FarSite COMMUNICATIONS

FarSync® BERT Tester - USB

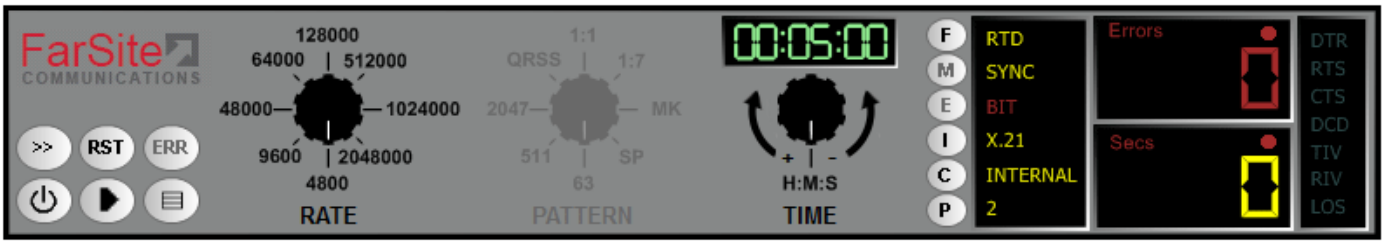
Bit Error Rate line quality testers
for your Windows Laptop

FarSync® BERT Tester - USB

Bit Error Rate line testers for your Windows Laptop

Key Features

- Complete set of BERT (Bit Error Rate Test) line test patterns
- BER testing from your laptop with a durable USB adapter, ideal for mobile Engineers
- Tests NRZ, FM0, FM1, Manchester Encoding, NRZI & Conditioned Di-phase line signalling
- LabVIEW 32 / 64 bit and Windows APIs for test management
- Round trip delay testing - test the latency of your network
- Tests synchronous, asynchronous and multidrop lines in loopback and point-to-point configurations
- Connects to RS232, V.35, RS530, RS422, X.21, RS485 multidrop and RS449 network interfaces
- User controlled error injection facility and customer supplied test patterns
- Speed range from 15 baud up to 2 Mbits/s or up to 16 Mbits/s with the HS version in NRZ (10Mbits/s for encoded modes)
- Tests can be test count or time controlled



Overview

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

The round trip delay testing calibrates your network performance, particularly useful for wireless networks. The BER test patterns and test support in the HS (High Speed) version are implemented in hardware and thus operate independent of host activity/loading.

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 15 baud up to 2 Mbits/s or up to 16 Mbits/s with the HS version in NRZ (10Mbits/s for encoded modes).

The FarSync Flex adapter is simply plugged into any of your Laptop's USB 2 or USB 3 ports; 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. Multiple FarSync BERTs can be run from a PC.

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.

Line Monitor software, which includes support for use with Wireshark, is also included in the product. Line Monitor cables are ordered separately.

End view USB Adapter for BERT line testing and line monitoring

Test Modes

- The tests can be run in point-to-point modes or loopback
- The FarSync BERT Tester can act as either the physical DTE or DCE
- Tests can be invoked from the GUI, batch command files or via the API
- Tests can be based on the pre-set number of test iterations required or run over a pre-set time

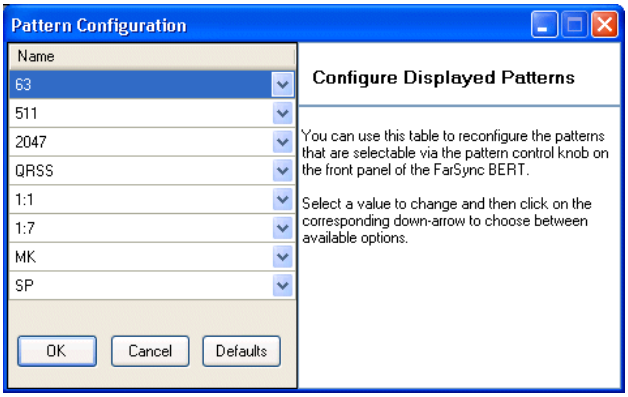
User Interface

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 Tester 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)

Asynchronous Lines

For asynchronous lines 5, 6, 7 and 8 bit operation can be tested. The following patterns are recommended:

- 63: 2^6 -1
- 511: 2^9-1
- 2047: 2^{11}-1
- FOX

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
- Framing Errors - number of incorrectly framed asynchronous characters received
- Parity Errors - number of asynchronous characters received with incorrect parity
- Errored Secs (ES) / Unavailable Secs (US) - seconds during which one or more errors has been detected
- Severely Errored Secs (SES) - number of seconds during which the bit error rate is >= 0.1%
- Available Secs (AS) / Error Free Secs (EFS) - seconds during which no errors have been detected
- Loss of Sync (LOS) - number of times synchronisation has been lost

Windows API

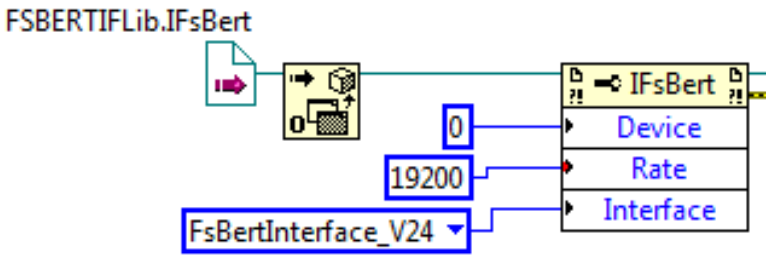
The BERT's COM API allows its functions to be invoked, and results supplied back, programmatically from Windows applications. All the features available from the GUI are supported by the COM API. Sample applications are supplied in Python, C# and VBS.

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.

LabVIEW API

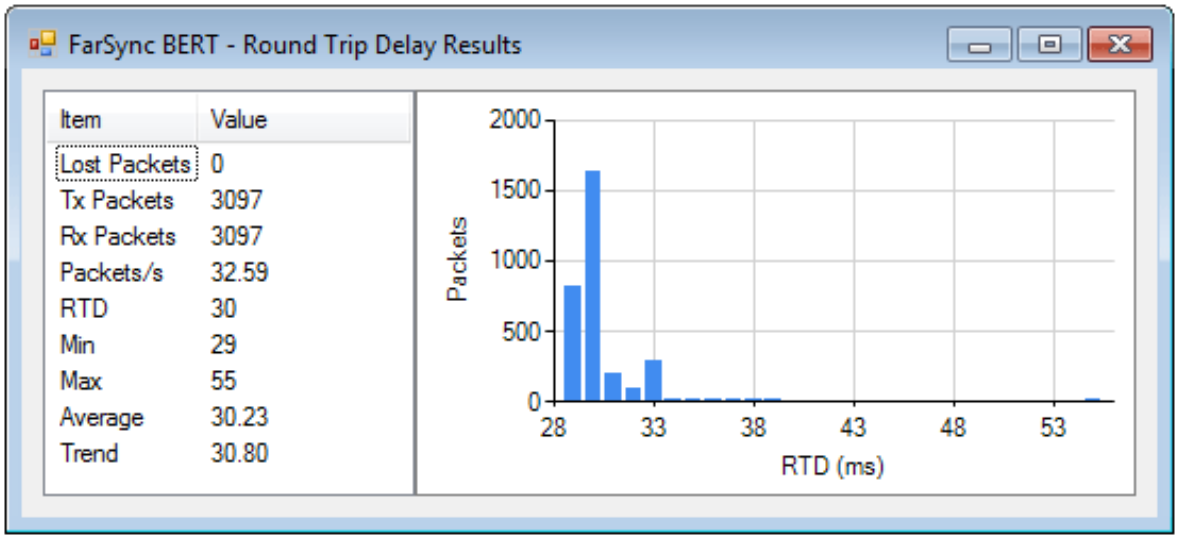
The LabVIEW API allows the BERT functions to be invoked, and results to be read by LabVIEW programs (VIs). Sample VIs are provided to illustrate the use of the API. All the features available from the GUI are supported by the LabVIEW API.

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



Round Trip Delay

Network latency can be measured using the round trip delay feature which is particularly useful for testing wireless networks. The results are shown as a readout and as a graphical spread of times measured.



Example Round Trip Delay Results

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.

Line clock speed display.

Bidirectional clocking and enhanced clocking modes and handling of custom clock rates.

Supported Network Interfaces

The products are supplied with the following cables, the most common network connector types used on synchronous and asynchronous lines.

- X.21 (V.11) DTE (DB15M connector) - use cable UCX1
- RS232 (V.24) DTE (DB25M connector) - use cable KCR1
- RS530 (RS422) DTE (DB25M connector) - use cable KCR1
- RS485 (4 wire) - use cable KCR1

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

- V.35 DTE (M34M connector) - cable name UCV1
- X.21 (V.11) DCE (DB15F connector) - cable name UCX1-DCE
- RS232 (V.24) DCE (DB25F connector) - cable name KCR1-DCE
- RS530 (RS422) DCE (DB25F connector) - cable name KCR1-DCE
- RS449 (V.36) DTE (DB37M connector) - cable name KC449

Supported Types of Line Data Encoding

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

Line Test Speed Range

FarSync BERT Tester-USB: Synchronous up to 2 Mbits/s, **Asynchronous** 15 baud to 115.2 Kbps/s

FarSync BERT HS Tester-USB: Synchronous up to 16 Mbits/s with the HS version in NRZ (10 Mbits/s for en coded modes), **Asynchronous**: 15 baud to 115.2 Kbps/s

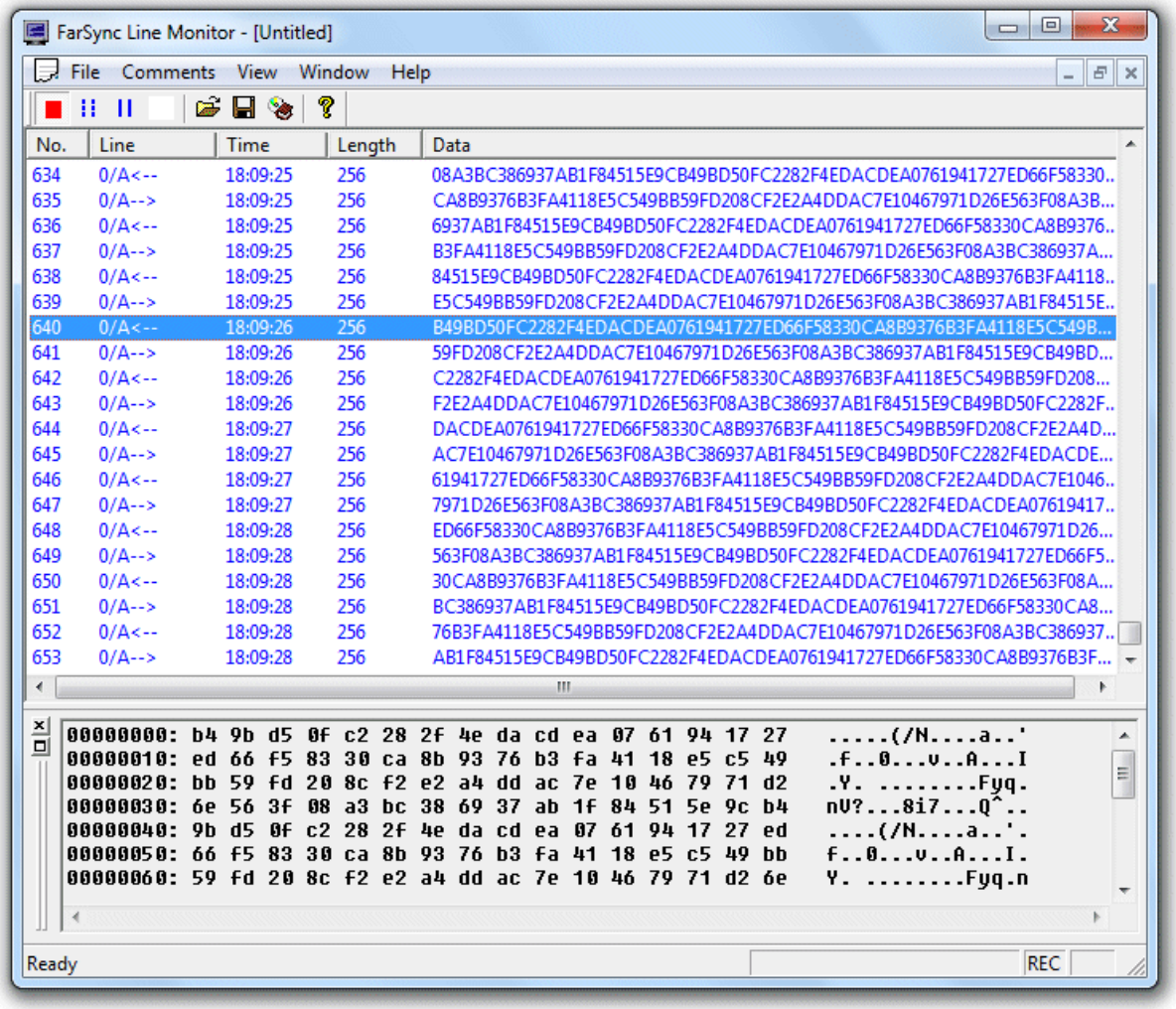
Windows Line Monitor

The product is supplied with a high performance multi-channel line monitor that allows the user to record and display, store line traffic with protocol decoding.

The software also allows Wireshark Line Monitor software to be used.

To monitor both data directions on the line, special line monitor cables are required. These cables are not included in the FarSync BERT Tester product but can be ordered separately.

See details of the line monitor cables available as listed in the Order Information section on the last page.



Order Information		
Name	**Description**	**Product Code**
FarSync BERT Tester - USB	**USB BERT line quality tester for Synchronous (up to 2 Mbits/s) & Asynchronous lines** with X.21, RS232, V.35, RS422, RS485(4 wire) or RS530 network interfaces *	FS4105
FarSync BERT HS Tester -USB	**High Speed USB BERT line quality tester for Synchronous (**up to 16 Mbits/s in NRZ (10Mbits/s for encoded modes)**) & Asynchronous lines** with X.21, RS232, V.35, RS422,	FS4106
	* Includes: FarSync Flex V3 - USB adapter with BERT Module Line Monitor and BERT application software for Windows 10, 8 and 7. **TEST CABLES INCLUDED:** KCR1 - RS232, RS530, RS485 DTE connection (DB25M) cable UCX1 - X.21 connection DTE (DB15M) cable Loopback connector for self test. Notes: Requires a Laptop or Notebook, not supplied. Line Monitor software requires a special cable to monitor data in both directions, to order see below. Connection to a USB 2 or USB 3 port is required for BERT operation.	
Additional cables available		
UCV1	Single V.35 DTE cable, M34M connector, 1.5 metres	FS6063
KC449	Single RS449 DTE cable, DB37M connector, 1.5 metres	FS6019
KCR1-DCE	Single combined RS232 (V.24) and RS530 (RS422) DCE cable, DB25F connector, 2 metres	FS6070
UCX1-DCE	Single X.21 (V.11) DCE cable, DB15F connector, 2 metres	FS6075
KCR-MON	Line Monitor cable for RS232 (V.24) and RS530 (RS422) with DB25M to DB25F pass-through	FS6016
KCX-MON	Line Monitor cable for X.21 (V.11) with DB15M to DB15F pass-through	FS6017
Accessories		
Flex Mounting Kit — metal	FarSync Flex metal mounting brackets. Must be ordered with the FarSync Flex, factory fit only. Only use if a metal mounting bracket is required.	FS4901
Flex Mounting Kit — plastic	FarSync Flex plastic mounting brackets, can be retrofitted, easy to fit, no disassembly of the case is required.	FS4902

FarSync ® is a registered trademark of FarSite Communications Ltd. All registered trademarks are acknowledged.
Microsoft, Windows are trademarks or registered trademarks of Microsoft Corporation in the United States and/or other countries.
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.

Tel: +49 (8241) 91 83 501
Fax: +49 (8241) 96 00 263
Email: farsite@B-NetCons.de
Web: www.B-NetCons.de
B-NetCons GmbH
Business - NetzwerkConsulting

FarSite COMMUNICATIONS

© Copyright FarSite Communications Ltd, 2012-2022. All rights reserved.