

# Installation and Quick Start Guide

**Agilent Technologies  
PNA Series Network Analyzers**

**Important: Please read “Preventing PNA Hard  
Drive Problems” on page 2-12**



**Agilent Technologies**

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E8356-90001

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## Assistance

Product maintenance agreements and other customer assistance agreements are available for Agilent Technologies, Inc. products. For information about these agreements and for other assistance, contact Agilent. Refer to [“Contacting Agilent” on page 3-2](#).

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## Safety Notes

The following safety notes are used throughout this manual. Familiarize yourself with each of the notes and its meaning before operating this instrument. All pertinent safety notes for using this product are located in [Chapter 4 , “Safety, Regulatory, and Environmental Information.”](#)

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<b>WARNING</b>	<b>Warning denotes a hazard. It calls attention to a procedure which, if not correctly performed or adhered to, could result in injury or loss of life. Do not proceed beyond a warning note until the indicated conditions are fully understood and met.</b>
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<b>CAUTION</b>	Caution denotes a hazard. It calls attention to a procedure that, if not correctly performed or adhered to, could result in damage to or destruction of the instrument. Do not proceed beyond a caution sign until the indicated conditions are fully understood and met.
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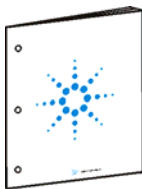
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## Documentation Map



The online Help files are embedded in the analyzer, offering quick reference to programming and user documentation. From the Help drop-down menu, you can access the Help system in six different languages. Also, you can view the Analyzer Product Overview multimedia presentation and access the analyzer's Web page.



The *Installation and Quick Start Guide* helps to quickly familiarize yourself with the analyzer. Procedures are provided for installing, configuring, and verifying the operation of the analyzer.

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## Downloading PNA Documentation from the Web

Documentation for all PNA models is available at [www.agilent.com](http://www.agilent.com).

This includes PDF versions of PNA Help (the online Help files that are embedded in the network analyzer), Service Guides, and Installation Notes.

To download documentation from the Agilent web site:

1. Go to **www.agilent.com**.
2. Enter your PNA model number in the search function.
3. Click on the **Manuals** hyperlink.
4. Open the PDF of your choice and print the document.

<b>1. Operating Precautions</b>	
Preventing Electrostatic Discharge Damage	1-1
Preventing Test Port Connector Damage	1-3
Preventing Electrical Overstress Damage	1-4
<b>2. Installing Your Analyzer</b>	
STEP 1. Check the Shipment	2-1
STEP 2. Meet Electrical and Environmental Requirements	2-4
STEP 3. Install the Analyzer on a Bench Top or in an Equipment Rack	2-6
To Install on a Bench Top	2-6
To Install in an Equipment Rack	
(option 1CP - Rack Mounting with Handles)	
(option 1CM - Rack Mounting without Handles)	2-6
STEP 4. Connect the Accessories	2-7
STEP 5. Install Ferrite Cores	2-8
STEP 6. Start Up the Analyzer	2-9
STEP 7. Perform Administrative Tasks	2-10
STEP 8. Run the Operator's Check	2-10
STEP 9. Turn Off the Analyzer	2-10
Hibernate	2-11
Shutdown	2-11
Preventing PNA Hard Drive Problems	2-12
Observe Proper Shutdown Procedures	2-12
Do NOT Modify or Reconfigure the Operating System	2-12
Install Antivirus Protection	2-12
Install Windows Critical Updates	2-12
Use AgileUpdate	2-12
Recovering from PNA Hard Drive Problems	2-13
Operating System Recovery	2-13
If You CANNOT Boot from the Hard Drive	2-14
<b>3. Getting Help with Your Analyzer</b>	
Help System	3-1
PNA on the Internet	3-1
Contacting Agilent	3-2
<b>4. Safety, Regulatory, and Environmental Information</b>	
Maintenance	4-1
Shipment for Service	4-1
Safety Symbols	4-1
General Safety Considerations	4-2
Safety Earth Ground	4-2
Before Applying Power	4-2
Servicing	4-3
Regulatory Information	4-4
Instructions for Use	4-4
Instrument Markings	4-5
Declaration of Conformity	4-6

Compliance with German Noise Requirements . . . . .

4-6

EMC Information . . . . .

4-6

Safety Information . . . . .

4-6

Environmental Information . . . . .

4-7

Warranty . . . . .

4-8

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# 1 Operating Precautions

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**IMPORTANT** Most causes of instrument failure can be avoided if you will apply the information in this section. *PLEASE READ!*

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## Preventing Electrostatic Discharge Damage

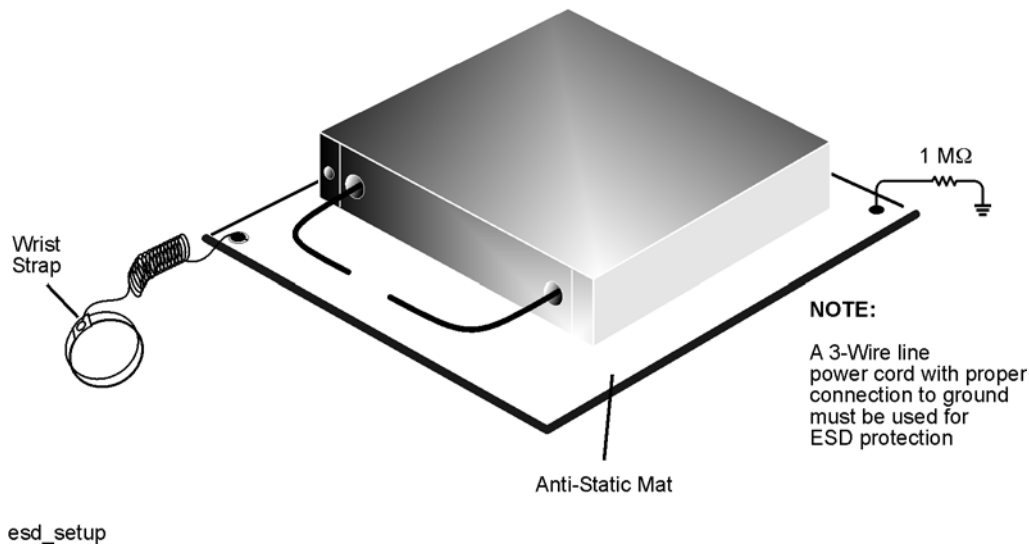
Protection against electrostatic discharge (ESD) is essential while removing assemblies from or connecting cables and assemblies (DUT) to the network analyzer. Static electricity can build up on your body and can easily damage sensitive internal circuit elements when discharged. Static discharges too small to be felt can cause permanent damage. To prevent damage to the instrument:

- *always* have a grounded, conductive table mat in front of your test equipment.
- *always* wear a grounded wrist strap, connected to a grounded conductive table mat, having a 1 M $\Omega$  resistor in series with it, when handling components and assemblies or when making connections.
- *always* wear a heel strap when working in an area with a conductive floor. If you are uncertain about the conductivity of your floor, wear a heel strap.
- *always* ground yourself before you clean, inspect, or make a connection to a static-sensitive device or test port. You can, for example, grasp the grounded outer shell of the test port or cable connector briefly.
- *always* ground the center conductor of a test cable and DUT before making a connection to the analyzer test port or other static-sensitive device. This can be done as follows:
  1. Connect a short (from your calibration kit) to one end of the cable and DUT to short the center conductor to the outer conductor.
  2. While wearing a grounded wrist strap, grasp the outer shell of the cable and DUT connector.
  3. Connect the other end of the cable and DUT to the test port and remove the short from the cable.

The following table lists Agilent part numbers for ESD protection devices. To order, refer to “Contacting Agilent” on page 3-2. Figure 1-1 shows a typical ESD protection setup using a grounded mat and wrist strap.

Description	Qty	Agilent Part Number
ESD Protection Devices		
Grounding wrist strap	1	9300-1367
5 ft grounding cord for wrist strap	1	9300-0980
2 x 4 ft conductive table mat and 15 ft ground wire	1	9300-0797

Figure 1-1 ESD Protection Setup





## Preventing Test Port Connector Damage

Visual Inspection and Gaging Connectors	
Do	Do Not
Inspect connectors with magnifying glass	Use a connector with a bent or broken center conductor
Look for metal debris, deep scratches or dents	Use a connector with deformed threads
Inspect and gage connectors	Use a connector with a protruding center conductor
Use correct torque wrench	Use an out-of-specification connector
Making Connections	
Do	Do Not
Align connectors first	Cross-thread the connection
Rotate only the connector nut	Twist connector body to make the connection
Use correct torque wrench	Mate different connector types

**NOTE** Agilent strongly recommends that adapters be used as connector savers to minimize the wear on the analyzer test port connectors. Use instrument-grade quality adapters or better.

For more information on the proper use and maintenance of connectors, search the analyzer's Help system for "Connector Care." See [Chapter 3](#) , "Getting Help with Your Analyzer."

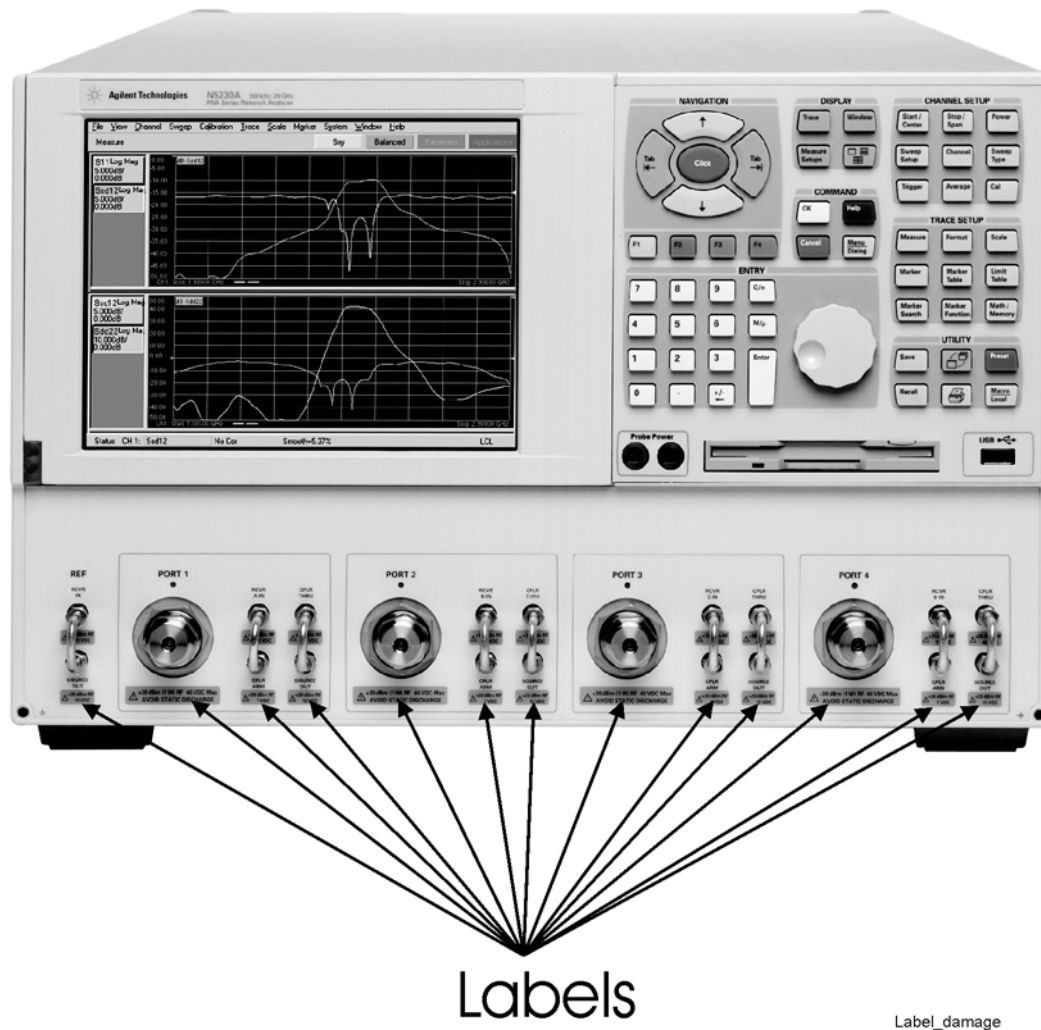
## Preventing Electrical Overstress Damage

Excessive RF power or voltage applied to the ports on the front panel will damage the analyzer. Each port has a label (see photo below) that shows damage levels – these levels must not be exceeded. Damage levels are also listed in the Specifications section of the analyzer's Help system. See [Chapter 3](#), “Getting Help with Your Analyzer.”

Two ways to protect the PNA input ports from high RF power:

1. Use power limiters at the ports. Information on limiters can be found at: [www.agilent.com/find/mta](http://www.agilent.com/find/mta).
2. Apply the recommendations in PNA Application Note 1408-10, “Recommendations for Testing High-Power Amplifiers,” found at: <http://cp.literature.agilent.com/litweb/pdf/5989-1349EN.pdf>.

**Figure 1-2. Labels Showing Damage Level for Each Port**



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## 2 Installing Your Analyzer

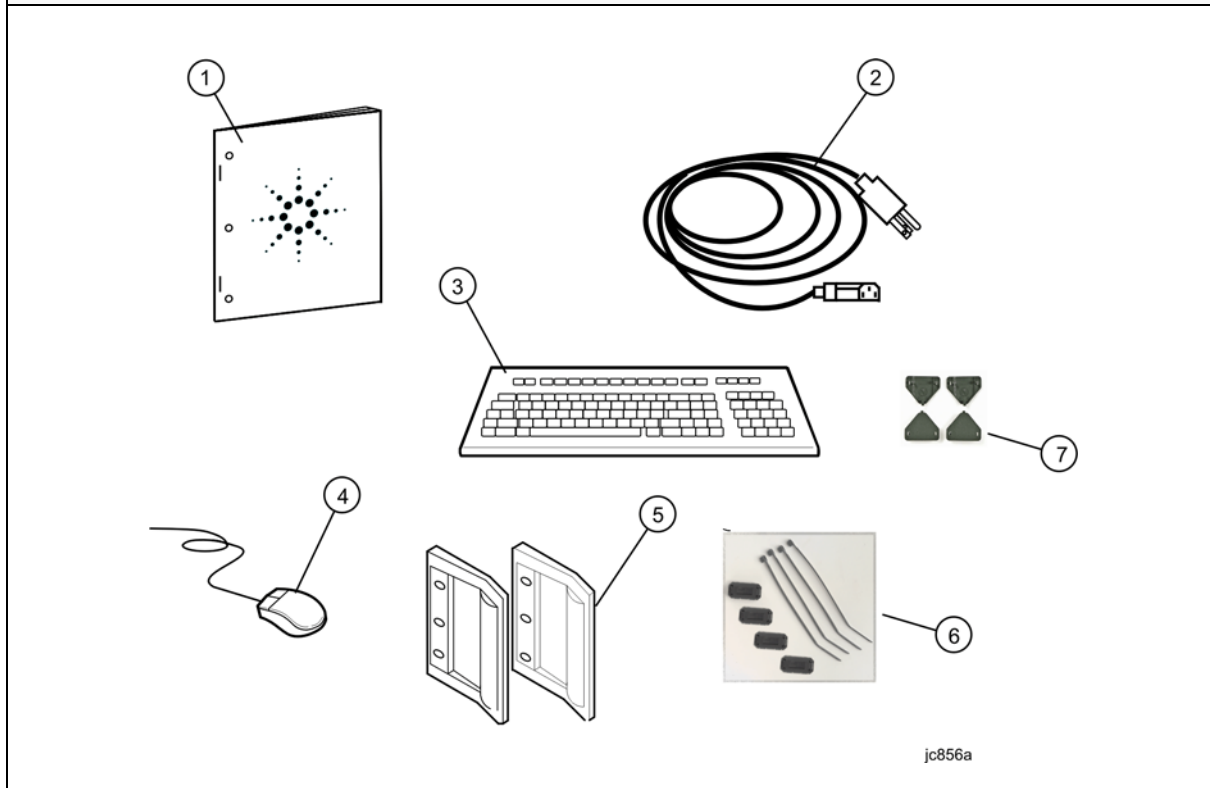
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### STEP 1. Check the Shipment

<p>1. Unpack the contents of the shipping container. (Keep the packaging material in case the analyzer needs to be returned to the factory.)</p>
<p><b>WARNING</b>     <b>The network analyzer is heavy. It is recommended that two individuals, or a mechanical lift, be used to lift or transport the instrument.</b></p>
<p>2. Carefully inspect the analyzer to make sure that it was not damaged during shipment.</p>
<p>If your analyzer was damaged during shipment, contact Agilent Technologies. Refer to <a href="#">“Contacting Agilent” on page 3-2.</a></p>

**STEP 1. Check the Shipment**

**3.** Use the Contents List in the shipping container to verify the completeness of your shipment. Although this list is the most accurate, you can also use the following illustration to verify the items in your shipment. If your shipment is not complete, contact Agilent Technologies. Refer to [“Contacting Agilent”](#) on page 3-2.



Item Number	Part Number	Part Description
1	E8356-90001	Installation and Quick Start Guide (this document)
2	Unique to country	AC Power Cord
3	not applicable <sup>a</sup>	USB Keyboard (English only)
4	not applicable <sup>a</sup>	USB Mouse
5	5063-9229	Front Handle Kit, RF-Frequency Model
	5063-9230	Front Handle Kit, Microwave-Frequency Model
6	not applicable	Ferrite cores & cable ties (See <a href="#">“STEP 5. Install Ferrite Cores”</a> on page 2-8)
7	W1312-40032	Hole plugs - used to replace the bottom plastic feet of the PNA when installed in an equipment rack.

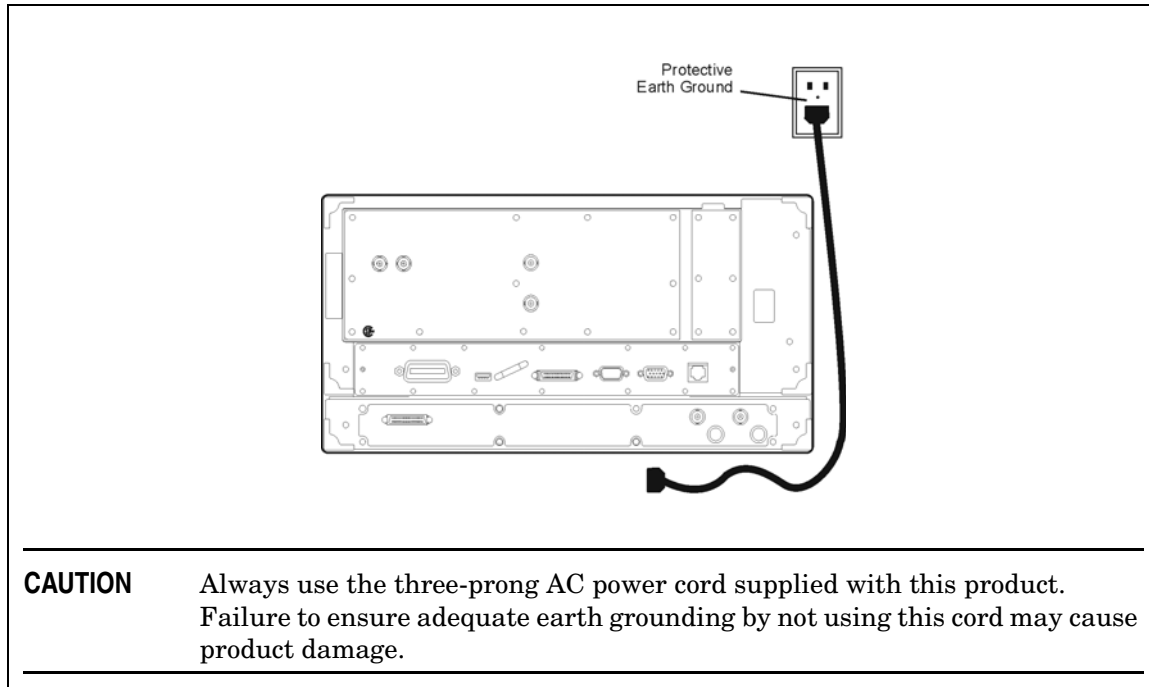
a. See the Contents List in the shipping container for the current part number.

**NOTE** A parallel port adapter, part number 1253-4226, was included with early versions of the PNA. This adapter is no longer necessary.

4. If you ordered any of the following options, check the parts. Option 1CM or 1CP (item numbers 1 or 2, below) are shipped in a separate container.		
<b>Item Number</b>	<b>Option Number</b>	<b>Part Description</b>
1	1CM	Rack Mount Flange Kit (For use without handles)
2		Rack Mount Rail Set
1	1CP	Rack Mount Flange Kit (For use with handles)
2		Rack Mount Rail Set
3	82375A	USB/GPIB Interface (included with Option 083 only)

## STEP 2. Meet Electrical and Environmental Requirements

<b>1.</b> Ensure the available AC power source meets the following requirements:	<b>2.</b> Ensure the operating environment meets the requirements found in <a href="#">“Environmental Information”</a> on page 4-7.
<div data-bbox="228 485 800 667"> <b>CAUTION</b>      This instrument has autoranging line voltage input. Be sure the supply voltage is within the specified range.         </div> <div data-bbox="228 667 800 1220"> <ul style="list-style-type: none"> <li>• Frequency             <ul style="list-style-type: none"> <li><input type="checkbox"/> 50/60/400 Hz for 100 to 120 V - models E836xA/B and N5230A</li> <li><input type="checkbox"/> 50/60 Hz for 100 to 120 V - model N5242A</li> <li><input type="checkbox"/> 50/60 Hz for 220 to 240 V</li> </ul> </li> <li>• Voltage             <ul style="list-style-type: none"> <li><input type="checkbox"/> 120/240 VAC</li> </ul> </li> <li>• Power (maximum consumed)             <ul style="list-style-type: none"> <li><input type="checkbox"/> 350 W - models E836xA/B and N5230A</li> <li><input type="checkbox"/> 450 W - model N5242A</li> </ul> </li> </ul> </div>	<div data-bbox="800 485 1369 667"> <b>NOTE</b>      Some analyzer performance parameters are specified for 25 °C. Refer to the Help system in the analyzer for the complete specifications.         </div>
<b>3.</b> Verify that the AC power cable is not damaged, and that the power-source outlet provides a protective earth contact.	

**STEP 2. Meet Electrical and Environmental Requirements**

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## STEP 3. Install the Analyzer on a Bench Top or in an Equipment Rack

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**IMPORTANT** Please review all safety information located in [Chapter 4 , “Safety, Regulatory, and Environmental Information”](#) before proceeding with installing and using the analyzer.

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The analyzer can be installed on a bench top or in an equipment rack. When installing the analyzer in an equipment rack, the analyzer can be set up with handles (option 1CP) or without handles (option 1CM).

In all installations, consider the following ventilation requirements when deciding where to set up your analyzer.

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**CAUTION**     **Ventilation Requirements:** When installing the product in a cabinet, the convection into and out of the product must not be restricted. The ambient temperature (outside the cabinet) must be less than the maximum operating temperature of the instrument by 4 °C for every 100 watts dissipated in the cabinet. If the total power dissipated in the cabinet is greater than 800 watts, then forced convection must be used.

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Refer to the section, listed below, that applies to your installation.

### To Install on a Bench Top

When you install the analyzer for bench top use, you may wish to attach the supplied handles to the analyzer.

If you wish to install the handles, follow the instructions provided with the handle kit.

### To Install in an Equipment Rack (Option 1CP - Rack Mounting with Handles) (Option 1CM - Rack Mounting without Handles)

When you install the analyzer in an equipment rack, you must install rails in the rack to support the weight of the analyzer. Attach the rack mount flanges (with or without handles) to the analyzer. Secure the analyzer to the equipment rack. Replace the analyzer bottom plastic feet with the hole plugs provided.

For installation, follow the instructions provided with the rack mount kit and the rail kit.



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## **STEP 4. Connect the Accessories**

You can connect several USB accessories to the PNA. Some PNA models have a four-port USB hub mounted internally and accessible through the rear panel. Other PNA models have two USB ports: one on the front panel and one on the rear panel. You can also use an optional USB Hub (model N4689) to increase the available USB ports on the PNA.

USB devices, including the optional hub, can be connected to any available USB port. The PNA will recognize the USB device when it is connected, and run the appropriate software driver to make the device operate correctly.

The following is a list of USB devices commonly used with the PNA. Some of these devices may require additional installation. Refer to the Help that is embedded in the PNA for more information.

- Mouse — standard
- Keyboard — standard
- Read/Write CD-ROM drive (separate product)
- USB Hub (separate product)
- Electronic Calibration (ECal) Modules (separate product)
- Printer (separate product)
- 82357A USB/GPIB Interface — supplied with Option 083

## STEP 5. Install Ferrite Cores

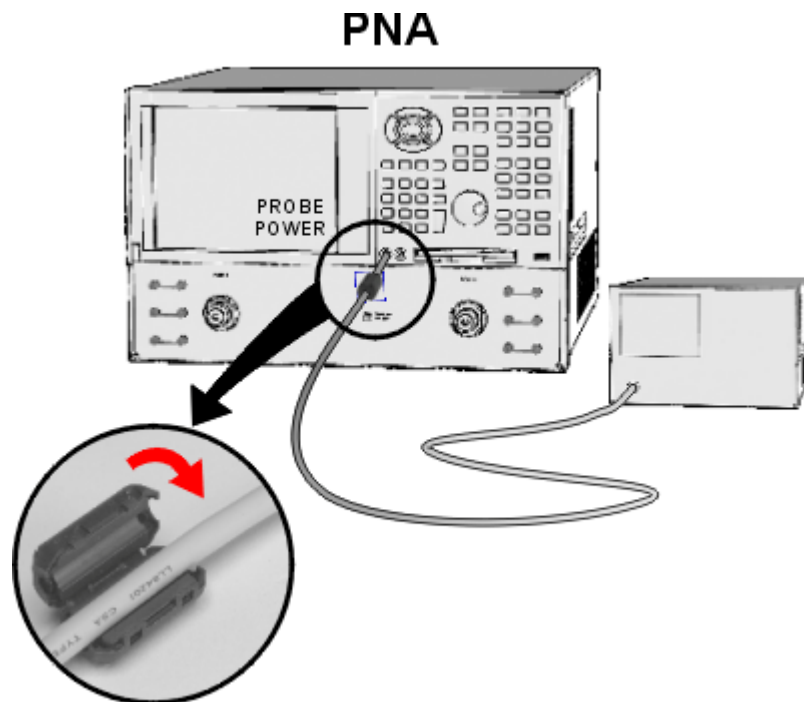
CISPR 11 is an international regulation that specifies the maximum level of frequency emissions that can originate from an electronic device. The regulation is designed to minimize the interference that one electronic device may have with another.

Frequency emissions can occur when cables are connected to an electronic device. To minimize this, try to use high-quality cables with built-in molded ferrite cores, with the core closest to the PNA. If cables with built-in cores cannot be found, use one of the clamp-on ferrite cores that are included with the PNA.

It is especially important to use these cores on cables that are connected to the following PNA connectors:

- Parallel Port (rear panel)
- Serial Port (rear panel)
- VGA (rear panel)
- Probe power (front panel)

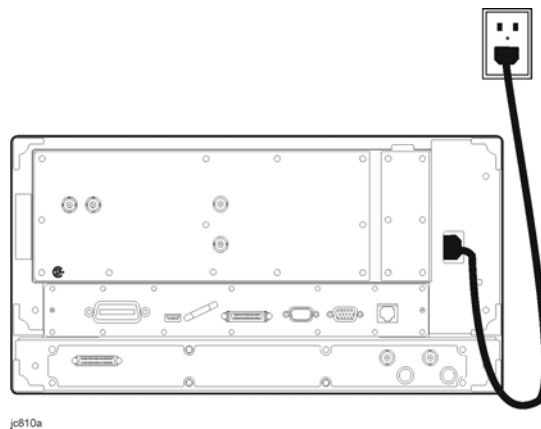
The core should snap closed to grip the cable firmly, but without damaging the cable. Attach the core to the cable as close as possible to the PNA connector end. Cable ties are included to help ensure that the ferrite cores remain in place.



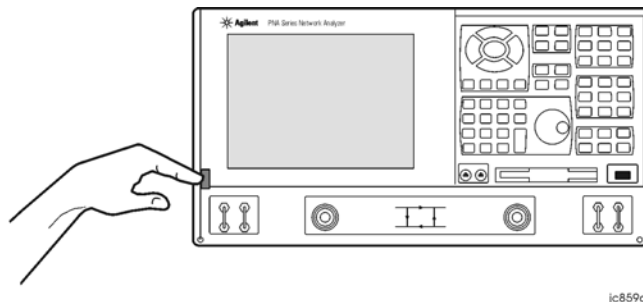
## STEP 6. Start Up the Analyzer

**CAUTION** Install the instrument so that the detachable power cord is readily identifiable and is easily reached by the operator. The detachable power cord is the instrument disconnecting device. It disconnects the mains circuits from the mains supply before other parts of the instrument. The front panel switch is only a standby switch and is not a LINE switch. Alternatively, an externally installed switch or circuit breaker (which is readily identifiable and is easily reached by the operator) may be used as a disconnecting device.

### 1. Connect the AC power cable.



### 2. Turn the analyzer on by pressing the front panel On/Off switch. When the analyzer is turned on, the On/Off switch changes color from yellow to green.



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**NOTE** The Agilent PNA Series Network Analyzer is a network analyzer that operates on a personal computer (PC) platform with Microsoft “Windows” as the operating system.

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The first time you start the PNA, the Microsoft “Windows” license agreement is presented. Click **I Accept**, then **Next**.


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## STEP 7. Perform Administrative Tasks

We recommend that you consider performing the following administrative tasks shortly after powering up the analyzer for the first time.

- ☐ Set up analyzer users
- ☐ Set up the administrator password
- ☐ Enter the computer name
- ☐ Set the time and date
- ☐ Select a local language for the help system (default is English)

Procedures for the above tasks are in the Help system in the analyzer. To view these procedures:

- On the analyzer’s front panel, press the **Help** button. Or, on the PNA display, click **Help**, **Network Analyzer Help**.
- Click **Quick Start** in PNA Help.   
Quick Start
- Click **Perform Administrative Tasks**.
- Click the task you wish to perform.

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## STEP 8. Run the Operator’s Check

The operator’s check should be performed when you first receive your analyzer, and any time you wish to have confidence that the analyzer is working properly. The operator’s check does not verify performance to specifications, but should give you a high degree of confidence that the instrument is performing properly.

On the **System** menu, point to **Service**, and then click **Operator’s Check**. Follow the prompts.

For assistance, use the **Help** button displayed on the screen of the Operator’s Check.

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## STEP 9. Turn Off the Analyzer

The PNA can be turned off with or without the use of a mouse.

**Without a Mouse** - BRIEFLY Press the green front panel On/Off switch.

**With a Mouse** - Minimize the PNA application, then click **Start, Shutdown**.

---

Both methods present a dialog box asking **What do you want the computer to do?** (If your PNA does not present a dialog box, type “power on” in the index of the PNA Help system to learn more.)

Using a mouse or front panel keys (Navigation plus **Enter**), choose an action:

- Log off (close programs and disconnect from the network)
- Restart (shutdown and start)
- Hibernate (see below)
- Shutdown (see below)

## **Hibernate**

The On/Off switch changes from green to yellow when power is OFF.

The current instrument state is saved to the PNA hard disk drive.

When the PNA is powered ON, this instrument state is loaded, thus saving time over a full system boot-up.

A password is not required to resume PNA operation from Hibernate mode.

For more hibernate information, type “hibernate” in the index of the PNA Help system.

## **Shutdown**

The On/Off switch changes from green to yellow when power is Off.

The current instrument state is NOT saved to the PNA hard disk drive.

When the PNA is powered ON, a full system boot-up is performed and the PNA powers-up in the Preset settings.

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**IMPORTANT** Only turn off the PNA using Shutdown mode when preparing to service it, or provide security via password protection.

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**Note:** Repeatedly doing either of the following two actions WILL cause damage to the PNA Hard Disk Drive.

1. **Only in an emergency** should the power cord be removed from the PNA without first being put in Hibernate or Shutdown mode.
2. If the PNA is locked and you cannot operate the mouse or keypad, turn OFF the PNA by pressing and holding the power button for at least four seconds.

## Preventing PNA Hard Drive Problems

The leading cause of PNA failures is problems with the PNA Hard Disk Drive (HDD). These problems are usually preventable, and in many cases, recoverable. The following could save you weeks of downtime and the cost of replacing your PNA HDD.

### Observe Proper Shutdown Procedures

See previous pages.

### Do NOT Modify or Reconfigure the Operating System

The Microsoft Windows operating system has been modified and optimized by Agilent to improve the performance of the PNA.

- Do NOT install a standard version of the Windows operating system on the PNA.
- Do NOT change advanced performance settings or group policies.
- Do NOT add or delete any hard disk drive partitions on the PNA.
- Do NOT delete the Agilent user account.
- Do NOT modify any of the Agilent software registry entries.

### Install Antivirus Protection

The PNA does NOT have antivirus protection when shipped. Use of an antivirus program is strongly recommended if you connect the PNA to the Internet.

In addition, the use of a firewall could help to protect the PNA from viruses. However, some firewalls could limit DCOM connectivity of the PNA.

### Install Windows Critical Updates

The PNA is always shipped with the latest service packs and critical updates that were available at the time that the PNA is produced. We recommend that you maintain the latest available protection for your PNA by automatically accepting and installing the latest critical security patches from the Microsoft Windows Update website:

<http://windowsupdate.microsoft.com>.

### Use AgileUpdate

If your PNA is connected to the Internet, use AgileUpdate to obtain the latest firmware. On the PNA, click **System, Service, AgileUpdate** to automatically update your firmware to the current revision.

If your PNA is NOT connected to the Internet, you must update firmware using a CDROM or pen drive. When updating, NEVER skip a major PNA firmware revision. For example, to update from A.02.xx to A.04.xx, first install any version of A.03.xx, then update to A.04.xx.

## Recovering from PNA Hard Drive Problems

The following three symptoms indicate a probable HDD failure. To troubleshoot the cause, first attempt to perform an Operating System Recovery (see below). If it fails, the HDD must be replaced.

1. Will not complete the boot process.
  - If 'Couldn't find NTLDR' appears, remove a disk if one is in the PNA floppy drive.
  - If 'Operating System not found' appears, replace the HDD.
2. Continual blue screens or multiple errors.
3. Excessive clicking or a loud high-pitch whine.
  - Back up files and replace HDD.

The following three symptoms indicate missing or corrupt files. To troubleshoot the cause, first try the suggestions indicated by bullets. Then, perform an Operating System Recovery (see below) which is likely to solve the problem.

1. Required system files are not found.
2. The operating system of PNA application does not function properly.
  - Uninstall the PNA application using Add/Remove Programs from the Control Panel. Then reinstall the PNA application by double-clicking on D:\Updates\Firmware\\*.msi. or download a firmware update using AgileUpdate (see previous page).
3. The PNA functions, but is very slow.
  - Check for excessive clicking or a loud high-pitch whine (see #3 above).
  - Check RAM. For best performance, RAM must be at least 128MB for PNA firmware rev. 3.0 or below; 256MB for firmware rev. 3.1 or higher. See PNA Help to learn more.
  - Scan for virus and spyware.

## Operating System Recovery

This procedure will completely restore the operating system of the PNA back to the original factory condition. It will not work if the hard drive is damaged.

**Important note:** This procedure will overwrite the entire C: drive and the following information will be lost:

- All changes and additions made to the analyzer since purchase (except options).
- All user accounts and passwords.
- All added programs.
- All saved instrument states.
- All user configurations and Windows settings.

You can save this information to a floppy drive or to a folder on the D: drive. The D: drive will not be affected by this restoration process. In addition, factory instrument calibration will not be affected if no changes have been made since the original factory calibration. If changes have been made through the service routines, copy all files that start with “mxcalfile\_” in the C:\Program Files\Agilent\Network Analyzer directory, and save them to the D:\Calfiles directory.

## Procedure

1. Click **Start, Shutdown, Restart**
2. After the Agilent logo, when ‘Please select the operating system to start:’ displays, quickly press the down arrow on the keyboard to select the System Recovery partition, (NOT the Recovery Console). Press **Enter**.  
**NOTE:** If you do not reach this screen during the boot process, you may be able to boot from a floppy disk. See **If You CANNOT Boot from the Hard Drive** (below).
3. The PNA will display a warning about proceeding and give you two chances to abort. After the second warning, the restoration process will begin immediately.
4. Restoration takes from 15 to 45 minutes. There is no user interaction required. Near the end of the process, the PNA may reboot several times. Do not attempt to use the analyzer until the PNA application is running and all activity has stopped for at least one minute.
5. Once the operating system is completely recovered, you can restore any files you may have saved back to their original locations. The mxcalfiles that were stored in D:\Calfiles will be restored automatically. Other files must be copied or moved manually.
6. If PNA application updates had previously been downloaded through AgileUpdate, they can now be re-installed. Double-click on D:\Updates\Firmware\ \*.msi. or download a firmware update using AgileUpdate.

## If You CANNOT Boot from the Hard Drive

During the boot process, you may not reach the screen that displays ‘**Please select the operating system to start**’. You may be able to boot from a floppy disk if your PNA Hard drive is labeled ‘S.02.xx’ and ‘S.05.50’. If labeled with a different code, the process will fail at step 2 below, but no further damage will be done.

Make this floppy disk using a computer that is currently running DOS or Windows 95/98/ME/XP. Note: Windows NT or 2000 cannot be used.

To create this floppy disk, right-click on the A: drive in Windows Explorer, select **Format**, then select **Make System Disk**. This may be called **copy system files**, or **Create an MS-DOS startup disk**.

To boot from this floppy disk:

1. Insert the system disk that you created into the PNA and restart. The PNA should detect the floppy disk and boot from it. See below if it does NOT boot.
2. At the DOS prompt (A:\>), type **CD C:** and press **Enter**. You are really changing to the D: drive because a DOS operating system does not recognize the NTFS format and



assumes the first valid drive is C:.

3. Type **C:\minint\bin\recovery.bat** and press **Enter**. If this returns an error, type **C:\Autoexec.bat**
4. Continue with **Operating System Restoration Procedure** (above).

**If the PNA does not boot from the floppy**, then change the PNA Bios settings. Due to bios revisions, this procedure may vary slightly from the following:

1. Restart the PNA
2. When the Agilent logo appears, press F2 (function key) on the keyboard a few times. The Bios menu will appear after several seconds.
3. Select **Boot** using the keyboard arrows. Read "Item Specific Help" to learn to move the **Removable Devices / floppy drive** selection to a boot position before the **Hard Drive** selection.
4. Select **Save** then **Exit**.
5. To prevent an error message when a floppy disk is inserted while powering up, use this procedure to resume booting from the hard drive.



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## 3 Getting Help with Your Analyzer

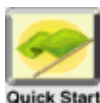
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### Help System

Use on-line Help to quickly reference programming and user documentation. English, Chinese, French, German, Japanese, and Spanish language versions are available through the Help menu. (Programming information is only available in English.)

We recommend that you begin by accessing Help and reading the topics in the Quick Start section. To access this information:

- On the analyzer's front panel, press the **Help** button. Or, on the PNA display, click **Help**, **Network Analyzer Help**.
- Click **Quick Start** in PNA Help.



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### PNA on the Internet

The PNA Series Network Analyzer System Web page is another resource for help with the analyzer. This Web page has links to information about equipment and literature related to PNA series network analyzers. You can visit the Agilent Technologies web site where you can find product information, service notes, training information, application notes, online manuals, and other information. To access the PNA Series Network Analyzer System Web page:

- Click **Help**.
  - Or, on the analyzer's front panel, press **Menu/Dialog**. Next, in the **NAVIGATION BLOCK**, press the Left Tab several times to move to **Help**.
- Click **Network Analyzer on the Web**.

## Contacting Agilent

Assistance with test and measurements needs and information on finding a local Agilent office are available on the Web at:

[www.agilent.com/find/assist](http://www.agilent.com/find/assist)

If you do not have access to the Internet, please contact your Agilent field engineer.

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<b>NOTE</b>	In any correspondence or telephone conversation, refer to the Agilent product by its model number and full serial number. With this information, the Agilent representative can determine whether your product is still within its warranty period.
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## 4 Safety, Regulatory, and Environmental Information

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### Maintenance

To remove dirt or dust from the external case of the network analyzer, clean the case using a dry or slightly-dampened cloth only.

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<b>WARNING</b>	<b>To prevent electrical shock, disconnect analyzer from mains before cleaning. Use a dry cloth or one slightly dampened with water to clean the external case parts. Do not attempt to clean internally.</b>
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### Shipment for Service

Contact Agilent Technologies for instructions on where to ship the analyzer for service. Refer to [“Contacting Agilent” on page 3-2](#).

Ship the analyzer using the original packaging materials. Shipping the analyzer in anything other than the original packaging may result in non-warranted damage.

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### Safety Symbols

The following safety symbols are used throughout this manual. Familiarize yourself with each of the symbols and its meaning before operating this instrument.

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<b>CAUTION</b>	Caution denotes a hazard. It calls attention to a procedure that, if not correctly performed or adhered to, would result in damage to or destruction of the product. Do not proceed beyond a caution note until the indicated conditions are fully understood and met.
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<b>WARNING</b>	<b>Warning denotes a hazard. It calls attention to a procedure which, if not correctly performed or adhered to, could result in injury or loss of life. Do not proceed beyond a warning note until the indicated conditions are fully understood and met.</b>
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## General Safety Considerations

### Safety Earth Ground

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<b>CAUTION</b>	<b>The Mains wiring and connectors shall be compatible with the connector used in the premise electrical system. Failure to ensure adequate earth grounding by not using the correct components may cause product damage and serious injury.</b>
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### Before Applying Power

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<b>WARNING</b>	<b>If this product is not used as specified, the protection provided by the equipment could be impaired. This product must be used in a normal condition (in which all means for protection are intact) only.</b>
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<b>WARNING</b>	<b>If an instrument handle is damaged, you should replace it immediately. Damaged handles can break while you are moving or lifting the instrument and cause personal injury or damage to the instrument.</b>
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<b>CAUTION</b>	<b>This instrument has autoranging line voltage input. Be sure the supply voltage is within the specified range.</b>
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<b>CAUTION</b>	<b>This product is designed for use in Installation Category II and Pollution Degree 2 per IEC 61010-1:2001 and 664 respectively.</b>
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<b>CAUTION</b>	<b>Ventilation Requirements:</b> When installing the product in a cabinet, the convection into and out of the product must not be restricted. The ambient temperature (outside the cabinet) must be less than the maximum operating temperature of the instrument by 4 °C for every 100 watts dissipated in the cabinet. If the total power dissipated in the cabinet is greater than 800 watts, then forced convection must be used.
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<b>CAUTION</b>	<b>The measuring terminals on this instrument are designed to be used with external signals described in Measurement Category I, but NOT with external signals described in Categories II, III, and IV. The input of this instrument cannot be connected to the mains.</b>
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## Servicing

<b>WARNING</b>	<b>These servicing instructions are for use by qualified personnel only. To avoid electrical shock, do not perform any servicing unless you are qualified to do so.</b>
<b>WARNING</b>	<b>Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended. Discard used batteries according to local ordinances and/or manufacturer's instructions.</b>
<b>WARNING</b>	<b>Procedures described in this document may be performed with power supplied to the product while protective covers are removed. Energy available at many points may, if contacted, result in personal injury.</b>
<b>WARNING</b>	<b>No operator serviceable parts inside. Refer servicing to qualified personnel. To prevent electrical shock, do not remove covers.</b>
<b>WARNING</b>	<b>The opening of covers or removal of parts may expose dangerous voltages. Disconnect the instrument from all voltage sources while it is being opened.</b>
<b>WARNING</b>	<b>For continued protection against fire hazard, replace line fuse only with same type and rating. The use of other fuses or material is prohibited.</b>
<b>WARNING</b>	<b>The detachable power cord is the instrument disconnecting device. It disconnects the mains circuits from the mains supply before other parts of the instrument. The front panel switch is only a standby switch and is not a LINE switch (disconnecting device).</b>

## Regulatory Information

This section contains information that is required by various government regulatory agencies.

### Instructions for Use

This product has been designed and tested in accordance with accepted industry standards, and has been supplied in a safe condition. The documentation contains information and warnings that must be followed by the user to ensure safe operation and to maintain the product in a safe condition.

Install the instrument so that the detachable power cord is readily identifiable and is easily reached by the operator.

The detachable power cord is the instrument disconnecting device. It disconnects the mains circuits from the mains supply before other parts of the instrument. **The front panel switch is only a standby switch and is not a LINE switch (disconnecting device).**

Alternatively, an externally installed switch or circuit breaker (which is readily identifiable and is easily reached by the operator) may be used as a disconnecting device.

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<b>WARNING</b>	<b>The PNA display must remain in the 16 bit color setting in order to comply with international emissions regulations.</b>
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## Instrument Markings



The instruction documentation symbol. The product is marked with this symbol when it is necessary for the user to refer to the instructions in the documentation.



The CE mark is a registered trademark of the European Community. (If accompanied by a year, it is when the design was proven.)



The CSA mark is a registered trademark of the Canadian Standards Association.

ICES/NMB-001

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

ISM1-A

This is a symbol of an Industrial Scientific and Medical Group 1 Class A product.



This is a required mark signifying compliance with an EMC requirement. The C-Tick mark is a registered trademark of the Australian Spectrum Management Agency.



This product complies with the WEEE Directive (2002/96/EC) marking requirements. The affixed label indicates that you must not discard this electrical/ electronic product in domestic household waste.

Product Category: With reference to the equipment types in the WEEE Directive Annex I, this product is classed as a "Monitoring and Control instrumentation" product.

Do not dispose in domestic household waste.

To return unwanted products, contact your local Agilent office, or see <http://www.agilent.com/environment/product/> for more information.

The ON and STANDBY symbols are used to mark the positions of the instrument power line switch.



ON symbol



STANDBY symbol

## Declaration of Conformity

A declaration of conformity is on file for the PNA models, and a copy is available upon request. See [“Contacting Agilent” on page 3-2](#).

## Compliance with German Noise Requirements

This is to declare that this instrument is in conformance with the German Regulation on Noise Declaration for Machines (Laermangabe nach der Maschinenlaermrrordnung –3.GSGV Deutschland).

Acoustic Noise Emission/Geraeuschemission	
LpA<70 dB	Lpa<70 dB
Operator Position	am Arbeitsplatz
Normal Operation	normaler Betrieb
per ISO 7779	nach DIN 45635 t. 19

## EMC Information

Complies with European EMC Directive 89/336/EEC, amended by 93/68/EEC

- IEC/EN 61326

This product complies with the Electrostatic Discharge immunity requirement in IEC/EN 61326 using performance criterion C. Degradation of the USB port can occur during the instance of an electrostatic discharge. The USB device operation can be recovered by unplugging and reconnecting the device to the USB port.

This product complies with the radiated electromagnetic field immunity requirement in IEC/EN 61326 using performance criterion B. Degradation of some product specifications can occur in the presence of ambient electromagnetic fields. The product self-recovers and operates as specified when the ambient field is removed.

This product complies with the Electrical Fast Transient/Burst immunity requirement in IEC/EN 61326 using performance criterion B. Degradation of some product specifications can occur during the instances of power line electrical transients. The product self-recovers and operates as specified after the fast transients are removed.

- CISPR Pub 11 Group 1, class A
- AS/NZS CISPR 11:2002
- ICES/NMB-001

## Safety Information

Complies with European Low Voltage Directive 73/23/EEC, amended by 93/68/EEC

- IEC/EN 61010-1:2001
- Canada: CSA C22.2 No. 61010-1:2001
- USA: UL 61010-1

# Environmental Information

**NOTE** Samples of this product have been type-tested in accordance with the Agilent Environmental Test Manual and verified to be robust against the environmental stresses of storage, transportation and end-use; those stresses include but are not limited to temperature, humidity, shock, vibration, altitude and power-line conditions. Test methods are aligned with IEC 60068-2 and levels are similar to MIL-PRF-28800F Class 3.

**Table 4-1 Environmental Information**

Parameter	Required Values/Ranges
Temperature	
Operating	0 °C to +40 °C  The instrument powers-up and displays no error messages within this temperature range (except for “source unleveled” error message that may occur at temperatures outside the specified performance temperature range of $25 \pm 5$ °C).
Storage	–40 °C to +70 °C
Error-corrected range	23 °C $\pm$ 3 °C with less than 1 °C deviation from calibration temperature
Altitude	
Operating	0 to 4,600 meters ( $\approx$ 15,000 feet)
Relative humidity	Type tested, 0% to 95% at 40 °C, non-condensing

## Warranty

The actual warranty on your instrument depends on the date it was ordered as well as whether or not any warranty options were purchased at that time. To determine the exact warranty on your instrument, contact Agilent Technologies with the model and serial number of your instrument. Refer to [“Contacting Agilent” on page 3-2](#).