8800SX DMR Repeater Test Option 06
DMR Repeater Test Option

The DMR Repeater test option allows testing of a DMR Repeater that is in conventional DMR Mode. Trunking or analog configurations are not supported.

This feature will simulate a subscriber radio by generating a wakeup burst and then synchronizes with the downlink signal from the repeater to allow the repeater to transmit.

While the repeater is transmitting, transmitter parametric measurements can be made to evaluate:

- Power
- Frequency
- FSK Error
- Symbol Deviation
- Magnitude Error
- Symbol Clock Error
- TX BER

With the 8800SX sending a 1031 pattern to the receiver, the repeater will transmit the pattern back to the 8800SX allowing the repeater RX sensitivity to be measured by monitoring the TX BER while lowering the RF Generator Output level. This method is Forward Error corrected so it is not exactly the same as testing the receiver directly.
Option Screen

Option 06 must be enabled to use the DMR Repeater Test function.
Option 06 requires Option 01 DMR System.
Advanced Digital Configuration

Select the “Advanced Digital” configuration from the System Menu.

The 8800 will reboot to load the Advanced Digital parameters.

When finished testing the repeater, return to the System Menu and return to the LMR system.
Screen Configuration

- Select the Digital Preset from the Utilities menu. Utilities>Presets>Digital
- Use the Fast Stack button on the “Freq Select” Tile to reveal the Modulation Tile.
- Expand the Modulation Tile with the Maximize Icon.
- Move the Modulation Tile to the lower right corner so that it covers the Digital Plots Tile.
- Establish the following settings on the Modulation Tile.
  - Pattern: 1031
  - Color Code: (Match the Repeater)
  - Priority: 0
  - Radio ID: 1  (Note: 0 is invalid)
  - Call ID: 16777215 (All Call)
  - Emergency: Off
  - Mode: Sync
  - Slot: 1
Screen Configuration

8800SX Generator Configuration:
- Frequency: Match repeater RX Freq.
- Port: ANT
- Level: -90 dBm

8800SX Receiver Configuration
- Frequency: Match repeater TX Freq.
- Port: TR
- Demod: DMR

Note: by expanding the 8800SX Receiver and Generator Tiles, Cable Offset values can be entered to correct for cable loss improving measurement accuracy.

Calibrate the 8800SX Power Measurement system:
- Select: ![Zero](image) to Zero the RF Broadband Power Meter.
- Select: ![Norm](image) to calibrate the Slot and Signal Power Meters.
Connect the 8800SX ANT Port to the repeater RX Input.

Note: to test RX Sensitivity, use of an external 40 dB pad is necessary. If used, the 40 dB Pad plus the cable loss can be entered on the Generator Offset entry.

Connect the 8800SX TR Port to the repeater TX Output.

The 8800SX can generate a signal down to -90 dBm from its ANT Port.

The addition of an external 40 dB attenuator allows output levels down to -130 dBm to test repeater RX Sensitivity.
Test the Transmitter

Select the Enable button on the Generator Tile and the repeater should begin to transmit.

On the Digital Demod Tile, set the Pattern to 1031 and the Slot to 1 and Symbol Clock Unit to ppm.

The Digital Demod Tile shows all of the Digital parametric measurements for Slot 1:

- Frequency Error
- Signal Power
- TX BER – Should be 0
- Symbol Deviation: 1944 Hz +/- 194 Hz
- Decoded Color Code
- FSK Error – Should be < 5%
- Magnitude Error – Should be < 1%
- Low Power – Slot 1 Power
- High Power – Slot 2 Power
- RF Power Avg: Broadband Power measurement
- Symbol Clock Error – Should be < 2 ppm

To test Slot 2, select Slot 2 on the Modulation Tile and Slot 2 on the Digital Demod Tile.
Test the Transmitter

Select the Fast Stack Icon on the Modulator Tile to reveal the Digital Plots Tile.

Using the Cycle button on the Digital Plots Tile to switch views from Distribution Plot, Constellation Plot and Eye Diagram.

From the Receivers Menu, select the Digital Decode Tile and place it in the lower left corner.

The Digital Decode Tile shows all of the decoded parameters.
Test the Transmitter

The Emergency feature can be tested by enabling the emergency button on the Generator Modulator Tile and monitoring the Digital Decode emergency field.
Test Repeater RX Sensitivity

The receiver RX Sensitivity can be measured by lowering the RF Generator level until an indication near 1% BER is indicated. This is the approximate sensitivity of the receiver portion of the repeater.

In this test, the repeater is receiving the 1031 pattern from the 8800SX. The repeater receiver is forward error correcting this signal and sending the data to the transmitter to transmit back out and is received by the 8800SX receiver. The TX BER meter is now reflecting the BER that the repeater receiver is receiving.

This test can be performed on Slot 1 or Slot 2 by making the slot selections on both the Digital Demod Panel and the Modulator Tile.
Alternate Interconnect
Connecting through a Duplexer

Connect the 8800SX TR Port to the Duplexer ANT Port. Connect the Duplexer to the Repeater as indicated.

The 8800SX can generate a signal down to -125 dBm from its TR Port.
8800SX Options and Accessories

8800SX Options and Accessories
139942 8800SX Digital Radio Test Set

Standard Accessories
Fuse, 5 A, 32 V, Mini Blade
AC Power Cord - USA
AC Power Cord - Europe
AC Power Cord - UK
Adapter, NiMh to NiCd, Qty 3
Front Cover

Internal Battery

Options
113334 8800OPT01 DMR
113335 8800OPT02 DMR
113336 8800OPT03 XDN
113337 8800OPT04 P25
138895 8800OPT05 P25 Phase 2
140215 8800OPT06 DMR Repeater Test
113338 8800OPT09 ARB 198
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 NX200 P25 Series Auto-Test
138527 8800OPT103 Motorola APX Auto-Test
138528 8800OPT104 Motorola MOTOTRBO™ Auto-Test
139315 8800OPT105 Motorola ASTRO² 25 XTS920X™ Auto-Test

Languages
113350 8800OPT300 Simplified Chinese
113351 8800OPT301 Traditional Chinese

8800OPT302 Spanish
8800OPT303 Portuguese
8800OPT304 Malay/Indonesian
8800OPT305 Korean
8800OPT306 Arabic
8800OPT307 Polish
8800OPT308 Russian
8800OPT309 Japanese
8800OPT310 German
8800OPT311 French
139625 8800OPT312 Italian

Accessories
138313 Calibration Certificate - 8800 Series
82560 AC27003 Attenuator - 20 dB/150 W
67076 Spare Internal Battery
114679 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 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.