VIAVI Solutions

TECNOUS

Brochure

VIAVI 8800SX

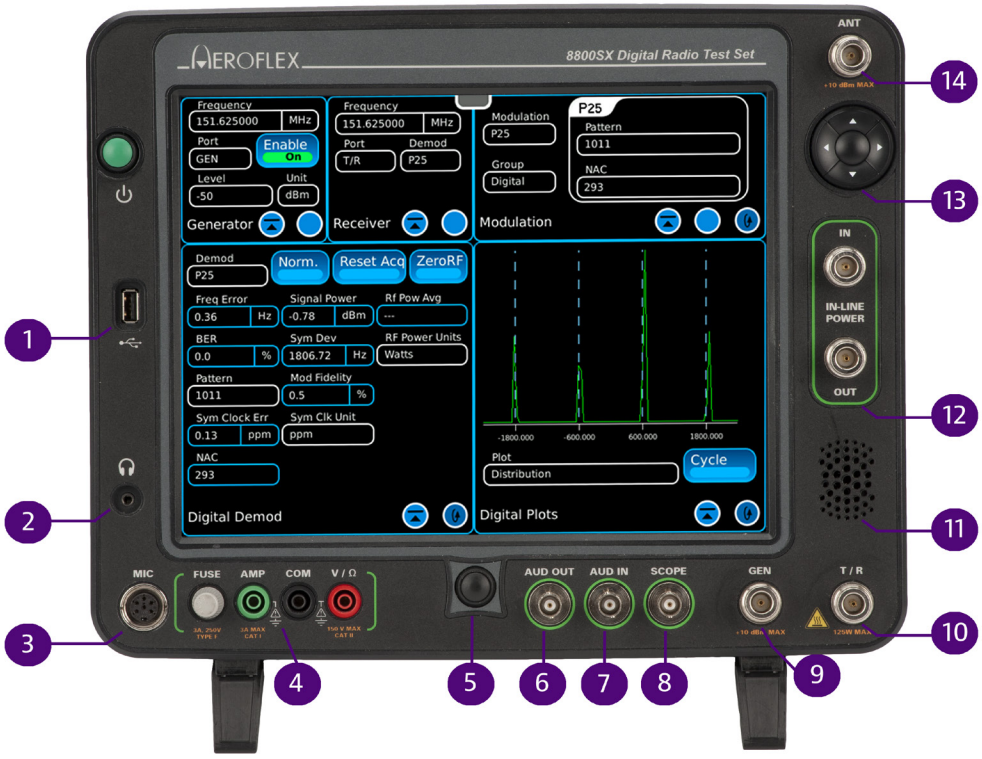
Digital Radio Test Set

The 8800SX expands upon the unprecedented features of the 8800 Series with a new 10 MHz external reference and new software capabilities to further speed testing of today's Land Mobile Radio systems.

With its hybrid portable design, the industry's largest color touch-screen display, ruggedness, internal battery, power accuracy, advanced automated test and alignment, fast VSWR/Return Loss and Cable Fault measurements, the 8800SX offers RF professionals a whole new experience in radio test.

At A Glance

- Dimensions: 34.3 cm x 29.3 cm x 14.6 cm
- Display Size: 30.5 cm (12 inches)
- Weight: 17 lbs (Base Unit)
- Battery: Internal, 2.5+ Hours Operation
- Rugged: 30 G Shock
- Test Range: –140 dBm to 500 Watts
- Technologies: P25, P25 Phase 2, DMR, NXDN™, TETRA, dPMR™, ARIB T98, FM, AM DMR Repeater, PTC



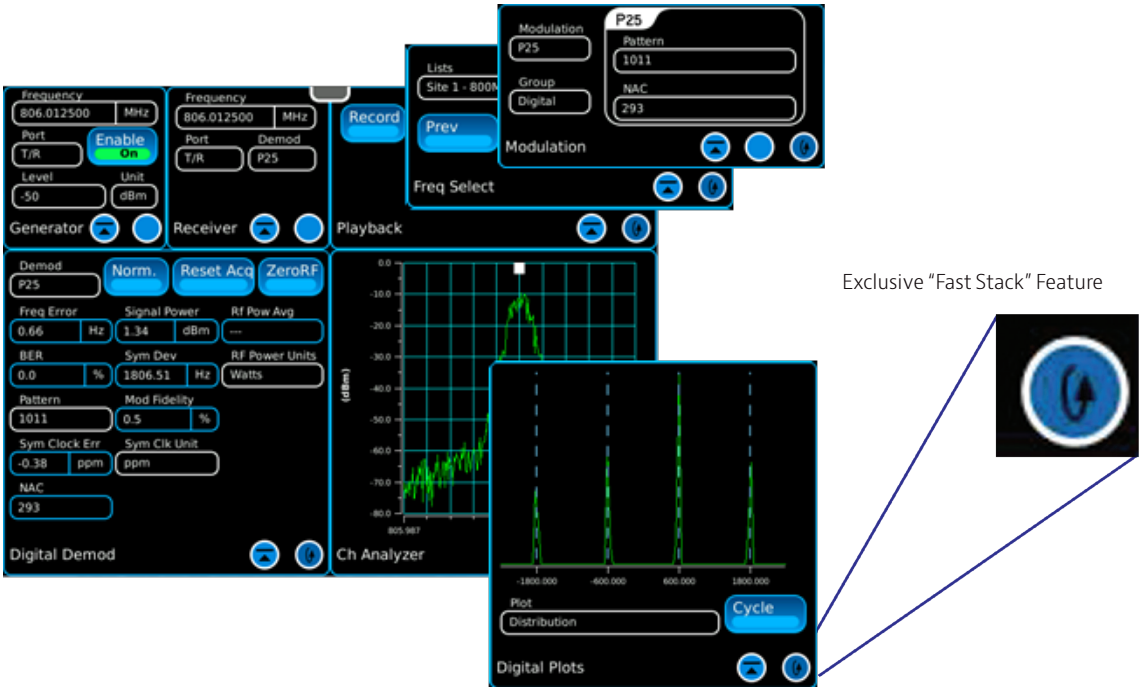
1. USB
2. Headphone Jack
3. Microphone
4. Digital Multi-Meter
5. Home Key Control
6. Audio Out Port, BNC
7. Audio In Port, BNC
8. Oscilloscope Port, BNC
9. RF GEN Port, Type N
10. T/R Duplex Port, Type N
11. Internal Loudspeaker
12. In-Line Power Meter (Optional)
13. Arrow Controls
14. Antenna Port, Type N

Hybrid Portable Design

The 8800SX combines the performance and features of a bench-level test set with the portability and ruggedness of a field-level instrument. Weighing only 17 lbs (7.71 kg), an internal battery with 2.5+ hours of operation, and rugged 30 G shock rating, now test professionals will no longer compromise portability for critical test features. Advanced features ranging from automated test and alignment to digital modulation analysis plots to an internal 500 W (4% accuracy) in-line power meter are all available within a one-box solution.

Unprecedented Display Size and Easy to Use Interface

The 8800SX is designed for maximum test efficiency. With the industry's largest display, ultra-fast store and recall "Presets", and its unique "Fast-Stack" user interface that allows test tiles to be stacked on one another and quickly accessed, test professionals can set up analog and digital tests in seconds and have instant access to more displayed meters and test functions.



The 8800SX User Interface with "Fast Stack" Tile Access

Complete Digital and Analog Test Suite

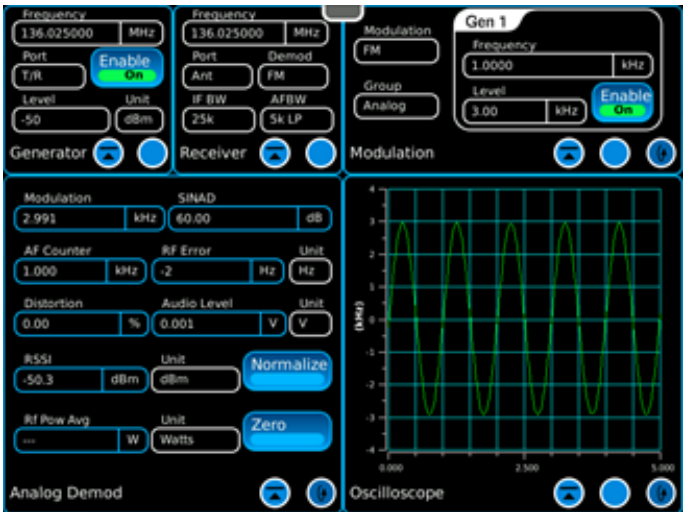
The global land mobile radio (LMR) market is rapidly transitioning from analog to digital. Therefore, test instrumentation must test both legacy analog systems as well as the new emerging digital standards. The 8800SX is designed with advanced frequency, power, and modulation analysis instruments for both analog and digital systems.

The 8800SX Technologies

- P25
- P25 Phase 2
- DMR
- NXDN
- TETRA
- dPMR
- AM
- FM
- ARIB T98
- Positive Train Control

Analog Test Features:

- Audio Oscilloscope
- Channel Analyzer
- Dual Modulation Source
- Audio Function Generator
- Tone Remote/Two-Tone/Tone Sequential
- Meters
  - RF Error
  - Frequency
  - Distortion
  - Audio Level
  - SNR
  - RF Power
  - SINAD
  - Audio Frequency
  - DMM

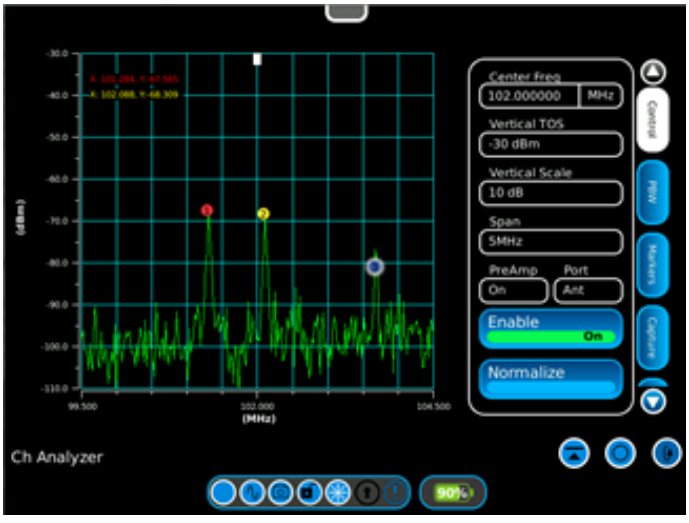


Example Analog Test Setup

Expanded Channel Analyzer with Markers

The channel analyzer offers a unique expanded display mode, which dedicates the entire screen to the analyzer. Combining the expanded mode with the industry's largest color display provides test professionals with an easy-to-see spectrum display; regardless of the test distance.

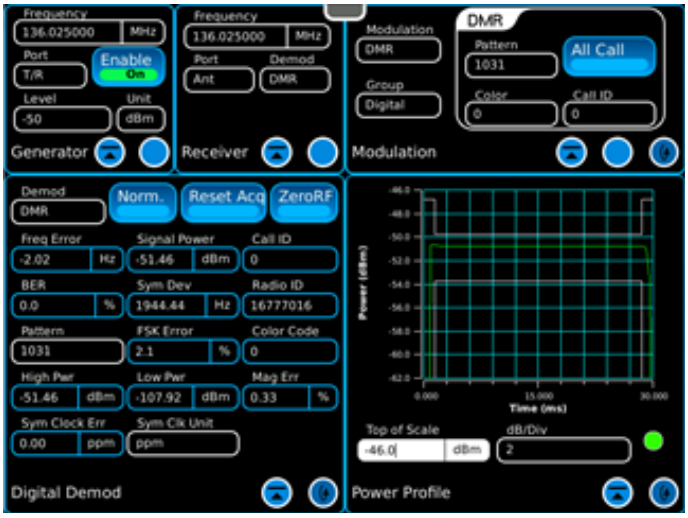
The channel analyzer now sweeps approximiate four times per second and offers up to six color markers for identifying signals and interference. An on-screen marker table provides users with instant frequency, level, and delta information on monitored signals.



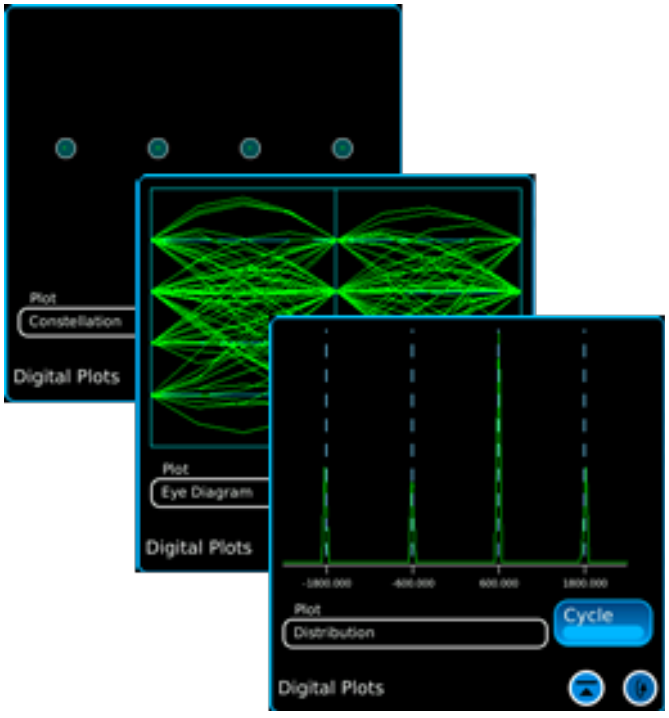
Channel Analyzer with Markers

Digital Test Features

- Digital Test Patterns
- Distribution, Constellation, Eye Diagram Plots
- TDMA Burst Profile with Mask for DMR and P25 Phase 2
- Digital Voice Quality Verification
- Meters
  - Signal Power
  - Slot Power
  - FSK Error
  - Symbol Deviation
  - Magnitude
  - Symbol Clock Error



Example Digital Test Setup



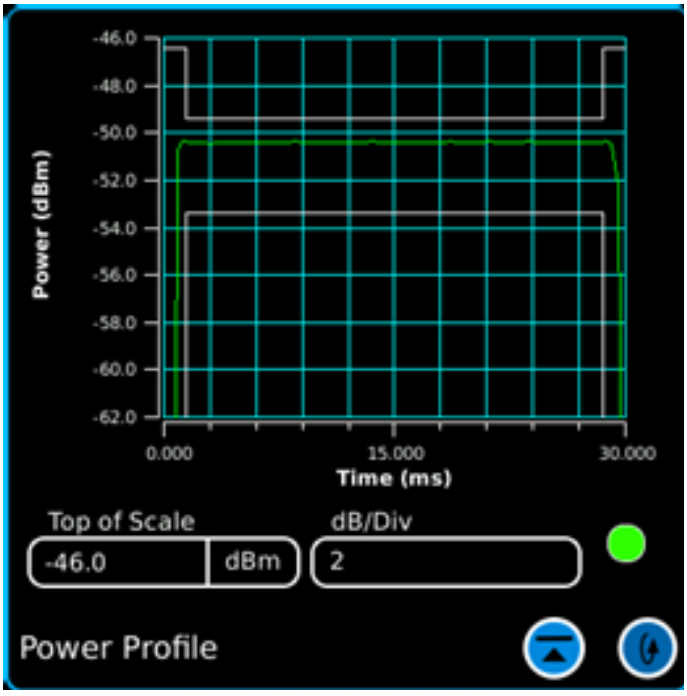
Modulation Analysis Plots

Digital Modulation Plots

Proper analysis of a radio's modulator requires digital modulation analysis plots, such as Distribution, Eye Diagram, and Constellation. These plots provide visual diagnostics of issues, such as deviation and symbol clock errors, to catch failing radios before they are deployed. The 8800SX provides these plots as well as an exclusive "Cycle" features, which allows ultra-fast toggling between the digital plots; ensuring full analysis in minimal time.

DMR Burst Power Profile Plot

DMR is an ETSI standard with specific pass and fail parameters defined for the TDMA burst power in a slot. The Burst Power Profile plot on the 8800SX captures and displays the power profile of the burst in the active slot. Additionally, the 8800SX offers an exclusive pass and fail mask, defined with the ETSI standard's burst profile parameters, to visually indicate incorrect burst power. Propoer bursts will display in green while burst errors will display in red.



DMR Burst Profile Plot with Mask

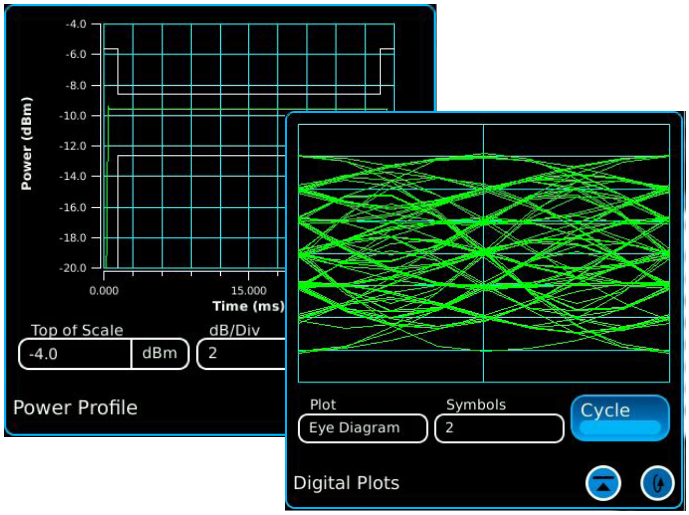
Advanced Digital

DMR Repeater Testing

The DMR Repeater test mode automatically keys up DMR repeaters and transmits synchronously to the downlink signal. This greatly simplifies the task of testing the transmitter and receiver of a DMR repeater.

P25 Phase 2 Analysis

P25 Phase 2, as part of the TIA/EIA-102 Technical Standard requires analysis of the TDMA burst profile as well as tests specific to P25 Phase 2 modulation. The 8800SX provides analysis of the HDQPSK downlink and HCPM uplink modulation formats used in the Phase 2 standard.



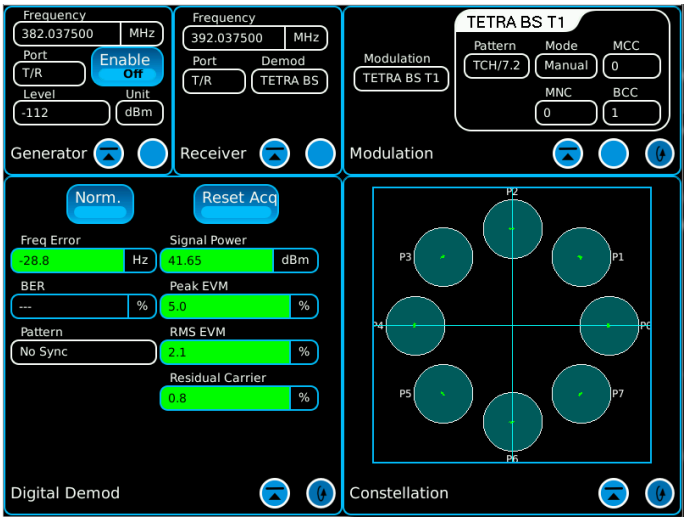
P25 Phase 2 Screen Shots

TETRA Base Station Analysis

The 8800SX includes a cost effective way to measure the critical parameters for field-testing of TETRA base stations.

The transmitter testing for TETRA base stations includes measuring the critical modulation parameters. This includes RMS EVM (Error Vector Magnitude), Peak EVM, Residual Carrier, Frequency Error, and Signal Power.

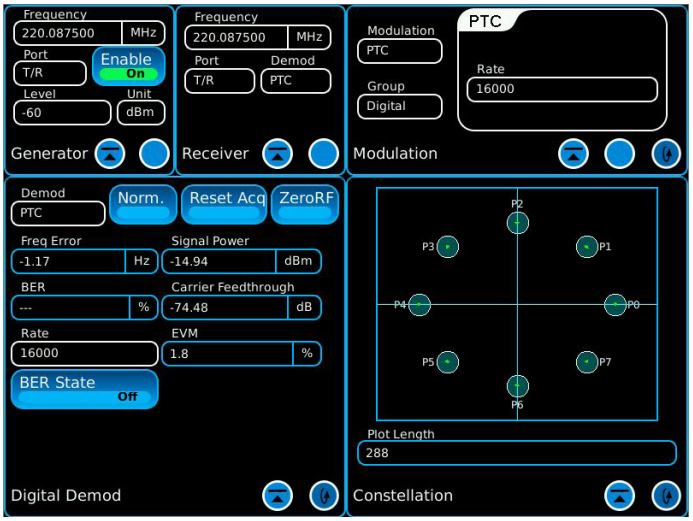
Field-testing for TETRA receivers is also a feature of the TETRA Base Station Test. The ETSI TETRA standard defines the method for generating the TETRA BS T1 test signal, and by use of this signal, the user can measure the sensitivity of the TETRA base station receiver.



TETRA Base Station Test

Positive Train Control Analysis

Recently enacted laws require that railroads provide remote monitoring and control of trains to ensure that the US railroad system provides the highest level of safety available. The 8800SX provides a Positive Train Control option that allows Class 1 railroad operators the ability to test their radio control systems in the field or in the lab to ensure that the radio meet stringent PTC RF parameters.



Positive Train Control Test

Color Meters

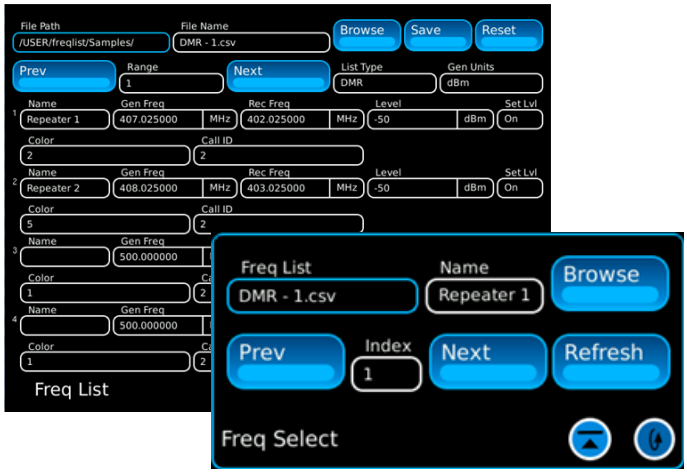
The 8800SX features color-coded meters for quick indication of pass and fail test results. Using the configuration tile, upper and lower limits for each meter can be set and saved by the user. Measurements that exceed the set limits will display “red” for values above the limit and “blue” for values below the limit. Now test professionals can perform fast “Go, No-Go” measurements simply by monitoring meter color indications.

Meters with Color Pass/Fail Indicators

Frequency List

Land mobile radios are often tested at multiple frequencies, which requires the various transmit and receive frequencies to be set on the test instrument, which can be tim consuming. The 8800SX frequency list feature provides a quick and easy way to test multiple frequencies. Frequency lists can be created using a configuration tool that allows users to:

- Create, Edit and Store Frequency Lists
- Set 8800SX Generator and Receiver Frequencies and Generator Level
- Add CTCSS, DCS codes for Analog Testing
- Add NAC, Color, CC, or RAN Code for Digital Testing



Frequency Select Control and Configuration Tiles

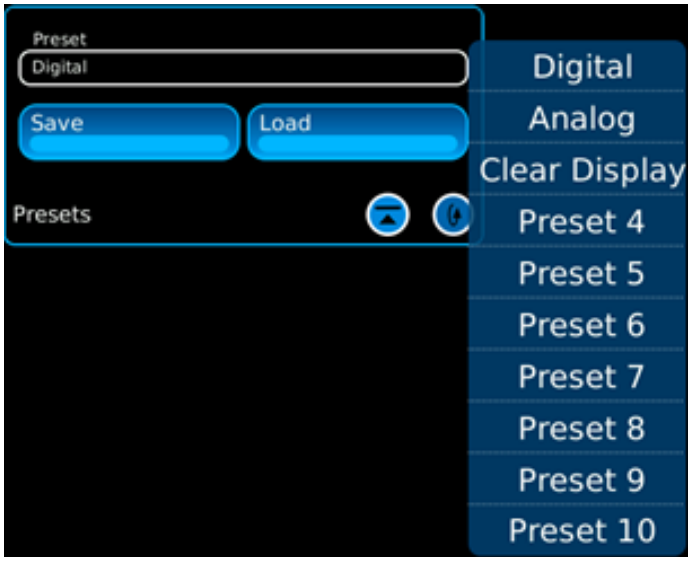
Digital Voice Tests

The 8800SX provides digital voice quality testing with its unique Record & Playback feature for P25, DMR, dPMR, NXDN, and ARIB T98 radio systems. Now users can record live voice from a radio under test, regardless of vocoder type, and play back the recording to the radio for audio quality verification. An “ideal” audio recording can be saved for each digital modulation type (P25, DMR, etc) allowing for fast play back and audio quality verification of the radio under test.

Record & Playback Tile for Voice Quality Testing

Quick Presets

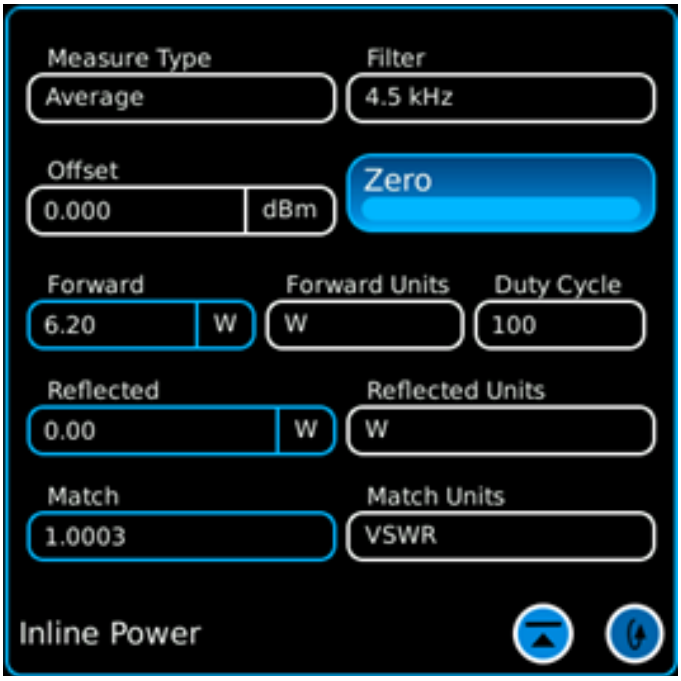
The Presets feature allows for common analog and digital tests to be set up in seconds on the 8800SX. Three default presets and seven user-defined presets are included. A Preset saves open tiles, tile locations, modulation type, audio routing, and filter settings.



Presets Manager

Internal In-Line Power Meter

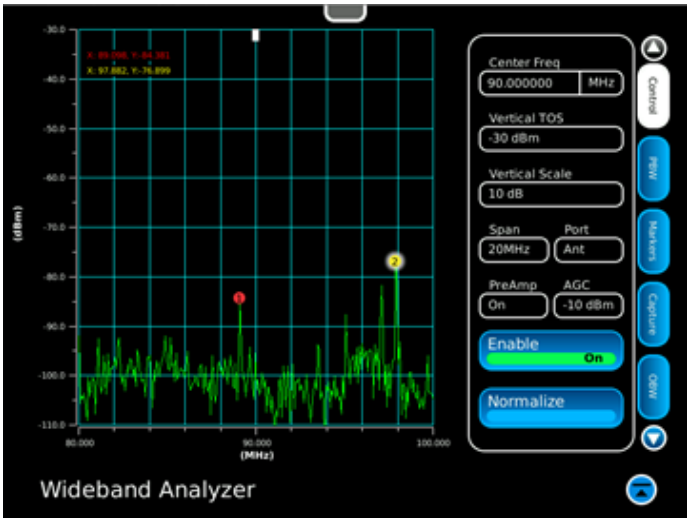
The 8800SX features an optional internal, 500 W in-line power meter with 4% accuracy. In-line power meters are especially useful test tools at remote repeater sites with high-power transmitters and cable/antenna networks. Now test professionals can measure true average and peak power, including VSWR. Since the in-line meter is built-in, you can ensure that this valuable tool will not be forgotten.



In-Line Power Meter Tile

Wideband Analyzer

In addition to the full suite of field-level test instrumentation, the 8800SX features a 50 MHz Wideband Analyzer with six color markers. This powerful feature allows desired signals, interferes, and other spectrum anomalies to be viewed. Screen hold and capture features provide instant storage of screen images to be saved and exported to a PC for later analysis and documentation.

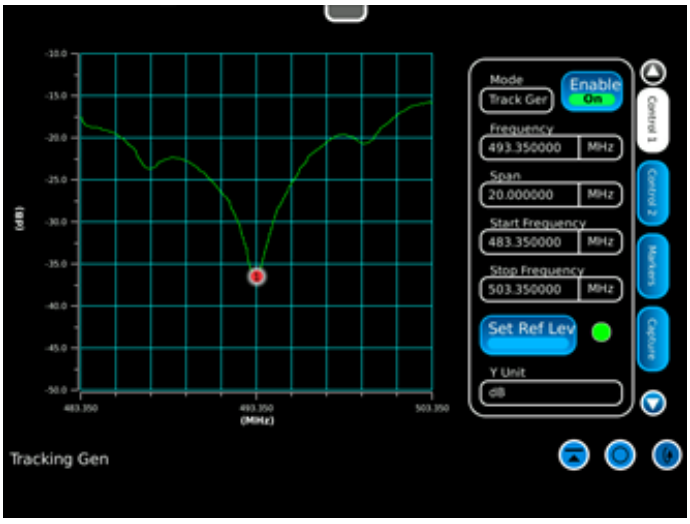


Wideband Analyzer with Color Markers

Tracking Generator

RF professionals maintain antenna transmission networks and tune duplexers, in addition to radio tests. With the optional tracking generator (88XXOPT10) and Precision VSWR/DTF Kit (114348), the 8800SX provides a simple, fast tool for VSWR, Return Loss, Insertion Loss, and Distance to Fault measurements.

The 8800SX soft case permits complete operation of the test set while inside the case. It is also specifically designed with compartments for the return loss bridge and power divider, which allows for VSWR, Return Loss, and Distance-to-Fault measurements to be performed ***in the case***. This exclusive feature test set up and ensures that these important accessories are not forgotten.



Tracking Generator with VSWR Measurement

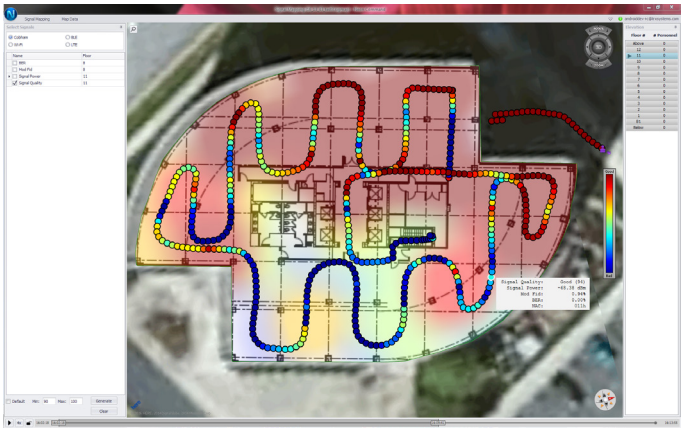
The 8800SX in Soft Case with Return Loss Bridge Connected

NEON® Signal Mapper Package

VIAVI Solutions and TRX Systems are providing a new joint solution that integrates TRX's NEON Signal Mapper Application with the Cobham 8800SX. NEON Signal Mapper automates the geo-referencing cloud storage, and 3D visualization of LMR test data for technicians who use Cobham test equipment to record and analyze two-way radio signals inside buildings and outdoors.

The NEON Signal Mapper includes the following:

- TRX Systems Tracking Unit with Belt Clip (1 Year Warranty)
- USB Cable and Wall Adapter for Charging
- 1 Year Signal Mapper Software License with NEON Cloud Access
- Portable Wireless Router/Access Point

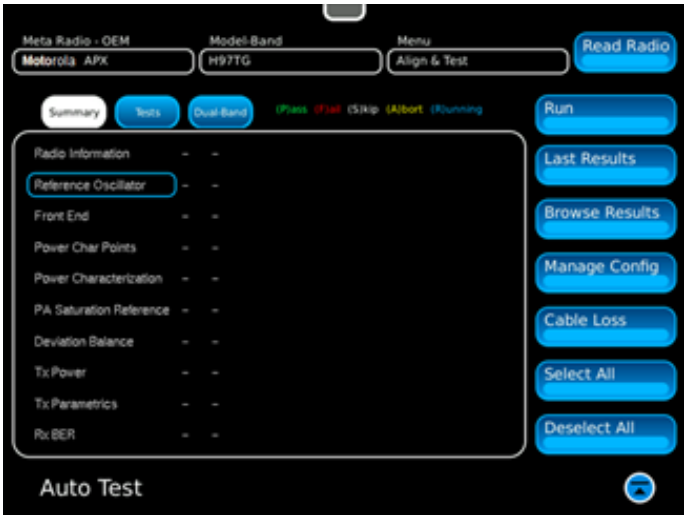


Auto-Test

The 8800SX is designed for complete automated radio test and alignment for analog and digital radios. Using the accurate instrumentation and high-speed remote command architecture, the 8800SX optimizes radio performance in minutes; with minimal human interaction.

Available automated test and alignments are available for various radio manufacturers, such as Motorola MOTOTRBO(tm). A complete list of support manufacturers is provided in the options section.

The 8800SX Auto-Test Setup



The 8800SX Auto-Test Summary Setup

Multiple automated test and alignment options can be installed on the 8800SX. Operators are only required to know radio type, such as Motorola MOTOTRBO; not radio model number. The unique "Read Radio" feature queries the radio to gather the specific model number, as well as, apply the specific test and alignment parameters for that model number as determined by the manufacturers. Specific tests and alignments can be selected and configured. Pressing "Run" enables the program and executes the selected tables.

The 8800SX also provides the required DMM with an optional Current Shunt for doing critical MOTOTRBO mobile radio power alignments.

The 8800SX provides a unique test result for each radio tested. The test result includes Date/Time, Radio Model Number, Serial Number, Firmware Version, and other information uniquely identifying the radio under test. It also includes the specific results of each test and alignment performed.

Test results are automatically stored and can be exported through USB to an external PC for printing and for documentation purposes.

Test Results Summary

Select 8800SX Accessories Overview

Item	Part Number	Description	Image
Soft Case	114478	The soft case allows full operation of the 8800SX while inside the case. The laptop style design is lightweight and provides extra protection during field operation. Storage pockets provide extra space for spare batteries, test cables, etc.	
Hard Transit Case	114477	The hard transit case features form-fitted slots for the 8800SX, protective cover, precision VSWR/DTF Kit, power supply, 150 W attenuators, spare battery, and more.	
Precision DTF/ VSWR Accessory Kit	114348	This accessory kit provides all items for accurate and VSWR, Return Loss, and Distance-to-Fault measurement. The kit includes a case, return loss bridge, power divider, 50 Ω calibrator, and two N-type test cables specifically designed for the 8800SX.	
Bird 5017D Thru-Line Power Sensor	92793	The 8800SX also supports the Bird 5017D Thru-Line Power Sensor as an external power meter for users that already have the 5017D. This capability requires 88XXOPT13 and provides simultaneous forward and reverse power measurements up to 500 W and VSWR measurements that are displayed on the 8800SX screen.	

Ordering Information

Versions and Options

Order Number	Description	
139942	8800SX Digital Radio Test Set	
Standard Configuration		
Analog Duplex Operation:		
1 GHz RF Generator (AM / FM)	1 GHz Receiver (AM / FM)	
Channel Analyzer	Oscilloscope	
DMM	Audio Level Meter	
Distortion Meter	SINAD Meter	
RF Power Meter	Audio Frequency Counter	
DTMF Encode / Decode	DCS Encode / Decode	
RF Frequency Error Meter	In-band Power Meter (RSSI)	
AM / FM Modulation Meter	2 Internal AM / FM Modulators	
2 Internal Audio Function Generators	Two Tone Sequential Encode / Decode	
Tone Remote Encode / Decode	Tone Sequence Encode / Decode	
I/O		
3 USB Ports	Ethernet Interface	
Ext 10 MHz Reference Input		
Features		
VNC Server	Screen Capture to file	
Hold Screen	Frequency list entry	
Fast Stack Tiles	Suspend Mode	
English Language		
Options		
113334	8800OPT01 DMR	
113335	8800OPT02 dPMR	
113336	8800OPT03 NXDN	
113337	8800OPT04 P25	
138895	8800OPT05 P25 Phase 2	
140215	8800OPT06 DMR Repeater Test	
113338	8800OPT09 ARIB T98	
113339	8800OPT10 Tracking Generator	
113340	8800OPT11 Occupied Bandwidth	
113309	8800OPT12 Internal Precision Power Meter (Meter + Sensor)	
113342	8800OPT13 External Precision Thru-Line Meter (for use with Bird WPS Sensor)	
113343	8800OPT14 PTC	
113344	8800OPT15 AAR Channel Plan	
139836	8800OPT20 NRT-Z Power Sensor Support	
139837	8800OPT21 Selectable Notch Filters	
139838	8800OPT22 SNR Meter	
138525	8800OPT101 Kenwood NXDN Auto-Test	
138526	8800OPT102 Kenwood 5X20 P25 Series Auto-Test	
138527	8800OPT103 Motorola APX Auto-Test	
138528	8800OPT104 Motorola MOTOTRBO™ Auto-Test	
139315	8800OPT105 Motorola ASTRO® 25 XTS® / XTL™ Auto-Test	
141178	8800OPT107 Kenwood NX-5x00 / TK 5x30 Auto-Test	
139314	8800OPT108 Hytera DMR Auto-Test	
139317	8800OPT111 Harris P25 (XG-75, M7300 / P7300, P5500) Auto-Test	
139320	8800OPT115 EF Johnson Viking Series (VP / M400, 600, 900) Auto-Test	
141180	8800OPT117 Harris XL-200P Auto-Test	
140913	8800OPT118 Kenwood Viking P25 Series Auto-Test	
140868	8800OPT128 Motorola APX 8000 Auto-Test (Requires 8800OPT103)	
140900	8800OPT129 Motorola APX "B" Model Auto-Test (Requires 8800OPT103)	
Languages		
113350	8800OPT300 Simplified Chinese	
113351	8800OPT301 Traditional Chinese	
113352	8800OPT302 Spanish	
113353	8800OPT303 Portuguese	
113354	8800OPT304 Malay / Indonesian	
113355	8800OPT305 Korean	
113356	8800OPT306 Arabic	
113357	8800OPT307 Polish	
113358	8800OPT308 Russian	

113359	8800OPT309 Japanese
113360	8800OPT310 German
113361	8800OPT311 French
139625	8800OPT312 Italian

Standard Accessories

Fuse, 5 A, 32 V, Mini Blade
Power Supply
AC Power Cord - USA
AC Power Cord - China
AC Power Cord - Europe
AC Power Cord - UK
Adapter, N(m) to BNC(f), Qty 3
Front Cover
Internal Battery

Optional Accessories

138313	Calibration Certificate - 8800 Series
82556	AC25059 Attenuator - 6 dB / 150 W
140227	Attenuator - 40 dB / 2 W
67076	Spare Internal Battery
114479	External Battery Charger
114477	Hard Transit Case
114478	Soft Carrying Case
114475	Antenna Kit
114348	Precision DTF / VSWR Accessory Kit for the 8800
140747	NEON Signal Mapper Package for Indoor Coverage Mapping
63927	AC25081 Site Survey Software
92793	5017D Bird Power Sensor
114312	Mounting Bracket
112861	Microphone
62404	DC Cord / Cigarette Adapter
63936	AC24009 DMM Test Leads
112277	10 Amp Current Shunt, 0.01 Ohm
67411	Scope Probe Kit
141707	Unbalanced to Balanced Audio Adapter

Extended Standard Warranties

114481	Extended Warranty 36 Months
114482	Extended Warranty 60 Months

Extended Standard Warranties with Calibration

114483	Extended Warranty 36 Months with scheduled calibration
114484	Extended Warranty 60 Months with scheduled calibration

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