### Brochure

# Radio Access Verification with VIAVI OneAdvisor-800

VIAVI OneAdvisor-800 is the ideal portable test solution to verify and troubleshoot radio access networks for proper deployment and effective operation.

OneAdvisor design is based on a multi-functional architecture, covering different test applications, scaling and adapting to different user's groups, including among others:

- Radio construction, covering all test aspects of the transmission lines of any cell site, validating coaxial cable, antennas, as well as fiber characterization and inspection.
- Radio operation, covering radio's transmission verification according to 3GPP standards, maintenance practices assessing radio's power level and coverage, as well as the ability to identify and locate interference impairments.

#### Key test functions include:

- Cable and antenna reflection tests, distance to fault and cable loss
- Fiber inspection and fiber validation including OTDR testing
- Real-time persistence spectrum for 5G FR1 (9KHz to 6GHz)
- Spectrum analysis with gated sweep for interference analysis in LTE or 5G TDD signals
- RFoCPRI interference analysis to effectively characterize interfering signals as received by the radio
- Over-the-Air RF spectrogram testing and logging capability to effectively characterize intermittent interference signals
- Automatic Interference location when is paired with VIAVI's InterferenceAdvisor
- Interference finding with triangulation when is paired with VIAVI's AntennaAdvsior
- Spectrum route map, validating radio's coverage and signal propagation

OneAdvisor Fiber Validation

OneAdvisor Realtime Persistence Spectrum

OneAdvisor RFoCPRI Interference Analysis







# **Real-Time Persistence Spectrum**

OneAdvisor real-time spectrum analysis (RTSA) performs a persistence power measurement in high-speed providing 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.



Real-time Spectrum Analysis





OneAdvisor's RTSA is ideal to properly characterize signals that have different communication profile in timedomain, 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, and it also provides the ability to identify the presence and location of 5G beam signals, also referred as synchronization signal block (SSB), thanks to its 100MHz of instantaneous analysis bandwidth.

# **Interference Analysis**

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

Key interference analysis measurement functions:

- RFoCPRI interference analysis
   Interference Finder
- Received Signal Strength Indicator (RSSI)
   Spectrum Re-player

#### **RFoCPRI Interference Analysis**

RFoCPRI technology performs RF measurements through the fiber fronthaul which is the link between base band units and remote radio heads.

RFoCPRI verifies the control signals and extracts the RF (IQ) data transmitted between the BBU and RRH at the ground without the need to climb the tower.

Key benefit of RFoCPRI is that it enables monitoring and analysis of uplink signals (mobile devices), and PIM detection, precisely as they are received by the cell site.



OneAdvisor RFoCPRI (MIMO 4x4)

#### 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.

#### Spectrum Logging and Replaying

Spectrum can be logged and replay to identify intermittent interference signals.

Spectrum measurements logged can be played back in the spectrum, spectrogram or RSSI mode, and limit lines can be set to create failure points when signals exceed it.

The failure points are clearly displayed on the trace timeline for quick access during playback.

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17.70 Scale Unit: dBm			M2: 2.559 885 507 GHz / -94.16 dBm Scale Unit: dBm				Alarm Count: 0	
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7.70	Marker M1	Frequency 2500.03 MHz	Limit 0.0 dBm	0.000 COO MHz 0 Max -91.98 dBm	Min -93.97 dBm	Count Average -93.09 dBm	800 Alarm Off	
7.70	Marker M1 M2	Frequency 2500.03 MHz 2559.89 MHz	Umit 0.0 dBm 0.0 dBm		Min -93.97 dBm -96.20 dBm	Count Average -93.09 dBm -88.48 dBm	800 Alarm Off Off	
7.70	Marker M1 M2 M3	Frequency 2500.03 MHz 2559.89 MHz	Limit 0.0 dBm 0.0 dBm	-91.98 dBm -78.35 dBm	Min -93.97 dBm -96.20 dBm 	Count Average -93.09 dBm -88.48 dBm	800 Alarm Off Off	

OneAdvisor RSSI Measurement



OneAdvisor Spectrum Logging and Replaying

#### **Gated Sweep Spectrum**

Interference analysis in TDD signals requires a different measurement technique than conventional spectrum analysis since the uplink and downlink signals are transmitted on the same frequency, but different timeslots.

OneAdvisor performs gated sweep spectrum, effectively conducting spectrum measurements triggered only on the timeslots assigned for uplink transmission.



Gated Sweep Spectrum – Gate Time Setting



Gated Sweep Spectrum – Spectrum Analysis

#### **Interference Finder**

Interference Finder is an automatic triangulation algorithm that uses GPS coordinates to locate the source of interference based on three measurement reference points.

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



OneAdvisor Interference Finder

#### **Interference Hunting**

InterferenceAdvisor<sup>™</sup> 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 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.



OneAdvisor Spectrum Measurements



InterferenceAdvisor – Interference Hunting

# **Cell Site Cable Verification**

Cell site infrastructure is composed of fiber links from the switch into the base band unit, also referred as backhaul, as well as fiber links from base band unit to remote radio units, also referred as fronthaul, then the remote radio performs a digital to analog conversion setting the signal into a specific RF carrier with a specific center frequency, bandwidth, and power level through coaxial cables to the transmitting RF antennas.



Cell Site Infrastructure – Fiber to the Antenna

#### **Fiber Inspection**

The most common cause of signal degradation in an optical transmission system between transmitter, fiber link and receiver, is dirt on fiber connectors, which can get contaminated very easily when the connectors are exposed to the environment.

Therefore, the first step in achieving acceptable insertionand return-loss in fiber link is by inspecting the fiber connector's end-faces with OneAdvisor equipped with a fiber microscope, capable of performing standard-based PASS/FAIL measurements, collecting results and creating comprehensive close-out reports.



Fiber Inspection

#### **Fiber Characterization**

Fiber is more prevalent in cell sites of any kind, from small cells and macro cells, to distributed antenna systems (DAS) and centralized radio access network (C-RAN).

The most effective test to characterize a fiber link is with an optical time-domain reflectometer (OTDR).

OneAdvisor can be equipped with an OTDR module capable of performing fiber testing for single-mode and/or multimode fibers in a simple, fast, and cost-effective manner.



Fiber Characterization – OTDR

#### Cable and Antenna Analysis (CAA)

OneAvisor can be equipped with a CAA module allowing cell technicians to perform sweep testing for RF cable and antenna verification, including:

- Return Loss and VSWR
- Distance to Fault
- Cable Loss

OneAdvisor's user-friendly GUI with intuitive PASS/FAIL results instantly identifies problems and enables technicians to easily determine if the cell site meets the coaxial transmission specifications.



Coaxial Cable and Antenna Analysis – Return Loss

# Test Process Automation with Job Manager and StrataSync

VIAVI's Test Process Automation allows cell technicians to perform installation and maintenances tests with confidence:

- In accordance with mobile operator's test criteria
- Covering all radios types (LTE and 5G) and topologies (Macro-cell, Small-cell, C-RAN, and/or DAS)
- Automatically uploading test results to the StrataSync cloud with simple PASS/FAIL indicator

#### Job Manager

VIAVI's Job Manager automates test processes, offering mobile network operations and cell site construction teams a self-guided test solution, improving efficiency in the field for cell-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.

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	Test Plan 🥝			
Favorites	Test Type	Reference Info		Status
	CAA Reflection VSWR	Sector: Alpha , Band: 600 , Cable: HFC-12D (1/2) , Termination: Load		To Do
Job Manager	CAA DTF VSWR	Sector: Alpha , Band: 600 , Cable: HFC-12D (1/2) , Termination: Load		To Do
	Fiber Inspection	Cable: Alpha Sector , Connector: DL		To Do
System	CAA Reflection Return L	oss Sector: Beta , Band: 600 , Cable: HFC-12D (1/2) , Termination: Load		To Do
	CAA DTF Return Loss	Sector: Beta , Band: 600 , Cable: HFC-12D (1/2) , Termination: Load		To Do
	Additional Repo	Irts Reference Info	File	Verdict
	RT Persistent Spectrum	Reference into	Test1.png	N/A
	CAA Reflection VSWR		t1.png	N/A
	CAA Reflection VSWR		t2.png	N/A
	RT Persistent Spectrum		Test2.png	N/A
	RF Sweep Tuned Spectru	ım	Test3.png	N/A
	RT Persistent Spectrum		Test4.png	N/A
	RT Persistent Spectrum		Test5.png	N/A
	RT Persistent Spectrum		Test6.png	N/A
	RT Persistent Spectrum		TEST-A.png	N/A
	RT Persistent Spectrum		TEST-B.png	N/A
	CAA Reflection VSWR		CAA-1.png	N/A

OneAdvisor Job Manager

#### StrataSync

StrataSync is VIAVI's 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.

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Asset class	Asset Type	Model	Serial No	Tech ID	Asset Status	Firmware	HW Version		
Syncable	CellAdvisor CAA	JD723C	BEF31069	rftest1234	Active	1.068.001	1.000		
Syncable	CellAdvisor BSA	JD745B	EFA41184	rftest1234	Active	3.110.023	4.000		
Syncable	CellAdvisor BSA	JD745B	GAH41868	rftest1234	Active	3.110.025	4.000		
Syncable	CellAdvisor 5G	CA5000	CA5N003	rftest1234	Active	5.055.025r-1	004		
Module	CellAdvisor 5G-module	Advisor SHIM	WHAK0041490005	rftest1234	Active		004		
Module	CellAdvisor 5G-module	4136 MA3FCO	00791	rftest1234	Active		16		
Module	CellAdvisor 5G-module	Advisor SHIM	WHAK0052090001	rftest1234	Active		005		
Module	CellAdvisor 5G-module	4146 QUAD	34208	rftest1234	Active		27		
Syncable	ONA-800	ONA-800	WMSR0011600010	rftest1234	Active	1.2.0-79d5204.	008		
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Module	ONA-800-module	IDB-SA	WMSG0042000020	) rftest1234	Active		004		
Module	ONA-800-module	ONA-800A-DISPL	WMSS0021600010	rftest1234	Active		002		
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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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To reach the VIAVI office nearest you, visit viavisolutions.com/contact

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