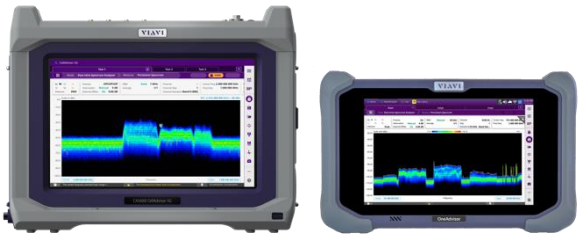


5G TDD Auto Gated Spectrum (TAGS)

CellAdvisor 5G | OneAdvisor-800

Table of Contents

1. Scope

This document describes how to configure the CellAdvisor 5G or OneAdvisor-800 form 5G interference analysis with TDD Auto-Gated Spectrum (TAGS).
The required products and parts to complete this procedure are as follows:

Description	Diagram

CellAdvisor 5G or OneAdvisor-800 with the following functions:
- OneAdvisor-800 platform equipped with the following modules and options:
  ○ SPA06MA or SPA06MA-O: Spectrum Analyzer 9KHz to 6GHz or 9KHz to 6GHz with Optical HW
  ○ ONA-SP-GNSS: GPS connectivity with GPS antenna
  ○ ONA-SP-TAGS: TDD Auto-Gated Spectrum
- CellAdvisor 5G platform equipped with the following modules and options:
  ○ CA5000-F002 or CA5000-F002-O: Frequency for 5G NR FR1 up to 6 GHz and FR2 up to 40 GHz or Frequency for 5G NR FR1 up to 6 GHz and FR2 up to 40 GHz with Optical HW
  ○ CA5000-B100: 100 MHz/100 MHz analysis bandwidth
  ○ CA5000-S002: GPS connectivity with GPS antenna
  ○ CA5000-S021: TDD Auto-Gated Spectrum
	
	OneAdvisor-800
	 
	CellAdvisor 5G

C-Band Antennas
- Broadband Directional Antennas:
  ○ G700050366: RF Log Periodic Antenna SMA-f 650 to 4000 MHz 1.85 dBd.
  ○ G700050367: RF Log Periodic Antenna SMA-f 650 to 6000 MHz 2.85 dBd.
	
	Directional Antenna

2. CellAdvisor 5G and OneAdvisor-800 Overview

The CellAdvisor 5G and OneAdvisor-800 are portable instruments for radio access installation, maintenance, and optimization. Their main test functions include:

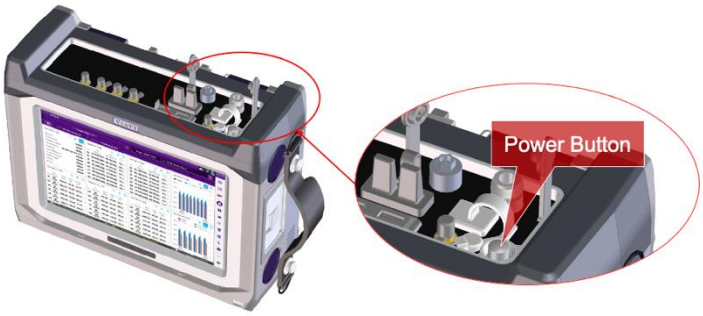
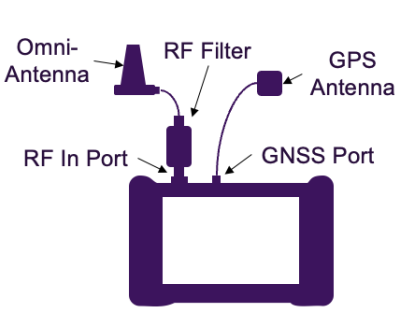
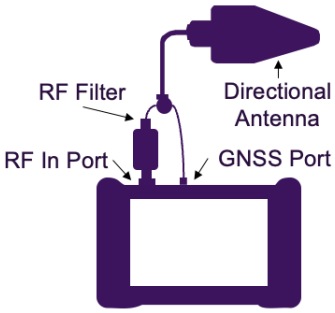
- Realtime Spectrum Analysis
- Interference Analysis
- LTE-TDD and LTE-FDD Signal Analysis
- 5GNR Signal Analysis
- NSA Signal Analysis (multi-carrier LTE and 5G)
- DSS Signal Analysis (co-channel LTE and 5G)
- Blind Scanner (DSS, LTE and 5G)
- RFoCPRI Interference Analysis

2.1 5G C-Band Analysis

The following procedure describes the steps to perform 5G TDD Interference Analysis using TAGS with the CellAdvisor 5G or OneAdvisor-800.

2.1.1 Initial Setup

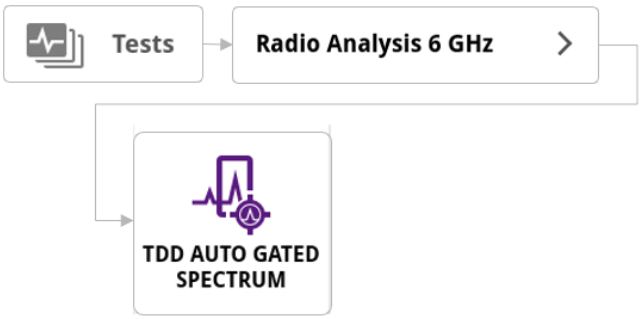
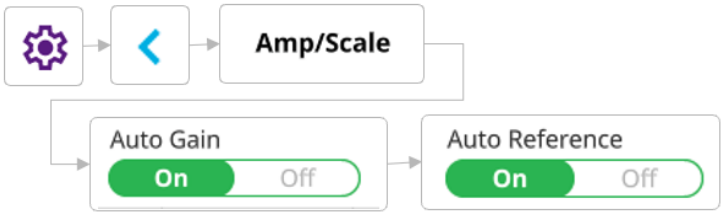
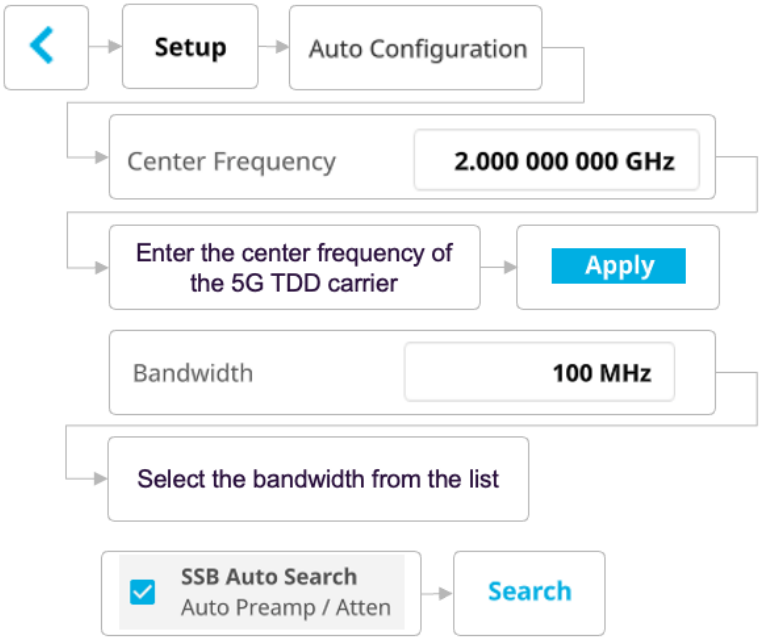
The following procedure describes the initial setup of cable and antenna analysis, including turn-up and connectivity.

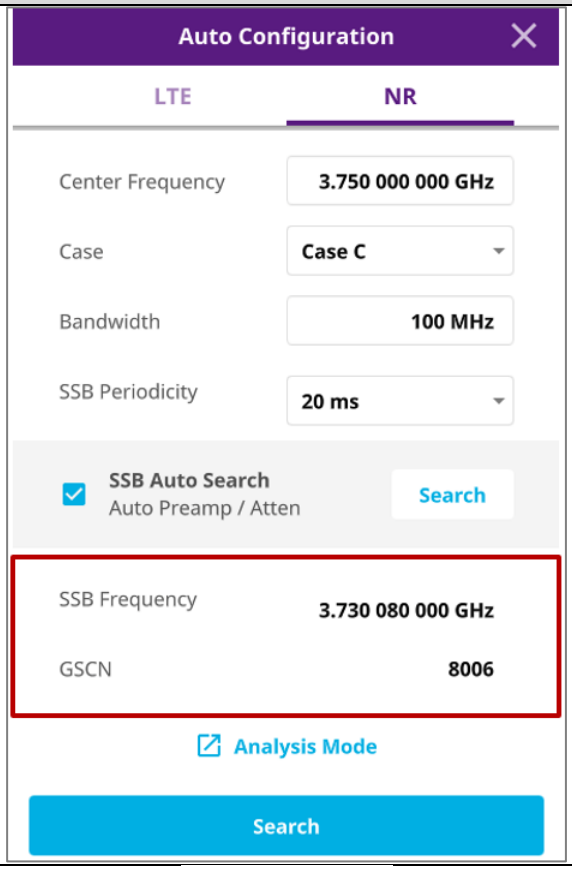
Step	Action	Description
1	Power ON the instrument	Press and hold the ON/OFF button for 3 seconds  OneAdvisor-800  CellAdvisor 5G
2	Connect the RF antenna into the instrument RF-In port: • Omni-antenna for drive test • Directional antenna for walk test.	 Omni-Antenna Setup  Directional Antenna Setup

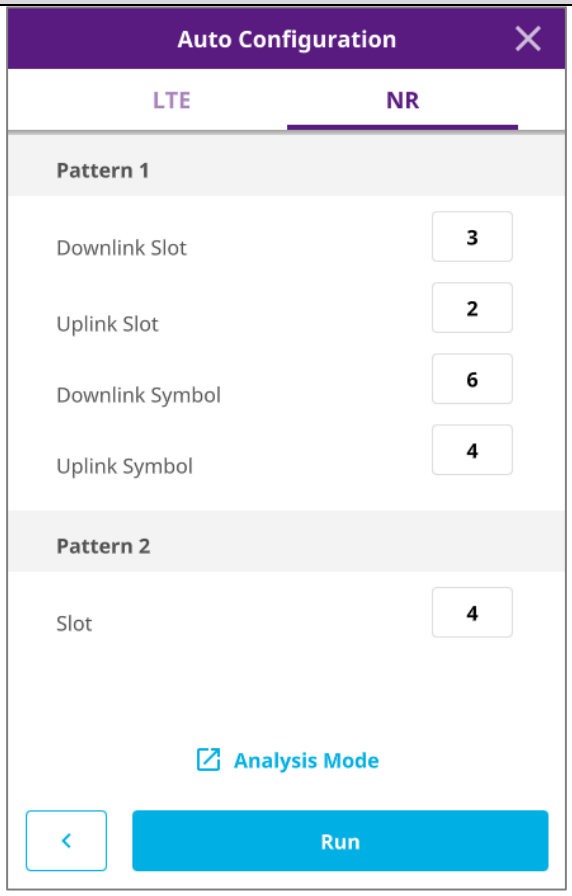
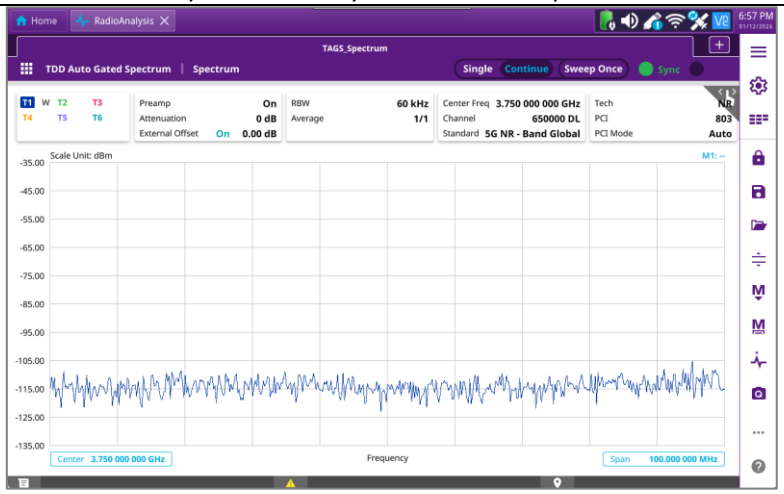
2.1.2 5G TDD Interference Analysis with TAGS

The following procedure describes the steps to perform 5G TDD Interference Analysis with TAGS.
There are two different ways to easily test 5G TDD Interference Analysis with TAGS, via Blind Scanner or directly accessing the test function TDD Auto Gated Spectrum.

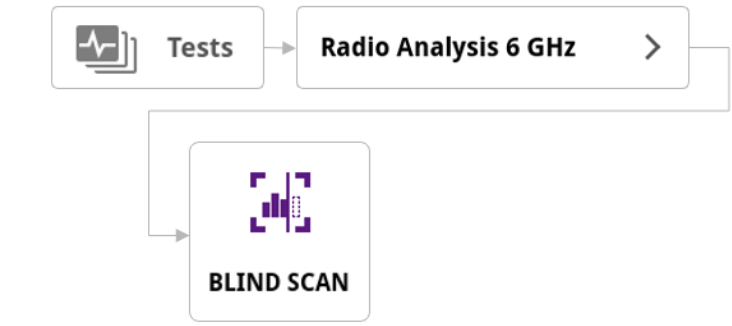
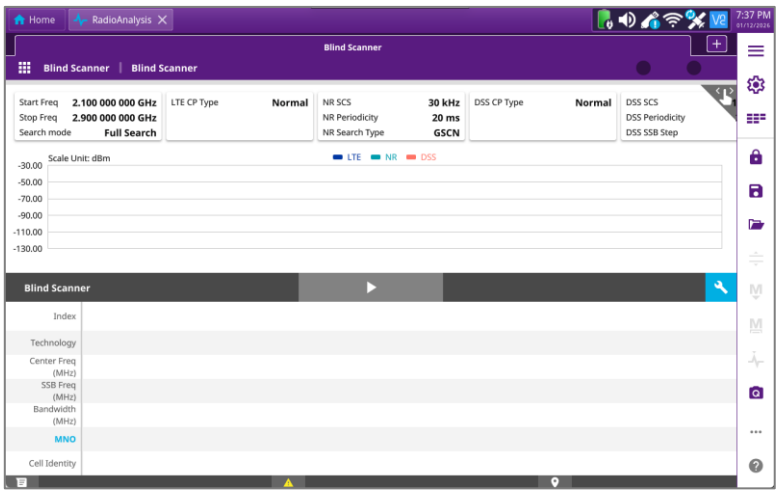
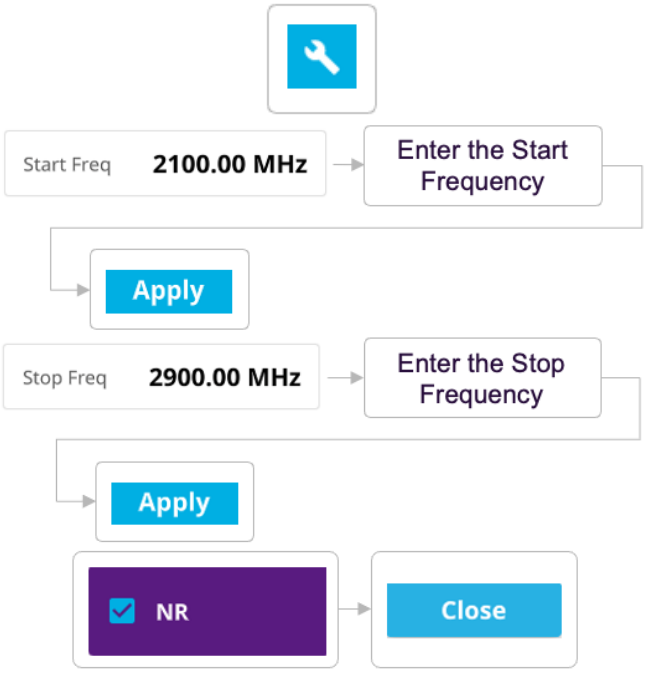
2.1.2.1 5G TAGS via Test Function TDD Auto Gated Spectrum

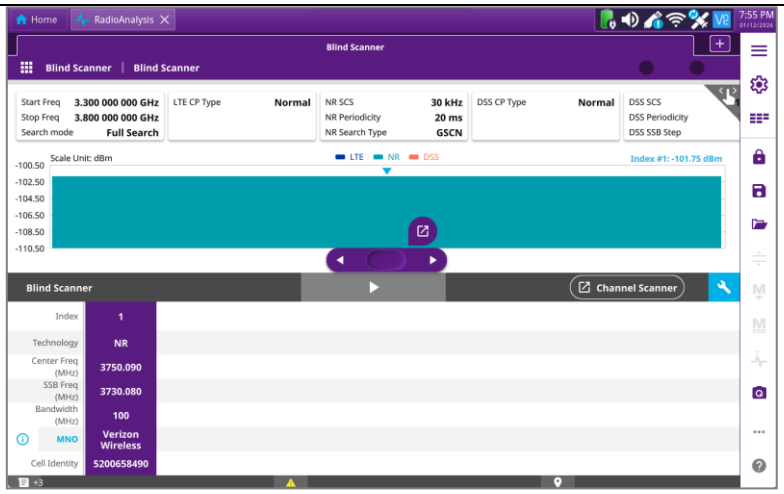
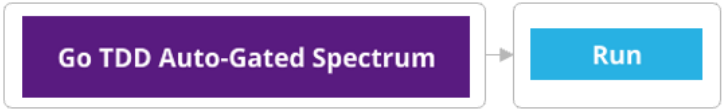
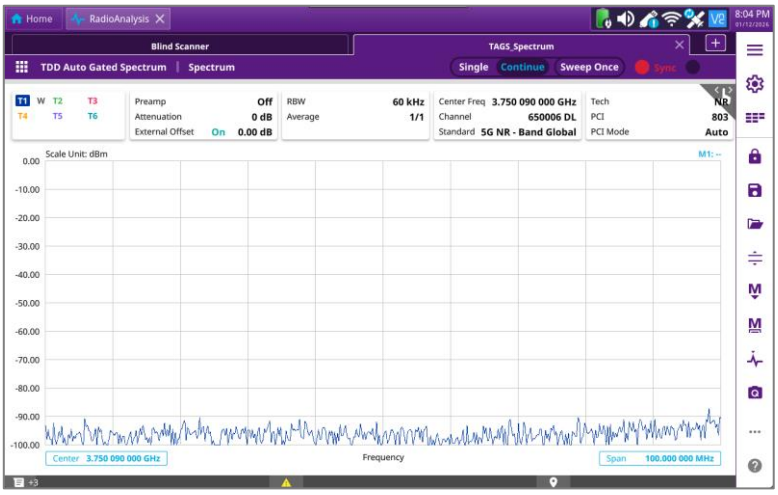
Step	Action	Description
1	Select the following: • [Test] • [Radio Analysis 6GHz] • [TDD Auto Gated Spectrum]	 TDD Auto Gated Spectrum
2	Set Auto Gain to ON by selecting: • [Setup Icon] • [Back Icon] • [Amp/Scale] • [Auto Reference] toggle to ON • [Auto Gain] toggle to ON	 Auto Reference: ON, Auto Gain: ON
3	Set Auto Configuration by selecting: • [Setup Icon] • [Auto Configuration] • [Center Frequency] number • Enter the center frequency of the 5G TDD carrier • [Apply] • [Bandwidth] value • Select the bandwidth from the list • [Check box] SSB Auto Search • [Search] Note: Make sure the SSB frequency and GSCN are displayed, otherwise verify the carrier center frequency and bandwidth settings, or RF antenna connection and select [Search].	 Sets Carrier Frequency and Automatically Search for Broadcast Beam (SSB)

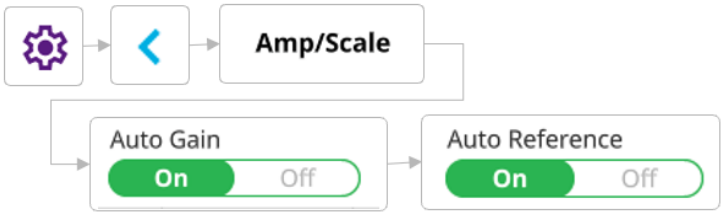
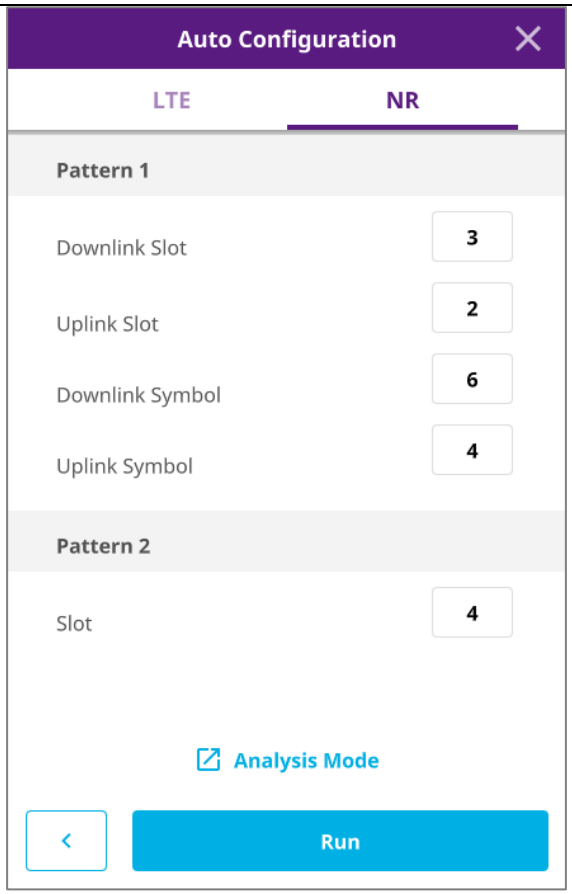
Step	Action	Description
		
4	Once the SSB frequency is obtained select: • [Search] Note: Make sure the 5G frame format values are obtained, otherwise select [Search] again. In some non-standalone cases the frame format is not transmitted on the 5G carrier, therefore the frame should be configured manually, please go to section Non-Stand Alone and Optional Adjustments for additional information.	 Automatically Gets the 5G TDD Frame Configuration (Downlink and Uplink Slots and Symbols)

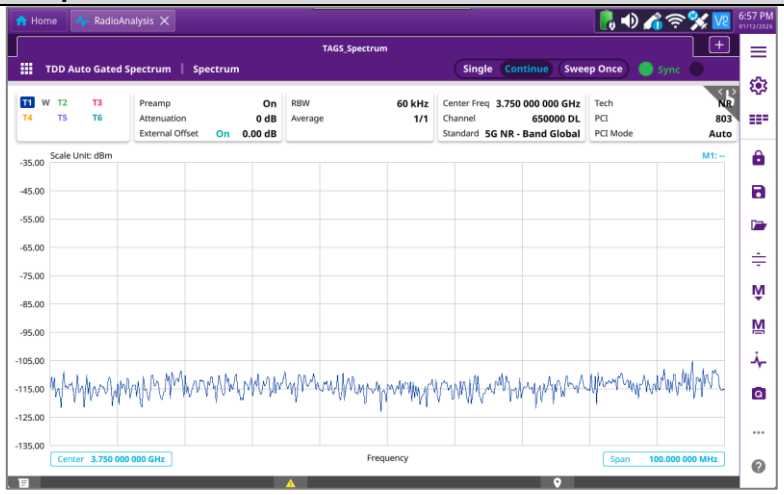
Step	Action	Description
	Once it is obtained the 5G TDD frame format select: • [Run] Note: This configuration will automatically trigger the spectrum in the 5G flexible symbols (pattern 1)	 5G TDD Frame Configuration  Spectrum Analysis on 5G TDD Uplink
5	TAGS Spectrum Analysis is enabled and set with the following characteristics: • Spectrum triggered on flexible slots where no downlink or uplink traffic are present, ideal for fast interference detection and location. • Spectrum is synchronized with the 5G broadcast beam, eliminating time drift of the measurement with 5G frame.	 TAGS 5GTDD Interference Analysis

2.1.2.2 5G TDD Interference Analysis with Blind Scan

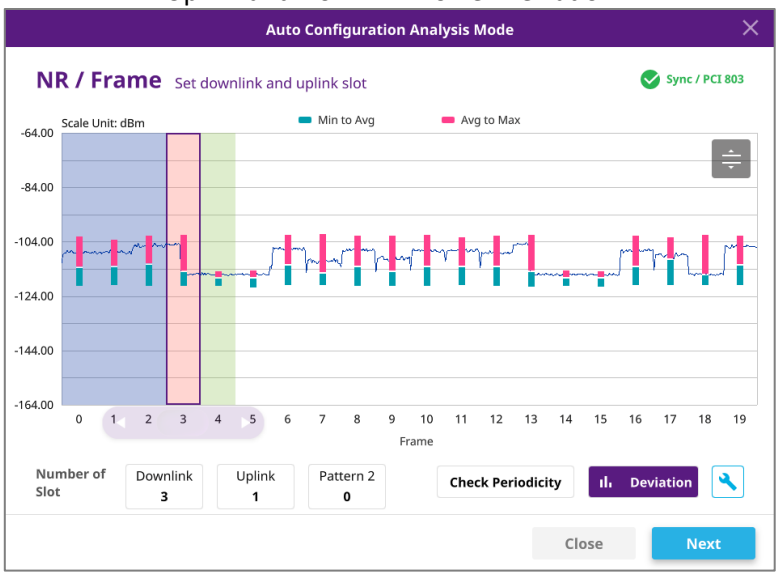
Step	Action	Description
1	Select the following: • [Test] • [Radio Analysis 6GHz] • [TDD Auto Gated Spectrum In the Blind Scan test function select	  Blind Scan
2	Configure the Blind Scan by selecting: • [Configuration Wrench] • [Start Frequency] • Enter the Start Frequency (e.g. 3.3 GHz) • [Apply] • [Stop Frequency] • Enter the Stop Frequency (e.g. 3.8 GHz) • [Apply] • [NR] • [Close]	 Blind Scan Configuration

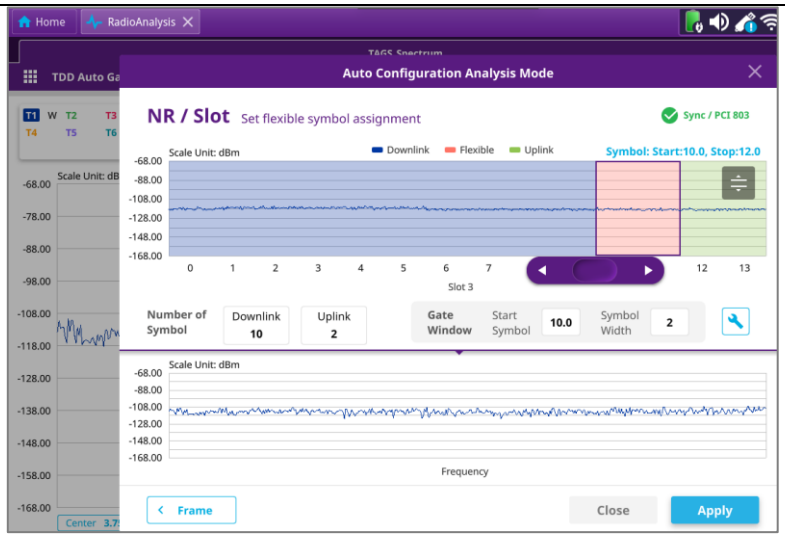
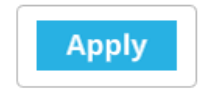
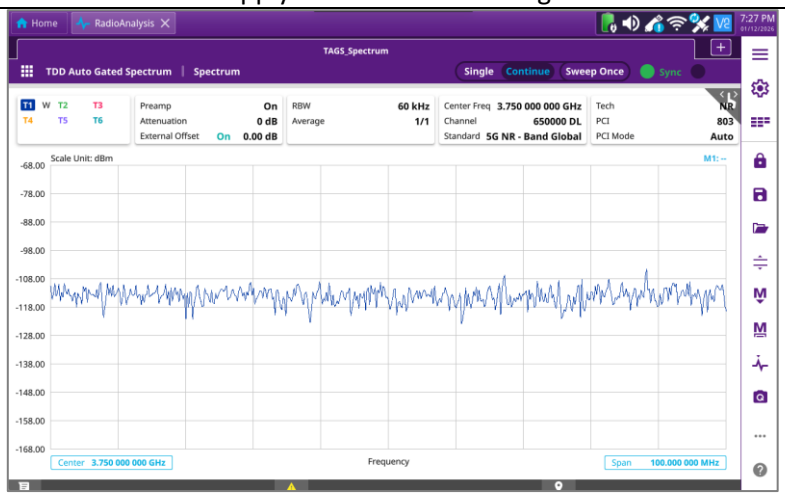
Step	Action	Description
3	Run the Blind Scan by selecting: • [Play]	 Run Blind Scan
4	Blind Scan result	 Blind Scan Result
5	To perform TAGS on a 5G carrier, select: • The carrier to be tested • [Open Window Icon] • [Go TDD Auto-Gated Spectrum] • [Run] Note: At this stage TAGS test function is running with the center frequency set of the carrier found in Blind Scan, and is required to enable TAGS.	 Carrier Open Window  TAGS Test  TAGS Spectrum

Step	Action	Description
6	Set Auto Gain to ON by selecting: • [Setup Icon] • [Back Icon] • [Amp/Scale] • [Auto Reference] toggle to ON • [Auto Gain] toggle to ON	 Auto Reference: ON, Auto Gain: ON
7	Automatically obtain the 5G TDD frame configuration (Downlink and Uplink Slots and Symbols) by selecting: • [Back Arrow] • [Setup] • [Auto Configuration] • [Search]	  Automatically Gets the 5G TDD Frame Configuration (Downlink and Uplink Slots and Symbols)
8	Once it is obtained the 5G TDD frame format select: • [Run] Note: This configuration will automatically trigger the spectrum in the 5G flexible symbols (pattern 1)	 5G TDD Frame Configuration  Spectrum Analysis on 5G TDD Uplink

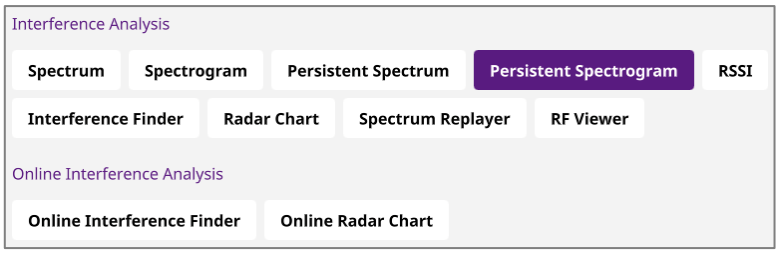
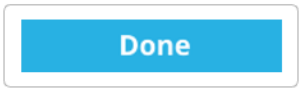
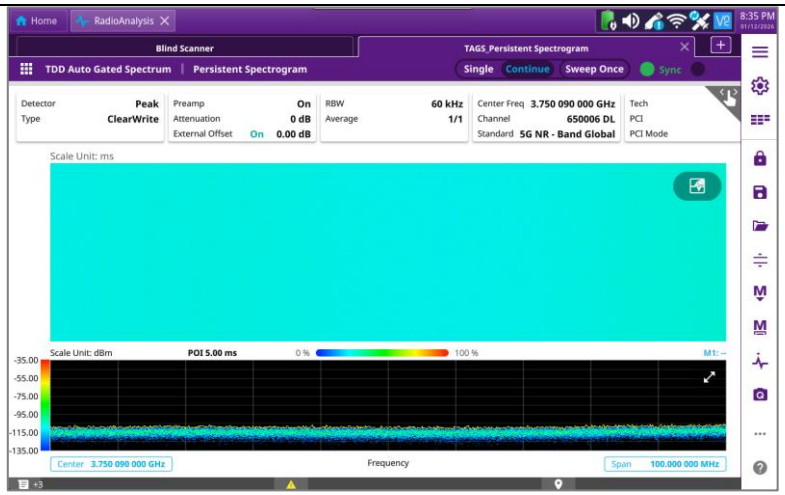
Step	Action	Description
9	TAGS Spectrum Analysis is enabled and set with the following characteristics: • Spectrum triggered on flexible slots where no downlink or uplink traffic are present, ideal for fast interference detection and location. Spectrum is synchronized with the 5G broadcast beam, eliminating time drift of the measurement with 5G frame.	 TAGS 5GTDD Interference Analysis

2.1.3 Non-Stand Alone and Optional Adjustments

Step	Action	Description
1	In case the 5G frame is information is not obtained, e.g. in some cases of Non-Stand Alone (NSA), or if it is desired to change the trigger window select: • Setup Icon] • [Auto Configuration] To increase visibility of Downlink and Uplink power deviation select: • [Deviation] If needed change the Slot to be analyzed, by default is Slot #3 and select: • [Next]	 5G TDD Manual Frame Configuration  Uplink and Downlink Power Deviation  5G Frame with DL and UL Power Deviation

Step	Action	Description
		 Next Shows Slot Configuration
2	The NR / Slot chart shows the 14 symbols of the slot selected (e.g. Slot 3), allowing to change the spectrum gate window by: • Moving the slide button through the slot. The bottom graph is the spectrum measurement of the defined gate window. To apply the setting select: • [Apply] Note: the areas of Downlink, Flexible, and Uplink with different colors, can only be for presentation purposes if the frame format was not obtained.	 TAGS Analysis Mode (Slot): Gate Window Configuration  Apply Gate Window Settings
3	TAGS Spectrum Analysis is enabled and set with the following characteristics: • Spectrum triggered accordingly to Gate Window configured by Slot and Symbol. • Spectrum is synchronized with the 5G broadcast beam, eliminating time drift of the measurement with 5G frame.	

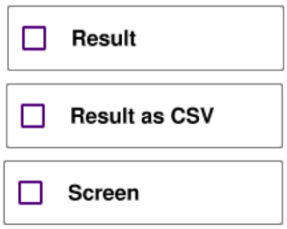
2.1.4 TAGS Measurement Modes

Step	Action	Description
1	To change the TAGS measurement mode from Spectrum, select: • [Test Functions Icon] • Select the desired test function, e.g. [Persistent Spectrogram] • [Done]	 Test Functions   Change TAGS Measurement Mode
2	TAGS Measurement Mode	 TAGS Persistent Spectrogram

3. Annex

3.1 Save Measurement Results

The following procedure describes the steps to save measurement results with OneAdvisor-800

Step	Action	Description
1	Saving measurements - Select the save icon and enter file name - Select the type of file to save: ○ Result (to be replayed or post-processed by the CellAdvisor 5G) ○ Result as CSV, to be post-processed by a PC application ○ Screen, as a picture - Select the destination to save the file - Select “Save”	 Save and File Name Sequence  File Type as Result, Result as CSV or Screen  Select the destination either Internal or USB  Select Save

4. Technical Support

Technical support is provided by:

- Phone: 1-844-GO-VIAVI (1-844-468-4284) options 3-2-3
- Email: diagnostics.tac@viavisolutions.com

Regularly new firmware updates for the CellAdvisor 5G are released and it is recommended to keep the instrument in the latest firmware to provide all the enhancements and bug fixes.

- For firmware updates go to: http://celladvisor.updatemyunit.net/
- For additional information of cell site test go to: http://www.viavisolutions.com/en/products/network-test-and-certification/cell-site-test