## **Ethernet Layer 2 Traffic Generation**

This quick card describes how to set up the OneAdvisor 800 as a Layer 2 Traffic Generator and measure Metro Ethernet key performance indicators (KPIs). The quick card documents a procedure to set up the OneAdvisor on a 1GigE Optical Interface, but the same workflow may be applied to other data rates.

### EQUIPMENT REQUIREMENTS

- OneAdvisor 800 equipped with the following:
  - RAxxMA-O Radio Analysis Module, SPA06MA-O Spectrum Analyzer Module, TM400GB-QQ 400G Module, or TM400GB-QO 400G Module.
  - Transport software release V5.1.0 or greater
  - CA10M1GE or ONA-SP-10M1GE 1 Gigabit Ethernet option
- Optical Transceiver supporting the Ethernet data rate to be tested (SFP, SFP+, SFP28, or QSFP28)
- Cables to match the optical transceiver and the line under test
- Fiber optic inspection microscope (P5000i, FiberChek Probe, or INX-760)
- Fiber optic cleaning supplies

### LAUNCH TEST

- 1. Press the Power button on the ONA-800 base top panel to turn on the OneAdvisor.
- 2. Tap 1 Home to display the Home Screen.
- 3. Tap 🚣 Tests to display the Tests menu.
- Tap Radio Analysis Transport > or 400G Transport > to show the Transport test application.



- If the Select Test menu is not displayed, tap
   All Tests in the lower left screen corner.
- 7. Using the Select Test menu or favorite test list, launch the Ethernet Layer 2 Traffic test for the desired data rate and port (P1 or P2).
   For example: Ethernet ►1GigE Optical ► Traffic ► P1 Terminate.
- If the current configuration is unknown, tap to open the **Tools** Panel and select
   Reset Test to Defaults.
- 9. Press **Vok** to continue.

OneAdvisor 800 Transport and Wireless Platforms

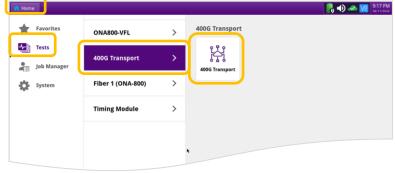
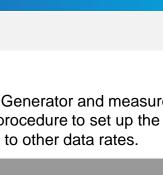


Figure 2: Transport Launch screen

Ethnenat	10/100/1000	•			
Fibre Channel 🕨	1GigE Optical	- Optics Self-Test	•		
OTN 🔸	10GigE LAN	5G NR Discovery	•		
Unframed +	25GigE	V QuickCheck			
Add Test	40GigE	a RFC 2544 (RFC 5180)			
Remove Test	50GigE 100GigE	4 Y.1564 SAMComplete	•		
Load Test	and the state of the second	Layer 2 Traffic	P1 Terminate		
	200GigE	Layer 2 Multiple Streams	P2 Terminate		
	4x100GigE 400GigE Single Port	Layer 3 Traffic Layer 3 Multiple Streams	•		

Figure 3: Select Test



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#### CONFIGURE TEST

- ► The following Info is needed to configure the test:
  - Type of Optical Transceiver (10/100/1000 Copper SFP, 1G/10G Multimode SFP+, 1G/10G Single mode, 100G LR4 QSFP28, etc.)
  - Auto Negotiation settings of the port under test.



Figure 4: Work Order

- For 1GigE Optical or 10/100/1000 Copper tests, tap the Ethernet tab of the Quick Configuration menu and set Auto Neg. to the same value as the Ethernet port under test (On or Off).
- ► For 10/100/1000 Copper tests:
  - Tap the Setup soft key on the top right side of the screen and proceed to page 3.
- ► For Optical Interfaces:
  - 1. Tap the **Setup** soft key in on the top right side of the screen.
  - 2. Select the Interface/Connector folder.
  - Insert desired Optical Transceiver into the Port 1 SFP or QSFP slot on the top of the OneAdvisor.
  - 4. Review SFP information:
    - Verify that the SFP operates on the required wavelength (850nm, 1310nm or 1550nm).
    - Verify that the SFP supports the required data rate (1G, 10G, etc.)
    - Note the Min and Max Tx Levels (dBm) and Max Rx Level (dBm) to assess if optical attenuators are required.

ef (dim) Auto Neg. et Mode France Ste Q Ork grint Signal Present Signal Pre	elect ~ Port 1: 1GigE Test	Laver 2 Traffic Te				What's This?	
event       event         exponence       event         exponence       event         event       event	Evel (dBm)	Ethernet	Payload				
s Spannary s Status e Summary (SAA/KPI) Signal Present Signal Loss Seconds 1187 Signal Loss Seconds 1187 Signal Loss Seconds 1187 Frame Loss FAR ⊟ Los Frames Unavailab Frame Loss FAR ⊟ Los Frames Unavailab Frame Loss FAR ⊟ Correct Frame Loss FAR = Frame Loss FAR = Fra				<b>Y</b>			
Signal Present         OFF Throughput, Current B           Signal Present         OFF Throughput, Current B           Signal Present         Fix Mops, 11         Unavailab           Machine         Signal Present         Signal Present         Unavailab           Signal Present         Signal Present         Unavailab         Unavailab           Signal Present         Signal Present         Unavailab         Unavailab           Signal Present         Contract         Signal Present         Unavailab           Signal Present         Contract         Contract         Unavailab           Signal Present         Unavailab         Unavailab         Unavailab           Signal Present         Unavailab         Unavailab         Unavailab           Signal Present         Unavailab         Normal         Unavailab           Signal Present         Unavailab         Normal         Unavailab           Signal Present         Unavailab         Unavailab         Unavailab           Signal Present         Unavailab         Unavailab         Unavailab		Summary	Status	0	Summary	\$ SLA / KPI	•
	Ebernet     Sync Acquired     Unk Active     Frame Detect     ATP Detect     VLAN Frame Detect     VLAN Frame Detect     Stacked VLAN Detect				Rx Mbps, L1 Tx Mbps, L1 Rx Mbps, L2 Tx Mbps, L2 Frame Loss - FLR III Los Frame Loss - FLR III Los Frame Loss Ratio Round Trip Delay - FD (us) III Average Current Maximum Packet Jitter - FDV (us) III Average Peak	Unavaila Unavaila Unavaila Unavaila Unavaila Unavaila Unavaila Unavaila	0.0 ble 0.0 ble ble ble ble ble ble ble ble
			tions Peak IEG Errors	Canture	*		
3 the 7 5FF28 + Laser Internal + -1 +1 -10 +10							

Figure 5: Quick Config, Auto Neg.

Select ~ Port 1: 1Gi	gE Layer 2 Traffic Term 🗙 📗			What's This?
Interface	Connector Signal Physic	al Layer Network Visibility		
Traffic	SFP SFP Expert I2C			<u> </u>
Capture	NOTE: Information on this	page is obtained from reading	g the management interface c	ontents of the SFP and may
Filters	Wavelength (nm)	1310.00	ita sheet.	
	Recommended Rates Vendor Vendor PN	FINISAR CORP. FTLX1471D3BTL	6144.0M,	2457.6M, 3072.0M, 4915.2M,
	Vendor SN	AZM0S2H	Max Rate (Mbits/sec)	
	Vendor Rev	A	Power Level Type	Average Power
	🤣 Min Rx Level (dBm)	-20.0000	🥝 Max Rx Level (dBm)	2.0000
	🤣 Min Tx Level (dBm)	-7.9997	🤣 Max Tx Level (dBm)	0.9999
	Diagnostic Monitoring	1	Diagnostic Byte	104
	Module ID	SFP		
	Transceiver 10G E	lase-LR		

Figure 6: Setup, Interface/Connector/SFP



## CONFIGURE TEST (CONTINUED)

- ► Select the **Ethernet** settings tab.
  - If you are testing a VLAN, set Encapsulation to VLAN, tap the VLAN field and enter your VLAN ID.
  - If you are testing head-to-head with another OneAdvisor or T-BERD/MTS:
    - Tap the SA field to display the Factory Default Source MAC Address. Provide this address to the operator of the other OneAdvisor or T-BERD/MTS, upon request.
    - Tap the DA field and enter the Source Address (SA) of the farend OneAdvisor or T-BERD/MTS in the Destination MAC field.
  - If you wish to measure Bit Error Rate, tap the Data field, and set Tx Payload to BERT. Note: This will disable Frame Loss and Round Trip Delay results.
- Select the Traffic settings tab. Set Load Unit to Bit Rate and set Load to the desired traffic rate or Committed Information Rate (CIR).
- ► Tap the **Results** soft key





Figure 7: Setup, Ethernet/VLAN

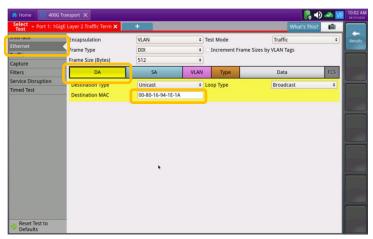


Figure 8: Setup, Ethernet/DA

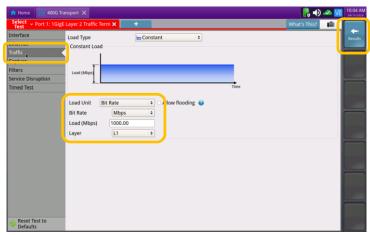


Figure 9: Setup, Traffic



## CONNECT TO LINE UNDER TEST

#### For Optical Interfaces:

- Use the VIAVI P5000i or FiberChek Probe microscope to inspect both sides of every connection being used (SFP, attenuators, patch cables, bulkheads)
  - Focus the fiber on the screen.
  - If it appears dirty, clean the fiber end-face and re-inspect.
  - If it appears clean, run the inspection test.
  - If it fails, clean the fiber and re-run inspection test. Repeat until it passes.
- 2. If necessary, insert optical attenuators into the SFP TX and/or RX ports.
- Connect the optical transceiver to the port under test using a jumper cable compatible with the line under test.
- 4. Select the **Laser** tab in the **Actions** panel.
- 5. Press  $\begin{bmatrix} Laser \\ Off \end{bmatrix}$ . The button will turn yellow and be relabeled  $\begin{bmatrix} Laser \\ On \end{bmatrix}$ .
- 6. Press the Restart soft key
- 7. Verify the following:
  - Summary LED is yellow.
  - Signal Present LED is green.
  - Sync Acquired LED is green.
  - **Link Active** LED is green.

#### ► For 10/100/1000M Copper Interfaces:

- 1. Connect the copper SFP to the port under test using CAT5e or better cable.
- 2. Press the Restart soft key.
- 3. Verify the following:
  - Summary LED is yellow.
  - Sync Acquired LED is green.
  - Link Active LED is green.



#### Figure 10: Inspect Before You Connect

Running 8m:28s	Etherne	Payload	1						
evel (dBm) +2.9 even Dev (norm) - 73 5 Summary:	On s Traffic s 0 0 (lowest) + 512 = Auto Neg. Test Mode VLAN ID Priority Frame Size								
	Summary		\$ Status	liji		¢	Summary	\$ SLA / KPI	•
There is a part of the second		Packet Detect			•		Throughput, Current E Fix Mips, L1 Tx Mips, L1 Fix Mips, L2 Frame Loss FLR E Frame Loss FLR E Frame Loss FLR E Average Average Average Mas Average Mas Average Peak Instantaneous		0.0 0.0 0.0 Unavailable Unavailable Unavailable Unavailable Unavailable Unavailable Unavailable
						* 1 8 1 8			

Figure 11: Optical Interface Results



#### LOOP UP AND RUN TEST

- 1. Select the Actions tab in the Actions Panel.
  - If you are testing head-to-head, to a hard loop, or if the loopback device is already in Local Loop Back (LLB) mode, proceed to step 2.
  - If the Loopback device is a OneAdvisor, T-BERD/MTS 5800 or another VIAVI compatible loopback device, tap to loop up the far end device.
- 2. Tap Traffic . The button will turn yellow and be relabeled Traffic .
- Press the **Restart** soft key on the right side of the screen. Verify that:
  - The Right Results window shows
     "Rx Mbps, L1" is approximately equal to the Committed Information Rate.
  - ✓ The Right Results window shows
     Lost Frames = 0.
- Allow the Test to run for the desired duration.
   Verify that the Left Result window displays

"ALL SUMMARY RESULTS OK" throughout the test.

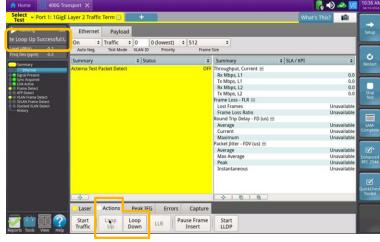


Figure 12: Loop Up

Running 4s	Layer 2 Traffic Term 🗙 🛨		What's This?	10			
3 messages vel (dBm) -5.2	COn = Traffic = 0 0 (lowest) = 512 = Auto Neg. Test Mode VLAN ID Priority Frame Size						
eq Dev (ppm)	Summary  \$ Status	Summary	\$ SLA / KPI	+			
Sumary Example Signal Analog Signal Analog Signal Analog	ALL SUMMARY RESULTS OK	Throughput, Current ⊟ Rx Mbps, L1 Tx Mbps, L1 Tx Mbps, L2 Tx Mbps, L2 Tr Ambps, L2 Tr Ambps, L2 Tr Ambes,		1,000.0 1,000.0 962.4 962.4 0 0.0 9,143 9,142 9,231 0.032 0.037 0,110 0.030			
		apture					
orts Tools View Help	Traffic Loop Loop LLB Pause I Started Up Down LLB Inse	Frame Start					

Figure 13: Start Traffic