

# Quick Site Testing with the 8800SX



# Site Testing with the 8800SX

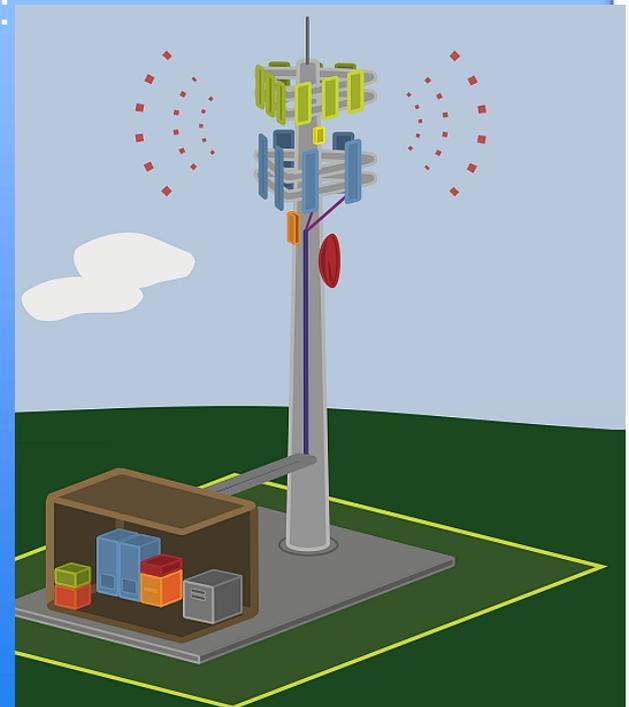
## Basic Tests

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



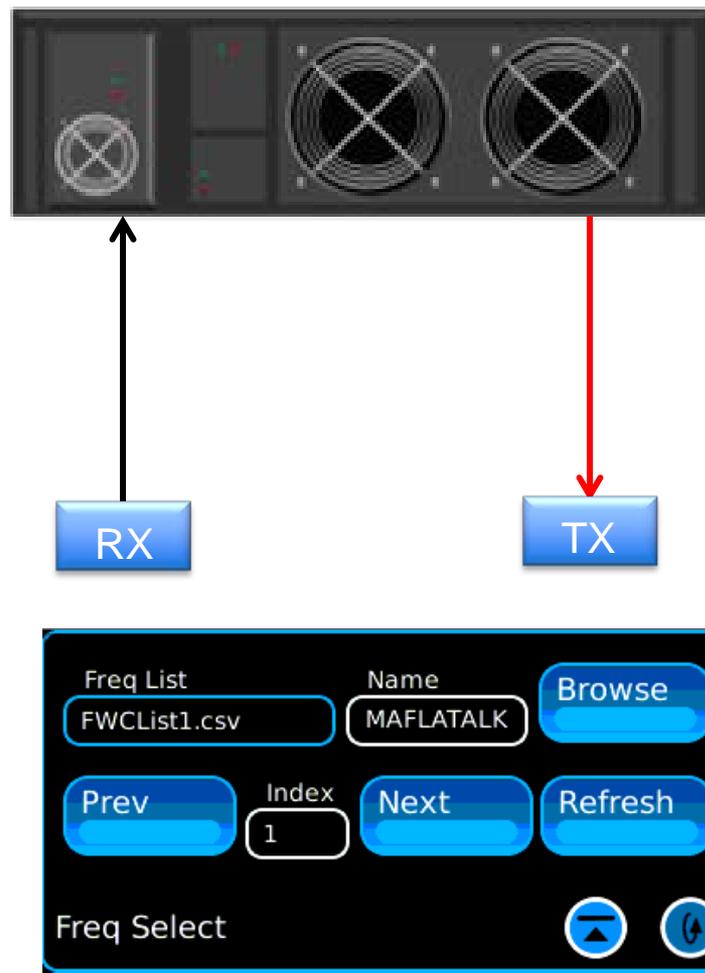
# Site Testing with the 8800SX

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.



# Simplified Site Diagram

## Initial Setup

This is what we are starting with at the site.

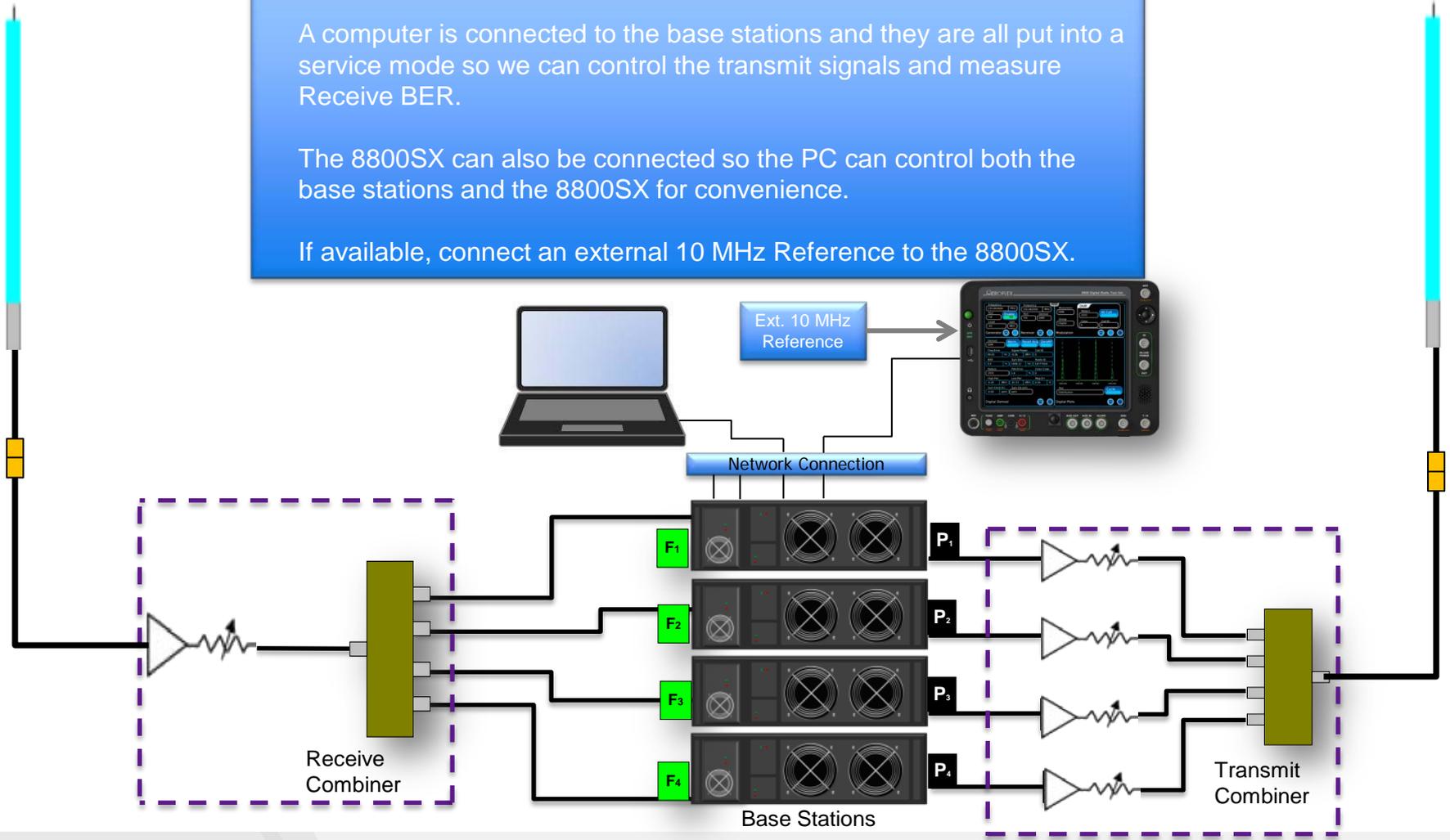
A computer is connected to the base stations and they are all put into a service mode so we can control the transmit signals and measure Receive BER.

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.

Receive Antenna

Transmit Antenna



# 8800SX Interconnect

## Verify Transmit Power, Antenna Match

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.

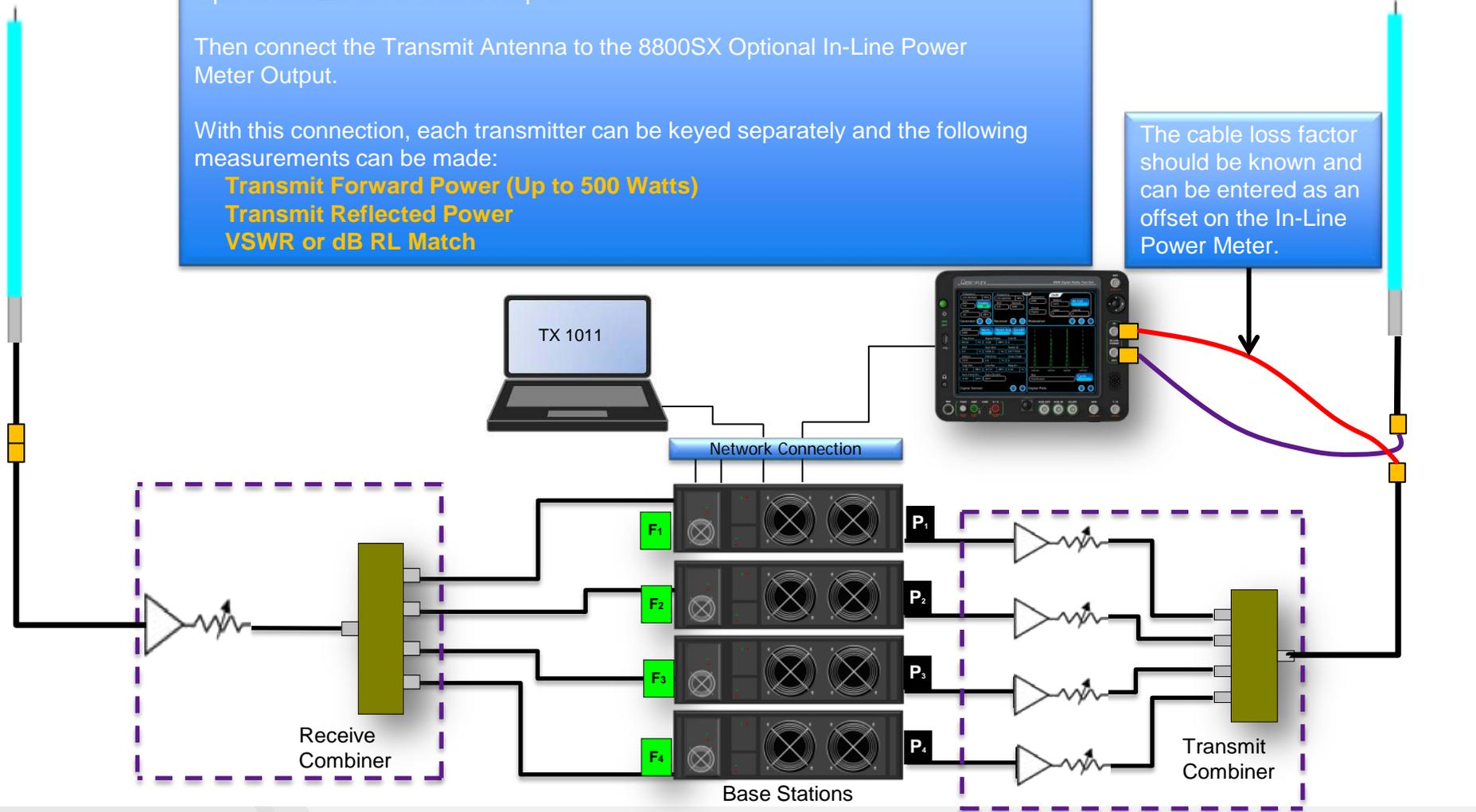
With this connection, each transmitter can be keyed separately and the following measurements can be made:

- 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.

Receive Antenna

Transmit Antenna



# 8800SX Interconnect

Verify Transmit Power, Reflected Power and Antenna Match

Receive Antenna

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.

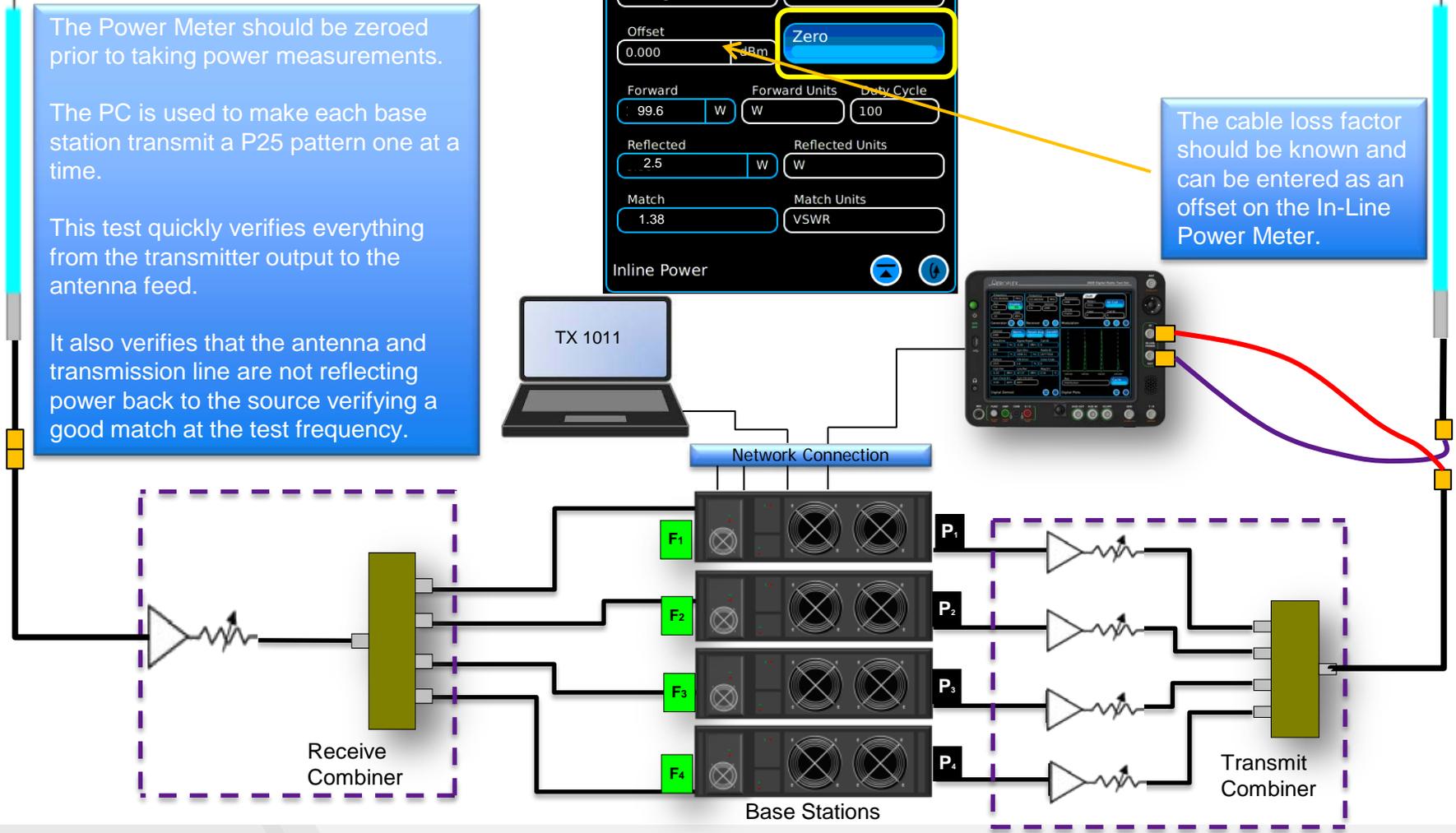
This test quickly verifies everything from the transmitter output to the antenna feed.

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.

Measure Type	Average	Filter	4.5 kHz
Offset	0.000	dBm	Zero
Forward	99.6	W	W
Forward Units	W	Duty Cycle	100
Reflected	2.5	W	W
Reflected Units	W	Match Units	VSWR
Match	1.38	Match Units	VSWR

Transmit Antenna

The cable loss factor should be known and can be entered as an offset on the In-Line Power Meter.



# 8800SX Interconnect

## Verify P25 Signaling Quality

Receive Antenna

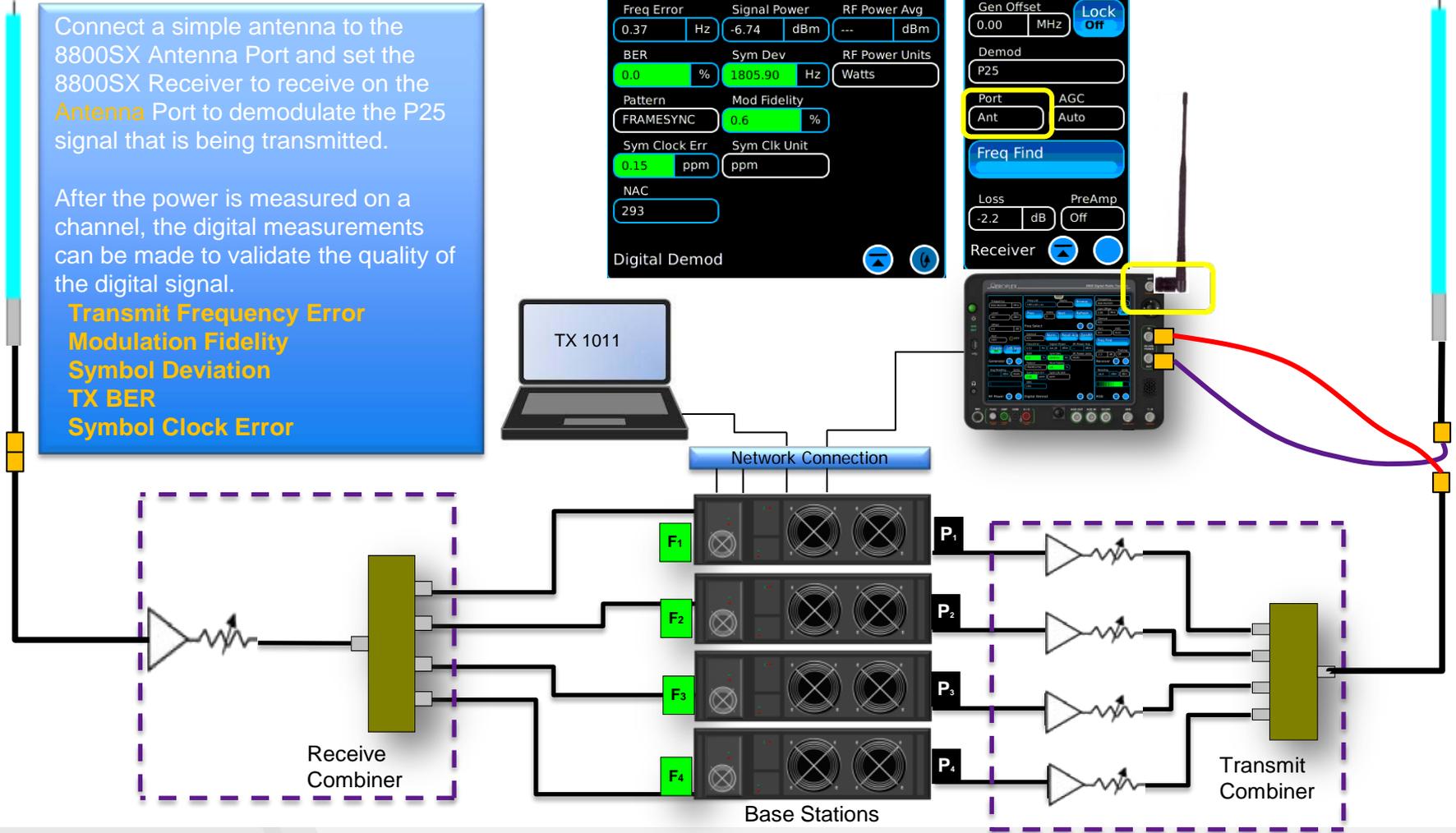
Connect a simple antenna to the 8800SX Antenna Port and set the 8800SX Receiver to receive on the Antenna Port to demodulate the P25 signal that is being transmitted.

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



Transmit Antenna



# 8800SX Interconnect

## Verify Receiver Sensitivity

Connect an ISO-TEE (Sampler port) to the output of the Receive Combiner.

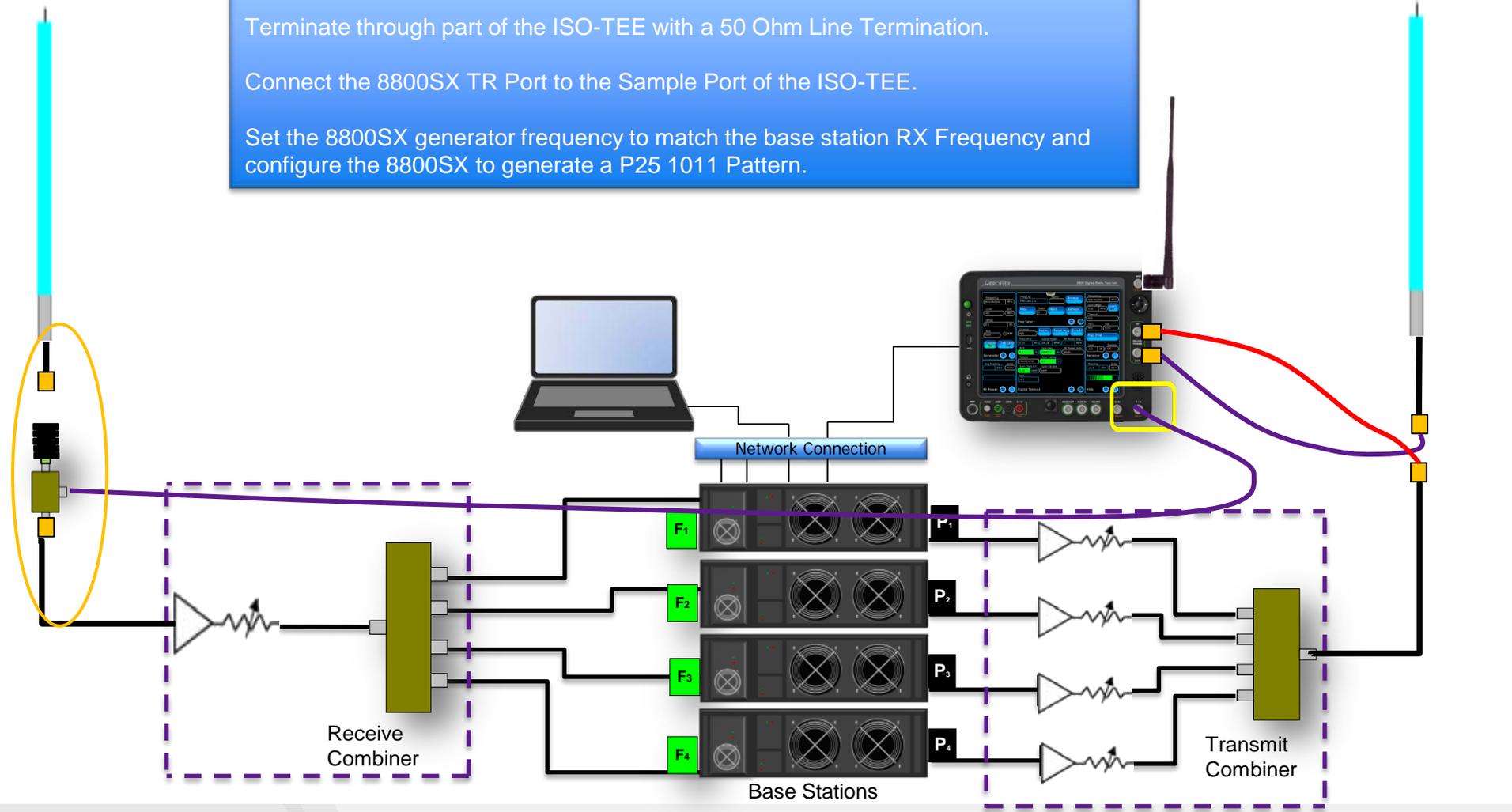
Terminate through part of the ISO-TEE with a 50 Ohm Line Termination.

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.

Receive Antenna

Transmit Antenna

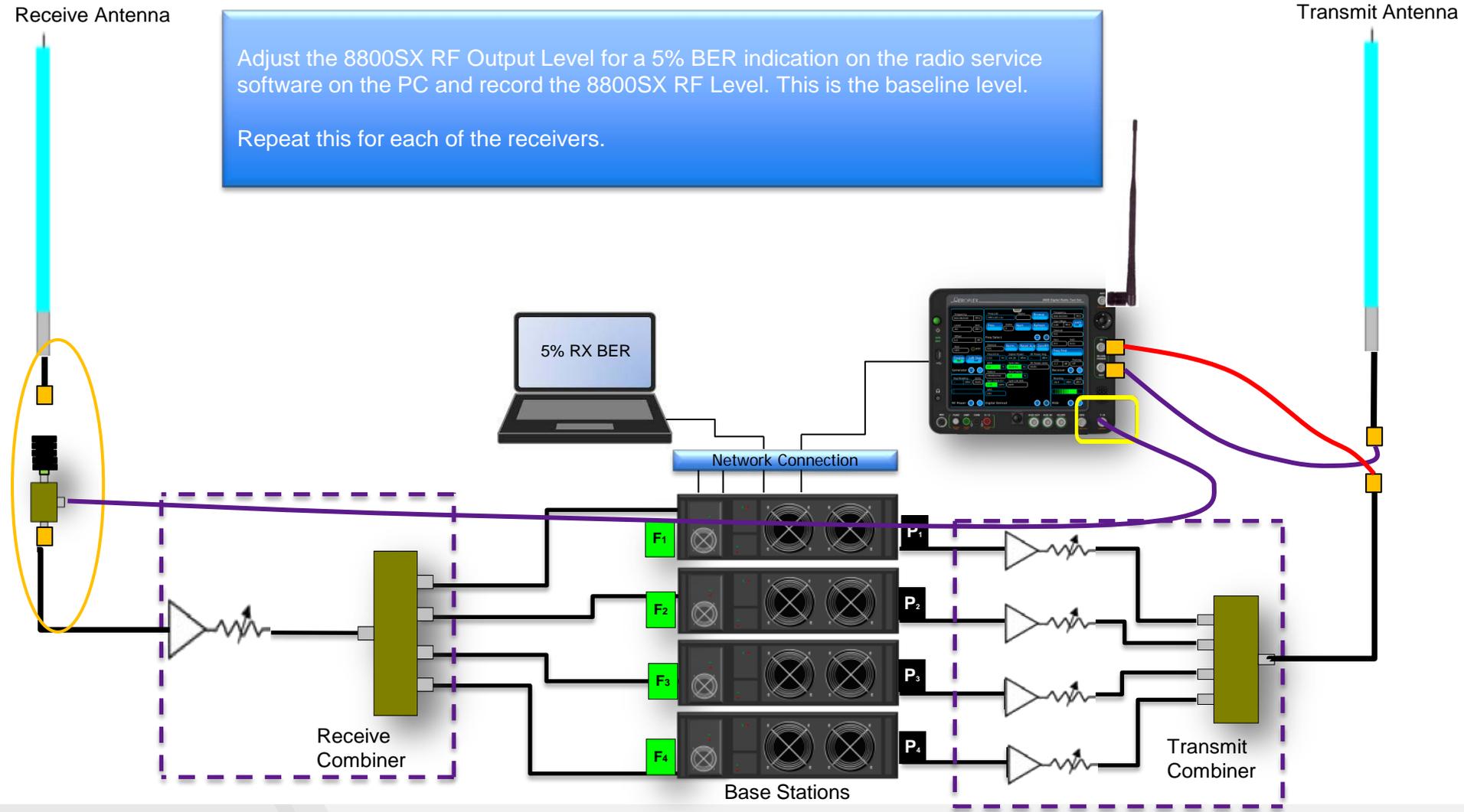


# 8800SX Interconnect

## Verify Receiver Sensitivity

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

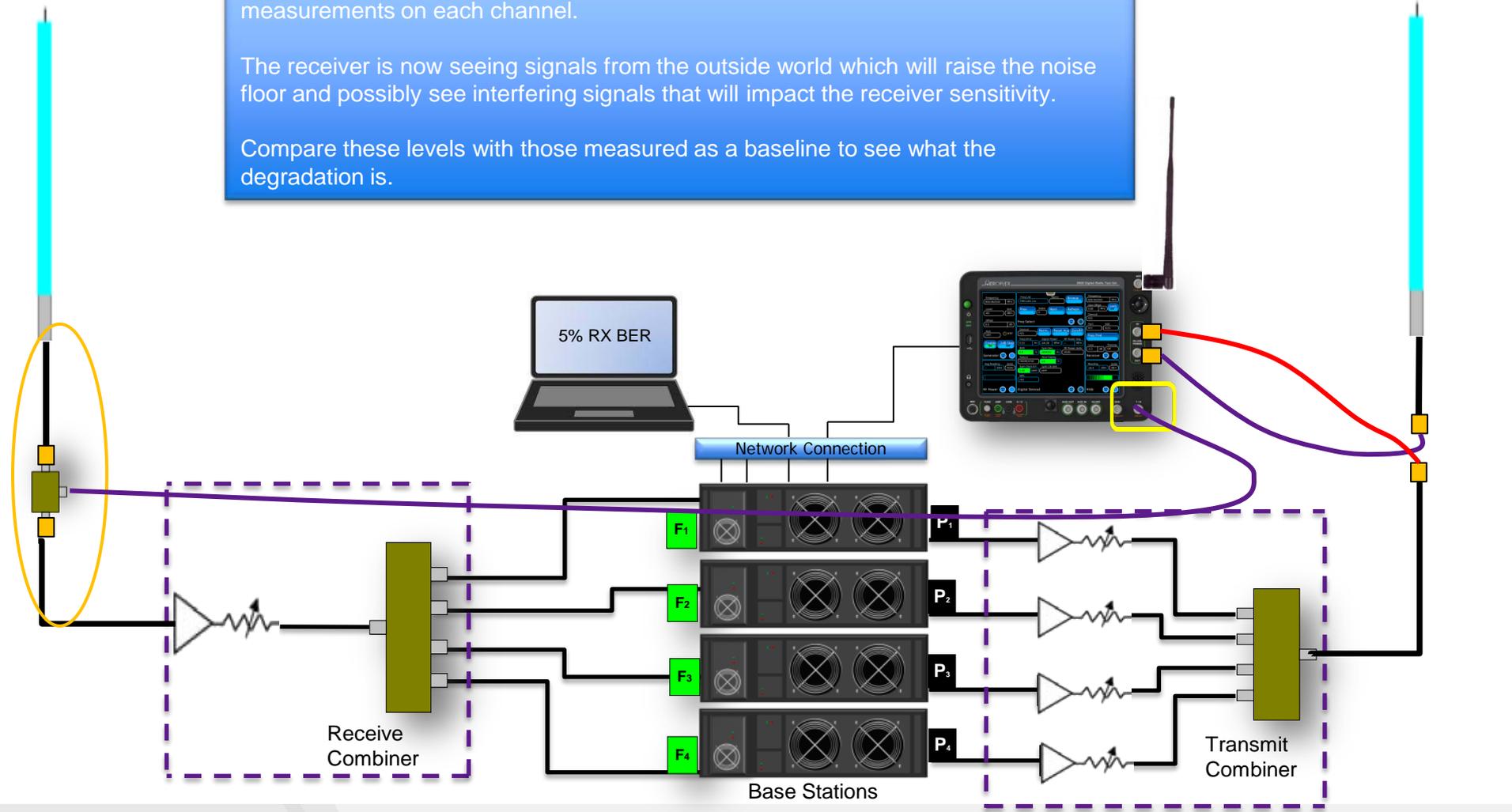
Connect the receive antenna to the ISO-TEE and repeat the receiver sensitivity measurements on each channel.

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.

Receive Antenna

Transmit Antenna



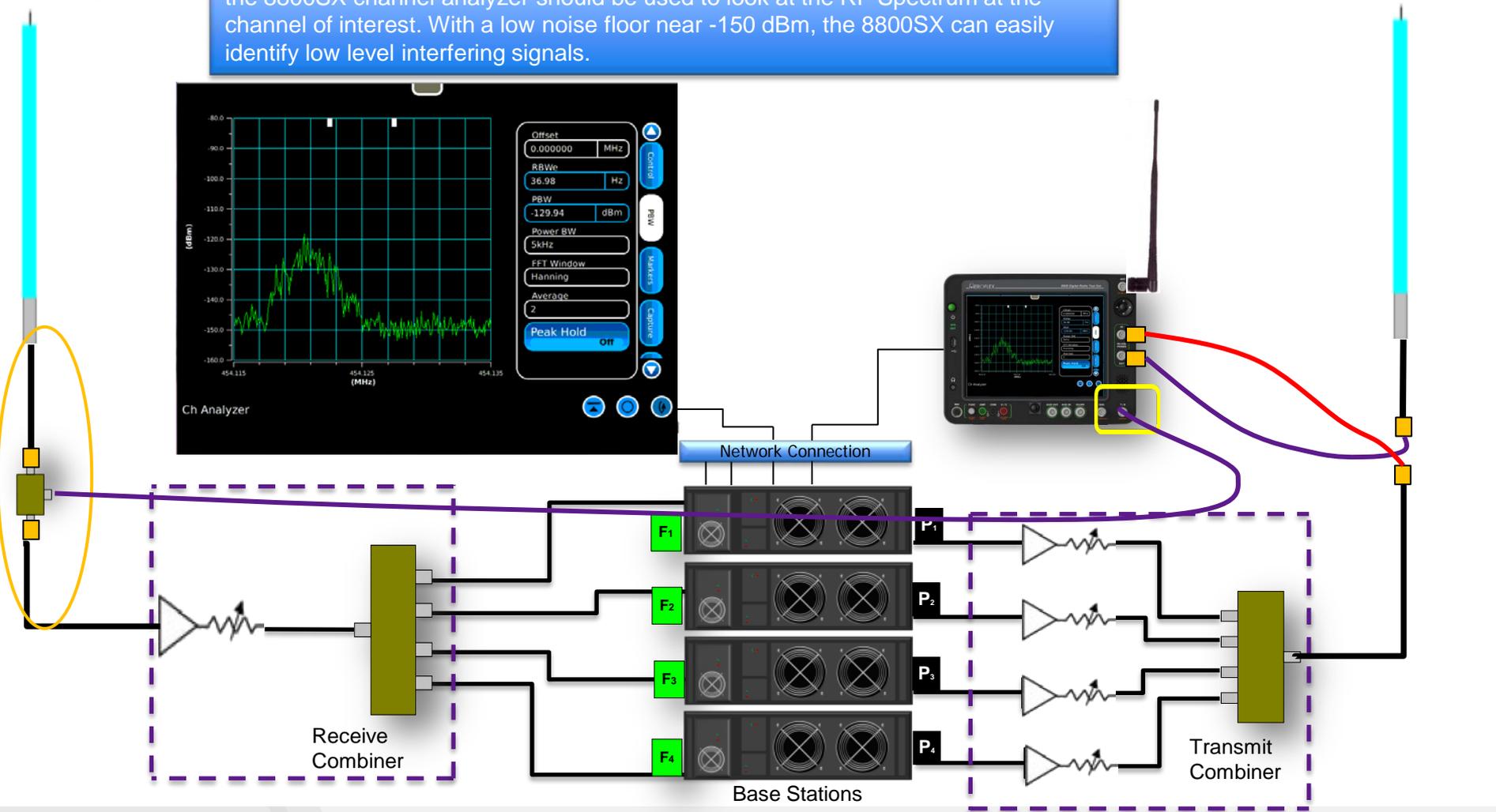
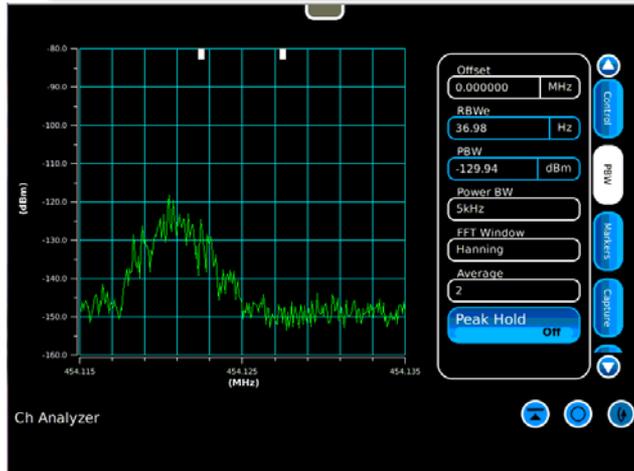
# 8800SX Interconnect

## 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.

Receive Antenna

Transmit Antenna

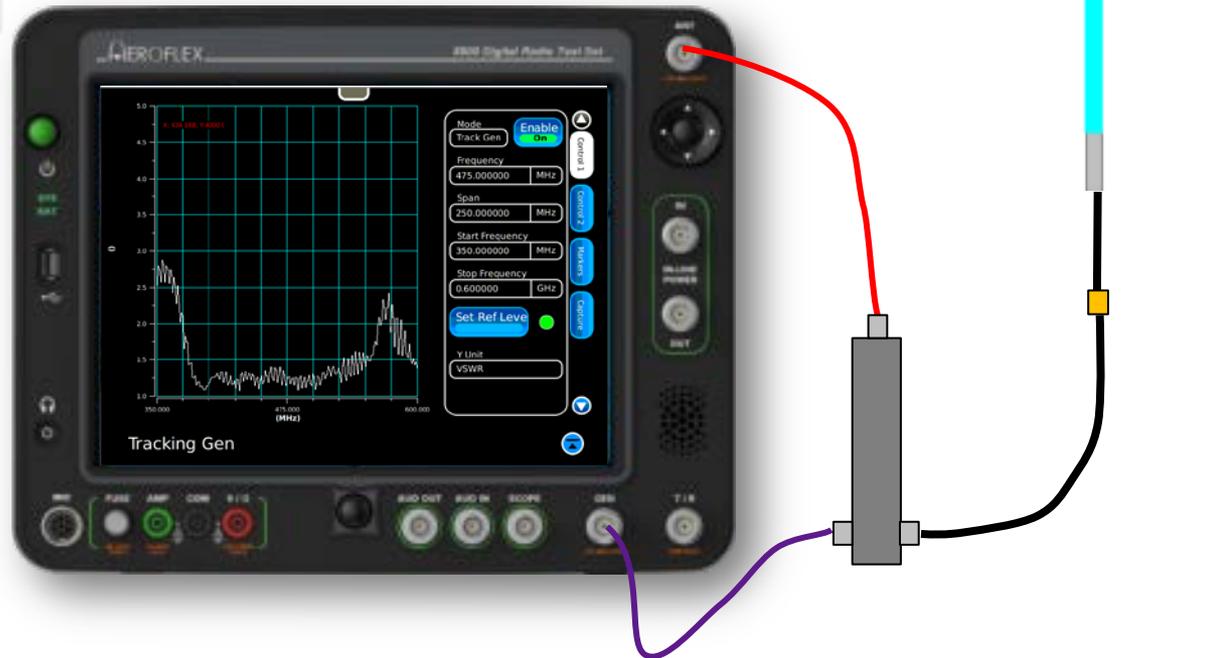


# 8800SX Interconnect

## Testing for Antenna and Transmission Line Faults

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.

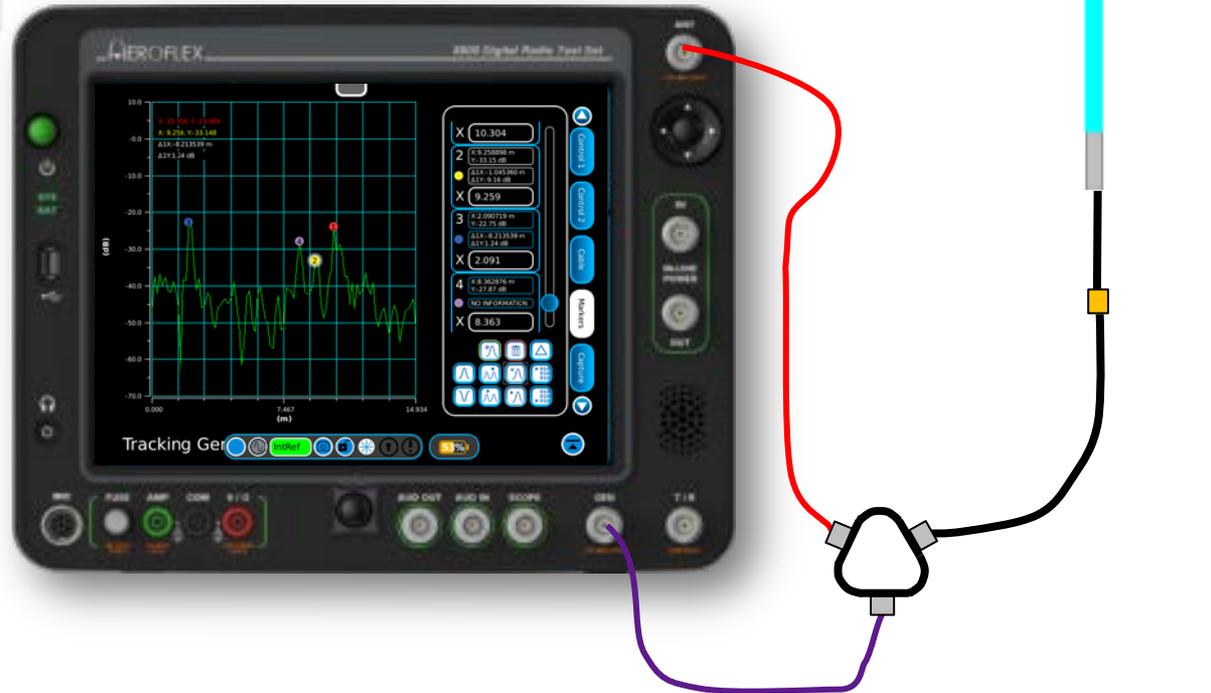


# 8800SX Interconnect

## Testing for Antenna and Transmission Line Faults

The Precision Return Loss Bridge Kit also includes a Power Divider 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

139942 8800SX Digital Radio Test Set

### 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	

### 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 R&S 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

### 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

### 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/VSWR 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	AC24009 DMM Test Leads
112277	10 AMP Current Shunt, 0.01 Ohm
67411	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/VSWR 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 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 88XOPT13 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

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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](mailto: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](mailto:Service.Americas@aeroflex.com).

[Click here](#) for more information on the 8800SX and latest software versions and training materials.