OneAdvisor 800 Transport and Wireless Platforms

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QUICK CARD

Ethernet Layer 2 Bit Error Rate Test (BERT)

This quick card describes how to set up the OneAdvisor 800 as a Layer 2 Traffic Generator and measure Bit Error Rate (BER). 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.

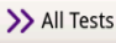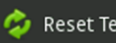### EQUIPMENT REQUIREMENTS

- 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

Figure 1: Equipment Requirements

LAUNCH TEST

1. Press the Power button ⬤ on the ONA-800 base top panel to turn on the OneAdvisor.

2. Tap 🏠 Home to display the Home Screen.

3. Tap Tests to display the Tests menu.

4. Tap **Radio Analysis Transport >** or **400G Transport >** to show the Transport test application.

5. Tap the **Transport** icon.

6. 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 ► Layer 2 Traffic ►P1 Terminate.**

8. If the current configuration is unknown, tap 🧰 Tools to open the **Tools** Panel and select Reset Test to Defaults.
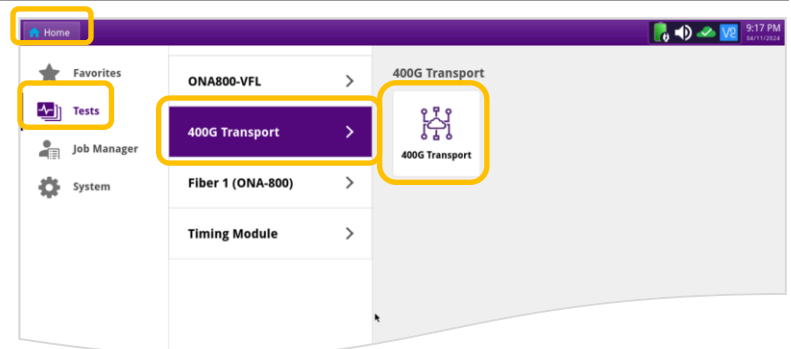
9. Press ✔ OK to continue.

Figure 2: Transport Launch screen

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.
- Bit Error Rate Threshold

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:
1. Tap the **Setup** soft key on the top right side of the screen and proceed to page 3.

Figure 5: Quick Config, Auto Neg.

► For Optical Interfaces:
1. Tap the **Setup** soft key on the top right side of the screen.
2. Select the **Interface/Connector** folder.
3. Insert desired Optical Transceiver into the Port 1 SFP or QSFP slot on the top of the OneAdvisor.
4. Review SFP information:
   o Verify that the SFP operates on the required wavelength (850nm, 1310nm or 1550nm).
   o Verify that the SFP supports the required data rate (1G, 10G, etc.)
   o Note the Min and Max Tx Levels (dBm) and Max Rx Level (dBm) to assess if optical attenuators are required.
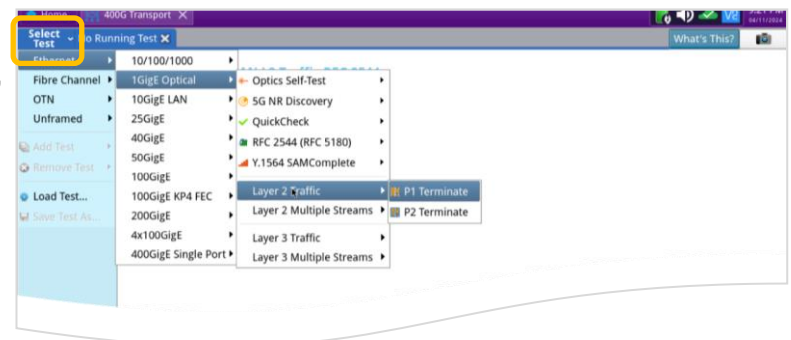

Figure 6: Setup, Interface/Connector/SFP

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CONFIGURE TEST (CONTINUED)

► Select the **Ethernet** settings tab.

1. If you are testing a VLAN, set **Encapsulation** to **VLAN,** tap the VLAN field and enter your **VLAN ID**.

2. If you are testing head-to-head with another OneAdvisor or T-BERD:

   • 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 upon request.

   • Tap the DA field and enter the Source Address (SA) of the far-end OneAdvisor or T-BERD in the **Destination MAC** field.

3. Tap the **Data** field, and set **Tx Payload** to **BERT**.
   Note: This will disable Frame Loss and Round-Trip Delay results.

► Select the **Filter** settings tab and set **Encapsulation** to **None**. Set **Filters** to Ethernet, tap the **Type** field, and set **Ethertype** to 0700.

► 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
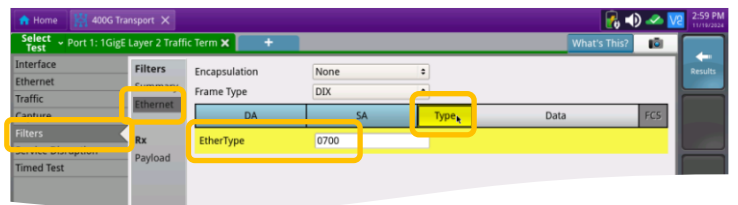

Figure 9: Setup, Ethernet/Data
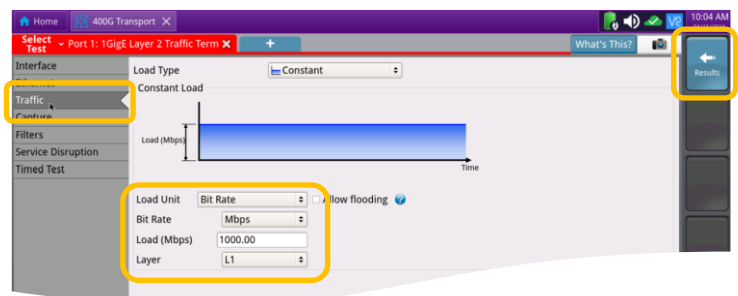

Figure 10: Setup, Filters

Figure 11: Setup, Traffic

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CONNECT TO LINE UNDER TEST

► **For Optical Interfaces:**

1. Use the VIAVI P5000i or FiberChek Probe microscope to inspect both sides of every connection being used (SFP, attenuators, patch cables, bulkheads)
   o Focus the fiber on the screen.
   o If it appears dirty, clean the fiber end-face and re-inspect.
   o If it appears clean, run the inspection test.
   o 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.
3. 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 [Laser Off]. The button will turn yellow and be relabeled [Laser On].
6. Press the **Restart** soft key [Restart].
7. Verify the following:
   o **Summary** LED is green.
   o **Signal Present** LED is green.
   o **Sync Acquired** LED is green.
   o **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:
   o **Summary** LED is green.
   o **Sync Acquired** LED is green.
   o **Link Active** LED is green.
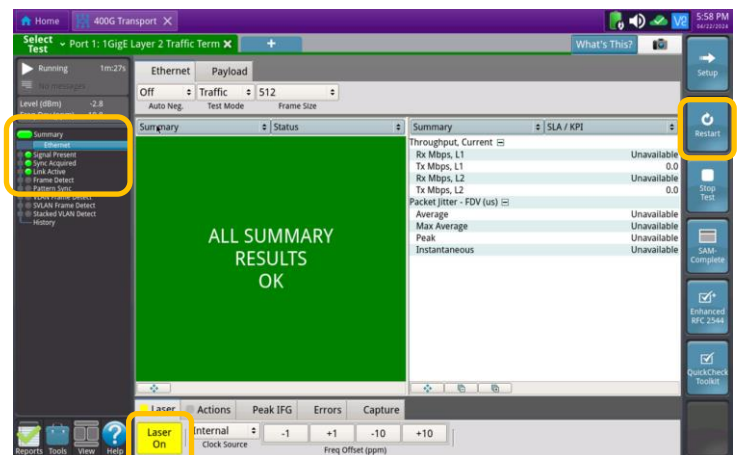

Figure 12: Inspect Before You Connect

Figure 13: 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 Loop Up to loop up the far end device.

2. Tap Start Traffic . The button will turn yellow and be relabeled Traffic Started .

3. Press the **Restart** soft key Restart on the right side of the screen. Verify that the Right Results window shows "Rx Mbps, L1" approximately equal to the Committed Information Rate.

4. Using the drop-down menus, change the right results window to **Ethernet/BERT Stats.**

5. Allow the test to run for the desired duration. Verify that your **Bit Error Rate** is less than the Bit Error Rate threshold.

Notes:

• The **Summary/Status** window with turn red if there is a single bit error, regardless of the **Payload Error Rate threshold**.

• If the test traffic is transported though any Layer 2 or Layer 3 network equipment, including Ethernet Switches, Routers, NIDs, and Layer 2 Loopback devices, they will drop all errored frames. This will result in multiple **Bit Errors** and **Pattern Losses**.
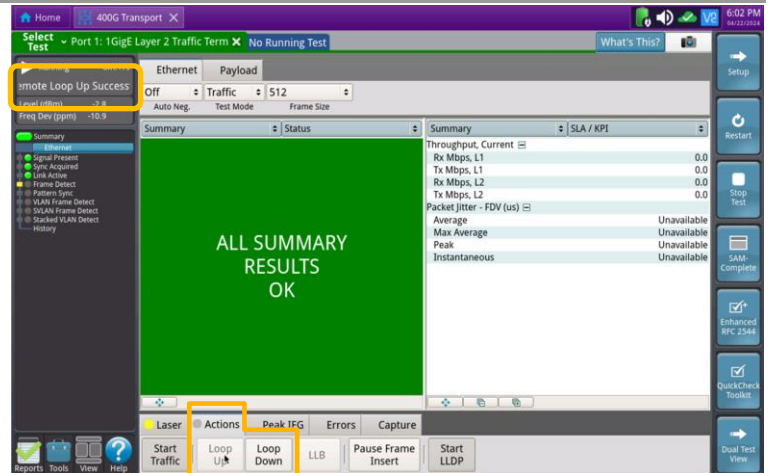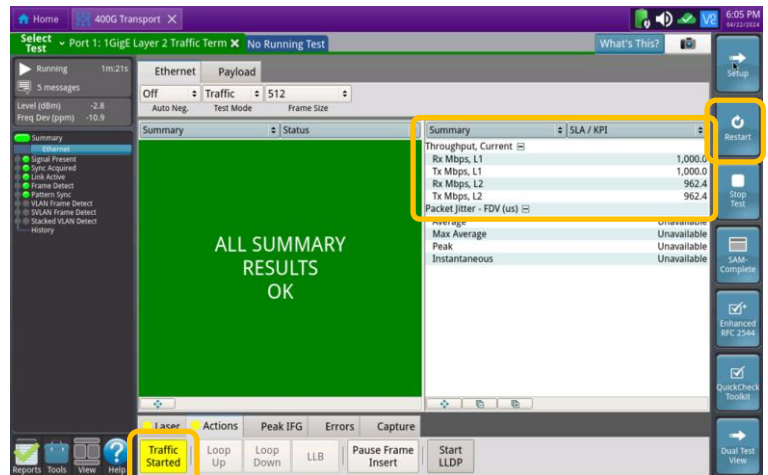

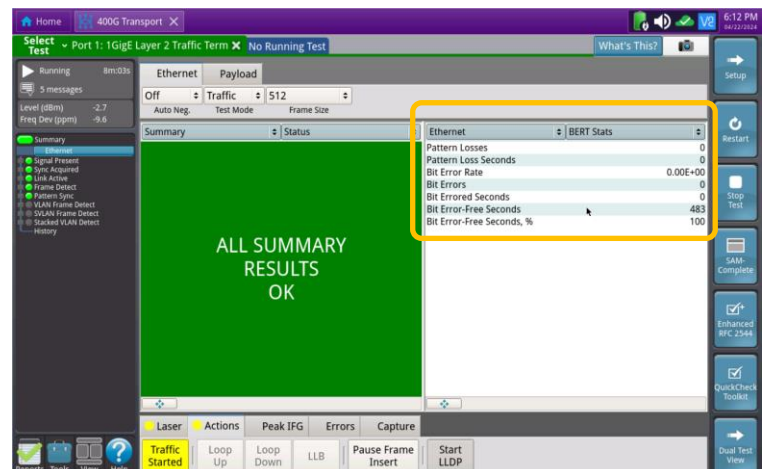*Figure 14: Loop Up*

Figure 15: Start Traffic

Figure 16: BERT Stats

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