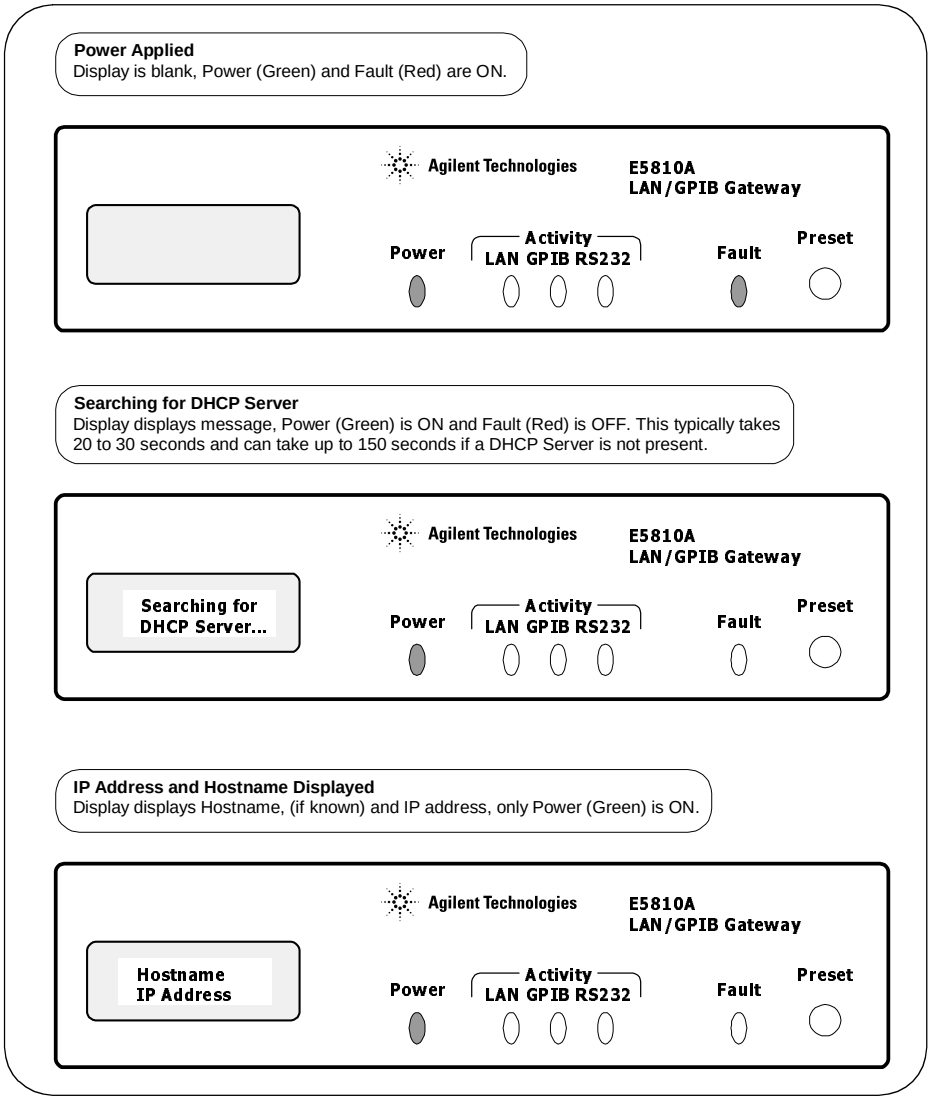
This figure shows E5810 front panel functions.



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Typical Power-On Sequence

This figure shows major steps in a typical power-on sequence for an E5810 that is connected to a network that supports Dynamic Host Configuration Protocol (DHCP) and Domain Name Service (DNS). If the network does not support DHCP and/or DNS, the power-on sequence may be different than that shown.



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Power-On (Default) Settings

When power is first applied to the E5810 and the hardware self-test has completed, the E5810 is initialized to the factory-set default configuration. This table shows the default configuration parameter settings for the E5810.

The E5810 uses these default configuration values until you set any other configuration values. The E5810 also uses these values when you press the **Preset** button and hold it down for >10 seconds. See *Chapter 3 - Using E5810 Web Access* for a description of each parameter.

Parameter	Default	Parameter	Default
DHCP:	ON	GPIB Address:	21
IP Address:	169.254.58.10	GPIB Logical Unit:	7
Subnet Mask:	255.255.0.0	RS-232 SICL Interface Name:	COM1
Default Gateway:	0.0.0.0	RS-232 Baud Rate:	9600
DNS Server(s):	0.0.0.0	RS-232 Parity:	NONE
Hostname:	*none*	RS-232 Bits:	8
Description:	Agilent E5810 <MAC Addr>	RS-232 Stop Bits:	1
Universal Plug & Play:	ON	RS-232 Flow Control:	NONE
LAN Keepalive (sec):	7200 sec	RS-232 SRQ:	RI
I/O Timeout (sec):	120 sec	Password	E5810
GPIB SICL Interface Name:	gpib0		

Preset Button Operation

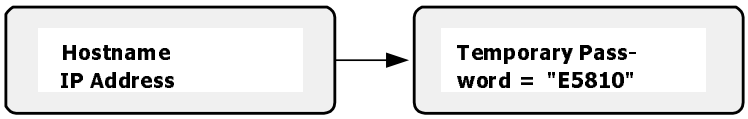
The **Preset** button on the front panel of the E5810 is used to reset the E5810 to its default configuration values (preset at the factory). As shown in the figure on the next page, the **Preset** button has two modes of operation:

- If you depress the **Preset** button and release it in <10 seconds, only the E5810 password is *temporarily* changed and is reset to its default value (E5810). If you cycle power or reboot the E5810, the E5810 will return to the actual password that was previously set. All existing configuration values remain unchanged.
- If you depress and hold the **Preset** button for 10 seconds or more, all configuration values are reset to their factory default values and the E5810 is rebooted. All network connections to the E5810, if any, are also terminated without any cleanups.

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Depress and Quickly (<10 seconds) Release the Preset Button *

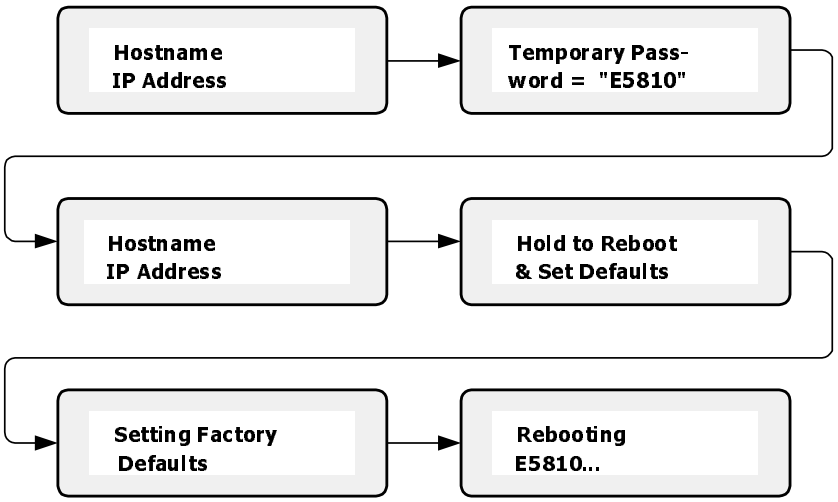
- The E5810 password is temporarily reset to its factory default (E5810).
- All other configuration parameters remain unchanged.
- This state is maintained until the next time the E5810 is booted.
- The front panel display sequence is as follows.



* Release the **Preset** button when Temporary Password = "E5810" is displayed.

Depress and Hold the Preset Button (>10 Seconds)**

- All configuration parameters are set to their default values.
- The E5810 is rebooted.
- The front panel display sequence is as follows.

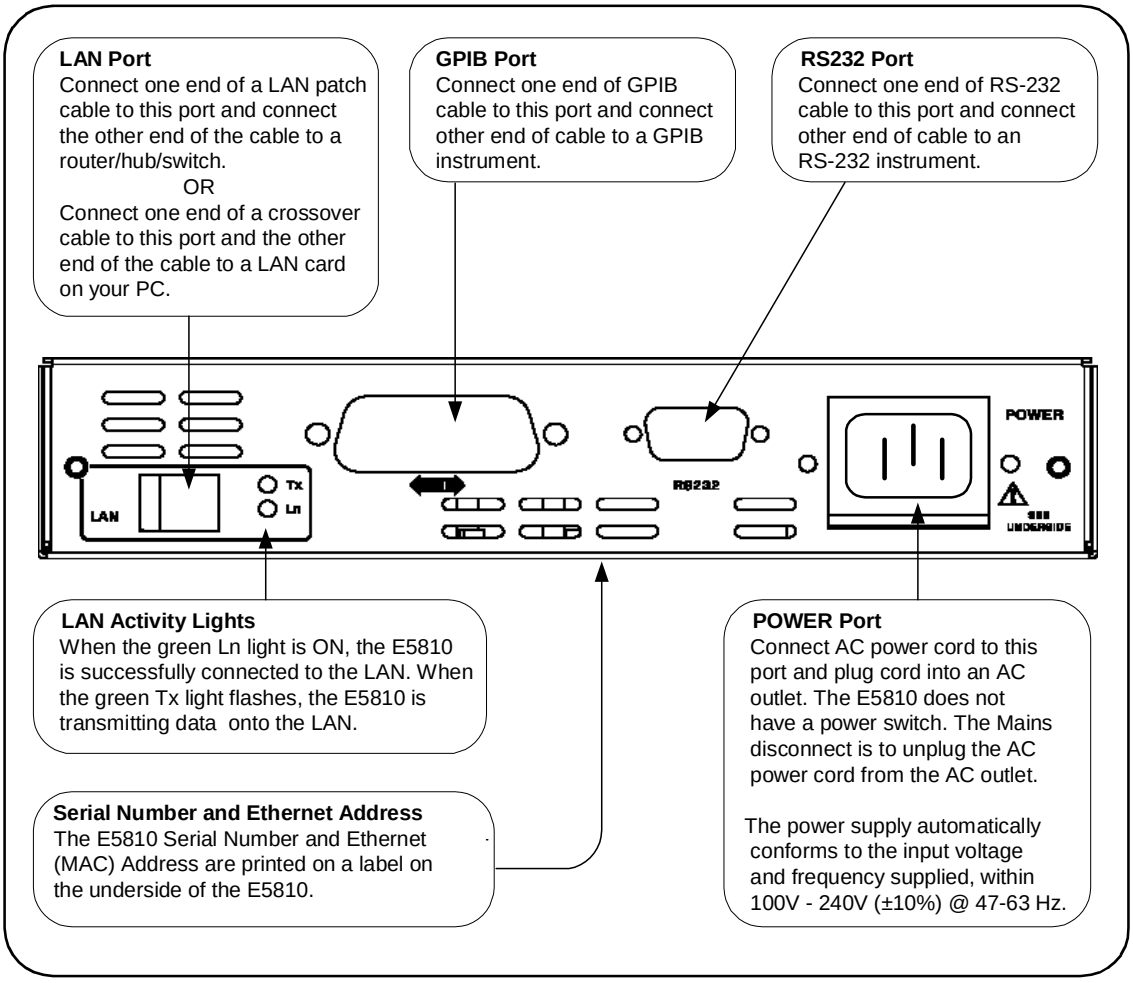


** Release the **Preset** button when **Rebooting E5810...** is displayed.

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Rear Panel Features

This figure shows the rear panel features of the E5810.



Rack Mount Kit (Optional)

As desired, you can mount up to two E5810 in a standard EIA rack using the E5810 Rack Mount Kit (E5810 Opt 100 or E5810-00100). The E5810 is one standard half-rack unit wide and one standard rack unit high. See the *E5810-00100 Rack Mount Kit* for installation instructions.

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E5810 Software/Firmware

The E5810 LAN/GPIB Gateway for Windows provides an interface (gateway) that allows networked computers to talk or listen to GPIB and/or RS-232 devices via Local Area Network (LAN) connections. The E5810 connects a network (Enterprise or Local) from PCs with Windows 2000/XP/Vista to GPIB and/or RS-232 instruments. This section describes E5810 software/firmware features, including:

- E5810 Operating Features
- Typical Network Operation
- Software/Firmware Architecture
- Typical Network IP Addressing
- Communicating with the E5810

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E5810 Operating Features

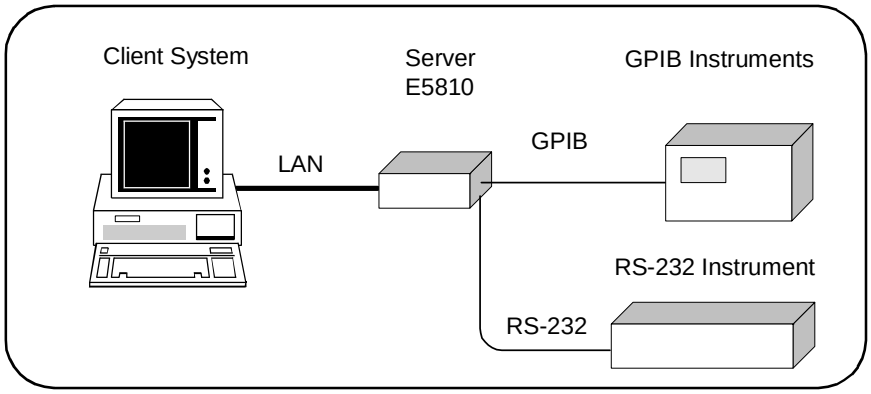
Feature	Description
Remote access to instruments via LAN	Access and control up to 14 GPIB and/or one RS-232 instrument via a 10BASE-T/100BASE-TX Ethernet. The E5810 detects the network and configures itself to the appropriate speed. The E5810 has a standard RJ-45 LAN connector. You can use adapters to connect other interface types, such as optical or wireless LAN.
I/O Software Included	The E5810 includes the Agilent IO Libraries Suite, which includes Agilent Virtual Instrument Software Architecture (VISA), VISA COM, Standard Instrument Control Library (SICL), and several I/O utilities. This standard software provides compatibility with different hardware and software vendors. It provides the I/O software layer used when accessing the E5810. You can use a standard programming language, such as Visual Basic, Visual C++, Agilent VEE, etc. The E5810 supports all I/O application operations provided by VISA, VISA COM, SICL, and Agilent VEE. The E5810 is supported on Microsoft Windows 2000/XP/Vista. You can also use the Agilent IntuiLink software (included with some Agilent products) to download data and send waveforms to the source, with no programming.
Supports DHCP Protocol	The E5810 supports Dynamic Host Configuration Protocol (DHCP) to get its IP address. Although the E5810 defaults to using DHCP, you can turn DHCP OFF and statically assign the E5810 IP address.
Ease of Use	Built-in Web access and front panel display allow you to easily set up, configure, and use the E5810. You can connect multiple E5810s in a test system. Each E5810 creates a separate GPIB bus.

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Typical Network Operation

The E5810 provides a network gateway between network-equipped computer systems and GPIB and/or RS-232 based instruments. The gateway enables users to obtain measurement data either locally or remotely from GPIB and/or RS-232 instruments. See “Typical Network Connections” in this chapter for typical connections to Enterprise or Local Networks or to a PC.

The E5810 connects a local area network (LAN) from the computer system to the GPIB and/or RS-232 buses. Network-equipped computer systems that are supported for use with the E5810 include PCs with Windows 2000/XP/Vista. Using the client/server model of computing, the computer system is the **client**, and the E5810 is the **server**.



Thus, applications running on the computer system can transparently interface to GPIB and RS-232 based instruments over the LAN. Since several computer systems can access the E5810, groups of users can share access to the same GPIB and/or RS-232 instruments via the E5810. In addition, existing I/O applications that are supported with the E5810 and are designed for GPIB or RS-232 can use the E5810 without modification other than an address change.

The E5810 and its attached instruments can be placed anywhere on the network (rather than with a particular controller or server computer system). This includes networks which span different geographic locations, such as when networked computer systems are located at several different sites. Thus, GPIB and RS-232 instruments can be located where they are most convenient. In addition, you can have more than one E5810 on a network, providing “clusters” of GPIB and/or RS-232 instrumentation at different locations.

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Software/Firmware Architecture

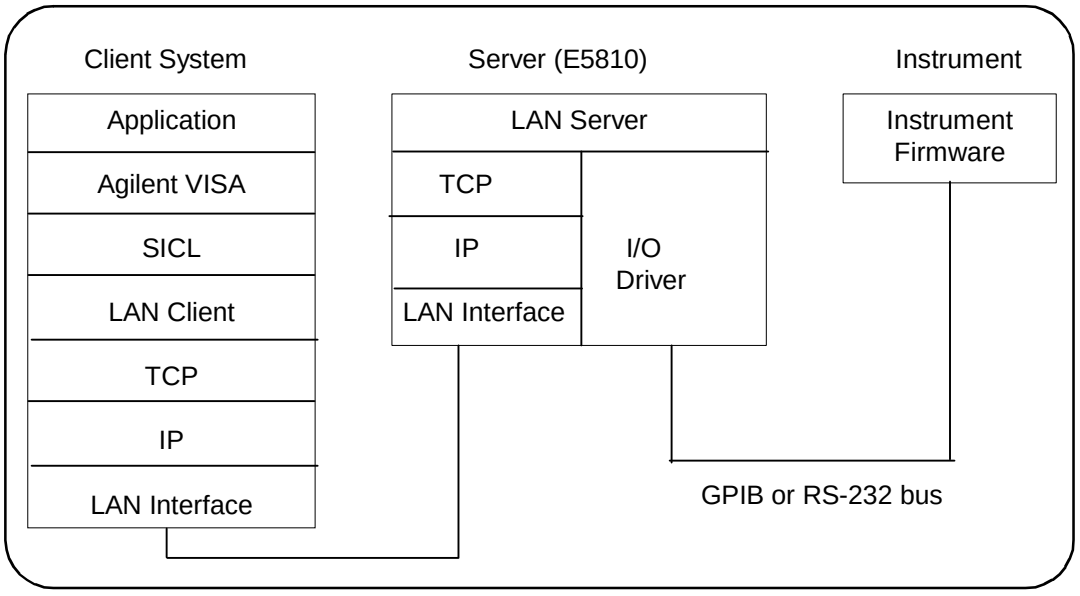
To program instruments from your PC via the E5810 using a programming language such as C or Visual Basic, you must install and configure the Agilent IO Libraries Suite on the client PC.

Client System Architecture

As shown in the following figure, the client (PC) system contains the VISA LAN client software as well as the TCP/IP LAN software needed to access the E5810. The E5810 contains LAN server and TCP/IP LAN firmware so it acts as the LAN server.

The VISA LAN client software is also known as the Remote IO Client software. It is part of the Agilent IO Libraries Suite. The LAN server software is also called the Remote IO Server software.

The VISA LAN client software uses the TCP/IP LAN protocol suite to pass messages between the client system and the server (the E5810). Therefore, the client sends I/O requests over the network to the server. The server then executes those I/O requests on the appropriate GPIB and/or RS-232 based instrument(s) connected to the server.



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How IO Application Software Works With the E5810

Before trying to perform an I/O application operation on the E5810 GPIB interface and the GPIB bus, the Remote IO Client software in the client computer system establishes a network connection to the remote I/O server (the E5810). Once the client establishes a connection, the client can begin to send I/O requests to the E5810.

The E5810 (remote I/O server) can have multiple clients connected and being serviced at any given time. The maximum number of concurrent client connections depends on memory usage in the E5810, including the number of clients and the number of current sessions running on those clients. However, up to 16 client connections can be running concurrently. Thus, if the maximum number of client connections to the E5810 has not been exceeded, the connection is allowed to occur.

Although several instruments can be connected to the E5810 GPIB bus, only one I/O application operation can occur on the GPIB bus at any given time. Therefore, once a client's request begins to execute on the GPIB, all other client requests for operations on the GPIB must wait until the current client request completes. Client requests are serviced in a first come, first served manner, unless they are prohibited by interface or device locks.

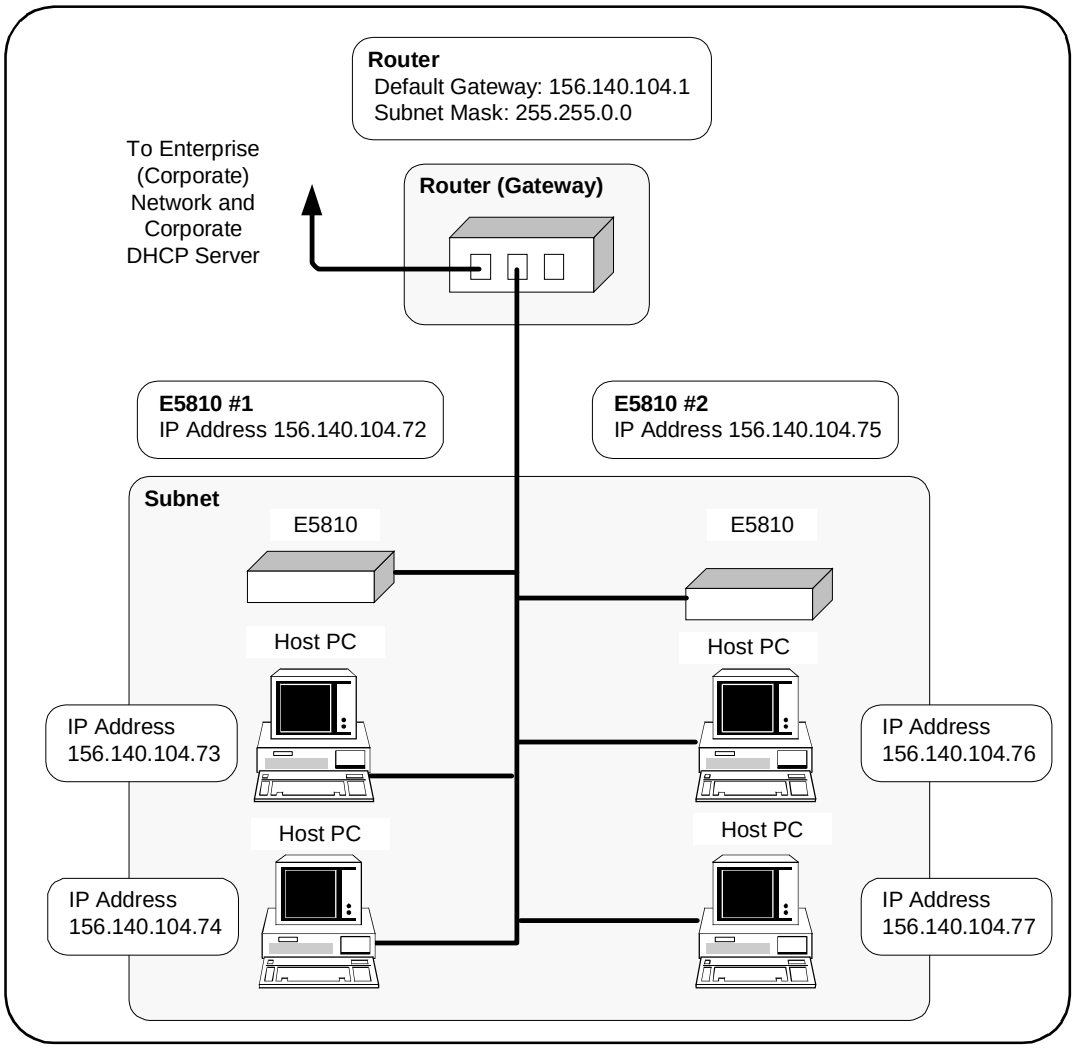
If a client has a sequence of I/O application operations to perform that should not be preempted, the client should obtain a lock on the E5810 GPIB interface or device. Once the client's sequence has completed, it should release its lock, allowing access for other clients.

When a client closes a connection, the E5810 frees up the resources allocated to that client, including any locks, pending I/O requests, memory usage, etc.

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Typical Network IP Addressing

This section describes typical Enterprise network IP addresses and subnet addresses on the network. This figure shows a typical Enterprise network, consisting of a Router (Gateway), a corporate Dynamic Host Configuration Protocol (DHCP) Server, and a subnet consisting of six hosts (two E5810s and four host PCs.) The Router sends packets of information to each host, based on the IP address of the host. The subnet is defined by the **Subnet Mask** for the IP addresses on the subnet.



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Subnet Addressing

A Subnet Mask is used to determine to which subnet an IP address belongs. An IP address has two components: the network address and the host address. For example, assuming IP address 156.215.117.109 is part of a Class B network, the first two numbers (156.215) represent the Class B network address and the second two numbers (117.109) identify a specific host on this network. See the *Glossary* for a description of a Class B network.

For the subnet in the figure, an example IP address for E5810 #1 is 156.140.104.72, where 156.140 represents the network address and 104.72 represents the E5810 #1 host address. An example IP address for E5810 #2 is 156.140.104.75, where 156.140 represents the network address and 104.75 represents the E5810 #2 host address.

E5810 IP Address Assignment

For the E5810 to operate on an Enterprise network, three addresses must be identified: E5810 IP Address, Subnet Mask, and Default Gateway Address.

If the Enterprise network supports Dynamic Host Configuration Protocol (DHCP), the E5810 will automatically receive an IP address, Subnet Mask, and Default Gateway from the DHCP Server. If the network does not support DHCP, the E5810 IP address must be configured manually.

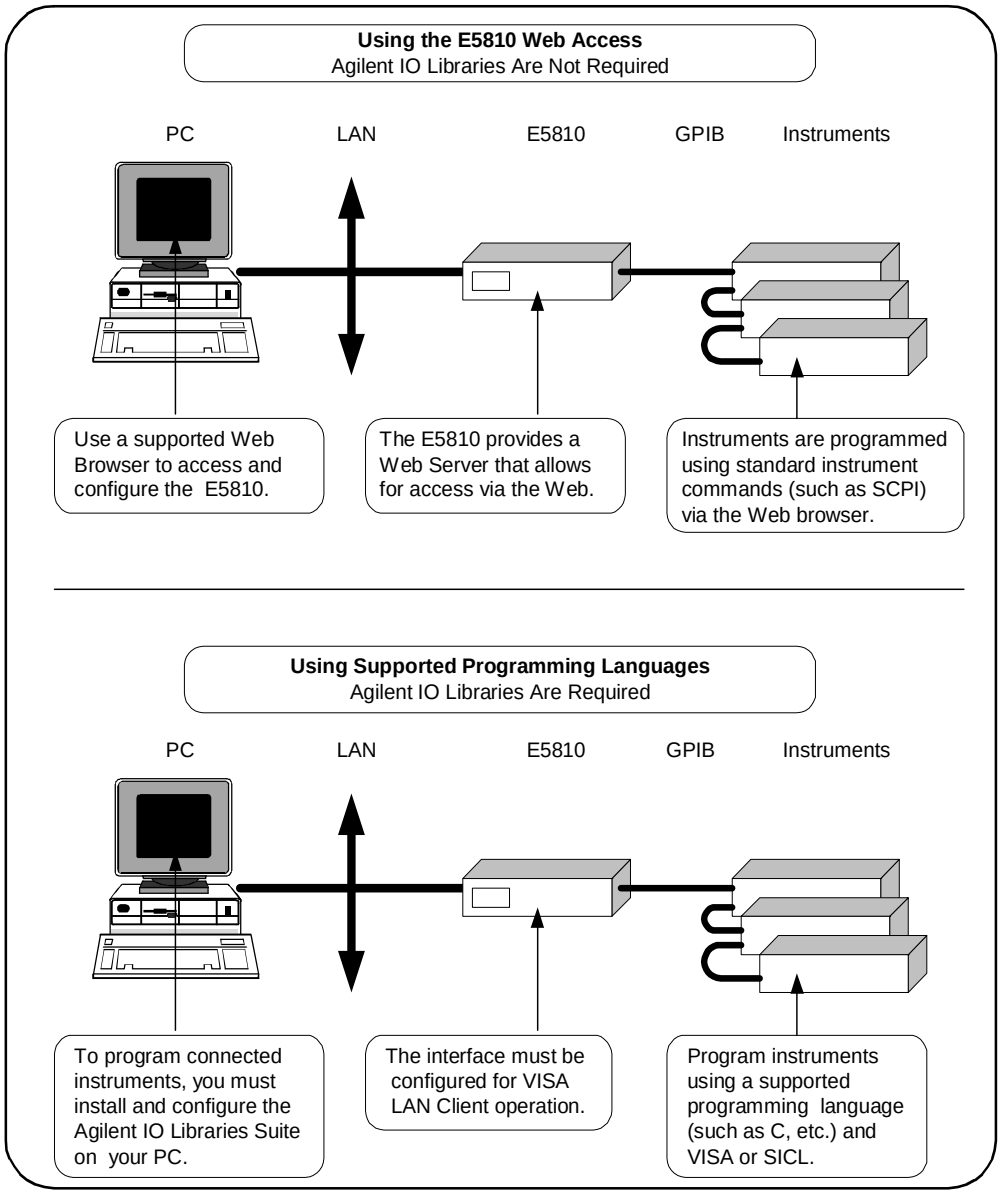
In addition, if the network supports Domain Name Service (DNS), an E5810 Hostname can be configured. This can be done in one of two ways:

- The DNS Server IP Address is provided by the DHCP Server (this is transparent to the user).
- A DNS Server IP address is supplied by the System Administrator and entered on the **Configuring your E5810 LAN/GPIB Gateway** page.

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Communicating with the E5810

There are two ways you can communicate with the E5810 via a network: use the E5810 Web access or use a supported programming language with the Agilent IO Libraries Suite.



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Using E5810 Web Access

Since the E5810 is Web-enabled, you can communicate with the E5810 from a supported Web browser. The E5810 supports Internet Explorer 4.0 or higher and Netscape Navigator 4.7 and higher. Typing in the E5810 IP address (or E5810 hostname, if known) on your Web browser address line and then pressing the **Enter** key displays the E5810 **Welcome** page.



You can use the Web access to configure the E5810 and to communicate with GPIB and/or RS-232 instruments. For example, using the **Configuring your E5810 LAN/GPIB Gateway** page of the E5810 interface, you can view and modify the configuration of the E5810. Or, you can communicate with installed GPIB and/or RS-232 instruments using the **Find and Control Instruments Connected to your E5810** page of the interface. See *Chapter 3 - Using E5810 Web Access* for information on E5810 Web access.

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Using a Supported Programming Language

To use applications that require the Agilent IO Libraries, you must install and configure the Agilent IO Libraries Suite on each PC to be used for programming. Then, you can program connected instruments using a supported programming language (such as C or Visual Basic) using the Agilent Virtual Instrument Software Architecture (VISA), VISA COM, or Standard Instrument Control Language (SICL). See the *Agilent IO Libraries Suite Getting Started Guide* and *Agilent IO Libraries Suite Online Help* for more information on the Agilent IO Libraries.

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Notes:

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Installing the E5810

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Installing the E5810

This chapter shows suggested steps to install the Agilent E5810 LAN/GPIB Gateway for Windows on LAN networks for Windows PCs, including:

- Installation Flowchart
- Before You Install the E5810
- Getting Network Information
- Configuring the E5810 on a Local Network
- Installing the E5810 on an Enterprise Network
- Verifying Instrument Communication
- Installing and Configuring the Agilent IO Libraries Suite

NOTE

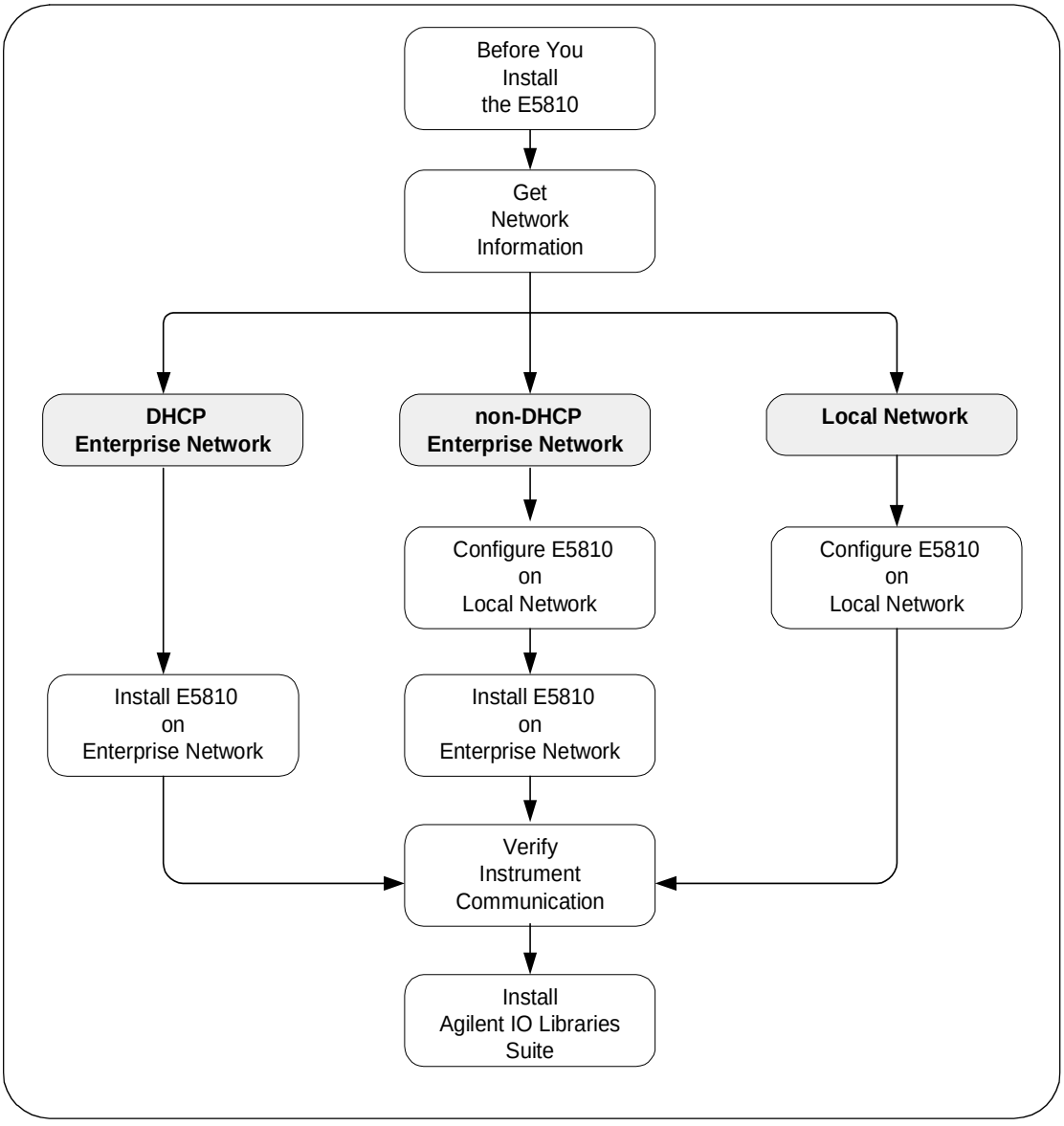
All Agilent IO Libraries information in this guide refers to Agilent IO Libraries Suite version 15.0. For specific information on other versions of the Agilent IO Libraries or Agilent IO Libraries Suite, see the documentation for that version. You can download both updates and older versions (for backward compatibility) of the IO Libraries software at `http://www.agilent.com/find/iolib`.

The Agilent E5810 is supported with PCs running Windows 2000, or Windows XP, or Windows Vista operating systems.

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Installation Flowchart

This figure shows suggested steps to install and configure an E5810 on an Enterprise or Local network. See the next page for more details.



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You can install the E5810 on an Enterprise (corporate) network that supports Dynamic Host Configuration Protocol (DHCP), an Enterprise network that does not support DHCP, or a Local network.

> **NOTE**
>
> *If you plan to install the E5810 on an Enterprise network, contact your Information Technology (IT) Department to see if the network supports Dynamic Host Configuration Protocol (DHCP).*

Installing the E5810 on a DHCP Enterprise Network

See these sections to install an E5810 on an Enterprise network that **does support DHCP**:

- Before You Install the E5810
- Getting Network Information
- Installing the E5810 on an Enterprise Network
- Verifying Instrument Communication
- Installing and Configuring the Agilent IO Libraries Suite

Installing the E5810 on a non-DHCP Enterprise Network

To install the E5810 on an Enterprise network that does not support DHCP, you may need to first configure the E5810 on a Local network and then install the E5810 on the Enterprise network. See these sections to install an E5810 on an Enterprise network that **does not support DHCP**:

- Before You Install the E5810
- Getting Network Information
- Configuring the E5810 on a Local Network
- Installing the E5810 on an Enterprise Network
- Verifying Instrument Communication
- Installing and Configuring the Agilent IO Libraries Suite

Installing the E5810 on a Local Network

If you plan to install the E5810 on a Local network, you may not need to contact your IT department. However, you will need to determine network parameters. See these sections to install and configure an E5810 on a Local network:

- Before You Install the E5810
- Getting Network Information
- Configuring the E5810 on a Local Network
- Verifying Instrument Communication
- Installing and Configuring the Agilent IO Libraries Suite

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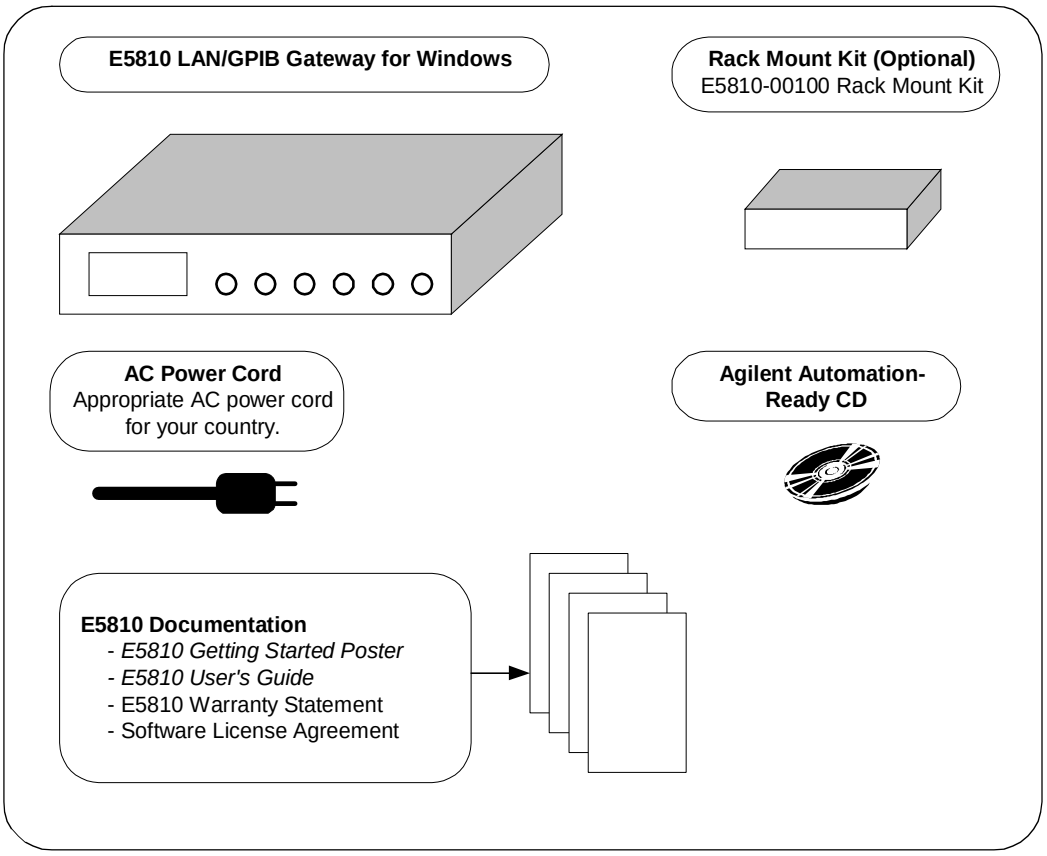
Before You Install the E5810

Before you connect the E5810 to a network, you should:

- Check Shipment Items
- Check System Requirements
- Rack Mount the E5810 (Optional)

Check Shipment Items

In addition to this *E5810 LAN/GPIB Gateway for Windows User's Guide*, your E5810 shipment should include the items shown in the following figure. If any items are missing or damaged, contact Agilent Technologies. See "Support Information" in the *Front Matter* of this guide for addresses.



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Check System Requirements

Before you install the E5810 on a network, you should verify that your system meets the **minimum** hardware and software requirements listed to install and use the Agilent IO Libraries Suite with the E5810. Adding additional RAM may improve overall system performance.

Note: If your PC does not meet these minimum requirements, see `http://www.agilent.com/find/iolib/osmatrix` for information on earlier revisions of the IO Libraries software.

Item	Minimum Requirements
Hardware Requirements	
Ethernet Connections	10BASE-T or 100BASE-TX compliant
Software Requirements	
PC Operation/ Memory	450 MHz Pentium II (1 GHz 32-bit recommended for Vista) and 128 MB RAM (512 MB or greater for Vista)
Hard Drive Space	280 MB free disk space, 1 GB for Microsoft .NET Framework 2.0, 65 MB for Agilent IO Libraries Suite
Operating System	Windows 2000 (Service Pack 4 or later)/ Windows XP (Service Pack 2 or later)/ Windows Vista
Agilent IO Libraries	Agilent IO Libraries Version 14.2 or above
Web Browser	Microsoft Internet Explorer 5.01 or greater (Microsoft Internet Explorer 7.0 or greater for Vista)

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Rack-Mount the E5810 (Optional)

As desired, you can mount up to two E5810s in a single standard EIA rack space using the E5810 Rack Mount Kit (E5810 Option 100 or E5810-00100). The E5810 is one standard half-rack unit wide and one standard rack unit high. See the *E5810-00100 Rack Mount Kit* for installation instructions.

NOTE

You may want to configure the E5810 and ensure proper operation on the Enterprise or Local network before rack-mounting the unit.

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Getting Network Information

This section gives guidelines to get information about Enterprise and Local networks, as applicable to your requirements.

Getting Enterprise Network Information

Before you connect the E5810 to an Enterprise (corporate) network, you will need to get some network configuration and network addressing parameters from the System Administrator in your Information Technology (IT) department.

Copy the Network Information Card

Make a copy of the *E5810 Network Information Card* shown on the next page. Then, enter the E5810 Serial Number and Ethernet (MAC) Hardware Address on the card.The E5810 Serial Number and Ethernet (MAC) Address are printed on a label on the underside of the E5810. See the *Glossary* for descriptions of the items on the Network Information card.

Contact Your System Administrator

Tell your system administrator you want to add a new device (the E5810) to the network that will provide remote access for GPIB and RS-232 instruments and ask him/her to provide the applicable network information on the *E5810 Network Information Card*. In addition to the E5810 Serial Number and Ethernet Address, tell the System Administrator about the E5810 (default) information listed on the card.

Getting Local Network Information

For installation on a Local network, you will probably not need to contact your IT department. However, you should have all the required network information available, such as IP addresses, etc.

Where to Go Next

- **To Install the E5810 on a DHCP Enterprise Network:** Go to “Installing the E5810 on an Enterprise Network”.
- **To Install the E5810 on a Non-DHCP Enterprise Network:** Go to “Configuring the E5810 on a Local Network”.
- **To Install the E5810 on a Local Network:** Go to “Configuring the E5810 on a Local Network”.

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E5810 LAN/GPIB Gateway for Windows Network Information

E5810 General Information (Completed by E5810 User)
(Serial Number and Ethernet (MAC) Hardware Address on label on underside of E5810)

Serial Number: _____

Ethernet (MAC) Hardware Address: _____

Default Values (for IT Department): DHCP: Enabled at power-on
Hostname: No hostname configured
Universal Plug&Play: Enabled

Enterprise Network Information (Completed by System Administrator)

Does the Network Support DHCP? Yes ___ No ___

If No, provide: IP Address (Static): _____._____._____._____

Subnet Mask: _____._____._____._____

Gateway IP Address: _____._____._____._____

Does the Network Support Dynamic DNS? Yes ___ No ____

If Yes, provide: E5810 Hostname: _____

Does the Network Support DNS? Yes ___ No ____

If Yes, provide: DNS Server (IP Address): _____._____._____._____

Will You Allow Universal Plug&Play to be Enabled? Yes ___ No ____

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Configuring the E5810 on a Local Network

This step gives guidelines to configure an E5810 on a Local network for eventual operation in a non-DHCP Enterprise network or in a Local network operation, including:

- What is a Local Network?
- Connecting the E5810 to a Local Network
- Configuring the E5810 on a Local Network

NOTE

*This step gives guidelines to configure your E5810 on a Local network for eventual installation on an Enterprise network that **does not support** Dynamic Host Configuration Protocol (DHCP) OR for installation on a Local network.*

*If you plan to install the E5810 on an Enterprise network that **does support** DHCP, **skip** this step and go to "Installing the E5810 on an Enterprise Network".*

What is a Local Network?

A local (peer-to-peer) network is a network consisting of a computer with an Ethernet port and an E5810 or a set of networking devices that are networked together but are not connected to an Enterprise network. The figure on the next page shows example configurations for Local networks with hub/switch or crossover cable connections.

Local Network (Hub/Switch) Connections

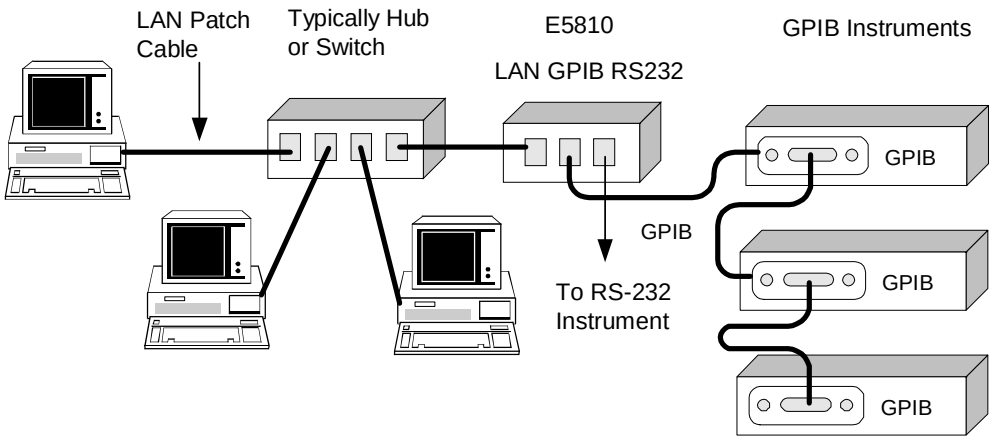
In a typical Local network (isolated LAN), a hub or switch may or may not act as a Dynamic Host Configuration Protocol (DHCP) Server. For Local Network connections, the E5810 is not visible on the Enterprise network. For this configuration, multiple PCs can communicate with the E5810 via the hub or switch.

Direct PC (Crossover Cable) Connections

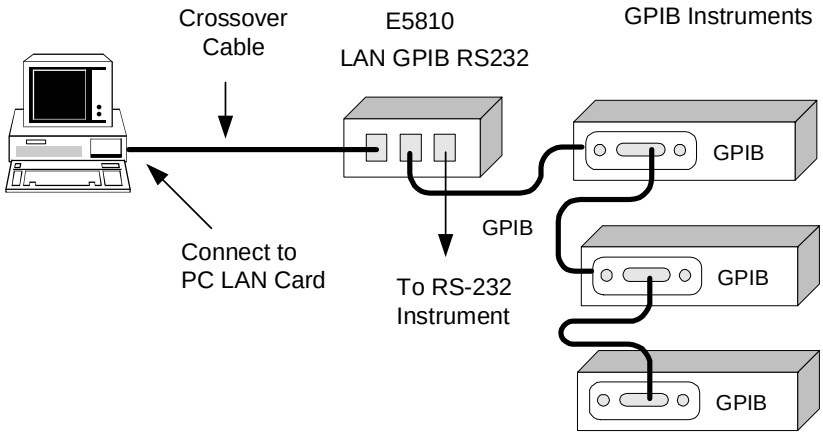
For direct PC connection to the E5810, a **crossover cable** is connected from the E5810 LAN port to a LAN card on the PC. There are no connections to an Enterprise network. This setup is typically used for local configuration. For this configuration, only a single PC can communicate with the E5810 via the crossover cable.

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Local Network Connections (Multiple PCs can Communicate with the E5810)



Direct PC Connection (Only One PC can Communicate with the E5810)



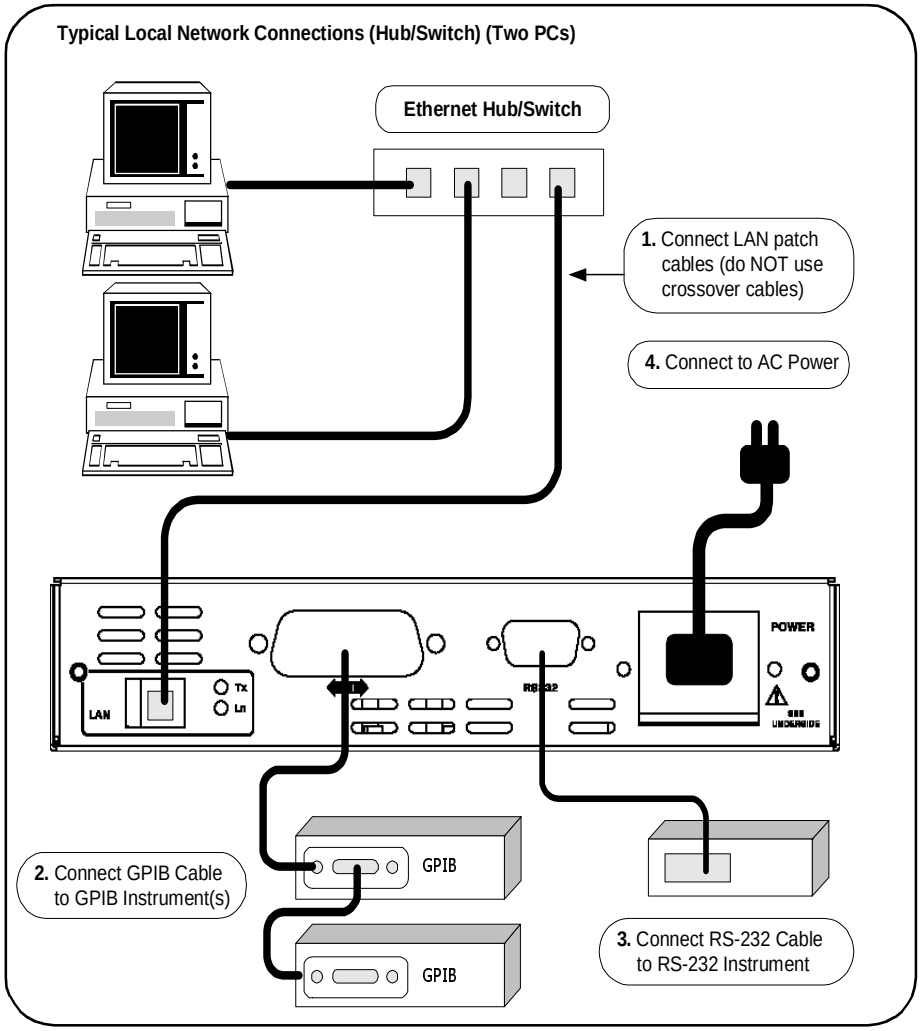
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Connecting the E5810 to a Local Network

This section shows how to connect the E5810 to a Local network using an Ethernet hub/switch or a crossover cable.

E5810 Hub/Switch Connections

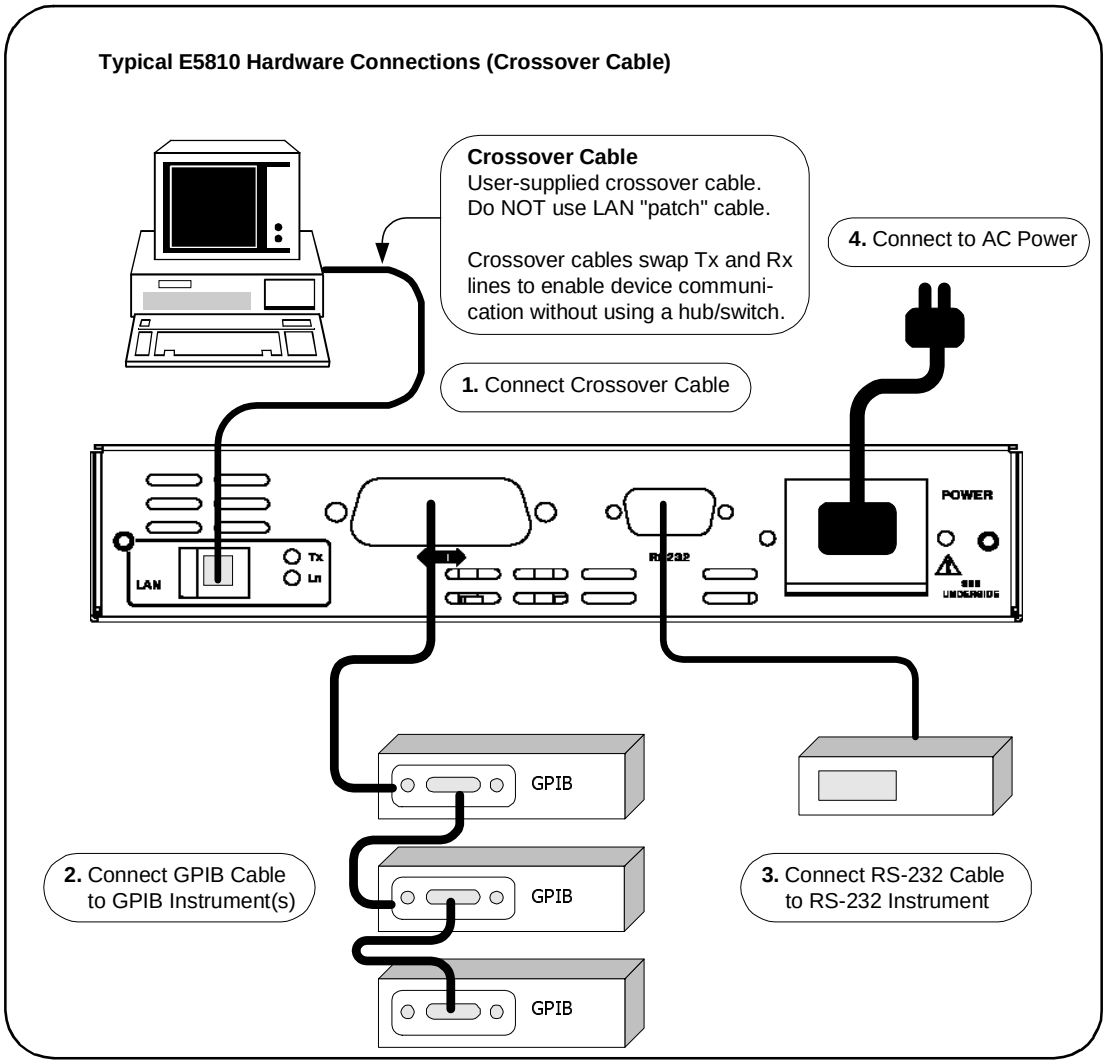
This figure shows typical E5810 Ethernet hub or switch connections. Since the E5810 has no AC Power switch, the Mains disconnect for the E5810 is to unplug the AC power cord from the AC outlet.



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E5810 Crossover Cable Connections

This figure shows typical E5810 connections using a crossover cable. Since the E5810 has no AC Power switch, the Mains disconnect for the E5810 is to unplug the AC power cord from the AC outlet. For this configuration, only one PC can communicate with the E5810.



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Apply Power to the E5810

After connecting the E5810 to a Local network, plug the E5810 AC power cord into an AC outlet and observe the power-on sequence. When the power-on sequence is complete, the default IP address of the E5810 is displayed on the second line of the front panel display. A typical display follows. See *Chapter 1 - E5810 Description* for power-on sequences.

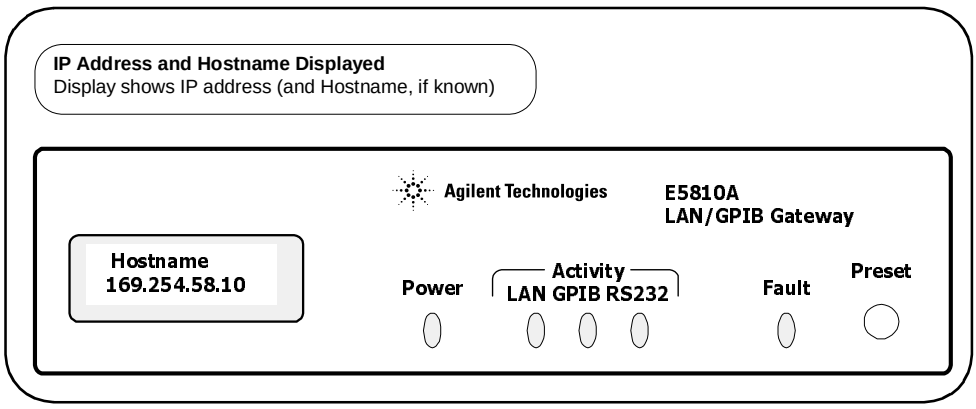
NOTE

Local networks may not have a DHCP Server. Since, by default, the E5810 tries to find a DHCP server until a timeout value is reached, it may require up to 75 seconds for the E5810 to display its default static IP address (169.254.58.10).

NOTE

The E5810 detects duplicate IP addresses and will not start operation if its IP address is already in use. If you try to simultaneously attach multiple E5810s without changing each unit's default static IP address, some E5810s may not start operation.

To prevent this from happening, add a single E5810 at a time to the network and configure each E5810 to a unique IP address before adding additional E5810s.



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Configuring the E5810 for Local Network Operation

This section gives guidelines to configure the E5810 on a Local network. This section applies if you plan to configure the E5810 for eventual installation on a non-DHCP Enterprise network or plan to configure the E5810 for eventual use on the Local network.

NOTE

When configuring the E5810, we recommend you change the default IP address to a unique IP address for each E5810 being added to the system. Otherwise, since the E5810 detects duplicate IP addresses, some E5810s added to the system may not operate. See Chapter 3 - Using E5810 Web Access for details on setting E5810 parameters.

Establishing Communication With Your PC

Whether your Local network includes a hub/switch or a crossover cable, the first step in configuring the E5810 is to establish communication between your PC and the E5810. To do this, the PC and the E5810 must be on the same subnet.

One way to put the PC and the E5810 on the same subnet is to use **`route add <E5810 IP Address> <PC IP Address>`** from the MS-DOS prompt. For example, if IP address of your PC is 155.139.103.152 and the E5810 IP address is 169.254.58.10 (the default), use one of the following:

```
! route is lost when the PC is rebooted
route add 169.254.58.10 155.139.103.152
```

or

```
! route persists when the PC is rebooted
route -p add 169.254.58.10 155.139.103.152
```

After communication has been established, you can set any required configuration parameters for the E5810 by using the E5810 Web access.

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Configuring the E5810 for Enterprise Network Operation

You can check or set E5810 configuration parameters using the E5810 Web access that is accessed from your Web browser (Internet Explorer 4.0 or higher or Netscape Navigator 4.7 or higher). The steps to set E5810 configuration parameters are:

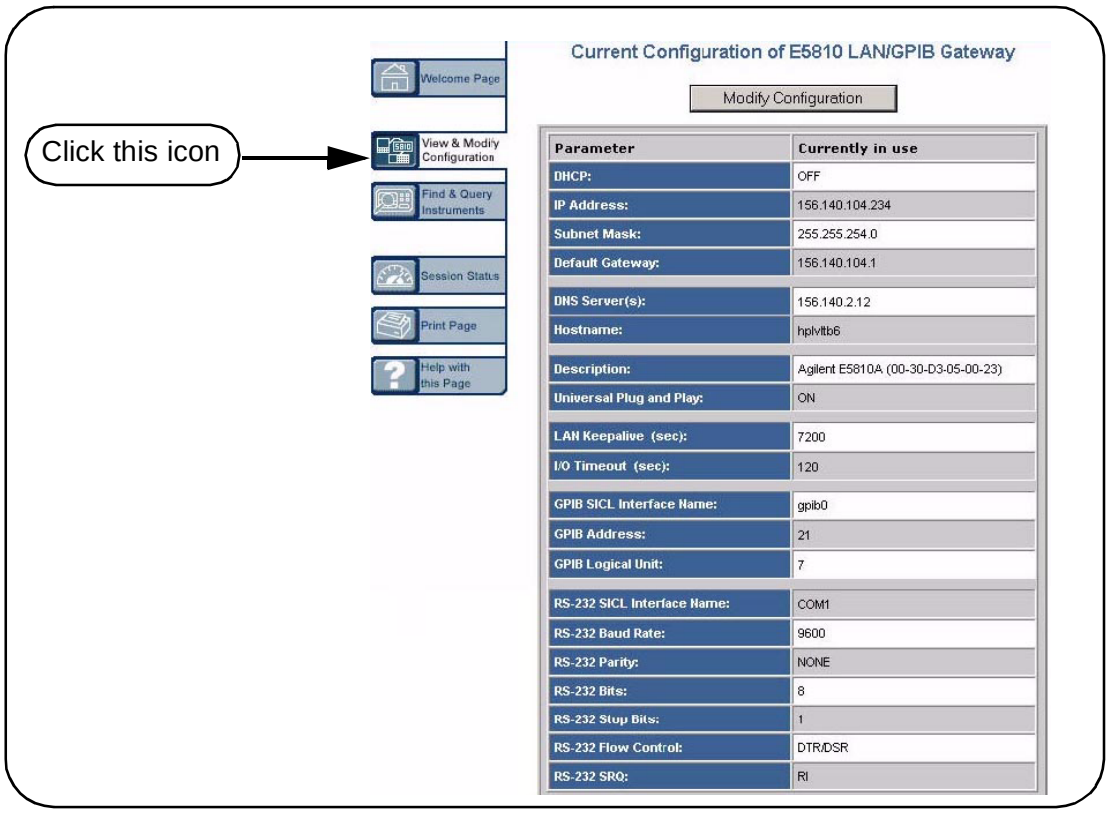
1 **Display the Welcome Page.** From your Web browser address line, type '**`http://<E5810 IP Address>`**', where <**`E5810 IP Address`**> is the IP address displayed on the E5810 front panel display. Then, press the **Enter** key to display the E5810 **Welcome** page.

For example, if the default IP address of 169.254.58.10 is displayed on the E5810 front panel, typing **`http://169.254.58.10`** on your Web browser address line and pressing **Enter** displays the E5810 Welcome page. The following figure shows a typical display.



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2 **Display the Current Configuration Page.** From the **Welcome** page, click the **View & Modify Configuration** icon to display the **Current Configuration of E5810 LAN/GPIB Gateway** page

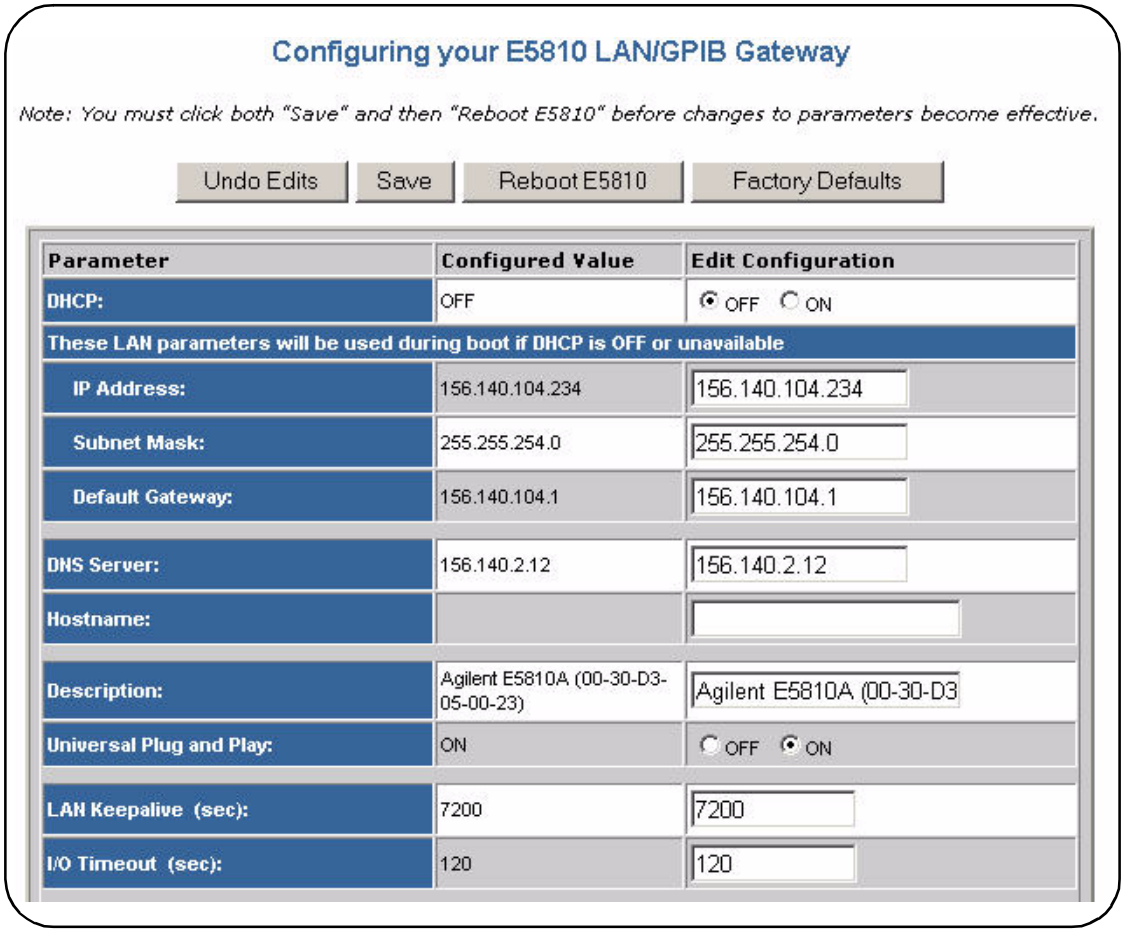


3 **Display the Modify Configuration Page.** From the **Current Configuration of E5810 LAN/GPIB Gateway** page, click the **Modify Configuration** button to display the **Password** dialog box.



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If the default password (E5810) is being used, the password is displayed as asterisks (*****). If not, type in the current password. Then, click the **Submit** button to display the **Configuring Your E5810 LAN/GPIB Gateway** page.



Configuring your E5810 LAN/GPIB Gateway

Note: You must click both "Save" and then "Reboot E5810" before changes to parameters become effective.

Undo Edits | Save | Reboot E5810 | Factory Defaults

Parameter	Configured Value	Edit Configuration
DHCP:	OFF	(•) OFF ( ) ON
These LAN parameters will be used during boot if DHCP is OFF or unavailable		
IP Address:	156.140.104.234	156.140.104.234
Subnet Mask:	255.255.254.0	255.255.254.0
Default Gateway:	156.140.104.1	156.140.104.1
DNS Server:	156.140.2.12	156.140.2.12
Hostname:		
Description:	Agilent E5810A (00-30-D3-05-00-23)	Agilent E5810A (00-30-D3
Universal Plug and Play:	ON	( ) OFF (•) ON
LAN Keepalive (sec):	7200	7200
I/O Timeout (sec):	120	120

4 **Set E5810 for Enterprise Network Operation.** To properly set E5810 configuration parameters for eventual use on an Enterprise network, you may need to enter the following network values, as provided to you by your System Administrator, on the **Configuring your E5810 LAN/GPIB Gateway** page.

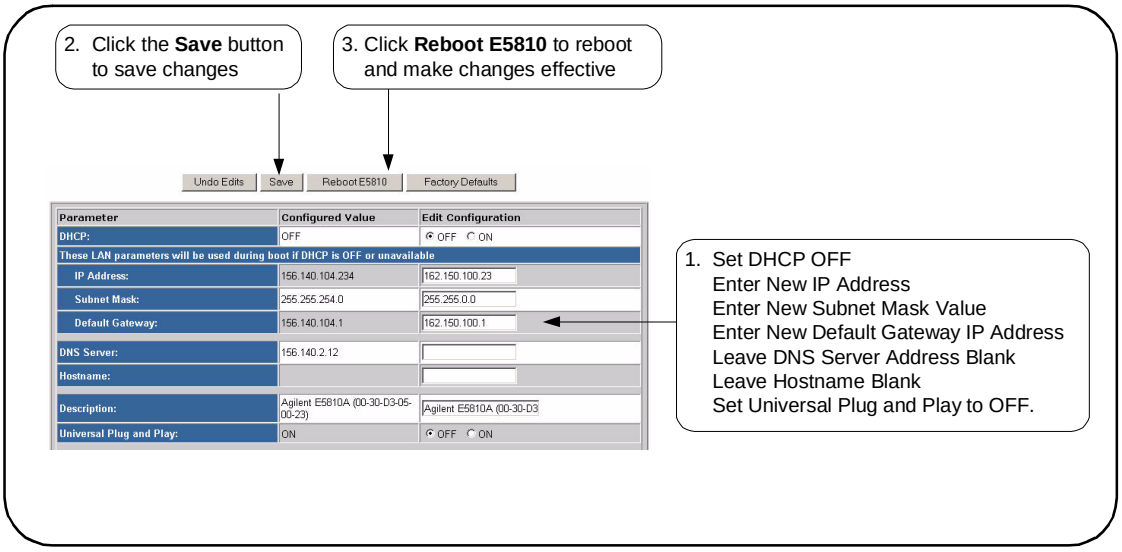
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IP Address Assignment	
Enterprise Network Supports DHCP No action required. The E5810 automatically receives an IP address from the network DHCP Server.	**Enterprise Network Does Not Support DHCP** Click DHCP OFF and enter the values provided by the System Administrator for IP Address, Subnet Mask, and Default Gateway IP Address.
Hostname	
Enterprise Network Supports DNS If the network supports dynamic DNS, enter the Hostname provided by the System Administrator. Then, you can access the E5810 from your Web browser by using the Hostname. If the network supports DNS, enter the DNS Server IP Address provided by the System Administrator.	**Enterprise Network Does Not Support DNS** No action required. Hostnames are not supported. Use only the IP address when communicating with the E5810.
Universal Plug and Play (UPnP)	
UPnP Enabled is Allowed on Enterprise Network No action is required for the E5810. However, if you want to see the E5810 in My Network Places, you may need to enable UPnP on your computer's Operating System.	**UPnP Enabled is Not Allowed on Enterprise Network or You Do Not Want the E5810 to be Displayed in My Network Places** Set Universal Plug and Play to OFF.

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Example: Configuring the E5810

This example shows one way to set various E5810 parameters on the **Configuring your E5810 LAN/GPIB Gateway** page, assuming the Enterprise network to which the E5810 will be connected does not support DHCP or DNS. Since the network does not support DNS, a Hostname cannot be used for this E5810. In addition, it is assumed the network does not allow UPnP, so Universal Plug and Play is set to OFF.



Configuring the E5810 for Local Network Operation

If you plan to install your E5810 on a Local network, use the **Configuring your E5810 LAN/GPIB Gateway** page to set the parameters applicable to your Local network.

Where to go Next

- **To Install the E5810 on an Enterprise Network.** Disconnect the E5810 from the Local network and go to “Installing the E5810 on an Enterprise Network”.
- **To Use the E5810 on a Local Network.** Leave the E5810 connected to the Local network and go to “Verifying Instrument Communication”.

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Installing the E5810 on an Enterprise Network

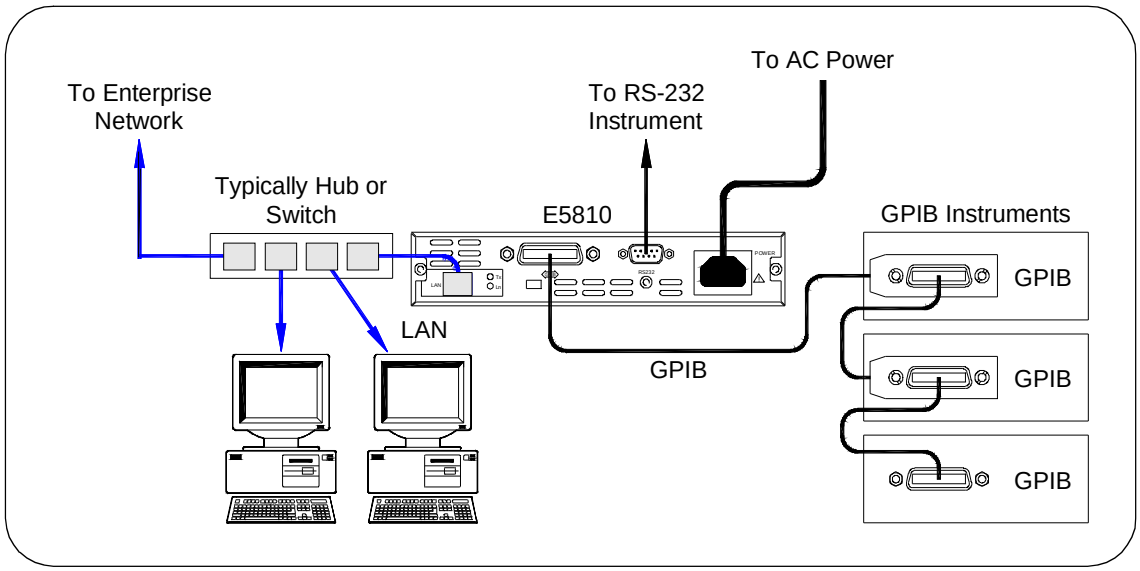
This step gives guidelines to install an E5810 on an Enterprise network.

NOTE

*If your Enterprise network does **not** support Dynamic Host Configuration Protocol (DHCP), you must first configure your E5810 on a Local network as shown in "Configuring the E5810 on a Local Network" and then return to this step to install the E5810 on the Enterprise network.*

Connecting the E5810 to the Network

This figure shows typical E5810 connections to an Enterprise network. You can connect up to 14 GPIB instruments and one RS-232 instrument to each E5810. Make connections from the E5810 to the network and to GPIB and/or RS-232 instruments as required.

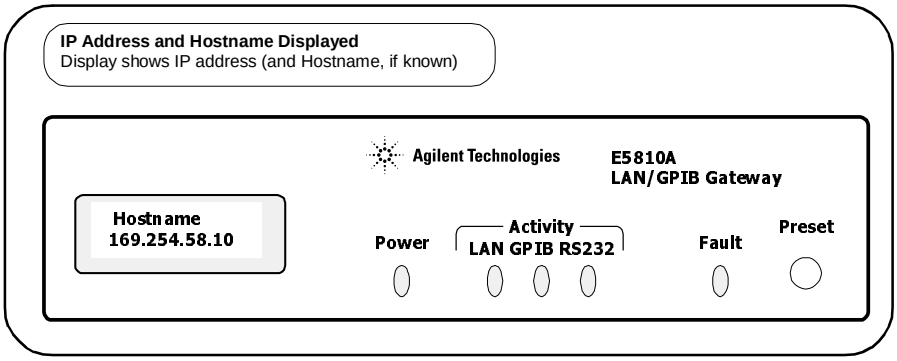


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After connecting the E5810 to the Enterprise network, plug the E5810 AC power cord into an AC outlet and observe the power-on sequence. When the power-on sequence is complete, the assigned IP address of the E5810 is displayed on the second line of the front panel display. A typical display follows. See *Chapter 1 - E5810 Description* for power-on sequences.

NOTE

The Mains disconnect for the E5810 is to unplug the AC power cord from the AC outlet. The E5810 has no AC Power switch.



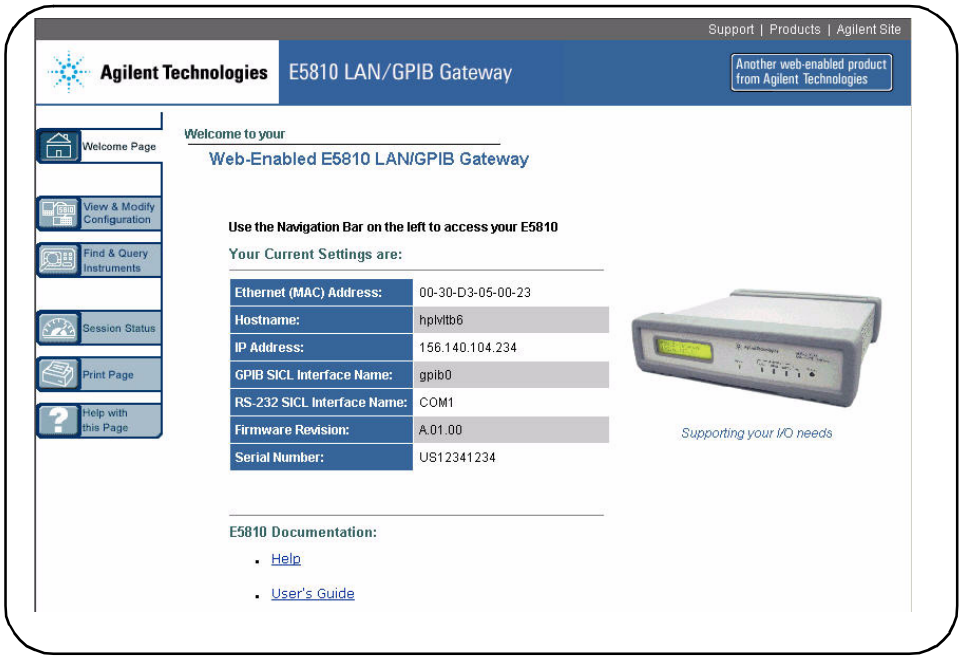
Configuring the E5810 for Enterprise Network Operation

After the E5810 is installed on the Enterprise network, you can check or set (as required) E5810 configuration parameters using the E5810 Web access that is accessed from your Web browser (Internet Explorer 4.0 or higher or Netscape Navigator 4.7 or higher). The steps to set E5810 configuration parameters are:

1 **Display the Welcome Page.** To display the E5810 **Welcome** page, from your Web browser address line, type '**http://<E5810 IP Address>**', where <E5810 IP Address> is the IP address displayed on the E5810 front panel display. Then, press the **Enter** key.

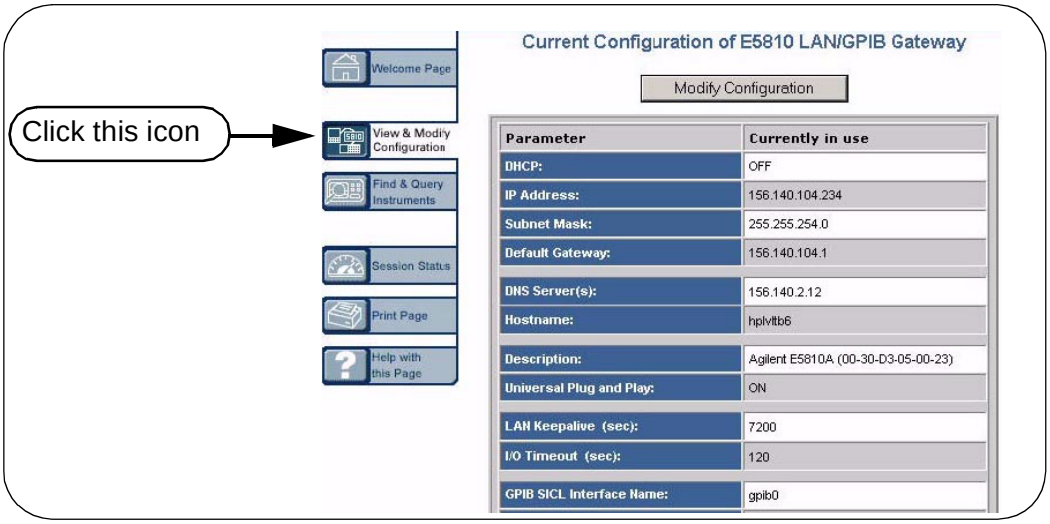
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For example, if the default IP address of 169.254.58.10 is displayed on the E5810 front panel, typing http://169.254.58.10 on your Web browser address line and pressing Enter displays the E5810 Welcome page. The following figure shows a typical display.



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2 **Display the Current Configuration Page.** from the **Welcome** page, click the **View & Modify Configuration** icon to display the **Current Configuration of E5810 LAN/GPIB Gateway** page

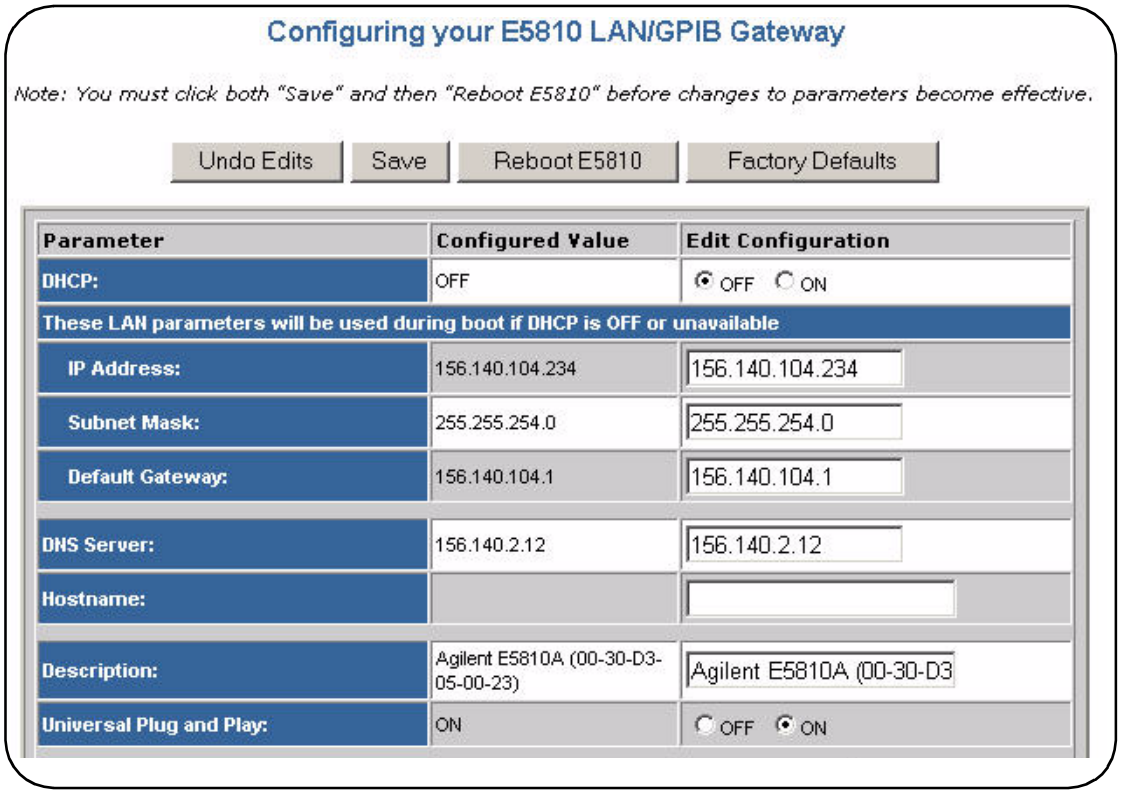


3 **Display the Modify Configuration Page.** From the **Current Configuration of E5810 LAN/GPIB Gateway** page, click the **Modify Configuration** button to display the **Password** dialog box.



If the default password (E5810) is being used, the password is displayed as asterisks (*****). If not, type in the current password. Then, click the **Submit** button to display the **Configuring Your E5810 LAN/GPIB Gateway** page.

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Configuring your E5810 LAN/GPIB Gateway

Note: You must click both "Save" and then "Reboot E5810" before changes to parameters become effective.

Undo Edits | Save | Reboot E5810 | Factory Defaults

Parameter	Configured Value	Edit Configuration
DHCP:	OFF	(•) OFF ( ) ON
These LAN parameters will be used during boot if DHCP is OFF or unavailable		
IP Address:	156.140.104.234	156.140.104.234
Subnet Mask:	255.255.254.0	255.255.254.0
Default Gateway:	156.140.104.1	156.140.104.1
DNS Server:	156.140.2.12	156.140.2.12
Hostname:		
Description:	Agilent E5810A (00-30-D3-05-00-23)	Agilent E5810A (00-30-D3
Universal Plug and Play:	ON	( ) OFF (•) ON

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4 **Set E5810 for DHCP Enterprise Network Operation.** For an Enterprise network that supports DHCP, the only values you may need to set are the Hostname and Universal Plug and Play (UPnP) settings, as provided to you by your System Administrator, on the **Configuring your E5810 LAN/GPIB Gateway** page.

Hostname	
Enterprise Network Supports DNS If the network supports dynamic DNS, enter the Hostname provided by the System Administrator. Then, you can access the E5810 from your Web browser by using the Hostname. If the network supports DNS, enter the DNS Server IP Address provided by the System Administrator.	**Enterprise Network Does Not Support DNS** No action required. Hostnames are not supported. Use only the IP address when communicating with the E5810.
Universal Plug and Play (UPnP)	
UPnP Enabled is Allowed on Enterprise Network No action is required for the E5810. However, if you want to see the E5810 in My Network Places, you may need to enable UPnP on your computer's Operating System.	**UPnP Enabled is Not Allowed on Enterprise Network or You Do Not Want the E5810 to be Displayed in My Network Places** Set Universal Plug and Play to OFF.

Where to Go Next

Go to "Verifying Instrument Communication."

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Verifying Instrument Communication

The last step in installing and configuring the E5810 is to verify communication from your PC to up to 14 connected GPIB instruments and/or one RS-232 instrument via the E5810 Web access. See *Chapter 3 - Using E5810 Web Access* for details.

NOTE

Over the Web, you can interact with instruments via your Web browser. To program instruments via the E5810 using an application language such as C or Visual Basic, you must first install and configure the Agilent IO Libraries Suite as shown in "Installing and Configuring the Agilent IO Libraries Suite" on page 64.

Open the Instrument Page

You can verify instrument communication using the **Find and Control Instruments Connected to your E5810** page of the E5810 Web access.

NOTE

Before opening the **Find and Control Instruments Connected to your E5810** *page, be sure all connected instruments are plugged in and turned on.*

On the address line of your Web browser type **`http://<E5810 IP Address>`** (where **`<E5810 IP Address>`** is the IP address of the E5810 shown on the front panel display). Then, press **Enter** to display the **Welcome** page.

From the **Welcome** page, click the **Find&Query Instruments** icon to display the **Password** dialog box. If the default password is being used, the **Password** dialog box shows asterisks (*****). If not, type in the E5810 password. Click the **Submit** button to display the **Find and Control Instruments Connected to your E5810** page.

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Instrument Page Functions

From the **Find and Control Instruments Connected to your E5810** page, you can check instrument communication, send command/queries, and do other functions.

Checking Instrument Communication

To check instrument communication, first select (highlight) the instrument to be addressed by clicking the SICL Address in the **Instruments Connected** column. Then, depending on the instrument selected, you can use button functions (device clear, *IDN?, etc.) to communicate with the instrument.

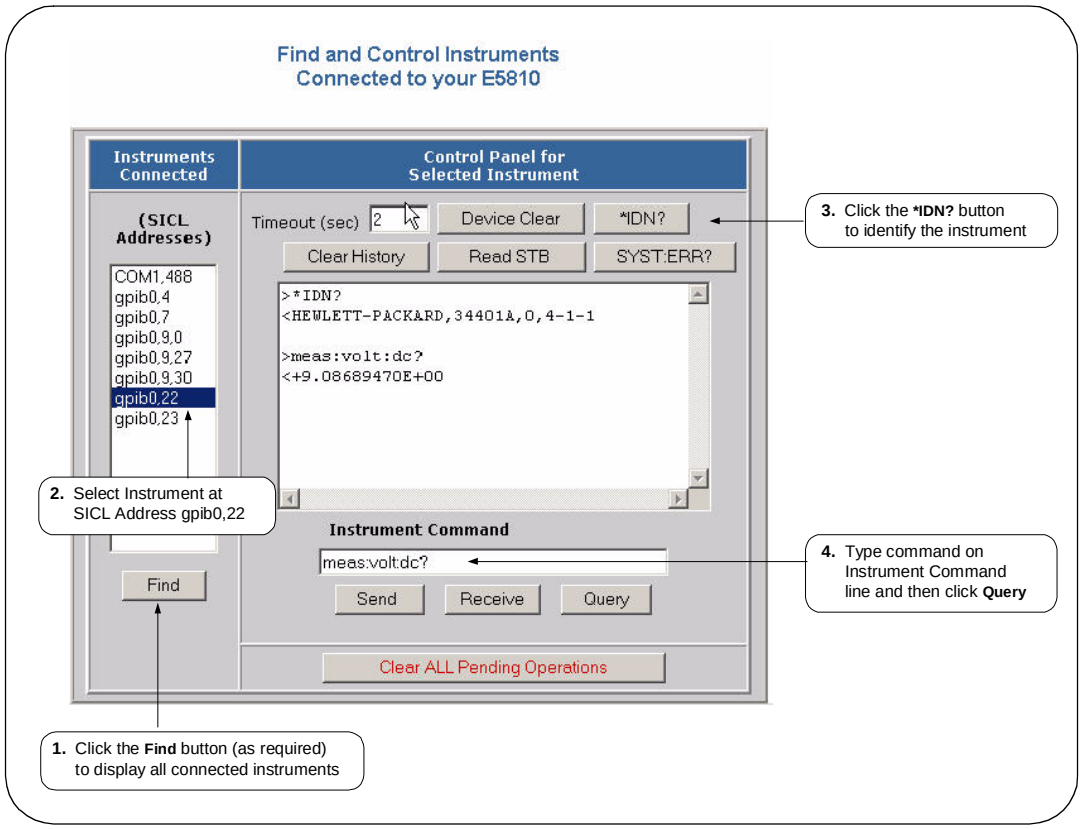
Sending Commands/Queries

You can also send instrument-specific commands to applicable instruments using the Instrument Command line and then clicking **Send**, **Receive**, or **Query**. In addition, you can clear the display on the screen by clicking the **Clear History** button, set the timeout value (in seconds) by typing in the desired value in the **Timeout (sec)** dialog box, and clear all pending operations on instruments connected to the E5810 by clicking the **Clear Pending Operations** button.

Example: Querying a DC Voltage Value

For example, the figure on the next page shows one way to identify and query the DC voltage value of a DMM instrument at SICL address gpib0,22. See *Chapter 3 - Using E5810 Web Access* for details

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Where to Go Next

- **If you want to program instruments from your PC.** Go to “Installing and Configuring the Agilent IO Libraries Suite” on page 64.
- **If you do not want to program instruments.** This completes the E5810 installation.

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Installing and Configuring the Agilent IO Libraries Suite

The following steps describe installing the Agilent IO Libraries Suite, using default settings, including:

- Checking for Installed Agilent IO Libraries or Agilent IO Libraries Suite
- Installing Agilent IO Libraries Suite

NOTE

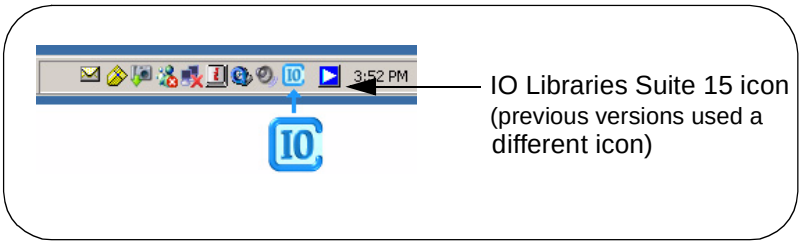
See the Agilent IO Libraries Connectivity Guide on your Automation-Ready CD for a full description of installation options and installation troubleshooting information.

NOTE

You must have Administrator privileges to install the IO Libraries Suite and to run the Connection Expert utility.

Check for Installed Agilent IO Libraries

Before you begin installation, check for previously installed Agilent IO Libraries software. If a version of the Agilent IO Libraries Suite is installed on your PC, an IO icon may be displayed on the Windows taskbar (on the lower right-hand side of the screen as shown below).



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NOTE
PCs installed with Windows Vista MUST upgrade to Agilent IO Libraries v15.0 or above.

- If the IO icon is displayed, click the icon and click **About Agilent IO Control** to display the version. The version must be 15.0 or greater.
- If the IO icon is not displayed, a version may still be installed. To check this, click **Start >Programs** and look for the **Agilent IO Libraries** or **Agilent IO Libraries Suite** program group.
- If this group is displayed, click **Agilent IO Libraries > Utilities > IO Control** to display the IO icon. Then, click the icon and click **About Agilent IO Libraries Control** to display the installed version (must be 15.0 or greater).
- If the Agilent IO Libraries Suite version is less than 15.0, install the newer version included on your *Automation-Ready CD* to support the E5810A.
- If your version of the Agilent IO Libraries Suite is at least 15.0, but less than the version on your *Automation-Ready CD*, you may want to install the newer version to take advantage of new features and greater ease of use.

Installing Agilent IO Libraries Suite

To install the Agilent IO Libraries Suite software,

1. First, disconnect any USB instruments, USB/GPIB converters, and FireWire-VXI interfaces that are connected to your PC.Insert the *Automation-Ready CD* into your CD-ROM drive. Wait for a few seconds until the auto-run window appears.

NOTE

If possible, always use the current version of the Agilent IO Libraries Suite. This version supports the newest interfaces and operating systems.

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2 If the auto-run window does not appear automatically, Click

- Click **Start > Run**
- Type <x>:autorun\auto.exe where <x> is your CD drive letter.

3 When the auto-run window appears, follow the directions on that window to install the Agilent IO Libraries Suite. (See *Agilent IO Libraries Connectivity Guide* on your *Automation-Ready CD* for a full description of installation options and installation troubleshooting information).

4 Go to “Configuring a Remote GPIB Interface” on page 66 to configure GPIB instruments connected to your E5810.

and/or

Go to “Configuring a Remote Serial Interface” on page 68 if an RS-232 instrument is connected to your E5810.

Configuring a Remote GPIB Interface

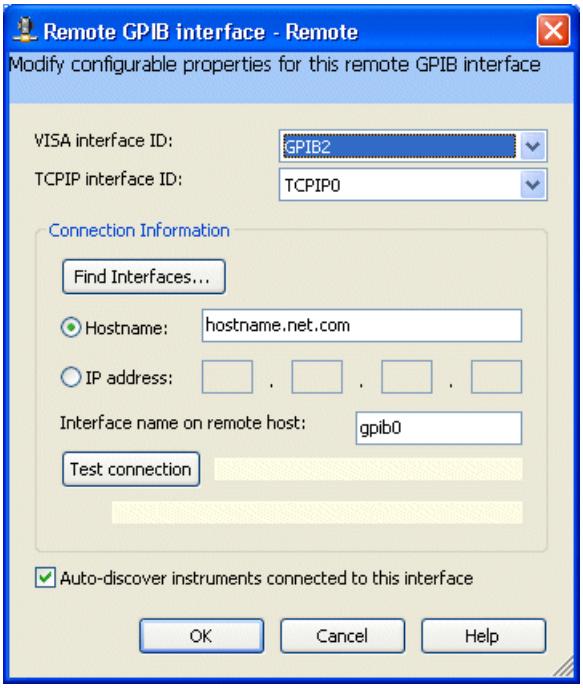
This section shows the steps to configure a **remote GPIB interface**, which is a logical interface on the client PC that supports communication with GPIB instruments on your E5810. If you do not have GPIB instruments connected to your E5810, but do have an RS-232 instrument connected, skip this section and go to “Configuring a Remote Serial Interface” on page 68.

1 Click the Agilent IO Control icon (blue circled **IO** icon on the Windows taskbar) and click **Agilent Connection Expert** to display the Connection Expert utility’s main window.

2 Click **Add an interface** on the Connection Expert toolbar.

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3 In the **Manually Add an Interface** dialog box, select **Remote GPIB interface** and click **Add**. The **Remote GPIB Interface** dialog will appear.



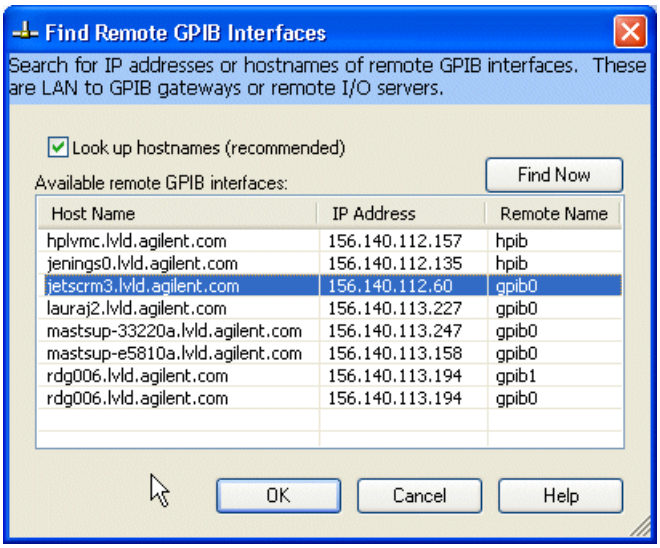
4 Specify the TCPIP interface that you wish to use to host this remote interface, in the **TCPIP interface ID:** field. This must be an interface that is already configured on your system; by default, a LAN interface named **TCPIP0** is configured when you start or refresh Connection Expert. To change timeouts and protocol properties for your remote interface, you must change the properties of this TCPIP interface.

5 *If your E5810 is on a different subnet from your client PC*, type the hostname or IP address of the E5810 in the **Remote GPIB interface** dialog box. Change the value in the **Interface name on remote host:** field, if necessary, to match the **GPIB SICL Interface Name** displayed on the E5810 **Welcome** page.

If your E5810 is on the same subnet as your client PC, click **Find Interfaces...**. Then, in the **Find Remote GPIB Interfaces** dialog, click

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Find Now, select your E5810 from the list, and click **OK** to return to the **Remote GPIB interface** dialog box.



6 In the **Remote GPIB interface** dialog box, click **Test connection** to check connectivity to your E5810. If the test is successful, you will see the message **The interface was successfully opened**.

If you leave the check box labeled **Auto-discover instruments connected to this interface** checked, then when you click **OK**, Connection Expert will search for GPIB instruments connected to your E5810 and will send a ***IDN?** (identification) query to each instrument found. You will then see the new remote GPIB interface and any attached GPIB instruments in the Connection Expert's explorer view.

Configuring a Remote Serial Interface

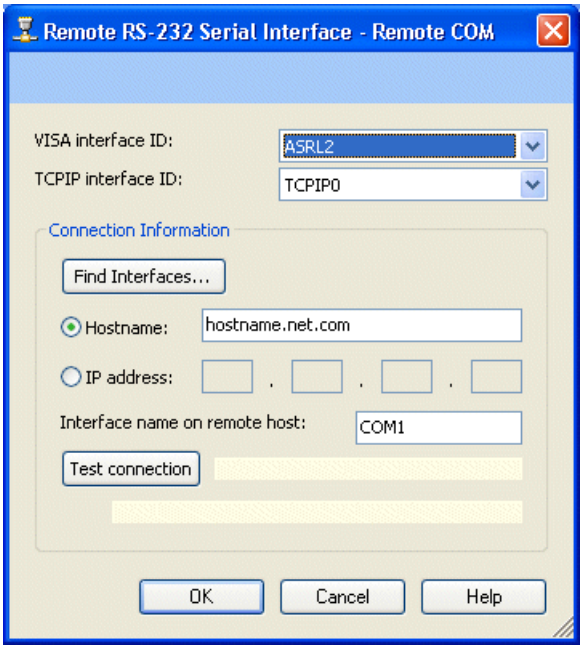
This section shows the steps to configure a **remote serial interface**, which is a logical interface on the client PC that supports communication with RS-232 instruments on your E5810. If you do not have an RS-232 instrument connected to your E5810, skip this section and go to the next step, "Verifying Communication From Your PC" on page 72.

1 Click the Agilent IO Control icon (blue circled **IO** icon on the Windows taskbar) and click **Agilent Connection Expert** to display the Connection Expert utility's main window.

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2 Click **Add Interface** on the Connection Expert toolbar.

3 In the **Manually Add an Interface** dialog box, select **Remote RS-232 serial interface** and click **Add**. The **Remote RS-232 Serial Interface** dialog will appear.



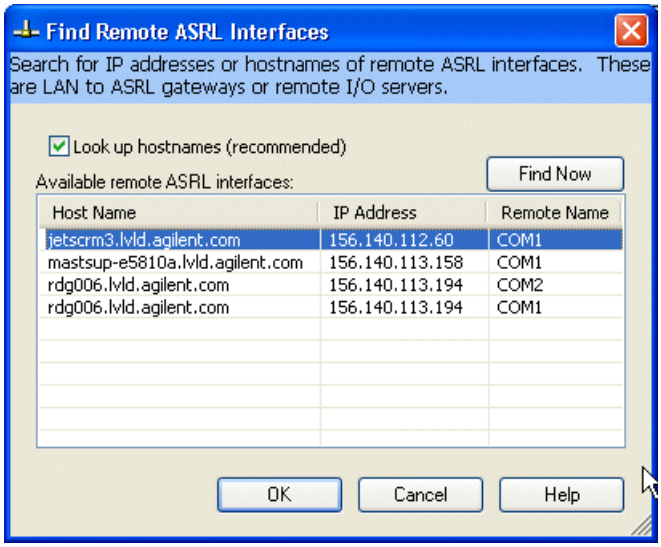
4 Specify the TCPIP interface that you wish to use to host this remote interface, in the **TCPIP interface ID:** field. This must be an interface that is already configured on your system; by default, a LAN interface named **TCPIP0** is configured when you start or refresh Connection Expert. To change timeouts and protocol properties for your remote interface, you must change the properties of this TCPIP interface.

5 *If your E5810 is on a different subnet from your client PC*, type the hostname or IP address of the E5810 in the **Remote RS-232 Serial Interface** dialog box. Change the value in the **Interface name on remote host:** field, if necessary, to match the **RS-232 SICL Interface Name** displayed on the E5810 **Welcome** page.

If your E5810 is on the same subnet as your client PC, click **Find Interfaces...**. Then, in the **Find Remote ASRL Interfaces** dialog, click

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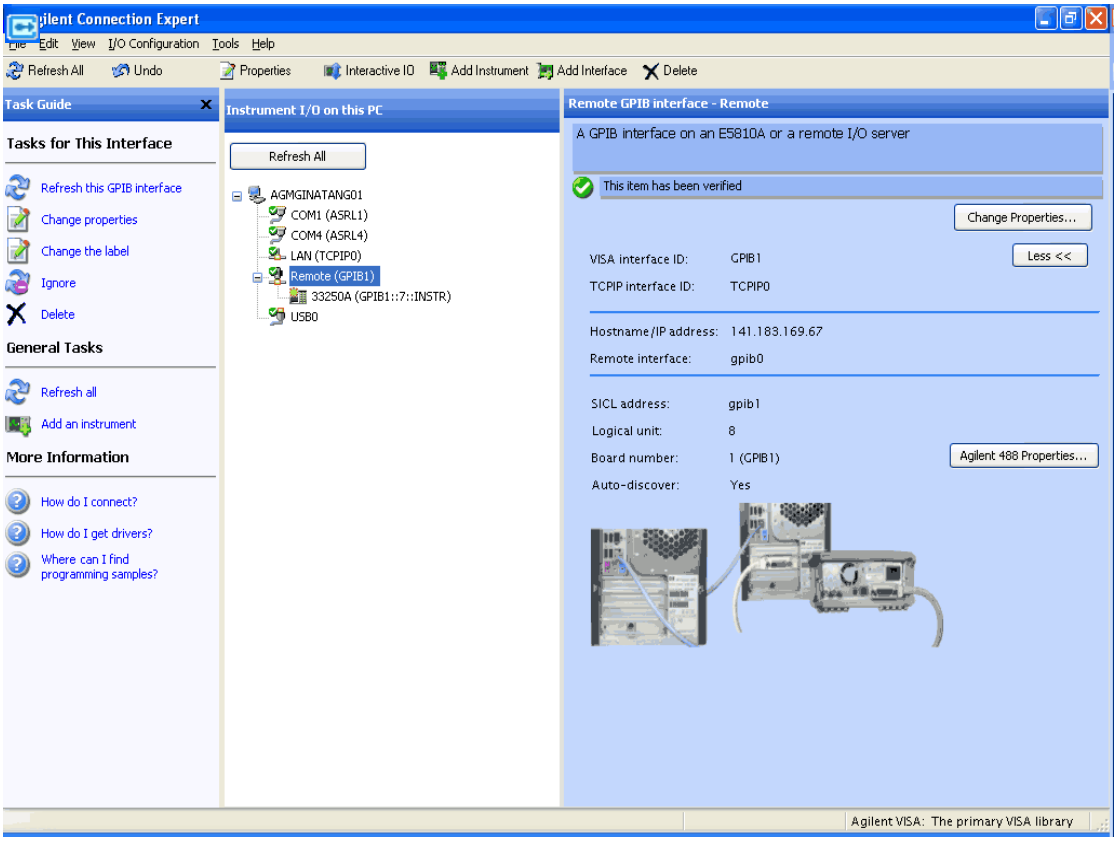
Find Now, select your E5810 from the list, and click **OK** to return to the **Remote RS-232 Serial Interface** dialog box.



6 In the **Remote RS-232 Serial Interface** dialog box, click **Test connection** to check connectivity to your E5810. If the test is successful, you will see the message **The interface was successfully opened**. Click **OK** to close the dialog box. You will see the new remote serial interface in the Connection Expert's explorer view.

7 To establish communication with a serial instrument connected to your E5810, you will need to add this instrument manually in Connection Expert. (Connection Expert cannot auto-discover serial devices.) In the main Connection Expert window, click **Add Instrument**. In the **Add Instrument** dialog box, select the remote serial interface that you just added and click **OK**. In the **RS-232 Serial Instrument** dialog box, leave **Auto-identify this instrument** checked if your instrument responds to the ***IDN?** query, and click **OK**. The instrument will appear in the Connection Expert's explorer view, and if it responds to the ***IDN?** query, its identification information will appear in the properties pane.

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Verifying Communication From Your PC

This section gives guidelines to communicate with and to program connected GPIB and RS-232 instruments from your PC via the E5810, including:

- Using Interactive IO for Communication
- Using Supported Programming Languages

NOTE

You can also communicate with (but not program) installed GPIB and/or RS-232 instruments using the E5810 Web access, whether or not you have installed and configured the Agilent IO Libraries Suite. See Chapter 3 - Using E5810 Web Access for details.

Using Interactive IO for Communication

After the E5810 has been configured and you have connected your GPIB and/or RS-232 instruments to the E5810, you can verify communication between your PC and the instruments by using the Interactive IO utility or by using VISA or SICL commands with supported programming languages. This section shows one way to use Interactive IO to verify instrument communication.

NOTE

Once your remote interface(s) and instrument(s) have been configured in Connection Expert, if you can see them in the Connection Expert explorer and see their IDN string information in the detail pane then communication has been verified. Interactive IO allows you to manually verify communication and send specific commands to your instrument.

Example: Using Interactive IO

To use Interactive IO to send a ***IDN?** (identification) query to an instrument:

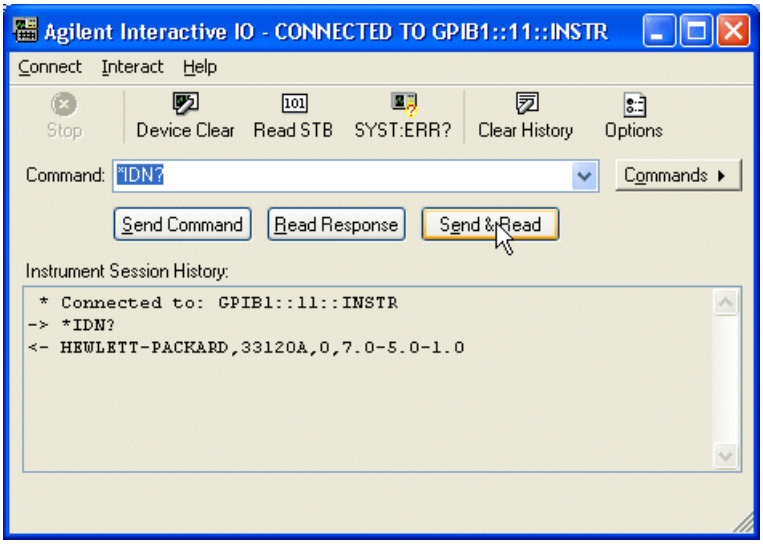
1. Select the instrument by clicking its icon in the Connection Expert explorer view.

2. Right-click the instrument and click **Send Commands To This Instrument** to display the Interactive IO window. For information on Interactive IO, including a list of common commands and their meanings, click **Help | Help Topics**.

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3 ***IDN?** is the default command. Click **Send & Read** to send the identification query to the instrument and display its reply in the Interactive IO window.

4 To send other commands, click **Commands>** to select from a list of common commands, or type a command into the **Command:** field. If you experience timeout errors for some commands, click **Options** to change the timeout value.



Programming Instruments

You can program GPIB and RS-232 instruments via the E5810 using VISA, VISA COM, or Agilent SICL to send instrument commands such as SCPI. You can program in various languages/applications, including Visual Studio .NET languages, Visual Basic, Visual C++, Agilent VEE, and National Instruments LabVIEW.

Applicable Programming Documents

For general programming guidelines, see the documentation for your programming environment. You can also find programming examples using various I/O libraries and instrument drivers in the instrument *User's Guide*. After the E5810 is successfully installed and configured, it should act as a transparent interface for programming GPIB and RS-232 instruments.

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For information on programming using Agilent VISA, see the *Agilent VISA User's Guide*. Also see the *Agilent Connectivity Guide* and *Agilent IO Libraries Suite Online Help* for further information and guidelines on programming with the Agilent IO Libraries.

Addressing Instruments using VISA and Remote IO Client

Once you have created a remote GPIB or remote serial interface in Connection Expert, you can use ordinary GPIB or serial addressing in your VISA or VISA COM programs to address instruments on these interfaces. The Remote IO Client software maps TCPIP address requests into appropriate interface type (GPIB or ASRL) addresses; thus the IP address and hostname of the E5810 do not appear in the instrument address. This makes it possible to use existing programs written for GPIB or ASRL without having to modify code.

See "Configuring a Remote GPIB Interface" on page 66 or "Configuring a Remote Serial Interface" on page 68 to configure a remote GPIB or remote serial interface. VISA programs can then use addresses such as **`GPIB0::22::INSTR`** (for GPIB) or **`ASRL1::INSTR`** (for RS-232). Use these addresses in your viOpen() call as follows:

```
viOpen (..."GPIB0::22::INSTR"...)
viOpen (..."ASRL1::INSTR"...)
```

Addressing Instruments using VISA and TCPIP Interface

Although remote GPIB and remote serial interfaces are the most convenient way to configure and program instruments on your E5810, you may choose not to use them. For example, if you are using another vendor's I/O software rather than the Agilent IO Libraries Suite, your I/O software probably does not support remote interface addressing. (At the time of this writing, only Agilent software supports remote interface types.)

If you are not using remote interfaces, you will address your instruments as TCPIP resources in VISA. These addresses include the IP address or hostname of the E5810 as well as the SICL address of the device on the E5810.

Use these addresses in your viOpen() call as follows. These examples assume that the VISA interface ID of your TCPIP interface is "TCPIP0". (You can specify this interface ID with the Connection Expert utility; "TCPIP0" is the default VISA ID for the default TCPIP interface.)

```
viOpen (..."TCPIP0::my_IP_address::gpib0,22::INSTR"...)
viOpen (..."TCPIP0::my_IP_address::COM1,488::INSTR"...)
```


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Addressing Instruments with SICL

SICL addresses include the IP address or hostname of your E5810 as well as the SICL address of the device on the E5810, and optionally the protocol to be used. Some example addresses for SICL programs follow. These examples assume that the SICL interface ID of your TCPIP interface is “lan”. (You can specify this interface ID with the Connection Expert utility; “lan” is the default SICL ID for the default TCPIP0 interface.)

```
lan[my_IP_Address]:gpib0,22
lan;vxi-11[my_IP_Address]:gpib0,22
lan[my_IP_Address]:COM1,488
lan;sicl-lan[my_IP_Address]:gpib0,11
```

NOTE

At the time of this writing, National Instruments I/O software does not support the SICL-LAN protocol, but only the VXI-11 protocol. Because RS-232 instruments are only supported by SICL-LAN and not VXI-11, you cannot use National Instruments I/O software to program an RS-232 instrument on your E5810.

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Notes:

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Using E5810 Web Access

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Using E5810 Web Access

This chapter gives guidelines on how to use E5810 Web access, including:

- Opening Your Web Browser for E5810 Web Access
- Using the Welcome Page
- Viewing and Modifying Current Configuration
- Finding and Querying Instruments
- Other Web Access Functions

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Opening Your Web Browser for E5810 Web Access

Since the E5810 is Web-enabled, you can access and communicate with the E5810 using your Web browser (Internet Explorer 4.0 or higher or Netscape 4.7 or higher).

To display the E5810 **Welcome** page, open your Web browser and type **`http://<E5810 IP Address>`** or **`http://<E5810 Hostname>`** on the address line, where **`<E5810 IP Address>`** is the IP address of the E5810 and **`<E5810 hostname>`** is the Hostname of the E5810 (if known). Then, press the **Enter** key.

For example, assume the E5810 IP Address is 169.254.58.10 (the default static IP address). Typing **`http://169.254.58.10`** and pressing **Enter** displays the E5810 **Welcome** page. A typical **Welcome** page display (with a non-default IP address shown) follows. The **Welcome** page is the home page. The banner and the Navigation Bar (Welcome Page, etc.) are a fixed frame for each page. The text within each page scrolls (as necessary) to display desired information.

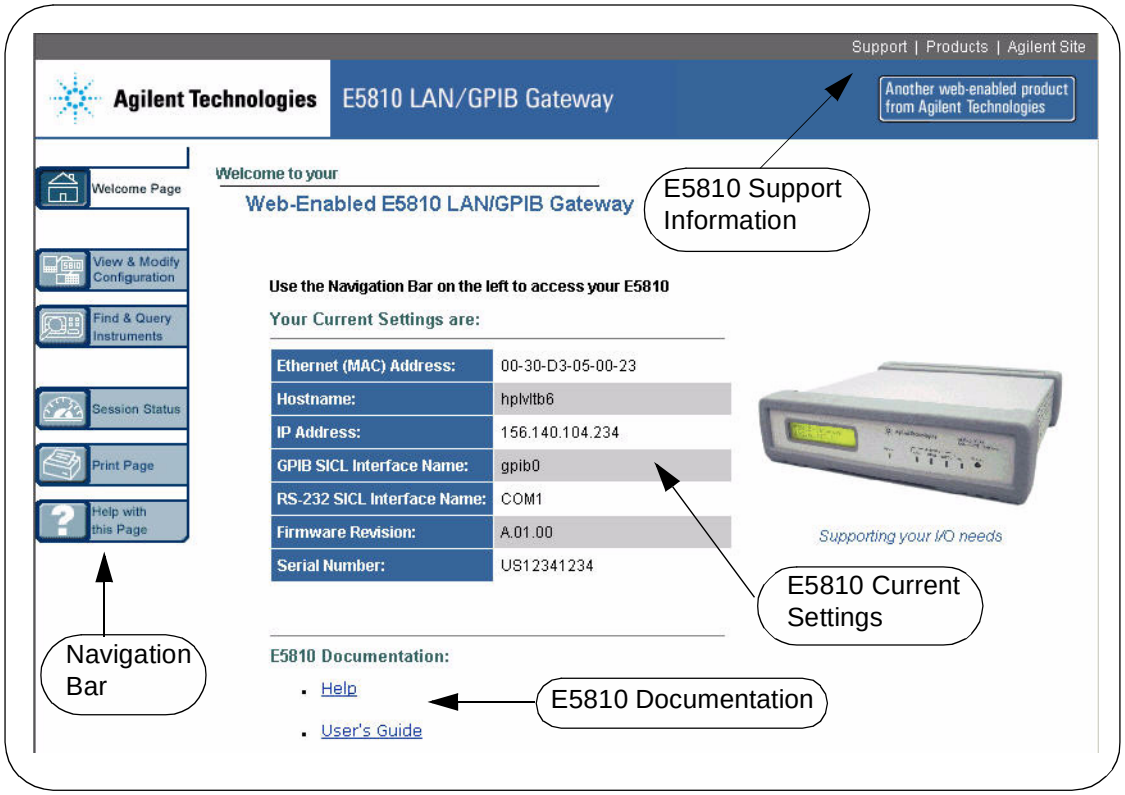


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Using the Welcome Page

This section shows the features of the E5810 **Welcome** page, including the following items. A typical **Welcome** page display follows.

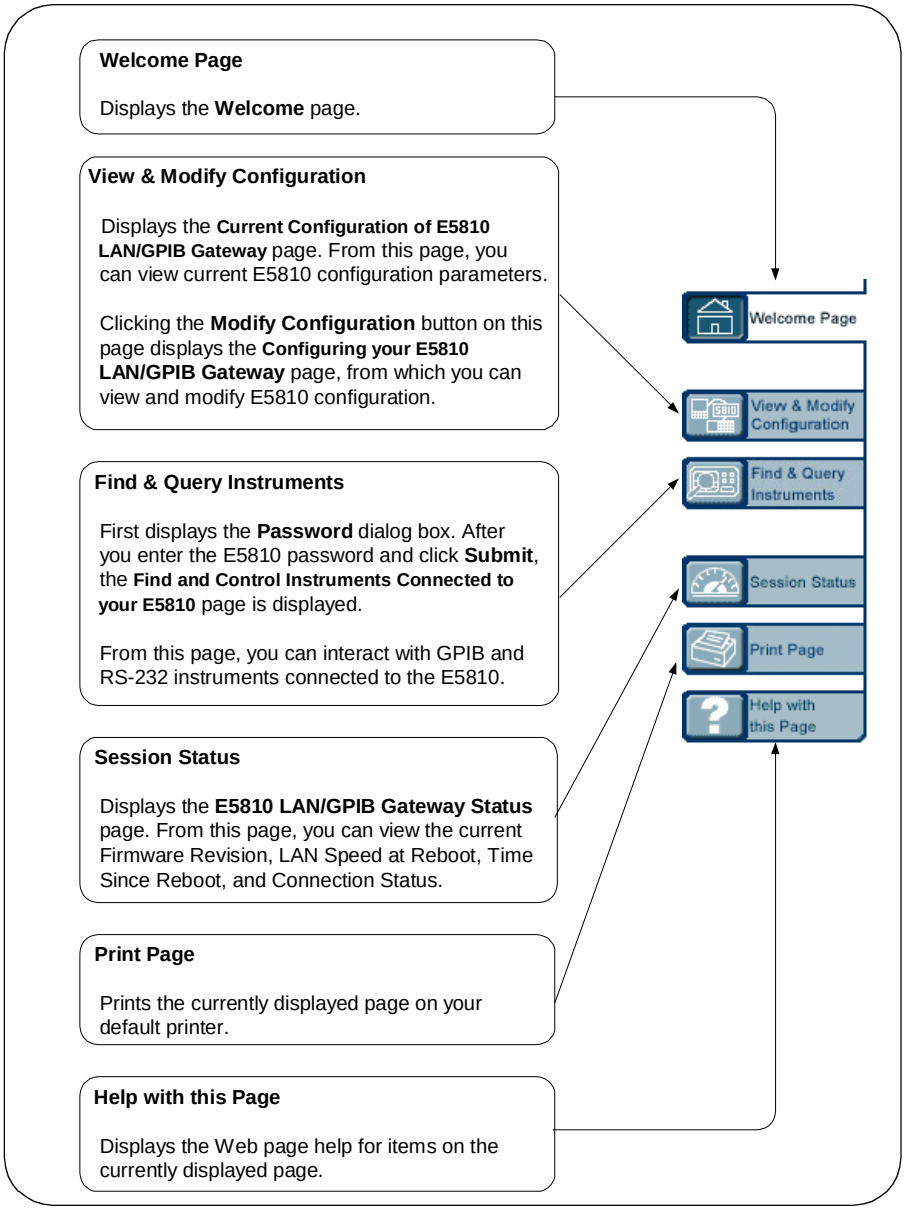
- Navigation Bar
- E5810 Current Settings
- E5810 Support Information Banner
- E5810 Documentation Links



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Navigation Bar

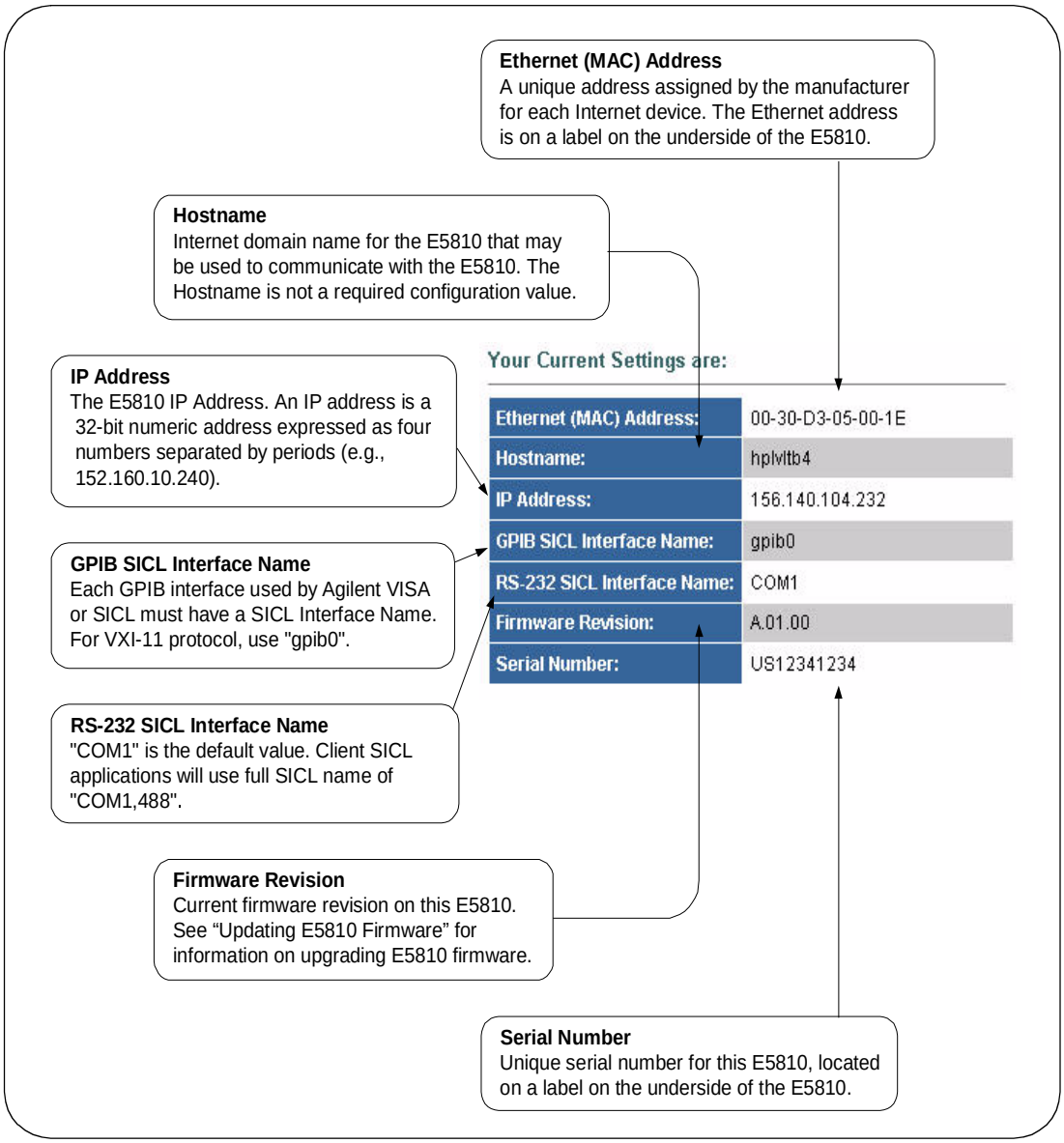
Clicking the applicable icon on the Navigation Bar on the left side of the page allows you to take the actions shown in the following figure.



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E5810 Current Settings

The **Current Settings** part of the **Welcome** page displays some of the current settings for the E5810. A typical display follows. See “E5810 Configuration Parameter Descriptions” in this chapter for detailed descriptions.



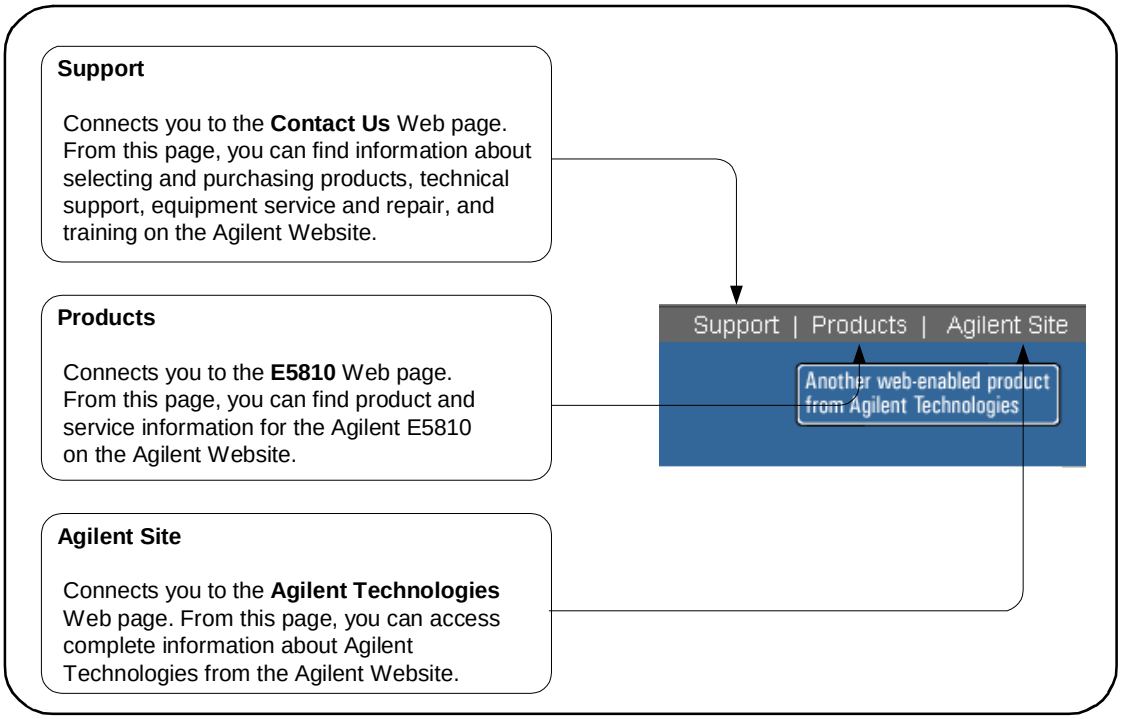
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E5810 Support Information

E5810 support information includes **Support**, **Products**, and **Agilent Site** as listed on the banner on the top of the page.

NOTE

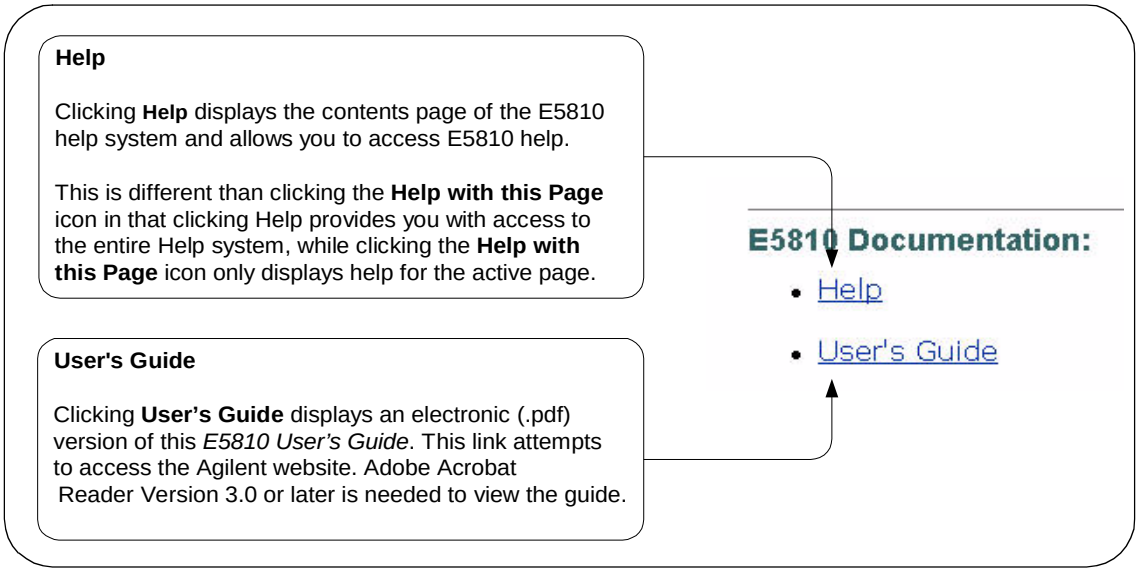
These links attempt to access the Agilent Web site. Depending on your network configuration, these links may not be accessible (network-dependent message).



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E5810 Documentation

You can click **Help** to access a complete E5810 help system or click **User's Guide** to display the *E5810 LAN/GPIB Gateway for Windows User's Guide*.



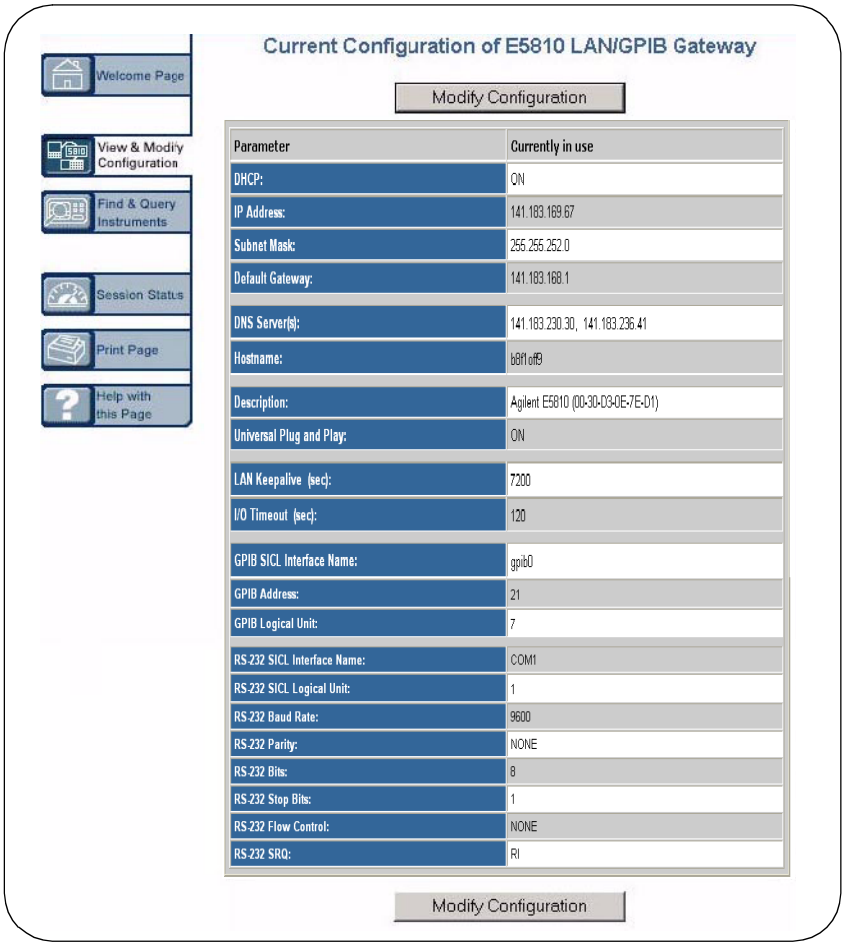
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Viewing and Modifying Configuration

This section shows how to view and modify (as required) the current configuration of the E5810 using the **Current Configuration of E5810 LAN/GPIB Gateway** and the **Configuring your E5810 LAN/GPIB Gateway** page.

Viewing E5810 Configuration

To begin modifying the E5810 current configuration, click the **View & Modify Configuration** icon to display the **Current Configuration of E5810 LAN/GPIB Gateway** page. A typical display of the page follows.



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Modifying E5810 Configuration

To modify the current E5810 configuration, from the **Current Configuration of E5810 LAN/GPIB Gateway** page, click the **Modify Configuration** button at the top or the bottom of the page to display the **Password** dialog box.



Displaying the Configuration Page

If the default password (E5810) is set as the current password, asterisks (*****) appear in the window. In this case, just click the **Submit** button to display the **Configuring your E5810 LAN/GPIB Gateway** page (see the figure on the next page). If no asterisks appear, enter the current E5810 password and then click the **Submit** button.

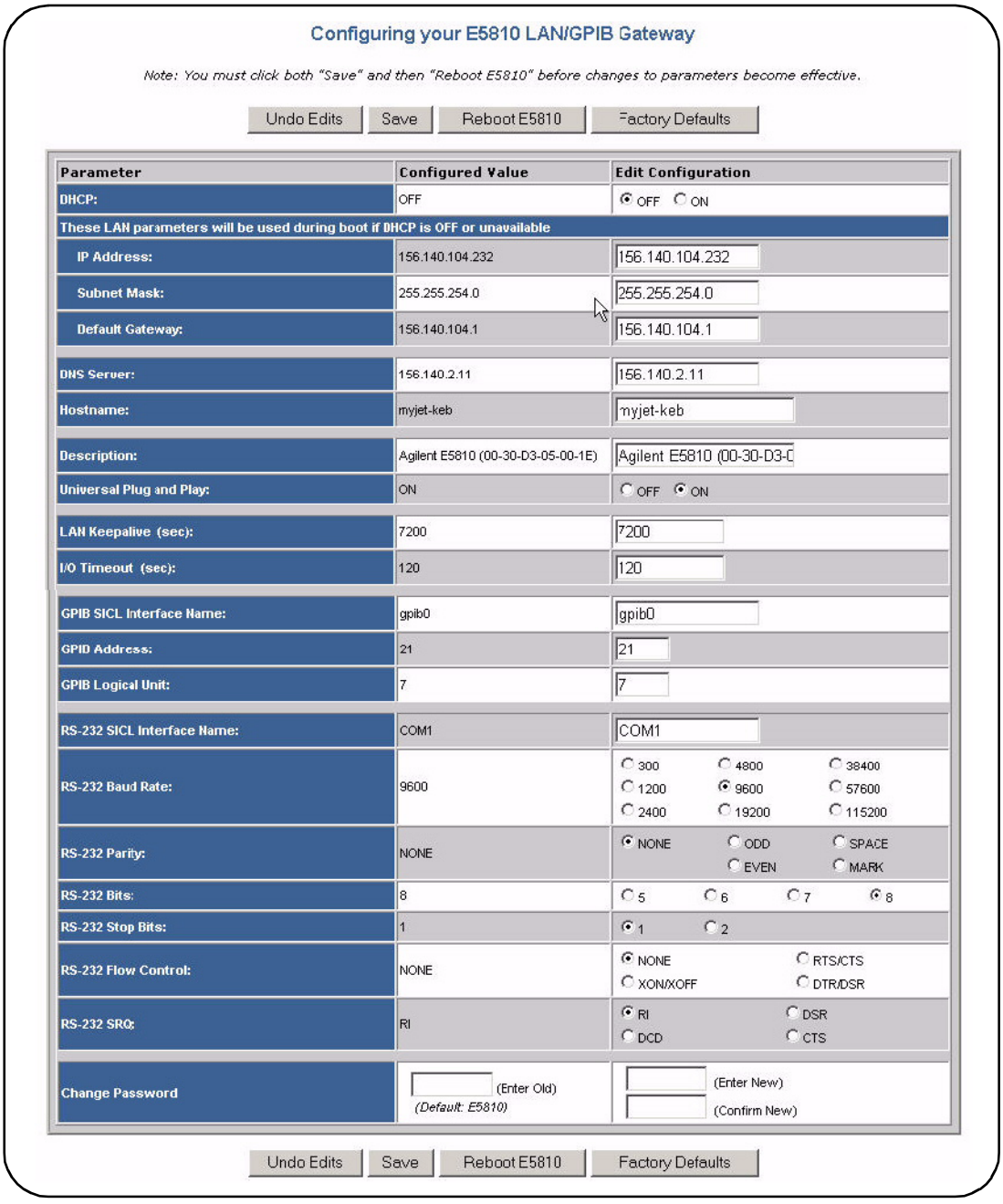
NOTE

*If you do not know the current E5810 password, you can temporarily reset the password to the default (E5810) by pressing the **Preset** button on the front panel of the E5810.*

When the **Configuring your E5810 LAN/GPIB Gateway** page is displayed, you can configure desired parameters by typing or selecting the new value in the **Edit Configuration** column and then clicking the **Save** button and then the **Reboot E5810** button at the top or the bottom of the page. See the figure on the next page for a typical display.

Although there are a few exceptions, most changes to configuration parameters are not effective until the **Save** button is clicked and then the **Reboot E5810** button is clicked.

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Configuring your E5810 LAN/GPIB Gateway

Note: You must click both "Save" and then "Reboot E5810" before changes to parameters become effective.

Undo Edits | Save | Reboot E5810 | Factory Defaults

Parameter	Configured Value	Edit Configuration
DHCP:	OFF	◉ OFF ○ ON
These LAN parameters will be used during boot if DHCP is OFF or unavailable		
IP Address:	156.140.104.232	156.140.104.232
Subnet Mask:	255.255.254.0	255.255.254.0
Default Gateway:	156.140.104.1	156.140.104.1
DNS Server:	156.140.2.11	156.140.2.11
Hostname:	myjet-keb	myjet-keb
Description:	Agilent E5810 (00-30-D3-05-00-1E)	Agilent E5810 (00-30-D3-0
Universal Plug and Play:	ON	○ OFF ◉ ON
LAN Keepalive (sec):	7200	7200
I/O Timeout (sec):	120	120
GPIB SICL Interface Name:	gpib0	gpib0
GPIB Address:	21	21
GPIB Logical Unit:	7	7
RS-232 SICL Interface Name:	COM1	COM1
RS-232 Baud Rate:	9600	○ 300 ○ 4800 ○ 38400 ○ 1200 ◉ 9600 ○ 57600 ○ 2400 ○ 19200 ○ 115200
RS-232 Parity:	NONE	◉ NONE ○ ODD ○ SPACE ○ EVEN ○ MARK
RS-232 Bits:	8	○ 5 ○ 6 ○ 7 ◉ 8
RS-232 Stop Bits:	1	◉ 1 ○ 2
RS-232 Flow Control:	NONE	◉ NONE ○ RTS/CTS ○ XON/XOFF ○ DTR/DSR
RS-232 SRQ:	RI	◉ RI ○ DSR ○ DCD ○ CTS
Change Password	(Enter Old) *(Default: E5810)*	(Enter New) (Confirm New)

Undo Edits | Save | Reboot E5810 | Factory Defaults

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E5810 Configuration Parameter Descriptions

An alphabetical listing of E5810 configuration parameter descriptions and applicable default (factory-set) values follows. The E5810 uses the default configuration values until you change any value and save/reboot. The E5810 also uses the default values when you press and hold down the **Preset** button for >10 seconds.

Parameter [Default]	Description
Default Gateway [0.0.0.0]	This value is the IP address of the default subnet gateway that allows the E5810 to communicate with systems that are not on the local subnet. This is the default subnet gateway where packets are sent which are destined for a device not on the local subnet, as determined by the subnet mask setting. Only one default subnet gateway can be configured. A value of **0.0.0.0** indicates that no subnetting is to be done.
Description ***[Factory-Set]***	The default description consists of “E5810 LAN/GPIB Gateway” followed by the Ethernet (MAC) address. The Ethernet address is printed on a label on the underside of the E5810. A typical description is: **Agilent E5810 00-30-D3-05-00-23**, where **00-30-D3-05-00-23** is the Ethernet address. The description is the “UPnP Friendly Name” of the E5810 that will automatically be displayed on UPnP (Universal Plug and Play) enabled LAN hosts. When the E5810 is connected to the LAN, it broadcasts its presence to the network if UPnP is enabled. UPnP clients will then see this E5810 in My Network Places, listed by this Description. A Friendly Name can be up to 39 characters, including spaces.
Domain Name Server (DNS) [0.0.0.0]	A DNS Server is an Internet service that translates domain names into IP addresses and vice-versa. Every time you use a domain name, a DNS Server must translate the name into the corresponding IP address. For example, the domain name **www.example.com** might translate to **198.105.232.4**. The DNS system has its own network. If one DNS Server does not know how to translate a particular domain name, it asks another DNS Server, etc. until the correct IP address is returned, if available.

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Parameter [Default]	Description
Domain Name Server (DNS) (cont) [0.0.0.0]	A DNS Server is an Internet service that translates domain names into IP addresses. Every time you use a domain name, a DNS server must translate the name into the corresponding IP address. For example, the domain name **www.example.com** might translate to **198.105.232.4**. The DNS system is distributed. If one DNS server does not know how to translate a particular domain name, it asks another DNS server, etc. until the correct IP address is returned. If DHCP is used, a DHCP Server may provide a DNS Server IP address to the E5810 (this is transparent to the user). If the user configures a DNS Server, the E5810 will try to use that Server first. This parameter shows the IP address of the domain name Server. More than one address may be listed on the **Current Configuration of the E5810 LAN/GPIB Gateway** page. Up to two of these values may have been returned by the DHCP Server during startup. Only one static value can be input on the **Configuring your E5810 LAN/GPIB Gateway** page. The DNS Server provides a Hostname, given an IP Address, for a LAN device based on entries in its DNS lookup table. If DHCP is OFF and you do not specify a DNS Server or if Dynamic DNS is not available on your enterprise LAN and your IP Address is not in the DNS lookup table on the DNS Server, your Hostname will be unknown and you must address the E5810 only by its IP Address. The Hostname is not a required entry.
Dynamic Host Configuration Protocol (DHCP) [ON]	DHCP is a protocol for assigning dynamic IP addresses to devices on a network. DHCP supports a mix of static and dynamic IP addresses. The two options for DHCP are ON (default) or OFF. **DHCP ON (Default):** If DHCP is ON (the factory default setting), the E5810 will try to obtain an IP address from a DHCP Server. If this fails, the E5810 will use its static IP address. If DHCP is ON and a DHCP Server is found, the manually configured IP Address, Subnet Mask, and Default Gateway parameters are not used by the E5810 during startup and thus are not required settings.

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Parameter [Default]	Description
Dynamic Host Configuration Protocol (DHCP) [ON] (cont'd)	**DHCP OFF:** If DHCP is OFF or unavailable, during startup the E5810 will use the static IP address that may be input in the **Configuring your E5810 LAN/GPIB Gateway** page. In this case, the values for the **IP Address**, **Subnet Mask**, and **Default Gateway** shown in the **Configured Value** column of the page will be used during startup.
E5810 Serial Number [*Factory-Set*]	The individual Serial Number assigned at the factory for each E5810. The Serial Number is printed on a label on the underside of the E5810 and has the form US12345678.
Ethernet (MAC) Address [*Factory-Set*]	This is the Media Access Control Address, also known as the link-level address, the Ethernet (station) Address, the LANIC ID and Hardware Address. This is a unique 48-bit address assigned by the manufacturer for each Ethernet device. The address is usually 12 hexadecimal characters, with colon or dash separators between every two characters, such as "00:30:D3:05:00:23" or "00-30-D3-05-00-23". The Ethernet address is printed on a label on the underside of the E5810.
GPIB Address [21]	This value configures the GPIB bus address of the E5810. This address is used when transfers are made on the GPIB bus. A SICL client application can change this value by using the SICL function **IGPIBBUSADDR**. The GPIB address value can be any number **0** through **30**.
GPIB Logical Unit [7]	This value is the interface logical unit (LU) number of the GPIB interface in the E5810. It may be used in an Agilent SICL client application's **iopen** statement to uniquely identify the GPIB interface in the E5810. The GPIB logical unit value can be any number **1** through **255**.
GPIB SICL Interface Name [gpib0]	This value is the symbolic name of the GPIB interface in the E5810. It is used in a SICL client application's **iopen** operation to symbolically reference the GPIB interface in the E5810. The maximum length of the GPIB interface name is 15 characters. If VXI-11 (TCP/IP Instrument Protocol) is used, the name must be **gpib<n>**. The names "**hpib**" or "**hpib7**" may be used to more easily support legacy programs, if only SICL/LAN protocols will be used.

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Parameter [Default]	Description
Hostname [*None*]	This value configures the internet domain name for the E5810. Hostnames are useful when IP addresses are being assigned by a DHCP Server, since the Hostname will not change despite DHCP Server changes and device IP address changes. If a Hostname is entered, the E5810 will try to register this name when it boots. The E5810 can only register the Hostname if the network has Dynamic DNS. If the network does not have Dynamic DNS, this value is not used. Since you can always use the IP Address or the name (possibly supplied by another name Server), the Hostname is not a required configuration value. You may enter up to 35 characters for the Hostname. The Hostname must start with a letter and consists of upper and lower case letters and digits and dashes. There is no default Hostname. If a Hostname is displayed on the **Welcome** page, it is a valid Hostname, since one was found on the network through DNS.
I/O Timeout [120 sec]	This value sets the Server I/O timeout in seconds. It configures the E5810 to use an I/O timeout of the specified amount of seconds if the client requests a timeout of infinity. If **0** is specified for this value and the client requests an infinite timeout, the E5810 will use a timeout of infinity as requested. **Setting the I/O timeout to 0 is NOT recommended, as this can result in the E5810 waiting indefinitely for an I/O operation and effectively "hang" the E5810.** This timeout value may be used to ensure that the E5810 does not wait indefinitely for an I/O operation. It also allows the E5810 to detect certain network events (such as when a client connection is dropped) that may otherwise go undetected. If the E5810 detects such a condition, it will release any resources, such as locks, associated with the client. This value also allows the E5810 to detect certain network events, such as when a client connection is dropped. If the E5810 detects such a condition, it will release any resources, such as locks, associated with the client. The factory default setting is 120 sec.

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Parameter [Default]	Description
IP Address [169.254.58.10]	This value is the Internet Protocol (IP) address of the E5810. The IP address is a required value and is used for all IP and TCP/IP communications with the E5810. The IP address is represented in dotted decimal notation (for example, **154.140.222.201**). This number is assigned by the System Administrator. The E5810 has a default static IP address of **169.254.58.10**. LAN traffic to the E5810 will be routed by the IP Address or by using a Hostname that may be provided by a DNS name Server which is mapped to this IP Address. The current E5810 IP Address may have been established in one of two ways: ■ The IP address was provided by a DHCP Server during startup (dynamic IP address). ■ The IP address shown on the **Current Configuration of the E5810 LAN/GPIB Gateway** page was used. This was set at the factory to **169.254.58.10.** If DHCP will not be used, the IP address should be set for your network.
LAN Keepalive [7200 sec]	This value sets the LAN connect timeout in seconds. The E5810 may use the TCP keepalive timer of the TCP/IP protocol stack to determine if a client is still reachable. By specifying this configuration value, the E5810 turns on the keepalive timer when connecting to the client. After the specified time, if there has been no activity on the connection, the E5810 sends keepalive probes to the client to determine if it is still alive. After a specified amount of time, the connection will be marked as down (“dropped”), and the E5810 will release any resources which were allocated to the associated client. A value of **0** means no timeout is set. Thus, the E5810 will wait forever and no keepalive probes are sent. If this value is set, it is recommended that the largest value be used which still meets the application’s need for unreachable client detection. Smaller LAN Keepalive values will generate more keepalive probes (network traffic), using more of the available network bandwidth. Allowable values are 0 and greater than or equal to 600 seconds (10 min). The factory default setting is 7200 sec (2 hrs).

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Parameter [Default]	Description
Password [E5810]	E5810 configuration and instrument control pages are password-protected against changes. To change from the default password (or any password) to a new one, enter the current (old) password in the **Configured Value** column and enter the new password in both boxes in the **Edit Configuration** column of the **Configuring your E5810 LAN/GPIB Gateway** page. The password is limited to 8 characters. The default password is “E5810”. You do not need to use a password for SICL or VISA programs with the E5810 interface. This password will not prevent unauthorized personnel from using your E5810, but it will prevent them from easily modifying its setup or controlling instruments attached to it. If additional security is desired, an isolated subnet is recommended.
RS-232 Baud Rate [9600]	Number of bits per second that are transmitted. Available baud rates for the E5810 are 300, 1200, 2400, 4800, 9600, 19200, 38400, 57600, and 115200. The RS-232 baud rate is the speed of data transmission and reception on the RS-232 interface. The baud rate value is dependent on the peripheral device you connect to the RS-232 port. Check the documentation for your peripheral device to set this value.
RS-232 Bits [8]	The number of bits that comprise a byte of data. Available number of bits options are 5, 6, 7, or 8. This is the number of data bits in a character frame in RS-232 serial data transmission. The value is dependent on the peripheral device you connect to the RS-232 port. Check the documentation for your peripheral device to set this value. Available number of bits options for the E5810 are 5, 6, 7, or 8.
RS-232 Flow Control [NONE]	Flow control is the protocol used to pace data transmission over the RS-232 serial connection. The flow control value is dependent on the peripheral device you connect to the RS-232 port. Check the documentation for your peripheral device to set this value. Available flow control mechanisms for the E5810 are NONE, XON/XOFF, RTS/CTS, and DTR/DSR.

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Parameter [Default]	Description
RS-232 Parity [NONE]	Parity is used by the RS-232 hardware to verify data transmission. The Parity value is dependent on the peripheral device you connect to the RS-232 port. Check the documentation for your peripheral device to set this value. Available parity check options for the E5810 are NONE, ODD, EVEN, SPACE and MARK.
RS-232 SICL Interface Name [COM1]	This parameter is the symbolic name of the RS-232 Interface in the E5810. It is used in an Agilent SICL **`iopen`** operation to symbolically reference the RS-232 interface in the E5810. It is also used in the Remote RS-232 Serial Interface dialog (as **Interface name on remote Host**) when specifying an RS-232 device for Agilent VISA. The RS-232 interface used by Agilent VISA or SICL must have a SICL Interface Name. The maximum length of the RS-232 SICL Interface Name is 15 characters.
RS-232 SRQ [RI]	Method used to request service from the RS-232 device. The SRQ Line is the modem status line on the RS-232 interface that is monitored for Service ReQuests (SRQs). Available SRQ options for the E5810 are RI, DCD, DSR, and CTS.
RS-232 Stop Bits [1]	A bit that indicates that a byte has just been transmitted. Every byte of data is preceded by a start bit and followed by a stop bit. Available stop bit options are 1 or 2. Stop Bits is the number of bits used to indicate the end of a character frame in RS-232 serial data transmission. The Stop Bits value is dependent on the peripheral device you connect to the RS-232 port. Check the documentation for your peripheral device to set this value. Available stop bit options for the E5810 are 1 or 2.
Subnet Mask [255.255.0.0]	This value is used to enable the E5810 to determine if a client IP address is on the same local subnet as the E5810. When a client IP address is on a different subnet, all packets must be sent to a subnet gateway. See the *Glossary* for an example of a subnet.

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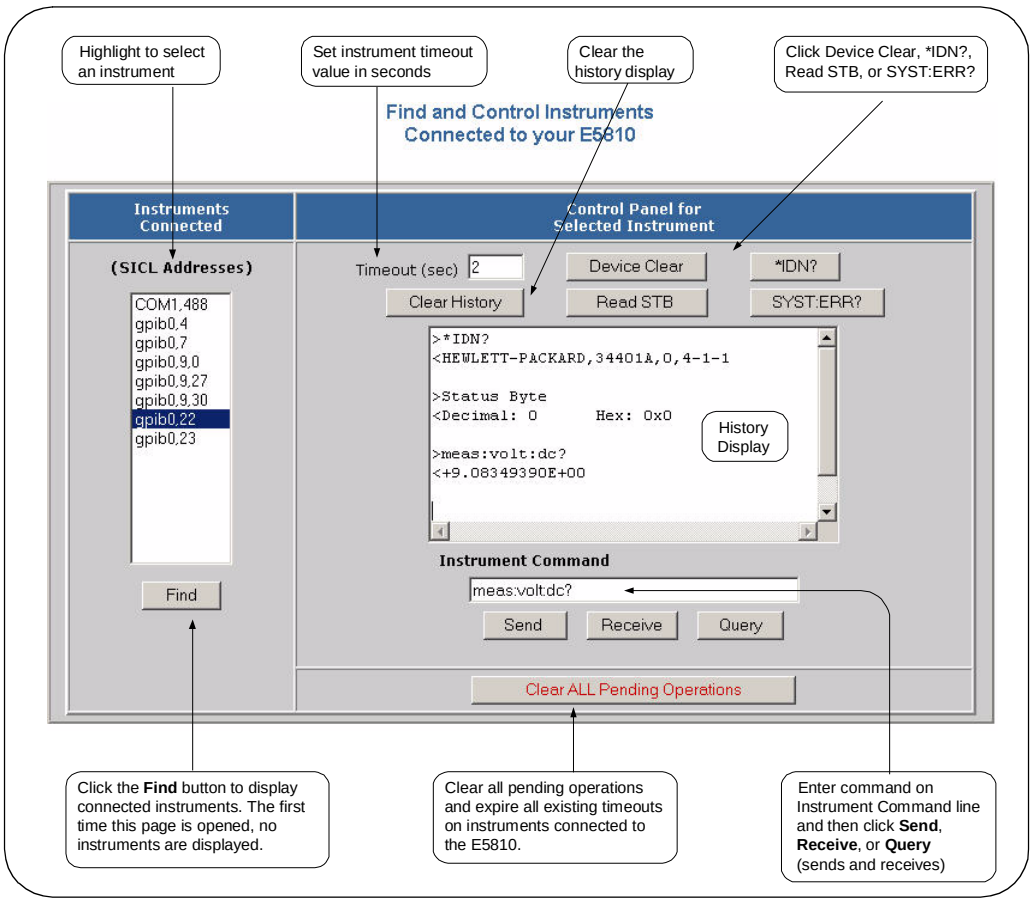
Parameter [Default]	Description
Universal Plug & Play (UPnP) [ON]	If Universal Plug & Play (UPnP) is enabled, a multicast message is generated and sent about once an hour to the subnet. Enterprise (corporate) networks will want to decide whether this additional traffic is acceptable. By default, UPnP is NOT enabled on Windows XP. Check your Operating System instructions to enable UPnP. Universal Plug and Play (UPnP) has two options: ON or OFF. ■ **Option ON:** The E5810 is configured as a UPnP device and provides information to the network about itself via an XML description when mounted to the network. ■ **Option OFF:** The E5810 is not UPnP capable and will not announce its presence as a UPnP device when mounted to the network.

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Finding and Querying Instruments

This section shows how to find and query GPIB and/or RS-232 instruments connected to your E5810 by using the **Find and Control Instruments Connected to your E5810** page. This page is password-protected since you can inadvertently interfere with running VISA/SICL applications if you query an instrument at an inappropriate time.

This page allows you to quickly communicate with your GPIB and RS-232 instruments and can help you determine if the instrument side of the E5810 is working properly. You can also use this page to set up and take measurements remotely by sending instrument commands.



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Finding Instruments

The **Instruments Connected** column of the page shows the GPIB and/or RS-232 instruments connected to your E5810. This column shows the SICL address for each instrument connected. The SICL address is required for programmatically interacting with instruments via the E5810.

Using the Find Button

To refresh the display or if instruments have been added/deleted, click the **Find** button to display the current configuration. The Find command is automatically run when the **Find and Control Instruments Connected to your E5810** page is opened and the correct password is provided. However, when this page first opens, no instruments are displayed. Click the **Find** button to display a current list of instruments that are powered up and connected to the E5810.

After clicking the **Find** button, all GPIB equipment should appear in the box below the button. In addition, the top item ("**COM1,488**") will always be listed whether or not you have a RS-232 instrument connected. All other devices shown in the **Instruments Connected** list box are the SICL addresses of your GPIB instruments. If no GPIB instruments are found, a message to this effect is displayed in the output text (History) area.

Checking for Connected Instruments

After using the **Find** button, if you do not see one or more of your connected GPIB instruments in the list, try these steps:

1. **Check Cables.** Make sure all GPIB instruments are connected via GPIB cables to the E5810 GPIB port and the RS-232 instrument is connected via an RS-232 cable to the E5810 RS-232 port.

2. **Turn Instrument Power ON.** Make sure power is turned on for all instruments. Then, click the **Find** button at the bottom of the **Instruments Connected** column.

3. **Check Hardware.** A broken GPIB instrument may short out the GPIB cable and cause all instruments to show a failure. If you are experiencing problems, try connecting only one GPIB instrument to the E5810 at a time. Possible causes of the problem may be broken cable, loose connectors, two or more instruments at the same GPIB address, an instrument may be broken, or the E5810 may be broken.

4. **Reboot the E5810.** After checking hardware connections, reboot the E5810 to do a self-test of E5810 hardware.

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Querying Instruments

After you have successfully found all connected instruments, you can use the **Control Panel for Selected Instrument** column of the page to interact with the instruments. There are two ways to interact with connected instruments: use the buttons at the top of the column or use the **Instrument Command** line at the bottom of the column.

NOTE

To program instruments using VISA, VISA COM, SICL, or Agilent VEE, you must install and configure the Agilent IO Libraries Suite on your PC (see Chapter 2 - Installing the E5810).

For VISA programming information, see the Agilent VISA User's Guide. If the Agilent IO Libraries Suite is installed, you can access an electronic version of the manual by clicking the blue IO icon on the taskbar and then clicking ***Documentation | VISA Users Guide****. The same* ***Documentation*** *menu also includes VISA COM and SICL information.*

Querying Instruments Using the Buttons

After highlighting the instrument to be addressed in the **Instruments Connected** column, you can click the applicable button to perform these actions for the device.

- Return the ID String for IEEE-488.2 compliant devices (***IDN?**)
- Clear the device (**Device Clear**)
- Read the Status Byte for IEEE-488.2 compliant devices (**Read STB**)
- Return a System Error for SCPI compliant devices (**SYST:ERR?**)

NOTE

These buttons will work only if the selected instrument supports IEEE 488.2 and/or SCPI command sets.

In addition, you can clear the display on the screen by clicking the **Clear History** button, set the timeout value (in seconds) by typing in the desired value in the **Timeout (sec)** dialog box, or clear all pending operations on instruments connected to the E5810 by clicking the **Clear ALL Pending Operations** button. The following table describes the actions of the six buttons and the **Timeout (sec)** dialog box.

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Button	Description
***IDN?**	**ID String.** Returns the ID string for the selected IEEE-488.2 compliant instrument.
Device Clear	**Device Clear.** Sometimes communication with an instrument may be impeded. This can occur for a wide variety of reasons. Sending a **Device Clear** to the instrument usually solves this problem and restores proper communication with the instrument. If you encounter an error while doing a Formatted I/O operation, you can send a **Device Clear** to ensure proper instrument communication is restored.
Read STB	**Read Status Byte.** Returns the decimal and hexadecimal value of the IEEE-488.2 compliant instrument's Status Byte. Many instruments that support Formatted I/O also have the ability to read the Status Byte. This returns information on the status of the instrument, such as error status and/or busy status. See your instrument manuals for status byte codes.
SYST:ERR?	**System Error.** Returns a SCPI system error for a SCPI compliant instrument. A “0 No errors” return is sent to show no system errors.
Clear History	**Clear the Display**. Clears the (History) display of all previous queries.
Clear ALL Pending Operations	**Clear All Pending Operations.** Clears all pending operations on instruments connected to the E5810. This operation expires all existing timeouts on all devices connected to the E5810. Taking this action may affect other users currently using the E5810. A password dialog box will appear that asks you if you really want to do this action.
Timeout	**Change instrument Timeout.** A timeout value is used to limit the amount of time for an I/O operation to complete. The I/O Timeout value, as set on the **Configuring your E5810 LAN/GPIB Gateway** page, may not be long enough for some instrument activities to complete. Setting a longer timeout here tells the E5810 to wait a longer time for the instrument to finish. As an alternative, doing a separate **Send** and **Receive** may also work. Also, if the configuration value is too long, you may force a shorter timeout here for faster troubleshooting of instrument tests, etc. To set a different timeout, enter a Timeout value in the **Timeout** text box. This value is used for all commands issued to an instrument from this page. The valid timeout range is 1 to 60 seconds.

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Querying Instruments Using the Instrument Command Line

For supported instruments, you can also query an instrument by first highlighting the instrument in the Instruments Connected column, typing in a SCPI command (such as **`meas:volt:dc?`**) on the **Instrument Command** line, and then clicking **Send** and **Receive**, or **Query**.

To send a command to the instrument without waiting for a response, click the **Send** button. Sending a string to the instrument does not return a result. To receive a string from the instrument, click the **Receive** button. To both send the string and receive a response from the instrument, click the **Query** button.

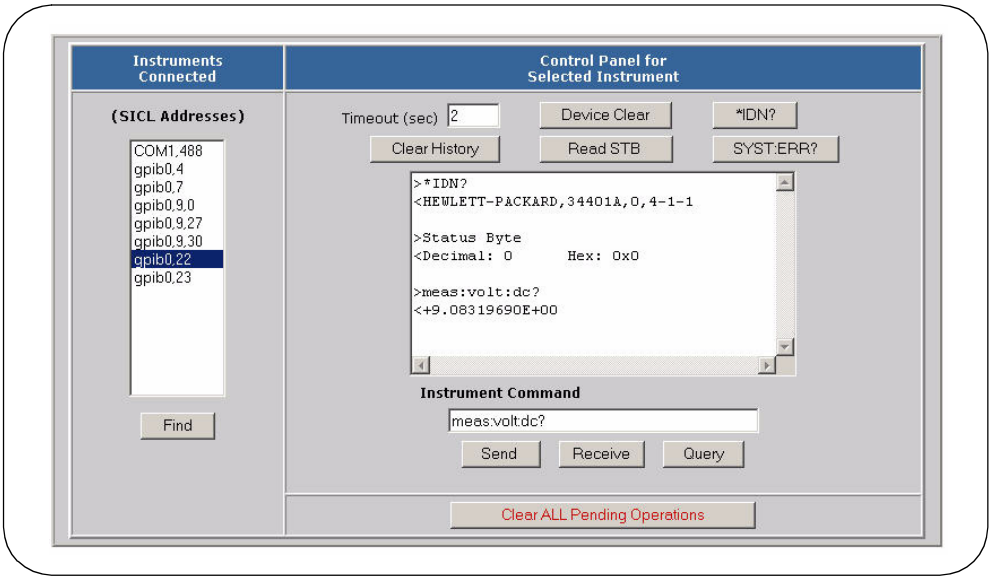
NOTE

*The History display buffers up to 200 lines of information. At 200 lines, the last lines are overwritten with new information. At this point, you may want to press the **Clear History** button.*

Example: Using the Instruments Page

This figure shows an example history display after taking these steps:

1. Selecting the instrument at SICL address gpib0,22
2. Clicking the ***IDN?** and **Read STB** buttons
3. Typing **`meas:volt:dc?`** on the **Instrument Command** Line
4. Clicking the **Query** button



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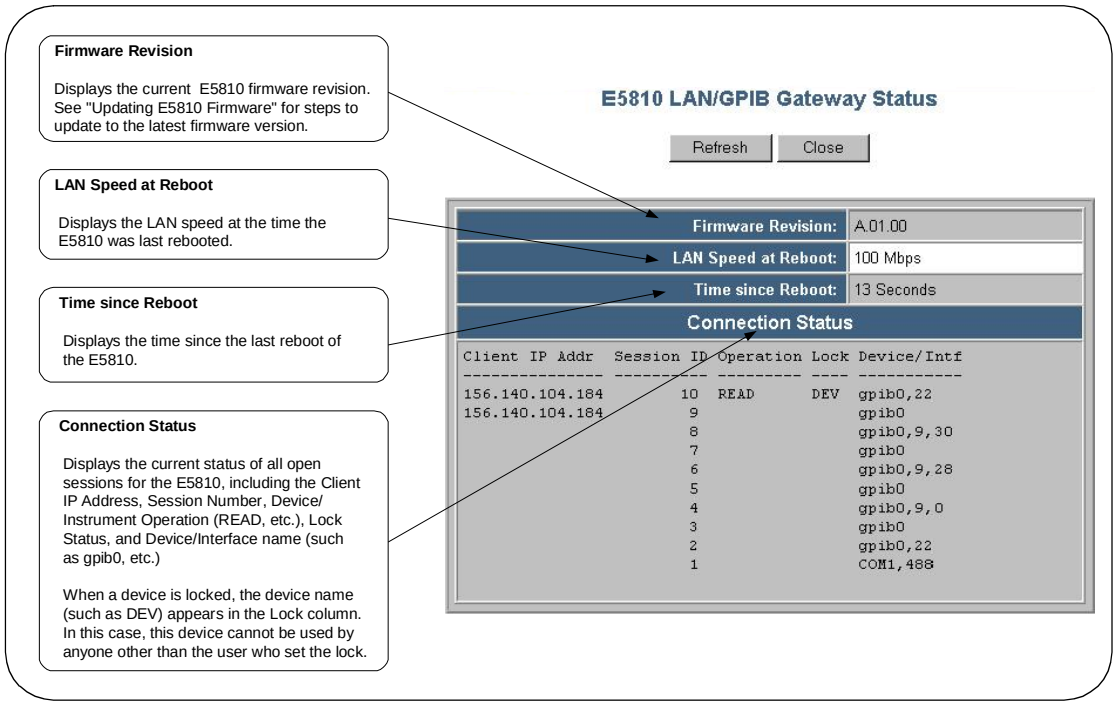
Other Web Access Functions

This section describes four other E5810 Web Access functions:

- Determining Session Status
- Using Web Help
- Updating E5810 Firmware

Determining Session Status

To open the **E5810 LAN/GPIB Gateway Status** page, click the **Session Status** icon on the Navigation Bar. A typical display follows. Click the **Refresh** button to update the display to the current configuration.

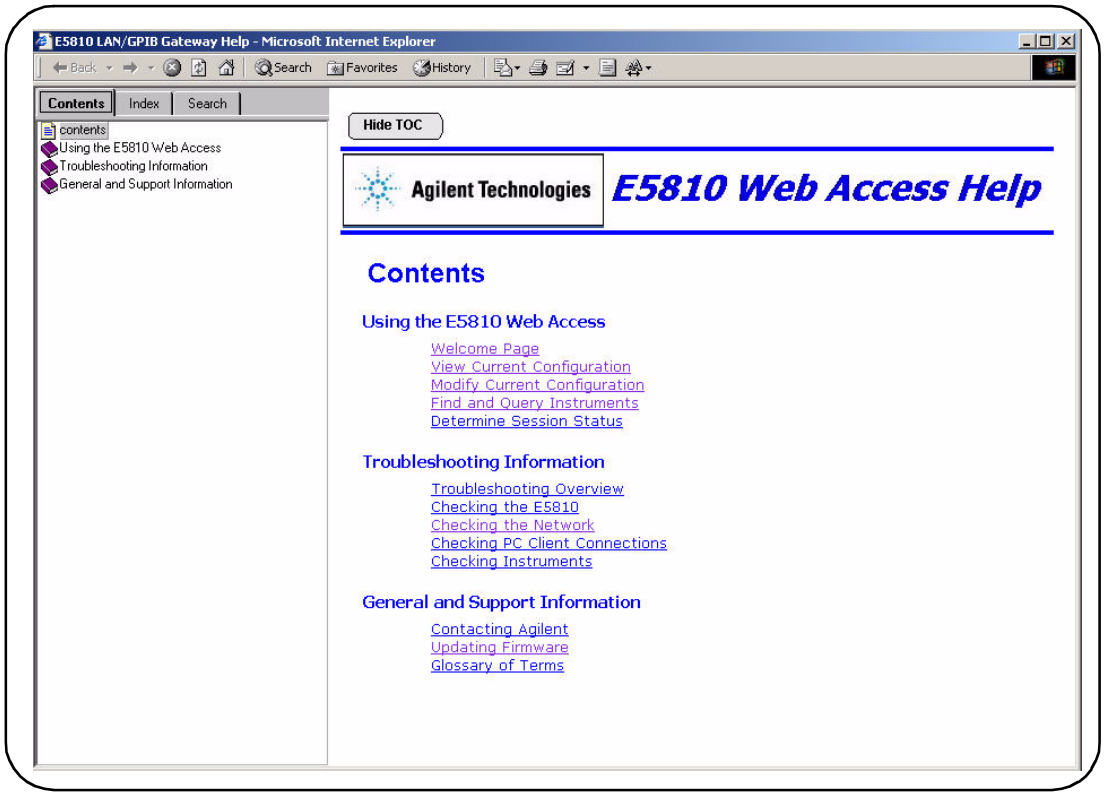


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Using Web Help

Clicking **Help** (under **E5810 Documentation**) displays the Contents page of the E5810 Web Access Help system from which you have full access to the entire help system. The **Contents** page display follows.

Note that your specific Windows toolbar appears at the top of the display for ease of navigation, printing, etc. Also, you can access a topic either from the Table of Contents on the left side or from the **Contents** listing on the page. Click the **Hide TOC** button to hide the Table of Contents. If the Table of Contents is not shown, click the **Show TOC** button to display the Table of Contents.



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Updating E5810 Firmware

This section gives guidelines to update your E5810 firmware to the latest version.

> **NOTE**
>
> *Do not update your E5810 firmware unless you have a specific need to do so, such as defect repair or instrument enhancements. If the firmware update fails, the E5810 reverts to its original firmware version.*

The E5810 uses standard FTP (File Transfer Protocol) to perform updates. The E5810 acts as an FTP client and searches for an FTP Server that contains the E5810 firmware image. Agilent maintains a publicly accessible FTP Server that contains the latest E5810 firmware at:

`ftp.agilent.com`, **`login: anonymous, password:`**
`<your e-mail address>`

Procedure to Update E5810 Firmware

The latest E5810 firmware is at **`/pub/e5810/e5810_latest_firmware.hex`** and is called **`"e5810_latest_firmware.hex"`**. Prior versions are also available in this ftp directory.

If you cannot reach the Agilent FTP Server from your E5810, you can use a any standard FTP Server that is available, provided you have an image of the firmware. The requirements are an FTP Server, an image of the E5810 firmware, and a LAN connection between the E5810 and the FTP Server.

The procedure to update E5810 firmware depends on whether or not the Agilent FTP site is accessible from the E5810. This, in turn, depends on how your network is configured. The E5810 FTP client used to upload new firmware is a standard FTP client and currently does not support proxies. This means that anyone behind a firewall will most likely **not** be able to directly access the Agilent FTP site.

A description of the two procedures to update E5810 firmware follows.

- If the Agilent FTP site is accessible from the E5810, see “Agilent FTP Site is Accessible From E5810”
- If the Agilent FTP site is not accessible from the E5810, see “Agilent FTP Site is not Accessible From E5810”

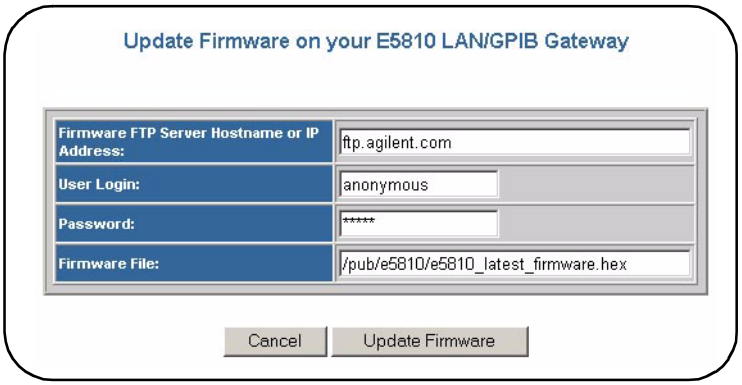
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Agilent FTP site is Accessible From E5810

1 **Verify the E5810 is Idle.** Updating the E5810 is a significant activity. Be sure no other user or program is using the E5810 before you attempt to update the firmware. You can check the number of open sessions by displaying the **E5810 LAN/GPIB Gateway Status** page. To open this page, click the **Session Status** icon on the Navigation Bar. We also recommend you reboot the E5810 before beginning the firmware update process.

2 **Open the Updating Firmware Page**

- **a** Open E5810 Web Help and click Updating Firmware in the Table of Contents to display the **Updating Your Firmware** topic page.
- **b** Click the updating firmware hyperlink on this page to display a prompt for a password and then display the **Updating Firmware on your E5810 LAN/GPIB Gateway** dialog box. A typical dialog box display follows.



NOTE

*You can also directly access the **Updating Firmware on your E5810 LAN/GPIB Gateway** page at http://<IP_Address>/html/passwordupdate.html, where <IP_Address> is the IP address displayed on the front display panel on the E5810.*

3 **Check that all Default Parameters are Correct:**

- Firmware FTP Server Hostname or IP Address: ftp.agilent.com
- User Login: anonymous
- Password: ***** (displayed as asterisks)
- Firmware Filename: /pub/e5810/e5810_latest_firmware.hex

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4 Perform Firmware Update

a Click the **Update Firmware** button to display a password dialog box. Click **OK** to confirm the update and the E5810 will attempt to download the firmware from the FTP site.

b After you confirm the update, the E5810 front panel should display the message "**Updating firmware...**"

c The LAN LEDs should light, indicating LAN activity is taking place. The firmware for the E5810 is approximately 5.1 MB and downloading time may vary, depending on network connections.

d After the firmware image has been downloaded into the E5810, the E5810 will automatically reboot and should display a "**Rebooting E5810..**." message. The E5810 will then begin a normal startup sequence.

5 **Verify Firmware Revision.** When the E5810 has successfully rebooted, to verify that the firmware has been downloaded successfully, display the E5810 **Welcome** page and verify that the **Firmware Revision Number** shows the correct version of the firmware.

Agilent FTP site is not accessible From the E5810

1 **Acquire an Image of the E5810 Firmware.** If the Agilent FTP site is not accessible from the E5810, you may still be able to get the image from your Web browser. You may need to set up an FTP proxy on your Web browser.

a On your Web browser, type ftp://ftp.agilent.com/pub/e5810/ to connect you to Agilent's FTP Server. This page displays files associated with the E5810.

b Select the file 'e5810_latest_firmware.hex' and save it. For example, in Internet Explorer right-click the file and select 'Copy to Folder'. Other web browsers may have a different sequence.

NOTE

As an alternative, you can directly FTP to the Agilent FTP Server at ftp.agilent.com using anonymous ftp, supplying the user login, and downloading the file /pub/e5810/e5810_latest_firmware.hex.

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2 **Install FTP Server, if Needed.** You will need to access a standard FTP Server program. See “Troubleshooting Guidelines” in this section for tips to access a standard FTP Server.

3 **Set up User Account Information for FTP Server.** Refer to the FTP Server documentation on creating a user account and a password. The user account is used for the login name.

4 **Copy E5810 Firmware Image to FTP Directory.** Once you have a FTP login, copy the E5810 firmware image to the directory on the FTP Server's file system that is associated with the user account as set up in Step 3. Then, manually start the FTP Server, if needed.

5 **Verify the E5810 is Idle.** Updating the E5810 is a significant activity. Be sure no other user or program is using the E5810 before you attempt to update the firmware. You can check the number of open sessions by displaying the **E5810 LAN/GPIB Gateway Status** page. To open this page, click the **Session Status** icon on the Navigation Bar. We also recommend you reboot the E5810 before beginning the firmware update process.

6 **Open the Updating Firmware Page**

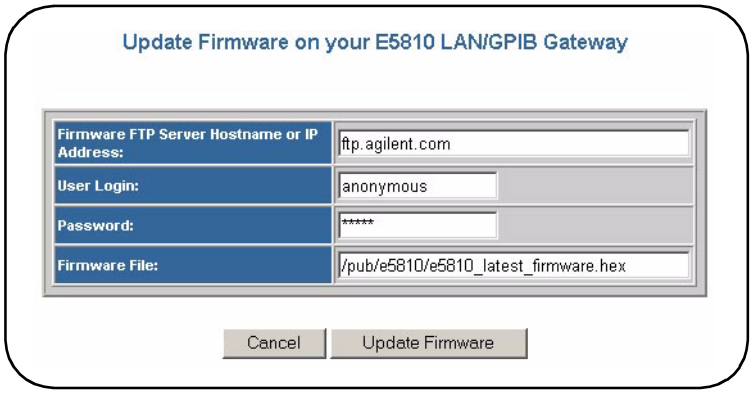
   a Open E5810 Web Help and click Updating Firmware from the Table of Contents to prompt for a password and then display the **Updating Your Firmware** topic page.

   b Click the updating firmware hyperlink on this page to display the **Updating Firmware on your E5810 LAN/GPIB Gateway** dialog box. A typical dialog box display follows on the next page..

NOTE

*You can also directly access the **Updating Firmware on your E5810 LAN/GPIB Gateway** page at http://<IP_Address>/html/passwordupdate.html, where <IP_Address> is the IP address displayed on the front display panel on the E5810.*

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7 **Configure FTP Parameters and Filename.** Enter the following information in the dialog box:

- **a** **Firmware FTP Server Hostname or IP Address:** Enter the IP address of the FTP Server (e.g., 192.6.143.21) OR enter the FTP Server domain name, if a DNS Server is available and configured in the E5810 (e.g., ftp.agilent.com)
- **b** **User Login:** Enter the Login name for the FTP Server (same as Step 3) (e.g., anonymous)
- **c** **Password:** Enter the password associated with the login name (same as Step 3).
- **d** **Firmware File:** Enter the filename of the E5810 firmware (default is **`e5810/e5810_latest_firmware.hex`**). You may also need to add the appropriate directory information to locate the file on the FTP Server.

8 **Perform Firmware Update.**

- **a** Click the **Update Firmware** button to display a password dialog box. Click **OK** to confirm the update and the E5810 will attempt to download the firmware from the FTP Server specified.
- **b** The E5810 front panel should display the message "**Updating firmware…**"

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c The LAN LEDs should light, indicating LAN activity is taking place. The firmware for the E5810 is ~ 5.1 MB. Download time may vary, depending on network connections.

d After the firmware image has been downloaded into the E5810, the E5810 will automatically reboot and display a "**Rebooting E5810..**." message. The E5810 then begins a normal startup sequence.

9 **Verify Firmware Revision.** When the E5810 has successfully rebooted, display the E5810 **Welcome** page and verify that the **Firmware Revision Number** displays the correct version of the firmware.

Troubleshooting Guidelines

The E5810 records information on the firmware update process in a **system log** that is viewable through the E5810 Web access or through the E5810 Telnet interface.

1 **View the System Log From Web Access.** To view the system log information on the E5810 Web access, on your Web browser address line, type: **`http://<IP Address>/systemLog.htm`** where **`<IP Address>`** is the IP address shown on the E5810 front panel display and press **Enter** to display the system log. After a successful firmware update, the E5810 systems log should show normal startup messages, such as:

```
(0:00:00:00) Selftest passed
(0:00:00:00) GPIB: Initialized, symbolic name = gpib0
(0:00:00:00) RS232: Initialized, symbolic name = COM1
```

OR

1 **View the System Log From Telnet.** To view the system log from Telnet, click **Start** and select **Run...**. Then, type "telnet <*IP_Address*>", where <*IP_Address*> is the IP address shown on the E5810 front panel display. See *Appendix B - Using the Telnet Utility* for additional information on the Telnet utility. When the telnet client has started, you can view the system log by typing '**syslog-display**'. After a successful firmware update, the E5810 systems log should have normal startup messages, such as:

```
(0:00:00:00) Selftest passed
(0:00:00:00) GPIB: Initialized, symbolic name = gpib0
(0:00:00:00) RS232: Initialized, symbolic name = COM1
```


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2 **If the Update was Unsuccessful.** If the last message in the system log indicates the E5810 was trying to update firmware, the firmware process was not successful and the E5810 firmware will revert to its original (factory-set) version. In this case, try the following:

   a **Verify FTP Server Address.** Verify that the Firmware FTP Server domain name is correct and fully qualified. A domain name is a symbolic name for an IP address. For example, 'ftp.agilent.com' is the domain name for IP Address 192.6.143.21. Try to manually use FTP to access the FTP Server that contains the E5810 firmware.Verify that the firmware file is in the proper directory and that the firmware file has the correct name.

   b **Manually Enter DNS Server Address.** For the firmware update process to use a domain name, the E5810 must have a DNS (Domain Name Server) setup. If you statically configured the IP Address for the E5810, you will need to manually enter the DNS Server address in the **Configuring your E5810 LAN/GPIB Gateway** page.

   c **Use the IP Address.** Try using the IP Address of the FTP Server instead of the domain name.

   d **Check Login, Password and Firmware Name Entries.** Make sure the login, password, firmware filename are entered correctly. Also, make sure the login name and password match a valid user account on the FTP Server.

   e **Check Directory Information.** Make sure the correct directory information is present (if needed), such as “/pub/e5810/e5810_latest_firmware.hex”. If you use directory information, make sure the directory designator character is correct for your FTP server. Some FTP servers use “/” (forward slash) and others use “\” (backslash).

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Notes:

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4

Troubleshooting Information

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Troubleshooting Information

This chapter gives guidelines to troubleshoot problems that may occur with the E5810 LAN/GPIB Gateway for Windows, including:

- Troubleshooting Overview
- Checking the E5810
- Checking the Network
- Checking PC Client Connections
- Checking Instruments

NOTE

There are no user-serviceable parts in the E5810 LAN/GPIB Gateway for Windows. If you suspect a hardware failure in the E5810, contact Agilent Technologies for procedures to return the device. See "Contacting Agilent" in the Front Matter for details.

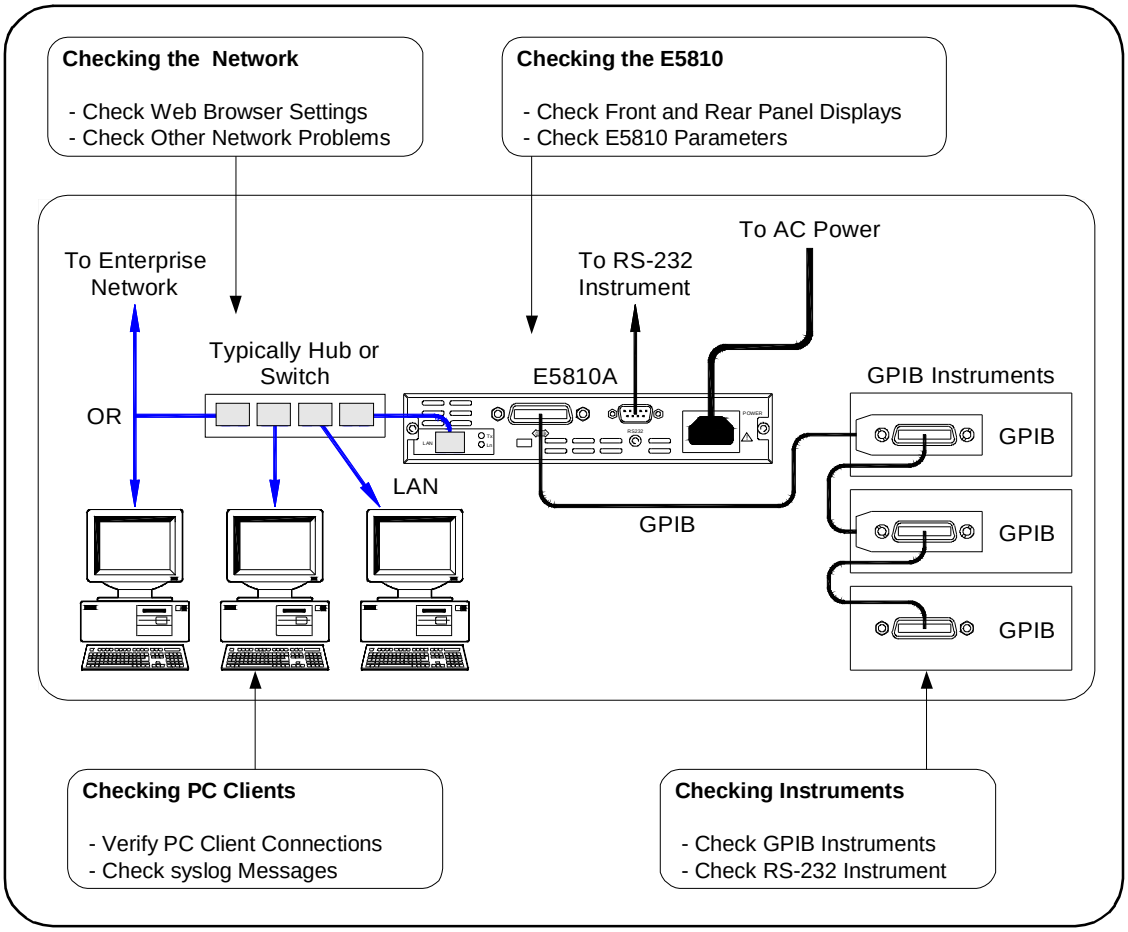
NOTE

Cleaning Instructions. *The only cleaning required (and authorized) for the E5810 is to clean the exterior with a slightly dampened, clean cloth and then dry the E5810 with a dry, clean cloth.*

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Troubleshooting Overview

This figure shows a typical network configuration using the E5810 and shows suggested sequence of steps to troubleshoot the system to determine if the cause is with the client PC, with the network, with the E5810, or with connected instruments.



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Checking the E5810

This section gives guidelines to check the E5810, including:

- Checking Front and Rear Panel Displays
- Checking E5810 Configuration Parameters

Checking Front and Rear Panel Displays

As a first step in troubleshooting the system, you should check the front panel display and LED status. In addition, you can check the rear panel Ln LED to see if there is communication from your PC to the E5810 via the LAN.

Checking LEDs

The following table shows suggested steps to troubleshoot the E5810 using the LED displays. If there is an error message on the front panel display, see "Checking Front Panel Display Error Messages".

NOTE

The Fault LED is turned ON briefly during power-on to show it is working and then turns OFF. If a hardware fault occurs, the Fault LED turns ON and remains ON for more than 10 seconds. In this case, contact Agilent Technologies.

LED Status	Possible Cause(s)	Corrective Action(s)
All LEDs OFF	No AC power to the E5810	Check AC power connections.
Only POWER and FAULT ON	If FAULT is ON for more than 10 seconds, suspect an E5810 hardware failure	Contact Agilent for instructions to return the E5810.
POWER ON, back panel Ln OFF	Indicates no communication from your PC to the E5810 via the LAN.	Check the LAN connection to the E5810. See *Chapter 1 - E5810 Description* for location of the LAN port and the Ln LED.
POWER and LAN ON, GPIB and/or RS-232 OFF during instrument activity	Indicates communication via the LAN to the E5810, but not to connected GPIB and/or RS-232 instruments.	Check GPIB and/or RS-232 connections and configuration. Make sure instrument power is turned ON.

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Checking Front Panel Display Error Messages

This table shows E5810 front panel display error messages and typical cause(s) for the error message.

Error Message	Description
Firmware Update not successful	The firmware update failed. Verify that the IP address of the ftp server, login, user password and filename are correct.
ERROR: NV RAM Setting defaults	Configuration nonvolatile data memory was corrupt. All data were restored to factory defaults, per the nonvolatile RAM (Random Access Memory).
ERROR: Selftest See syslog	A power-on self-test error occurred. Errors may be viewed in the syslog message by typing http://<IP Address>/systemLog.htm.
ERROR: No LAN connection found	LAN Link integrity not detected. Make sure the LAN cable is connected and the LAN is active.
ERROR: IP in use <*addr*>	The E5810 tried to use an IP address that is currently being used by another device on the network. Try these actions: ■ Reboot the E5810 with the **Preset** button depressed to set the E5810 back to booting with DHCP enabled. OR ■ Remove other device(s) from the network and reboot the E5810 OR ■ Move the E5810 to a Local network, disable DHCP, and set the E5810 to an unused IP Address.

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Checking E5810 Parameters

If the front panel display and LEDs indicate no error conditions, check the E5810 configuration parameters.

Checking E5810 Current Parameters

If the E5810 is connected to an Enterprise (corporate) network, you can check the E5810 current settings displayed on the **Configuring your E5810 LAN/GPIB Gateway** page against the Enterprise Network Information provided to you by your System Administrator. If the settings do not match, re-configure the E5810 from the **Configuring your E5810 LAN/GPIB Gateway** page.

> **NOTE**
>
> *If the E5810 is connected to an Enterprise (corporate) Network, be sure to contact your IT Department before making any configuration changes to the E5810. If E5810 configuration checks are required, see Chapter 3 - Using E5810 Web Access for information.*

Resetting E5810 Defaults

As required, you can use the **Preset** button on the E5810 front panel to reset the E5810 to its default settings. There are two modes of operation. See *Chapter 1 - E5810 Description* for the location of the **Preset** button.

- **Momentarily Depress the Preset Button.** If you momentarily depress the **Preset** button, ONLY the password is temporarily set to the default value of E5810. All other E5810 configuration parameters remain the same. The password remains until the next time you reboot the E5810.
- **Depress the Preset Button for at Least 10 Seconds.** If you depress the **Preset** button for at least 10 seconds, ALL E5810 configuration parameters are set to their defaults and the E5810 reboots.

> **NOTE**
>
> *You should terminate all applications that use the E5810 before taking this action.*

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Checking the Network

If the E5810 is correctly installed and configured and is operational, the next step is to check the network installation and configuration. To do this step, you may need the help of your System Administrator. This section gives guidelines to check your network.

Network Configuration Problems Summary

Symptom	Possible Cause(s)	Corrective Action(s)
Cannot access E5810 Web access (Web Server)	Improper network installation	Check network installation or contact System Administrator
	Missing or improper setup of network addresses: - Ethernet (MAC) Address - IP Address - Subnet mask - Default gateway (router)	Try the **ping** command (type **`ping <IP_address>`** from the MS-DOS window). If this does not work, contact your System Administrator.
	Incorrect Web Browser Settings	Change Javascript Enabled, Cache and Page Refresh, and/or Proxy settings as required. See “Checking Web Browser Settings”.
Incorrect password	Unknown or forgotten password	Use the **Preset** button to reset the E5810 password to the factory default setting (E5810).
Other Network Problems	- E5810 Operation Hangs - SICL Timeout Set to 0	See “Checking Other Network Problems”

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Checking Web Browser Settings

The E5810 Web access (web server) generates web pages that depend on Javascript and Frames. You can use any web browser that supports these features to view and interact with the E5810 web server. For best results, you may need to Enable Javascript, and configure Cache and Page Refresh, and/or Proxies options on your Web browser. Internet Explorer 5.5 or later or Netscape Navigator 6.2 or later are recommended.

Enabling Javascript

The E5810 web server uses Javascript. The E5810 can detect if Javascript is not enabled and will display instructions on the E5810 **Welcome** page to enable Javascript for selected versions of Internet Explorer and Netscape Navigator. If Javascript is not enabled, you will not be able to modify configurations in the **View & Modify Configuration** page, nor will you be able to Interact with instruments using the **Find & Query Instruments** page. Steps to enable Javascript for Internet Explorer and Netscape Navigator follow.

Steps to Enable Javascript (Microsoft Internet Explorer 5.0, 5.5)

1. From Internet Explorer menu select **`Tools->Internet Options`**
2. Click the **`Securities`** tab
3. Click the **`Custom Level…`** button
4. Under **`Settings`**, scroll down to the category called **`Scripting`**
5. Click the **`Enable`** radio button under **`Active Scripting`**
6. Click the **`Enable`** radio button under **`Scripting of Java`** applets
7. Click the **`OK`** button on bottom of page to accept security settings
8. When the **`Warning!`** dialog box appears, click the **`YES`** button when prompted for "**`Are you sure you want to change the security settings for this zone?"`**
9. Click the **`OK`** button on the bottom of the **`Internet Options`** dialog box to make changes active.

Steps to Enable Javascript (Netscape Navigator 6.2)

1. From the Navigator Menu select **`Edit->Preferences`**
2. Under the **`Category`** tree, click **`Advanced`** to change the fields on the right to display the **`Advanced`** configuration options
3. Under "**`Enable features that help interpret web pages"`**, make sure that **`Enable Java`** and **`Enable JavaScript for Navigator`** are both checked
4. Click the **`OK`** button on the bottom of the page to activate changes.

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Cache and Page Refresh

For faster performance, most web browsers cache web pages. If a page is cached, an image of the web page is stored locally. When you navigate to a page that has already been viewed, the browser will load the page from it cache rather than loading it from the network.

Usually, this process works well for static web pages. However, this process may cause problems for 'dynamically' changing web pages. This problem may occur when you are navigating using the browser's forward / back / refresh options.

Doing this usually causes the browser to first look in its cache to see if the page exists. If the page is cached, the browser displays the page from the cache instead of going to the network to update changes. Since the E5810 web pages are dynamic in nature, the cache may contain content that is outdated on modern browsers.

If you see a problem where dynamic pages are not being updated automatically (for example, click refresh on status page and see the time since reboot information), the browser should be instructed to check for newer versions of a web page on each every page visit. Steps for cache and page refresh for some Internet Explorer and Netscape Navigator versions follow.

Steps for Cache and Page Refresh (Microsoft Internet Explorer 5.0, 5.5)

1. From Internet Explorer menu select **`Tools->Internet Options`**
2. Click the **`General`** tab
3. Under **`Temporary Internet`** files, click the **`Settings`** button to display the **`Settings`** dialog box
4. Under **`Check for newer versions of stored pages:`**, click the **`"Every visit to the page"`** radio button ("**`Automatically`**" should be OK for Internet Explorer 5.5 and >)
5. Click the **`OK`** button on the **`Settings`** page to accept the change
6. Click the **`OK`** button on the bottom of the **`Internet Options`** dialog box to make changes active

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Steps for Cache and Page Refresh (Netscape Navigator 6.2)

1. From the Navigator menu, select **Edit->Preferences**
2. Under the **Category** tree, click the triangle icon located to the left of **Advanced** (the category should expand) and then click **Cache**. This will change the panel on the right to display the **Cache** configuration fields.
3. Under **Compare the page in the cache to the page on the network:**, click the" **Every time I view the page"** radio button
4. Click the **OK** button on the bottom of the page to activate changes

Proxies

A **proxy** is a service running on a computer that takes an information request from another computer and passes the request on as if the request was its own. Typically, many companies use proxies to control access from their internal network to the external Internet.

In some situations, you may not be able to communicate with the E5810 if you are using a proxy server. Typically, the web page will timeout because the requested address is not accessible by the network, although the correct IP address or hostname is entered into the Web browser address field.

To fix this communication problem between the web browser and the E5810 web server, the browser must be informed that any requests to the E5810 should **not** utilize a proxy. Suggested steps to set proxy notification for some Internet Explorer and Netscape Navigator versions follow.

Steps to Set Proxy Notification (Microsoft Internet Explorer 5.0, 5.5)

1. From Internet Explorer, select **Tools->Internet Options**
2. Click the **Connections** tab
3. Click the **LAN Settings…** button under **Local Area Network (LAN) settings**
4. Under **Proxy server**, if "**Use a proxy server**" is checked, click the **Advanced…** button
5. Under **Exceptions**, add the IP address of the E5810 or a fully-qualified domain name (such as **myE5810.example.com**) to the list box called "**Do not use proxy server for addresses beginning with:"** Use a semicolon (;') to separate entries.
6. Click the **OK** button on the bottom of the **Internet Options** dialog box to make changes active.

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Steps to Set Proxy Notification (Netscape Navigator 6.2)

1. From the Navigator menu, select **`Edit->Preferences`**
2. Under the **`Category`** tree, click the triangle icon located to the left of **`Advanced`** (the category should expand) and then click **`Proxies`**. This will change the panel on the right to display the **`Proxies`** configuration fields.
3. Under **`No Proxy for:`**, add the IP address of the E5810 or a fully-qualified domain name (such as **`myE5810.example.com`**) to the list. Use a comma (,) to separate multiple entries.
4. Click the **`OK`** button on the bottom of the page to activate changes

Checking Other Network Problems

There are two additional network checks you may encounter: E5810 operation hangs or SICL timeout is set to 0 (infinite)

E5810 Operation Hangs

The E5810 has a single Remote IO Server servicing both GPIB and RS-232 interfaces. Thus, if either interface “hangs” in an operation where a timeout has been set to a long time period, there is no more communication on **either** interface (GPIB or RS-232) until the pending transaction completes (via normal completion, or a timeout). That is, a pending operation on the RS-232 interface will hang GPIB operations, and vice-versa.

To avoid this, set as short a timeout as possible for **both** the GPIB and RS-232 interfaces, so the E5810 is not left in a hung situation awaiting a pending I/O operation. For example, a detached (or loose) GPIB or RS-232 cable can cause an operation to hang if timeouts are set too high.

Setting long timeouts with the E5810 is not recommended. However, if a long timeout period is required for your programming application, you can set the timeout with:

```
VISA: viSetAttribute() and VI_ATTR_TMO_VALUE attribute
SICL: itimeout()
```

See the *Agilent VISA User’s Guide* for a description of the VISA command. See the *Agilent SICL User’s Guide for Windows* for a description of the SICL command.

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SICL Timeout Set to 0 (infinite)

The E5810 uses the **LAN maximum timeout** configured in Connection Expert's LAN interface for its default or infinite timeout. If a SICL **`itimeout(id,0)`** command is used (where a 0 timeout value is an infinite timeout) the E5810 will use the **I/O Timeout (sec):** value set on the **Current Configuration of E5810 LAN/GPIB Gateway** page. The default timeout value is 120 sec. Setting the **I/O Timeout (sec):** value to 0 enables infinite timeouts from SICL applications.

> **NOTE**
>
> *It is highly recommended you **not** set an infinite timeout which can cause the E5810 to become unresponsive due to a pending operation that will never timeout.*

Setting long timeouts with the E5810 is discouraged. However, if a long timeout period is required for your application, you can set the timeout with these commands:

```
VISA: viSetAttribute(vi, attr, attrState)
         where: attr is VI_ATTR_TMO_VALUE
          attrState is a large value

SICL:  itimeout(id,tval),  where tval is a large
number
```


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Checking PC Client Connections

Even if the E5810 has been successfully configured and the configuration has been verified, individual PC clients may still have problems connecting to the E5810. This section gives guidelines to check PC client connections to the E5810, including:

- Verifying PC Client Connections
- Checking syslog Messages
- Runtime Error Messages

Verifying PC Client Connections

Even if the E5810 has been successfully configured and the configuration has been verified, individual clients may still have problems getting a connection to the E5810.

How to Verify PC Client Connections

To verify that the PC client system has network access to the E5810, open the Web Browser on the client PC and type in the E5810 IP address (or hostname, if known) on the browser's address line. If the E5810 **Welcome** page appears, this client PC has network connection to the E5810. Repeat this step for each client PC on the network.

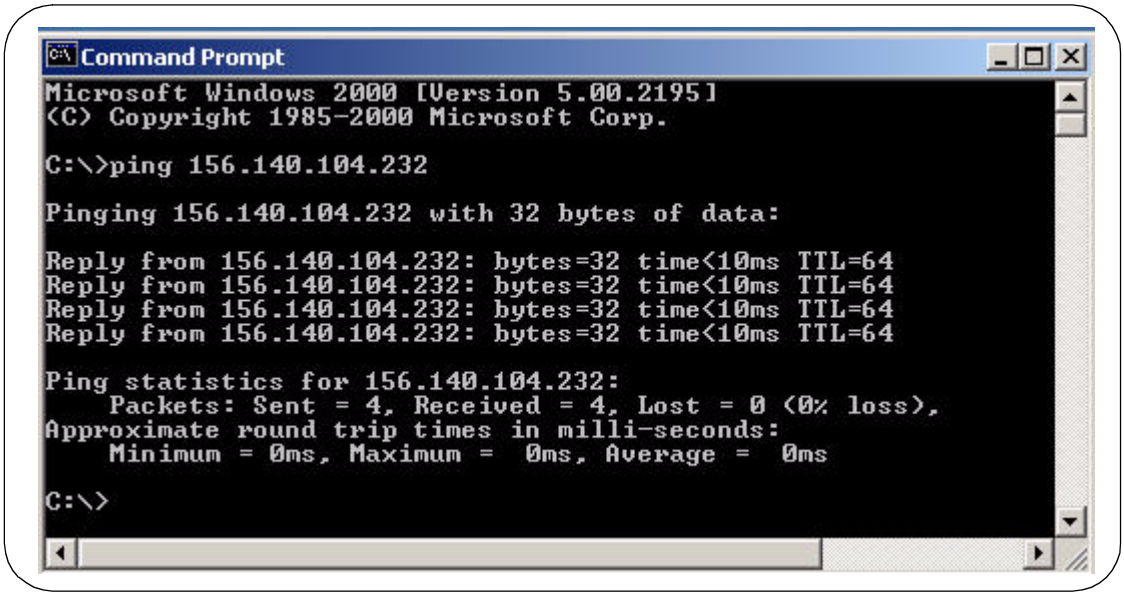
> **NOTE**
>
> *You can also use the Telnet utility or a **ping** command from a DOS command window to check for network connections to the E5810. See Appendix B - Using the Telnet Utility for details.*

If the **Welcome** page times out, this indicates the client PC was unable to connect to the E5810. The E5810 may be on a different subnet than the client or the E5810 may have incorrect network configuration values. In this case, try the **ping** command. A typical example follows. If the **ping** command does not work, contact your System Administrator.

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Example: Using the ping Command

To send a **ping** command from your PC to an E5810, open the MS-DOS window. For example, on Windows 2000, click **Start | Programs | Accessories | Command Prompt**. When the MS-DOS window opens, type ping <*IP_address*>, where <*IP_address*> is the IP address of the E5810, and press the **Enter** key. A typical display follows.



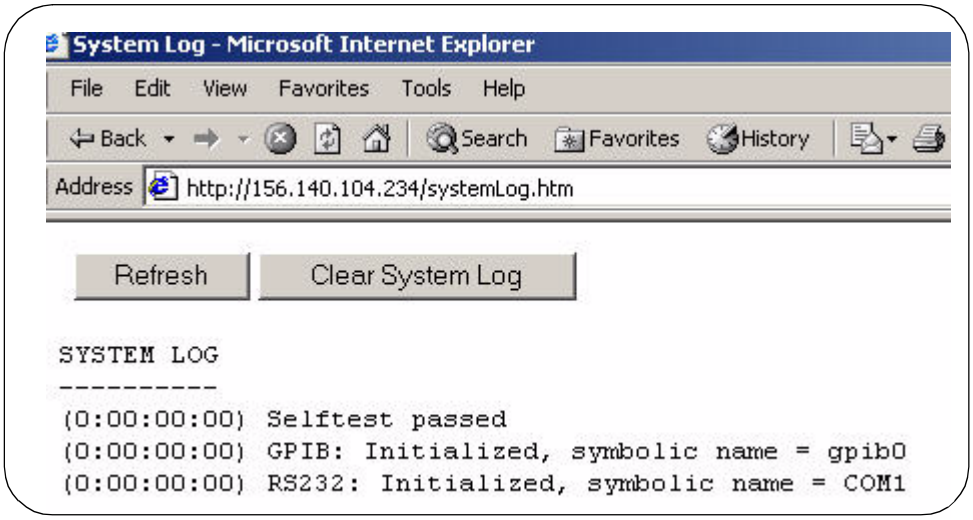
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Checking `syslog` Messages

The **`syslog`** messages can be viewed by typing **`<E5810 IP address>/systemLog.htm`** on your web browser, where **`<E5810 IP address>`** is the IP address of the E5810. For example, if the IP address of the E5810 is 169.254.58.10, type **`http://169.254.58.10/systemLog.htm`** to display the message table.

Typical Display

The syslog file messages can also be viewed via the Telnet **`syslog-display`** command (see *Appendix B - Using the Telnet Utility*). A typical display (with time from power-on in parentheses) follows.



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syslog Messages

The following table lists common **`syslog`** messages generated by the E5810.

> **NOTE**
>
> *The Telnet Utility is the ONLY way to clear syslog messages. When the syslog message queue is full, new messages will not be accepted and will not overwrite existing syslog messages. See Appendix B - Using the Telnet Utility for steps to clear syslog messages.*

Message	Description
Selftest Passed	E5810 has successfully completed its hardware self-test.
rebooting	E5810 is about to do a reboot or a **factory-reset** command.
Max connections exceeded, client *IP_address* refused	A client specified by the IP_address was not allowed to connect to the E5810 because the maximum number of concurrent client connections on the E5810 has been exceeded. No more than 16 client connections can be running concurrently on the E5810 and fewer may be allowed, depending on memory usage for existing clients.
client: <*id*> <*id*> Opened Closed	Typical open/close messages (logged each time a client opens or closes a connection). For example: client: 156.140.104.184, id: 1 opened
Firmware update: Looking for FTP server	Logged prior to trying to do an '1s' command on the FTP Server to see if any data may be fetched.
Firmware update: Beginning firmware update	Logged prior to starting to get the file.
Firmware update complete	Firmware update was successful. This message is usually not seen, as the E5810 reboots after download is complete.
ERROR: Firmware update already in progress, cannot begin update	Tried to begin an update while an update was already in progress.
ERROR: Firmware Update: No DNS server, cannot use hostname	A hostname was used for FTP Server, but there is no DNS Server configured. Configure a DNS Server or use an IP address for FTP server.
ERROR: Firmware Update: Hostname not found	Could not find hostname. Hostname or DNS server may be invalid.

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Message	Description
ERROR: Firmware Update: FTP server not found	Could not find FTP server specified.
ERROR: Firmware Update: Invalid User Login or Password	Login or Password is invalid for the FTP server.
ERROR: Firmware Update: Data not received from FTP Server	Could not receive data from the FTP Server. May be trying to access FTP server through a firewall.
ERROR: Firmware Update: Invalid file or directory	Could not find file. Filename or directory is wrong.
ERROR: Firmware Update: Internal error	Out of system resources. Reboot the E5810 and try again.

Example: Typical syslog Messages

This table shows typical syslog messages and provides a description of each message, where the value in ( ), such as (0:00:00:18), is the time since power-on expressed in Day (DD):Hour (HH):Minutes (MM):Seconds (SS).

Message		Description
(0:00:00:00)	Selftest passed	Power-on self-test results
(0:00:00:00)	GPIB: Initialized, symbolic name = gpib0	GPIB and RS-232 initialized
(0:00:00:00)	RS232: Initialized, symbolic name = COM1	
(0:00:00:18)	client: 156.140.104.184, id: 1 opened	Typical open/close messages (logged each time a client opens or closes a connection)
(0:00:00:18)	client: 156.140.104.184, id: 1 closed	
(0:00:00:18)	client: 156.140.104.184, id: 1 opened	
(0:00:00:19)	client: 156.140.104.184, id: 2 opened	
(0:00:00:19)	client: 156.140.104.184, id: 3 opened	
(0:00:39:21)	Max connections exceeded, client refused	Indicates the server had the maximum number of connections when another connection was requested, so the request was refused.

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Runtime Error Messages

Common runtime errors that may occur in your programs when using an E5810 are described in the following table, where "**`viopen`**" is a VISA open command.

Message	Description/Actions
`viopen` fails: Invalid address errors	Use the E5810 **Welcome** page on your Web browser to verify that the GPIB address, GPIB interface name, and/or GPIB logical unit configuration values are correct. Or, you can use Connection Expert. To open Connection Expert, click the blue IO icon on the Windows taskbar and then click **Agilent Connection Expert**.
`viopen` fails: No connection	The connection to the E5810 failed for one of these reasons: ■ A TCP/IP network timeout occurred because the network connection is down or the E5810 is down. ■ The E5810 has reached its maximum concurrent client connections (16) and this new connection was refused. You may need to have a client close its connection or you may need to reboot the E5810 to close all client connections to allow a new connection to be made. Up to 16 sessions can be in use at any one time.
`viopen` fails: Timeout	The client has timed out. The E5810 has not responded within the appropriate timeout time because: ■ The network connection is down or the E5810 is down. ■ The server is busy performing an operation for a different client. You may need to increase the **Client delta timeout** configuration value on the LAN client PC. To set this value, click the blue IO icon on the Windows taskbar and then click **Agilent Connection Expert**. In the Connection Expert window, select (highlight) the LAN interface that is associated with your remote GPIB and/or remote serial interface. Click the **Change Properties...** button in the detail pane on the right. When the **LAN Interface** properties dialog appears, set the desired **Client delta timeout** value and then click the **OK** button.

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Message	Description/Actions
`viopen` fails or I/O operation fails: Out of resources	The E5810 was unable to open another session or perform the operation because it is out of resources. You may need to have a client terminate its connection or you may need to reboot the E5810 to close all client connections to reclaim resources. Rebooting will disconnect all other users accessing the E5810.
I/O operation fails: No connection	The connection to the E5810 failed because: ■ The network connection is down or the E5810 is down and a network timeout occurred. ■ The E5810 was powered off and then on or an E5810 reboot was executed, either of which terminates any open client connections.
I/O operation fails: Timeout	There are several possible causes: ■ The client may be attempting a transaction to a non-existent or powered-off device. Check the address used, as well as the status of the device. ■ The network connection or the E5810 has gone down since the previous I/O operation. ■ The I/O timeout specified is not long enough for the transaction to complete. You may need to verify that the E5810 I/O timeout configuration value is long enough if the client specified a timeout value of infinity. ■ The E5810 is busy performing an I/O operation for another client or another client has the device/interface locked. See “E5810 appears to be hung” for more information.

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Message	Description/Actions
E5810 appears to be hung	There are several possible causes. For all of the following, use of client timeouts and/or E5810 timeouts (the I/O timeout and LAN timeout configuration values) can be used to ensure that the E5810 will not "hang" indefinitely. ■ If you determine that the E5810 is truly hung, you may be able to free it by terminating a particular client connection at the client, thus freeing the resources to allow the E5810 to proceed. Otherwise, you can press the **Clear ALL Pending Operations** button on the **Find and Control Instruments Connected to your E5810** Web page or you can reboot the E5810. ■ The network connection to the E5810 has been broken. ■ The E5810 may be attempting a transaction to a non-existent or powered-off device. Check the address used, as well as the status of the device. ■ The E5810 is busy performing a very long transaction to a (slow) device, or it is waiting for input from a device. ■ A client may be waiting for access to a device/interface locked by another client. Check for possible deadlock situations and, if possible, make sure the clients owning locks and the connections to those clients are still up and functioning. You can check the current session by clicking the **Session Status** icon to display the **E5810 LAN/GPIB Gateway Status** Web page.

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Checking Instruments

This section gives guidelines to check connected GPIB and RS-232 instruments, including:

- Checking GPIB Instruments
- Checking RS-232 Instruments

Checking GPIB Instruments

If you cannot establish communication with connected GPIB instruments, see the following table for suggested troubleshooting steps.

Possible Cause(s)	Corrective Action(s)
Attempting to Communicate From the E5810 Web Access	
Intermittent or missing GPIB connection	Check GPIB cables
GPIB device power not ON or defective GPIB device	Make sure GPIB device power is ON and the device is operating properly
Attempting to Communicate Programmatically	
VISA/SICL not configured	Run the Connection Expert utility (see *Chapter 2 - Installing the E5810*)
Incorrect VISA/SICL address	Check VISA/SICL address being used.

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Checking RS-232 Instruments

If you cannot establish communication with a connected RS-232 instrument, see the following table for suggested troubleshooting steps.

Possible Cause(s)	Corrective Action(s)
Attempting to Communicate From the E5810 Web Access	
Intermittent or missing RS-232 connection	Check RS-232 cable connections. Verify that the RS-232 cable is the correct cable for this application.
RS-232 device power not ON or defective RS-232 device	Make sure RS-232 device power is ON and the device is operating properly.
RS-232 interface not configured for attached device	Change E5810 RS-232 interface attributes to match RS-232 device attributes (baud rate, parity, etc.).
Attempting to Communicate Programmatically	
VISA/SICL not configured	Run the Connection Expert utility (see *Chapter 2 - Installing the E5810*).
Incorrect VISA/SICL address	Check VISA/SICL address being used.

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A

E5810 Specifications

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E5810 Specifications

This appendix lists E5810 LAN/GPIB Gateway for Windows technical specifications, supplementary information, and supported network protocols.

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Specifications and Supplementary Information

General Requirements	
Minimum System Requirements for Agilent IO Libraries Suite	Windows 2000 SP4/XP SP2/Windows Vista 450 MHz Pentium II (1 GHz 32-bit recommended for Vista), 128MB RAM (512 MB or greater for Vista), 280MB free disk space, 1 GB for Microsoft .NET Framework 2.0, 65 MB for Agilent IO Libraries Suite
Web Browser	Microsoft Internet Explorer 5.01 or greater (Microsoft Internet Explorer 7.0 or greater for Vista)
Supported Standards	VXI-11 Protocol IEEE-488.1 and IEEE-488.2 Compatible 10BASE-T/100BASE-TX Networks RS-232 VISA 2.2 and Agilent SICL
General Characteristics	
Power	25 VA peak (7.5 Watts typical)
Input Voltage	Universal Input 100 - 240V (± 10%) @ 47 - 63 Hz
Connectors	Standard 24-pin IEEE-488, 9-pin RS-232, RJ-45 LAN
Power Cord	US/Canada: P/N: 8120-1378 (UL Listed, CSA Certified) 10A/ 250V. All other cordsets: Appropriate foreign country approval associated with cord for per country of use.
Dimensions	8.36 W x 9.06 D x 1.71 H (in.); 212.3 W x 230 D x 43.4 H (mm)
Weight	3.6 lb (1.6 Kg)
Indicators	Power, Activity, Fault
Warranty	1 year
Environmental Specifications	
Operating Environment	0^{o}C to 55^{o}C - Indoor use, Pollution Degree 2
Installation Category	II (mains input)
Altitude (operating)	3000 meters

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Operating Humidity	up to 95% R.H. @40^{o}C
Environmental Specifications (cont'd)	
Storage Humidity	up to 90% R.H. @65^{o}C
Storage Temperature	-40^{o}C to +70^{o}C
Operating Conditions	
Operating State	Continuous
Connection to Supply Mains	Detachable cord
Degree of Mobility	Portable (Bench and Cabinet)
Supported Languages and Applications	
Applications (with Agilent Intuilink)	Microsoft Excel 97 and 2000 Microsoft Word 97 and 2000 Check the Web for latest supported applications.
Software Development	Visual Basic 5.0/6.0 Visual C++ 5.0/6.0 Visual Studio Agilent VEE 5.0 or greater BASIC for Windows Visual Studio .NET
Ordering Information	
Interface	E5810A LAN/GPIB Gateway for Windows
Options	Opt 100 - Rack Mount Kit Opt AG6 - Additional Client Software Opt 0B1 - Add Paper Manual
Accessories	None
Supplementary Information	
GPIB Modes of Operation Supported	The E5810 supports all standard GPIB modes of operation.
IEEE-488.1 and IEEE-488.2 Compliance	The E5810 is in full compliance with IEEE-488.1 and IEEE-488.2 specifications. The E5810 fully supports IEEE-488.1 subsets AH1, C1, C2, C3, C4, C27, DC0, DT0, LE3, PP0, RL0, SH1, SR0, and TE7.

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Maximum Number of Simultaneous I/O Connections	The maximum number of simultaneous I/O connections supported by the E5810 is 16. Each client process requires a separate connection.

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Supported Network Protocols

The E5810 uses the network IP and Ethernet protocols listed in the following table. See the *Glossary* for a definition of these protocols.

Name	RFC	Role	When	Description
ARP	826	Peer	As needed	Maps IP address to Ethernet address
DHCP	2131, 2132	Client	Power-up	E5810 requests IP configuration information
DNS	1035	Client	As needed	E5810 resolves DNS names to IP addresses
FTP	959	Client	Upgrade	Downloads new firmware into the E5810
HTTP	1945, 2068	Server	User Setup	Web pages/forms for E5810 configuration
ICMP	792	Server	As needed	E5810 answers ECHO requests (ping)
RPC	1831, 1832, 1833	Server	User	Controls GPIB instruments using VXI-11
Telnet		Server	User Setup	E5810 Configuration. See *Appendix B - Using the Telnet Utility*.

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B

Using the Telnet Utility

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Using the Telnet Utility

This appendix explains how to access and exit the Telnet utility. It also summarizes various Telnet commands you can use with the E5810 LAN/GPIB Gateway for Windows. The appendix contents are:

- Using the Telnet Utility
- Telnet Commands for the E5810

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Using the Telnet Utility

For backward compatibility with the E2050 LAN/GPIB Gateway, the Telnet Utility functionality is provided with the E5810. However, E5810 Web Access is the preferred method to configure the E5810.

Accessing the Telnet Utility

To access the Telnet utility:

1. If you are on a Windows 2000 computer system, do the following:
   - From the Windows 2000 taskbar, select **`Start`** | **`Programs`** | **`Accessories`** | **`Command Prompt`**. The MS-DOS window opens.
   - From the Windows XP taskbar, select **`Start`** | **`All Programs`** | **`Accessories`** | **`Command Prompt`**. The MS-DOS window opens.
2. From the MS-DOS window, type **`telnet`** *IP_address*, where *IP_address* is the IP address of the E5810, and then press **Enter**.
3. When you are connected to the E5810 Telnet utility, you will see a listing of main Telnet commands and current configuration values for this E5810.
4. You may also need to adjust **Local Echo** in the **Terminal Preferences** dialog box so the Telnet utility will properly display your typed input. To do this:
   - From the menu at the top of the Telnet window, select **`Terminal`** | **`Preferences`**. The **Terminal Preferences** dialog box is displayed.
   - Click the check box next to **`Local Echo`** to change it.
5. Click **OK** to close the **Terminal Preferences** dialog box.

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Exiting the Telnet Utility

To exit the Telnet utility, use these Telnet commands.

- If you want to exit *without* saving any changes (if any) you have made to the configuration values, at the Telnet prompt (**>**) type **`bye`** (or) **`exit`** (or) **`quit`**.
- If you want to save the changes you have made to the configuration values via the Telnet utility, at the Telnet prompt (**>**) type **`reboot`**.

CAUTION

*Any client operations in progress and client connections will be terminated by the **`reboot`** command.*

- To reset the E5810 to the default configuration values and reboot the E5810, at the Telnet prompt (**>**) type **`factory-reset`**.

CAUTION

*Any client operations in progress and client connections will be terminated by the **`factory-reset`** command when it reboots the E5810.*

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Typical Telnet Screen Display

A typical display screen for an E5810 follows. The configuration values you see for your E5810 will probably be different from those shown.

```
Welcome to the E5810 LAN/GPIB Gateway Configuration Utility.
  Controls GPIB and RS-232 interfaces via the LAN

Commands

    ?              View Available Commands
    exit, quit     Exit WITHOUT Saving Configuration Changes (see reboot)
    reboot         Save Configuration Changes and Restart E5810
    status         View the LAN/GPIB Gateway Connection Status

Read-only E5810 Parameters

  hardware-addr:   0030D305001E      # Ethernet (MAC) Address
  serial-num:      US12341234        # Serial Number

Configurable Parameters saved in E5810 non-volatile memory
  (Note: Some E5810 current values "in-use" may be different)

  dhcp:            OFF               # Configure LAN for DHCP boot
    ip:            156.140.104.232   # Internet Protocol (IP) Address
    subnet-mask:   255.255.254.0     # Network Subnet Mask
    gateway:       156.140.104.1     # Network Gateway
  dns-server       156.140.2.11      # DNS Server
  hostname:        my1234567         # Internet Hostname

  description:     Agilent E5810 (00-30-D3-05-00-1E)
                   # Device Description (UPnP Friendly Name)

  upnp:            ON                # Configured as UPnP device
  lan-timeout:     600               # LAN Timeout (Keepalive) in sec
  io-timeout:      120               # I/O Timeout in seconds
  gpib-name:       gpib0             # GPIB SICL Interface Name
  gpib-address:    21                # GPIB System Controller Address
  gpib-unit:       7                 # GPIB Logical Unit (LU) Number

  rs232-name:      COM1              # RS-232 SICL Interface Name
  rs232-baud:      9600              # RS-232 Baud Rate
  rs232-bits:      8                 # RS-232 Bits
  rs232-stopbits:  1                 # RS-232 Stop Bits
  rs232-parity:    NONE              # RS-232 Parity
  rs232-flow:      NONE              # RS-232 Flow Control
  rs232-srq:       RI                # RS-232 SRQ
```


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Telnet Commands for the E5810

This table lists the Telnet commands you can use with the E5810. You should use the Telnet configuration commands *only* if you are using the Telnet configuration method to configure the E5810.You can see a summary of all Telnet commands online by typing **?** at any time within the Telnet utility.

NOTE

The Telnet utility is the ONLY way to clear syslog messages. When the syslog message queue is full, new messages will not be accepted and will not overwrite existing syslog messages. Use the ***syslog-clear*** *command to clear syslog messages.*

Command	Description
help	View Help Information
?	View Available Commands
config	View Configured Settings
serial-num	View the Device Serial Number
version	View the Firmware Revision
hardware-addr	View the Ethernet (MAC) Address
dhcp <*OFF|ON*>	Turn OFF or ON the use of DHCP
ip <*ip address*>	View/Set the IP Address
subnet-mask <*ip address*>	View/Set the Network Subnet Mask
gateway <*ip address*>	View/Set the Gateway Address
dns-server <*ip address*>	View/Set the DNS Server Address
hostname <*string*35*>	View/Set the Internet Hostname
description <*string*40*>	View/Set Device Description (UPnP Friendly Name)
upnp <*OFF|ON*>	Turn OFF or ON the use of UPnP
lan-timeout <*seconds*>	View/Set the LAN Timeout (Keepalive). 0 is Off.
io-timeout <*seconds*>	View/Set the Server I/O Timeout. 0 is Off.

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Command	Description
gpib-name <*string*15*>	View/Set the GPIB SICL Interface Name
gpib-address <*0-30*>	View/Set the GPIB System Controller Address
gpib-unit <*1-255*>	View/Set the GPIB Logical Unit Number
rs232-name <*string*15*>	View/Set the RS-232 SICL Interface Name
rs232-baud <*300|1200|2400|4800|9600|19200|38400|57600|115200*>	View/Set Baud Rate
rs232-bits <*5|6|7|8*>	View/Set number of RS-232 data Bits
rs232-stopbits <*1|2*>	View/Set number of RS-232 Stop Bits
rs232-parity <*NONE|EVEN|ODD|MARK|SPACE*>	View/Set the RS-232 Parity
rs232-flow <*NONE|XON|RTS|DTR*>	View/Set the RS-232 Flow Control
rs232-srq <*RI|DSR|DCD|CTS*>	View/Set the RS-232 SRQ Line
status	View the LAN/GPIB Gateway Connection Status
syslog-display	View Contents of the Syslog
syslog-clear	Clear the Syslog
password	Enter the Password (when prompted) (Password is required when making changes)
changepassword	Change the Password (when prompted)
reboot	Save Configuration and Reboot E5810
factory-reset	Reset Config to Factory Defaults and Reboot
exit	Exit WITHOUT Saving Configuration (see reboot)
quit	Exit WITHOUT Saving Configuration (see reboot)
bye	Exit WITHOUT Saving Configuration (see reboot)

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Glossary

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Glossary

A

address
A string uniquely identifying a particular interface or a device on that interface which is interpreted at the E5810 LAN/GPIB Gateway to identify the interface or device.

ASRL
For the E5810, ASRL is synonymous with RS-232. See RS-232.

B

bridge
In telecommunication networks, a bridge is a product that connects a local area network (LAN) to another local area network that uses the same protocol (for example, Ethernet or token ring). You can envision a bridge as being a device that decides whether a message from you to someone else is going to the local area network in your building or to someone on the local area network in the building across the street. A bridge examines each message on a LAN, “passing” those known to be within the same LAN, and forwarding those known to be on the other interconnected LAN (or LANs).

C

client
Part of the client/server model used in distributed computing. A client is a computer system that requests services from a server computer system, such as I/O application requests, networking requests, etc.

controller
A computer used to communicate with a remote device such as an instrument. In the communications between the controller and the device, the controller is in charge of and controls the flow of communication that is, it does the addressing and/or other bus management). The controller acts as the remote I/O client to the E5810 server.

D

device
A unit that receives commands from a controller. Typically a device is an instrument but could also be a computer acting in a non-controller role, or another peripheral such as a printer or plotter.

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DHCP

Short for Dynamic Host Configuration Protocol, a protocol for assigning dynamic IP addresses to devices on a network. With dynamic addressing, a device can have a different IP address every time it connects to the network.

In some systems, the device's IP address can even change while it is still connected. DHCP also supports a mix of static and dynamic IP addresses.

Dynamic addressing simplifies network administration because the software keeps track of IP addresses rather than requiring an administrator to manage the task. This means that a new computer can be added to a network without manually assigning it a unique IP address. DHCP client support is built into Windows workstations.

DNS

Short for Domain Name System (or Service), an Internet service that translates domain names into IP addresses. Because domain names are alphabetic, they are easier to remember. The Internet, however, is really based on IP addresses. Every time you use a domain name, therefore, a DNS service must translate the name into the corresponding IP address.

For example, the domain name **`www.example.com`** might translate to 198.105.232.4. The DNS system is a distributed system. If one DNS server does not know how to translate a particular domain name, it asks another one, and so on, until the correct IP address is returned.

E

Ethernet (MAC) Address

The Media Access Control Address, also known as the link-level address, the Ethernet (station) Address, the LANIC ID and Hardware Address. This is a unique 48-bit address assigned by the manufacturer for each Ethernet device. It is usually displayed as 12 hexadecimal characters, sometimes with colon or dash separators between every two characters, such as “00:03:d3:00:00:17” or “00-03-d3-00-00-17”.

F

Friendly Name

The “UPnP Friendly Name” of the E5810 that will automatically be displayed on Universal Plug and Play (UPnP) enabled LAN hosts. When the E5810 is connected to the LAN, it broadcasts its presence to the network if UPnP is enabled. UPnP clients will then see the name and description of this E5810 in My Network Places. A Friendly Name can be up to 39 characters including spaces.

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G

gateway

Hardware that permits a network connection between the LAN that your computer understands and the instrument specific interface that your device understands.

Gateway IP Address

This parameter is the IP Address of the default subnet gateway that allows the E5810 to communicate with systems that are not on the local subnet. Thus, this is the default subnet gateway where packets are sent that are destined for a device not on the local subnet, as determined by the subnet mask setting. Only one default subnet gateway can be configured. A value of 0.0.0.0 indicates that no subnetting is to be done.

H

Hostname

This parameter is the Internet domain name for the E5810. Depending upon the type of servers in the network, you may be able to use this name to communicate with the E5810. However, since you can always use the IP Address or the name supplied by another name server, the Hostname is not a required configuration value.

You may enter up to 15 characters for the Hostname. The Hostname must start with a letter and consists of upper and lower case letters and digits and dashes. The default Hostname is “E5810-” plus the last four characters of the Ethernet (MAC) address, such as E5810-e40c.

hub

A common connection point for devices in a network. Hubs are commonly used to connect segments of a LAN. A hub contains multiple ports. When a packet arrives at one port, it is copied to the other ports so that all segments of the LAN can see all packets.

- **Passive hubs** serve simply as a conduit for the data, enabling it to go from one device (or segment) to another.

- **Intelligent hubs** include additional features that enables an administrator to monitor the traffic passing through the hub and to configure each port in the hub. Intelligent hubs are also called manageable hubs.

- **Switching hubs** actually read the destination address of each packet and then forward the packet to the correct port.

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I

instrument
A device that accepts commands and performs a test or measurement function.

interface
A connection and communication media between devices and controllers, including mechanical, electrical, and protocol connections.

IP address
An Internet Protocol (IP) address is an identifier for a computer or device on a TCP/IP network. Networks using the TCP/IP protocol route messages based on the IP address of the destination. The format of an IP address is a 32-bit numeric address written as four numbers separated by periods. Each number can be zero to 255. For example, 1.160.10.240 could be an IP address.

Within an isolated network, you can assign IP addresses at random as long as each one is unique. However, connecting a private network to the Internet requires using registered IP addresses (called Internet addresses) to avoid duplicates. The four numbers in an IP address are used in different ways to identify a particular network and a host on that network. The InterNIC Registration Service assigns Internet addresses from the following three classes.

- Class A - supports 16 million hosts on each of 127 networks
- Class B - supports 65,000 hosts on each of 16,000 networks
- Class C - supports 254 hosts on each of 2 million networks

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L

LAN

Local Area Network. A computer network that spans a relatively small area. Most LANs are confined to a single building or group of buildings. However, one LAN can be connected to other LANs over any distance via telephone lines and radio waves. A system of LANs connected in this way is called a wide-area network (WAN).

Most LANs connect workstations and personal computers. Each node (individual computer) in a LAN has its own CPU with which it executes programs, but it also is able to access data and devices anywhere on the LAN. This means that many users can share expensive devices, such as laser printers, as well as data. Users can also use the LAN to communicate with each other, by sending e-mail or engaging in chat sessions.

There are many different types of LANs, Ethernets being the most common for PCs. Most Apple Macintosh networks are based on Apple's AppleTalk network system, which is built into Macintosh computers. The following characteristics differentiate one LAN from another:

topology: The geometric arrangement of devices on the network. For example, devices can be arranged in a ring or in a straight line.

protocols: The rules and encoding specifications for sending data. The protocols also determine whether the network uses a peer-to-peer or client/server architecture.

media: Devices can be connected by twisted-pair wire, coaxial cables, or fiber optic cables. Some networks do without connecting media altogether, communicating instead via radio waves.

LANs are capable of transmitting data at very fast rates, much faster than data can be transmitted over a telephone line. However, the distances are limited and there is also a limit on the number of computers that can be attached to a single LAN.

lock

A state that prohibits other users from accessing a resource, such as a device or interface.

logical unit

A logical unit is a number associated with an interface. In Agilent SICL, a logical unit uniquely identifies an interface. Each interface on the controller must have a unique logical unit.

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N

network protocols

The E5810 supports these network protocols: ARP, DHCP, DNS, FTP, HTTP, ICMP, and RPC.

ARP: Short for Address Resolution Protocol, a TCP/IP protocol used to convert an IP address into a physical address (called a DLC address), such as an Ethernet address.

DHCP: See DHCP

DNS: See DNS

FTP: Abbreviation of File Transfer Protocol, the protocol used on the Internet for sending files.

HTTP: Short for HyperText Transfer Protocol, the underlying protocol used by the World Wide Web. HTTP defines how messages are formatted and transmitted, and what actions Web servers and browsers should take in response to various commands.

ICMP: Short for Internet Control Message Protocol, an extension to the Internet Protocol (IP) defined by RFC 792. ICMP supports packets containing error, control, and informational messages. The PING command, for example, uses ICMP to test an Internet connection.

RPC: Abbreviation of remote procedure call, a type of protocol that allows a program on one computer to execute a program on a server computer. Using RPC, a system developer need not develop specific procedures for the server. The client program sends a message to the server with appropriate arguments and the server returns a message containing the results of the program executed.

P

proxy server

A server that sits between a client application, such as a Web browser, and a real server. It intercepts all requests to the real server to see if it can fulfill the requests itself. If not, it forwards the request to the real server. Proxy servers have two main purposes:

Improve Performance: Proxy servers can dramatically improve performance for groups of users, since a proxy server saves the results of all requests for a certain amount of time. Consider the case where both user X and user Y access the Web through a proxy server. First user X requests a certain Web page, which we will call Page 1. Sometime later, user Y requests the same page.

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Instead of forwarding the request to the Web server where Page 1 resides, which can be a time-consuming operation, the proxy server returns the Page 1 it already fetched for user X. Since the proxy server is often on the same network as the user, this is a much faster operation. Real proxy servers support hundreds or thousands of users.

Filter Requests: Proxy servers can also be used to filter requests. For example, a company might use a proxy server to prevent its employees from accessing a specific set of Web sites.

R

router

A device that connects any number of LANs. Routers use headers and a forwarding table to determine where packets go. They use Internet Control Message Protocol (ICMP) to communicate with each other and configure the best route between any two hosts. Very little filtering of data is done through routers. Routers do not care about the type of data they handle. Routers often have DHCP Server capability.

RS-232

Short for recommended standard-232C, a standard interface approved by the Electronic Industries Association (EIA) for connecting serial devices. The standard is also referred to as RS-232C, or just RS-232.

For RS-232, the device that connects to the interface is called a Data Communications Equipment (DCE) and the device to which it connects (such as a computer) is called a Data Terminal Equipment (DTE).

The RS-232 standard supports two types of connectors - a 25-pin D-type connector (DB-25) and a 9-pin D-type connector (DB-9). The type of serial communications used by PCs requires only 9 pins so either type of connector will work equally well.

S

server

Part of the client/server model used in distributed computing. The server is a computer system designated to act as a main servicer of requests from other client computer systems, such as I/O application requests, networking requests, and so forth.

SICL

The Agilent Standard Instrument Control Library, which is software used for I/O application programming. SICL is part of the Agilent IO Libraries Suite.

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SRQ

Service Request. An asynchronous request (an interrupt) from a remote device indicating that the device requires servicing.

subnet

A portion of a network that shares a common address component. On TCP/IP networks, subnets are defined as all devices whose IP addresses have the same prefix. For example, all devices with IP addresses that start with 100.100.100. would be part of the same subnet. Dividing a network into subnets is useful for both security and performance reasons. IP networks are divided using a subnet mask.

subnet mask

A mask used to determine to what subnet an IP address belongs. An IP address has two components: the network address and the host address. For example, consider the IP address 150.215.017.009. Assuming this is part of a Class B network, the first two numbers (150.215) represent the Class B network address and the second two numbers (017.009) identify a particular host on this network.

Subnetting enables a System Administrator to further divide the host part of the address into two or more subnets. In this case, a part of the host address is reserved to identify the particular subnet.

For example, the full address for 150.215.017.009 is 10010110.11010111.00010001.00001001. The Class B network part is 10010110.11010111 and the host address is 00010001.00001001. If this network is divided into 14 subnets, the first four bits of the host address (0001) are reserved for identifying the subnet.

The subnet mask is the network address plus the bits reserved for identifying the subnetwork. (By convention, the bits for the network address are all set to 1, though it would also work if the bits were set exactly as in the network address.) In this case, the subnet mask is 11111111.11111111.11110000.00000000.

It is called a mask because it can be used to identify the subnet to which an IP address belongs by performing a bitwise AND operation on the mask and the IP address. The result is the subnetwork address:

Subnet Mask 255.255.240.000	11111111.11111111.11110000.00000000
IP Address 150.215.017.009	10010110.11010111.00010001.00001001
Subnet Address 150.215.016.000	10010110.11010111.00010000.00000000

The default subnet mask for the E5810 is 255.255.0.0

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switch

A device that filters and forwards packets between LAN segments. Switches operate at the data link layer (layer 2) and sometimes the network layer (layer 3) of the OSI Reference Model and therefore support any packet protocol. LANs that use switches to join segments are called switched LANs or, in the case of Ethernet networks, switched Ethernet LANs. A hub connects all the devices on its “ports” together.

A switch is a bit smarter, as it understands when two devices (out of four, five, eight, sixteen, or even more) want to talk to each other and gives them a switched connection.

symbolic name

A name corresponding to a single interface. This name uniquely identifies the interface on a controller or gateway. If there is more than one interface on the controller or gateway, each interface must have a unique symbolic name.

U

Universal Plug and Play

Universal Plug and Play (UPnP) is an open industry standard that uses Internet and Web protocols to enable devices such as PCs, peripherals, intelligent appliances, and wireless devices to be plugged into a network and automatically know about each other.

UPnP is an architecture for pervasive peer-to-peer network connectivity of PCs and intelligent devices or appliances. UPnP builds on Internet standards and technologies, such as TCP/IP, HTTP, and XML, to enable LAN devices to automatically connect with one another and work together.

With UPnP, when a user plugs a device into the network, the device will configure itself, acquire a TCP/IP address, and use a discovery protocol based on the Internet's Hypertext Transfer Protocol (HTTP) to announce its presence on the network to other devices. UPnP devices use Extensible Markup Language (XML) to establish a common language, or “protocol negotiation”, to talk to each other and determine capabilities.

The E5810 has two options for Universal Plug and Play (UPnP):

- **Option ON:** The E5810 is configured as a UPnP device and provides information to the network about itself via an XML description when mounted to the network.

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- **Option OFF:** The E5810 is not UPnP capable and will not announce its presence as a UPnP device when mounted to the network.

V

VEE

The Agilent Visual Engineering Environment, which is software used for I/O application programming.

VISA

The Agilent Virtual Instrument Software Architecture library, which is software used for I/O application programming. Agilent VISA is part of the Agilent IO Libraries Suite.

VISA COM

A COM (Common Object Model) implementation of VISA. Agilent VISA COM is part of the Agilent IO Libraries Suite.

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