

SITE MASTER S100C/S200C/S300C/S800C Series

2 MHz to 20 GHz



For Analyzing Cable and Antenna Problems

NEW



S331C



S332C



S251C



S113C



S114C



S820C

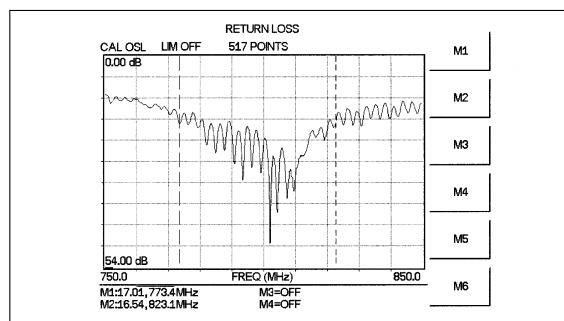
Site Master is the instrument of choice for transmission line/antenna installation and maintenance. It is the best way to reduce maintenance expenses and improve quality. It replaces stacks of heavy, expensive, and complex test equipment. Site Master's frequency domain reflectometry technique allows it to locate faults before they become catastrophic faults, thereby creating huge cost savings.

The Site Master is a precision, hand-held return loss/SWR and fault location measurement instrument. The Site Master series offers wide frequency coverage, from 2 MHz to 20 GHz. Built-in fault location, RF power monitor, bias tee, and spectrum analysis capabilities are available. Light weight, rugged design, and wide temperature range make them ideal for field applications. Site Master's proprietary design provides superior immunity to on-channel RF interference, which is important for live site testing. Site Master Software Tools is a Windows® compatible software program provided with every Site Master unit. This software program provides many useful features, including a database for Site Master measurements, Smith Chart display of S11, zoom capability, a "drag-n-drop" overlay for measurement comparison, the capability to download data to a PC, the capability to upload data such as custom cable list or traces to selected Site Master model, and distance-to-fault calculation from return loss or SWR plots. Advanced printing capabilities are provided by Site Master Software Tools including user definable plot scaling and a multiple plots per page option. Site Master is the first test tool to provide the required accuracy, interference immunity, and repeatability for transmission line/antenna commissioning, and maintenance of today's wireless systems infrastructures.

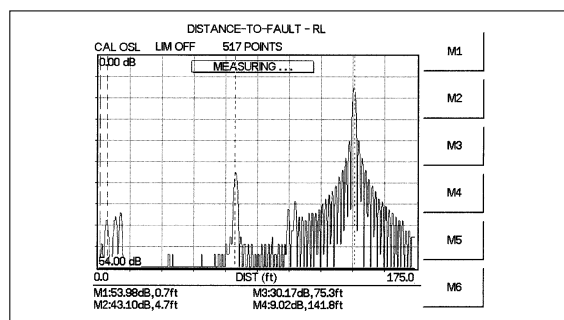
Features

- Accurate return loss/SWR and fault location measurements
- Accurately tests RF transmission lines and antennas
- Superior immunity to on-channel interference for testing at co-located antenna sites
- Multilingual user interface: German, Spanish, French, Chinese, Japanese
- Insertion Loss/Gain (S251C only)
- Spectrum analysis (S114C and S332C only)
- Optional RF power monitor
- Optional built-in bias tee (S251C only)
- Synthesizer accurate to 75 ppm
- Internal memory saves up to 200 traces
- Instrument configuration up to 10 configurations
- Alphanumeric trace naming
- Time, Date stamp
- Field replaceable battery
- Segmented limit lines
- Six markers

- Graticule lines
- Trace overlay
- Direct printing via RS-232 serial port
- Remote operation via RS-232 serial port



Return loss



Distance-to-fault

Applications

Cellular, ISM, PCS/PCN, paging service, safety service, avionics, two-way radio, military, and microwave point-to-point radio. Site Master allows implementation of preventative maintenance procedures. Unlike TDRs and spectrum analyzers/tracking generators, Site Master can spot RF degradation before failures occur. Problems can be fixed before expensive cables or waveguides are ruined. Site Master is designed for field requirements. Its rugged construction survives rough field treatment. Battery power, light weight, small size, wide

temperature range, and simple user interface are exactly what field technicians want today. Technicians can test antennas from ground level because Site Master's distance-to-fault measurement compensates for cable insertion loss. Furthermore, spectrum analysis, available in certain Site

Master models, allows technicians and field engineers to quickly identify and solve common RF system problems, such as coverage, interference, and other path related signal problems. Site Master offers a new and better method to install and maintain transmission lines and antennas.

Specifications*1

Model	S251C	S113C/S331C	S114C/S332C
Frequency range	625 to 2500 MHz	2 to 1600 MHz (S113C) 25 to 4000 MHz (S331C)	2 to 1600 MHz (S114C) 25 to 4000 MHz (S332C)
Frequency resolution	10 kHz	100 kHz	100 kHz
Frequency accuracy (CW mode)	± 75 ppm		
Display data points	Selectable: 130, 259, 517		
Immunity to interfering RF signals*2	S251C	S113C	S331C
On-frequency*3	+10 dBm (RF out), +30 dBc transmission	+10 dBm	-5 dBm
On-channel*4	+17 dBm	+17 dBm	+17 dBm
Return loss	Range: 0 to 54 dB; Resolution: 0.01 dB		
SWR	Range: 1 to 65; Resolution: 0.01		
Cable loss	Range: 0 to 20 dB; Resolution: 0.01 dB		
Insertion Loss/Gain S251C only	Display range: -120 to +100 dB Resolution: 0.1 dB	N/A	N/A
Distance-to-fault	Vertical range Return loss: 0 to 54 dB SWR: 1 to 65 Horizontal range (meter): 0 to (# of data points -1) x resolution, where data points = 130, 259 or 517 Horizontal resolution, rectangular windowing resolution (meter): $(1.5 \times 10^8) (\Delta f) / \Delta \text{frequency}^5$		
RF power monitor (Option 5)	Display range: -80 to +80 dBm, 10 pW to 100 kW Detector range: -50 to +20 dBm, 10 µW to 100 mW Offset range: 0 to +60 dB Resolution: 0.1 dB or 0.1 W		
Bias Tee (Option 10B) S251C only	Voltage: Switchable 15V (high voltage) OR 12V (low voltage) Current: Switchable 1A surge/650 mA steady state (high current) OR 460 mA surge/244 mA steady state (low current)	N/A	N/A
Spectrum analysis			
Frequency range	N/A	N/A	100 kHz to 1600 MHz (S114C) 100 kHz to 3000 MHz (S332C)
Accuracy	N/A	N/A	± 2 ppm
Aging	N/A	N/A	± 1 ppm/yr
Frequency span	N/A	N/A	0 Hz (zero span), 1KHz in 1, 2, 5 step selections
Resolution bandwidth	N/A	N/A	10 kHz, 30 kHz, 100 kHz, 1 MHz
Video Bandwidth	N/A	N/A	100 Hz to 300 kHz in 1-3 sequence
SSB Phase Noise @ (1 GHz) 30 kHz offset	N/A	N/A	≤ -75 dBc/Hz
Spurious responses (Input related)	N/A	N/A	≤ -45 dBc
Spurious responses (residual)	N/A	N/A	≤ -95 dBm
Dynamic range	N/A	N/A	≥ 65 dB
Average noise level	N/A	N/A	100KHz to 300KHz ≤ -80 dBm 300KHz to 500KHz ≤ -92 dBm 500KHz to 3GHz ≤ -95dBm
Measurement range	N/A	N/A	+20 dBm to -95 dBm
Display range	N/A	N/A	2 to 15 dB/div in 1 dB steps, 10 divisions display
Total level accuracy	N/A	N/A	± 2 dB ≥ 500 kHz, typical ± 3 dB < 500 kHz, typical
RF input VSWR	N/A	N/A	2.0:1
Trace memory	Up to 200		
Instrument configuration*6	10		
Markers	6 for all models		
Test port connector	Precision N female		
Maximum input	RF OUT test port: +22 dBm, 50 Ω, +50 Vdc RF IN test port: +10 dBm, 50 Ω, +50 Vdc RF power detector: +20 dBm, 50 Ω, +50 Vdc	RF power detector: +20 dBm, 50 Ω, +50 Vdc	RF IN Spectrum Analyzer port: +20 dBm safe input, +27 dBm damage level, Peak Pulse Power ± 50 Vdc RF power detector: +20 dBm, 50 Ω, ± 50 Vdc
Temperature	Operating: 0°C to +50°C Storage: -20°C to +75°C		
Weight	2.14 kg (4.76 lbs.) nominal		
Size	25.4 cm x 17.8 cm x 6.1 cm (10 in x 7 in x 2.4 in)		
General	Electromagnetic compatibility: Meets European community requirements for CE marking. RS232: 9 pin D-sub, three wire serial		

Continued on next page

- *1: All specifications apply when calibrated at ambient temperature after a five minutes warm up.
- *2: In most applications, immunity is typically better because interfering signals are modulated and varying in frequency rather than being CW. Measurements were made in CW mode by injecting a signal into the Site Master through a coupler.
- *3: On-Frequency interference immunity is specified to within +10 kHz of the carrier frequency.
- *4: On-Channel interference immunity is specified to within 1 MHz of the carrier frequency.
- *5: Where v_p is the cable's relative propagation velocity. Δ frequency is the stop frequency minus the start frequency (in Hz). Wide frequency sweeps improve resolution but reduce maximum display range.
- *6: Calibration stored with instrument configuration.

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



Specifications*1

Model	S810C/S820C
Frequency range	3.3 to 10.5 GHz (S810C) 3.3 to 20 GHz (S820C)
Frequency accuracy (CW mode)	$\leq \pm 50$ ppm
Frequency resolution	100 kHz
Display data points	Selectable: 130, 259, 517
Immunity to interfering RF signals up to*2	-10 dBm
Return loss	Range: 0 to 54 dB, Resolution: 0.01 dB
SWR	Range: 1 to 65, Resolution: 0.01
Cable/Waveguide Loss	Range: 0 to 54 dB, Resolution: 0.01 dB
Distance-to-fault	Vertical range Return loss: 0 to 54 dB SWR: 1 to 65 Horizontal range: (# of data points - 1) x resolution, where data points = 130, 259 or 517 Horizontal resolution, rectangular windowing resolution (meter): Coax: $(1.5 \times 10^8)(v_p)/\Delta \text{ frequency}^{*3}$ Waveguide: $(1.5 \times 10^8)/\sqrt{(1 - (F_c/F_1)^2)}/\Delta \text{ frequency}^{*4}$
RF power monitor (Option 5)	Display range: -80 to +80 dBm, 10 pW to 100 kW Detector range: -45 to +20 dBm, 10 μ W to 100 mW Offset range: 0 to +60 dB Resolution: 0.1 dB, 0.1 x W
Trace memory	200
Instrument configuration with calibration	10
Markers	6 for all models
Test port connector	K type
Maximum input without damage	N(f) test port: +22 dBm RF power detector: +20 dBm, 50 Ω
Temperature	Operating: 0°C to 50°C Storage: -20°C to 75°C
Weight	2.14 kg (4.76 lbs.) nominal
Size	25.4 cm x 17.8 cm x 6.1 cm (10 in x 7 in x 2.4 in)
General	Electromagnetic compatibility: Meets European community requirements for CE marking. RS232: 9-pin D-sub, three wire serial

- *1: All specifications apply when calibrated at ambient temperature after a five minute warm up.
- *2: In most applications, immunity is typically better because interfering signals are modulated and varying in frequency rather than being CW. Measurements were made in CW mode by injecting a signal into the Site Master through a coupler.
- *3: Where v_p is the cable's relative propagation velocity. Δ frequency is the stop frequency minus the start frequency (in Hz). Wide frequency sweeps improve resolution but reduce maximum display range.
- *4: Where F_c is the waveguide's cutoff frequency (in Hz) and F_1 is the start frequency (in Hz). Δ frequency is the stop frequency minus the start frequency (in Hz). Wide frequency sweeps improve resolution but reduce maximum display range.

Ordering Information

Please specify model/order number, name, and quantity when ordering.

Model/Order No.	Name
Model S113C	Main frame
Model S114C	Site Master (2 to 1600 MHz), Built in DTF
Model S251C	Site Master (2 to 1600 MHz), Built in DTF, Spectrum Analysis (100 kHz to 1.6 GHz)
Model S331C	Site Master (625 to 2500 MHz), Built in DTF, 2-port
Model S332C	Site Master (25 to 4000 MHz), Built in DTF
Model S810C	Site Master (25 to 4000 MHz), Built in DTF, Spectrum Analysis (100 kHz to 3.0 GHz)
Model S820C	Site Master (3.3 to 10.5 GHz), Built in DTF
	Standard accessories
	User's Guide
	Soft Carrying Case
	AC-DC Adapter
	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
	Precision ruggedized K(m) to N(f) adapter (S810C and S820C only)
Option 5	Option
Option 10B	RF Power Monitor (RF detector not included)
	Built-in Bias Tee - S251C only
	Optional accessories
42N50A-30	Attenuator, 30 dB, DC to 18 GHz, 50 W
42N50-20	Attenuator, 20 dB, DC to 18 GHz, 5 W
ICN50	InstaCAL (S113C, S114C, S331C, S332C)
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
IN50C	5W Limiter, N(m)-N(f), 18 GHz
22K50	Precision K(m) Short/Open, 40 GHz
22KF50	Precision K(f) Short/Open, 40 GHz
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 N(m) Open/short/Load, 42 dB, 4.0 GHz
OSLNF50LF	Precision N(f) Open/short/Load, 42 dB, 4.0 GHz
28K50	Precision N(m) Load, 40 GHz
28KF50	Precision N(f) Load, 40 GHz
28N50-2	Precision N(m) Load, 40 dB, 18 GHz
28NF50-2	Precision N(f) Load, 40 dB, 18 GHz
2000-767	Precision Open/Short/Load, 7-16 (m), 4 GHz
2000-768	Precision Open/Short/Load, 7-16 (f), 4 GHz
15ND50-1.5C	Test Port Ext. Cable, 1.5 meters, N(m) to 7/16 DIN(f), 6.0 GHz
15NN50-1.5C	Test Port Ext. Cable, 1.5 meters, N(m) to N(m), 6.0 GHz
15NN50-3.0C	Test Port Ext. Cable, 3.0 meters, N(m) to N(m), 6.0 GHz
15NN50-5.0C	Test Port Ext. Cable, 5.0 meters, N(m) to N(m), 6.0 GHz
15NNF50-1.5B	Test port cable armored, 1.5 meter, N(m) to N(f), 18 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
15KKF50-1.5A	Test port cable armored, 1.5 meter, K(m) to K(f), 26.5 GHz
15NDF50-1.5C	Test port cable armored, 1.5 meter, N(m) to 7/16 DIN(f), 6 GHz
15RKF50-1.5A	Test port cable armored, 1.5 meter, K(m) to K(f), 26.5 GHz

Model/Order No.	Name
800-109	Detector extender cable, 7.6 m (25 ft.)
800-110	Detector extender cable, 15.2 m (50 ft.)
800-111	Detector extender cable, 30.5 m (100 ft.)
800-112	Detector extender cable, 61 m (200 ft.)
34NN50A	Precision N(m) to N(m) Adapter, 18 GHz
34NFN50	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
1091-26	Adapter N(m) to SMA(m), 18 GHz
1091-27	Adapter N(m) to SMA(f), 18 GHz
1091-80	Adapter, N(f) to SMA(n), 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 (m) to 7/16 (m), 7.5 GHz
510-97	Adapter 7/16 (f) to 7/16 (f), 7.5 GHz
48258	Spare Soft Carrying Case for "C" version Site Master
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 Case for Site Master
633-27	Rechargeable battery, NiMH for "C" version Site Master
2300-347	Spare Site Master Software Tools
10580-00076	Spare Site Master S810C, S820C User's Guide
10580-00060	Spare Site Master User's Guide (S113C, S114C, S331C & S332C)
10580-00065	Spare Site Master User's Guide (S251C)
10580-00077	Site Master Programming Manual (for S810C, S820C)
10580-00061	Site Master Programming Manual (for S113C, S114C, S331C, S332C)
10580-00066	Site Master Programming Manual (for S251C)
10580-00078	Site Master Maintenance Manual (for S810C & S820C)
10580-00062	Site Master Maintenance Manual (for S113C, & S331C)
10580-00067	Site Master Maintenance Manual (for S251C)
10580-00068	Site Master Maintenance Manual (for S114C & S332C)
2000-1214	HP DeskJet printer includes: serial-to-parallel interface cable, black print cartridge, and US power cable
2000-753	Spare serial-to-parallel converter cable
2000-663	Power cable (Europe) for DeskJet printer
2000-664	Power cable (Australia) for DeskJet printer
2000-665	Power cable (UK) for DeskJet printer
2000-666	Power cable (Japan) for DeskJet printer
2000-667	Power cable (So. Africa) for DeskJet printer
2000-1030	Portable antenna, SMA (m) 1.71 to 1.88 GHz
2000-1031	Portable antenna, SMA (m) 1.85 to 1.99 GHz
2000-1032	Portable antenna, SMA (m) 2.4 to 2.5 GHz
2000-1200	Portable antenna, SMA (m) 806 to 869 MHz
2000-1035	Portable antenna, SMA (m) 902 to 960 MHz
2000-1216	Black printer cartridge for DeskJet printer
2000-1217	Rechargeable battery for DeskJet printer
551-1691	Earthmate USB to serial or RS232 adapter cable

Universal Waveguide Component Accessories

	Part number*1	Freq. range	Waveguide type	Compatible flanges
Precision waveguide calibration components	XXUM70	5.85 to 8.20 GHz	WR137, WG14	CAR70, PAR70, UAR 70, PDR70
	XXUM84	7.05 to 10.00 GHz	WR112, WG15	CBR84, UBR84, PBR84, PDR84
	XXUM100	8.20 to 12.40 GHz	WR90, WG16	CBR100, UBR100, PBR100, PDR100
	XXUM120	10.00 to 15.00 GHz	WR75, WG17	CBR120, UBR120, PBR120, PDR120
	XXUA187	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
	XXUA137	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	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	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
	XXUA62	12.40 to 18.00 GHz	WR62, WG18	UG-541A/U, UG-419/U, UG-1665/U, UG1666/U
	XXUA42	17.00 to 26.50 GHz	WR42, WG20	UG-596A/U, UG-595/U, UG-597/U, UG-598A/U
Precision waveguide-to-coaxial adapters	35UM70N	5.85 to 8.20 GHz	WR137, WG14	CAR70, PAR70, UAR 70, PDR70
	35UM84N	7.05 to 10.00 GHz	WR112, WG15	CBR84, UBR84, PBR84, PDR84
	35UM100N	8.20 to 12.40 GHz	WR90, WG16	CBR100, UBR100, PBR100, PDR100
	35UM120N	10.00 to 15.00 GHz	WR75, WG17	CBR120, UBR120, PBR120, PDR120
	35UA187N	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
	35UA137N	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	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	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
	35UA62N	12.40 to 18.00 GHz	WR62, WG18	UG-541A/U, UG-419/U, UG-1665/U, UG1666/U
	35UA42K	17.00 to 26.50 GHz	WR42, WG20	UG-596A/U, UG-595/U, UG-597/U, UG-598A/U

Note*1: 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
 35 waveguide to coaxial adapter