

## Key Features

- Highly flexible USB attached sync / async line
- USB 2.0 bus powered, 3.0 and 1.1 compatible
- Network interface choice: X.21, V.35, RS530, RS422, RS449, RS232 and RS485
- Handles NRZ, NRZI, Manchester Encoding, Conditioned Diphas, FM0 and FM1 line encoding
- Line speeds to well over 3 Mbits/s
- FarSite customisable communications controller
- Dynamic clock rate control through the API
- APIs to access HDLC, Transparent Bitstream and Async
- Interoperates with TCP/IP
- Support for Linux, Windows 10, 8.1, 8, 7, Vista; Windows Server 2016, 2012, 2008
- Line Monitor capability - compatible with Wireshark
- Strong durable anodised aluminium case



## Overview

The FarSync Flex V3\* USB adapter is a high quality synchronous solution for business, government and military applications, using the FarSite customisable communications controller it has been developed to provide a high performance, neat, durable and versatile connectivity for Linux and Windows systems.

The bus powered USB adapter will support a sync line at speeds of well over 3 Mbits/s continuously; and async operation up to 115.2 Kbits/s. The highly flexible universal network connector supports RS232, X.21, RS530, RS422, RS449, RS485 and V.35 network interfaces.

The adapter can support the host computer's TCP/IP protocol stack or an Application can be written to use the API for a variety of different functions. The FarSync Flex SDK provides the Developers Toolkit for the product.

The FarSync Flex supports DAB connections the FarSync Flex supports ETI (NI, V.11) and STI (PI, V.11).

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.

## 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
- Interfacing transparent bitstream for handling unusual protocols
- Line monitoring (both transmit and receive)
- Data generators for test systems
- Engineering monitoring and for control of systems
- Master or slave device in a RS485 2 or 4 wire multi-drop environment
- BERT Line Testing - the FarSync Flex is the hardware used in the FarSync BERT Tester product
- Connection to radio modems controlling data rate using dynamically variable clock speeds
- Interfacing video and voice bitstreams such as T-DMB, DAB ETI (N1, V.11) and STI (P1, V.11)
- Connection to secure BRENT units

\*The FarSync Flex V3 has superseded the FarSync Flex and Flex V2 versions. The Flex V3 is 100% compatible, can run at higher line speeds and has a much wider operating temperature range, a driver change is required for Linux and Windows.

## FarSync Flex V3 - 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.

### 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 RS232 (V.24)
- Multiple FarSync Flex units may be connected to a single server
- High efficiency, USB Bus powered, energy saving design USB 2.0, compliant, USB 3.0 and 1.1 compatible
- NRZ, NRZI, Manchester Encoding, Conditioned Diphas, FM0 and FM1 line signalling formats, tri-state transmitters and receivers
- Sync line speeds to over 3 Mbits/s, Async line speeds up to 115.2 Kbits/s
- RS485 2 or 4 wire multi-drop operation using FM0, FM1, Manchester Encoding, Conditioned Di-phase or NRZI
- Line clocking external or internal for 100's of synthesizer generated clock speeds with fully configurable bidirectional clocking.
- Custom clock rates configurable dynamically through the API with glitch free transition between rates
- Soft selectable Async, Sync HDLC and Transparent Bitstream formats
- Dual bank flash for secure in field upgrades and previous system restore capability
- FarSite customisable communications controller
- Industrial temperature range operation
- Optional mounting brackets (factory fitted)
- Board only and blank case options for OEM requirements

### Key Features supported on Linux

The **Char I/O API** provides a programming language independent, high-level interface to the FarSync base driver it supports access to bit synchronous (HDLC) framed and transparent bitstream data.

The card can also use the TCP/IP stack to allow access to IP based networks such as the Internet. It also allows selection of the full range of clock modes.

The link level protocol used can be PPP, Cisco HDLC, LAPB (using hdlcX API) or Frame Relay with optional authentication by CHAP, MSCHAP or PAP (RFC 1334) thus providing a standard point-to-point network interface. ETI (NI, V.11) is supported with the FarSync SDK.

The card installs seamlessly as a plug and play device. **The driver supports Linux kernel version series 2.6 and later** including the leading distributions supplied by Redhat, SuSE, CentOS, Debian, Ubuntu, Fedora, Slackware and more. Multi-processor systems are supported. The driver is dynamically loadable so a kernel rebuild is not required for the driver to be installed.

FarSite is committed to supporting the cards on new versions of Linux and Linux kernels as they are released. The source code for the driver is supplied with the product allowing rebuilding by the end user for use with almost any of the current or future Linux variants. **The driver supports both little endian and big endian memory storage formats.**

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.

### Key Features supported on Windows

The FarSync Flex supports a Windows based API, common to the entire range of FarSync cards/devices, it is referred to as the **FarSync Windows API (FsWinAPI)**. This is an extension of the MS Win32 COMM API and enables, for example, applications developed to support COM ports, to be easily ported to use FarSync support in synchronous modes. This standardization enables the API to also be readily accessible from higher level environments such as .NET, C#, VB etc. Standard COM port access is provided for use in Async mode.

The FsWinAPI provides applications with direct access to the adapter's communications port/s for bit sync (HDLC) framing, LAPB, V.120, ETI (NI, V.11) and also transparent bitstream operation for video and voice type applications.

The FarSync Flex can also be installed to appear as a NDIS (LAN) interface so it can simply use the TCP/IP stack over PPP to allow access to IP based networks such as the Internet.

### LabVIEW applications can access this card.

The product is supplied with a comprehensive configuration utility. The lines can be reconfigured and restarted without reloading the software. There is context sensitive help and an on-line manual should it be required.

The product is supplied with 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 via a DLL supplied with the Flex.**

## FarSync SDK—The Developers Toolkit

The SDK includes support for writing applications on both Linux and Windows and contains documentation, working sample applications, development and test utility 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 ETI and STI with bitstream encoder and decoders. Also included are details on using the Flex with RS485 networks.

The FarSync SDK is ordered separately from the FarSync Flex.

Our Engineering department provides free email and telephone assistance to application developers using the API as part of the package provided when the FarSync SDK is purchased.

The FarSync SDK is ordered separately from the FarSync Flex, full details are available on a [separate datasheet](#).

### Configuration

**Windows:** Configuration is by a GUI application

The line can be reconfigured and restarted without reloading the software.

There is context sensitive help and an on-line manual should it be required. An advanced tab permits users to exactly specify the configuration of the line if necessary.

**Linux:** Configuration utility is provided, alternatively text files can be used.

The line can be reconfigured and restarted without reloading the software.

<b>FarSync Flex V3 Hardware Technical Specifications</b>	
<b>General</b>	Intelligent USB adapter with ARM processor, dedicated RAM and dual bank Flash memory. Field upgradeable onboard firmware with FarSite customisable communications controller. USB bus powered, USB 2.0 (high-speed - 480Mb/s mode), 3.0 and 1.1 compatible. Network line connector: HD26 for connection of network cables (see Order Information).
<b>Physical details</b>	Construction: Very strong extruded aluminium anodised case 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. RoHS2 and REACH Compliant
<b>Network connections types available</b>	X.21 (V.11) - DTE DB15M connector, V.35 - DTE M34M connector, RS530 (EIA-530, RS422) - DTE DB25M connector, RS449 - DTE DB37M connector, RS232 (V.24, X.21bis) - DTE DB25M connector, RS485 2 and 4 wire, DCE type cables are also available.
<b>Link speed range</b>	RS232: up to 128 Kbits/s, X.21, V.35, RS530, RS422, RS449 and RS485: to well over 3 Mbits/s, Async: up to 115.2 Kbits/s.
<b>Line signal modes</b>	NRZ, NRZI, FM0, FM1, Manchester Encoding, Conditioned Diphas to well over 3 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 Class B.
<b>Reliability</b>	MTBF: 360,181 hours - calculation based on Bellcore Method 1 Case 3, 40 deg.C ambient, 15 deg.C case temperature rise above ambient.
<b>Operating Temperature</b>	-40°C to 85°C ambient air temperature. (industrial temperature range)
<b>Power requirements</b>	USB Bus powered, <500 mA on full load, < 2 watt.
<b>Line clocking</b>	Internal and externally generated line clocking is supported, Internal clock range 75 baud to 4.096 Mbits/s on X.21, V.35, RS530, RS422, RS449 and RS485, Internal clock range 75 baud to 128 Kbits/s on RS232 (V.24), Custom clock rates are dynamically configurable through the API with glitch free transitions.
<b>Extra line control features</b>	Bit reversal, receive clock inversion, configurable resistive interface signal termination. Full configurable bidirectional clocking.
<b>Cables</b>	Cables are ordered separately, see the Compatible Cables section on Order Information Table on the last page.

## FarSync Flex V3 - Software Specifications

### Linux

Distribution Support	Distributions by Red Hat, SuSE, Slackware, Mandriva, Debian, Ubuntu, Fedora and more. Drivers for kernel 2.6 and later on both single and multi-core 32 and 64 bit systems
Kernel Support	Kernel releases from 2.6.12 onwards. Big Endian and Little Endian memory storage format drivers supplied.
Protocols Supported	TCP/IP, PPP, Cisco HDLC, LAPB, Frame Relay, CHAP, MSCHAP, PAP (RFCs 1661, 1332, 1334). Bitstream. ETI (NI, V.11) with the FarSync SDK.
API and Interfaces	Char I/O API, hdlcX.

### Windows

O/S types	Windows 10, 8.1, 8, 7, Vista; Windows Server 2016, 2012, 2008. LabVIEW running on a Windows O/S. 32 and 64 bit (single and multi-core systems)
Protocols Supported	TCP/IP, PPP, LAPB, V.120, CHAP, PAP (RFCs 1661, 1332, 1334), ETI (NI, V.11), Bitstream.
API and Interfaces	FsWinAPI, NDIS (LAN) where the line appears as a LAN interface
Utilities	Line monitor to record, display and store line traffic included, Wireshark compatible.

## Order Information

Product Name	Product Code	Description
FarSync Flex V3	FS4100	1 port sync and async USB Adapter with Linux and Windows software. This is the base product, it includes the Flex hardware, USB cable, drivers, utility programs, documentation on CD-ROM and a quick start guide.
FarSync SDK	FS9610	Developers Toolkit for the FarSync Flex and other FarSync adapters - required if you want to write software to use the adapters API
FarSync Flex X25	FS6100	Same features as FarSync Flex plus X.25 support and a X.25 SDK for Linux and Windows, <a href="#">see separate datasheet</a>
<b>Compatible Cables</b>		
KCR1	FS6011	<b>Cable - RS232 (V.24) and RS530 (RS422) DTE</b> , DB25M connector, 1.5 metres
UCX1	FS6062	<b>Cable - X.21 (V.11) DTE</b> , DB15M connector, 1.5 metres
UCV1	FS6063	<b>Cable - V.35 DTE</b> , M34M connector, 1.5 metres
KC449	FS6019	<b>Cable - RS449 DTE</b> , DB36M connector, 1.5 metres
KCR1-DCE	FS6070	<b>RS232 (V.24) and RS530 (EIA530, RS422) DCE cable</b> , DB25F connector, 2 metres
UCX1-DCE	FS6075	<b>Single X.21 (V.11) DCE cable</b> , DB15F connector, 2 metres.
UX35C	FS6095	<b>V.35 DCE cable</b> , M34F connector, 1.5 metres.
KCR-MON	FS6016	Monitor Cable - RS232 (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.
<b>Accessories</b>		
Flex Mounting Kit	FS4901	A pair of FarSync Flex mounting brackets. Can be fitted without opening case.

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