

Quick Card

T-BERD[®]/MTS-5800 Network Tester

GNSS Reception Test

This document outlines how to use T-BERD/MTS 5800 instrument to perform GNSS reception testing for GNSS antenna installation, verification or troubleshooting.

Equipment Requirements:

- One of the following T-BERD/MTS 5800 mainframe configurations:
 - T-BERD/MTS-5800-100G (TB/MTS-5800-100G)
 - BERT software release V27.2 or greater
 - GNSS test option (C5GNSS)
 - GNSS Antenna (C5TEM-ANTENNA)

- T-BERD/MTS-5882 (TB/MTS-5882)
- BERT software release V27.2 or greater
- C5GNSS test option
- GNSS Antenna (C5TEM-ANTENNA)

- T-BERD/MTS 5800v2 (TB/MTS-5811P or TB/MTS-5822P)
- BERT software release V27.2 or greater
- GNSS test option (C5GNSS)
- Timing Expansion Module with Rubidium Oscillator (C5TEM)
- GNSS Antenna (C5TEM-ANTENNA)



Figure 1: T-BERD 5800-100G



Figure 2: T-BERD 5882



Figure 3: T-BERD 5800v2 w/ TEM

T-BERD/MTS Placement and GNSS Antenna Connection:

- If you are testing GNSS reception to scout for optimal location for permanent GNSS antenna installation:
 - Connect portable GNSS antenna (C5TEM-ANTENNA) to the antenna receptacle on the T-BERD/MTS-5800-100G or T-BERD/MTS-5882 mainframe or to antenna receptacle on the TEM module.
 - Place T-BERD/MTS unit in potential location where permanent GNSS antenna may be installed (e.g. roof-top, etc.) and ensure the antenna has clear unobstructed view of the sky.
- If you are testing GNSS reception of a permanent GNSS antenna installation:
 - Connect permanent GNSS antenna to the antenna receptacle on T-BERD/MTS-5800-100G or T-BERD/MTS-5882 mainframe or to the antenna receptacle on TEM module. A coax connector adapter may be required.

Configure GNSS Reception Test:

1. Press the **Power** button to turn on the T-BERD/MTS instrument.
2. Tap on the **Timing Source** tab at the top of the screen to launch the internal GNSS receiver or TEM module GNSS receiver. Once the GNSS receiver application is running, tap on the **Setup** button to configure the GNSS parameters.

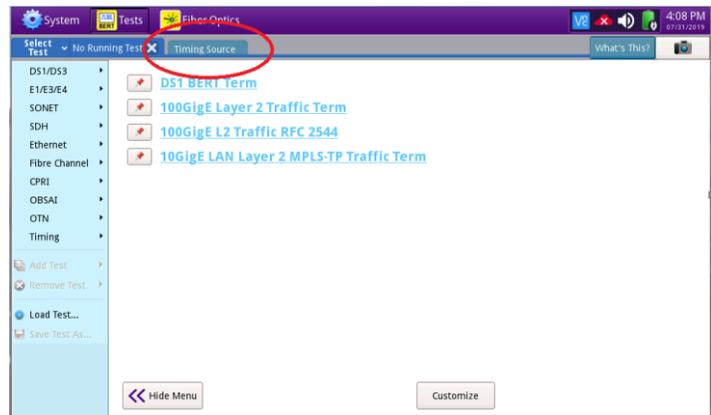


Figure 4: Launch Screen

3. On the GNSS parameters tab select the appropriate GNSS constellation for your geographical area. For North America select **GPS** system.
4. If using T-BERD/MTS portable antenna set the **Antenna Power** to 3.3 Volts. If testing with permanent antenna select the appropriate voltage for it and specify the correct **Antenna Time Bias** to compensate for antenna cable delay. **Typical antenna cables add approximately 1.2ns of delay per foot.** Leave all other parameters at defaults.
5. Tap on the **Results** button to move to the **Results** screen.

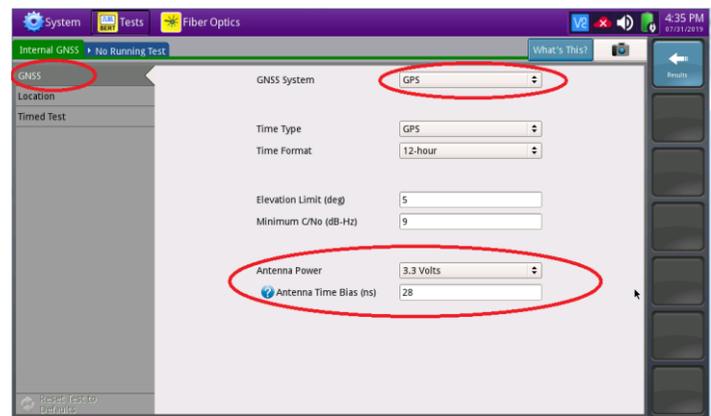


Figure 5: Setup

Run GNSS Reception Test:

1. Tap on the **Start Survey** button and select **Fast** survey mode to start the GNSS reception test.

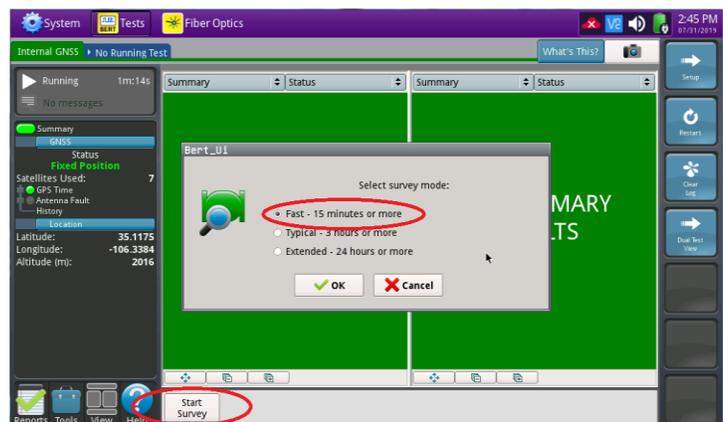


Figure 6: Start Survey

- Wait approximately 15 minutes for the satellite survey to complete, which will be indicated by the **Summary->Status** results view turning green and GNSS receiver obtaining position lock on the **GNSS -> Status** results view.

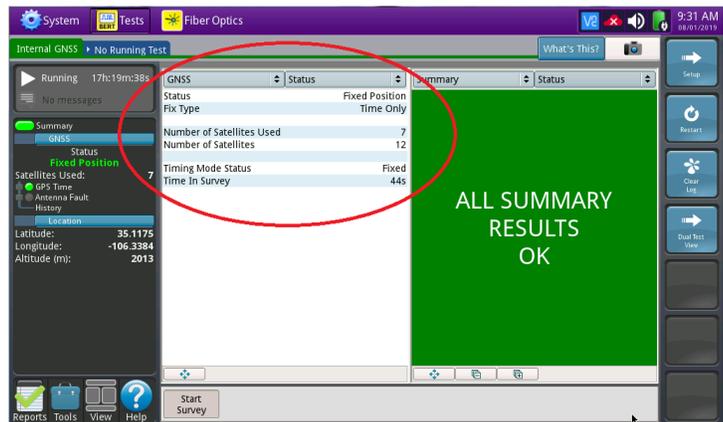


Figure 7: GNSS Status Results

- Use the **Satellites -> Sky Plot**, **Satellites -> Signal Strength** and other results views to obtain an initial assessment of GNSS reception quality. Note that GNSS CNO (carrier to noise ratio) acceptable range is 35-45 dB-Hz with maximum of 50 dB-Hz.
- If scouting for permanent antenna location installation and the GNSS reception is inadequate or CNO is too low, move the T-BERD/MTS to a different location and repeat **Steps 1 thru 3** until a location with adequate GNSS reception is found.
- If validating permanent antenna installation and the GNSS reception is inadequate or CNO is too low, proceed to antenna and/or cable troubleshooting.

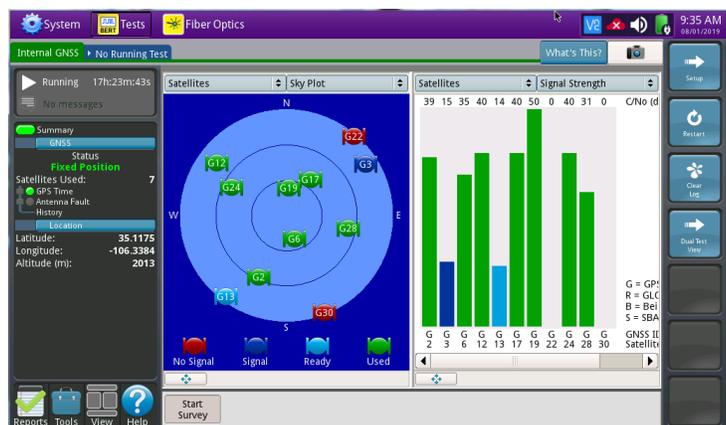


Figure 8: Satellites Sky Plot Results

- Once the initial GNSS reception quality assessment is positive in location being tested, leave the reception test running for 24 hours to track GNSS satellite reception in this location for two full orbital periods.
- Monitor and analyze the **Satellites -> CNO Map Spectrogram** results view for details on GNSS reception quality in this location throughout the test duration.

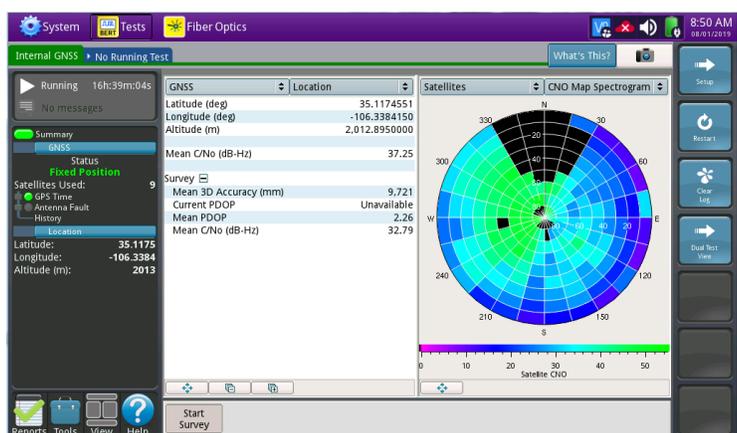


Figure 9: GNSS Location and Satellites CNO Map Spectrogram results

- At the end of the test tap on **Reports** button in bottom left screen corner and select **Create Report** option to save the GNSS Reception Test results in this location.