

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

to Figure 1: Equipment Requirements

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- 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.



Figure 2: Inspect Before You Connect

• Repeat until it passes.



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.
- 3. 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.

Launch and Configure Tests:

- 1. 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 desire physical interface. For example: Ethernet ▶ 10/100/1000 ▶ Layer 2 Traffic ▶ P1 Terminate.
- 4. If the test is not in the default settings, tap





Figure 3: T-BERD 5800v2



Figure 4: T-BERD 5882



Figure 5: T-BERD 5800-100G



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



Figure 7: Ethernet Layer 2 Traffic Test



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

System 🔛 Tests	😽 Fiber Optics 🛛 💆 🐔	P 🛹 🕕 🔒 09:25
Internal GNSS Select Po	vrt 1: 10/100/1000 Eth Layer 2 Traffic Term 🗙 👥 🛨	What's Th s?
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L= No messages	On Traffic Figure 512 Auto Nex. Text Mode Frame Size	
Commany		
Ethernet	Summary 🗢 Status 🗢 Summary 🗢 SLA / KPI	¢ Lestar
C Link Active	Acterna Test Packet Detect OFF Throughput, Current 🖃	
Frame Detect	Rx Mbps, L1	Unavailable
Pattern Sync	Sync Loss Seconds 3 Tx Mbps, L1	0.00 Scop
🖷 🖲 VLAN Frame Detect	Clink Coss Seconds S Rx Mbps, L2	Unavailable
SVLAN Frame Detect	IX MBps, L2	0.00
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Time Source	East Parties	Unavailable
🕸 🔿 ToD Sync	Round Trin Delay - ED (us)	Chavanable Company
PPS Sync	Average	Unavailable
History	Current	Unavailable
	Maximum	Unavailable Enhanced
	Packet Jitter - FDV (us) 😑	incom
	Average	Unavailable
	Max Average	Unavailable 🛛 🗹
		QuickCheck Toolkit
	Actions Peak IFG Errors OAM Capture	
Reports Tools View Help	Start Loop Loop Down LLB Pause Frame Traffic Up Down LLB Insert Insert	Duard Test View

Figure 8: Time Source LEDs

- 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.**

System 🔛 Tests	🗯 Fiber Optics	VZ 奈 🗻 🌒 🔒 09:53
Select rest	ort 1: 10/100/1000 Eth Layer 2 Traffic Term 🗙 🛑 🕂	What's This?
Interface	Connecter Physical Layer Network Visibilit GPS/CDMA Receiver	Results
ectioniec	Receiver	
OAM	(((a)) NOTE: In order to transmit ATP packets with timing information from an	external time source
Traffic	(CDMA or GPS), both ToD and 1PPS synchronization must be acquired.	
Capture	The CDMA or GPS Receiver must be enabled to perform One Way Delay	measurements.
Filters	Enable GPS Receiver	
Timed Test	COMA Receiver channel Set North America	•
C. Decet Test to		
Defaults		View

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.
- 12. For 1GigE to 100GigE optical tests, select the Laser tab in the Action panel, and press
 - Lase Off The button will turn yellow and be Laser On
- 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 Start

Traffic button The button will turn yellow Traffic Started

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 11: Traffic Setup



Figure 12: Results







Figure 14: One Way Delay results

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