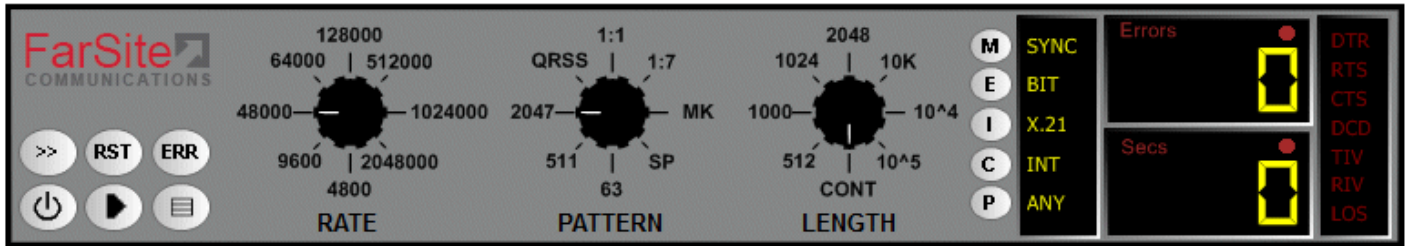


## FarSync BERT Tester - PCIe

A BER 2 port line quality tester for a Windows PC with a PCIe slot



### Key Features

- Complete set of BERT (Bit Error Rate Test) line test patterns
- BER testing of 1 or 2 lines from your PC using a dual port PCIe adapter
- Tests NRZ, FM0, FM1, Manchester Encoding & Conditioned Di-phase line signalling
- LabVIEW and Windows APIs for test management
- Operates in loopback and point-to-point including interoperation with other BER Testers
- Connects to RS232, V.35, RS530, RS422, X.21, RS485 and RS449 network interfaces
- User controlled error injection facility
- Line speed range from 100 baud to 10 Mbits/s

### Overview

The FarSync BERT provides a comprehensive, simple to use, all in one, line testing utility for testing synchronous lines from your PC. There are no extra expensive modules to buy to test different line types. All the popular standard BERT test patterns can be selected; the test period can be controlled; real time error counters and full line test statistics are provided as well as support for user controlled error injection.

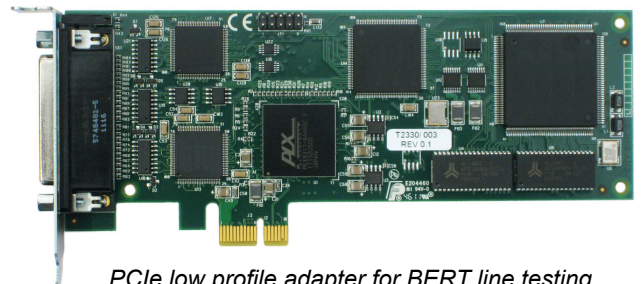
Lines with network interfaces RS232 (V.24), V.35, RS530 (EIA530), RS422, X.21 (V.11), RS449 and RS485 (4 wire) can be tested with line speeds ranging from 100 baud up to 10 Mbits/s.

The FarSync T2Ee adapter is fitted in one your PC's PCIe slots; select one of the cables provided to connect to the line to be tested; the BERT application can then be started and the line quality results are displayed in real time.

There is API access for LabVIEW or Windows applications, this allows programmatic control of when tests are run, the tests to be run, and the results obtained.

### Test Modes

- The FarSync BERT Tester can act as either the physical DTE or DCE
- The tests can be run in point-to-point modes or loopback
- The tests can be invoked manually via the graphical user interface, via batch command files or via the API



PCIe low profile adapter for BERT line testing, a full height PCIe bracket is also supplied.

### User Interface

The FarSync BERT Tester has a full graphical user interface (screen shot at the top of the page) that enables the user to select and configure the test to be run. The final test results are displayed via the user interface. The status of each test is reported in real-time via the GUI whilst each test is being run. A drop down window provides additional detailed test results.

## Test Patterns

A wide variety of pseudo random and fixed test patterns may be configured on the FarSync BERT used to test the line. ITU compliant test pattern recommendations are supported, these are compatible with other industry standard BER Testers.

### Synchronous Lines

The following *pseudo random* patterns are ITU-T compliant, they are used to test synchronous lines:

- 63:  $2^6-1$ - including a max of 5 sequential zeros and 6 sequential ones
- 511:  $2^9-1$ - including a max of 8 sequential zeros and 9 sequential ones
- 2047:  $2^{11}-1$ - including a max of 10 sequential zeros and 11 sequential ones
- $2^{15}-1$  including a max of 14 sequential zeros and 15 sequential ones
- $2^{20}-1$  including a max of 19 sequential zeros and 20 sequential ones
- $2^{23}-1$  including a max of 22 sequential zeros and 23 sequential ones
- QRSS:  $2^{20}-1$  modified to transmit a maximum of 14 sequential zeros

The following *fixed* patterns can be used to test synchronous lines:

- 1:7 (1/8, 1-in-8) - 1 mark followed by 7 spaces
- 1/16 (1:15, 1-in-16) - 1 mark followed by 15 spaces
- 2/8 (2:6, 2-in-8) - 2 marks in 8 bits (0100 0010...)
- 3/24, 3-in-24 - 3 marks in 24 bits (0010 0010 0010 0000 0000 0000...)
- MK - all 1s
- SP - all 0s
- 1:1 - alternating 1s and 0s
- FOX (see ITU recommendation R.52 for definition)

### Line Error Reporting

The line test results displays industry-standard count values (e.g. ITU-T G.821) which help indicate the quality of the line under test. The result table shows error rates, expressed as a percentage or in scientific/engineering format.

- Bits - number of bits received
- Blocks - number of blocks received
- Block Errors - number of blocks received with errors
- Errored Secs (ES) / Unavailable Secs (US) - number of secs during which one or more errors has been detected
- Severely Errored Secs (SES) - number of secs during which > 30% of blocks are in error or for which the bit error density is  $>10^{-2}$
- Available Secs (AS) / Error Free Secs (EFS) - number of secs during which no errors have been detected
- Loss of Sync (LOS) - number of times synchronisation has been lost

### Supported Network Interfaces

The FarSync BERT Tester products is supplied with the following cables, these are the most common network connector types used on synchronous lines.

- V.35 DTE - using cable FCR2 plus 2 TCV1
- X.21 (V.11) DTE - using cable FCR2 plus 2 TCX1
- RS232 (V.24) DTE - using cable FCR2
- RS530 (RS422) DTE - using cable FCR2
- RS485 (4 wire) - using cable FCR2
- RS449 (V.36) DTE - using cable FCR2 plus 2 TC449

Additional cables supporting the following other interfaces may also be purchased if required.

- X.21 (V.11) DCE - cable name Null-MX
- RS232 (V.24) and RS530 (RS422) DCE - cable name Null-MR4

See the Order Information section on the last page of this datasheet.

## Supported Types of Line Data Encoding

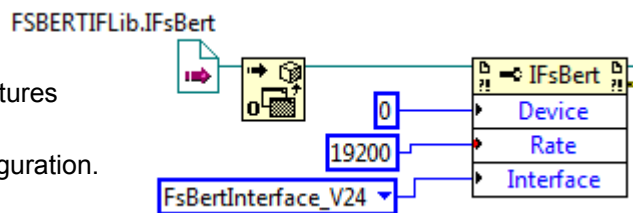
- NRZ
- FM0
- FM1
- Manchester Encoding
- Differential Manchester (Conditioned Di-phase)

## LabVIEW API

The LabVIEW API allows the BERT functions to be invoked, and results to be read, by LabVIEW programs (VIs). A sample VI program is provided to illustrate the use of the API. All the features available from the GUI are supported by the LabVIEW API.

The adjacent diagram shows a synchronous V.24 (RS232) configuration.

LabVIEW 2010-2012 versions are supported.



## Windows API

The BERT's COM API allows its functions to be invoked, and results supplied back, programmatically from Windows applications. All the features available from the GUI are supported by the COM API.

The FarSync BERT can also be used in command line/script mode with the configuration being specified by command line parameters - the results are written to a log file.

## Other Features

- Single or multiple bit errors can be injected at the user's request.
- Line data can be inverted to support lines where the balanced pair data lines may have been swapped over or the data supplied has been inverted.
- Inverted receive data can be automatically detected and converted as required.
- Using the supplied loopback connector, the FarSync BERT Tester may be self tested prior to use.
- Audible Alerts on errors and loss of sync.

## Order Information

Name	Description	Product Code
<b>FarSync BERT Tester - PCIe</b>	<p><b>BER (Bit Error Rate) line quality tester for testing synchronous lines from a PCIe card</b>, tests X.21, RS232, V.35, RS422, RS485 (4 wire), RS530, RS449 network interfaces, it includes:</p> <p>FarSync T2Ee - dual port low profile PCIe adapter (standard and low profile PCI brackets supplied) BERT Tester - software for Windows 8, 7, Vista and XP.</p> <p><b>TEST CABLES INCLUDED</b></p> <ul style="list-style-type: none"> <li>1 FCR2 - dual port RS232, RS530, RS422, RS485 DTE connection cable</li> <li>2 TCX1 - X.21 connection DTE cable</li> <li>2 TCV1 - V.35 connection DTE cable</li> <li>2 TC449 - RS449 connection DTE cable</li> <li>Loopback connector for self test.</li> </ul> <p>Note: Requires a PC, not supplied.</p>	FS4205
<b>Additional cables available</b>		
<b>Null-MX</b>	<b>X.21 double shielded crossover cable</b> , DB15F connector to DB15F connector, 0.5 metres. Converts DTE presentation to DCE.	FS6090
<b>Null-MR4</b>	<b>Combined RS530 (RS422, EIA530) and RS232 (V.24) double shielded crossover cable</b> , DB25F connector to DB25F connector, 0.5 metres. Converts DTE presentation to DCE	FS6097

Microsoft, Windows, and the Windows logo are trademarks or registered trademarks of Microsoft Corporation in the United States and/or other countries. All trademarks and registered trademarks are acknowledged.

Changes are periodically made to the information herein; these changes will be incorporated into new editions of the publication.

FarSite Communications may make improvements and/or changes in the products and/or programs described in this publication at any time.