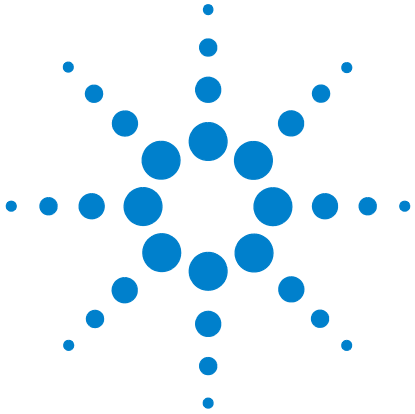

Agilent 855xxA Series CalPods and 85523A CalPod Controller

85530A 20 GHz CalPod (Standard)

85531A 20 GHz CalPod (Temperature Characterized)

85540A 40 GHz CalPod (Standard)

85541A 40 GHz CalPod (Temperature Characterized)

85523A CalPod Controller

Use this manual with the following document:

PNA Series Network Analyzer Online Help System

User's Guide

Edition, April 8, 2011

85523-90001

Agilent Technologies

Notices

Manual Part Number

85523-90001

Edition

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Safety Notices

The following safety notes are used throughout this document. Familiarize yourself with each of these notes and its meaning before performing any of the procedures in this document.

CAUTION

A **CAUTION** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a **CAUTION** notice until the indicated conditions are fully understood and met.

WARNING

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Agilent Technologies 855xxA Series CalPod

Introducing the Agilent 855xxA Series CalPod

Congratulations on your purchase from Agilent Technologies, Inc.

To get the most out of your purchase, it is recommended that this *User's Guide* be read carefully and completely.

Agilent 855xxA Series CalPod eliminate errors due to cable or test system stability and operate end-to-end on very long cables simplifying the process of recalibrating the PNA without requiring the removal of the Device Under Test (DUT) or the physical connection of standards. This allows recalibration from a remote location such as when the DUT is in a temperature chamber.

Agilent 855xxA Series CalPod Models:

- Agilent 85530A 20 GHz CalPod (Standard)
- Agilent 85531A 20 GHz CalPod (Temperature Characterized)
- Agilent 85540A 40 GHz CalPod (Standard)
- Agilent 85541A 40 GHz CalPod (Temperature Characterized)

Each Agilent 855xxA Series CalPod is controlled with the Agilent Technologies 85523A CalPod Controller.

In this document...

This document describes the set up process of all software and hardware required for Agilent 855xxA Series CalPods, how to confirm operation, and how to use Agilent 855xxA Series CalPods with an Agilent PNA microwave network analyzer.

Quick Steps...

1. Install the Agilent 855xxA Series CalPod software and update the Agilent PNA microwave network analyzer firmware to A.09.33.05 or later. (Refer to http://na.tm.agilent.com/pna/calpod.)
2. Open the CalPod dialog and assign CalPods to ports on the PNA.
3. Using short cables, connect the CalPods to the ports, set up your measurements, and calibrate at the CalPod RF2 ports.
4. Save this initial calibration using the **Initialize CalPod** function. Save this state (you won't need to calibrate again for this setup).
5. Replace the short cables if needed with longer cables, connect the CalPods directly to the DUT, and use the **Recorrect** function to refresh the calibration.
6. Repeat the **Recorrect** function whenever drift or instability degrades the measurement.

Detailed Steps...

Step 1. Inspect the Shipment

NOTE The contents of your shipment may vary depending on the items that were ordered and may not contain all items shown in the following tables.

Inspect the shipping container
If the container or packing material is damaged, it should be kept until the contents of the shipment have been checked mechanically and electrically.

If there is physical damage, refer to "Contacting Agilent" on page 25.

Keep damaged shipping materials (if any) for inspection by the carrier and an Agilent Technologies representative.

Table 1 855xxA Series CalPods and 85523A CalPod Controller

Agilent 85530A 20 GHz CalPod (Standard)*
Agilent 85540A 40 GHz CalPod (Standard)*

RF2 Connector, 2.92 mm (m)

CTRL Connector, 9 pin

RF1 Connector, 2.92 mm (f)

Agilent 85531A 20 GHz CalPod (Temperature Characterized)*
Agilent 85541A 40 GHz CalPod (Temperature Characterized)*

USB Drive - Each Temperature Characterized CalPod comes with a USB Drive that has a matching serial number. Each USB Drive contains Temperature Characterization data that is unique to each Agilent 85531A 20 GHz CalPod or Agilent 85541A 40 GHz CalPod.

Agilent 85523A CalPod Controller*

Agilent 0960-2955 USB 2.0 to LAN Adapter, 7.5 in†

* For CalPod drive cables, see Table 2, "855xxA Series CalPods Drive Cables," on page 6.

† The device driver software for the USB 2.0 to LAN Adapter is installed during the procedure called "Step 4. Download the CalPod Installation Package" on page 9.

Drive Cable Path *- is the total cable length of the CTRL drive cable path.*

If additional drive cable lengths are required, see Table 5 on page 23.

Table 2 855xxA Series CalPods Drive Cables

Agilent 85552A 20 GHz CalPod drive cable* (2 meter, 28 AWG) used with:
- Agilent 85530A 20 GHz CalPod (Standard)
- Agilent 85531A 20 GHz CalPod (Temperature Characterized)

Agilent 85553A 40 GHz CalPod drive cable* (2 meter, 28 AWG) used with:
- Agilent 85540A 40 GHz CalPod (Standard)
- Agilent 85541A 40 GHz CalPod (Temperature Characterized)

Agilent 85554A 20 GHz and 40 GHz CalPod drive cable extension† (10 meter, 22 AWG)

* Drive cables for 20 GHz and 40 GHz CalPod models are not interchangeable.

† CalPod drive cable extensions may be used with either the Agilent 85552A 20 GHz CalPod drive cable or the Agilent 85553A 40 GHz CalPod drive cable. A maximum total drive cable length of 302 meters can be used.

Step 2. Confirm the Models, Firmware and Installed Options

For information on updating the Application Code Version or adding Options to the PNA, refer to the web links listed under "Websites with Additional PNA Information Related to CalPods" on page 20.

1 Plug in the AC line cord and turn power on to the PNA.

2 Select **Start/Programs/Agilent Network Analyzer/Network Analyzer.**

3 Select the **Help** pull down menu.

4 Select **About Network Analyzer** and confirm the following (see Table 3):

   a Confirm the PNA Model.

   b Confirm the PNA Firmware Version (Application Code Version).

   c Confirm the PNA has Option 301 or 302 installed.

5 Select **OK** after confirming all of the above.

6 Select the **File** pull down menu and select **Minimize Application**.

Table 3 PNA Models, Firmware, and Options Required for 855xxA Series CalPods

Network Analyzer Models*	Network Analyzer Firmware Version (Application Code Version)	Network Analyzer Options (CalPod License)	Agilent 855xxA Series CalPod Models
N5241A PNA-X N5242A PNA-X N5244A PNA-X N5245A PNA-X N5247A PNA-X E8361C PNA E8362C PNA E8363C PNA E8364C PNA N5230C PNA-L	A.09.33.05 or later	Option 301 or Option 302†	85530A 20 GHz CalPod‡ (Standard) RF2 Connector, 2.92 mm (m) RF1 Connector, 2.92 mm (f)
		Option 302**	85531A 20 GHz CalPod‡ (Temperature Characterized) RF2 Connector, 2.92 mm (m) RF1 Connector, 2.92 mm (f)
		Option 301 or Option 302†	85540A 40 GHz CalPod‡ (Standard) RF2 Connector, 2.92 mm (m) RF1 Connector, 2.92 mm (f)
		Option 302**	85541A 40 GHz CalPod‡ (Temperature Characterized) RF2 Connector, 2.92 mm (m) RF1 Connector, 2.92 mm (f)

* Only the above listed Agilent Network Analyzer Models support the use of 855xxA Series CalPods.

† Option 301 is a software application that adds support for Standard models 85530A 20 GHz CalPod and 85540A 40 GHz CalPod. Temperature Characterized models 85531A 20 GHz CalPod and 85541A 40 GHz CalPod may also be used with Option 301 in non-temperature compensated mode.

‡ Head connectors of 85552A 20 GHz CalPod drive cables are different from CTRL connectors on 85553A 40 GHz CalPod drive cables and only connect to an 85530A 20 GHz CalPod or an 85531A 20 GHz CalPod. (See Table 2 on page 6.)

** Option 302 is a software application that adds support for Temperature Characterized models 85531A 20 GHz CalPod and 85541A 40 GHz CalPod. Temperature Characterized models 85531A 20 GHz CalPod and 85541A 40 GHz CalPod may also be used with Option 301 in non-temperature compensated mode.

Step 3. Confirm System Configuration and Misc. Equipment

The following steps assume a simple, basic CalPod configuration. For information on more complex configurations, see the Agilent 855xxA Series CalPod Information web page at: http://na.tm.agilent.com/pna/calpod

The following miscellaneous equipment may be required when using CalPods:

- **LAN Cable** - required to connect the PNA to CalPod Controller. To determine if a cross-over LAN cable is required, refer to "Connect PNA to CalPod Controller with LAN Cable" on page 13.
- **RF Cables** - required to connect each CalPod to a PNA port. Attenuation loss in these cables may degrade performance. Information about the typical performance degradation is contained in the *Agilent 855xxA Series CalPod Performance Characteristics* document (85523-90003) and is available at: http://na.tm.agilent.com/pna/calpod/calpod_perf_char.pdf
- **RF Adapters** - are required if the Device Under Test (DUT) connectors are not compatible with the CalPod RF2 connector. RF adapters may also be required between PNA ports and cable connectors and is dependent on the connector types being used.
- **Calibration Kit or ECal** - compatible with DUT connectors.
- **(Optional) CalPod Drive Cable Extensions** - when CalPod drive cable extensions are used, the total length of cabling between a CalPod Controller port and a CalPod must not exceed 302 meters.

Step 4. Download the CalPod Installation Package

NOTE The following steps assume that the *CalPod Installation Package* has not previously been installed on the PNA.

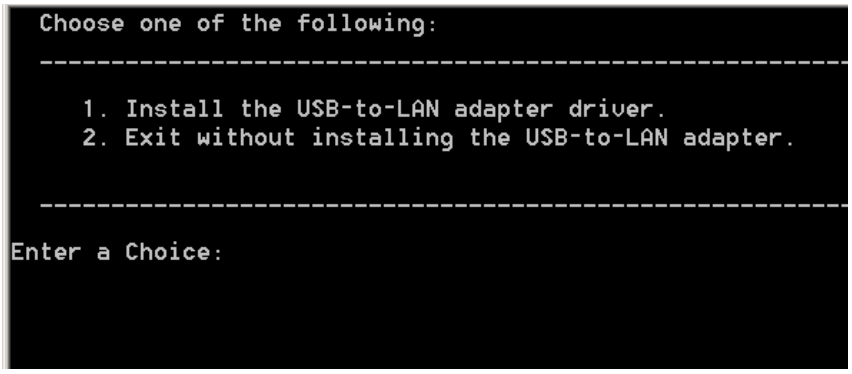
If unsure, refer "Determining the CalPod Software Version" on page 20.

CalPod Installation Package *- is a software package that includes all software that is required for full CalPod operation. It is compatible with PNA Application Code Version A.09.33.05 or later.*

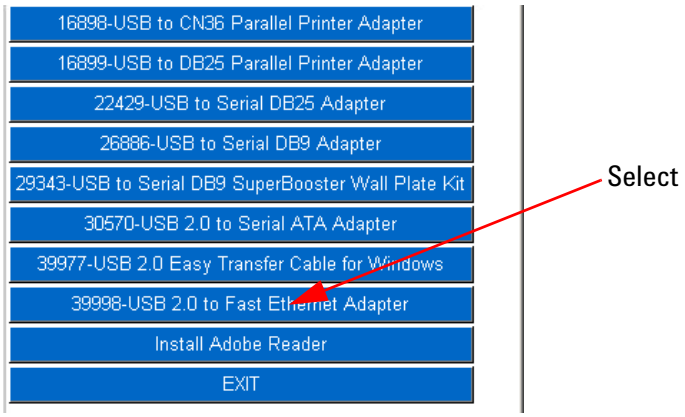
Save vs. Run from the Internet *The "CalPod Installation Package" must be saved to the PNA and then run.*

1. Select the **File** pull down menu and select **Minimize Application**.
2. Connect a LAN cable to the PNA that gives it access to the Internet.
3. Select **Start/Programs/Internet Explorer** and access the Agilent 855xxA Series CalPod website at: http://na.tm.agilent.com/pna/calpod
4. Scroll down the web page and select the link titled: "**Download the 30 MB CalPod Installation Package**."
5. Select **Save** at the *File Download - Security Warning* prompt to download the *CalPod Installation Package* to the PNA.
6. When the download is complete, run the *CalPod Installation Package* on the PNA and follow the prompts.

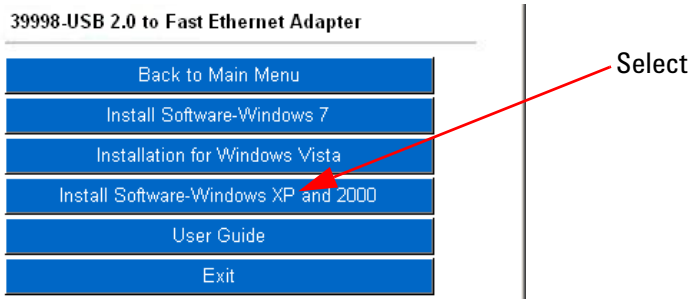
   Toward the end of the installation process, a screen is displayed that allows the driver software for the USB 2.0 to LAN Adapter to be installed.
7. Select **1. Install the USB-to-LAN adapter driver**.



8 Select **39998-USB 2.0 to Fast Ethernet Adapter** from the list.



9 Select **Install Software-Windows XP and 2000** from the list.



NOTE

If there is a prompt to completely remove the selected application, perform the following:

a Click **Yes**.

b Wait for the prompts to continue, then click **Cancel**, wait for ten seconds, and click **Finish**.

c Repeat step 9 to re-install the drivers application.

10 Wait for an Install Shield Wizard screen with a “Finish” button. When it appears, select **Finish** and then **Exit**.

11 Proceed to “Step 5. Select a LAN Connection Scheme" on page 11.

Step 5. Select a LAN Connection Scheme

Select one of the following LAN connection schemes:

- "Connect PNA to CalPod Controller with USB to LAN Adapter" on page 12

  This scheme is recommended.

  OR

- "Connect PNA to CalPod Controller with LAN Cable" on page 13

  This LAN connection scheme does not allow the PNA to access the Internet while connected to the 85523A CalPod Controller.

NOTE

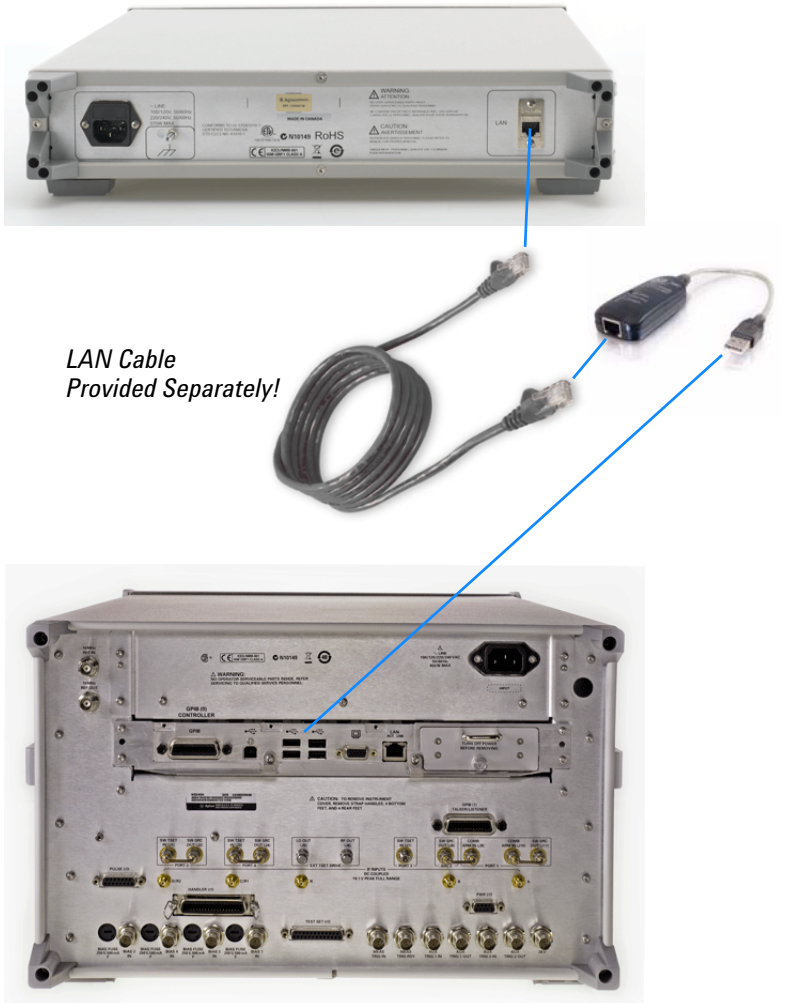
- Agilent 85523A CalPod Controllers do not support DHCP networking!
- The Agilent 85523A CalPod Controller must be set to a static IP Address.
- For additional information on making connections to the LAN using network switches and network hubs, contact your network administrator.

Connect PNA to CalPod Controller with USB to LAN Adapter

LAN Cable Provided Separately!
- A LAN cable is required, but is not included.

LAN Cable Type *- This connection scheme can use either a standard LAN cable or a cross over LAN cable.*

Figure 1 Connect PNA to CalPod Controller with USB 2.0 to LAN Adapter



1. Connect a LAN cable to the rear of the 85523A CalPod Controller and connect the other end to the USB 2.0 to LAN Adapter.
2. Connect the USB 2.0 to LAN Adapter to a USB port on the PNA. (Typically this is on the rear of the PNA, but any USB port can be used.)
3. Verify that AC line cords are connected to both the PNA and CalPod Controller and that they are powered on.
4. Select the **File** pull down menu and select **Minimize Application**.
5. Run the **CalPod LAN Config** icon on the PNA desktop and select option **2. USB-to-LAN Adapter**.
6. If DHCP operation is desired on the built-in PNA LAN adapter, run the **CalPod LAN Config** icon again and select option 3.

Connect PNA to CalPod Controller with LAN Cable

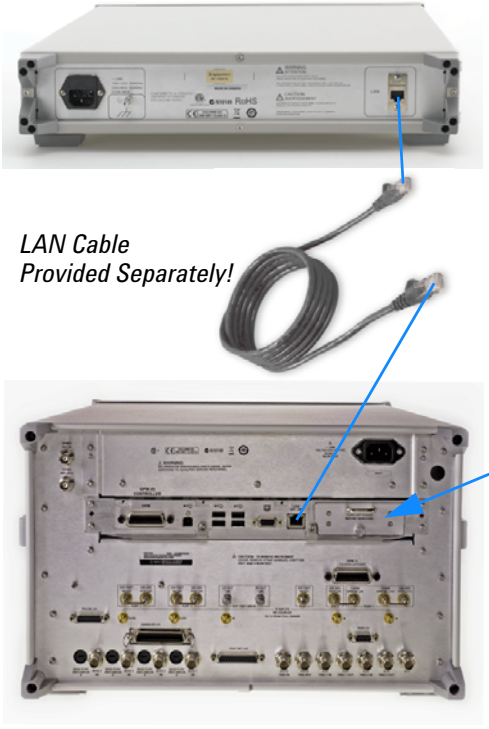
LAN Cable Provided Separately! *- A LAN cable is required, but is not included.*

Cross-Over LAN Cable *- is a type of Ethernet cable used to connect computing devices together directly where they would normally be connected via a network switch, hub, or router. Some PNA models require a cross-over LAN cable.*

To Determine if a Cross-Over LAN Cable is required:
- If using a PNA model E836xC or N5230C, a cross-over LAN cable is required.

- If using a PNA-X model N524xA, see Figure 3.

Figure 2 Connect PNA to CalPod Controller with LAN Cable



1. Connect an appropriate type of LAN cable to the rear of the 85523A CalPod Controller.
2. Connect the other end of the LAN cable directly to the PNA. There is no network connection. The PNA must be configured to communicate with the static IP address of the CalPod Controller.
3. Verify that AC line cords are connected to both the PNA and CalPod Controller and that they are powered on.
4. Select the **File** pull down menu and select **Minimize Application**.
5. Run the **CalPod LAN Config** icon on the PNA desktop and select option **1. Direct Cable Connect.**

Figure 3 LAN Cable Requirements for PNA-X N524xA Models

Use a Cross-Over LAN cable.

Use any LAN cable if using a removable hard drive.

Step 6. Load Temperature Characterization Data

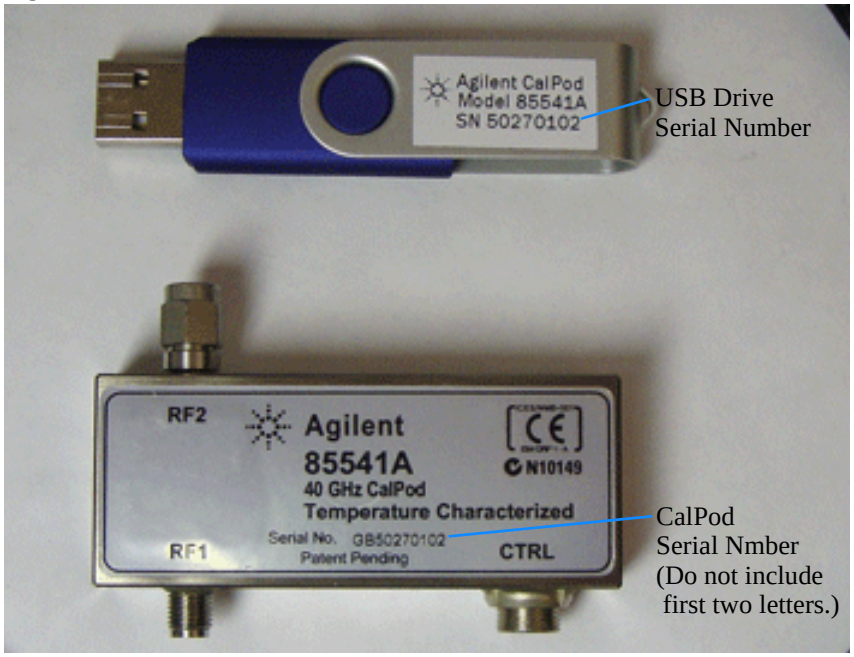
NOTE The following process is **not required** for a 85530A 20 GHz CalPod or 85540A 40 GHz CalPod since these models do not have Temperature Characterization data.

Load temperature characterization data for each 85531A 20 GHz CalPod or 85541A 40 GHz CalPod:

1. Insert the USB drive (containing matched Temperature Characterization data) into a USB port on the Agilent PNA microwave network analyzer.
2. To access the Windows desktop when the PNA application is active, select the **File** pull down menu and select **Minimize Application**.
3. Right-click on **Start** and select **Explore**, find the USB drive, and double-click **setup.exe** to run the program.
4. When the dialog "CalPod Thermal Characterization Data Install Utility" opens, click "***I accept license terms...***" and wait for additional text to be displayed. This loads CalPod Temperature Characterization data onto the PNA.

   Note that the serial number on each USB drive matches the serial number on each 85531A 20 GHz CalPod or 85541A 40 GHz CalPod; do not include the first two letters.
5. When "PNA restore archive complete" is displayed, close the window.

Figure 4 USB Drive Matches Serial Number on Each CalPod



Step 7. Configure 855xxA Series CalPods

In this section, complete the following process:

If additional information is needed about any of the dialog boxes shown in this process, refer to "Reference Information" on page 20.

1. Connect each CalPod to the CalPod Controller

For CalPod drive cables, see Table 2, "855xxA Series CalPods Drive Cables," on page 6.

2. Start the PNA Application.

Start/Programs/Agilent Network Analyzer/Network Analyzer

3. Start the CalPod Dialog

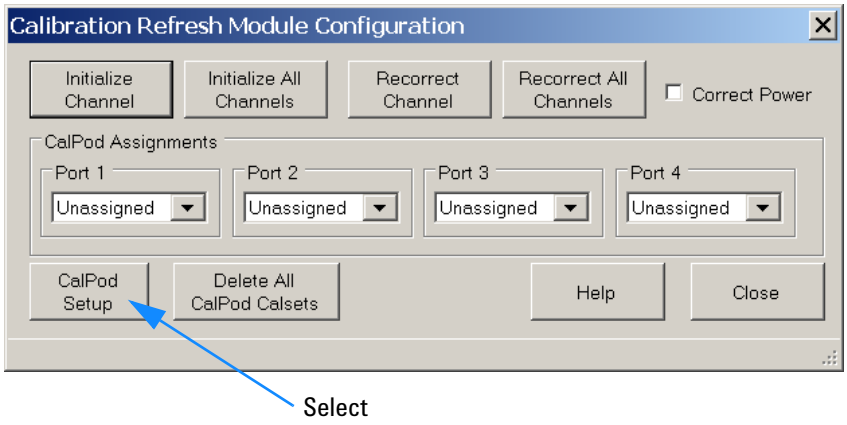
Using the PNA front panel HARDKEYs [softkeys]:

This dialog can also be started using a mouse and the PNA pull-down menus:
*a. Click **Response***
*b. then **Cal***
*c. then **Calpod***
*d. then **Calpod...***

a Press **CAL**
b then **[More]**
c then **[Calpod]**
d then **[Calpod...]**

NOTE If a "Windows Security Alert" appears that is related to the etrak Api, select "Unblock."

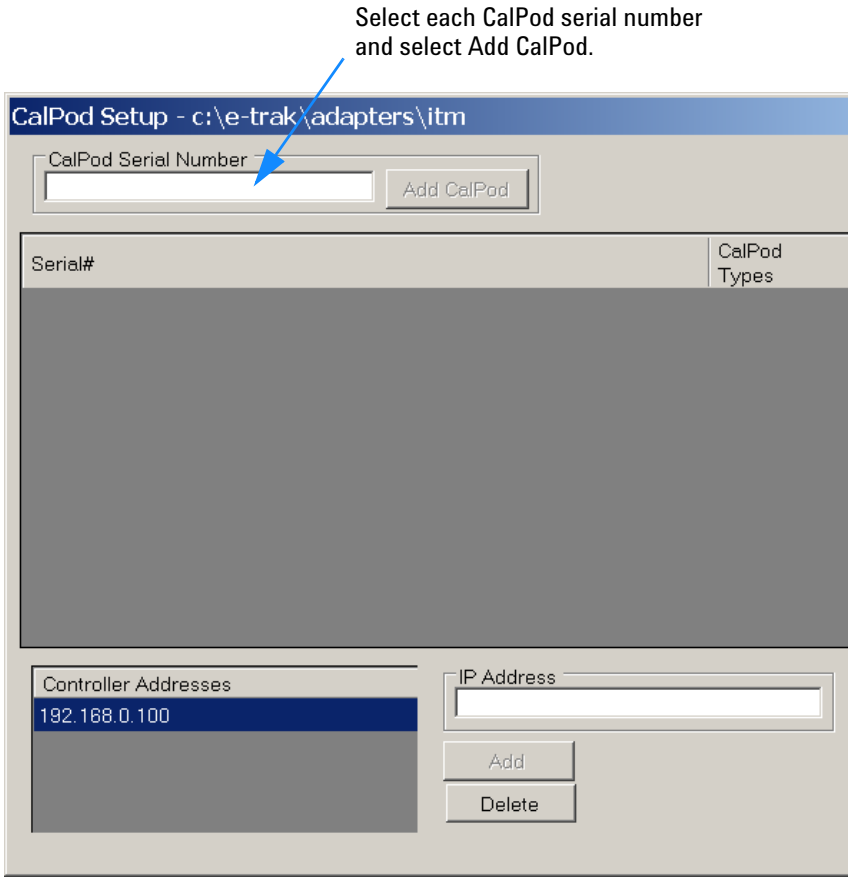
4. Select CalPod Setup



Help
The Help button links to CalPod information in the built-in PNA Help.

Refer to the web links listed under "Websites with Additional PNA Information Related to CalPods" on page 20.

5. Enter Each CalPod Serial Number



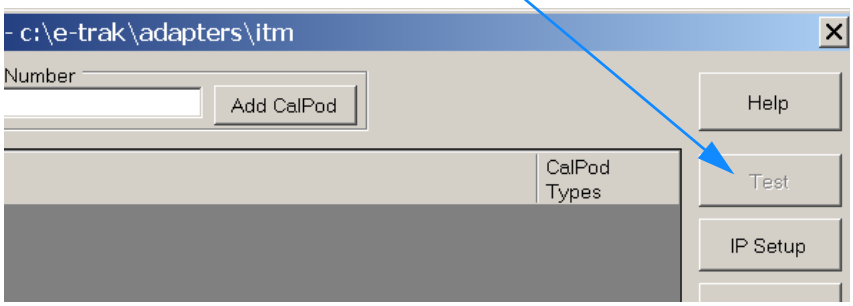
CalPod Types
listed as "STADARD" refer to the: Agilent 85530A 20 GHz CalPod and Agilent 85540A 40 GHz CalPod and require software Option 301 or 302.

CalPod Types
listed as "THERMAL" refer to the: Agilent 85531A 20 GHz CalPod and Agilent 85541A 40 GHz CalPod and require software Option 302.

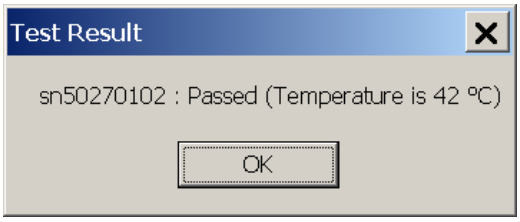
In order for a CalPod to be listed as "THERMAL", its Temperature Characterization data must have been installed previously in "Step 6. Load Temperature Characterization Data" on page 14. Without its Temperature Characterization data loaded, each CalPod will be listed as a "STADARD."

6. Test Each CalPod to Verify that it is Working

Highlight a CalPod from the list and select Test.



- If Test Result shows Passed, the CalPod is functioning.



- If Test Result shows Failed
  and the window text contains the words “Controller @ ..... : Failed”
  - Check that the CalPod Controller is powered on and connected to the PNA correctly. (See “Step 5. Select a LAN Connection Scheme" on page 11.)
  - If all connections appear to be correct and the USB 2.0 to LAN Adapter is being used, set a static IP address on the PNA. Refer to “Setting a Static IP Address on the PNA (when using USB 2.0 to LAN Adapter)" on page 21.
  - If all connections appear to be correct and there is a direct connection between the PNA and the CalPod Controller (no USB 2.0 to LAN Adapter), check that a cross-over LAN cable is being used. (To determine if a cross-over LAN cable is required, see “Connect PNA to CalPod Controller with LAN Cable" on page 13.)
- If Test Result shows Failed
  and the window text contains the words “sn..... : Failed”
  - Check that the CalPod is properly connected to CalPod Controller.

Step 8. Perform a 2-Port Calibration

Background:

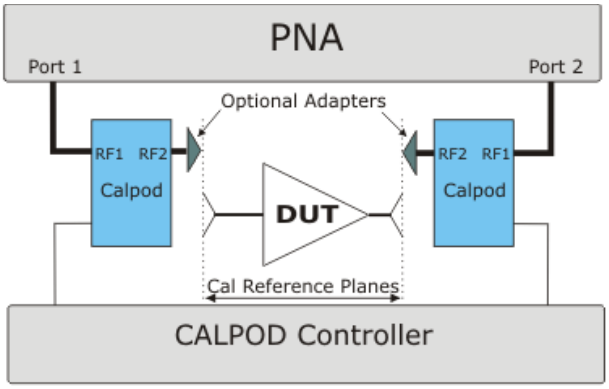
In "Step 7. Configure 855xxA Series CalPods" on page 15, each CalPod was configured with the CalPod dialog and assigned to a port on the PNA.

The following instructions assume CalPods will be connected to Port 1 and Port 2 on the PNA. It also assumes a 2-Port Calibration is used.

Almost any PNA calibration type may be used with CalPods. For details, see "Calibration Types Not Supported by CalPods" on page 21.

For information on PNA traces and channels, see the Quick Start section of the PNA Online Help.

1. Connect the CalPods to the CalPod Controller.
2. Power on the CalPod Controller.
3. Activate the CalPod dialog and confirm that each CalPod is assigned to the expected PNA port. (Activating the CalPod dialog is necessary because it forces the CalPods to the default thru state.)
4. Exit the CalPod dialog.
5. For each CalPod, connect RF1 to the appropriate port on the PNA. The RF cable (and an adapter if required) used for the connection should be very stable. It is critical that the electrical characteristics of the connection between the CalPod and the PNA port remain stable during the calibration and initialization steps below (until step 8 is complete). If required for the DUT, connect an adapter to RF2 on the CalPod.



   The blue boxes represent CalPods with internal Thru, Short, Open, and Load states.
6. Preset the PNA, then set up a two port measurement (S21, etc). This measurement is set up on Channel 1 of the PNA by default.

   Measurement frequencies below 100 MHz are not supported by CalPod software.

NOTE For best results, it is recommended to use a 1 kHz or lower IF BW and perform the calibration with eight averages.

7. Perform a full 2-port calibration on the PNA. At the end of the calibration, click **Save as User CalSet**. Any filename that does not contain "calpod" may be used. Following the final step of the calibration, continue immediately to step 8 without disturbing cables or connections.

NOTE

Notes on the calibration:

- An ECal or a mechanical cal kit may be used to perform the calibration. An ECal is preferred because the RF cables can remain totally undisturbed during the calibration and initialization steps.
- When an ECal is used and multiple connections are required, order the steps such that the final step requires an ECal connection.
- When a mechanical cal kit is used, take precautions to minimize cable movement. Leave the final standards connected through the initialization step below.

---

8 Open the Calpod dialog and click **Initialize Channel** to save this initial calibration. (Response > CalPods > Initialize Channel)

Perform this step only once for each calibration
and perform it immediately after completing the last calibration step.

9 If needed, replace the cable between the PNA port and the CalPod to allow access to the DUT.

10 Connect the CalPods to the DUT and recorrect the calibration (**Response > CalPods > Recorrect Channel**).

The system is now ready to make calibrated measurements on the DUT.

11 When necessary, recorrect the calibration (**Response > CalPods > Recorrect Channel**).

Any of the following actions will cause the current calibration to become invalid and require recorrection:

- Moving the CalPod to the ends of long cables.
- Changing the cables.
- Extreme temperature variations.
- Measurement drift over long time periods.

Reference Information

In this section, reference information is available for the following:

Websites with Additional PNA Information Related to CalPods

- Agilent 855xxA Series CalPod Information
  http://na.tm.agilent.com/pna/calpod
- Agilent 855xxA Series CalPod Performance Characteristics
  http://na.tm.agilent.com/pna/calpod/calpod_perf_char.pdf
- Agilent 855xxA Series CalPod Information in PNA Online Help
  http://na.tm.agilent.com/pna/help/index.html
- Network Analyzer Firmware
  http://na.tm.agilent.com/pna/firmware
- General PNA Documentation
  http://www.agilent.com/find/pna

Determining the CalPod Software Version

The following process determines if CalPod software is installed on the PNA. If CalPod software is installed, the revision level is displayed.

1 In the PNA application, click **Response > Cal > CalPod > CalPod...**
   - If there is no CalPod menu to select, the PNA firmware must be updated.

2 Click **CalPod Setup** when the CalPod dialog window is displayed.
   - If an error is reported, the CalPod software is not installed.
   - If the CalPod Setup window is displayed, click **About** to view the CalPod Software Version.

Calibration Types Not Supported by CalPods

Agilent 855xxA Series CalPod's support almost all PNA S-parameter calibration types. The exceptions are calibration types that do not include a return loss portion for the port connected to the CalPod. An example of an unsupported calibration type is a Response Calibration.

When an unsupported calibration type is used, the CalPod software reports an error during "Initialize Channel."

Setting a Static IP Address on the PNA (when using USB 2.0 to LAN Adapter)

When the CalPod Controller connects to the PNA via the USB 2.0 to LAN Adapter, sometimes it is necessary to manually set a Static IP address on the LAN interface. Multiple installations of the CalPod Installation Package may require this procedure.

1. Minimize the PNA application to access the desktop.
2. Click **Start > Settings > Network Connections**.

   There should be two or more listings under "LAN or High-Speed Internet."

3. Right-click on an item in the list and select **Properties**.

   The listing under "Connect using:" should display "**ASIX AX88772A USB2.0 to Fast Ethernet**."

   If this text is not displayed, try another item in the list under "LAN or High-Speed Internet" until this device is found.

4. In the listing under "This connection uses the following items:", scroll down the list and highlight "**Internet Protocol (TCP/IP)**."
5. Click **Properties** or double-click the item on the list.
6. Enter the IP Address of **192.168.0.1** with a Subnet Mask of **255.255.255.0**.
7. Leave the DNS settings blank.
8. Click **OK** as necessary to close the dialog windows.
9. Return to "Step 7. Configure 855xxA Series CalPods" on page 15 and follow the steps to test and verify that each CalPod is working.

Connecting 1x12 Fan Out Splitters to 855xxA Series CalPods

An Agilent 85556A 20 GHz and 40 GHz CalPod 1x12 fan out splitter is used to connect more than four 855xxA Series CalPods to a 85523A CalPod Controller.

Drive Cable Path *- is the total cable length of the CTRL drive cable path.*

Table 4 1x12 Splitter and 855xxA Series CalPods

Agilent 85554A 20 GHz and 40 GHz CalPod drive cable extension (10 meter, 22 AWG)
Agilent 85556A 20 GHz and 40 GHz CalPod 1x12 fan out splitter
Agilent 85555A 20 GHz and 40 GHz CalPod 1x12 fan out splitter drive cable (2 meter, 22 AWG)

Connects to 855xxA CalPods

The 85555A CalPod 1x12 fan out splitter drive cable connects to the CalPod Controller.

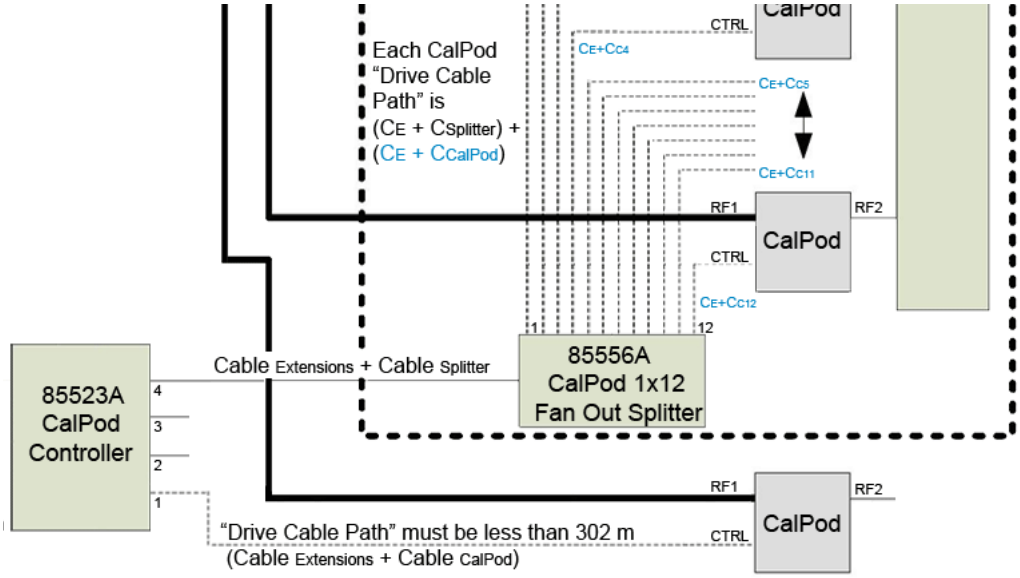
Table 5 Maximum Length of CalPod Drive Cables
= Cable Length Before Splitter + Cable Length After Splitter

Splitter = Agilent 85556A 20 GHz and 40 GHz CalPod 1x12 fan out splitter
Cable $_{Splitter}$ = Agilent 85555A 20 GHz and 40 GHz CalPod 1x12 fan out splitter drive cable (2 m, 22 AWG)
Cable $_{Extension}$ = Agilent 85554A 20 GHz and 40 GHz CalPod drive cable extension (10 meter, 22 AWG)*
Cable $_{CalPod}$ = Agilent 85552A or 85553A CalPod drive cable (2 meter, 28 AWG)

Number of CalPods	No Splitter	Cable Length Before Splitter (from 85523A CalPod Controller to Splitter) with 12 m Cable After Splitter (from Splitter to CalPod) Maximum Length of Drive Cable = (Cable $_{Extensions}$ + Cable $_{Splitter}$) + (Cable $_{Extension}$ + Cable $_{CalPod}$)	Cable Length Before Splitter (from 85523A CalPod Controller to Splitter) with 102 m Cable After Splitter (from Splitter to CalPod) Maximum Length of Drive Cable = (Cable $_{Extensions}$ + Cable $_{Splitter}$) + (Cable $_{Extensions}$ + Cable $_{CalPod}$)
1	**302 m** = 300 m + 2 m	**264 m** = (250 m + 2 m) + (10 m + 2 m)	**304 m** = (200 m + 2 m) + (100 m + 2 m)
2	**302 m** = 300 m + 2 m	**154 m** = (140 m + 2 m) + (10 m + 2 m)	**204 m** = (100 m + 2 m) + (100 m + 2 m)
4	**302 m** = 300 m + 2 m	**84 m** = (70 m + 2 m) + (10 m + 2 m)	**144 m** = (40 m + 2 m) + (100 m + 2 m)
6	-	**54 m** = (40 m + 2 m) + (10 m + 2 m)	**134 m** = (30 m + 2 m) + (100 m + 2 m)
8	-	**44 m** = (30 m + 2 m) + (10 m + 2 m)	**124 m** = (20 m + 2 m) + (100 m + 2 m)
10	-	**34 m** = (20 m + 2 m) + (10 m + 2 m)	**114 m** = (10 m + 2 m) + (100 m + 2 m)
12	-	**34 m** = (20 m + 2 m) + (10 m + 2 m)	**114 m** = (10 m + 2 m) + (100 m + 2 m)

* Various lengths of CalPod drive cables are formed by daisy chaining 10 meter lengths of 85554A CalPod Drive Cable $_{Extensions}$.

Figure 5 Maximum Length of CalPod Drive Cables



Service Information

WARNING **No operator serviceable parts inside. Refer servicing to qualified personnel. To prevent electrical shock do not remove covers.**

WARNING **These servicing instructions are for use by qualified personnel only. To avoid electrical shock, do not perform any servicing unless you are qualified.**

Contacting Agilent

Assistance with test and measurement needs, and information on finding a local Agilent office are available on the Internet at:

http://www.agilent.com/find/assist

You can also purchase accessories or documentation on the Internet at:

http://www.agilent.com/find

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

NOTE In any correspondence or telephone conversation, refer to the product by its model number and full serial number. With this information, the Agilent representative can determine whether your unit is still within its warranty period.

Safety and Regulatory Information for the Agilent 85523A CalPod Controller

Review this product and related documentation to familiarize yourself with safety markings and instructions before you operate the instrument. 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.

Before Applying Power

Verify that the premises electrical supply is within the range of the instrument. The instrument has an autoranging power supply.

WARNING **To prevent electrical shock, disconnect the Agilent PNA microwave network analyzer from mains power supply before cleaning. Use a dry cloth or one slightly dampened with water to clean the external case parts. Do not attempt to clean internally.**

Connector Care and Cleaning

If alcohol is used to clean the connectors, the power cord to the instrument must be removed. All cleaning should take place in a well ventilated area. Allow adequate time for the fumes to disperse and moist alcohol to evaporate prior to energizing the instrument.

WARNING **Keep isopropyl alcohol away from heat, sparks, and flame. Store in a tightly closed container. It is extremely flammable. In case of fire, use alcohol foam, dry chemical, or carbon dioxide; water may be ineffective.**

Declaration of Conformity

A European Union (EU) declaration of conformity exists for the Agilent 85523A CalPod Controller and a copy is available upon request. A copy is also available on the Agilent Technologies website at: http://regulations.corporate.agilent.com/DoC/search.htm

Shipping Instructions

You must always call the Agilent Technologies Instrument Support Center to initiate service before retuning your instrument to a service office. See "Contacting Agilent" on page 25. Always transport or ship the instrument using the original packaging if possible. If not, comparable packaging must be used. Attach a complete description of the failure symptoms.

Compliance with Canadian EMC Requirements

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

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 Maschinenlaermrerordnung-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 2004/108/EC.

- IEC/EN 61326-1
- CISPR Pub 11 Group 1, class A
- AS/NZS CISPR 11
- ICES/NMB-001

Safety Information

Complies with European Low Voltage Directive 2006/95/EC

- IEC/EN 61010-1 (2nd Edition)
- Canada: CSA C22.2 No. 61010-1-04
- USA: UL Std. No. 61010-1 (2nd Edition)

Warnings

WARNING The WARNING notice denotes a hazard. It calls attention to a procedure, practice, or the like, which if not correctly performed or adhered to, could result in personal injury. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

WARNING For continued protection against fire hazard, replace line fuse only with same type and rating: Fuse 5A/250V, Part Number 2110-0709
The use of other fuses or material is prohibited.

WARNING This is a Safety Class I product (provided with a protective earthing ground incorporated in the power cord). The mains plug shall be inserted only into a socket outlet provided with a protective earth contact. Any interruption of the protective conductor, inside or outside the instrument, is likely to make the instrument dangerous. Intentional interruption is prohibited.

WARNING No operator serviceable parts inside. Refer servicing to qualified personnel. To prevent electrical shock do not remove covers.

WARNING The opening of covers or removal of parts is likely to expose the user to dangerous voltages. Disconnect the instrument from all voltage sources while it is being opened.

WARNING 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.

WARNING 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).

Cautions

CAUTION The CAUTION notice denotes a hazard. It calls attention to an operating procedure, practice, or the like, which if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a CAUTION notice until the indicated conditions are fully understood and met.

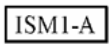
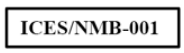
CAUTION Always use the three-prong ac power cord supplied with this instrument. Failure to ensure adequate earth grounding (by not using this cord) can cause instrument damage and the risk of electrical shock.

CAUTION This instrument has autoranging line voltage input; be sure the supply voltage is within the specified range.

CAUTION Ventilation Requirements: When installing the instrument in a cabinet, the convection into and out of the instrument 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, forced convection must be used.

CAUTION This product is designed for use in Installation Category II and Pollution Degree 2.

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.
	This symbol indicates that the instrument requires alternating current (ac) input.
	This symbol indicates separate collection for electrical and electronic equipment, mandated under EU law as of August 13, 2005. All electric and electronic equipment are required to be separated from normal waste for disposal (Reference WEEE Directive, 2002/96/EC).*
	This symbol indicates that the power line switch is ON.
	This symbol indicates that the power line switch is in the STANDBY position.
	This symbol indicates that the power line switch is in the OFF position.
	This symbol is used to identify a terminal which is internally connected to the product frame or chassis.
	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 CSA International. This instrument complies with Canada: CSA 22.2 No. 61010-1-04.
	This is a symbol of an Industrial Scientific and Medical Group 1 Class A product.
	This is a marking to indicate product compliance with the Canadian Interference-Causing Equipment Standard (ICES-001).
	Direct Current.
	This is a required mark signifying compliance with an EMC requirement. The C-Tick mark is a registered trademark of the Australian Communications and Media Authority (ACMA).
	China RoHS regulations include requirements related to packaging, and require compliance to China standard GB18455-2001.
	This symbol indicates compliance with the China RoHS regulations for paper/fiberboard packaging.

* The URL for take-back/WEEE information is http://www.agilent.com/environment/product

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