

5G Handheld Spectrum Analyzer

Key Benefits

- High-performance handheld analyzer for construction & maintenance of 5G NR systems
- Frequency range 9 kHz ~ 43 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 & FR2); 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.

Signal Scan Up To 43 GHz

The E8800F performs standard spectrum analysis up to 43 GHz and 5G NR analysis support 5G FR1 and FR2 band. 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.

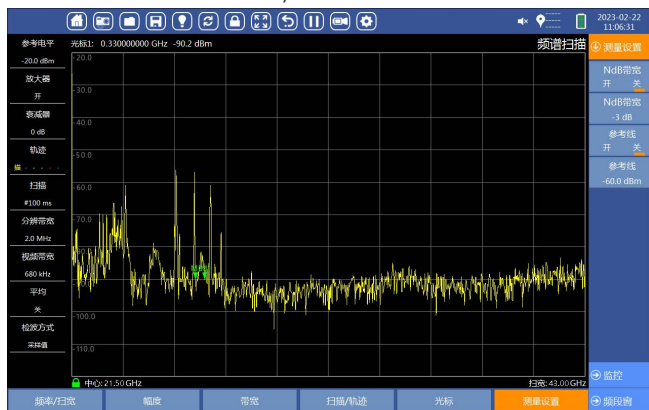


Figure 1: Standard spectrum analyzer with frequency range of 9 kHz to 43 GHz, >100 dB of dynamic range @ 1 GHz and DANL -155 dBm @ 10 MHz.

To meet this need, Deviser Instruments has designed the E8800F: a 5G NR spectrum analyzer boasting a frequency range of 9 kHz to 43 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.

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.

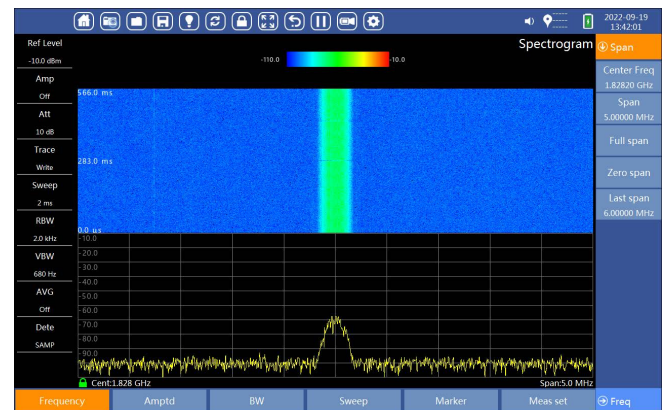


Figure 2: The spectrogram provides a scrolling three-dimensional display for tracking amplitude over time.

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.

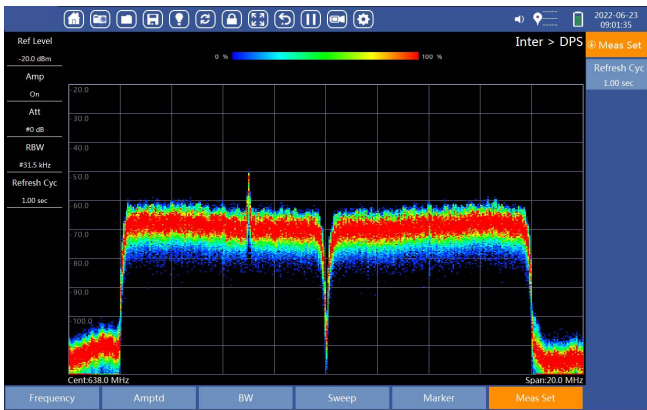


Figure 3: DPS mode reveals "hidden" ingress signal.

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.

5G NR FR2

The E8800F's primary toolkit provides a typical measurement methodology for 5G new radio (NR) in the frequency ranges one (FR1) and two (FR2). It can meet the new subcarrier interval requirements and provide the measured value of PCI, Beam ID, SS-RSRP, SS-SINR, EVM, SSB constellation and more, which is up to 64 beams.

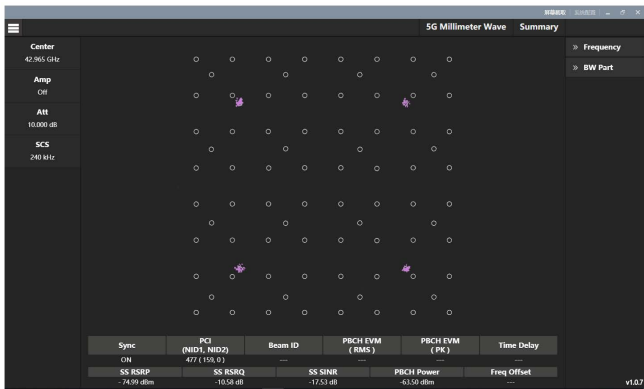


Figure 5: 5G NR FR2.

The 5G-NR Beam Analyzer is a key feature of the E8800F's new demodulation analysis suite. This mode is configured for Massive MIMO systems, enabling you to track and measure 8 beam IDs simultaneously.

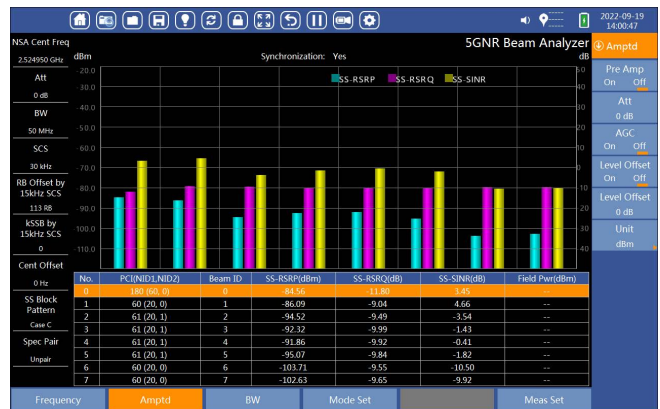


Figure 6: 5G NR FR1 beam analyzer measures up to 8 beams at once.

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

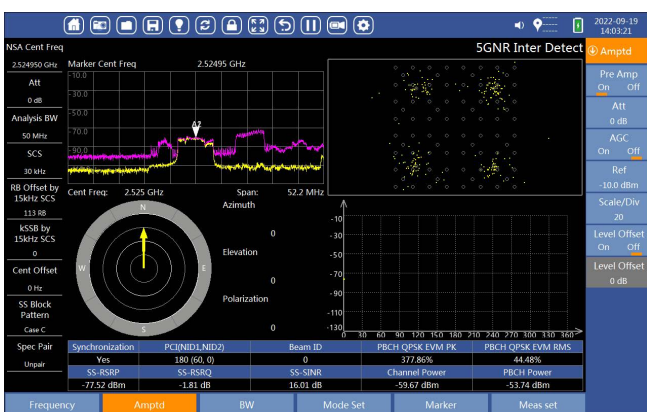


Figure 7: 5G NR interference detection.

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

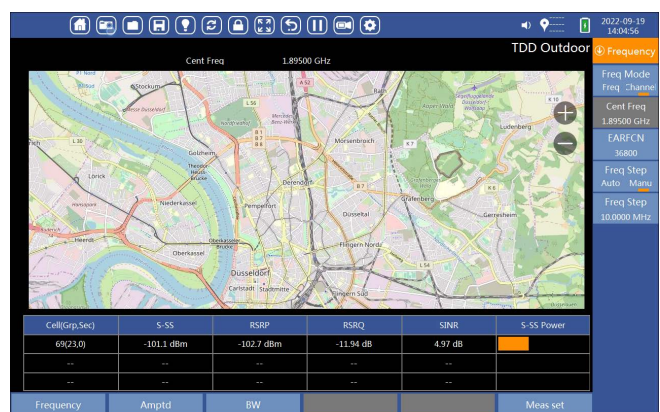


Figure 8: Drive tests map local cell ID, power, etc. onto GPS pin.

Specifications

Spectrum Analyzer	
Model	E8800C/D/F
Frequency range	9k~18G/26.5G/43GHz
IF bandwidth	110 MHz
Phase noise (100 kHz offset from 1 GHz)	-103 dBc/Hz
Displayed average noise level (DANL)	<p>preamp off</p> <ul style="list-style-type: none"> -134 dBm (10MHz ~ 7.5GHz) -140 dbm (1GHz) -136 dBm (7.5 GHz ~ 18 GHz) -134 dBm (18 GHz ~ 39 GHz) -130 dBm (39 GHz ~ 42 GHz) -128 dBm (42 GHz ~ 43 GHz) <p>preamp on:</p> <ul style="list-style-type: none"> -154 dBm (10MHz ~ 7.5GHz) -160dbm (1GHz) -155 dBm (7.5 GHz ~ 18 GHz) -152 dBm (18 GHz ~ 39 GHz) -149 dBm (39 GHz ~ 42 GHz) -146 dBm (42 GHz ~ 43 GHz)

Spectrum Analyzer	
3rd-order intercept (TOI)	+8.5 dBm
2nd harmonic distortion	-60 dBc
Voltage standing wave ratio (VSWR)	<2.2
Frequency accuracy	±1 ppm
Amplitude accuracy	±1.5 dB
Sweep Rate	30GHz/s@(<25kHz)
RTSA 100% POI	5us

5G NR Analyzer	
Frequency range	FR1 (410 MHz ~ 7125 MHz) FR2 (24250 MHz ~ 43000 MHz)
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 style="width: 50%;">• Physical cell ID (PCI) <li style="width: 50%;">• Time offset <li style="width: 50%;">• Beam ID <li style="width: 50%;">• Beam stat analyzer <li style="width: 50%;">• PB/PDS chan. power, constellation, EVM <li style="width: 50%;">• 5G NR interference detection <li style="width: 50%;">• SS-RSRP, SS-RSRQ, SS-SINR <li style="width: 50%;">• Power vs. time

LTE Analyzer	
Modes	TDD-LTE, FDD-LTE
Measurements	<ul style="list-style-type: none"> <li style="width: 50%;">• Power vs. RB <li style="width: 50%;">• Constellation <li style="width: 50%;">• Power vs. time <li style="width: 50%;">• Channel power

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

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

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

General	
Display	10.1" 1280 x 800 capacitive touchscreen
Test interface	<ul style="list-style-type: none"> • 3x USB 2.0 ports, 1x USB 3.0 port • 1x Ethernet LAN port • External GPS antenna connection • External reference input • IF output
Data transfer	USB, Ethernet, WiFi
Data storage	Up to 256 GB
Operating time	2.5 hours
Operating temperature	-10 ~ +50°C
Dimensions (LxWxH)	292mm x 211mm x 82mm
Weight	3.9 kg

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