

Agilent 8510C Network Analyzer Family

Configuration Guide

45 MHz to 110 GHz

The Agilent Technologies 8510C is a modular family of compatible products. For flexibility in specifying a solution that meets your exact needs, a system is typically ordered as separate line items. For those who wish ordering convenience, complete bundled systems are available. Whether ordering individual components or a bundled system, all 8510C network analyzers include one-year, on-site service. For systems built from individual components, installation may be ordered separately. A PC running BASIC Rev 6.3 or higher under Windows® (3.1/95/NT) is recommended for installation and service.

Complete Systems

Agilent 8510XF family 110 GHz single sweep systems (45 MHz to 110 GHz)

The 8510XF family has two models which are complete single-connection, single-sweep vector network analyzer systems that offer S-parameter measurements over an ultra-broadband frequency in a 1.0 mm coaxial connector. The broadest frequency model covers 45 MHz to 110 GHz. A lower frequency model is available covering 45 MHz to 85 GHz. Both systems are designed to facilitate easy connection to wafer probe hardware while still preserving excellent RF measurement performance. In addition, the system can be used to make coaxial measurements (to interface to a coaxial fixture or a coaxial DUT) using the same millimeter head configuration.

Agilent E7340A single-connection single-sweep network analyzer system (2 to 85 GHz)

The E7340A is a complete system configured with an 8510C, a 20 GHz and 50 GHz synthesizer, two 85 GHz S-parameter test heads, and a millimeter test set controller. The instruments are integrated in the system rack, the system is fully tested, and a complete system verification is performed prior to shipment from Agilent. Installation is included at no additional charge. The E7340A system does not include calibration kits or test port cable sets.

System components include:

- 8510C network analyzer
- E7342A millimeter subsystem
- 83621B synthesizer
- 83651B synthesizer
- System rack

Calibration kits and test port cables are not included and must be ordered separately.

- **Option 005** add (45 MHz to 2 GHz) low frequency extension
- **Option 006** add RF pass thru (Provides coupled output of 50 GHz source for additional test set(s). Additional test set(s) must have Option 001 installed.)
- **Option 010** add time domain
- **Option 230** 220/240 V line voltage operation
- **Option W31** add two years additional on-site service



Agilent Technologies

Innovating the HP Way

Agilent E7350A single-connection single-sweep network analyzer system (2 to 110 GHz)

The E7350A is a complete system configured with an 8510C, a 20 GHz and 50 GHz synthesizer, two 110 GHz S-parameter test heads, and a millimeter test set controller. The instruments are integrated in the system rack, the system is fully tested, and a complete system verification is performed prior to shipment from Agilent. Installation is included at no additional charge. The E7350A system does not include calibration kits or test port cable sets.

System components include:

8510C network analyzer
E7352A millimeter subsystem
83621B synthesizer
83651B synthesizer
System rack

Calibration kits and test port cables are not included and must be ordered separately.

- **Option 005** add (45 MHz to 2 GHz) low frequency extension
- **Option 006** add RF pass thru (provides coupled output of 50 GHz source for additional test set(s). Additional test set(s) must have Option 001 installed.)
- **Option 010** add time domain
- **Option 230** 220/240 V line voltage operation
- **Option W31** add two years additional on-site service

Agilent 85107B network analyzer system (45 MHz to 50 GHz)

The 85107B is a complete system configured with a 50 GHz synthesizer, 50 GHz S-parameter test set, and 2.4 mm measurement accessories. The instruments are integrated in the system rack, the system is fully tested, and a complete system verification is performed prior to shipment from the factory. Installation is included at no additional charge.

System components include:

8510C network analyzer
8517B test set with Option 002
(deleted step attenuators and bias tees)
83651B synthesizer
85056A calibration kit
85133F cable set
85043C rack

- **Option 001** add 3.5 mm measurement accessories (85052B and 85134F)
- **Option 005** add step attenuators and bias tees to the 8517B
- **Option 007** add high power and high dynamic range configuration to the 8517B (should order Option 005 with this option)
- **Option 010** add time domain capability to the 8510C
- **Option 230** 220/240 V line voltage operation
- **Option W31** add two years additional on-site service

Agilent 8510SX network analyzer system (45 MHz to 26.5 GHz)

The 8510SX is a complete system configured with a 26.5 GHz synthesizer, 26.5 GHz S-parameter test set, and a complete set of 3.5 mm measurement accessories. The instruments are integrated in the system rack, the system is fully tested, and a complete system verification is performed prior to shipment from the factory. Installation is included at no additional charge.

System components include:

8510C network analyzer
8515A test set
83631B synthesizer
85043C rack
85052C calibration kit
11752D gauge kit
85131F cable set

- **Option 001** add 7 mm accessories (85050C and 85132F)
- **Option 010** add time domain capability to 8510C
- **Option 230** 220/240 V line voltage operation
- **Option W31** add two years additional on-site service

Agilent 8510E network analyzer system (45 MHz to 20 GHz)

The 8510E is a complete unracked system configured with a 20 GHz synthesizer, 20 GHz S-parameter test set, and 3.5 mm connector accessories. Installation is not included.

System components include:

8510C network analyzer
8514B test set with Option 002
(deleted step attenuators and bias tees)
83621B synthesizer
85052D calibration kit
85131D cable set

- **Option 002** add step attenuators and bias tees to 8514B
- **Option 005** replace 85052D with 85052B calibration kit
- **Option 010** add time domain capability to 8510C
- **Option W31** add two years additional on-site service

Agilent 85106D millimeter-wave network analyzer subsystem (33 GHz to 110 GHz)

When combined with the appropriate 85104A series test set modules (see page 6) and 11644A series calibration kits, the 85106D provides a complete system for measurements in the millimeter-wave frequency range. The instruments are integrated in a 1600 mm system rack. It is fully tested and a complete system verification is performed prior to shipment from the factory. Installation is included at no additional charge.

The 85106D system consists of:

8510C network analyzer
85105A test set controller
83621B synthesizer (2 total)
1600 mm rack

Must also order appropriate 85104A series test set modules and 11644A series calibration kit for complete system.

- **Option 001** add microwave test set (Adds 8517B, 85056A, 85133F, and Option 050 to 85105A, replaces 83621B with 83651B.)
- **Option 007** add high power and high dynamic range configuration to the 8517B (must also order system Option 001)
- **Option 010** add time domain capability to the 8510C
- **Option 230** 220/240 V line voltage operation
- **Option W31** add two years additional on-site service

Agilent 85108A pulsed-RF network analyzer system (2 GHz to 20 GHz)

Based on an 8510C with Option 008, this system provides the capability to measure the amplitude and phase response of a device or component being driven with a pulsed-RF input signal. The instruments are integrated in a 1600 mm system rack. It is fully tested and a complete system verification is performed prior to shipment from the factory. Installation is included at no additional charge.

System components include:

8510C network analyzer with Option 008
(pulsed-RF measurement capability)
85110A test set
1600 mm rack
83622B synthesizer with Options 001/004/008
83623L synthesizer with Options 004/008
Calibration kits and test port cables in the appropriate connector interface are not included and must be ordered separately.

- **Option 010** add time domain capability to the 8510C
- **Option 230** 220/240 V line voltage operation
- **Option W31** add two years additional on-site service

Other configurations are available for systems covering frequency ranges 500 MHz to 20 GHz and 2 GHz to 50 GHz.

Agilent 85108L pulsed-RF network analyzer system

(45 MHz to 2 GHz)

Based on an 8510C with Option 008, this system provides the capability to measure the amplitude and phase response of a device or component being driven with a pulsed-RF input signal. The instruments are integrated in a 1600 mm system rack, the system is fully tested, and a complete system verification is performed prior to shipment from the factory. Installation is included at no additional charge.

System components include:

- 8510C network analyzer with Option 008 (pulsed-RF measurement capability)
 - 85110L test set
 - 1600 mm rack
 - 83620B synthesizer with Options 001/004/008/H80
 - 83620B synthesizer with Options 004/008/H80
- Calibration kits and test port cables in the appropriate connector interface are not included and must be ordered separately.*

- **Option 010** add time domain capability to 8510C
- **Option 230** 220/240 V line voltage operation
- **Option W31** add two years additional on-site service

Agilent 85122A high frequency device modeling system

(45 MHz to 20 GHz)

When combined with the 85190 series high frequency IC-CAP software, along with Cascade probes or ICM fixtures, the 85122A can be used to model BJT, FET, MOS, and diode devices. All instruments are integrated in a 1600 mm system rack prior to shipment from the factory. Installation is included at no additional charge.

System components include:

- 8510C network analyzer
 - 8514B test set
 - 83621B synthesizer
 - 11612A Option K10/K20 force/sense bias networks
 - 4142B Option 400/410 DC source/monitor
 - 85131F cable set
 - 1600 mm rack
- Probes, fixtures, calibration kits, 85190 series software, and workstation must be ordered separately.*

- **Option 230** provides system cabinet set up for 220/240 V operation

Custom configurations available to meet other frequency coverage and power requirements.

System Components

For flexibility in specifying a solution that meets your exact needs, a system can be ordered as separate line items. A complete system includes the Agilent 8510C network analyzer, a test set, compatible source, and measurement accessories.

All major system components (network analyzer, test sets, and sources) include one-year on-site service.

Analyzer (A required system component)

- **8510C network analyzer**
 - Option 008** pulsed-RF measurement capability
Requires HP 85110A or 85110L S-parameter test set.
Also, see 85108A or 85108L pulsed-RF network analyzer system.
 - Option 010** add time domain capability
 - Option 908** add rack flange kit
 - Option 910** add extra operating, programming and service manual set
 - Option 913** add rack flange and handles kit
 - Option 916** add extra operating and programming manual
 - Option W31** add two years additional on-site service
 - Option 1BN** add MIL-STD 45662A calibration certificate
 - Option 1BP** add MIL-STD 45662A calibration certificate and test data

Test sets (Choose one)

- **8514B S-parameter test set** (45 MHz to 20 GHz)
With rugged 3.5 mm connector test ports
- **8515A S-parameter test set** (45 MHz to 26.5 GHz)
With rugged 3.5 mm connector test ports
- **8517B S-parameter test set** (45 MHz to 50 GHz)
With rugged 2.4 mm connector test ports
- **85110A pulsed-RF S-parameter test set** (2 to 20 GHz)
For use with 8510C Option 008. Includes rugged 3.5 mm connector test ports and four built-in step attenuators to independently set power level to all four downconverter channels.
Requires 8360 series synthesized sources for complete operation (83622B and 83624B).
- **85110L pulsed-RF S-parameter test set** (45 MHz to 2 GHz)
For use with 8510C Option 008. Includes rugged 7 mm connector test ports and four built-in step attenuators to independently set power level to all four downconverter channels. Requires two 8360 series synthesized sources for complete operation (83620B-H80, two each).
- **8511A frequency converter** (45 MHz to 26.5 GHz)
3.5 mm connector ports
- **8511B frequency converter** (45 MHz to 50 GHz)
2.4 mm connector ports

Note: Agilent 8511A/B require external, customer-furnished couplers, or signal separating devices to provide complete test set capability. A source with front panel RF power output may be more suitable for 8511-based applications.

Test set options

Option	Description	8514B	8515A	8517B	85110A	85110L	8511A/B
001	Add IF switching for multiple test set operation	X	X	X	X	X	X
002	Delete step attenuators and bias tees	X	X	X			
003	High forward dynamic range configuration (degrades reverse transmission dynamic range)	X					
004	High power configuration (moves port 2 attenuator in front of b2 sampler)			X			
007	High dynamic range configuration (adds buffer amplifiers)			X			
1BN	Add MIL-STD 45662A calibration certificate	X	X	X			X
1BP	Add MIL-STD 45662A calibration certificate and test data	X	X	X			X
908	Add rack flange kit	X	X	X	X		X
913	Add rack flange and handles kit	X	X	X	X		X
910	Extra operating and service manual	X	X	X	X		X

Millimeter-wave Test Sets and Controllers

Banded waveguide millimeter-wave subsystem

(Components of 85106D)

- **85105A millimeter-wave test set controller**
Requires addition of two 85104A series modules for complete waveguide S-parameter test set operation. Includes IF switching (Option 001) and 26.5 GHz RF switching for multiple test set operation.
Option 004 rear panel connections for 85104A modules
Option 050 50 GHz RF source switch (Required when used with 83651B 50 GHz source.)

Must also order two test set modules for complete waveguide S-parameter test set operation for each waveguide band:

- **Q85104A test set module** (33 GHz to 50 GHz)
Option W31 add two years additional on-site service
- **U85104A test set module** (40 GHz to 60 GHz)
Option W31 add two years additional on-site service
- **V85104A test set module** (50 GHz to 75 GHz)
Option W31 add two years additional on-site service
- **W85104A test set module** (75 GHz to 110 GHz)
Option W31 add two years additional on-site service

Sources

Choose an 8360 series synthesized sweeper

- **83651B Synthesized Sweeper** (45 MHz to 50 GHz)
- **83631B Synthesized Sweeper** (45 MHz to 26.5 GHz)
- **83621B Synthesized Sweeper** (45 MHz to 20 GHz)
- **83620B-H80 Synthesized Sweeper** (45 MHz to 2 GHz) for 85110L only
- **83622B Synthesized Sweeper** (2 GHz to 20 GHz) for 85110A
- **83623L Synthesized Sweeper** (45 MHz to 20 GHz) for 85110A

Common Options for RF Sources

Option	Description
W31	Add two years additional on-site service
1BN	Add MIL-STD 45662A calibration certificate
1BP	Add MIL-STD 45662A calibration certificate and test data
908	Add rack flange kit
910	Extra operating and service manual
913	Add rack flange and handles kit

Note: Although general purpose (GP) 8360 series synthesized sweepers (836x0B) can be used in place of the 8510-dedicated 8360 series synthesized sweepers (836x1B, as listed above), the following options are typically recommended: Option 004 (rear panel connectors) and Option 008 (1-Hz frequency resolution). These options come as standard in the 8510-dedicated 8360 series synthesized sweepers.

Measurement Accessories

There are measurement accessories for seven device connector types: 7 mm, 3.5 mm, 2.92 mm, 2.4 mm, 1.85 mm, 1.0 mm, and Type-N. Calibration kits include standards that are required for vector error correction. Verification kits include standards used to verify system performance specifications. Test port return cables extend the ports of the test set and connect to the device under test. Agilent 85130X adapter sets convert test set ports to the same connector type (acting as a test port saver) or to a different connector type.

Electronic calibration

Electronic calibration (ECal) is a precision, single connection, one- or two-port calibration technique that uses fully traceable and verifiable electronic impedance standards. ECal replaces the traditional calibration technique that uses mechanical standards. ECal requires fewer connections. It removes the intensive operator interaction, which is prone to errors. A full two-port calibration can be accomplished with a single connection of the ECal module and minimal operator interaction. This results in a faster and more repeatable calibration. Calibrations for non-insertable devices are equally convenient and straight forward.

ECal modules are controlled manually or automatically via the Agilent 85097A PC interface module with control software. The 85097A consists of a PC interface module, control software, and a power supply. The 85090 family of RF ECal modules provides calibration across the complete frequency range of the 8753C/D/E vector network analyzers. The 85060 family of microwave ECal modules provides calibrations through 26.5 GHz for the 8510B/C and 8719/20/22C/D vector network analyzers.

ECal modules and available options^{A, B}

Connector type ¹	Frequency range	ECal module model number	Available options
7 mm	30 kHz to 6 GHz ²	85091A	1BN, 1BP, 910, UK6
7 mm	1 GHz to 18 GHz	85060B	001, 1BN, 1BP, 910, UK6
Type-N	30 kHz to 6 GHz ²	85092A	00F, 00M, 00A, 1BN, 1BP, 910, UK6
Type-N	1 GHz to 18 GHz	85064B	001, 00F, 00M, 00A, 1BN, 1BP, 910, UK6
3.5 mm	30 kHz to 6 GHz ²	85093A	00F, 00M, 00A, 1BN, 1BP, 910, UK6
3.5 mm	1 GHz to 26.5 GHz	85062B	001, 00F, 00M, 00A, 1BN, 1BP, 910, UK6

Options

Option	Description
001	Adds a 30 kHz to 6 GHz RF module ²
00F	Replace f/m connectors on ECal module(s) with f/f connectors
00M	Replace f/m connectors on ECal module(s) with m/m connectors
00A	Adds male-to-male and female-to-female adapters (also adds a 5/16" 90 N-cm (8 in-lb) torque wrench to 3.5 mm modules)
1BN	MIL-STD 45662 calibration certificate
1BP	MIL-STD 45662 calibration certificate with measured data
910	Add an extra operating and service manual
UK6	Commercial calibration certificate with measured data

An 85097A PC interface module with control software must be ordered to drive all ECal modules.

The 85097A requires a customer-supplied PC meeting the following minimum requirements:

- Windows 95, Windows NT 4.0, or later operating system
- 486 or later CPU
- 32 MB of RAM
- 10 MB available hard-disk space
- One of the following GPIB interface cards: 82340A/B, 82341C/D, National AT-GPIB/TNT, National AT-GPIB/TNT (*plug&play*), or National PCI-GPIB

1. For ECal modules with sexed (m-f) connectors, the standard modules have one female and one male connector.

2. RF ECal modules are specified to operate from 300 kHz to 6 GHz, with typical performance down to 30 kHz.

A. 85060 series modules cover a frequency range of 1 GHz to either 18 or 26.5 GHz. The upper frequency is limited by the connector cutoff frequency. Each module is supplied with a torque wrench and foam-padded wood storage box.

B. 85090 series modules cover a frequency range of 30 kHz to 6 GHz. Each module is supplied with a torque wrench and foam-padded wood storage box.

Calibration Kits

Error correction requires that the systematic errors in the measurement system be characterized by measuring known devices (standards) over the frequency range of interest with the process of calibration. All calibration kits contain standards used for this purpose. The standards in the 3.5 mm,

2.4 mm, and Type-N calibration kits use the precision slotless connector (PSC-3.5, PSC-2.4, and PSC-N). Unless otherwise noted all coaxial calibration kits include connector gauges and a torque wrench. Option 002 provides calibration kit data on magnetic tape for use with the 8510A/B (not available with 85059A).

Mechanical calibration Kit	Connector type	Frequency range (GHz)	Description
85050B	7 mm	0.045 to 18	Contains open and short circuits, fixed and sliding terminations.
85050C	7 mm	0.045 to 18	Precision kit. Contains standards for TRL calibration, including precision airline. Also contains open and short circuits and fixed termination.
85050D	7 mm	0.045 to 18	Economy kit. Contains open and short circuits and precision fixed termination. Gauges not included.
85052B	3.5 mm	0.045 to 26.5	Contains open and short circuits, fixed and sliding terminations, and in-series adapters.
85052C	3.5 mm	0.045 to 26.5	Precision kit. Contains standards for TRL calibration, including precision airlines. Also contains open and short circuits, fixed terminations, and in-series adapters. Gauges not included.
85052D	3.5 mm	0.045 to 26.5	Economy kit. Contains open and short circuits, precision fixed termination, and in-series adapters. Gauges not included.
85054B	Type-N	0.045 to 18	Contains open and short circuits, fixed and sliding terminations, in-series adapters, and 7 mm-to-Type-N adapters.
85054D	Type-N	0.045 to 18	Economy kit. Contains open and short circuits, fixed terminations, in-series adapters and 7 mm-to-Type-N adapters. Gauges not included.
85056A	2.4 mm	0.045 to 50	Contains open and short circuits, fixed and sliding terminations, and in-series adapters.
85056D	2.4 mm	0.045 to 50	Economy kit. Contains open and short circuits, fixed terminations, and in-series adapters. Gauges not included.
85056K	2.92/2.4 mm	0.045 to 50	Contains 2.4 mm open and short circuits, fixed loads, and 2.92 mm adapters.
85059A	1.0 mm	0.045 to 110	Broadband coaxial precision calibration kit consists of 1.0 mm shorts, opens, fixed loads, and in-series adapters. It also includes offset-shorts covering 50 to 110 GHz. Gauges not included.
11904S	2.92 mm	0.045 to 40	Must be used with 85056A/D 2.4 mm calibration kit. Includes four 2.92-mm-to-2.4-mm adapters. Gauges not included.
X11644A	WR-90	8.2 to 12.4	
P11644A	WR-62	12.4 to 18	
K11644A	WR-42	18.0 to 26.5	
R11644A	WR-28	26.5 to 40	Contains standards for TRL calibration. Includes precision waveguide section, short circuit, and fixed or sliding terminations. Gauges not included.
Q11644A	WR-22	33 to 50	
U11644A	WR-19	40 to 60	
V11644A	WR-15	50 to 75	
W11644A	WR-10	75 to 110	

Verification kits

Verification kits are used to verify the performance specifications of an Agilent 8510 system. All kits include a precision Z_0 airline, mismatched airline, and fixed attenuators. Measured data and uncertainties traceable to the U.S. National Institute of Standards and Technology (NIST) are included with each kit. Compliance with MIL-STD 45662A is available for an extra charge (Option 1BP). Option 002 provides verification kit data on magnetic tape for use with the 8510A/B.

Choose a verification kit for each connector type required.

Verification kit	Connector type	Frequency range (GHz)
85051B	7 mm	0.045 to 18
85053B	3.5 mm	0.045 to 26.5
85055A	Type-N	0.045 to 18
85057B	2.4 mm	0.045 to 50
R11645A	WR-28	26.5 to 40
Q11645A	WR-22	33 to 50
U11645A	WR-19	40 to 60
V11645A	WR-15	50 to 75
W11645A	WR-10	75 to 110

Test port cables and adapters

Test port cables and adapter sets are available for various connector types. Special test port adapter sets convert the rugged ports of the network analyzer test set to the desired connector interface. Each kit contains two adapters, one male and one female. Both the cables and the test port adapters have one special female connector which is designed to connect directly to the 3.5 mm test port (2.4 mm for 8517B). This side of the cable or adapter can only be connected to the test set port and cannot be mated to a standard 3.5 mm (or 2.4 mm) male connector. Choose one of the configurations shown.

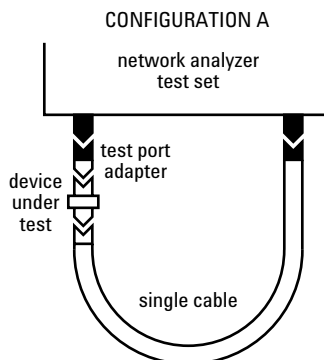
Configuration A. This cable arrangement is for applications where the device under test is connected directly to the test set port. This setup offers the best mechanical rigidity for device connection. To adapt the test set port (port 1) to the device under test, choose the appropriate special adapter set. In addition to converting the test port to the desired interface, these adapters also function as “test port savers” which protect the test set from damage and wear due to heavy use.

For Agilent 8514B/8515A/85110A Test Sets (3.5 mm rugged test port connectors)

	Cables/Adapters	Connector Type (on device side of cable/adapter)
For 3.5 mm devices	85131C semi-rigid cable or 85131E flexible cable 85130D adapter set	3.5 mm (f) 3.5 mm (f) 3.5 mm (m and f)
For 7 mm devices	85132C semi-rigid cable or 85132E flexible cable 85130B adapter set	7 mm 7 mm 7 mm
For Type-N devices	Use 7 mm cables and the 7-mm-to-Type-N adapters included in the 85054B/D Type-N calibration kit	

For Agilent 8517B Test Sets (2.4 mm rugged test port connectors)

	Cables/Adapters	Connector Type (on device side of cable/adapter)
For 2.4 mm devices	85133C semi-rigid cable or 85133E flexible cable 85130G adapter set	2.4 mm (f) 2.4 mm (f) 2.4 mm (m and f)
For 3.5 mm devices	85134C semi-rigid cable or 85134E flexible cable 85130F adapter set	3.5 mm (f) 3.5 mm (f) 3.5 mm (m and f)
For 7 mm devices	85135C semi-rigid cable or 85135E flexible cable 85130E adapter set	7 mm 7 mm 7 mm



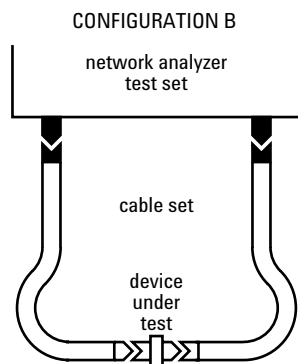
Configuration B. This cable arrangement is for applications where the device under test is connected between cable ends. This setup offers more flexibility when connecting to the device under test.

For Agilent 8514B/8515A/85110A Test Sets (3.5 mm rugged test port connectors)

	Cables/Adapters	Connector Type (on device side of cable/adaptor)
For 3.5 mm devices	85131D semi-rigid cable set or 85131F flexible cable set	3.5 mm (m and f) 3.5 mm (m and f)
For 7 mm devices	85132D semi-rigid cable set or 85132F flexible cable set	7 mm 7 mm
For Type-N devices	Use 7 mm cables and the 7-mm-to-Type-N adapters included in the 85054B/D Type-N calibration kit	

For Agilent 85110L Test Sets (7 mm rugged test port connectors)

	Cables/Adapters	Connector Type (on device side of cable/adaptor)
For 7 mm devices	11857D cable pair	7 mm



For Agilent 8517B Test Sets (2.4 mm rugged test port connectors)

	Cables/Adapters	Connector Type (on device side of cable/adaptor)
For 2.4 mm devices	85133D semi-rigid cable set or 85133F flexible cable set	2.4 mm (m and f) 2.4 mm (m and f)
For 3.5 mm devices	85134D semi-rigid cable set or 85134F flexible cable set	3.5 mm (m and f) 3.5 mm (m and f)
For 7 mm devices	85135D semi-rigid cable set or 85135F flexible cable set	7 mm 7 mm

For Agilent 8510XF Systems (1.0 mm test port connectors)

	Cables/Adapters	Connector Type
For 1.0 mm devices	11500I (8.8 cm) test port cable 11500J (16 cm) test port cable 11500K (20 cm) test port cable 11500L (24 cm) test port cable	1.0 mm (f and f) 1.0 mm (m and f) 1.0 mm (m and f) 1.0 mm (m and f)
For V-band waveguide devices	V281C adapter V281D adapter	1.0 mm (f) to V-band waveguide devices 1.0 mm (m) to V-band waveguide devices
For W-band waveguide devices	W281C adapter W281D adapter	1.0 mm (f) to W-band waveguide devices 1.0 mm (m) to W-band waveguide devices

Test Configuration Accessories

Power meter and power sensors

- **E4418A power meter and 8480 series power sensors**
Required for use with test port power flatness correction feature.

Bias supply

- **6626A precision DC power supply**
For connection to 851XA test set bias input, also order 14852A.
- **14852A bias interconnect cable**

Bias networks

For supplying DC bias externally from the test set. Standard S-parameter test sets include bias networks.

- **11590B bias network** (100 MHz to 12.4 GHz) with Type-N connectors (0.5A maximum current)
Option 001 (100 MHz to 18 GHz) with 7 mm connectors (0.5A maximum current)
- **11612A bias network** (45 MHz to 26.5 GHz) with 3.5 mm connectors (0.5A maximum current)
Option 001 2 amps maximum current (400 MHz to 26.5 GHz)
- **11612B bias network** (45 MHz to 50 GHz) with 2.4 mm connectors (0.5A maximum current)

Amplifier

- **8349B microwave amplifier** (2 GHz to 20 GHz)
May be used to increase input power level to S-parameter test sets and increase system dynamic range.
Option 001 recommended (rear panel in/out installed) for use in racked configurations

System rack

- **85043C system rack kit**
132 cm (52 in.) high x 60 cm (23.6 in.) wide x 90.5 cm (35.6 in.) deep. Supplied with anti-static mat (part number 85043-80013), support rails, rack mounting kits (Option 913), and power distribution. Includes two 10833A GPIB cables for connecting system peripherals to 8510C.
Option 230 220/240 V line operation

System software

Compatible with a PC, running BASIC Rev 6.3 or higher under Windows (3.1/95/NT). Comes in 3½ inch disk media.

- **85161B measurement automation software**
- **85070B materials measurement software/probe kit** (PC version)
Option 300 9000 series 300, 9816, or 9836 version
- **85071B materials measurement software** (PC version)
Option 300 9000 series 300, 9816, or 9836 version

Peripherals

Hardcopy results may be output directly to a printer or plotter over the system bus (GPIB compatible) or serial output ports (RS-232-C) without the need of an external computer. Measurement data, calibration sets and kits, and instrument states may be stored on disk using either the built-in disk drive or an external disk drive. GPIB cables must be ordered for each peripheral. Two serial interface (RS-232-C) cables are included with 8510C.

Graphics printers

HP C2678A DeskJet 1120C Color Printer
HP C2679A DeskJet 1120Cse Color Printer
HP C2680A DeskJet 1120Cxi Color Printer
HP C5876A DeskJet 890Cxi Color Printer
HP C5877A DeskJet 890Cse Color Printer
HP C3941A LaserJet 5L Printer
HP C3150A LaserJet 5P Printer

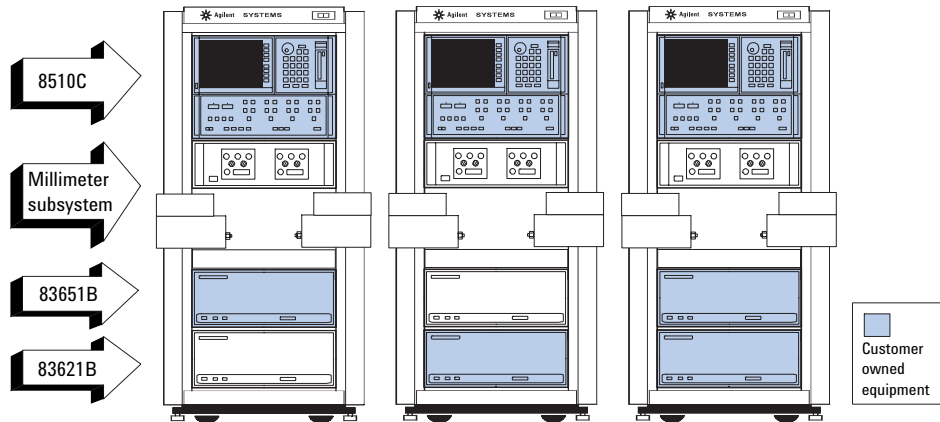
GPIB cables

- 10833A 1-Meter GPIB cable
- 10833B 2-Meter GPIB cable
- 10833D 0.5-Meter GPIB cable

System Upgrades

Upgrades available for existing Agilent 8510 systems to 8510XF single-sweep systems

Upgrades from ...	85107B 85109C	85106C 85106C w/ Opt.002 85106D	85106C w/ Opt.001 & 002 85106D w/ Opt.001 85109C w/ Opt.002
... to 85 GHz	E7345A	E7346A	E7347A
... to 110 GHz	E7355A	E7356A	E7357A



Upgrades for 85107B 85109C

Upgrade consists of two test heads, a millimeter test set controller, an 83621B for LO source, and rack. It does not include calibration kits or test port cables.

- **E7345A** upgrade to an 8510XF 85 GHz system
 - **E7355A** upgrade to an 8510XF 110 GHz system
- The following options are available for both upgrades:
- Option 005** add 45 MHz to 2 GHz low frequency extension
 - Option 006** add RF pass thru (provides coupled output of 50 GHz source for additional test sets. Additional test set(s) must have Option 001 installed.)

Upgrades for 85106C

85106C with Option 002 (replaced 8350B/83540A with 83621A/B)
85106D

Upgrade consists of two test heads, a millimeter test set controller, and an 83651B for RF source. It does not include calibration kits, test port cables, or rack.

- **E7346A** upgrade to an 8510XF 85 GHz system
- **E7356A** upgrade to an 8510XF 110 GHz system

The following options are available for both upgrades:

- Option 005** add 45 MHz to 2 GHz low frequency extension
- Option 006** add RF pass thru (provides coupled output of 50 GHz source for additional test sets. Additional test set(s) must have Option 001 installed.)

Upgrades for 85106C with Options 001 and 002

(added 8517B, replaced 83621A/B with 83651A/B, and replaced 8350B/83540A with 83621A/B)

85106D with Option 001 (added 8517B and replaced 83621B with 83651B)

85109C with Option 002 (replaced 8350B/83540A with 83621A/B)

Upgrade consists of two test heads and a millimeter test set. It does not include calibration kits, test port cables or rack.

- **E7347A** upgrade to an 8510XF 85 GHz system
 - **E7357A** upgrade to an 8510XF 110 GHz system
- The following options are available for both upgrades:
- Option 005** add 45 MHz to 2 GHz low frequency extension
 - Option 006** add RF pass thru (provides coupled output of 50 GHz source for additional test sets. Additional test set(s) must have Option 001 installed.)

Instrument and Firmware Upgrades

Upgrades for Agilent 8510A

8510C Upgrade (includes on-site installation by Agilent Customer Engineer)

- **85103C** 8510A to 8510C upgrade (replaces the top unit on the 8510A)
 - Option 001** adds rack modification kit (for systems mounted in an 85043A system rack)
 - Option 002** adds 8360 series source compatibility kit for 8517A/B test sets
 - Option 003** adds 8360 series source compatibility kit for the 8514/15 test sets

Time domain upgrade

- **85012A** time domain (Option 010) upgrade for 8510A (customer installed)

Upgrades for Agilent 8510B

8510C Upgrade (includes on-site installation by Agilent Customer Engineer)

- **85103D** 8510B to 8510C upgrade (replaces the top unit on the 8510B)
 - Option 001** adds rack modification kit (for systems mounted in a 85043A system rack)
 - Option 002** adds 8360 series source compatibility kit for 8517A/B test sets
 - Option 003** adds 8360 series source compatibility kit for the 8514/15 test sets

Wideband IF detector upgrade (reference to 85108A for additional hardware requirements)

- **85111A** pulsed-RF measurement capability upgrade for the 8510B (upgrade adds circuitry to the 8510B and includes on-site installation by Agilent Customer Engineer.)

Time domain upgrade

- **85012B** time domain (Option 010) upgrade for 8510B (customer installed)

Firmware upgrades for 8510B

- **11575E** revision 5.14 upgrade (customer installed)
Only for instruments with Rev 5.0 or higher currently installed.
 - Option 010** add time domain (for 8510B with previously installed Option 010)
- **11575H** revision 6.54 upgrade (customer installed)
Only for instruments with Rev 6.3 or higher currently installed.
 - Option 010** add time domain (for 8510B with previously installed Option 010)
- **11575F** revision 6.54 upgrade (customer installed)
For any revision of 8510B firmware currently installed.
 - Option 010** add time domain (for 8510B with previously installed Option 010)

Upgrades for Agilent 8510C

Wideband IF Detector Upgrade (reference to 85108A for additional hardware requirements)

- **85111B** pulsed-RF measurement capability upgrade for the 8510C (upgrade adds circuitry to the 8510C and includes on-site installation by Agilent Customer Engineer)

Time domain upgrade

- **85012C** time domain (Option 010) upgrade for 8510C (customer installed)

Firmware upgrades for 8510C

- **11575G** revision 6.54 upgrade (customer installed)
Only for instruments with Rev 6.0 or higher currently installed.
- **11575J** revision 7.10 upgrade (customer installed)
For any revision of 8510C firmware currently installed.
 - Option 002** adds 8360 series source compatibility kit for 8517A/B test sets
 - Option 003** adds 8360 series source compatibility kit for the 8514/15 test sets

Test Set Upgrades

For any Agilent 8510 test set

- **8511A K01** add IF switching (Option 001) for multiple test set operation

Miscellaneous Compatibility Upgrades

- **83601A** for 8510C with 83621/31A shipped prior to January 1, 1991
Includes on-site installation by Agilent Customer Engineer.

Connector repair kits

Include tools for removing and replacing center conductor contacts of precision slotless connectors (PSC). Kits include ten replacement center conductor contacts.

- **85052B Option K11 PSC-3.5 connector repair kit**
- **85054B Option K11 PSC-N connector repair kit**

User training courses

- **8510C+24D basic measurements using the 8510**
Three-day user training course. This basic measurements course is recommended to bring you up to speed with hands-on knowledge of the 8510C network analyzer's full capabilities.
- **85101B+24D advanced programming course for the 8510A/B/C**
Two-day training course on advanced programming topics using BASIC. Prior attendance in 8510B+24D training course is recommended.

System installation

To include system installation by an Agilent Customer Engineer, order support Option +17A for each major system component (network analyzer, test sets and sources). Installation includes integration of system components and performance verification.

System performance verification

Recommended once per year. For on-site system performance verification, order Option +23R for each major system component (network analyzer, test sets and sources). Compliance with MIL-STD 45662A is an additional charge (where available).

Related Literature

5091-8970E	Agilent 8510 Network Analyzer Color Brochure
5965-8837E	Agilent 8510 System Solutions
5091-8484E	Agilent 8510 Family Network Analyzer Data Sheet
5091-8969E	Agilent 85103 Upgrade Package to the Agilent 8510 Network Analyzer
5964-4229E	Agilent 85106 Millimeter-Wave Network Analyzer System Product Overview
5091-8965E	Agilent 85108A/LCW/Pulsed Network Analyzer Systems Product Overview
5965-9888E	Agilent 8510XF 110 GHz Single-Sweep Systems Products Overview
5963-3743E	Agilent 85060 Series and Agilent 85090 Series Electronic Calibration Modules and PC interface
5091-0699E	Agilent 8530 Microwave Receiver Color Brochure

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."

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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.

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