

Agilent N9330A Handheld Cable and Antenna Tester

25 MHz - 4.0 GHz
Technical Overview



**Your perfect solution
for today's communications
network cable and
antenna tester**



Agilent Technologies

Ensure the reliability of your cable and antenna system



Easy to use and convenient to carry on to any site.



Today, the increasing range of wireless applications provides end users on the move with faster and more diverse services.

Broadband mobile data and telephony are now becoming ubiquitous, with coverage in most urban and many rural areas.

The number of base stations (BTS) needing fast, efficient installation continues to grow. Moreover, the vast numbers of existing installed base stations need periodic maintenance and, from time to time, trouble shooting and repair.

N9330A Applications

- **Wireless service providers: base station cable & antenna system I&M**
- **Aerospace and defense: radio and radar cable & antenna system I&M**
- **Broadcasting and radio links: cable & antenna system I&M**
- **Utilities, emergency and security services**
- **Contractors for all the above**

Whether you do your own maintenance, test or rely on third-party contractors, you know that well-maintained antenna networks and cable help ensure:

- Better voice and data quality
- Fewer dropped calls
- Less dropped links

Consequently, an efficient and effective cable and antenna tester is now an essential basic test tool for use by network engineers and technicians during wireless network installation and maintenance.

- New site installation and deployment
- Routine maintenance
- Trouble shooting

Verify performance and trouble-shoot base station cable and antenna systems: test wide band or narrow band from 25MHz to 4GHz:

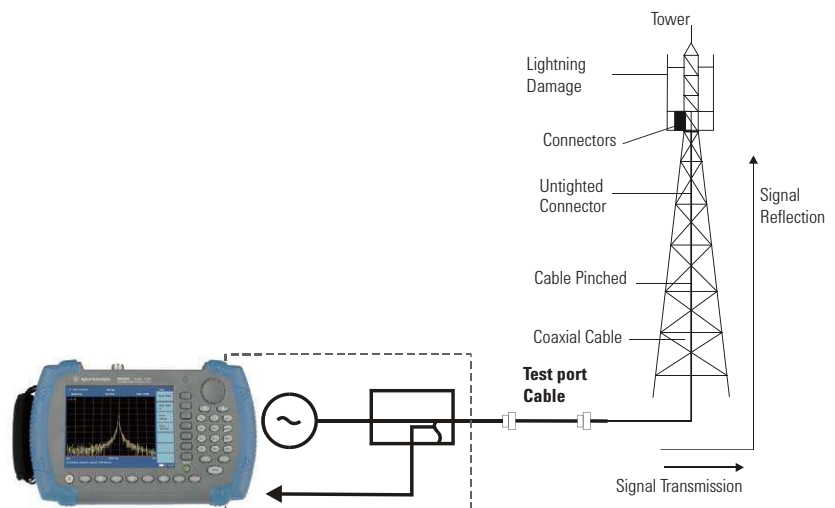
Key measurement

Frequency domain

- Return loss vs. Frequency
- VSWR vs. Frequency
- Cable loss test

Distance to fault (DTF)

- Return loss vs. Distance
- VSWR vs. Distance



Early identification of potential problems

Deteriorating cable and antenna conditions, such as a loose or corroded connector, a pinched or restricted cable, or damaged lightning arrestors cause minor RF impedance changes. These result in poor VSWR, power loss and antenna bandwidth drift.

Early identification of potential problems

Distance-To-Fault testing uses frequency domain reflectometry (FDR) techniques that readily identify these slight changes in RF impedance. Therefore, routine DTF tests as part of a preventative maintenance plan help identify these potential problems allowing timely correction before they make costly repairs necessary.

With its fast startup time, technicians are ready to test in seconds.

Its small lightweight size is easy to handle and stands up to rough field use and all weather conditions.

Due to its fast startup time and measurement speed the Agilent N9330A lets your technicians evaluate one of the primary trouble spots in a matter of minutes.

Alternatively, perhaps you are expanding or newly installing such services to meet end-user demand for total geographic coverage and service availability.

Whatever your test circumstances, you most likely define your test targets as the number of sites tested per day by your technicians consequently you'll appreciate speed is important; adequate data stored to permit confident post-test analysis.

You will find the Agilent N9330A tester useful and reliable, whether you are relying on the rapid installation of a new cellular network infrastructure, 2-way radio communication system or working in rugged field environments on any type of communication system.



Easier operation

N9330A optimized usability:

- Long battery life
- Modern USB connectivity
- Sunlight-viewable LCD
- Multi-language UI
- Rugged design for field use

A fast job, well done

As a busy technician, you demand fast tester setup, fast calibration, and a straightforward, repeatable test procedure.

That's what an Agilent N9330A tester gives you.

- USB memory stick support
- USB connectivity for PC software
- Fast startup time
- Auto calibration
- Test set-up recall
- More direct-access hard keys
- Rapid cursor control and marker movement using scroll knob
- Easy data storage
- Customized, unmistakably named data files and auto-sequential file naming
- Comprehensive results saved in an easy-to-use format
- Auto pass/fail test comparisons

The Agilent N9330A is so easy to use, it minimizes the need for training. Technicians will get up to speed fast - and get their work done quickly every day.



Well organized front-panel with more hard buttons and function keys for faster access to essential test functions.

You will discover that the combination of hardkeys and softkeys provide an intuitive interface for all measurements.

You'll discover we have made more of your most-used functions conveniently selectable, directly via the large, front-panel keys without you having to search through successive screen menus.

We know that working through many layers of soft keys and screen menu selections can be tedious and time consuming.

Furthermore, the front-panel knob provides a simple scroll function, allowing rapid cursor movement to access data points across scan displays, or data entries.

Powerful functions:

- Smart and fast electronic calibrator
- Powerful post analysis PC software

Smart, fast calibration

At the start of any new test setup, a three-step calibration is necessary, using an open, a short, and a calibrated test load.

The most accurate calibration method is to use an optional special 'T-combo' open/short/load. This avoids the need to bring 3 separate calibrators, and makes for easy use in the field.



'T-combo'
open/short/50 ohm load



N9330A-203
Electronic calibrator

For fastest and automatic calibration, you can also choose the N9330A-203 electronic calibrator, simply connect the electronic calibrator and use electronic calibration.

Use sensible archive file names related to each site tested

The N9330A offers you the opportunity to use meaningful names for your stored data: names that you customize and relate to your site.

You no longer have to tolerate anonymous file names with no linkage to your site. It is easy to recognise and recall archived data files without the need for cross-referencing.

The Agilent N9330A provides convenience by also allowing the tester to save sequential file names as you store successive files.



Fast export of data via USB interface

Store data and setup configuration

Data storage is large enough for even the largest of site test plans and procedures. For fast instrument set up, just select any of the 15 stored configurations from the internal memory.

When you take the tester out into the field, and have a large number of sites and installations to check, you need sufficient storage capacity for previous, historic data. The internal memory also stores up to 200 traces, and you can save screen shots.

For unlimited file storage, simply use a USB memory stick for external storage.

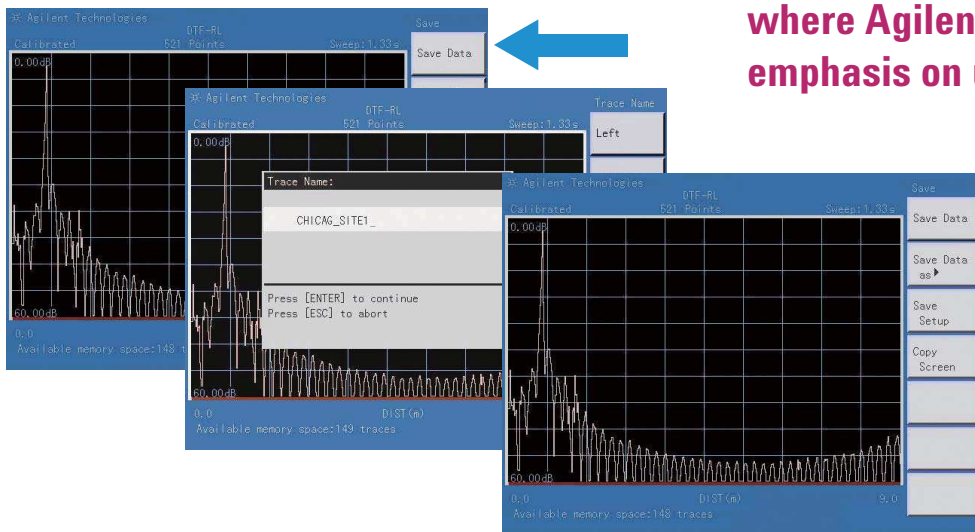
Powerful PC based post analysis software

Effective cable and antenna testing is more than just making measurements.

To improve the effectiveness of data analysis, Agilent provides a powerful PC based post-analysis tool. This software tool is standard with every Agilent N9330A, which provides trace analysis, trace comparison, customized reports and data file management.

The USB connection permits easy connection to a PC for fast data export.

Take a closer look and see where Agilent puts the emphasis on usability



Pressing the front panel "Save" function key displays the soft key, "Save DATA as". This then allows you to enter an appropriate file name.

Subsequently, press the "Save DATA" soft key, each new file name automatically increments, as in example: CHICAG_SITE2, CHICAG_SITE3,...

Agilent Technologies N9330A Handheld Cable and Antenna Tester



Test port, with connector protection cap

Robust, comfortable, quick-grab hand strap

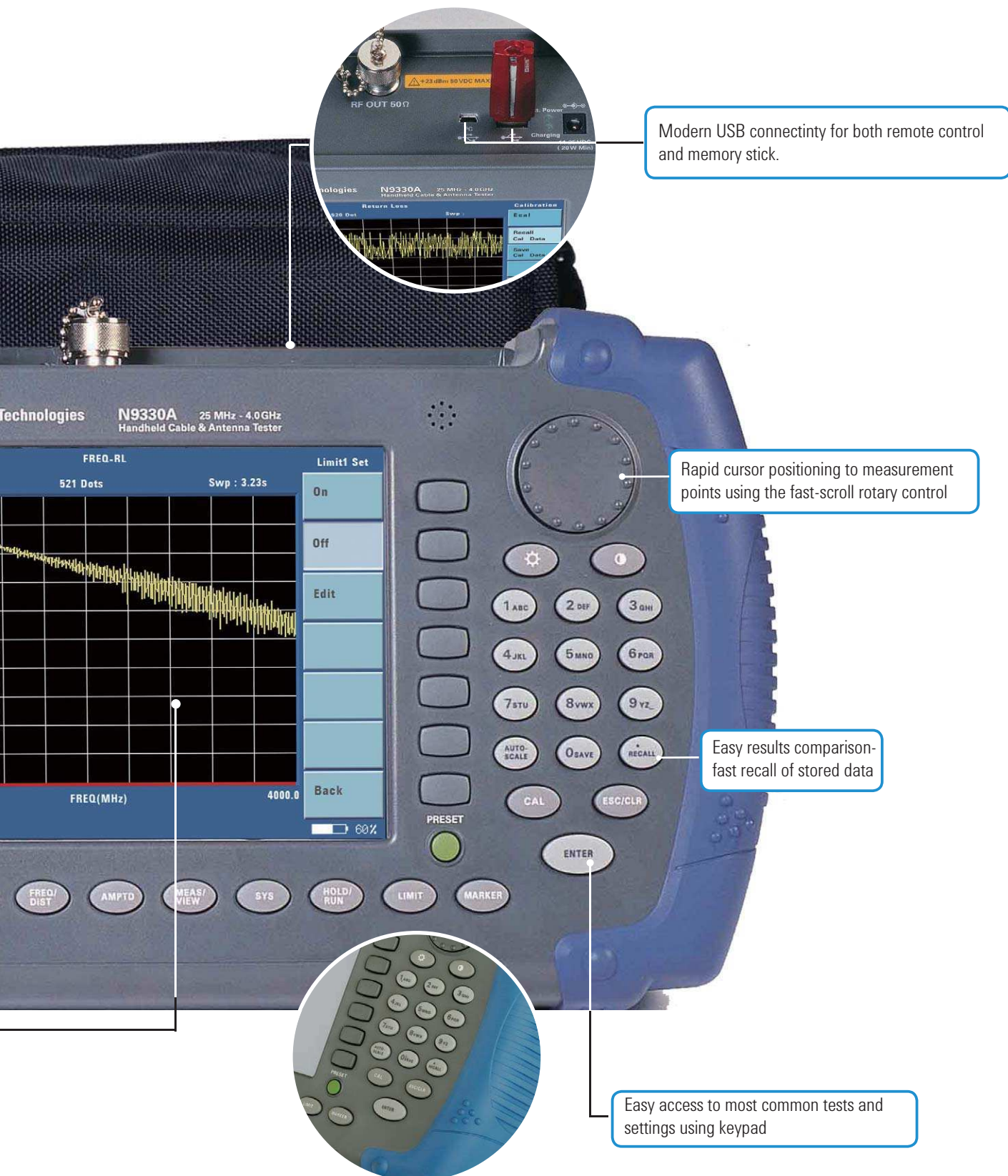


The protective soft carrying case with its ergonomic design provides further protection for the Agilent N9330A



The 7.2" transfective LCD gives sharp and clear reading of results when working in direct sunlight with the high resolution of 640x480 pixels.

Agilent Technologies N9330A Handheld Cable and Antenna Tester



Agilent reliable field use

Testing in the field means that you must often transport the tester to remote locations and work in the open: sometimes carrying it up towers, or possibly working in small, cramped buildings with no direct access to AC power on site.

What is more, it is likely that you will have to test:

- under outside temperature extremes
- in bright sunlight
- or in poor weather conditions

None of these provides the best operating environment for precision electronic test equipment.

Yet, you will find that Agilent has designed the N9330A cable and antenna tester for all weather conditions.



Outstanding display technology provides superior performance under the most demanding lighting conditions

See scans clearly in the sunlight

On site, in field test situations, you may have to contend with bright sunlight.

To avoid these problems and enable easier, more accurate readings, we equip each N9330A with a larger, transreflective color LCD display. The transreflective display ensure clear reading in bright lighting.

The transreflective display technology uses very small amounts of electric power, important for power conservation in battery-powered electronic devices.

You can be sure that that N9330A will continue to give excellent performance under the severest of conditions, wherever you use it and in extreme environments.

Carry-case options provide safe, comfortable transport

A soft carrying case which is a standard configuration provides added protection for the tester when you take it on site. This case has convenient shoulder straps, leaving the hands free for carrying other tools and equipment, or for safe climbing of access towers and gangways.



For further protection of the tester when transporting it in more harsh environments, or loading it in the back of a truck, an optional hard transit case is available.

The tester itself has a strong hand strap to help with portability when carried without the case.

Low-cost, with Agilent worldwide support

Superior battery performance

There is often no convenient conventional AC power line connection available at remote BTS or antenna sites. Earlier battery technology used in some portable testers allowed only limited tester operating time before needing recharging.

Based on customer inputs, Agilent understands that good battery life is essential for remote, on-site testing.

Your Agilent N9330A incorporates advanced battery pack technology with additional intelligent charging technology, providing you with up to four hours of continuous use. When extended operation is necessary, you simply switch batteries which only takes seconds.

The long-life lithium-ion batteries essentially have no 'memory', which is an important improvement over earlier battery types.

Additionally, to maximise useful instrument test time when on site, each tester incorporates smart power management to help conserve battery power.

Worldwide service support

Of course, when you buy an Agilent tester, you are confident that should you need it you have the best worldwide support.



The Agilent N9330A Cable and Antenna Tester - One of Agilent Technologies' new test instruments in the compact, low-cost series

N9330A Handheld Cable and Antenna Tester Specifications

Test functions		Return loss SWR Cable loss Distance-to-fault(DTF)
Frequency Range		25 MHz to 4.0 GHz
Frequency Resolution:		100 KHz
Output Power:		0~-20 dBm
Measurement Speed:		<2 second / screen (full span,521 data point) (CW sweep mode)(3.0ms/data point,typically)
Number of Data Points:		(maximun): 521(selectable 521,261,131)
Return Loss:		Range: 0.00 to 60.00dB Accuracy: $A=20 \times \log_{10}(1.1 + 10^{(-D-RL)/20}) + 0.016 \times 10^{(-RL/20)} + 10^{(-3+RL/20)}$ D: directivity of calibrator. RL: return loss value of DUT. Resolution: 0.01 dB
SWR:		Range: 1.00 to 65.00 Accuracy: same as RL Resolution: 0.01
Cable Loss:		Range: 0.00 to 30.00 dB Resolution: 0.01 dB
Measurement Accuracy:		>42 dB corrected directivity after mechanical calibration >38 dB corrected directivity after electronic calibration
Distance-to-Fault:		Vertical Range: Return Loss: 0.00 to 60.00 dB SWR 1.00 to 65.00
Range:		(Number of data points - 1) x Resolution Number of data points=521,261, or 131
Resolution:		Resolution (meter)=(1.5×10^8) x (Vp)/(f2-f1)Hz Where Vp is the cable's relative propagation velocity. where f2 is the stop frequency and f1 is start frequency.
Markers:		6
User storage:		Internal user flash memory: Instrument setup storage: up to 15 Trace data storage: up to 200 traces Screen pictures storage: 10 screens Support USB memory stick for instrument setup and trace data storage
General		Display: 7.2"640x480 transfective color LCD with adjustable backlight

Input and output ports:		
RF Test Port:	Type N,female,50Ω	
Maximum Input without Damage:	+25 dBm, ±50 VDC	
USB master:	1 x A plug	v1.1 protocol
USB slave:	1 x B plug	v1.1 protocol
Electromagnetic Compatibility:		
IEC 61326-1:1997+A1:	1998/EN 61326-1:1997+A1:1998	
CISPR 11:1990/EN 55011:	1991 Group 1 Class A	
IEC 61000-4-2:1995+A1:	1998/EN 61000-4-2:1995(ESD 4kV CD,8kV AD)	
IEC 61000-4-3:	1995/EN 61000-4-3:1995(3V/m,80% AM)	
IEC 61000-4-4:	1995/EN 61000-4-4:1995(EFT 0.5kV line-line,1kV line-earth)	
IEC 61000-4-5:	1995/EN 61000-4-5:1995(Surge 0.5kV line-line,1kV line-earth)	
IEC 61000-4-6:	1996/EN 61000-4-6:1996(3V,0.15~80 MHz,80% AM,power line)	
IEC 61000-4-11:	1994/EN 61000-4-11:1994(Dips 1 cycle,100%)	
Canada:	ICES-001:1998	
Australia/New Zealand:	AS/NZS 2064.1	
Safety:		
IEC 61010-1:	2001/EN61010-1:2001,CSA C22.2 No.61010-1:2004,UL61010-1:2004	
Temperature:		
Operating:	-10℃ to 50℃,humidity 85% or less	
Non-operating:	-40℃ to +70℃ (Recommend the battery be stord separately below 0℃ and above +40℃ for any prolonged non-operating storage period.)	
Environmental:		
According to Agilent Environmental Test Manual class OE, except Temperature		
Power Supply:		
External DC Input:		
+11 to +25 volt dc, 40W min.		
Internal battery:		
Rechargeable Lithium-ion battery. 4 hours operating time		
Dimensions:		
Size(w x h x d):	317mm x 207 mm x 69 mm (12.5 in x 8.1 in x 2.7 in)	
Weight:	Net weight: 2.6 kg (5.73 lbs)	
	Weight with battery: 2.9 kg (6.39 lbs)	



Ordering Information

Model	Description	Number	Connectors
N9330A	25 MHz to 4 GHz Handheld Cable and Antenna Tester		
	Accessories supplied as standard with the tester:		
	<ul style="list-style-type: none">• Soft carrying case• Rechargeable battery• AC-DC adaptor with power cord• USB cable• Quick-start Tutorial• Documentation CD (also includes a free PC software)		
Options			
201	Precision mechanical short/open/50 ohm load, DC to 4 GHz		N-type (male)
202	Precision mechanical short/open/50 ohm load, DC to 4 GHz		7/16 DIN (male)
203	Electronic calibrator		N-type (male)
301	Phase-stable extension cable 1.5 m		Type-N (male) to type-N (female)
302	Phase-stable extension cable 1.5 m		Type-N (male) to 7/16 DIN (female)
303	Connector adaptor		Type-N (male) to 7/16 DIN (female)
BAT	Spare battery pack		
1DC	Automotive 12V DC adaptor		
1TC	Hard transit case		
ADP	Spare AC-DC adaptor		
ABA	Hard copy English User Guide		
AB2	Hard copy Chinese User Guide		
Warranty and service			
	Standard warranty is one year.		
R-51B-001-3C	1-year return-to-Agilent warranty extended to 3-years		
Calibration			
R-51B-001-3	Agilent calibration upfromt support plan, 3-year coverage		

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/removeall doubt



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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.

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