Agilent 8757D
Scalar Network Analyzers

Configuration Guide
Optimize your scalar analysis system to meet your specific measurement requirements. The Agilent 8757D measurement features provide greater system versatility and measurement throughout. This network analyzer forms the basis of a complete Agilent scalar measurement system. System components may be ordered separately, or as a complete package. The basic components of any scalar system include a scalar analyzer, a swept source, a directional bridge or coupler, and detectors. Other accessories such as a plotter, printer, or disk drive can be added to make a complete manual measurement system.

Agilent 8757D Scalar Network Analyzers

Test set options
• 8757D-700 standard test set
• 8757D-001 add fourth detector input
• 8757D-002 add internal power calibrator and a Type-N (m) to 3.5 (f) adapter
• 8757D-012 add fourth detector and internal power calibrator

Kit for rack flanges
• 8757D-908 add rack flange kit for instruments without handles
• 8757D-913 add rack flange kit for instruments with handles

Documentation
• 8757D-910 add extra manual set

Service options are available
Coaxial System Configurations

The following configurations allow scalar network analyzer measurements in the indicated frequency ranges and connector types. Ratioing is recommended for all configurations, since it improves the effective source match by removing the effects of source power variations versus frequency. When ratio measurements are not desired, the power splitter and one detector may be removed from the system. See Figure 1 for a block diagram of a basic scalar measurement system.

Other adapters might be necessary if the connectors of the device under test do not mate with the test port connectors. The test port connectors are documented for each of the configured systems below. Adapter ordering information is provided in the ordering guide on page six.

Coaxial system configurations by frequency range and connector type

<table>
<thead>
<tr>
<th>Frequency range</th>
<th>0.01 to 18 GHz</th>
<th>0.01 to 20 GHz</th>
<th>0.01 to 26.5 GHz</th>
<th>0.01 to 40 GHz</th>
<th>0.01 to 50 GHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connector type</td>
<td>Type-N</td>
<td>3.5 mm</td>
<td>3.5 mm</td>
<td>2.4 mm</td>
<td>2.4 mm</td>
</tr>
<tr>
<td>Analyzer</td>
<td>8757D</td>
<td>8757D</td>
<td>8757D</td>
<td>8757D</td>
<td>8757D</td>
</tr>
<tr>
<td>Synthesized sweeper&lt;br&gt;with Options 520, 007, IED</td>
<td>E8257D</td>
<td>E8257D</td>
<td>E8257D</td>
<td>E8257D</td>
<td>E8257D</td>
</tr>
<tr>
<td>Synthesized sweeper&lt;br&gt;with Options 540, 007</td>
<td>E8257D</td>
<td>E8257D</td>
<td>E8257D</td>
<td>E8257D</td>
<td>E8257D</td>
</tr>
<tr>
<td>Synthesized sweeper&lt;br&gt;(discontinued)</td>
<td>83620B with Option C01, or 83752A with Option 1ED</td>
<td>83620B with Options 520, 007</td>
<td>83630B/L</td>
<td>83640B/L</td>
<td>83650B/L</td>
</tr>
<tr>
<td>Detector</td>
<td>85025A</td>
<td>85025E</td>
<td>85025E</td>
<td>85025D</td>
<td>85025D</td>
</tr>
<tr>
<td>Directive bridge</td>
<td>85027C</td>
<td>85027E</td>
<td>85027E</td>
<td>85027D</td>
<td>85027D</td>
</tr>
<tr>
<td>Test port type</td>
<td>Type-N (f)</td>
<td>3.5 mm (m)</td>
<td>3.5 mm (m)</td>
<td>2.4 mm (m)</td>
<td>2.4 mm (m)</td>
</tr>
<tr>
<td>Through adapter</td>
<td>N/A</td>
<td>Included with bridge</td>
<td>Included with bridge</td>
<td>11900B</td>
<td>11900B</td>
</tr>
<tr>
<td>Power splitter&lt;br&gt;with Options 001</td>
<td>11667A</td>
<td>11667B</td>
<td>11667B</td>
<td>11667C</td>
<td>11667C</td>
</tr>
<tr>
<td>Adapter (power splitter to bridge)</td>
<td>Part No. 1250-1748</td>
<td>Part No. 1250-1748</td>
<td>Part No. 1250-1748</td>
<td>2.4 mm (m) to (m)</td>
<td>2.4 mm (m) to (m)</td>
</tr>
<tr>
<td>Reference detector</td>
<td>85025A</td>
<td>85025E</td>
<td>85025E</td>
<td>85025D</td>
<td>85025D</td>
</tr>
<tr>
<td>System cable kit</td>
<td>85022A</td>
<td>85022A</td>
<td>85022A</td>
<td>85022A</td>
<td>85022A</td>
</tr>
</tbody>
</table>

Note: Shaded items above have been discontinued.

1. These accessories required for ratio measurements only.
2. For higher output power and dynamic range, add option IEA to the E8247C/57C PSG Signal Generator.
Basic Measurement System Components

Sources
• **E8257D (Option 520, 007)** 250 kHz to 20 GHz synthesized sweeper with analog and pulse modulation
• **E8257D (Option 540, 007)** 250 kHz to 40 GHz synthesized sweeper with analog and pulse modulation
• **E8257D (Option 550, 007)** 250 kHz to 50 GHz synthesized sweeper with analog and pulse modulation

(for high output add option IEA)

Extended service options available.

Directional bridges
The following operate in AC or DC detection modes.

• 85027A 0.01 to 18 GHz, 7 mm
• 85027B 0.01 to 26.5 GHz, 3.5 mm (f)
• 85027C 0.01 to 18 GHz, Type-N (f)
• 85027D 0.01 to 50 GHz, 2.4 mm (m)
• 85027E 0.01 to 26.5 GHz, 3.5 mm (m)

Power splitters
• 11667A DC to 18 GHz, all connectors Type-N (f)
• 1167A-001 Type-N (m) input connector
• 1167A-002 7-mm output connectors
• 11667B DC to 26.5 GHz, 3.5 mm (f)
• 11667C DC to 50 GHz, 2.4 mm (f)

Power dividers
• 11636A DC to 18 GHz, Type-N (f)
• 11636B DC to 26.5 GHz, 3.5 mm (f)

Waveguide detectors
• R85026A 26.5 to 40 GHz, WR-28
• Q85026A 33 to 50 GHz, WR-22
• U85026A 40 to 60 GHz, WR-19
• 85025CK-K57 50 to 75 GHz, WR-15, must order with 85025C
• 85025CK-K71 75 to 110 GHz, WR-10, must order with 85025C

Waveguide accessories
• Part No. 11644-20015 V/W fixed short, WR-15/10
• Part No. 85043-80013 anti-static mat
• Part No. 11644-20004 Q/U fixed short, WR-22/19
• Part No. 11644-20005 R fixed short, WR-28

Precision detectors (For use with the 8757D only)
• 85037A 0.01 to 18 GHz, type-N (m)
• 85037A-001 7-mm connector
(A Type-N (m) to 7-mm adapter is included to calibrate the 85037A-001 precision detector via the 8757D-002 internal power calibrator.)
• 85037B 0.01 to 26.5 GHz, 3.5 mm (m)

Detectors
• 85025A 0.01 to 18 GHz, Type-N (m)
• 85037A-001 7-mm connector
• 85025B 0.01 to 26.5 GHz, 3.5 mm (m)
• 85025D 0.01 to 50 GHz, 2.4 mm (m)
• 85025E 0.01 to 26.5 GHz, 3.5 mm (m) with improved return loss

Detector adapters
• 85025C SMA (m), AC or DC detection

1. Connector types refer to the test port (or output) connector unless otherwise specified.
Other Measurement Accessories

Standards

- **909A** 50 ohm termination, 7 mm
- **909B** 50 ohm termination, 3.5 mm (m)
- **909D** 50 ohm termination, 3.5 mm (f)
- **8490D** Option 010 50 ohm 10 dB pad, 2.4 mm (m)
- **8491B** Option 010 50 ohm 10 dB pad, Type-N (m)
- **8492A** Option 010 50 ohm 10 dB pad, 7 mm
- **8493C** Option 010 50 ohm 10 dB pad, 3.5 mm (m)
- **85013A** 50 ohm termination, 2.4 mm (m)
- **85013B** 50 ohm termination, 2.4 mm
- **85140A** short, 2.4 mm (m)
- **85141A** open, 2.4 mm (m)
- **85141B** open, 2.4 mm (f)
- **Part No. 1250-1530** 75 ohm short, Type-N (m)
- **Part No. 1250-1532** 75 ohm termination, Type-N (m)
- **Part No. 85021-60001** open/short, 7 mm
- **Part No. 85027-60004** open/short, 3.5 mm (f)
- **Part No. 85032-60001** 50 ohm open, Type-N (m)
- **Part No. 85037-60001** open/short, 3.5 mm (m)

Other accessories

- **11613B** calibrator
- **11679A** 7.6 m (25 ft) extension cable
- **11679B** 61 m (200 ft) extension cable
- **11852B** 50/75 ohm minimum loss pad
- **85022A** system cable kit
- **Disk drive** Agilent no longer offers Option 802, the 9122C disk drive. 8757D/E compatible disk drives are available from ISA, Inc. In the U.S., contact Saaya, Inc. (formerly known as ISA, Inc.). Elsewhere, contact ISA Company, Ltd at www.isa-j.co.jp/

Adapters

- **R281A** 2.4 mm (f) to WR-28
- **R281B** 2.4 mm (m) to WR-28
- **Q281A** 2.4 mm (f) to WR-22
- **Q281B** 2.4 mm (m) to WR-22
- **11900A** 2.4 mm (m) to (m)
- **11900B** 2.4 mm (f) to (f)
- **11900C** 2.4 mm (m) to (f)
- **Part No. 1250-1745** Type-N (m) to (m)
- **Part No. 1250-1743** 3.5 mm (m) to Type-N (m)
- **Part No. 1250-1746** 7 mm to 3.5 mm (m)
- **Part No. 1250-1747** 7 mm to 3.5 mm

Directional bridge connector savers

- **Part No. 85027-60002** 3.5 mm (m) to (m)
  *(For use with the 85027B directional bridge only)*
- **Part No. 85027-60003** 3.5 mm (m) to (f)
  *(For use with the 85027B directional bridge only)*
- **Part No. 85027-60005** 3.5 mm (f) to (f)
- **Part No. 85027-60006** 3.5 mm (f) to (m)
- **Part No. 85027-60007** 3.5 mm (m) to (m)

Peripherals

For a list of compatible printers, consult our printer-compatibility guide Web page. Its URL location is www.agilent.com/find/pcg

Upgrade Kits

- **Hardware upgrades**
  - **86383C** 8757D upgrade kit
    *(order one or both of the following options)*
    - **86383C-001** modifies 8757D to include 8757D-001 (fourth detector input)
    - **86383C-002** modifies 8757D to include 8757D-002 (internal power calibrator)

Figure 2. Hardware upgrade paths
Millimeter-wave System Configurations
Based on Discontinued Products

The information below is provided as a reference for users who currently own these products, or those who are considering purchasing them from a used equipment supplier.

![Figure 3. Block diagram for millimeter-wave ratio transmission and reflection measurements](image-url)

Millimeter-wave system configurations by frequency range and connector type

<table>
<thead>
<tr>
<th>Frequency range</th>
<th>26.5 to 40 GHz</th>
<th>33 to 50 GHz</th>
<th>40 to 60 GHz</th>
<th>50 to 75 GHz</th>
<th>75 to 110 GHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connector type</td>
<td>WR-28 (R band)</td>
<td>WR-22 (Q band)</td>
<td>WR-19 (U band)</td>
<td>WR-15 (V band)</td>
<td>WR-10 (W band)</td>
</tr>
<tr>
<td>Analyzer</td>
<td>8757D</td>
<td>8757D</td>
<td>8757D</td>
<td>8757D</td>
<td>8757D</td>
</tr>
<tr>
<td>Source</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Synthesized sweeper</td>
<td>E8257D</td>
<td>E8257D</td>
<td>E8257D</td>
<td>E8257D</td>
<td>E8257D</td>
</tr>
<tr>
<td>Options</td>
<td>Options 520, 007, IEA</td>
<td>Options 520, 007, IEA</td>
<td>Options 520, 007, IEA</td>
<td>Options 520, 007, IEA</td>
<td>Options 520, 007, IEA</td>
</tr>
<tr>
<td>Source module</td>
<td>83554A²</td>
<td>83555A²</td>
<td>83556A²</td>
<td>83557A²</td>
<td>83558A²</td>
</tr>
<tr>
<td>(discontinued)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Detector</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(need 3)</td>
<td>R85026A</td>
<td>Q85026A</td>
<td>U85026A</td>
<td>85025CK Option K57 and 85025C</td>
<td>85025CK Option K71 and 85025C</td>
</tr>
<tr>
<td>Directional coupler</td>
<td>R band (R752C³)</td>
<td>Q band (Q752C³)</td>
<td>U band (U752C³)</td>
<td>V band (V752C³)</td>
<td>W band (W752C³)</td>
</tr>
<tr>
<td>(need 2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(discontinued)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Isolator</td>
<td>R band (R365A⁴)</td>
<td>Q band (Q365A⁴)</td>
<td>U band (U365A⁴)</td>
<td>V band (V365A⁴)</td>
<td>W band (W365A⁴)</td>
</tr>
<tr>
<td>(discontinued)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fixed short</td>
<td>11644-20005</td>
<td>11644-20004</td>
<td>11644-20004</td>
<td>11644-20015</td>
<td>11644-20015</td>
</tr>
<tr>
<td>Straight or twist</td>
<td>3rd party vendor</td>
<td>3rd party vendor</td>
<td>3rd party vendor</td>
<td>3rd party vendor</td>
<td>3rd party vendor</td>
</tr>
<tr>
<td>System cable kit</td>
<td>85022A</td>
<td>85022A</td>
<td>85022A</td>
<td>85022A</td>
<td>85022A</td>
</tr>
</tbody>
</table>

Note: Shaded items above have been discontinued.

1. Installation not included.
2. The Agilent 8355xA source modules have been discontinued as of 2005. However, they are still compatible with this configuration.
3. The Agilent x365C directional couplers have been discontinued as of 2002. However, they are still compatible with this configuration as well as other equivalent products.
4. The Agilent x365A isolators have been discontinued as of 2002. However, they are still compatible with this configuration as well as other equivalent products.
Literature Guide

- *Agilent 8757D/E scalar network analyzers*, Data Sheet, publication number 5091-2471E

- *Improving network analyzer measurements of frequency-translating devices*, Application Note 1287-7, publication number 5966-3318E

- *Network analyzer measurements: filter and amplifier examples*, Application Note 1287-4, publication number 5965-7710E

- *Microwave component measurements; amplifier measurements using the scalar network analyzer*, Product Note 345-1, publication number 5954-1599

- *Improving scalar network analysis using the PSG signal generator and the 8757D scalar network analyzer*, Application Note 1435, publication number 5988-8432EN

Web Resources

Visit our Web sites for additional product information and literature.

Scalar Network Analyzers  
[www.agilent.com/find/8757](www.agilent.com/find/8757)

RF & MW Network Analyzers  
[www.agilent.com/find/na](www.agilent.com/find/na)

Test and Measurement Accessories  
[www.agilent.com/find/accessories](www.agilent.com/find/accessories)
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

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

Phone or Fax

United States:
(tel) 800 829 4444
(fax) 800 829 4433

Canada:
(tel) 877 894 4414
(fax) 800 746 4866

China:
(tel) 800 810 0189
(fax) 800 820 2816

Europe:
(tel) 31 20 547 2111

Japan:
(tel) (81) 426 56 7832
(fax) (81) 426 56 7840

Korea:
(tel) (080) 769 0800
(fax) (080) 769 0900

Latin America:
(tel) (305) 269 7500

Taiwan:
(tel) 0800 047 866
(fax) 0800 286 331

Other Asia Pacific Countries:
(tel) (65) 6375 8100
(fax) (65) 6755 0042
Email: tm_ap@agilent.com
Revised: 09/14/06

Product specifications and descriptions in this document subject to change without notice.
Printed in USA, September 26, 2006
5967-6177E