

# FarSync T4U

A 4 port PCI synchronous communications adapter

## Key Features

- Universal PCI bus mastering WAN adapter
- 4 synchronous ports
- 4 asynchronous port option
- Network interfaces for RS232C, X.21, RS530, RS449 and V.35
- Wide speed range - up to 10 Mbits/s
- Transparent bitstream & HDLC framed data
- APIs for Windows and Linux
- Interoperates with TCP/IP
- Comprehensive Developers Toolkit available



## Overview

The FarSync T4U adapter and software is designed to provide high performance hardware communications solutions for business, government and military applications which need a PCI synchronous communications adapter. The product includes a low level driver that allows access to the communications features available in the hardware. The adapter can optionally use the host's standard TCP/IP protocol stack to allow access to IP based networks such as the Internet. The FarSync SDK provides a Developers Toolkit for the product.

The adapter will support a synchronous line at speeds of up to 10Mbits/s continuous. The highly flexible universal network connector supports RS232C, X.21, RS530 (RS422 signaling), RS449 and V.35 network interfaces.

**Features under Windows:** The products include support for the Microsoft standard Windows SDCI API, providing applications with direct access to the adapter's communications port/s for bit synchronous (HDLC) framing and also transparent bitstream operation for video and voice type applications. The FarSync T4U+Async supports soft selectable asynchronous access as well.

The adapter installs seamlessly under Windows XP, Windows Server 2003, Vista and Windows Server 2008 on both 32 and 64 bit, single and multi-core systems. The FarSync drivers are signed by Microsoft for easy installation.

The FarSync T4U can also be installed to appear as a NDIS (LAN) interface so it can simply use the TCP/IP stack to allow access to IP based networks such as the Internet.

**Features under Linux:** The low level API is based on the raw socket interface and supports bit synchronous (HDLC) framed and transparent bit stream data. The adapter can also use the TCP/IP stack to allow access to IP based networks such as the Internet.

The T4U adapter installs seamlessly as a plug and play device under the popular Linux 32 and 64 bit distributions. The adapters supports Linux kernel version 2.6 in 32 and 64 bit formats, including the leading distributions supplied by Redhat, SuSE, Mandriva, Debian, Ubuntu, Fedora, Slackware and more. Multi-processor systems are supported.

FarSite is committed to supporting the FarSync T4U on new versions of Linux and Linux kernels as they are released. The source code for the driver is supplied with the product allowing rebuilding by the end user for use with almost any of the current or future Linux variants.

**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.

## Typical Applications

The FarSync T4U adapter is suitable for a very wide variety of applications, including, for example:

- **High speed multi-port HDLC framing support for non standard or specialist protocols**
- **Interfacing DAB ETI (Ensemble Transport Interface - ETSI EN 300 797) transparent bit streams to Servers**
- **Interfacing MPEG Video bit streams T-DMB ETI to Servers**
- **Interfacing high speed MPEG Video bit streams to Servers**
- **Watchdog systems**
- **Data generators for test systems**
- **Engineering monitoring and control systems**
- **Internet Access and remote office access over leased lines**
- **HDLC framing support for non standard or specialist protocols**

## FarSync T4U - Product Details

The FarSync T4U is supplied with software drivers for Windows and Linux. This includes a low level driver that allows access to the communications features available in the hardware and an optionally installable driver that connects with the standard TCP/IP protocol stack to allow access to IP based networks such as the Internet.

The drivers supplied with Windows and Linux allow large numbers of ports to be supported by the installation of multiple FarSync T4U adapters in a Server. Typically 12 or more adapters (48+ ports) can be supported; the adapter limit is only dependent on the resources available in the host Server and the total bandwidth of the PCI bus.

### Network Interfaces

The multi function line drivers available on all 4 ports support **RS232C (V.24), X.21 (V.11), V.35, EIA530 (RS422) and RS449 network interfaces, all soft configurable** and ESD protected from static charges. The maximum supported line speed is 10 Mbits/s full duplex.

### Clock Generation

The T4U supports **accurate internal clock generation at a wide range of standard frequencies from 9,600 baud to 8.192 Mbits/s** and dual clocks can be generated in V.11 mode if required. The clocking speed of all ports is individually selectable.

### PCI Bus Specification

The FarSync T4U card is suitable for systems with a PCI or PCI-X bus, covering single processor systems, multi-processor systems. The card is PCI revision 2.2 compliant with support for both 3.3 and 5 volt signaling, the power for the card is taken from the 3.3 volt supply rail. The FarSync T4U card may be fitted in either 32-bit PCI bus slots or 64-bit PCI-X bus slots as this Universal PCI card will work perfectly well in both.

## Key Features supported on Linux

The FarSync T4U installs seamlessly under Linux kernel series 2.4 and 2.6 on both single and multi-core 32 and 64 bit systems. All the popular distributions are supported including Red Hat, SuSE, Slackware, Ubuntu, Mandriva, Debian and Fedora.

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 link level protocol can be PPP, Cisco HDLC or Frame Relay with optional authentication by CHAP, MSCHAP or PAP (RFC 1334) providing a standard point-to-point network interface. The driver is supplied with source code.

The Raw Sockets API allows applications developed using the FarSync SDK to access the full feature set of the hardware, these include bit synchronous (HDLC framed) data, and transparent bitstream data in signal mode NRZ.

A configuration utility is provided to set the line speed, interface type and protocol, after which the ports may be configured with standard networking tools.

## Key Features supported on Windows

The FarSync T4U installs easily under Windows Vista, Windows XP, Windows Server 2003 and Windows Server 2008 on single or multi-core 32 and 64 bit systems. A low level SDCI driver is installed with the optional installation of an NDIS (LAN) driver. The NDIS driver supports TCP/IP running over PPP with optional authentication by CHAP or PAP (RFC 1334) providing a standard point-to-point network interface. The drivers are signed by Microsoft for easy installation.

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.

The FarSync T4U enhanced SDCI API allows applications to exactly control the type of data sent and received in bit synchronous (HDLC framed) data and transparent bitstream formats in NRZ signal mode.

## FarSync SDK - The Developers Toolkit

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.

The FarSync SDK is ordered separately from the FarSync T4U.

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.

## Windows SDCI API

The SDCI API allows applications to exactly control the type of data sent and received in both bit synchronous data and transparent bitstream formats. The SDCI API manual in Adobe PDF format provides a comprehensive set of function call definitions and helpful advice on the best way to utilise the interface. The sample applications for HDLC and bitstream operation are written in C.

### Synchronous data

The SDCI API has been extended to allow applications to exactly control the type of data sent and received in both bit synchronous (HDLC framed) data and transparent bitstream formats. The SDCI SDK contains everything a user needs to rapidly develop and test applications for such requirements as supporting specialist synchronous protocols or transparent data requirements such as Audio, MPEG Video T-DMB and DAB ETI. The unique clocking options are selectable and configurable from the API.

### Asynchronous Data - for the FS4441

To operate a port with asynchronous data under Windows, the FarSync driver supports a subset of the standard Win32 COMM API as detailed in Microsoft's MSDN Documentation. This enables applications that currently interface to standard serial ports on Windows to be easily ported to use FarSync ports in asynchronous mode. SDCI clients also have the option of using much of the same code to support FarSync ports in either asynchronous or synchronous modes e.g. the same data transfer IOCTLs.

### Sample Applications

A number of easy to follow sample applications are provided demonstrating the wide variety of features available with the adapter. This includes a kernel mode sample for those customers who require the ultimate performance. GUI based demonstration and test utilities are supplied capable of utilizing the wide range of features supported by the adapter.

## Linux Raw Sockets API

The Linux API allows applications to send and receive HDLC format (bitsync) frames and also transparent bitstreams with the raw sockets based API. The sample application supplied with the Developers Toolkit demonstrates both modes of operation.

Data rates of up to 10 Mbits/s are supported, with all the ports individually selectable for speed, clocking direction and mode of operation (HDLC or Transparent). Frame sizes up to 32 Kbytes are supported in HDLC mode to allow support for a wide variety of specialist synchronous protocols. The transparent bit stream is suitable for transparent data requirements such as Audio, MPEG Video T-DMB and DAB ETI. Asynchronous operation is not available from the Raw Sockets API.

The source for the application and drivers is included, with the Linux API manual provided in Adobe PDF format. The driver is supported under kernel version 2.6 for both single CPU and multi-processor 32 and 64 bit machines. Typically 12 or more adapters (48+ ports) can be supported on a single Server; the adapter limit is only dependent on the PCI slots resources available in the Server, the maximum within Linux is 32.

<b>Order Information</b>		
<b>Name</b>	<b>Description</b>	<b>Product Code</b>
<b>FarSync T4U</b>	4 port synchronous Universal PCI adapter, supplied with drivers and utilities for Windows and Linux	FS4440
<b>FarSync T4U +Async</b>	4 port synchronous and asynchronous Universal PCI adapter, supplied with drivers and utilities for Windows and Linux. Note: asynchronous supported on Windows only at present	FS4441
<b>FarSync SDK</b>	Linux and Windows Developers Toolkit	FS9610
<b>Compatible Cables</b>		
<b>MCX4</b>	Quad X.21 (V.11) DTE cable with male 15 pin D type connectors, 1.5m	FS6041
<b>MCV4</b>	Quad V.35 cable DTE with standard MRAC-34 (brick) male connectors, 1.5m	FS6042
<b>MCR4</b>	Quad RS232C (V.24, X.21bis) DTE cable with male 25 pin D type connectors, 1.5m	FS6043
<b>MTU4</b>	Quad port conversion cable 0.5 metres. <i>This conversion cable allows the single port cables listed below to also be used, useful for mixed connection type requirements</i>	FS6074
<b>UCR1</b>	Single RS232C (V.24, X.21bis) DTE cable with male 25 pin D type connector, 1.5m	FS6061
<b>UCX1</b>	Single X.21 (V.11) DTE cable with male 15 pin D type connector, 1.5m	FS6062
<b>UCV1</b>	Single V.35 DTE cable with standard MRAC-34 (brick) male connector, 1.5m	FS6063
<b>UX35C</b>	Single V.35 DCE cable where the DCE generates clocks, female connector, 1.5m	FS6095
<b>U530</b>	Single RS530 (EIA-530, RS422) DTE cable with male 25 pin D type connector, 1.5m	FS6064
<b>X21-449-INT</b>	X.21 - RS449 DTE - conversion cable when the adapter generates the clock, 0.5m	FS6093
<b>X21-449-EXT</b>	X.21 - RS449 DCE - conversion cable for externally generated clock (DCE Clock), 0.5m	FS6094
<b>Cross Over Cables (DTE to DCE)</b>		
<b>Null-MX</b>	X.21 (V.11) double shielded crossover cable, 15 pin D type female connectors, 0.5m. Converts the DTE presentation into a DCE.	FS6090
<b>Null-MR3</b>	RS232C (V.24) double shielded crossover cable, 25 pin D type female connectors, 0.5m. Converts the DTE presentation into a DCE.	FS6092
<b>Null-MR4</b>	RS530 (EIA530, RS422) double shielded crossover cable, 25 pin D type female connectors, 0.5m. Converts the DTE presentation into a DCE.	FS6097

<b>Technical Specification - Software</b>	
<b>Linux</b>	
Distribution Support	Distributions by Red Hat, SuSE, Slackware, Mandriva, Ubuntu, Debian, Fedora and more. Drivers for kernel series 2.4 and 2.6 on both single and multi-core 32 and 64 bit systems
Protocols Supported	TCP/IP, PPP, Cisco HDLC, Frame Relay, CHAP, MSCHAP, PAP (RFCs 1661, 1332, 1334)
API and Interfaces	Raw Sockets API
<b>Windows</b>	
O/S types	All 32 and 64bit versions off Windows XP, Windows Vista, Windows Server 2003, Windows Server 2008
Protocols Supported	TCP/IP, PPP, CHAP, PAP (RFCs 1661, 1332, 1334)
API and Interfaces	Extended SDCI API, NDIS (LAN) where the line appears as a LAN interface
Utilities	Line monitor is included to record, display and store line traffic
<b>FarSync SDK - Developers Toolkit</b>	
API reference manuals	Windows SDCI user manual, Linux Raw Sockets user manual
Sample programs	Sample applications that use the SDCI and Raw Sockets APIs. Adapter performance and function test applications
Source code	Sample C applications and Linux drivers source code supplied
Customer Support	We provide free email and telephone assistance to the application developer using the API as part of the package provided when the FarSync SDK is purchased.

## Technical Specifications—Hardware Features

<b>Adapter type and PCI specification</b>	AMD processor with SRAM and quad port synchronous controller, Universal PCI (PCI-X compatible, PCI v2.2 compliant), bus mastering, DMA enabled, Supports 3.3 & 5 volt PCI signaling,
<b>Physical characteristics</b>	Short adapter: height 107mm, length 167mm
<b>Network connections</b>	4 synchronous ports (FS4440) 4 synchronous or asynchronous ports (FS4441) X.21 (V.11) - 15 pin D type, RS232C (V.24, X.21bis) - 25 pin D type, V.35 - MRAC-34 'brick' type, RS530 (RS422) - 25 pin D type, RS449 (RS422) - 37 pin D type, DTE and DCE cables available
<b>Link speed range Sync</b>	RS232C: up to 128 Kbits/s X21, V35, RS530 (RS422), RS449: up to 10 Mbits/s
<b>Line signal mode</b>	NRZ
<b>ESD line protection</b>	Yes, Littelfuse high speed ESD and over-voltage protection
<b>Max total bandwidth</b>	64 Mbits/s
<b>Indicators</b>	4 LEDs indicating line status
<b>Approvals</b>	EN55022 class B, CE, FCC class B
<b>Power requirements</b>	< 1.75 A @ +3.3v, < 10mA @ +/- 12v, < 6 watts
<b>MTBF</b>	238,319 hours - Bellcore Method 1 Case 3, 40 deg.C ambient, 15 deg.C case temperature rise above ambient
<b>Line clocking (internal / external)</b>	External and adapter generated line clocking is supported. The clock speed is independently selectable on each port. Adapter generated clock range 9,600 baud to 8,192 Mbits/s.  No special cables are required to use adapter generated clocks on RS232C, X.21 and RS530 (RS422).  Internal clocking is supported on V.35 and RS449 with the use of cables designed for adapter generated clocks
<b>Cables</b>	Cables are ordered separately, see the Order Information section on the page 4
<b>Warranty</b>	5 years
<b>RoHS compliant</b>	Yes

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