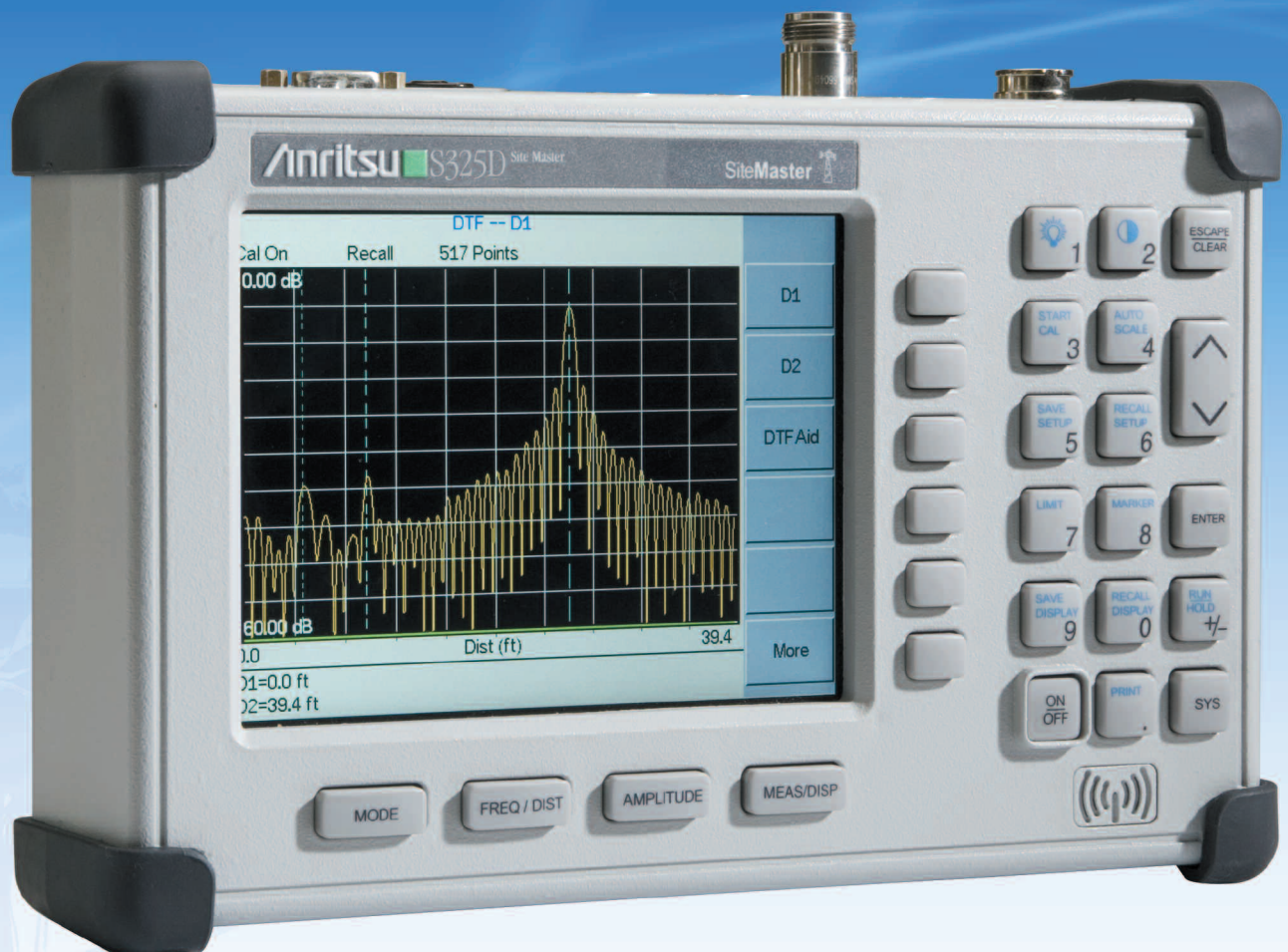


Site Master™ S325D

Cable and Antenna Analyzer, 250 MHz to 2500 MHz



Site Master™ is the Preferred Cable and Antenna Analyzer of Wireless Service Providers, Contractors, and Installers.

Cost Savings and Quality Improvement

Wireless market competition requires operators to reduce per site maintenance expense. Site Master's Frequency Domain Reflectometry (FDR) techniques break away from the traditional fix-after-failure maintenance process by finding small, hard to identify problems before major failures occur.

Sixty to eighty percent of a typical cell site's problems are caused by problematic cables, connectors and antennas. When cables or antennas are contaminated with moisture, damaged, or mispositioned during storms, Site Master identifies the problem quickly. Antenna degradation reduces the cell coverage pattern and can cause dropped calls. Site Master can pinpoint the antenna problem from ground level in a few seconds making climbing the antenna tower unnecessary.

A poorly installed weather seal will corrode connectors and, if undetected, will eventually damage an expensive coaxial cable. Site Master has the sensitivity to identify the connector problem before the cable is damaged. Distance-To-Fault provides the clearest indication of troubled areas.

**Site Master
Revolutionizes
Cable and
Antenna
Sweeping in
the Wireless
Industry.**



Rugged and Reliable

Because the Site Master was designed specifically for field environments, it can easily withstand the day-to-day punishment of field use. The analyzer is almost impervious to the bumps and bangs typically encountered by portable field-equipment.

Easy-to-Use

Site Master operation is straightforward; measurements are obtained through a menu-driven user interface that is easy to use and requires little training. The large, and high-resolution TFT color display makes test interpretation easy and quick. A full range of markers enable the user to make accurate measurements. Limit lines simplify measurements allowing users to create quick and simple pass/fail tests.

RS-232 Interface

Transfer stored data to and from a personal computer (PC) or download to a printer via a serial cable for further analysis. Use PC to automatically control and collect data in the field.

Snap-in Field replaceable battery location**External DC Power Port****Cable and Antenna Analyzer Port****Rugged and Reliable Chassis Design**

Ruggedized, lightweight, compact, high-impact housing is designed to withstand repeated drops and rough handling. Weather resistant seals and rubber membrane keypad protect unit from dirt and moisture.

TFT Color Display

Standard TFT (640 x 480) color display featuring variable brightness control. Viewable in direct sunlight.

Function Keys

Four dedicated function keys simplify measurement tasks.

Soft Keys

Intuitive soft key menu and user interface.

Save and Recall Display

Up to 300 memory locations. Alphanumeric data labeling and automatic time/date stamp simplify data management.

Save and Recall Setup

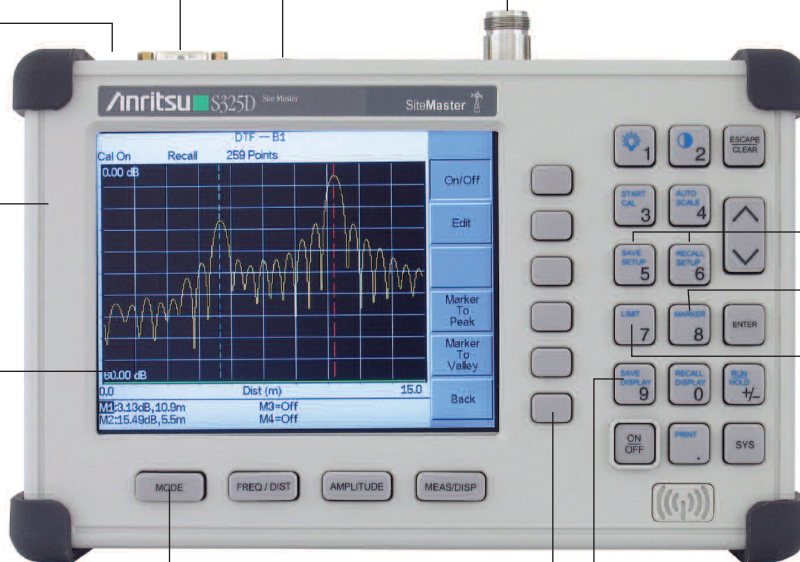
Save setups for fast repeatable testing

Markers

Six markers for more comprehensive measurements.

Limits

Create simple pass/fail measurements with a single limit line, upper and/or lower mask limit lines.



Function	Benefits
Cable and Antenna Analyzer (S325D)	Characterize antenna system and pinpoint location of faults
Standard TFT Color Display (S325D)	Display is viewable in direct sunlight
Power Monitor (S325D)	Performs accurate broadband power measurements using an external detector

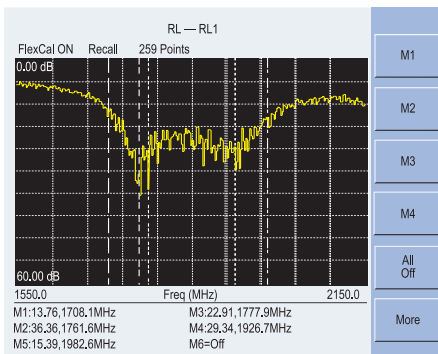
Cable and Antenna Analysis – Increase System Uptime

FDR Technique

Frequency Domain Reflectometry, (FDR), and Time Domain Reflectometry, (TDR), have similar acronyms, and both techniques are used to test transmission lines. But, that's where the similarities end. TDRs are not sensitive to RF problems: the TDR stimulus is a DC pulse, not RF. Thus, TDRs are unable to detect system faults that often lead to system failures. Additionally, FDR techniques save costly, time-consuming trouble shooting efforts by testing cable feed-line and antenna systems at their proper operating frequency. Deficient connectors, lightning arrestors, cables, jumpers, or antennas are replaced before call quality is compromised.

Quick, Simple Measurements

Site Master performs various RF measurements aimed at simplifying cable feedline and antenna analysis: Return Loss, SWR, Cable Loss and Distance-to-Fault (DTF). A single key selection on the main menu activates the desired measurement mode.

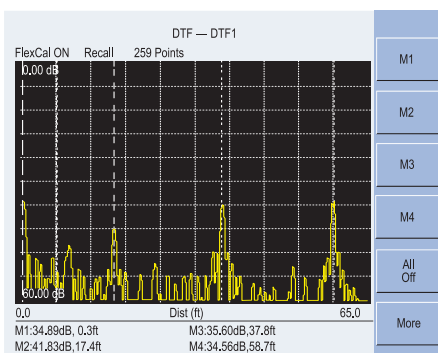
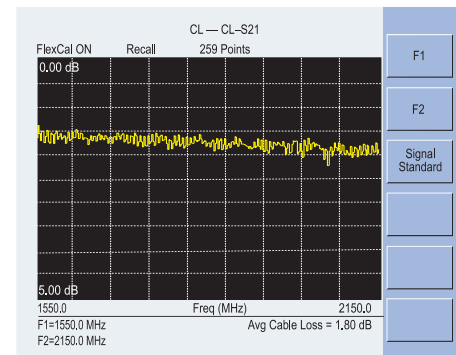


Return Loss, SWR

Return Loss and SWR “system” measurements ensure conformance to system performance engineering specifications. Measurement easily toggles between either one of the two modes and can be performed without climbing the tower.

Cable Loss

Cable Loss measurements measure the level of insertion loss within the cable feed-line system. Insertion loss can be verified prior to deployment, when you have access to both ends of the cable, or on installed cables without access to the opposite end. Site Master automatically calculates and displays the average cable loss so there is no more guess work or a need to perform calculations in the field.



Distance-to-Fault

Although a Return Loss test can tell users the magnitude of signal reflections, it cannot tell the precise location of a fault within the feed-line system. Distance-To-Fault measurements provide the clearest indication of trouble areas as it tells us both the magnitude of signal reflection and the location of the signal anomaly.

Distance-To-Fault measurement capability is built into all Site Master models as a standard feature. Return Loss (SWR) measurement data is processed using Fast Fourier Transform and the resulting data indicates Return Loss (SWR) versus distance. Distance-to-Fault measurements indicating Return Loss or SWR versus time is available with Handheld Software Tools™.

OSL Calibration

Open-Short-Load (OSL) calibration is standard for the S325D. All errors from source match, directivity and frequency response are mathematically removed allowing for accurate vector corrected Return Loss, Cable Loss, VSWR, and DTF measurements. Directivity is usually the main contributor to measurement uncertainty, and corrected directivity of 42 dB or better is common using Anritsu's precision components.

FlexCal™

The Site Master FlexCal™ broadband calibration feature is an OSL-based calibration method. It offers field technicians a simple and convenient way to troubleshoot and identify faulty antenna system components, because it eliminates the need for multiple instrument calibrations and calibration setups. Field technicians can now perform a broadband calibration from 250 MHz to 2500 MHz and change the frequency range after calibration without having to recalibrate the instrument. A zoom-in/zoom-out capability is available in Return Loss, Cable Loss or VSWR mode. Because the resolution and maximum distance are dependent on the frequency range, field technicians can even change the frequency range in DTF mode to produce the desired fault resolution and horizontal range needed for the measurement, without performing additional calibrations.

InstaCal™ Calibration

The InstaCal Calibration module is available for the S325D and users can cut the time required to calibrate the Site Master by as much as 50 percent. With InstaCal, users are only required to connect the InstaCal calibration module once and the calibration process will be done automatically. Directivity specification for the InstaCal module is 38 dB for the entire frequency range allowing the user to make fast and accurate measurements.



RF Immunity

In today's wireless environment it is very common that there will be other RF activity present when making a measurement. In order to make accurate measurements in hostile RF environments, the receiver has to be able to reject the unwanted signals. Special dithering techniques are applied to the Site Master when making a measurement, and the Site Master can reject signals up to +17 dBm ensuring accurate measurements in RF rich environments.



Site Master Options

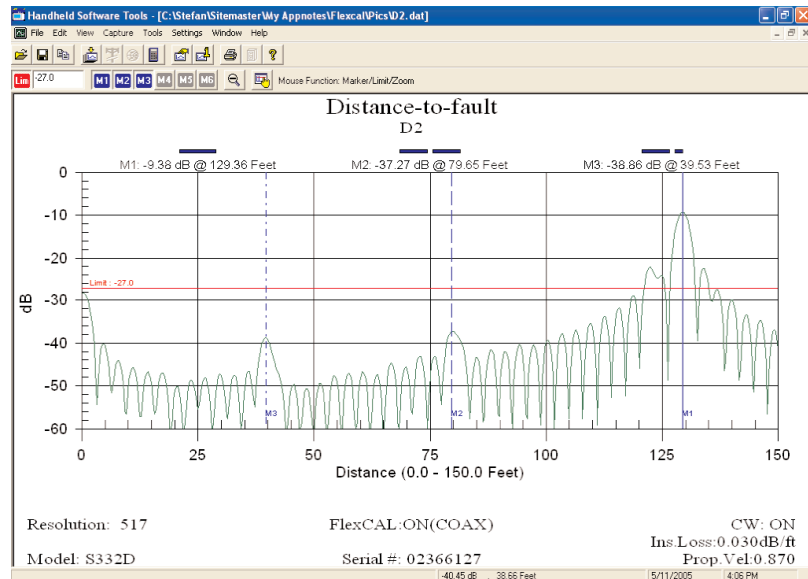
Power Monitor (Option 5)

Use Anritsu's 560 and 5400 series detector to measure broadband power. They are an excellent solution to measure an 18 GHz microwave link carrying the Base Station T1/E1 link. The detectors use precision high return loss detectors with excellent impedance match designed to minimize mismatch uncertainty. Measurement range is from -50 to $+16$ dBm and the display range is from -80 to $+80$ dBm. There are several detectors available designed for different frequency ranges.



Handheld Software Tools™

Although Site Master features built-in analytical and reporting functions, users can also download measurement data to a PC for additional analysis or report generation. Site Master's user friendly Software Tools is a Windows® program designed specifically for cable and antenna analysis and will run on any computer with Windows 95/98/NT4/2000/ME/XP. Test data can be analyzed and compared to historical performance.



- Up to 300 Site Master trace memory locations can be downloaded with a single menu selection.
- Build historical records with an unlimited number of traces in one document.
- Familiar Windows 95/98/NT4/2000/ME/XP interface simplifies data analysis and report generation.
- Intelligent drag and drop automatically converts traces to a common scale and speeds fault identification.
- Supports long file names for easy measurement data identification.



Specifications

Cable and Antenna Analyzer

Frequency Range: 250 MHz to 2500 MHz
 Frequency Accuracy: ± 75 ppm @ +25°C
 Frequency Resolution: 100 kHz
 Output Power: <0 dBm (~10 dBm nominal)
 Immunity to Interfering Signals: On-channel: +17 dBm
 On-frequency: -5 dBm
 Measurement Speed: ≤ 3.5 msec / data point (CW ON)
 Number of Data Points: 130, 259, 517
 Return Loss: Range: 0.00 to 60.00 dB
 Resolution: 0.01 dB
 VSWR: Range: 1.00 to 65.00
 Resolution: 0.01
 Cable Loss: Range: 0.00 to 30.00 dB
 Resolution: 0.01 dB
 Measurement Accuracy: >42 dB corrected directivity after calibration
 Distance-to-Fault:
 Vertical Range: Return Loss: 0.00 to 60.00 dB
 VSWR 1.00 to 65.00
 Horizontal Range: 0 to (# of data pts -1) x
 Resolution to a maximum of 1197m (3929 ft),
 # of data pts = 130, 259 or 517
 Horizontal Resolution (Rectangular Windowing):
 Resolution (meter) = $(1.5 \times 108) \times (V_p)/DF$
 Where V_p is the cable's relative propagation velocity
 and where DF is the stop frequency minus the start
 frequency (in Hz).

Power Monitor (Option 5)

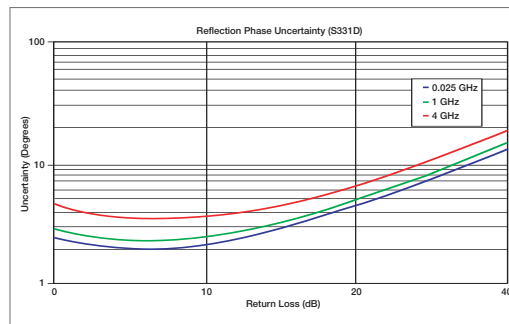
Detector Range: -80 to +80 dBm (10 pW to 100 kW)
 Measurement Range: -50 to +16 dBm (10 nW to 40 mW)
 Offset Range: 0 to +60 dB
 Resolution: 0.1 dB, 0.1W
 Accuracy: ± 1 dB
General
 Language Support: English
 Internal Trace Memory: 300 traces
 Setup Configuration: VNA: 10, Power Monitor: 5
 Display: TFT color LCD with adjustable backlight
 Inputs and Outputs Ports:
 RF Out: Type N, female, 50 Ω
 Maximum Input without Damage: +23 dBm, ± 50 VDC
 RF In: Type N, female, 50 Ω
 Maximum Input without Damage: +43 dBm (peak), ± 50 VDC
 Serial Interface: RS-232 9 pin D-sub, three wire serial
 Electromagnetic Compatibility:
 Meets European Community requirements for CE marking
 Safety: Conforms to EN 61010-1 for Class 1 portable equipment

Temperature:
 Operating: -10°C to 55°C, humidity 85% or less
 Non-operating: -51°C to +71°C (Recommend the battery be stored
 separately between 0°C and +40°C for any prolonged
 non-operating storage period.)
 Environmental: MIL-PRF-28800F Class 2
 Power Supply:
 External DC Input: +12.5 to +15 volt dc, 3A max
 Internal NiMH battery: 10.8 volts, 1800 mAH
 Dimensions:
 Size (w x h x d): 254 mm x 178 mm x 61 mm (10.0 in x 7.0 in x 2.4 in)
 Weight: <2.28 kg (<5 lbs) includes battery

The following graphs provide measurement uncertainty accuracy at 23°±3C after vector error correction for the standard N connector types. The errors are worst-case contributions of residual directivity, source match, frequency response, network analyzer dynamic range, and connector repeatability. In preparing these graphs, Fixed CW is ON. Calibration components 22N50 and 28N50-2 are used.

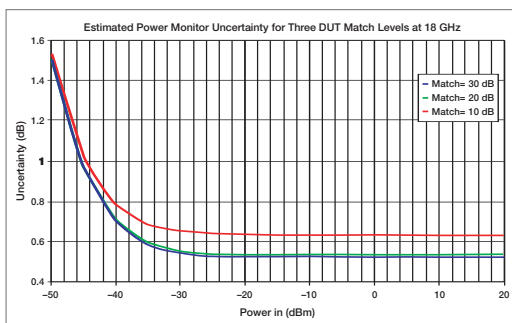


Reflection Magnitude Uncertainty

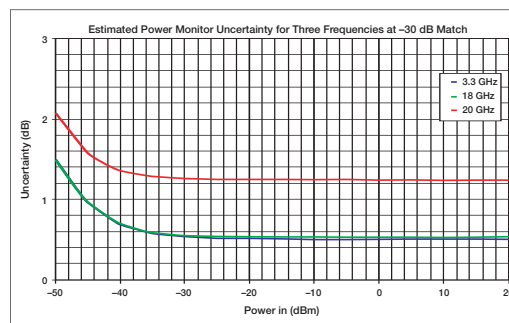


Reflection Phase Uncertainty

Using the 560-7N50B detector, the following curves show estimated power monitor uncertainties for various DUT match.



Estimated Power Monitor Uncertainty for Three DUT Match Levels at 18 GHz



Estimated Power Monitor Uncertainty for Three Frequencies at -30 dB Match

Specifications (Continued)

Power Monitor - Detectors

Model	Frequency Range	Impedance	Return Loss	Input Connector	Frequency Response
5400-71N50	0.001 to 3 GHz	50Ω	26 dB	N(m)	±0.2 dB, <1 GHz ±0.3 dB, <3 GHz
5400-71N75	0.001 to 3 GHz	75Ω	26 dB, <2 GHz 20 dB, <3 GHz	N(m)	±0.2 dB, <1 GHz ±0.5 dB, <3 GHz
560-7A50	0.01 to 18 GHz	50Ω	15 dB, <0.04 GHz 22 dB, <8 GHz 17 dB, <18 GHz	GPC-7	±0.5 dB, <18 GHz
560-7N50B	0.01 to 20 GHz	50Ω	15 dB, <0.04 GHz 22 dB, <8 GHz 17 dB, <18 GHz 14 dB, <20 GHz	N(m)	±0.5 dB, <18 GHz ±1.25 dB, <20 GHz
560-7S50B	0.01 to 20 GHz	50Ω	15 dB, <0.04 GHz 22 dB, <8 GHz 17 dB, <18 GHz 14 dB, <20 GHz	WSMA(m)	±0.5 dB, <18 GHz ±1.25 dB, <20 GHz
560-7S50-2	0.01 to 26.5 GHz	50Ω	15 dB, <0.04 GHz 22 dB, <8 GHz 17 dB, <18 GHz 14 dB, <26.5 GHz	WSMA(m)	±0.5 dB, <18 GHz ±1.25 dB, <26.5 GHz
560-7K50	0.01 to 40 GHz	50Ω	12 dB, <0.04 GHz 22 dB, <8 GHz 17 dB, <18 GHz 15 dB, <26.5 GHz 14 dB, <32 GHz 13 dB, <40 GHz	K(m)	±0.5 dB, <18 GHz ±1.25 dB, <26.5 GHz ±2.2 dB, <32 GHz ±2.5 dB, <40 GHz
560-7VA50	0.01 to 50 GHz	50Ω	12 dB, <0.04 GHz 19 dB, <20 GHz 15 dB, <40 GHz 10 dB, <50 GHz	V(m)	±0.8 dB, <20 GHz ±2.5 dB, <40 GHz ±3.0 dB, <50 GHz

Ordering Information

Basic Models

Model	Description
S325D	Cable and Antenna Analyzer (250 MHz to 2500 MHz)

Options

Options	Description
Option 5	Power Monitor - requires external detector

Standard Accessories

Part No.	Description
10580-00172	S325D Site Master User's Guide
2300-347	Anritsu Handheld Software Tools CDROM
48258	Soft Carrying Case
633-27	Rechargeable Battery, NiMH
40-168	AC-DC Adapter with Power Cord
806-141	Automotive Cigarette Lighter/12 Volt DC Adapter
806-441	Serial Interface Cable
	One Year Warranty

Optional Accessories

Part No.	Description
1N50C	Limiter, N(m) to N(f), 50Ω, 10 MHz to 18 GHz
42N50-20	Attenuator, 20 dB, 5 watt, DC to 18 GHz, N(m)-N(f)
42N50A-30	Attenuator, 30 dB, 50 watt, DC to 18 GHz, N(m)-N(f)
1010-121	Attenuator, 40 dB, 100 watt, DC to 18 GHz, N(m)-N(f)
ICN50	InstaCal™ Calibration Module, 2 MHz to 4.0 GHz, N(m), 50Ω N(m)-N(f)
22N50	Open/Short, DC to 18 GHz, N(m), 50Ω
22NF50	Open/Short, DC to 18 GHz, N(f), 50Ω
SM/PL	Precision Load, DC to 4 GHz, 42 dB, N(m), 50Ω
SM/PLNF	Precision Load, DC to 4 GHz, 42 dB, N(f), 50Ω
OSLN50LF	Precision Open/Short/Load, DC to 4 GHz, 42 dB, 50Ω, N(m)
OSLNF50LF	Precision Open/Short/Load, DC to 4 GHz, 42 dB, 50Ω, N(f)
2000-767	Precision Open/Short/Load, DC to 4 GHz, 7/16 DIN(m), 50Ω
2000-768	Precision Open/Short/Load, DC to 4 GHz, 7/16 DIN(f), 50Ω
22N75	Open/Short, DC to 3 GHz, N(m) 75Ω
22NF75	Open/Short, DC to 3 GHz, N(f) 75Ω
26N75A	Precision Termination, DC to 3 GHz, N(m) 75Ω
26NF75A	Precision Termination, DC to 3 GHz, N(f) 75Ω
12N75B	Impedance Adapter, DC to 3 GHz, N(m), converts 50Ω to 75Ω
12N50-75B	Matching Pad, DC to 3 GHz, 50Ω to 75Ω to 50Ω

Part No.	Description
15NN50-1.5C	Test Port Cable Armored, 1.5 meters, N(m)-N(m), 6 GHz, 50Ω
15NN50-3.0C	Test Port Cable Armored, 3.0 meters, N(m)-N(m), 6 GHz, 50Ω
15NN50-5.0C	Test Port Cable Armored, 5.0 meters, N(m)-N(m), 6 GHz, 50Ω
15NNF50-1.5C	Test Port Cable Armored, 1.5 meters, N(m)-N(f), 6 GHz, 50Ω
15NNF50-3.0C	Test Port Cable Armored, 3.0 meters, N(m)-N(f), 6 GHz, 50Ω
15NNF50-5.0C	Test Port Cable Armored, 5.0 meters, N(m)-N(f), 6 GHz, 50Ω
15ND50-1.5C	Test Port Cable Armored, 1.5 meters, N(m)-7/16 DIN(m), 6 GHz, 50Ω
15NDF50-1.5C	Test Port Cable Armored, 1.5 meters, N(m)-7/16 DIN(f), 6 GHz, 50Ω
34NN50A	Precision Adapter, N(m)-N(m), DC to 18 GHz, 50Ω
34NNF50	Precision Adapter, N(f)-N(f), DC to 18 GHz, 50Ω
1091-26	Adapter, N(m)-SMA(m), DC to 18 GHz, 50Ω
1091-27	Adapter, N(m)-SMA(f), DC to 18 GHz, 50Ω
1091-80	Adapter, N(f)-SMA(m), DC to 18 GHz, 50Ω
1091-81	Adapter, N(f)-SMA(f), DC to 18 GHz, 50Ω
1091-172	Adapter, N(m)-BNC(f), DC to 1.3 GHz, 50Ω
510-90	Adapter, 7/16 DIN(f)-N(m), DC to 7.5 GHz, 50Ω
510-91	Adapter, 7/16 DIN(f)-N(f), DC to 7.5 GHz, 50Ω
510-92	Adapter, 7/16 DIN(m)-N(m), DC to 7.5 GHz, 50Ω
510-93	Adapter, 7/16 DIN(m)-N(f), DC to 7.5 GHz, 50Ω
510-96	Adapter, 7/16 DIN(m)-7/16 DIN(m), DC to 7.5 GHz, 50Ω
510-97	Adapter, 7/16 DIN(f)-7/16 DIN(f), DC to 7.5 GHz, 50Ω

61532 Antenna Kit

2000-1030	Portable Antenna, SMA(m), 1.71 to 1.88 GHz, 50Ω
2000-1031	Portable Antenna, SMA(m), 1.85 to 1.99 GHz, 50Ω
2000-1032	Portable Antenna, SMA(m), 1.85 to 1.99 GHz, 50Ω
2000-1035	Portable Antenna, SMA(m), 896-941 MHz, 50Ω
2000-1200	Portable Antenna, SMA(m), 806-869 MHz, 50Ω
2000-1361	Portable Antenna, SMA(m), 5.725-5.825 MHz, 50Ω

551-1691	USB to RS-232 adapter cable
48258	Soft Carrying Case
760-235	Transit Case
633-27	Rechargeable Battery, NiMH
2000-1029	Battery Charger, NiMH, with Universal Power Supply
40-168	AC/DC Adapter
806-141	Automotive Cigarette Lighter/12 Volts DC Adapter
800-441	Serial Interface Cable
2300-347	Software Tools

Ordering Information

Printers

Part No.	Description
2000-1214	HP DeskJet Printer, Model 450: Includes printer cable, 2000-1216 black print cartridge and U.S. power cord. Also includes 2000-753 serial-to-parallel Centronics converter cable and 1091-310 Centronics-to DB25 adapter. Rechargeable battery is optional and is not included.
2000-1216	Black Print Cartridge
2000-1217	Rechargeable Battery for DeskJet Printer, Model 450
2000-1218	Power Cable (U.K.) for DeskJet Printer
2000-663	Power Cable (Europe) for DeskJet Printer
2000-664	Power Cable (Australia) for DeskJet Printer
2000-667	Power Cable (S. Africa) for DeskJet Printer
2000-753	Null Modem Serial-to-Parallel Centronics Converter Cable

Product Literature

Part No.	Description
10580-00172	S325D Site Master User's Guide



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