

## Key Features

- Complete set of BERT (Bit Error Rate Test) line test patterns
- BERT testing from your laptop with a USB adapter
- Supported on Windows 7, Vista and XP
- Order the complete product or purchase components as required
- Tests synchronous and asynchronous lines
- Connects to RS232C, V.35, RS530 (RS422), X.21 and RS449 network interfaces
- User controlled error injection facility
- Line speed range from 15 baud to 2 Mbits/s

## 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; the test period can be controlled; real time error counters and user controlled error injection with full line test statistics are provided.

Lines with network interfaces RS232C (V.24), V.35, RS530 (EIA530, RS422), X.21 (V.11) and RS449 can be tested with line speeds ranging from 15 baud up to 2 Mbits/s.

The FarSync Flex adapter is simply plugged into any of your Laptop's USB 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.

FarSync BERT will run on Windows 7, Vista and XP.

Line Monitor software is also included in the product, supporting Wireshark. Line Monitor cables are ordered separately.

## Test Modes

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



USB Adapter for BERT line testing and Line Monitoring

## 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. Drop down windows provide additional detailed test results.

## Test Patterns

A wide variety of pseudorandom and fixed test patterns and test messages may be configured on the FarSync BERT Tester used to test the line

### Synchronous Lines

The following *pseudorandom* patterns can be 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 consecutive zeros

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

- 1-8: 1 mark followed by 8 spaces
- 1-16: 1 mark followed by 16 spaces
- 3-24: 24 bit pattern of 1 mark and 3 spaces (3 times) followed by 15 consecutive spaces
- all 1s
- all 0s
- alternating 1s and 0s
- FOX

### Asynchronous Lines

On asynchronous lines the following messages may be used:

- 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
- 1-8: 1 mark followed by 8 spaces
- 1-16: 1 mark followed by 16 spaces
- 3-24: 24 bit pattern of 1 mark and 3 spaces (3 times) followed by 15 consecutive spaces
- all 1s
- all 0s
- alternating 1s and 0s
- 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:

- 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<sup>-2</sup>
- 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

The result table shows error rates, expressed as a percentage or in scientific/engineering format.

## Other Features

Single or multiple bit errors can be injected at the users command.

Received data can optionally be logged with test results.

Using the supplied loopback connector the FarSync BERT Tester may be self tested prior to use.

When connected to a USB 2.0 port lines up to 2 Mbits/s can be tested.

## Supported Network Interfaces

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

- V.35 DTE - cable name UCV1
- X.21 (V.11) DTE - cable name UCX1
- RS232C (V.24) DTE - cable name KCR1
- RS530 (RS422) DTE - cable name KCR1

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

- X.21 (V.11) DCE - cable name UCX1-DCE
- RS232C (V.24) DCE - cable name KCR1-DCE
- RS530 (RS422) DCE - cable name KCR1-DCE
- RS449 (V.36) DTE - cable name KC449

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

## Supported Line Test Speeds

Synchronous : from 15 baud to 2 Mbits/s

Asynchronous : 2.4, 4,8, 9.6, 19.2, 38.4, 57.6, 115.2 Kbps/s

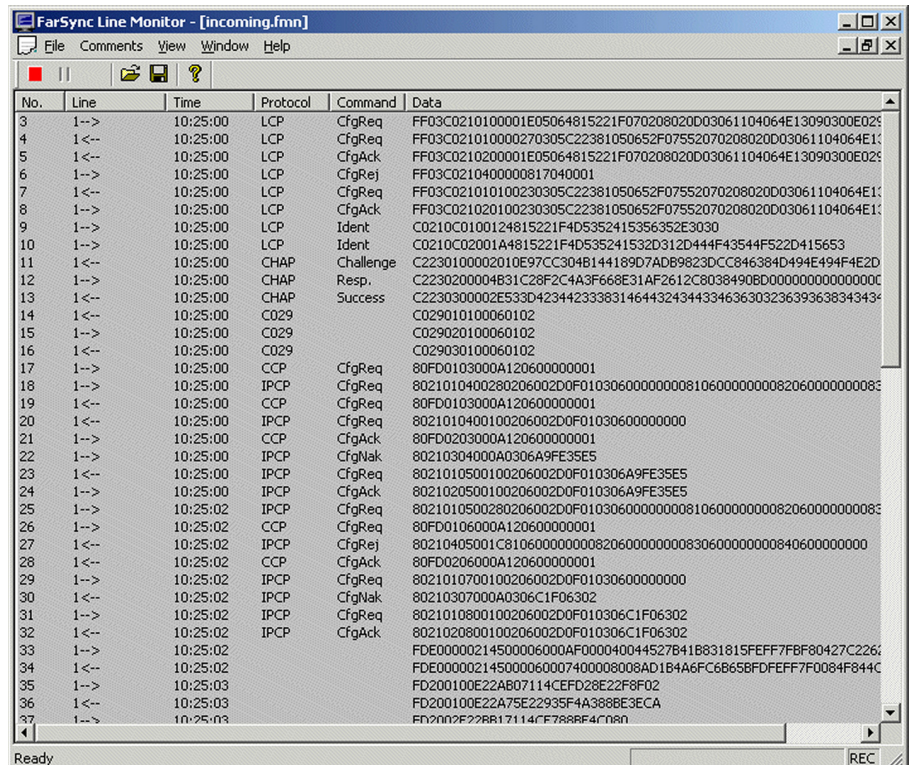
## Windows Line Monitor

The product is supplied with a high performance multi-channel line monitor that allows the user to record, display, store and replay line traffic with protocol decoding (sample screen below). Comments can even be inserted into the line trace to assist later analysis.

The Line Monitor supported included with the FarSync BERT Tester allows the popular Wireshark Line Monitor software to be used to Monitor the data sent on the line that the FarSync Flex USB adapter is connected to.

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 they can be ordered separately.

Details of the line monitor cables available are listed on the Order Information section on the last page of this datasheet.



The screenshot shows the 'FarSync Line Monitor - [incoming.fmn]' window. It features a menu bar (File, Comments, View, Window, Help) and a toolbar with icons for file operations and help. The main area is a table with columns: No., Line, Time, Protocol, Command, and Data. The table displays a series of network packets, including LCP, CHAP, C029, and CCP protocols, with their respective commands and hex data. The status bar at the bottom shows 'Ready' and a 'REC' button.

No.	Line	Time	Protocol	Command	Data
3	1->	10:25:00	LCP	CfgReq	FF03C0210100001E05064815221F070208020D03061104064E13090300E029
4	1<-	10:25:00	LCP	CfgReq	FF03C021010000270305C22381050652F07552070208020D03061104064E13
5	1<-	10:25:00	LCP	CfgAck	FF03C0210200001E05064815221F070208020D03061104064E13090300E029
6	1->	10:25:00	LCP	CfgReq	FF03C0210400000817040001
7	1<-	10:25:00	LCP	CfgReq	FF03C021010100230305C22381050652F07552070208020D03061104064E13
8	1->	10:25:00	LCP	CfgAck	FF03C021020100230305C22381050652F07552070208020D03061104064E13
9	1->	10:25:00	LCP	Ident	C0210C0100124815221F4D5352415356352E3030
10	1->	10:25:00	LCP	Ident	C0210C02001A4815221F4D535241532D312D444F43544F522D415653
11	1<-	10:25:00	CHAP	Challenge	C2230100002010E97CC304B144189D7ADB9823DC846384D494E494F4E2D
12	1->	10:25:00	CHAP	Resp.	C2230200004B31C28F2C4A3F668E31AF2612C8038490BD00000000000000
13	1<-	10:25:00	CHAP	Success	C2230300002E533D4234423338314644324344334636303236393638343434
14	1<-	10:25:00	C029		C029010100060102
15	1->	10:25:00	C029		C029020100060102
16	1<-	10:25:00	C029		C029030100060102
17	1->	10:25:00	CCP	CfgReq	80FD0103000A120600000001
18	1->	10:25:00	IPCP	CfgReq	80210104002802060020F0103060000000081060000000082060000000082
19	1<-	10:25:00	CCP	CfgReq	80FD0103000A120600000001
20	1<-	10:25:00	IPCP	CfgReq	80210104001002060020F01030600000000
21	1->	10:25:00	CCP	CfgAck	80FD0203000A120600000001
22	1->	10:25:00	IPCP	CfgNak	80210304000A0306A9FE35E5
23	1<-	10:25:00	IPCP	CfgReq	80210105001002060020F010306A9FE35E5
24	1->	10:25:00	IPCP	CfgAck	80210205001002060020F010306A9FE35E5
25	1->	10:25:02	IPCP	CfgReq	80210105002802060020F0103060000000081060000000082060000000082
26	1->	10:25:02	CCP	CfgReq	80FD0106000A120600000001
27	1<-	10:25:02	IPCP	CfgReq	80210405001C810600000000820600000000830600000000840600000000
28	1<-	10:25:02	CCP	CfgAck	80FD0206000A120600000001
29	1->	10:25:02	IPCP	CfgReq	80210107001002060020F01030600000000
30	1<-	10:25:02	IPCP	CfgNak	80210307000A0306C1F06302
31	1->	10:25:02	IPCP	CfgReq	80210108001002060020F010306C1F06302
32	1<-	10:25:02	IPCP	CfgAck	80210208001002060020F010306C1F06302
33	1->	10:25:02			FDE0000021450006000AF000040044527B41B831815FEFF77BF80427C226;
34	1<-	10:25:02			FDE00000214500060007400008003AD1B4A6FC68658FD0EFF7F0084F844C
35	1->	10:25:03			FD200100E22AB07114CEFD28E22F8F02
36	1<-	10:25:03			FD200100E22A75E22935FA388BE3ECA
37	1->	10:25:03			FD2002F228R17114CF7888F4C080

## Order Information

Name	Description	Product Code
<b>Complete Product</b>		
<b>FarSync BERT Tester</b>	<b>USB BERT (Bit Error Rate Test) line quality tester for Synchronous and Asynchronous lines</b> with X.21, RS232C, V.35 or RS530 network interfaces. Includes: FarSync Flex - USB adapter with Line Monitor software BERT Tester - software for Windows 7, Vista and XP. KCR1 - RS232C and RS530 DTE connection cable UCX1 - X.21 connection DTE cable UCV1 - V.35 connection DTE cable Loopback cable for self test  Notes: Requires Laptop, not supplied Line Monitor software requires a Line Monitor cables monitoring both data directions, not supplied Connection to USB 2.0 port is required for BERT operation.	FS4105
<b>Components</b>		
<b>FarSync Flex</b>	USB synchronous / asynchronous adapter, includes Line Monitor application, Supports X.21, V.35, RS232C, RS530 (RS422) and RS449, Connection to USB 2.0 port is required for BERT operation.	FS4100
<b>Software</b>		
<b>FarSync BERT Software</b>	BERT test software for use with the FarSync Flex, supported on Windows 7, Vista and XP compatible with the FarSync Flex	FS9509
<b>Cables</b>		
<b>KCR1</b>	Single combined RS232C (V.24) and RS530 (RS422) DTE cable, 1.5 metres	FS6011
<b>UCX1</b>	Single X.21 (V.11) DTE cable, 1.5 metres	FS6062
<b>UCV1</b>	Single V.35 DTE cable, 1.5 metres	FS6063
<b>KC449</b>	Single RS449 DTE cable, 1.5 metres	FS6019
<b>KCR1-DCE</b>	Single combined RS232C (V.24) and RS530 (RS422) DCE cable, 2 metres	FS6070
<b>UCX1-DCE</b>	Single X.21 (V.11) DCE cable, 2 metres	FS6075
<b>KCR-MON</b>	Line Monitor cable for RS232C (V.24) and RS530 (RS422) with DB25M to DB25F pass-through	FS6016
<b>KCX-MON</b>	Line Monitor cable for X.21 (V.11) with DB15M to DB15F pass-through	FS6017

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