

## TMPCI-1005

PCI development board for the  
pnx1005  
TriMedia / Nexperia processor

The TMPCI-1005 is a PCI based hardware platform for the development of PNX1005 (including PNX9530) applications and algorithms where the PC is used as the development platform and as the TriMedia processor's I/O subsystem during development.

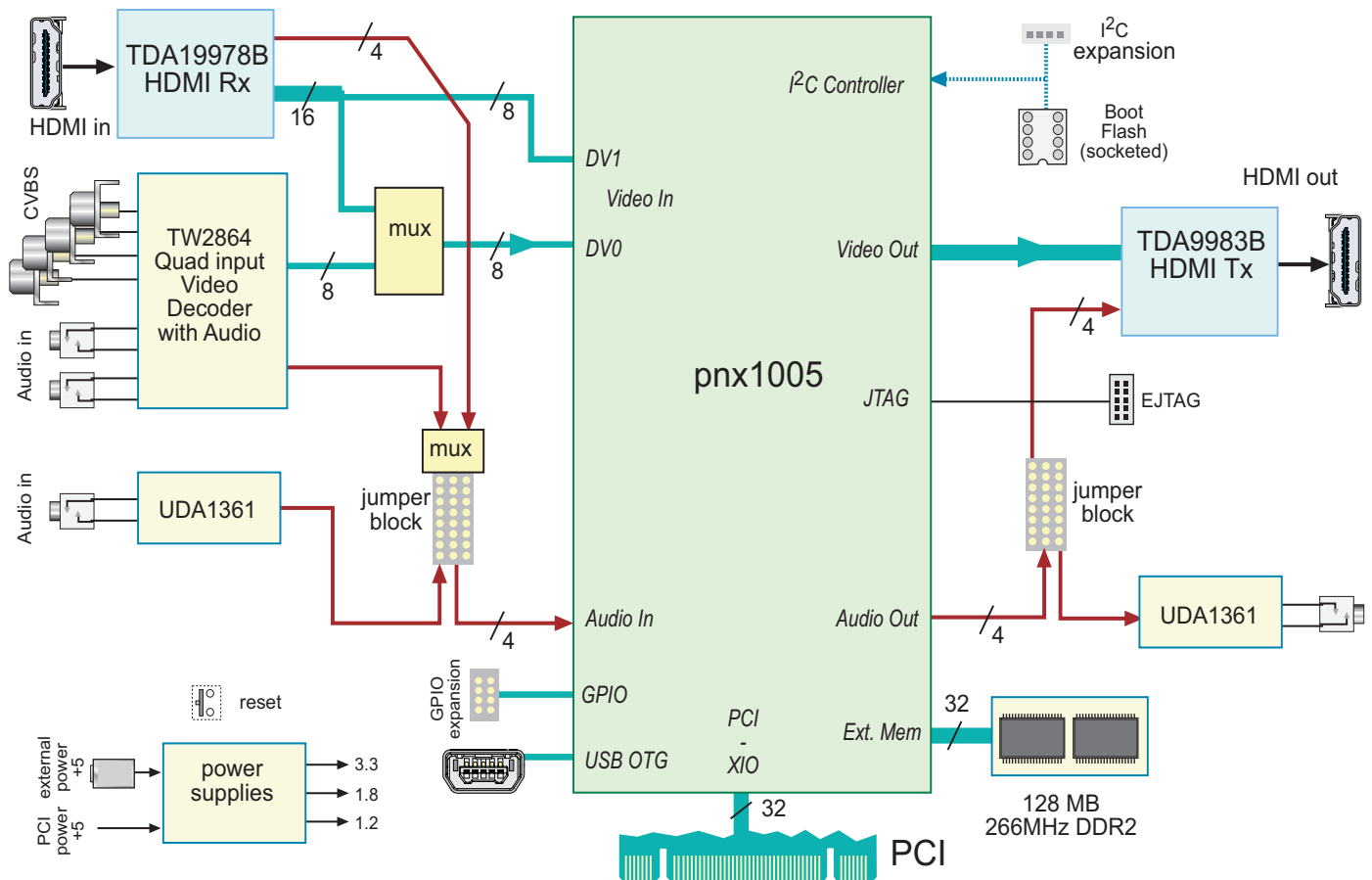
The TMPCI supports video I/O in a variety of formats, making it ideal as a development platform for video encoding, decoding, and processing applications.

The card is available with the NXP NDK tools for compilation and debugging. The NDK includes NXP's SurTK (Surveillance Tool Kit) which adds a h264 encoder and decoder and more example programs for building security related applications. For other codec applications the MPTK decoder libraries are available separately.

Host drivers for Windows and Linux are included in the NDK.

### Hardware Features

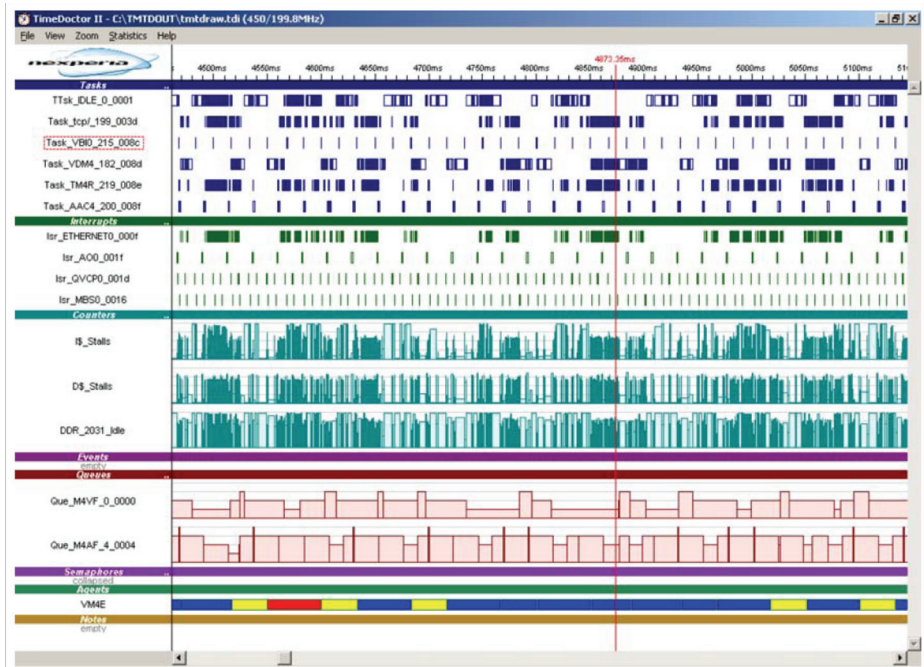
- 4 CVBS (NTSC/PAL) video inputs with companion audio channels
- HDMI input up to 1080p (12 bit YUV, 8 bit RGB, up to 8 channel PCM audio). (note: can not be used with HDCP sources)
- HDMI output up to 1080p (12 bit YUV, 8 bit RGB, up to 8 channel PCM or compressed audio).
- stereo analog audio in/out (audio sources/sink set via jumper blocks)
- 128MB of 333 MHz DDR2 memory (note that the pnx1005 is currently qualified for 267 MHz memory operation)
- USB HS OTG port
- external power input allows operation via JTAG outside of a PCI system



# TMPCI-1005: pnx1005 PCI card for development of surveillance, video, and media applications

Please note that support for all of the possible video/LCD inputs or output modes and formats is not available in all applications; some driver modification may be needed to handle specific software and system requirements.

This board is functionally equivalent to the original NXP PCI pnx1005 board except that the single input NXP SAA7115 is replaced with the quad input Techwell TW2864.



**TimeDoctor - part of the NDK tools**

## GENERAL SPECIFICATIONS:

Processor: 400MHz PNX1005, 128 MB DDR2 333 MHz DRAM operating at 266 MHz clock (533 MHz data rate)

Analog Video + audio: Techwell TW2864

- composite NTSC/PAL input (CVBS)
- Single 8 bit multiplexed output (at up to 108 MHz) connects directly to pnx1005 video input port
- Also provides 4 audio inputs multiplexed on to one I2S data line
  - I2S lines shared with HDMI and UDA1361 and selected by a jumper block

HDMI A/V input NXP TDA19978B

- Typically used for video with HDMI 1.2 characteristics (12 bit YUV or 8 bit RGB up to 1080p resolution)
  - The TDA19978B can receive deep color, but the datapath to the pnx1005 is 8 bit Y & 8 bit UV.
- Data passed to the pnx1005 in YUV 4:2:2 format
- PCM audio, up to 8 channels. Compressed audio requires software decoders.
- HDCP sources are not supported due to HDCP license restrictions.
  - customer can replace with TDA19978A for applications with HDCP

Analog Audio input: NXP UDA1361

- stereo ADC
- sample rate controlled by pnx1005
  - supports 8 kHz to 96 kHz sample rates

General Purpose I/O

- GPIO Expansion, .1" pitch IDC style expansion header
  - 8 GPIO lines (0-7: also used by boot settings)

Serial Boot EEPROM:

- 8 pin serial EEPROM, socketed

## JTAG

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

HDMI A/V output NXP TDA9983B

- Typically used for video with HDMI 1.2 characteristics (12 bit YUV or 8 bit RGB up to 1080p resolution)
- Connects to I2S output of pnx1005, normally used for up to 8 channels of PCM audio

Analog Audio output: NXP UDA1334

- stereo DAC
- sample rate controlled by pnx1005
  - supports 8 kHz to 96 kHz sample rates

I2S jumper blocks

- Used to select sources and destinations for pnx1005 audio in and audio out for AI1 and AO1 ports

PCI interface

- Universal 3.3/5V signaling card, PCI 2.2 compliant
- Only uses +5V power from PCI connector
- 66 MHz PCI operation supported

Dimensions:

- Full height, Half length PCI card

Please see product manual for complete details of connectors.

Please note that hardware support of a particular mode does not mean examples and drivers support that mode. Supplied examples generally support PAL and NTSC standard definition modes, and HD signals at 480p and 720p rates. VGA (RGB) video typically includes 640x480, 800x600, and 1024 x 768.

# TMPCI-1005: pnx1005 PCI card for development of surveillance, video, and media applications

## NDK and Media Processor Tool Kit (MPTK)

### NDK Core Components

#### Tool Chain: TCS

- C/C++ compiler
- linker with dynamic loader/overlay support to minimize memory footprint
- cycle accurate CPU/cache simulator
- code profiler
- System level task/event monitoring with TimeDoctor
- debugger for use with Nexperia/TriMedia compatible JTAG emulator (JTAG not needed for TMPCI-1005)
- Eclipse (preconfigured for TCS tool chain)
- Runs under Windows or Linux

#### RTOS:

- pSOS™ version 2.5 Real Time OS - royalty free

#### MPTK Core Libraries:

- TriMedia Streaming Software Architecture (TSSA) library components
- audio I/O, video I/O, internal video peripherals (MBS, VIP, QVCP), I2C, board support, 2D graphics primitives

### Surveillance Tool Kit (SurTK)

This is included with the NDK and provides a h264 video encoder and decoder library, along with example applications.

### Optional MPTK Library package

The libraries are developed by NXP Semiconductors, some require a license from the IP/patent holder before delivery. Except for Ogg Vorbis, others may require run time licenses.

- Dolby Digital Decode (AC3 decode)
- Basic A/V decode (MPEG2, JPEG, MP3)
- Audio encode (MP3)
- MPEG4 Decode
- DivX Decode
- WMV and WMA decode
- Ogg Vorbis codec

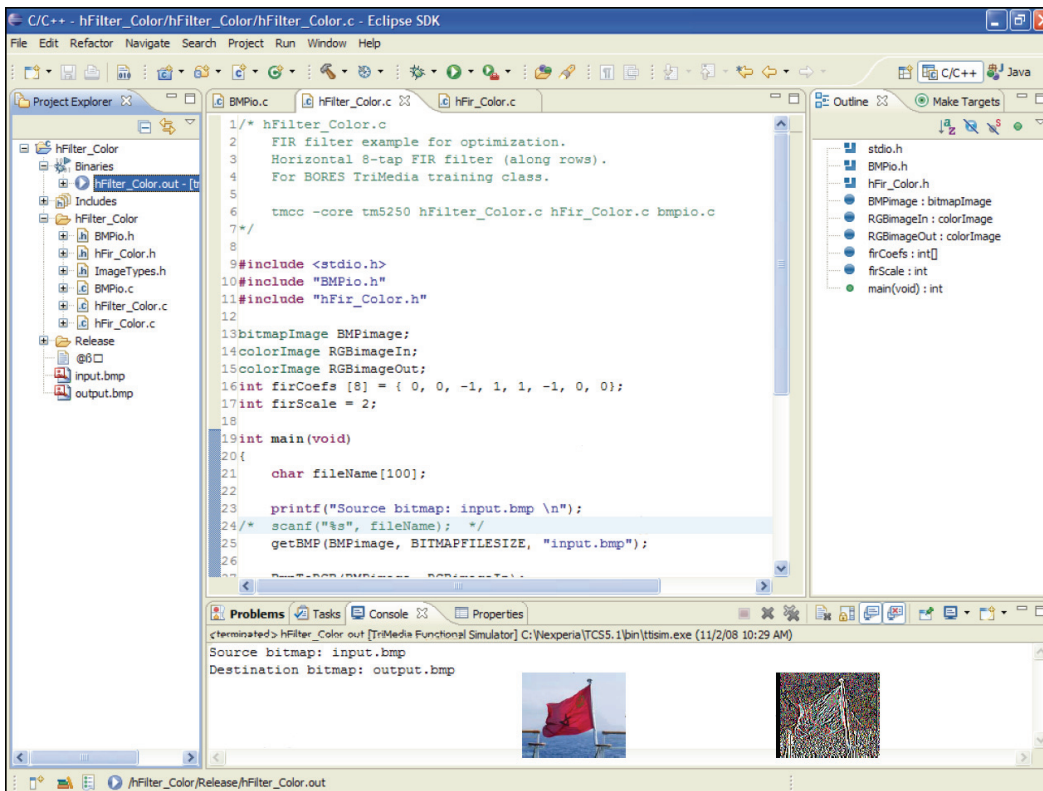
Please contact MDS for specific licensing details.

### Optional source code library

MDS can provide, with a separate NXP source code license, source for USB drivers, h264 encoder/decoder (partial), and WiFi drivers for specific Atheros based WiFi devices.

### Optional 3rd party packages

MDS can supply Blunk's target TCP library (source version) or Unicoi's Fusion TCP library (binary or source version) for basic ethernet functionality. Customers looking for higher level protocols can also purchase separate stack components from Unicoi or Blunk.



Eclipse configured for TCS use

# TMPCI-1005: pnx1005 PCI card for development of surveillance, video, and media applications

## Ordering Information (order code is in *Italics*)

### *TMPCI-1005-KIT* 400 MHz pnx1005 based development board

- TriMedia board with 128MB 333MHz DDR2 RAM (operates at 266 MHz)
- HDMI cable
- three mini stereo plug to stereo RCA (for audio)
- 2 video RCA cables
- Board design and documentation package (in optional NDK package)

### *NDK-6* NDK/TCS development and compilation tools

- Provided electronically
- Access to private website for add-ons
- Liberal upgrade policy

Custom software and hardware engineering services are available. MDS can quickly take this board design and modify it to your exact requirements. If desired MDS can produce fully tested and warranted boards for your company.

### *VCP-STD-TRI* 90 Day Getting Started Support (when board purchased with NDK)

- Help with installation of hardware/software.
- Problems in installation.
- How to use/run hardware or software that comes with the VCP.
- General questions on locating background information (MPEG, industry standards like CCIR 601 or CCIR 656, video formats, HDTV) that is applicable to the TMPCI hardware.

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

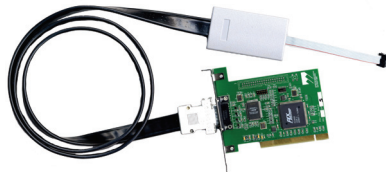
Please note there is a public support forum for Nexperia/TriMedia via Yahoo eGroups.

## Related items

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

More information about TriMedia/Nexperia can be found on NXP Semiconductors' website: <http://www.nxp.com>.

Additional information may also be available on NXP's post sales support site <http://www.tcshelp.com>



**PCI or USB JTAG:** These MDS products were specifically designed for Nexperia developers and offers unmatched code download speed.

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TargetTCP is a trademark of Blunk Microsystems Inc.



TMPCI-1005 data sheet - subject to change, rev 1b June-09

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