ORAN ODU Emulation

OneAdvisor 800

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1. Scope

This document describes how to configure the OneAdvisor for ORAN ODU Emulation, including:

- O-RU Connectivity
- M-Plane Results
- S-Plane Results
- VSWR Results

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

Description	Diagram
OneAdvisor with the following functions: - ONA-800 mainframe equipped with the following module/Firmware/Licenses: ○ SPA06MA-O: SPA Module with Optical Board ○ Firmware version 4.2.1 ○ ODU-E Licenses	 ONA Front View.
SFP+ for 10GBPS	 SM SFP+
Duplex Singlemode Fiber cable (potentially using the existing cable that connects to the RU)	 Duplex SM Fiber

2. OneAdvisor Overview

The OneAdvisor is a portable instrument for Cell Site installation and maintenance, the main test functions of OneAdvisor for cell site installation include:

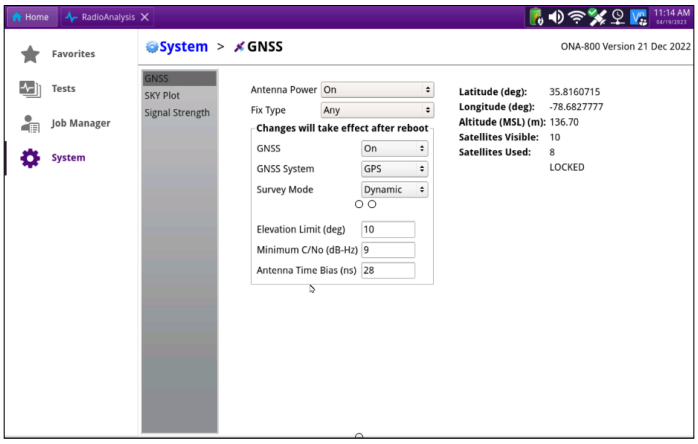
- Cable and antenna analysis up to 6GHz
- Fiber Inspection verification and Fiber validation (OTDR)
- Ethernet/VLAN testing
- ODU Emulation

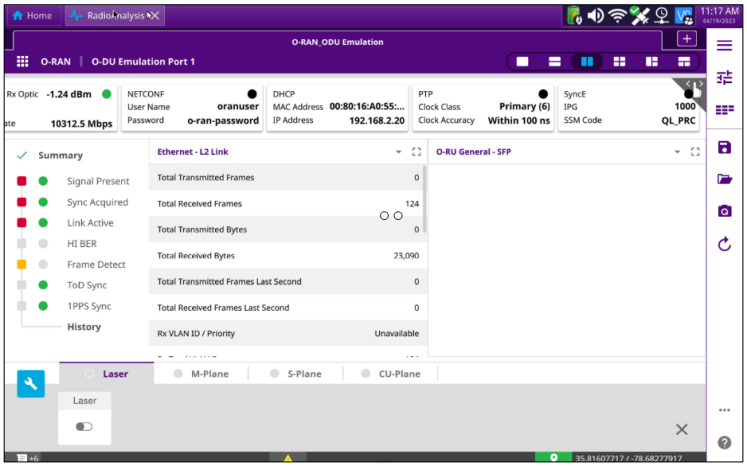
2.1 ORAN ODU Emulation

The following procedure describes the steps to perform ORAN ODU Emulation analysis with OneAdvisor800. Successful results of this test prove that the radio is powered, connected, and ready to communicate with the actual DU. If this process fails to reach that end, one can troubleshoot based on what phase the process could/could not achieve.

2.1.1 Initial Setup

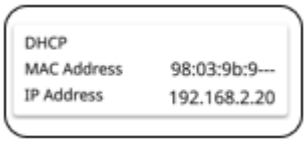
The following procedure describes the initial setup of ODU Emulation analysis, including turn-up and connectivity.

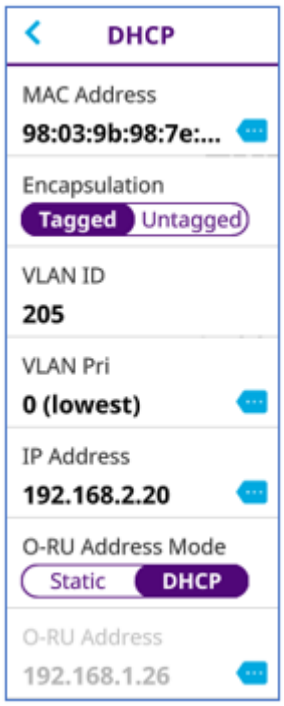
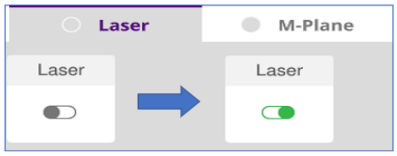
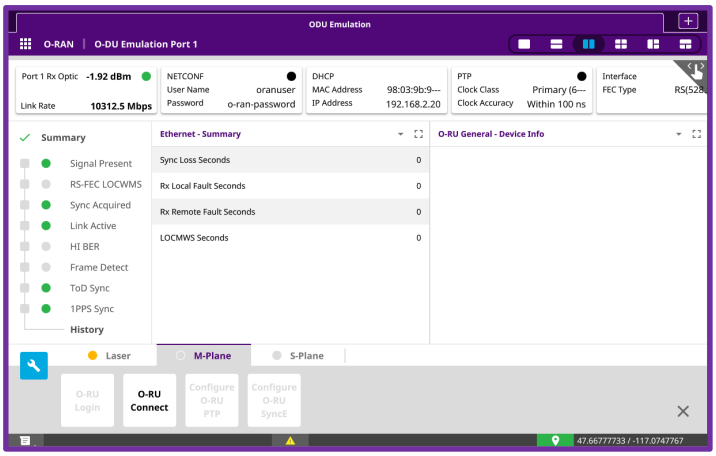
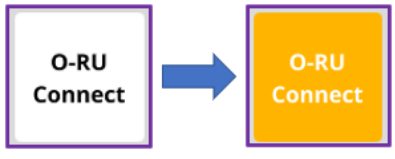
Step	Action	Description
1	Power ON OneAdvisor	Press and hold the ON/OFF button for 3 seconds to power on the One Advisor 
2	Connectivity: - Insert the SFP+ into Port 1 on the optical board - Inspect, Clean, and connect a duplex fiber between the ONA and the RU under test	 ONA Front View. ORU Example
3	Enable GPS: - Connect the GPS antenna to the SMA port - Select {Home}, {System}, {GNSS} - Set Antenna Power to: ON - Ensure the OneAdvisor gets a lock and displays Lat/Long	

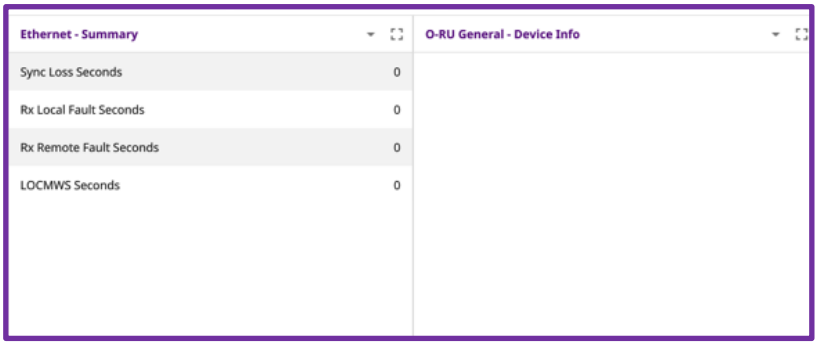
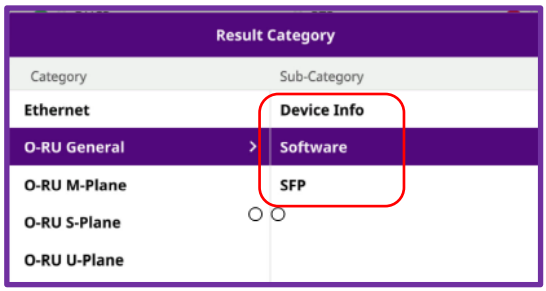
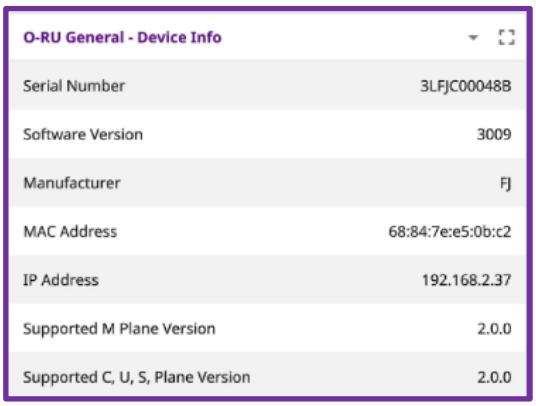
Step	Action	Description
4	ORAN ODU Emulation mode: - Select {Home}, {Tests}, {Radio Analysis}, {O-DU Emulation}	 ORAN ODU Emulation Measurement Mode  ORAN ODU Emulation Measurement Screen

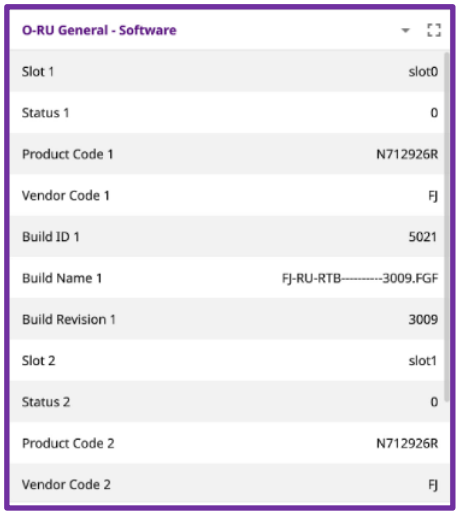
2.1.2 ORAN ODU Emulation Testing – M-Plane RU Query

The following procedure describes the steps to perform ODU Emulation tests with OneAdvisor.

Step	Action	Description
1	ODU Emulation Link Rate: - Set the Optical Link Rate to 10312.5 Mbps. *Note: If testing a 25Gbps RU, use an SFP28 and set the link rate to 25781.5 Mbps*	 SFP+ Optical Link Rate
2	Set the Master (ONA) IP Address and VLAN ID : - Select the DHCP field and set the IP Address to 192.168.2.20 - Set the VLAN to a value between than 200 and 210 (i.e., 205) - Verify the Encapsulation is set to Tagged	 Top bar DHCP group  Side-bar configuration icon

Step	Action	Description
	- Verify the O-RU Address Mode is set to DHCP	 Setting IP Address and VLAN Information
3	Start the ODU Emulation Process: - Turn ON the ONA Laser - Select the M-Plane tab - If the RU is powered and connected there will be green lights on the Summary area of the screen -	 
4	Connect to the RU: - Press the O-RU Connect button to start the communications with the RU	

Step	Action	Description
5	Reading the RU Data: - If operating properly, the radio should be attempting to communicate through VLAN IDs 201 to 210. - Once the radio wraps around to the VLAN set on the OneAdvisor (205), the initial connection will be made. - This could take up to 3 minutes. - The following screens are available from the O-RU M-Plane	The User Interface has two results screens that can be changed as desired. Click in the header to change either screen.  Results Categories and Sub-Categories  O-RU General > Device Info (below)  O-RU General > Software Information (below)

Step	Action	Description
		

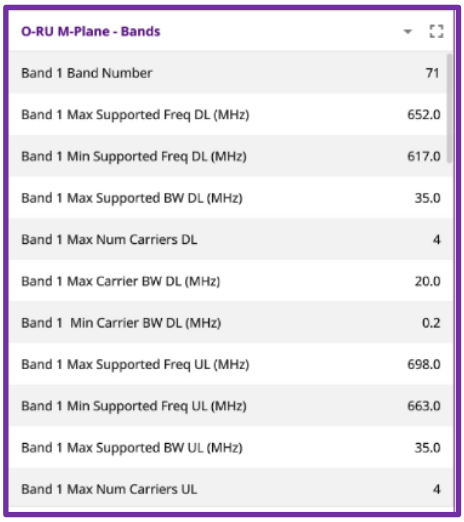
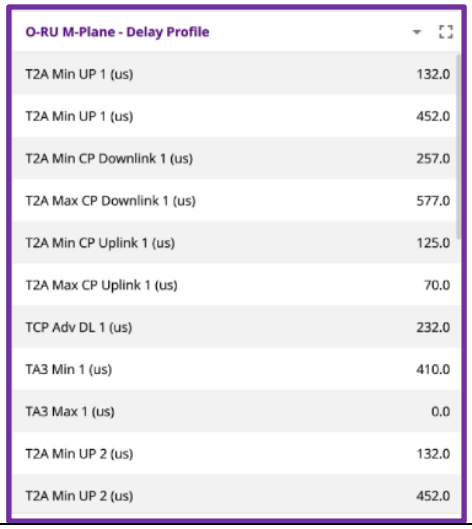
O-RU General - Software	
Slot 1	slot0
Status 1	0
Product Code 1	N712926R
Vendor Code 1	FJ
Build ID 1	5021
Build Name 1	FJ-RU-RTB----------3009.FGF
Build Revision 1	3009
Slot 2	slot1
Status 2	0
Product Code 2	N712926R
Vendor Code 2	FJ

O-RU General > SFP Information (below)

O-RU General - SFP	
SFP 1 Interface Name	fheth0
SFP 1 Port Number	0
SFP 1 Vendor Name	000000SFP-10GS
SFP 1 Rx Power (dBm)	-5.2
SFP 1 Tx Power (dBm)	-1.8
SFP 1 Bias Current (mA)	6.4
SFP 1 Voltage (mV)	3,340.8
SFP 1 Temperature (C)	54.7

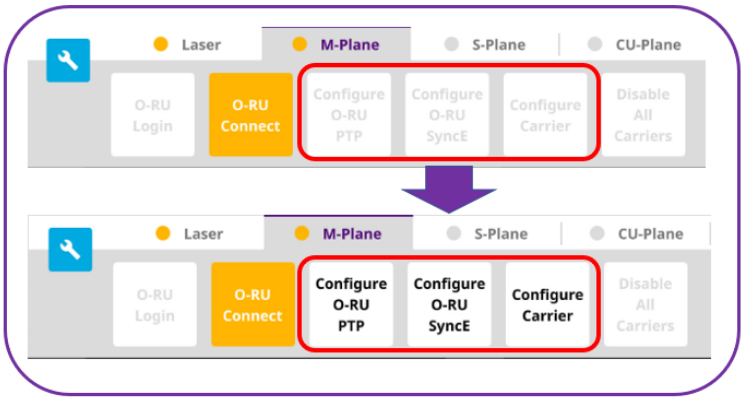
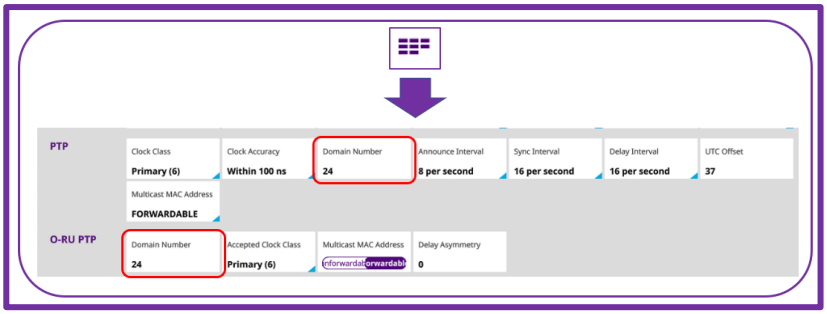
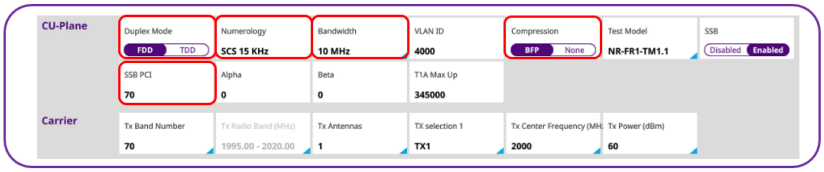
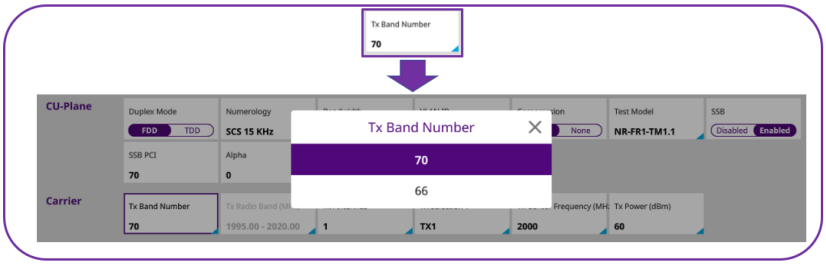
O-RU M-Plane > Capability (below)

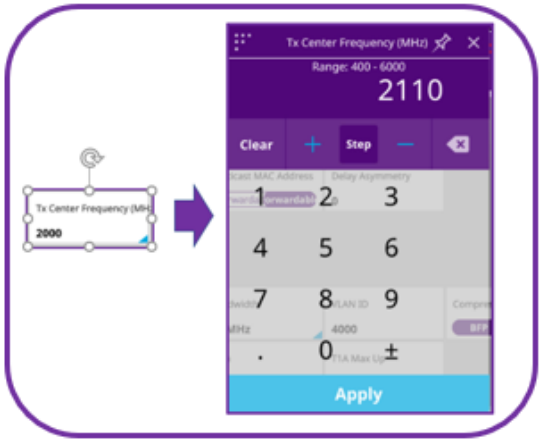
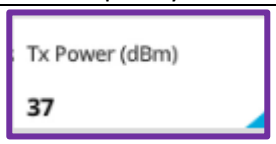
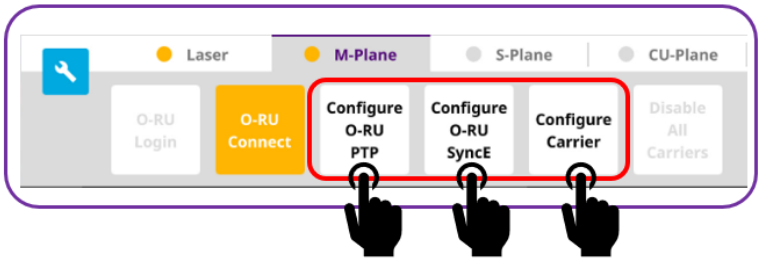
O-RU M-Plane - Capability	
Supported Category	Category A
Supported Number of Ports	8
Number of Spatial Streams	4
Max Power per PA Antenna (dBm)	49.0
Min Power per PA Antenna (dBm)	37.0
IQ Sample Dynamic Compression Supported	false
IQ Sample Realtime Variable Bitwidth Supported	false
IQ Sample Count of Supported Compression Methods	1
IQ Compression Method 1 IQ Bitwidth	9
IQ Compression Method 1 Compression Type	Static
IQ Compression Method 1 Compression Format Exponent	4

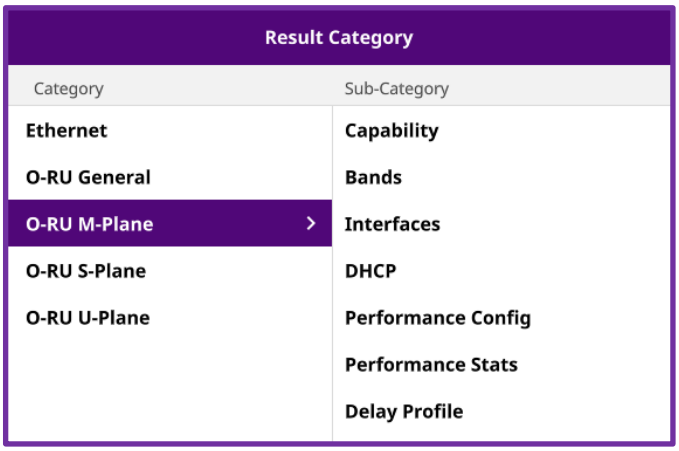
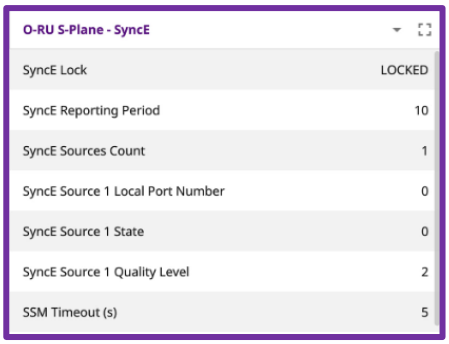
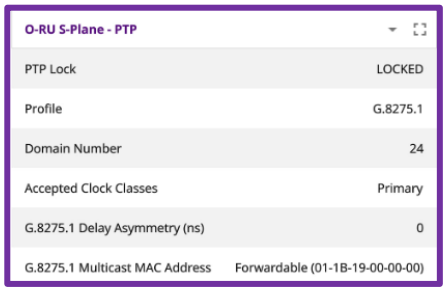
Step	Action	Description
		O-RU M-Plane > Bands (below)  O-RU M-Plane > Delay Profile (below) 

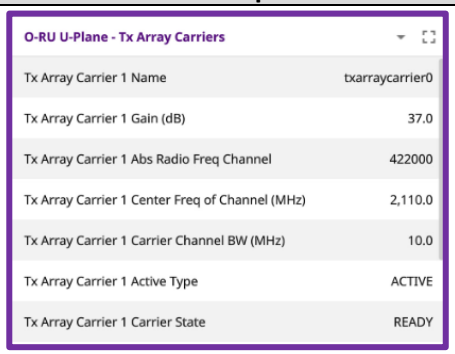
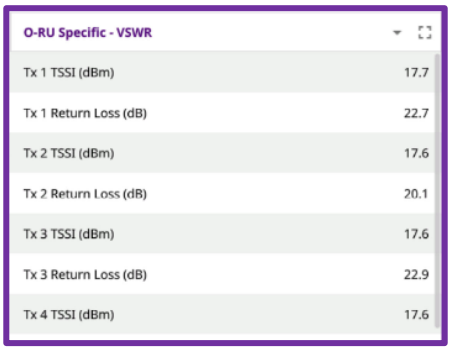
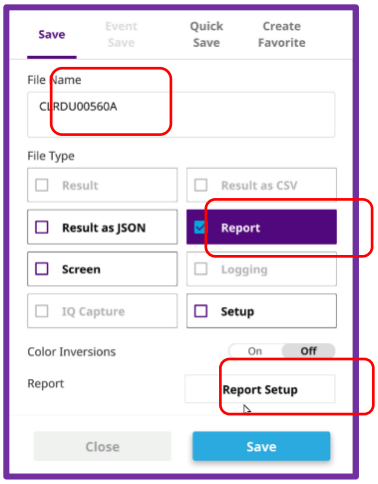
2.1.3 ORAN ODU Emulation Testing – S and CU-Plane RU Transmit

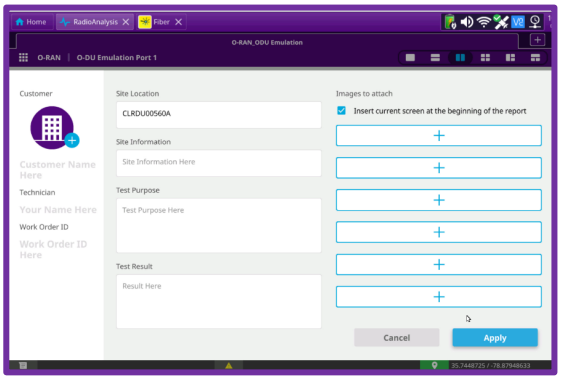
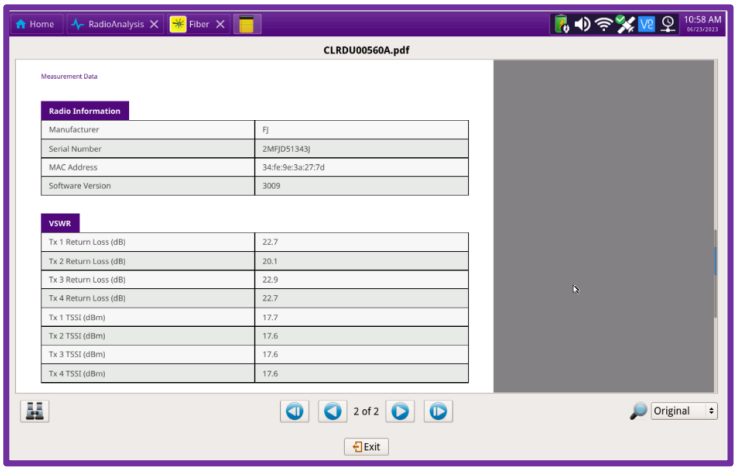
The following procedure describes the steps to perform O-DU Emulation tests with OneAdvisor.

Step	Action	Description
1	Reading the RU Data: - After about 3 minutes the RU will respond to the ONA - The PTP and SyncE buttons will activate when the RU is ready	 Wait for the Configuration Buttons to become Active
2	Configuring PTP, and CU Plane - Set the Domain Number to 24 for BOTH the ONA AND the O-RU!	 PTP Setting
3	CU-Plane Settings - Duplex = FDD - Numerology = 15 kHz - Bandwidth = RU Band Dependent - Compression = BFP - Set the PCI to **104**	
4	RU Carrier Settings - Select the Tx Band Number (this will depend on the radio's capabilities) - Enter the Center Frequency of the Band (the available range will depend on the radio's	 Band Number

Step	Action	Description
	capabilities. Always transmit in Dish owned spectrum)	 Center Frequency of Carrier
5	RU TX POWER - Set TX Power to lowest allowed by the RU - Press the menu button to exit	 Carrier Power  Exit Settings
6	Push Configurations to the RU - Press the PTP button to push the config to the RU - Press the SyncE button to push the config to the RU - Press the Configure Carrier button to push the config to the RU NOTE – The Configure Carrier configuration takes several seconds to finish	 Press Each button once
7	Turn on PTP - Press the SyncE and the PTP buttons NOTE - PTP takes 2 minutes to connect and turn green	 Timing Buttons

Step	Action	Description
		 PTP Sync Status
8	Turning on the Carrier - When you have your measurements Turn Off the carrier	 TX OFF TX ON
9	- The following screens are available from the RU	ORAN Results Categories and Sub-Categories  O-RU S-Plane – SyncE (Below)  O-RU S-Plane – PTP (Below)  O-RU U-Plane > Tx Array Carriers (below)

Step	Action	Description
		 O-RU Specific > VSWR (below) 
10	Save a Report - Press Save  - Enter a file name - Select Report as the File Type and then click on Report Set-up - Add any additional descriptive information to the fields available here - Click Apply - Then Click Save - Home > System > Files and open the report - From here you can also copy to a USB Drive	 

Step	Action	Description
		 

3. 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 additional information of cell site test go to: http://www.viavisolutions.com/en/products/network-test-and-certification/cell-site-test