FarSite COMMUNICATIONS

FarSync® Flex X25

X.25 USB adapter for Linux and Windows

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Key Features

- **USB X.25 and ISO Transport rugged designed adapter**
- **Network interfaces for RS232, X.21, RS530, RS422, RS449 and V.35 line speeds to over 3 Mbits/s**
- **USB 2.0 bus powered, USB 3 compatible**
- **Handles NRZ, NRZI, Manchester Encoding, Conditioned Diphase, FM0 & FM1 encoding**
- **32 and 64 bit drivers for Linux and Windows**
- **APIs to X.25 and ISO Transport**
- **32 and 64 bit drivers for Linux and Windows**
- **Up to 4095 simultaneous sessions**
- **Includes IP over X.25 and Support for openFT/FTAM**
- **X.25 Developers Toolkit and Line monitor included**

Overview

The FarSync Flex X.25 adapter is a high quality X.25 solution for business, government and military applications, it has been developed to provide high performance, rugged X.25 connectivity for Linux and Windows systems.

The USB powered adapter will support an X.25 line at speeds of over 3 Mbits/s. The highly flexible universal network connector supports RS232, X.21, RS422, RS530, RS449 and V.35 network interfaces.

A Developers Toolkit is provided with the product including a Line Monitor application.

Features under Linux:

The Flex adapter supports Linux kernel 2.6 onwards in 32 and 64 bit formats, including the leading distributions supplied by Red Hat, SuSE, Debian, Ubuntu, Fedora, Slackware and more. SMP (multi-processor) and multi-core systems are supported. Configuration is by a Java based GUI or via text files for embedded use.

There are APIs to the X.25 layer, a Sockets based interface and a Java API. There is also an API to the ISO Transport layers (ISO 8073 - connection oriented).

IP over X.25 support is included permitting TCP/IP operation over an X.25 network.

XOT (X.25 over TCP/IP) support is available as an option, using the same APIs as X.25. XOT can operate at the same time as X.25.

Up to 254 connections are supported as standard, or up to 4,095 connections using the FarSync X25 High Capacity Pack.

FarSite is committed to supporting the FarSync Flex X25 on new versions of Linux and Linux kernels as they are released. The source code for the driver and the libraries for the API are supplied with the product, allowing rebuilding by the end user for use with almost any of the current or future Linux variants.

Features under Windows:

The Flex adapter installs seamlessly as a plug and play device under Windows 11, 10, Windows Server 2025, 2022 and 2019 , on single or multi-core 32 and 64 bit systems.

The X.25 software has a host of features including ISO Transport (classes 0 to 3), support for OpenFT FTAM, a WinSock2 compliant Sockets API, a Java API, and a COM Port API. The Sockets API is also accessible from .NET applications.

Up to 4095 connections can be supported using the FarSync X25 High Capacity Pack or 254 as standard.

IP over X.25 support is included permitting TCP/IP operation over an X.25 network.

Typical Applications

The FarSync Flex X25 adapter is suitable for connection to all types of X.25 networks, X.25 over the ISDN D channel, and leased lines. FarSync X.25 adapters are in use today in a variety of applications, including:

- **X.25 networks such as Lottery, Police, Customs, Military, Fishery, Financial, Government and Airline**
- **E-Commerce gateways for credit adapter verification**
- **Mixed X.25 and IP networks**
- **Billing and Mediation**
- **ATM connections**
- **Lottery Terminals**
- **FTAM access**
- **X.400**

The adapter is compatible with all public X.25 networks.

Line Monitor and Network Statistics Utilities

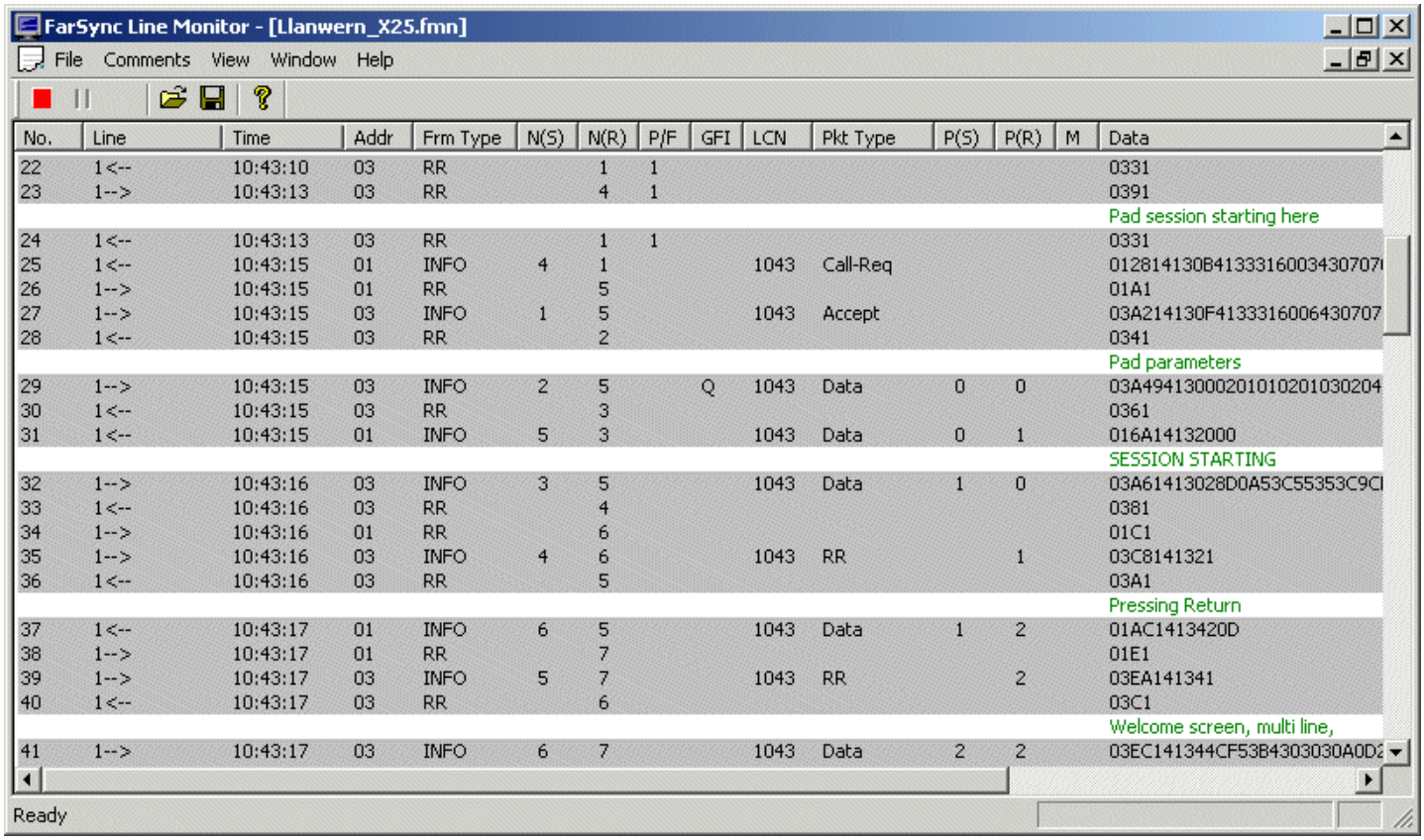
The line monitor included for Windows and Linux is an invaluable tool. Line traces can be displayed in real time, recorded and reviewed with full protocol decoding.

Windows version only features:

Recording in pcap format

Wireshark can also be used to trace X.25 line activity in real time.

A connection status and statistics utility is also provided. It's functions include the display of the channel connection status and statistics of user data, packet and frame types passed over the X.25 lines.



No.	Line	Time	Addr	Frm Type	N(S)	N(R)	P/F	GFI	LCN	Pkt Type	P(S)	P(R)	M	Data
22	1<--	10:43:10	03	RR		1	1							0331
23	1-->	10:43:13	03	RR		4	1							0391
														Pad session starting here
24	1<--	10:43:13	03	RR		1	1							0331
25	1<--	10:43:15	01	INFO	4	1			1043	Call-Req				012814130B4133316003430707
26	1-->	10:43:15	01	RR		5								01A1
27	1-->	10:43:15	03	INFO	1	5			1043	Accept				03A214130F4133316006430707
28	1<--	10:43:15	03	RR		2								0341
														Pad parameters
29	1-->	10:43:15	03	INFO	2	5		Q	1043	Data	0	0		03A4941300020101020103020
30	1<--	10:43:15	03	RR		3								0361
31	1<--	10:43:15	01	INFO	5	3			1043	Data	0	1		016A14132000
														SESSION STARTING
32	1-->	10:43:16	03	INFO	3	5			1043	Data	1	0		03A61413028D0A53C55353C9C
33	1<--	10:43:16	03	RR		4								0381
34	1-->	10:43:16	01	RR		6								01C1
35	1-->	10:43:16	03	INFO	4	6			1043	RR		1		03C8141321
36	1<--	10:43:16	03	RR		5								03A1
														Pressing Return
37	1<--	10:43:17	01	INFO	6	5			1043	Data	1	2		01AC1413420D
38	1-->	10:43:17	01	RR		7								01E1
39	1-->	10:43:17	03	INFO	5	7			1043	RR		2		03EA141341
40	1<--	10:43:17	03	RR		6								03C1
														Welcome screen, multi line,
41	1-->	10:43:17	03	INFO	6	7			1043	Data	2	2		03EC141344CF53B4303030A0D2

Screen shot extract from the Windows Line Monitor application

TCP/IP over X.25

The IP over X.25 support is included as part of the FarSync Flex X25 product and is integrated into Linux and Windows.

Linux Features: IP over X.25 support complies with RFC 1356 (IP over X.25). Higher level protocols that run over IP including TCP, UDP, HTTP and FTP are supported.

Windows Features: The IP over X.25 support complies with RFC 1356 (IP over X.25), for single and multiple X.25 destinations. Higher level protocols that run over IP including TCP, UDP, HTTP and FTP are supported.

API and Developers Toolkit

Application developers have a choice of APIs for X.25 and ISO Transport. An API selector guide is provided to assist the developer in choosing the most appropriate interface. The comprehensive Developers Toolkit is included with the product. See FarSync_X.25_Developers_Toolkit_Datasheet for full details.

FarSync XOT Extension option

The XOT extension allows applications using the same API to transmit data over XOT (X.25 over TCP/IP). TCP/IP is normally routed over Ethernet on PCs and Servers. The XOT support is compatible with FarSite's FarLinX X25 Gateway and also other manufacturers' XOT products. The XOT and X.25 interfaces can be used simultaneously.

For Linux use the **FarSync XOT Extension for Linux**, it should be ordered at the same time that the FarSync X25 adapter is purchased, although a retrofit is possible.

For Windows use the **FarSync XOT Runtime - Windows** product.

FarSync X.25 High Capacity Pack option

An optional high capacity pack is available for the FarSync Flex X25. The **FarSync X.25 High Capacity Pack** allows up to 4,095 simultaneous connections to be made; a huge increase from the standard 254 on each line. The expanded capacity applies to SVC, PVC and ISO Transport connections.

Customer applications developed to use the standard X.25 Sockets API are compatible with the FarSync X25 High Capacity Pack.

Order the **FarSync X.25 High Capacity Pack - Windows** or **FarSync X.25 High Capacity Pack - Linux.** These products should be ordered at the same time that the FarSync Flex X.25 is purchased although a retrofit upgrade is possible. One FarSync X.25 High Capacity Pack is required per adapter.

Configuration

For both Windows and Linux, configuration is by a GUI configuration application, rapid installation and easy configuration are key features of the product.

X.25 lines can be reconfigured and restarted without reloading the software.

Many of the parameters such as DTE / DCE selection are determined automatically. Selecting the line speed by default automatically sets suitable timer and retry values. An advanced tab permits users to exactly specify the configuration of the line if necessary.

New releases of the software are made available for free download from farsite.com.

Cables

The cable and connector configurations available for the FarSync Flex X25 are described in the **Order Information Table** on the last page of the datasheet.

FarSync Flex End views

Software Technical Specifications	
Operating System support	Windows 11, 10, Windows Server 2025, 2022 and 2019 . Linux distributions supplied by Red Hat, SuSE, Slackware, CentOS, Debian, Ubuntu, Fedora and others with kernel version 2.6 and onward.
Linux kernel support	All sub versions of kernel releases from 2.6.12 and onward.
32 and 64 bit systems	The FarSync Flex X25 can be used on 32 and 64 bit systems using Intel/AMD X86/ x64 type processors under Linux and Windows with 32 or 64 bit applications
X.25 Features	
Data Packets per Second throughput	> 2,000 pps
X.25 CCITT Compliance	1980, 84 & 88
DTE/DCE Operation	Both & Automatic detection and selection
Maximum SVCs (all types)	254, any mix of bothway, incoming & outgoing. 4,095 with the High Capacity Pack (any mix of bothway, incoming & outgoing)
Maximum PVCs	254, 4,095 with the High Capacity Pack
Logical Channel Numbers (LCN)	From 1 to all 4095 LCNs can be specified. Allows incoming calls to be accepted on any channel
Data Packet size range	0 to 4096 bytes
X25 facilities support	Closed User Group (CUG), Network User Identifier (NUI), Fast Select, Packet and Windows size negotiation, Throughput Class Negotiation.
Extended sequence numbering (128)	Yes
IP over X.25	Supported, complies with RFC 1356
Accessible via API	Three APIs, a Sockets based interface, a Java API and a legacy NCB based API
XOT Option Features	
XOT Specification	Complies with RFC 1613 - X.25 over TCP (XOT)
Maximum XOT connections	4,095 on Linux, 4,095 on Windows
Maximum SVCs and PVCs	4,095 on Linux, 4,095 on Windows (any mix of SVCs and PVCs)
Data packets size range	0 to 4,096 bytes
OOB (Out of Band) data	Supported for Interrupts, Resets and the D bit
X.25 facilities support	Closed User Group (CUG), Network User Identifier (NUI), Fast Select, Packet and Windows size negotiation, Throughput Class Negotiation.
Accessible via API	Two APIs, a Sockets based interface and a Java API
ISO 8073 Transport Features	
Standard supported	ISO 8073 (connection oriented)
Classes supported	Classes 0, 1, 2 and 3
Negotiation between classes	Yes
Transport connections	254, 4,095 with the High Capacity Pack
TPDUs in a NSDU	1
Accessible via API	Yes

Developers Toolkit API Summary	
X.25 API - Linux and Windows	The **Sockets API** is easy to use and provides access to the majority of X.25 features. This is recommended for most developments. Accessible from .NET applications. The **Java API**, specially developed for Java applications (J2SE, J2EE), is quick and easy to use. Legacy **NCB based API** providing low level access to all the features of X.25.
ISO Transport API - Linux and Windows	Using a **Sockets API on Windows, NCB API on Linux.** Provides access to ISO Transport features.
API Manuals	**Manuals included, one for each API** plus an API selector guide.
Sample programs	A large number of example applications are available for driving all the various APIs. Includes samples using SVC and PVC operation.

Technical Specifications - Hardware Features	
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 Hot plug in supported
Physical characteristics	Size: - Height 30mm, Length 126 mm, Width 62mm, Weight: 190g Material: Anodized extruded aluminium 0.6 Metre A to B USB cable with a thumb screw secured B connector.
Network connections and cables supported	X.21 (V.11) - DTE and DCE - DB15M connector, V.35 - DTE and DCE - M34M connector, RS232 (V.24, X.21bis) - DTE and DCE - DB25M connector, RS530 (RS422) - DTE and DCE - DB25M connector, RS449 - DTE DB37M connector. Cables are ordered separately, see the Cables section on the last page for details.
Line Signal Modes	NRZ, NRZI, FM0, FM1, Manchester Encoding, Conditioned Diphase to 2.048 Mbits/s.
Link speed range	RS232: up to 128 Kbits/s X21, V35, RS530, RS449, RS422: 75 baud to over 3 Mbits/s.
Line Protection	Yes, Littelfuse high speed ESD and over-voltage protection
LEDs	Line status indicator
Approvals and Compliance	EN55022 class B, CE, FCC class B. RoHS2 and REACH Compliant
Operating range °C	From –40°C to 85°C ambient air temperature (industrial temperature range)
Power requirements	USB Bus powered, < 500 mA on full load, < 2 watt
MTBF	MTBF: 360,181 hours - calculation based on Bellcore Method 1 Case 3, 40 deg.C ambient, 15 deg.C case temperature rise above ambient.
Line clocking (internal / external)	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, 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.
Mounting Plates	Used to mount the case in a fixed position, supplied as a pair, choice of 2 versions.
Warranty	Free 5 year warranty.

Ordering Information		
Product Name	**Description**	**Product Code**
FarSync Flex X25	1 port synchronous USB Adapter with X.25 Software and Developers Toolkit. Includes the Flex hardware, USB cable, drivers, utility programs, API documentation and a Quick Start Guide.	FS6100
Software Options		
FarSync X.25 High Capacity Pack - Windows	Upgrade to the standard Windows FarSync X.25 software that allows up to 4,095 simultaneous sessions	FS9504
FarSync X.25 High Capacity Pack - Linux	Upgrade to the standard Linux FarSync X.25 software that allows up to 4,095 simultaneous sessions	FS9505
FarSync XOT Extension for Linux	Upgrade to add XOT (X.25 over TCP/IP) to FarSync X.25 adapters on Linux. A FarSync Flex X25 adapter must be purchased.	FS9508
FarSync XOT Runtime - Windows	XOT (X.25 over TCP/IP) Runtime support on Windows	FS9511

Cables		
Product Name	**Description of cable types available**	**Product Code**
KCR1	**RS232 (V.24, X.21bis) and RS530 (EIA530, RS422) DTE cable**, same cable for both, DB25M connector, 1.5 metres.	FS6011
KCR1-DCE	**RS232 (V.24, X.21bis) and RS530 (EIA530, RS422) DCE cable**. Same cable for both interfaces, DB25F connector, 2 metres.	FS6070
UCX1	**X.21 (V.11) DTE cable** - DB15M connector, 1.5 metres.	FS6062
UCX1-DCE	**X.21 (V.11) DCE cable** - DB15F connector, 2 metres.	FS6075
UCV1	**V.35 DTE cable** - M34M V.35 connector, 1.5 metres.	FS6063
UX35C	**V.35 special DCE cable** - M34F V.35 connector, 1.5 metres.	FS6095
KC449	**RS449 (RS422) DTE cable** - DB37M connector, 1.5 metres.	FS6019
Accessories		
Flex Mounting Kit — metal	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.	FS4901
Flex Mounting Kit — plastic	Pair of FarSync Flex mounting brackets, can be retrofitted, easy to fit, no disassembly of the case is required.	FS4902

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