SITE MASTER
S100C/S200C/S300C/S800A Series
2 MHz to 20 GHz

For Analyzing Cable and Antenna Problems

NEW


S331C


S332C


S251C


S113C

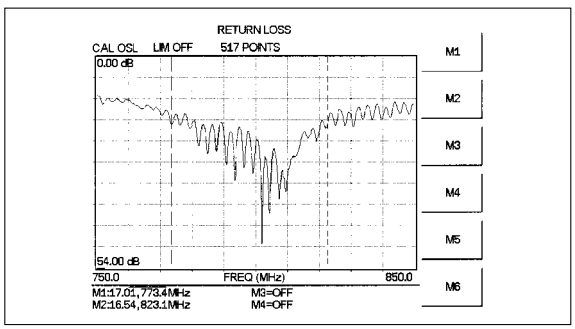

S114C


S820A

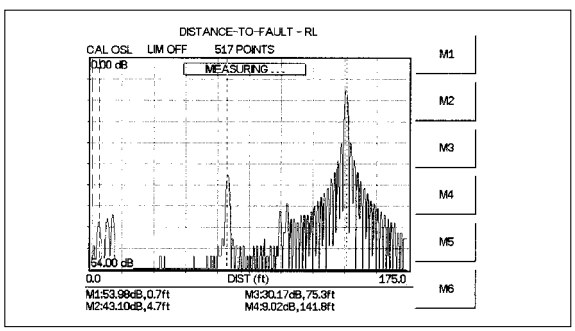
CE GPIB

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 ("C" version only)
- Time, Date stamp ("C" version only)
- Field replaceable battery ("C" version only)
- Segmented limit lines
- Six markers
- Graticule lines
- Test Port Detector (S113C, S114C only)
- 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 (114C) 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	S251C	S113C	S331C	S114C	S332C
On-frequency*[3]	+10 dBm (RF out), +30 dBc transmission	+10 dBm	-5 dBm	+10 dBm	-5 dBm
On-channel*[4]	+17 dBm	+17 dBm	+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 (dp x resolution), where dp = 128, 256 or 512 Horizontal resolution, rectangular windowing resolution (meter): (1.5 x 10^8) (υp)/ Δ 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 nW to 100 mW Offset range: 0 to +60 dB Resolution: 0.1 dB				
Bias Tee (Option 10A) S251C only	+15 VDC, Surge: 275 mA maximum, 25 ms; Steady State: 240 mA maximum	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), 100 kHz to full span	
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	
Display datapoint	N/A	N/A		400	
SSB Phase Noise @ (1 GHz) 30 kHz offset	N/A	N/A		≤ –75 dBc/Hz	
Spurious responses (Input related)	N/A	N/A		< –95 dBm	
Spurious responses (residual)	N/A	N/A		≤ –45 dBc	
Dynamic range	N/A	N/A		≥ 65 dB	
Average noise level	N/A	N/A		≤ –97 dBm (full span)	
Measurement range	N/A	N/A		+20 dBm to –97 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 >300 kHz, typical ± 3 dB <300 kHz, typical	
RF input VSWR	N/A	N/A		2.0:1	
Trace memory	Up to 200				
Instrument configuration*[6]	10				
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	2.18 kg (4.78 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 interferring 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 υ_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

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Specifications*1

Model	S810A/S818A/S820A
Frequency range	3.3 to 10.5 GHz (S810A) 3.3 to 18.0 GHz (S818A) 3.3 to 20.0 GHz (S820A)
Frequency accuracy (CW mode)	75 ppm
Frequency resolution	1 MHz
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 20 dB, Resolution: 0.01 dB
Distance-to-fault (S810A, S818A, S820A)	Vertical range Return loss: 0 to 54 dB SWR: 1 to 65 Horizontal range: 0 to 128 x (resolution) Horizontal resolution, rectangular windowing resolution (meter): Coax: $(1.5 \times 10^8)(\upsilon p)/\Delta$ frequency*3 Waveguide: $(1.5 \times 10^8)(\sqrt{(1-(F_c/F_1)^2)}/\Delta$ frequency)*4
Wattmeter (RF power monitor, Option 5)	Display range: –80 to +80 dBm, 10 pW to 100 kW Detector range: –50 to +20 dBm, 10 nW to 100 mW Offset range: 0 to +60 dB Resolution: 0.1 dB, 0.1 x W
Trace memory	70
Instrument configuration with calibration	6
Test port connector	Precision N female
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	1.36 kg (3.0 lbs.) nom (S800A series)
Size	203.2 mm x 177.8 mm x 57.2 mm (8 in x 7 in x 2.25 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 interferring 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 υp 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
	Main frame
Model S113C	Site Master (2 to 1600 MHz), Built in DTF
Model S114C	Site Master (2 to 1600 MHz), Built in DTF, Spectrum Analysis (100 kHz to 1.6 GHz)
Model S251C	Site Master (625 to 2500 MHz), Built in DTF, 2-port
Model S331C	Site Master (25 to 4000 MHz), Built in DTF
Model S332C	Site Master (25 to 4000 MHz), Built in DTF, Spectrum Analysis (100 kHz to 3.0 GHz)
Model S810A	Site Master (3.3 to 10.5 GHz), Built in DTF
Model S818A	Site Master (3.3 to 18.0 GHz), Built in DTF
Model S820A	Site Master (3.3 to 20.0 GHz), Built in DTF
	Standard accessories
	InstaCAL (standard on S113C, S114C, S331C, S332C)
	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 ("C" version only)
	Precision ruggedized K(m) to N(f) adapter (S820A only)
	Option
Option 5	RF Watt Meter Power Monitor (RF detector not included)
Option 10A	Built-in Bias Tee (240 mA) - 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 (standard on 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/STS	Standard N(m) Short, 3.5 GHz
SM/STSNF	Standard N(f) Short, 3.5 GHz
SM/PL	Precision N(m) Load, 42 dB, 4.0 GHz
SM/PLNF	Precision N(f) Load, 42 dB, 4.0 GHz
SM/STL	Standard N(m) Load, 35 dB, 3.5 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), 3.5 GHz
2000-768	Precision Open/Short/Load, 7-16 (f), 3.5 GHz
15ND50-1.5C	Test Port Ext. Cable, 3.5 GHz, 1.5 meters
15NN50-1.5C	Test Port Ext. Cable, 6 GHz, 1.5 meters
15NN50-3.0C	Test Port Ext. Cable, 6 GHz, 3.0 meters
15NN50-5.0C	Test Port Ext. Cable, 6 GHz, 5.0 meters
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), 3.5 GHz
15RKKF50-1.5A	Test port cable armored, 1.5 meter, K(m) to K(f), 26.5 GHz
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
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

Model/Order No.	Name
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), 3.5 GHz
510-91	Adapter 7-16(f) to N(f), 3.5 GHz
510-92	Adapter 7-16(m) to N(m), 3.5 GHz
510-93	Adapter 7-16(m) to N(f), 3.5 GHz
510-96	Adapter 7/16 (m) to 7/16 (m), 3.5 GHz
510-97	Adapter 7/16 (f) to 7/16 (f), 3.5 GHz
D41955	Spare Soft Carrying Case
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
760-213	Transit Case for S800 Series Site Master
760-215A	Transit Case for Site Master
633-27	Rechargeable battery, NiMH for "C" version Site Master
2300-347	Spare Site Master Software Tools
10580-00014	Spare Site Master S810A, S818A User's Guide
10580-00060	Spare Site Master User's Guide (S113C, S114C, S331C & S332C)
10580-00030	Spare Site Master S820A User's Guide
10580-00065	Spare Site Master User's Guide (S251C)
10580-00015	Site Master Programming Manual (for S810A, S818A, S820A)
10580-00061	Site Master Programming Manual (for S113C, S114C, S331C, S332C)
10580-00066	Site Master Programming Manual (for S251C)
10580-00022	Site Master Maintenance Manual (for S810A & S818A)
10580-00062	Site Master Maintenance Manual (for S113C, S114C, S331C & S332C)
10580-00031	Site Master Maintenance Manual (for S820A)
10580-00067	Site Master Maintenance Manual (for S251C)
2000-766	HP DeskJet printer includes: serial-to-parallel interface cable, black print cartridge, and US power cable
2000-753	Spare serial-to-parallel converter cable
2000-661	Black print cartridge
2000-662	Rechargeable battery for DeskJet printer
2000-663	Power cable (Europe) for DeskJet printer
2000-664	Power cable (Australia) for DeskJet printer
2000-665	Power cable (UK) for DeskJet printer
2000-667	Power cable (So. Africa) for DeskJet printer
2000-1008	Seiko DPU-441-30BU thermal printer (120VAC) Includes: internal battery, thermal printer paper, serial cable, US power cable
2000-761	Seiko DPU-441-30BU thermal printer (220VAC) Includes: internal battery, thermal printerpPaper, serial cable, Euro power cable
2000-755	Five (5) rolls of thermal paper
2000-756	Spare serial 9-pin to 25-pin D-sub converter cable (Seiko DPU-411)
2000-1002	US Adapter (for Seiko DPU-41-30BU printer)
2000-1003	Europe Adapter (for Seiko DPU-41-30BU printer)
2000-1194	Japan adapter (for Seiko DPU-414-30B)
2000-1004	Battery pack (for Seiko DPU-41-30BU printer)
2000-1012	Spare serial 9-pin(m) to 9-pin (f) cable (for Seiko DPU-414-30BU printer)
2000-1029	Battery charger, NiMH for "B" version Site Master
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
2000-1034	Portable antenna, SMA (f) 806 to 869 MHz
2000-1035	Portable antenna, SMA (m) 902 to 960 MHz

For product ordering information, see pages 4 –10