

Quick Card

T-BERD[®]/MTS-5800 Network Tester

One Way Delay (OWD) Measurement

This document outlines how to set T-BERD/MTS 5800's to measure One Way Delay on Ethernet datalinks at rates up to 100Gbps.

Equipment Requirements:

- Two T-BERD/MTS-5800's equipped with the following:
 - BERT software release V27.0 or greater
 - Test options:
 - Ethernet and One Way Delay:
 - C510M1GE and C5OWD for 1Gigabit or less
 - C510GELAN and C5OWD for 10Gig
 - C525GE and C5100GOWD for 25Gig
 - C540GE and C5100GOWD for 40Gig
 - C5100GE and C5100GOWD for 100Gigabit Ethernet
 - GNSS/GPS (VIAVI Part# C5GNSS)
- GNSS Antenna (Taoglas AA.171, VIAVI Part# C5ANTENNA)
- SFP, QSFP, or CFP4 optical transceiver to match the line under test
- Jumper Cables to match the optical transceiver and the line under test
- Fiber optic inspection microscope (VIAVI P5000i or FiberChek Probe)
- Fiber Optic Cleaning supplies



Figure 1: Equipment Requirements

The following information is required 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
- VLAN ID (if encapsulation = VLAN)

Fiber Inspection Guidelines:

- Use the VIAVI P5000i or FiberChek Probe microscope to inspect the jumper cable or loopback plug before connection to the optical transceiver.
- Focus the fiber on the screen. If dirty, clean the connector.
- If it appears clean, run inspection test.
- If it fails, clean the fiber and re-run inspection test.
- Repeat until it passes.

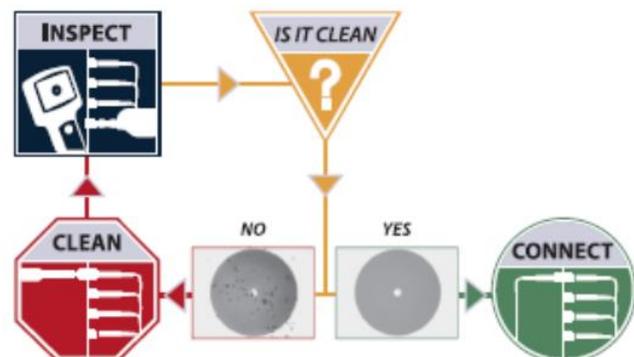


Figure 2: Inspect Before You Connect

Connect Each T-BERD to Port Under Test:

- For copper 10/100/1000BASE-T interface testing with the T-BERD/MTS 5800v2 or T-BERD/MTS 5882, connect the Port 1 10/100/1000 RJ-45 jack to the port under test using CAT 5E or better cable.
- For copper 10/100/1000BASE-T interface testing with the T-BERD/MTS 5800-100G, insert a copper SFP into the Port 1 SFP+/SFP28 slot and connect to the port under test using CAT 5E or better cable.
- For optical interfaces:
 - Insert desired SFP, QSFP, or CFP4 into the Port 1 slot on the top of the T-BERD/MTS.
 - Inspect and, if necessary, clean all SFPs, fibers, and bulkheads, as described on page 1.
- Connect the SFP, QSFP, or CFP4 to the port under test using a Single Mode or Multimode jumper cable compatible with the interface under test.



Figure 3: T-BERD 5800v2



Figure 4: T-BERD 5882



Figure 5: T-BERD 5800-100G

Launch and Configure Tests:

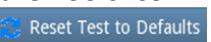
- Press the Power button  to turn on the test set.
- Enable the Timing Expansion Module (TEM) or Internal GNSS Receiver and complete a survey, as documented in “*T-BERD®/MTS-5800 Network Tester, Enabling the GNSS/GPS Receiver for Sky Plot, One-Way Delay, and Sync Measurements*” Quick Card.
- Using the **Select Test** menu, **Quick Launch** menu, or **Job Manager**, launch an **Ethernet, Layer 2 Traffic, Terminate** test on port 1 for the desired physical interface. For example: **Ethernet ▶ 10/100/1000 ▶ Layer 2 Traffic ▶ P1 Terminate**.
- If the test is not in the default settings, tap the **Tools icon** , and select **Reset Test to Defaults** . Press **OK**  to continue.



Figure 6: T-BERD 5882/T-BERD 5800-100G Internal GNSS

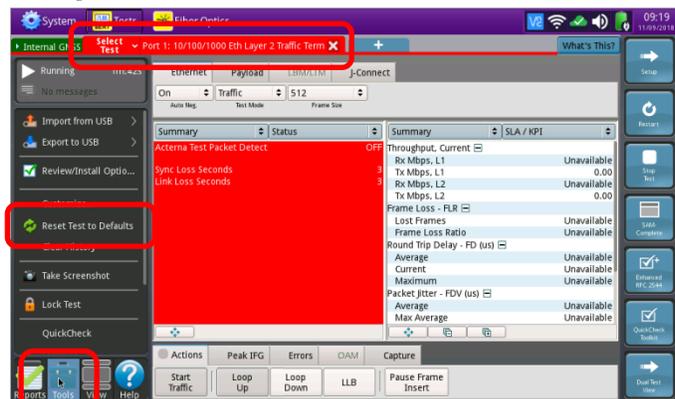


Figure 7: Ethernet Layer 2 Traffic Test

5. Verify that the **ToD Sync** and **1 PPS Sync** LEDs are both green. If they are not green, check your TEM or GNSS Receiver Setup.
6. Press the **Setup** Soft Key,  to display the **Interface** settings tab.

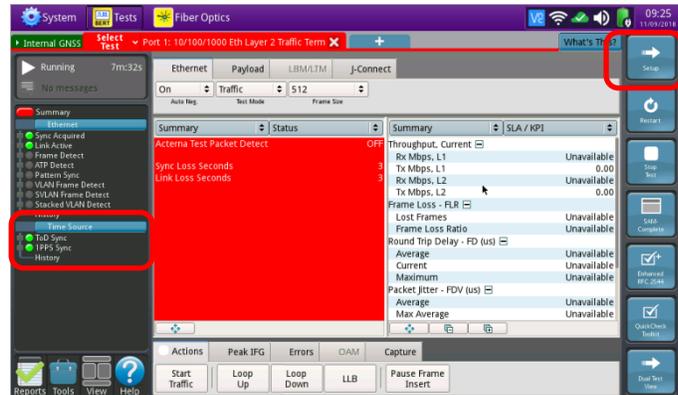


Figure 8: Time Source LEDs

7. If you are testing a **10/100/1000** Electrical or **1GigE** Optical tests with auto negotiation disabled, select the **Physical Layer** tab and configure settings to match the Ethernet port under test.
8. Select the **GPS/CDMA** tab and tap (check) the checkbox to **Enable GPS Receiver**.

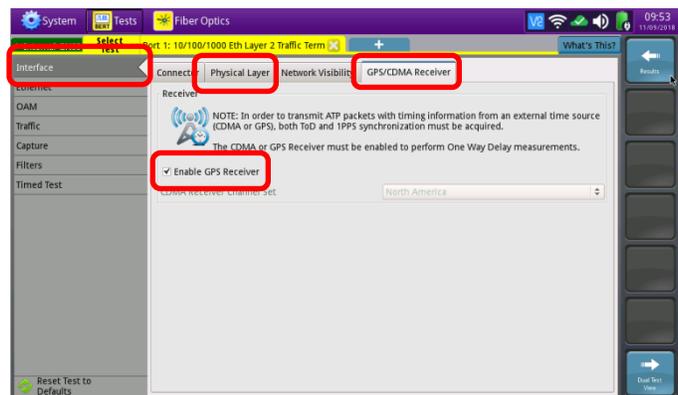


Figure 9: GPS/CDMA Receiver Setup

9. Select the **Ethernet** tab to configure Ethernet settings.
 - Tap [**DA**] to display the **Destination MAC** Address. Enter the MAC Address of the T-BERD/MTS at the far end of the line under test.
 - Tap [**SA**] 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.
 - If you are testing a port that requires VLAN encapsulation, set **Encapsulation** to **VLAN**, tap [**VLAN**] and enter your **VLAN ID**.
 - If you wish to measure Bit Error Rate, tap [**Data**] and set **Acterna Payload** to **BERT**.

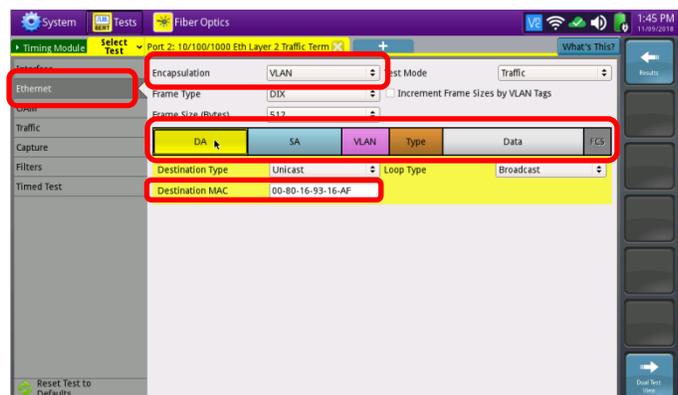


Figure 10: Ethernet Setup

10. Select the **Traffic** tab to configure Traffic settings.

- Set **Load Unit** to **Bit Rate**.
- Set **Load** to the desired traffic rate or Committed Information Rate (CIR).

11. Press the **Results** Soft Key, , to view the Results screen.

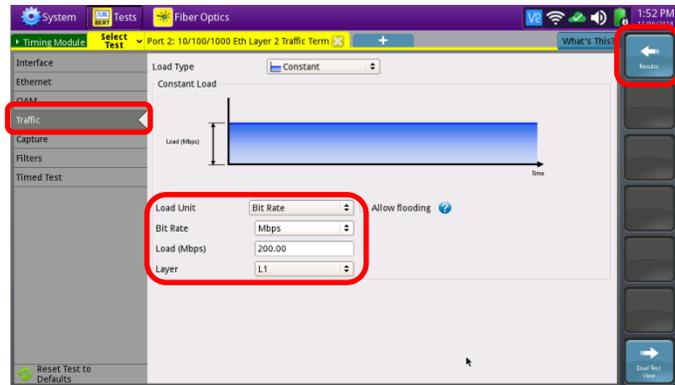


Figure 11: Traffic Setup

12. For **1GigE to 100GigE** optical tests, select the **Laser** tab in the Action panel, and press

. The button will turn yellow and be relabeled .

13. A green **Signal Present** LED  indicates the T-BERD/MTS is receiving an optical signal from the port under test. Green **Sync Acquired** and **Link Active** LEDs indicate the T-BERD/MTS has successfully connected to the port under test and the link is active.

14. Tap the **Actions** tab and tap the **Start Traffic** button . The button will turn yellow

and be relabeled .

15. Instruct the operator of the other T-BERD/MTS to also **Start Traffic**.

16. 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 CIR.
- The Right Results window shows Lost Frames = 0.

17. Allow the Test to run for the desired duration. Verify that the Left Result window displays “**ALL SUMMARY RESULTS OK**” throughout the test.

18. Swipe up or scroll down in the Right Results Display to display **One Way Delay** results.

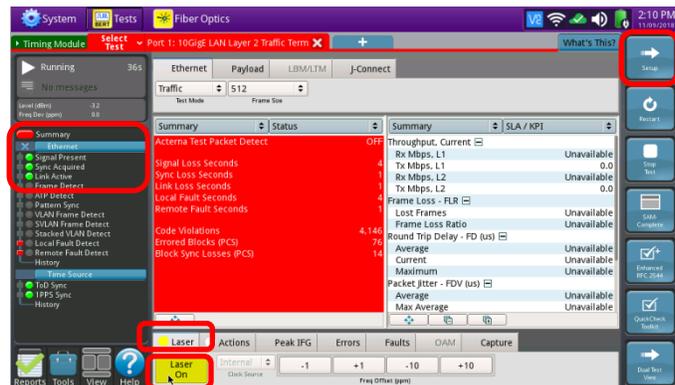


Figure 12: Results

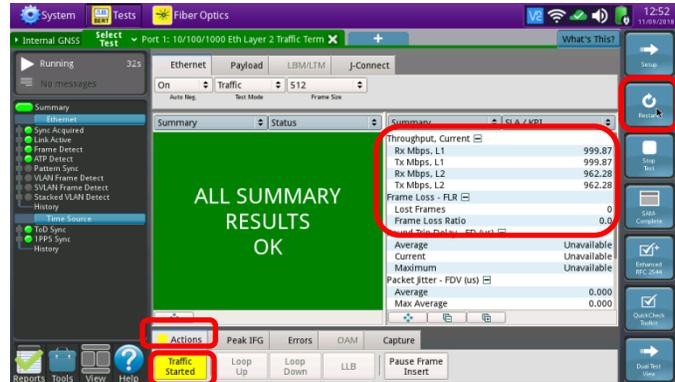


Figure 13: Start Traffic



Figure 14: One Way Delay results