**QUICK CARD**

**Ethernet Layer 2 Traffic Generation**

This document outlines how to configure and run an Ethernet Bit Error Rate Test (BERT). Bit Error Rate Testing is only recommended when testing head-to-head with another T-BERD/MTS, or when testing to a hard loop on a Layer 1 Transport Network.

- T-BERD/MTS 5800 equipped with the following:
  - Transport software release V31.2.1 or greater
  - C510M1GE test option for 10 Megabit to 1 Gigabit Ethernet
  - C510GELAN test option for 10 Gigabit Ethernet
  - C525GE test option for 25 Gigabit Ethernet
  - C540GE test option for 40 Gigabit Ethernet
  - C550GE test option for 50 Gigabit Ethernet
  - C5100GE test option for 100 Gigabit Ethernet
- Optical Transceiver supporting the line rate to be tested (SFP or QSFP)
- Cables to match the optical transceiver and the line under test
- Fiber optic inspection microscope (P5000i or FiberChek Probe)
- Fiber optic cleaning supplies

**LAUNCH TEST**

1. Press the Power button to turn on the T-BERD.
2. Tap the Test icon at the top of the screen to display the Launch Screen.
3. Using the Select Test menu, Quick Launch menu, or Job Manager, launch the Ethernet Layer 2 Traffic test on Port 1 for the desired data rate. For example: Ethernet ► 1GigE Optical ► Layer 2 Traffic ► P1 Terminate.
4. Tap to open the Tools Panel and select .
5. Tap to continue.
The following Information is needed to configure the test:

- Physical Interface (10/100/1000BASE-T, 1000BASE-LX, 10GBASE-LR, 100GBASE-LR4, etc.)
- Auto Negotiation settings of the port under test.
- Bit Error Rate Threshold

For 10/100/1000 Electrical tests:
1. 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).
2. 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 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 T-BERD/MTS.
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 LAN, etc).
   - Note the Min and Max Tx Levels (dBm) and Max Rx Level (dBm) to assess if optical attenuators are required.
Configure Test (continued)

- Select the Ethernet settings tab.
  1. If you are testing to a hard loop, proceed to step 2. If you are testing head-to-head with another T-BERD/MTS:
     - Tap the SA field to display the Factory Default Source MAC Address of your T-BERD/MTS. Provide this address to the operator of the other T-BERD/MTS, upon request.
     - Tap the DA field and enter the Source Address (SA) of the far-end T-BERD/MTS in the Destination MAC field.
  2. Tap the Data field and set Acterna Payload to BERT.

- Select the Traffic settings tab. Set Load Unit to Bit Rate and set Load to the desired traffic rate or Committed Information Rate (CIR).

- Select the Interface setting tab and Physical Layer folder.
  1. Tap the check box to Enable Error Rate Threshold.
  2. Set Payload Bit Error Rate Threshold to desired value.

- Tap the Results soft key.
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)
   - 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.
3. Connect the SFP 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. Tap . The button will turn yellow and be relabeled .
6. Tap 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 Copper 10/100/1000BASE-T interfaces:
1. Connect the 10/100/1000 RJ-45 jack to the port under test using CAT 5E or better cable.
2. Tap the Restart soft key .
3. Verify the following:
   - Summary LED is yellow.
   - Sync Acquired LED is green.
   - Link Active LED is green.
RUN TEST

1. Select the **Actions** tab in the **Actions Panel**.
2. Tap **Start Traffic**. The button will turn yellow and be relabeled **Traffic Started**.
3. Press the **Restart** soft key on the right side of the screen.
4. 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**.
5. Using the drop-down menus, change the right results window to **Ethernet/BERT Stats**.
6. Allow the Test to run for the desired duration. Verify that the right result window displays **“Payload Error Rate threshold = OFF”** throughout the test.

**Notes:**
- The **Summary/Status** screen 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, Lost Frames, and Pattern Losses.**