

Agilent 4263B LCR Meter 100 Hz to 100 kHz

Technical Overview

Introduction

The Agilent Technologies LCR meter makes fast measurements on components. It is optimized for applications that require precision and versatility. The instrument's performance ranges from general bench-top impedance measurements to complex transformer, coil and electrolytic capacitor measurements. The LCR meter offers fast, reliable, and versatile testing at a low cost.

Satisfy your needs for...

Fast system test throughput

- Maximize testing with rapid 25 ms measurements
- Minimize user intervention with pass/fail testing
- Communicate results with display and GPIB
- Automate testing with built-in handler interface



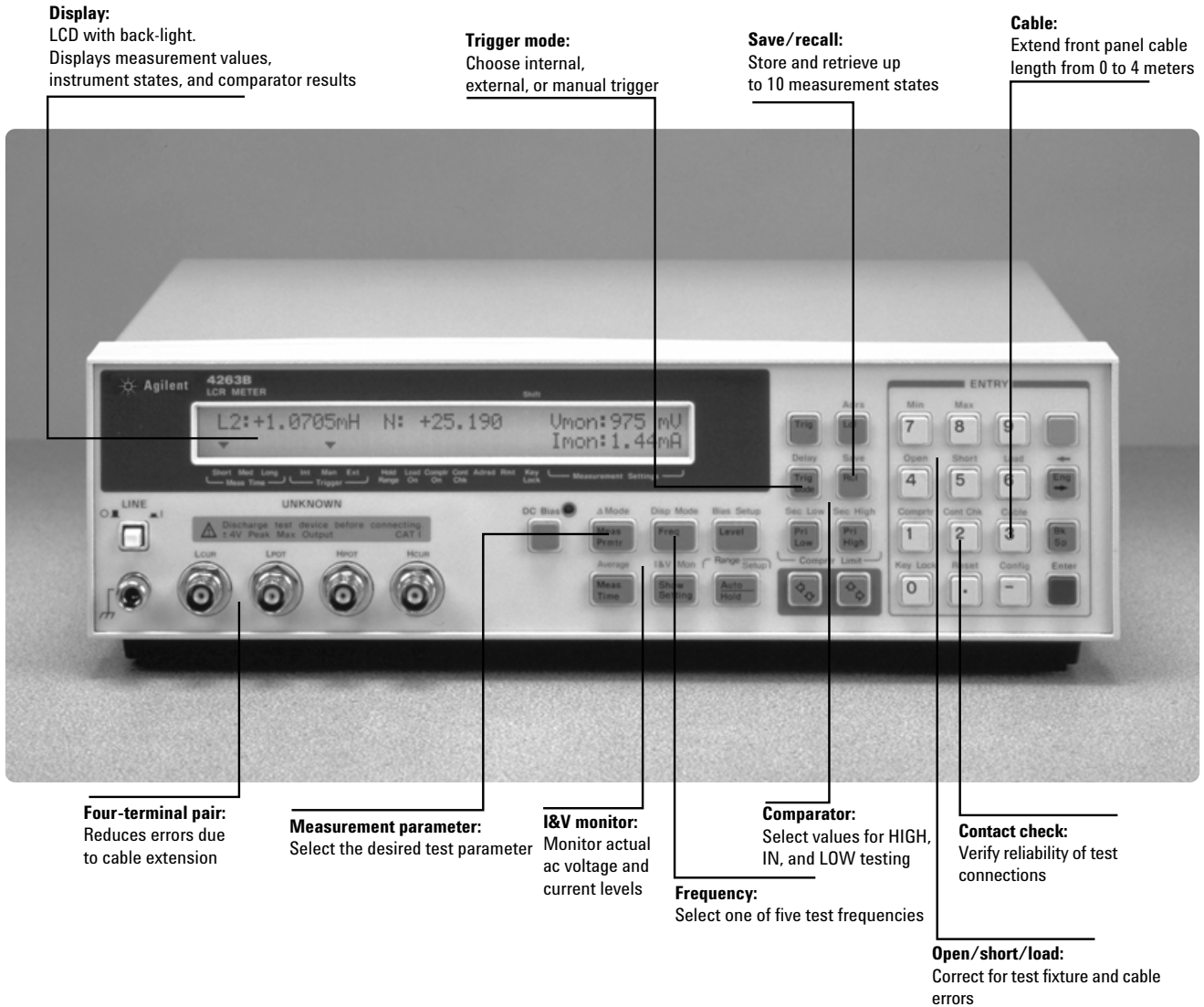
Fault-free results

- Test with confidence using contact check function
- Remove parasitics with error correction
- Get the best data with 0.1% basic accuracy
- Eliminate trigger timing errors with trigger delay function

Versatile measurements

- Select from 11 impedance parameters
- Add three complex transformer parameters with Option 4263B-001
- Set signal level with 5mVrms resolution
- Monitor actual ac voltage and current levels
- Pick from many test fixtures and accessories
- Save and recall up to ten measurement setups





Key Parameters and Specifications

Test frequencies:

100 Hz, 120 Hz, 1 kHz, 10 kHz, 100 kHz

Option 4263B-002 adds 20kHz

AC test signal levels:

20m-1Vrms, 5mVrms steps

Basic accuracy:

0.1%

Impedance parameters:

|Z|, R, X, |Y|, G, B, C, L, D, Q, U

Option 4263B-001 adds transformer measurement functions: turns-ratio, mutual-inductance and dc-resistance

Cable length settings:

0, 1, 2, 4 meters

Bias:

1.5 and 2.0 Vdc

Error correction:

Open, short, and load

Built-in system features:

GPIB and handler interfaces

Measurement time (typical):

25 ms at best conditions

Contact check time (typical):

5 ms per measurement

High-quality results

- See five digits of data
- Make precise measurements with 0.1% basic accuracy
- Select from 11 impedance parameters
- Verify device performance at simulated operating conditions
- Monitor actual test signal voltage and current levels



Make reliable impedance measurements.

System features for test automation

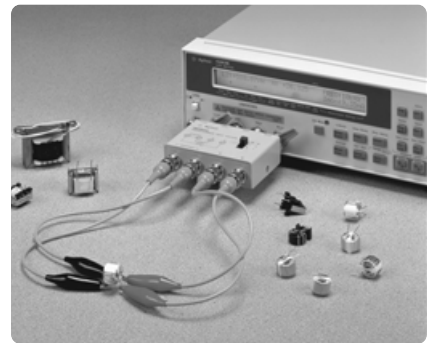
- Maximize accuracy with error correction
- Use performance specified with 0, 1, 2, and 4 meter cables
- Test device contact failure with contact check function
- Automate testing with GPIB interface
- Reduce ground-loops with isolated handler interface
- Continue testing after ac power loss with continuous memory
- Perform pass/fail testing with comparator function (High/In/Low)



The 4263B LCR meter is designed for automated applications.

Evaluate transformers and coils with Option 4263B-001

- Measure turns-ratio, mutual inductance and dc-resistance
- Easily make connections with 16060A transformer test fixture
- Measure parameter responses with variable signal levels



Simplify transformer testing.

Make electrolytic capacitor measurements

- Obtain versatile testing with a large capacitance range
- Keep costs down with built-in dc bias source
- Protect your investment: high energy protection on terminals
- Increase test throughput with fast system measurements
- Make reliable handler measurements with contact check function



Quickly evaluate electrolytic capacitors.

Specifications

Measurement accuracy

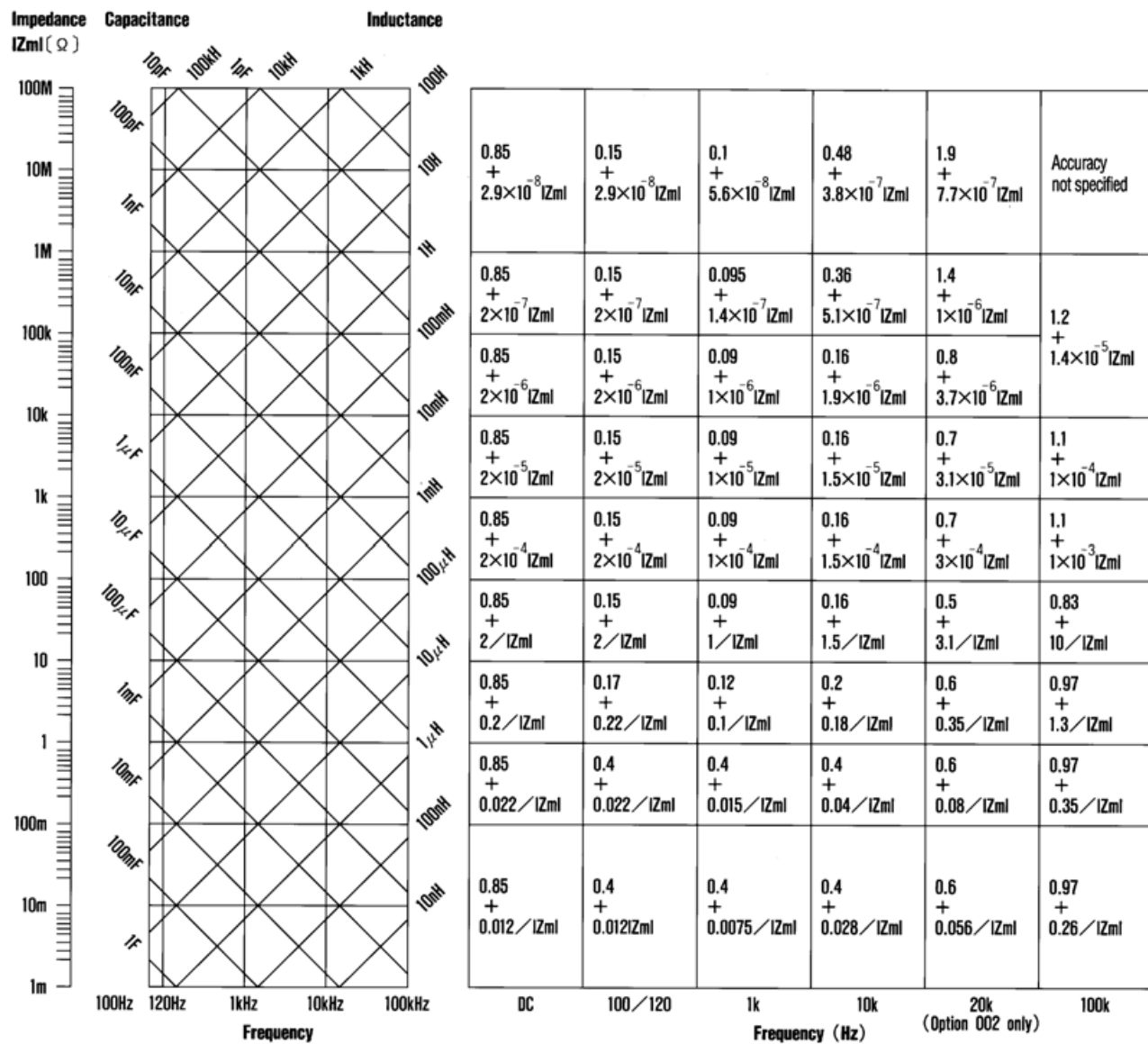


Figure 1. Conversion diagram

0.85 + $2.9 \times 10^{-8} Z_{ml}$	0.15 + $2.9 \times 10^{-8} Z_{ml}$	0.1 + $5.6 \times 10^{-8} Z_{ml}$	0.48 + $3.8 \times 10^{-7} Z_{ml}$	1.9 + $7.7 \times 10^{-7} Z_{ml}$	Accuracy not specified
0.85 + $2 \times 10^{-7} Z_{ml}$	0.15 + $2 \times 10^{-7} Z_{ml}$	0.095 + $1.4 \times 10^{-7} Z_{ml}$	0.36 + $5.1 \times 10^{-7} Z_{ml}$	1.4 + $1 \times 10^{-6} Z_{ml}$	1.2 + $1.4 \times 10^{-5} Z_{ml}$
0.85 + $2 \times 10^{-6} Z_{ml}$	0.15 + $2 \times 10^{-6} Z_{ml}$	0.09 + $1 \times 10^{-6} Z_{ml}$	0.16 + $1.9 \times 10^{-6} Z_{ml}$	0.8 + $3.7 \times 10^{-6} Z_{ml}$	
0.85 + $2 \times 10^{-5} Z_{ml}$	0.15 + $2 \times 10^{-5} Z_{ml}$	0.09 + $1 \times 10^{-5} Z_{ml}$	0.16 + $1.5 \times 10^{-5} Z_{ml}$	0.7 + $3.1 \times 10^{-5} Z_{ml}$	1.1 + $1 \times 10^{-4} Z_{ml}$
0.85 + $2 \times 10^{-4} Z_{ml}$	0.15 + $2 \times 10^{-4} Z_{ml}$	0.09 + $1 \times 10^{-4} Z_{ml}$	0.16 + $1.5 \times 10^{-4} Z_{ml}$	0.7 + $3 \times 10^{-4} Z_{ml}$	1.1 + $1 \times 10^{-3} Z_{ml}$
0.85 + $2 / Z_{ml}$	0.15 + $2 / Z_{ml}$	0.09 + $1 / Z_{ml}$	0.16 + $1.5 / Z_{ml}$	0.5 + $3.1 / Z_{ml}$	0.83 + $10 / Z_{ml}$
0.85 + $0.2 / Z_{ml}$	0.17 + $0.22 / Z_{ml}$	0.12 + $0.1 / Z_{ml}$	0.2 + $0.18 / Z_{ml}$	0.6 + $0.35 / Z_{ml}$	0.97 + $1.3 / Z_{ml}$
0.85 + $0.022 / Z_{ml}$	0.4 + $0.022 / Z_{ml}$	0.4 + $0.015 / Z_{ml}$	0.4 + $0.04 / Z_{ml}$	0.6 + $0.08 / Z_{ml}$	0.97 + $0.35 / Z_{ml}$
0.85 + $0.012 / Z_{ml}$	0.4 + $0.012 / Z_{ml}$	0.4 + $0.0075 / Z_{ml}$	0.4 + $0.028 / Z_{ml}$	0.6 + $0.056 / Z_{ml}$	0.97 + $0.26 / Z_{ml}$
DC	100/120	1k	10k	20k (Option 002 only)	100k

Table 1. Measurement accuracy ($\pm\%$ of reading)

Measurement conditions

1. Warm-up time: ≥ 15 min.
2. Ambient temperature: 23 ± 5 °C
3. Test signal voltage: 1 Vrms
4. Test cable length: 0 meter
5. Open and short corrections performed
6. Measurement time: Medium or Long
(Other test condition data is available in the operation manual.)

For |Z|, |Y|, L, C, R, X, G, and B accuracy (Ae), refer to Table 1. Table 1 equations yield accuracy based on frequency and DUT characteristic impedance (Zm). Zm is from Figure 1, Conversion Diagram.

$$D \text{ accuracy}(De) = \pm Ae/100$$

$$Q \text{ accuracy}(Qe) = \pm \frac{(Qm)^2 \times De}{1 - / + (Qm \times De)}$$

$$u \text{ accuracy}(ue) = 0.573 \times Ae$$

Ae = Accuracy of |Z|, |Y|, L, C, R, X, G, and B

De = D accuracy

Dm = Measured value of D

Qe = Q accuracy

Qm = Measured value of Q

ue = u phase angle accuracy

Zm = DUT impedance at test frequency in Hertz

Other Specifications

Measurement parameters/ranges

Parameter	Range
Z , R, X	1 m Ω to 100 M Ω
Y , G, B	10 nS to 1000S
C	1 pF to 1 F
L	10 nH to 100 kH
D	0.0001 to 9.9999
Q	0.1 to 9999.9
u	-180° to +180°
Δ	-999.99% to 999.99%

Option 4263B-001: DC resistance 1 m Ω to 100 M Ω

Mutual inductance 1 μ H to 100 H (typical)

Turns-ratio 0.9 to 200 (typical)

Measurement conditions and functions

Test frequency: 100 Hz, 120 Hz, 1 kHz, 10 kHz, 100 kHz. (Option 4263B-002 adds 20 kHz.)

AC test signal level: 20 m - 1 Vrms, 5 mVrms steps

Bias:

Internal: +1.5 and +2.0 Vdc

External: 0 to +3.0 Vdc

Ranging: Auto and Hold

Trigger: Internal, Manual, and External

Trigger delay time: 0 to 9999 ms in 1 ms steps

Test cable lengths:

0, 1 meter @ $f \leq 100$ kHz

2 meter @ $f \leq 10$ kHz (20 kHz)

4 meter @ $f \leq 1$ kHz

Measurement time:

SHORT	MEDIUM	LONG
25ms	65ms	500ms

Other instrument functions

Test signal level monitor:

Voltage, current

Error Correction: Open, Short, Load

Comparator: HIGH, IN, and LOW for each displayed parameter

Save/recall: 10 instrument states from non-volatile memory

Front-end Protection:

$$V_{max} = \sqrt{8/C} \quad @ \quad V_{max} \leq 250 \text{ V}$$

$$V_{max} = \sqrt{2/C} \quad @ \quad V_{max} \leq 1000 \text{ V}$$

C in Farads

Handler interface: Negative logic and isolated.

Signals are HIGH/IN/LOW, No-Contact, EOM, Index, Alarm, Keylock, Ext. Trigger.

GPIB interface: Instrument control, TALK-only mode for LISTEN-only printers using GPIB or Centronics/GPIB converter

Physical characteristics

Power: 90-132 Vac or 198-264 Vac. 47-66 Hz. 45 VA typical.

Operating temperature: 0 to 45 °C

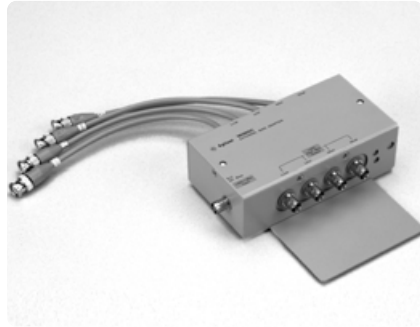
Dimensions: 320 (W) x 100 (H) x 300 (H) mm

Weight: 4.5 kg (typical)

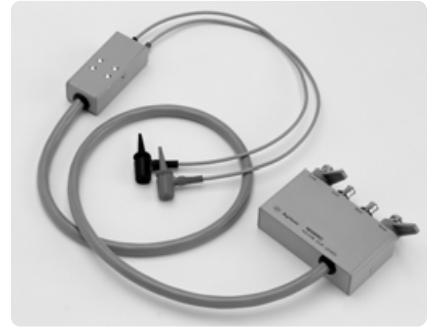
Test Fixtures/Accessories for the Agilent 4263B



16060A transformer test fixture
Allows fast connections to transformers



16065C external bias adapter
For external dc bias of DUT. $V_{max} \leq 40$ Vdc.



16089C Kelvin IC clip leads
IC package clip. 1 meter length.



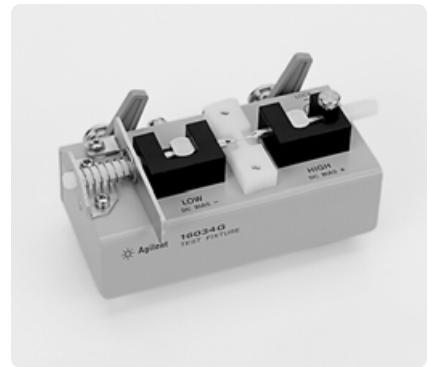
16064B LED display/trigger box
Displays comparator status. 1.5 meter cable. External trigger.



16089A Kelvin clip leads
Large clip. 1 meter length.

16089B Kelvin clip leads
Medium clip. 1 meter length.

16089D Alligator clip leads
Four clips. 1 meter length.



16034G Test fixture
For SMD components.

Component dimensions (L x W):
0.6 mm x 0.3 mm to 5.0. mm x 1.6 mm

Ordering information ¹

Agilent 4263B LCR Meter

Furnished accessory: power cable

Options

4263B-001 Add N/M/DCR Measurement Function

4263B-002 Add 20 kHz Test Frequency
Test fixtures are not furnished as standard.

Manual options ²

4263B-AB0 Taiwan - Chinese localization

4263B-AB1 Korea - Korean localization

4263B-AB2 China - Chinese localization

4263B-ABA U.S. - English localization

4263B-ABD Germany - German localization

4263B-ABE Spain - Spanish localization

4263B-ABF France - French localization

4263B-ABJ Japan - Japanese localization

4263B-ABZ Italy - Italian localization

4263B-0BW Add service manual

Cabinet options

4263B-1CM Rackmount kit

4263B-1CN Handle kit

(Rack flange and handle kit are not compatible.)

Calibration certificate option

4263B-1A7 ISO 17025 compliant calibration

Test fixtures and accessories

16034E/G/H SMD component test fixture

16043A/B ³ 3-terminal SMD test fixture

Options

16043A-ABA U.S. - English localization

16043A-ABJ Japan - Japanese localization

16043B-ABA U.S. - English localization

16043B-ABJ Japan - Japanese localization

16044A ³ Test fixture

Options

16044A-ABA U.S. - English localization

16044A-ABJ Japan - Japanese localization

16047A/E ⁴ Axial and radial test fixture

Options

16047E-ABA U.S. - English localization

16047E-ABJ Japan - Japanese localization

16334A SMD tweezer test fixture

16048A 0.94-meter/BNC test leads

16048B 0.94-meter/SMC test leads

16048D 1.89-meter/BNC test leads

16048E 3.8-meter/BNC test leads

16060A Transformer test fixture

16064B LED display/trigger box

16065A 200-Vdc external voltage bias fixture

16065C 40-Vdc external voltage bias adapter

16089A Large Kelvin clip leads

16089B Medium Kelvin clip leads

16089C Kelvin IC clip leads

16089D Alligator clip leads

16089E Kelvin clip leads

¹ Accessories and options are priced individually.

² Manual is not furnished as standard

³ Must specify one of language options (ABA or ABJ) for operation manual for shipment with product.

⁴ Must specify one of language options (ABA or ABJ) for operation manual of 16047E for shipment with product.



Agilent Email Updates

www.agilent.com/find/emailupdates

Get the latest information on the products and applications you select.

Agilent T&M Software and Connectivity

Agilent's Test and Measurement software and connectivity products, solutions and developer network allows you to take time out of connecting your instruments to your computer with tools based on PC standards, so you can focus on your tasks, not on your connections. Visit www.agilent.com/find/connectivity

for more information.

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 onsite education and training, as well as design, system integration, project management, and other professional engineering 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 & measurement needs

Phone or Fax

United States:

(tel) 800 829 4444

Canada:

(tel) 877 894 4414

(fax) 905 282 6495

China:

(tel) 800 810 0189

(fax) 800 820 2816

Europe:

(tel) (31 20) 547 2323

(fax) (31 20) 547 2390

Japan:

(tel) (81) 426 56 7832

(fax) (81) 426 56 7840

Korea:

(tel) (82 2) 2004 5004

(fax) (82 2) 2004 5115

Latin America:

(tel) (305) 269 7500

(fax) (305) 269 7599

Taiwan:

(tel) 0800 047 866

(fax) 0800 286 331

Other Asia Pacific Countries:

(tel) (65) 6375 8100

(fax) (65) 6836 0252

Email: tm_asia@agilent.com

Online Assistance

www.agilent.com/find/assist

Product specifications and descriptions in this document subject to change without notice.

© Agilent Technologies, Inc., 2004, 2003, 2000, 1995

Printed in USA, April 2, 2004

5964-6181E



Agilent Technologies