

# Agilent N7800A Calibration and Adjustment Software for Agilent RF/ $\mu$ W Instruments

The collage features several key elements:

- Software Interface:** A screenshot of the 'Agilent N7800A Test Management Environment Software' showing fields for Order Number (PSA E4440A US40420757), Model (E4440A), and various test parameters like 'Smoke Test' and 'Performance Verification (Agilent Recommended)'.
- Measurement Report (ISO 17025):** A document titled 'Measurement Report (ISO 17025) Agilent E4440A Performance Verification' with a 'Test Date' of 08-Jun-2007. It includes a 'Test Equipment Summary' table.
- Frequency Response Graph:** A line graph titled 'Frequency Response Above 3 GHz' showing 'Power Level (+0 dBm)' on the y-axis and 'Frequency (GHz)' on the x-axis. The graph displays multiple data series with error bars.
- Table of Test Results:** A table with columns for 'Frequency (GHz)', 'Power Level (dBm)', 'Pass/Fail', and 'Test Result'. It lists various frequency points from 3.000 to 8.000 GHz.
- Technician:** A circular inset image showing a technician in a lab coat and glasses working with an Agilent instrument.
- Agilent Instrument:** A large image of an Agilent N7800A instrument at the bottom, showing its screen with multiple graphs and the physical control panel.

Agilent customers choosing to perform their own periodic maintenance (performance verification and adjustments) can now use the same automated software used in Agilent Service Centers.

Agilent strives to provide the best service available for a broad range of instruments, but you may be a customer who balances cost, quality, and cycle time requirements by performing your own calibrations whenever possible. You may have the necessary equipment, facility, manpower, and skill, but for complex RF/ $\mu$ W instruments, you could benefit greatly from having robust automated routines to facilitate the calibration task.

The current families of Agilent RF/ $\mu$ W products are tested in Agilent Service Centers using a robust common software environment. We are offering licenses to customers who would like to use the same software. These licenses guarantee you have access to the most current versions of test software, while also protecting Agilent intellectual property from inappropriate use.

This licensing applies to products in the following instrument families:

<b>PSA</b>	<b>ESA</b>	<b>VSA</b>
<b>CSA</b>	<b>EMI</b>	<b>X-series</b>
<b>PSG</b>	<b>ESG</b>	<b>MXG</b>
<b>NFA</b>	<b>PNA</b>	<b>P-Series</b>
<b>E8663B</b>	<b>N4010A</b>	<b>E6601A</b>
<b>U200x</b>	<b>896xx</b>	<b>N9039A</b>
<b>Upconverters</b>	<b>Downconverters</b>	

For a complete list of instrument model numbers, please refer to the table in page 6. As other families of instruments become supported with compatible PC-based calibration and adjustment software, they will be added to the licensing program. See page 6 for minimum PC requirements.

### Gain confidence in calibrations and adjustments: take advantage of Agilent’s experience and expertise in calibration and adjustment software.

- Measurement uncertainty analysis based on international standards<sup>1</sup>
- Broad set of lab standards supported, all guaranteed to meet uncertainty requirements
- ISO/IEC 17025 and ANSI/NCSL Z540.3 compliance
- Automatic adjustments where applicable
- Flexible test executive, data export, and system management included
- Free web download of latest versions covering latest models and options
- Network installation capability, with centralized data base

### Maximize your cal lab’s effectiveness, while minimizing turnaround time and cost.

With Agilent calibration software, you eliminate the time and expense involved in developing software yourself and you gain the confidence of knowing that your instruments are calibrated in accordance with the manufacturer’s recommended procedures. The software is designed with the flexibility you need to increase your company’s productivity and improve quality. As new instruments and/or options are released, you will save time by simply downloading the latest revision of software from the web. See page 7 for a full list of software features.

*Records indicate that over 10% of products appearing otherwise “healthy” actually fail some datapoint during testing, requiring adjustment. Even if they do not need hardware replacement or repair, such adjustment would require a round trip to a service provider if the adjustment tools are not available to a self-maintainer. Likewise, even when hardware can be repaired in the field, it often requires post-repair adjustment to ensure the instrument is performing within specifications.*

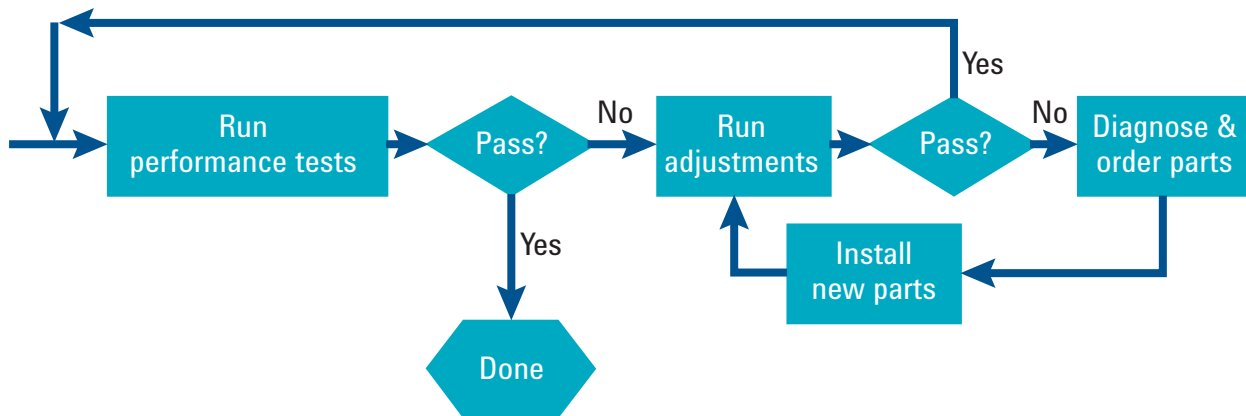


Fig. 2 Calibration, Adjustment, and Repair process

1. ISO Guide to Expression of Measurement Uncertainty, 1995.

**Save time and expense by automatically adjusting products that fail specifications.**

The days of screwdriver “tweaks” are long gone. Many of the performance advantages offered by Agilent products are due to the ability to “fine tune” the hardware under microprocessor control. Amplifier gains, filter corners, DC offsets, and other functions can be adjusted according to measurement environment and component aging. These adjustments require complex iterative external measurements and calculations to characterize the instrument and then make the appropriate adjustments. Intimate knowledge of the architecture and detailed circuitry are required, so such adjustment capability is available only in the Agilent calibration and adjustment software. Service Center records indicate that roughly 10% of the products calibrated initially fail some specification, but can be brought into compliance simply through automatic adjustment, eliminating the need for any hardware “repair”. From your perspective, that means saving a round-trip to an Agilent facility for adjustment.

**Automatically generate and report results of measurement uncertainty analyses.**

While the gains Agilent software offers in shorter turnaround times and lower costs are important, Agilent has taken even greater steps in ensuring that calibration quality meets the highest possible standards. The software generates a measurement uncertainty analysis for each test point in any calibration you perform. That analysis is based upon the strictest possible interpretation of the regulatory standards, and is guaranteed to meet or exceed the requirements laid out by ISO 17025 or ANSI Z540. The engineering derivation of each uncertainty analysis often encompasses 20 to 30 pages of complex equations, so having them embedded in the software

saves your metrology staff many weeks of complex calculations and analysis. You can generate the report format of your choice, to comply with the requirements of the standard(s) you must meet. Test results can be exported if you wish to maintain calibration records elsewhere.

**You only need to buy one license for each calibration station that is to be operated using our software.**

**A licensed station can test all covered instrument models in any quantity for one year, and can test any new models/options released during the license period.**

**Such a “seat license” may not be used to provide commercial calibration services for Agilent instruments.**

You may use this seat license as a self-maintainer calibrating equipment you own, or equipment that is an integral part of a government program in which you are participating. This includes contractors who are operating calibration laboratories in support of government or military organizations. However, you may not use this seat license to provide general commercial calibration service.

The seat license must be renewed annually to maintain your access to the latest software revisions.

**For calibration labs providing commercial calibration services, we offer licenses to enable the calibration and/or adjustment of any covered instrument for a period of 90 days.**

When activated, these licenses are linked to a specific serial number and provide adequate time for testing, adjusting, repairing, and re-testing of that specific instrument. Even if you are primarily a self-maintainer, your

laboratory must make use of these Universal 90-day licenses if/when you calibrate outside equipment for commercial purposes. As the user, you can choose whether to provide a commercial calibration or a Z540/17025 calibration by choosing the corresponding 90-day license.

<b>Product number</b>	<b>Description</b>
N7800A-U1S	TME Non-commercial seat license new install
N7800A-U1R	TME Non-commercial seat license, renewal, (requires existing install)
N7800A-U9C	Universal 90-day license, individual instrument, Agilent Commercial Calibration
N7800A-U9Z	Universal 90-day license, individual instrument Agilent ANSI Z540 and ISO 17025 calibration
N7800A-UPZ	Universal perpetual license, individual instrument, Agilent ANSI Z540 and ISO 17025 calibration

If your instrument volume does not justify a seat license, or your operational model would be better addressed by long-term individual instrument licenses, we offer perpetual licenses for individual instruments. They provide full ANSI Z540 and ISO 17025 analysis and reporting, and can be used with any instrument model covered by our Calibration Software. You are entitled to use our software tools for the lifetime of the product, and to any new revisions of software that might be issued. The license can be installed on as many systems, in as many places as you wish, so there are no geographic or time restrictions. The only limitation is that the license is valid only for the specific instrument serial number used to activate the license.

All licenses include access to both performance verification tests and to automatic adjustments (if required to make the instrument pass specification). All licenses enable you to create full test result reports that can be exported to other systems. All self-maintainer seat licenses and the U9Z 90-day licenses enable you to report all uncertainty calculations within the final tabular report and graphs.

**Most software and licensing transactions with Agilent can be made quickly, online, at any time. Licenses are activated through a simple interaction with an Agilent web site.**

When a license is purchased, you receive a uniquely numbered Certificate of Entitlement that you must then activate (“redeem”) online. You may go to the Agilent web site at [agilent.com/find/softwarelicense](http://agilent.com/find/softwarelicense) at any time. Using your order number and your certificate number, you activate a license by:

- 1) entering the MAC address of the test station PC to be licensed, in the case of “seat” licenses, *or*
- 2) entering the model and serial number of an instrument to be licensed, in the case of individual perpetual or 90-day licenses.

Shortly afterward, you will receive an email with the electronic license file(s) attached. Using the instructions supplied, you import those licenses into your TME system, and you are then ready to calibrate.

**Software may be downloaded, or you can check for the latest software revisions online.**

Visiting our web site at [www.agilent.com/find/calibrationsoftware](http://www.agilent.com/find/calibrationsoftware) is an excellent way to examine the thorough “Help” text included. Many details, such as system configuration, required test equipment (and alternatives), and test descriptions, are included in the help text.

See page 7 for a collection of important web links pertaining to Cal SW Licensing.

**In addition, the calibration and adjustment application for each product family can be purchased on a CD (for a nominal charge) under the following product numbers, should you be unable or unwilling to download it free from the web:**

<b>Product number</b>	<b>Application</b>
<b>N7805A</b>	<b>E6601A</b> Wireless comms test set
<b>N7810A</b>	<b>PSA</b> Cal and adjust
<b>N7811A</b>	<b>ESA</b> Cal and adjust
<b>N7812A</b>	<b>VSA</b> (E4406A) Cal and adjust
<b>N7813A</b>	<b>CSA</b> Cal and adjust
<b>N7814A</b>	<b>X-Series</b> Cal and adjust
<b>N7815A</b>	<b>896xx</b> Cal and adjust
<b>N7817A</b>	<b>EMI</b> Cal and adjust
<b>N7820A</b>	<b>PSG</b> Cal and adjust
<b>N7821A</b>	<b>ESG-C</b> (E4428C, E4438C) Cal and adjust
<b>N7822A</b>	<b>MXG</b> Cal and adjust
<b>N7823A</b>	<b>E8663B</b> Cal and adjust
<b>N7824A</b>	<b>ESG-B</b> Cal and adjust
<b>N7830A</b>	<b>NFA</b> Cal and adjust
<b>N7831A</b>	<b>N4010A</b> Cal and adjust
<b>N7832A</b>	<b>P-Series</b> Power meters cal
<b>N7833A</b>	<b>N8300A</b> Wireless network test set
<b>N7840A</b>	<b>PNA</b> Cal
<b>N7845A</b>	Upconverter synthetic Instruments cal and adjust
<b>N7846A</b>	Downconverter synthetic instrument cal
<b>N7851A</b>	<b>U200x</b> Power sensor cal

New software packages are released continually. For the most current list of software CDs, go to: [agilent.com/find/calibrationsoftware](http://agilent.com/find/calibrationsoftware)

You may order the CD-ROM set containing the calibration software for the corresponding product family. Each software CD-ROM set includes test and adjustments for all products and options within that product family. For your convenience, every CD-ROM set includes a copy of the Agilent Test Management Environment (TME) test executive. The test executive need only be loaded once (whether downloaded or loaded from CD). After that, it is necessary only to load the product family-specific application software.

**Nothing has been done to disable older versions of Agilent test software.**

If you are using older versions of our test software (without uncertainty analysis reporting), you may continue to use that software to calibrate the corresponding products. However, please note that the older versions cannot reside on the same PC as the newer, licensed version. Attempting to have them on the same PC will result in file corruption that is difficult to correct. In addition, the older versions will not be updated for new products and options.

Combine the advantages you have as a self-maintainer with the experience that Agilent has in high-performance metrology to achieve the optimum level of internal process control and external accreditation.

Your "cost of calibration" will be predictable from year-to-year, because all technical support, software updates, new products and options, and revision control are included in the price of a single renewable license.

Automated test times are far less than the manual equivalent.

They are also guaranteed to return more consistent, repeatable results across all test conditions.

If you normally require a Z540 or 17025 calibration before you can put equipment into program use, you can now perform such a calibration on your own, rather than arranging for a special calibration from Agilent or other service providers. Your "incoming inspection" can be run as a Z540 (or 17025) calibration.

ANSI Z540 and ISO 17025 uncertainty analyses are guaranteed to meet all requirements.

If you are trying to achieve certification, you can rely on the Agilent uncertainty analyses to meet the strictest interpretations of Z540/17025 requirements. The exact same analyses are used in our certified Service Centers. All seat licenses include Z540/17025 reporting capability. For the 90-day licenses, you can choose whether to pay a modest price premium for Z540/17025 over the commercial calibration license price. Agilent TME software already meets the requirements of Z540.3.

Agilent calibration routines are available at the time of product/option introduction.

If you purchase a newly-released product or option, you can immediately verify its performance, rather than waiting 1-2 years for other software alternatives (i.e. creating your own test software or purchasing software from a third party).

*A knowingly maladjusted instrument was chosen to gather this data, to demonstrate how measurement uncertainty can affect the pass/fail conclusion associated with measurement data that never exceeds the actual specification limit. "Indeterminate," in this case, should be taken to mean "Adjustment Recommended,"*

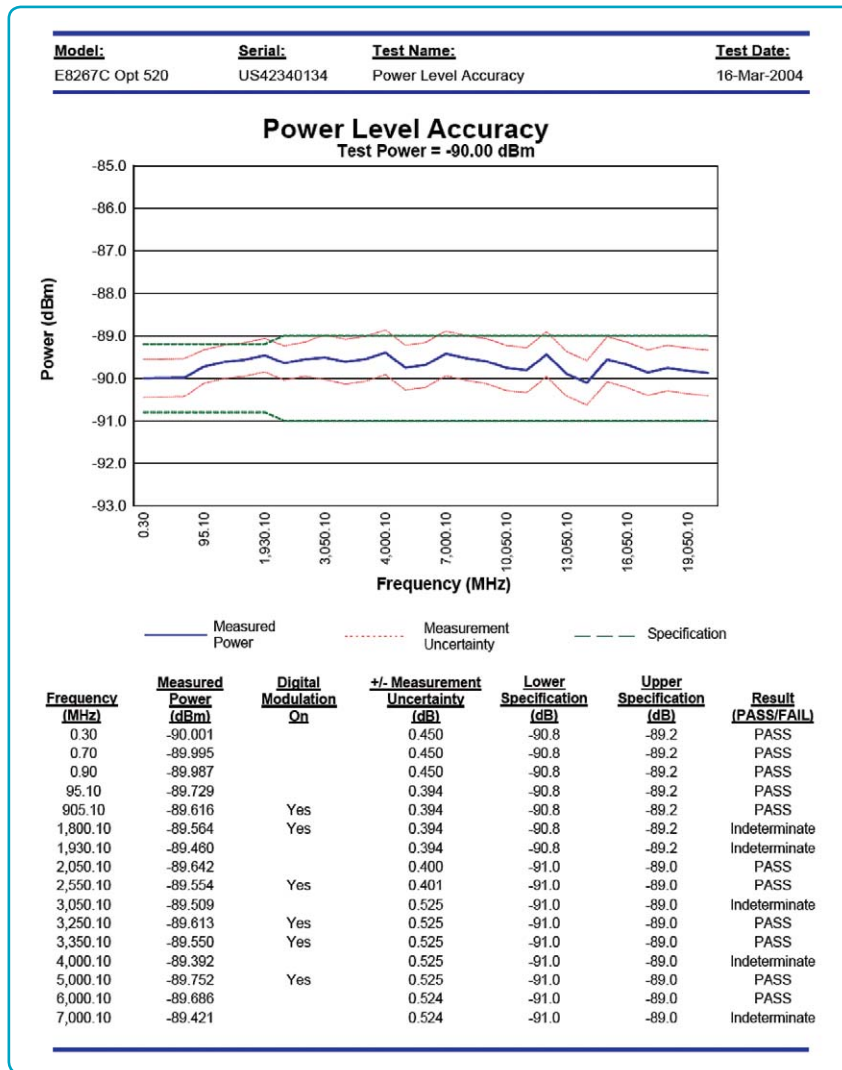


Fig. 3 Reports show Measured Value, Specification, and Uncertainty

## Instruments Covered

For the latest list of instruments covered please see:  
[agilent.com/find/calibrationsoftware](http://agilent.com/find/calibrationsoftware)

Product family	Models
<b>PSA</b> spectrum analyzers	E4440A, E4443A, E4445A, E4446A, E4447A, E4448A
<b>ESA</b> spectrum analyzers	E4401B, E4402B, E4403B, E4404B, E4405B, E4407B, E4408B, E4411B, E7401A, E7402A, E7403A, E7404A, E7405A
<b>VSA</b> vector signal analyzer	E4406A
<b>VSA</b> vector signal analyzer	896xxA
<b>CSA</b> spectrum analyzer	N1996A
<b>EXA</b> signal analyzer	N9010A
<b>MXA</b> signal analyzer	N9020A
<b>EMI</b> receiver	N9039A
<b>PSG</b> signal generators	E8241A, E8244A, E8247C, E8251A, E8254A, E8257C, E8257D, E8267C, E8267D
<b>ESG</b> signal generators	E4428C, E4438C, E4400B, E4420B, E4421B, E4422B, E4423B, E4424B, E4425B, E4426B, E4430B, E4431B, E4432B, E4433B, E4434B, E4435B, E4436B, E4437B
<b>MXG</b> signal generators	N5181A, N5182A
<b>E8663B</b> signal generator	E8663B
<b>NFA</b> noise figure analyzers	N8972A, N8973A, N8974A, N8975A
Wireless connectivity test set	N4010A
<b>PNA</b> network analyzers	E8356A, E8357A, E8358A, E8361A, E8362A, E8362B, E8363A, E8363B, E8364A, E8364B, E8801A, E8802A, E8803A, N3381A, N2282A, N3383A, N5230A
Upconverter synthetic instrument	N8211A, N8212A
<b>P-series</b> power meters	N1911A, N1912A, add N8262A
Wireless comms test set	E6601A
U2000-series power sensors	U200xA
Wireless network test set	N8300A
Downconverter synthetic instrument	N8201A

## Minimum PC System Requirements

- **PC Hardware**
  - 450 MHz Pentium II (600 MHz or faster recommended)
  - 128 MB RAM (256 MB or more recommended)
  - 200 MB available hard drive  
*NOTE:* Data storage will average approximately 200 MB of disk space per 100 full instrument calibrations. Test data is saved for every test that is run within TME therefore overall data storage needs will vary depending on the number of instruments calibrated.
  - Minimum 800 x 600 display with 256 colors
  - GPIB card (One of the following cards must be installed prior to installing this application):
    - Agilent 82350A\*
    - NI GPIB/TNT\*\*
    - NI PCI-GPIB\*\*
- **Operating system supported:**
  - Windows 2000 (SP3 or higher)
  - XP Professional (SP1 or SP2)
- **Additional software:**
  - I/O Libraries
    - Agilent VISA\* (Recommended version M.01.01.04 or later)
    - or
    - NI VISA\*\* (Recommended version 3.2 or later \*\*\*)
  - Web Browser
    - Internet Explorer (IE) 5.5 or higher

\* Agilent Visa & GPIB drivers can be downloaded from the Agilent Technologies website at: [www.agilent.com](http://www.agilent.com)

\*\* National Instruments Visa library can be downloaded from the website: [www.ni.com](http://www.ni.com)

\*\*\* Version 3.2 of the National Instruments VISA will fix an issue found in the TME installation. If any version of NI VISA prior to 3.2 is installed on the target system, you may experience an error during installation of the Agilent IO library to be used with TME. The kernel error that occurs will not affect the performance of TME once the installation completes. To avoid the error, upgrade to Version 3.2 of the NI VISA before executing the TME installation.

## Licensed Software Features

Feature	Seat License or Individual Perpetual License	90-day Z540/17025 Individual License	90-day Commercial Individual License
Fully meets audit requirements (processes comply with ISO 17025)	X	X	X
Fully traceable to national and international standards	X	X	X
Agilent quality measurement methods	X	X	X
Networked Installation	X	X	X
Determination of malfunction	X	X	X
Instrument adjustment if found out of tolerance	X	X	X
Full after calibration performance data	X	X	X
Full "on receipt" performance data	X	X	X
Calibration suitable for general use	X	X	X
Increased measurement confidence from many more test points	X	X	X
Complete instrument functionality tested	X	X	X
Measurement uncertainties provided with the calibration data	X	X	
Full conformance to ANSI Z540 and IEC/ISO17025 requirements	X	X	

## Important Web Links (externally accessible)

To download actual calibration software: [calsw.tm.agilent.com/](https://calsw.tm.agilent.com/)

To redeem license certificates: [agilent.com/find/softwarelicense](https://agilent.com/find/softwarelicense)

For more information:

- Program Overview
- Recommended Lab Standards
- Alternative Supported Lab Standards
- Getting Started Guide and Tutorial
- Free Sample Trial

[agilent.com/find/calibrationsoftware](https://agilent.com/find/calibrationsoftware)



### Agilent Email Updates

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Quickly choose and use your test equipment solutions with confidence.



[www.agilent.com/find/open](http://www.agilent.com/find/open)  
Agilent Open simplifies the process of connecting and programming test systems to help engineers design, validate and manufacture electronic products. Agilent offers open connectivity for a broad range of system-ready instruments, open industry software, PC-standard I/O and global support, which are combined to more easily integrate test system development.



[www.lxistandard.org](http://www.lxistandard.org)  
LXI is the LAN-based successor to GPIB, providing faster, more efficient connectivity. Agilent is a founding member of the LXI consortium.

## Remove all doubt

Our repair and calibration services will get your equipment back to you, performing like new, when promised. You will get full value out of your Agilent equipment throughout its lifetime. Your equipment will be serviced by Agilent-trained technicians using the latest factory calibration procedures, automated repair diagnostics and genuine parts. You will always have the utmost confidence in your measurements.

Agilent offers a wide range of additional expert test and measurement services for your equipment, including initial start-up assistance onsite education and training, as well as design, system integration, and project management.

For more information on repair and calibration services, go to

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

## [www.agilent.com](http://www.agilent.com)

For more information on Agilent Technologies' products, applications or services, please contact your local Agilent office. The complete list is available at: [www.agilent.com/find/contactus](http://www.agilent.com/find/contactus)

### Americas

Canada	877 894 4414
Latin America	305 269 7500
United States	800 829 4444

### Asia Pacific

Australia	1 800 629 485
China	800 810 0189
Hong Kong	800 938 693
India	1 800 112 929
Japan	81 426 56 7832
Korea	080 769 0800
Malaysia	1 800 888 848
Singapore	1 800 375 8100
Taiwan	0800 047 866
Thailand	1 800 226 008

### Europe & Middle East

Austria	0820 87 44 11
Belgium	32 (0) 2 404 93 40
Denmark	45 70 13 15 15
Finland	358 (0) 10 855 2100
France	0825 010 700* <small>*0.125 € fixed network rates</small>
Germany	01805 24 6333* <small>*0.14€/minute</small>
Ireland	1890 924 204
Israel	972 3 9288 504/544
Italy	39 02 92 60 8484
Netherlands	31 (0) 20 547 2111
Spain	34 (91) 631 3300
Sweden	0200-88 22 55
Switzerland (French)	41 (21) 8113811 (Opt 2)
Switzerland (German)	0800 80 53 53 (Opt 1)
United Kingdom	44 (0) 118 9276201

Other European Countries:

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

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