



5G NR Signal Analysis Guide

OneAdvisor 800

Table of Contents

1. Scope	2
2. OneAdvisor 800 Overview	3
3. 5G Radio Verification	4
3.1 Overview	4
3.1.1 Test Setup	4
3.1.2 5G Radio – Downlink Spectrum	5
3.1.3 Uplink Spectrum – TDD Auto-Gated Spectrum (TAGS)	6
3.1.4 PCI Scan: 5G Radio Physical Cell Identity	9
3.1.5 Time Drift: 5G Time and Frequency Verification	11
4. 5G Network Verification	13
4.1 Overview	13
4.1.1 Test Setup	13
4.1.2 Network Coverage of 4G and 5G	13
4.1.3 Cell Phase Synchronization	16
5. Annex.....	20
5.1 Save Measurement Results.....	20
5.2 Creating Maps for OneAdvisor-800	20
6. Technical Support.....	23

1. Scope

This document describes how to configure the OneAdvisor 800 for 5G NR analysis, including:

- RF spectrum profile: Realtime Spectrum
- TDD Interference: Gated Spectrum
- PCI Scan: Carrier Scanner and Beam Analysis
- Time Drift: Frequency and Time Error Variation
- Cell Phase Synchronization
- Coverage Map: 5G NR Route Map

The required products and parts to complete this procedure are as follows:

Description	Diagram
<p>CellAdvisor 5G or OneAdvisor-800 with the following functions:</p> <ul style="list-style-type: none"> - OneAdvisor-800 platform equipped with the following modules and options: <ul style="list-style-type: none"> o SPA06MA or SPA06MA-O: Spectrum Analyzer 9KHz to 6GHz or 9KHz to 6GHz with Optical HW o ONA-SP-GNSS: GPS connectivity with GPS antenna o ONA-SP-GSS: Gated Sweep Spectrum o ONA-SP-5GOTA: 5GNR OTA Beamforming analyzer o ONA-SP-CPS: 5G Cell Phase Synchronization 	 <p style="text-align: center;">OneAdvisor-800</p>
<p>RF Antennas:</p> <ul style="list-style-type: none"> - Either of the following broadband omni-antennas: <ul style="list-style-type: none"> o G700050350: RF omni antenna Type-N(m); 3300 to 3800 MHz o G700050345: Mag mount RF omni antenna Type-N(m) 600 MHz to 6 GHz - Either of the following broadband directional antennas: <ul style="list-style-type: none"> o G700050366: RF Log Periodic Antenna SMA-f 650 to 4000 MHz 1.85 dBd o G700050367: RF Log Periodic Antenna SMA-f 650 to 6000 MHz 2.85 dBd 	 <p style="display: flex; justify-content: space-around;"> Omni-Antenna Mag-Mount Antenna </p> <p style="text-align: center;">Directional Antenna</p>

2. OneAdvisor 800 Overview

The OneAdvisor 800 is a portable instrument for radio access installation, maintenance, and optimization. Their main test functions include:

RF Testing

- 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

Cable Testing

- Reflection (Return Loss, VSWR)
- Distance to Fault (Return Loss, VSWR)
- Cable Loss
- Insertion Gain Loss

x-Haul Testing

- Ethernet Test (1G, 10G, 25G, 100G)
- Sync and Timing (PTP/1588)
- 5G NR Discovery
- Network Devices: Throughput, Latency, Frame Loss (RFC 1544 / 5180)
- Ethernet Service Activation (Y.1564)

Fiber Testing

- Fiber inspection (Fiber Scope P5000i or FiberCheck)
- Fiber Characterization (OTDR)



OneAdvisor 800

3. 5G Radio Verification

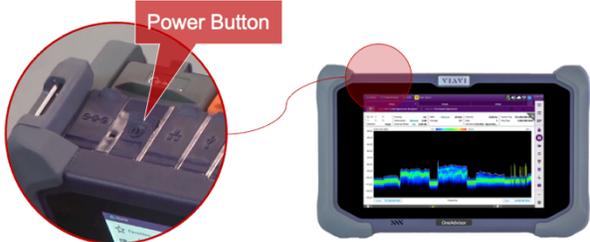
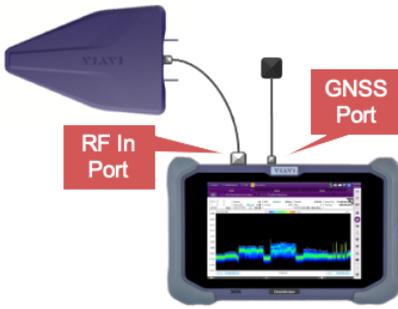
The following procedure describes the steps to perform 5G radio verification over the air with the OneAdvisor 800.

3.1 Overview

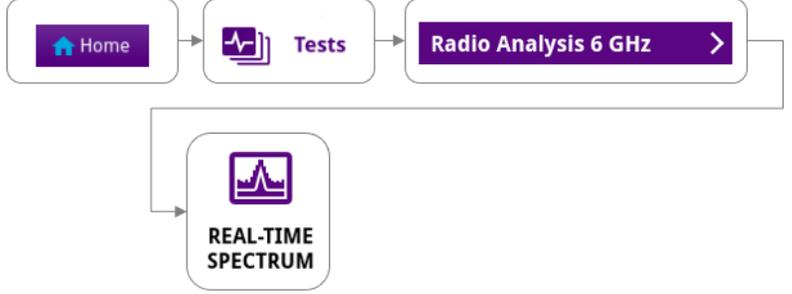
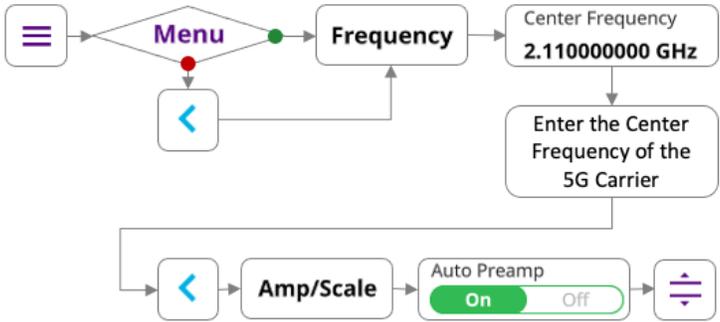
The following procedure describes the steps to perform 5G Radio Verification, including:

- **Downlink Spectrum:** Realtime spectrum of the signal transmitted by the radio to verify carrier’s center frequency and power.
- **Uplink Spectrum:** TDD Interference analysis with gated spectrum
- **PCI Scan:** 5G beam analysis to verify the carrier power, modulation quality, beam forming and PCI values
- **Time Drift:** 5G time and frequency to verify 3GPP stability requirements ($\leq \pm 1.5\mu s$) against GPS.

3.1.1 Test Setup

Step	Action	Description
1	Power ON OneAdvisor-800	<p>Press and hold the ON/OFF button for 3 seconds</p>  <p style="text-align: center;">OneAdvisor-800</p>
2	<p>For 5G radio verification, connect the following antennas into the OneAdvisor 800:</p> <ul style="list-style-type: none"> - Directional antenna into the Spectrum Analyzer RF In port. - GPS antenna into the GNSS port. 	 <p style="text-align: center;">OneAdvisor 800 with RF antennas (Directional and GPS)</p>

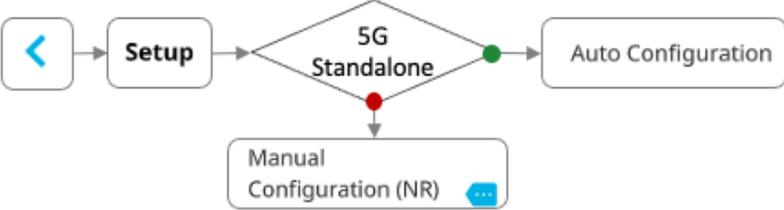
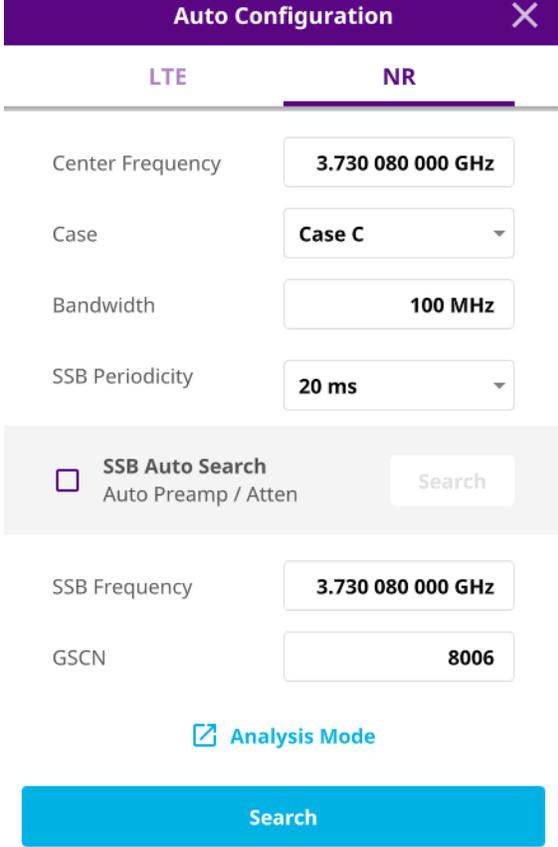
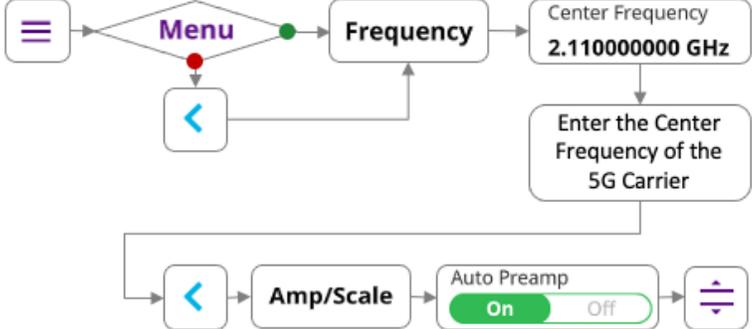
3.1.2 5G Radio – Downlink Spectrum

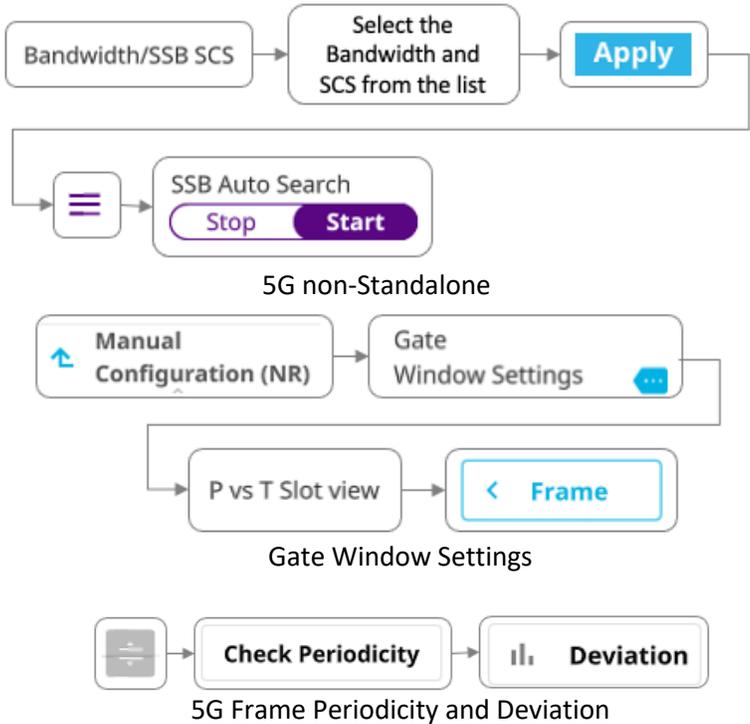
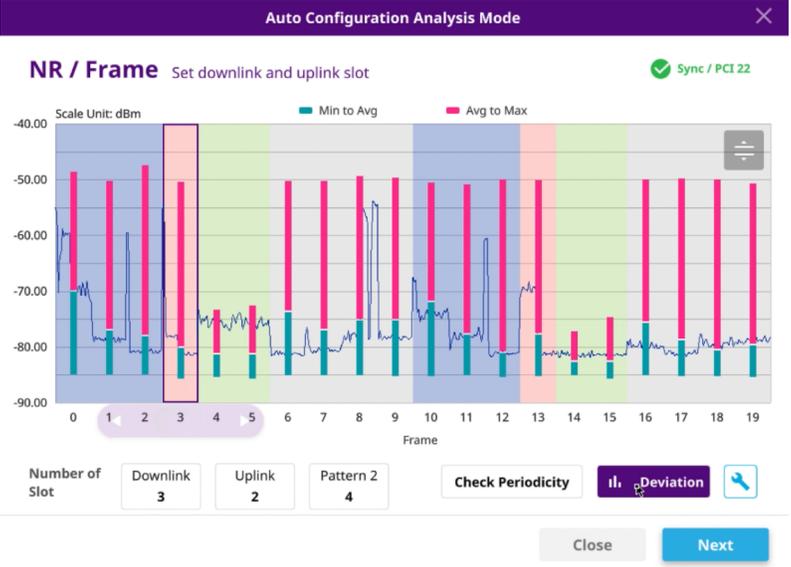
Step	Action	Description
1	<p>Test Mode: Realtime Spectrum Analysis.</p> <p>To start real-time spectrum analysis, select:</p> <ul style="list-style-type: none"> - {Home}, {Tests}, {Radio Analysis}, {Real-time Spectrum} 	 <p style="text-align: center;">Real-time Spectrum Measurement Mode</p>  <p style="text-align: center;">Real-time Spectrum</p>
2	<p>Configuration: Configure the amplitude and frequency settings by selecting:</p> <ul style="list-style-type: none"> - {Settings}, if the title is not “Menu” {Back Arrow}, {Frequency}, {Center Frequency}, Enter the Center Frequency of the 5G Carrier, {Back Arrow}, {Amp/Scale}, {Auto Preamp: On}, {Auto-Scale} 	 <p style="text-align: center;">Frequency and Amplitude Settings</p>

Step	Action	Description
3	<p>Result: verify carrier's center frequency, bandwidth, and power level.</p> <p>Note: To save a measurement result refer to Section 5.1 Save Measurement Results</p>	<p style="text-align: center;">5G Real-time Spectrum</p>

3.1.3 Uplink Spectrum – TDD Auto-Gated Spectrum (TAGS)

Step	Action	Description
1	<p>Test Mode: To test Uplink Spectrum with TAGS, select:</p> <ul style="list-style-type: none"> - {Home}, {Tests}, {Radio Analysis}, {TDD Auto-Gated Spectrum} 	<p style="text-align: center;">TAGS Measurement Mode</p>
2	<p>Configuration: Configure the amplitude and frequency settings by selecting:</p> <ul style="list-style-type: none"> - {Settings}, if the title is not "Menu" {Back Arrow}, {Frequency}, {Center Frequency}, Enter the Center Frequency of the 5G Carrier, {Back Arrow}, {Amp/Scale}, {Auto Preamp: On}, {Auto-Scale} <p>5G Setup: there are two different setup process based on the 5G transmission mode (5G Standalone or 5G non-</p>	<p style="text-align: center;">Frequency and Amplitude Settings</p>

Step	Action	Description
	<p>Standalone). To select the proper setup, select:</p> <ul style="list-style-type: none"> - {Back Arrow}, {Setup}, if 5G is standalone the select {Auto Configuration}, else select {Manual Configuration (NR)} 	 <p>5G Stand-Alone and 5G Non-Stand-Alone Setup</p>
4	<p>5G Standalone Setup: Set the 5G signal properties by selecting:</p> <ul style="list-style-type: none"> - Center Frequency field, enter the center frequency of the 5G carrier - Case field, select the case (sub-carrier spacing) of the 5G signal from the drop-list. - Bandwidth field, select the bandwidth of the 5G carrier from the drop-list. - SSB Periodicity field: select the SSB periodicity of the 5G signal, standard is 20ms. - Enable SSB Auto Search with the check-box and select {Search} - Select {Analysis Mode} 	 <p>5G Standalone</p>
5	<p>5G Non-Standalone Setup: Set the 5G signal properties by selecting:</p> <ul style="list-style-type: none"> - {Settings}, if the title is not "Menu" {Back Arrow}, {Frequency}, {Center Frequency}, Enter the Center Frequency of the 5G Carrier, {Back Arrow}, {Amp/Scale}, {Auto Preamp: On}, {Auto-Scale} - {Bandwidth/SSB SCS}, select the bandwidth and sub- 	 <p>5G Frequency and Amplitude Settings</p>

Step	Action	Description
	<p>carrier spacing of the 5G signal from the list, {Apply}</p> <ul style="list-style-type: none"> - Beam can be found by selecting {Settings}, {SSB Auto Search}, {Start} <p>Set the gate window to uplink slot and symbol by selecting:</p> <ul style="list-style-type: none"> - {Manual Configuration (NR)}, {Gate Window Settings}, {P vs T Slot view}, {Frame} - {Auto-Scale}, {Check Periodicity}, {Deviation} - NR/Frame: Set the Downlink, Uplink and Pattern 2 slots according to the deviation, selecting: <ul style="list-style-type: none"> o {Downlink}, enter the number of downlink slots from the beginning of the frame. o {Uplink}, enter the number of uplink slots. o {Pattern 2}, enter second pattern slots, if needed. o Select the transmission slot with the swipe icon  o {Next} - NR/Slot: Set the Downlink, Uplink symbols, and the Gate Window start symbol and width, by selecting: <ul style="list-style-type: none"> o {Downlink}, enter the number of downlink symbols. o {Uplink}, enter the number of uplink symbols. o Gate Window: Start Symbol field, enter the starting window slot o Gate Window: Symbol width field, enter the number of symbols for the window width. 	 <p>5G non-Standalone</p> <p>Gate Window Settings</p> <p>5G Frame Periodicity and Deviation</p>  <p>NR/Frame Configuration</p>

Step	Action	Description
		<p style="text-align: center;">NR/Slot Configuration</p>
6	<p>Result: verify uplink spectrum activity to detect interference.</p> <p>Note 1: Analyze TAGS with Spectrum, Spectrogram, Persistent Spectrum, Persistent Spectrogram, RSSI, Interference Finder, or Radar Chart by selecting:</p> <p>Note 2: To save a measurement result refer to Section 5.1 Save Measurement Results</p>	<p style="text-align: center;">5G Uplink Spectrum Analysis</p>

3.1.4 PCI Scan: 5G Radio Physical Cell Identity

Step	Action	Description
1	<p>Test Mode: 5G Beam Analysis. To start 5G beam analysis, select:</p> <ul style="list-style-type: none"> - {Home}, {Tests}, {Radio Analysis}, {5G NR Signal Analyzer}, {Menu}, {Beam Analyzer}, {Done} 	<p style="text-align: center;">5G NR Signal Analyzer / Beam Analyzer Measurement Mode</p>

Step	Action	Description																																																																																																												
2	<p>Configuration: Set the 5G signal properties by selecting:</p> <ul style="list-style-type: none"> - {Settings}, if the title is not “Menu” {Back Arrow}, {Frequency}, {Center Frequency}, Enter the Center Frequency of the 5G Carrier, {Back Arrow}, {Amp/Scale}, {Auto Preamp: On}, {Auto-Scale} - {Settings}, if the title is not “Setup”, {Back Arrow}, {Bandwidth/SSB SCS}, select the bandwidth and sub-carrier spacing of the 5G signal from the list, {Apply} - {Settings}, Beam can be found by selecting {SSB Auto Search}, {Start} 	<p style="text-align: center;">Frequency and Amplitude Settings</p> <p style="text-align: center;">Bandwidth and Sub-carrier Spacing and SSB Frequency Settings</p>																																																																																																												
3	<p>Result: verify carrier’s PCIs are those configured at the radio.</p> <p>Note: To save a measurement result refer to Section 5.1 Save Measurement Results</p>	<p style="text-align: center;">5G Signal Analysis – PCI Scan</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>No</th> <th>PCI (Grp.Scr)</th> <th>SSB Index (DM-RS,PBCH)</th> <th>S-SS RSRP (dBm)</th> <th>P-SS RSRP (dBm)</th> <th>P-SS SNR (dB)</th> <th>S-SS SINR (dB)</th> <th>S-SS RSRQ (dB)</th> <th>S-SS RSSI (dBm)</th> <th>PBCH DM-RS RSRP (dBm)</th> <th>PBCH DM-RS EVM (%)</th> <th>Time Error (µs)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>792 (264.0)</td> <td>0 (0,-)</td> <td>-93.51</td> <td>-93.64</td> <td>21.60</td> <td>8.68</td> <td>-11.89</td> <td>-72.47</td> <td>-95.86</td> <td>34.88</td> <td>143.23</td> </tr> <tr> <td>2</td> <td>14 (4.2)</td> <td>0 (0,-)</td> <td>-108.82</td> <td>-110.97</td> <td>8.94</td> <td>-4.12</td> <td>-27.35</td> <td>-87.78</td> <td>-123.33</td> <td>74.09</td> <td>143.23</td> </tr> <tr> <td>3</td> <td>-- (-,-)</td> <td>-- (-,-)</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> </tr> <tr> <td>4</td> <td>-- (-,-)</td> <td>-- (-,-)</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> </tr> <tr> <td>5</td> <td>-- (-,-)</td> <td>-- (-,-)</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> </tr> <tr> <td>6</td> <td>-- (-,-)</td> <td>-- (-,-)</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> </tr> <tr> <td>7</td> <td>-- (-,-)</td> <td>-- (-,-)</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> </tr> <tr> <td>8</td> <td>-- (-,-)</td> <td>-- (-,-)</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> </tr> </tbody> </table>	No	PCI (Grp.Scr)	SSB Index (DM-RS,PBCH)	S-SS RSRP (dBm)	P-SS RSRP (dBm)	P-SS SNR (dB)	S-SS SINR (dB)	S-SS RSRQ (dB)	S-SS RSSI (dBm)	PBCH DM-RS RSRP (dBm)	PBCH DM-RS EVM (%)	Time Error (µs)	1	792 (264.0)	0 (0,-)	-93.51	-93.64	21.60	8.68	-11.89	-72.47	-95.86	34.88	143.23	2	14 (4.2)	0 (0,-)	-108.82	-110.97	8.94	-4.12	-27.35	-87.78	-123.33	74.09	143.23	3	-- (-,-)	-- (-,-)	--	--	--	--	--	--	--	--	--	4	-- (-,-)	-- (-,-)	--	--	--	--	--	--	--	--	--	5	-- (-,-)	-- (-,-)	--	--	--	--	--	--	--	--	--	6	-- (-,-)	-- (-,-)	--	--	--	--	--	--	--	--	--	7	-- (-,-)	-- (-,-)	--	--	--	--	--	--	--	--	--	8	-- (-,-)	-- (-,-)	--	--	--	--	--	--	--	--	--
No	PCI (Grp.Scr)	SSB Index (DM-RS,PBCH)	S-SS RSRP (dBm)	P-SS RSRP (dBm)	P-SS SNR (dB)	S-SS SINR (dB)	S-SS RSRQ (dB)	S-SS RSSI (dBm)	PBCH DM-RS RSRP (dBm)	PBCH DM-RS EVM (%)	Time Error (µs)																																																																																																			
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3.1.5 Time Drift: 5G Time and Frequency Verification

Step	Action	Description
1	<p>Test Mode: 5G Beam Analysis.</p> <p>To start 5G beam analysis, select:</p> <ul style="list-style-type: none"> - {Home}, {Tests}, {Radio Analysis}, {5G NR Signal Analyzer}, {Menu}, {Beam Analyzer}, {Done} 	<p style="text-align: center;">5G NR Signal Analyzer / Freq / Time/ Power Variation Mode</p>
2	<p>Configuration: Set the 5G signal properties by selecting:</p> <ul style="list-style-type: none"> - {Settings}, if the title is not “Menu” {Back Arrow}, {Frequency}, {Center Frequency}, Enter the Center Frequency of the 5G Carrier, {Back Arrow}, {Amp/Scale}, {Auto Preamp: On}, {Auto-Scale} - {Settings}, if the title is not “Setup”, {Back Arrow}, {Bandwidth/SSB SCS}, select the bandwidth and sub-carrier spacing of the 5G signal from the list, {Apply} - {Settings}, Beam can be found by selecting {SSB Auto Search}, {Start} <p>Set the sync and timing reference to GPS by selecting:</p> <ul style="list-style-type: none"> - {Back Arrow}, {Trigger/Freq Ref}, {Trigger}, {GPS}, {Frequency Reference}, {GPS} 	<p style="text-align: center;">Frequency and Amplitude Settings</p> <p style="text-align: center;">Bandwidth and Sub-carrier Spacing and SSB Frequency Settings</p> <p style="text-align: center;">Sync and Timing Reference Configuration</p>

Step	Action	Description
		<p style="text-align: center;">Amplitude / Scale Reference and Scale Configuration</p>
3	<p>Result: Verify that the time reference is within 3GPP stability requirements ($\leq \pm 1.5\mu\text{s}$) against GPS.</p> <p>Note: To save a measurement result refer to Section 5.1 Save Measurement Results</p>	<p style="text-align: center;">5G Signal Analysis – Sync and Timing Verification</p>

4. 5G Network Verification

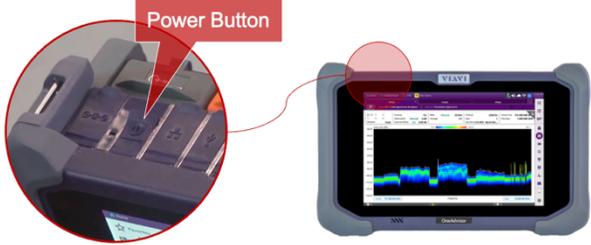
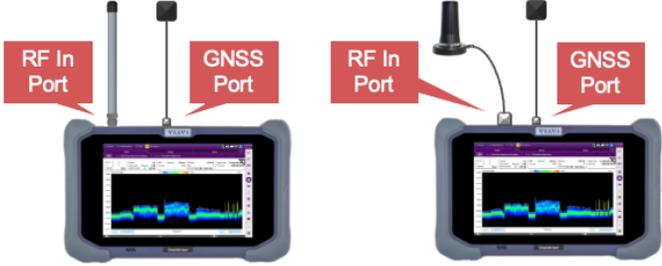
The following procedure describes the steps to perform 5G network verification over the air with the OneAdvisor 800.

4.1 Overview

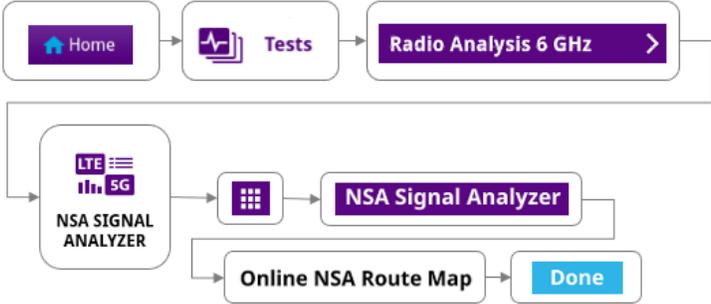
The following procedure describes the steps to perform 5G network verification, including:

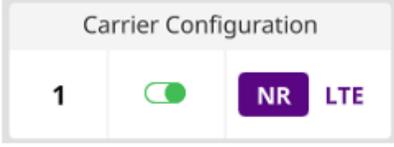
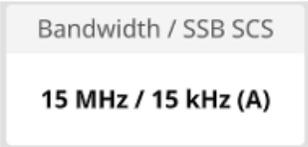
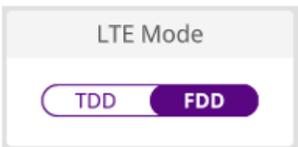
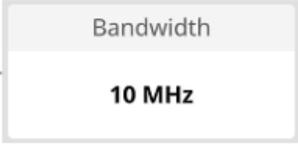
- **Network Coverage:** signal strength network coverage of 5G and 4G.
- **Cell Phase Synchronization:** network synchronization verification.

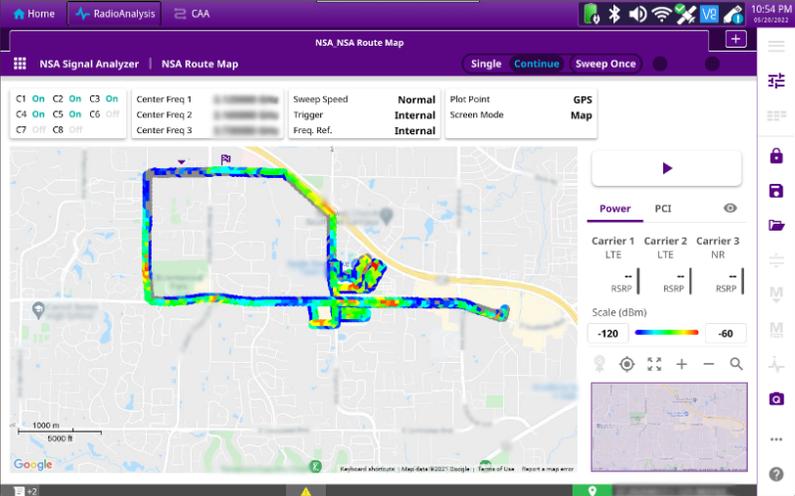
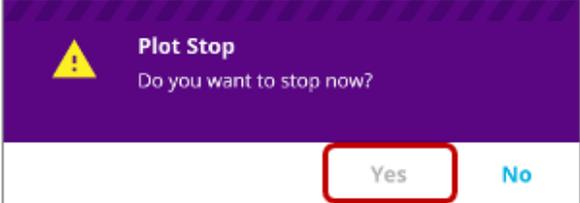
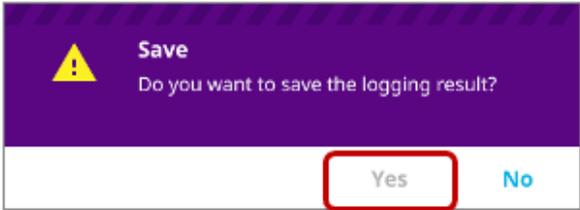
4.1.1 Test Setup

Step	Action	Description
1	Power ON OneAdvisor-800	Press and hold the ON/OFF button for 3 seconds  OneAdvisor-800
2	For 5G network verification, the following antennas into the OneAdvisor 800: <ul style="list-style-type: none"> - Either of the omni-directional antennas into the Spectrum Analyzer RF In port. - GPS antenna into the GNSS port. 	 OneAdvisor 800 with RF antennas (Omni-directional and GPS)

4.1.2 Network Coverage of 4G and 5G

Step	Action	Description
1	Test Mode: NSA Beam Analysis. To start 5G beam analysis, select: <ul style="list-style-type: none"> - {Home}, {Tests}, {Radio Analysis}, {NSA Signal Analyzer}, {Menu}, {NSA Analyzer}, {Online NSA Route Map}, {Done} 	 NSA Signal Analyzer / NSA Analyzer Mode

Step	Action	Description
2	<p>Configuration: Set the 4G and 5G signal properties by selecting:</p> <ul style="list-style-type: none"> - {Settings}, {Configuration} - Carrier Configuration: <ul style="list-style-type: none"> o Select the carrier number to be configured. o Select the toggle button to enable the carrier to be configured. o Select the carrier type to be configured. - Center Frequency <ul style="list-style-type: none"> o Enter the center frequency of the carrier, alternatively, enter the channel number - Channel Number <ul style="list-style-type: none"> o Enter the 5G channel number - Bandwidth/SSB SCS <ul style="list-style-type: none"> o In case of 5G carrier, in this field select the corresponding Bandwidth and Sub-Carrier Spacing - Auto Search <ul style="list-style-type: none"> o Automatically search the SSB - In case or LTE carriers: <ul style="list-style-type: none"> o Select the carrier type o Set the bandwidth from the list. - To start making outdoor signal coverage make sure the GPS antenna is connected and the GPS is locked 	 <p>Configuration</p>  <p>Carrier Configuration</p> <ul style="list-style-type: none"> • Number: Carrier number being configured • Toggle: enables and disables the carrier • Technology: set the technology type NR or LTE  <p>Center Frequency</p> <p>Enter the Center Frequency of the Carrier</p>  <p>Channel Number</p> <p>Enter the Channel Number of the Carrier</p>  <p>Bandwidth / SSB SCS</p> <p>15 MHz / 15 kHz (A)</p> <p>Select the Bandwidth of the carrier and Center Frequency of the SSB</p> <p>In case of 5G: Select the 5G Bandwidth and SSB SCS</p>  <p>LTE Mode</p> <p>Select the LTE Mode</p>  <p>Bandwidth</p> <p>10 MHz</p> <p>Select the LTE Mode</p> <p>LTE Mode and Bandwidth Configuration</p>

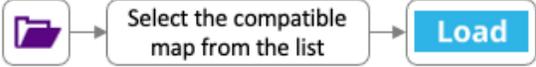
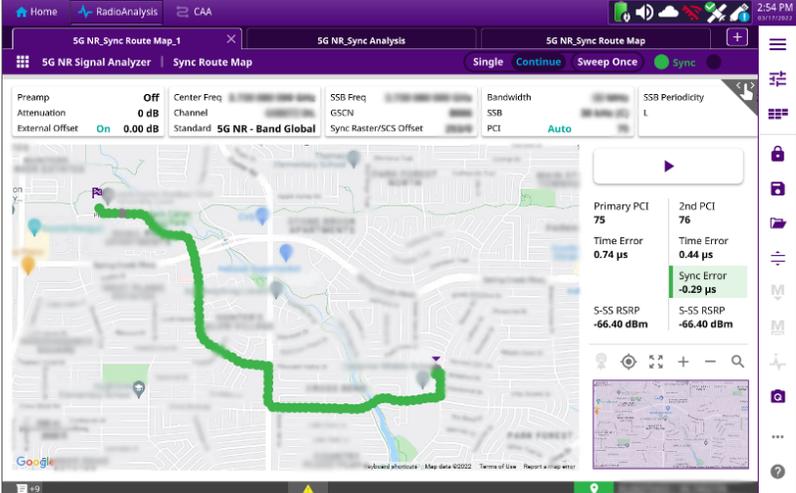
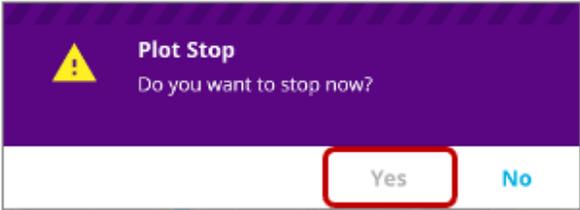
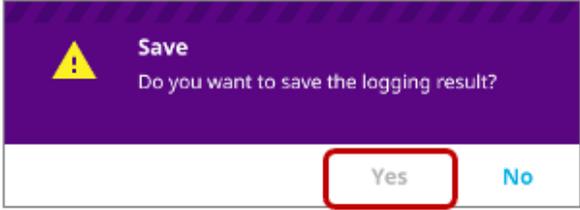
Step	Action	Description
3	<p>To start the Online Route Measurement, select:</p> <ul style="list-style-type: none"> - Close Configuration  - Center Map  - Start Measurement  - Start the drive-test - To suspend the measurement, select Pause  - To finish the measurement, select Stop  - A pop-up window will be displayed, to confirm the measurement has been completed select Yes - A pop-up window will be displayed, to save the measurement select Yes - Select the desire file type formats - Select the file name field - Enter the file name - Select Done - Select Save <p>Result: verify network signal coverage of 4G and 5G.</p> <p>Note: To save a measurement result refer to Section 5.1 Save Measurement Results</p>	<div style="text-align: center;">  <p>Start Online Route Measurements</p> </div>  <div style="text-align: center;"> <p>4G and 5G Network Coverage</p>  <p>Cell Phase Synchronization Map Control</p> </div> <div style="text-align: center;">  <p>Stop Measurement</p> </div> <div style="text-align: center;">  <p>Save Measurement</p> </div>

Step	Action	Description
		<p>File Type</p> <div style="display: flex; flex-wrap: wrap;"> <div style="width: 50%; border: 1px solid black; padding: 5px; margin-bottom: 5px;"><input checked="" type="checkbox"/> Result</div> <div style="width: 50%; border: 1px solid black; padding: 5px; margin-bottom: 5px;"><input checked="" type="checkbox"/> Result as CSV</div> <div style="width: 50%; border: 1px solid black; padding: 5px; margin-bottom: 5px;"><input type="checkbox"/> Result as JSON</div> <div style="width: 50%; border: 1px solid black; padding: 5px; margin-bottom: 5px;"><input type="checkbox"/> Report</div> <div style="width: 50%; border: 1px solid black; padding: 5px; margin-bottom: 5px;"><input checked="" type="checkbox"/> Screen</div> <div style="width: 50%; border: 1px solid black; padding: 5px; margin-bottom: 5px;"><input type="checkbox"/> Logging as CSV</div> <div style="width: 50%; border: 1px solid black; padding: 5px; margin-bottom: 5px;"><input type="checkbox"/> IQ Capture</div> <div style="width: 50%; border: 1px solid black; padding: 5px; margin-bottom: 5px;"><input type="checkbox"/> Setup</div> </div> <p style="text-align: center;">File type formats</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <p>File Name</p> <p>5G-C-Band_VzW-Setup</p> </div> <div style="border: 1px solid black; padding: 5px; display: inline-block; margin-right: 10px;">Type the file name</div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="border: 1px solid black; padding: 5px; background-color: #00aaff; color: white; border-radius: 10px;">Enter</div> <div style="border: 1px solid black; padding: 5px; background-color: #00aaff; color: white; border-radius: 10px;">Save</div> </div> <p style="text-align: center;">Enter the file name</p>

4.1.3 Cell Phase Synchronization

Step	Action	Description
1	<p>Test Mode: 5G Beam Analysis, To start 5G beam analysis, select:</p> <ul style="list-style-type: none"> - {Home}, {Tests}, {Radio Analysis}, {5G NR Signal Analyzer}, {Menu}, {5G NR Signal Analyzer}, {Sync Analysis}, {Done} 	<p style="text-align: center;">5G NR Signal Analyzer / Cell Phase Synchronization Mode</p>
2	<p>Configuration: Set the 5G signal properties by selecting:</p> <ul style="list-style-type: none"> - {Settings}, if the title is not "Menu" {Back Arrow}, {Frequency}, {Center Frequency}, Enter the Center Frequency of the 5G Carrier, {Back Arrow}, {Amp/Scale}, {Auto Preamp: On}, {Auto-Scale} 	<p style="text-align: center;">Frequency and Amplitude Settings</p>

Step	Action	Description																																																	
	<ul style="list-style-type: none"> - {Settings}, if the title is not "Setup", {Back Arrow}, {Bandwidth/SSB SCS}, select the bandwidth and sub-carrier spacing of the 5G signal from the list, {Apply} - {Settings}, Beam can be found by selecting {SSB Auto Search}, {Start} <p>Set the sync and timing reference to GPS by selecting:</p> <ul style="list-style-type: none"> - {Back Arrow}, {Trigger/Freq Ref}, {Trigger}, {GPS}, {Frequency Reference}, {GPS} <p>Set the Cell Phase Synchronization limit by selecting:</p> <ul style="list-style-type: none"> - {Back Arrow}, {Limit}, {Test Limits: ON} 	<p>Bandwidth and Sub-carrier Spacing and SSB Frequency Settings</p> <p>Sync and Timing Reference Configuration</p> <p>CPS Limit Configuration</p>																																																	
3	<p>Result: Verify that the Cell Phase Synchronization is within 3GPP requirements ($\leq \pm 3\mu\text{s}$).</p> <p>Note: To save a measurement result refer to Section 5.1 Save Measurement Results</p>	<p>5G Signal Analysis – Cell Phase Synchronization Verification</p> <table border="1"> <thead> <tr> <th>No</th> <th>PCI</th> <th>S-SS RSRP</th> <th>Sync Error</th> <th>Time Error</th> <th>S-SS SINR</th> <th>S-SS RSRQ</th> </tr> </thead> <tbody> <tr> <td>Primary</td> <td>75</td> <td>-67.68 dBm</td> <td>0.00 μs</td> <td>0.09 μs</td> <td>4.02 dB</td> <td>-16.06 dB</td> </tr> <tr> <td>2nd</td> <td>76</td> <td>-72.33 dBm</td> <td>0.46 μs</td> <td>0.55 μs</td> <td>4.00 dB</td> <td>-20.77 dB</td> </tr> <tr> <td>3rd</td> <td>77</td> <td>-77.79 dBm</td> <td>1.37 μs</td> <td>1.46 μs</td> <td>2.58 dB</td> <td>-27.13 dB</td> </tr> <tr> <td>4th</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> </tr> <tr> <td>5th</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> </tr> <tr> <td>6th</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> </tr> </tbody> </table>	No	PCI	S-SS RSRP	Sync Error	Time Error	S-SS SINR	S-SS RSRQ	Primary	75	-67.68 dBm	0.00 μs	0.09 μs	4.02 dB	-16.06 dB	2nd	76	-72.33 dBm	0.46 μs	0.55 μs	4.00 dB	-20.77 dB	3rd	77	-77.79 dBm	1.37 μs	1.46 μs	2.58 dB	-27.13 dB	4th	--	--	--	--	--	--	5th	--	--	--	--	--	--	6th	--	--	--	--	--	--
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5th	--	--	--	--	--	--																																													
6th	--	--	--	--	--	--																																													
4	<p>Test Mode: Cell Phase Synchronization Route Map, To start 5G Sync Route Map, select:</p>																																																		

Step	Action	Description
	<ul style="list-style-type: none"> - {Menu}, {5G Signal Analyzer}, {Sync Route Map}, {Done} - Create a compatible map, as described on Section 5.2 Creating Maps for OneAdvisor-800 - Load the compatible map by selecting: <ul style="list-style-type: none"> o {Folder}, Select the compatible map from the list, {Load} - To start making outdoor cell phase synchronization network make sure the GPS antenna is connected and the GPS is locked <div style="text-align: center; margin: 5px 0;">  </div> - Select {Play} - Start the drive-test - To suspend the measurement, select Pause <div style="text-align: center; margin: 5px 0;">  </div> - To finish the measurement, select Stop <div style="text-align: center; margin: 5px 0;">  </div> - A pop-up window will be displayed, to confirm the measurement has been completed select Yes - A pop-up window will be displayed, to save the measurement select Yes - Select the desire file type formats - Select the file name field - Enter the file name - Select Done - Select Save <p>Result: Verify that the Cell Phase Synchronization is within 3GPP requirements ($\leq \pm 3\mu s$).</p>	<p style="text-align: center;">5G NR Signal Analyzer – Sync Route Map Measurement Mode</p> <div style="text-align: center; margin: 10px 0;">  <p>Load Compatible Map</p> </div> <div style="text-align: center; margin: 10px 0;">  <p>Cell Phase Synchronization Network</p> </div> <div style="text-align: center; margin: 10px 0;">  <p>Cell Phase Synchronization Map Control</p> </div> <div style="text-align: center; margin: 10px 0;">  <p>Stop Measurement</p> </div> <div style="text-align: center; margin: 10px 0;">  <p>Save Measurement</p> </div>

Step	Action	Description
		<p>File Type</p> <div style="display: flex; flex-wrap: wrap;"> <div style="width: 50%; border: 1px solid #ccc; padding: 5px; margin-bottom: 5px;"><input checked="" type="checkbox"/> Result</div> <div style="width: 50%; border: 1px solid #ccc; padding: 5px; margin-bottom: 5px;"><input checked="" type="checkbox"/> Result as CSV</div> <div style="width: 50%; border: 1px solid #ccc; padding: 5px; margin-bottom: 5px;"><input type="checkbox"/> Result as JSON</div> <div style="width: 50%; border: 1px solid #ccc; padding: 5px; margin-bottom: 5px;"><input type="checkbox"/> Report</div> <div style="width: 50%; border: 1px solid #ccc; padding: 5px; margin-bottom: 5px;"><input checked="" type="checkbox"/> Screen</div> <div style="width: 50%; border: 1px solid #ccc; padding: 5px; margin-bottom: 5px;"><input type="checkbox"/> Logging as CSV</div> <div style="width: 50%; border: 1px solid #ccc; padding: 5px; margin-bottom: 5px;"><input type="checkbox"/> IQ Capture</div> <div style="width: 50%; border: 1px solid #ccc; padding: 5px; margin-bottom: 5px;"><input type="checkbox"/> Setup</div> </div> <p style="text-align: center;">File type formats</p> <div style="border: 1px solid #ccc; padding: 10px; margin-bottom: 10px;"> <p>File Name</p> <div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 5px;">5G-C-Band_VzW-Setup</div> <div style="border: 1px solid #ccc; border-radius: 15px; padding: 5px; display: inline-block;">Type the file name</div> </div> <div style="display: flex; align-items: center; gap: 10px;"> <div style="border: 1px solid #ccc; border-radius: 15px; padding: 5px 15px; background-color: #00aaff; color: white;">Enter</div> <div style="border: 1px solid #ccc; border-radius: 15px; padding: 5px 15px; background-color: #00aaff; color: white;">Save</div> </div> <p style="text-align: center;">Enter the file name</p>

5. Annex

5.1 Save Measurement Results

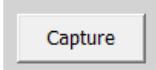
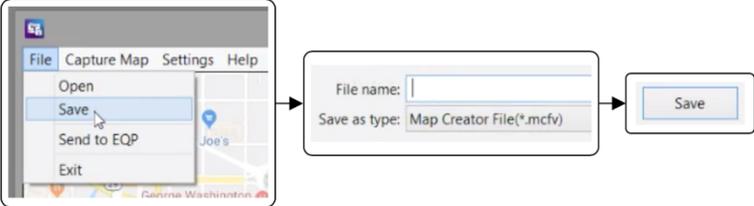
The following procedure describes the steps to save measurement results with OneAdvisor-800

Step	Action	Description
1	Saving measurements <ul style="list-style-type: none"> - Select the save icon and enter file name - Select the type of file to save: <ul style="list-style-type: none"> o Result (to be replayed or post-processed by the CellAdvisor 5G) o Result as CSV, to be post-processed by a PC application o Screen, as a picture - Select the destination to save the file - Select "Save" 	<p>Save and File Name Sequence</p> <p>File Type as Result, Result as CSV or Screen</p> <p>Select the destination either Internal or USB</p> <p>Select Save</p>

5.2 Creating Maps for OneAdvisor-800

Step	Action	Description
1	Open JDMapCreator application	Run the application software JDMapCreator* and select the CellAdvisor platform type, for example, [CellAdvisor 5G]:

Step	Action	Description
		<div data-bbox="662 212 1377 541" data-label="Image"> </div> <p data-bbox="829 552 1203 583" style="text-align: center;">JMapCreator > CellAdvisor 5G</p> <p data-bbox="613 625 1365 762">*Note: JMapCreator is a free application software of Viavi Solutions' CellAdvisor instruments that can be downloaded at http://celladvisor.updatemyunit.net/ on the section CellAdvisor AppSW</p>
2	<p data-bbox="256 806 532 867">Set the number of map layers to be created:</p> <ul data-bbox="256 873 574 972" style="list-style-type: none"> - Select Settings - Select Map Layers - Select Single or Multiple 	<p data-bbox="613 806 1300 835">Configure the number of layers to be created on the map:</p> <ol data-bbox="662 873 1292 940" style="list-style-type: none"> a. Single, creates 1-layer map (no zooming) b. Multiple, creates 3-layer map (zooming available) <div data-bbox="634 978 1401 1205" data-label="Image"> </div> <p data-bbox="894 1209 1138 1241" style="text-align: center;">Multiple Map Layers</p>
3	<p data-bbox="256 1285 558 1346">Create a geo-coordinates map.</p> <ul data-bbox="256 1352 532 1593" style="list-style-type: none"> - Select Capture Map - Select Open Google Maps - Enter the Address of interest - Select Search - Select Capture 	<p data-bbox="613 1285 1370 1346">To set a map with geo-coordinates select [Capture Map], [Open Google Maps], as follows:</p> <div data-bbox="797 1383 1235 1549" data-label="Image"> </div> <p data-bbox="808 1554 1224 1583" style="text-align: center;">Capture Map > Open Google Maps</p> <p data-bbox="613 1623 1419 1684">Search the location of the interest test area by entering the address in the [Address] field, as follows:</p> <div data-bbox="634 1724 1398 1793" data-label="Image"> </div> <p data-bbox="922 1797 1110 1829" style="text-align: center;">Search Address</p>

Step	Action	Description
		<p>Once the test area has been located, select [Capture] to create the single or multi-layer map, as follows:</p> <div data-bbox="938 310 1094 422" style="text-align: center;">  <p>Map Capture</p> </div>
4	<p>Save the created map into a USB memory:</p> <ul style="list-style-type: none"> - Select File - Select Save - Enter the file name - Select Save button <p>Note: Make sure the map file (*.mcfv) is saved on a USB memory drive.</p>	<p>Save the map into a USB memory device:</p> <div data-bbox="641 537 1395 743" style="text-align: center;">  </div> <p style="text-align: center;">File > Save > File Name > Save</p>



6. 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>