

FarSync TE1R

A Universal PCI adapter for E1 and T1 (G.703 / G.704) connections
for Linux and Windows

Key Features

- **Cost effective solution E1 and T1 unstructured and fractional (G.703, G.704)**
- **Universal PCI Bus mastering DMA Intelligent adapter**
- **APIs for Windows and Linux and interoperation with TCP/IP**
- **Comprehensive Developers Toolkit available including a general purpose bitstream decoding library**



Overview

The intelligent FarSync TE1R adapter brings cost effective comprehensive E1 and T1 support to Linux and Windows to allow your application full access to the E1 and T1 features available on the board. Full bandwidth on unstructured T1 and E1 G.703 lines, T1 and E1 fractional (G.703/G.704), HDLC framed and transparent operation are all supported with easy software configuration. 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 the Developers Toolkit for the product and includes a general purpose bitstream encoding and decoding library that reduces application development timescales.

The product is supplied with a 5 year warranty.

If BNC connectors are required for E1 operation then the [FarSync TE1 adapter should be used, see the datasheet](#)

Features under Windows: The product includes support for the Microsoft standard Windows SDCI API, providing applications with direct access to the adapter's communications port/s for bit sync (HDLC) framing and also transparent bitstream operation for video and voice type applications.

The adapter installs seamlessly under Windows XP, Windows Server 2003, Vista, Windows 7 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 low level API is based on an extended SDCI interface and supports bit sync (HDLC) framed and transparent bitstream data.

The FarSync TE1R can also be installed to appear as a NDIS (LAN) interface so it can simply use the TCP/IP stack over PPP 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 sync (HDLC) framed and transparent bitstream data. The TE1R adapter can also use the TCP/IP stack to allow access to IP based networks such as the Internet.

The TE1R adapter installs seamlessly as a plug and play device under the popular Linux 32 and 64 bit distributions. The cards supports Linux kernel version 2.4 and 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 TE1R 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 TE1R adapter is suitable for a very wide variety of applications, including for example:

- **HDLC framing support for non standard or specialist protocols**
- **Integration with embedded Linux and Windows based products**
- **E1 Internet access**
- **E1 Frame Relay Access**
- **Remote office access over leased lines**
- **Server based network hub (Routers and Firewalls)**
- **Satellite Multicasting**
- **Video Teleconferencing**

FarSync TE1R Product Details

The FarSync TE1R 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.

Adapter Hardware

The 1 port adapter runs an AMD processor with SRAM. The adapter has an embedded HDLC / transparent controller with SDMA access (128 buffers) and a wide range of timers. The whole memory space may be mapped via the PCI interface to the PC/Server.

Network Interfaces

The TE1R supports E1 unstructured (G.703) and Transparent operation at 2.048 Mbits/s, E1 fractional (G.703/G.704) at speeds from 64 Kbits/s to 1.984 Mbits/s, T1 unstructured (G.703) and Transparent operation at 1.544 Mbits/s, T1 fractional (G.703/G.704) at speeds from 64 Kbits/s to 1.536 Mbits/s. **E1 Modes:** HDLC-framed or transparent data over G.703 unframed/unstructured or G.703/G.704 framed/structured Doubleframe and CRC4 multiframe modes.

T1 Modes: HDLC-framed or transparent data over G.703 unframed/unstructured or G.703/G.704 framed/structured F4 (FT), F12 (D3/D4, SF), F24 (D5, Fe, ESF) and F72 (SLC96) modes.

PCI Bus Specification

The FarSync TE1R adapter is suitable for systems with a PCI or PCI-X bus, covering single and multiprocessor systems. The adapter is PCI 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. The FarSync TE1R adapter may be fitted in either 32-bit PCI bus slots or 64-bit PCI-X bus slots as this Universal PCI adapter will work perfectly well in both.

Key Features supported on Linux

The FarSync TE1R 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 sync (HDLC framed) data, and transparent bitstream data.

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 TE1R installs easily under Windows Vista, Windows XP, Windows 7, 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 TE1R enhanced SDCI API allows applications developed using the FarSync SDK to exactly control the type of data sent and received in bit sync (HDLC framed) data and transparent bitstream formats.

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 with a bitstream encoder and decoder library.

The FarSync SDK is ordered separately from the FarSync TE1R.

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. **See the [FarSync SDK datasheet](#) for full details.**

Product Packaging

The FarSync TE1R product includes:

- The TE1R communications adapter,
- Documentation supplied on CD-ROM,
- A quick start guide,
- RJ48C (RJ45) 2 metre cable
- Windows and Linux driver software (source code is provided for Linux driver)

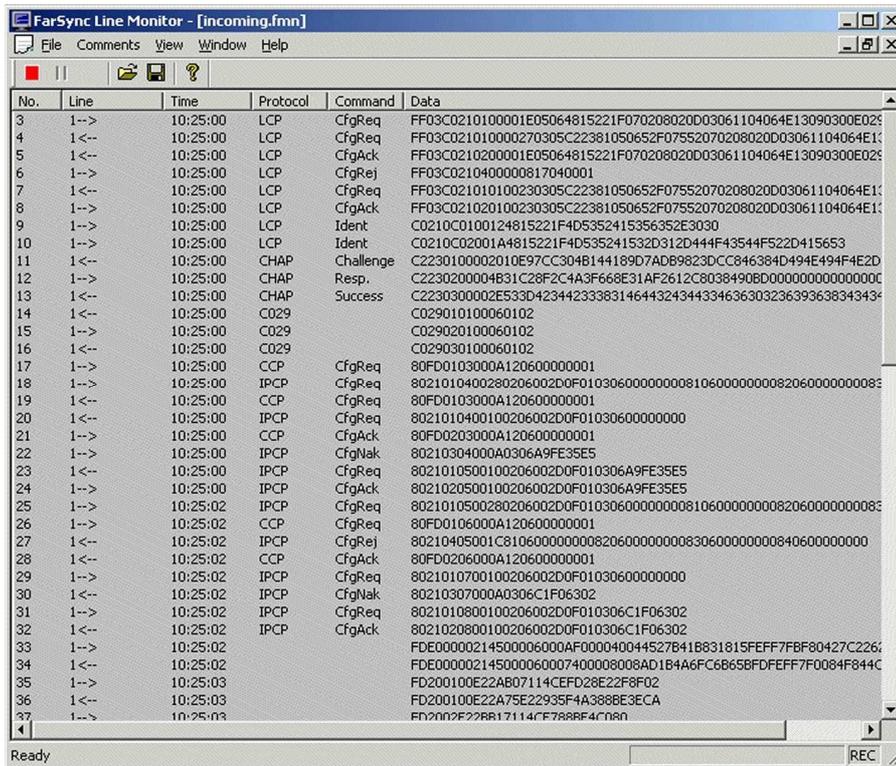
New versions of the software are made available from the support section on www.farsite.com as they are released.

Linux Line Monitoring

The Farmon utility allows all data sent and received on the line to be recorded.

Windows Line Monitor

The product is supplied with a high performance multi-channel line monitor that allows the user to record, display, store and replay line traffic with protocol decoding (sample screen below). Comments can even be inserted into the line trace to assist later analysis.



Software Technical Specifications

Linux

| | |
|-----------------------------|---|
| 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 |
| Kernel support | All sub versions of kernel releases from 2.4.2 and 2.6.1 |
| Protocols supported | TCP/IP, PPP, Cisco HDLC, Frame Relay, CHAP, MSCHAP, PAP (RFCs 1661, 1332, 1334), Raw Bitstream |
| API and interfaces | Raw Sockets API |

Windows

| | |
|----------------------------|--|
| O/S types | Windows XP, Windows Vista, Windows 7, Windows Server 2003, Windows Server 2008 32 and 64 bit (single and multi-core systems) |
| Protocols supported | TCP/IP, PPP, CHAP, PAP (RFCs 1661, 1332, 1334), Raw bitstream |
| API and interfaces | Extended SDCI API, NDIS (LAN) where the line appears as a LAN interface |
| Utilities | Multi-channel line Monitoring Utility, with protocol decode |

MikroTik

| | |
|---------------|---|
| Router | E1 interface supported on RouterOS Version 3.15 and later |
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Technical Specifications — Hardware Features

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|---|--|
| Adapter type | AMD processor with SRAM and FALC56 E1/T1 comms controller, Universal PCI (PCI-X compatible, PCI v2.2 compliant), bus mastering, DMA enabled, Supports 3.3 & 5 volt PCI signaling, Suitable for 32 and 64 bit PCI bus slots |
| Physical size | Short adapter (height 107mm, length 167mm) |
| Network connectors | E1: 120-ohm RJ48C (often referred to as RJ45) T1: 100-ohm RJ48C (RJ45) |
| Link speed range | E1: unstructured (G.703) : 2.048 Mbits/s, fractional (G.704): 64 Kbits/s to 1.984 Mbits/s, T1: unstructured (G.703): 1.544 Mbits/s, fractional (G.704): 64 Kbits/s to 1.536 Mbits/s |
| T1 frame structure and modes | T1 - HDLC-framed or transparent data over G.703 unframed/unstructured or G.703/G.704 framed/structured F4 (FT), F12 (D3/D4, SF), F24 (D5, Fe, ESF) and F72 (SLC96) modes |
| E1 frame structure and modes | E1 - HDLC-framed or transparent data over G.703 unframed/unstructured or G.703/G.704 framed/ structured doubleframe and CRC4 multiframe modes |
| G.706 features | CRC4 to non-CRC4 interworking according to ITU-T G.706 Annex B (E1) Error checking via CRC4 procedures according to ITU-T G.706 (E1) Error checking via CRC6 procedures according to ITU-T G.706 and JT G.706(T1) |
| ESD Protection | Sidactor and telelink fuse, designed for zero maintenance. The FarSync TE1R uses solid state fuses unlike many E1 interface cards, no parts need to be replaced after a survivable lightening strike |
| Back panel Indicators | LEDs for Port open, Loss of Signal (LOS), Receive Remote Alarm (RRA), Alarm Indication Signal (AIS) |
| Approvals | EN55022 class B, CE, FCC class B, TBR12 and TBR13 |
| Loss of Signal indication | According to ITU-T G.775, ETS300233, user programmable between 50mV and 800mV |
| Jitter Specifications Compliance | ITU-T I.431, G.703, G.736, G.823 |
| Intrinsic Jitter | < 0.02 UI (using internal clock) |
| Jitter Tolerance | 10 UI @ 1KHz 0.5 UI @ 40KHz – 100KHz |
| Power requirements | < 1.4 Amp @ +3.3v, < 5 watts |
| Cables | 2 metre RJ48 cable included |
| MTBF | 273,220 Hours - Bellcore Method 1 Case 3, 40 deg.C ambient, 15 deg.C case rise above ambient |
| RoHS | Compliant |
| Warranty | 5 years |

Order Information

| Description | Product Code |
|---|--------------|
| Intelligent 1 port E1 / T1 adapter, Universal PCI with RJ48C (RJ45) connectors, with an API for customer applications and support for TCP/IP operation. Includes a 2 metre cable with RJ48C Connectors. Drivers for Linux and Windows XP, Windows 7, Server 2003, Server 2008 and Vista. To develop applications that will use the API the FarSync SDK should be ordered | FS4151 |
| Linux and Windows Developers Toolkit for the FarSync TE1R and other FarSync cards, this is required if you want to write software to use the adapter's API | FS9610 |

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