Site Master™
S331D/S332D
Cable and Antenna Analyzer
25 MHz to 4000 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 mis-positioned 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.

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 LCD display makes test interpretation easy and quick. Displays are available in either monochrome or color (Option 3). 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.

Features local language graphical user interface support in English, Chinese, Japanese, French, German, and Spanish.
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 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 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.

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 can not tell the precise location of a fault within the feedline 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 pinpoints the location and reflection amplitude of transmission line components.
Spectrum Analysis – Anywhere, Anytime (S332D)

The Site Master S332D integrated Spectrum Analysis capability provides the “ultimate” in measurement flexibility for field environments and applications requiring mobility. With the S332D you can locate, identify, record and solve communication systems problems quickly and easily, and with incredible accuracy – making it a perfect solution for conducting field measurements in the 100 kHz to 3 GHz frequency range.

One Button Measurements

The S332D has dedicated routines for one-button measurements of field strength, channel power, occupied bandwidth, Adjacent Channel Power Ratio (ACPR), Carrier-to-Interference, and interference analysis. These are increasingly critical measurements for today’s wireless communication systems. The simple interface for these complex measurements significantly reduces test time and increases analyzer usability.

Interference Analysis

The S332D can provide assistance in identifying signal types from cellular sites. If you are plagued by an unknown signal, you simply enter the frequency of the signal of interest as the “IA Frequency” and press “Measure.” The instrument looks at the bandwidth and skirt shape and, if the signal is of a known type, it gives the name of the air interface standard (e.g., 1250 kHz CDMA) and the measured bandwidth of the signal. If the signal isn’t a cellular signal, it simply gives the bandwidth.

Adjacent Channel Power Ratio

A common transmitter measurement is that of adjacent channel leakage power. This is the ratio of the amount of leakage power in an adjacent channel to the total transmitted power in the main channel. This measurement is used to replace the traditional two-tone intermodulation distortion (IMD) test for system non-linear behavior.

The result of an ACPR measurement can be expressed either as a power ratio or a power density. In order to calculate the upper and lower adjacent channel values, the S332D allows the adjustment of four parameters to meet specific measurement needs: main channel center frequency, measurement channel bandwidth, adjacent channel bandwidth and channel spacing. When an air interface standard is specified in the S332D, all these values are automatically set to the normal values for that standard.

AM/FM/SSB Demodulator

A built-in demodulator for AM, narrowband FM, wideband FM and single sideband (selectable USB and LSB) allows a technician to easily identify interfering signals.
The FCN4760 is a block down converter for the 4.7 to 6.0 GHz frequency range. It is designed to work with an Anritsu Site Master S332D equipped with Option 6. This converter is primarily intended for field use by fixed wireless engineers who are responsible for the design, deployment and optimization of 802.11a networks. It is also used to conduct interference analysis measurements to determine the level of interference and locate the sources of interference.
Handheld Software Tools™ Powerful PC-based Data Management and Analysis Software

A comprehensive data management and analysis software suite comes with every Site Master unit, providing users with a simple and easy method of managing, archiving, and analyzing system performance, trends, and the general health of monitored base stations. Handheld Software Tools also provides a professional report generator, for those times when recorded data must be communicated.

- Handheld Software Tools is Windows 95/98/NT4/2000/ME/XP compatible, and supports long alpha-numeric file names for descriptive data labeling
- Stores an unlimited number of data traces for comparison of historical performance measurements, easing the task of trend analysis
- Transfer data traces between the Site Master and the PC with a single menu selection
- Has the ability to convert Return Loss measurements to Distance-To-Fault measurements
- Handheld Software Tools has DTF and Smith Chart analysis capabilities

Color Display (Option 3)

High resolution color STN display for crisp display/trace representation in indoor lighting conditions.

Frequency Converter Control Module Interface (Option 6 on S332D only)

Connector providing internal control signals to drive the Anritsu Frequency Converter Module.

Bias Tee (Option 10 on S332D only)

Built-in 18V power supply to bias tower mounted amplifier.

Power Meter (Option 29)

The power meter performs accurate power measurements, and can display the measured power in dBm or Watts reducing coverage holes and interference.

Transmission Measurement (Option 21 on S332D only)

An optional built-in 25 MHz to 3 GHz signal source provides the capability to measure loss, gain, or isolation of devices such as filters, cables, attenuators, amplifiers, and antennas.

T1/E1 Analyzer (Option 50 on S3331D only)

Site Master built-in T1/E1 Analyzer performs T1/E1 functional tests, simplifying the task of determining if the source of the problem is on the wireline or the wireless side. Site Master can display the T1/E1 data in histogram form and collect the data for up to two days. Site Master can also measure the voltage (V_{pp}) of the signal and it can also be displayed as dBdsx.
Specifications

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

**Cable and Antenna Analyzer**

**Frequency Range:** 25 MHz to 4.0 GHz
**Frequency Accuracy:** ±0.75 ppm @ +25°C
**Frequency Resolution:** 100 kHz
**Output Power:** <0 dBm (–10 dBm nominal)
**Immunity to Interfering Signals:** on-channel +17 dBm
**Measurement Speed:** 120 samples per second
**Output Power Level:** –10 dBm typical
**Dynamic Range:** >65 dB, typical
**Display Range:** 1 to 15 dB/division, in 1 dB steps, 10 divisions displayed
**Scale Units:** dBm, dBV, dBmV, dBµV, V, W
**RF Input VSWR:** (with ≥20 dB attenuation), 1.5:1 typical, (10 MHz to 2.4 GHz)

**Bias Tee (Option 10 S332D only)**

**Voltage:** +18 Vdc
**Transmit Level:** 0 dB, –7.5 dB, and –15 dB
**Receiver Sensitivity:** 0 to –36 dB
**Error Insertion:** Bit, BPV, Framing Bits, RAI, AIS
**Loopback Modes:** Self loopback
**Level Measurements:** Vp-p (±5%)

**Data Log:** Continuous, up to 48 hrs.

**E1 Analyzer (Option 50 S331D only)**

**Line Coding:** AMI, HD3
**Framing Modes:** PCM30, PCM30CRC, PCM31, PCM31CRC
**Connection Configurations:** Terminated (75Ω), 120Ω
**Bridge (≥1000Ω):** Monitor (Connect via 20 dB pad in DSX)
**Receiver Sensitivity:** 0 to –43 dB
**Clock Sources:** External
**Internal:** 2.048 MHz ±30 ppm
**Pulse Shapes:** Conform to ITU G.703
**Pattern Generation and Detection:** PRBS: 2-9, 2-11, 2-15, 2-20, 2-23 Inverted and non-inverted, QRSS, 1-in-8 (1-in-7), 2-in-8, 3-in-24, All ones, All zeros, T1-Daly, User defined (≤32 bits)
**Circuit Status Reports:** Carrier present, Frame ID and Sync., Pattern ID and Sync.
**Alarm Detection:** AIS, RAI, MMF
**Error Detection:** Frame Bits, Bit, BER, BPV, CRC, E-Bits, Error Sec
**Error Insertion:** Bit, BPV, Framing Bits, RAI, AIS
**Loopback Modes:** Self loopback
**Level Measurements:** Vp-p (±5%)
**Data Log:** Continuous, up to 48 hrs.

**General**

**Language Support:** Chinese, English, French, German, Japanese, Spanish
**Internal Trace Memory:** 200 traces
**Setup Configuration:** S332D - 20, S331D - 25
**Display:** VGA monochrome or VGA color LCD (Option 3) with adjustable backlight

**Inputs and Outputs Ports:**
**RF Out:** Type N, female, 50Ω
**Maximum Input without Damage:** –23 dBm, ±50 VDC
**RF In:** Type N, female, 50Ω
**Maximum Input without Damage:** +48 dBm (peak), ±50 VDC
**Ext. Trig In:** BNC, female (5V TTL) (S332D Models only)
**Ext. Freq Ref In (2 to 20 MHz):** Shared BNC, female, ±0.5 dB typical, 3 MHz to <10 MHz
**E1/E1 (Receive & Transmit):** Bantam Jack (S331D Models with Option 50 only)
**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): 25.4 cm x 17.8 cm x 6.1 cm (10 in x 7 in x 2.4 in)
**Weight:** <2.28 kg (<5 lbs) includes battery
Ordering Information

Basic Models
S331D Cable and Antenna Analyzer (25 MHz to 4.0 GHz) with built-in DTF
S332D Cable and Antenna Analyzer (25 MHz to 4.0 GHz), with built-in DTF, Spectrum Analyzer (100 kHz to 3.0 GHz)

Standard Accessories Include
User’s Guide
Soft Carrying Case
AC-DC Adapter with Power Cord
Automotive Cigarette Lighter/12 Volt DC Adapter
One Year Warranty
Handheld Software Tools CDROM
Serial Interface Cable
Rechargeable Battery, NiMH

Options
Option 3 Color LCD Display
Option 6 Frequency Converter Control Module Interface (S332D only)
Option 10 Bias Tee (S332D only)
Option 21 Transmission Measurement (S332D only)
Option 29 Power Meter (does not require external detector)
Option 50 T1/E1 Analyzer (S331D only)

Optional Accessories
FCN4760 Frequency Converter, 4.7 to 6.0 GHz
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)
ICN50 InstaCal™ Calibration Module, 2 MHz to 4.0 GHz, N(m), 50Ω
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
OSLNF50LF Precision Open/Short/Load, DC to 4 GHz, 42 dB, 50Ω, N(m)
OSLNF500FL 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(f), 50Ω
2000-768 Precision Open/Short/Load, DC to 4 GHz, 7/16 DIN(f), 50Ω

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