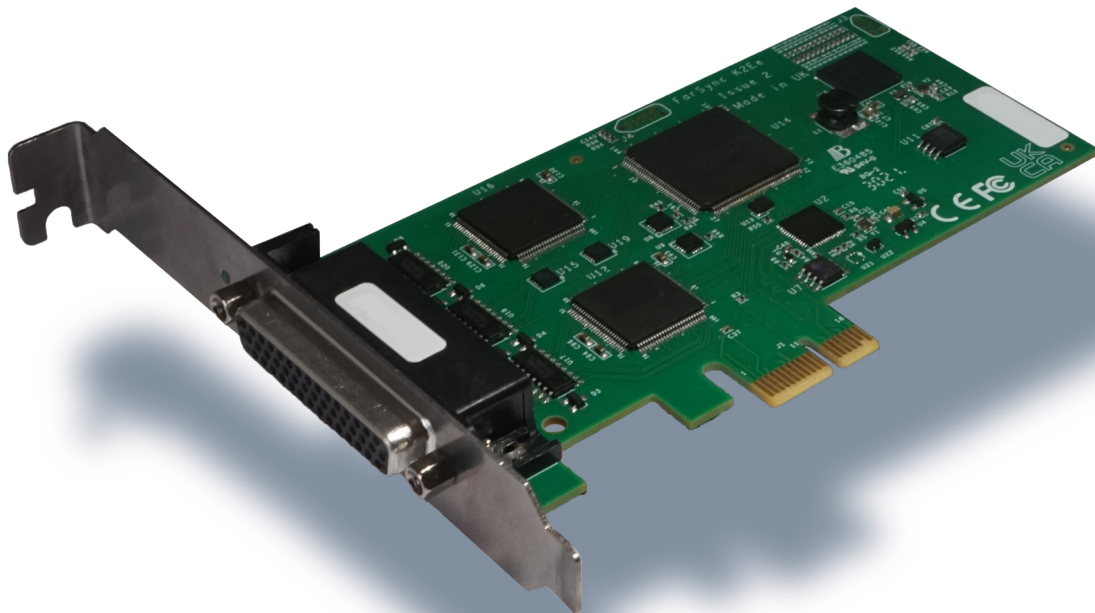# FarSite COMMUNICATIONS

FarSync ® X25 K2Ee
### X.25 2 port low profile PCIe adapter for Linux and Windows

Datasheet Version 1.01

FarSync® X25 K2Ee - X.25 2 Port PCIe adapter

FarSite COMMUNICATIONS

Key Features

- **2 port low profile PCIe X.25 adapter**
- **Network interfaces for RS232, X.21, RS530, RS422, RS449 and V.35**
- **Wide speed range: 150 baud to 2 Mbits/s**
- **NRZ, FM0, FM1, Manchester Encoding, Conditioned Diphase line signalling**
- **APIs to X.25 and ISO Transport**
- **32 and 64 bit drivers for Linux and Windows**
- **4095 simultaneous sessions per port**
- **Includes IP over X.25**
- **Support for *open*FT/FTAM**
- **Developers Toolkit & Line Monitor included**
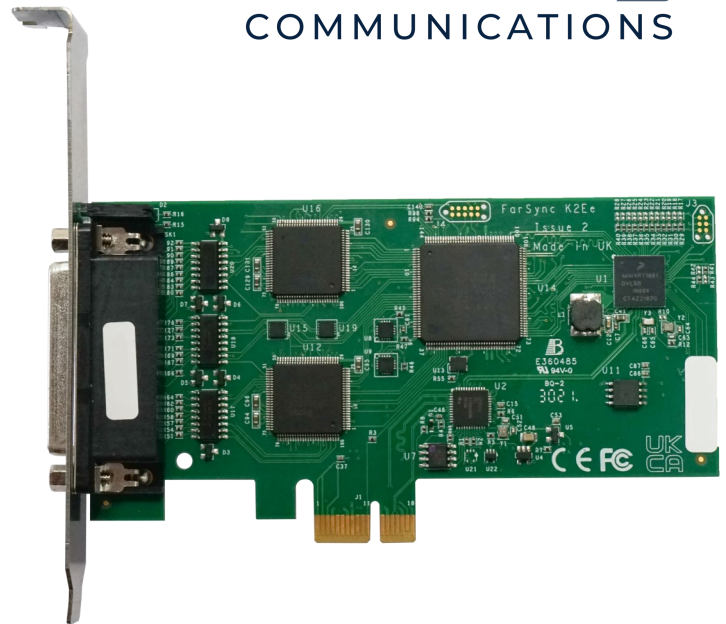
Overview

The FarSync X25 K2Ee product is a high quality X.25 adapter for business, government and military applications, it has been developed to provide high performance, versatile X.25 connectivity for Linux and Windows systems.

The low profile, half length PCI Express adapter will support 2 X.25 lines at speeds to over 2.048 Mbits/s. The highly flexible universal network connector supports RS232, X.21, RS530, RS449 and V.35 network interfaces.

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

Typical Applications

The FarSync X25 T4Ue 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, Radar, Military, Fishery, Financial, Government and Airline
- E-Commerce gateways for credit adapter verification
- Mixed X.25 and IP networks
- SMS message gateways
- Billing and Mediation
- FTAM access
- Low cost PC / Server based X.25 switches
- X.400
- PC / Server based X.25 switch with an XOT option

The adapter is compatible with all public X.25 networks.
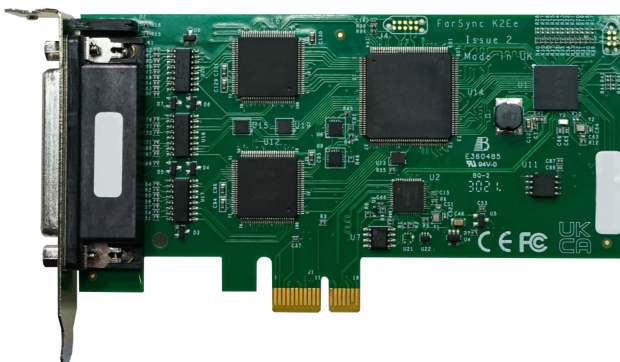
Standard PCIe I/O bracket

Low profile PCIe I/O bracket

Features under Linux:

The X.25 K2Ee card installs seamlessly as a plug and play device under the popular Linux 32 and 64 bit distributions. The card supports Linux kernel versions from 2.6 and onwards in 32 and 64 bit formats, including the leading distributions supplied by Red Hat, CentOS, SuSE, Debian, Ubuntu, Fedora, Slackware and more. SMP (multi-processor) systems are supported. Configuration is by a Java based GUI.

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 API's as X.25. XOT can operate at the same time as X.25.

Up to 254 connections per port as standard or up to 4095 connections using the FarSync X25 High Capacity Pack.

FarSite is committed to supporting the FarSync X25 K2Ee 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 K2Ee adapter installs seamlessly as a plug and play device under Windows 11, 10, 8, 7; Windows Server 2022, 2019, 2019 and 2012. 32 and 64 bit Windows operating systems with SMP (multi-processor) systems are supported.

The X.25 software has a host of features including ISO Transport (classes 0 to 3), support for *Open*FT FTAM, a WinSock2 compliant Sockets API, a Java API and a LAPB layer 2 (HDLC) that is also directly accessible by its own 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 per line as standard.

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

FarSync X25 K2Ee - Hardware Details

The low profile FarSync X25 K2Ee 2 port adapter runs an AMD processor with SRAM and FarSite extended communications controller (customisable). Standard and low profile PCIe I/O brackets supplied.

Network Interfaces & Cables

This two port adapter uses a single HD44F connector with multi function ESD protected line drivers, the cable splits out to two connectors. Two port cables are available for X.21 (V.11), V.35, RS232 (V.24, X.21bis), RS530 (EIA530, RS422) and RS449 operation. Details of the standard cables are listed in the Order Information on the last page.

Clock Generation

External (line generated) clocking is supported. The K2Ee also supports adapter generated clocks speeds from 9,600 baud to over 2.048 Mbits/s, each line can be set to a different speed.

PCI Bus Specification

The FarSync X25 K2Ee adapter is suitable for systems with a PCI express x1 (or higher) slot, covering single and multi-processor systems. The adapter is PCI Express Base Specification Revision 1.0a compliant.

Multiple Cards

The drivers supplied with Windows and Linux allow large numbers of lines to be supported by the installation of multiple FarSync X25 K2Ee adapters in a Server. The limit is only dependent on the PCIe slot count and resources available in the host Server.

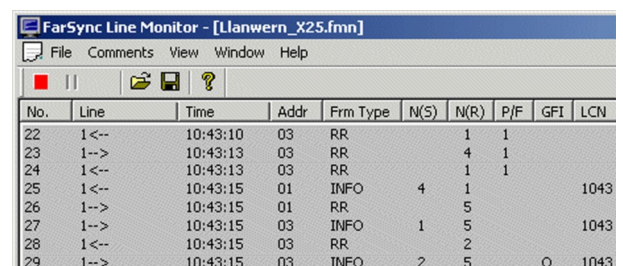## Line Monitor and Network Statistics Utilities

The multi-port 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 be used to trace X.25 line activity in real time.

No.	Line	Time	Addr	Frm Type	N(S)	N(R)	P/F	GFI	LCN
22	1<--	10:43:10	03	RR		1	1		
23	1-->	10:43:13	03	RR		4	1		
24	1<--	10:43:13	03	RR		1	1		
25	1<--	10:43:15	01	INFO	4	1			1043
26	1-->	10:43:15	01	RR		5			
27	1-->	10:43:15	03	INFO	1	5			1043
28	1<--	10:43:15	03	RR		2			
29	1-->	10:43:15	03	INFO	2	5		Q	1043

Screen shot extract from the Windows Line Monitor application

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. connection status and statistics of user data, packet and frame types passed over the X.25 lines.

TCP/IP over X.25

The IP over X.25 support is included as part of the FarSync X25 T4Ue 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 the [Datasheet here](#) 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 X25 K2Ee. 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 X.25 T4Ue 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.

Cables

The cable and connector configurations available for the FarSync X25 K2Ee are described in the **Order Information Table** on the last page of this datasheet.

Packaging

The X.25 software, firmware, drivers, utilities and the X.25 Developers Toolkit are all included with the FarSync adapter. Cables are ordered separately.

The software and documentation is downloaded from this website using a code supplied with the FarSync X25 adapter, it includes:

- Drivers for Linux and Windows
- Numerous example applications with source code
- Documentation for all the APIs in Adobe PDF format
- Source code for Linux drivers and API Libraries
- Network monitor and various useful utility programs

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

Software Technical Specifications

Operating System support	Windows 11, 10, 8, 7; Windows Server 2022, 2019, 2016 and 2012 Linux distributions supplied by Red Hat, CentOS, SuSE, Debian, Ubuntu, Fedora, Slackware and others with kernel version 2.6 onwards.
Linux kernel support	All sub versions of kernel releases from 2.6.12 onward. The product may operate successfully with earlier versions of the kernel but no specific testing has been undertaken by FarSite.
32 and 64 bit systems	The FarSync X25 K2Ee 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	> 2000 pps
X.25 CCITT Compliance	1980, 84 & 88
DTE/DCE Operation	Both & Automatic detection and selection
Maximum SVCs (all types)	254 per port, any mix of bothway, incoming & outgoing. 4,095 per port with the High Capacity Pack (any mix of bothway, incoming & outgoing)
Maximum PVCs	254 per port, 4,095 per port with the High Capacity Pack
Logical Channel Numbers (LCN)	From 1 to all 4095 LCNs can be specified on each port. 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	3 APIs, a Sockets based interface, a Java API and a legacy NCB based API
X.25 switch	X.25 Switch daemon available on Linux for free download

XOT Option Features

XOT Specification	Complies with RFC 1613 - X.25 over TCP (XOT)
Maximum XOT connections	4,095 on Linux and Windows
Maximum SVCs and PVCs	4,095, 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	2 APIs, a Sockets based interface and a Java API

ISO Transport Features

Standard supported	ISO 8073 (connection oriented)
Classes supported	Classes 0, 1, 2 and 3
Negotiation between classes	Yes
Transport connections	254 per port, 4,095 per port 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

Card type and PCI Specification	AMD Processor with SRAM and a FarSite extended communications controller (customisable). PCIe bus compliant with PCI Express Base Specification Revision 1.0a, x1 (single lane) bus mastering adapter. HD44F connector for the 2 synchronous ports.
Physical characteristics	Short card (height 69mm, length 125mm), standard and low profile PCIe I/O brackets supplied.
Network connections supported	2 ports, soft switchable line termination with Terminal Timing **RS232** (V.24, X.21bis) - DTE DB25M type connector, **X.21** (V.11) - DTE DB15M type connector, **V.35** - DTE M34M type connector, **RS530** (EIA530, RS422) - DTE DB25M type connector, **RS449** - DTE DB37M type connector. DCE type cables are also available.
Link speed range	RS232: 75 baud to 128 Kbits/s X21, V35, RS530: 75 baud to over 2.048 Mbits/s
Line signalling modes	NRZ, Manchester Encoding, Conditioned Diphase (Differential Manchester), FM0 and FM1
ESD Line Protection	Yes, Littelfuse high speed ESD and over-voltage protection.
Multiple adapters	Yes, the adapter limit is only dependent on the resources available in the host Server.
LEDs	2 LEDs, one per port showing line connection status.
Approvals and Compliance	EN55022 class B, CE, FCC class B, RoHS2, REACH
Power requirements	500 mA @ +3.3V, < 10 mA @ +3.3V Aux, < 25 mA @ +12V, total < 2 Watts
MTBF	1,088,665 hours calculated using Telcordia SR-332 Issue4, 55 deg.C ambient, 15 deg.C case temperature rise above ambient.
Line clocking (internal / external)	Card generated and external clocking supported Card generated clock range 9,600 baud to over 2.048 Mbits/s. No special cables are required to use adapter generated clocks on RS232, X.21, V.35, RS530 (RS422) and RS449.
Temperature range	Operating Temperature: 0 - +60°C ambient air temperature, Storage Temperature: -45 - +90°C ambient air temperature.
Cables	Cables are ordered separately, see the Cables section on the last page for details.
Warranty	Free 5 year warranty

Ordering Information

Product Name	Description	Product Code
FarSync X25 K2Ee	Intelligent 2 port X.25 PCI Express (PCIe) low profile card with X.25 Software, X.25 Developers Toolkit for Windows and Linux included. Cables are ordered separately, see below.	FS6266

Software Options

FarSync X.25 High Capacity Pack -Windows	Upgrade to the standard Windows FarSync X.25 software that allows up to 4095 simultaneous sessions	FS9504
FarSync X.25 High Capacity Pack - Linux	Upgrade to the standard Linux FarSync X.25 software that allows up to 4095 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 X25 adapter must be purchased.	FS9508
FarSync XOT Runtime - Windows	XOT (X.25 over TCP/IP) Runtime support on Windows	FS9511

Cables for the FarSync X25 K2Ee

FCR1	**One port RS530 and RS232 DTE cable** DB25M connector, 1.5 metres. Also supports adaption to X.21, V.35 and RS449 interfaces with addition of conversion cables TCX1, TCV1 and TC449	FS6073
FCR2	**Dual port RS530 and RS232 DTE cable** DB25M connectors, 1.5 metres. Also supports adaption to X.21, V.35 and RS449 interfaces with addition of conversion cables TCX1, TCV1 and TC449	FS6077
FCX2	**Dual port X.21 (V.11) DTE cable**, DB15M connectors, 2.0 metres.	FS6078
FCV2	**Dual port V.35 DTE cable**, M34M V.35 connectors, 2.0 metres.	FS6079
FC449	**Dual port RS449 DTE cable**, DB37M connectors, 3.0 metres.	FS6080

Crossover (Null Modem) DTE to DCE conversation cables

Null-MX	X.21 (V.11) crossover DTE to DCE conversion cable, DB15F type connectors, 0.5 metres.	FS6090
Null-MR4	Combined RS232 (V.24) and RS530 (EIA530, RS422) crossover DTE to DCE conversion cable, DB25F type connectors, 0.5 metres.	FS6097

FarSync X25 K2Ee Datasheet Version 1.01

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