

# E8900A 5G Handheld Spectrum 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
- 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

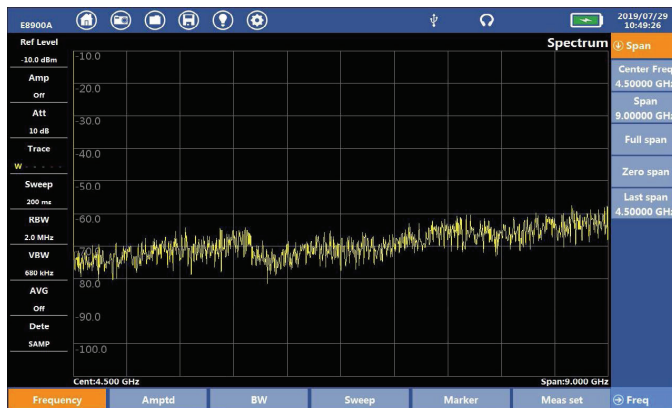
With radio bandwidth requirements escalating to all-time highs, the 5G New Radio (NR) standard is poised to change the landscape of wireless communications. 5G NR promises to elevate the possibilities of 5G network service to all-new levels of flexibility and efficiency. To claim a foothold in this space, 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 E8900A: 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.

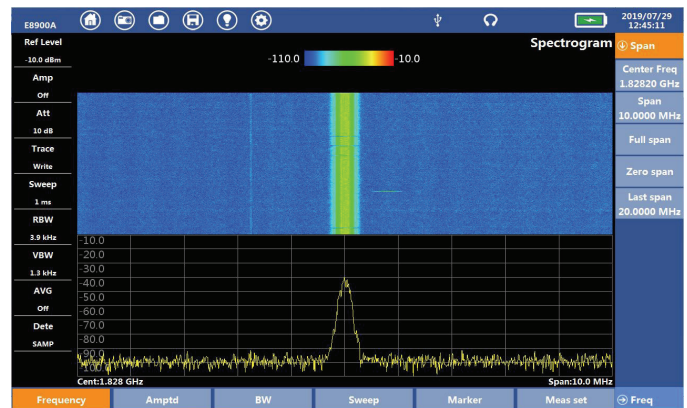
## Signal Scan Up To 9.0 GHz

The E8900A 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.

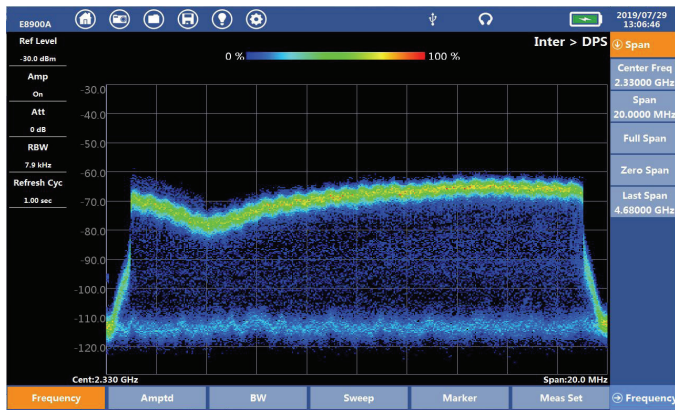


Figure 3: DPS mode reveals "hidden" ingress signal.

### 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 E8900A'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 E8900A's new demodulation analysis suite. This mode is configured for Massive MIMO systems, enabling you to track and measure 8 beam IDs simultaneously.

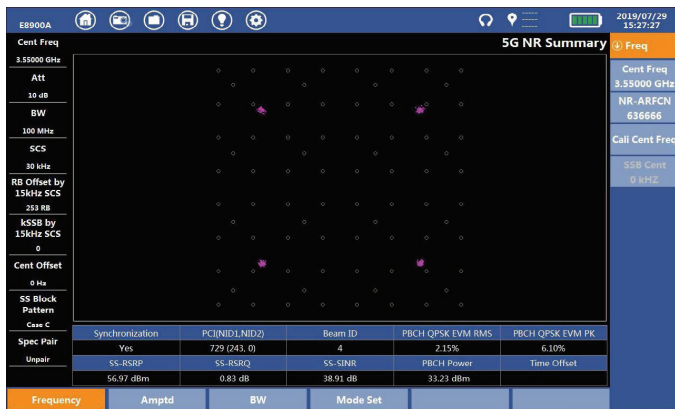


Figure 5: 5G NR summary.

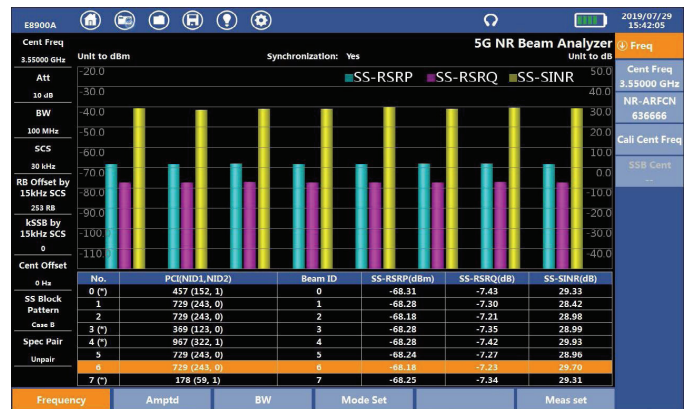


Figure 6: 5G NR beam analyzer measures up to 8 beams at once..

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.

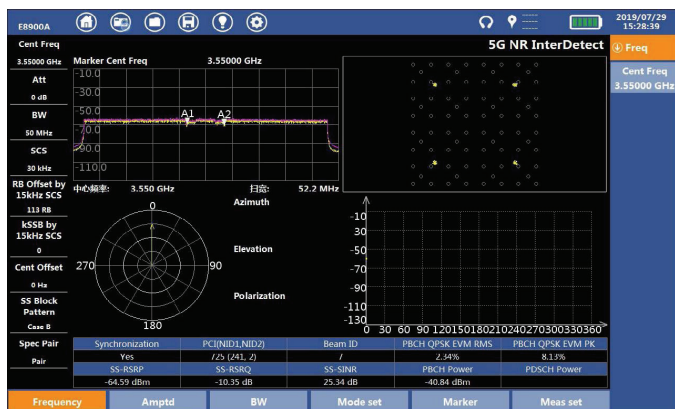


Figure 7: 5G NR interference detection.

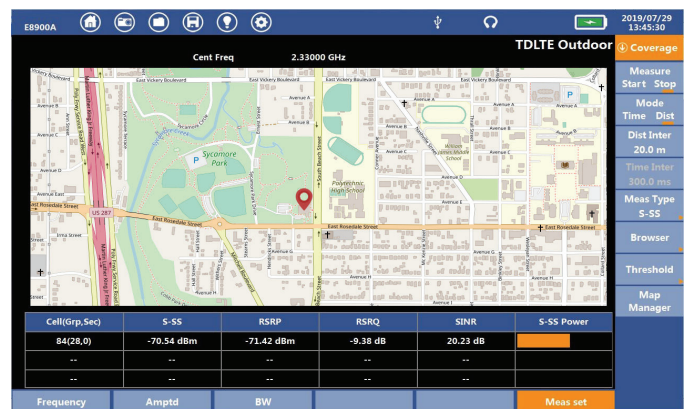


Figure 8: Drive tests map local cell ID, power, etc. onto GPS pin.

## 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 -125 dBm (100kHz ~ 1MHz) -135 dBm (1MHz ~ 3GHz) -130 dBm (3 GHz ~ 6 GHz) -125 dBm (6 GHz ~ 9 GHz)
	Typical, preamp on -145 dBm (100kHz ~ 1MHz) -155 dBm (1 MHz ~ 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	>3 hours
Operating temperature	-10 ~ +50°C (14 ~ 122°F)
Dimensions (LxWxH)	12.4" x 9.0" x 3.0" (316mm x 228mm x 77mm)
Weight	<10 lbs (<4.5 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

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