FarSync® Flex & Flex+

USB Synchronous & Asynchronous adapters

[FS4100] FarSync Flex

USB Synchronous & Asynchronous adapter

[FS4185] FarSync Flex+

High Performance USB Synchronous & Asynchronous adapter

FarSync® Flex & Flex+ USB Synchronous & Asynchronous adapters

Key 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.

- **The multi function line drivers available support X.21 (V.11), V.35, RS232 (V.24, X.21bis), RS530 (EIA530, RS422), RS449 and RS485 2 and 4 wire network interfaces, all soft configurable and ESD protected from static charges.**
- **Flex gives Sync line speeds up to 3 Mbits/s, Async line speeds up to 115.2 Kbits/s**
- **Flex+ gives Sync line speeds up to 20 Mbits/s, Async line speeds up to 115.2 Kbits/s**
- **USB 2.0 high-speed mode (480mb/s), USB 3 and USB 1.1 compatible**
- **Multiple Flex operation from a single server**
- **High efficiency USB Bus powered, energy saving design**
- **NRZI, NRZ, Manchester Encoding, Conditioned Di-phase, FM0 and FM1 line signalling formats, tri-state transmitters and receivers**
- **Master or slave support for 2 or 4 wire multidrop (NRZI, Manchester Encoding, Conditioned Di-phase, FM0 or FM1) RS485 operation**
- **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**
- **Dual bank flash for secure in field upgrades and previous system restore capability**
- **Software selectable Synchronous HDLC, Transparent Bitstream and Asynchronous formats**
- **FarSite customisable communications controller**
- **Optional mounting brackets (factory fitted)**

Overview

The FarSync Flex 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 solution with versatile connectivity for Linux and Windows systems.

FarSync Flex End views

The bus powered USB adapter will support synchronous line at speeds of up to 3 Mbits/s continuous or up to 20Mbits/s with the high performance version, the Flex+.

The highly flexible universal network connector supports RS232, X.21, RS530 (RS422 signaling), RS449 , RS485 and V.35 network interfaces.

Applications can be written to use the low level API for a variety of different functions. The FarSync Flex SDK provides a Developers Toolkit for the product.

The Flex+ can be used for passive line monitoring with the addition of a special monitor cable. A monitoring application is included which captures line traces which can be viewed in realtime or saved as pcap files, for subsequent, offline viewing in applications such as Wireshark.

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

Typical Applications

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

- **HDLC framing support for non standard or specialist protocols**
- **LAPB line mode available with the Flex+**
- **Interfacing to transparent bitstreams for handling unusual protocols**
- **Line monitoring (both transmit and receive). For passive line monitoring choose Flex+**
- **Data generator for test systems**
- **Engineering monitoring and for control of systems**
- **Master or slave in a RS485 2 or 4 wire multidrop environment**
- **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)**

High Performance Version:

The **FarSync Flex** capability has now been extended with the addition of the **FarSync Flex+** which offers higher speeds and additional functionality.

This high performance version supports:

- **Synchronous line rates of up to 20 Mbits/s and async line speeds up to 115.2 Kbits/s**
- **LAPB protocol support - for use with lines running the LAPB level 2 protocol (as opposed to the HDLC framing of user data).**
- **Passive monitoring capability - this enables network engineers to monitor existing lines and to capture the synchronous or asynchronous traffic passively, without the need to act as an endpoint on the line.**

[FS4185] FarSync Flex+

Hardware Features

The intelligent FarSync Flex is designed for reliability, high performance and flexibility. The USB adapter with ARM processor, dedicated RAM and dual bank Flash memory has field upgradeable onboard firmware.

- **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 and USB 1.1 compatible**
- **NRZ, NRZI, Manchester Encoding, Conditioned Diphase, FM0 and FM1 line signalling formats, tri-state transmitters and receivers**
- **Flex gives Sync line speeds up to 3 Mbits/s, Async line speeds up to 115.2 Kbits/s**
- **Flex+ gives Sync line speeds up to 20 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 options for OEM requirements**

Key Features supported on Linux

FarSync adapters support Linux kernel versions from 2.6.12 onwards, in 32 and 64 bit formats, including the leading distributions supplied by Red Hat, SuSE, CentOS, Ubuntu, Debian, Fedora, Slackware and more.
FarSite is committed to supporting FarSync adapters on new versions of Linux and Linux kernels as they are released.

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 driver is supplied with source code. The driver supports both big-endian and little-endian memory storage formats.

This adapter can be accessed from customers' native Linux applications as well as those using third-party frameworks such as LabVIEW.

The char-based FarSync API provides a programming language independent, high-level interface to the FarSync base driver. This provides access to bit synchronous lines that are using HDLC-framed or transparent bitstreams. In addition asynchronous lines are supported by FarSync adapters that support async operation (FarSync Flex/Flex+ and FarSync T4E).

A configuration utility is provided to set each port's line speed, interface type etc. Alternatively the port configuration can optionally be managed by a user application developed using the FarSync API.

If the host TCP/IP stack is required to be used over the FarSync adapter to allow access to IP-based networks, such as the Internet, then please just contact us for more information.

Key Features supported on Windows

The FarSync adapters install easily under Windows 11, 10, Windows Server 2025, 2022, 2019, on single or multi-core 32 and 64 bit systems. The FarSync drivers are signed by Microsoft for easy installation. For use on earlier Windows versions contact FarSite.

This adapter can be accessed from customers' native Windows applications as well as those using third-party frameworks such as LabVIEW.

All FarSync cards/devices are supported by a set of Windows FarSync drivers that support FsWinAPI, an API that provides a consistent interface across all classes of FarSync cards/ adapters. LabVIEW applications can also run over FsWinAPI thereby enabling VIs to utilise the FarSync ports.

FsWinAPI allows applications developed using the FarSync SDK to exactly control the type of data sent and received in bit synchronous (HDLC framed) data and transparent bitstream formats.

The FsWinAPI is an extension of the MS COMM API and enables, for example, applications developed to support COM ports, to be easily ported to use FarSync support in synchronous or asynchronous modes. This standardization enables the API to also be readily accessible from higher level environments such as .NET, C#, VB etc.

The API provides applications with access to the card/device's communications port/s for bit sync HDLC-framing or transparent bitstream operation (video and voice type applications). In addition asynchronous lines are supported by FarSync adapters that support async operation (FarSync Flex/Flex+ and FarSync T4E).

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.

FarSync SDK—The Developers Toolkit

The FarSync SDK provides a Developers Toolkit with full documentation, useful utilities, such as a line monitor, and many sample applications for Linux and Windows. Free support from FarSite's Engineering department is provided to customers purchasing the FarSync SDK who have technical questions using the API.

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 with bitstream encoder and decoder.

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.

Configuration

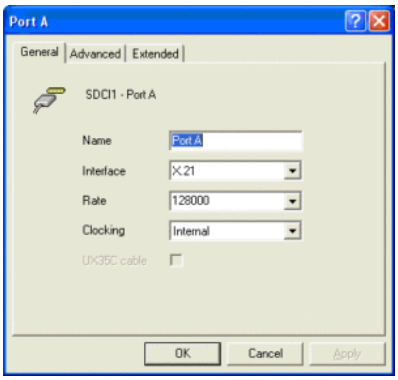
Windows: Configuration is by a GUI application as shown in the image to the right.

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.



FarSync Flex - Hardware Technical Specifications	
General	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), USB 3 and USB 1.1 compatible. Network line connector: HD26 for connection of network cables (see Order Information).
Physical details	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
Network connections types available	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.
Link speed range	RS232: up to 128 Kbits/s,* X.21, V.35, RS530, RS422, RS449 and RS485: to up to 3 Mbits/s, or up to 20Mbits/s with Flex+.* Async: up to 115.2 Kbits/s.*
Line signal modes	NRZ, NRZI, FM0, FM1, Manchester Encoding, Conditioned Diphase up to 3 Mbits/s or up to 20Mbits/s with Flex+.*
ESD protection	Littelfuse high speed ESD and over-voltage protection.
Indicators	LED displaying network line status.
Approvals	EN55022 class B, CE, FCC Class B.
Reliability	MTBF: 360,181 hours - calculation based on Bellcore Method 1 Case 3, 40 deg.C ambient, 15 deg.C case temperature rise above ambient.
Operating Temperature	-40°C to 85°C ambient air temperature (industrial temperature range).
Power requirements	USB Bus powered, <500 mA on full load, < 2 watt.
Line clocking	Internal and externally generated line clocking is supported, Internal clock range 100 baud up to 3Mbits/s (Flex) and 20Mbits/s (Flex+) on X.21, V.35, RS530, RS422, RS449 and RS485,* Internal clock range 100 baud to 128 Kbits/s on RS232 (V.24), Custom clock rates are dynamically configurable through the API with glitch free transitions.
Extra line control features	Bit reversal, receive clock inversion, configurable resistive interface signal termination. Full configurable bidirectional clocking.
Cables	Cables are ordered separately, see the Compatible Cables section on Order Information Table on the last page.
*Quoted speeds represents the maximum possible per device, actual performance is configuration dependent, for information on likely restrictions please consult the FarSync Flex FAQ webpage .	

FarSync Flex - Software Specifications	
Linux	
Distribution & Kernel Support	FarSync adapters support Linux kernel versions from 2.6.12 onwards, in 32 and 64 bit formats, including the leading distributions supplied by Red Hat, SuSE, CentOS, Ubuntu, Debian, Fedora, Slackware and more. FarSite is committed to supporting FarSync adapters on new versions of Linux and Linux kernels as they are released. The products may operate successfully with earlier or later versions of the kernel but no specific testing has been undertaken by FarSite. Big Endian and Little Endian memory storage format drivers supplied.
Protocols Supported	Cisco HDLC, LAPB (Flex+ only), 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
Windows	
O/S types	Windows 11, 10, Windows Server 2025, 2022, 2019, LabVIEW running on a Windows O/S. 32 and 64 bit (single and multi-core systems)
Protocols Supported	HDLC, LAPB (Flex+ only), V.120, 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	FS4100	**1 port USB synchronous and asynchronous adapter**[1] (X.21 / V.35 / RS232 / EIA530 / RS422 / RS449 / RS485), async, bitstream and HDLC run-time support for custom applications and a Line Monitor. NRZ, NRZI, FM1, FM0, Manchester Encoding, Conditioned Di-Phase Selectable. - Sync line speeds up to 3 Mbits/s, Async line speeds up to 115.2 Kbits/s
FarSync Flex+	FS4185	**High Performance 1 port USB synchronous and asynchronous adapter**[1] (X.21 / V.35 / RS232 / EIA530 / RS422 / RS449 / RS485), async, bitstream and HDLC run-time support for custom applications and a Line Monitor. NRZ, NRZI, FM1, FM0, Manchester Encoding, Conditioned Di-Phase Selectable. - Sync line speeds up to 20 Mbits/s, Async line speeds up to 115.2 Kbits/s - LAPB support - Passive monitoring capability
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,

[1] includes:

APIs for Linux, Windows 11, 10, Server 2025, 2022 and 2019. For older versions of Windows please contact FarSite.

To develop applications to use the APIs order the FarSync SDK.

USB cable included, other cables are ordered separately

Compatible Cables		
KCR1	FS6011	**Cable - RS232 (V.24) and RS530 (RS422) DTE**, DB25M connector, 1.5 metres
UCX1	FS6062	**Cable - X.21 (V.11) DTE**, DB15M connector, 1.5 metres
UCV1	FS6063	**Cable - V.35 DTE,** M34M connector, 1.5 metres
KC449	FS6019	**Cable - RS449 DTE,** DB36M connector, 1.5 metres
KCR1-DCE	FS6070	**RS232 (V.24) and RS530 (EIA530, RS422) DCE cable**, DB25F connector, 2 metres
UCX1-DCE	FS6075	**Single X.21 (V.11) DCE cable**, DB15F connector, 2 metres.
UX35C	FS6095	**V.35 DCE cable**, 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.
Accessories		
Flex Mounting Kit — metal	FS4901	Pair of FarSync Flex metal mounting brackets. Must be ordered with the FarSync Flex, factory fit only. Only use if a metal mounting bracket is required.
Flex Mounting Kit — plastic	FS4902	Pair of FarSync Flex mounting brackets, can be retrofitted, easy to fit, no disassembly of the case is required.

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