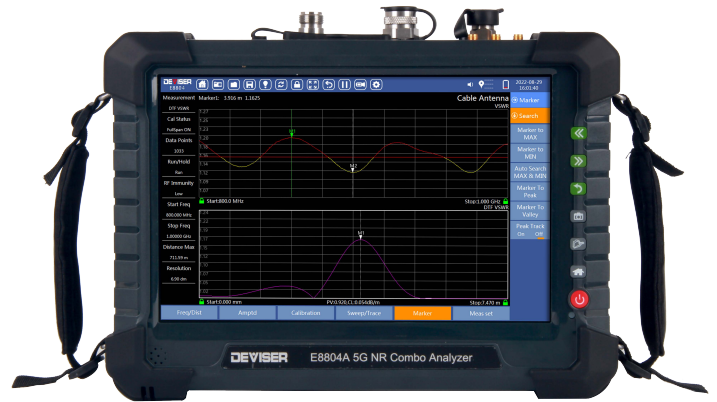


# E8804A 5G NR Combo Analyzer

## Key Benefits

- High-performance handheld analyzer for construction & maintenance of 5G NR systems
- Frequency range 9 kHz ~ 9 GHz
- High-speed S/A analysis, measuring 30 GHz/s @ 7.8 kHz RBW
- Up to 110MHz bandwidth RTSA and 100% POI less than 5us
- Test and demodulate 5G NR (FR1); TDD-LTE; FDD-LTE signals
- IQ data acquisition
- Internal and external antenna for max accuracy
- Additional modes include spectrogram; DPS; gated sweep; GPS data for locating interference
- Can support correlative interferometer DF antenna
- 10.1" capacitive touchscreen for easy control & visibility
- Numerous data transfer options: LAN, USB, & more



## Overview

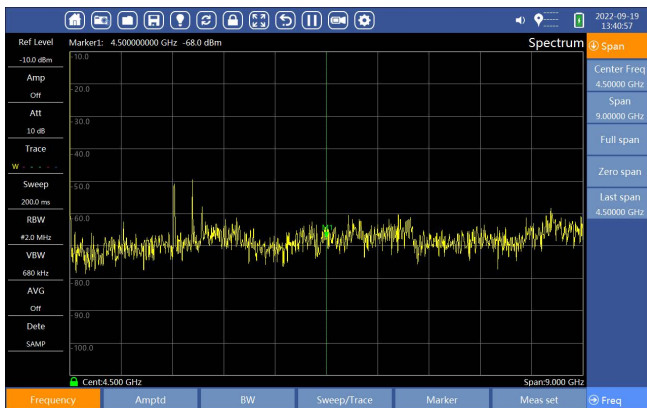
With radio bandwidth requirements escalating to all-time highs, the 5G New Radio (NR) standard is poised to change the landscape of wireless communications. 5G NR promises to elevate the possibilities of 5G network service to all-new levels of flexibility and efficiency. To claim a foothold in this space, providers and technicians must be able to characterize higher frequencies - and at higher speeds - than was possible in previous generations of spectrum analysis.

To meet this need, Deviser Instruments has designed the E8804A: a 5G NR spectrum analyzer boasting a frequency range of 9 kHz to 9 GHz, a wider-than-ever IF span of 100 MHz, the speed to conduct 3+ full-span sweeps per second at 7.8 kHz RBW, and a range of digital and analog test modes designed to provide a comprehensive picture of the signal environment - including 5G NR gNB demodulation and high-accuracy interference location.

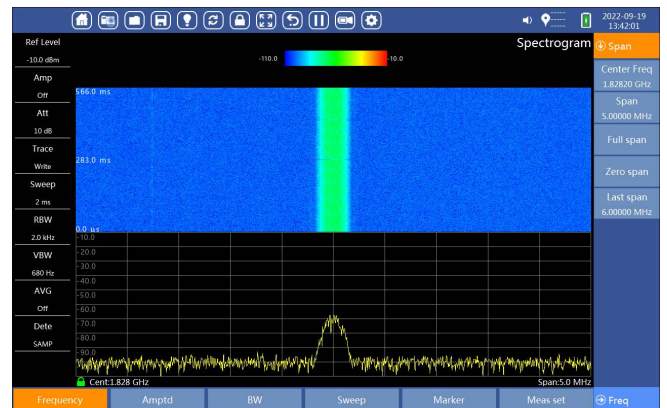
## Signal Scan Up To 9.0 GHz

The E8804A performs standard spectrum analysis up to 9,000 MHz and 5G NR analysis up to 6,000 MHz. Rapid sweeps help capture bursty signals in real time, and deep customization options allow both new and experienced technicians to zero in on key data.

The built-in Interference Analyzer mode targets hard-to-isolate signals that can threaten a system's capacity and coverage. Use the 3D Spectrogram tool to monitor change in the signal environment over time.



**Figure 1:** Standard spectrum analyzer with frequency range of 9 kHz to 9 GHz, >100 dB of dynamic range @ 1 GHz and DANL -155 dBm @ 10 MHz.



**Figure 2:** The spectrogram provides a scrolling three-dimensional display for tracking amplitude over time.

### Digital Persistence Spectrum

Persistence testing separates the intended signal transmission from underlying low-level inference signals with supreme clarity, with no service interruptions at any point.

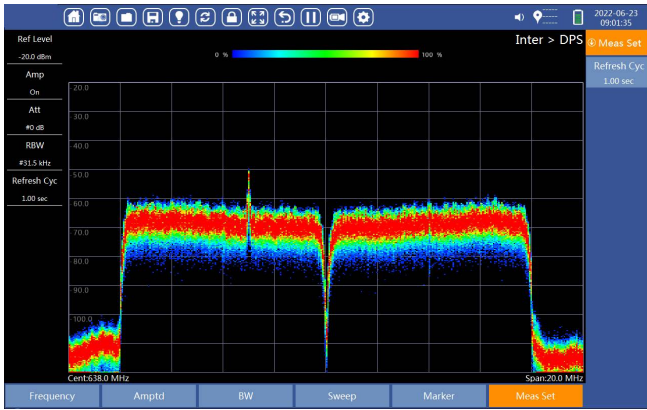


Figure 3: DPS mode reveals "hidden" ingress signal.

### TDD-LTE Testing

TDD-LTE demodulation analysis includes channel power, cell ID, 4G time-division multiple-access signal analysis, sub-frame spectrum, and special sub-frame demodulation indicators.



Figure 4: TDD-LTE power vs. time measurement.

### An All-New 5G Spectrum Test Suite

The E8804A's primary toolkit is built to elevate wireless service to the next level under the New Radio standard. It includes 5G-NR cell ID (PCI), SS-RSRQ, SSB constellation, SS-SINR power indicators, EVM demodulation indicators, and more.

The 5G-NR Beam Analyzer is a key feature of the E8804A's new demodulation analysis suite. This mode is configured for Massive MIMO systems, enabling you to track and measure 8 beam IDs simultaneously.

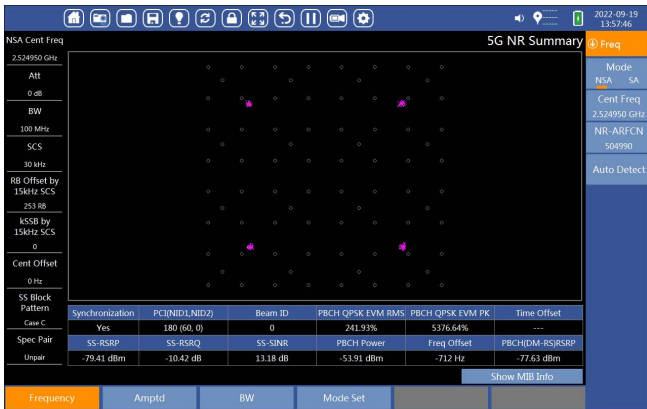


Figure 5: 5G NR summary.

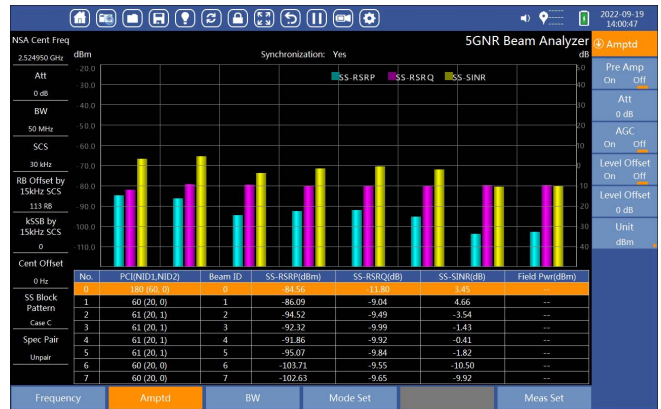


Figure 6: 5G NR beam analyzer measures up to 8 beams at once..

Use the Interference Detection mode with a directional antenna to hunt down ingress signals in a 360-degree swath.

In conjunction with an external GPS antenna, conduct 4G & 5G outdoor drive tests to obtain signal maps of entire test sites.

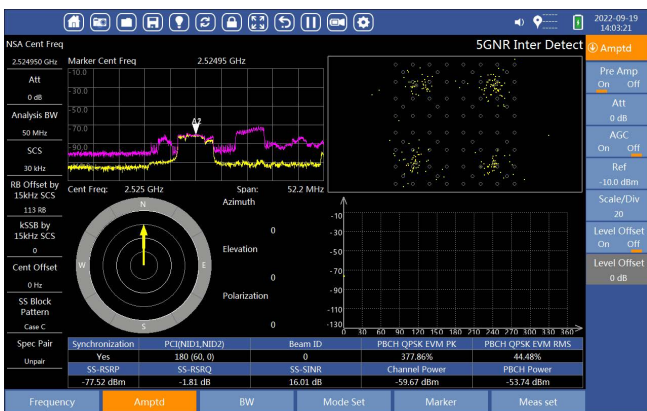


Figure 7: 5G NR interference detection.

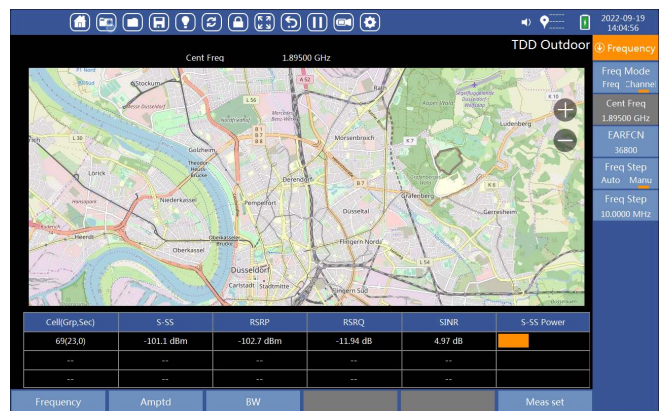


Figure 8: Drive tests map local cell ID, power, etc. onto GPS pin.

## Specifications

Spectrum Analyzer	
Frequency range	9 kHz ~ 9 GHz
Frequency ref. accuracy (based on local clock)	±1 ppm (0 ~ +50°C)
IF bandwidth	20 MHz, 100 MHz
Resolution bandwidth	1 Hz ~ 3 MHz
Video bandwidth	1 Hz ~ 3 MHz
Dynamic range	>100 dB @ 1 GHz (1 Hz RBW)
Measurement range	DANL ~ +30 dBm
Amplitude accuracy	± 1.5 dB (20 ~ 30°C)
RF max input	+25 dBm peak (typical); ±50 VDC (>30 dB atten.)
Displayed average noise level (DANL)	Typical, preamp off -135 dBm (10MHz ~ 3GHz) -130 dBm (3 GHz ~ 6 GHz) -125 dBm (6 GHz ~ 9 GHz)
	Typical, preamp on -155 dBm (10MHz ~ 3 GHz) -150 dBm (3 GHz ~ 6 GHz) -145 dBm (6 GHz ~ 9 GHz)
3rd-order intercept (TOI)	+14 dBm (typical)
2nd harmonic distortion	< -65 dBc (typical)
Phase noise (100 kHz offset from 1 GHz)	-105 dBc/Hz

LTE Analyzer	
Modes	TDD-LTE, FDD-LTE
Measurements	<ul style="list-style-type: none"> <li>Power vs. RB</li> <li>Power vs. time</li> <li>Constellation</li> <li>Channel power</li> </ul>

Drive Test	
Std. spectrum analysis	Indoor / outdoor level testing
TDD-LTE outdoor test	Cell ID; S-SS; RSRP; RSRQ; SINR
5G-NR spectrum analysis	Indoor / outdoor PCI, Beam ID, SS-RSRP, SS-RSRQ, SS-SINR

General	
Display	10.1" 1280 x 800 capacitive touchscreen
Test interface	<ul style="list-style-type: none"> <li>3x USB 2.0 ports, 1x USB 3.0 port</li> <li>1x Ethernet LAN port</li> <li>External GPS antenna connection</li> <li>External reference input</li> <li>IF output</li> </ul>
Data transfer	USB, Ethernet, WiFi
Data storage	Up to 16 GB
Operating time	2.5 hours
Operating temperature	-10 ~ +50°C
Dimensions (LxWxH)	290mm x 210mm x 101mm
Weight	4.3 kg

Spectrum Analyzer (cont'd)	
Spurs	-85 dBm (preamp off)
Voltage standing wave ratio (VSWR)	< 2.0 @ 10 dB input attenuation
Preamplifier	18 dB
Attenuation	0 ~ 50 dB (9 kHz ~ 6 GHz) 0 ~ 30 dB (6 GHz ~ 9 GHz)
Span settings	Full span; last span; zero span
Sweep modes	Single; continuous; gated sweep (GPS, external gate)
Detection modes	Peak; negative peak; RMS; average; normal
Markers	Up to 6 normal and delta markers
Sweep Time	1 us to 1000s

5G NR Analyzer	
Frequency range	FR1 band (10 MHz ~ 6 GHz)
IF bandwidth	Up to 100 MHz
Rx sensitivity	-115 dBm @ SCS = 30 kHz -118 dBm @ SCS = 15 kHz
Measurements	<ul style="list-style-type: none"> <li>Physical cell ID (PCI)</li> <li>Beam ID</li> <li>PB/PDS chan. power, constellation, EVM</li> <li>SS-RSRP, SS-RSRQ, SS-SINR</li> <li>Time offset</li> <li>Beam stat analyzer</li> <li>5G NR interference detection</li> <li>Power vs. time</li> </ul>

Remote Control	
Control modes	Spectrum analysis; drive testing
Control interface	Ethernet, WiFi
Programming language	SCPI

IQ Data Acquisition	
Sampling rate	1.92, 3.84, 7.68, 15.36, 30.72, 61.44, 122.88 MHz
IQ file size	Up to 256 MB

# Cable Antenna

## Key Benefits

- 100+ wireless frequency bands and cable type presets for best ease of use
- Reduced test time with dual simultaneous measurement display
- Detect signal degradation and system performance over time with trace overlay
- Instant Pass/Fail results

## Standard Configuration Includes

- Cable and Antenna Analyzer, 2MHz to 4.4GHz
- Internal E-Calibration Module, 2MHz to 4.4GHz

## Key Measurement Includes

- Reflection - Return Loss or VSWR
- Fault Location – DTF/RL or DTF/VSWR

## Key Measurements

**Reflection** measures the cell-site transmission line impedance performance across the selected frequency range in VSWR or Return Loss.

- The instrument's database offers over 100 wireless frequency bands and more can be customized.
- A user-definable limit line will automatically indicate pass/fail status.
- Users can set up to 6 markers for trace analysis.

**Distance to Fault (DTF)** identifies fault locations at cell-sites indicating signal discontinuities using VSWR or Return Loss.

- Cable lengths up to 1,500 meters (4,921 ft)
- High-resolution mode with 2065 data points.
- The instrument's database includes over 100 cable types and more can be customized.
- A user-definable limit line will automatically indicate pass/fail status.
- Users can set up to 6 markers for trace analysis.

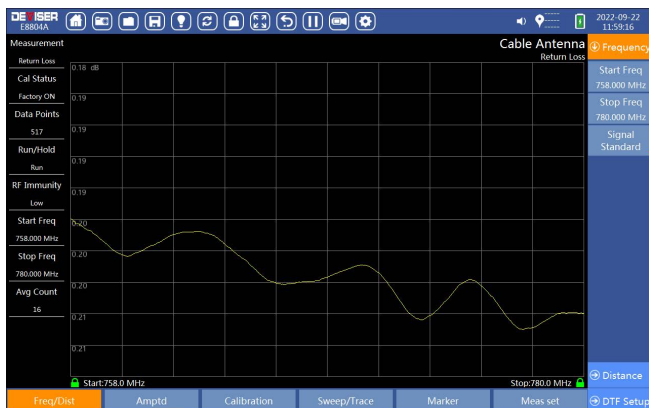


Figure 9: Reflection — Return Loss

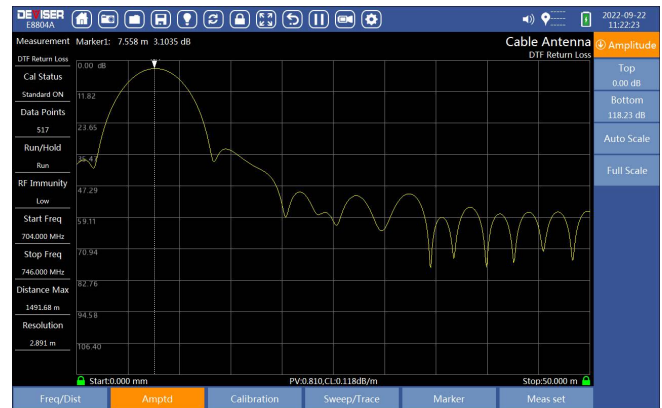


Figure 10: DTF-Return Loss

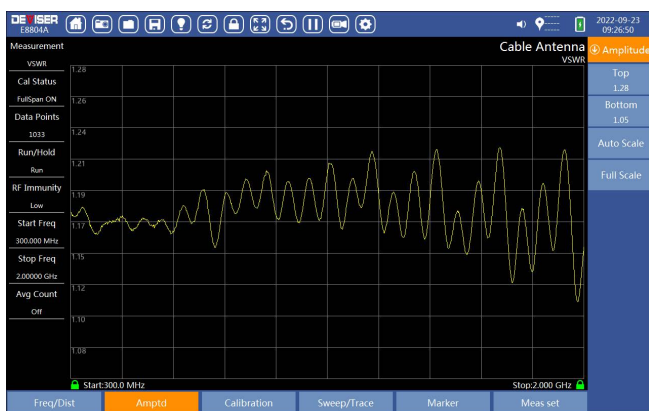


Figure 11: VSWR

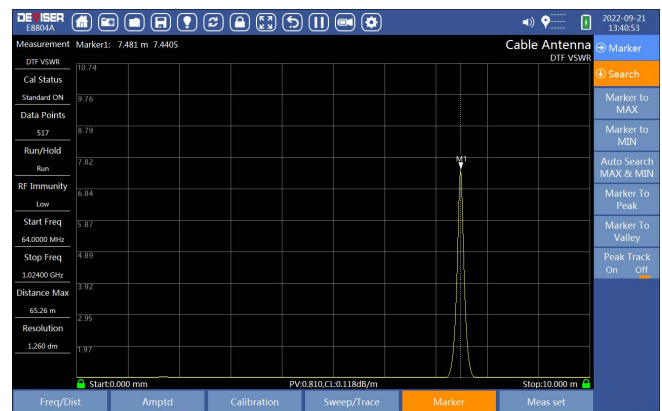


Figure 12: DTF-VSWR

## Cable Antenna Specifications

Cable & Antenna	
Measurement	VSWR Return Loss Cable Loss Distance-to-Fault (DTF) Return Loss Distance-to-Fault (DTF) VSWR
Frequency	
Frequency Range	2 MHz to 4400MHz
Frequency Accuracy	±2 ppm
Frequency Resolution	0.5kHz
Output Power	
High	0 dBm (nominal)
Low	-30 dBm (nominal)
Measurement Speed	
Reflection	< 1.0 mS/point
DTF	< 1.25 mS/point
Measurement Accuracy	
Corrected Directivity	42dB (typical, after standard OSL calibration) 38dB (typical, after E-CAL calibration)
Interference Immunity	
On-channel	+18 dBm @ >1 MHz of carrier frequency
Off-channel	+13 dBm within ± 10 kHz of carrier frequency
Return Loss	
Measurement Range	0 to 60dB
Resolution	0.01 dB
VSWR	
Measurement Range	1 to 65
Resolution	0.0001
Cable Loss	
Measurement Range	0 to 30dB
Resolution	0.01 dB
Distance to Fault	
Vertical Range Return Loss	0 to 60dB
Vertical Range VSWR	1 to 65
Horizontal Range (m)	0 to (Data Points - 1) x Fault Resolution, to maximum of 1500 meters (4921 ft)
Fault Resolution(m)	$(V_p \times C) / (\text{Span} \times 2)$
Data Points	130,259,517,1033,2065
Connectors (Reflection/RF Out)	
RF Out	Type N, female, 50Ω
RF Out Damage Level	+25 dBm, ± 50 VDC