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 OneAdvisor can also test channelized payloads (DS1, VT1.5, and STS-n). Please refer to the OneAdvisor User’s Guide for information.

**LAUNCH TEST**

1. Press the Power button to turn on the OneAdvisor.
2. Press the 100G Module Test icon at the top of the screen.
3. Tap the Power button and click to launch the 100G Module.
4. 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.**
5. Tap to open the Tools Panel and select .
6. Press to continue.
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

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 100G Transport Module.
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.

<table>
<thead>
<tr>
<th>Folder, Option</th>
<th>Value(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interface, Signal Clock Source</td>
<td>Select “Recovered” unless you are testing dark fiber with no SONET equipment</td>
</tr>
<tr>
<td>Pattern Pattern Mode</td>
<td>ANSI</td>
</tr>
<tr>
<td>Pattern Pattern Pattern</td>
<td>2^23-1 ANSI</td>
</tr>
</tbody>
</table>

6. Press the Results soft key to view the Test Results screen.
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.

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 . The button will turn yellow and be relabeled .
3. Press the Restart soft key .
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)

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**Figure 8: Inspect Before You Connect**

**Figure 9: Results, Payload BERT**

**Figure 10: Troubleshooting Tips**

<table>
<thead>
<tr>
<th>Status</th>
<th>Tip</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signal Present LED not green</td>
<td>Check your cables. Tx and Rx may be reversed.</td>
</tr>
<tr>
<td>Path Pointer Present LED not green and AIS-P alarm on</td>
<td>There may be no loop or no connectivity to the loop. The wrong payload may be selected (concatenated vs. channelized).</td>
</tr>
<tr>
<td>RDI-L alarm on</td>
<td>The Tx Level is too high. Add an attenuator between the SFP Tx port and the line under test.</td>
</tr>
<tr>
<td>Path Pointer Adjustments incrementing</td>
<td>Clock Source is set incorrectly. Change Clock Source to “Recovered.”</td>
</tr>
</tbody>
</table>
6. In the 100G Module’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.

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**CREATE REPORT**

1. Tap to open the Reports Panel and select .
2. Tap .
3. A report will be saved to the OneAdvisor 1000 100G Module’s /bert/reports folder.