Multi-Channel Bit Error Rate Test

Online and Offline Testing of Input Streams

Channels 1 to 24 for T1 and 1 to 32 for E1 per Card

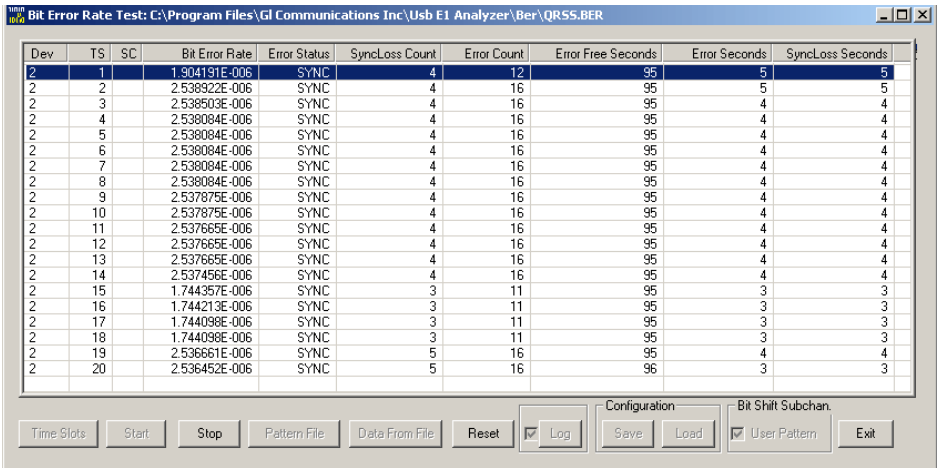
7 Sub-Channels Selection (8 to 56Kbps), each of 8 kbps

Hyper Channels Selection Ranging from 2x64K to 24/32

Data Transmission Rate of 64/56/N*64 Kbps

3 Sync States - NoSync, PreSync, and Sync to Compare Bits

Log File Option to Record Final Results



Dev	TS	SC	Bit Error Rate	Error Status	SyncLoss Count	Error Count	Error Free Seconds	Error Seconds	SyncLoss Seconds
2	1		1.904191E-006	SYNC	4	12	95	5	5
2	2		2.538922E-006	SYNC	4	16	95	5	5
2	3		2.538503E-006	SYNC	4	16	95	4	4
2	4		2.538084E-006	SYNC	4	16	95	4	4
2	5		2.538084E-006	SYNC	4	16	95	4	4
2	6		2.538084E-006	SYNC	4	16	95	4	4
2	7		2.538084E-006	SYNC	4	16	95	4	4
2	8		2.538084E-006	SYNC	4	16	95	4	4
2	9		2.537875E-006	SYNC	4	16	95	4	4
2	10		2.537875E-006	SYNC	4	16	95	4	4
2	11		2.537665E-006	SYNC	4	16	95	4	4
2	12		2.537665E-006	SYNC	4	16	95	4	4
2	13		2.537665E-006	SYNC	4	16	95	4	4
2	14		2.537456E-006	SYNC	4	16	95	4	4
2	15		1.744357E-006	SYNC	3	11	95	3	3
2	16		1.744213E-006	SYNC	3	11	95	3	3
2	17		1.744098E-006	SYNC	3	11	95	3	3
2	18		1.744098E-006	SYNC	3	11	95	3	3
2	19		2.536661E-006	SYNC	5	16	95	4	4
2	20		2.536452E-006	SYNC	5	16	96	3	3

Multi-Channel Bit Error Rate Testing (MCBERT) measures correctness of data received on T1/E1 lines/timeslots with stored data in a reference file. The application can work in real-time with data simultaneously being received on T1/E1 lines/timeslots, or off-line with data stored in a file. The on-line T1/E1 testing can be done on full or fractional T1/E1.The following independent streams can be compared to a pattern file.

- A Hyperchannel per T1/E1 (Nx64k timeslots, where N = 1...24 T1, 1...31 E1) line/trunk.
- Multiple 64k (or 56k) channels.
- Multiple subchannels Nx8K (8k, 16k…56k). For example, for T1 it could be up to 24x8 separate 8K subchannels (eight sub-channels per timeslot).

Interface and Functional Features

The visual interface of this application consists of the following controls:

- **Time Slots**: Allows user to select independent stream timeslots, or hyper channels, or subchannels to be tested.
- **Start, Stop:** Start or Stop the actual testing of the incoming data on the selected timeslots (Online), or begin file comparison operation (offline).
- **Pattern File:** User can choose any type of file to be used as the reference file. The chosen file is used for either online or offline testing.
- **Data from File:** For Offline analysis, user can select any type of captured file to be compared against the reference file.
- **Reset**: This resets all the counter values to zero in the MCBERT statistics window.
- **Log:** Records the comparison of Expected and Received data to a file.
- **Save**: This option allows users to save the selected stream into a *.BRC file format.
- **Load**: Allows user to load the previously saved configuration.
- **Bit Shift Synchronization**: Check the User Pattern option to achieve proper synchronization with smaller file sizes on Subchannels.

The following columns are displayed when the MCBERT is monitoring a pattern or data file:

- **Dev** (Device Port Number): Displays the GL's card number selected.
- **TS** (Stream Timeslot Selection): Displays the chosen timeslot.
- **SC** (Stream Sub-Channel Selection): Displays the specific sub channel.
- **Average Error Rate:** Displays the rate of error received since the start of MCBERT.
- **Error Status:** Displays SYNC if the received data currently matches with the ref data.
- **SyncLoss Count:** Displays number of transitions from SYNC state to noSYNC state.
- **Error Count:** Displays total number of single bit errors while in SYNC state.
- **Error Free Seconds:** Displays total seconds without any errors while in SYNC state.
- **Error Seconds:** Displays total number of seconds with one or more errors (while in SYNC), and includes seconds during which there was noSync.
- **SyncLoss Seconds:** Displays seconds when MCBERT in noSync or PreSync state.

For more details, please visit our web page http://www.gl.com/multichannelbert.html.

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Selecting Input Stream: Offline and Online Analysis

A pattern file is selected for comparing the data. The entire pattern file is read into a circular memory buffer. In Online analysis this buffer is subsequently used to compare with the input stream from T1/E1 line(s) or input file. Multiple input streams are always compared to the same patterns.

Mode of received data (64kbps, n x 64kbps or n x 8kbps) is selected depending upon timeslot specification. With the start of the MCBERT, the application provides all the statistics.

In case of Offline analysis, selection of data file will be compared with the selected reference file to provide the statistics.

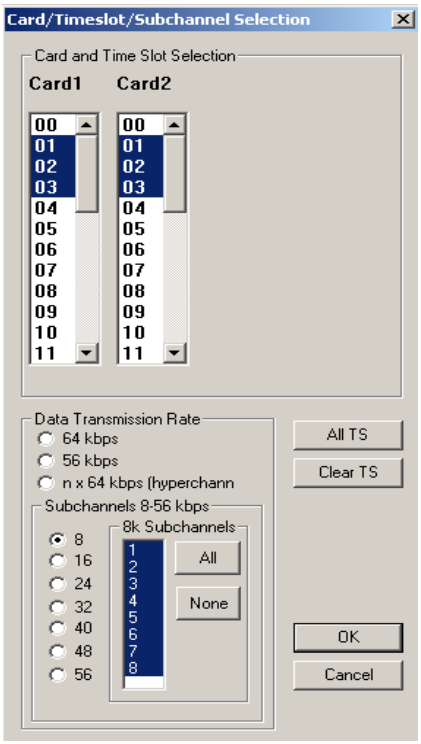

Figure: Card / Timeslot / Subchannel Selection

Selecting On-line streams on T1/E1 Lines

Click timeslot selection to select input streams. The following selections can be made:

- Channels 1-24 for T1 and 1-32 for E1 per card (multiple streams per card). Hyper channel selection possible.
- Sub channels Up to 8x24/32- 8K sub channels (one or more bits per timeslot can represent a separate stream, for example, 56k is using 7 bits per timeslot. Multiple streams per timeslot and multiple timeslots per card can be used.

Note: When multiple timeslots are selected, selection of different data rate transmission is possible. When 64k radio button is selected, it means N separate streams of single timeslot each.

Synchronization Algorithm and States

MCBERT can be in one of the following three states:

NoSync

Initially MCBERT will be in NoSync state where it stays till the continuous bytes match is found between five consecutive input bytes and five consecutive pattern bytes.

PreSync

After continuous match is found MCBERT state changes in PreSync till sufficient number of bytes are matched, so that error rate becomes below 10^{-2}.

Sync

After sufficient number of consecutive input bytes match, MCBERT enters Sync state.

Any errors in PreSync or Sync state exceeding the error rate more than 10^{-2} cause transition into NoSync state.

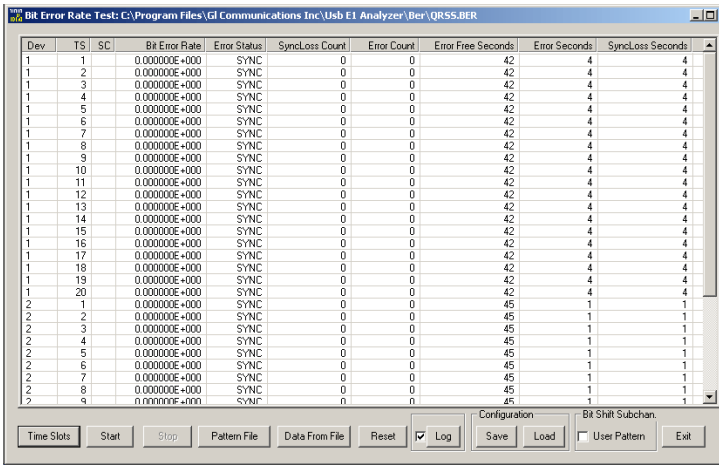

Figure: Multi-channel Bit Error Rate Test

Buyer's Guide and Related Software

XX018 Multi-Channel BERT Software

Related Software

XX020 – Record/Playback File software
STE040 – Mux /Demux Software
XX019 – Transmit / Receive File Utility Software
XX600 – Basic Client/Server Scripted Control Software
XX610 – w/ Transmit and Receive File Capability
XX670 – w/ Multi-Channel BER Testing

Related Hardware

UTE001 - Portable USB based Dual T1 or E1 Laptop Analyzer

UTA001/UEA001 - Portable USB based Dual T1 or E1 Laptop Analyzer
HTE001 - Universal HD T1 or E1 PCI Cards
HUT001/HUE001 – Basic Universal HD T1/E1 Software

*Specifications and features subject to change without notice.

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