

LCP-1500

PCI Development Board for the pnx1500 TriMedia / Nexperia processor

The LCP-1500 is a PCI based hardware platform for the development of pnx1500 algorithms where the PC is used as the I/O subsystem during development.

The LCP-1500 supports video capture in a variety of formats, making it ideal as a front end compressor for PC based PVR and security applications. Its built-in Ethernet offers flexibility for streaming media applications where processing needs to be off-loaded from the host CPU.

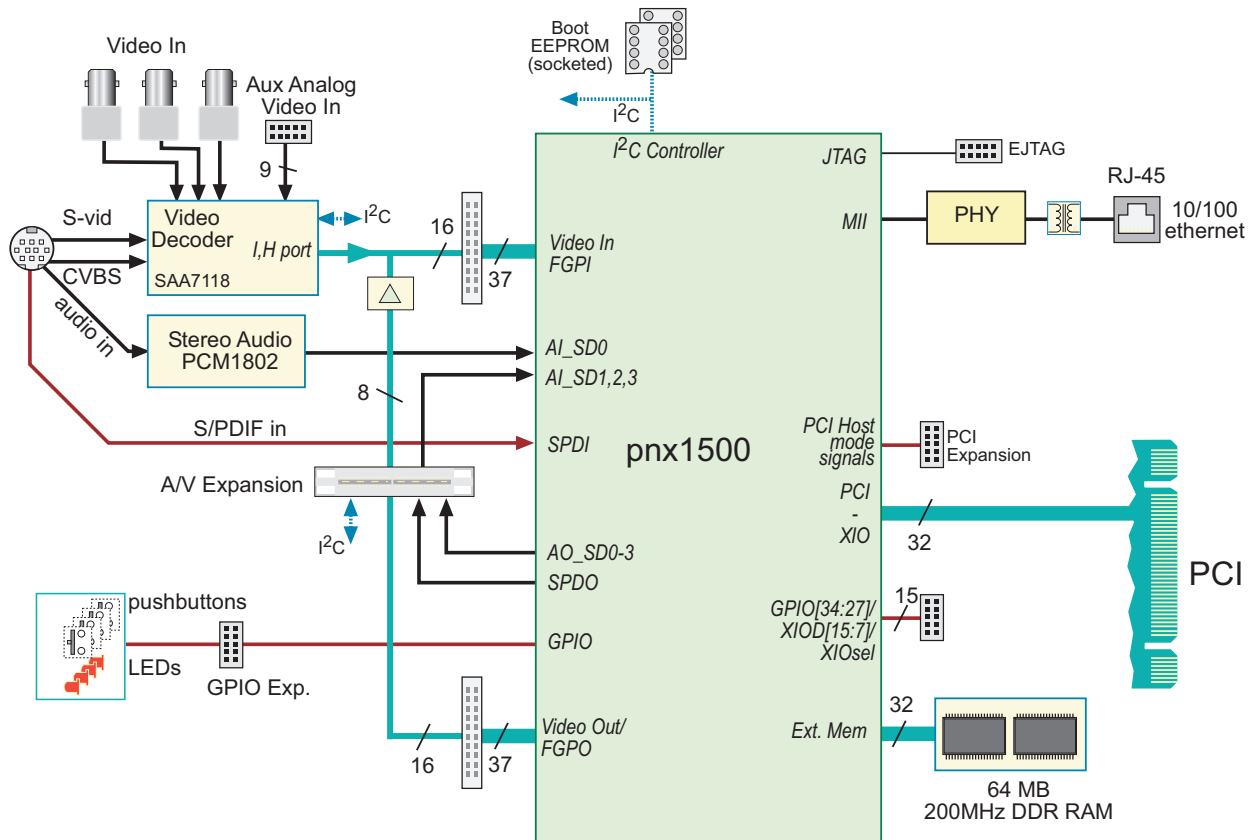
The 266 MHz Philips Nexperia™ pnx1500 (formerly called the TriMedia) is programmed in C/C++ and supported by library functions including audio and video codecs. The dual que built in Ethernet makes the pnx1500 ideal for high performance multi-media network applications that need QoS for real-time operation. To support that, FUSION® and TargetTCP® TCP/IP protocol suites are available for use with the pnx1500.

The card is also available with the Philips IADK/NDK tools for compilation and debugging.

To help you get started, MDS offers Nexperia training classes to minimize the learning curve and engineering services help you get your application into production quickly.

Hardware Features

- CVBS, S-video, and component video input with ability to expand to 8 CVBS inputs
- 2 channel analog audio in
- S/P DIF input digital audio
- Ethernet with optional FUSION® or TargetTCP® Protocol Suite allows development of embedded applications directly from your PC
- 64MB of 200 MHz DDR memory (DDR400)
- Controlled impedance expansion connector for daughter card with custom A/V input or output, compatible with cards developed for MDS IREF (pnx1300) boards.
- FGPI/FGPO for daisy chaining boards for multi-processor development.



LCP-1500 : pnx1500 PCI card for development of codecs, PVR, and video streaming applications

For applications needing video or analog audio output a daughter card can be added. DVI and VGA output daughter cards are also available.

The LCP-1500 can be used in a standard passive backplane (PICMG) system by adding the MDS "arbiter" card. This card contains NOR, NAND, and M-System Disk-On-Chip flash devices, as well as an IDE interface. This allows the development of standalone system software, as well as the use of off the shelf PCI cards for peripheral functions like USB, 1394, etc.

Information on the above products can be found on the MDS website.

Preproduction silicon

Please note that preproduction silicon may not have all features operational and/or supported in software, and that memory speed may be limited by the silicon. We suggest reviewing the chip's errata sheet to ensure such issues will not affect your development.

GENERAL SPECIFICATIONS:

Processor: 266MHz Philips Nexperia PNX1500™, 64 MB DDR RAM at 200MHz clock (400 MHz data rate)

Video In: Philips SAA7118 PAL/NTSC/SECAM

- Four analog video inputs per ADC, four ADCs
- Features are programmable via I²C bus interface

Audio In: TI PCM1802

- 2 channels, 3V p-p line level input, < -90 dB THD+N, > 100 dB SNR
 - 24 bit I²S format
- sample rate controlled by pnx1500
 - supports 16 kHz to 96 kHz sample rates

Clocking

- Video input recovered pixel clock with SAV/EAV codes
- All other clocks generated by pnx1500

Ethernet: pnx1500 with external PHY

- Full duplex support at both 10 and 100 Mbps
- RJ-45 jack with status LEDs on backplate

General Purpose I/O

- XIO, .1" pitch IDC style expansion header
 - 8 quasi-bidirectional lines (XIO_Data operated as GPIO)
 - also includes five XIO selects, XIO_AD, XIO_ack
- GPIO Expansion, .1" pitch IDC style expansion header
 - 6 GPIO lines shared with user switches/LEDs

Serial Boot EEPROM:

- two 8 pin serial EEPROM
- jumper selection simplifies 'factory' vs. 'normal' operational scenarios

JTAG

- JTAG connector for use with MDS Nexperia/TriMedia JTAG emulator or other Nexperia/TriMedia compatible JTAG emulators
- 14 pin EJTAG pinout

A/V in

- 10 pin mini-DIN with stereo audio, SPDIF in, CVBS and S-video (kit includes breakout cable)
- Three BNC jacks for component input (RGB) or can be used for CVBS
- Internal .1" pitch IDC style expansion header for 9 more lines

TOSlink in

- Mounting holes and pads for user installation of optical digital audio receiver, Sharp model number GHFJ300R

PCI interface

- Universal 3.3/5V signaling card, PCI 2.2 compliant
- Header strip for access to pnx1500 PCI host mode signals

FGPI/FGPO

- Two 80 pin fine pitch connectors
- Access to all FGPI/FGPO signals
- Supports daisy chain of FGPO to FGPI with straight through cable

A/V Expansion

- 76 pin controlled impedance board-board style connector
- 8 bit video in, 16 bit video out, audio I/O

Power

- Uses PCI 3.3V, +5V, +/- 12V. Requires ATX compliant supply with 3.3V regulated to +/- 4%
- On board supplies for all other voltages

Dimensions:

- Full height, Half length PCI card
- Note: With installation of TMVDC-AVOUT daughter card the assembly may intrude on adjacent slot due to the connectors on the daughter card.

Please see product manual for complete details of connectors



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<http://www.mds.com>

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Media Processor Tool Kit (MPTK)

Nexperia™ Development systems from MDS include the core Philips MPTK components. Optional high level libraries complement the basic functions and provide a total set of software to reduce development time and cost.

Please note that while the Philips MPTK is similar in concept to the Philips pnx1300 NDK/IADK tools, it is a completely different software package and no upgrade from the pnx1300 NDK/IADK to MPTK is available.

NDK Core Components

Tool Chain:

- C/C++ compiler
- linker with dynamic loader/overlay support to minimize memory footprint
- cycle accurate machine simulator
- code profiler
- debugger for use with NEXPERIA/TriMedia compatible JTAG emulator (JTAG not needed for LCP-1500)

RTOS:

- pSOS+m™ version 2.5 Real Time OS includes single and multi-processor support

MPTK Core Libraries:

- TriMedia Streaming Software Architecture (TSSA) library components
- audio I/O, video I/O, synchronous serial, interface (SSI), image co-processor, I2C, board support, variable-length decoder, 2D graphics

Optional MPTK Libraries

The libraries are developed by Philips Semiconductor, please consult the MDS website for further details and availability:

- Dolby Digital Decode (AC3 decode)
- Basic A/V decode (MPEG2, BMP, GIF, JPEG, MP3)
- Basic A/V encode (MPEG2, MP3)
- MPEG4 A/V Decode
- DTS decoder
- JPEG2000 decoder
- UPnP (Allegro)
- MP3Pro decoder

MDS LCP-1500 CD

The -KIT version of the board includes the MDS CD of example programs and documentation. The source to the full board support library (BSL) is also provided, which can serve as an excellent starting point for developing custom BSPs.

Included is the "Getting Started" guide which provides extremely useful information to get up and running quickly.

While the pnx1500 has built in Ethernet, there is no default Ethernet stack included in the Philips toolset. Two popular commercial TCP/IP stacks can be purchased: the Blunk Microsystems TargetTCP® or Unicoi's FUSION®.

FUSION Protocol Suite

The following protocols are available:

Core Protocols

- TCP/IP (includes TCP, UDP, IP, ARP, RARP, ICMP and TFTP)
- DHCP client and server
- PPP client and server
- BOOTP client
- PPP over Ethernet (PPPoE)
- RTP/RCP
- T/TCP (Transaction TCP)

Application Protocols

- FTP client and server
- Telnet server
- DNS Server and Resolver
- SNTP client and server

Routing Protocols

- IGMP v2
- RIP/RIP-2
- OSPF v2
- NAT

Network Management

- SNMP v1/v2 with MIB Code Generator
- SNMP v3 with MIB Code Generator

Web Services

- Embedded Micro-Browser
- Web Server
- SMTP
- POP3

XML Toolkit

- XML MicroParser
- XML Schema Compiler
- SOAP

Blunk Protocol Suite

The following protocols are available:

Core Protocols

- TCP/IP (includes TCP, UDP, IP, ARP, RARP, ICMP, TFTP, AutoIP)
- DHCP client
- PPP (with CHAP, CHAT, and PAP)

Application Protocols

- FTP client and server
- Telnet server
- DNS Resolver
- RARP server

Routing Protocols

- IGMPv2

Network Management

- SNMP v1/v2 with MIB Code Generator



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Ordering Information (order code is in *Italics*)

LCP-1500-DK-FULL Full Development Kit includes:

- PCI-1500 board with 266MHz pnx1500™, 64MB 200MHz DDR RAM
- Philips MPTK Core Components (NDK). Includes compiler tools, debugger, and basic TSSA software library components
- Documentation on CDROM.
- MDS board manual and examples on CD.
- Audio/video 10 pin mini-DIN breakout cable
- BNC to RCA adapters, S video cable, RCA plug to RCA plug cable
- 1/8" mini stereo plug to 1/8" mini stereo plug cable
- FGPI/FGPO cable
- Standard 90 Day Getting Started Support

LCP-1500-KIT Development board

- PCI-1500 board with 266MHz pnx1500™, 64MB 200MHz DDR RAM
- Audio/video 10 pin mini-DIN breakout cable
- BNC to RCA adapters
- S video cable, RCA plug to RCA plug cable
- 1/8" mini stereo plug to 1/8" mini stereo plug cable
- FGPI/FGPO cable
- MDS board manual and examples on CD
- Standard 90 Day Getting Started Support

LCP-1500-BO Board without accessories, software, support

- PCI-1500 board with 266MHz pnx1500™, 64MB 200MHz DDR RAM

TMVDC-AVOUT-BO A/V Out Daughter Card

- CVBS and S video out
- 2 channel audio out
- RCA (S/P DIF) and Optical (TOSlink) digital audio out
- Mounts with included standoffs directly to LCP-1500 board
- 8 bit 656 style video input
- SAA7105 Video encoder

TMVDC-AVOUT-KIT Daughter Card

- TMVDC-AVOUT card (see above)
- S video cable, RCA plug to RCA plug cable
- 1/8" mini stereo plug to 1/8" mini stereo plug cable
- MDS board manual and examples on CD
- Standard 90 Day Getting Started Support

IADK/MPTK optional libraries

- Please see the MDS web site

NEXP-TRN

- 4 day intensive training on NEXPERIA/TriMedia pnx150x Processor

LCP-1500-STD-TRI 90 Day Getting Started Support (inc. with LCP-1500-DK-FULL, LCP-1500-KIT, and TMVDC-AVOUT-KIT)

- Help with installation of hardware/software.
- Problems in installation.
- How to use/run hardware or software that comes with the PCI-1500. This excludes example programs because they are provided as-is, without support.
- General questions on background information (MPEG, industry standards like CCIR 601 or CCIR 656, video formats, HDTV)

Please see the MDS website for a copy of the Support data sheet, which has full details.

Please note there is a public support forum for Nexperia/TriMedia via Yahoo eGroups.

Related items

FUSION TCP/IP Protocol Suite

- Evaluation version included on MDS CD
- Please contact MDS for ordering information to convert evaluation license to a product license.
- Each component is sold separately as source code. Some components require others to be used. Customer must execute Unicoi Software License Agreement prior to ordering.
- All source licenses normally include a bundled 90 day support contract, a 1 year support contract. also available on request.

TargetTCP Protocol Suite

- Evaluation version included on MPTK CD
- Please contact Blunk Microsystems directly to convert evaluation license to a product license.

Please visit <http://www.mds.com> for more information on these and other software products to speed your design to market.

S004-W-SFX QEDesign2000™ Advanced DSP Filter Design Software for Windows

Custom software and hardware engineering services are available.

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FUSION is a trademark of Unicoi Inc.

TargetTCP is a trademark of Blunk Microsystems Inc.

QEDesign2000 is a trademark of Momentum Data Systems Inc.



LCP-1500 data sheet - subject to change, rev 2b 23-Mar-04

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