Quick Site Testing with the 8800SX
Site Testing with the 8800SX

P25 site testing involves several tests to verify site operation.

NOTE: This is not intended to be a complete commissioning procedure.

With the 8800SX, you can perform the following tests:

- Transmit Forward Power
- Transmit Reverse Power
- Antenna VSWR Match
- Modulation Fidelity
- Symbol Deviation
- TX Frequency
- TX BER
- Symbol Clock Error
- Receiver Sensitivity
- Receiver Desense
- Antenna VSWR / RL Sweep
- Antenna DTF (Distance to Fault) Plot
Site Testing with the 8800SX

Each base station has an RX Input and a TX Output Port.

Within the site you will find any number of base stations that are all connected to the site transmit antenna through a transmit combiner as well as a receive antenna that is connected to a receive combiner in the same manner.

Each base station is placed into a service mode using OEM software that allows configuring the base station transmitter and measurement of RX BER.

Note the transmit and receive frequencies of each base station. Configure a frequency list on the 8800SX to allow quick changes in frequency when going from one channel to the next.
This is what we are starting with at the site.

A computer is connected to the base stations and they are all put into a service mode so we can control the transmit signals and measure Receive BER.

The 8800SX can also be connected so the PC can control both the base stations and the 8800SX for convenience.

If available, connect an external 10 MHz Reference to the 8800SX.
First we will connect the output of the transmit combiner to the 8800SX Optional In-Line Power Meter Input.

Then connect the Transmit Antenna to the 8800SX Optional In-Line Power Meter Output.

With this connection, each transmitter can be keyed separately and the following measurements can be made:
- Transmit Forward Power (Up to 500 Watts)
- Transmit Reflected Power
- VSWR or dB RL Match

The cable loss factor should be known and can be entered as an offset on the In-Line Power Meter.
The Power Meter should be zeroed prior to taking power measurements.

The PC is used to make each base station transmit a P25 pattern one at a time.

This test quickly verifies everything from the transmitter output to the antenna feed.

It also verifies that the antenna and transmission line are not reflecting power back to the source verifying a good match at the test frequency.

The cable loss factor should be known and can be entered as an offset on the In-Line Power Meter.
Connect a simple antenna to the 8800SX Antenna Port and set the 8800SX Receiver to receive on the Antenna Port to demodulate the P25 signal that is being transmitted. After the power is measured on a channel, the digital measurements can be made to validate the quality of the digital signal.

- **Transmit Frequency Error**
- **Modulation Fidelity**
- **Symbol Deviation**
- **TX BER**
- **Symbol Clock Error**

**Network Connection**

**Receive Combiner**

**Base Stations**

**Transmit Combiner**

**Receive Antenna**

**Transmit Antenna**

**Digital Demod**

- **Mod Fidelity**
- **Sym Dev**
- **RF Power Units**
- **Watts**
- **BER**
- **Symbol Clock Error**
- **PreAmp**
- **AGC**
- **Freq Find**
- **Lock**
- **Lock Off**

**Frequency**

- **585.562 kHz**
- **Gen Off**
- **0.00 MHz**

**Demod**

- **P25**

**Receive Antenna**

**Combiner**

**Transmit Antenna**

**Network Connection**

**Base Stations**

**Transmit Combiner**

**Receive Combiner**

**Network Connection**

**Base Stations**

**Transmit Combiner**

**Receive Combiner**
Connect an ISO-TEE (Sampler port) to the output of the Receive Combiner.
Terminate through part of the ISO-TEE with a 50 Ohm Line Termination.
Connect the 8800SX TR Port to the Sample Port of the ISO-TEE.
Set the 8800SX generator frequency to match the base station RX Frequency and configure the 8800SX to generate a P25 1011 Pattern.
Adjust the 8800SX RF Output Level for a 5% BER indication on the radio service software on the PC and record the 8800SX RF Level. This is the baseline level.

Repeat this for each of the receivers.
**8800SX Interconnect**

Verify Receiver Desense Test

Connect the receive antenna to the ISO-TEE and repeat the receiver sensitivity measurements on each channel.

The receiver is now seeing signals from the outside world which will raise the noise floor and possibly see interfering signals that will impact the receiver sensitivity.

Compare these levels with those measured as a baseline to see what the degradation is.
8800SX Interconnect
Verify Receiver Desense Test

Significant degradation may indicate that there is interference on that channel and the 8800SX channel analyzer should be used to look at the RF Spectrum at the channel of interest. With a low noise floor near -150 dBm, the 8800SX can easily identify low level interfering signals.
With the optional Precision Return Loss Bridge Kit and Tracking Generator System we can perform a VSWR or Return Loss sweep on the transmit and receive antennas.

Traces can be stored internally and recalled the next time you visit the site to see if any degradation has occurred.
The Precision Return Loss Bridge Kit also includes a Power Dividers to allow Distance to Fault (DTF) sweeps to identify any faults in the transmission line.

Traces can be stored internally and recalled the next time you visit the site to see if any degradation has occurred.
# 8800 Options and Accessories

## 8800SX Options and Accessories

### Standard Accessories
- Power Supply
- AC Power Cord - USA
- AC Power Cord - China
- AC Power Cord - Europe
- AC Power Cord - UK
- Front Cover

### Options
- 139942 8800OPT01 DMR
- 11334 8800OPT02 dPMR
- 11336 8800OPT03 NXDN
- 11337 8800OPT04 P25
- 138895 8800OPT05 P25 Phase 2
- 140215 8800OPT06 DMR Repeater Test
- 11338 8800OPT09 ARQ 98
- 11339 8800OPT10 Tracking Generator
- 11340 8800OPT11 Occupied Bandwidth
- 11309 8800OPT12 Internal Precision Power Meter (Meter + Sensor)
- 11342 8800OPT13 External Precision Thru-Line Meter (for use with Bird WPS Sensor)
- 11334 8800OPT14 PTC
- 11334 8800OPT15 AAR Channel Plan
- 139836 8800OPT20 R&S NRT-Z Power Sensor Support
- 139837 8800OPT21 Selectable Notch Filters
- 139838 8800OPT22 SWR Meter
- 138525 8800OPT101 Kenwood NXDN Auto-Test
- 138526 8800OPT102 Kenwood SX20 P25 Series Auto-Test
- 138527 8800OPT103 Motorola APX Auto-Test
- 138528 8800OPT104 Motorola MOTORBOAT™ Auto-Test
- 139315 8800OPT105 Motorola ASTRO® 25 XTS9620™ Auto-Test

### Languages
- 113350 8800OPT300 Simplified Chinese
- 113351 8800OPT301 Traditional Chinese

### Accessories
- 138313 Calibration Certificate - 8800 Series
- 82560 AC27003 Attenuator - 20 dB/150 W
- 67076 Spare Internal Battery
- 114479 External Battery Charger
- 114477 Hard Transit Case
- 114478 Soft Carrying Case
- 114475 Antenna Kit
- 114348 Precision DTF/PSWR Accessory Kit for 8800
- 63927 AC25081 Site Survey Software
- 92793 5017D Bird Power Sensor
- 114312 Mounting Bracket
- 112861 Microphone
- 62404 DC Cord/Cigarette Adapter
- 63936 AC24091 DMX Test Leads
- 112277 10 AMP Current Shunt, 0.01 Ohm
- 67441 Scope Probe Kit

### Extended Warranties
- 114481 Extended Standard Warranty 36 Months
- 114482 Extended Standard Warranty 60 Months
- 114483 Extended Standard Warranty 36 Months with Scheduled Calibration
- 114484 Extended Standard Warranty 60 Months with Scheduled Calibration

## Select 8800SX Accessories Overview

### 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/PSWR Accessory Kit
- 114348

This accessory kit provides all items necessary for accurate and VSWR, Return Loss, and Distance-to-Fault measurement. The kit includes a case, return loss bridge power divider, 50 Ohm 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 8800OPT13 and provides simultaneous forward and reverse power measurements up to 500 W and VSWR measurements that are displayed on the 8800SX screen.
Questions or Comments?

Contact Information

For information about pricing for our products, contact the sales office by calling VIAVI Solutions at (800) 835-2352 or emailing AvComm.Sales@viavisolutions.com.

For technical/product support, calibration, maintenance and general customer service inquiries, you can contact our help desk by clicking here, calling (800) 835-2350, or emailing Service.Americas@aeroflex.com.

Click here for more information on the 8800SX and latest software versions and training materials.