QUICK CARD

SONET Bit Error Rate Testing (BERT)

This quick card describes how to configure and run a SONET Bit Error Rate Test at the full concatenated line rate. Please note that the T-BERD can also test channelized payloads (DS1, VT1.5, and STS-n). Please refer to the T-BERD 5800 User's Guide for information.

- T-BERD/MTS 5800 equipped with the following:
    - BERT software release V30.1.0 or greater
    - C5LSSONSDH test option for OC-3 and OC-12
    - C525GSONSDH test option for OC-48
    - C510GSONSDH test option for OC-192

- Optical Transceiver supporting the Optical Carrier level to be tested (SFP or SFP+)

- LC Attenuators (5dB, 10dB, and/or 15dB)

- Cables to match the optical transceiver and the line under test

- Fiber optic inspection microscope (P5000i or FiberChek Probe)

- Fiber optic cleaning supplies

Figure 1: Equipment Requirements

LAUNCH TEST

1. Press the Power button ⏻ to turn on the T-BERD.

2. Press the **Test** icon 🔲 Tests 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 SONET Bulk BERT test on Port 1 for the desired Optical Carrier level. For Example:
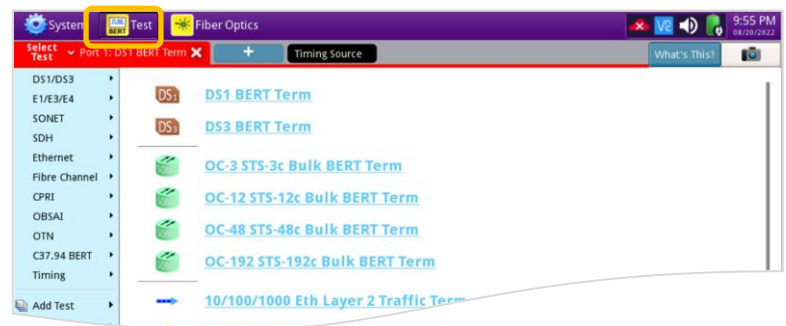**SONET► OC-3► STS-3c Bulk BERT► P1 Terminate.**

Figure 2: Launch Screen

4. Tap 🧰 to open the **Tools** Panel and select 🔄 Reset Test to Defaults .

5. Press ✔ OK to continue.

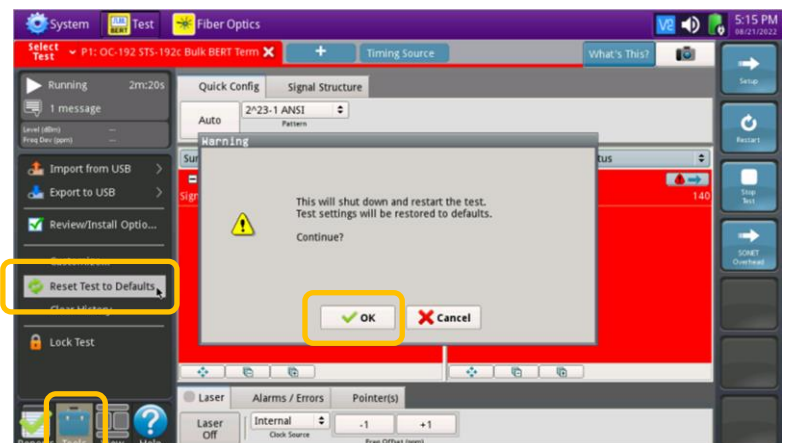

Figure 3: Tools Panel

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CONFIGURE TEST

- The following Information is needed to configure the test:
  - Optical wavelength (typically, 1310nm or 1550nm)
  - Test Pattern(s) (default is 2^23-1 ANSI)
  - BER Pass/Fail Threshold

Figure 4: Work Order

1. Press the **Setup** soft key ⬛ on the top right side of the screen.

2. Select the **Interface/Connector** folder.

3. Insert desired SFP into the Port 1 SFP+ slot on the top of the T-BERD.

4. Review **SFP** information in the **Connector** tab:
   - ► Verify that the SFP operates on the required wavelength (1310nm or 1550nm).
   - ► Verify that the SFP supports the required optical carrier level (OC-3, OC-12, OC-48, or OC-192).
   - ► Note the Min and Max Tx Levels (dBm) and Max Rx Level (dBm) to assess if optical attenuators are required.

5. Select the indicated folders and configure your test as follows. Leave all other values at default, unless specified in the work order.
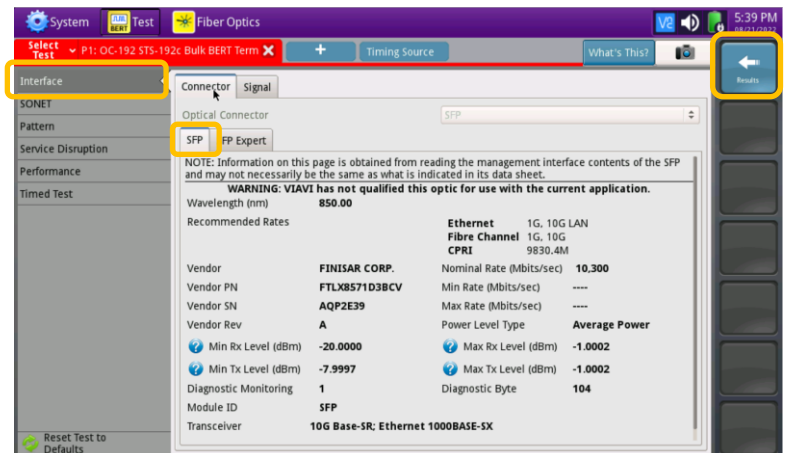

Figure 5: Setup, Interface/Connector/SFP
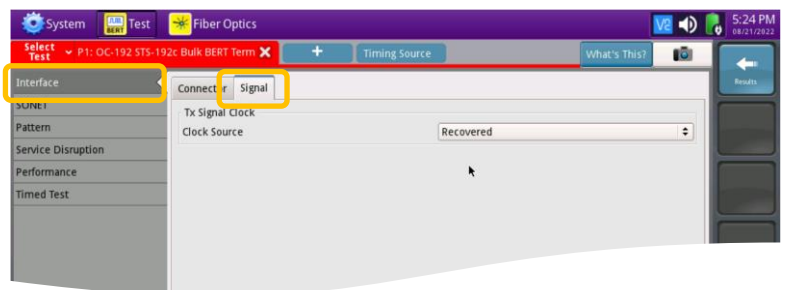
Figure 6: Setup, Interface/Signal

Folder	Option	Value(s)
Interface, Signal	Clock Source	Select "Recovered" unless you are testing dark fiber with no SONET equipment
Pattern	Pattern Mode	ANSI
	Pattern	2^23-1 ANSI

6. Press the **Results** soft key ⬛ to view the Test Results screen.
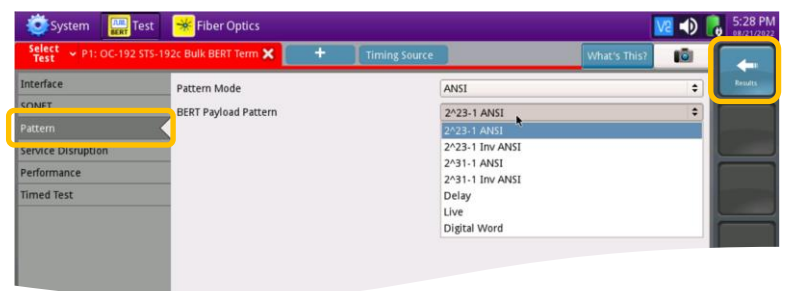
Figure 7: Setup, Pattern

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CONNECT TO LINE UNDER TEST

- Use the VIAVI P5000i or FiberChek Probe microscope to inspect both sides of every connection being used (SFP, attenuators, patch cables, bulkheads)
  - ► Focus fiber on the screen.
  - ► If it appears dirty, clean the fiber end-face and re-inspect.
  - ► If it appears clean, run inspection test.
  - ► If it fails, clean the fiber and re-run inspection test. Repeat until it passes.
- If necessary, insert optical attenuators into the SFP TX and/or RX ports.
- Connect the SFP to the port under test using a jumper cable compatible with the line under test.
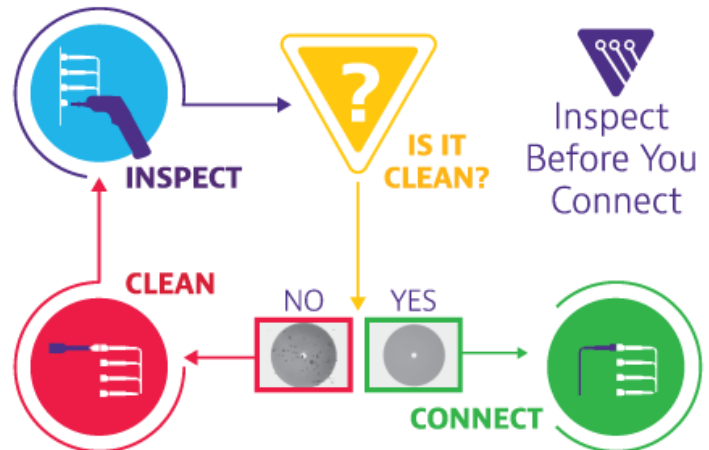
Figure 8: Inspect Before You Connect

RUN TEST

1. Using drop-down menus ⬍ , select "**Payload/BERT**" for the right results display.

2. Select the Laser tab in the Actions panel, and press [Laser Off] . The button will turn yellow and be relabeled [Laser On] .

3. Press the Restart soft key [Restart] .

4. Verify the following:
   - ► **Level (dBm)** is within the Rx Level range of the SFP.
   - ► **Summary** LED is green.
   - ► **Signal Present** LED is green.
   - ► **Frame Sync** LED is green.
   - ► **Path Pointer Present** LED is green
   - ► **Pattern Sync** LED is green.
   - ► **Summary/Status** results shows '**ALL SUMMARY RESULTS OK**"

5. Allow the test to run for desired duration and verify the following:
   - ► **Bit/TSE Error Rate** result does not exceed your required threshold. (0.00E+00 if pass/fail threshold unknown)

Figure 9: Results, Payload BERT

Status	Tip
Signal Present LED not green	Check your **cables.** Tx and Rx may be reversed.
Path Pointer Present LED not green and **AIS-P** alarm on	There may be no loop or no connectivity to the loop. The wrong payload may be selected (concatenated vs. channelized).
RDI-L alarm on	The Tx Level is too high. Add an attenuator between the SFP Tx port and the line under test.
Path Pointer Adjustments incrementing	**Clock Source** is set incorrectly. Change **Clock Source** to "**Recovered**."

Figure 10: Troubleshooting Tips

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6. In the T-BERD's **Quick Config** menu, change "**Pattern**" to the next value in the test plan.

7. Press the **Restart** soft key [⟳] to reset results.

8. Allow test to run for desired duration and verify the following:
   - ► **Pattern Sync** LED is green.
   - ► **Bit/TSE Error Rate** or **Round Trip Delay** does not exceed your required threshold.
   - ► Repeat steps 6 through 8 for all **Patterns** in the test plan. Patterns may include:
     - ▪ **Delay**: Measures **Round Trip Delay** (RTD) instead of Bit Errors. RTD values are shown instead of BER in the "Payload/BERT" results display.
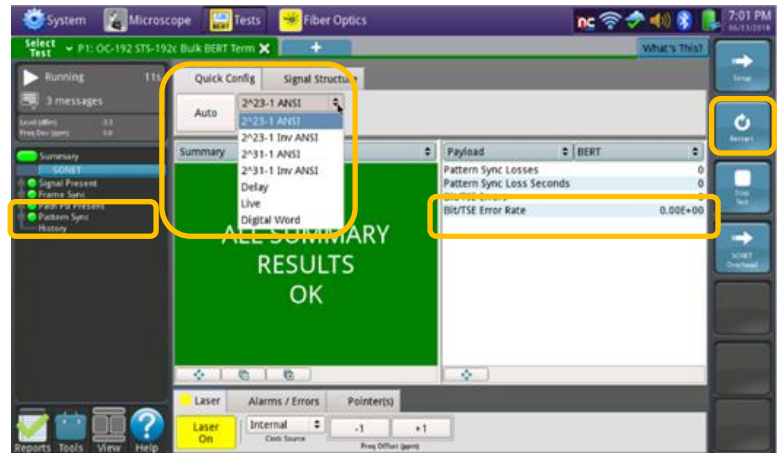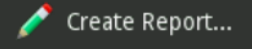

Figure 11: Results, Quick Config

CREATE REPORT

1. Tap [Reports] to open the **Reports** Panel and select [✎ Create Report...].

2. Tap [Create].

3. A report will be saved to the T-BERD 5800's **/bert/reports** folder.

Figure 12: Create Report

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