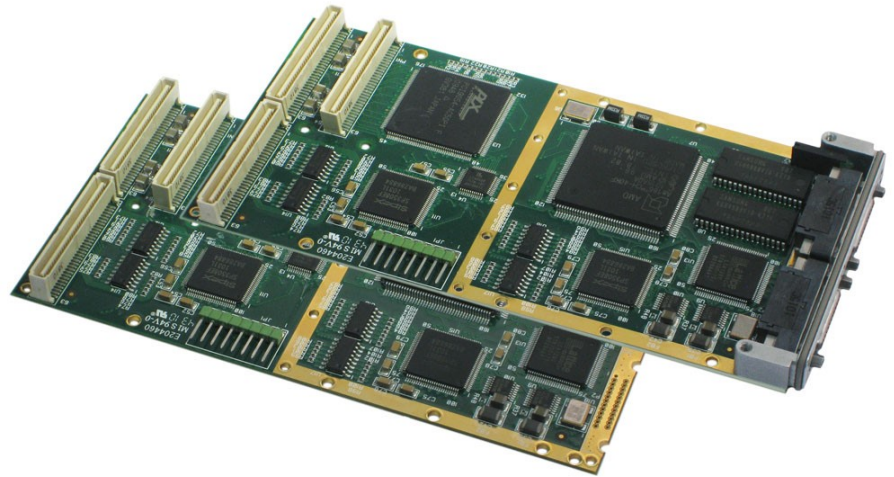


Key Features

- **PMC (PCI Mezzanine) 2 port X.25 adapters**
- **Network interfaces for RS232, X.21, RS530, RS422, RS449 and V.35**
- **Front I/O and Rear I/O versions**
- **Wide speed range, 75 baud to 2 Mbits**
- **APIs to X.25 and ISO Transport - Sockets, Java and COM Port**
- **32 and 64 bit drivers for Linux and Windows**
- **Includes IP over X.25**
- **Up to 4095 simultaneous sessions per port**
- **Wide operating temperature range, low power consumption, conduction or air cooling**
- **Developers Toolkit and Line Monitor included**



Overview

The FarSync X25 T2U-PMC adapters offer a high quality X.25 PCI Mezzanine adapter solution for business, government and military applications. They have been developed to provide high performance, versatile X.25 connectivity for Linux and Windows systems using industrial quality components providing wide temperature range operation.

The PMC adapters will support 2 X.25 ports at speeds of over 2 Mbits/s. Two versions of the adapter are available - the FarSync X25 T2U-PMC-R supporting rear I/O and the FarSync X25 T2U-PMC-F supporting both rear and front I/O. Both the front and rear I/O connectors can support RS232, X.21, RS530, RS422, RS449 and V.35 network interfaces.

A X.25 Developers Toolkit is provided with the product including a multi port Line Monitor application.

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, CentOS 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 T2U-PMC adapters 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 adapter installs seamlessly as a plug and play device under Windows 10, 8, 7; Windows Server 2019, 2016 and 2012. 32 and 64 bit systems are supported.

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 per line as standard.

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

Typical Applications

The FarSync X25 T2U-PMC 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 all over the world in a variety of applications, including:

- **X.25 networks such as Air traffic control, Lottery, Police, Customs, Military, Fishery, Financial and Government**
- **E-Commerce gateways for credit card verification**
- **Mixed X.25 and IP networks**
- **SMS message gateways**
- **Billing and Mediation**
- **ATM connections**
- **FTAM and X.400 access**
- **PC / Server based X.25 switch with an XOT option**

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

FarSync X25 T2U-PMC - Hardware Details

The FarSync X25 T2U-PMC 2 port adapters run an AMD processor with SRAM and an embedded HDLC controller connected to the Server/PC through a PMC bus.

Network Interfaces

The 2 multi function line drivers support X.21 (V.11), V.35, RS232 (V.24, X.21bis), RS530 (EIA530, RS422), RS449 (RS422), network interfaces, all soft configurable and ESD protected from static charges. Line speeds to over 2.048 MBits/s are supported.

Clock Generation

External (line generated) clocking is supported. The X.25 T2U-PMC also supports adapter generated clocks speeds from 100 baud to over 2.048 Mbits/s, each line can be set to a different speed.

PMC Specification

The FarSync X25 T2U-PMC (PCI Mezzanine card) are suitable for systems with a PMC connector, covering single processor and multi-processor systems. The adapter is 33/66Mhz PCI bus revision 2.2 compliant with support for both 3.3 and 5 volt signaling, the power for the adapter is taken from the 3.3 volt supply rail.

Multiple Adapters

The drivers supplied with Windows and Linux allow large numbers of lines to be supported by the installation of multiple FarSync X25 T2U-PMC adapters in a Server. Typically 12 or more adapters can be supported (24+ lines); the adapter limit is only dependent on the number of PMC connectors and resources available in the host Server and the total bandwidth of the PCI bus.

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 [FarSync X.25 Developers Toolkit Datasheet](#) for full details.

Applications written for other FarSync X.25 adapters will work with the FarSync X25 T2U-PMC as the APIs are the same.

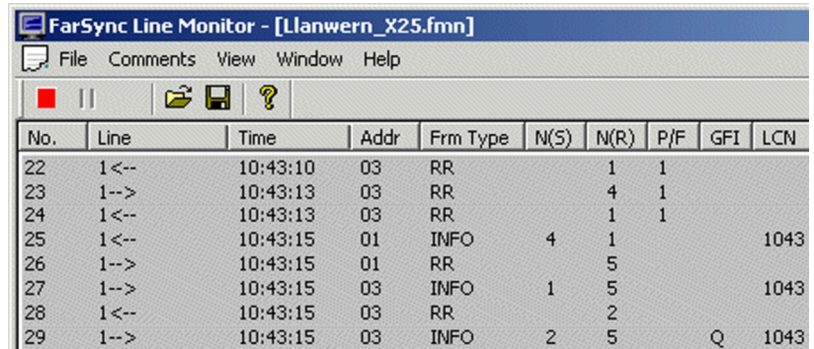
Line Monitor and Network Statistics Utilities

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.

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



The screenshot shows the 'FarSync Line Monitor - [Llanwern_X25.fmn]' application window. It has a menu bar with 'File', 'Comments', 'View', 'Window', and 'Help'. Below the menu bar is a toolbar with icons for a red square, a play button, a folder, a floppy disk, and a question mark. The main area contains a table with the following data:

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

TCP/IP over X.25

The IP over X.25 support is included as part of the FarSync X25 T2U-PMC products 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's 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 T2U-PMC. 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 T2U-PMC 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

Cables can be supplied to connect to the Front I/O connector (FarSync X25 T2U-PMC-F) to support RS232, X.21, RS422, RS530, RS449 and V.35 connections, see the order information for details on the last page.

Cables are not supplied for the Rear I/O only version (FarSync T2U-PMC-R), full connection details on the IEEE 1386 connector for operation with RS232, X.21, RS422, RS530, RS449 and V.35 are supplied.

Packaging

FarSync X25 T2U-PMC adapter. Cables ordered separately.

Software and documentation is downloaded from www.farsite.com using a code supplied with the FarSync adapter it includes:

- Drivers for Linux and Windows
- X.25 Developers Toolkit,
- 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. Linux distributions supplied by Red Hat, SuSE, Debian, Ubuntu, Fedora, Slackware, CentOS and others with kernel version 2.6 and onward.
Linux kernel support	All sub versions of kernel releases from 2.6.12 onward.
32 and 64 bit systems	The FarSync X25 T2U-PMC adapters 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	> 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 numbers(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	4095 on Windows and Linux
Maximum SVCs and PVCs	4095, 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
TPDUs in a NSDU	1
Negotiation between classes	Yes
Transport connections	254 per port, 4,095 per port with the High Capacity Pack
Accessible via API	Yes

Developers Toolkit API Summary

X.25 API - Linux and Windows	<p>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.</p> <p>The Java API, specially developed for Java applications (J2SE, J2EE), is quick and easy to use.</p> <p>Quick and simple to use COM Port API (Windows only) suitable for many applications particularly those based on Visual Basic and similar languages.</p> <p>Legacy NCB based API providing low level access to all the features of X.25.</p>
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

Adapter type and specification	PMC adapter 33/66Mhz PCI Mezzanine Card, AMD Processor embedded communications controller, Intelligent bus-mastering adapter, Conduction cooled or air cooled, Conduction cooling based on ANSI VITA 20-2001 (R2005), Supports 3.3 & 5 volt signalling, Rear I/O and Front and Rear I/O versions, Front I/O connectors 2 MD25M (Micro D).
Network connections supported	2 X.25 ports, soft switchable line termination. Interface types supported on the FarSync T2U-PMC-F using FarSite supplied cables: RS232 (V.24, X.21bis) - DTE DB25M connector, DCE DB25F connector, X.21 (V.11) - DTE DB15M connector, DCE DB15F connector, V.35 - DTE M34M connector, RS530 (EIA530, RS422) - DTE DB25M connector, DCE DB25F connector, RS449 (RS422) - DTE DB37M connector.
Link speed range	RS232: 75 baud to 128 Kbits/s, X21, V35, RS530, RS422, RS449: 75 baud to over 2.048 Mbits/s.
Cables	Supplied for the FarSync X.25 T2U-PMC-F only, see the Order Information on the last page.
ESD Protection	Lines protected by Littelfuse high speed ESD and over-voltage protection.
Line clocking (internal / external)	External and adapter generated line clocking supported. Adapter generated clock range 100 baud to over 2.048 Mbits/s.
Multiple adapters	Yes, typically 12 or more adapters (24+ lines) can be supported; the adapter limit is only dependent on the resources available in the host Server.
Approvals and Compliance	EN55022 class B, CE, FCC class B, Designed to comply with: Vibration standard: 0.1g ² /Hz Random, 5-2000Hz 5 g Sine, Shock standard: 40g, 11 msec sawtooth.
Temperature range	Operating temperature range: -40°C to 85°C (Case/Frame Temperature), Storage temperature range: -55°C to 105°C.
Power requirements	< 850mA @ +3.3v, < 2.8 watts.
MTBF	284,027 hours — calculation based on Bellcore Method 1 Case 3, 40 deg.C ambient, 15 deg.C case temperature rise above ambient.
Warranty	Free 5 year warranty
Compliance	RoHS2, REACH

Ordering Information		
Product Name	Description	Product Code
FarSync X25 T2U-PMC-F	PMC 2 port X.25 bus mastering adapter with Front and Rear I/O (X.21 / V.35 / RS232 / EIA530 / RS422 / RS449), Software supplied with the X.25 Developers Toolkit for Windows and Linux.	FS6280
FarSync X25 T2U-PMC-R	PMC 2 port X.25 bus mastering adapter with Rear I/O (X.21 / V.35 / RS232C / EIA530 / RS422 / RS449). Software supplied with the X.25 Developers Toolkit for Windows and Linux.	FS6281

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 for Windows	XOT (X.25 over TCP/IP) Runtime support on Windows.	FS9511

Compatible Cables		
Product Name	Description of cable types available for the FarSync X25 T2U-PMC-F	Product Code
DCR1	Single RS232 (V.24, X.21bis) and RS530 (EIA530, RS422) DTE cable , same cable for both, DB25M type connector, 1.5 metres.	FS6031
DCX1	Single X.21 (V.11) DTE cable - DB15M type connector, 2.0 metres.	FS6032
DCV1	Single V.35 DTE cable - M34M V.35 connector, 2.0 metres.	FS6033
DC449	Single RS449 DTE cable - DB25M type connector, 2.0 metres.	FS6034
Crossover (Null Modem) DTE to DCE conversation cables		
Null-MX	X.21 (V.11) crossover DTE to DCE conversion cable , DB15F to DB15F connectors, 0.5 metres.	FS6090
Null-MR4	RS530 (EIA530, RS422) and RS232 (V.24) crossover DTE to DCE conversion cable , DB25F to DB25F connectors, 0.5 metres.	FS6097

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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

FarSite
 COMMUNICATIONS