

## FarSync Flex - USB synchronous adapter

with X.21, V.35, RS-530, RS422, RS449, RS485 and RS232C interfaces

### Key Features

- Highly flexible synchronous adapter
- USB bus powered
- TCP/IP-PPP and X.25 protocol options
- Network interface choice: X.21, V.35, RS530, RS449, RS232C, RS485 and RS422 signals
- Line speeds up to 2 Mbits/s
- Support for Linux, Windows XP, Server 2003, Vista, Server 2008
- APIs to access to HDLC, Transparent Bitstream, X.25 and ISO Transport
- USB 1.1 and 2.0 compliant
- Line Monitor capability - compatible with Wireshark



### Overview

The FarSync Flex product family provides a versatile and neat solution for your synchronous requirements. The USB attached adapter is bus powered and supplied with drivers for Linux and Windows. The adapter can support the host computer's TCP/IP protocol stack or an Application can be written to use the low level API for a variety of different functions. The FarSync Flex SDK provides a Developers Toolkit with full documentation, useful utilities and many sample applications for Linux and Windows.

If your requirement is for X.25 then the FarSync Flex X25 is the product for you. As well as supporting all the features of the FarSync Flex it includes an X.25 and ISO Transport Protocol stack with an X.25 Developers Toolkit.

The intelligent FarSync Flex is equipped with a fast ARM processor, Flash and RAM. This allows the network interface to be driven at speeds up to 2 Mbits/s and minimises transmission latency. The highly flexible universal network connector interface can support X.21, RS530, V.35, RS449, RS232C, RS422, multi-drop RS485 interfaces.

Whether you are connecting to the Internet, a satellite link, a private network using TCP/IP or X.25, the FarSync Flex provides the connectivity solution.

The Flex can be used for line monitoring with the addition of a special Monitor cable. A monitoring application is included. The monitoring support is also compatible with Wireshark.

The adapter installs seamlessly as a plug and play device under the popular Linux distributions, Windows XP, Windows Server 2003, Windows Server 2008, Windows 2000 and Vista on both 32 and 64 bit, single and multi-core systems. The FarSync Flex drivers are signed by Microsoft for easy installation.

### Typical Applications

The FarSync Flex adapters are suitable for a very wide range of uses. Typical applications include:

- Internet Access and remote office access over leased lines
- HDLC framing support for non standard or specialist protocols
- Connection to secure BRENT units
- Interfacing video and voice bitstreams such as T-DMB, DAB and ETI
- Interfacing high speed MPEG Video bitstreams to Servers
- Line monitor
- Data generators for test systems
- Engineering monitoring and control systems
- Connection to X.25 networks such as Lottery, Police, Customs, Military, Fishery, Financial, Government and Airline
- Telecom switch Billing and Mediation connectivity
- FTAM access
- Master or slave in a RS485 half duplex multi-drop environment

## Hardware Features

The intelligent FarSync Flex is designed for reliability, high performance and flexibility. The adapter uses a fast ARM processor with Flash and RAM for the onboard code.

- **Network interfaces for X.21 (V.11), V.35, RS530 (EIA530, RS422), RS449, RS485 and V.24 (RS232C)**
- **Multiple FarSync Flex units may be connected to a single server**
- **High efficiency, USB Bus powered, energy saving design**
- **NRZI, NRZ, FM0 and FM1 line signalling formats, tri-state transmitters and receivers**
- **Line speeds up to 2 Mbits/s**
- **Half duplex multi-drop for 2 wire (NRZI, FM0 or FM1) RS485 operation**
- **Internal and external clocking with many clock handling options**
- **Soft selectable Synchronous HDLC and bitstream**
- **Dual bank flash for secure in field upgrades and previous system restore**
- **USB 2.0 high-speed mode (480Mb/s) and 1.1 compatible**

## FarSync Flex Product Family Details

There are 3 products in the FarSync Flex range of products:

The **FarSync Flex** is the base product, it includes the Flex hardware, USB cable, Windows and Linux drivers that link in with the operating system, utility programs, Windows line monitor application, documentation on CD-ROM and a quick start guide.

The **FarSync SDK** is the developer's toolkit for the FarSync Flex and other FarSync adapters.

The **FarSync Flex X25** includes the Flex hardware, USB Cable, the Flex base product drivers, utility programs, Windows line monitor application, quick start guide and an X.25 protocol stack for Windows and Linux, with a Developer's Toolkit and Documentation on CD-ROM to enable the X.25 support to be used.

## FarSync Flex - Product Details

The FarSync Flex is supplied with support for Windows and Linux. This includes a low level driver that allows access to the communications features available in the hardware and an optionally installable driver that connects with the standard TCP/IP protocol stack to allow access to IP based networks such as the Internet. Multiple devices can be installed.

### Key Features supported on Linux

The FarSync Flex installs seamlessly under Linux kernel series 2.6 on both single and multi-core 32 and 64 bit systems. All the popular distributions are supported including Red Hat, SuSE, Slackware, Mandriva, Ubuntu, Debian and Fedora.

Installation is simple, the driver is dynamically loadable so a kernel rebuild is not required for the driver to be installed. The driver acts as a dynamically loadable module. The link level protocol can be PPP, Cisco HDLC or Frame Relay with optional authentication by CHAP, MSCHAP or PAP (RFC 1334) providing a standard point-to-point network interface. The driver is supplied with source code.

A configuration utility is provided to set the line speed, interface type and protocol, after which the ports may be configured with standard networking tools.

The Raw Sockets API allows applications developed using the FarSync Flex SDK to access the full feature set of the hardware, these include bit synchronous (HDLC framed) data, transparent bitstream data and signal modes NRZ, NRZI, FM1 and FM0.

### Key Features supported on Windows

The FarSync Flex installs easily under Windows 2000, Windows XP, Windows Server 2003, Windows Vista and Windows Server 2008 on single or multi-core 32 and 64 bit systems. A low level SDCI driver is installed with the optional installation of an NDIS (LAN) driver. The NDIS driver supports TCP/IP running over PPP with optional authentication by CHAP or PAP (RFC 1334) providing a standard point-to-point network interface. The drivers are signed by Microsoft for easy installation.

The product is supplied with a comprehensive configuration utility and its own Line Monitor that allows the user to record, display and store line traffic with WAN protocol decoding for fast debugging. The Line Monitor application is also suitable for standalone use with a special cable. The line monitor function is compatible with Wireshark.

FarSync Flex's enhanced SDCI API allows applications developed using the FarSync SDK to exactly control the type of data sent and received in bit synchronous (HDLC framed) data, transparent bitstream formats and signal modes NRZ, NRZI, FM1 and FM0.

## FarSync SDK - The Developers Toolkit

The SDK includes support for writing applications on both Linux and Windows and contains documentation and working sample applications. There is everything a user needs to rapidly develop and test a wide variety of applications such as specialist synchronous (HDLC framed) protocols or transparent bitstream data requirements including Audio, MPEG Video, T-DMB and DAB ET1 with bitstream encoders and decoders.

### Windows SDCI API

The SDCI API allows applications to exactly control the type of data sent and received in both bit synchronous data and transparent bitstream formats. The SDCI API manual is provided in Adobe PDF format, the sample applications are written in C.

### Linux Raw Sockets API

The Raw Sockets API allows applications to exactly control the type of data sent and received in both bit synchronous data and transparent bitstream formats. The Linux Raw Sockets API manual provided in Adobe PDF format, sample applications are provided in C, source for the driver is included.

## FarSync Flex X25 - X.25 Features

The FarSync Flex X25 has all the features of the FarSync Flex with the addition of the renowned FarSync X.25 and ISO Transport stack for Linux and Windows. This includes the X25 Developers Toolkit and Line Monitor with X.25 packet decode. The FarSync Flex shares the same protocol stacks and APIs as other FarSync X25 products for assured compatibility.

### Linux X.25 Key Features

There are 2 APIs to the X.25 layer, an API to the ISO Transport layer and TCP/IP over X.25 support (RFC 1356 - IP over X.25).

The **Sockets API** provides a programming language independent, connection orientated interface with access to a comprehensive set of X.25 features. It is simple to convert applications written for TCP/IP to instead use X.25 as the transport mechanism.

The **Java API** allows applications written in Java easy access to the functions and features of X.25. Full documentation and sample applications are provided.

Configuration of the X.25 is by a Java and XML-based GUI configuration application or by text file.

### Windows X.25 Key Features

The X.25 software has a host of features including 4 APIs, TCP/IP over X.25 and support for *OpenFT* FTAM.

The **Winsock2 compliant API** provides a high-level programming language independent, connection orientated interface with access to a comprehensive set of X.25 and ISO Transport features. This API is compatible with Microsoft's X.25 API standard and it is easy to convert applications written for TCP/IP to use X.25 as the transport mechanism instead.

The **Java API** allows applications written in Java easy access to the functions and features of X.25 offered by the FarSync Flex. Full documentation and sample applications are provided.

The **COM Port API** provides a very quick and easy to use interface to X.25. Each X.25 session is represented by a COM Port controlled by AT commands. The COM Port API is particularly suitable for applications developed in Visual Basic.

The **API to access Lapb layer 2 (HDLC)** allows the X.25 layer 3 to be completely bypassed.

**TCP/IP over X.25** supported to: RFC 1356 - IP over X.25, RFC 1598 - PPP over X.25, RFC 1662 - Async format PPP over X.25. X.25 configuration is by a Windows application with full online help.

## FarSync Flex - Software Specifications

Linux	
Distribution Support	Distributions by Red Hat, SuSE, Slackware, Mandriva, Debian, Ubuntu, Fedora and more. Drivers for kernel series 2.6 on both single and multi-core 32 and 64 bit systems
Protocols Supported	TCP/IP, PPP, Cisco HDLC, Frame Relay, CHAP, MSCHAP, PAP (RFCs 1661, 1332, 1334)
API and Interfaces	Raw Sockets API
Windows	
O/S types	Windows XP, 2000, Server 2003 and 2008, Vista 32 and 64 bit (single and multi-core systems)
Protocols Supported	TCP/IP, PPP, CHAP, PAP (RFCs 1661, 1332, 1334)
API and Interfaces	NDIS (LAN), the line appears as a LAN interface, Extended SDCI API
Utilities	Line monitor to record, display and store line traffic included. Compatible with Wireshark.

## FarSync Flex X25 - X.25 Software Features

### X.25 Features - summary

X.25 CCITT compliance	1980, 84 & 88
DTE/DCE operation	Both and Automatic detection and selection
Maximum SVCs / PVCs	256 per adapter, any mix of bothway, incoming and outgoing SVCs and PVCs. 4095 per adapter with the optional High Capacity Pack
Data Packet size range	16 to 4096 bytes
Data packets per second	> 2000 pps
X25 facilities supported	Reverse charging, Closed User Group (CUG), Network User Identifier (NUI), Fast Select, Packet & Windows size negotiation, Extended sequence numbers (128), Throughput Class Negotiation.
Types of network connection	X.25 packet switch, leased line, dial up (X.32, dial on DTR)
Accessible via API	Linux and Windows: Sockets API, Java API and NCB Based API, Windows only: HDLC Lapb API, Com port API
IP over X.25	On Windows: RFCs 1356 (IP over X.25), RFC 1598 (PPP over X.25), RFC 1662 (Async PPP over X.25) On Linux: RFC 1356 (IP over X.25)

### ISO Transport Features - summary

Standard supported	ISO 8073 (connection oriented), Classes 0, 1, 2 and 3
Negotiation between classes	Yes
Simultaneous connections	256 per adapter, 4095 per adapter with the optional High Capacity Pack
Accessible via API	Yes

## FarSync Flex Hardware Technical Specifications

<b>Adapter type</b>	Intelligent USB adapter with ARM processor, dedicated RAM and dual bank Flash memory, Field upgradeable onboard firmware, USB bus powered, USB 2.0 (high-speed - 480Mb/s mode) and 1.1 compatible, Network line connector: HD26 for connection of network cables (see Cable table below)
<b>Physical details</b>	Size: - Height 30mm, Length 126 mm, Width 62mm Weight: 190g 0.6 Metre A to B USB cable with a thumb screw secured B connector.
<b>Network connections types available</b>	X.21 (V.11) - DTE 15 pin male D type, V.35 - MRAC-34 DTE male 'brick' type, RS530 (EIA-530, RS422) - DTE 25 pin male D type, RS449 - DTE 37 pin male D type, RS232C (V.24, X.21bis) - DTE 25 pin male D type, RS485. DCE type cables are also available
<b>Link speed range</b>	RS232C: up to 128 Kbits/s, X.21, V.35, RS530, RS422, RS449 and RS485: up to 2.048 Mbits/s RS485: up to 512 Kbits/s
<b>Line signal modes</b>	NRZI, FM0 and FM1 up to 512 Kbits/s, NRZ up to 2.048 Mbits/s
<b>ESD protection</b>	Littelfuse high speed ESD and over-voltage protection
<b>Indicators</b>	LED displaying network line status
<b>Approvals</b>	EN55022 class B, CE, FCC
<b>Reliability</b>	MTBF: 308,000 Hours - Bellcore Method 1 (Case 3)
<b>Power requirements</b>	USB Bus powered, <100 mA on startup, <500 mA on full load, < 1.6 watt
<b>Line clocking</b>	Internal and Externally generated line clocking is supported. Internal clock range 75 baud to 2.048 Mbits/s on X.21, V.35, RS530, RS422 and RS449 Internal clock range 75 baud to 128 Kbits/s on RS232C (V.24) Internal clock range 75 baud to 512 Kbits/s on RS485
<b>Extra line control features</b>	Bit reversal, receive clock inversion, configurable resistive interface signal termination. Clocking source for receive and transmit channels can be independently set.
<b>Cables</b>	Cables are ordered separately, see the Cables section below

## Product names, product codes and compatible cables

Product Name	Product Code	Description
FarSync Flex	FS4100	USB Sync adapter with drivers for Linux and Windows
FarSync SDK	FS9610	Developers Toolkit for the FarSync Flex and other FarSync adapters
FarSync Flex X25	FS6100	Same features as FarSync Flex plus X.25 support and X.25 SDK for Linux and Windows
		<b>Compatible Cables</b>
KCR1	FS6011	Cable - RS232C (V.24, X.21bis) and RS530 (EIA 530, RS422), same cable for both, 1.5 metres
UCX1	FS6062	Cable - X.21 (V.11), 1.5 metres
UCV1	FS6063	Cable - V.35 with standard MRAC-34 (brick) male connector, 1.5 metres
KC449	FS6019	Cable - RS449, 1.5 metres
KCR-MON	FS6016	Monitor Cable - RS232C (V.24) and RS530 (RS422) with DB25M to DB25F passthrough, 1.5 metres
KCX-MON	FS6017	Monitor Cable - X.21 (V.11) with DB15M to DB15F passthrough, 1.5 metres

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