Anritsu

Site Master™

Transmission Line and Antenna Analyzer

2 MHz - 20 GHz

The World's Leading Cable and Antenna System Analyzer

THE LEADING CABLE AND ANTENNA ANALYZER FOR WIRELESS PROFESSIONALS

Anritsu's Site Master cable and antenna analyzer is the preferred choice of service providers, network operators and contractors worldwide who install, deploy, maintain and troubleshoot wireless communication systems.

Featuring an advanced synthesizer-based, handheld, battery-operated design, Site Master helps wireless field engineers and technicians detect cable feedline and antenna system problems before they become costly, time-consuming system failures. Superior immunity to ambient RF levels, and excellent directivity and source match ensure accurate and repeatable measurements.

Easy-to-Use

Site Master's menu driven interface requires little training and simplifies the field engineers and technicians task of deployment, site-to-site maintenance and troubleshooting by identifying, recording and solving problems without sacrificing measurement accuracy.

- Store ten test setups for fast repeatable testing.
- Store up to 200 measurement traces in nonvolatile memory.
- Quickly select cable type and test parameters without setup error.
- Multilingual user interface features on screen menus and messages in 6-different languages.
- InstaCal® calibration module simplifies Site Master calibration.

Accurate, Repeatable Measurements

Utilizing vector error correction, Site Master delivers accurate, reliable and repeatable Return Loss/SWR and Fault Location measurements. Site Master's high immunity to interference allows users to conduct measurements of an active site without the loss of accuracy.

- Locate long range problems with 517 data points.
- Superior immunity to on-channel interference for testing at co-located antenna sites.
- Large, high-resolution display allows for easy viewing and trace interpretation under a variety of conditions.
- Full range of marker and limit functions facilitate quick, comprehensive measurements.

Rugged and Reliable

Designed specifically for field environments, Site Master withstands harsh environments and rough handling. Built-in energy conservation combined with a rechargeable battery pack allows users to extend battery life beyond an eight hour work day. Site Master can also be operated from a 12.5 Vdc source such as an AC-DC adapter or automotive cigarette lighter adapter, which also simultaneously charges the battery.

Powerful Data Analysis Software

Powerful data analysis software comes with every Site Master unit, providing users with an easy method of analyzing system performance, trends and problems in addition to professional report generation.

- Site Master PC software is Windows 95/98/2000/ME and NT workstation compatible and supports long alpha-numeric file names for descriptive data labeling.
- Store an unlimited number of data traces for comparison to historical performance.
- Quickly and easily download data traces from the Site Master to a PC database with a single menu selection.

Site Master Software Tools provides a data base to compare maintenance interval performance to site commissioning data. The Distance-To-Fault display pinpoints problem areas before they degenerate into failures. In the graph to the left, a loosened connector changes the return loss characteristic from 38 dB to 33 dB (< 0.05 SWR increase). Although the above cable sweeps appear to meet specifications, they are indicative of a probable loose weather seal which will eventually allow water intrusion.

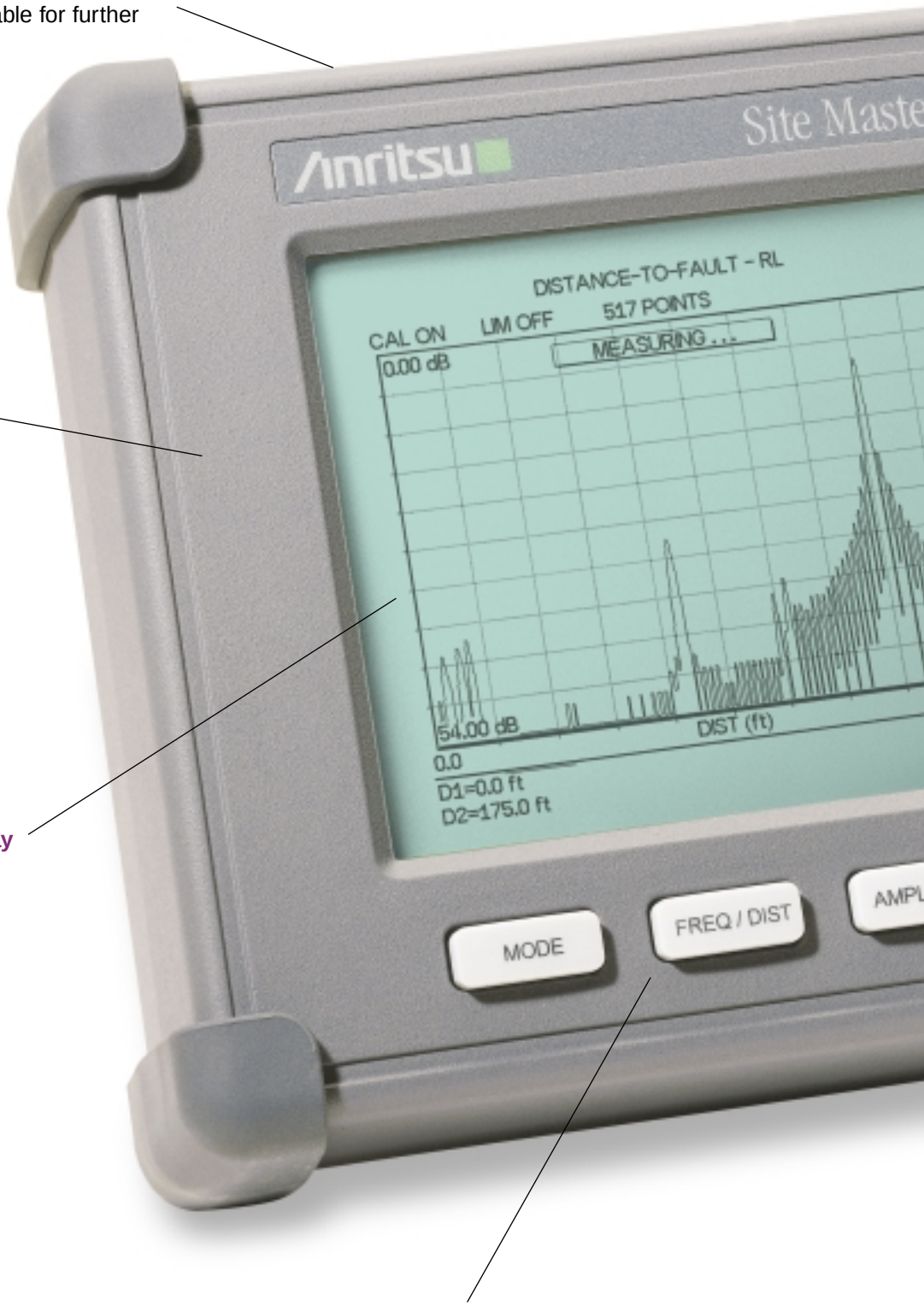
The Picture is Actual Size . . .

RS-232 Interface
Download stored data to a personal computer (PC) or a printer via a serial cable for further analysis. Use your notebook computer to automatically control and collect data in the field. Use a modem for remote operation.

Rugged Chassis Design
Ruggedized, lightweight, high-impact housing ideally suited for handheld operation and field environments. A softcase is provided for easy carrying and additional environmental protection.

Large High Resolution Display
High resolution (640x480) display featuring contrast and back-lighting capability. Easy viewing under a variety of lighting conditions.

Unit Measurements
Metric: 2.54 x 17.8 x 6.10 cm
Inches: 10 x 7 x 2.4 in



Function Keys
Four dedicated function keys simplify measurement tasks.

Soft Keys
Intuitive soft key menu and user interface

Multilingual User Interface
Multi-language user interface features on-screen menus and messages in 6-different languages.

Save Setup
Ten memory locations for calibration profiles or test set-ups. Enables fast repeatable testing.

Limit Line
Create simple, quick pass/fail measurements

Full Range of Marker Capabilities
Faster, more comprehensive measurements

Save Display
Up to 200 memory locations for measurement data. Alphanumeric data labeling allows descriptive naming of measurement data; Automatic time and date stamp simplifies data management.

Cable List
Quickly select cable type and test parameters without set-up errors. Site Master features pop-up menus that contain over 75 of the most popular cables used within the industry, 3 frequency band presets.

The Benefits are Much Larger

EASY-TO-USE, REDUCES ERROR, INCREASES SYSTEM UPTIME

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.

Site Master's approach to preventive maintenance pays for itself quickly. A poorly installed cable, connector, or connector weather seal will degrade system performance and, if undetected, will eventually damage expensive coaxial cable. Only Site Master has the sensitivity to identify cable, connector and antenna related problems before system performance is compromised.

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 feedline and antenna systems at their proper operating frequency.

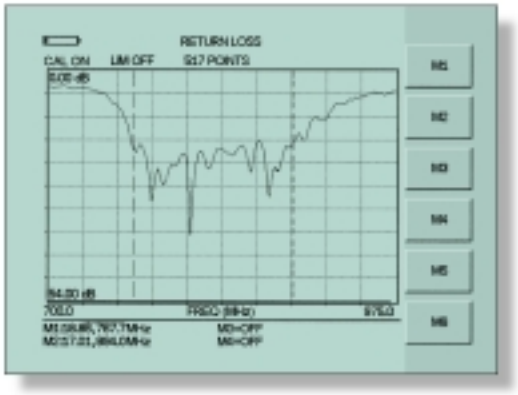
Deficient connectors, lightning arrestors, cables, jumpers, or antennas are replaced before call quality is compromised.

Quick, Simple Measurements

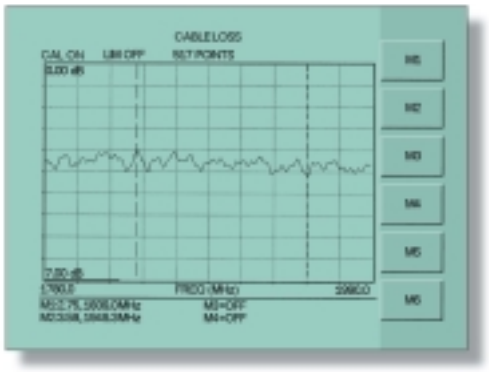
Site Master performs various RF measurements aimed at simplifying cable feedline and antenna system analysis: Return Loss, SWR, Cable Loss and Distance-to-Fault (DTF). A single softkey selection on the main menu activates the desired measurement mode.

Return Loss, SWR

Return Loss and/or 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

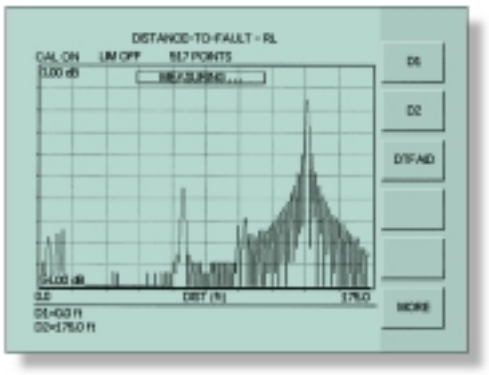


Cable Loss measurements measure the level of insertion loss within the cable feedline system. Insertion loss can be verified prior to deployment, when you have access to both ends of the cable, or on installed cables without access to the opposite end.

Distance-to-Fault

Although a Return Loss test can tell users the magnitude of signal reflections, it can not tell the precise location of a fault within the feedline system. Distance-To-Fault measurements provide the clearest indication of trouble areas (screen display below) 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.



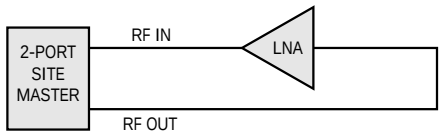
Distance-To-Fault pinpoints the location and reflection amplitude of transmission line components.

SITE MASTER S251C FOR 2-PORT/TOWER TOP APPLICATIONS

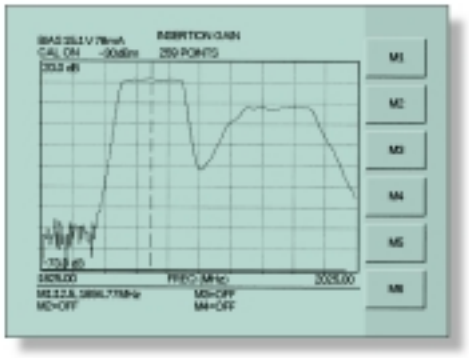
Performance enhancing design trends such as high sector-to-sector isolation, tower-mounted amplifiers and duplexed antennas add new complexities to site installation, deployment, maintenance and troubleshooting. To help simplify performance verification for these systems, a second test port for isolation, gain and insertion loss measurements is required. Addressing this need, the Site Master S251C features a second test-port for testing sector-to-sector isolation, tower-mounted amplifiers and duplexed antennas.

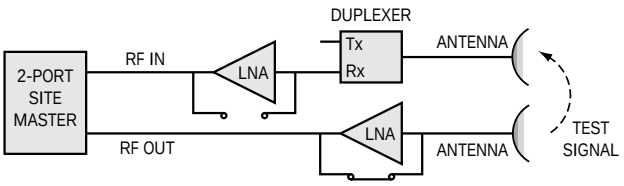
Gain

The Site Master S251C, features a selectable output power at +6 dBm or –30 dBm and an optional, built-in Bias Tee, to enable two-port insertion gain measurement of Tower Mounted Amplifiers (TMA) without the need of an external supply through the PDU (Power Distribution Unit) and an external attenuator. This greatly simplifies the technician's task of verifying amplifier and system performance during installation or periodic maintenance and troubleshooting intervals. Site Master's industry leading high RF interference immunity allows test signal injection between antennas with a minimum of interference induced distortion and is designed to perform both installation and maintenance tests from ground level.



Amplifier Gain Test Measurement.

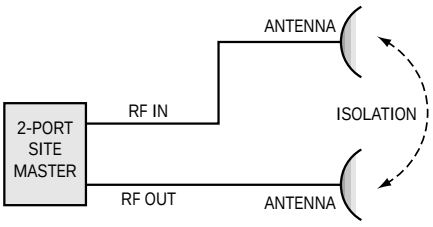




Site Master's high dynamic range enables LNA measurements at ground level.

Isolation

Improving isolation between antenna sectors can reduce cell-to-cell RF Interference and improve system coverage and capacity. To address this measurement requirement, the Site Master S251C features high dynamic range, which ensures that antenna isolation is accurately measured during deployment and during periodic maintenance intervals – including the extremely high >90 dB isolation ranges required at RF-RF repeater sites.



Accurately measure antenna isolation with Site Master's high dynamic range.

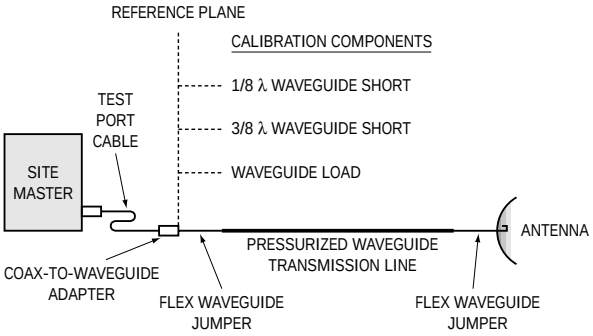
Measuring antenna isolation during periodic maintenance intervals conveniently verifies antenna position after harsh weather. If the antenna has been moved from the installed mounting angle, the change in side lobe and back lobe coupling magnitudes between the antennas causes a clear performance change. Tx-Rx isolation of duplexers and filters is easily tested with Site Master's >90 dB dynamic range. Filters are easily aligned and verified to manufacturer's specifications.

SITE MASTER S800 SERIES FOR MICROWAVE APPLICATIONS

The Site Master S800 series, is the most accurate and convenient tool available for field installation, verification, troubleshooting and repair of microwave communication systems. Difficult test specifications are easy to verify. The S800 series improves quality and reduces maintenance expenses by providing vector corrected calibration and a convenient user interface. These new microwave Site Master models test both waveguide and coaxial cables more conveniently than laboratory-sized scalar analyzers or microwave test sets.

Vector Error Correction

Vector error correction within the S800 series improves the quality and convenience of measurements compared to traditional scalar techniques. Accuracy and repeatability account for errors such as test port match and source match errors. Vector correction allows the test port to achieve the highest commercial directivity to 50 dB (frequency range dependent) using relatively small calibration components.



Vector Correction Avoids Bulky Waveguide Coupler

Waveguide Calibration

The test port interface to the waveguide under test is a small coaxial-to-waveguide adapter rather than a bulky precision coupler.

The calibration components include two offset shorts,1/8 and 3/8 wavelength, and a precision load. The two offset shorts eliminate reference error suffered by scalar systems when only a single waveguide short is used to determine the 0.0 dB reflection reference level. Site Master's innovative flange design mates to square, rectangular or circular flanges. For a given waveguide size, only one calibration set is required. Site Master's waveguide calibration components are built with precision alignment pins that mate the companion coaxial to waveguide adapters. As a result, proper alignment of waveguide is fast and convenient.

Waveguide Dispersion

Vector error correction also improves the quality of Distance-To-Fault data. Not only is the reflection magnitude more accurate, but the waveguide dispersion correction for fault location (different frequencies propagate at different speeds) is more accurate and repeatable. The post-vector corrected data accounts for the non-dispersive length of coaxial cable preceding the input of the waveguide under test. Unlike scalar-based systems, the Site Master S800 Series do not suffer reflection magnitude errors (a failure looks better than actual) and length inaccuracies in proportion to the relative lengths of the coaxial input cable and waveguide under test.

SITE MASTER WITH INTEGRATED SPECTRUM ANALYSIS CAPABILITY

Site Master models S114C and S332C add spectrum analysis capability to the standard cable and antenna analyzer function of Site Master. Now technicians and field engineers can identify and solve RF system problems like coverage, interference, antenna alignment, and in-band interference from unwanted sources among other path related signal problems in addition to cable and antenna analysis measurements.

- Wide dynamic range, featuring –97dBm DANL
- Increased video bandwidth selection
- Quick zoom-in, zoom-out display
- Manual and automatic coupling/decoupling of span, RBW and VBW functions
- Manual and automatic attenuator control
- Field strength measurement
- Occupied bandwidth measurement
- Channel power measurement
- Adjacent channel power measurement

Signal Mapping

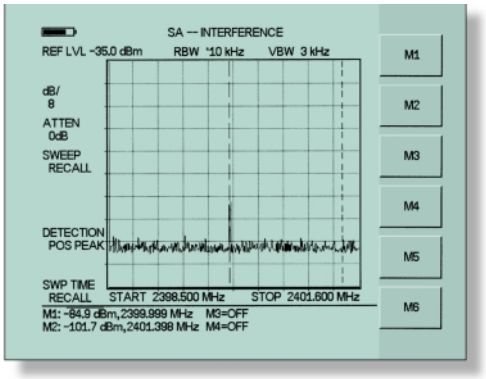
Ideal for site surveys and other signal mapping applications, the Site Master Models S114C and S332C can optimize placement of antennas and access points in a WLAN or WPBX network. Identification of potential in-band interference as well as transmitted signal quality can be easily performed as the installer moves about the installation site.

Field Maintenance

Ideal for field maintenance, the Site Master S114C, S332C simplifies the task of going site-to-site identifying, recording and solving problems. Moreover, these tasks can be completed in a fraction of the time required to haul bench-top or other "portable" equipment to the field. Featuring a synthesizer-based design and built-in measurement functions allow for easy verification of system performance. User-frequency menu functions, high sensitivity, and excellent repeatability pinpoint the smallest RF signal levels. Harmonics, Occupied Bandwidth, Channel Power and potential interference can be measured before small problems grow into big, costly, time-consuming headaches and unwanted site down time.

RF Interference

Identifying the RF Interference problems can be very difficult. Site Master's low noise floor make small signals easily detectable.



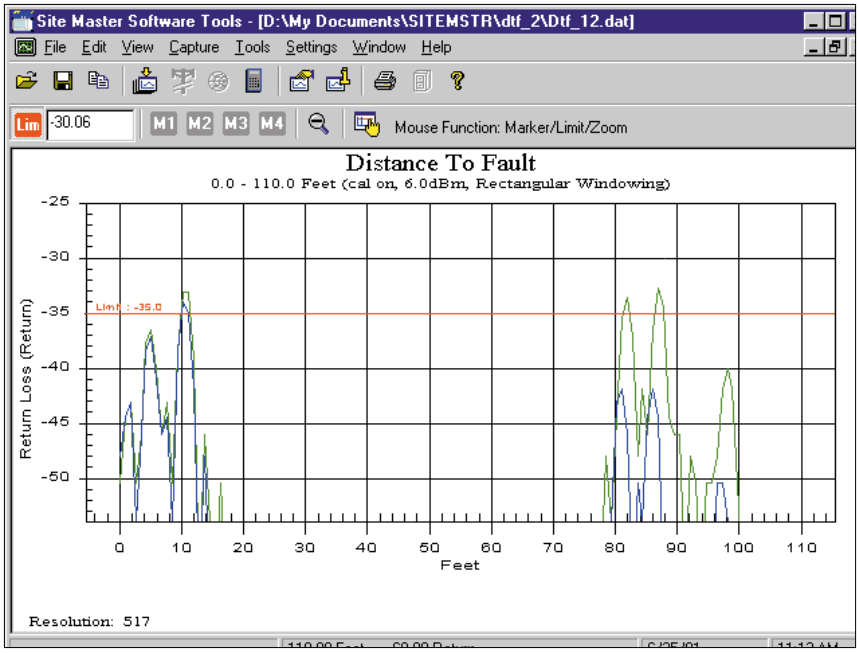
Channel Power

Performing channel power measurements help to determine if a transmitter is operating in compliance with system specifications by measuring the power and power spectral density in a given channel bandwidth. Another common transmitter measurement is adjacent channel leakage power that measures the amount (or ratio) of power leakage into adjacent radio channels.

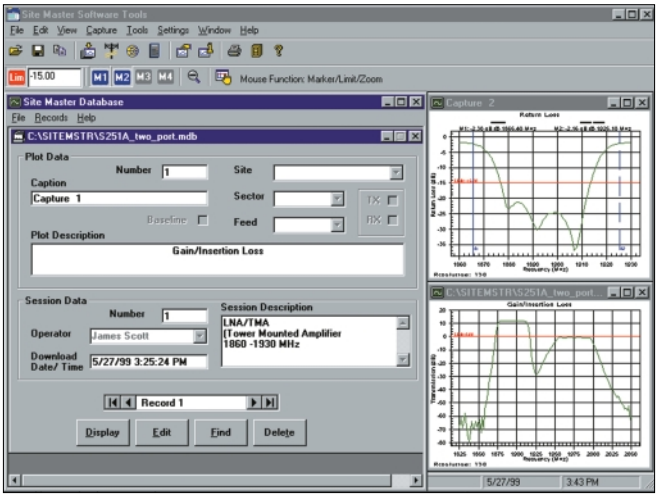
PC SOFTWARE TOOLS FOR PROFESSIONAL ANALYSIS AND REPORT GENERATION

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 95/98/2000/ME or NT. Test data can be analyzed and compared to historical performance.

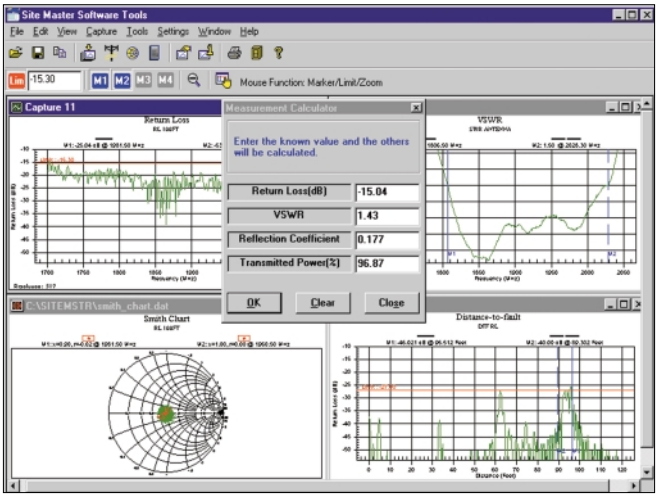
- Up to 200 Site Master trace memory locations can be down loaded with a single menu selection.
- Build historical records with an unlimited number of traces in one document.
- Familiar Windows 95/98/2000/ME and NT interface simplifies data analysis and report generation.
- Intelligent drag-and drop automatically converts traces to a common scale and speeds fault identification.
- Supports long file names for easy measurement data identification.
- Smith Chart function displays S11 vector magnitude and phase data, allowing system components to be impedance matched for optimum performance.



Create professional reports with Site Master software tools. The above plot illustrates connector related problems that can be easily understood.



Create new database files or add to an existing database. Site Master Software Tools quickly stores antenna system test data to a single relational database file.



Analysis displays include MilliRho (mρ) reflection coefficient data format or S_{11} Smith Chart. The on-screen measurement calculator now also includes Transmitted power percentage. Print outs support multiple plots per page.

NEVER BEFORE HAS ONE ANALYZER FAMILY SOLVED SO MANY ANTENNA SYSTEM PROBLEMS

Anritsu Site Master Models	S113C	S114C	S331C	S332C	S251C	S810A	S818A	S820A
Frequency Range (MHz)	2-1600	2-1600	25-4000	25-4000	625-2500	3.3-10.5 GHz	3.3-18 GHz	3.3-20 GHz
Resolution kHz	10	10	100	100	10	1 MHz	1 MHz	1 MHz
Markers	6	6	6	6	6	4	4	4
Display Point (Max.)	517	517	517	517	517	130	130	130
Interference Immunity (dBm)								
On-Frequency[1]	+10	+10	–5	–5	+10 RF Out; +30 dBc RF In[3]	–10	–10	–10
On-Channel[2]	+17	+17	+17	+17	+17	N/A	N/A	N/A
Calibration:								
Instrument Configurations	10	10	10	10	10	6	6	6
Data Storage Reporting:								
Alpha Numeric	Yes	Yes	Yes	Yes	Yes	No	No	No
Time/Date Stamp	Yes	Yes	Yes	Yes	Yes	No	No	No
Numeric	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Memory Locations (Max.)	200	200	200	200	200	70	70	70
Measurement Characteristics[4]								
Return Loss	✓	✓	✓	✓	✓	✓	✓	✓
SWR	✓	✓	✓	✓	✓	✓	✓	✓
Cable Loss	✓	✓	✓	✓	✓	✓	✓	✓
DTF	✓	✓	✓	✓	✓	✓	✓	✓
Insertion Gain					✓			
Isolation					✓			
Insertion Loss					✓			
Spectrum Analysis	N/A	0.1-1600 MHz	N/A	0.1-3000 MHz	N/A	N/A	N/A	N/A

1. On-Frequency Interference Immunity is specified to within ±10 kHz of the carrier frequency.
2. On-Channel Interference Immunity is specified at >1 MHz of the carrier frequency.
3. In most field applications, Immunity is typically better because interferring signals are modulated and varying in frequency rather than CW. Measurements were made in CW mode by injecting a signal into the Site Master through a coupler.
4. All Anritsu Site Master models include Return Loss, SWR, Cable Loss, and Distance-To-Fault.

Whether your system is cellular, PCS/DCS, 3G, paging, data, SMR, WLAN/WPBX or any other type of wireless service covering the 2 MHz to 20 GHz frequency range, Site Master by Anritsu offers a cable and antenna analyzer solution for you.

SITE MASTER OPTIONS AND ACCESSORIES

RF Power Monitor (Option 5)

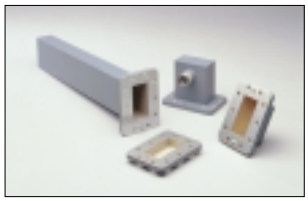
The optional RF Power Monitor features precision, high return loss (low SWR) detectors. This excellent impedance match significantly reduces the largest component of power measurement error, mismatch uncertainty. Display formats include absolute power (dBm or Watts) and relative power (dBr or %). Built-in Auto-Averaging automatically reduces the effects of noise while zeroing control allows optimum measurement accuracy at low power levels.

Bias Tee (Option 10A-S251C Only)

The optional bias tee is integrated inside the Site Master and is designed for applications where both DC and RF signals must be applied to a device under test, such as a tower mounted amplifier (TMA). DC voltages of up to 15 volts at 0.24 amps may be applied to test devices with negligible effect on RF performance as an RF input DC block isolates the input port from the applied bias voltage.

Microwave Accessories

Calibration components mate directly to a variety of commercial and standard military flanges – eliminating the necessity of bulky, precision waveguide couplers. A few examples of waveguide adapters are 35UA187N, 35UM40N, and 35UM58.



InstaCal® Module ICN50

InstaCal™ Calibration Module*

The InstaCal calibration module is available for all one-port Site Master models (S113C, S114C, S331C and S332C). With InstaCal, users can cut the time required to calibrate the Site Master by as much as 50%. Moreover, InstaCal reduces the potential for calibration error. With discrete calibration components users are required to connect, disconnect, and reconnect the various calibration components during the calibration process, which greatly increases the potential for calibration/measurement error. With InstaCal, users are only required to connect the InstaCal calibration module once – the calibration process sequences automatically, ensuring an accurate calibration of the Site Master. The benefit is calibrated measurements in much less time.

*The InstaCal™ Calibration Module exhibits slightly degraded directivity performance compared to precision loads. Users having applications that require DTF-RL measurements > |38 dB| may want to consider using precision load calibration components in place of the InstaCal calibration module for greater measurement accuracy.

InstaCal® Module ICN50

UNIVERSAL WAVEGUIDE COMPONENT ACCESSORIES

Precision Waveguide Calibration Components

Part Number	Description	Freq Range	Waveguide Type	Compatible Flanges
xxUM40	1/8, 3/8 λ Offset Short and Load, Metric	3.30 to 4.90 GHz	WR229, WG11A	PDR40
xxUM48	1/8, 3/8 λ Offset Short and Load, Metric	3.95 to 5.85 GHz	WR187, WG12	CAR48, PAR48, UAR48, PDR48
xxUM58	1/8, 3/8 λ Offset Short and Load, Metric	4.90 to 7.05 GHz	WR159, WG13	CAR58, PAR58, UAR58, PDR58
xxUM70	1/8, 3/8 λ Offset Short and Load, Metric	5.85 to 8.20 GHz	WR137, WG14	CAR70, PAR70, UAR 70, PDR70
xxUM84	1/8, 3/8 λ Offset Short and Load, Metric	7.05 to 10.00 GHz	WR112, WG15	CBR84, UBR84, PBR84, PDR84
xxUM100	1/8, 3/8 λ Offset Short and Load, Metric	8.20 to 12.40 GHz	WR90, WG16	CBR100, UBR100, PBR100, PDR100
xxUM120	1/8, 3/8 λ Offset Short and Load, Metric	10.00 to 15.00 GHz	WR75, WG17	CBR120, UBR120, PBR120, PDR120
xxUM140	1/8, 3/8 λ Offset Short and Load, Metric	12.40 to 18.00 GHz	WR62, WG18	CBR140, UBR140, PBR140, PDR140
xxUM220	1/8, 3/8 λ Offset Short and Load, Metric	17.00 to 26.50 GHz	WR42, WG20	CBR220, UBR220, PBR220, PDR220
xxUA229	1/8, 3/8 λ Offset Short and Load, US	3.30 to 4.90 GHz	WR229, WG11A	CPR229F, CPR229G, UG-1350/U, UG-1351/U, UG-1726/U, UG-1727/U
xxUA187	1/8, 3/8 λ Offset Short and Load, US	3.95 to 5.85 GHz	WR187, WG12	CPR187F, CPR187G, UG-1352/U, UG-1353/U, UG-1728/U, UG-1729/U, UG-148/U, UG-149A/U
xxUA159	1/8, 3/8 λ Offset Short and Load, US	4.90 to 7.05 GHz	WR159, WG13	CPR159F, CPR159G, UG-1354/U, UG-1355/U, UG-1730/U, UG-1731/U
xxUA137	1/8, 3/8 λ Offset Short and Load, US	5.85 to 8.20 GHz	WR137, WG14	CPR137F, CPR137G, UG-1356/U, UG-1357/U, UG-1732/U, UG-1733/U, UG-343B/U, UG-344/U, UG-440B/U, UG-441/U
xxUA112	1/8, 3/8 λ Offset Short and Load, US	7.05 to 10.00 GHz	WR112, WG15	CPR112F, CPR112G, UG-1358/U, UG-1359/U, UG-1734/U, UG-1735/U, UG-52B/U, UG-51/U, UG-137B/U, UG-138/U
xxUA90	1/8, 3/8 λ Offset Short and Load, US"	8.20 to 12.40 GHz	WR90, WG16	CPR90F, CPR90G, UG-1360/U, UG-1361/U, UG-1736/U, UG-1737/U, UG-40B/U, UG-39/U, UG-135/U, UG-136B/U
xxUA75	1/8, 3/8 λ Offset Short and Load, US	10.00 to 15.00 GHz	WR75, WG17	WR75
xxUA62	1/8, 3/8 λ Offset Short and Load, US	12.40 to 18.00 GHz	WR62, WG18	UG-541A/U, UG-419/U, UG-1665/U, UG1666/U
xxUA42	1/8, 3/8 λ Offset Short and Load, US	17.00 to 26.50 GHz	WR42, WG20	UG-596A/U, UG-595/U, UG-597/U, UG-598A/U
xxCMR229	1/8, 3/8 λ Offset Short and Load, CMR	3.30 to 4.90 GHz	WR229, WG11A	CMR229
xxCMR187	1/8, 3/8 λ Offset Short and Load, CMR	3.95 to 5.85 GHz	WR187, WG12	CMR187, UG1475/U, UG1480/U
xxCMR159	1/8, 3/8 λ Offset Short and Load, CMR	4.90 to 7.05 GHz	WR159, WG13	CMR159
xxCMR137	1/8, 3/8 λ Offset Short and Load, CMR	5.85 to 8.20 GHz	WR137, WG14	CMR137, UG1476/U, UG1481/U
xxCMR112	1/8, 3/8 λ Offset Short and Load, CMR	7.05 to 10.00 GHz	WR112, WG15	CMR112, UG1477/U, UG1482/U
xxCMR90	1/8, 3/8 λ Offset Short and Load, CMR	8.2 to 12.4 GHz	WR90, WG16	CMR90, UG1478/U, UG1483/U
xxUER40	1/8, 3/8 λ Short and Load, UER	3.30 to 4.90 GHz	WR229, WG11A	UER40
xxUER48	1/8, 3/8 λ Short and Load, UER	3.95 to 5.85 GHz	WR187, WG12	UER48
xxUER58	1/8, 3/8 λ Short and Load, UER	4.90 to 7.05 GHz	WR159, WG13	UER58
xxUER70	1/8, 3/8 λ Short and Load, UER	5.85 to 8.20 GHz	WR137, WG14	UER70
xxUER84	1/8, 3/8 λ Short and Load, UER	7.05 to 10.00 GHz	WR112, WG15	UER84
xxUER100	1/8, 3/8 λ Short and Load, UER	8.2 to 12.4 GHz	WR90, WG16	UER100

Note: Part Number Ordering Information Prefix (xx) - 23 for 1/8 λ Offset Short
- 24 for 3/8 λ Offset Short
- 26 for Precision Waveguide Load

Precision Waveguide-to-Coaxial Adapters

35UM40N	Coaxial Adapter, N(m), Metric	3.30 to 4.90 GHz	WR229, WG11A	PDR40
35UM48N	Coaxial Adapter, N(m), Metric	3.95 to 5.85 GHz	WR187, WG12	CAR48, PAR48, UAR48, PDR48
35UM58N	Coaxial Adapter, N(m), Metric	4.90 to 7.05 GHz	WR159, WG13	CAR58, PAR58, UAR58, PDR58
35UM70N	Coaxial Adapter, N(m), Metric	5.85 to 8.20 GHz	WR137, WG14	CAR70, PAR70, UAR 70, PDR70
35UM84N	Coaxial Adapter, N(m), Metric	7.05 to 10.00 GHz	WR112, WG15	CBR84, UBR84, PBR84, PDR84
35UM100N	Coaxial Adapter, N(m), Metric	8.20 to 12.40 GHz	WR90, WG16	CBR100, UBR100, PBR100, PDR100
35UM120N	Coaxial Adapter, N(m), Metric	10.00 to 15.00 GHz	WR75, WG17	CBR120, UBR120, PBR120, PDR120
35UM140N	Coaxial Adapter, N(m), Metric	12.40 to 18.00 GHz	WR62, WG18	CBR140, UBR140, PBR140, PDR140
35UM220K	Coaxial Adapter, K(m), Metric	17.00 to 26.50 GHz	WR42, WG20	CBR220, UBR220, PBR220, PDR220
35UA229N	Coaxial Adapter, N(m), US	3.30 to 4.90 GHz	WR229, WG11A	CPR229F, CPR229G, UG-1350/U, UG-1351/U, UG-1726/U, UG-1727/U
35UA187N	Coaxial Adapter, N(m),US	3.95 to 5.85 GHz	WR187, WG12	CPR187F, CPR187G, UG-1352/U, UG-1353/U, UG-1728/U, UG-1729/U, UG-148/U, UG-149A/U
35UA159N	Coaxial Adapter, N(m), US	4.90 to 7.05 GHz	WR159, WG13	CPR159F, CPR159G, UG-1354/U, UG-1355/U, UG-1730/U, UG-1731/U
35UA137N	Coaxial Adapter, N(m), US	5.85 to 8.20 GHz	WR137, WG14	CPR137F, CPR137G, UG-1356/U, UG-1357/U, UG-1732/U, UG-1733/U, UG-343B/U, UG-344/U, UG-440B/U, UG-441/U
35UA112N	Coaxial Adapter, N(m),US	7.05 to 10.00 GHz	WR112, WG15	CPR112F, CPR112G, UG-1358/U, UG-1359/U, UG-1734/U, UG-1735/U, UG-52B/U, UG-51/U, UG-137B/U, UG-138/U
35UA90N	Coaxial Adapter, N(m),US	8.20 to 12.40 GHz	WR90, WG16	CPR90F, CPR90G, UG-1360/U, UG-1361/U, UG-1736/U, UG-1737/U, UG-40B/U, UG-39/U, UG-135/U, UG-136B/U
35UA75N	Coaxial Adapter, N(m), US	10.00 to 15.00 GHz	WR75, WG17	WR75
35UA62N	Coaxial Adapter, N(m), US	12.40 to 18.00 GHz	WR62, WG18	UG-541A/U, UG-419/U, UG-1665/U, UG1666/U
35UA42K	Coaxial Adapter, K(m), US	17.00 to 26.50 GHz	WR42, WG20	UG-596A/U, UG-595/U, UG-597/U, UG-598A/U
35CMR229N	Coaxial Adapter, N(m), CMR	3.30 to 4.90 GHz	WR229, WG11A	CMR229
35CMR187N	Coaxial Adapter, N(m), CMR	3.95 to 5.85 GHz	WR187, WG12	CMR187, UG1475/U, UG1480/U
35CMR159N	Coaxial Adapter, N(m), CMR	4.90 to 7.05 GHz	WR159, WG13	CMR159
35CMR137N	Coaxial Adapter, N(m), CMR	5.85 to 8.20 GHz	WR137, WG14	CMR137, UG1476/U, UG1481/U
35CMR112N	Coaxial Adapter, N(m), CMR	7.05 to 10.00 GHz	WR112, WG15	CMR112, UG1477/U, UG1482/U
35CMR90N	Coaxial Adapter, N(m), CMR	8.2 to 12.4 GHz	WR90, WG16	CMR90, UG1478/U, UG1483/U
35UER40N	Coaxial Adapter, N(m), UER	3.30 to 4.90 GHz	WR229, WG11A	UER40
35UER48N	Coaxial Adapter, N(m), UER	3.95 to 5.85 GHz	WR187, WG12	UER48
35UER58N	Coaxial Adapter, N(m), UER	4.90 to 7.05 GHz	WR159, WG13	UER58
35UER70N	Coaxial Adapter, N(m), UER	5.85 to 8.20 GHz	WR137, WG14	UER70
35UER84N	Coaxial Adapter, N(m), UER	7.05 to 10.00 GHz	WR112, WG15	UER84
35UER100N	Coaxial Adapter, N(m) UER	8.2 to 12.4 GHz	WR90, WG16	UER100

SPECIFICATIONS

All specifications apply when calibrated at ambient temperature after a five minute warm up. Typical values are given for reference, and are not guaranteed.

Return Loss
Range: 0.00 to 54.00 dB
Resolution: 0.01 dB

SWR
Range: 1.00 to 65.00
Resolution: 0.01

Distance-To-Fault
Vertical Range:
Return Loss: 0.00 to 54.00 dB
SWR : 1.00 to 65.00
Horizontal Range:
Range: 0 to (# of data pts -1) x Resolution to a maximum of 1000 m (3281 ft.), # of data pts. = 130, 259, 517
Horizontal Resolution, Rectangular Windowing:
For Coax,
Resolution (meter) =
$1.5 \times 10^8 (v_p / \Delta \text{ Frequency})$
Where: v_p is the cable's relative propagation velocity.
Δ Frequency is the stop frequency minus the start frequency (in Hz).

For Waveguide,
Resolution (meter) =

$$\frac{1.5 \times 10^8 \left(\sqrt{1-(F_C / F_1)^2}\right)}{\Delta \text{ Frequency}}$$

Where: F_C is the waveguide's cutoff frequency (in Hz).
F_1 is the start frequency (in Hz).
Δ Frequency is the stop frequency minus the start frequency (in Hz).

Gain/Insertion Loss
Range: –90 to +50 dB
Resolution: 0.1 dB

RF Power Monitor Option
Display Range: –80.0 to +80.0 dBm, or 10.0 pW to 100.0 kW
Detector Range –50.0 to +20.0 dBm, or 10.0 µW to 100.0 mW
Offset Range: 0.0 to +60.0 dB
Resolution: 0.1 dB or 0.1 x W

Transmission Line Loss (one-port)
Range: 0.00 to 20.00 dB
Resolution: 0.01 dB

Test Port Connector
Precision N female

Maximum Input Without Damage
N(f) Test Ports: +20 dBm, 50 Ω, +50 Vdc
RF Power Detector: +20 dBm, 50 Ω, +50 Vdc

SPECTRUM ANALYZER

Frequency

Frequency Range: 100 kHz to 1.6 GHz, S114C
100 kHz to 3.0 GHz, S332C

Frequency Reference: Aging: ±1 ppm/yr.
Accuracy: ±2 ppm

Frequency Span: 0 Hz (zero span)
100 kHz to 1.6 GHz, S114C
100 kHz to 3.0 GHz, S332C

Sweep Time: ≥650 ms (full span)
500 ms (zero span)

Resolution Bandwidth:
10 kHz, 30 kHz, 100 kHz, 1 MHz

Accuracy: ±20% typical

Video Bandwidth:
100 Hz to 300 kHz in 1-3 sequence

SSB Phase Noise
(1 GHz) @ 30 kHz Offset: -75 dBc/Hz

Spurious Responses
Input Related: ≤–45 dBc

Spurious
Residual Responses: ≤–95 dBm

Amplitude

Measurement Range: –97 dBm to +20 dBm, typical

Dynamic Range: ≥65 dB, typical

Maximum
Safe Input Level: +20 dBm max. measurement safe input
+27 dBm max. input (damage)
+27 dBm Peak Pulse Power
+50 Vdc

Displayed Average Noise Level:
≤–97 dBm (>300 kHz, typical)
≤-80 dBm (100 kHz to 300 kHz, typical)

Display Range: 2 to 15 dB/div. In 1 dB steps. Ten divisions displayed.

RF Input VSWR: 2.0:1

Total Level Accuracy: ±2 dB, ≥300 kHz, typical
±3 dB, <300 kHz, typical

GENERAL

RS-232: 9 pin D-sub, three wire serial

Electromagnetic Compatibility:
Complies with European Community Requirements for CE marking.

Temperature:
Operating: –0°C to 50°C
Storage: –20°C to 75°C
Operation at temperatures to –10.0°C is normal. However, please note that the LCD display will fade at low temperature extremes.

Weight:
Site Master A Series, 1.36 kgs. (3.0 lbs.) nominal, includes battery
Site Master C Series, 1.81 kgs. (4.0 lbs.) nominal, includes battery
Site Master 332C, 2.14 kgs. (4.76 lbs.) nominal, includes battery

Size :
A Series: 20.3 x 17.8 x 5.72 cm (8 x 7 x 2.25 in.)
C Series: 25.4 x 17.8 x 6.10 cm (10 x 7 x 2.4 in.)

MEASUREMENT ACCURACY

Return Loss and SWR

Accuracy = $< 0.9 + \left| 20 \log (1 \pm 10^{-E\Delta/20}) \right|$ dB, typical.
where $E\Delta$ = Directivity - Measured Return Loss

Directivity is the largest source of return loss measurement uncertainty. The quality of the load or termination used for calibration determines directivity performance. Loads can be verified using a vector network analyzer calibrated with either sliding load or TRL.

Directivity:
Precision 7/16 Components:
≥45 dB (≤ 3.5 GHz),
≥ 42 dB (3.5 to 4.0 GHz)

N Components: SM/PL, SM/PNFL
≥42 dB (≤ 3.5 GHz),
≥ 40 dB (3.5 to 4.0 GHz)

28N50A:
≥40 dB, (≤ 18 GHz)

InstaCal™: ICN50
≥ 38 dB (<3.5 GHz),
≥ 35 dB (3.5 to 4.0 GHz)

Precision Waveguide Load:
≥45 dB (frequency range dependent)

The protective softcase is designed to hold calibration components. Velcro adjustments on the shoulder strap allow convenient, one hand operation.

Cable Loss Accuracy

Accuracy: <±1.0 dB typical, for insertion losses of <4.0 dB.
Assumes cable return loss >26 dB.

Accuracy is improved using ripple averaging. Set the frequency sweep such that 5 to 6 ripple cycles are visible. Calibrate the Site Master and place markers at an adjacent peak and valley. Sum the marker values and divide by two. For cable loss greater than 4.0 dB, see formula in technical notes.

Repeatability: <± 0.05 dB, typical

Cable Loss is determined by measuring one end of the cable and disconnecting the opposite end from any antennas or other devices. This open circuit condition return loss is measured and divided by two. This test is excellent for trouble shooting or verifying previously installed cables. For best results comparing measurements to historic data, always disconnect the opposite cable end at the same position and avoid simultaneous tests of multiple cable or connector types.

Distance-To-Fault Accuracy:

The Fast Fourier Transform which calculates the DTF display provides an exact indication of electrical length. This relates to physical length through knowledge of the cable's propagation velocity, v_p :

$d = (c * n * v_p) / (2 * \Delta f)$

Distance is displayed according to the accuracy of v_p. In the equation above, c is the speed of light, n the number of ripples in the frequency domain display and Δf is frequency sweep range. Cable manufactures specify the v_p of cables. When this specification is not available, the v_p value is easily determined by measuring a known length of cable.

Non-phase stable cables will cause small measurement errors because bending of the cable changes the physical length of the cable's center conductor and outer ground shield. The Open, Short and Load components used during calibration create a phase "reference plane" from which Site Master bases the vector error correction formulas. The physical length of the cable is allowed to change as it flexes, the phase relationship of the calibrated reference plane position and the actual cable end position also changes - creating errors.

Panel connections include a 9 pin D-sub RS-232, precision test port connector, DC power input, and an optional RF detector connection for the Power Monitor operation.

ORDERING INFORMATION

Model S113C	(2 MHz to 1600 MHz), Built in DTF
Model S114C	(2 MHz to 1600 MHz), Built in DTF, Spectrum Analysis (100 kHz-1.6 GHz)
Model S251C	(625 MHz to 2500 MHz), Built in DTF
Model S331C	(25 MHz to 4000 MHz), Built in DTF
Model S332C	(25 MHz to 4000 MHz), Built in DTF, Spectrum Analysis (100 kHz-3.0 GHz)
Model S810A	(3.3 GHz to 10.5 GHz), Built in DTF
Model S818A	(3.3 GHz to 18.0 GHz), Built in DTF
Model S820A	(3.3 GHz to 20.0 GHz), Built in DTF

Standard Accessories Includes

User's Guide
Soft Carrying Case
AC-DC Adapter with Power Cord
Automotive Cigarette Lighter/12 Volt DC Adapter
One Year Warranty
CD ROM containing Fault Location (DTF), Smith Chart and Software Management Tools
Serial Interface Cable
Rechargeable Battery, NiMH (All Models Except S800A Series)
InstaCal® (S113C, S114C, S331C and S332C Only)

Optional Accessories

Option 5	RF Power Monitor (RF Detector not included)
Option 10A	Bias Tee, 240 mA (S251C Only)
5400-71N50	RF Detector, N(m), 50 Ohm, 1 to 3000 MHz
560-7N50B	RF Detector, N(m), 50 Ohm, 10 MHz to 20 GHz
560-7K50	RF Detector, K(m), 50 Ohm, 10 MHz to 40 GHz
560-7VA50	RF Detector, V(m), 50 Ohm, 10 MHz to 50 GHz
42N50A-30	Attenuator, 30 dB, 50 Watt, DC to 18 GHz, N(m) to N(f)
42N50-20	Attenuator, 20 dB, 5 Watt, DC to 18 GHz, N(m) to N(f)
1N50C	Limiter, N(m) to N(f), 50 Ohm, 10 MHz to 20 GHz
ICN50	InstaCal™ Calibration Module, 50 Ohm, 2 MHz to 4.0 GHz, N(m) (S113C, S114C, S331C and S332C Only)
22N50	Precision N(m) Short/Open, 18 GHz
22NF50	Precision N(f) Short/Open, 18 GHz
SM/PL	Precision N(m) Load, 42 dB, 4.0 GHz
SM/PLNF	Precision N(f) Load, 42 dB, 4.0 GHz
OSLN50LF	Precision Open/Short/Load, DC to 4.0 GHz, 50 Ohm, N(m)
OSLNF50LF	Precision Open/Short/Load, DC to 4.0 GHz, 50 Ohm, N(f)
2000-767	Precision Open/Short/Load, 7/16 (m), 4.0 GHz
2000-768	Precision Open/Short/Load, 7/16 (f), 4.0 GHz
28N50-2	Precision N(m) Load, 40 dB, 18 GHz
28NF50-2	Precision N(f) Load, 40 dB, 18 GHz
22K50	Precision K(m) Short/Open, 40 GHz
22KF50	Precision K(f) Short/Open, 40 GHz
28K50	Precision Termination, DC to 40 GHz, 50 Ohm, K(m)
28KF50	Precision Termination, DC to 40 GHz, 50 Ohm, K(f)
15NN50-1.5C	Test Port Cable Armored, 1.5 meter, N(m) to N(m), 6.0 GHz
15NN50-3.0C	Test Port Cable Armored, 3.0 meter, N(m) to N(m), 6.0 GHz
15NN50-5.0C	Test Port Cable Armored, 5.0 meter, N(m) to N(m), 6.0 GHz
15NNF50-1.5C	Test Port Cable Armored, 1.5 meter, N(m) to N(f), 6.0 GHz
15NNF50-3.0C	Test Port Cable Armored, 3.0 meter, N(m) to N(f), 6.0 GHz
15NNF50-5.0C	Test Port Cable Armored, 5.0 meter, N(m) to N(f), 6.0 GHz
15ND50-1.5C	Test Port Cable Armored, 1.5 meter, N(m) to 7/16 DIN(m), 6.0 GHz
15NDF50-1.5C	Test Port Cable Armored, 1.5 meter, N(m) to 7/16 DIN(f), 6.0 GHz
15NNF50-1.5B	Test Port Cable Armored, 1.5 meter, N(m) to N(f), 18 GHz
15KKF50-1.5A	Test Port Cable Armored, 1.5 meter, K(m) to K(f), 26.5 GHz
15RKKF50-1.5A	Test Port Cable Armored, 1.5 meter, RK(m) to R(f), 26.5 GHz
1091-26	Adapter, DC to 18 GHz, 50 Ohm, N(m) to SMA(m)
1091-27	Adapter, DC to 18 GHz, 50 Ohm, N(m) to SMA(f)
1091-80	Adapter N(f) to SMA(m), 18 GHz
1091-81	Adapter N(f) to SMA(f), 18 GHz
1091-172	Adapter, DC to 1.3 GHz, 50 Ohm, N(m) to BNC(f)
510-90	Adapter 7/16(f) to N(m), 7.5 GHz
510-91	Adapter 7/16(f) to N(f), 7.5 GHz
510-92	Adapter 7/16(m) to N(m), 7.5 GHz
510-93	Adapter 7/16(m) to N(f), 7.5 GHz
510-96	Adapter 7/16 DIN(m) to 7/16 DIN(m), 7.5 GHz
510-97	Adapter 7/16 DIN(f) to 7/16 DIN(f), 7.5 GHz
34NN50A	Precision N(m) to N(m) Adapter, 18 GHz
34NFNF50	Precision N(f) to N(f) Adapter, 18 GHz
34RKNF50	Precision Ruggedized K(m) to N(f) Adapter, 20 GHz
34RSN50	Precision Ruggedized WSMA(m) to N(m) Adapter, 20 GHz
K220B	Precision K(m)-K(m) Adapter, 40 GHz
K222B	Precision K(f)-K(f) Adapter, 40 GHz
D41955	Spare Soft Carrying Case (S800A series)
48258	Spare Soft Carrying Case (S113C, S114C, S331C, S332C, and S251C)
40-115	Spare AC/DC Adapter
806-62	Spare Automotive Cigarette Lighter/12 Volts DC adapter
800-441	Spare Serial Interface Cable
760-215A	Transit Cases for Anritsu Site Master (S113C, S114C, S331C, S332C, and S251C)
760-213	Transit Case for S800 Series Site Master
2300-347	Anritsu Site Master Software Tools
10580-00060	Anritsu Site Master S113C, S114C, S331C, S332C User's Guide
10580-00065	Anritsu Site Master S251C User's Guide
10580-00014	Anritsu Site Master S810A, S818A User's Guide
10580-00030	Anritsu Site Master S820A User's Guide
633-27	Rechargeable Battery, NiMH (C Series only)
2000-1029	Battery Charger, NiMH with Universal Power Supply
2000-1030	Portable Antenna, 50 Ohm, SMA(m), 1.71-1.88 GHz
2000-1031	Portable Antenna, 50 Ohm, SMA (m), 1.85-1.99 GHz
2000-1032	Portable Antenna, 50 Ohm, SMA (m), 2.4-2.5 GHz
2000-1034	Portable Antenna, 50 Ohm, SMA (m), 806-869 MHz
2000-1035	Portable Antenna, 50 Ohm, SMA (m), 902-960 MHz

Printers

2000-766	HP DeskJet Printer, model 350 Includes: Interface Cable, Black Print Cartridge, and US Power Cable
2000-753	Spare Serial-to-Parallel Converter Cable
2000-661	Black Print Cartridge
2000-663	Power Cable (Europe) for DeskJet Printer
2000-664	Power Cable (Australia) for DeskJet Printer
2000-665	Power Cable (U.K.) for DeskJet Printer
2000-667	Power Cable (So. Africa) for DeskJet Printer
2000-1008	Seiko DPU-414-30B Thermal Printer Includes: Internal Battery, Thermal Printer Paper, Serial Cable, Power Cable
2000-1012	Spare Serial 9 pin (male) to 9 pin (female) cable (for Seiko DPU-414-30B)
2000-755	Five (5) rolls of Thermal Paper
2000-1002	U.S. Adapter (for Seiko DPU-414-30B)
2000-1003	Euro Adapter (for Seiko DPU-414-30B)
2000-1194	Japan Adapter (for Seiko DPU-414-30B)

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