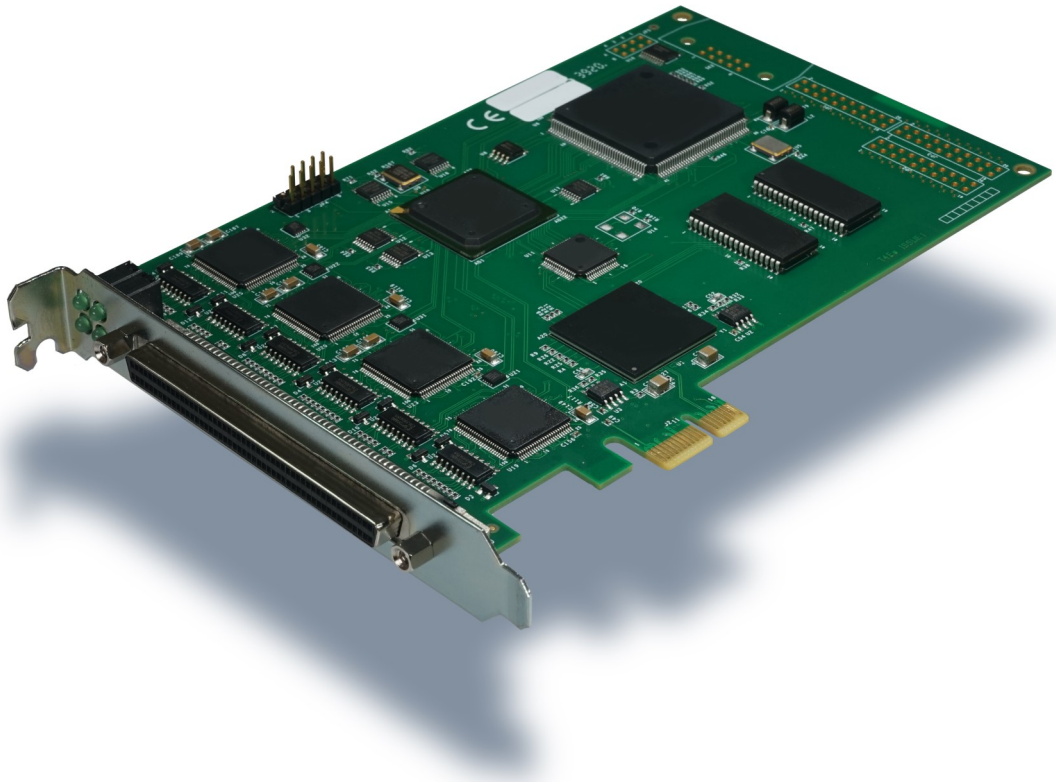
FarSync® X25 T4Ee

X.25 4 port PCIe Adapter with Multi source clocking

Datasheet v2.10



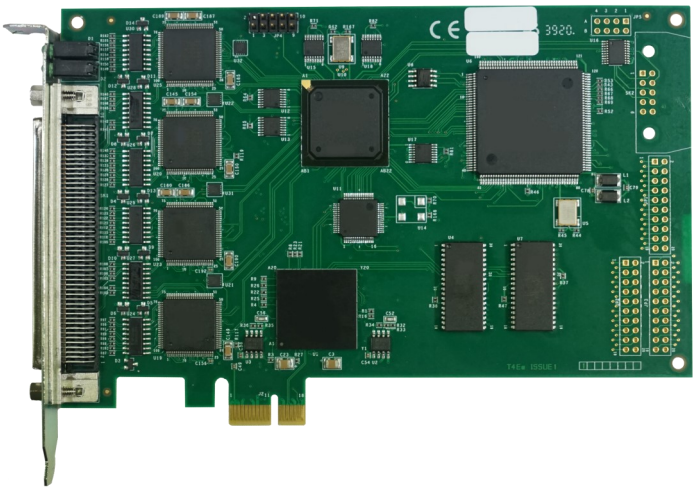
FarSync® X25 T4Ee

Intelligent X.25 4 port PCIe adapter for Linux and Windows

FarSite COMMUNICATIONS

Key Features

- **4 port 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**
- **Sockets and Java APIs**
- **APIs to X.25 and ISO Transport**
- **NRZ, NRZI, FM0, FM1, Manchester Encoding, Conditioned Diphase line signalling**
- **32 and 64 bit drivers for Linux and Windows**
- **Up to 4095 simultaneous sessions per port**
- **Includes IP over X.25**
- **Support for *open*FT/FTAM**
- **Developers Toolkit and Line Monitor**



Overview

The FarSync X.25 T4Ee is FarSite's top of the range X.25 adapter for government and military applications, it has been developed to provide high performance, versatile X.25 connectivity for Linux and Windows systems.

The PCI Express adapter will support 4 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.

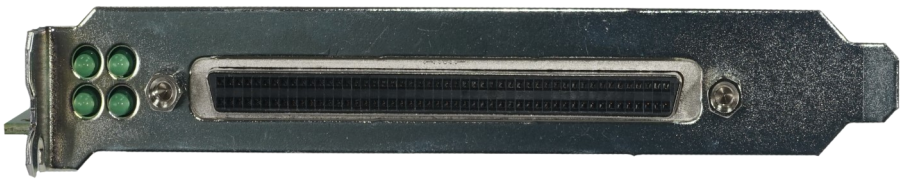
A Developers Toolkit is provided with the product including a multi port Line Monitor application.

Typical Applications

The FarSync X25 T4Ee adapter is suitable for connection to all types of **X.25 networks and leased lines.** FarSync X.25 adapters are in use today in a variety of applications, including:

- **X.25 networks such as Police, Radar, Customs, Military, Fishery, Financial, Government and Airline**
- **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.



FarSync T4Ee 100 pin HIPPI type connector

Features under Linux:

The adapter supports Linux kernel 2.6 and 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 per line are supported as standard or up to 4095 connections using the FarSync X25 High Capacity Pack.

FarSite is committed to supporting the FarSync X25 T4Ee 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 T4Ee adapter installs seamlessly as a plug and play device under Windows 11, ,0, 8, 7; Windows Server 2019, 2016 and 2012. 32 and 64 bit Windows operating 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 and a Java API. The Sockets API is 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 T4Ee - Hardware Details

The FarSync X25 T4Ee 4 port adapter runs an AMD processor with SRAM and an embedded HDLC controller connected to the Server/PC through a PCI Express bus.

Network Interfaces

The multi function line drivers available on all the ports support RS232 (V.24), X.21 (V.11), V.35, RS530 (EIA530, RS422), RS485 and RS449 (RS422 signalling) network interfaces, all soft configurable and protected from static charges by ESD protection devices. Line speeds to over 2.048MBits/s are supported.

Line Signalling Modes

The popular NRZ line signalling plus also NRZI, FM0, FM1, Manchester Encoding and Conditioned Diphase (also known as Differential Manchester) are support by the adapter.

Clock Generation

External (line generated) clocking is supported. The T4Ee also has five on-board frequency synthesisers configurable for generating clocks to the four serial ports.

PCI Bus Specification

The FarSync T4Ee adapter is suitable for systems with a PCIe bus, covering single and multi-processor systems. The adapter is compliant with PCI Express Base specification revision 1.0a and above. The FarSync T4Ee is a bus mastering, 1x (single lane) adapter.

Multiple Cards

The drivers supplied with Windows and Linux allow large numbers of lines to be supported by the installation of multiple FarSync X25 T4Ee 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

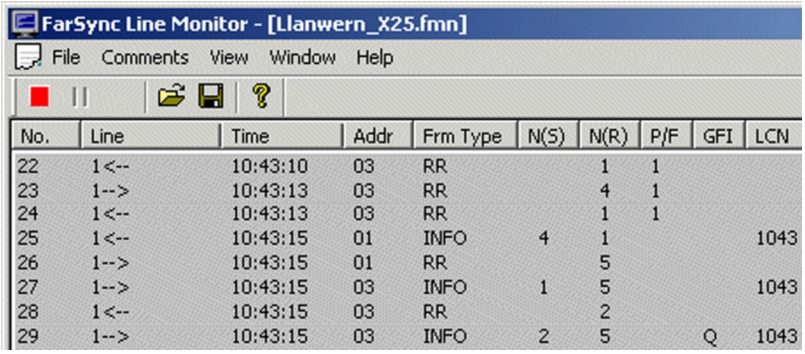
The multi-port line monitor included for Windows and Linux is an invaluable tool. Line traces can be displayed in real time, recorded and reviewed with full protocol decoding.

Windows version only features:

Recording in pcap format

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

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
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

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.

For more details see the www.farsite.com/datasheets/FarSync_X.25_Developers_Toolkit_Datasheet.pdf

TCP/IP over X.25

The IP over X.25 support is included as part of the FarSync X25 T4Ee 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.

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 T4Ee. 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 T4Ee 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

This four port adapter uses a single large high density 100 pin HIPPI Female type connector, all four lines are available though this connector. The quad port cable HCR4 splits out the four network interfaces into separate network connectors to provide support for EIA530 and RS232. X.21, V.35 and RS449 are available through transition connectors. Details of the cables and DTE to DCE conversion cables are listed in the Order Information on the last page.

HCR4 Cable 100 pin HIPPI type connector split into 4 ports

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 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 10, 8, 7; Windows Server 2019, 2016 and 2012 and Linux distributions supplied by Red Hat, SuSE, Debian, Ubuntu, Fedora, Slackware and others with kernel version 2.6 and onwards.
Linux kernel support	All sub versions of kernel releases from 2.6.12 and onward.
32 and 64 bit systems	The FarSync X25 T4Ee 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	Three 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	Two 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. HIPPI 100 pin Female connector for the 4 ports.
Adapter size	Short adapter (height 107mm, length 167mm).
Network connections supported	4 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, NRZI, 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	4 line status indicators
Approvals and Compliance	EN55022 class B, CE, FCC class B, RoHS2, REACH
Power requirements	< 2.32 A @ +3.3v, < 1mA @ +12v, < 7.7 watts.
Temperature	Operating Range 0 to 50° C
Humidity	Operating humidity 10 to 85% non condensing.
MTBF	165,256 hours calculated using Bellcore Method 1 Case 3, 40 deg.C ambient, 15 deg.C case temperature rise above ambient.
Line clocking (internal / external)	Internal clock range: over 160 different frequencies between 300 baud & 10 Mbits/s. No special cables are required to use internal clocks. Internal clocking is supported on RS530, RS232, X.21, V.35 and RS449 connections. External clocks received from a serial port and used to a drive serial communication port can be any frequency up to 10MHz.
Cables	Cables are ordered separately, see the Order Information on the last page for details.
Warranty	Free 5 year warranty

Ordering Information		
Product Name	**Description**	**Product Code**
FarSync X25 T4Ee	Intelligent 4 port X.25 PCIe adapter with X.25 Software and the X.25 Developers Toolkit for Windows and Linux included	FS6456
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		
Product Name	**Description of cable types available for the FarSync X25 T4Ee**	**Product Code**
HCR4	HCR4, Quad port RS530 and RS232 DTE cable, 2.0 metres for use with FarSync X25 T4Ee cards. Also supports X.21, V.35 and RS449 interfaces with addition of conversion cables TCX1, TCV1 and TC449 respectively.	FS6076
TCX1	TCX1, X.21 DTE (V.11) DB15M 1 port HCR4 cable to X.21 transition connector.	FS6052
TCV1	TCV1, V.35 DTE M34M 1 port HCR4 cable to V.35 transition connector.	FS6053
TC449	TC449, RS449 DTE DB37M 1 port HCR4 cable to RS449 transition connector.	FS6054
	Crossover (Null Modem) DTE to DCE conversation cables	
Null-MX	X.21 (V.11, RS422) double shielded crossover cable, DB15F to DB15F connectors, 0.5 metres. Converts DTE presentation to DCE.	FS6090
Null-MR4	Combined RS530 (RS422, EIA 530) and RS232 (V.24) double shielded crossover cable, DB25F to DB25F connectors, 0.5 metres. Converts DTE presentation to DCE.	FS6097

FarSync ® is a registered trademark of FarSite Communications Ltd. All registered trademarks are acknowledged.
Microsoft, Windows are trademarks or registered trademarks of Microsoft Corporation in the United States and/or other countries.
Changes are periodically made to the information herein; these changes will be incorporated into new editions of the publication.
FarSite Communications may make improvements and/or changes in the products and/or programs described in this publication at any time.

Tel: +49 (8241) 91 83 501
Fax: +49 (8241) 96 00 263
Email: farsite@B-NetCons.de
Web: www.B-NetCons.de
B-NetCons GmbH
Business - NetzwerkConsulting

© Copyright FarSite Communications Ltd, 2012-2024. All rights reserved.