

**Agilent 8924E**  
**CDMA Mobile Station Service Test Set**  
**30 MHz to 1000 MHz,**  
**1700 MHz to 2000 MHz**  
Brochure

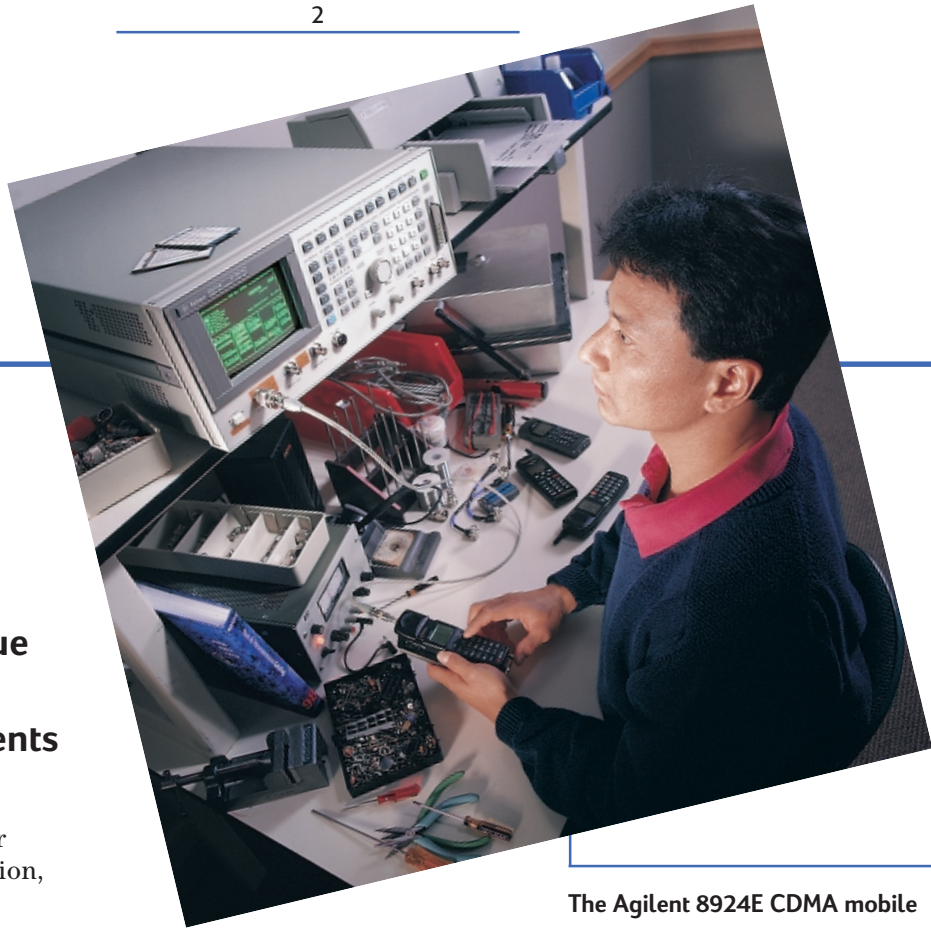
**83236B PCS Interface**  
**83217A CDMA Dual-Mode Mobile Station Test Software**  
**E8290A CDMA Dual-Mode Point of Service Test**  
**(PoST) Software**



**Lower the cost of  
servicing CDMA cellular  
and PCS mobile phones—  
without sacrificing quality**



**Agilent Technologies**  
Innovating the HP Way



## A low-cost, high-value test set for CDMA service measurements

As a CDMA service provider or mobile-phone repair organization, you know the complexities of CDMA technology. To be sure that your mobile phones are performing according to manufacturers' specifications, you need to test accurately and affordably.

Agilent Technologies addresses these needs with a test set designed exclusively for servicing CDMA dual-mode cellular and CDMA PCS mobile phones.

The Agilent Technologies 8924E CDMA mobile station service test set provides accurate, comprehensive CDMA measurement capability at a new low price. Covering international cellular and PCS frequencies, the 8924E is an excellent solution for the incoming inspection, failure verification, troubleshooting, and repair verification of CDMA mobile phones.

The 8924E test set is based on the popular 8924C CDMA mobile station test set used by mobile phone manufacturers, so you get the proven benefits of an accurate and reliable, flexible CDMA test platform.

Accuracy, automated features, and the right mix of standard and optional features also save you time and money.

**The Agilent 8924E CDMA mobile station service test set provides accurate, comprehensive CDMA measurement capability at a new low price.**

## The lower price of this test set isn't the whole story



### Gain new efficiencies with automated testing

With thousands of new and returned mobile phones coming in for testing every month, you need to perform inspections quickly and thoroughly. The 8924E's comprehensive, automated CDMA and analog measurement capabilities free you from hours of complicated manual testing and provide consistent, repeatable results.

### Correlate measurement results with manufacturers' tests

Using the 8924E, you can determine with confidence whether a mobile phone is working properly or is in need of repair. Measurement accuracy and repeatability match that of the 8924C manufacturing test set which is used to test the majority of the CDMA/PCS

phones on the market today. This allows you to be able to better correlate your measurement results with manufacturers' tests. This means fewer "no trouble found" (NTF) phones when you send units back to the manufacturer for repair.

### Test dual-mode, dual-band mobile phones with a single solution

Dual-mode, dual-band mobile phones are becoming more common as mobile communication customers request roaming capability beyond their CDMA coverage area. Now you can test these phones with a single solution. The 8924E provides comprehensive CDMA and analog cellular test capabilities from 30 to 1000 MHz. The add-on Agilent Technologies 83236B PCS interface extends coverage from 1700 to 2000 MHz for testing U.S. PCS, Korean PCS, and similar bands. The test set also supports CDMA to analog hand-offs from both the cellular and PCS bands.

### Get the right mix of standard and optional features

The 8924E is a comprehensive solution for mobile service testing. It includes many standard features that are often sold as "extras," such as an accurate AWGN source required for CDMA testing, a full analog cellular test capability, and a high-stability time base.

Options that are priced separately include the PCS interface and a spectrum analyzer. The spectrum analyzer allows in-depth troubleshooting of CDMA and analog mobile phones.



**One-button call processing  
greatly simplifies  
CDMA testing**

The complexity of CDMA measurement is simplified by the 8924E's one-button features and automated test capability.

At the press of a button, the test set automatically handles the complex, over-the-air call processing required to make a CDMA phone call. Once the phone call has been established, you can easily verify the overall functionality of a mobile phone.

The 8924E also offers one-button AMPS, NAMPS, EAMPS, TACS, NTACS, ETACS, and JTACS analog cellular call processing to simplify the testing of dual-mode mobile phones. You can set cell configuration parameters such as control channel number, SID, SAT, and VMAC. With a single keystroke you can control real-time parameters such as power-level changes, hand-offs, and registration.

## **A** service test set that is easier to use

### Simple upgrades

To reduce the time and effort it takes to upgrade an instrument, Agilent sends firmware upgrades for the 8924E on PC cards. You simply insert the upgrade card into the test set, cycle power, and follow the easy on-screen instructions.

### Internal controller

For those who wish to write their own test software, the 8924E includes an internal, programmable IBASIC controller.

## Automated testing with customized software

Test results screen from PoST PC-based software

Test Title	Measured Value	Lower Limit	Upper Limit	Results
Power Class: Class II				
Transmission: Cont				
Slot Class: Slotted				
Slot Index: 1				
Protocol Rev: 3				
Mode Cnfg: Dual Mode				
✓ Page successful	Yes			Pass
✓ CDMA Rho	0.99	.94	1	Pass
✓ CDMA Frequency Error	-10.41 Hz	-300 Hz	300 Hz	Pass
✓ CDMA Static Timing Offset	0.23 uS	-1 uS	1 uS	Pass
✓ CDMA Amplitude Error	6.54 %	0 %	100 %	Pass
✓ CDMA Phase Error	4.4 deg	0 deg	90 deg	Pass
✓ CDMA Carrier Feedthru	-22.76 dB		0 dB	Pass
For a neighbor Ec/Io=-14.8 and active Ec/Io=-10.8				
The reported neighbor pilot strength=27				
✓ Sector B Ec/Io for T_ADD	-14.8 dB	-17 dB	-11 dB	Pass
For a candidate Ec/Io=-10.5 and active Ec/Io=-12.5				

### Automated PC-based software

The 8924E is best used in conjunction with the Agilent Technologies E8290A Point of Service Test (PoST) PC-based software, which automates dual-mode mobile phone testing. The easy-to-use, mouse-driven, on-screen graphics allow operators to make fast, accurate, and repeatable measurements with minimal training, virtually eliminating the need for manual interaction with the 8924E. This allows sales clerks and other non-technical personnel to perform testing at the point of sale and thereby respond more quickly to customers' problems.

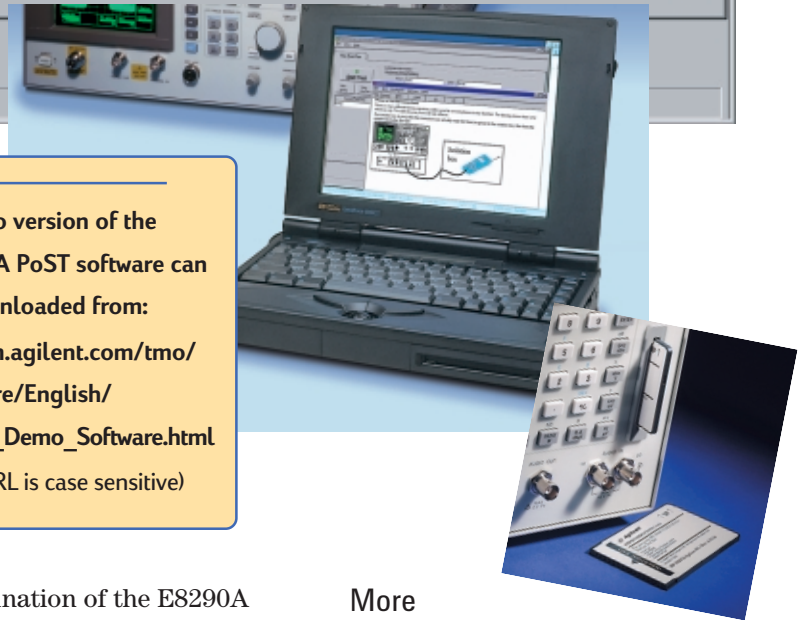
A built-in database allows the operator to view results for further analysis. Reports can be generated and data can be combined into customer care databases so trends in phone performance can be characterized. The 8924E and E8290A solution saves cost by reducing the number of no trouble found phones sent back to manufacturers and by reducing the number of phones exchanged or replaced.

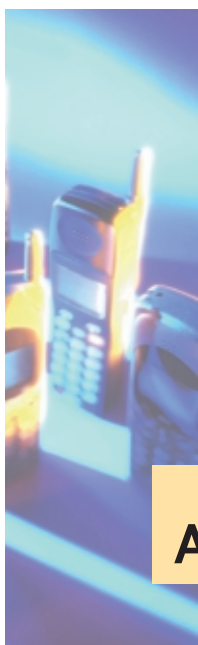
A demo version of the E8290A PoST software can be downloaded from:  
[www.tm.agilent.com/tmo/software/English/E8290\\_Demo\\_Software.html](http://www.tm.agilent.com/tmo/software/English/E8290_Demo_Software.html)  
 (This URL is case sensitive)

The combination of the E8290A CDMA PoST software and the 8924C provides a practical test solution to meet your R&D and manufacturing needs as well. The E8290A features two modes of operation: one that helps ensure ease-of-use for non-technical users, and another that provides access to a rich development environment. In the software's password-protected development mode, technical operators can access the software's full set of capabilities. Test configurations, test plans, test specifications, and measurement parameters can all be set up and customized with ease.

### More Software Options

The Agilent Technologies 83217A CDMA dual-mode mobile station test software can also be used to automate CDMA and analog mobile phone measurements. The 83217A solution does not require a PC. Rather, automatic tests can be set up from the front panel of the 8924E. Options are available to meet your test needs for CDMA, AMPS, NAMPS, JTACS, NTACS, U.S. PCS, and Korean PCS phones.





## A rich feature set to provide accuracy

With outstanding measurement accuracy and repeatability, the 8924E test set enables you to reduce test equipment costs, improve measurement efficiency, and remain confident that your test results are comparable to those of a mobile phone manufacturer.

Accurate power measurement of mobile phone transmitters is critical because manufacturers typically set the maximum power level of a CDMA phone to just above the *minimum* requirement, in order to extend battery life.

The 8924E provides two highly accurate power level measurements based on digital signal processing technology. With these measurements, you can verify that the power levels of a CDMA mobile are within tightly specified tolerances.



- CDMA average power measures the average power in CDMA signals from 3 W to 0.1 mW with  $\pm 5\%$  accuracy.
- CDMA low-level power measures the power in a 1.23 MHz bandwidth (channel) at its internal IF with absolute accuracy of  $\pm 1.0$  dB.

The test set measures transmitted waveform quality using the TIA/EIA-98-B and ANSI J-STD-018 recommended correlated power method, known as the rho ( $\rho$ ) measurement. The rho measurement includes the frequency error, the modulation phase and amplitude error, time offset, and carrier feedthrough.

Greatly improve test efficiency, reduce costs, and produce test results comparable to that of a mobile phone manufacturer with the 8924E

## Accurate base station simulation essential for operation of CDMA receivers

Accurate base station simulation, determined by the relative accuracy of the CDMA code channel power sources, is essential for verifying the operation of CDMA receivers. The test set's advanced design yields an outstanding  $\pm 0.2$  dB relative accuracy of code channel power sources.

A key measure of CDMA receiver performance is frame error rate (FER) in the presence of Additive White Gaussian Noise (AWGN). This measurement quantifies the receiver's ability to correctly demodulate a signal in the presence of high interference.

The AWGN source included in the 8924E provides interference that simulates the noise generated by adjacent cells in a working CDMA network. The test set not only displays FER measurement results reported by the mobile station. It also delivers highly accurate FER measurements using RF data loopback modes, service Option 002 (9,600 bps) and service Option 009 (14,400 bps). Frame error rate is measured according to procedures defined in TIA/EIA IS-126-A.



The 8924E emulates a CDMA base station to provide accurate receiver FER characterization

Confidence limit testing lets you make accurate CDMA receiver measurements in the shortest possible time. You simply set the target FER specification then start the test. The 8924E performs the statistical calculations, based on the TIA/EIA-98-B and ANSI J-STD-018 standard, that determine if and when the CDMA phone has passed the test.

A high stability time base with 0.1 ppm per year stability helps ensure the accuracy of critical CDMA frequency measurements.



### **Agilent Technologies' Test and Measurement Support, Services, and Assistance**

Agilent Technologies aims to maximize the value you receive, while minimizing your risk and problems. We strive to ensure that you get the test and measurement capabilities you paid for and obtain the support you need. Our extensive support resources and services can help you choose the right Agilent products for your applications and apply them successfully. Every instrument and system we sell has a global warranty. Support is available for at least five years beyond the production life of the product. Two concepts underlie Agilent's overall support policy: "Our Promise" and "Your Advantage."

#### **Our Promise**

"Our Promise" means your Agilent test and measurement equipment will meet its advertised performance and functionality. When you are choosing new equipment, we will help you with product information, including realistic performance specifications and practical recommendations from experienced test engineers. When you use Agilent equipment, we can verify that it works properly, help with product operation, and provide basic measurement assistance for the use of specified capabilities, at no extra cost upon request. Many self-help tools are available.

#### **Your Advantage**

"Your Advantage" means that Agilent offers a wide range of additional expert test and measurement services, which you can purchase according to your unique technical and business needs. Solve problems efficiently and gain a competitive edge by contracting with us for calibration, extra-cost upgrades, out-of-warranty repairs, and on-site education and training, as well as design, system integration, project management, and other professional services. Experienced Agilent engineers and technicians worldwide can help you maximize your productivity, optimize the return on investment of your Agilent instruments and systems, and obtain dependable measurement accuracy for the life of those products.

By internet, phone, or fax, get assistance with all your test and measurement needs.

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

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A demo version of the E8290A PoST Software can be downloaded from:  
**[www.tm.agilent.com/tmo/software/English/E8290\\_Demo\\_Software.html](http://www.tm.agilent.com/tmo/software/English/E8290_Demo_Software.html)**

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