VIAVI Solutions

VIAVI
OneAdvisor 800 Wireless

All-in-One Installation and Maintenance Test Solution for Land Mobile Radio Operation

The VIAVI OneAdvisor 800 is designed to verify and troubleshoot radio access networks for proper deployment and effective operation quickly and easily.

OneAdvisor 800 leverages a multi-functional, modular architecture that allows users the flexibility to address many test applications and different user groups, including:

- Traditional Radio sites; cover all test scenarios of any radio site including transmission lines, coaxial cable, antennas, fiber end-face inspection and fiber characterization
- 5G NR Signal Analysis, EMF Analysis, Ethernet, and O-RAN testing

Key test functions include:

- 100MHz real-time persistence spectrum (9kHz to 6GHz)
- Over-the-Air RF spectrum, spectrogram, and persistence spectrum testing with 72hr logging capability to effectively characterize intermittent interference signals
- Channel Scanner with route map to track RSSI and coverage of multiple carriers with different technologies
- Automatic Interference location finder when paired with the VIAVI InterferenceAdvisor
- Interference hunting with triangulation when paired with the VIAVI AntennaAdvisor
- Blind Scan for easy identification of LTE and NR signals including carrier frequency, carrier BW, and MCC/MNC
- Cable and antenna reflection tests, distance-to-fault, and cable loss
- 2-Port transmission mode for tuning of filters and duplexers
- Terminating and through type RF power sensor
- Optional fiber inspection and fiber validation including OTDR testing

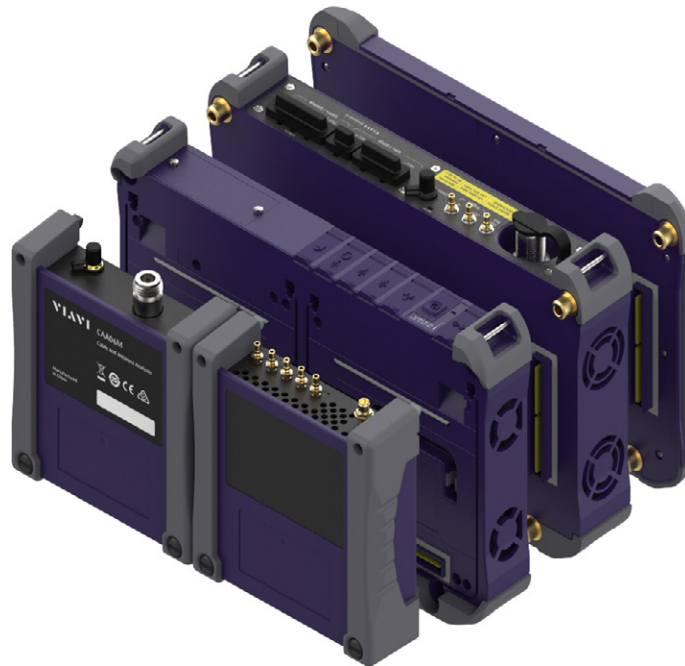OneAdvisor 800 Cable and Antenna Analysis
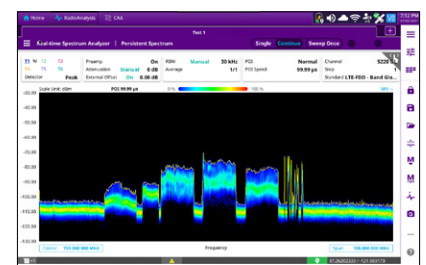
OneAdvisor 800 Realtime Persistence Spectrum
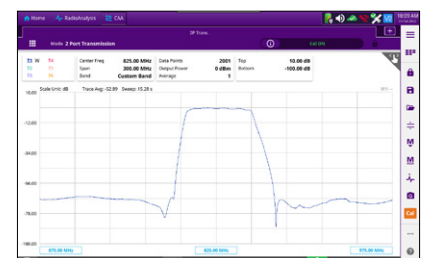
OneAdvisor 800 Two-Port Transmission

OneAdvisor 800 Expanded View with Full-size Module

OneAdvisor 800 Expanded View with Full-size and Half-size Modules

Real-Time Persistence Spectrum

OneAdvisor 800 real-time spectrum analysis (RTSA) performs a persistence power measurement through a defined frequency range in high speed.

RTSA provides a comprehensive view of intermittent signals for a fast characterization of wireless signals and the identification of intermittent interference signals through its 2D and 3D spectrogram measurements that characterize signals in power, frequency, and time.
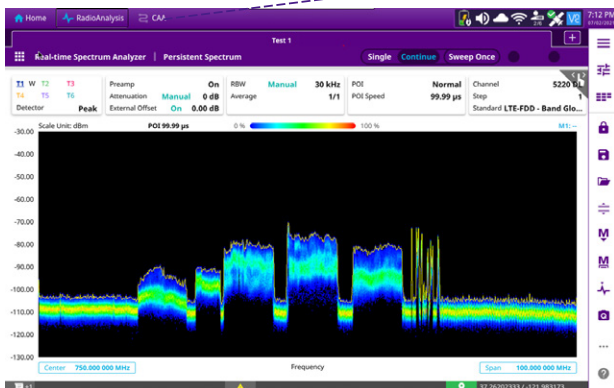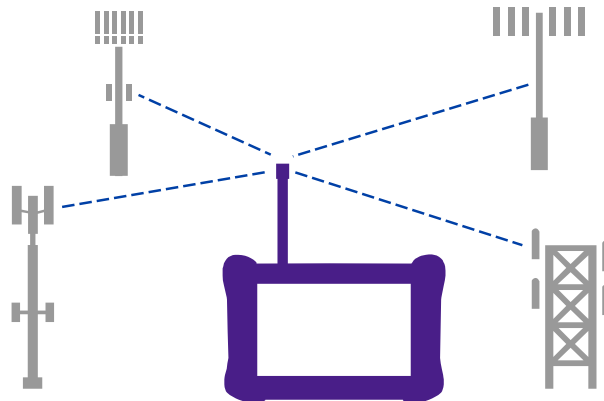
OneAdvisor 800 Real-time Spectrum Analysis - Persistent Spectrum
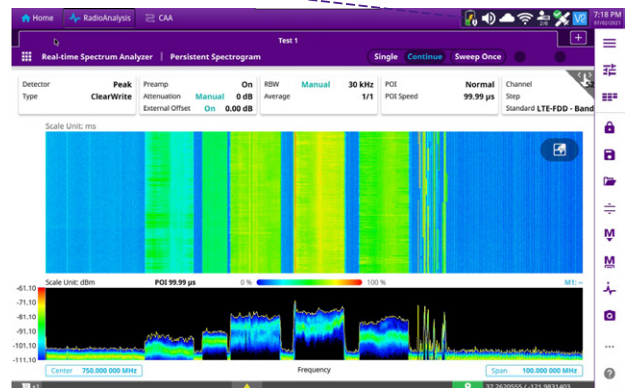
OneAdvisor 800 Real-Time Spectrum Analysis - Persistent Spectrogram

OneAdvisor 800 real-time spectrum analysis is ideal to properly characterize signals that have different communication profile in time-domain, such as time division duplex (TDD) transmissions which in the same frequency channel allocates different time-slots for uplink and downlink signals which is the case of 5G carriers above 3GHz. It also provides the ability to identify the presence and location of 5G beam signals, also referred as synchronization signal block (SSB), due to its 100MHz of instantaneous analysis bandwidth.

Channel Scanner

The fast evolution of wireless technologies results in a coexistence of multiple wireless service offerings from different technologies including cellular and non-cellular.

A channel scanner is a spectrum analysis-based feature and is commonly used to scan the signal strength of various commercially available wireless channels.

Key Scanner measurement functions:

- Channel Scanner

- Frequency Scanner

- Customer Scanner

- Route Map

Scanners

Depending on the allocation status of carriers to measure, user can choose one of the following and track the RSSI of multiple carriers up to 20.

- Channel Scanner allows user can track multiple carriers which are allocated with equal channel spacing and carrier bandwidth.

- Frequency Scanner allows user can track multiple carriers which are allocated with equal frequency spacing and carrier bandwidth

- Custom Scanner allows user can track multiple carriers which are allocated arbitrarily frequency steps and have different carrier bandwidth. It is useful for multi-tech network environment.
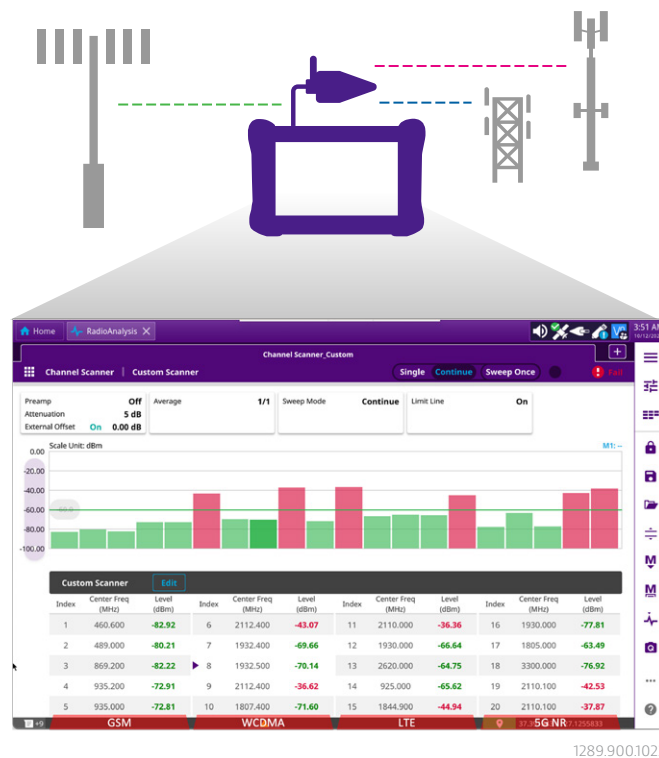
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OneAdvisor 800 Channel Scanner - Custom Scanner

Route Map

Route Map allows to plot the RSSIs of each carrier achieved with Custom Scanner on the map. By displaying the measurement results in different colors according to the intensity of the RSSI, a user can easily compare the coverage for each carrier at each location. Full down key allows to check RSSI of all carriers, up to 20, at once and also can change the top three carrier as needed.

OneAdvisor 800 Channel Scanner Channel Scanner - Route Map

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Wireless Interference Analysis

Outdoor coverage can be affected by shadowing in the case of mm-wave signals that experience high penetration loss through materials such as concrete, steel or reflective glass; as well as the effects from interfering signals that collide with the radio's transmission or reception bands, which in cases despite of acceptable signal levels the throughput is limited or might even cause call drops.

VIAVI RAN analyzers are equipped with route map test functions that performs coverage testing in real-time, by plotting signal strength, with different color scheme based on the received power level, in a geographical map obtaining location from GPS. The resulting route map shows coverage levels and dead-zones or areas with no coverage which might cause service impairments such as call drops.

Coverage test data can be saved as a mapping test result allowing post-analyze with the RAN analyzer displaying signal analysis parameters for each data point including originating physical cell identification or PCI, as well as beamforming profile including beam index and beam power level. In addition, coverage test data can also be saved as comma separated files for post-processing analysis.
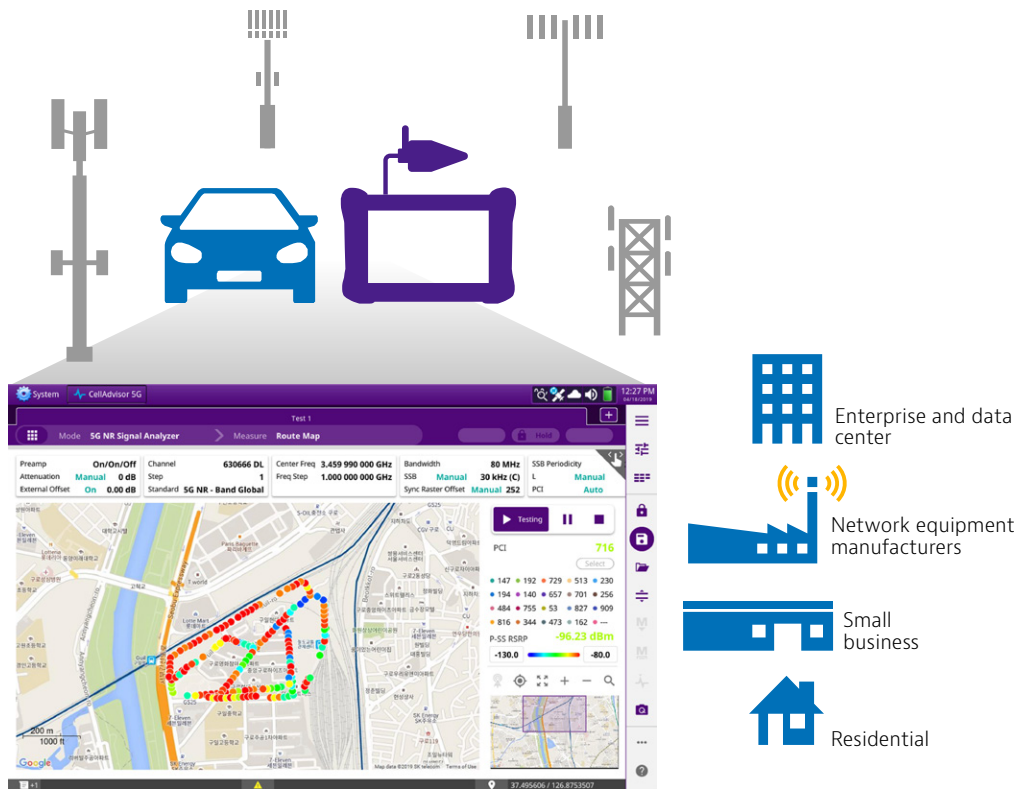
OneAdvisor 800 5G NR Signal Analysis - Route Map

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Radio Access Indoor Coverage

Indoor coverage can be affected by many factors, including reflections and attenuation caused by building materials including concrete walls, steel, and reflective windows, as well as for potential interfering signals that collide with signals of small cells or customer premise equipment.

Therefore, it is essential in the deployment of indoor networks to verify the spectrum is clear, verifying no other signals are present, avoiding service quality impairments; and subsequently the network is not causing interference to other networks.

VIAVI RAN analyzers can perform indoor coverage mapping in two different modes to obtain location and overcoming the lack of GPS information availability for indoor networks:

- Manual geo-location, assisted by user intervention selecting the physical location.
- Automatic geo-location, assisted by NEON Tracker and NEON Signal Mapper.

Wireless Interference Analysis

OneAdvisor 800 Interference Analyzer functions provides the most comprehensive measurement techniques to effectively identify, characterize and locate interfering signals.

Key interference analysis measurement functions:

- Received Signal Strength Indicator (RSSI)
- Interference Finder
- Radar Chart
- Interference Hunting

### Received Signal Strength Indicator (RSSI)

RSSI performs a multi-signal measurement (up to 6 simultaneously signals) in time, assessing the power-level variations of interference signals over time. In RSSI measurements power limits can be set for audible alarms and increase alarm counters every time a signal exceeds the defined limit line. For long-term analysis, the spectrogram and RSSI measurements can be saved into an external USB memory for post-analysis.

OneAdvisor 800 Interference Analysis - RSSI

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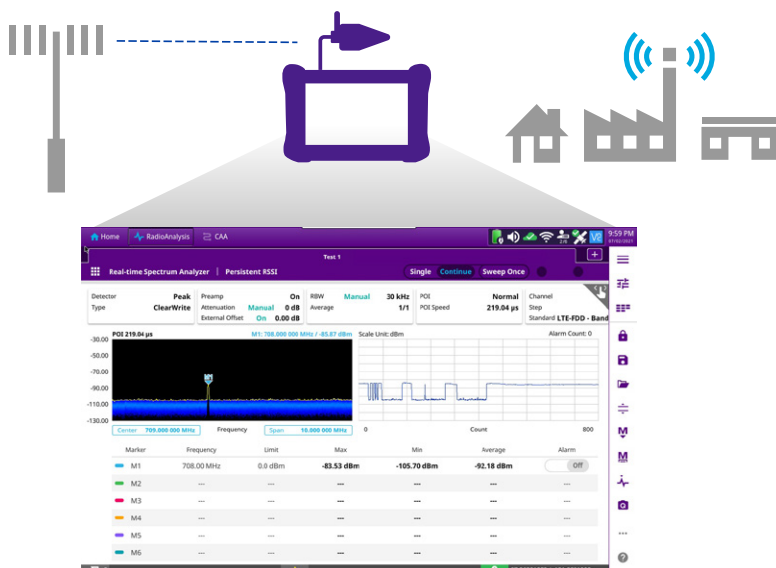
Interference Finder

Interference Finder is an automatic triangulation algorithm performed by the OneAdvisor-800 that uses GPS to extract geo-coordinates in multiple test points to locate the source of interference.

The interference finder automatically calculates the interference locations using an inscribed or circumscribed area based on the measured intersection points.
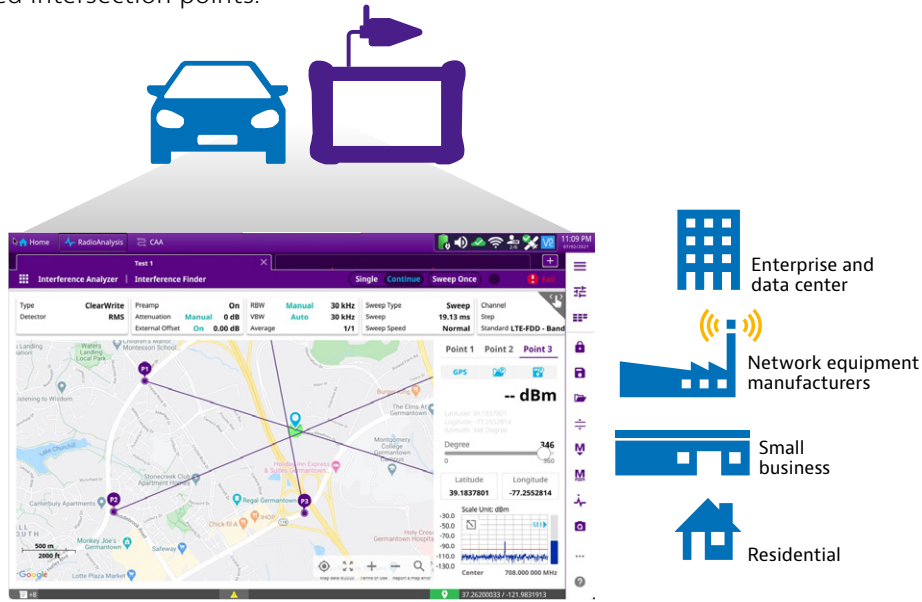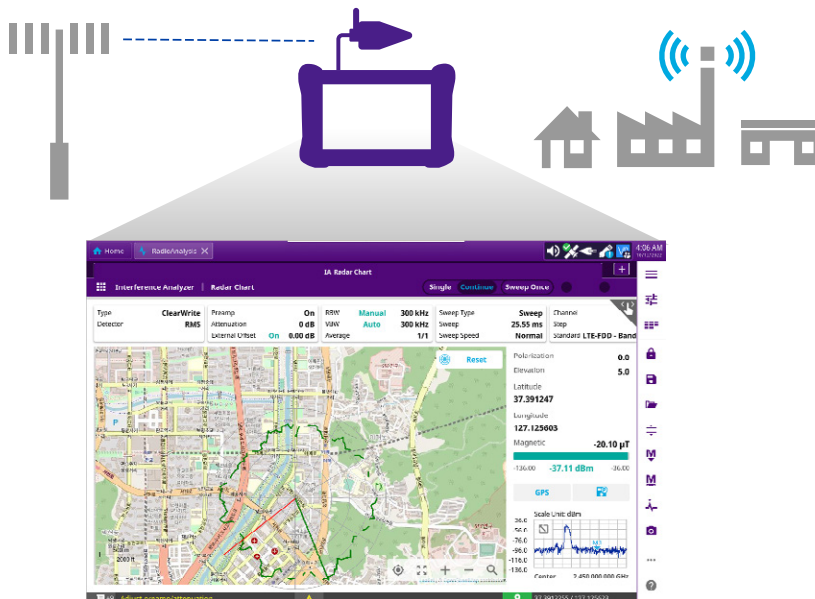

OneAdvisor 800 Interference Analysis - Interference Finder

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Radar Chart

The radar chart works with the AntennaAdvisor handle to detect the direction the interfering signal is coming from. The AA handle has a built-in gyro sensor that detects the azimuth the antenna is scanning. By linking the measured signal strength and the azimuth of the YAGI antenna and displaying the interference signal strength on the radar chart, field engineer can easily isolate the direction of the interference signal. At a crowded downtown or in a shopping mall area where vehicles are not available, interference hunting should be carried out on foot and radar chart help you to find the interference source quickly and accurately.
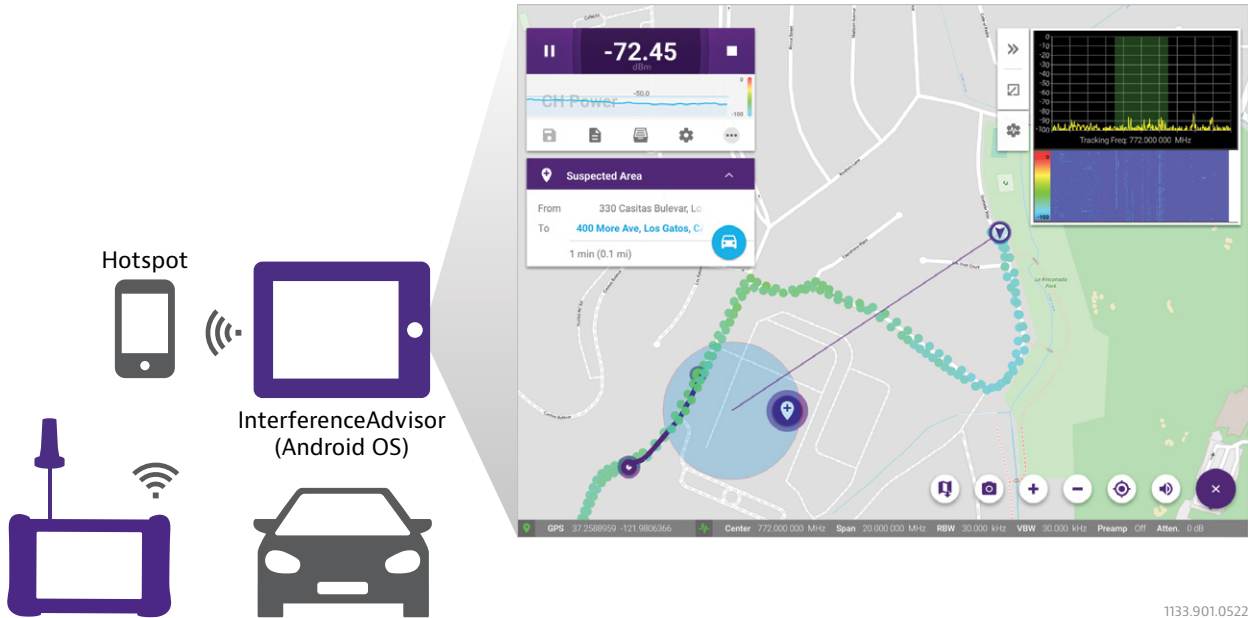

OneAdvisor 800 Interference Analysis - Radar Chart

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Interference Hunting

InterferenceAdvisor is a fully automated RF interference hunting solution. Easy to set up and simple to use, it allows one RF engineer to identify and locate an interference source in just hours, simply by following voice prompts on a familiar map-style application on an Android tablet.

The InterferenceAdvisor software communicates with OneAdvisor-800 to retrieve RF power measurements (Peak, RSSI, Channel) and creating a power heat-map during a drive test, and automatically detects the area of incidence with the highest presence of interference, giving optional navigation instructions to the detected location of interference.

InterferenceAdvisor - Heat Map

Cable and Antenna Analysis

OneAdvisor 800 can be equipped with a Cable and Antenna Analyzer module allowing RF technicians to verification the connectivity between the radio and antennas which are RF devices such as cables, jumpers, filters and duplexer, and the antenna, including:

- Return Loss and VSWR

- Distance to Fault

- Cable Loss

OneAdvisor 800 user-friendly GUI with intuitive PASS/FAIL results instantly identifies problems and enables technicians to easily determine if the radio site meets the coaxial transmission specifications.
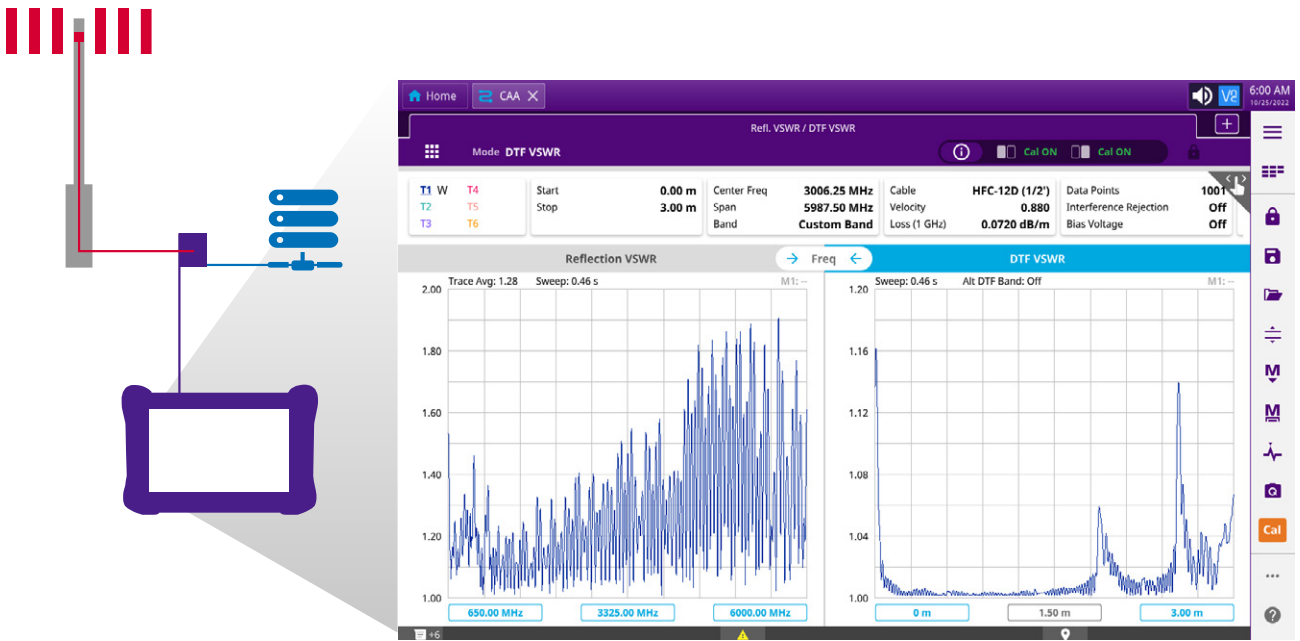
OneAdvisor 800 Coaxial Cable and Antenna Analysis – Return Loss

Easy Multi Band Antenna Testing

The larger display also allows for multiple pass/fail zones, this is especially useful when testing modern multiband antenna's commonly used in public safety vehicle installs.
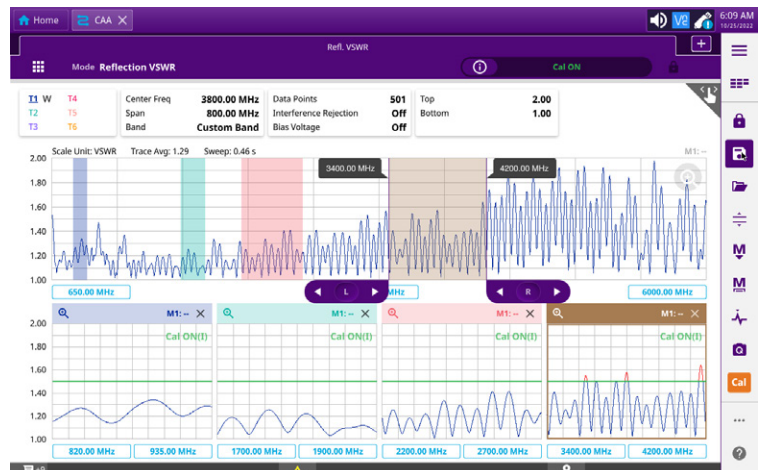
OneAdvisor 800 Cable and Antenna Analysis - Zoom

Cellular Signal Analysis

OneAdvisor 800 Signal Analysis functions provides the most comprehensive measurement techniques to effectively identify and characterize wireless signal quality. Including service cell site's identifier and key power indicators, as well as signal quality assessment of wireless control signals.
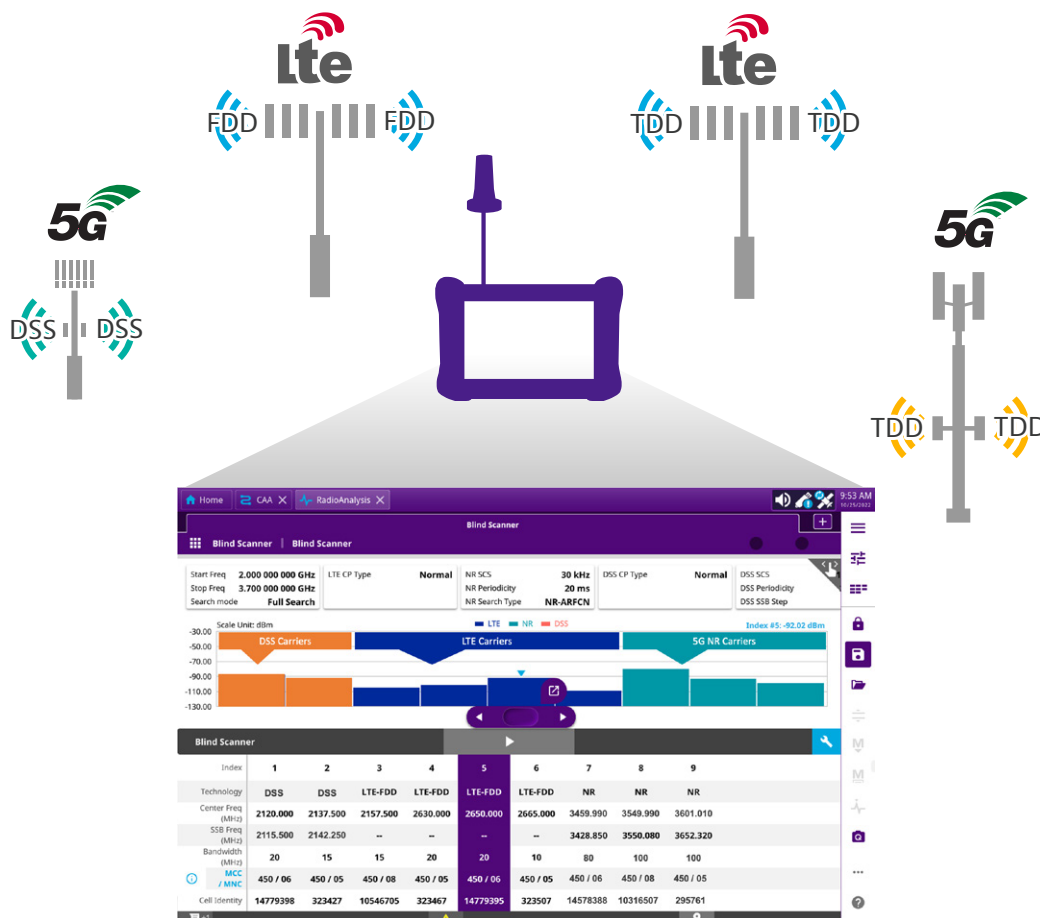
Key signal analysis measurement functions:
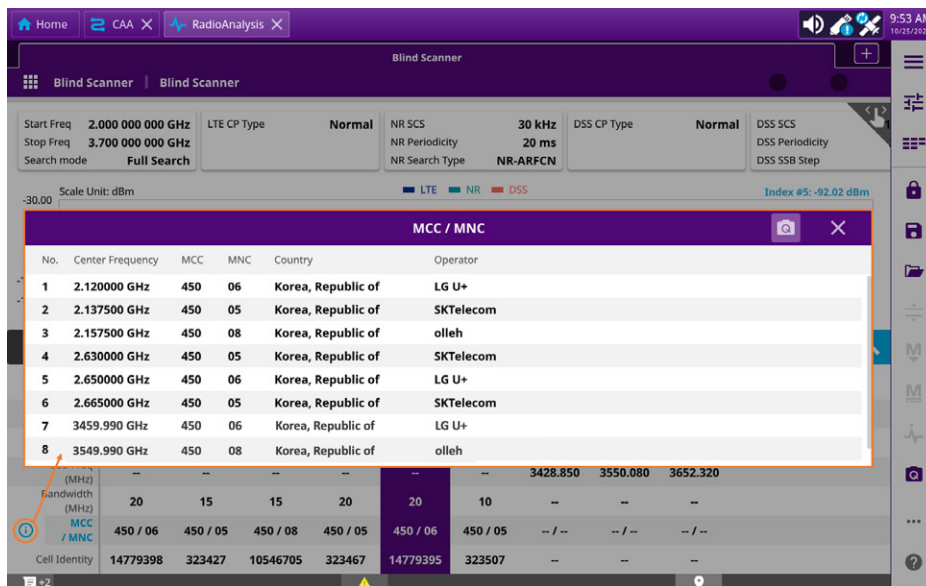
• Blind Scanner
• LTE Signal Analysis

Blind Scanner

OneAdvisor 800 is capable of performing a blind scan this allows for easy identification of 4G/5G cellular with only having to specific the bands or frequency range searching and identifying any of the following signal types:

• LTE Frequency Division Duplex (FDD)
• LTE Time Division Duplex (TDD)
• 5G New Radio (NR)
• Dynamic Spectrum Sharing (DSS)

Index	1	2	3	4	5	6	7	8	9
Technology	DSS	DSS	LTE-FDD	LTE-FDD	LTE-FDD	LTE-FDD	NR	NR	NR
Center Freq (MHz)	2120.000	2137.500	2157.500	2630.000	2650.000	2665.000	3459.990	3549.990	3601.010
SSB Freq (MHz)	2115.500	2142.250	--	--	--		3428.850	3550.080	3652.320
Bandwidth (MHz)	20	15	15	20	20	10	80	100	100
MCC / MNC	450 / 06	450 / 05	450 / 08	450 / 05	450 / 06	450 / 05	450 / 06	450 / 08	450 / 05
Cell Identity	14779398	323427	10546705	323467	14779395	323507	14578388	10316507	295761

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OneAdvisor 800 RF Blind Scanner

OneAdvisor 800 Blind Scanner PLMN code

LTE Signal Analysis

OneAdvisor 800 is capable of performing signal analysis in LTE-FDD and LTE-TDD signal formats, covering the following key measurements:

- RF Characterization: 3GPP conformance tests including, channel power, occupied bandwidth, adjacent channel leakage ratio, and spectrum emission mask

- LTE Over-the-Air: LTE carrier scanner for carrier aggregation validation; LTE ID scanner for multi-serving cell sites; LTE control channel for signal quality assessment; and LTE Route

- Map for service coverage verification
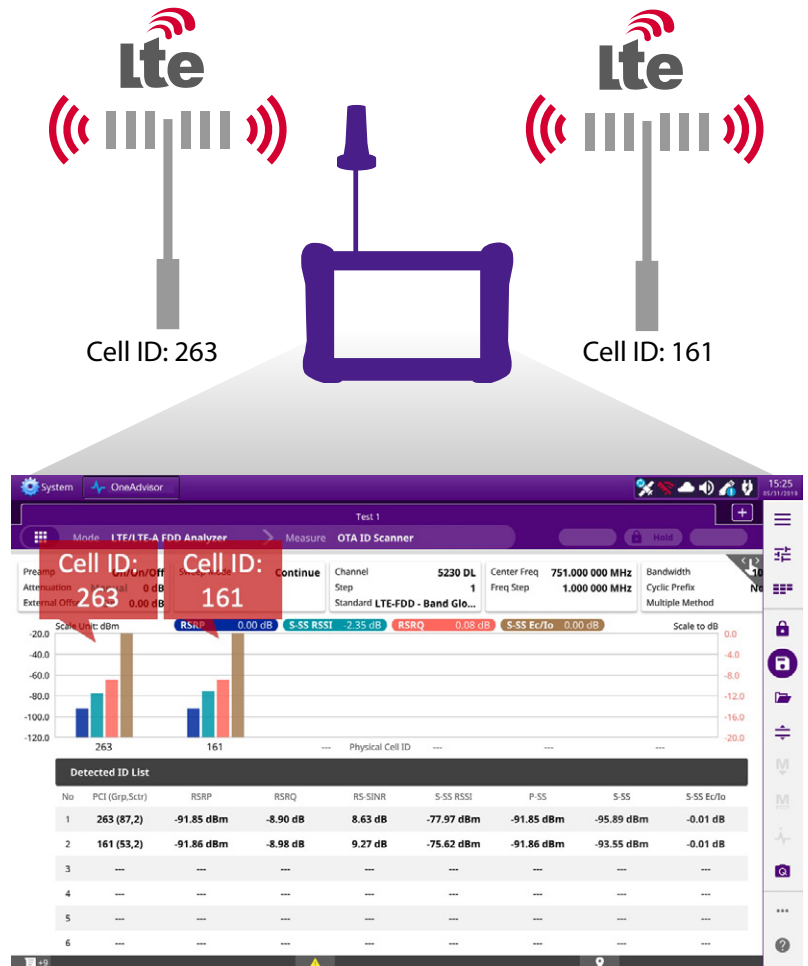
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OneAdvisor 800 LTE Signal Analysis - OTA ID Scanner

Test Process Automation with Job Manager and StrataSync

VIAVI Test Process Automation allows RF technicians to perform installation and maintenance tests with confidence:

• In accordance with mobile operator's test criteria

• Covering all radio types and topologies

• Automatically uploading test results to the StrataSync cloud with simple PASS/FAIL indicator
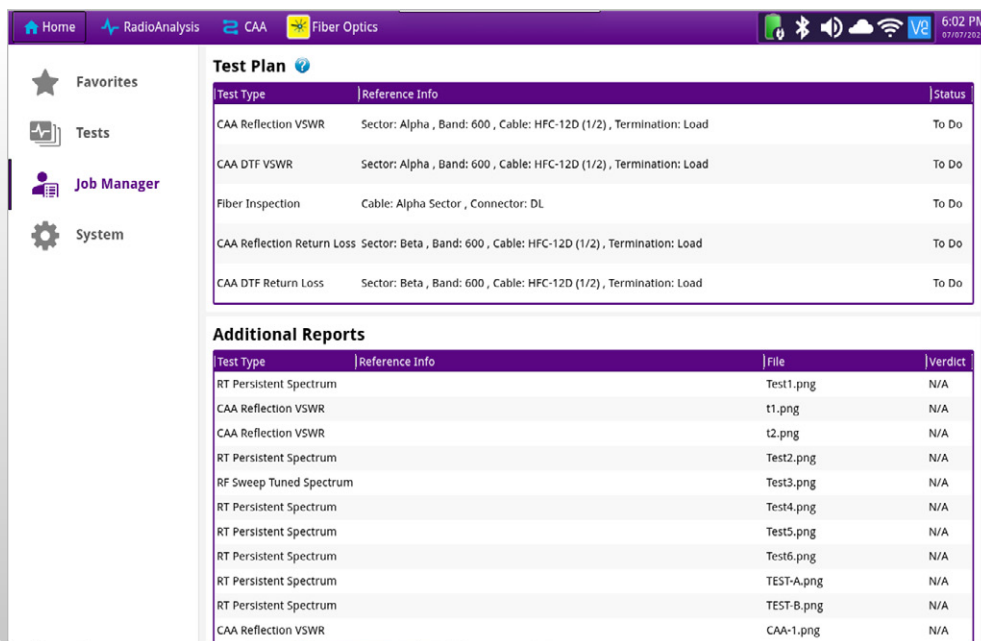
Job Manager

The VIAVI Job Manager automates test processes, offering mobile network operations and construction teams a self-guided test solution, improving efficiency in the field for radio site installation and maintenance.

Job Manager's automates the entire process ensuring the proper test sequence is executed according to mobile operator's requirements, configuration test time is minimized, and results are consistent and consolidated.

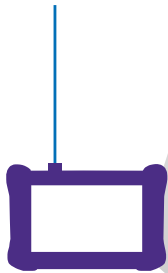OneAdvisor 800 Job Manager   1129.900.0522

StrataSync

VIAVI StrataSync is a cloud-hosted system that provides a centralized management of test solutions including test set management, test configurations, data management, and test results.

StrataSync is designed to eliminate email dispatches, manual test procedures, manual report consolidation, test solution availability and test devices that need calibration.
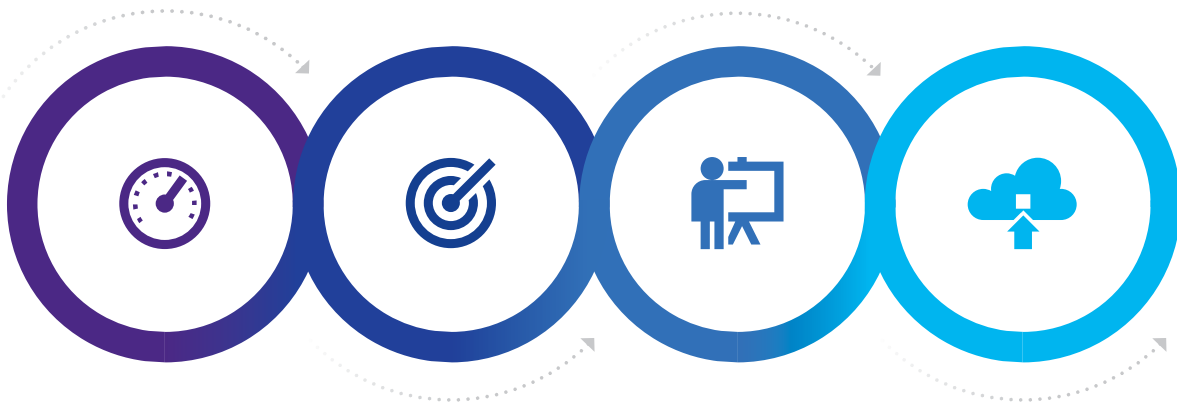
VIAVI StrataSync enabled

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StrataSync – Asset Management

Faster Work Speed
Eliminate wasted time trying to remember which tests to run and how to run them

Greater Consistency
Drive consistent, repeatable results, regardless of technician skill or experience

Lower Training Costs
New technicians get up to speed quickly with easy-to-follow prompts

Peace of Mind
Test results automatically saved to StrataSync cloud

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VIAVI Solutions

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